



## Full wwPDB EM Validation Report ⓘ

Mar 9, 2026 – 01:10 AM UTC

PDB ID : 7SSD / pdb\_00007ssd  
EMDB ID : EMD-25407  
Title : Mid translocation intermediate with EF-G bound with GDP (Structure IV)  
Authors : Carbone, C.E.; Korostelev, A.A.  
Deposited on : 2021-11-10  
Resolution : 3.30 Å(reported)

This is a Full wwPDB EM Validation Report for a publicly released PDB entry.

We welcome your comments at [validation@mail.wwpdb.org](mailto:validation@mail.wwpdb.org)

A user guide is available at

<https://www.wwpdb.org/validation/2017/EMValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

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The following versions of software and data (see [references ⓘ](#)) were used in the production of this report:

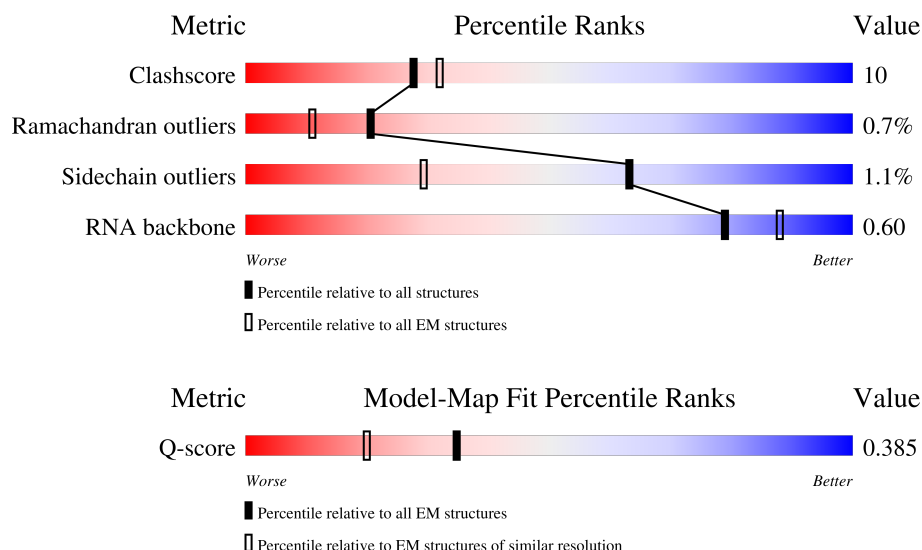
EMDB validation analysis : 0.0.1.dev132  
Mogul : 2022.3.0, CSD as543be (2022)  
MolProbity : 4-5-2 with Phenix2.0  
Buster-report : wwPDB partial adaption of 1.1.7 (2018)  
Percentile statistics : 20250101.v01 (using entries in the PDB archive January 1st 2025)  
EM percentile statistics : 202505.v01 (Using data in the EMDB archive up until May 2025)  
MapQ : 1.9.13  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.49

# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:  
*ELECTRON MICROSCOPY*




The reported resolution of this entry is 3.30 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



Metric	Whole archive (#Entries)	EM structures (#Entries)	Similar EM resolution (#Entries, resolution range(Å))
Clashscore	229148	23984	-
Ramachandran outliers	224038	23583	-
Sidechain outliers	223484	23102	-
RNA backbone	8273	3508	-
Q-score	-	25397	15087 ( 2.80 - 3.80 )

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the bar indicate the fraction of residues that contain outliers for  $\geq 3$ , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions  $\leq 5\%$ . The upper red bar (where present) indicates the fraction of residues that have poor fit to the EM map (all-atom inclusion  $< 40\%$ ). The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	3	1539	
2	1	2903	
3	2	120	












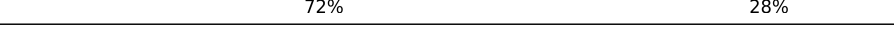







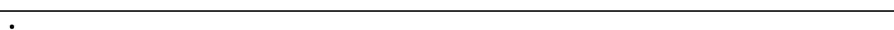

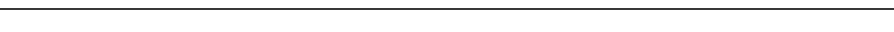
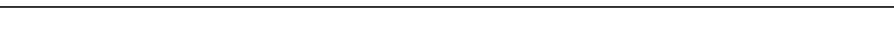


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Mol	Chain	Length	Quality of chain
4	8	697	
5	6	77	
6	b	271	
7	c	209	
8	d	201	
9	e	177	
10	f	176	
11	g	149	
12	a	234	
13	i	142	
14	j	142	
15	k	122	
16	l	143	
17	m	136	
18	n	120	
19	o	116	
20	p	114	
21	q	117	
22	r	103	
23	s	110	
24	t	93	
25	u	102	
26	v	94	
27	w	75	
28	x	77	






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Mol	Chain	Length	Quality of chain
29	y	63	
30	z	58	
31	A	66	
32	B	56	
33	C	50	
34	D	46	
35	E	64	
36	F	38	
37	4	39	
38	5	77	
39	G	225	
40	H	206	
41	I	205	
42	J	157	
43	K	100	
44	L	151	
45	M	129	
46	N	127	
47	O	98	
48	P	116	
49	Q	123	
50	R	114	
51	S	100	
52	T	88	
53	U	82	

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Mol	Chain	Length	Quality of chain
54	V	80	 79% 21%
55	W	65	 83% 17%
56	X	79	 80% 20%
57	Y	85	 78% 22%
58	Z	65	 65% 34% .

## 2 Entry composition [i](#)

There are 59 unique types of molecules in this entry. The entry contains 153049 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, the AltConf column contains the number of residues with at least one atom in alternate conformation and the Trace column contains the number of residues modelled with at most 2 atoms.

- Molecule 1 is a RNA chain called 16S rRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	3	1539	Total	C	N	O	P	0	0
			33012	14725	6052	10697	1538		

- Molecule 2 is a RNA chain called 23S rRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	1	2903	Total	C	N	O	P	0	0
			62317	27801	11468	20146	2902		

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
1	747	C	U	conflict	GB 802133627

- Molecule 3 is a RNA chain called 5S RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	2	120	Total	C	N	O	P	0	0
			2568	1145	471	833	119		

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
2	120	A	-	insertion	GB 1266961702

- Molecule 4 is a protein called Elongation factor G.

Mol	Chain	Residues	Atoms					AltConf	Trace
4	8	666	Total	C	N	O	S	0	0
			5157	3256	886	992	23		

- Molecule 5 is a RNA chain called tRNA fMet.

Mol	Chain	Residues	Atoms					AltConf	Trace
5	6	77	Total	C	N	O	P	0	0
			1640	732	297	535	76		

- Molecule 6 is a protein called 50S ribosomal protein L2.

Mol	Chain	Residues	Atoms					AltConf	Trace
6	b	271	Total	C	N	O	S	0	0
			2083	1288	423	365	7		

- Molecule 7 is a protein called 50S ribosomal protein L3.

Mol	Chain	Residues	Atoms					AltConf	Trace
7	c	209	Total	C	N	O	S	0	0
			1565	979	288	294	4		

- Molecule 8 is a protein called 50S ribosomal protein L4.

Mol	Chain	Residues	Atoms					AltConf	Trace
8	d	201	Total	C	N	O	S	0	0
			1552	974	283	290	5		

- Molecule 9 is a protein called 50S ribosomal protein L5.

Mol	Chain	Residues	Atoms					AltConf	Trace
9	e	177	Total	C	N	O	S	0	0
			1411	899	249	257	6		

- Molecule 10 is a protein called 50S ribosomal protein L6.

Mol	Chain	Residues	Atoms					AltConf	Trace
10	f	176	Total	C	N	O	S	0	0
			1323	832	243	246	2		

- Molecule 11 is a protein called 50S ribosomal protein L9.

Mol	Chain	Residues	Atoms					AltConf	Trace
11	g	149	Total	C	N	O	S	0	0
			1111	699	197	214	1		

- Molecule 12 is a protein called 50S ribosomal protein L1.

Mol	Chain	Residues	Atoms					AltConf	Trace
12	a	134	Total	C	N	O	S	0	0
			1026	645	186	193	2		

- Molecule 13 is a protein called 50S ribosomal protein L11.

Mol	Chain	Residues	Atoms					AltConf	Trace
13	i	141	Total	C	N	O	S	0	0
			1032	651	179	196	6		

- Molecule 14 is a protein called 50S ribosomal protein L13.

Mol	Chain	Residues	Atoms					AltConf	Trace
14	j	142	Total	C	N	O	S	0	0
			1129	714	212	199	4		

- Molecule 15 is a protein called 50S ribosomal protein L14.

Mol	Chain	Residues	Atoms					AltConf	Trace
15	k	122	Total	C	N	O	S	0	0
			939	587	180	166	6		

- Molecule 16 is a protein called 50S ribosomal protein L15.

Mol	Chain	Residues	Atoms					AltConf	Trace
16	l	143	Total	C	N	O	S	0	0
			1045	649	206	189	1		

- Molecule 17 is a protein called 50S ribosomal protein L16.

Mol	Chain	Residues	Atoms					AltConf	Trace
17	m	136	Total	C	N	O	S	0	0
			1074	686	205	177	6		

- Molecule 18 is a protein called 50S ribosomal protein L17.

Mol	Chain	Residues	Atoms					AltConf	Trace
18	n	120	Total	C	N	O	S	0	0
			961	593	196	167	5		

- Molecule 19 is a protein called 50S ribosomal protein L18.



Mol	Chain	Residues	Atoms				AltConf	Trace
19	o	116	Total	C	N	O	0	0
			892	552	178	162		

- Molecule 20 is a protein called 50S ribosomal protein L19.

Mol	Chain	Residues	Atoms					AltConf	Trace
20	p	114	Total	C	N	O	S	0	0
			917	574	179	163	1		

- Molecule 21 is a protein called 50S ribosomal protein L20.

Mol	Chain	Residues	Atoms				AltConf	Trace
21	q	117	Total	C	N	O	0	0
			947	604	192	151		

- Molecule 22 is a protein called 50S ribosomal protein L21.

Mol	Chain	Residues	Atoms					AltConf	Trace
22	r	103	Total	C	N	O	S	0	0
			816	516	153	145	2		

- Molecule 23 is a protein called 50S ribosomal protein L22.

Mol	Chain	Residues	Atoms					AltConf	Trace
23	s	110	Total	C	N	O	S	0	0
			857	532	166	156	3		

- Molecule 24 is a protein called 50S ribosomal protein L23.

Mol	Chain	Residues	Atoms					AltConf	Trace
24	t	93	Total	C	N	O	S	0	0
			739	466	139	132	2		

- Molecule 25 is a protein called 50S ribosomal protein L24.

Mol	Chain	Residues	Atoms				AltConf	Trace
25	u	102	Total	C	N	O	0	0
			780	492	146	142		

- Molecule 26 is a protein called 50S ribosomal protein L25.

Mol	Chain	Residues	Atoms					AltConf	Trace
26	v	94	Total	C	N	O	S	0	0
			753	479	137	134	3		

- Molecule 27 is a protein called 50S ribosomal protein L27.

Mol	Chain	Residues	Atoms					AltConf	Trace
27	w	75	Total	C	N	O	S	0	0
			575	356	116	102	1		

- Molecule 28 is a protein called 50S ribosomal protein L28.

Mol	Chain	Residues	Atoms					AltConf	Trace
28	x	77	Total	C	N	O	S	0	0
			625	388	129	106	2		

- Molecule 29 is a protein called 50S ribosomal protein L29.

Mol	Chain	Residues	Atoms					AltConf	Trace
29	y	63	Total	C	N	O	S	0	0
			509	313	99	95	2		

- Molecule 30 is a protein called 50S ribosomal protein L30.

Mol	Chain	Residues	Atoms					AltConf	Trace
30	z	58	Total	C	N	O	S	0	0
			449	281	87	79	2		

- Molecule 31 is a protein called 50S ribosomal protein L31.

Mol	Chain	Residues	Atoms					AltConf	Trace
31	A	46	Total	C	N	O	S	0	0
			355	221	62	66	6		

- Molecule 32 is a protein called 50S ribosomal protein L32.

Mol	Chain	Residues	Atoms					AltConf	Trace
32	B	56	Total	C	N	O	S	0	0
			444	269	94	80	1		

- Molecule 33 is a protein called 50S ribosomal protein L33.

Mol	Chain	Residues	Atoms				AltConf	Trace
33	C	50	Total	C	N	O	0	0
			410	263	75	72		

- Molecule 34 is a protein called 50S ribosomal protein L34.

Mol	Chain	Residues	Atoms					AltConf	Trace
34	D	46	Total	C	N	O	S	0	0
			377	228	90	57	2		

- Molecule 35 is a protein called 50S ribosomal protein L35.

Mol	Chain	Residues	Atoms					AltConf	Trace
35	E	64	Total	C	N	O	S	0	0
			504	323	105	74	2		

- Molecule 36 is a protein called 50S ribosomal protein L36.

Mol	Chain	Residues	Atoms					AltConf	Trace
36	F	38	Total	C	N	O	S	0	0
			302	185	65	48	4		

- Molecule 37 is a RNA chain called mRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
37	4	16	Total	C	N	O	P	0	0
			350	156	70	108	16		

- Molecule 38 is a RNA chain called tRNA Pro.

Mol	Chain	Residues	Atoms					AltConf	Trace
38	5	77	Total	C	N	O	P	0	0
			1647	733	295	542	77		

- Molecule 39 is a protein called 30S ribosomal protein S2.

Mol	Chain	Residues	Atoms					AltConf	Trace
39	G	218	Total	C	N	O	S	0	0
			1705	1081	305	312	7		

- Molecule 40 is a protein called 30S ribosomal protein S3.

Mol	Chain	Residues	Atoms					AltConf	Trace
40	H	206	Total	C	N	O	S	0	0
			1625	1028	305	289	3		

- Molecule 41 is a protein called 30S ribosomal protein S4.

Mol	Chain	Residues	Atoms					AltConf	Trace
41	I	205	Total	C	N	O	S	0	0
			1643	1026	315	298	4		

- Molecule 42 is a protein called 30S ribosomal protein S5.

Mol	Chain	Residues	Atoms					AltConf	Trace
42	J	157	Total	C	N	O	S	0	0
			1157	719	218	214	6		

- Molecule 43 is a protein called 30S ribosomal protein S6.

Mol	Chain	Residues	Atoms					AltConf	Trace
43	K	100	Total	C	N	O	S	0	0
			818	515	148	149	6		

- Molecule 44 is a protein called 30S ribosomal protein S7.

Mol	Chain	Residues	Atoms					AltConf	Trace
44	L	151	Total	C	N	O	S	0	0
			1182	735	227	216	4		

- Molecule 45 is a protein called 30S ribosomal protein S8.

Mol	Chain	Residues	Atoms					AltConf	Trace
45	M	129	Total	C	N	O	S	0	0
			979	616	173	184	6		

- Molecule 46 is a protein called 30S ribosomal protein S9.

Mol	Chain	Residues	Atoms					AltConf	Trace
46	N	127	Total	C	N	O	S	0	0
			1022	634	206	179	3		

- Molecule 47 is a protein called 30S ribosomal protein S10.

Mol	Chain	Residues	Atoms					AltConf	Trace
47	O	98	Total	C	N	O	S	0	0
			787	493	150	143	1		

- Molecule 48 is a protein called 30S ribosomal protein S11.

Mol	Chain	Residues	Atoms					AltConf	Trace
48	P	116	Total	C	N	O	S	0	0
			870	535	173	159	3		

- Molecule 49 is a protein called 30S ribosomal protein S12.

Mol	Chain	Residues	Atoms					AltConf	Trace
49	Q	123	Total	C	N	O	S	0	0
			955	590	196	165	4		

- Molecule 50 is a protein called 30S ribosomal protein S13.

Mol	Chain	Residues	Atoms					AltConf	Trace
50	R	114	Total	C	N	O	S	0	0
			884	546	178	157	3		

- Molecule 51 is a protein called 30S ribosomal protein S14.

Mol	Chain	Residues	Atoms					AltConf	Trace
51	S	100	Total	C	N	O	S	0	0
			805	499	164	139	3		

- Molecule 52 is a protein called 30S ribosomal protein S15.

Mol	Chain	Residues	Atoms					AltConf	Trace
52	T	88	Total	C	N	O	S	0	0
			714	439	144	130	1		

- Molecule 53 is a protein called 30S ribosomal protein S16.

Mol	Chain	Residues	Atoms					AltConf	Trace
53	U	82	Total	C	N	O	S	0	0
			649	406	128	114	1		

- Molecule 54 is a protein called 30S ribosomal protein S17.

Mol	Chain	Residues	Atoms					AltConf	Trace
54	V	80	Total	C	N	O	S	0	0
			649	411	121	114	3		

- Molecule 55 is a protein called 30S ribosomal protein S18.

Mol	Chain	Residues	Atoms					AltConf	Trace
55	W	65	Total	C	N	O	S	0	0
			536	339	100	96	1		

- Molecule 56 is a protein called 30S ribosomal protein S19.

Mol	Chain	Residues	Atoms					AltConf	Trace
56	X	79	Total	C	N	O	S	0	0
			638	408	120	108	2		

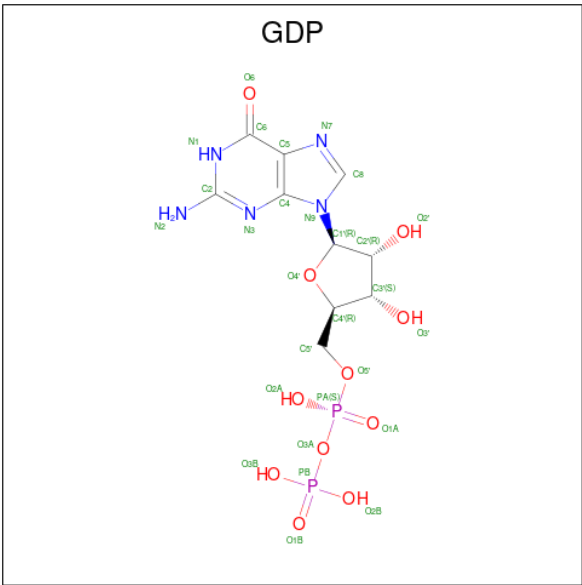
- Molecule 57 is a protein called 30S ribosomal protein S20.

Mol	Chain	Residues	Atoms					AltConf	Trace
57	Y	85	Total	C	N	O	S	0	0
			665	411	137	114	3		

- Molecule 58 is a protein called 30S ribosomal protein S21.

Mol	Chain	Residues	Atoms					AltConf	Trace
58	Z	65	Total	C	N	O	S	0	0
			545	335	117	92	1		

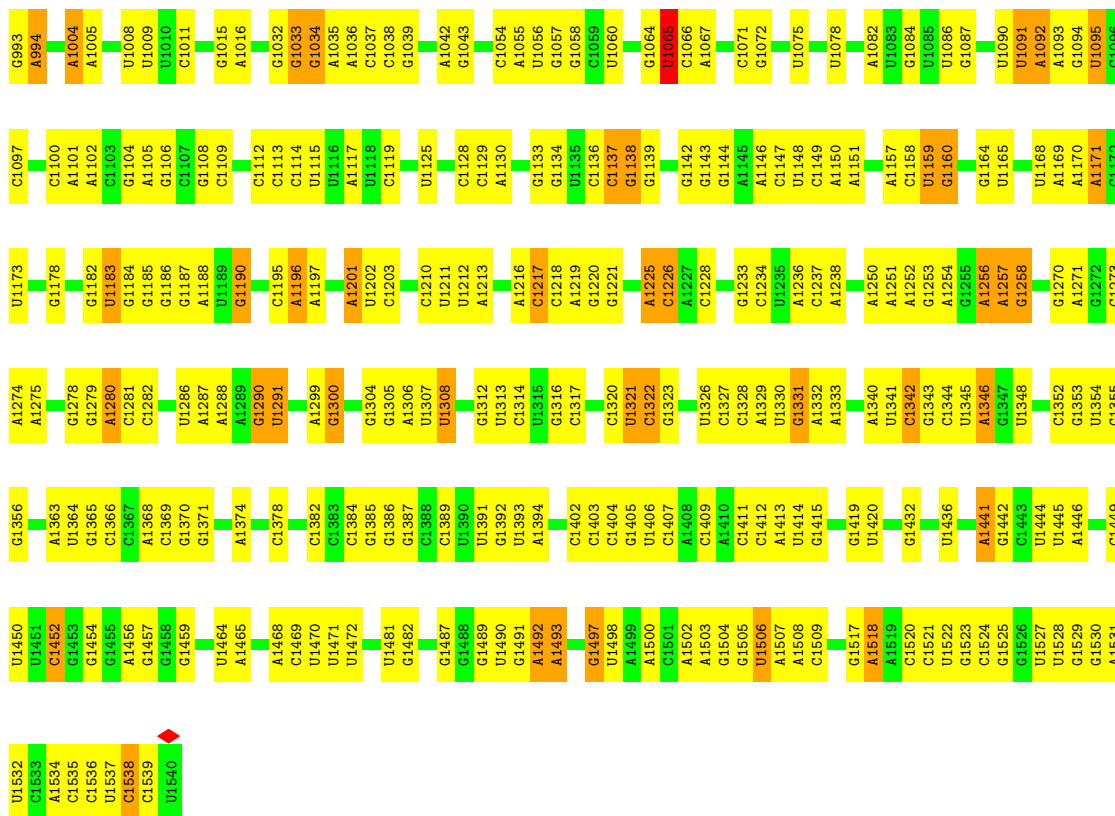
- Molecule 59 is GUANOSINE-5'-DIPHOSPHATE (CCD ID: GDP) (formula:  $C_{10}H_{15}N_5O_{11}P_2$ ) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms					AltConf
59	8	1	Total	C	N	O	P	0
			28	10	5	11	2	

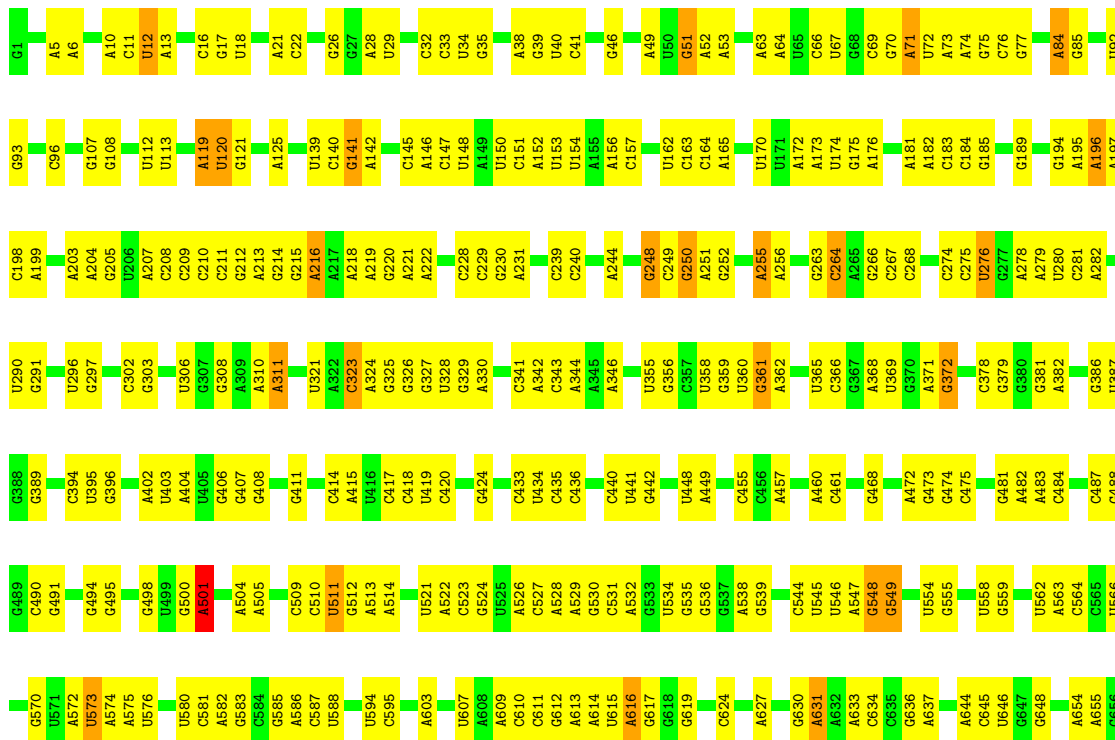




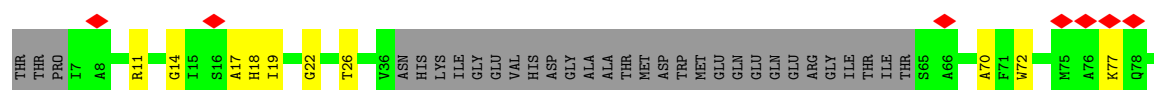


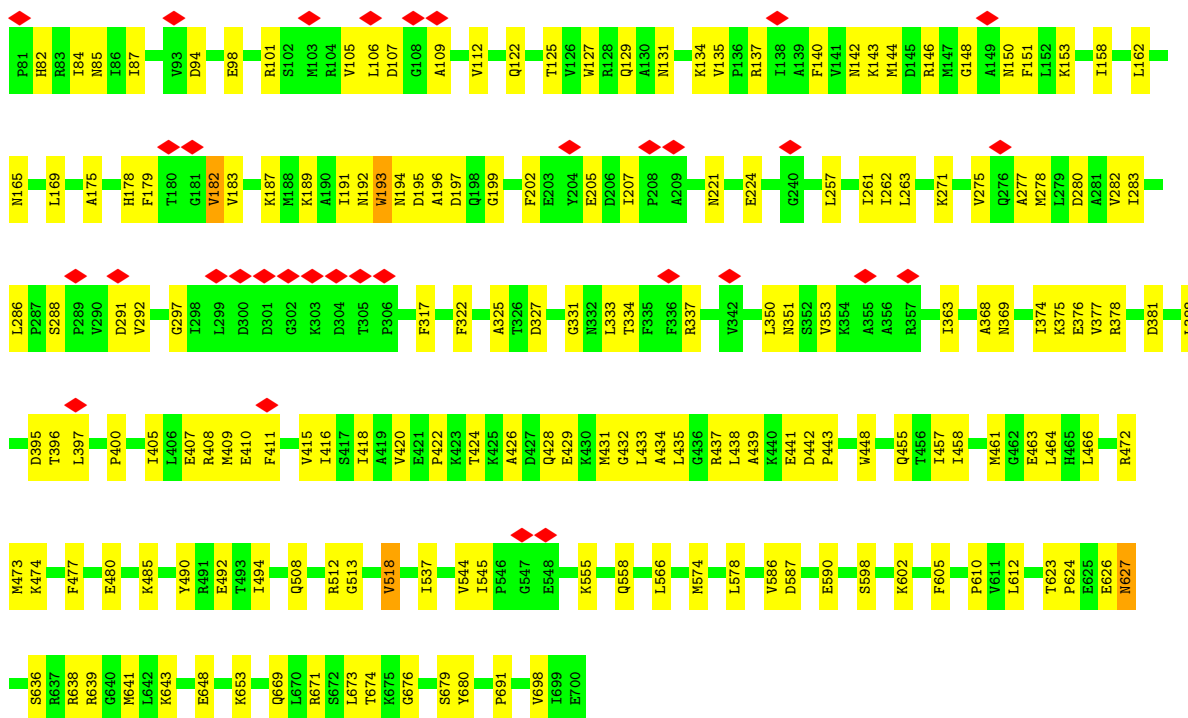
### • Molecule 2: 23S rRNA

Chain 1: 56% 39% 5%



U2011	G1929	U1818	C1726	U1624	G1527	G1424	A1327	A1230	A1143	G1062	U1970	C873	U767	U657
G2012	G1930	A1819	C1727	C1625	A1528	G1425	A1328	U1231	A1144	G1063	G971	C874	G768	C660
A2013	U1931	G1824	U1728	A1626	G1529	G1426	U1329	G1232	C1145	U1065	A972	G875	G769	
A2014	U1932	U1825	C1730	G1627	A1535	A1428	C1330	G1236	G1149	U1066	A973	C876	G770	G659
U2015	G1933	U1826	C1731	G1628	C1536	G1429	U1336	A1237	C1150	A878	G974	A877	G771	
U2017		U1827	C1732		G1537		A1337	G1238		G879	A975	G878	C772	G674
	A1937	G1828		A1634			G1338		C1153	A1070	C982	G883	U773	A675
U2022	A1938	U1736	U1736	A1635	U1542	A1433	G1337	U1242	G1154	C1076	A983	U884	G776	A676
G2023	U1939	G1737	G1737	A1637	G1543	A1434	U1339	C1243	A1155	A1077	C984	G885	G777	U686
G2024	U1940	G1738				G1435	U1340			A886	C986	A887	G778	
G2025				G1645	C1547		A1342	U1249	G1162	U1078	G989	U887	U779	G690
U2026	U1944	A1744	A1744	C1646	C1548	G1441	G1343	G1250	G1163	A1080	G990	G891	G780	C691
G1945	G1945	A1745		U1647	A1549		U1344	C1251	C1164	U1081	A991	A781	A781	
U1946	U1947			U1648	C1550	G1444	C1345	G1252	A1165	C992	A982	A892	G782	U694
G1948	G1948	C1748	C1748	G1651	A1551	G1445	U1346	A1253	G1166	U1083	C993	C893	G783	G695
		A1749	A1749	G1652	C1558	G1446	C1347	U1254	C1167	A1084	G993	U894	G784	
U1951	U1951	U1758	U1758	G1652	C1559	G1448	U1352	G1255	A1169	A1085	C994	U895	G785	A699
A1952	A1952	C1759		C1658	U1560		A1353	G1256	C1170	C995	C995	A896	G785	G700
U1953	U1953	G1760		G1659	C1561	G1451	U1354	U1263	G1171	A1086	A996	A897	G785	G701
G1954	G1954	C1764	C1764	G1660	U1562	G1452	G1355	A1264	C1172	A1087	A996	C897	G785	
U1955	U1955	U1765	U1765	G1661	U1563	G1453	G1356	U1264	U1173	A1088	A1000	A898	G785	A705
U1956	U1956			G1662	G1567	G1454	U1356	G1271	U1174		A1001	A910	G785	A706
C1958	C1958	G1770		G1666	A1570		G1360	A1272	A1175	C1092	A1002	A911	G785	A707
G1959	G1959			G1667	C1571	G1461	G1361	U1273	U1176	G1093	G1005	A912	G785	G708
U1963	U1963	A1773	A1773	G1674	C1572	G1462	C1362	U1274	G1177	U1097	C1006	U913	G785	U709
G1964	G1964	U1774	U1774	G1675	C1573	G1463	U1363	A1275	C1178	A1098	U1012	U914	G785	U710
C1965	C1965	U1775	U1775	G1676	U1574	G1464	G1364	G1276	G1179		U1013	A918	G785	A716
A1966	A1966	U1776	U1776	G1677	U1575		A1365	A1277	U1180	U1101	U1014	G923	G785	C717
C1967	C1967	U1777	U1777	G1678	C1582	G1465	U1366	G1280	U1181	C1102	U1015	G924	G785	A718
U1968	U1968	U1778	U1778	A1679	A1583	G1466	C1367	G1281	G1182	A1103	U1016	G925	G785	C718
A1969	A1969	U1779	U1779	G1683	U1584	G1467	U1368	U1282	U1183	C1104	U1017	U926	G785	C719
U1970	U1970	U1780	U1780	G1684	U1585	G1468	U1369	G1283	U1184	U1105	U1018	U927	G785	U720
C1971	C1971	U1781	U1781	G1685	A1586	G1469	U1370	G1284	G1185		U1019	U928	G785	A721
U1972	U1972	U1782	U1782	G1686	A1587	G1470	U1371	A1285	G1186	G1110	U1020	U929	G785	
G1973	G1973	A1783	A1783	G1687	A1588	G1471	C1383	A1286	U1187	A1111	A1021	A933	G785	G725
C1974	C1974	U1784	U1784	G1688	A1589	G1472	U1384	A1287	U1188	U934	A1022	A934	G785	G726
G1975	G1975	A1785	A1785	G1689	C1592	G1473	U1385	A1288	A1189	C1112	A1023	A935	G785	A727
U1976	U1976	U1786	U1786	G1690	U1593	G1474	U1386	G1293	G1190	U1113	U1033	A936	G785	G728
C1977	C1977	U1787	U1787	A1700	U1594	G1475	A1387	U1294	G1191	C1114	U1034	C937	G785	G729
U1978	U1978	U1788	U1788	G1702	C1595	G1476	U1390	C1295	C1196	G1115	U1035	U828	G785	A730
					A1596	G1477	U1391	G1296	U1197	G1124	U1036	G940	G785	U741
U1982	U1982	U1791	U1791	G1706	A1597	G1478	U1392	C1297	U1198	A941	G1037	A942	G785	A742
A1983	A1983	U1792	U1792	G1707	A1598	G1479	U1393	C1298	U1199	U1125	G1038	A943	G785	A743
G1984	G1984	U1793	U1793	G1708	U1599	G1480	U1394	G1299	C1200	A1126	U1039	A944	G785	U744
C1985	C1985	U1794	U1794	G1709	U1600	G1481	U1395	G1300	G1196	A1127	C1043	A945	G785	G745
U1986	U1986	A1801	A1801	G1710	G1601	G1482	U1396	G1301	U1203	A1128	C1044	A946	G785	U746
A1987	A1987	U1802	U1802	G1711	U1602	G1483	U1397	A1302	A1204	U1130	C1045	A947	G785	C747
					A1603	G1484	A1403	A1303	A1205	U1132	A1046	C948	G785	G748
U1988	U1988	U1803	U1803	A1713	A1604	G1485	U1406	U1316	G1212	A1133	G1055	G952	G785	A753
C1989	C1989	C1806	C1806	U1714	A1605	G1486	U1407	G1317	G1213	A1134	G1056	G953	G785	U754
U1990	U1990	G1807	G1807	G1715	A1606	G1487	U1408	U1318	U1219	C1135	U1057	G954	G785	G760
A1991	A1991	U1808	U1808	G1716	G1613	G1488	U1409	U1319	G1220	A1058	U1058	G955	G785	A761
U1992	U1992	A1809	A1809	G1717	A1614	G1489	G1410	C1320	G1221	U1059	U1059	G956	G785	U762
C1993	C1993	U1810	U1810	G1718	A1615	G1490	U1411	A1321	G1222	U1141	U1060	G957	G785	G763
U1994	U1994	U1811	U1811	A1719	A1616	G1491	U1412	A1322	G1223	A1142	U1061	G958	G785	A764
A1995	A1995	G1812	G1812	G1720	A1617	G1492	U1413	U1323	C1224			G959	G785	
G1996	G1996	U1813	U1813	G1721	A1618	G1493	U1414	A1324	G1225			G960	G785	
U1997	U1997	C1814	C1814	G1722	A1619	G1494	U1415	U1325	C1226			G961	G785	
C1998	C1998	U1815	U1815	G1723	A1620	G1495	U1416	A1326	G1227			G962	G785	
A1999	A1999	U1816	U1816	G1724	A1621	G1496	U1417	U1327	C1228			G963	G785	
U2000	U2000	G1817	G1817	U1725	A1622	G1497	U1418	U1328	C1229			G964	G785	
G2001	G2001													
U2002	U2002													
C2003	C2003													
U2004	U2004													
A2005	A2005													
G2006	G2006													
U2007	U2007													
A2008	A2008													
C2009	C2009													
U2010	U2010													
A2011	A2011													
G2012	G2012													
U2013	U2013													
A2014	A2014													
U2015	U2015													
C2016	C2016													
U2017	U2017													
A2018	A2018													
G2019	G2019													
U2020	U2020													
A2021	A2021													
C2022	C2022													
U2023	U2023													
A2024	A2024													
G2025	G2025													
U2026	U2026													
A2027	A2027													
C2028	C2028													
U2029	U2029													
A2030	A2030													
G2031	G2031													
U2032	U2032													
A2033	A2033													
G2034	G2034													
U2035	U2035													
A2036	A2036													
C2037	C2037													
U2038	U2038													
A2039	A2039													
G2040	G2040													
U2041	U2041													
A2042	A2042													
C2043	C2043													
U2044	U2044													
A2045	A2045													
G2046	G2046													
U2047	U2047													
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C2049	C2049													
U2050	U2050													
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A2054	A2054													
C2055	C2055													





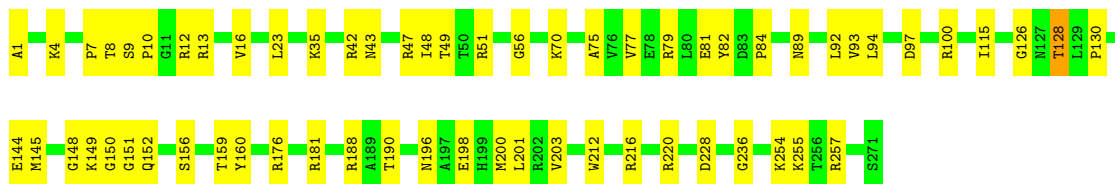
• Molecule 5: tRNA fMet

Chain 6: 56% 34% 10%



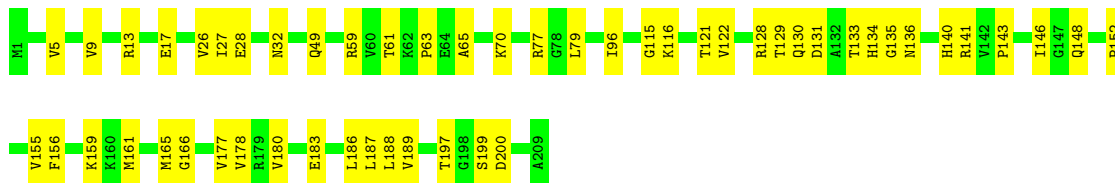
• Molecule 6: 50S ribosomal protein L2

Chain b: 77% 23%




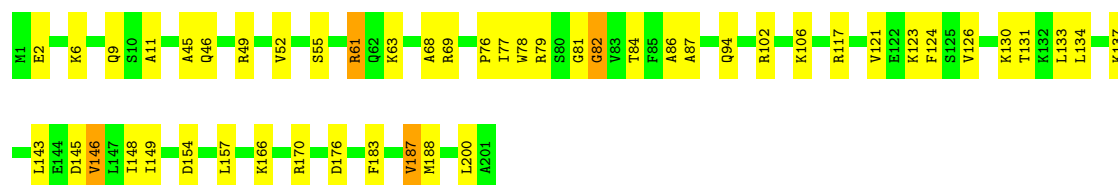
• Molecule 7: 50S ribosomal protein L3

Chain c: 75% 25%



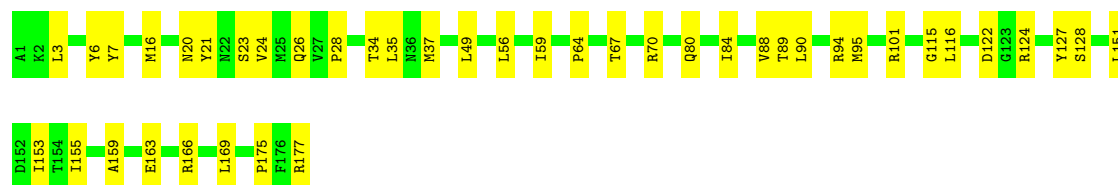
• Molecule 8: 50S ribosomal protein L4

Chain d:  76% 22% .




• Molecule 9: 50S ribosomal protein L5

Chain e:  76% 24%




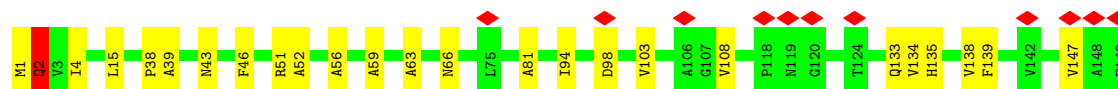
• Molecule 10: 50S ribosomal protein L6

Chain f:  85% 14% .



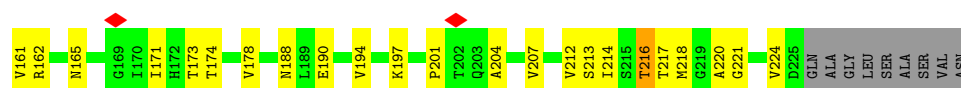
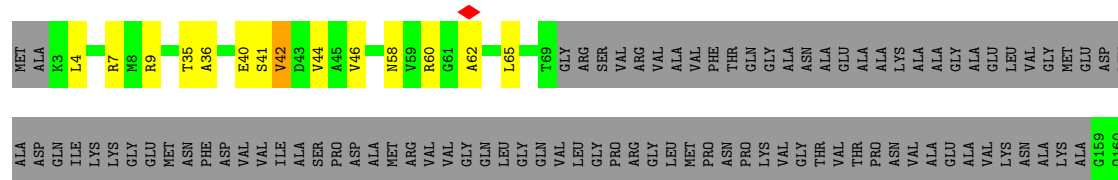
• Molecule 11: 50S ribosomal protein L9

Chain g:  7% 83% 16% .

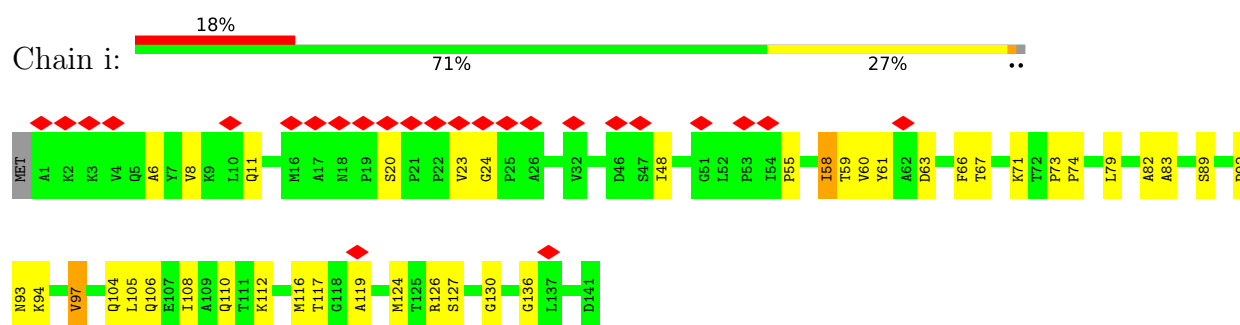


• Molecule 12: 50S ribosomal protein L1

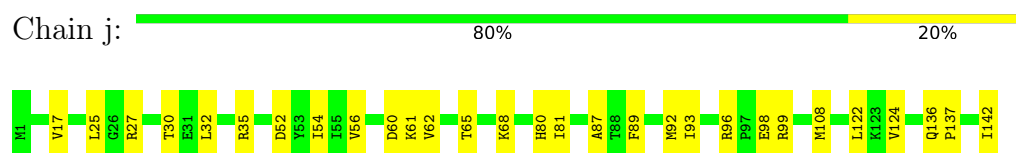
Chain a:  41% 15% 43% .



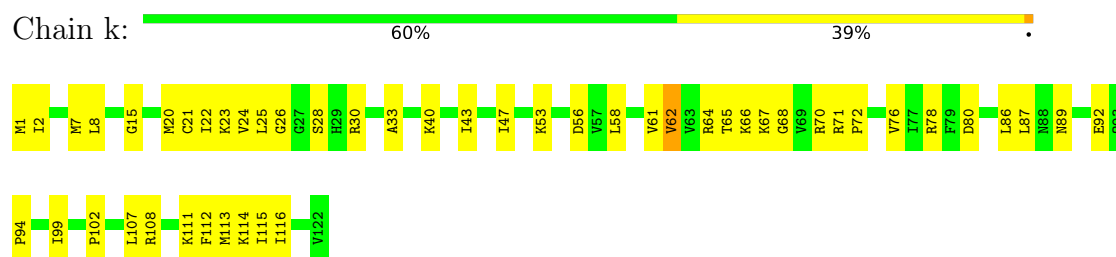
• Molecule 13: 50S ribosomal protein L11



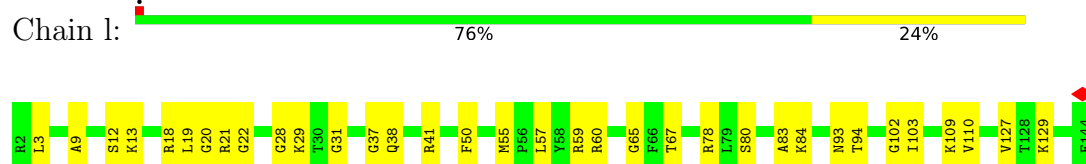
- Molecule 14: 50S ribosomal protein L13



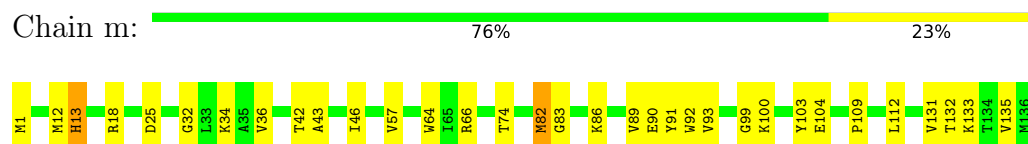
- Molecule 15: 50S ribosomal protein L14



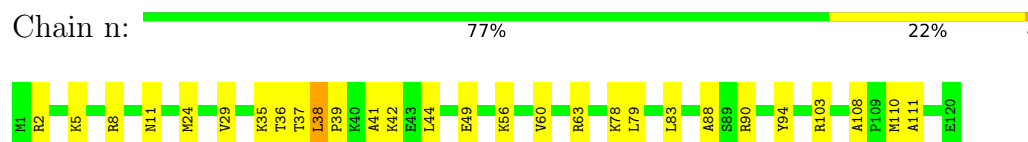
- Molecule 16: 50S ribosomal protein L15




- Molecule 17: 50S ribosomal protein L16



- Molecule 18: 50S ribosomal protein L17




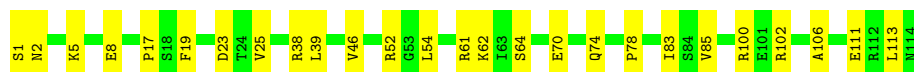
- Molecule 19: 50S ribosomal protein L18

Chain o:  84% 16%




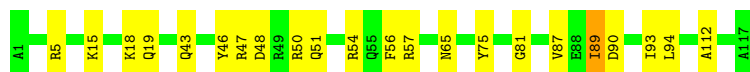
- Molecule 20: 50S ribosomal protein L19

Chain p:  77% 23%



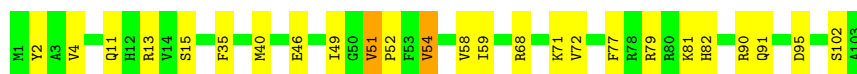
- Molecule 21: 50S ribosomal protein L20

Chain q:  81% 18%



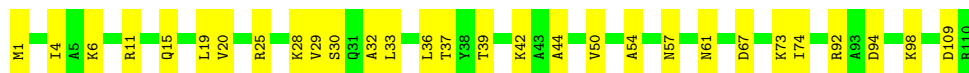
- Molecule 22: 50S ribosomal protein L21

Chain r:  76% 22%




- Molecule 23: 50S ribosomal protein L22

Chain s:  74% 26%




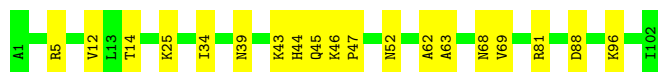
- Molecule 24: 50S ribosomal protein L23

Chain t:  85% 15%



- Molecule 25: 50S ribosomal protein L24

Chain u:  81% 19%




- Molecule 26: 50S ribosomal protein L25

Chain v:  72% 28%




- Molecule 27: 50S ribosomal protein L27

Chain w:  83% 17%



- Molecule 28: 50S ribosomal protein L28

Chain x:  82% 18%




- Molecule 29: 50S ribosomal protein L29

Chain y:  94% 6%



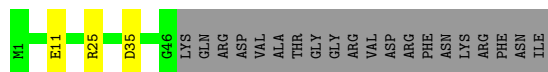
- Molecule 30: 50S ribosomal protein L30

Chain z:  76% 22%




- Molecule 31: 50S ribosomal protein L31

Chain A:  65% 5% 30%



- Molecule 32: 50S ribosomal protein L32

Chain B:  80% 18%



- Molecule 33: 50S ribosomal protein L33





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- ```

graph LR
    M1[M1] --- K2[K2]
    K2 --- R3[R3]
    R3 --- S8[S8]
    S8 --- V9[V9]
    V9 --- L10[L10]
    L10 --- K11[K11]
    K11 --- R14[R14]
    R14 --- A23[A23]
    A23 --- R28[R28]
    R28 --- K46[K46]
  
```

- 

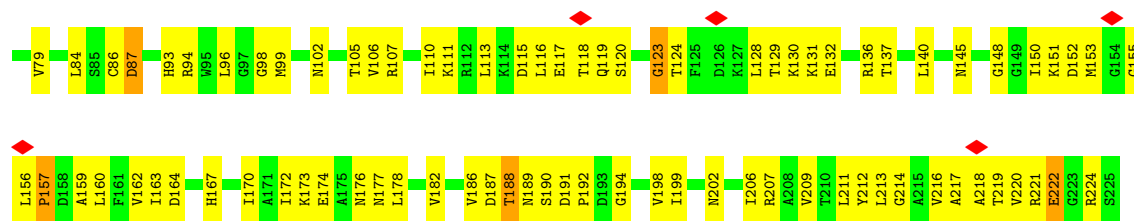
- 
- | Category | Count |
|----------|-------|
| M1       | 1     |
| V7       | 1     |
| C11      | 1     |
| C14      | 1     |
| E30      | 1     |
| P31      | 1     |
| K32      | 1     |
| R36      | 1     |
| Q37      | 1     |
| G38      | 1     |

- G G G C A A5 G6 G7 A8 G9 G10 U U A A A A A15 A16 U17 G18 C19 C20 C21 A21 A22 A23 G23 U24 U U C U C A A A A A A A A A A A A

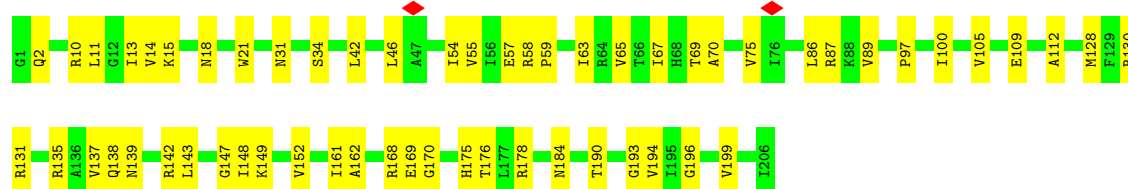
- |    |    |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |      |
|----|----|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|
| C1 | C2 | C3 | C4 | C5 | C6 | C7 | C8 | C9 | C10 | C11 | C12 | C13 | C14 | C15 | C16 | C17 | C18 | C19 | C20 | C21 | C22 | C23 | C24 | C25 | C26 | C27 | C28 | C29 | C30 | C31 | C32 | C33 | C34 | C35 | C36 | C37 | C38 | C39 | C40 | C41 | C42 | C43 | C44 | C45 | C46 | C47 | C48 | C49 | C50 | C51 | C52 | C53 | C54 | C55 | C56 | C57 | C58 | C59 | C60 | C61 | C62 | C63 | C64 | C65 | C66 | C67 | C68 | C69 | C70 | C71 | C72 | C73 | C74 | C75 | C76 | C77 | C78 | C79 | C80 | C81 | C82 | C83 | C84 | C85 | C86 | C87 | C88 | C89 | C90 | C91 | C92 | C93 | C94 | C95 | C96 | C97 | C98 | C99 | C100 |
|----|----|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|



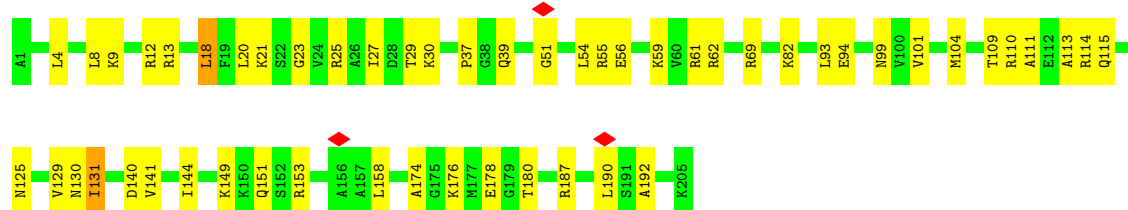
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|-----|-----|-----|-----|-----|-----|-----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| ALA | THR | VAL | SER | MET | ARG | ASP | MB | V13 | H14 | F15 | G16 | H17 | Q18 | R19 | R20 | Y21 | W22 | N23 | P24 | K25 | M26 | K27 | P28 | F29 | I30 | F31 | G32 | A33 | R34 | N35 | I39 | I40 | H41 | L42 | E43 | K44 | T45 | V46 | A47 | M48 | F49 | N50 | E51 | A52 | L53 | L56 | K63 | G64 | K65 | I66 | L67 | F68 | V69 | A75 |
|-----|-----|-----|-----|-----|-----|-----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|



- Molecule 40: 30S ribosomal protein S3



- Molecule 41: 30S ribosomal protein S4




- Molecule 42: 30S ribosomal protein S5

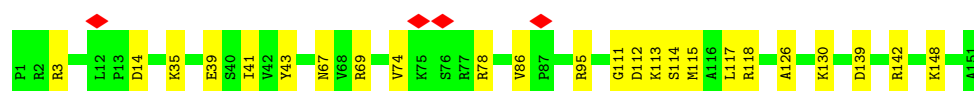


- Molecule 43: 30S ribosomal protein S6



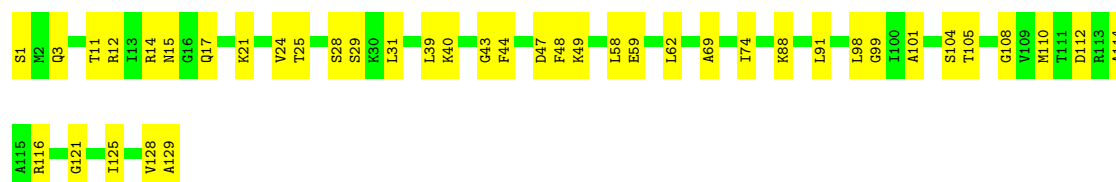
- Molecule 44: 30S ribosomal protein S7

Chain L:  84% 16%



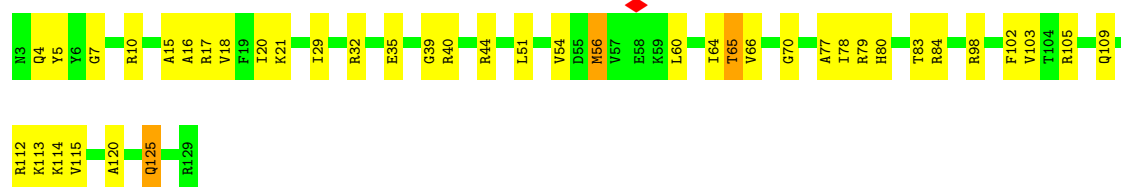
- Molecule 45: 30S ribosomal protein S8

Chain M:  68% 32%



- Molecule 46: 30S ribosomal protein S9

Chain N:  68% 30% .



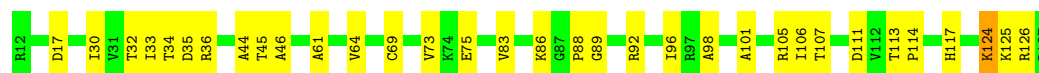
- Molecule 47: 30S ribosomal protein S10

Chain O:  71% 29%



- Molecule 48: 30S ribosomal protein S11

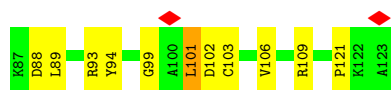
Chain P:  72% 28% .



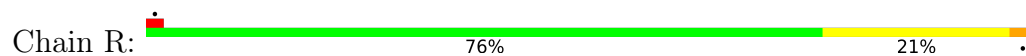
- Molecule 49: 30S ribosomal protein S12

Chain Q:  63% 32% 5% .

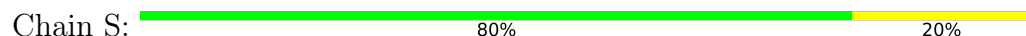




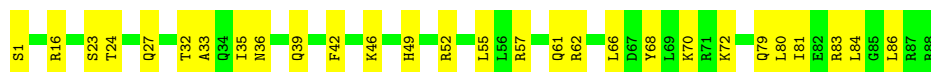
- Molecule 50: 30S ribosomal protein S13



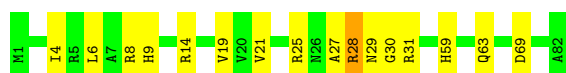
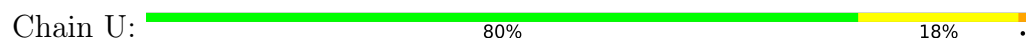
- Molecule 51: 30S ribosomal protein S14



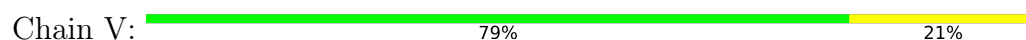
- Molecule 52: 30S ribosomal protein S15



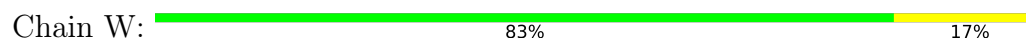
- Molecule 53: 30S ribosomal protein S16



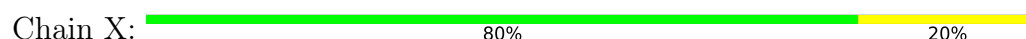
- Molecule 54: 30S ribosomal protein S17



- Molecule 55: 30S ribosomal protein S18

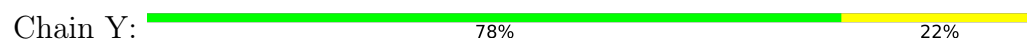


- Molecule 56: 30S ribosomal protein S19





- Molecule 57: 30S ribosomal protein S20



- Molecule 58: 30S ribosomal protein S21



## 4 Experimental information

| Property                             | Value                                   | Source    |
|--------------------------------------|-----------------------------------------|-----------|
| EM reconstruction method             | SINGLE PARTICLE                         | Depositor |
| Imposed symmetry                     | POINT, Not provided                     |           |
| Number of particles used             | 3778                                    | Depositor |
| Resolution determination method      | FSC 0.143 CUT-OFF                       | Depositor |
| CTF correction method                | PHASE FLIPPING AND AMPLITUDE CORRECTION | Depositor |
| Microscope                           | FEI TITAN KRIOS                         | Depositor |
| Voltage (kV)                         | 300                                     | Depositor |
| Electron dose ( $e^-/\text{\AA}^2$ ) | 47.6                                    | Depositor |
| Minimum defocus (nm)                 | 800                                     | Depositor |
| Maximum defocus (nm)                 | 2000                                    | Depositor |
| Magnification                        | Not provided                            |           |
| Image detector                       | GATAN K3 (6k x 4k)                      | Depositor |
| Maximum map value                    | 27.032                                  | Depositor |
| Minimum map value                    | -14.235                                 | Depositor |
| Average map value                    | 0.111                                   | Depositor |
| Map value standard deviation         | 0.944                                   | Depositor |
| Recommended contour level            | 0.7                                     | Depositor |
| Map size (Å)                         | 370.5408, 370.5408, 370.5408            | wwPDB     |
| Map dimensions                       | 448, 448, 448                           | wwPDB     |
| Map angles (°)                       | 90.0, 90.0, 90.0                        | wwPDB     |
| Pixel spacing (Å)                    | 0.8271, 0.8271, 0.8271                  | Depositor |

## 5 Model quality

### 5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: GDP

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with  $|Z| > 5$  is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

| Mol | Chain | Bond lengths |             | Bond angles |                 |
|-----|-------|--------------|-------------|-------------|-----------------|
|     |       | RMSZ         | $\# Z  > 5$ | RMSZ        | $\# Z  > 5$     |
| 1   | 3     | 0.43         | 0/36963     | 0.50        | 2/57662 (0.0%)  |
| 2   | 1     | 0.44         | 0/69796     | 0.51        | 4/108888 (0.0%) |
| 3   | 2     | 0.44         | 0/2872      | 0.49        | 0/4479          |
| 4   | 8     | 0.30         | 0/5253      | 0.80        | 9/7106 (0.1%)   |
| 5   | 6     | 0.44         | 0/1832      | 0.50        | 0/2855          |
| 6   | b     | 0.48         | 0/2122      | 0.74        | 0/2852          |
| 7   | c     | 0.40         | 0/1586      | 0.70        | 0/2134          |
| 8   | d     | 0.35         | 0/1571      | 0.65        | 0/2113          |
| 9   | e     | 0.30         | 0/1435      | 0.69        | 0/1926          |
| 10  | f     | 0.26         | 0/1343      | 0.56        | 0/1816          |
| 11  | g     | 0.26         | 0/1122      | 0.68        | 2/1515 (0.1%)   |
| 12  | a     | 0.22         | 0/1033      | 0.52        | 0/1387          |
| 13  | i     | 0.27         | 0/1046      | 0.66        | 0/1410          |
| 14  | j     | 0.38         | 0/1152      | 0.57        | 0/1551          |
| 15  | k     | 0.43         | 0/948       | 0.77        | 2/1268 (0.2%)   |
| 16  | l     | 0.39         | 0/1054      | 0.83        | 2/1403 (0.1%)   |
| 17  | m     | 0.40         | 0/1093      | 0.67        | 0/1460          |
| 18  | n     | 0.42         | 0/974       | 0.77        | 0/1301          |
| 19  | o     | 0.28         | 0/902       | 0.57        | 0/1209          |
| 20  | p     | 0.35         | 0/929       | 0.61        | 0/1242          |
| 21  | q     | 0.41         | 0/960       | 0.59        | 0/1278          |
| 22  | r     | 0.34         | 0/829       | 0.66        | 0/1107          |
| 23  | s     | 0.37         | 0/864       | 0.67        | 0/1156          |
| 24  | t     | 0.32         | 0/745       | 0.59        | 0/994           |
| 25  | u     | 0.31         | 0/788       | 0.64        | 2/1051 (0.2%)   |
| 26  | v     | 0.31         | 0/766       | 0.58        | 0/1025          |
| 27  | w     | 0.36         | 0/582       | 0.66        | 0/769           |
| 28  | x     | 0.41         | 0/635       | 0.57        | 0/848           |
| 29  | y     | 0.28         | 0/510       | 0.51        | 0/677           |
| 30  | z     | 0.34         | 0/453       | 0.71        | 0/605           |
| 31  | A     | 0.24         | 0/362       | 0.62        | 0/485           |
| 32  | B     | 0.38         | 0/450       | 0.69        | 0/599           |

| Mol | Chain | Bond lengths |             | Bond angles |                  |
|-----|-------|--------------|-------------|-------------|------------------|
|     |       | RMSZ         | $\# Z  > 5$ | RMSZ        | $\# Z  > 5$      |
| 33  | C     | 0.29         | 0/417       | 0.55        | 0/554            |
| 34  | D     | 0.46         | 0/380       | 0.77        | 0/498            |
| 35  | E     | 0.43         | 0/513       | 0.91        | 4/676 (0.6%)     |
| 36  | F     | 0.42         | 0/303       | 0.87        | 0/397            |
| 37  | 4     | 0.56         | 0/392       | 0.64        | 0/608            |
| 38  | 5     | 0.45         | 0/1840      | 0.54        | 0/2868           |
| 39  | G     | 0.38         | 0/1736      | 0.88        | 4/2338 (0.2%)    |
| 40  | H     | 0.27         | 0/1652      | 0.63        | 0/2225           |
| 41  | I     | 0.27         | 0/1665      | 0.66        | 0/2227           |
| 42  | J     | 0.38         | 0/1170      | 0.82        | 0/1573           |
| 43  | K     | 0.34         | 0/836       | 0.83        | 5/1128 (0.4%)    |
| 44  | L     | 0.23         | 0/1196      | 0.58        | 0/1602           |
| 45  | M     | 0.29         | 0/989       | 0.58        | 0/1326           |
| 46  | N     | 0.31         | 0/1034      | 0.76        | 1/1375 (0.1%)    |
| 47  | O     | 0.29         | 0/797       | 0.71        | 0/1077           |
| 48  | P     | 0.32         | 0/886       | 0.71        | 2/1195 (0.2%)    |
| 49  | Q     | 0.33         | 0/969       | 0.81        | 3/1300 (0.2%)    |
| 50  | R     | 0.29         | 0/893       | 0.70        | 1/1193 (0.1%)    |
| 51  | S     | 0.23         | 0/817       | 0.52        | 0/1088           |
| 52  | T     | 0.32         | 0/722       | 0.63        | 0/964            |
| 53  | U     | 0.29         | 0/659       | 0.80        | 0/884            |
| 54  | V     | 0.33         | 0/658       | 0.69        | 0/881            |
| 55  | W     | 0.29         | 0/545       | 0.65        | 0/731            |
| 56  | X     | 0.28         | 0/653       | 0.76        | 2/877 (0.2%)     |
| 57  | Y     | 0.27         | 0/671       | 0.62        | 0/888            |
| 58  | Z     | 0.33         | 0/551       | 0.88        | 2/728 (0.3%)     |
| All | All   | 0.41         | 0/165914    | 0.57        | 47/247372 (0.0%) |

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand. A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

| Mol | Chain | #Chirality outliers | #Planarity outliers |
|-----|-------|---------------------|---------------------|
| 2   | 1     | 0                   | 3                   |
| 4   | 8     | 0                   | 5                   |
| 7   | c     | 0                   | 1                   |
| 8   | d     | 0                   | 2                   |
| 9   | e     | 0                   | 1                   |
| 10  | f     | 0                   | 1                   |
| 11  | g     | 0                   | 1                   |
| 16  | l     | 0                   | 1                   |

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| Mol | Chain | #Chirality outliers | #Planarity outliers |
|-----|-------|---------------------|---------------------|
| 17  | m     | 0                   | 2                   |
| 22  | r     | 0                   | 1                   |
| 30  | z     | 0                   | 1                   |
| 35  | E     | 0                   | 1                   |
| 37  | 4     | 0                   | 1                   |
| 41  | I     | 0                   | 1                   |
| 43  | K     | 0                   | 1                   |
| 44  | L     | 0                   | 1                   |
| 46  | N     | 0                   | 1                   |
| 49  | Q     | 0                   | 4                   |
| 50  | R     | 0                   | 2                   |
| 54  | V     | 0                   | 2                   |
| 55  | W     | 0                   | 1                   |
| 56  | X     | 0                   | 1                   |
| 58  | Z     | 0                   | 3                   |
| All | All   | 0                   | 38                  |

There are no bond length outliers.

All (47) bond angle outliers are listed below:

| Mol | Chain | Res  | Type | Atoms       | Z     | Observed(°) | Ideal(°) |
|-----|-------|------|------|-------------|-------|-------------|----------|
| 4   | 8     | 194  | ASN  | CA-C-N      | 7.76  | 136.35      | 121.54   |
| 4   | 8     | 194  | ASN  | C-N-CA      | 7.76  | 136.35      | 121.54   |
| 43  | K     | 51   | ILE  | CA-C-N      | 7.01  | 134.93      | 121.54   |
| 43  | K     | 51   | ILE  | C-N-CA      | 7.01  | 134.93      | 121.54   |
| 35  | E     | 30   | HIS  | CA-C-N      | 6.72  | 134.06      | 121.97   |
| 35  | E     | 30   | HIS  | C-N-CA      | 6.72  | 134.06      | 121.97   |
| 4   | 8     | 353  | VAL  | N-CA-C      | -6.60 | 107.44      | 113.71   |
| 39  | G     | 20   | ARG  | N-CA-C      | -6.43 | 106.64      | 114.75   |
| 39  | G     | 17   | HIS  | N-CA-C      | 6.05  | 116.42      | 108.07   |
| 58  | Z     | 35   | GLU  | CA-C-N      | 6.05  | 133.09      | 121.54   |
| 58  | Z     | 35   | GLU  | C-N-CA      | 6.05  | 133.09      | 121.54   |
| 39  | G     | 30   | ILE  | N-CA-C      | 5.92  | 116.81      | 108.17   |
| 49  | Q     | 73   | LEU  | CA-C-N      | 5.89  | 132.80      | 121.54   |
| 49  | Q     | 73   | LEU  | C-N-CA      | 5.89  | 132.80      | 121.54   |
| 25  | u     | 52   | ASN  | CA-C-N      | 5.86  | 127.03      | 120.06   |
| 25  | u     | 52   | ASN  | C-N-CA      | 5.86  | 127.03      | 120.06   |
| 4   | 8     | 369  | ASN  | N-CA-C      | -5.80 | 103.93      | 111.71   |
| 2   | 1     | 1130 | U    | C2'-C3'-O3' | 5.76  | 118.14      | 109.50   |
| 15  | k     | 24   | VAL  | CA-C-N      | 5.72  | 132.47      | 121.54   |
| 15  | k     | 24   | VAL  | C-N-CA      | 5.72  | 132.47      | 121.54   |
| 46  | N     | 125  | GLN  | CA-CB-CG    | 5.66  | 125.43      | 114.10   |

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| Mol | Chain | Res  | Type | Atoms       | Z     | Observed(°) | Ideal(°) |
|-----|-------|------|------|-------------|-------|-------------|----------|
| 43  | K     | 52   | ASN  | CA-C-N      | 5.66  | 135.21      | 122.19   |
| 43  | K     | 52   | ASN  | C-N-CA      | 5.66  | 135.21      | 122.19   |
| 4   | 8     | 490  | TYR  | N-CA-C      | 5.52  | 117.37      | 110.91   |
| 16  | l     | 93   | ASN  | CA-C-N      | 5.50  | 132.04      | 121.54   |
| 16  | l     | 93   | ASN  | C-N-CA      | 5.50  | 132.04      | 121.54   |
| 50  | R     | 96   | VAL  | N-CA-C      | 5.46  | 120.69      | 109.34   |
| 35  | E     | 31   | ILE  | N-CA-C      | 5.37  | 120.51      | 109.34   |
| 43  | K     | 53   | LYS  | N-CA-C      | -5.33 | 99.60       | 108.07   |
| 49  | Q     | 99   | GLY  | N-CA-C      | -5.28 | 107.93      | 113.58   |
| 2   | 1     | 501  | A    | N9-C1'-C2'  | 5.18  | 119.77      | 112.00   |
| 1   | 3     | 1065 | U    | N1-C1'-C2'  | 5.15  | 119.73      | 112.00   |
| 4   | 8     | 627  | ASN  | CA-C-N      | 5.11  | 127.38      | 120.38   |
| 4   | 8     | 627  | ASN  | C-N-CA      | 5.11  | 127.38      | 120.38   |
| 1   | 3     | 1538 | C    | N1-C1'-C2'  | 5.09  | 119.64      | 112.00   |
| 39  | G     | 115  | ASP  | N-CA-C      | -5.08 | 105.86      | 111.71   |
| 4   | 8     | 271  | LYS  | CA-C-N      | 5.07  | 130.01      | 122.82   |
| 4   | 8     | 271  | LYS  | C-N-CA      | 5.07  | 130.01      | 122.82   |
| 56  | X     | 77   | ARG  | CA-C-N      | 5.06  | 131.21      | 121.54   |
| 56  | X     | 77   | ARG  | C-N-CA      | 5.06  | 131.21      | 121.54   |
| 2   | 1     | 1730 | C    | C2'-C3'-O3' | 5.05  | 121.28      | 113.70   |
| 2   | 1     | 1081 | U    | N1-C1'-C2'  | 5.04  | 119.57      | 112.00   |
| 11  | g     | 2    | GLN  | CA-C-N      | 5.02  | 131.01      | 121.97   |
| 11  | g     | 2    | GLN  | C-N-CA      | 5.02  | 131.01      | 121.97   |
| 35  | E     | 31   | ILE  | N-CA-CB     | -5.02 | 102.95      | 111.23   |
| 48  | P     | 124  | LYS  | CA-C-N      | 5.00  | 131.09      | 121.54   |
| 48  | P     | 124  | LYS  | C-N-CA      | 5.00  | 131.09      | 121.54   |

There are no chirality outliers.

All (38) planarity outliers are listed below:

| Mol | Chain | Res  | Type | Group     |
|-----|-------|------|------|-----------|
| 2   | 1     | 1779 | U    | Sidechain |
| 2   | 1     | 1964 | G    | Sidechain |
| 2   | 1     | 511  | U    | Sidechain |
| 37  | 4     | 9    | G    | Sidechain |
| 4   | 8     | 193  | TRP  | Peptide   |
| 4   | 8     | 368  | ALA  | Peptide   |
| 4   | 8     | 411  | PHE  | Peptide   |
| 4   | 8     | 648  | GLU  | Peptide   |
| 4   | 8     | 698  | VAL  | Peptide   |
| 35  | E     | 30   | HIS  | Peptide   |
| 41  | I     | 18   | LEU  | Peptide   |

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| Mol | Chain | Res | Type | Group   |
|-----|-------|-----|------|---------|
| 43  | K     | 53  | LYS  | Peptide |
| 44  | L     | 148 | LYS  | Peptide |
| 46  | N     | 56  | MET  | Peptide |
| 49  | Q     | 101 | LEU  | Peptide |
| 49  | Q     | 121 | PRO  | Peptide |
| 49  | Q     | 72  | ASN  | Peptide |
| 49  | Q     | 73  | LEU  | Peptide |
| 50  | R     | 112 | ARG  | Peptide |
| 50  | R     | 95  | PRO  | Peptide |
| 54  | V     | 14  | ASP  | Peptide |
| 54  | V     | 15  | LYS  | Peptide |
| 55  | W     | 18  | GLN  | Peptide |
| 56  | X     | 78  | THR  | Peptide |
| 58  | Z     | 10  | PRO  | Peptide |
| 58  | Z     | 33  | ARG  | Peptide |
| 58  | Z     | 7   | GLU  | Peptide |
| 7   | c     | 133 | THR  | Peptide |
| 8   | d     | 79  | ARG  | Peptide |
| 8   | d     | 82  | GLY  | Peptide |
| 9   | e     | 20  | ASN  | Peptide |
| 10  | f     | 173 | ALA  | Peptide |
| 11  | g     | 2   | GLN  | Peptide |
| 16  | l     | 102 | GLY  | Peptide |
| 17  | m     | 57  | VAL  | Peptide |
| 17  | m     | 82  | MET  | Peptide |
| 22  | r     | 46  | GLU  | Peptide |
| 30  | z     | 10  | ARG  | Peptide |

## 5.2 Too-close contacts [i](#)

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

| Mol | Chain | Non-H | H(model) | H(added) | Clashes | Symm-Clashes |
|-----|-------|-------|----------|----------|---------|--------------|
| 1   | 3     | 33012 | 0        | 16618    | 524     | 0            |
| 2   | 1     | 62317 | 0        | 31346    | 867     | 0            |
| 3   | 2     | 2568  | 0        | 1303     | 46      | 0            |
| 4   | 8     | 5157  | 0        | 5137     | 138     | 0            |
| 5   | 6     | 1640  | 0        | 837      | 23      | 0            |
| 6   | b     | 2083  | 0        | 2157     | 50      | 0            |

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| Mol | Chain | Non-H | H(model) | H(added) | Clashes | Symm-Clashes |
|-----|-------|-------|----------|----------|---------|--------------|
| 7   | c     | 1565  | 0        | 1616     | 35      | 0            |
| 8   | d     | 1552  | 0        | 1619     | 33      | 0            |
| 9   | e     | 1411  | 0        | 1447     | 28      | 0            |
| 10  | f     | 1323  | 0        | 1374     | 15      | 0            |
| 11  | g     | 1111  | 0        | 1148     | 15      | 0            |
| 12  | a     | 1026  | 0        | 1092     | 25      | 0            |
| 13  | i     | 1032  | 0        | 1088     | 27      | 0            |
| 14  | j     | 1129  | 0        | 1162     | 21      | 0            |
| 15  | k     | 939   | 0        | 1012     | 27      | 0            |
| 16  | l     | 1045  | 0        | 1117     | 27      | 0            |
| 17  | m     | 1074  | 0        | 1157     | 21      | 0            |
| 18  | n     | 961   | 0        | 1000     | 21      | 0            |
| 19  | o     | 892   | 0        | 923      | 14      | 0            |
| 20  | p     | 917   | 0        | 965      | 15      | 0            |
| 21  | q     | 947   | 0        | 1022     | 17      | 0            |
| 22  | r     | 816   | 0        | 839      | 18      | 0            |
| 23  | s     | 857   | 0        | 922      | 23      | 0            |
| 24  | t     | 739   | 0        | 807      | 7       | 0            |
| 25  | u     | 780   | 0        | 834      | 13      | 0            |
| 26  | v     | 753   | 0        | 780      | 18      | 0            |
| 27  | w     | 575   | 0        | 592      | 12      | 0            |
| 28  | x     | 625   | 0        | 655      | 9       | 0            |
| 29  | y     | 509   | 0        | 543      | 3       | 0            |
| 30  | z     | 449   | 0        | 491      | 10      | 0            |
| 31  | A     | 355   | 0        | 353      | 2       | 0            |
| 32  | B     | 444   | 0        | 461      | 10      | 0            |
| 33  | C     | 410   | 0        | 440      | 9       | 0            |
| 34  | D     | 377   | 0        | 418      | 5       | 0            |
| 35  | E     | 504   | 0        | 574      | 8       | 0            |
| 36  | F     | 302   | 0        | 341      | 6       | 0            |
| 37  | 4     | 350   | 0        | 176      | 57      | 0            |
| 38  | 5     | 1647  | 0        | 832      | 40      | 0            |
| 39  | G     | 1705  | 0        | 1732     | 120     | 0            |
| 40  | H     | 1625  | 0        | 1699     | 35      | 0            |
| 41  | I     | 1643  | 0        | 1710     | 38      | 0            |
| 42  | J     | 1157  | 0        | 1199     | 102     | 0            |
| 43  | K     | 818   | 0        | 808      | 18      | 0            |
| 44  | L     | 1182  | 0        | 1240     | 14      | 0            |
| 45  | M     | 979   | 0        | 1034     | 26      | 0            |
| 46  | N     | 1022  | 0        | 1070     | 32      | 0            |
| 47  | O     | 787   | 0        | 828      | 22      | 0            |
| 48  | P     | 870   | 0        | 878      | 23      | 0            |

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| Mol | Chain | Non-H  | H(model) | H(added) | Clashes | Symm-Clashes |
|-----|-------|--------|----------|----------|---------|--------------|
| 49  | Q     | 955    | 0        | 1019     | 30      | 0            |
| 50  | R     | 884    | 0        | 944      | 26      | 0            |
| 51  | S     | 805    | 0        | 847      | 16      | 0            |
| 52  | T     | 714    | 0        | 737      | 18      | 0            |
| 53  | U     | 649    | 0        | 666      | 17      | 0            |
| 54  | V     | 649    | 0        | 691      | 12      | 0            |
| 55  | W     | 536    | 0        | 552      | 18      | 0            |
| 56  | X     | 638    | 0        | 665      | 13      | 0            |
| 57  | Y     | 665    | 0        | 714      | 14      | 0            |
| 58  | Z     | 545    | 0        | 579      | 17      | 0            |
| 59  | 8     | 28     | 0        | 12       | 2       | 0            |
| All | All   | 153049 | 0        | 104822   | 2492    | 0            |

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 10.

All (2492) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

| Atom-1            | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|------------------|--------------------------|-------------------|
| 4:8:512:ARG:HD2   | 37:4:22:A:OP2    | 1.30                     | 1.23              |
| 1:3:813:U:H2'     | 1:3:814:A:H5''   | 1.28                     | 1.12              |
| 4:8:512:ARG:HD3   | 37:4:22:A:O5'    | 1.49                     | 1.10              |
| 2:1:1175:A:H3'    | 2:1:1176:U:H5'   | 1.29                     | 1.09              |
| 3:2:83:G:H2'      | 3:2:84:G:H5''    | 1.35                     | 1.08              |
| 37:4:21:A:N1      | 38:5:34:U:O4     | 1.91                     | 1.02              |
| 1:3:793:U:H3'     | 1:3:794:A:H5''   | 1.38                     | 1.02              |
| 4:8:512:ARG:HD2   | 37:4:22:A:P      | 1.98                     | 1.01              |
| 5:6:44:A:H3'      | 5:6:45:G:H5''    | 1.42                     | 1.01              |
| 1:3:347:G:H2'     | 1:3:348:G:H5''   | 1.39                     | 1.00              |
| 2:1:803:U:H2'     | 2:1:804:A:H5''   | 1.45                     | 0.95              |
| 1:3:1158:C:H4'    | 39:G:131:LYS:HB2 | 1.47                     | 0.95              |
| 37:4:9:G:H4'      | 55:W:42:ARG:HH22 | 1.30                     | 0.95              |
| 2:1:1064:C:H3'    | 2:1:1065:U:H5''  | 1.47                     | 0.95              |
| 37:4:23:G:H5'     | 49:Q:43:LYS:HZ1  | 1.31                     | 0.94              |
| 42:J:160:VAL:HG13 | 42:J:161:GLU:H   | 1.32                     | 0.94              |
| 4:8:512:ARG:CD    | 37:4:22:A:P      | 2.56                     | 0.93              |
| 2:1:1082:U:H2'    | 2:1:1083:U:H4'   | 1.49                     | 0.93              |
| 39:G:42:LEU:HD23  | 39:G:42:LEU:H    | 1.33                     | 0.92              |
| 4:8:512:ARG:CD    | 37:4:22:A:OP2    | 2.16                     | 0.92              |
| 1:3:405:U:H3'     | 1:3:406:G:H5'    | 1.48                     | 0.92              |
| 5:6:13:C:H2'      | 5:6:14:A:H5''    | 1.52                     | 0.92              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 4:8:590:GLU:OE2  | 37:4:23:G:N2      | 2.03                     | 0.91              |
| 39:G:13:VAL:HG22 | 39:G:14:HIS:H     | 1.34                     | 0.91              |
| 2:1:1872:A:H2'   | 2:1:1873:G:H5'    | 1.53                     | 0.90              |
| 42:J:84:VAL:HG12 | 42:J:85:LYS:H     | 1.37                     | 0.90              |
| 2:1:275:C:H2'    | 2:1:276:U:H4'     | 1.53                     | 0.89              |
| 1:3:1538:C:H2'   | 1:3:1539:C:C6     | 2.06                     | 0.89              |
| 2:1:940:G:H2'    | 2:1:941:A:H5''    | 1.53                     | 0.89              |
| 3:2:3:C:H2'      | 3:2:4:C:H5''      | 1.55                     | 0.88              |
| 5:6:7:G:H3'      | 5:6:8:U:H5''      | 1.56                     | 0.87              |
| 1:3:813:U:C2'    | 1:3:814:A:H5''    | 2.04                     | 0.86              |
| 37:4:23:G:H5'    | 49:Q:43:LYS:NZ    | 1.90                     | 0.86              |
| 2:1:548:G:H2'    | 2:1:549:G:H4'     | 1.54                     | 0.86              |
| 1:3:617:G:H2'    | 1:3:618:C:H5''    | 1.58                     | 0.85              |
| 2:1:1659:G:H2'   | 2:1:1660:G:H5''   | 1.57                     | 0.85              |
| 3:2:83:G:C2'     | 3:2:84:G:H5''     | 2.06                     | 0.85              |
| 2:1:694:U:H2'    | 2:1:695:G:H5''    | 1.57                     | 0.85              |
| 2:1:803:U:C2'    | 2:1:804:A:H5''    | 2.05                     | 0.85              |
| 1:3:347:G:C2'    | 1:3:348:G:H5''    | 2.07                     | 0.84              |
| 2:1:1394:U:H4'   | 2:1:1603:A:H4'    | 1.59                     | 0.84              |
| 1:3:1308:U:H5''  | 50:R:97:ARG:C     | 2.03                     | 0.84              |
| 2:1:2590:A:H61   | 2:1:2604:U:H3     | 1.24                     | 0.84              |
| 42:J:161:GLU:O   | 42:J:164:LEU:HG   | 1.78                     | 0.84              |
| 4:8:586:VAL:O    | 37:4:22:A:N6      | 2.11                     | 0.83              |
| 37:4:9:G:C4'     | 55:W:42:ARG:HH22  | 1.91                     | 0.83              |
| 5:6:15:G:H3'     | 5:6:16:C:H5''     | 1.61                     | 0.83              |
| 42:J:76:ASN:HD22 | 42:J:81:GLN:HE22  | 1.26                     | 0.83              |
| 42:J:98:ALA:HB2  | 42:J:123:LEU:HD23 | 1.59                     | 0.82              |
| 39:G:19:THR:HG21 | 39:G:188:THR:HG23 | 1.59                     | 0.82              |
| 39:G:25:LYS:HE2  | 39:G:25:LYS:HA    | 1.61                     | 0.82              |
| 39:G:137:THR:HA  | 39:G:140:LEU:HD12 | 1.61                     | 0.82              |
| 1:3:793:U:H3'    | 1:3:794:A:C5'     | 2.10                     | 0.81              |
| 1:3:974:A:H4'    | 1:3:975:A:H3'     | 1.62                     | 0.81              |
| 2:1:2590:A:H5''  | 6:b:236:GLY:HA2   | 1.59                     | 0.81              |
| 2:1:799:G:H3'    | 2:1:800:A:H5''    | 1.63                     | 0.81              |
| 2:1:2128:G:H21   | 2:1:2173:A:H1'    | 1.43                     | 0.81              |
| 4:8:512:ARG:CD   | 37:4:22:A:O5'     | 2.29                     | 0.81              |
| 37:4:9:G:C5'     | 55:W:42:ARG:NH2   | 2.44                     | 0.81              |
| 42:J:55:VAL:HB   | 42:J:56:PRO:HD3   | 1.63                     | 0.81              |
| 1:3:1308:U:C6    | 50:R:97:ARG:HA    | 2.16                     | 0.80              |
| 2:1:203:A:H3'    | 2:1:204:A:H5''    | 1.62                     | 0.80              |
| 42:J:133:ILE:O   | 42:J:136:VAL:HG12 | 1.81                     | 0.80              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 1:3:78:A:H61      | 1:3:91:U:H3       | 1.29                     | 0.80              |
| 42:J:76:ASN:HB2   | 42:J:81:GLN:NE2   | 1.97                     | 0.80              |
| 38:5:32:U:H3      | 38:5:38:A:H61     | 1.29                     | 0.79              |
| 1:3:575:G:H4'     | 1:3:576:C:H5''    | 1.63                     | 0.79              |
| 2:1:2046:G:H5'    | 32:B:15:ARG:HG3   | 1.65                     | 0.79              |
| 2:1:215:G:H4'     | 2:1:216:A:H4'     | 1.65                     | 0.79              |
| 2:1:2553:G:H2'    | 2:1:2554:U:H4'    | 1.65                     | 0.79              |
| 2:1:1175:A:H3'    | 2:1:1176:U:C5'    | 2.11                     | 0.78              |
| 5:6:40:C:H2'      | 5:6:41:C:H5''     | 1.66                     | 0.78              |
| 39:G:206:ILE:O    | 39:G:209:VAL:HG12 | 1.84                     | 0.78              |
| 1:3:1459:G:H4'    | 57:Y:18:LYS:HE2   | 1.63                     | 0.77              |
| 1:3:1493:A:H5'    | 37:4:22:A:O2'     | 1.84                     | 0.77              |
| 1:3:1236:A:H4'    | 1:3:1304:G:H4'    | 1.64                     | 0.76              |
| 2:1:803:U:C3'     | 2:1:804:A:H5''    | 2.15                     | 0.76              |
| 39:G:53:LEU:HD22  | 39:G:219:THR:HG21 | 1.67                     | 0.76              |
| 49:Q:23:LEU:HD13  | 49:Q:58:ASN:HD22  | 1.51                     | 0.76              |
| 39:G:27:LYS:H     | 39:G:28:PRO:HD3   | 1.50                     | 0.76              |
| 42:J:132:PRO:O    | 42:J:135:VAL:HG22 | 1.84                     | 0.76              |
| 4:8:590:GLU:CD    | 37:4:23:G:H22     | 1.93                     | 0.76              |
| 1:3:208:U:H1'     | 1:3:212:G:H22     | 1.51                     | 0.75              |
| 1:3:664:G:H22     | 1:3:741:G:H1      | 1.32                     | 0.74              |
| 2:1:784:G:H5'     | 2:1:785:G:OP1     | 1.87                     | 0.74              |
| 37:4:9:G:H4'      | 55:W:42:ARG:NH2   | 2.02                     | 0.74              |
| 2:1:1567:G:H5''   | 6:b:84:PRO:HB3    | 1.68                     | 0.74              |
| 3:2:12:C:O2'      | 3:2:13:G:H5'      | 1.87                     | 0.74              |
| 1:3:1537:U:C4     | 1:3:1538:C:C5     | 2.76                     | 0.74              |
| 2:1:1277:G:H1     | 2:1:1293:C:H42    | 1.36                     | 0.74              |
| 37:4:9:G:P        | 55:W:42:ARG:HH21  | 2.11                     | 0.74              |
| 37:4:9:G:C4'      | 55:W:42:ARG:NH2   | 2.50                     | 0.73              |
| 2:1:586:A:H5'     | 8:d:84:THR:HG21   | 1.69                     | 0.73              |
| 39:G:53:LEU:HA    | 39:G:56:LEU:HD12  | 1.68                     | 0.73              |
| 42:J:86:GLY:O     | 42:J:88:HIS:N     | 2.21                     | 0.73              |
| 2:1:1203:U:H3'    | 2:1:1204:A:H5''   | 1.71                     | 0.73              |
| 2:1:1177:G:H3'    | 2:1:1178:C:H5''   | 1.69                     | 0.73              |
| 39:G:128:LEU:HD23 | 39:G:132:GLU:HG2  | 1.70                     | 0.73              |
| 2:1:119:A:H4'     | 2:1:120:U:H5'     | 1.71                     | 0.73              |
| 2:1:1801:A:H5''   | 2:1:2203:U:H2'    | 1.69                     | 0.73              |
| 2:1:2645:G:H3'    | 2:1:2646:C:H5'    | 1.71                     | 0.73              |
| 5:6:7:G:H3'       | 5:6:8:U:C5'       | 2.18                     | 0.73              |
| 1:3:1522:U:H2'    | 1:3:1523:G:H8     | 1.53                     | 0.72              |
| 1:3:948:C:H2'     | 1:3:949:A:H8      | 1.54                     | 0.72              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 1:3:1352:C:H2'   | 1:3:1353:G:C8     | 2.25                     | 0.72              |
| 39:G:174:GLU:HA  | 39:G:177:ASN:HD22 | 1.54                     | 0.72              |
| 4:8:512:ARG:NE   | 37:4:22:A:N7      | 2.37                     | 0.72              |
| 42:J:142:GLY:HA2 | 42:J:145:ASN:HD22 | 1.54                     | 0.72              |
| 17:m:36:VAL:HG12 | 26:v:82:TYR:HB2   | 1.71                     | 0.72              |
| 1:3:1075:U:H3    | 1:3:1082:A:H61    | 1.35                     | 0.71              |
| 2:1:2830:C:H3'   | 7:c:59:ARG:HH11   | 1.55                     | 0.71              |
| 1:3:1538:C:C2    | 1:3:1539:C:C4     | 2.78                     | 0.71              |
| 5:6:13:C:C2'     | 5:6:14:A:H5''     | 2.19                     | 0.71              |
| 38:5:4:C:O2'     | 38:5:5:G:H5'      | 1.89                     | 0.71              |
| 2:1:1326:U:H2'   | 2:1:1327:A:H8     | 1.55                     | 0.71              |
| 2:1:2656:U:H5''  | 4:8:146:ARG:HH12  | 1.54                     | 0.71              |
| 39:G:46:VAL:CG1  | 39:G:47:PRO:HD3   | 2.20                     | 0.71              |
| 4:8:586:VAL:HG21 | 38:5:35:G:O2'     | 1.89                     | 0.71              |
| 1:3:1538:C:N3    | 1:3:1539:C:N4     | 2.39                     | 0.71              |
| 1:3:751:U:H4'    | 52:T:23:SER:HA    | 1.73                     | 0.71              |
| 1:3:1113:C:H4'   | 40:H:13:ILE:HG13  | 1.73                     | 0.71              |
| 1:3:67:C:H2'     | 1:3:68:G:H8       | 1.56                     | 0.70              |
| 1:3:1250:A:H61   | 1:3:1354:U:H1'    | 1.57                     | 0.70              |
| 4:8:512:ARG:HH21 | 37:4:22:A:H62     | 1.39                     | 0.70              |
| 2:1:1077:A:H2'   | 2:1:1078:U:H5'    | 1.74                     | 0.70              |
| 22:r:58:VAL:H    | 22:r:102:SER:HB2  | 1.57                     | 0.70              |
| 39:G:46:VAL:HG13 | 39:G:47:PRO:HD3   | 1.73                     | 0.70              |
| 3:2:3:C:C2'      | 3:2:4:C:H5''      | 2.21                     | 0.70              |
| 1:3:1308:U:H5''  | 50:R:98:GLY:N     | 2.06                     | 0.69              |
| 2:1:2334:U:H5'   | 19:o:12:THR:HB    | 1.73                     | 0.69              |
| 2:1:2014:A:H2'   | 2:1:2015:A:C8     | 2.27                     | 0.69              |
| 4:8:448:TRP:HB2  | 4:8:457:ILE:HB    | 1.73                     | 0.69              |
| 2:1:2156:G:H2'   | 2:1:2157:G:H5'    | 1.74                     | 0.69              |
| 2:1:716:A:H3'    | 2:1:717:C:H5''    | 1.74                     | 0.69              |
| 2:1:1080:A:H2'   | 2:1:1081:U:H5''   | 1.74                     | 0.69              |
| 2:1:2209:G:H3'   | 2:1:2210:U:H5''   | 1.72                     | 0.69              |
| 7:c:5:VAL:H      | 7:c:32:ASN:HD21   | 1.41                     | 0.69              |
| 42:J:93:VAL:HG22 | 42:J:126:ALA:HA   | 1.75                     | 0.69              |
| 1:3:70:U:H5''    | 1:3:71:A:OP1      | 1.93                     | 0.69              |
| 1:3:1531:A:H62   | 58:Z:46:ARG:HH22  | 1.41                     | 0.69              |
| 2:1:73:A:H3'     | 29:y:47:ARG:HH12  | 1.58                     | 0.68              |
| 37:4:21:A:H2     | 38:5:34:U:H3      | 1.41                     | 0.68              |
| 39:G:33:ALA:O    | 39:G:34:ARG:HG2   | 1.93                     | 0.68              |
| 1:3:617:G:C2'    | 1:3:618:C:H5''    | 2.24                     | 0.68              |
| 2:1:821:A:H1'    | 2:1:944:C:H5'     | 1.76                     | 0.68              |

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| Atom-1            | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|------------------|--------------------------|-------------------|
| 2:1:2642:G:H5'    | 14:j:80:HIS:CD2  | 2.28                     | 0.68              |
| 2:1:694:U:C2'     | 2:1:695:G:H5''   | 2.23                     | 0.68              |
| 2:1:1059:G:H21    | 13:i:127:SER:HB3 | 1.59                     | 0.68              |
| 2:1:248:G:O5'     | 2:1:249:C:H5''   | 1.94                     | 0.68              |
| 2:1:2312:U:H4'    | 9:e:67:THR:HG21  | 1.75                     | 0.68              |
| 2:1:1659:G:C2'    | 2:1:1660:G:H5''  | 2.23                     | 0.68              |
| 5:6:12:G:H1       | 5:6:23:C:H42     | 1.42                     | 0.68              |
| 11:g:46:PHE:HB3   | 11:g:51:ARG:HG2  | 1.76                     | 0.68              |
| 42:J:35:LEU:HD21  | 42:J:49:TYR:HD1  | 1.58                     | 0.68              |
| 2:1:2638:G:H1'    | 2:1:2778:A:H61   | 1.58                     | 0.67              |
| 3:2:65:U:H2'      | 3:2:66:A:H5'     | 1.75                     | 0.67              |
| 39:G:65:LYS:HB2   | 39:G:157:PRO:HA  | 1.76                     | 0.67              |
| 2:1:940:G:C2'     | 2:1:941:A:H5''   | 2.24                     | 0.67              |
| 2:1:1713:A:H61    | 2:1:1745:A:H61   | 1.43                     | 0.67              |
| 2:1:2553:G:H3'    | 2:1:2554:U:H5''  | 1.77                     | 0.67              |
| 2:1:215:G:C4'     | 2:1:216:A:H4'    | 2.23                     | 0.67              |
| 39:G:94:ARG:H     | 39:G:94:ARG:HD3  | 1.59                     | 0.67              |
| 4:8:512:ARG:CZ    | 37:4:24:U:O4     | 2.42                     | 0.67              |
| 42:J:84:VAL:O     | 42:J:94:PHE:HB2  | 1.95                     | 0.67              |
| 48:P:126:ARG:HB3  | 58:Z:34:ARG:HE   | 1.58                     | 0.67              |
| 2:1:1597:A:H5''   | 2:1:1598:A:H5'   | 1.76                     | 0.67              |
| 2:1:2743:U:H2'    | 2:1:2744:G:H5''  | 1.76                     | 0.67              |
| 38:5:20:U:H3'     | 38:5:21:A:H5'    | 1.77                     | 0.67              |
| 1:3:408:A:H61     | 1:3:434:U:H3     | 1.43                     | 0.67              |
| 2:1:1874:C:H2'    | 2:1:1875:G:O4'   | 1.95                     | 0.67              |
| 42:J:104:ILE:HG23 | 42:J:111:ARG:NH1 | 2.10                     | 0.67              |
| 1:3:1306:A:H2'    | 1:3:1307:U:O4'   | 1.94                     | 0.66              |
| 39:G:64:GLY:C     | 39:G:65:LYS:HD2  | 2.19                     | 0.66              |
| 2:1:1807:G:H2'    | 2:1:1808:A:H5'   | 1.77                     | 0.66              |
| 4:8:512:ARG:HD3   | 37:4:22:A:P      | 2.31                     | 0.66              |
| 42:J:40:ASP:HB2   | 42:J:44:ARG:HB2  | 1.77                     | 0.66              |
| 1:3:375:U:H1'     | 53:U:28:ARG:HH11 | 1.60                     | 0.66              |
| 1:3:1491:G:H2'    | 1:3:1492:A:H5''  | 1.77                     | 0.66              |
| 1:3:440:C:H3'     | 1:3:441:A:H5''   | 1.76                     | 0.66              |
| 42:J:84:VAL:HG12  | 42:J:85:LYS:N    | 2.08                     | 0.66              |
| 2:1:1179:G:H3'    | 2:1:1180:U:H4'   | 1.76                     | 0.66              |
| 33:C:12:SER:HA    | 33:C:48:TYR:HA   | 1.78                     | 0.66              |
| 1:3:440:C:H2'     | 1:3:441:A:H4'    | 1.78                     | 0.66              |
| 1:3:1391:U:H2'    | 1:3:1392:G:C8    | 2.30                     | 0.66              |
| 39:G:32:GLY:HA2   | 39:G:39:ILE:HG13 | 1.77                     | 0.66              |
| 1:3:1151:A:H5''   | 47:O:44:THR:HG23 | 1.78                     | 0.66              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 5:6:28:C:H6      | 5:6:28:C:H5'     | 1.59                     | 0.66              |
| 1:3:367:U:H3     | 1:3:393:A:H2     | 1.43                     | 0.65              |
| 2:1:282:A:H61    | 2:1:358:U:H3     | 1.45                     | 0.65              |
| 2:1:1645:G:H5''  | 2:1:1646:C:H5'   | 1.77                     | 0.65              |
| 5:6:44:A:H3'     | 5:6:45:G:C5'     | 2.24                     | 0.65              |
| 1:3:9:G:H5'      | 42:J:107:GLY:HA3 | 1.77                     | 0.65              |
| 2:1:1181:U:H2'   | 2:1:1182:G:H8    | 1.61                     | 0.65              |
| 5:6:34:C:H42     | 37:4:18:G:H1     | 1.44                     | 0.65              |
| 1:3:1522:U:H2'   | 1:3:1523:G:C8    | 2.32                     | 0.65              |
| 2:1:1651:G:H5'   | 18:n:39:PRO:HG2  | 1.78                     | 0.65              |
| 39:G:13:VAL:HG22 | 39:G:14:HIS:N    | 2.09                     | 0.65              |
| 18:n:38:LEU:HD22 | 18:n:111:ALA:HB2 | 1.79                     | 0.65              |
| 2:1:962:G:H21    | 2:1:2250:G:H1    | 1.42                     | 0.65              |
| 1:3:167:A:C3'    | 1:3:168:G:H5''   | 2.27                     | 0.65              |
| 48:P:124:LYS:HG3 | 58:Z:34:ARG:HG2  | 1.78                     | 0.65              |
| 1:3:1218:C:H2'   | 1:3:1219:A:C8    | 2.31                     | 0.65              |
| 1:3:1317:C:H4'   | 51:S:47:LEU:HD13 | 1.77                     | 0.65              |
| 2:1:1177:G:C3'   | 2:1:1178:C:H5''  | 2.26                     | 0.65              |
| 2:1:1231:U:H2'   | 2:1:1232:G:H8    | 1.62                     | 0.65              |
| 2:1:2271:G:H5'   | 27:w:16:ARG:HD3  | 1.79                     | 0.64              |
| 2:1:2732:G:H3'   | 2:1:2733:A:C5'   | 2.27                     | 0.64              |
| 20:p:17:PRO:HG3  | 20:p:83:ILE:HB   | 1.78                     | 0.64              |
| 1:3:110:C:H5'    | 53:U:25:ARG:NH2  | 2.13                     | 0.64              |
| 1:3:1125:U:H4'   | 47:O:7:ARG:HH22  | 1.63                     | 0.64              |
| 2:1:2502:G:H5'   | 2:1:2503:A:H5''  | 1.79                     | 0.64              |
| 2:1:2519:U:H4'   | 2:1:2520:C:OP1   | 1.96                     | 0.64              |
| 15:k:71:ARG:HD2  | 15:k:72:PRO:HD2  | 1.79                     | 0.64              |
| 1:3:66:A:H61     | 1:3:103:U:H3     | 1.46                     | 0.64              |
| 4:8:70:ALA:HB3   | 4:8:84:ILE:HB    | 1.79                     | 0.64              |
| 1:3:445:G:H1     | 1:3:489:C:H42    | 1.45                     | 0.64              |
| 2:1:811:U:H5'    | 16:l:22:GLY:HA2  | 1.79                     | 0.64              |
| 1:3:67:C:H2'     | 1:3:68:G:C8      | 2.32                     | 0.64              |
| 1:3:631:C:H3'    | 1:3:632:U:H5'    | 1.80                     | 0.64              |
| 1:3:913:A:H4'    | 1:3:914:A:H4'    | 1.80                     | 0.64              |
| 2:1:1056:G:H4'   | 2:1:1057:A:H4'   | 1.78                     | 0.64              |
| 2:1:1081:U:H5'   | 2:1:1082:U:H5    | 1.61                     | 0.64              |
| 3:2:65:U:H3'     | 3:2:108:A:H61    | 1.62                     | 0.64              |
| 3:2:82:U:H3      | 3:2:94:A:H61     | 1.46                     | 0.64              |
| 42:J:148:SER:HB3 | 42:J:149:PRO:HD2 | 1.79                     | 0.64              |
| 1:3:1343:G:H5'   | 46:N:125:GLN:HB3 | 1.80                     | 0.64              |
| 2:1:1077:A:H5'   | 13:i:93:ASN:CG   | 2.22                     | 0.64              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 2:1:1138:G:H2'    | 2:1:1139:G:O4'    | 1.97                     | 0.64              |
| 2:1:1173:U:C3'    | 2:1:1174:U:H5''   | 2.28                     | 0.64              |
| 14:j:56:VAL:HB    | 14:j:124:VAL:HG23 | 1.80                     | 0.64              |
| 39:G:93:HIS:CE1   | 39:G:145:ASN:HD22 | 2.16                     | 0.64              |
| 46:N:35:GLU:HA    | 46:N:39:GLY:HA3   | 1.78                     | 0.64              |
| 1:3:560:A:C4'     | 1:3:561:U:H5'     | 2.27                     | 0.63              |
| 1:3:1158:C:H2'    | 1:3:1159:U:H4'    | 1.80                     | 0.63              |
| 49:Q:6:LEU:HD21   | 49:Q:11:ARG:HH21  | 1.63                     | 0.63              |
| 1:3:1491:G:C2'    | 1:3:1492:A:H5''   | 2.28                     | 0.63              |
| 2:1:1339:G:OP2    | 24:t:15:HIS:HE1   | 1.81                     | 0.63              |
| 1:3:1280:A:O2'    | 1:3:1281:C:H5'    | 1.98                     | 0.63              |
| 42:J:14:LEU:HD11  | 42:J:34:ALA:HB1   | 1.78                     | 0.63              |
| 42:J:87:VAL:O     | 42:J:87:VAL:HG22  | 1.98                     | 0.63              |
| 1:3:940:C:H2'     | 1:3:941:G:H8      | 1.63                     | 0.63              |
| 2:1:2052:A:H4'    | 7:c:148:GLN:O     | 1.98                     | 0.63              |
| 16:l:20:GLY:HA2   | 16:l:28:GLY:HA2   | 1.81                     | 0.63              |
| 39:G:67:LEU:HD12  | 39:G:157:PRO:HG3  | 1.80                     | 0.63              |
| 42:J:160:VAL:HG13 | 42:J:161:GLU:N    | 2.09                     | 0.63              |
| 1:3:111:G:H5''    | 53:U:27:ALA:HB2   | 1.80                     | 0.63              |
| 2:1:2747:G:O6     | 2:1:2755:C:H5''   | 1.99                     | 0.63              |
| 2:1:263:G:H2'     | 2:1:264:C:H5''    | 1.81                     | 0.63              |
| 1:3:521:G:H4'     | 49:Q:69:GLU:HG3   | 1.79                     | 0.62              |
| 2:1:1097:U:H2'    | 2:1:1098:A:O4'    | 1.98                     | 0.62              |
| 2:1:1302:A:H5'    | 2:1:1608:A:OP1    | 1.99                     | 0.62              |
| 43:K:63:ASN:ND2   | 43:K:96:VAL:O     | 2.32                     | 0.62              |
| 2:1:548:G:H2'     | 2:1:549:G:C4'     | 2.29                     | 0.62              |
| 2:1:1825:U:H2'    | 2:1:1826:G:H8     | 1.64                     | 0.62              |
| 2:1:2391:G:H2'    | 2:1:2424:C:N4     | 2.15                     | 0.62              |
| 1:3:386:C:C3'     | 1:3:387:U:H5''    | 2.28                     | 0.62              |
| 5:6:40:C:C2'      | 5:6:41:C:H5''     | 2.30                     | 0.62              |
| 2:1:580:U:H2'     | 2:1:581:C:C6      | 2.33                     | 0.62              |
| 42:J:56:PRO:O     | 42:J:59:ILE:HG22  | 1.99                     | 0.62              |
| 1:3:1128:C:H4'    | 1:3:1148:U:H3     | 1.65                     | 0.62              |
| 2:1:1860:G:H5''   | 12:a:207:VAL:HG23 | 1.82                     | 0.62              |
| 2:1:2144:G:H4'    | 2:1:2145:C:H5     | 1.63                     | 0.62              |
| 2:1:2356:U:H4'    | 27:w:16:ARG:HG3   | 1.81                     | 0.62              |
| 4:8:195:ASP:HB2   | 4:8:199:GLY:HA2   | 1.80                     | 0.62              |
| 18:n:49:GLU:HG2   | 18:n:94:TYR:HD2   | 1.64                     | 0.62              |
| 19:o:32:PRO:HA    | 19:o:102:ARG:HH12 | 1.65                     | 0.62              |
| 1:3:675:A:H1'     | 48:P:117:HIS:CD2  | 2.35                     | 0.62              |
| 2:1:1937:A:N7     | 2:1:1939:U:H2'    | 2.15                     | 0.62              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 10:f:154:GLU:HB3  | 10:f:158:GLY:H    | 1.65                     | 0.62              |
| 37:4:19:C:C2      | 38:5:37:G:N2      | 2.68                     | 0.62              |
| 2:1:1998:A:H4'    | 2:1:2724:U:O2'    | 2.00                     | 0.62              |
| 39:G:137:THR:O    | 39:G:140:LEU:HB2  | 1.99                     | 0.62              |
| 1:3:441:A:H3'     | 1:3:442:G:H8      | 1.65                     | 0.62              |
| 2:1:2478:A:H5'    | 36:F:32:LYS:HE3   | 1.80                     | 0.62              |
| 28:x:44:ARG:NH1   | 28:x:45:PHE:O     | 2.33                     | 0.62              |
| 50:R:95:PRO:HG2   | 50:R:105:ALA:HB1  | 1.81                     | 0.62              |
| 2:1:947:A:H2'     | 2:1:948:C:C6      | 2.34                     | 0.61              |
| 11:g:103:VAL:HB   | 11:g:108:VAL:HB   | 1.82                     | 0.61              |
| 44:L:139:ASP:HA   | 44:L:142:ARG:HD3  | 1.82                     | 0.61              |
| 1:3:1538:C:H2'    | 1:3:1539:C:C5     | 2.36                     | 0.61              |
| 2:1:1923:U:H2'    | 2:1:1924:C:C6     | 2.35                     | 0.61              |
| 2:1:1965:C:H5''   | 2:1:1966:A:H2'    | 1.81                     | 0.61              |
| 45:M:47:ASP:OD2   | 45:M:49:LYS:NZ    | 2.33                     | 0.61              |
| 1:3:347:G:C3'     | 1:3:348:G:H5''    | 2.30                     | 0.61              |
| 2:1:2312:U:H5'    | 9:e:84:ILE:HG21   | 1.80                     | 0.61              |
| 7:c:177:VAL:HA    | 7:c:189:VAL:HA    | 1.83                     | 0.61              |
| 2:1:1139:G:O2'    | 2:1:1140:C:H5'    | 2.00                     | 0.61              |
| 4:8:512:ARG:NE    | 37:4:22:A:C5      | 2.60                     | 0.61              |
| 10:f:27:GLY:HA3   | 10:f:78:VAL:HB    | 1.83                     | 0.61              |
| 18:n:37:THR:HA    | 18:n:110:MET:HA   | 1.80                     | 0.61              |
| 2:1:1825:U:H2'    | 2:1:1826:G:C8     | 2.35                     | 0.61              |
| 2:1:2065:C:H2'    | 2:1:2066:C:C6     | 2.35                     | 0.61              |
| 15:k:43:ILE:HD12  | 15:k:56:ASP:HB2   | 1.83                     | 0.61              |
| 39:G:14:HIS:HA    | 39:G:202:ASN:HB2  | 1.83                     | 0.61              |
| 42:J:160:VAL:O    | 42:J:163:ILE:HG12 | 2.00                     | 0.61              |
| 46:N:84:ARG:NH2   | 46:N:103:VAL:O    | 2.34                     | 0.61              |
| 49:Q:2:THR:HG22   | 49:Q:4:ASN:H      | 1.66                     | 0.61              |
| 1:3:715:A:H2'     | 1:3:716:A:C8      | 2.35                     | 0.61              |
| 39:G:211:LEU:HD12 | 39:G:212:TYR:N    | 2.16                     | 0.61              |
| 2:1:494:G:H4'     | 23:s:6:LYS:HG3    | 1.82                     | 0.61              |
| 2:1:546:U:H2'     | 2:1:547:A:C4'     | 2.31                     | 0.61              |
| 2:1:2742:G:OP1    | 36:F:36:ARG:HD2   | 2.00                     | 0.61              |
| 4:8:420:VAL:O     | 4:8:455:GLN:NE2   | 2.34                     | 0.61              |
| 40:H:149:LYS:HG3  | 40:H:168:ARG:HB3  | 1.82                     | 0.61              |
| 41:I:9:LYS:HA     | 41:I:12:ARG:HE    | 1.65                     | 0.61              |
| 49:Q:74:GLN:HG3   | 49:Q:76:HIS:H     | 1.65                     | 0.61              |
| 21:q:89:ILE:HD12  | 21:q:94:LEU:HD13  | 1.82                     | 0.61              |
| 39:G:27:LYS:N     | 39:G:28:PRO:CD    | 2.63                     | 0.61              |
| 39:G:42:LEU:H     | 39:G:42:LEU:CD2   | 2.08                     | 0.61              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 4:8:351:ASN:HD21 | 4:8:395:ASP:HB2   | 1.66                     | 0.61              |
| 39:G:159:ALA:O   | 39:G:160:LEU:HD22 | 2.01                     | 0.61              |
| 3:2:66:A:H61     | 3:2:107:G:H2'     | 1.65                     | 0.60              |
| 4:8:416:ILE:HG21 | 4:8:466:LEU:HD11  | 1.83                     | 0.60              |
| 39:G:26:MET:SD   | 39:G:192:PRO:HD3  | 2.41                     | 0.60              |
| 40:H:139:ASN:OD1 | 40:H:142:ARG:NH2  | 2.34                     | 0.60              |
| 2:1:441:U:O2'    | 2:1:442:G:H5'     | 2.01                     | 0.60              |
| 1:3:386:C:H3'    | 1:3:387:U:H5''    | 1.82                     | 0.60              |
| 37:4:21:A:N1     | 38:5:34:U:C4      | 2.68                     | 0.60              |
| 2:1:2642:G:H5'   | 14:j:80:HIS:NE2   | 2.16                     | 0.60              |
| 4:8:135:VAL:O    | 4:8:137:ARG:NH1   | 2.34                     | 0.60              |
| 2:1:308:G:C8     | 2:1:501:A:H1'     | 2.36                     | 0.60              |
| 2:1:1858:A:H1'   | 2:1:1885:A:C2     | 2.36                     | 0.60              |
| 39:G:22:TRP:CZ3  | 39:G:24:PRO:HA    | 2.37                     | 0.60              |
| 2:1:1079:C:H1'   | 13:i:130:GLY:HA3  | 1.84                     | 0.60              |
| 2:1:1796:U:H2'   | 2:1:1797:G:H8     | 1.66                     | 0.60              |
| 2:1:2153:C:H2'   | 2:1:2154:A:H8     | 1.67                     | 0.60              |
| 2:1:2221:G:O2'   | 2:1:2222:C:H5'    | 2.02                     | 0.60              |
| 3:2:46:A:H5''    | 19:o:3:LYS:HE2    | 1.84                     | 0.60              |
| 8:d:149:ILE:HG23 | 8:d:188:MET:HA    | 1.82                     | 0.60              |
| 9:e:116:LEU:H    | 9:e:175:PRO:HB2   | 1.66                     | 0.60              |
| 2:1:1773:A:H2'   | 2:1:1774:C:H5'    | 1.83                     | 0.60              |
| 6:b:42:ARG:HG2   | 6:b:48:ILE:HA     | 1.82                     | 0.60              |
| 7:c:131:ASP:O    | 7:c:136:ASN:ND2   | 2.30                     | 0.60              |
| 44:L:35:LYS:HG2  | 44:L:39:GLU:HB2   | 1.84                     | 0.60              |
| 55:W:62:ARG:HD3  | 55:W:69:TYR:HA    | 1.84                     | 0.60              |
| 1:3:1506:U:O2'   | 1:3:1507:A:H5'    | 2.02                     | 0.60              |
| 2:1:1064:C:H3'   | 2:1:1065:U:C5'    | 2.26                     | 0.60              |
| 2:1:2286:G:H2'   | 33:C:29:LYS:NZ    | 2.17                     | 0.60              |
| 43:K:29:ILE:HG22 | 43:K:34:GLY:HA2   | 1.84                     | 0.60              |
| 1:3:1196:A:C2    | 40:H:161:ILE:HG13 | 2.36                     | 0.60              |
| 42:J:24:VAL:HG12 | 42:J:25:LYS:N     | 2.16                     | 0.60              |
| 1:3:1184:G:H2'   | 1:3:1185:G:H5'    | 1.83                     | 0.59              |
| 2:1:69:C:O2'     | 2:1:70:G:H5'      | 2.02                     | 0.59              |
| 2:1:2638:G:H1'   | 2:1:2778:A:N6     | 2.18                     | 0.59              |
| 39:G:174:GLU:HA  | 39:G:177:ASN:ND2  | 2.17                     | 0.59              |
| 2:1:1805:A:H1'   | 6:b:49:THR:HG23   | 1.83                     | 0.59              |
| 2:1:2656:U:H5''  | 4:8:146:ARG:HH22  | 1.66                     | 0.59              |
| 4:8:14:GLY:HA3   | 4:8:106:LEU:HD22  | 1.84                     | 0.59              |
| 11:g:38:PRO:O    | 11:g:43:ASN:ND2   | 2.33                     | 0.59              |
| 2:1:912:C:O2'    | 2:1:913:U:H5'     | 2.02                     | 0.59              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 2:1:2514:U:H2'   | 2:1:2515:C:C6     | 2.36                     | 0.59              |
| 4:8:192:ASN:HD21 | 4:8:205:GLU:HB2   | 1.67                     | 0.59              |
| 13:i:8:VAL:H     | 13:i:58:ILE:HD11  | 1.67                     | 0.59              |
| 57:Y:55:PRO:O    | 57:Y:59:ARG:N     | 2.33                     | 0.59              |
| 1:3:212:G:H2'    | 1:3:213:G:H8      | 1.68                     | 0.59              |
| 1:3:1535:C:H42   | 37:4:10:G:H21     | 1.48                     | 0.59              |
| 39:G:117:GLU:HA  | 39:G:120:SER:OG   | 2.02                     | 0.59              |
| 2:1:630:G:H2'    | 2:1:631:A:H5''    | 1.85                     | 0.59              |
| 2:1:1451:C:H4'   | 2:1:1452:G:O4'    | 2.02                     | 0.59              |
| 3:2:5:U:H2'      | 3:2:6:G:H8        | 1.66                     | 0.59              |
| 39:G:69:VAL:CG1  | 39:G:162:VAL:HG22 | 2.32                     | 0.59              |
| 44:L:67:ASN:ND2  | 44:L:126:ALA:O    | 2.36                     | 0.59              |
| 2:1:1176:U:H2'   | 2:1:1177:G:C8     | 2.37                     | 0.59              |
| 1:3:1384:C:H2'   | 1:3:1385:G:C8     | 2.37                     | 0.59              |
| 3:2:65:U:C2'     | 3:2:66:A:H5'      | 2.33                     | 0.59              |
| 16:l:9:ALA:HB3   | 16:l:12:SER:HB3   | 1.85                     | 0.59              |
| 42:J:152:VAL:HA  | 42:J:155:LYS:HG2  | 1.84                     | 0.59              |
| 2:1:1341:G:H5''  | 2:1:1397:U:O2     | 2.03                     | 0.59              |
| 2:1:1998:A:H4'   | 2:1:2724:U:HO2'   | 1.68                     | 0.59              |
| 37:4:5:A:H2'     | 37:4:6:G:C8       | 2.37                     | 0.59              |
| 39:G:63:LYS:HB2  | 39:G:224:ARG:NH2  | 2.18                     | 0.59              |
| 1:3:386:C:H2'    | 1:3:387:U:H5''    | 1.83                     | 0.59              |
| 2:1:1433:A:H2'   | 2:1:1434:A:C8     | 2.37                     | 0.59              |
| 39:G:27:LYS:H    | 39:G:28:PRO:CD    | 2.16                     | 0.59              |
| 39:G:186:VAL:HB  | 39:G:190:SER:OG   | 2.03                     | 0.59              |
| 1:3:375:U:H1'    | 53:U:28:ARG:NH1   | 2.17                     | 0.59              |
| 2:1:706:A:H2'    | 2:1:707:G:O4'     | 2.02                     | 0.59              |
| 2:1:2137:U:H3    | 2:1:2154:A:H61    | 1.51                     | 0.59              |
| 2:1:2475:C:H42   | 2:1:2529:G:H22    | 1.48                     | 0.59              |
| 2:1:2743:U:C3'   | 2:1:2744:G:H5''   | 2.32                     | 0.59              |
| 3:2:30:C:C2'     | 3:2:31:C:H5'      | 2.33                     | 0.59              |
| 4:8:112:VAL:HA   | 4:8:140:PHE:HB3   | 1.85                     | 0.59              |
| 54:V:63:CYS:SG   | 54:V:73:THR:OG1   | 2.59                     | 0.59              |
| 1:3:596:A:H61    | 1:3:644:U:H3      | 1.51                     | 0.58              |
| 1:3:1342:C:O2'   | 46:N:125:GLN:HB2  | 2.03                     | 0.58              |
| 1:3:1492:A:OP1   | 49:Q:43:LYS:HB2   | 2.03                     | 0.58              |
| 2:1:1264:A:H2'   | 2:1:2014:A:N6     | 2.18                     | 0.58              |
| 15:k:66:LYS:NZ   | 15:k:80:ASP:OD1   | 2.35                     | 0.58              |
| 1:3:236:A:H5''   | 54:V:43:LEU:HD21  | 1.84                     | 0.58              |
| 2:1:203:A:H3'    | 2:1:204:A:C5'     | 2.33                     | 0.58              |
| 2:1:1939:U:H3'   | 2:1:1940:U:H5'    | 1.84                     | 0.58              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 4:8:288:SER:H    | 4:8:291:ASP:HB2  | 1.67                     | 0.58              |
| 27:w:19:VAL:HG12 | 27:w:34:VAL:HG22 | 1.86                     | 0.58              |
| 37:4:19:C:N3     | 38:5:37:G:C2     | 2.71                     | 0.58              |
| 42:J:57:ALA:HA   | 42:J:60:GLN:OE1  | 2.03                     | 0.58              |
| 2:1:2360:G:H1'   | 16:l:60:ARG:HE   | 1.66                     | 0.58              |
| 3:2:30:C:H2'     | 3:2:31:C:H5'     | 1.84                     | 0.58              |
| 8:d:49:ARG:HG3   | 8:d:76:PRO:HD3   | 1.86                     | 0.58              |
| 1:3:1015:G:O2'   | 1:3:1218:C:H4'   | 2.03                     | 0.58              |
| 1:3:1441:A:H2'   | 1:3:1442:G:H5'   | 1.83                     | 0.58              |
| 2:1:893:C:H2'    | 2:1:894:U:O4'    | 2.04                     | 0.58              |
| 2:1:1355:G:O2'   | 2:1:1356:G:H5'   | 2.04                     | 0.58              |
| 4:8:187:LYS:HE3  | 4:8:189:LYS:HB2  | 1.85                     | 0.58              |
| 56:X:27:LYS:HG3  | 56:X:28:LYS:HG2  | 1.83                     | 0.58              |
| 4:8:85:ASN:ND2   | 4:8:381:ASP:OD1  | 2.32                     | 0.58              |
| 4:8:673:LEU:HD12 | 4:8:674:THR:HG23 | 1.84                     | 0.58              |
| 1:3:818:G:H2'    | 1:3:818:G:N3     | 2.19                     | 0.58              |
| 1:3:1290:G:H3'   | 1:3:1291:U:H5'   | 1.86                     | 0.58              |
| 2:1:2372:U:C2'   | 2:1:2373:G:H5'   | 2.34                     | 0.58              |
| 2:1:2580:U:H4'   | 7:c:135:GLY:HA3  | 1.83                     | 0.58              |
| 2:1:2585:U:C5    | 38:5:76:A:H3'    | 2.39                     | 0.58              |
| 4:8:107:ASP:OD2  | 4:8:337:ARG:NH2  | 2.36                     | 0.58              |
| 7:c:121:THR:HG21 | 7:c:143:PRO:HG3  | 1.85                     | 0.58              |
| 2:1:784:G:OP1    | 2:1:2588:G:H5''  | 2.02                     | 0.58              |
| 42:J:28:ARG:HD2  | 42:J:28:ARG:C    | 2.29                     | 0.58              |
| 1:3:782:A:H2'    | 1:3:783:C:H5'    | 1.85                     | 0.58              |
| 1:3:1321:U:H3'   | 1:3:1322:C:H5''  | 1.84                     | 0.58              |
| 2:1:1701:A:H2'   | 2:1:1702:G:H5'   | 1.85                     | 0.58              |
| 2:1:2048:G:H2'   | 2:1:2049:G:O4'   | 2.04                     | 0.58              |
| 4:8:512:ARG:HH21 | 37:4:22:A:N6     | 2.02                     | 0.58              |
| 28:x:39:VAL:HG12 | 28:x:41:SER:H    | 1.68                     | 0.58              |
| 41:I:125:ASN:ND2 | 41:I:140:ASP:OD1 | 2.36                     | 0.58              |
| 42:J:54:GLU:HG2  | 42:J:56:PRO:HD2  | 1.86                     | 0.58              |
| 1:3:184:G:H5''   | 1:3:225:C:H5'    | 1.86                     | 0.58              |
| 1:3:405:U:C3'    | 1:3:406:G:H5'    | 2.29                     | 0.58              |
| 1:3:562:U:H1'    | 49:Q:11:ARG:HG3  | 1.86                     | 0.58              |
| 1:3:1369:C:H2'   | 1:3:1370:G:C8    | 2.39                     | 0.58              |
| 2:1:279:A:H2'    | 2:1:280:U:H5'    | 1.85                     | 0.58              |
| 3:2:87:U:H5''    | 3:2:88:C:OP2     | 2.03                     | 0.58              |
| 9:e:59:ILE:O     | 9:e:101:ARG:NH1  | 2.37                     | 0.58              |
| 1:3:188:C:H2'    | 1:3:189:A:O4'    | 2.03                     | 0.57              |
| 1:3:340:U:H3     | 1:3:349:A:H61    | 1.52                     | 0.57              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 2:1:2156:G:C2'    | 2:1:2157:G:H5'    | 2.34                     | 0.57              |
| 2:1:2732:G:H3'    | 2:1:2733:A:H5'    | 1.85                     | 0.57              |
| 37:4:9:G:H5'      | 55:W:42:ARG:NH2   | 2.17                     | 0.57              |
| 41:I:158:LEU:HD21 | 41:I:174:ALA:HB1  | 1.86                     | 0.57              |
| 58:Z:16:ARG:O     | 58:Z:20:ARG:NH1   | 2.37                     | 0.57              |
| 1:3:229:U:H2'     | 1:3:230:G:C8      | 2.39                     | 0.57              |
| 2:1:1173:U:H2'    | 2:1:1174:U:H5''   | 1.86                     | 0.57              |
| 2:1:1173:U:H3'    | 2:1:1174:U:H5''   | 1.86                     | 0.57              |
| 3:2:3:C:C3'       | 3:2:4:C:H5''      | 2.35                     | 0.57              |
| 4:8:494:ILE:HG22  | 4:8:610:PRO:HB3   | 1.86                     | 0.57              |
| 45:M:28:SER:OG    | 45:M:29:SER:N     | 2.37                     | 0.57              |
| 2:1:244:A:H5''    | 16:l:67:THR:HG21  | 1.86                     | 0.57              |
| 5:6:14:A:H2'      | 5:6:15:G:O4'      | 2.03                     | 0.57              |
| 30:z:10:ARG:NH2   | 30:z:52:PHE:O     | 2.37                     | 0.57              |
| 1:3:948:C:H5'     | 1:3:1306:A:O2'    | 2.03                     | 0.57              |
| 2:1:1082:U:H2'    | 2:1:1083:U:C4'    | 2.29                     | 0.57              |
| 10:f:80:GLU:O     | 10:f:133:LYS:NZ   | 2.38                     | 0.57              |
| 21:q:46:TYR:O     | 21:q:50:ARG:NH1   | 2.36                     | 0.57              |
| 2:1:780:G:H1      | 6:b:228:ASP:CG    | 2.11                     | 0.57              |
| 6:b:92:LEU:HD11   | 6:b:100:ARG:HB3   | 1.85                     | 0.57              |
| 14:j:96:ARG:NH2   | 14:j:98:GLU:OE2   | 2.38                     | 0.57              |
| 42:J:143:LEU:O    | 42:J:146:MET:HG3  | 2.04                     | 0.57              |
| 48:P:105:ARG:NH1  | 48:P:106:ILE:O    | 2.36                     | 0.57              |
| 57:Y:79:THR:O     | 57:Y:83:ASN:ND2   | 2.36                     | 0.57              |
| 1:3:197:A:N6      | 1:3:221:C:H4'     | 2.19                     | 0.57              |
| 1:3:844:G:H2'     | 1:3:844:G:N3      | 2.18                     | 0.57              |
| 1:3:1228:C:C5'    | 50:R:112:ARG:HB3  | 2.34                     | 0.57              |
| 2:1:742:A:H2'     | 2:1:743:A:C8      | 2.40                     | 0.57              |
| 3:2:90:C:H5'      | 17:m:18:ARG:HB3   | 1.87                     | 0.57              |
| 26:v:35:GLU:OE1   | 26:v:93:ARG:NH2   | 2.37                     | 0.57              |
| 42:J:45:VAL:HG21  | 42:J:113:VAL:HG13 | 1.86                     | 0.57              |
| 2:1:575:A:O2'     | 2:1:576:U:H5'     | 2.04                     | 0.57              |
| 17:m:34:LYS:HE3   | 17:m:131:VAL:HG11 | 1.86                     | 0.57              |
| 40:H:112:ALA:HB3  | 40:H:184:ASN:HD22 | 1.69                     | 0.57              |
| 42:J:164:LEU:HD12 | 42:J:165:GLY:N    | 2.20                     | 0.57              |
| 1:3:167:A:H2'     | 1:3:168:G:H5''    | 1.85                     | 0.57              |
| 2:1:546:U:H2'     | 2:1:547:A:H4'     | 1.87                     | 0.57              |
| 2:1:1085:A:H2'    | 2:1:1086:A:C8     | 2.40                     | 0.57              |
| 2:1:1900:A:H1'    | 2:1:1970:A:O2'    | 2.04                     | 0.57              |
| 2:1:2183:A:H2'    | 2:1:2184:A:C8     | 2.40                     | 0.57              |
| 2:1:2584:U:H2'    | 2:1:2585:U:H2'    | 1.85                     | 0.57              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 6:b:42:ARG:HH21   | 6:b:48:ILE:HD12   | 1.70                     | 0.57              |
| 16:l:80:SER:O     | 16:l:84:LYS:NZ    | 2.36                     | 0.57              |
| 24:t:53:VAL:HG11  | 24:t:87:LEU:HD13  | 1.86                     | 0.57              |
| 40:H:14:VAL:HG23  | 40:H:15:LYS:HG2   | 1.87                     | 0.57              |
| 1:3:350:G:H2'     | 1:3:351:G:C8      | 2.40                     | 0.57              |
| 2:1:2124:G:H4'    | 12:a:174:THR:HG21 | 1.86                     | 0.57              |
| 19:o:94:ARG:NH2   | 19:o:97:PHE:O     | 2.38                     | 0.57              |
| 47:O:18:ILE:HD12  | 47:O:72:ARG:HH22  | 1.70                     | 0.57              |
| 1:3:167:A:H3'     | 1:3:168:G:H5''    | 1.85                     | 0.57              |
| 1:3:594:U:H2'     | 1:3:595:A:O4'     | 2.04                     | 0.57              |
| 1:3:1538:C:C4     | 1:3:1539:C:N4     | 2.73                     | 0.57              |
| 2:1:500:G:H2'     | 2:1:501:A:H5''    | 1.85                     | 0.57              |
| 8:d:6:LYS:O       | 8:d:9:GLN:NE2     | 2.38                     | 0.57              |
| 39:G:27:LYS:N     | 39:G:28:PRO:HD3   | 2.19                     | 0.57              |
| 18:n:24:MET:HE2   | 18:n:44:LEU:HD11  | 1.87                     | 0.56              |
| 1:3:403:C:H5'     | 41:I:131:ILE:HG23 | 1.86                     | 0.56              |
| 2:1:359:G:H2'     | 2:1:360:U:O4'     | 2.05                     | 0.56              |
| 10:f:86:LEU:HD12  | 10:f:130:ILE:HB   | 1.87                     | 0.56              |
| 40:H:57:GLU:HG2   | 40:H:59:PRO:HD3   | 1.86                     | 0.56              |
| 49:Q:6:LEU:HD11   | 49:Q:11:ARG:HE    | 1.70                     | 0.56              |
| 1:3:1345:U:H4'    | 1:3:1346:A:H5''   | 1.86                     | 0.56              |
| 2:1:49:A:H5'      | 2:1:51:G:O4'      | 2.04                     | 0.56              |
| 2:1:674:G:H2'     | 2:1:804:A:H61     | 1.71                     | 0.56              |
| 2:1:858:G:H5'     | 2:1:859:G:OP2     | 2.05                     | 0.56              |
| 2:1:940:G:H2'     | 2:1:941:A:C5'     | 2.32                     | 0.56              |
| 2:1:1168:G:H2'    | 2:1:1169:A:C4'    | 2.36                     | 0.56              |
| 17:m:32:GLY:HA2   | 17:m:104:GLU:HA   | 1.87                     | 0.56              |
| 33:C:5:ARG:NH2    | 33:C:23:THR:OG1   | 2.39                     | 0.56              |
| 42:J:24:VAL:HG12  | 42:J:25:LYS:H     | 1.71                     | 0.56              |
| 1:3:625:U:OP1     | 53:U:9:HIS:HB3    | 2.06                     | 0.56              |
| 2:1:969:G:H2'     | 2:1:970:U:C6      | 2.41                     | 0.56              |
| 9:e:16:MET:HG2    | 9:e:21:TYR:HB2    | 1.87                     | 0.56              |
| 9:e:124:ARG:HB3   | 9:e:159:ALA:HB1   | 1.87                     | 0.56              |
| 11:g:1:MET:HG2    | 11:g:2:GLN:HG2    | 1.86                     | 0.56              |
| 13:i:89:SER:HB3   | 13:i:97:VAL:HG11  | 1.88                     | 0.56              |
| 39:G:206:ILE:HG23 | 39:G:207:ARG:N    | 2.19                     | 0.56              |
| 2:1:112:U:H2'     | 2:1:113:U:H5'     | 1.88                     | 0.56              |
| 2:1:2045:C:O3'    | 32:B:14:MET:HB3   | 2.05                     | 0.56              |
| 30:z:16:LEU:HB2   | 30:z:19:HIS:HD2   | 1.70                     | 0.56              |
| 43:K:15:SER:OG    | 43:K:44:ARG:NH1   | 2.39                     | 0.56              |
| 1:3:1187:G:H4'    | 46:N:114:LYS:HD3  | 1.87                     | 0.56              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 2:1:1930:G:H2'    | 2:1:1968:G:H1     | 1.71                     | 0.56              |
| 42:J:104:ILE:HD12 | 42:J:122:VAL:O    | 2.06                     | 0.56              |
| 43:K:26:THR:HA    | 43:K:29:ILE:HD12  | 1.87                     | 0.56              |
| 1:3:1307:U:C2'    | 50:R:96:VAL:H     | 2.18                     | 0.56              |
| 2:1:2743:U:C2'    | 2:1:2744:G:H5''   | 2.35                     | 0.56              |
| 11:g:94:ILE:HG23  | 11:g:98:ASP:HB2   | 1.87                     | 0.56              |
| 16:l:110:VAL:HB   | 16:l:127:VAL:HG22 | 1.86                     | 0.56              |
| 31:A:11:GLU:HG2   | 31:A:25:ARG:HG2   | 1.87                     | 0.56              |
| 42:J:38:VAL:HG23  | 42:J:70:MET:SD    | 2.46                     | 0.56              |
| 1:3:1384:C:H2'    | 1:3:1385:G:H8     | 1.71                     | 0.56              |
| 2:1:327:G:C2'     | 2:1:328:U:H5'     | 2.36                     | 0.56              |
| 2:1:1167:C:H2'    | 2:1:1168:G:C8     | 2.40                     | 0.56              |
| 6:b:7:PRO:HB3     | 6:b:13:ARG:HG3    | 1.87                     | 0.56              |
| 8:d:77:ILE:HG23   | 8:d:78:TRP:HD1    | 1.69                     | 0.56              |
| 1:3:560:A:H4'     | 1:3:561:U:H5'     | 1.88                     | 0.56              |
| 2:1:1837:C:H2'    | 2:1:1899:A:H61    | 1.71                     | 0.56              |
| 2:1:2285:C:OP2    | 33:C:5:ARG:HD3    | 2.06                     | 0.56              |
| 2:1:2432:A:H1'    | 5:6:75:C:O4'      | 2.04                     | 0.56              |
| 2:1:2690:U:O2'    | 2:1:2872:A:H1'    | 2.04                     | 0.56              |
| 4:8:508:GLN:NE2   | 4:8:587:ASP:OD2   | 2.37                     | 0.56              |
| 6:b:23:LEU:HD13   | 6:b:82:TYR:HB2    | 1.88                     | 0.56              |
| 1:3:422:C:H4'     | 1:3:423:G:C2      | 2.41                     | 0.56              |
| 2:1:1765:U:H3     | 2:1:1987:A:H61    | 1.53                     | 0.56              |
| 5:6:36:U:H2'      | 5:6:37:A:C8       | 2.40                     | 0.56              |
| 45:M:48:PHE:HB2   | 45:M:58:LEU:HD11  | 1.88                     | 0.56              |
| 45:M:112:ASP:O    | 45:M:116:ARG:NH1  | 2.39                     | 0.56              |
| 46:N:4:GLN:HB2    | 46:N:21:LYS:HE3   | 1.87                     | 0.56              |
| 47:O:18:ILE:HB    | 47:O:72:ARG:HH12  | 1.71                     | 0.56              |
| 1:3:560:A:H5''    | 1:3:561:U:H5'     | 1.89                     | 0.55              |
| 1:3:796:C:H6      | 1:3:796:C:H5'     | 1.72                     | 0.55              |
| 2:1:554:U:H2'     | 2:1:555:G:O4'     | 2.06                     | 0.55              |
| 2:1:2543:G:H2'    | 2:1:2544:G:C8     | 2.41                     | 0.55              |
| 2:1:2730:C:O2'    | 2:1:2731:G:H5'    | 2.06                     | 0.55              |
| 19:o:58:ILE:HA    | 19:o:61:GLN:HE21  | 1.70                     | 0.55              |
| 1:3:617:G:H2'     | 1:3:618:C:C5'     | 2.33                     | 0.55              |
| 1:3:884:U:H4'     | 1:3:885:G:H5''    | 1.87                     | 0.55              |
| 2:1:1092:C:H2'    | 2:1:1093:G:O4'    | 2.06                     | 0.55              |
| 2:1:2282:G:H4'    | 2:1:2389:G:O2'    | 2.07                     | 0.55              |
| 4:8:435:LEU:HA    | 4:8:438:LEU:HB2   | 1.87                     | 0.55              |
| 1:3:603:U:H2'     | 1:3:604:G:C8      | 2.41                     | 0.55              |
| 2:1:572:A:H5''    | 2:1:573:U:OP2     | 2.05                     | 0.55              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 2:1:1509:A:H2'    | 2:1:1510:G:C8     | 2.41                     | 0.55              |
| 18:n:56:LYS:HE3   | 18:n:88:ALA:HA    | 1.88                     | 0.55              |
| 40:H:65:VAL:HB    | 40:H:100:ILE:HG22 | 1.87                     | 0.55              |
| 42:J:163:ILE:HG13 | 42:J:164:LEU:N    | 2.21                     | 0.55              |
| 43:K:42:TRP:HE1   | 43:K:61:LEU:HB2   | 1.70                     | 0.55              |
| 1:3:1537:U:N3     | 1:3:1538:C:C5     | 2.75                     | 0.55              |
| 2:1:1524:G:H2'    | 2:1:1525:A:C8     | 2.42                     | 0.55              |
| 2:1:1791:A:N6     | 2:1:1828:G:O2'    | 2.39                     | 0.55              |
| 2:1:2455:G:H2'    | 2:1:2456:C:C6     | 2.41                     | 0.55              |
| 4:8:566:LEU:HB2   | 4:8:605:PHE:HZ    | 1.70                     | 0.55              |
| 28:x:32:LEU:HA    | 28:x:51:SER:HA    | 1.88                     | 0.55              |
| 1:3:994:A:H3'     | 1:3:994:A:OP2     | 2.06                     | 0.55              |
| 2:1:936:A:H2'     | 2:1:937:C:C6      | 2.42                     | 0.55              |
| 2:1:995:C:H6      | 2:1:995:C:H5'     | 1.71                     | 0.55              |
| 48:P:33:ILE:HD12  | 48:P:73:VAL:HG11  | 1.87                     | 0.55              |
| 1:3:380:G:H2'     | 1:3:381:C:H5''    | 1.87                     | 0.55              |
| 1:3:617:G:C3'     | 1:3:618:C:H5''    | 2.37                     | 0.55              |
| 2:1:1173:U:H2'    | 2:1:1174:U:O4'    | 2.06                     | 0.55              |
| 2:1:1659:G:C3'    | 2:1:1660:G:H5''   | 2.36                     | 0.55              |
| 2:1:2023:C:H2'    | 2:1:2024:G:C8     | 2.41                     | 0.55              |
| 28:x:42:GLU:OE1   | 28:x:44:ARG:NE    | 2.39                     | 0.55              |
| 30:z:5:LYS:HD2    | 30:z:34:THR:HG22  | 1.88                     | 0.55              |
| 39:G:159:ALA:C    | 39:G:160:LEU:HD22 | 2.32                     | 0.55              |
| 46:N:10:ARG:HA    | 46:N:15:ALA:HA    | 1.88                     | 0.55              |
| 53:U:4:ILE:HG12   | 53:U:21:VAL:HG12  | 1.87                     | 0.55              |
| 2:1:2508:G:H2'    | 2:1:2509:G:H8     | 1.72                     | 0.55              |
| 5:6:40:C:C3'      | 5:6:41:C:H5''     | 2.36                     | 0.55              |
| 46:N:79:ARG:NH1   | 46:N:102:PHE:O    | 2.40                     | 0.55              |
| 52:T:84:LEU:HB3   | 52:T:86:LEU:HD22  | 1.87                     | 0.55              |
| 57:Y:66:ILE:HD12  | 57:Y:70:LYS:HD3   | 1.89                     | 0.55              |
| 2:1:1082:U:C2'    | 2:1:1083:U:H4'    | 2.29                     | 0.55              |
| 2:1:2849:U:H4'    | 2:1:2868:A:C2     | 2.41                     | 0.55              |
| 35:E:36:ALA:O     | 35:E:40:LYS:NZ    | 2.40                     | 0.55              |
| 51:S:36:SER:OG    | 51:S:40:ARG:NH1   | 2.39                     | 0.55              |
| 53:U:8:ARG:NH1    | 53:U:9:HIS:O      | 2.39                     | 0.55              |
| 1:3:600:A:H5''    | 45:M:88:LYS:HB2   | 1.88                     | 0.55              |
| 1:3:1538:C:N3     | 1:3:1539:C:C4     | 2.75                     | 0.55              |
| 2:1:2343:U:H2'    | 2:1:2344:U:C6     | 2.42                     | 0.55              |
| 2:1:2350:C:H2'    | 2:1:2351:G:O4'    | 2.07                     | 0.55              |
| 4:8:131:ASN:OD1   | 4:8:137:ARG:NH2   | 2.39                     | 0.55              |
| 15:k:26:GLY:O     | 15:k:30:ARG:NH1   | 2.35                     | 0.55              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 38:5:3:G:O2'     | 38:5:4:C:H6      | 1.90                     | 0.55              |
| 58:Z:3:ILE:HD11  | 58:Z:24:LYS:HG3  | 1.89                     | 0.55              |
| 58:Z:4:LYS:HZ1   | 58:Z:6:ARG:HH11  | 1.55                     | 0.55              |
| 1:3:205:A:H2'    | 1:3:206:C:O4'    | 2.06                     | 0.55              |
| 1:3:231:U:H2'    | 1:3:232:G:H8     | 1.71                     | 0.55              |
| 2:1:2016:U:H1'   | 32:B:2:VAL:HG11  | 1.89                     | 0.55              |
| 2:1:2853:C:H2'   | 2:1:2854:G:H8    | 1.72                     | 0.55              |
| 7:c:17:GLU:HA    | 20:p:78:PRO:HG2  | 1.89                     | 0.55              |
| 26:v:4:ILE:HD13  | 26:v:61:LEU:HD23 | 1.89                     | 0.55              |
| 39:G:107:ARG:HD3 | 39:G:111:LYS:NZ  | 2.22                     | 0.55              |
| 42:J:93:VAL:HA   | 42:J:125:LYS:O   | 2.07                     | 0.55              |
| 1:3:1060:U:H4'   | 47:O:54:SER:HA   | 1.88                     | 0.54              |
| 2:1:402:A:H2'    | 2:1:403:U:H5'    | 1.89                     | 0.54              |
| 2:1:575:A:H2'    | 2:1:576:U:H6     | 1.72                     | 0.54              |
| 2:1:833:A:H2'    | 2:1:834:G:C8     | 2.43                     | 0.54              |
| 2:1:1337:G:H2'   | 2:1:1338:G:H8    | 1.72                     | 0.54              |
| 2:1:1880:U:H2'   | 2:1:1881:C:C6    | 2.42                     | 0.54              |
| 9:e:127:TYR:HB3  | 9:e:155:ILE:HB   | 1.89                     | 0.54              |
| 11:g:15:LEU:HD21 | 11:g:56:ALA:HB1  | 1.89                     | 0.54              |
| 16:l:83:ALA:HB3  | 16:l:84:LYS:HZ2  | 1.72                     | 0.54              |
| 40:H:138:GLN:NE2 | 40:H:169:GLU:OE1 | 2.40                     | 0.54              |
| 55:W:58:ILE:HG22 | 55:W:62:ARG:HG3  | 1.89                     | 0.54              |
| 1:3:448:A:H62    | 1:3:486:U:H3     | 1.53                     | 0.54              |
| 1:3:1228:C:H5''  | 50:R:112:ARG:HB3 | 1.88                     | 0.54              |
| 2:1:803:U:H3'    | 2:1:804:A:H5''   | 1.89                     | 0.54              |
| 2:1:2271:G:OP1   | 27:w:14:ALA:HB1  | 2.08                     | 0.54              |
| 28:x:11:PRO:HB3  | 28:x:29:LEU:HD12 | 1.89                     | 0.54              |
| 47:O:64:GLN:H    | 51:S:97:LYS:HE2  | 1.72                     | 0.54              |
| 2:1:84:A:H4'     | 2:1:85:G:O5'     | 2.07                     | 0.54              |
| 12:a:165:ASN:HB3 | 12:a:171:ILE:HB  | 1.90                     | 0.54              |
| 33:C:32:LYS:HE3  | 33:C:50:GLU:HG2  | 1.89                     | 0.54              |
| 39:G:13:VAL:CG2  | 39:G:14:HIS:H    | 2.15                     | 0.54              |
| 2:1:361:G:O2'    | 2:1:362:A:H5'    | 2.07                     | 0.54              |
| 2:1:1829:A:H2'   | 2:1:1830:C:H5'   | 1.89                     | 0.54              |
| 2:1:2645:G:H3'   | 2:1:2646:C:C5'   | 2.37                     | 0.54              |
| 3:2:2:G:H2'      | 3:2:3:C:C6       | 2.42                     | 0.54              |
| 7:c:77:ARG:NH2   | 7:c:200:ASP:OD2  | 2.40                     | 0.54              |
| 17:m:12:MET:O    | 17:m:86:LYS:NZ   | 2.36                     | 0.54              |
| 25:u:14:THR:OG1  | 25:u:68:ASN:ND2  | 2.41                     | 0.54              |
| 37:4:19:C:H2'    | 37:4:20:C:C6     | 2.42                     | 0.54              |
| 48:P:83:VAL:HG11 | 48:P:96:ILE:HG22 | 1.90                     | 0.54              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 1:3:962:C:H1'    | 1:3:1201:A:N6     | 2.22                     | 0.54              |
| 1:3:1411:C:H2'   | 1:3:1412:C:C6     | 2.43                     | 0.54              |
| 2:1:1626:A:H5''  | 2:1:1627:G:OP1    | 2.07                     | 0.54              |
| 4:8:438:LEU:HD11 | 4:8:472:ARG:HH12  | 1.71                     | 0.54              |
| 9:e:21:TYR:HB3   | 9:e:26:GLN:HB3    | 1.87                     | 0.54              |
| 44:L:111:GLY:HA2 | 44:L:118:ARG:HD3  | 1.90                     | 0.54              |
| 1:3:320:A:H2'    | 1:3:321:A:C8      | 2.42                     | 0.54              |
| 1:3:795:C:H3'    | 1:3:796:C:H5'     | 1.88                     | 0.54              |
| 2:1:267:C:H2'    | 2:1:268:C:C6      | 2.41                     | 0.54              |
| 2:1:2469:A:C2    | 2:1:2482:A:H1'    | 2.42                     | 0.54              |
| 21:q:15:LYS:O    | 21:q:19:GLN:NE2   | 2.41                     | 0.54              |
| 39:G:218:ALA:O   | 39:G:222:GLU:HG2  | 2.08                     | 0.54              |
| 40:H:18:ASN:HA   | 40:H:55:VAL:HG12  | 1.89                     | 0.54              |
| 42:J:86:GLY:HA3  | 42:J:92:ARG:O     | 2.06                     | 0.54              |
| 51:S:32:ASP:O    | 56:X:6:LYS:NZ     | 2.39                     | 0.54              |
| 2:1:198:C:O2'    | 2:1:199:A:H5'     | 2.07                     | 0.54              |
| 2:1:1424:G:H2'   | 2:1:1425:G:O4'    | 2.07                     | 0.54              |
| 2:1:1562:U:H2'   | 2:1:1563:U:O4'    | 2.07                     | 0.54              |
| 4:8:408:ARG:NH2  | 4:8:410:GLU:OE2   | 2.39                     | 0.54              |
| 11:g:52:ALA:HA   | 11:g:56:ALA:HB2   | 1.90                     | 0.54              |
| 18:n:2:ARG:HG2   | 18:n:5:LYS:HB3    | 1.88                     | 0.54              |
| 40:H:58:ARG:HE   | 40:H:63:ILE:HD12  | 1.73                     | 0.54              |
| 1:3:510:A:N3     | 1:3:543:U:H1'     | 2.23                     | 0.54              |
| 1:3:1225:A:H5'   | 1:3:1226:C:OP2    | 2.08                     | 0.54              |
| 2:1:2231:U:H2'   | 2:1:2232:C:H6     | 1.71                     | 0.54              |
| 4:8:277:ALA:HA   | 4:8:280:ASP:HB2   | 1.89                     | 0.54              |
| 2:1:973:A:H5''   | 22:r:81:LYS:HD2   | 1.90                     | 0.54              |
| 2:1:2013:A:H61   | 2:1:2613:U:H3     | 1.56                     | 0.54              |
| 17:m:66:ARG:NH1  | 17:m:104:GLU:OE2  | 2.40                     | 0.54              |
| 39:G:23:ASN:H    | 39:G:189:ASN:HA   | 1.71                     | 0.54              |
| 40:H:109:GLU:HB2 | 40:H:143:LEU:HD13 | 1.89                     | 0.54              |
| 43:K:71:ILE:HD12 | 43:K:74:LEU:HD13  | 1.89                     | 0.54              |
| 57:Y:5:SER:O     | 57:Y:8:LYS:NZ     | 2.40                     | 0.54              |
| 1:3:575:G:H4'    | 1:3:576:C:C5'     | 2.36                     | 0.54              |
| 2:1:2114:A:C5    | 2:1:2115:G:H1'    | 2.43                     | 0.54              |
| 2:1:2209:G:H3'   | 2:1:2210:U:C5'    | 2.38                     | 0.54              |
| 1:3:766:A:H2'    | 1:3:767:A:O4'     | 2.08                     | 0.53              |
| 2:1:745:G:O2'    | 2:1:748:G:H1'     | 2.07                     | 0.53              |
| 2:1:780:G:H2'    | 2:1:782:A:N7      | 2.23                     | 0.53              |
| 2:1:1468:U:H2'   | 2:1:1522:A:N6     | 2.23                     | 0.53              |
| 4:8:134:LYS:NZ   | 4:8:257:LEU:O     | 2.33                     | 0.53              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 42:J:39:GLY:HA3  | 42:J:116:VAL:HB  | 1.89                     | 0.53              |
| 2:1:327:G:O2'    | 2:1:328:U:H5'    | 2.08                     | 0.53              |
| 2:1:1316:U:H2'   | 2:1:1317:G:C8    | 2.44                     | 0.53              |
| 2:1:2295:C:O2'   | 2:1:2296:U:H5'   | 2.07                     | 0.53              |
| 2:1:2732:G:C3'   | 2:1:2733:A:H5'   | 2.38                     | 0.53              |
| 4:8:72:TRP:O     | 4:8:82:HIS:N     | 2.39                     | 0.53              |
| 40:H:31:ASN:OD1  | 40:H:58:ARG:NH1  | 2.40                     | 0.53              |
| 54:V:46:HIS:HD2  | 54:V:73:THR:HG23 | 1.73                     | 0.53              |
| 1:3:9:G:C5'      | 42:J:107:GLY:HA3 | 2.37                     | 0.53              |
| 1:3:1032:G:N2    | 1:3:1033:G:H4'   | 2.24                     | 0.53              |
| 1:3:1105:A:H2'   | 1:3:1106:G:H8    | 1.73                     | 0.53              |
| 1:3:1178:G:O6    | 46:N:98:ARG:NH2  | 2.41                     | 0.53              |
| 2:1:355:U:H2'    | 2:1:356:G:H8     | 1.73                     | 0.53              |
| 2:1:1958:C:O2'   | 2:1:1959:G:H5'   | 2.08                     | 0.53              |
| 2:1:2098:U:H2'   | 2:1:2099:U:O4'   | 2.08                     | 0.53              |
| 42:J:159:SER:HB3 | 42:J:162:GLU:HB2 | 1.89                     | 0.53              |
| 43:K:6:ILE:HG23  | 43:K:62:MET:HB3  | 1.89                     | 0.53              |
| 51:S:48:GLN:HB3  | 56:X:12:LEU:HD22 | 1.89                     | 0.53              |
| 55:W:46:THR:OG1  | 55:W:51:GLN:NE2  | 2.39                     | 0.53              |
| 1:3:253:A:H61    | 1:3:273:U:H3     | 1.54                     | 0.53              |
| 1:3:1133:G:H2'   | 1:3:1134:G:H8    | 1.74                     | 0.53              |
| 2:1:581:C:H2'    | 2:1:582:A:C8     | 2.42                     | 0.53              |
| 2:1:669:G:H2'    | 2:1:669:G:N3     | 2.23                     | 0.53              |
| 2:1:952:G:H2'    | 2:1:953:G:H5''   | 1.89                     | 0.53              |
| 2:1:1179:G:H3'   | 2:1:1180:U:C4'   | 2.38                     | 0.53              |
| 2:1:1968:G:C2'   | 2:1:1969:A:H5''  | 2.38                     | 0.53              |
| 28:x:6:VAL:O     | 28:x:73:ARG:NH2  | 2.38                     | 0.53              |
| 39:G:42:LEU:HD23 | 39:G:42:LEU:N    | 2.15                     | 0.53              |
| 47:O:52:LEU:HD23 | 51:S:80:ARG:HH21 | 1.72                     | 0.53              |
| 52:T:35:ILE:HG23 | 52:T:55:LEU:HD11 | 1.90                     | 0.53              |
| 1:3:255:G:H4'    | 54:V:18:LYS:HD2  | 1.90                     | 0.53              |
| 1:3:363:A:OP1    | 49:Q:29:LYS:HD2  | 2.07                     | 0.53              |
| 1:3:386:C:C2'    | 1:3:387:U:H5''   | 2.38                     | 0.53              |
| 1:3:1130:A:H4'   | 46:N:4:GLN:NE2   | 2.24                     | 0.53              |
| 2:1:594:U:H2'    | 2:1:595:C:C6     | 2.44                     | 0.53              |
| 2:1:1796:U:H2'   | 2:1:1797:G:C8    | 2.44                     | 0.53              |
| 2:1:2660:A:H1'   | 4:8:676:GLY:HA3  | 1.89                     | 0.53              |
| 4:8:221:ASN:ND2  | 4:8:224:GLU:OE1  | 2.41                     | 0.53              |
| 39:G:52:ALA:O    | 39:G:56:LEU:HG   | 2.09                     | 0.53              |
| 1:3:397:A:H3'    | 1:3:397:A:N3     | 2.23                     | 0.53              |
| 1:3:423:G:H2'    | 1:3:424:G:H5'    | 1.91                     | 0.53              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 1:3:1092:A:H5''   | 44:L:3:ARG:HG2    | 1.91                     | 0.53              |
| 1:3:1469:C:H2'    | 1:3:1470:U:H5'    | 1.89                     | 0.53              |
| 2:1:112:U:C2'     | 2:1:113:U:H5'     | 2.38                     | 0.53              |
| 2:1:1111:A:O2'    | 2:1:1112:G:H4'    | 2.08                     | 0.53              |
| 2:1:1174:U:O2'    | 2:1:1175:A:H5'    | 2.08                     | 0.53              |
| 42:J:104:ILE:HG23 | 42:J:111:ARG:HH12 | 1.74                     | 0.53              |
| 48:P:45:THR:OG1   | 48:P:46:ALA:N     | 2.42                     | 0.53              |
| 50:R:1:ALA:HA     | 50:R:8:ILE:HA     | 1.91                     | 0.53              |
| 1:3:373:A:O2'     | 1:3:374:A:H5'     | 2.09                     | 0.53              |
| 1:3:936:C:H2'     | 1:3:937:A:O4'     | 2.09                     | 0.53              |
| 2:1:777:G:O2'     | 2:1:778:G:H5'     | 2.09                     | 0.53              |
| 6:b:43:ASN:OD1    | 6:b:49:THR:OG1    | 2.24                     | 0.53              |
| 6:b:75:ALA:HB3    | 6:b:115:ILE:HG13  | 1.91                     | 0.53              |
| 13:i:11:GLN:HA    | 13:i:23:VAL:HG21  | 1.91                     | 0.53              |
| 39:G:94:ARG:H     | 39:G:94:ARG:CD    | 2.21                     | 0.53              |
| 2:1:1077:A:C2'    | 2:1:1078:U:H5'    | 2.39                     | 0.53              |
| 2:1:1219:U:H2'    | 2:1:1220:G:C8     | 2.43                     | 0.53              |
| 6:b:144:GLU:HA    | 6:b:151:GLY:HA2   | 1.91                     | 0.53              |
| 8:d:134:LEU:HD21  | 8:d:157:LEU:HG    | 1.91                     | 0.53              |
| 22:r:51:VAL:HG22  | 22:r:52:PRO:HD2   | 1.90                     | 0.53              |
| 50:R:100:ARG:HD2  | 50:R:102:LYS:H    | 1.74                     | 0.53              |
| 2:1:2257:U:O2'    | 2:1:2258:C:H5'    | 2.09                     | 0.53              |
| 15:k:64:ARG:NH1   | 15:k:102:PRO:O    | 2.42                     | 0.53              |
| 45:M:24:VAL:HG12  | 45:M:62:LEU:HD11  | 1.91                     | 0.53              |
| 1:3:179:A:H61     | 1:3:196:A:H62     | 1.57                     | 0.53              |
| 1:3:358:U:H2'     | 1:3:359:G:C8      | 2.43                     | 0.53              |
| 1:3:1386:G:H2'    | 1:3:1387:G:C8     | 2.44                     | 0.53              |
| 2:1:617:G:H5''    | 8:d:102:ARG:HH11  | 1.73                     | 0.53              |
| 2:1:799:G:C3'     | 2:1:800:A:H5''    | 2.37                     | 0.53              |
| 7:c:28:GLU:HA     | 7:c:186:LEU:HA    | 1.91                     | 0.53              |
| 11:g:66:ASN:HB3   | 11:g:134:VAL:HG23 | 1.90                     | 0.53              |
| 39:G:75:ALA:O     | 39:G:79:VAL:HG23  | 2.08                     | 0.53              |
| 1:3:252:U:O2      | 1:3:252:U:H2'     | 2.07                     | 0.52              |
| 1:3:940:C:H2'     | 1:3:941:G:C8      | 2.42                     | 0.52              |
| 1:3:1210:C:H2'    | 1:3:1211:U:O4'    | 2.10                     | 0.52              |
| 1:3:1251:A:O2'    | 1:3:1370:G:H5'    | 2.09                     | 0.52              |
| 2:1:1923:U:H2'    | 2:1:1924:C:H6     | 1.71                     | 0.52              |
| 2:1:2457:U:H3     | 2:1:2494:G:H1     | 1.56                     | 0.52              |
| 50:R:85:TYR:HA    | 50:R:88:LEU:HB2   | 1.91                     | 0.52              |
| 1:3:392:C:H2'     | 1:3:393:A:O4'     | 2.09                     | 0.52              |
| 2:1:182:A:H2'     | 2:1:183:C:C6      | 2.44                     | 0.52              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 2:1:2619:C:O2'   | 2:1:2620:C:H5'    | 2.08                     | 0.52              |
| 3:2:83:G:C3'     | 3:2:84:G:H5''     | 2.39                     | 0.52              |
| 4:8:513:GLY:O    | 37:4:22:A:N1      | 2.42                     | 0.52              |
| 9:e:155:ILE:HG21 | 9:e:169:LEU:HD21  | 1.91                     | 0.52              |
| 13:i:83:ALA:HA   | 13:i:104:GLN:HE22 | 1.74                     | 0.52              |
| 17:m:90:GLU:HB3  | 17:m:91:TYR:HD1   | 1.73                     | 0.52              |
| 38:5:43:U:H2'    | 38:5:44:G:H8      | 1.73                     | 0.52              |
| 1:3:1369:C:OP2   | 46:N:113:LYS:HE2  | 2.09                     | 0.52              |
| 2:1:358:U:H2'    | 2:1:359:G:C8      | 2.43                     | 0.52              |
| 2:1:834:G:H5'    | 35:E:56:LEU:HD21  | 1.90                     | 0.52              |
| 2:1:2553:G:H2'   | 2:1:2554:U:C4'    | 2.38                     | 0.52              |
| 3:2:30:C:H2'     | 3:2:31:C:C5'      | 2.39                     | 0.52              |
| 4:8:598:SER:O    | 4:8:602:LYS:N     | 2.42                     | 0.52              |
| 4:8:638:ARG:NH1  | 4:8:669:GLN:OE1   | 2.42                     | 0.52              |
| 7:c:27:ILE:O     | 7:c:187:LEU:N     | 2.40                     | 0.52              |
| 16:l:78:ARG:NH2  | 16:l:80:SER:OG    | 2.41                     | 0.52              |
| 38:5:44:G:H2'    | 38:5:45:G:H5'     | 1.91                     | 0.52              |
| 41:I:110:ARG:O   | 41:I:114:ARG:N    | 2.40                     | 0.52              |
| 49:Q:86:VAL:HG21 | 49:Q:89:LEU:HB2   | 1.91                     | 0.52              |
| 1:3:860:A:H2'    | 1:3:861:G:O4'     | 2.09                     | 0.52              |
| 1:3:1196:A:H2    | 40:H:161:ILE:HG13 | 1.74                     | 0.52              |
| 2:1:992:C:H2'    | 2:1:993:G:H8      | 1.75                     | 0.52              |
| 20:p:1:SER:OG    | 20:p:2:ASN:N      | 2.41                     | 0.52              |
| 29:y:17:GLU:HB3  | 29:y:53:VAL:HG11  | 1.92                     | 0.52              |
| 42:J:92:ARG:HB2  | 42:J:127:TYR:HB2  | 1.92                     | 0.52              |
| 1:3:38:G:H22     | 1:3:397:A:H5'     | 1.75                     | 0.52              |
| 2:1:139:U:H3'    | 2:1:141:G:H1'     | 1.91                     | 0.52              |
| 2:1:1167:C:H2'   | 2:1:1168:G:H8     | 1.75                     | 0.52              |
| 2:1:1203:U:H5'   | 16:l:3:LEU:HD23   | 1.91                     | 0.52              |
| 2:1:2421:G:H2'   | 5:6:76:A:N6       | 2.24                     | 0.52              |
| 45:M:104:SER:HB2 | 45:M:125:ILE:HD11 | 1.90                     | 0.52              |
| 52:T:46:LYS:HE2  | 52:T:52:ARG:HH22  | 1.75                     | 0.52              |
| 1:3:705:G:H2'    | 1:3:706:A:O4'     | 2.09                     | 0.52              |
| 1:3:1056:U:H5'   | 40:H:162:ALA:HB2  | 1.90                     | 0.52              |
| 2:1:196:A:C2     | 16:l:50:PHE:HZ    | 2.28                     | 0.52              |
| 2:1:1678:A:H2'   | 2:1:1679:A:O4'    | 2.10                     | 0.52              |
| 2:1:2504:U:H2'   | 2:1:2505:G:H5'    | 1.91                     | 0.52              |
| 38:5:43:U:H2'    | 38:5:44:G:C8      | 2.45                     | 0.52              |
| 48:P:34:THR:OG1  | 48:P:35:ASP:N     | 2.43                     | 0.52              |
| 53:U:8:ARG:O     | 53:U:29:ASN:ND2   | 2.42                     | 0.52              |
| 5:6:34:C:N4      | 37:4:18:G:H1      | 2.08                     | 0.52              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 40:H:70:ALA:HA    | 40:H:105:VAL:HB   | 1.92                     | 0.52              |
| 42:J:80:LEU:HG    | 42:J:122:VAL:HG22 | 1.92                     | 0.52              |
| 47:O:36:VAL:HG12  | 47:O:76:ILE:HB    | 1.91                     | 0.52              |
| 1:3:730:G:H2'     | 1:3:731:G:H5'     | 1.92                     | 0.52              |
| 1:3:1313:U:OP2    | 56:X:5:LYS:HG3    | 2.09                     | 0.52              |
| 15:k:87:LEU:HD13  | 15:k:92:GLU:HB3   | 1.92                     | 0.52              |
| 16:l:12:SER:OG    | 16:l:13:LYS:N     | 2.43                     | 0.52              |
| 17:m:25:ASP:N     | 17:m:25:ASP:OD1   | 2.43                     | 0.52              |
| 22:r:95:ASP:OD1   | 22:r:95:ASP:N     | 2.39                     | 0.52              |
| 1:3:405:U:H3'     | 1:3:406:G:C5'     | 2.31                     | 0.52              |
| 2:1:279:A:C2'     | 2:1:280:U:H5'     | 2.39                     | 0.52              |
| 2:1:615:U:H5''    | 2:1:616:A:OP2     | 2.09                     | 0.52              |
| 2:1:993:G:N3      | 22:r:91:GLN:NE2   | 2.57                     | 0.52              |
| 2:1:1506:U:H2'    | 2:1:1507:C:C6     | 2.45                     | 0.52              |
| 2:1:2847:U:H2'    | 2:1:2848:G:H5'    | 1.91                     | 0.52              |
| 42:J:95:MET:HB3   | 42:J:124:ALA:HB2  | 1.91                     | 0.52              |
| 57:Y:19:HIS:O     | 57:Y:22:SER:OG    | 2.27                     | 0.52              |
| 1:3:1341:U:H2'    | 1:3:1342:C:C6     | 2.45                     | 0.52              |
| 1:3:1464:U:H2'    | 1:3:1465:A:C8     | 2.45                     | 0.52              |
| 2:1:368:A:C2'     | 2:1:369:U:H5'     | 2.39                     | 0.52              |
| 4:8:77:LYS:NZ     | 4:8:283:ILE:O     | 2.37                     | 0.52              |
| 4:8:175:ALA:H     | 4:8:178:HIS:HB2   | 1.74                     | 0.52              |
| 7:c:178:VAL:N     | 7:c:188:LEU:O     | 2.41                     | 0.52              |
| 41:I:101:VAL:HG23 | 41:I:113:ALA:HB1  | 1.92                     | 0.52              |
| 56:X:30:LEU:HD11  | 56:X:46:LEU:HD22  | 1.92                     | 0.52              |
| 1:3:167:A:C2'     | 1:3:168:G:H5''    | 2.40                     | 0.51              |
| 1:3:501:C:H2'     | 1:3:502:A:H8      | 1.75                     | 0.51              |
| 2:1:12:U:H3       | 2:1:526:A:H62     | 1.58                     | 0.51              |
| 2:1:40:U:H2'      | 2:1:41:C:C6       | 2.45                     | 0.51              |
| 2:1:700:G:O2'     | 2:1:701:G:H5'     | 2.11                     | 0.51              |
| 2:1:971:G:H2'     | 2:1:972:A:O4'     | 2.11                     | 0.51              |
| 4:8:435:LEU:O     | 4:8:439:ALA:N     | 2.36                     | 0.51              |
| 12:a:4:LEU:O      | 12:a:9:ARG:NH2    | 2.43                     | 0.51              |
| 39:G:63:LYS:HD2   | 39:G:224:ARG:CZ   | 2.39                     | 0.51              |
| 44:L:113:LYS:HB3  | 44:L:117:LEU:HG   | 1.92                     | 0.51              |
| 50:R:30:LYS:O     | 50:R:34:ALA:N     | 2.42                     | 0.51              |
| 50:R:38:ILE:HG21  | 50:R:47:LEU:HD21  | 1.93                     | 0.51              |
| 1:3:1093:A:H2     | 1:3:1109:C:H1'    | 1.74                     | 0.51              |
| 1:3:1524:C:H2'    | 1:3:1525:G:C8     | 2.45                     | 0.51              |
| 2:1:92:U:H2'      | 2:1:93:G:O4'      | 2.10                     | 0.51              |
| 2:1:720:U:H2'     | 2:1:721:A:C8      | 2.45                     | 0.51              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 2:1:962:G:N2     | 2:1:2250:G:H1     | 2.07                     | 0.51              |
| 3:2:115:A:H2'    | 3:2:116:G:C8      | 2.45                     | 0.51              |
| 13:i:82:ALA:O    | 13:i:104:GLN:NE2  | 2.43                     | 0.51              |
| 14:j:65:THR:O    | 14:j:68:LYS:NZ    | 2.40                     | 0.51              |
| 18:n:8:ARG:HH12  | 18:n:42:LYS:HE3   | 1.75                     | 0.51              |
| 38:5:73:A:H5''   | 38:5:74:C:O4'     | 2.10                     | 0.51              |
| 39:G:50:ASN:HA   | 39:G:53:LEU:HG    | 1.92                     | 0.51              |
| 1:3:250:A:H4'    | 1:3:251:G:O5'     | 2.11                     | 0.51              |
| 1:3:1146:A:H2'   | 1:3:1147:C:H5'    | 1.93                     | 0.51              |
| 1:3:1307:U:H2'   | 50:R:96:VAL:C     | 2.35                     | 0.51              |
| 2:1:1337:G:H2'   | 2:1:1338:G:C8     | 2.45                     | 0.51              |
| 2:1:2144:G:H4'   | 2:1:2145:C:C5     | 2.44                     | 0.51              |
| 6:b:94:LEU:HD13  | 6:b:100:ARG:HG2   | 1.92                     | 0.51              |
| 21:q:90:ASP:OD1  | 22:r:11:GLN:NE2   | 2.43                     | 0.51              |
| 41:I:13:ARG:HD3  | 41:I:37:PRO:HG3   | 1.92                     | 0.51              |
| 54:V:30:HIS:N    | 54:V:35:LYS:O     | 2.43                     | 0.51              |
| 1:3:409:U:OP1    | 41:I:23:GLY:HA3   | 2.09                     | 0.51              |
| 1:3:882:C:O2'    | 1:3:883:C:H5'     | 2.10                     | 0.51              |
| 1:3:1329:A:O2'   | 1:3:1330:U:H5'    | 2.11                     | 0.51              |
| 2:1:1383:A:H2    | 2:1:1406:U:H1'    | 1.75                     | 0.51              |
| 2:1:2453:A:H2'   | 2:1:2454:G:H8     | 1.76                     | 0.51              |
| 4:8:165:ASN:HB3  | 4:8:261:ILE:HG22  | 1.92                     | 0.51              |
| 7:c:199:SER:OG   | 7:c:200:ASP:N     | 2.43                     | 0.51              |
| 9:e:90:LEU:HD23  | 9:e:94:ARG:HG3    | 1.93                     | 0.51              |
| 20:p:111:GLU:HG2 | 20:p:113:LEU:HD23 | 1.92                     | 0.51              |
| 44:L:41:ILE:HD13 | 44:L:115:MET:HE2  | 1.93                     | 0.51              |
| 1:3:673:A:H2'    | 1:3:674:G:C8      | 2.45                     | 0.51              |
| 2:1:2555:U:H2'   | 2:1:2556:C:H5'    | 1.91                     | 0.51              |
| 2:1:2837:A:H2'   | 2:1:2838:G:C8     | 2.44                     | 0.51              |
| 8:d:76:PRO:HA    | 8:d:82:GLY:HA2    | 1.92                     | 0.51              |
| 49:Q:41:PRO:HB3  | 49:Q:88:ASP:HB3   | 1.92                     | 0.51              |
| 1:3:1538:C:C2    | 1:3:1539:C:C5     | 2.98                     | 0.51              |
| 2:1:581:C:H2'    | 2:1:582:A:H8      | 1.75                     | 0.51              |
| 2:1:778:G:H5''   | 6:b:47:ARG:HD3    | 1.92                     | 0.51              |
| 8:d:130:LYS:HB2  | 8:d:133:LEU:HG    | 1.92                     | 0.51              |
| 38:5:14:A:H2'    | 38:5:15:G:H5'     | 1.93                     | 0.51              |
| 41:I:187:ARG:HD2 | 41:I:190:LEU:HD21 | 1.92                     | 0.51              |
| 52:T:66:LEU:O    | 52:T:70:LYS:N     | 2.43                     | 0.51              |
| 2:1:1351:C:H2'   | 2:1:1352:U:C6     | 2.46                     | 0.51              |
| 2:1:2006:C:H5'   | 2:1:2049:G:OP1    | 2.11                     | 0.51              |
| 2:1:2847:U:C2'   | 2:1:2848:G:H5'    | 2.41                     | 0.51              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 4:8:127:TRP:HH2  | 4:8:262:ILE:HG21 | 1.76                     | 0.51              |
| 4:8:334:THR:HG21 | 4:8:388:LEU:HB2  | 1.92                     | 0.51              |
| 18:n:36:THR:HG23 | 18:n:41:ALA:HB2  | 1.92                     | 0.51              |
| 42:J:88:HIS:NE2  | 42:J:137:ARG:HD2 | 2.25                     | 0.51              |
| 1:3:1290:G:C3'   | 1:3:1291:U:H5'   | 2.41                     | 0.51              |
| 2:1:1173:U:C2'   | 2:1:1174:U:H5''  | 2.41                     | 0.51              |
| 7:c:61:THR:O     | 7:c:65:ALA:N     | 2.44                     | 0.51              |
| 39:G:14:HIS:HA   | 39:G:202:ASN:CG  | 2.36                     | 0.51              |
| 39:G:217:ALA:C   | 39:G:221:ARG:HE  | 2.19                     | 0.51              |
| 52:T:32:THR:OG1  | 52:T:62:ARG:NE   | 2.44                     | 0.51              |
| 2:1:11:C:H3'     | 2:1:12:U:H5''    | 1.92                     | 0.51              |
| 2:1:12:U:O2      | 2:1:12:U:H2'     | 2.10                     | 0.51              |
| 2:1:1189:A:H2'   | 2:1:1190:G:H5'   | 1.92                     | 0.51              |
| 2:1:1662:U:O2    | 2:1:2687:U:H5''  | 2.10                     | 0.51              |
| 4:8:282:VAL:HG13 | 4:8:286:LEU:HD12 | 1.93                     | 0.51              |
| 6:b:128:THR:O    | 6:b:128:THR:OG1  | 2.29                     | 0.51              |
| 39:G:13:VAL:HG13 | 39:G:14:HIS:ND1  | 2.26                     | 0.51              |
| 39:G:148:GLY:O   | 39:G:151:LYS:HG2 | 2.11                     | 0.51              |
| 43:K:6:ILE:HG13  | 43:K:89:VAL:HG22 | 1.93                     | 0.51              |
| 51:S:78:LEU:HD12 | 51:S:82:LYS:HD3  | 1.92                     | 0.51              |
| 1:3:216:U:H2'    | 1:3:217:C:C6     | 2.46                     | 0.51              |
| 1:3:222:C:H2'    | 1:3:223:A:H8     | 1.76                     | 0.51              |
| 1:3:769:G:O2'    | 1:3:770:C:H5'    | 2.11                     | 0.51              |
| 1:3:1305:G:H1'   | 1:3:1332:A:N6    | 2.25                     | 0.51              |
| 2:1:864:G:O2'    | 2:1:865:C:H5'    | 2.11                     | 0.51              |
| 2:1:1101:U:O2'   | 2:1:1102:C:H5'   | 2.11                     | 0.51              |
| 2:1:1242:U:H2'   | 2:1:1243:C:C6    | 2.46                     | 0.51              |
| 2:1:1249:U:O4    | 16:l:18:ARG:HD2  | 2.10                     | 0.51              |
| 2:1:2294:G:H2'   | 2:1:2295:C:C6    | 2.46                     | 0.51              |
| 2:1:2473:U:O2    | 4:8:636:SER:HB2  | 2.11                     | 0.51              |
| 4:8:429:GLU:O    | 4:8:433:LEU:N    | 2.45                     | 0.51              |
| 39:G:53:LEU:HD22 | 39:G:219:THR:CG2 | 2.39                     | 0.51              |
| 39:G:170:ILE:O   | 39:G:174:GLU:HG3 | 2.11                     | 0.51              |
| 46:N:114:LYS:HE3 | 46:N:115:VAL:H   | 1.75                     | 0.51              |
| 1:3:617:G:H21    | 53:U:14:ARG:HH12 | 1.59                     | 0.50              |
| 4:8:101:ARG:NH1  | 4:8:322:PHE:O    | 2.44                     | 0.50              |
| 4:8:193:TRP:HD1  | 4:8:195:ASP:HA   | 1.75                     | 0.50              |
| 4:8:374:ILE:HG13 | 4:8:376:GLU:H    | 1.75                     | 0.50              |
| 4:8:626:GLU:O    | 4:8:627:ASN:ND2  | 2.44                     | 0.50              |
| 46:N:7:GLY:N     | 46:N:18:VAL:O    | 2.43                     | 0.50              |
| 1:3:831:A:H5'    | 39:G:20:ARG:HH12 | 1.76                     | 0.50              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:3:945:G:H2'    | 1:3:945:G:N3     | 2.26                     | 0.50              |
| 1:3:947:G:H2'    | 1:3:948:C:C6     | 2.46                     | 0.50              |
| 2:1:38:A:H5'     | 8:d:45:ALA:HB3   | 1.93                     | 0.50              |
| 2:1:290:U:H2'    | 2:1:291:G:H8     | 1.75                     | 0.50              |
| 2:1:760:G:H2'    | 2:1:761:A:O4'    | 2.10                     | 0.50              |
| 2:1:1434:A:H2'   | 2:1:1435:G:H8    | 1.76                     | 0.50              |
| 16:l:19:LEU:HD12 | 16:l:31:GLY:HA3  | 1.93                     | 0.50              |
| 50:R:89:ARG:HH21 | 50:R:94:LEU:HD12 | 1.76                     | 0.50              |
| 55:W:58:ILE:O    | 55:W:62:ARG:N    | 2.34                     | 0.50              |
| 1:3:1086:U:H2'   | 1:3:1087:G:H8    | 1.77                     | 0.50              |
| 1:3:1413:A:H2    | 1:3:1487:G:H22   | 1.60                     | 0.50              |
| 2:1:323:C:H2'    | 2:1:1205:A:N1    | 2.26                     | 0.50              |
| 2:1:2515:C:O2'   | 2:1:2516:A:H5'   | 2.11                     | 0.50              |
| 4:8:327:ASP:HB2  | 4:8:331:GLY:H    | 1.76                     | 0.50              |
| 6:b:89:ASN:OD1   | 6:b:196:ASN:ND2  | 2.44                     | 0.50              |
| 39:G:119:GLN:HA  | 39:G:123:GLY:HA3 | 1.94                     | 0.50              |
| 42:J:44:ARG:HA   | 42:J:71:ILE:O    | 2.10                     | 0.50              |
| 2:1:145:C:H2'    | 2:1:146:A:H8     | 1.75                     | 0.50              |
| 2:1:435:C:H2'    | 2:1:436:C:H5'    | 1.92                     | 0.50              |
| 2:1:636:G:OP1    | 16:l:129:LYS:HE3 | 2.12                     | 0.50              |
| 2:1:1001:A:H2'   | 2:1:1002:G:O4'   | 2.11                     | 0.50              |
| 2:1:2498:C:H6    | 2:1:2498:C:H5'   | 1.76                     | 0.50              |
| 2:1:2619:C:H5'   | 7:c:155:VAL:O    | 2.12                     | 0.50              |
| 4:8:109:ALA:HB3  | 4:8:137:ARG:HG3  | 1.93                     | 0.50              |
| 7:c:148:GLN:HE21 | 7:c:152:PRO:HG2  | 1.77                     | 0.50              |
| 38:5:9:A:N3      | 38:5:45:G:H2'    | 2.26                     | 0.50              |
| 40:H:128:MET:HE2 | 40:H:130:ARG:HD2 | 1.93                     | 0.50              |
| 40:H:147:GLY:HA2 | 40:H:170:GLY:HA3 | 1.94                     | 0.50              |
| 45:M:12:ARG:NH1  | 45:M:25:THR:O    | 2.43                     | 0.50              |
| 48:P:98:ALA:HA   | 48:P:101:ALA:HB3 | 1.94                     | 0.50              |
| 55:W:61:ALA:HB1  | 55:W:66:LEU:HB2  | 1.93                     | 0.50              |
| 1:3:155:A:H61    | 1:3:166:U:H3     | 1.60                     | 0.50              |
| 1:3:204:G:H2'    | 1:3:205:A:C8     | 2.47                     | 0.50              |
| 2:1:1813:G:H21   | 6:b:49:THR:HG22  | 1.75                     | 0.50              |
| 4:8:150:ASN:HB3  | 4:8:153:LYS:HG3  | 1.94                     | 0.50              |
| 8:d:46:GLN:OE1   | 8:d:87:ALA:N     | 2.44                     | 0.50              |
| 8:d:176:ASP:OD2  | 8:d:176:ASP:N    | 2.44                     | 0.50              |
| 38:5:72:G:O2'    | 38:5:73:A:H8     | 1.94                     | 0.50              |
| 52:T:57:ARG:HH11 | 52:T:61:GLN:HG3  | 1.76                     | 0.50              |
| 54:V:16:MET:N    | 54:V:16:MET:SD   | 2.85                     | 0.50              |
| 1:3:79:G:H2'     | 1:3:80:A:O4'     | 2.11                     | 0.50              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 1:3:220:G:O2'     | 1:3:221:C:H5'     | 2.12                     | 0.50              |
| 1:3:950:U:H5      | 50:R:100:ARG:HH22 | 1.58                     | 0.50              |
| 1:3:1090:U:O2'    | 1:3:1091:U:H4'    | 2.12                     | 0.50              |
| 1:3:1527:U:O2'    | 1:3:1528:U:H5'    | 2.11                     | 0.50              |
| 2:1:1652:A:H62    | 18:n:11:ASN:ND2   | 2.09                     | 0.50              |
| 2:1:1782:U:H1'    | 2:1:2609:U:H5''   | 1.94                     | 0.50              |
| 2:1:1872:A:C2'    | 2:1:1873:G:H5'    | 2.32                     | 0.50              |
| 2:1:2720:U:OP1    | 20:p:52:ARG:NH2   | 2.45                     | 0.50              |
| 8:d:154:ASP:N     | 8:d:154:ASP:OD1   | 2.44                     | 0.50              |
| 13:i:79:LEU:HA    | 13:i:82:ALA:HB3   | 1.92                     | 0.50              |
| 38:5:61:C:H2'     | 38:5:62:C:C6      | 2.47                     | 0.50              |
| 58:Z:52:VAL:O     | 58:Z:56:ALA:N     | 2.43                     | 0.50              |
| 2:1:1570:A:H5'    | 6:b:35:LYS:HB3    | 1.93                     | 0.50              |
| 2:1:1727:C:H2'    | 2:1:1728:C:O4'    | 2.11                     | 0.50              |
| 2:1:1779:U:H5     | 2:1:1784:A:N7     | 2.09                     | 0.50              |
| 2:1:2508:G:H2'    | 2:1:2509:G:C8     | 2.47                     | 0.50              |
| 2:1:2705:A:H2'    | 2:1:2706:A:O4'    | 2.12                     | 0.50              |
| 2:1:2724:U:H2'    | 2:1:2725:A:C8     | 2.47                     | 0.50              |
| 2:1:2861:U:H2'    | 2:1:2862:G:H8     | 1.76                     | 0.50              |
| 8:d:61:ARG:NH2    | 8:d:63:LYS:O      | 2.44                     | 0.50              |
| 38:5:48:C:H4'     | 38:5:49:G:H5''    | 1.94                     | 0.50              |
| 1:3:751:U:O2'     | 52:T:24:THR:HG23  | 2.11                     | 0.50              |
| 2:1:213:A:O2'     | 2:1:214:G:H5'     | 2.12                     | 0.50              |
| 2:1:440:C:H2'     | 2:1:441:U:C6      | 2.47                     | 0.50              |
| 2:1:527:C:H4'     | 2:1:528:A:O4'     | 2.10                     | 0.50              |
| 2:1:631:A:O2'     | 16:l:65:GLY:HA2   | 2.12                     | 0.50              |
| 2:1:1316:U:H2'    | 2:1:1317:G:H8     | 1.76                     | 0.50              |
| 2:1:2259:U:H2'    | 2:1:2260:C:H6     | 1.77                     | 0.50              |
| 2:1:2372:U:H2'    | 2:1:2373:G:H5'    | 1.94                     | 0.50              |
| 2:1:2834:G:H2'    | 2:1:2879:A:N6     | 2.26                     | 0.50              |
| 4:8:18:HIS:ND1    | 4:8:19:ILE:O      | 2.44                     | 0.50              |
| 20:p:62:LYS:NZ    | 20:p:64:SER:OG    | 2.42                     | 0.50              |
| 39:G:102:ASN:HD21 | 39:G:105:THR:HG21 | 1.77                     | 0.50              |
| 43:K:23:GLU:O     | 43:K:26:THR:OG1   | 2.28                     | 0.50              |
| 46:N:10:ARG:O     | 46:N:105:ARG:NH2  | 2.45                     | 0.50              |
| 49:Q:23:LEU:HB3   | 49:Q:26:CYS:HB2   | 1.93                     | 0.50              |
| 1:3:54:C:H2'      | 1:3:352:C:H41     | 1.77                     | 0.50              |
| 1:3:224:U:H2'     | 1:3:225:C:C6      | 2.46                     | 0.50              |
| 2:1:197:A:H4'     | 2:1:2069:G:OP2    | 2.12                     | 0.50              |
| 14:j:60:ASP:OD1   | 14:j:61:LYS:NZ    | 2.38                     | 0.50              |
| 15:k:2:ILE:HD12   | 15:k:62:VAL:HG21  | 1.93                     | 0.50              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 23:s:28:LYS:HE3  | 23:s:30:SER:HB2   | 1.94                     | 0.50              |
| 26:v:30:ILE:HD11 | 26:v:38:LEU:HD23  | 1.94                     | 0.50              |
| 34:D:8:SER:HB3   | 34:D:11:LYS:HB2   | 1.94                     | 0.50              |
| 37:4:5:A:H2'     | 37:4:6:G:H8       | 1.76                     | 0.50              |
| 38:5:6:A:H61     | 38:5:67:U:H3      | 1.60                     | 0.50              |
| 38:5:11:C:H2'    | 38:5:12:G:C8      | 2.47                     | 0.50              |
| 40:H:34:SER:OG   | 40:H:58:ARG:NH2   | 2.45                     | 0.50              |
| 1:3:560:A:H5'    | 1:3:566:G:N2      | 2.27                     | 0.49              |
| 1:3:1304:G:H21   | 1:3:1333:A:H62    | 1.59                     | 0.49              |
| 1:3:1308:U:OP2   | 50:R:98:GLY:N     | 2.42                     | 0.49              |
| 1:3:1308:U:H6    | 50:R:97:ARG:HA    | 1.76                     | 0.49              |
| 2:1:263:G:C3'    | 2:1:264:C:H5''    | 2.42                     | 0.49              |
| 2:1:1179:G:N7    | 2:1:1180:U:H1'    | 2.27                     | 0.49              |
| 2:1:2215:C:H2'   | 2:1:2216:G:H8     | 1.77                     | 0.49              |
| 2:1:2566:A:N1    | 15:k:28:SER:OG    | 2.42                     | 0.49              |
| 39:G:198:VAL:O   | 39:G:199:ILE:HD13 | 2.12                     | 0.49              |
| 42:J:97:PRO:O    | 42:J:98:ALA:HB3   | 2.11                     | 0.49              |
| 1:3:1508:A:H2'   | 1:3:1509:C:C6     | 2.47                     | 0.49              |
| 2:1:544:C:H2'    | 2:1:545:U:O4'     | 2.12                     | 0.49              |
| 2:1:2246:G:H1'   | 2:1:2426:A:C2     | 2.47                     | 0.49              |
| 4:8:641:MET:HB2  | 4:8:643:LYS:HE2   | 1.94                     | 0.49              |
| 5:6:37:A:H2'     | 5:6:38:A:O4'      | 2.12                     | 0.49              |
| 15:k:92:GLU:HG3  | 15:k:111:LYS:HD3  | 1.94                     | 0.49              |
| 19:o:24:THR:HG22 | 19:o:42:PRO:HD3   | 1.94                     | 0.49              |
| 39:G:64:GLY:O    | 39:G:65:LYS:HD2   | 2.11                     | 0.49              |
| 47:O:33:GLY:HA3  | 47:O:83:THR:HG23  | 1.95                     | 0.49              |
| 1:3:114:U:H1'    | 1:3:353:A:H1'     | 1.94                     | 0.49              |
| 1:3:1144:G:H21   | 1:3:1146:A:H62    | 1.60                     | 0.49              |
| 2:1:2820:A:N1    | 7:c:197:THR:HB    | 2.27                     | 0.49              |
| 10:f:21:GLN:NE2  | 10:f:37:ASN:O     | 2.40                     | 0.49              |
| 39:G:33:ALA:O    | 39:G:35:ASN:N     | 2.43                     | 0.49              |
| 48:P:17:ASP:HB2  | 48:P:36:ARG:HE    | 1.77                     | 0.49              |
| 1:3:723:U:H5'    | 58:Z:48:LYS:HG2   | 1.93                     | 0.49              |
| 2:1:1454:C:O2'   | 18:n:60:VAL:HG13  | 2.12                     | 0.49              |
| 2:1:2391:G:H2'   | 2:1:2424:C:H41    | 1.76                     | 0.49              |
| 27:w:24:GLY:HA2  | 27:w:62:LYS:HD2   | 1.93                     | 0.49              |
| 39:G:33:ALA:C    | 39:G:35:ASN:H     | 2.19                     | 0.49              |
| 42:J:21:SER:HA   | 42:J:30:PHE:HA    | 1.93                     | 0.49              |
| 42:J:76:ASN:HB2  | 42:J:81:GLN:HE22  | 1.76                     | 0.49              |
| 44:L:115:MET:HA  | 44:L:118:ARG:HB2  | 1.94                     | 0.49              |
| 1:3:1456:A:H2'   | 1:3:1457:G:O4'    | 2.13                     | 0.49              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 2:1:876:C:H2'    | 2:1:877:A:O4'    | 2.12                     | 0.49              |
| 2:1:1773:A:C2'   | 2:1:1774:C:H5'   | 2.42                     | 0.49              |
| 2:1:1951:U:H2'   | 2:1:1953:A:OP2   | 2.12                     | 0.49              |
| 2:1:2589:A:H2'   | 2:1:2590:A:O4'   | 2.12                     | 0.49              |
| 4:8:437:ARG:HE   | 4:8:441:GLU:HG3  | 1.76                     | 0.49              |
| 4:8:463:GLU:H    | 4:8:671:ARG:HH22 | 1.61                     | 0.49              |
| 4:8:512:ARG:NE   | 37:4:22:A:C8     | 2.81                     | 0.49              |
| 4:8:679:SER:OG   | 4:8:680:TYR:N    | 2.44                     | 0.49              |
| 11:g:66:ASN:ND2  | 11:g:134:VAL:O   | 2.40                     | 0.49              |
| 26:v:83:LYS:HE3  | 26:v:84:PRO:HD2  | 1.93                     | 0.49              |
| 39:G:46:VAL:HG13 | 39:G:47:PRO:CD   | 2.41                     | 0.49              |
| 39:G:94:ARG:HD3  | 39:G:94:ARG:N    | 2.26                     | 0.49              |
| 42:J:54:GLU:CG   | 42:J:56:PRO:HD2  | 2.42                     | 0.49              |
| 1:3:1034:G:H2'   | 1:3:1035:A:H5'   | 1.95                     | 0.49              |
| 2:1:230:G:O2'    | 2:1:231:A:H5'    | 2.12                     | 0.49              |
| 2:1:274:C:H2'    | 2:1:275:C:O4'    | 2.12                     | 0.49              |
| 2:1:878:A:H3'    | 2:1:879:G:H8     | 1.77                     | 0.49              |
| 2:1:1447:C:H2'   | 2:1:1448:G:C8    | 2.48                     | 0.49              |
| 2:1:1470:A:H2'   | 2:1:1471:G:O4'   | 2.13                     | 0.49              |
| 2:1:2144:G:H21   | 2:1:2148:G:H1    | 1.61                     | 0.49              |
| 2:1:2153:C:H2'   | 2:1:2154:A:C8    | 2.48                     | 0.49              |
| 2:1:2264:C:N4    | 27:w:11:ASP:OD2  | 2.45                     | 0.49              |
| 14:j:96:ARG:HH11 | 14:j:99:ARG:HD3  | 1.78                     | 0.49              |
| 15:k:70:ARG:HG2  | 15:k:76:VAL:HB   | 1.95                     | 0.49              |
| 40:H:54:ILE:HD12 | 40:H:67:ILE:HD12 | 1.94                     | 0.49              |
| 43:K:49:TYR:OH   | 55:W:62:ARG:O    | 2.28                     | 0.49              |
| 49:Q:38:THR:HG22 | 49:Q:50:LYS:HA   | 1.93                     | 0.49              |
| 1:3:1305:G:N2    | 1:3:1331:G:H2'   | 2.27                     | 0.49              |
| 1:3:1497:G:H2'   | 1:3:1498:U:H5'   | 1.92                     | 0.49              |
| 2:1:402:A:C2'    | 2:1:403:U:H5'    | 2.43                     | 0.49              |
| 2:1:694:U:C3'    | 2:1:695:G:H5''   | 2.43                     | 0.49              |
| 2:1:1651:G:C5'   | 18:n:39:PRO:HG2  | 2.42                     | 0.49              |
| 2:1:2385:C:H2'   | 2:1:2386:A:C8    | 2.48                     | 0.49              |
| 2:1:2853:C:H2'   | 2:1:2854:G:C8    | 2.48                     | 0.49              |
| 4:8:94:ASP:OD1   | 4:8:671:ARG:NH1  | 2.46                     | 0.49              |
| 25:u:88:ASP:OD1  | 25:u:88:ASP:N    | 2.44                     | 0.49              |
| 51:S:25:GLU:HB2  | 51:S:29:ILE:HD12 | 1.94                     | 0.49              |
| 1:3:779:C:H2'    | 1:3:780:A:O4'    | 2.13                     | 0.49              |
| 1:3:1187:G:H2'   | 1:3:1188:A:C8    | 2.47                     | 0.49              |
| 1:3:1279:G:H5''  | 47:O:9:ARG:NH2   | 2.28                     | 0.49              |
| 2:1:910:A:H62    | 17:m:12:MET:HA   | 1.77                     | 0.49              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 2:1:1181:U:H2'    | 2:1:1182:G:C8     | 2.44                     | 0.49              |
| 2:1:2625:G:H2'    | 2:1:2626:C:O4'    | 2.13                     | 0.49              |
| 3:2:12:C:O2       | 3:2:12:C:O4'      | 2.28                     | 0.49              |
| 9:e:115:GLY:HA3   | 9:e:177:ARG:HB2   | 1.95                     | 0.49              |
| 38:5:8:U:H5'      | 38:5:49:G:H5'     | 1.94                     | 0.49              |
| 40:H:11:LEU:HA    | 40:H:15:LYS:HB2   | 1.93                     | 0.49              |
| 2:1:587:C:O2'     | 16:l:19:LEU:HD23  | 2.13                     | 0.49              |
| 2:1:2345:G:H5'    | 2:1:2347:C:O4'    | 2.13                     | 0.49              |
| 2:1:2514:U:H5''   | 14:j:81:ILE:HD11  | 1.94                     | 0.49              |
| 9:e:64:PRO:HB3    | 9:e:88:VAL:HG22   | 1.95                     | 0.49              |
| 13:i:59:THR:O     | 13:i:67:THR:OG1   | 2.28                     | 0.49              |
| 41:I:187:ARG:HH12 | 41:I:192:ALA:HA   | 1.78                     | 0.49              |
| 42:J:75:LEU:C     | 42:J:75:LEU:HD12  | 2.37                     | 0.49              |
| 46:N:17:ARG:HB2   | 46:N:65:THR:HG23  | 1.94                     | 0.49              |
| 49:Q:49:ARG:NH1   | 49:Q:65:TYR:OH    | 2.46                     | 0.49              |
| 1:3:303:A:H2'     | 1:3:304:U:O4'     | 2.12                     | 0.49              |
| 1:3:407:U:H2'     | 1:3:408:A:C8      | 2.48                     | 0.49              |
| 1:3:438:U:H5''    | 1:3:439:U:OP1     | 2.11                     | 0.49              |
| 1:3:1414:U:H2'    | 1:3:1415:G:H8     | 1.76                     | 0.49              |
| 2:1:21:A:O2'      | 2:1:22:C:H5'      | 2.13                     | 0.49              |
| 2:1:1524:G:H2'    | 2:1:1525:A:H8     | 1.75                     | 0.49              |
| 2:1:2065:C:H2'    | 2:1:2066:C:H6     | 1.77                     | 0.49              |
| 10:f:77:GLY:HA2   | 10:f:81:GLY:HA2   | 1.94                     | 0.49              |
| 13:i:105:LEU:HD23 | 13:i:108:ILE:HD11 | 1.94                     | 0.49              |
| 20:p:8:GLU:HA     | 20:p:54:LEU:HD22  | 1.95                     | 0.49              |
| 24:t:66:LYS:HB2   | 24:t:77:ARG:HD2   | 1.94                     | 0.49              |
| 36:F:11:CYS:SG    | 36:F:14:CYS:N     | 2.86                     | 0.49              |
| 1:3:782:A:C2'     | 1:3:783:C:H5'     | 2.42                     | 0.48              |
| 2:1:172:A:H2'     | 2:1:173:A:C8      | 2.48                     | 0.48              |
| 2:1:564:C:OP2     | 22:r:79:ARG:NH2   | 2.46                     | 0.48              |
| 2:1:709:U:H2'     | 2:1:710:U:C6      | 2.48                     | 0.48              |
| 2:1:1255:U:C5     | 8:d:68:ALA:HA     | 2.48                     | 0.48              |
| 2:1:2015:A:N1     | 32:B:2:VAL:HG13   | 2.28                     | 0.48              |
| 2:1:2656:U:H5''   | 4:8:146:ARG:NH1   | 2.25                     | 0.48              |
| 4:8:512:ARG:NH2   | 37:4:22:A:N7      | 2.61                     | 0.48              |
| 11:g:43:ASN:HA    | 11:g:46:PHE:HB2   | 1.95                     | 0.48              |
| 13:i:112:LYS:NZ   | 13:i:124:MET:O    | 2.43                     | 0.48              |
| 17:m:46:ILE:O     | 17:m:103:TYR:OH   | 2.31                     | 0.48              |
| 39:G:25:LYS:HG3   | 39:G:191:ASP:OD2  | 2.13                     | 0.48              |
| 1:3:33:A:H2'      | 1:3:34:C:C6       | 2.47                     | 0.48              |
| 1:3:560:A:C3'     | 1:3:561:U:H5'     | 2.43                     | 0.48              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 1:3:701:U:OP1     | 1:3:702:A:H2'     | 2.12                     | 0.48              |
| 1:3:1004:A:H2'    | 1:3:1005:A:O4'    | 2.12                     | 0.48              |
| 1:3:1326:U:H2'    | 1:3:1327:C:C6     | 2.48                     | 0.48              |
| 4:8:87:ILE:HG12   | 4:8:105:VAL:HG23  | 1.95                     | 0.48              |
| 22:r:35:PHE:HB2   | 22:r:59:ILE:HB    | 1.95                     | 0.48              |
| 47:O:8:ILE:HB     | 47:O:74:VAL:HB    | 1.95                     | 0.48              |
| 54:V:59:GLU:HB2   | 54:V:75:VAL:HB    | 1.95                     | 0.48              |
| 1:3:651:C:H2'     | 1:3:652:U:C6      | 2.48                     | 0.48              |
| 2:1:1263:U:O2'    | 32:B:7:PRO:HD2    | 2.13                     | 0.48              |
| 2:1:1329:U:H5''   | 2:1:1330:C:OP2    | 2.13                     | 0.48              |
| 2:1:1364:G:H5'    | 2:1:1809:A:H1'    | 1.95                     | 0.48              |
| 2:1:1947:C:H2'    | 2:1:1948:G:H8     | 1.78                     | 0.48              |
| 2:1:1982:U:H2'    | 2:1:1983:G:H8     | 1.77                     | 0.48              |
| 4:8:376:GLU:OE2   | 4:8:378:ARG:NH2   | 2.42                     | 0.48              |
| 10:f:123:GLU:HB2  | 10:f:131:VAL:HG23 | 1.96                     | 0.48              |
| 12:a:46:VAL:HG13  | 12:a:212:VAL:HG12 | 1.94                     | 0.48              |
| 13:i:55:PRO:HD3   | 13:i:73:PRO:HA    | 1.96                     | 0.48              |
| 23:s:25:ARG:HE    | 23:s:74:ILE:HG23  | 1.78                     | 0.48              |
| 42:J:55:VAL:O     | 42:J:58:ALA:HB3   | 2.14                     | 0.48              |
| 1:3:5:U:C5        | 41:I:82:LYS:HD2   | 2.49                     | 0.48              |
| 1:3:501:C:H2'     | 1:3:502:A:C8      | 2.49                     | 0.48              |
| 1:3:1060:U:H3     | 1:3:1197:A:H61    | 1.59                     | 0.48              |
| 1:3:1308:U:OP1    | 50:R:89:ARG:NH1   | 2.47                     | 0.48              |
| 1:3:1535:C:H2'    | 1:3:1536:C:H5'    | 1.95                     | 0.48              |
| 2:1:833:A:H2'     | 2:1:834:G:H8      | 1.78                     | 0.48              |
| 2:1:2259:U:H2'    | 2:1:2260:C:C6     | 2.49                     | 0.48              |
| 2:1:2334:U:H5'    | 19:o:12:THR:CB    | 2.43                     | 0.48              |
| 2:1:2588:G:H2'    | 2:1:2589:A:O4'    | 2.13                     | 0.48              |
| 20:p:25:VAL:HG23  | 20:p:85:VAL:HA    | 1.96                     | 0.48              |
| 39:G:113:LEU:HD12 | 39:G:116:LEU:HD23 | 1.95                     | 0.48              |
| 1:3:8:A:H1'       | 42:J:107:GLY:CA   | 2.43                     | 0.48              |
| 1:3:580:C:H2'     | 1:3:581:G:O4'     | 2.13                     | 0.48              |
| 1:3:656:G:H21     | 52:T:27:GLN:NE2   | 2.12                     | 0.48              |
| 1:3:1195:C:H2'    | 1:3:1197:A:O4'    | 2.12                     | 0.48              |
| 2:1:483:A:H5''    | 25:u:46:LYS:HD2   | 1.95                     | 0.48              |
| 2:1:745:G:H2'     | 2:1:746:U:H5'     | 1.95                     | 0.48              |
| 2:1:1179:G:C3'    | 2:1:1180:U:H4'    | 2.42                     | 0.48              |
| 2:1:1428:C:O2'    | 2:1:1429:G:H5'    | 2.13                     | 0.48              |
| 2:1:2078:C:H2'    | 2:1:2079:U:C6     | 2.47                     | 0.48              |
| 2:1:2537:U:H2'    | 2:1:2538:C:C6     | 2.49                     | 0.48              |
| 4:8:18:HIS:HD2    | 4:8:122:GLN:HB2   | 1.77                     | 0.48              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 4:8:433:LEU:O    | 4:8:437:ARG:N    | 2.46                     | 0.48              |
| 8:d:117:ARG:NH2  | 8:d:183:PHE:O    | 2.45                     | 0.48              |
| 9:e:7:TYR:OH     | 9:e:28:PRO:O     | 2.29                     | 0.48              |
| 42:J:88:HIS:O    | 42:J:89:THR:C    | 2.56                     | 0.48              |
| 46:N:77:ALA:HA   | 46:N:80:HIS:HB2  | 1.95                     | 0.48              |
| 1:3:5:U:C4       | 41:I:82:LYS:HD2  | 2.48                     | 0.48              |
| 1:3:521:G:H4'    | 49:Q:69:GLU:CG   | 2.43                     | 0.48              |
| 1:3:911:U:OP2    | 49:Q:93:ARG:NH2  | 2.47                     | 0.48              |
| 1:3:1493:A:C5'   | 37:4:22:A:O2'    | 2.56                     | 0.48              |
| 2:1:729:G:H4'    | 2:1:763:G:O5'    | 2.14                     | 0.48              |
| 2:1:753:A:O2'    | 2:1:754:U:H5'    | 2.13                     | 0.48              |
| 2:1:784:G:O2'    | 2:1:785:G:H5''   | 2.13                     | 0.48              |
| 2:1:1000:A:H62   | 2:1:1154:G:H2'   | 1.79                     | 0.48              |
| 2:1:2415:G:H2'   | 2:1:2416:C:C6    | 2.48                     | 0.48              |
| 38:5:35:G:H2'    | 38:5:36:G:C8     | 2.48                     | 0.48              |
| 45:M:14:ARG:NH2  | 45:M:74:ILE:O    | 2.38                     | 0.48              |
| 1:3:375:U:H4'    | 53:U:6:LEU:HD23  | 1.95                     | 0.48              |
| 1:3:423:G:C2'    | 1:3:424:G:H5'    | 2.44                     | 0.48              |
| 2:1:783:A:H2'    | 2:1:784:G:H4'    | 1.95                     | 0.48              |
| 2:1:1582:C:H2'   | 2:1:1585:C:H42   | 1.79                     | 0.48              |
| 2:1:1624:U:O2'   | 2:1:1625:C:H5'   | 2.14                     | 0.48              |
| 2:1:1666:G:C2'   | 2:1:1667:G:H5'   | 2.44                     | 0.48              |
| 2:1:1683:U:H2'   | 2:1:1684:G:C8    | 2.49                     | 0.48              |
| 13:i:55:PRO:HG2  | 13:i:71:LYS:HB3  | 1.95                     | 0.48              |
| 26:v:61:LEU:N    | 26:v:72:VAL:O    | 2.47                     | 0.48              |
| 39:G:164:ASP:CG  | 39:G:167:HIS:HB2 | 2.39                     | 0.48              |
| 1:3:8:A:N3       | 42:J:107:GLY:HA2 | 2.28                     | 0.48              |
| 1:3:128:G:H4'    | 54:V:5:ARG:HH22  | 1.79                     | 0.48              |
| 1:3:1314:C:OP2   | 56:X:5:LYS:HG2   | 2.14                     | 0.48              |
| 2:1:194:G:H2'    | 2:1:195:A:O4'    | 2.14                     | 0.48              |
| 2:1:1850:G:H2'   | 2:1:1851:U:O4'   | 2.13                     | 0.48              |
| 2:1:2295:C:C2'   | 2:1:2296:U:H5'   | 2.44                     | 0.48              |
| 2:1:2832:U:H1'   | 2:1:2834:G:C4    | 2.49                     | 0.48              |
| 3:2:4:C:H2'      | 3:2:5:U:O4'      | 2.12                     | 0.48              |
| 4:8:512:ARG:HB3  | 37:4:22:A:C4     | 2.49                     | 0.48              |
| 10:f:158:GLY:O   | 10:f:162:ARG:NH1 | 2.43                     | 0.48              |
| 17:m:42:THR:HA   | 17:m:93:VAL:HA   | 1.96                     | 0.48              |
| 20:p:70:GLU:OE2  | 20:p:100:ARG:NH1 | 2.44                     | 0.48              |
| 23:s:19:LEU:HD22 | 32:B:20:ALA:HA   | 1.96                     | 0.48              |
| 38:5:23:C:H2'    | 38:5:24:G:C8     | 2.48                     | 0.48              |
| 38:5:39:C:H2'    | 38:5:40:C:C6     | 2.49                     | 0.48              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 42:J:106:ALA:O   | 42:J:111:ARG:HB2  | 2.14                     | 0.48              |
| 1:3:59:A:H2'     | 1:3:59:A:N3       | 2.29                     | 0.48              |
| 1:3:591:U:H2'    | 1:3:592:G:C8      | 2.49                     | 0.48              |
| 1:3:831:A:H5'    | 39:G:20:ARG:NH1   | 2.29                     | 0.48              |
| 1:3:1312:G:N7    | 56:X:2:ARG:HB2    | 2.27                     | 0.48              |
| 2:1:263:G:C2'    | 2:1:264:C:H5''    | 2.43                     | 0.48              |
| 2:1:636:G:O6     | 16:l:109:LYS:HD2  | 2.14                     | 0.48              |
| 2:1:1434:A:O2'   | 2:1:1435:G:H5'    | 2.14                     | 0.48              |
| 2:1:1799:G:OP1   | 6:b:257:ARG:NH1   | 2.43                     | 0.48              |
| 2:1:2124:G:N2    | 12:a:217:THR:HA   | 2.29                     | 0.48              |
| 2:1:2530:A:N7    | 10:f:171:LYS:NZ   | 2.59                     | 0.48              |
| 2:1:2632:A:O2'   | 2:1:2633:G:H5'    | 2.14                     | 0.48              |
| 5:6:17:C:H5'     | 5:6:61:C:OP1      | 2.14                     | 0.48              |
| 23:s:36:LEU:HA   | 23:s:39:THR:HG22  | 1.96                     | 0.48              |
| 56:X:18:VAL:HG11 | 56:X:43:MET:HG2   | 1.96                     | 0.48              |
| 1:3:10:A:H2'     | 1:3:11:G:H8       | 1.79                     | 0.48              |
| 1:3:560:A:C5'    | 1:3:561:U:H5'     | 2.44                     | 0.48              |
| 1:3:1078:U:H4'   | 42:J:137:ARG:NH1  | 2.28                     | 0.48              |
| 1:3:1317:C:H5'   | 51:S:47:LEU:HD22  | 1.94                     | 0.48              |
| 2:1:419:U:H2'    | 2:1:420:C:C6      | 2.49                     | 0.48              |
| 2:1:929:U:H4'    | 30:z:37:ARG:NH2   | 2.29                     | 0.48              |
| 2:1:1282:U:H2'   | 2:1:1283:G:O4'    | 2.13                     | 0.48              |
| 2:1:1507:C:H2'   | 2:1:1508:A:O4'    | 2.13                     | 0.48              |
| 2:1:2581:G:H2'   | 2:1:2581:G:N3     | 2.28                     | 0.48              |
| 2:1:2619:C:H4'   | 7:c:156:PHE:O     | 2.14                     | 0.48              |
| 3:2:65:U:H3'     | 3:2:108:A:N6      | 2.29                     | 0.48              |
| 12:a:194:VAL:HA  | 12:a:197:LYS:HE3  | 1.95                     | 0.48              |
| 14:j:52:ASP:OD1  | 14:j:52:ASP:N     | 2.47                     | 0.48              |
| 15:k:7:MET:HA    | 15:k:20:MET:HG2   | 1.96                     | 0.48              |
| 39:G:102:ASN:O   | 39:G:105:THR:HG22 | 2.13                     | 0.48              |
| 1:3:292:G:H2'    | 1:3:293:G:H5'     | 1.96                     | 0.47              |
| 1:3:665:A:H2'    | 1:3:732:C:O2      | 2.14                     | 0.47              |
| 1:3:695:A:H2     | 1:3:787:A:HO2'    | 1.60                     | 0.47              |
| 2:1:372:G:H5''   | 28:x:60:LYS:HD3   | 1.95                     | 0.47              |
| 2:1:407:G:H2'    | 2:1:408:G:H8      | 1.79                     | 0.47              |
| 2:1:1824:G:OP1   | 6:b:51:ARG:HB3    | 2.14                     | 0.47              |
| 2:1:1985:C:O2'   | 2:1:1986:C:H5'    | 2.14                     | 0.47              |
| 2:1:2521:C:H5'   | 2:1:2565:A:H4'    | 1.94                     | 0.47              |
| 4:8:280:ASP:HA   | 4:8:283:ILE:HG22  | 1.95                     | 0.47              |
| 38:5:20:U:H3'    | 38:5:21:A:C5'     | 2.41                     | 0.47              |
| 48:P:61:ALA:HA   | 48:P:64:VAL:HB    | 1.96                     | 0.47              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:3:1142:G:H2'   | 1:3:1143:G:H5'   | 1.95                     | 0.47              |
| 1:3:1409:C:H5'   | 2:1:1916:A:C2    | 2.49                     | 0.47              |
| 2:1:1076:C:H2'   | 2:1:1077:A:O4'   | 2.14                     | 0.47              |
| 2:1:1212:G:H1'   | 2:1:1236:G:N2    | 2.29                     | 0.47              |
| 2:1:1277:G:H1    | 2:1:1293:C:N4    | 2.08                     | 0.47              |
| 2:1:2286:G:H4'   | 2:1:2287:A:O4'   | 2.13                     | 0.47              |
| 2:1:2315:G:H2'   | 2:1:2316:G:C8    | 2.50                     | 0.47              |
| 2:1:2363:G:O2'   | 2:1:2364:C:H5'   | 2.14                     | 0.47              |
| 2:1:2519:U:C4'   | 2:1:2520:C:OP1   | 2.62                     | 0.47              |
| 18:n:79:LEU:HA   | 18:n:83:LEU:HB2  | 1.96                     | 0.47              |
| 1:3:116:A:O2'    | 1:3:117:G:H5'    | 2.14                     | 0.47              |
| 1:3:1112:C:O2    | 40:H:178:ARG:HG2 | 2.14                     | 0.47              |
| 1:3:1273:C:H2'   | 1:3:1274:A:H5'   | 1.97                     | 0.47              |
| 1:3:1299:A:H2'   | 1:3:1300:G:H4'   | 1.96                     | 0.47              |
| 2:1:1736:U:H2'   | 2:1:1737:G:O4'   | 2.15                     | 0.47              |
| 42:J:84:VAL:CG1  | 42:J:85:LYS:H    | 2.17                     | 0.47              |
| 1:3:371:A:H2'    | 1:3:372:C:O4'    | 2.14                     | 0.47              |
| 1:3:722:G:H3'    | 1:3:722:G:N3     | 2.30                     | 0.47              |
| 2:1:250:G:H4'    | 16:l:59:ARG:NE   | 2.29                     | 0.47              |
| 2:1:417:C:H2'    | 2:1:418:C:C6     | 2.50                     | 0.47              |
| 2:1:1177:G:H2'   | 2:1:1178:C:H5''  | 1.97                     | 0.47              |
| 5:6:64:G:O2'     | 5:6:65:C:H5'     | 2.14                     | 0.47              |
| 13:i:116:MET:HE3 | 13:i:117:THR:H   | 1.78                     | 0.47              |
| 26:v:32:GLY:O    | 26:v:93:ARG:NH1  | 2.38                     | 0.47              |
| 39:G:48:MET:HE1  | 39:G:198:VAL:HB  | 1.96                     | 0.47              |
| 47:O:10:LEU:HG   | 47:O:72:ARG:HB3  | 1.95                     | 0.47              |
| 47:O:82:LYS:NZ   | 47:O:85:ASP:OD1  | 2.41                     | 0.47              |
| 1:3:1150:A:H4'   | 47:O:43:PRO:HB3  | 1.95                     | 0.47              |
| 1:3:1250:A:C2    | 1:3:1370:G:H1'   | 2.49                     | 0.47              |
| 2:1:279:A:H2'    | 2:1:280:U:C5'    | 2.44                     | 0.47              |
| 2:1:573:U:O2'    | 2:1:574:A:H3'    | 2.14                     | 0.47              |
| 2:1:2743:U:H3'   | 2:1:2744:G:H5''  | 1.97                     | 0.47              |
| 2:1:2820:A:C6    | 7:c:197:THR:HB   | 2.50                     | 0.47              |
| 3:2:5:U:H2'      | 3:2:6:G:C8       | 2.47                     | 0.47              |
| 12:a:36:ALA:HB2  | 12:a:218:MET:HE1 | 1.96                     | 0.47              |
| 50:R:48:SER:HB2  | 50:R:51:GLN:HE22 | 1.80                     | 0.47              |
| 1:3:228:A:H2'    | 1:3:229:U:O4'    | 2.15                     | 0.47              |
| 1:3:1100:C:O2    | 1:3:1102:A:H5'   | 2.14                     | 0.47              |
| 1:3:1250:A:H2    | 1:3:1370:G:H1'   | 1.80                     | 0.47              |
| 1:3:1345:U:H4'   | 1:3:1346:A:C5'   | 2.44                     | 0.47              |
| 2:1:1575:C:H2'   | 2:1:1576:U:O4'   | 2.13                     | 0.47              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 2:1:1709:U:O2'    | 2:1:1710:G:H5'    | 2.14                     | 0.47              |
| 2:1:2436:G:O2'    | 2:1:2437:G:H5'    | 2.14                     | 0.47              |
| 4:8:512:ARG:CZ    | 37:4:22:A:N7      | 2.77                     | 0.47              |
| 15:k:58:LEU:HD11  | 15:k:86:LEU:HD23  | 1.96                     | 0.47              |
| 16:l:55:MET:HG3   | 16:l:59:ARG:HB3   | 1.97                     | 0.47              |
| 24:t:39:THR:HG23  | 24:t:42:GLU:H     | 1.80                     | 0.47              |
| 42:J:67:ARG:O     | 42:J:70:MET:HG2   | 2.14                     | 0.47              |
| 42:J:105:ILE:HG13 | 42:J:105:ILE:O    | 2.15                     | 0.47              |
| 42:J:135:VAL:O    | 42:J:138:ALA:HB3  | 2.15                     | 0.47              |
| 1:3:212:G:H2'     | 1:3:213:G:C8      | 2.50                     | 0.47              |
| 1:3:459:A:H2'     | 1:3:460:A:C8      | 2.49                     | 0.47              |
| 1:3:1137:C:H4'    | 1:3:1138:G:N2     | 2.29                     | 0.47              |
| 1:3:1444:U:H2'    | 1:3:1445:U:C6     | 2.50                     | 0.47              |
| 2:1:760:G:C2'     | 2:1:761:A:H5'     | 2.44                     | 0.47              |
| 2:1:896:A:O2'     | 2:1:897:C:H5''    | 2.15                     | 0.47              |
| 2:1:985:C:OP2     | 2:1:986:C:OP2     | 2.33                     | 0.47              |
| 2:1:1082:U:OP1    | 13:i:119:ALA:HB2  | 2.14                     | 0.47              |
| 2:1:1177:G:H3'    | 2:1:1178:C:C5'    | 2.42                     | 0.47              |
| 2:1:1427:A:H4'    | 2:1:1428:C:O4'    | 2.15                     | 0.47              |
| 2:1:1997:C:OP1    | 7:c:128:ARG:HA    | 2.14                     | 0.47              |
| 2:1:2122:U:H2'    | 2:1:2123:G:O4'    | 2.14                     | 0.47              |
| 2:1:2247:A:O2'    | 2:1:2248:C:H5'    | 2.14                     | 0.47              |
| 2:1:2861:U:H2'    | 2:1:2862:G:C8     | 2.50                     | 0.47              |
| 3:2:3:C:H3'       | 3:2:4:C:H5''      | 1.97                     | 0.47              |
| 3:2:75:G:H1'      | 26:v:29:ILE:HG13  | 1.96                     | 0.47              |
| 4:8:363:ILE:HD13  | 4:8:377:VAL:HG22  | 1.96                     | 0.47              |
| 4:8:639:ARG:HH22  | 4:8:691:PRO:HG3   | 1.80                     | 0.47              |
| 6:b:79:ARG:NH1    | 6:b:81:GLU:OE1    | 2.46                     | 0.47              |
| 12:a:58:ASN:OD1   | 12:a:60:ARG:NE    | 2.46                     | 0.47              |
| 16:l:29:LYS:HB3   | 22:r:82:HIS:CE1   | 2.50                     | 0.47              |
| 17:m:132:THR:OG1  | 17:m:133:LYS:N    | 2.48                     | 0.47              |
| 23:s:67:ASP:N     | 23:s:67:ASP:OD1   | 2.46                     | 0.47              |
| 25:u:25:LYS:HB2   | 25:u:34:ILE:HG13  | 1.96                     | 0.47              |
| 26:v:49:ASN:O     | 26:v:53:LYS:NZ    | 2.33                     | 0.47              |
| 39:G:84:LEU:HD12  | 39:G:84:LEU:C     | 2.40                     | 0.47              |
| 39:G:105:THR:HG23 | 39:G:106:VAL:N    | 2.29                     | 0.47              |
| 40:H:137:VAL:HG13 | 40:H:148:ILE:HG23 | 1.97                     | 0.47              |
| 41:I:27:ILE:HG12  | 41:I:29:THR:HG23  | 1.95                     | 0.47              |
| 42:J:35:LEU:HD23  | 42:J:49:TYR:HA    | 1.96                     | 0.47              |
| 42:J:132:PRO:HA   | 42:J:135:VAL:HG22 | 1.97                     | 0.47              |
| 45:M:1:SER:HB3    | 45:M:3:GLN:HE21   | 1.80                     | 0.47              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 47:O:28:THR:O     | 47:O:32:THR:OG1   | 2.32                     | 0.47              |
| 48:P:86:LYS:HA    | 48:P:113:THR:HG22 | 1.96                     | 0.47              |
| 1:3:137:U:H2'     | 1:3:138:G:C8      | 2.50                     | 0.47              |
| 1:3:406:G:H5''    | 41:I:4:LEU:HD22   | 1.97                     | 0.47              |
| 1:3:499:A:H1'     | 1:3:500:G:C8      | 2.49                     | 0.47              |
| 1:3:663:A:H5'     | 1:3:836:G:OP1     | 2.15                     | 0.47              |
| 1:3:843:U:OP1     | 1:3:846:G:H1'     | 2.15                     | 0.47              |
| 2:1:183:C:H42     | 2:1:214:G:H1      | 1.63                     | 0.47              |
| 2:1:2701:U:H3     | 2:1:2706:A:H61    | 1.62                     | 0.47              |
| 2:1:2843:G:O2'    | 2:1:2844:G:H5'    | 2.15                     | 0.47              |
| 2:1:2899:A:H5'    | 14:j:136:GLN:HE22 | 1.80                     | 0.47              |
| 4:8:191:ILE:HG23  | 4:8:202:PHE:HB2   | 1.97                     | 0.47              |
| 6:b:1:ALA:HB1     | 6:b:198:GLU:HG2   | 1.95                     | 0.47              |
| 32:B:51:ARG:HB2   | 32:B:53:VAL:HG13  | 1.97                     | 0.47              |
| 39:G:14:HIS:HA    | 39:G:202:ASN:CB   | 2.45                     | 0.47              |
| 53:U:8:ARG:HB3    | 53:U:29:ASN:HD21  | 1.79                     | 0.47              |
| 1:3:5:U:H5        | 41:I:82:LYS:NZ    | 2.13                     | 0.47              |
| 2:1:511:U:H2'     | 2:1:512:G:H5'     | 1.97                     | 0.47              |
| 2:1:768:G:O2'     | 2:1:769:U:H5'     | 2.14                     | 0.47              |
| 2:1:1133:A:C8     | 2:1:2026:U:H4'    | 2.50                     | 0.47              |
| 2:1:1154:G:OP2    | 21:q:57:ARG:NH1   | 2.48                     | 0.47              |
| 2:1:1168:G:H2'    | 2:1:1169:A:H4'    | 1.97                     | 0.47              |
| 2:1:1594:U:H2'    | 2:1:1595:C:C6     | 2.49                     | 0.47              |
| 2:1:2039:U:H2'    | 2:1:2040:G:C8     | 2.49                     | 0.47              |
| 2:1:2105:U:H2'    | 2:1:2106:U:O4'    | 2.13                     | 0.47              |
| 40:H:69:THR:HG21  | 40:H:75:VAL:HG21  | 1.97                     | 0.47              |
| 42:J:30:PHE:HD1   | 42:J:30:PHE:H     | 1.63                     | 0.47              |
| 42:J:123:LEU:HD12 | 42:J:123:LEU:O    | 2.14                     | 0.47              |
| 43:K:91:ARG:HG2   | 43:K:92:THR:H     | 1.79                     | 0.47              |
| 44:L:69:ARG:HH11  | 44:L:95:ARG:HD2   | 1.79                     | 0.47              |
| 2:1:500:G:C2'     | 2:1:501:A:H5''    | 2.45                     | 0.47              |
| 2:1:941:A:H2'     | 2:1:942:G:O4'     | 2.15                     | 0.47              |
| 2:1:1138:G:N3     | 14:j:108:MET:HE2  | 2.30                     | 0.47              |
| 2:1:1155:A:O3'    | 21:q:54:ARG:NH2   | 2.45                     | 0.47              |
| 2:1:1169:A:H2'    | 2:1:1170:C:O4'    | 2.15                     | 0.47              |
| 2:1:2461:A:H2'    | 2:1:2462:C:C6     | 2.50                     | 0.47              |
| 4:8:11:ARG:HB3    | 4:8:84:ILE:HA     | 1.96                     | 0.47              |
| 6:b:4:LYS:HG3     | 6:b:16:VAL:HG22   | 1.97                     | 0.47              |
| 6:b:128:THR:HG22  | 6:b:190:THR:HG22  | 1.97                     | 0.47              |
| 8:d:148:ILE:HA    | 8:d:187:VAL:HG13  | 1.96                     | 0.47              |
| 15:k:2:ILE:HG21   | 15:k:8:LEU:HD12   | 1.97                     | 0.47              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 25:u:43:LYS:HE3  | 25:u:45:GLN:HG3  | 1.96                     | 0.47              |
| 46:N:29:ILE:N    | 46:N:32:ARG:O    | 2.47                     | 0.47              |
| 1:3:448:A:H2'    | 1:3:449:G:O4'    | 2.15                     | 0.46              |
| 1:3:731:G:O2'    | 1:3:732:C:H5'    | 2.15                     | 0.46              |
| 1:3:818:G:H5'    | 1:3:819:A:OP2    | 2.14                     | 0.46              |
| 1:3:1190:G:H2'   | 40:H:2:GLN:HB3   | 1.97                     | 0.46              |
| 2:1:1660:G:O2'   | 2:1:1661:G:H5'   | 2.15                     | 0.46              |
| 2:1:2248:C:C2'   | 2:1:2249:U:H5'   | 2.44                     | 0.46              |
| 2:1:2292:U:H2'   | 2:1:2293:G:C8    | 2.50                     | 0.46              |
| 2:1:2312:U:H5'   | 9:e:84:ILE:CG2   | 2.45                     | 0.46              |
| 23:s:1:MET:HE3   | 23:s:1:MET:HB3   | 1.77                     | 0.46              |
| 39:G:53:LEU:HA   | 39:G:56:LEU:CD1  | 2.41                     | 0.46              |
| 41:I:176:LYS:HG3 | 41:I:178:GLU:HG2 | 1.96                     | 0.46              |
| 42:J:142:GLY:O   | 42:J:145:ASN:HB2 | 2.15                     | 0.46              |
| 1:3:736:C:OP1    | 43:K:90:MET:HE1  | 2.15                     | 0.46              |
| 1:3:1038:C:H2'   | 1:3:1039:G:C8    | 2.50                     | 0.46              |
| 2:1:341:C:H2'    | 2:1:342:A:C8     | 2.50                     | 0.46              |
| 2:1:745:G:C2'    | 2:1:746:U:H5'    | 2.45                     | 0.46              |
| 2:1:1080:A:H2'   | 2:1:1081:U:C5'   | 2.45                     | 0.46              |
| 2:1:1939:U:C3'   | 2:1:1940:U:H5'   | 2.45                     | 0.46              |
| 2:1:2494:G:H2'   | 2:1:2495:G:H8    | 1.80                     | 0.46              |
| 9:e:37:MET:HE2   | 9:e:151:LEU:HD22 | 1.97                     | 0.46              |
| 24:t:7:LEU:HD22  | 24:t:46:ALA:HB2  | 1.98                     | 0.46              |
| 35:E:16:THR:OG1  | 35:E:20:GLY:O    | 2.33                     | 0.46              |
| 39:G:26:MET:O    | 39:G:30:ILE:HD11 | 2.16                     | 0.46              |
| 42:J:17:VAL:HB   | 42:J:34:ALA:HB2  | 1.98                     | 0.46              |
| 1:3:553:A:H1'    | 49:Q:27:PRO:HG3  | 1.96                     | 0.46              |
| 1:3:959:A:H2'    | 1:3:960:U:O4'    | 2.15                     | 0.46              |
| 1:3:1034:G:H2'   | 1:3:1035:A:O4'   | 2.14                     | 0.46              |
| 1:3:1057:G:H2'   | 1:3:1058:G:O4'   | 2.16                     | 0.46              |
| 2:1:153:U:H2'    | 2:1:154:U:C6     | 2.51                     | 0.46              |
| 2:1:310:A:H2'    | 2:1:311:A:H5''   | 1.98                     | 0.46              |
| 2:1:1198:U:H2'   | 2:1:1199:U:C6    | 2.50                     | 0.46              |
| 2:1:1319:C:O2'   | 2:1:1320:C:H5'   | 2.15                     | 0.46              |
| 2:1:1844:C:H4'   | 6:b:255:LYS:HD2  | 1.97                     | 0.46              |
| 6:b:160:TYR:H    | 6:b:176:ARG:HD3  | 1.81                     | 0.46              |
| 9:e:116:LEU:O    | 9:e:177:ARG:N    | 2.42                     | 0.46              |
| 25:u:34:ILE:HG22 | 25:u:63:ALA:HA   | 1.96                     | 0.46              |
| 26:v:9:ARG:HH12  | 26:v:12:GLN:HA   | 1.80                     | 0.46              |
| 42:J:129:SER:C   | 42:J:131:ASN:H   | 2.23                     | 0.46              |
| 45:M:105:THR:OG1 | 45:M:108:GLY:O   | 2.29                     | 0.46              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 48:P:86:LYS:HG3  | 48:P:114:PRO:HD3  | 1.96                     | 0.46              |
| 1:3:204:G:H2'    | 1:3:205:A:H8      | 1.79                     | 0.46              |
| 2:1:1726:C:H2'   | 2:1:1727:C:C6     | 2.51                     | 0.46              |
| 2:1:2121:G:H2'   | 2:1:2122:U:O4'    | 2.16                     | 0.46              |
| 2:1:2557:G:H2'   | 2:1:2558:C:C6     | 2.51                     | 0.46              |
| 2:1:2579:C:O2'   | 2:1:2580:U:H5'    | 2.15                     | 0.46              |
| 4:8:197:ASP:N    | 4:8:197:ASP:OD1   | 2.48                     | 0.46              |
| 6:b:254:LYS:HB2  | 6:b:254:LYS:HE3   | 1.72                     | 0.46              |
| 12:a:40:GLU:HG3  | 12:a:178:VAL:HG21 | 1.97                     | 0.46              |
| 16:l:57:LEU:HD11 | 35:E:53:ASP:HB3   | 1.96                     | 0.46              |
| 21:q:43:GLN:HE21 | 22:r:77:PHE:HB3   | 1.79                     | 0.46              |
| 23:s:33:LEU:O    | 23:s:37:THR:OG1   | 2.24                     | 0.46              |
| 39:G:44:LYS:C    | 39:G:47:PRO:HD2   | 2.40                     | 0.46              |
| 39:G:176:ASN:ND2 | 39:G:194:GLY:HA3  | 2.30                     | 0.46              |
| 42:J:76:ASN:ND2  | 42:J:81:GLN:HE22  | 2.05                     | 0.46              |
| 42:J:149:PRO:O   | 42:J:152:VAL:HG12 | 2.16                     | 0.46              |
| 42:J:161:GLU:HG3 | 42:J:162:GLU:N    | 2.30                     | 0.46              |
| 1:3:603:U:H2'    | 1:3:604:G:H8      | 1.80                     | 0.46              |
| 1:3:1233:G:H2'   | 1:3:1234:C:C6     | 2.50                     | 0.46              |
| 2:1:212:G:H2'    | 2:1:213:A:C8      | 2.50                     | 0.46              |
| 2:1:690:G:H2'    | 2:1:691:C:C6      | 2.51                     | 0.46              |
| 2:1:1322:A:OP1   | 23:s:11:ARG:HD2   | 2.15                     | 0.46              |
| 2:1:1409:U:H2'   | 2:1:1410:G:C8     | 2.51                     | 0.46              |
| 4:8:474:LYS:HG3  | 4:8:480:GLU:HG3   | 1.98                     | 0.46              |
| 8:d:46:GLN:HB2   | 8:d:86:ALA:HB1    | 1.97                     | 0.46              |
| 9:e:70:ARG:O     | 9:e:80:GLN:NE2    | 2.36                     | 0.46              |
| 48:P:89:GLY:O    | 48:P:92:ARG:NH1   | 2.48                     | 0.46              |
| 1:3:181:A:N6     | 1:3:194:C:H2'     | 2.31                     | 0.46              |
| 1:3:231:U:H2'    | 1:3:232:G:C8      | 2.49                     | 0.46              |
| 1:3:1034:G:C2'   | 1:3:1035:A:H5'    | 2.45                     | 0.46              |
| 1:3:1419:G:O2'   | 1:3:1420:U:H5'    | 2.16                     | 0.46              |
| 2:1:585:G:N7     | 21:q:5:ARG:NH1    | 2.62                     | 0.46              |
| 4:8:127:TRP:CD1  | 4:8:131:ASN:HD21  | 2.34                     | 0.46              |
| 4:8:415:VAL:HG22 | 4:8:461:MET:HA    | 1.98                     | 0.46              |
| 12:a:201:PRO:HG2 | 12:a:204:ALA:HB2  | 1.98                     | 0.46              |
| 15:k:80:ASP:HB2  | 20:p:61:ARG:HH12  | 1.81                     | 0.46              |
| 26:v:72:VAL:HG12 | 26:v:93:ARG:HA    | 1.97                     | 0.46              |
| 41:l:93:LEU:O    | 41:l:99:ASN:ND2   | 2.49                     | 0.46              |
| 1:3:861:G:O2'    | 1:3:862:C:H5'     | 2.15                     | 0.46              |
| 1:3:1108:G:H5'   | 40:H:175:HIS:ND1  | 2.31                     | 0.46              |
| 2:1:575:A:H2'    | 2:1:576:U:C6      | 2.51                     | 0.46              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 2:1:686:U:H2'     | 2:1:788:A:N1      | 2.31                     | 0.46              |
| 2:1:803:U:C3'     | 2:1:804:A:C5'     | 2.91                     | 0.46              |
| 2:1:805:G:C4'     | 16:l:38:GLN:HG3   | 2.46                     | 0.46              |
| 2:1:857:G:O3'     | 27:w:41:PHE:HZ    | 1.98                     | 0.46              |
| 2:1:1081:U:O2     | 2:1:1081:U:H2'    | 2.16                     | 0.46              |
| 2:1:2586:U:H2'    | 2:1:2587:A:C8     | 2.50                     | 0.46              |
| 2:1:2636:C:H2'    | 2:1:2637:U:C6     | 2.51                     | 0.46              |
| 4:8:144:MET:HE1   | 4:8:151:PHE:HB2   | 1.97                     | 0.46              |
| 4:8:175:ALA:O     | 4:8:179:PHE:N     | 2.49                     | 0.46              |
| 6:b:56:GLY:HA2    | 6:b:212:TRP:HA    | 1.98                     | 0.46              |
| 6:b:77:VAL:HG22   | 6:b:93:VAL:HG12   | 1.97                     | 0.46              |
| 25:u:39:ASN:HB3   | 25:u:62:ALA:HB3   | 1.97                     | 0.46              |
| 34:D:8:SER:OG     | 34:D:9:VAL:N      | 2.49                     | 0.46              |
| 37:4:8:A:H2'      | 37:4:9:G:O4'      | 2.16                     | 0.46              |
| 42:J:53:ARG:HD3   | 42:J:53:ARG:N     | 2.31                     | 0.46              |
| 46:N:20:ILE:HD11  | 46:N:60:LEU:HD12  | 1.96                     | 0.46              |
| 1:3:21:G:H2'      | 1:3:22:G:C8       | 2.51                     | 0.46              |
| 1:3:370:C:H2'     | 1:3:371:A:C8      | 2.51                     | 0.46              |
| 1:3:1290:G:H2'    | 1:3:1290:G:N3     | 2.31                     | 0.46              |
| 1:3:1493:A:C4'    | 37:4:22:A:O2'     | 2.64                     | 0.46              |
| 2:1:767:U:H2'     | 2:1:768:G:H8      | 1.81                     | 0.46              |
| 2:1:780:G:OP1     | 6:b:216:ARG:NH2   | 2.45                     | 0.46              |
| 2:1:1298:C:H2'    | 2:1:1299:G:O4'    | 2.16                     | 0.46              |
| 2:1:1636:U:H2'    | 2:1:1637:A:C8     | 2.51                     | 0.46              |
| 2:1:2081:U:O2'    | 2:1:2082:A:H5'    | 2.16                     | 0.46              |
| 2:1:2728:U:O2'    | 2:1:2729:G:H8     | 1.99                     | 0.46              |
| 3:2:48:U:H2'      | 3:2:49:C:C6       | 2.50                     | 0.46              |
| 4:8:98:GLU:HA     | 4:8:101:ARG:HE    | 1.81                     | 0.46              |
| 5:6:28:C:H2'      | 5:6:29:G:C8       | 2.51                     | 0.46              |
| 6:b:130:PRO:HA    | 6:b:188:ARG:HA    | 1.97                     | 0.46              |
| 19:o:43:ASN:OD1   | 19:o:43:ASN:N     | 2.49                     | 0.46              |
| 39:G:46:VAL:HG12  | 39:G:47:PRO:HD3   | 1.97                     | 0.46              |
| 39:G:172:ILE:HG22 | 39:G:182:VAL:HG11 | 1.98                     | 0.46              |
| 40:H:86:LEU:HA    | 40:H:89:VAL:HG22  | 1.98                     | 0.46              |
| 52:T:80:LEU:HD23  | 52:T:83:ARG:HD3   | 1.98                     | 0.46              |
| 1:3:129:A:O2'     | 1:3:130:A:H5''    | 2.15                     | 0.46              |
| 1:3:273:U:O2'     | 1:3:274:A:H5'     | 2.16                     | 0.46              |
| 1:3:1084:G:H5'    | 1:3:1102:A:OP2    | 2.16                     | 0.46              |
| 1:3:1371:G:O3'    | 46:N:70:GLY:HA3   | 2.16                     | 0.46              |
| 2:1:96:C:H4'      | 29:y:41:HIS:CE1   | 2.51                     | 0.46              |
| 2:1:674:G:H1'     | 8:d:69:ARG:HE     | 1.80                     | 0.46              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 2:1:940:G:C3'    | 2:1:941:A:H5''    | 2.45                     | 0.46              |
| 2:1:1165:A:H2'   | 2:1:1166:G:H8     | 1.81                     | 0.46              |
| 2:1:1585:C:H2'   | 2:1:1586:A:H5'    | 1.97                     | 0.46              |
| 2:1:1838:C:H4'   | 2:1:1839:G:H8     | 1.81                     | 0.46              |
| 2:1:2176:A:H5''  | 12:a:221:GLY:H    | 1.80                     | 0.46              |
| 2:1:2345:G:N3    | 2:1:2381:A:H2'    | 2.30                     | 0.46              |
| 2:1:2465:C:O2'   | 2:1:2466:C:H5'    | 2.16                     | 0.46              |
| 3:2:94:A:OP1     | 26:v:19:ARG:HD3   | 2.16                     | 0.46              |
| 9:e:23:SER:OG    | 9:e:24:VAL:N      | 2.49                     | 0.46              |
| 1:3:785:G:O2'    | 1:3:786:G:H5'     | 2.16                     | 0.46              |
| 1:3:1038:C:H2'   | 1:3:1039:G:H8     | 1.81                     | 0.46              |
| 1:3:1492:A:H2'   | 1:3:1492:A:N3     | 2.31                     | 0.46              |
| 2:1:26:G:H1'     | 2:1:514:A:N6      | 2.31                     | 0.46              |
| 2:1:52:A:H2'     | 2:1:53:A:C8       | 2.51                     | 0.46              |
| 2:1:107:G:H2'    | 2:1:108:G:H8      | 1.81                     | 0.46              |
| 2:1:365:U:H2'    | 2:1:366:C:C6      | 2.50                     | 0.46              |
| 2:1:566:U:OP1    | 16:l:29:LYS:HE3   | 2.16                     | 0.46              |
| 2:1:2173:A:H2'   | 2:1:2173:A:N3     | 2.30                     | 0.46              |
| 2:1:2475:C:N4    | 2:1:2529:G:H22    | 2.14                     | 0.46              |
| 2:1:2543:G:H2'   | 2:1:2544:G:H8     | 1.80                     | 0.46              |
| 4:8:434:ALA:O    | 4:8:438:LEU:N     | 2.42                     | 0.46              |
| 15:k:40:LYS:NZ   | 15:k:89:ASN:OD1   | 2.32                     | 0.46              |
| 25:u:12:VAL:HG12 | 25:u:69:VAL:HG12  | 1.97                     | 0.46              |
| 39:G:177:ASN:C   | 39:G:178:LEU:HD22 | 2.41                     | 0.46              |
| 43:K:5:GLU:HB2   | 43:K:90:MET:HB3   | 1.98                     | 0.46              |
| 1:3:308:C:H2'    | 1:3:309:A:C8      | 2.51                     | 0.45              |
| 1:3:643:C:H4'    | 45:M:31:LEU:HD22  | 1.98                     | 0.45              |
| 1:3:1288:A:O2'   | 1:3:1353:G:H5'    | 2.16                     | 0.45              |
| 1:3:1471:U:O2'   | 1:3:1472:U:H5'    | 2.16                     | 0.45              |
| 1:3:1493:A:O4'   | 37:4:22:A:O2'     | 2.31                     | 0.45              |
| 2:1:968:C:H2'    | 2:1:969:G:C8      | 2.51                     | 0.45              |
| 2:1:1047:G:H2'   | 2:1:1110:G:N2     | 2.31                     | 0.45              |
| 2:1:1177:G:C2'   | 2:1:1178:C:H5''   | 2.45                     | 0.45              |
| 2:1:1361:G:H2'   | 2:1:1362:C:C6     | 2.50                     | 0.45              |
| 2:1:2615:U:O2'   | 2:1:2616:C:H5'    | 2.15                     | 0.45              |
| 6:b:115:ILE:HG21 | 6:b:126:GLY:HA3   | 1.98                     | 0.45              |
| 42:J:98:ALA:O    | 42:J:121:ASN:HB3  | 2.16                     | 0.45              |
| 48:P:44:ALA:HB3  | 48:P:69:CYS:HB3   | 1.97                     | 0.45              |
| 51:S:34:ASN:O    | 51:S:40:ARG:NH2   | 2.49                     | 0.45              |
| 55:W:71:ASP:N    | 55:W:71:ASP:OD1   | 2.46                     | 0.45              |
| 1:3:310:G:H5''   | 53:U:31:ARG:HB2   | 1.99                     | 0.45              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 1:3:1502:A:C8     | 1:3:1505:G:N2     | 2.83                     | 0.45              |
| 2:1:189:G:H2'     | 2:1:205:G:N2      | 2.31                     | 0.45              |
| 2:1:821:A:C2      | 2:1:946:C:C4      | 3.04                     | 0.45              |
| 2:1:2176:A:OP1    | 12:a:220:ALA:HB1  | 2.16                     | 0.45              |
| 7:c:122:VAL:HG21  | 7:c:141:ARG:HD2   | 1.98                     | 0.45              |
| 26:v:9:ARG:HD3    | 26:v:39:ALA:HB1   | 1.98                     | 0.45              |
| 26:v:46:LYS:HE3   | 26:v:46:LYS:HB3   | 1.78                     | 0.45              |
| 1:3:948:C:H2'     | 1:3:949:A:C8      | 2.44                     | 0.45              |
| 1:3:1105:A:H2'    | 1:3:1106:G:C8     | 2.49                     | 0.45              |
| 2:1:1199:U:H2'    | 2:1:1200:C:C6     | 2.51                     | 0.45              |
| 2:1:2085:U:O2'    | 2:1:2086:U:H5'    | 2.16                     | 0.45              |
| 2:1:2196:C:O2'    | 2:1:2197:U:H5'    | 2.16                     | 0.45              |
| 4:8:18:HIS:CD2    | 4:8:122:GLN:HB2   | 2.50                     | 0.45              |
| 9:e:56:LEU:HD13   | 9:e:88:VAL:HG23   | 1.98                     | 0.45              |
| 23:s:29:VAL:HA    | 23:s:32:ALA:HB3   | 1.98                     | 0.45              |
| 38:5:26:A:H2'     | 38:5:27:A:H8      | 1.81                     | 0.45              |
| 39:G:209:VAL:HG22 | 39:G:213:LEU:HD12 | 1.97                     | 0.45              |
| 41:I:20:LEU:HD11  | 41:I:62:ARG:HG2   | 1.99                     | 0.45              |
| 1:3:328:C:H4'     | 1:3:329:A:H5''    | 1.99                     | 0.45              |
| 2:1:1124:G:H2'    | 2:1:1125:G:O4'    | 2.17                     | 0.45              |
| 2:1:1256:G:H1'    | 8:d:77:ILE:HD11   | 1.98                     | 0.45              |
| 2:1:1869:G:C2     | 2:1:1871:A:H5''   | 2.51                     | 0.45              |
| 2:1:2124:G:H4'    | 12:a:174:THR:CG2  | 2.45                     | 0.45              |
| 2:1:2215:C:H2'    | 2:1:2216:G:C8     | 2.51                     | 0.45              |
| 4:8:418:ILE:HG23  | 4:8:458:ILE:HG13  | 1.98                     | 0.45              |
| 12:a:44:VAL:HB    | 12:a:173:THR:HB   | 1.99                     | 0.45              |
| 13:i:60:VAL:HG12  | 13:i:66:PHE:HA    | 1.99                     | 0.45              |
| 15:k:112:PHE:HB3  | 15:k:115:ILE:HD12 | 1.99                     | 0.45              |
| 18:n:29:VAL:HG12  | 18:n:78:LYS:HD3   | 1.98                     | 0.45              |
| 26:v:14:LYS:O     | 26:v:17:SER:OG    | 2.27                     | 0.45              |
| 27:w:66:GLU:HB2   | 27:w:75:PHE:HB2   | 1.97                     | 0.45              |
| 39:G:33:ALA:C     | 39:G:34:ARG:HG2   | 2.41                     | 0.45              |
| 42:J:156:ARG:C    | 42:J:158:LYS:H    | 2.25                     | 0.45              |
| 45:M:25:THR:HA    | 45:M:59:GLU:HG2   | 1.97                     | 0.45              |
| 46:N:64:ILE:HG21  | 46:N:78:ILE:HG12  | 1.98                     | 0.45              |
| 46:N:80:HIS:O     | 46:N:83:THR:OG1   | 2.34                     | 0.45              |
| 49:Q:53:ARG:HA    | 49:Q:63:THR:HA    | 1.98                     | 0.45              |
| 52:T:33:ALA:HA    | 52:T:36:ASN:HD22  | 1.80                     | 0.45              |
| 1:3:20:U:H2'      | 1:3:21:G:O4'      | 2.17                     | 0.45              |
| 1:3:137:U:H2'     | 1:3:138:G:H8      | 1.81                     | 0.45              |
| 1:3:553:A:OP1     | 49:Q:20:VAL:HG21  | 2.15                     | 0.45              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:3:755:G:H2'    | 1:3:756:C:C6     | 2.52                     | 0.45              |
| 1:3:1535:C:H42   | 37:4:10:G:N2     | 2.12                     | 0.45              |
| 2:1:495:G:H4'    | 23:s:4:ILE:O     | 2.17                     | 0.45              |
| 2:1:973:A:H5'    | 2:1:1188:U:H1'   | 1.98                     | 0.45              |
| 2:1:1005:C:O2'   | 14:j:30:THR:HG21 | 2.17                     | 0.45              |
| 2:1:1817:G:C2    | 2:1:1818:U:H1'   | 2.52                     | 0.45              |
| 2:1:2065:C:H1'   | 2:1:2449:U:H3    | 1.80                     | 0.45              |
| 2:1:2321:U:H5''  | 2:1:2322:A:OP2   | 2.17                     | 0.45              |
| 3:2:30:C:H2'     | 3:2:31:C:O4'     | 2.15                     | 0.45              |
| 6:b:70:LYS:HD2   | 6:b:70:LYS:HA    | 1.77                     | 0.45              |
| 7:c:183:GLU:OE2  | 7:c:183:GLU:N    | 2.50                     | 0.45              |
| 13:i:92:PRO:HA   | 13:i:136:GLY:HA2 | 1.98                     | 0.45              |
| 21:q:81:GLY:HA3  | 21:q:112:ALA:HB1 | 1.98                     | 0.45              |
| 23:s:28:LYS:HE2  | 23:s:28:LYS:HB3  | 1.76                     | 0.45              |
| 50:R:25:GLY:O    | 50:R:29:SER:N    | 2.46                     | 0.45              |
| 1:3:1346:A:N1    | 1:3:1374:A:H5''  | 2.31                     | 0.45              |
| 2:1:500:G:C3'    | 2:1:501:A:H5''   | 2.46                     | 0.45              |
| 2:1:1386:C:H2'   | 2:1:1387:A:C8    | 2.52                     | 0.45              |
| 2:1:2346:A:H3'   | 2:1:2347:C:H5''  | 1.99                     | 0.45              |
| 4:8:125:THR:O    | 4:8:129:GLN:NE2  | 2.50                     | 0.45              |
| 10:f:126:THR:HG1 | 10:f:129:GLU:H   | 1.63                     | 0.45              |
| 26:v:77:VAL:HG23 | 26:v:89:ILE:HG12 | 1.99                     | 0.45              |
| 38:5:15:G:H2'    | 38:5:59:A:H2     | 1.81                     | 0.45              |
| 41:I:101:VAL:HA  | 41:I:104:MET:HB2 | 1.99                     | 0.45              |
| 42:J:139:THR:O   | 42:J:143:LEU:HG  | 2.17                     | 0.45              |
| 49:Q:52:CYS:HB2  | 49:Q:66:ILE:HD11 | 1.99                     | 0.45              |
| 1:3:45:G:O2'     | 1:3:46:G:H5'     | 2.17                     | 0.45              |
| 1:3:891:U:O2'    | 1:3:892:A:H5'    | 2.17                     | 0.45              |
| 1:3:1386:G:H2'   | 1:3:1387:G:H8    | 1.81                     | 0.45              |
| 2:1:394:C:H2'    | 2:1:395:U:O4'    | 2.16                     | 0.45              |
| 2:1:1280:G:O2'   | 2:1:1281:G:H5'   | 2.17                     | 0.45              |
| 2:1:2699:C:H2'   | 2:1:2700:A:C8    | 2.52                     | 0.45              |
| 4:8:148:GLY:O    | 4:8:153:LYS:NZ   | 2.41                     | 0.45              |
| 6:b:16:VAL:HB    | 6:b:203:VAL:HG22 | 1.98                     | 0.45              |
| 39:G:18:GLN:O    | 39:G:18:GLN:CD   | 2.59                     | 0.45              |
| 40:H:10:ARG:NH2  | 40:H:176:THR:O   | 2.50                     | 0.45              |
| 42:J:14:LEU:HD12 | 42:J:35:LEU:O    | 2.16                     | 0.45              |
| 42:J:40:ASP:CB   | 42:J:44:ARG:HB2  | 2.44                     | 0.45              |
| 43:K:82:ASP:OD1  | 43:K:82:ASP:N    | 2.49                     | 0.45              |
| 49:Q:81:ILE:HG23 | 49:Q:94:TYR:HB3  | 1.99                     | 0.45              |
| 54:V:43:LEU:HD22 | 54:V:72:TRP:HE1  | 1.82                     | 0.45              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 1:3:257:G:H1     | 1:3:269:C:H42     | 1.65                     | 0.45              |
| 1:3:477:C:H2'    | 1:3:478:A:C8      | 2.51                     | 0.45              |
| 1:3:662:U:H2'    | 1:3:663:A:C8      | 2.52                     | 0.45              |
| 1:3:681:A:H2'    | 1:3:682:G:C8      | 2.52                     | 0.45              |
| 1:3:738:C:H2'    | 1:3:739:C:C6      | 2.51                     | 0.45              |
| 1:3:1130:A:H61   | 1:3:1144:G:H1'    | 1.82                     | 0.45              |
| 1:3:1406:U:H2'   | 1:3:1407:C:C6     | 2.52                     | 0.45              |
| 2:1:720:U:H2'    | 2:1:721:A:H8      | 1.80                     | 0.45              |
| 2:1:821:A:H1'    | 2:1:944:C:C5'     | 2.42                     | 0.45              |
| 2:1:989:G:N7     | 30:z:13:ILE:HD12  | 2.32                     | 0.45              |
| 2:1:1701:A:C2'   | 2:1:1702:G:H5'    | 2.46                     | 0.45              |
| 2:1:1727:C:C2'   | 2:1:1728:C:H5'    | 2.46                     | 0.45              |
| 2:1:2578:G:O2'   | 2:1:2579:C:H5'    | 2.17                     | 0.45              |
| 4:8:512:ARG:NH2  | 37:4:22:A:H62     | 2.12                     | 0.45              |
| 14:j:87:ALA:HB3  | 14:j:92:MET:HE2   | 1.99                     | 0.45              |
| 18:n:103:ARG:HB3 | 18:n:108:ALA:HB3  | 1.98                     | 0.45              |
| 22:r:2:TYR:HA    | 22:r:15:SER:HA    | 1.99                     | 0.45              |
| 39:G:206:ILE:CG2 | 39:G:207:ARG:N    | 2.80                     | 0.45              |
| 42:J:63:MET:O    | 42:J:66:ALA:HB3   | 2.17                     | 0.45              |
| 49:Q:47:ALA:HB3  | 49:Q:49:ARG:HH21  | 1.82                     | 0.45              |
| 52:T:39:GLN:HA   | 52:T:42:PHE:HB3   | 1.99                     | 0.45              |
| 54:V:46:HIS:CG   | 54:V:66:LEU:HD13  | 2.52                     | 0.45              |
| 1:3:84:U:H2'     | 1:3:87:C:N3       | 2.32                     | 0.45              |
| 1:3:602:A:H61    | 1:3:636:U:H3      | 1.64                     | 0.45              |
| 1:3:676:A:H5''   | 48:P:114:PRO:CB   | 2.46                     | 0.45              |
| 1:3:930:C:H2'    | 1:3:931:C:O4'     | 2.16                     | 0.45              |
| 1:3:1537:U:C2    | 1:3:1538:C:C6     | 3.04                     | 0.45              |
| 2:1:1225:G:OP1   | 22:r:71:LYS:NZ    | 2.50                     | 0.45              |
| 2:1:1360:G:H2'   | 2:1:1361:G:H5'    | 1.98                     | 0.45              |
| 2:1:2124:G:H22   | 12:a:217:THR:HA   | 1.82                     | 0.45              |
| 4:8:409:MET:HE2  | 4:8:409:MET:HB2   | 1.88                     | 0.45              |
| 7:c:9:VAL:HB     | 7:c:26:VAL:HG13   | 1.99                     | 0.45              |
| 15:k:23:LYS:HD3  | 15:k:23:LYS:HA    | 1.75                     | 0.45              |
| 24:t:36:LYS:HE2  | 24:t:62:VAL:HG11  | 1.99                     | 0.45              |
| 36:F:30:GLU:O    | 36:F:32:LYS:N     | 2.45                     | 0.45              |
| 37:4:7:G:OP1     | 58:Z:58:LYS:HD2   | 2.15                     | 0.45              |
| 44:L:130:LYS:HD3 | 44:L:130:LYS:HA   | 1.79                     | 0.45              |
| 45:M:74:ILE:HG13 | 45:M:128:VAL:HG22 | 1.97                     | 0.45              |
| 46:N:80:HIS:CE1  | 46:N:105:ARG:HG2  | 2.52                     | 0.45              |
| 46:N:112:ARG:HD3 | 51:S:100:TRP:HB2  | 1.97                     | 0.45              |
| 1:3:608:A:H2'    | 1:3:609:A:O4'     | 2.17                     | 0.45              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 1:3:946:A:H2'     | 1:3:947:G:C8      | 2.52                     | 0.45              |
| 1:3:1067:A:H2'    | 1:3:1093:A:O2'    | 2.16                     | 0.45              |
| 1:3:1137:C:H4'    | 1:3:1138:G:H21    | 1.82                     | 0.45              |
| 1:3:1236:A:H2'    | 1:3:1237:C:O4'    | 2.17                     | 0.45              |
| 2:1:28:A:O2'      | 2:1:583:G:H5'     | 2.17                     | 0.45              |
| 2:1:1335:C:H2'    | 2:1:1336:A:H8     | 1.82                     | 0.45              |
| 2:1:1806:C:H2'    | 2:1:1807:G:O4'    | 2.17                     | 0.45              |
| 2:1:1825:U:P      | 6:b:51:ARG:HH12   | 2.40                     | 0.45              |
| 4:8:512:ARG:C     | 37:4:22:A:C2      | 2.95                     | 0.45              |
| 9:e:127:TYR:O     | 9:e:155:ILE:N     | 2.43                     | 0.45              |
| 42:J:152:VAL:HG11 | 45:M:98:LEU:HG    | 1.99                     | 0.45              |
| 45:M:40:LYS:HD3   | 45:M:47:ASP:H     | 1.80                     | 0.45              |
| 1:3:52:C:H2'      | 1:3:53:A:H8       | 1.82                     | 0.44              |
| 1:3:975:A:O2'     | 51:S:71:GLY:HA2   | 2.17                     | 0.44              |
| 2:1:341:C:H2'     | 2:1:342:A:H8      | 1.82                     | 0.44              |
| 2:1:482:A:H4'     | 25:u:44:HIS:HB2   | 1.99                     | 0.44              |
| 2:1:539:G:H1      | 2:1:554:U:H3      | 1.65                     | 0.44              |
| 2:1:644:A:H61     | 2:1:2349:G:H21    | 1.65                     | 0.44              |
| 2:1:1081:U:O2     | 2:1:1081:U:C2'    | 2.66                     | 0.44              |
| 2:1:1219:U:OP2    | 21:q:18:LYS:NZ    | 2.50                     | 0.44              |
| 2:1:1468:U:H2'    | 2:1:1522:A:H61    | 1.82                     | 0.44              |
| 2:1:1930:G:H2'    | 2:1:1968:G:N1     | 2.31                     | 0.44              |
| 2:1:2656:U:H5''   | 4:8:146:ARG:NH2   | 2.32                     | 0.44              |
| 4:8:431:MET:HA    | 4:8:434:ALA:HB3   | 1.99                     | 0.44              |
| 9:e:163:GLU:HA    | 9:e:166:ARG:HB3   | 1.99                     | 0.44              |
| 13:i:20:SER:HA    | 13:i:24:GLY:HA2   | 1.99                     | 0.44              |
| 33:C:7:LYS:HD2    | 35:E:33:THR:HG21  | 1.98                     | 0.44              |
| 39:G:116:LEU:CD2  | 39:G:140:LEU:HD23 | 2.47                     | 0.44              |
| 46:N:51:LEU:HD12  | 46:N:56:MET:HB2   | 1.99                     | 0.44              |
| 47:O:30:LYS:HE3   | 47:O:30:LYS:HB3   | 1.81                     | 0.44              |
| 1:3:556:C:O2'     | 1:3:557:G:H5'     | 2.17                     | 0.44              |
| 1:3:1432:G:H1'    | 1:3:1468:A:H62    | 1.82                     | 0.44              |
| 1:3:1457:G:O3'    | 57:Y:29:THR:HG21  | 2.16                     | 0.44              |
| 1:3:1531:A:C2'    | 1:3:1532:U:H5'    | 2.47                     | 0.44              |
| 2:1:873:C:H2'     | 2:1:874:G:O4'     | 2.17                     | 0.44              |
| 2:1:1601:G:C2'    | 2:1:1602:U:H5'    | 2.47                     | 0.44              |
| 2:1:1775:U:H2'    | 2:1:1776:G:H5'    | 1.99                     | 0.44              |
| 2:1:1801:A:N6     | 2:1:2202:U:H5'    | 2.32                     | 0.44              |
| 2:1:2011:U:H2'    | 2:1:2012:G:O4'    | 2.17                     | 0.44              |
| 2:1:2104:C:H2'    | 2:1:2105:U:O4'    | 2.17                     | 0.44              |
| 2:1:2322:A:H2'    | 2:1:2323:G:O4'    | 2.17                     | 0.44              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 3:2:114:C:H2'    | 3:2:115:A:C8     | 2.52                     | 0.44              |
| 4:8:107:ASP:HB3  | 4:8:292:VAL:HG11 | 1.98                     | 0.44              |
| 4:8:512:ARG:NH2  | 37:4:24:U:O4     | 2.50                     | 0.44              |
| 21:q:47:ARG:NH1  | 21:q:48:ASP:OD1  | 2.49                     | 0.44              |
| 36:F:7:VAL:HG13  | 36:F:38:GLY:HA3  | 1.98                     | 0.44              |
| 47:O:82:LYS:HD2  | 47:O:82:LYS:HA   | 1.86                     | 0.44              |
| 52:T:16:ARG:NH1  | 52:T:23:SER:OG   | 2.48                     | 0.44              |
| 1:3:70:U:H2'     | 1:3:94:G:O6      | 2.18                     | 0.44              |
| 1:3:138:G:H2'    | 1:3:139:A:C8     | 2.52                     | 0.44              |
| 1:3:258:G:H2'    | 1:3:259:G:O4'    | 2.18                     | 0.44              |
| 1:3:706:A:H4'    | 48:P:30:ILE:HD11 | 1.99                     | 0.44              |
| 1:3:817:C:H4'    | 1:3:818:G:H5''   | 2.00                     | 0.44              |
| 2:1:156:A:O2'    | 2:1:157:C:H5'    | 2.16                     | 0.44              |
| 2:1:210:C:H2'    | 2:1:211:C:C6     | 2.53                     | 0.44              |
| 2:1:381:G:O2'    | 2:1:382:A:H5'    | 2.18                     | 0.44              |
| 2:1:495:G:H1'    | 23:s:57:ASN:OD1  | 2.17                     | 0.44              |
| 2:1:586:A:H2     | 2:1:809:G:N3     | 2.15                     | 0.44              |
| 2:1:1637:A:H5'   | 2:1:1760:C:O2'   | 2.17                     | 0.44              |
| 2:1:2506:U:O2    | 2:1:2506:U:H2'   | 2.16                     | 0.44              |
| 4:8:17:ALA:HB2   | 4:8:112:VAL:HB   | 2.00                     | 0.44              |
| 4:8:544:VAL:HG13 | 4:8:545:ILE:HG13 | 1.99                     | 0.44              |
| 17:m:42:THR:OG1  | 17:m:92:TRP:O    | 2.31                     | 0.44              |
| 17:m:100:LYS:HE2 | 17:m:100:LYS:HB2 | 1.69                     | 0.44              |
| 41:I:144:ILE:HB  | 41:I:149:LYS:HE2 | 1.99                     | 0.44              |
| 58:Z:52:VAL:HA   | 58:Z:55:HIS:HB2  | 1.99                     | 0.44              |
| 1:3:133:U:H1'    | 1:3:230:G:N2     | 2.32                     | 0.44              |
| 1:3:451:A:H4'    | 1:3:452:A:O4'    | 2.18                     | 0.44              |
| 1:3:1382:C:H1'   | 44:L:78:ARG:HH12 | 1.82                     | 0.44              |
| 2:1:706:A:H62    | 2:1:725:G:H21    | 1.66                     | 0.44              |
| 2:1:716:A:C3'    | 2:1:717:C:H5''   | 2.43                     | 0.44              |
| 2:1:851:C:H2'    | 2:1:852:U:C6     | 2.53                     | 0.44              |
| 2:1:1287:A:H5'   | 18:n:103:ARG:NE  | 2.32                     | 0.44              |
| 2:1:2233:U:H2'   | 2:1:2234:G:C8    | 2.52                     | 0.44              |
| 2:1:2269:G:H3'   | 2:1:2269:G:OP1   | 2.16                     | 0.44              |
| 8:d:106:LYS:HG3  | 8:d:200:LEU:HD23 | 1.98                     | 0.44              |
| 15:k:15:GLY:HA2  | 15:k:47:ILE:HD12 | 1.98                     | 0.44              |
| 22:r:68:ARG:HB3  | 22:r:90:ARG:HB3  | 2.00                     | 0.44              |
| 38:5:37:G:H2'    | 38:5:38:A:O4'    | 2.17                     | 0.44              |
| 46:N:16:ALA:HA   | 46:N:66:VAL:HG22 | 2.00                     | 0.44              |
| 47:O:40:ILE:HB   | 47:O:73:LEU:HB3  | 2.00                     | 0.44              |
| 1:3:706:A:O2'    | 48:P:32:THR:HG21 | 2.17                     | 0.44              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 1:3:1095:U:P     | 1:3:1108:G:H1     | 2.41                     | 0.44              |
| 2:1:343:C:C2'    | 2:1:344:A:H5'     | 2.48                     | 0.44              |
| 2:1:473:G:O2'    | 2:1:474:G:H5'     | 2.17                     | 0.44              |
| 2:1:538:A:H2'    | 2:1:539:G:O4'     | 2.17                     | 0.44              |
| 2:1:2078:C:H2'   | 2:1:2079:U:O4'    | 2.18                     | 0.44              |
| 2:1:2155:U:H2'   | 2:1:2156:G:O4'    | 2.18                     | 0.44              |
| 2:1:2247:A:H2'   | 2:1:2248:C:H6     | 1.83                     | 0.44              |
| 2:1:2257:U:H2'   | 2:1:2258:C:C6     | 2.53                     | 0.44              |
| 2:1:2609:U:O2'   | 2:1:2610:C:H5'    | 2.18                     | 0.44              |
| 3:2:29:A:H2'     | 3:2:30:C:C6       | 2.52                     | 0.44              |
| 4:8:492:GLU:HA   | 4:8:612:LEU:HA    | 2.00                     | 0.44              |
| 42:J:86:GLY:C    | 42:J:88:HIS:N     | 2.76                     | 0.44              |
| 44:L:74:VAL:HG13 | 44:L:86:VAL:H     | 1.82                     | 0.44              |
| 44:L:114:SER:O   | 44:L:118:ARG:N    | 2.51                     | 0.44              |
| 45:M:11:THR:O    | 45:M:15:ASN:N     | 2.42                     | 0.44              |
| 45:M:110:MET:HB3 | 45:M:114:ALA:HB3  | 1.98                     | 0.44              |
| 51:S:42:ASN:O    | 51:S:46:LYS:N     | 2.50                     | 0.44              |
| 58:Z:34:ARG:HD2  | 58:Z:36:PHE:CZ    | 2.52                     | 0.44              |
| 1:3:31:G:H5'     | 1:3:306:A:C6      | 2.53                     | 0.44              |
| 1:3:135:C:H2'    | 1:3:136:C:H5'     | 1.99                     | 0.44              |
| 1:3:333:U:OP1    | 57:Y:2:ASN:ND2    | 2.51                     | 0.44              |
| 1:3:1016:A:O2'   | 1:3:1217:C:H1'    | 2.17                     | 0.44              |
| 2:1:633:A:H2'    | 2:1:634:C:O4'     | 2.18                     | 0.44              |
| 2:1:1389:G:O2'   | 2:1:1390:U:H5'    | 2.18                     | 0.44              |
| 2:1:1537:G:H3'   | 2:1:1537:G:N3     | 2.33                     | 0.44              |
| 2:1:1748:C:H2'   | 2:1:1749:A:C8     | 2.53                     | 0.44              |
| 2:1:2156:G:H2'   | 2:1:2157:G:C5'    | 2.47                     | 0.44              |
| 2:1:2172:U:H4'   | 2:1:2175:C:H41    | 1.81                     | 0.44              |
| 2:1:2334:U:C5'   | 19:o:12:THR:HB    | 2.44                     | 0.44              |
| 2:1:2569:G:H2'   | 2:1:2570:G:H8     | 1.82                     | 0.44              |
| 7:c:96:ILE:HD12  | 7:c:96:ILE:HA     | 1.92                     | 0.44              |
| 39:G:187:ASP:C   | 39:G:189:ASN:H    | 2.26                     | 0.44              |
| 43:K:1:MET:HG2   | 43:K:67:PRO:HB3   | 2.00                     | 0.44              |
| 48:P:111:ASP:HB3 | 48:P:113:THR:HG23 | 2.00                     | 0.44              |
| 1:3:619:U:C2     | 41:I:130:ASN:HB2  | 2.53                     | 0.44              |
| 1:3:664:G:N2     | 1:3:741:G:H1      | 2.08                     | 0.44              |
| 1:3:672:U:H2'    | 1:3:673:A:C8      | 2.52                     | 0.44              |
| 1:3:1216:A:C6    | 1:3:1217:C:N4     | 2.86                     | 0.44              |
| 1:3:1220:G:H2'   | 1:3:1221:G:O4'    | 2.18                     | 0.44              |
| 2:1:16:C:O2'     | 2:1:17:G:H5'      | 2.18                     | 0.44              |
| 2:1:699:A:H2'    | 2:1:700:G:O4'     | 2.16                     | 0.44              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 2:1:728:G:H5''   | 6:b:12:ARG:HH21  | 1.83                     | 0.44              |
| 2:1:1254:A:H3'   | 2:1:1255:U:C5'   | 2.47                     | 0.44              |
| 2:1:2151:U:H2'   | 2:1:2152:G:C8    | 2.53                     | 0.44              |
| 2:1:2347:C:OP1   | 33:C:37:LYS:NZ   | 2.50                     | 0.44              |
| 14:j:17:VAL:HG23 | 14:j:137:PRO:HB2 | 1.99                     | 0.44              |
| 23:s:50:VAL:O    | 23:s:54:ALA:N    | 2.49                     | 0.44              |
| 41:I:8:LEU:HD13  | 41:I:21:LYS:HB2  | 1.99                     | 0.44              |
| 43:K:7:VAL:HG22  | 43:K:61:LEU:HA   | 2.00                     | 0.44              |
| 1:3:741:G:OP2    | 52:T:1:SER:HA    | 2.18                     | 0.44              |
| 2:1:76:C:H2'     | 2:1:77:G:H8      | 1.82                     | 0.44              |
| 2:1:325:G:H2'    | 2:1:326:G:H8     | 1.83                     | 0.44              |
| 2:1:1036:G:H2'   | 2:1:1037:G:C8    | 2.53                     | 0.44              |
| 2:1:1190:G:H2'   | 2:1:1191:G:C8    | 2.53                     | 0.44              |
| 8:d:170:ARG:HD3  | 8:d:170:ARG:HA   | 1.75                     | 0.44              |
| 11:g:135:HIS:HB3 | 11:g:138:VAL:H   | 1.82                     | 0.44              |
| 15:k:65:THR:HG22 | 15:k:67:LYS:H    | 1.82                     | 0.44              |
| 20:p:2:ASN:HA    | 20:p:5:LYS:HE2   | 1.99                     | 0.44              |
| 27:w:14:ALA:O    | 27:w:16:ARG:NH1  | 2.51                     | 0.44              |
| 40:H:87:ARG:HH22 | 40:H:97:PRO:HB3  | 1.82                     | 0.44              |
| 43:K:13:ASP:OD1  | 43:K:13:ASP:N    | 2.50                     | 0.44              |
| 1:3:293:G:H5'    | 1:3:609:A:H61    | 1.82                     | 0.44              |
| 1:3:678:U:H2'    | 1:3:679:C:C6     | 2.53                     | 0.44              |
| 1:3:1097:C:H4'   | 1:3:1170:A:H4'   | 2.00                     | 0.44              |
| 1:3:1313:U:P     | 56:X:5:LYS:HG3   | 2.58                     | 0.44              |
| 2:1:521:U:H2'    | 2:1:522:A:H8     | 1.82                     | 0.44              |
| 2:1:1035:U:O2'   | 2:1:1036:G:H5'   | 2.18                     | 0.44              |
| 2:1:1550:C:H2'   | 2:1:1551:A:H8    | 1.83                     | 0.44              |
| 2:1:2012:G:OP1   | 23:s:98:LYS:HD2  | 2.17                     | 0.44              |
| 2:1:2378:A:C5    | 2:1:2379:G:H1'   | 2.53                     | 0.44              |
| 2:1:2447:G:C4    | 2:1:2500:U:C5    | 3.06                     | 0.44              |
| 3:2:114:C:H2'    | 3:2:115:A:H8     | 1.83                     | 0.44              |
| 32:B:39:ARG:HD2  | 32:B:39:ARG:HA   | 1.84                     | 0.44              |
| 41:I:30:LYS:HB2  | 41:I:30:LYS:HE3  | 1.78                     | 0.44              |
| 1:3:130:A:N1     | 1:3:233:C:H1'    | 2.32                     | 0.43              |
| 1:3:240:G:H2'    | 1:3:241:G:H8     | 1.82                     | 0.43              |
| 1:3:355:C:H2'    | 1:3:356:A:O4'    | 2.17                     | 0.43              |
| 1:3:425:G:H2'    | 1:3:426:U:O4'    | 2.18                     | 0.43              |
| 1:3:738:C:H2'    | 1:3:739:C:H6     | 1.83                     | 0.43              |
| 1:3:1405:G:H21   | 1:3:1518:A:H8    | 1.66                     | 0.43              |
| 1:3:1432:G:H4'   | 1:3:1468:A:H61   | 1.83                     | 0.43              |
| 2:1:63:A:O2'     | 2:1:64:A:H5'     | 2.18                     | 0.43              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 2:1:368:A:H2'     | 2:1:369:U:H5'     | 1.99                     | 0.43              |
| 2:1:558:U:H2'     | 2:1:559:G:C8      | 2.52                     | 0.43              |
| 2:1:1168:G:H3'    | 2:1:1169:A:H5''   | 2.00                     | 0.43              |
| 2:1:1219:U:H2'    | 2:1:1220:G:H8     | 1.81                     | 0.43              |
| 2:1:2899:A:C5'    | 14:j:136:GLN:HE22 | 2.30                     | 0.43              |
| 4:8:158:ILE:HA    | 4:8:162:LEU:HD13  | 2.00                     | 0.43              |
| 8:d:2:GLU:HB3     | 8:d:11:ALA:HB1    | 2.00                     | 0.43              |
| 21:q:65:ASN:HB2   | 21:q:75:TYR:HB2   | 2.00                     | 0.43              |
| 21:q:87:VAL:HG13  | 22:r:49:ILE:HD11  | 2.00                     | 0.43              |
| 42:J:39:GLY:HA2   | 42:J:44:ARG:O     | 2.18                     | 0.43              |
| 42:J:156:ARG:HG3  | 45:M:43:GLY:O     | 2.17                     | 0.43              |
| 1:3:391:G:H5''    | 53:U:8:ARG:HE     | 1.82                     | 0.43              |
| 1:3:597:G:H2'     | 1:3:598:U:O4'     | 2.18                     | 0.43              |
| 1:3:715:A:H2'     | 1:3:716:A:H8      | 1.83                     | 0.43              |
| 1:3:947:G:H1      | 1:3:1234:C:H42    | 1.66                     | 0.43              |
| 1:3:1090:U:C2'    | 1:3:1091:U:H4'    | 2.48                     | 0.43              |
| 2:1:189:G:H1'     | 2:1:207:A:H61     | 1.83                     | 0.43              |
| 2:1:1183:U:H2'    | 2:1:1184:U:C6     | 2.53                     | 0.43              |
| 2:1:1476:U:O2'    | 2:1:1477:A:H5'    | 2.18                     | 0.43              |
| 2:1:2125:G:H4'    | 12:a:41:SER:HB2   | 2.00                     | 0.43              |
| 4:8:183:VAL:HG11  | 4:8:207:ILE:HG13  | 2.00                     | 0.43              |
| 4:8:396:THR:HG21  | 4:8:407:GLU:H     | 1.83                     | 0.43              |
| 15:k:2:ILE:O      | 15:k:33:ALA:N     | 2.51                     | 0.43              |
| 24:t:6:ARG:HA     | 24:t:6:ARG:HD2    | 1.80                     | 0.43              |
| 38:5:35:G:H2'     | 38:5:36:G:H8      | 1.82                     | 0.43              |
| 40:H:190:THR:OG1  | 40:H:193:GLY:O    | 2.37                     | 0.43              |
| 49:Q:31:GLY:HA2   | 49:Q:56:LEU:HA    | 2.00                     | 0.43              |
| 50:R:100:ARG:HH11 | 50:R:102:LYS:HB3  | 1.83                     | 0.43              |
| 52:T:79:GLN:HG3   | 52:T:83:ARG:HD2   | 2.00                     | 0.43              |
| 1:3:194:C:H5''    | 57:Y:59:ARG:HE    | 1.83                     | 0.43              |
| 1:3:1148:U:H2'    | 1:3:1149:C:H5'    | 2.00                     | 0.43              |
| 1:3:1251:A:H2'    | 1:3:1252:A:O4'    | 2.17                     | 0.43              |
| 1:3:1532:U:O4     | 58:Z:46:ARG:NH1   | 2.51                     | 0.43              |
| 2:1:609:A:H2'     | 2:1:610:C:O4'     | 2.19                     | 0.43              |
| 2:1:982:C:H5''    | 2:1:983:A:OP1     | 2.19                     | 0.43              |
| 2:1:1786:A:H62    | 2:1:2606:C:C4'    | 2.32                     | 0.43              |
| 2:1:1877:A:H2'    | 2:1:1878:G:O4'    | 2.18                     | 0.43              |
| 2:1:2294:G:H2'    | 2:1:2295:C:H6     | 1.83                     | 0.43              |
| 4:8:195:ASP:O     | 4:8:197:ASP:N     | 2.40                     | 0.43              |
| 4:8:555:LYS:HA    | 4:8:558:GLN:HB2   | 2.00                     | 0.43              |
| 23:s:57:ASN:OD1   | 23:s:61:ASN:ND2   | 2.51                     | 0.43              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 31:A:35:ASP:OD1  | 31:A:35:ASP:N     | 2.43                     | 0.43              |
| 39:G:118:THR:C   | 39:G:120:SER:H    | 2.25                     | 0.43              |
| 39:G:128:LEU:HG  | 39:G:129:THR:H    | 1.83                     | 0.43              |
| 42:J:110:MET:HE3 | 42:J:126:ALA:HB2  | 1.99                     | 0.43              |
| 43:K:38:ARG:HB2  | 43:K:63:ASN:HD22  | 1.83                     | 0.43              |
| 1:3:57:G:H1      | 1:3:355:C:H42     | 1.66                     | 0.43              |
| 1:3:768:A:OP1    | 1:3:804:U:H4'     | 2.18                     | 0.43              |
| 1:3:973:G:OP1    | 47:O:59:LYS:NZ    | 2.47                     | 0.43              |
| 1:3:1450:U:H2'   | 1:3:1452:C:O4'    | 2.18                     | 0.43              |
| 1:3:1489:G:O2'   | 1:3:1490:U:H5'    | 2.19                     | 0.43              |
| 2:1:112:U:H2'    | 2:1:113:U:C5'     | 2.48                     | 0.43              |
| 2:1:174:U:H2'    | 2:1:175:G:C8      | 2.53                     | 0.43              |
| 2:1:1765:U:H3    | 2:1:1987:A:N6     | 2.17                     | 0.43              |
| 2:1:1782:U:H1'   | 2:1:2609:U:C5'    | 2.49                     | 0.43              |
| 2:1:2235:G:H2'   | 2:1:2236:U:O4'    | 2.17                     | 0.43              |
| 2:1:2470:G:O2'   | 2:1:2471:A:H5'    | 2.18                     | 0.43              |
| 4:8:142:ASN:ND2  | 59:8:801:GDP:N7   | 2.67                     | 0.43              |
| 4:8:424:THR:HG22 | 4:8:426:ALA:H     | 1.83                     | 0.43              |
| 12:a:62:ALA:HB2  | 12:a:162:ARG:HD3  | 1.99                     | 0.43              |
| 17:m:109:PRO:HD2 | 17:m:112:LEU:HD12 | 2.00                     | 0.43              |
| 19:o:57:ALA:O    | 19:o:61:GLN:NE2   | 2.52                     | 0.43              |
| 22:r:49:ILE:HG22 | 22:r:54:VAL:HG13  | 2.00                     | 0.43              |
| 39:G:69:VAL:HG13 | 39:G:162:VAL:HG13 | 2.00                     | 0.43              |
| 46:N:5:TYR:HB2   | 46:N:20:ILE:HG22  | 1.99                     | 0.43              |
| 53:U:69:ASP:OD1  | 53:U:69:ASP:N     | 2.50                     | 0.43              |
| 1:3:56:U:H2'     | 1:3:57:G:C8       | 2.53                     | 0.43              |
| 1:3:368:U:H5'    | 1:3:369:G:H5'     | 2.01                     | 0.43              |
| 1:3:1057:G:H4'   | 40:H:196:GLY:H    | 1.83                     | 0.43              |
| 1:3:1226:C:H5'   | 56:X:79:TYR:CE1   | 2.53                     | 0.43              |
| 2:1:433:C:O2'    | 2:1:434:U:H5'     | 2.18                     | 0.43              |
| 2:1:523:C:H2'    | 2:1:524:G:C8      | 2.54                     | 0.43              |
| 2:1:611:C:H2'    | 2:1:612:G:O4'     | 2.18                     | 0.43              |
| 2:1:873:C:H4'    | 17:m:64:TRP:CD1   | 2.53                     | 0.43              |
| 2:1:1153:C:H2'   | 2:1:1154:G:O4'    | 2.18                     | 0.43              |
| 2:1:1549:A:H2'   | 2:1:1550:C:C6     | 2.54                     | 0.43              |
| 2:1:1744:A:H3'   | 2:1:1745:A:H8     | 1.83                     | 0.43              |
| 2:1:1770:G:C6    | 2:1:1983:G:C6     | 3.07                     | 0.43              |
| 2:1:1977:A:H2'   | 2:1:1978:A:O4'    | 2.19                     | 0.43              |
| 2:1:2285:C:H2'   | 2:1:2286:G:H5''   | 2.01                     | 0.43              |
| 2:1:2293:G:H2'   | 2:1:2294:G:H8     | 1.83                     | 0.43              |
| 58:Z:33:ARG:HE   | 58:Z:33:ARG:HB2   | 1.58                     | 0.43              |

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| Atom-1          | Atom-2          | Interatomic distance (Å) | Clash overlap (Å) |
|-----------------|-----------------|--------------------------|-------------------|
| 1:3:104:G:H2'   | 1:3:105:G:H8    | 1.84                     | 0.43              |
| 1:3:319:G:H2'   | 1:3:320:A:C8    | 2.53                     | 0.43              |
| 1:3:1008:U:H2'  | 1:3:1009:U:O4'  | 2.19                     | 0.43              |
| 1:3:1340:A:H2'  | 1:3:1341:U:O4'  | 2.18                     | 0.43              |
| 1:3:1449:C:H42  | 1:3:1454:G:H1   | 1.66                     | 0.43              |
| 2:1:175:G:H2'   | 2:1:176:A:H8    | 1.84                     | 0.43              |
| 2:1:474:G:O2'   | 2:1:475:C:H5''  | 2.19                     | 0.43              |
| 2:1:1229:C:H2'  | 2:1:1230:A:C8   | 2.53                     | 0.43              |
| 2:1:2787:C:H1'  | 7:c:63:PRO:HG3  | 2.01                     | 0.43              |
| 3:2:52:A:N7     | 19:o:33:ARG:NH2 | 2.67                     | 0.43              |
| 6:b:200:MET:HG3 | 6:b:201:LEU:HG  | 2.00                     | 0.43              |
| 19:o:29:HIS:HB3 | 19:o:36:TYR:HB2 | 2.00                     | 0.43              |
| 25:u:46:LYS:HE3 | 25:u:47:PRO:HD2 | 2.00                     | 0.43              |
| 25:u:81:ARG:NH2 | 25:u:96:LYS:HZ3 | 2.17                     | 0.43              |
| 39:G:93:HIS:O   | 39:G:94:ARG:C   | 2.61                     | 0.43              |
| 42:J:24:VAL:HB  | 42:J:27:GLY:HA3 | 2.00                     | 0.43              |
| 2:1:607:U:O4    | 2:1:619:G:H2'   | 2.19                     | 0.43              |
| 2:1:630:G:C2'   | 2:1:631:A:H5''  | 2.47                     | 0.43              |
| 2:1:771:G:OP1   | 34:D:14:ARG:HD2 | 2.18                     | 0.43              |
| 2:1:992:C:H2'   | 2:1:993:G:C8    | 2.53                     | 0.43              |
| 2:1:1144:A:H2'  | 2:1:1145:C:C6   | 2.53                     | 0.43              |
| 2:1:2231:U:H2'  | 2:1:2232:C:C6   | 2.53                     | 0.43              |
| 2:1:2852:G:H2'  | 2:1:2853:C:O4'  | 2.19                     | 0.43              |
| 12:a:213:SER:OG | 12:a:214:ILE:N  | 2.51                     | 0.43              |
| 38:5:26:A:H61   | 38:5:44:G:H1    | 1.66                     | 0.43              |
| 46:N:83:THR:OG1 | 46:N:84:ARG:NH1 | 2.52                     | 0.43              |
| 1:3:563:A:H2'   | 1:3:567:G:C8    | 2.53                     | 0.43              |
| 1:3:1186:G:H2'  | 1:3:1187:G:C8   | 2.54                     | 0.43              |
| 1:3:1190:G:H5'' | 40:H:2:GLN:O    | 2.18                     | 0.43              |
| 2:1:239:C:H2'   | 2:1:240:C:O4'   | 2.18                     | 0.43              |
| 2:1:343:C:H2'   | 2:1:344:A:H5'   | 2.00                     | 0.43              |
| 2:1:803:U:H3'   | 2:1:804:A:C5'   | 2.48                     | 0.43              |
| 2:1:1271:G:H2'  | 2:1:1618:A:OP1  | 2.19                     | 0.43              |
| 2:1:1932:A:H2'  | 2:1:1933:G:O4'  | 2.18                     | 0.43              |
| 2:1:2103:C:H2'  | 2:1:2104:C:C6   | 2.54                     | 0.43              |
| 2:1:2197:U:O2'  | 2:1:2198:A:H5'' | 2.19                     | 0.43              |
| 2:1:2214:C:O5'  | 2:1:2214:C:H6   | 2.02                     | 0.43              |
| 2:1:2698:U:H2'  | 2:1:2699:C:C6   | 2.54                     | 0.43              |
| 6:b:7:PRO:HA    | 6:b:13:ARG:HA   | 1.99                     | 0.43              |
| 9:e:95:MET:HE3  | 9:e:95:MET:HB3  | 1.70                     | 0.43              |
| 11:g:133:GLN:HA | 11:g:139:PHE:HA | 2.01                     | 0.43              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 41:I:25:ARG:HH22 | 41:I:30:LYS:HD3   | 1.83                     | 0.43              |
| 41:I:56:GLU:HA   | 41:I:59:LYS:HG3   | 2.00                     | 0.43              |
| 42:J:39:GLY:CA   | 42:J:116:VAL:HB   | 2.49                     | 0.43              |
| 49:Q:82:ARG:NH1  | 49:Q:83:GLY:O     | 2.51                     | 0.43              |
| 1:3:591:U:H2'    | 1:3:592:G:H8      | 1.82                     | 0.43              |
| 1:3:764:C:H5''   | 52:T:49:HIS:ND1   | 2.34                     | 0.43              |
| 1:3:1037:C:H2'   | 1:3:1038:C:C6     | 2.54                     | 0.43              |
| 1:3:1065:U:O2'   | 1:3:1066:C:H6     | 2.02                     | 0.43              |
| 2:1:566:U:H4'    | 2:1:809:G:P       | 2.59                     | 0.43              |
| 2:1:705:A:C2     | 2:1:727:A:H1'     | 2.54                     | 0.43              |
| 2:1:799:G:OP2    | 2:1:800:A:H3'     | 2.18                     | 0.43              |
| 2:1:934:U:H2'    | 2:1:935:C:C6      | 2.54                     | 0.43              |
| 2:1:2265:U:H4'   | 17:m:13:HIS:CE1   | 2.53                     | 0.43              |
| 2:1:2502:G:C5'   | 2:1:2503:A:H5''   | 2.49                     | 0.43              |
| 2:1:2562:U:H2'   | 2:1:2563:U:H5'    | 2.01                     | 0.43              |
| 3:2:21:G:H2'     | 3:2:22:U:O4'      | 2.19                     | 0.43              |
| 11:g:81:ALA:HB2  | 11:g:147:VAL:HG23 | 2.01                     | 0.43              |
| 17:m:1:MET:HE3   | 17:m:1:MET:HB2    | 1.81                     | 0.43              |
| 27:w:64:LYS:HA   | 27:w:64:LYS:HD2   | 1.84                     | 0.43              |
| 42:J:92:ARG:O    | 42:J:93:VAL:O     | 2.37                     | 0.43              |
| 42:J:159:SER:O   | 42:J:163:ILE:HG23 | 2.19                     | 0.43              |
| 46:N:40:ARG:HA   | 46:N:44:ARG:HH11  | 1.83                     | 0.43              |
| 1:3:322:C:O2'    | 57:Y:17:ARG:HG3   | 2.19                     | 0.43              |
| 1:3:458:U:H2'    | 1:3:459:A:C8      | 2.54                     | 0.43              |
| 1:3:1150:A:N3    | 47:O:41:PRO:HG2   | 2.34                     | 0.43              |
| 2:1:28:A:H1'     | 2:1:513:A:C2      | 2.54                     | 0.43              |
| 2:1:164:C:H2'    | 2:1:165:A:O4'     | 2.19                     | 0.43              |
| 2:1:2358:A:H2'   | 2:1:2359:C:O4'    | 2.19                     | 0.43              |
| 3:2:91:C:H2'     | 3:2:92:C:C6       | 2.53                     | 0.43              |
| 14:j:32:LEU:HD13 | 14:j:122:LEU:HD11 | 2.00                     | 0.43              |
| 21:q:93:ILE:HG21 | 22:r:4:VAL:HG11   | 2.01                     | 0.43              |
| 23:s:15:GLN:NE2  | 23:s:15:GLN:O     | 2.52                     | 0.43              |
| 33:C:9:LYS:HG3   | 33:C:51:ALA:HB3   | 2.00                     | 0.43              |
| 37:4:20:C:O2     | 38:5:36:G:C2      | 2.71                     | 0.43              |
| 41:I:55:ARG:HD3  | 41:I:55:ARG:HA    | 1.72                     | 0.43              |
| 42:J:52:ALA:HB3  | 42:J:58:ALA:HA    | 2.01                     | 0.43              |
| 42:J:132:PRO:O   | 42:J:133:ILE:C    | 2.60                     | 0.43              |
| 45:M:101:ALA:HB3 | 45:M:112:ASP:HB3  | 2.00                     | 0.43              |
| 1:3:133:U:H3     | 1:3:229:U:H3      | 1.67                     | 0.42              |
| 1:3:539:A:H2'    | 1:3:540:G:C8      | 2.54                     | 0.42              |
| 1:3:734:G:O2'    | 55:W:59:LYS:HD3   | 2.19                     | 0.42              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 1:3:884:U:H4'     | 1:3:885:G:C5'     | 2.47                     | 0.42              |
| 2:1:28:A:H2'      | 2:1:29:U:O4'      | 2.19                     | 0.42              |
| 2:1:1542:U:H2'    | 2:1:1543:G:O4'    | 2.19                     | 0.42              |
| 2:1:1797:G:H5''   | 6:b:255:LYS:HG2   | 2.00                     | 0.42              |
| 2:1:2091:C:H4'    | 28:x:55:MET:HE3   | 2.02                     | 0.42              |
| 2:1:2292:U:H2'    | 2:1:2293:G:H8     | 1.83                     | 0.42              |
| 2:1:2359:C:H4'    | 35:E:53:ASP:OD2   | 2.19                     | 0.42              |
| 2:1:2704:C:H2'    | 2:1:2705:A:O4'    | 2.18                     | 0.42              |
| 12:a:65:LEU:HD22  | 12:a:188:ASN:HD21 | 1.83                     | 0.42              |
| 41:I:18:LEU:HD21  | 41:I:62:ARG:HH22  | 1.84                     | 0.42              |
| 42:J:17:VAL:O     | 42:J:17:VAL:HG13  | 2.19                     | 0.42              |
| 45:M:99:GLY:HA3   | 45:M:129:ALA:HA   | 2.01                     | 0.42              |
| 56:X:18:VAL:HG21  | 56:X:43:MET:HE2   | 2.00                     | 0.42              |
| 1:3:410:G:H2'     | 1:3:429:U:C4      | 2.54                     | 0.42              |
| 1:3:896:C:H2'     | 1:3:897:C:C6      | 2.55                     | 0.42              |
| 1:3:1328:C:O2'    | 1:3:1329:A:H5'    | 2.18                     | 0.42              |
| 2:1:5:A:H2'       | 2:1:6:A:C8        | 2.54                     | 0.42              |
| 2:1:32:C:H2'      | 2:1:33:C:C6       | 2.54                     | 0.42              |
| 2:1:355:U:H2'     | 2:1:356:G:C8      | 2.54                     | 0.42              |
| 2:1:989:G:C8      | 30:z:13:ILE:HD12  | 2.53                     | 0.42              |
| 2:1:1143:A:H62    | 14:j:27:ARG:HD2   | 1.84                     | 0.42              |
| 2:1:1376:C:H2'    | 2:1:1377:G:O4'    | 2.19                     | 0.42              |
| 2:1:1447:C:H2'    | 2:1:1448:G:H8     | 1.81                     | 0.42              |
| 2:1:2841:C:H2'    | 2:1:2842:G:H8     | 1.84                     | 0.42              |
| 17:m:74:THR:HG22  | 17:m:89:VAL:HG22  | 2.02                     | 0.42              |
| 35:E:18:LYS:HB2   | 35:E:18:LYS:HE3   | 1.91                     | 0.42              |
| 39:G:48:MET:CE    | 39:G:198:VAL:HB   | 2.49                     | 0.42              |
| 39:G:107:ARG:HD2  | 39:G:107:ARG:C    | 2.44                     | 0.42              |
| 39:G:172:ILE:HG13 | 39:G:173:LYS:N    | 2.32                     | 0.42              |
| 49:Q:32:VAL:HG22  | 49:Q:78:VAL:HG23  | 2.00                     | 0.42              |
| 1:3:326:G:H2'     | 1:3:327:A:H5'     | 2.01                     | 0.42              |
| 1:3:411:A:C4      | 1:3:413:G:H1'     | 2.54                     | 0.42              |
| 1:3:562:U:C2      | 49:Q:12:ALA:HB3   | 2.54                     | 0.42              |
| 3:2:62:C:H2'      | 3:2:63:C:C6       | 2.55                     | 0.42              |
| 13:i:94:LYS:HE3   | 13:i:94:LYS:HB3   | 1.72                     | 0.42              |
| 21:q:93:ILE:HD12  | 22:r:13:ARG:HB2   | 2.00                     | 0.42              |
| 23:s:42:LYS:HB3   | 23:s:42:LYS:HE2   | 1.78                     | 0.42              |
| 39:G:16:GLY:HA2   | 39:G:40:ILE:HG13  | 2.01                     | 0.42              |
| 40:H:42:LEU:O     | 40:H:46:LEU:N     | 2.51                     | 0.42              |
| 41:I:141:VAL:HG12 | 41:I:180:THR:HG22 | 2.01                     | 0.42              |
| 1:3:75:G:H1       | 1:3:95:C:H42      | 1.66                     | 0.42              |

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| Atom-1            | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|------------------|--------------------------|-------------------|
| 1:3:445:G:H1      | 1:3:489:C:N4     | 2.15                     | 0.42              |
| 1:3:509:A:O2'     | 41:I:55:ARG:NH2  | 2.52                     | 0.42              |
| 1:3:1217:C:H2'    | 1:3:1218:C:O4'   | 2.19                     | 0.42              |
| 1:3:1253:G:H2'    | 1:3:1254:A:H8    | 1.83                     | 0.42              |
| 1:3:1321:U:C3'    | 1:3:1322:C:H5''  | 2.47                     | 0.42              |
| 2:1:196:A:N3      | 2:1:196:A:H2'    | 2.34                     | 0.42              |
| 2:1:255:A:H2'     | 2:1:256:A:O4'    | 2.20                     | 0.42              |
| 2:1:1297:C:OP1    | 2:1:2710:C:H4'   | 2.19                     | 0.42              |
| 2:1:1697:G:H4'    | 2:1:1978:A:H5''  | 2.01                     | 0.42              |
| 2:1:2065:C:H1'    | 2:1:2449:U:N3    | 2.35                     | 0.42              |
| 2:1:2559:C:O2'    | 2:1:2560:A:H5'   | 2.19                     | 0.42              |
| 4:8:442:ASP:HA    | 4:8:443:PRO:HD3  | 1.88                     | 0.42              |
| 27:w:33:ILE:HG22  | 27:w:34:VAL:HG23 | 2.02                     | 0.42              |
| 33:C:22:THR:OG1   | 33:C:23:THR:N    | 2.52                     | 0.42              |
| 38:5:23:C:H2'     | 38:5:24:G:H8     | 1.85                     | 0.42              |
| 39:G:136:ARG:O    | 39:G:140:LEU:HG  | 2.19                     | 0.42              |
| 39:G:220:VAL:HG23 | 39:G:221:ARG:N   | 2.34                     | 0.42              |
| 44:L:14:ASP:OD1   | 44:L:43:TYR:OH   | 2.30                     | 0.42              |
| 48:P:88:PRO:HG3   | 58:Z:32:ARG:HH21 | 1.84                     | 0.42              |
| 1:3:594:U:C2'     | 1:3:595:A:H5'    | 2.49                     | 0.42              |
| 1:3:924:C:H2'     | 1:3:925:G:C8     | 2.54                     | 0.42              |
| 2:1:321:U:H5''    | 8:d:131:THR:HG23 | 2.01                     | 0.42              |
| 2:1:327:G:H2'     | 2:1:328:U:O4'    | 2.18                     | 0.42              |
| 2:1:455:C:N3      | 2:1:472:A:H2'    | 2.35                     | 0.42              |
| 2:1:1744:A:H3'    | 2:1:1745:A:C8    | 2.55                     | 0.42              |
| 2:1:1968:G:O2'    | 2:1:1969:A:H5''  | 2.19                     | 0.42              |
| 2:1:2682:A:O2'    | 2:1:2683:C:H5'   | 2.18                     | 0.42              |
| 2:1:2715:C:H2'    | 2:1:2716:C:O4'   | 2.19                     | 0.42              |
| 5:6:17(A):U:H3'   | 5:6:17(A):U:OP2  | 2.19                     | 0.42              |
| 6:b:145:MET:HE1   | 6:b:181:ARG:NE   | 2.35                     | 0.42              |
| 6:b:156:SER:O     | 6:b:159:THR:OG1  | 2.35                     | 0.42              |
| 8:d:52:VAL:HG21   | 8:d:81:GLY:HA2   | 2.02                     | 0.42              |
| 39:G:49:PHE:O     | 39:G:53:LEU:HG   | 2.18                     | 0.42              |
| 45:M:91:LEU:HD23  | 45:M:91:LEU:HA   | 1.85                     | 0.42              |
| 1:3:593:U:H2'     | 1:3:594:U:C6     | 2.54                     | 0.42              |
| 1:3:1436:U:OP1    | 57:Y:17:ARG:NH2  | 2.51                     | 0.42              |
| 1:3:1500:A:H5''   | 1:3:1508:A:H5''  | 2.00                     | 0.42              |
| 2:1:11:C:C3'      | 2:1:12:U:H5''    | 2.50                     | 0.42              |
| 2:1:746:U:H4'     | 2:1:748:G:N3     | 2.34                     | 0.42              |
| 2:1:1343:G:N3     | 2:1:1343:G:H2'   | 2.34                     | 0.42              |
| 2:1:2504:U:C2'    | 2:1:2505:G:H5'   | 2.49                     | 0.42              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 2:1:2515:C:H2'    | 2:1:2516:A:H8     | 1.83                     | 0.42              |
| 2:1:2662:A:H4'    | 4:8:464:LEU:HD11  | 2.01                     | 0.42              |
| 25:u:5:ARG:HE     | 25:u:5:ARG:HB3    | 1.65                     | 0.42              |
| 30:z:8:GLN:HB2    | 30:z:28:LEU:HD13  | 2.00                     | 0.42              |
| 39:G:86:CYS:O     | 39:G:87:ASP:OD2   | 2.38                     | 0.42              |
| 1:3:208:U:H4'     | 1:3:209:U:C5      | 2.55                     | 0.42              |
| 1:3:1392:G:O2'    | 1:3:1393:U:H5'    | 2.20                     | 0.42              |
| 2:1:414:C:H2'     | 2:1:415:A:C8      | 2.55                     | 0.42              |
| 2:1:918:A:H4'     | 3:2:97:C:O2       | 2.19                     | 0.42              |
| 2:1:1019:U:H3     | 2:1:1142:A:H62    | 1.66                     | 0.42              |
| 2:1:1043:C:H2'    | 2:1:1044:C:H5'    | 2.00                     | 0.42              |
| 2:1:1149:G:H2'    | 2:1:1150:C:C6     | 2.54                     | 0.42              |
| 2:1:1454:C:H5'    | 18:n:63:ARG:NH1   | 2.35                     | 0.42              |
| 2:1:1727:C:H2'    | 2:1:1728:C:H5'    | 2.02                     | 0.42              |
| 2:1:2039:U:H2'    | 2:1:2040:G:H8     | 1.84                     | 0.42              |
| 2:1:2228:G:H2'    | 2:1:2229:U:C6     | 2.54                     | 0.42              |
| 2:1:2229:U:O2     | 28:x:33:HIS:NE2   | 2.51                     | 0.42              |
| 9:e:34:THR:HA     | 9:e:89:THR:HA     | 2.02                     | 0.42              |
| 17:m:43:ALA:HA    | 17:m:46:ILE:HG22  | 2.02                     | 0.42              |
| 20:p:38:ARG:HG2   | 20:p:39:LEU:H     | 1.84                     | 0.42              |
| 39:G:150:ILE:C    | 39:G:152:ASP:H    | 2.27                     | 0.42              |
| 42:J:20:VAL:O     | 42:J:30:PHE:HB2   | 2.18                     | 0.42              |
| 49:Q:101:LEU:O    | 49:Q:103:CYS:N    | 2.52                     | 0.42              |
| 49:Q:106:VAL:HG11 | 49:Q:109:ARG:HD3  | 2.00                     | 0.42              |
| 1:3:123:U:H5''    | 1:3:311:C:O2'     | 2.20                     | 0.42              |
| 1:3:132:C:O3'     | 57:Y:67:HIS:HE1   | 2.02                     | 0.42              |
| 1:3:293:G:H2'     | 1:3:294:U:C6      | 2.54                     | 0.42              |
| 1:3:418:C:H2'     | 1:3:419:C:C6      | 2.55                     | 0.42              |
| 1:3:545:C:OP2     | 41:I:61:ARG:NH2   | 2.53                     | 0.42              |
| 1:3:1307:U:H2'    | 50:R:97:ARG:N     | 2.34                     | 0.42              |
| 1:3:1368:A:H5'    | 46:N:112:ARG:HH21 | 1.85                     | 0.42              |
| 1:3:1404:C:H2'    | 1:3:1405:G:C8     | 2.55                     | 0.42              |
| 2:1:513:A:H2      | 2:1:582:A:H4'     | 1.84                     | 0.42              |
| 2:1:1061:U:O4     | 13:i:74:PRO:HG2   | 2.20                     | 0.42              |
| 2:1:1613:G:H1'    | 34:D:3:ARG:HD2    | 2.01                     | 0.42              |
| 2:1:1920:C:H2'    | 2:1:1921:G:O4'    | 2.19                     | 0.42              |
| 2:1:2097:A:H2'    | 2:1:2098:U:C6     | 2.55                     | 0.42              |
| 2:1:2366:A:H2'    | 2:1:2367:G:O4'    | 2.20                     | 0.42              |
| 2:1:2673:G:H2'    | 2:1:2674:G:H8     | 1.84                     | 0.42              |
| 2:1:2855:C:H2'    | 2:1:2856:A:H8     | 1.84                     | 0.42              |
| 10:f:169:ARG:HH11 | 36:F:31:PRO:HD2   | 1.84                     | 0.42              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 22:r:40:MET:HE3   | 22:r:40:MET:HB3   | 1.76                     | 0.42              |
| 27:w:10:ARG:HE    | 27:w:10:ARG:HB2   | 1.67                     | 0.42              |
| 46:N:114:LYS:HZ2  | 46:N:115:VAL:HG22 | 1.84                     | 0.42              |
| 58:Z:32:ARG:HA    | 58:Z:32:ARG:HD3   | 1.82                     | 0.42              |
| 1:3:132:C:H2'     | 1:3:133:U:O4'     | 2.19                     | 0.42              |
| 1:3:547:A:OP1     | 41:I:69:ARG:NH1   | 2.52                     | 0.42              |
| 1:3:1307:U:O2     | 50:R:96:VAL:HG23  | 2.20                     | 0.42              |
| 1:3:1355:G:H2'    | 1:3:1356:G:C8     | 2.55                     | 0.42              |
| 1:3:1535:C:O2     | 1:3:1535:C:O4'    | 2.38                     | 0.42              |
| 2:1:183:C:C2'     | 2:1:184:C:H5'     | 2.50                     | 0.42              |
| 2:1:1056:G:H5''   | 2:1:1057:A:O3'    | 2.19                     | 0.42              |
| 2:1:1127:A:H2'    | 2:1:1128:G:H5''   | 2.02                     | 0.42              |
| 2:1:1231:U:H2'    | 2:1:1232:G:C8     | 2.49                     | 0.42              |
| 2:1:2024:G:OP2    | 2:1:2034:U:H4'    | 2.20                     | 0.42              |
| 2:1:2161:C:H2'    | 2:1:2162:G:H8     | 1.84                     | 0.42              |
| 4:8:106:LEU:HD12  | 4:8:135:VAL:HG11  | 2.02                     | 0.42              |
| 10:f:44:HIS:NE2   | 10:f:46:ASP:O     | 2.53                     | 0.42              |
| 14:j:25:LEU:HD13  | 14:j:62:VAL:HG21  | 2.01                     | 0.42              |
| 39:G:163:ILE:HD12 | 39:G:163:ILE:N    | 2.35                     | 0.42              |
| 39:G:214:GLY:O    | 39:G:217:ALA:HB3  | 2.20                     | 0.42              |
| 41:I:115:GLN:HE21 | 41:I:153:ARG:HH22 | 1.66                     | 0.42              |
| 48:P:75:GLU:N     | 48:P:75:GLU:OE2   | 2.53                     | 0.42              |
| 1:3:75:G:H2'      | 1:3:76:G:O4'      | 2.19                     | 0.42              |
| 1:3:1146:A:C2'    | 1:3:1147:C:H5'    | 2.49                     | 0.42              |
| 1:3:1164:G:C2     | 1:3:1171:A:N6     | 2.88                     | 0.42              |
| 2:1:279:A:H2'     | 2:1:280:U:O4'     | 2.20                     | 0.42              |
| 2:1:676:A:H62     | 2:1:802:A:H61     | 1.67                     | 0.42              |
| 2:1:718:A:H2'     | 2:1:719:C:H5'     | 2.01                     | 0.42              |
| 2:1:2415:G:H2'    | 2:1:2416:C:H6     | 1.85                     | 0.42              |
| 2:1:2506:U:O2     | 2:1:2506:U:C2'    | 2.67                     | 0.42              |
| 3:2:8:C:H5'       | 19:o:27:VAL:HG11  | 2.00                     | 0.42              |
| 3:2:10:G:H2'      | 3:2:11:C:O4'      | 2.20                     | 0.42              |
| 8:d:143:LEU:HD13  | 8:d:146:VAL:HG11  | 2.02                     | 0.42              |
| 9:e:122:ASP:N     | 9:e:122:ASP:OD1   | 2.52                     | 0.42              |
| 39:G:106:VAL:O    | 39:G:110:ILE:HG13 | 2.20                     | 0.42              |
| 39:G:212:TYR:O    | 39:G:216:VAL:HG23 | 2.19                     | 0.42              |
| 42:J:24:VAL:O     | 42:J:26:GLY:N     | 2.52                     | 0.42              |
| 1:3:76:G:O2'      | 1:3:77:A:H5'      | 2.20                     | 0.41              |
| 1:3:121:U:H2'     | 1:3:122:G:H5'     | 2.02                     | 0.41              |
| 1:3:973:G:H3'     | 1:3:974:A:H8      | 1.84                     | 0.41              |
| 1:3:1504:G:OP1    | 1:3:1507:A:H4'    | 2.20                     | 0.41              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 2:1:494:G:H4'    | 23:s:6:LYS:O     | 2.19                     | 0.41              |
| 2:1:534:U:H2'    | 2:1:535:G:C8     | 2.56                     | 0.41              |
| 2:1:1037:G:O2'   | 2:1:1038:G:H5'   | 2.19                     | 0.41              |
| 2:1:1600:C:H2'   | 2:1:1601:G:H8    | 1.84                     | 0.41              |
| 2:1:1723:G:H2'   | 2:1:1724:G:O4'   | 2.20                     | 0.41              |
| 2:1:2066:C:O2'   | 2:1:2067:G:H5'   | 2.21                     | 0.41              |
| 4:8:351:ASN:HD22 | 4:8:397:LEU:HB3  | 1.85                     | 0.41              |
| 16:l:109:LYS:HB2 | 16:l:109:LYS:HE3 | 1.83                     | 0.41              |
| 21:q:48:ASP:HA   | 21:q:51:GLN:HB3  | 2.01                     | 0.41              |
| 35:E:30:HIS:O    | 35:E:32:LEU:N    | 2.48                     | 0.41              |
| 38:5:21:A:N6     | 38:5:47:U:H1'    | 2.35                     | 0.41              |
| 1:3:297:G:H2'    | 1:3:298:A:H5''   | 2.01                     | 0.41              |
| 1:3:386:C:H2'    | 1:3:387:U:C5'    | 2.50                     | 0.41              |
| 1:3:537:G:H2'    | 1:3:538:G:C8     | 2.56                     | 0.41              |
| 1:3:950:U:OP2    | 50:R:100:ARG:NH2 | 2.44                     | 0.41              |
| 1:3:1402:C:H2'   | 1:3:1403:C:O4'   | 2.20                     | 0.41              |
| 2:1:66:C:H2'     | 2:1:67:U:H6      | 1.85                     | 0.41              |
| 2:1:150:U:H2'    | 2:1:151:C:C6     | 2.55                     | 0.41              |
| 2:1:306:U:H3     | 2:1:310:A:H62    | 1.67                     | 0.41              |
| 2:1:536:G:H4'    | 21:q:56:PHE:CZ   | 2.55                     | 0.41              |
| 2:1:580:U:H2'    | 2:1:581:C:H6     | 1.80                     | 0.41              |
| 2:1:910:A:H1'    | 2:1:2264:C:O2'   | 2.19                     | 0.41              |
| 2:1:1043:C:C2'   | 2:1:1044:C:H5'   | 2.49                     | 0.41              |
| 2:1:1845:G:O2'   | 2:1:1846:G:H5'   | 2.20                     | 0.41              |
| 2:1:2603:G:O2'   | 2:1:2604:U:H5'   | 2.19                     | 0.41              |
| 2:1:2708:G:O2'   | 2:1:2709:G:H5'   | 2.19                     | 0.41              |
| 4:8:187:LYS:HB2  | 4:8:189:LYS:HZ3  | 1.84                     | 0.41              |
| 4:8:325:ALA:O    | 4:8:333:LEU:N    | 2.49                     | 0.41              |
| 18:n:37:THR:HG22 | 18:n:110:MET:HG2 | 2.02                     | 0.41              |
| 30:z:36:GLU:O    | 30:z:37:ARG:NH1  | 2.53                     | 0.41              |
| 34:D:23:ALA:O    | 34:D:28:ARG:NH1  | 2.53                     | 0.41              |
| 37:4:9:G:P       | 55:W:42:ARG:NH2  | 2.85                     | 0.41              |
| 37:4:21:A:C2     | 38:5:34:U:N3     | 2.81                     | 0.41              |
| 41:I:51:GLY:HA2  | 41:I:54:LEU:HB2  | 2.02                     | 0.41              |
| 45:M:39:LEU:HD12 | 45:M:44:PHE:HB2  | 2.02                     | 0.41              |
| 57:Y:73:ARG:O    | 57:Y:77:ASN:ND2  | 2.53                     | 0.41              |
| 1:3:8:A:H1'      | 42:J:107:GLY:N   | 2.35                     | 0.41              |
| 1:3:1128:C:O2'   | 1:3:1129:C:H5'   | 2.19                     | 0.41              |
| 1:3:1353:G:O2'   | 1:3:1354:U:H5'   | 2.20                     | 0.41              |
| 2:1:468:G:O3'    | 8:d:55:SER:HB3   | 2.20                     | 0.41              |
| 2:1:741:U:H2'    | 2:1:742:A:C8     | 2.55                     | 0.41              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 2:1:1463:C:H2'    | 2:1:1464:G:H8     | 1.84                     | 0.41              |
| 2:1:1974:C:H2'    | 2:1:1975:G:C8     | 2.55                     | 0.41              |
| 2:1:2774:C:H2'    | 2:1:2775:G:O4'    | 2.20                     | 0.41              |
| 3:2:28:C:O2'      | 3:2:29:A:H5'      | 2.20                     | 0.41              |
| 3:2:97:C:H2'      | 3:2:98:G:H5'      | 2.02                     | 0.41              |
| 4:8:623:THR:HB    | 4:8:627:ASN:HB2   | 2.02                     | 0.41              |
| 6:b:145:MET:HE1   | 6:b:181:ARG:HE    | 1.85                     | 0.41              |
| 6:b:200:MET:HE3   | 6:b:200:MET:HB2   | 1.89                     | 0.41              |
| 7:c:70:LYS:HD3    | 7:c:70:LYS:HA     | 1.82                     | 0.41              |
| 9:e:35:LEU:HD23   | 9:e:153:ILE:HD12  | 2.02                     | 0.41              |
| 17:m:34:LYS:HD3   | 17:m:99:GLY:HA2   | 2.01                     | 0.41              |
| 42:J:105:ILE:HD11 | 42:J:123:LEU:CB   | 2.50                     | 0.41              |
| 47:O:37:ARG:HB3   | 47:O:75:ASP:HB3   | 2.02                     | 0.41              |
| 1:3:403:C:C5'     | 41:I:131:ILE:HG23 | 2.51                     | 0.41              |
| 1:3:711:G:O2'     | 1:3:712:A:H5'     | 2.20                     | 0.41              |
| 1:3:913:A:H4'     | 1:3:914:A:C4'     | 2.49                     | 0.41              |
| 1:3:1104:G:H2'    | 1:3:1105:A:O4'    | 2.20                     | 0.41              |
| 1:3:1117:A:H5'    | 46:N:109:GLN:NE2  | 2.35                     | 0.41              |
| 1:3:1344:C:O2'    | 1:3:1345:U:H5'    | 2.19                     | 0.41              |
| 2:1:66:C:H2'      | 2:1:67:U:C6       | 2.55                     | 0.41              |
| 2:1:302:C:H2'     | 2:1:303:G:H8      | 1.84                     | 0.41              |
| 2:1:1029:A:H2'    | 2:1:1030:C:O4'    | 2.19                     | 0.41              |
| 2:1:1141:U:H4'    | 2:1:1142:A:O4'    | 2.21                     | 0.41              |
| 2:1:1182:G:H2'    | 2:1:1183:U:O4'    | 2.20                     | 0.41              |
| 2:1:2066:C:C2'    | 2:1:2067:G:H5'    | 2.50                     | 0.41              |
| 2:1:2248:C:H2'    | 2:1:2249:U:H5'    | 2.03                     | 0.41              |
| 2:1:2661:G:O2'    | 2:1:2662:A:H5'    | 2.21                     | 0.41              |
| 4:8:350:LEU:HD12  | 4:8:350:LEU:HA    | 1.90                     | 0.41              |
| 7:c:49:GLN:HG2    | 7:c:79:LEU:HD23   | 2.02                     | 0.41              |
| 8:d:123:LYS:HD2   | 8:d:123:LYS:HA    | 1.94                     | 0.41              |
| 14:j:89:PHE:O     | 14:j:93:ILE:N     | 2.53                     | 0.41              |
| 26:v:73:LYS:O     | 26:v:92:VAL:N     | 2.53                     | 0.41              |
| 39:G:102:ASN:ND2  | 39:G:105:THR:HG21 | 2.35                     | 0.41              |
| 39:G:153:MET:HE3  | 39:G:155:GLY:O    | 2.20                     | 0.41              |
| 40:H:21:TRP:HB3   | 40:H:58:ARG:HB2   | 2.02                     | 0.41              |
| 42:J:110:MET:O    | 42:J:114:LEU:HD13 | 2.20                     | 0.41              |
| 51:S:63:CYS:HB3   | 51:S:67:GLY:H     | 1.85                     | 0.41              |
| 1:3:622:A:H2'     | 1:3:623:C:H5'     | 2.02                     | 0.41              |
| 1:3:701:U:H4'     | 1:3:703:G:H1'     | 2.00                     | 0.41              |
| 1:3:971:G:H1'     | 1:3:1365:G:O2'    | 2.20                     | 0.41              |
| 1:3:978:A:H61     | 1:3:1316:G:H21    | 1.68                     | 0.41              |

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| Atom-1            | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|------------------|--------------------------|-------------------|
| 1:3:1183:U:H3'    | 1:3:1184:G:H5'   | 2.01                     | 0.41              |
| 1:3:1202:U:H2'    | 1:3:1203:C:H5'   | 2.03                     | 0.41              |
| 2:1:185:G:H4'     | 2:1:218:A:H4'    | 2.01                     | 0.41              |
| 2:1:878:A:H3'     | 2:1:879:G:C8     | 2.54                     | 0.41              |
| 2:1:942:G:H2'     | 2:1:943:A:O4'    | 2.20                     | 0.41              |
| 2:1:1590:A:H2'    | 2:1:1591:A:C8    | 2.56                     | 0.41              |
| 2:1:2146:C:H5''   | 2:1:2147:A:C8    | 2.55                     | 0.41              |
| 2:1:2712:C:OP1    | 2:1:2714:G:H4'   | 2.21                     | 0.41              |
| 2:1:2837:A:H2'    | 2:1:2838:G:H8    | 1.85                     | 0.41              |
| 4:8:182:VAL:HG13  | 4:8:191:ILE:HB   | 2.01                     | 0.41              |
| 4:8:485:LYS:HD3   | 4:8:485:LYS:HA   | 1.85                     | 0.41              |
| 8:d:121:VAL:HG21  | 8:d:124:PHE:HB2  | 2.03                     | 0.41              |
| 8:d:126:VAL:HG22  | 8:d:137:LYS:HE2  | 2.02                     | 0.41              |
| 20:p:19:PHE:HE2   | 20:p:46:VAL:HG21 | 1.85                     | 0.41              |
| 20:p:102:ARG:NE   | 20:p:106:ALA:O   | 2.45                     | 0.41              |
| 39:G:124:THR:HG23 | 39:G:124:THR:O   | 2.20                     | 0.41              |
| 42:J:39:GLY:N     | 42:J:116:VAL:HB  | 2.36                     | 0.41              |
| 1:3:240:G:H2'     | 1:3:241:G:C8     | 2.56                     | 0.41              |
| 1:3:425:G:H22     | 41:I:39:GLN:HE21 | 1.67                     | 0.41              |
| 1:3:1270:G:H2'    | 1:3:1271:A:H8    | 1.85                     | 0.41              |
| 1:3:1348:U:H5''   | 46:N:120:ALA:CB  | 2.50                     | 0.41              |
| 1:3:1481:U:H2'    | 1:3:1482:G:C8    | 2.55                     | 0.41              |
| 2:1:147:C:O2'     | 2:1:148:U:H5'    | 2.20                     | 0.41              |
| 2:1:156:A:H61     | 2:1:170:U:H3     | 1.66                     | 0.41              |
| 2:1:263:G:H2'     | 2:1:264:C:C5'    | 2.48                     | 0.41              |
| 2:1:278:A:H2'     | 2:1:278:A:N3     | 2.35                     | 0.41              |
| 2:1:562:U:H2'     | 2:1:572:A:O4'    | 2.20                     | 0.41              |
| 2:1:624:C:O2'     | 2:1:657:U:H5''   | 2.20                     | 0.41              |
| 2:1:1695:G:H3'    | 2:1:1695:G:N3    | 2.35                     | 0.41              |
| 2:1:2174:C:H2'    | 2:1:2175:C:O4'   | 2.21                     | 0.41              |
| 2:1:2368:C:H2'    | 2:1:2369:A:H8    | 1.86                     | 0.41              |
| 3:2:30:C:OP1      | 19:o:3:LYS:NZ    | 2.44                     | 0.41              |
| 4:8:422:PRO:HG2   | 4:8:428:GLN:HG3  | 2.01                     | 0.41              |
| 6:b:13:ARG:HH11   | 6:b:13:ARG:HD3   | 1.73                     | 0.41              |
| 7:c:115:GLY:HA2   | 7:c:166:GLY:HA3  | 2.02                     | 0.41              |
| 7:c:116:LYS:HD2   | 7:c:165:MET:HE3  | 2.02                     | 0.41              |
| 8:d:145:ASP:HA    | 8:d:166:LYS:HB3  | 2.02                     | 0.41              |
| 10:f:55:ASP:OD1   | 10:f:55:ASP:N    | 2.54                     | 0.41              |
| 12:a:42:VAL:HA    | 12:a:216:THR:HA  | 2.03                     | 0.41              |
| 14:j:35:ARG:HB2   | 14:j:54:ILE:HD11 | 2.02                     | 0.41              |
| 15:k:108:ARG:HG2  | 15:k:113:MET:HE1 | 2.03                     | 0.41              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 18:n:90:ARG:HA    | 18:n:90:ARG:HD3   | 1.87                     | 0.41              |
| 38:5:44:G:C2'     | 38:5:45:G:H5'     | 2.50                     | 0.41              |
| 39:G:176:ASN:HD21 | 39:G:194:GLY:HA3  | 1.86                     | 0.41              |
| 39:G:216:VAL:O    | 39:G:220:VAL:HG22 | 2.19                     | 0.41              |
| 50:R:88:LEU:HB3   | 50:R:92:ARG:HH21  | 1.86                     | 0.41              |
| 1:3:406:G:O2'     | 1:3:407:U:H5'     | 2.21                     | 0.41              |
| 1:3:1256:A:H5'    | 1:3:1258:G:H1'    | 2.03                     | 0.41              |
| 2:1:251:A:H2'     | 2:1:252:G:O4'     | 2.21                     | 0.41              |
| 2:1:263:G:H2'     | 2:1:264:C:O4'     | 2.20                     | 0.41              |
| 2:1:1023:U:H2'    | 2:1:1024:G:H5'    | 2.02                     | 0.41              |
| 2:1:1111:A:C2'    | 2:1:1112:G:H4'    | 2.50                     | 0.41              |
| 2:1:1441:G:H4'    | 2:1:1628:G:H5'    | 2.02                     | 0.41              |
| 3:2:51:G:H2'      | 3:2:52:A:O4'      | 2.21                     | 0.41              |
| 4:8:169:LEU:HD22  | 4:8:263:LEU:HD21  | 2.02                     | 0.41              |
| 4:8:275:VAL:HA    | 4:8:278:MET:HE3   | 2.03                     | 0.41              |
| 7:c:13:ARG:NH1    | 20:p:74:GLN:OE1   | 2.48                     | 0.41              |
| 30:z:18:LYS:HA    | 30:z:18:LYS:HD3   | 1.84                     | 0.41              |
| 37:4:21:A:C6      | 38:5:34:U:O4      | 2.71                     | 0.41              |
| 39:G:156:LEU:HD12 | 39:G:157:PRO:HD2  | 2.02                     | 0.41              |
| 41:I:151:GLN:N    | 41:I:151:GLN:OE1  | 2.53                     | 0.41              |
| 53:U:6:LEU:HD12   | 53:U:19:VAL:HG12  | 2.02                     | 0.41              |
| 53:U:59:HIS:CE1   | 53:U:63:GLN:HE22  | 2.39                     | 0.41              |
| 58:Z:28:LEU:HA    | 58:Z:31:VAL:HG12  | 2.01                     | 0.41              |
| 1:3:303:A:O2'     | 1:3:555:U:H4'     | 2.21                     | 0.41              |
| 1:3:748:G:H2'     | 1:3:749:A:C8      | 2.55                     | 0.41              |
| 2:1:18:U:H3       | 2:1:522:A:H61     | 1.69                     | 0.41              |
| 2:1:327:G:H2'     | 2:1:328:U:H5'     | 2.03                     | 0.41              |
| 2:1:570:G:H2'     | 2:1:2030:A:N7     | 2.36                     | 0.41              |
| 2:1:1114:C:H2'    | 2:1:1115:G:C8     | 2.56                     | 0.41              |
| 2:1:1345:C:H6     | 2:1:1345:C:H5'    | 1.84                     | 0.41              |
| 2:1:1352:U:O2'    | 2:1:1353:A:H5'    | 2.20                     | 0.41              |
| 2:1:1777:U:O2'    | 2:1:1778:U:H5'    | 2.20                     | 0.41              |
| 2:1:1818:U:H3     | 6:b:152:GLN:NE2   | 2.19                     | 0.41              |
| 2:1:2396:G:H2'    | 2:1:2397:G:H8     | 1.86                     | 0.41              |
| 2:1:2818:U:P      | 18:n:42:LYS:HZ1   | 2.44                     | 0.41              |
| 11:g:4:ILE:HG12   | 11:g:39:ALA:HB2   | 2.03                     | 0.41              |
| 12:a:7:ARG:HH22   | 12:a:218:MET:HG2  | 1.86                     | 0.41              |
| 13:i:106:GLN:O    | 13:i:110:GLN:N    | 2.50                     | 0.41              |
| 15:k:107:LEU:HB3  | 15:k:116:ILE:HD11 | 2.02                     | 0.41              |
| 16:l:20:GLY:O     | 16:l:21:ARG:NH2   | 2.43                     | 0.41              |
| 18:n:35:LYS:HG2   | 18:n:110:MET:HE2  | 2.03                     | 0.41              |

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| Atom-1            | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|------------------|--------------------------|-------------------|
| 23:s:73:LYS:HE3   | 23:s:73:LYS:HB2  | 1.91                     | 0.41              |
| 32:B:28:SER:OG    | 32:B:37:HIS:NE2  | 2.54                     | 0.41              |
| 39:G:46:VAL:N     | 39:G:47:PRO:CD   | 2.84                     | 0.41              |
| 39:G:53:LEU:O     | 39:G:56:LEU:HB2  | 2.21                     | 0.41              |
| 1:3:36:C:H2'      | 1:3:37:U:O4'     | 2.21                     | 0.41              |
| 1:3:407:U:H2'     | 1:3:408:A:H8     | 1.84                     | 0.41              |
| 1:3:713:G:H2'     | 1:3:714:G:C8     | 2.55                     | 0.41              |
| 1:3:1133:G:H2'    | 1:3:1134:G:C8    | 2.54                     | 0.41              |
| 1:3:1253:G:H2'    | 1:3:1254:A:C8    | 2.56                     | 0.41              |
| 1:3:1317:C:C5'    | 51:S:47:LEU:HD22 | 2.51                     | 0.41              |
| 1:3:1365:G:H2'    | 1:3:1366:C:C6    | 2.55                     | 0.41              |
| 1:3:1469:C:C2'    | 1:3:1470:U:H5'   | 2.50                     | 0.41              |
| 2:1:72:U:O2'      | 2:1:73:A:H5'     | 2.20                     | 0.41              |
| 2:1:219:A:H2'     | 2:1:220:G:O4'    | 2.21                     | 0.41              |
| 2:1:660:C:C5'     | 8:d:94:GLN:HE21  | 2.34                     | 0.41              |
| 2:1:1058:U:H5     | 2:1:1080:A:H61   | 1.67                     | 0.41              |
| 2:1:1059:G:N2     | 13:i:127:SER:HB3 | 2.31                     | 0.41              |
| 2:1:1127:A:C2'    | 2:1:1128:G:H5''  | 2.51                     | 0.41              |
| 2:1:1163:G:O2'    | 2:1:1164:C:H5'   | 2.21                     | 0.41              |
| 2:1:1285:A:H2'    | 2:1:1286:A:H5'   | 2.03                     | 0.41              |
| 2:1:1550:C:H2'    | 2:1:1551:A:C8    | 2.56                     | 0.41              |
| 2:1:1658:C:OP1    | 7:c:140:HIS:NE2  | 2.54                     | 0.41              |
| 2:1:1666:G:H2'    | 2:1:1667:G:H5'   | 2.03                     | 0.41              |
| 2:1:2076:U:H5''   | 2:1:2238:G:H22   | 1.86                     | 0.41              |
| 2:1:2497:A:H1'    | 2:1:2498:C:H5    | 1.84                     | 0.41              |
| 2:1:2623:G:H2'    | 2:1:2624:G:C8    | 2.55                     | 0.41              |
| 2:1:2633:G:H1'    | 7:c:63:PRO:HB2   | 2.03                     | 0.41              |
| 3:2:23:G:H2'      | 3:2:24:G:C8      | 2.56                     | 0.41              |
| 3:2:57:A:H4'      | 9:e:26:GLN:HE22  | 1.85                     | 0.41              |
| 4:8:22:GLY:O      | 4:8:26:THR:N     | 2.48                     | 0.41              |
| 4:8:127:TRP:CG    | 4:8:162:LEU:HD23 | 2.56                     | 0.41              |
| 4:8:297:GLY:HA3   | 4:8:405:ILE:HG22 | 2.03                     | 0.41              |
| 4:8:317:PHE:HB3   | 4:8:400:PRO:HD3  | 2.03                     | 0.41              |
| 4:8:375:LYS:HD3   | 4:8:375:LYS:HA   | 1.95                     | 0.41              |
| 4:8:653:LYS:HB2   | 4:8:653:LYS:HE2  | 1.84                     | 0.41              |
| 7:c:129:THR:OG1   | 7:c:130:GLN:N    | 2.52                     | 0.41              |
| 7:c:146:ILE:HD11  | 7:c:161:MET:HE2  | 2.02                     | 0.41              |
| 12:a:212:VAL:HG23 | 12:a:224:VAL:HB  | 2.03                     | 0.41              |
| 13:i:6:ALA:HB3    | 13:i:60:VAL:HG23 | 2.03                     | 0.41              |
| 15:k:68:GLY:HA3   | 15:k:78:ARG:HG2  | 2.03                     | 0.41              |
| 37:4:7:G:H2'      | 37:4:8:A:C8      | 2.55                     | 0.41              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 38:5:57:G:H2'    | 38:5:58:A:H5'    | 2.01                     | 0.41              |
| 39:G:14:HIS:CA   | 39:G:202:ASN:HB2 | 2.47                     | 0.41              |
| 39:G:96:LEU:O    | 39:G:99:MET:HG2  | 2.21                     | 0.41              |
| 39:G:98:GLY:HA3  | 39:G:102:ASN:HB3 | 2.03                     | 0.41              |
| 42:J:24:VAL:CG1  | 42:J:25:LYS:N    | 2.84                     | 0.41              |
| 42:J:160:VAL:CG1 | 42:J:161:GLU:H   | 2.15                     | 0.41              |
| 45:M:17:GLN:NE2  | 45:M:69:ALA:HB1  | 2.36                     | 0.41              |
| 54:V:16:MET:HG2  | 54:V:17:GLU:H    | 1.85                     | 0.41              |
| 56:X:38:THR:OG1  | 56:X:39:ILE:N    | 2.52                     | 0.41              |
| 1:3:719:C:N3     | 55:W:62:ARG:NH2  | 2.69                     | 0.41              |
| 1:3:800:G:H2'    | 1:3:801:U:C5     | 2.56                     | 0.41              |
| 1:3:909:A:H2'    | 1:3:910:C:O4'    | 2.21                     | 0.41              |
| 1:3:1520:C:H2'   | 1:3:1521:C:H6    | 1.86                     | 0.41              |
| 2:1:878:A:H5'    | 2:1:879:G:OP2    | 2.21                     | 0.41              |
| 2:1:923:G:H2'    | 2:1:924:G:C8     | 2.56                     | 0.41              |
| 2:1:1085:A:H4'   | 2:1:1104:C:O2'   | 2.21                     | 0.41              |
| 2:1:1318:U:H2'   | 2:1:1319:C:C6    | 2.56                     | 0.41              |
| 2:1:1409:U:H2'   | 2:1:1410:G:H8    | 1.86                     | 0.41              |
| 2:1:1826:G:H2'   | 2:1:1827:U:C6    | 2.56                     | 0.41              |
| 2:1:2304:G:H4'   | 9:e:128:SER:O    | 2.21                     | 0.41              |
| 2:1:2707:U:H2'   | 2:1:2708:G:C8    | 2.56                     | 0.41              |
| 4:8:143:LYS:HD3  | 59:8:801:GDP:C5  | 2.56                     | 0.41              |
| 4:8:376:GLU:HG3  | 4:8:378:ARG:HE   | 1.85                     | 0.41              |
| 39:G:24:PRO:C    | 39:G:26:MET:H    | 2.27                     | 0.41              |
| 50:R:71:GLU:O    | 50:R:75:SER:N    | 2.54                     | 0.41              |
| 1:3:219:U:O2'    | 1:3:220:G:H5'    | 2.21                     | 0.40              |
| 1:3:264:C:O2'    | 54:V:65:PRO:HG2  | 2.21                     | 0.40              |
| 1:3:723:U:OP1    | 58:Z:44:ARG:HG2  | 2.20                     | 0.40              |
| 2:1:71:A:H5''    | 2:1:73:A:C8      | 2.56                     | 0.40              |
| 2:1:175:G:H2'    | 2:1:176:A:C8     | 2.56                     | 0.40              |
| 2:1:208:C:H2'    | 2:1:209:C:H6     | 1.86                     | 0.40              |
| 2:1:1196:C:H2'   | 2:1:1197:G:H8    | 1.87                     | 0.40              |
| 2:1:1444:G:H2'   | 2:1:1445:G:C8    | 2.57                     | 0.40              |
| 2:1:1706:C:OP2   | 2:1:1706:C:H6    | 2.03                     | 0.40              |
| 15:k:21:CYS:SG   | 15:k:22:ILE:N    | 2.94                     | 0.40              |
| 39:G:29:PHE:CD1  | 39:G:29:PHE:N    | 2.88                     | 0.40              |
| 45:M:91:LEU:HD11 | 45:M:121:GLY:HA2 | 2.03                     | 0.40              |
| 48:P:17:ASP:OD1  | 48:P:17:ASP:N    | 2.54                     | 0.40              |
| 53:U:27:ALA:O    | 53:U:30:GLY:N    | 2.54                     | 0.40              |
| 1:3:59:A:H1'     | 1:3:354:G:N2     | 2.36                     | 0.40              |
| 1:3:672:U:H2'    | 1:3:673:A:H8     | 1.86                     | 0.40              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 1:3:1042:A:H2'   | 1:3:1043:G:C8     | 2.56                     | 0.40              |
| 1:3:1257:A:O2'   | 1:3:1258:G:P      | 2.79                     | 0.40              |
| 2:1:172:A:H2'    | 2:1:173:A:H8      | 1.86                     | 0.40              |
| 2:1:378:C:C2'    | 2:1:379:G:H5'     | 2.50                     | 0.40              |
| 2:1:460:A:H2'    | 2:1:461:C:O4'     | 2.21                     | 0.40              |
| 2:1:482:A:H1'    | 2:1:498:G:N2      | 2.37                     | 0.40              |
| 2:1:1196:C:H2'   | 2:1:1197:G:C8     | 2.56                     | 0.40              |
| 2:1:1867:G:H2'   | 2:1:1868:C:C6     | 2.55                     | 0.40              |
| 2:1:2297:A:N1    | 2:1:2321:U:H5     | 2.19                     | 0.40              |
| 2:1:2468:A:H1'   | 2:1:2482:A:N6     | 2.36                     | 0.40              |
| 4:8:428:GLN:O    | 4:8:432:GLY:N     | 2.53                     | 0.40              |
| 4:8:574:MET:SD   | 4:8:574:MET:N     | 2.94                     | 0.40              |
| 6:b:9:SER:HA     | 6:b:10:PRO:HD3    | 1.94                     | 0.40              |
| 6:b:97:ASP:OD1   | 6:b:97:ASP:N      | 2.53                     | 0.40              |
| 10:f:117:PRO:HD2 | 10:f:120:ILE:HD13 | 2.04                     | 0.40              |
| 11:g:59:ALA:O    | 11:g:63:ALA:N     | 2.54                     | 0.40              |
| 12:a:7:ARG:NH1   | 12:a:35:THR:OG1   | 2.54                     | 0.40              |
| 15:k:53:LYS:N    | 15:k:56:ASP:OD2   | 2.44                     | 0.40              |
| 15:k:94:PRO:HD2  | 15:k:114:LYS:HD3  | 2.02                     | 0.40              |
| 23:s:20:VAL:HG11 | 23:s:44:ALA:HA    | 2.02                     | 0.40              |
| 23:s:92:ARG:NH2  | 23:s:94:ASP:OD2   | 2.53                     | 0.40              |
| 39:G:69:VAL:HG13 | 39:G:69:VAL:O     | 2.21                     | 0.40              |
| 40:H:131:ARG:HE  | 40:H:135:ARG:HH22 | 1.69                     | 0.40              |
| 48:P:124:LYS:HE2 | 48:P:124:LYS:HB2  | 2.00                     | 0.40              |
| 1:3:184:G:C5'    | 1:3:225:C:H5'     | 2.51                     | 0.40              |
| 1:3:642:A:H2'    | 1:3:643:C:O4'     | 2.20                     | 0.40              |
| 1:3:1160:G:H4'   | 39:G:130:LYS:HE2  | 2.02                     | 0.40              |
| 1:3:1535:C:C2'   | 1:3:1536:C:H5'    | 2.52                     | 0.40              |
| 2:1:310:A:C2'    | 2:1:311:A:H5''    | 2.52                     | 0.40              |
| 2:1:487:C:H2'    | 2:1:488:G:H5'     | 2.02                     | 0.40              |
| 2:1:827:U:H4'    | 2:1:828:U:C6      | 2.56                     | 0.40              |
| 2:1:1080:A:H4'   | 13:i:126:ARG:HG2  | 2.02                     | 0.40              |
| 2:1:1719:G:H2'   | 2:1:1720:U:C6     | 2.56                     | 0.40              |
| 2:1:1827:U:OP2   | 6:b:220:ARG:HD2   | 2.21                     | 0.40              |
| 2:1:2845:U:H2'   | 2:1:2846:G:C8     | 2.56                     | 0.40              |
| 2:1:2898:U:H2'   | 2:1:2899:A:C8     | 2.57                     | 0.40              |
| 10:f:10:VAL:HG23 | 10:f:14:VAL:HB    | 2.03                     | 0.40              |
| 12:a:190:GLU:O   | 12:a:194:VAL:N    | 2.42                     | 0.40              |
| 13:i:61:TYR:CZ   | 13:i:63:ASP:HB2   | 2.56                     | 0.40              |
| 23:s:109:ASP:OD1 | 23:s:109:ASP:N    | 2.52                     | 0.40              |
| 37:4:9:G:OP1     | 55:W:42:ARG:NE    | 2.54                     | 0.40              |

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| Atom-1            | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|------------------|--------------------------|-------------------|
| 42:J:33:THR:HG21  | 42:J:49:TYR:CZ   | 2.56                     | 0.40              |
| 42:J:161:GLU:HG3  | 42:J:162:GLU:H   | 1.86                     | 0.40              |
| 45:M:21:LYS:HE3   | 45:M:21:LYS:HB3  | 1.95                     | 0.40              |
| 47:O:40:ILE:HA    | 47:O:41:PRO:HD3  | 1.87                     | 0.40              |
| 51:S:1:ALA:N      | 51:S:66:THR:O    | 2.44                     | 0.40              |
| 52:T:81:ILE:HA    | 52:T:86:LEU:HD23 | 2.03                     | 0.40              |
| 1:3:408:A:H2'     | 1:3:409:U:O4'    | 2.21                     | 0.40              |
| 1:3:632:U:H3'     | 1:3:633:G:H5'    | 2.03                     | 0.40              |
| 1:3:1086:U:H2'    | 1:3:1087:G:C8    | 2.56                     | 0.40              |
| 1:3:1157:A:H5'    | 1:3:1157:A:H8    | 1.86                     | 0.40              |
| 1:3:1391:U:H2'    | 1:3:1392:G:H8    | 1.82                     | 0.40              |
| 2:1:296:U:H2'     | 2:1:297:G:C8     | 2.56                     | 0.40              |
| 2:1:1055:G:H3'    | 2:1:1056:G:H8    | 1.86                     | 0.40              |
| 2:1:1162:G:H2'    | 2:1:1163:G:C8    | 2.57                     | 0.40              |
| 2:1:1528:A:H2'    | 2:1:1529:G:O4'   | 2.21                     | 0.40              |
| 2:1:2017:U:H4'    | 32:B:4:GLN:O     | 2.20                     | 0.40              |
| 6:b:75:ALA:N      | 6:b:115:ILE:O    | 2.53                     | 0.40              |
| 6:b:144:GLU:OE1   | 6:b:148:GLY:N    | 2.52                     | 0.40              |
| 7:c:159:LYS:HA    | 7:c:159:LYS:HD2  | 1.71                     | 0.40              |
| 9:e:3:LEU:HA      | 9:e:6:TYR:HB3    | 2.02                     | 0.40              |
| 13:i:71:LYS:HD3   | 13:i:71:LYS:HA   | 1.90                     | 0.40              |
| 16:l:37:GLY:O     | 16:l:41:ARG:NH2  | 2.55                     | 0.40              |
| 30:z:22:THR:HG21  | 30:z:49:ALA:HB3  | 2.04                     | 0.40              |
| 37:4:19:C:C2      | 38:5:37:G:C2     | 3.10                     | 0.40              |
| 39:G:113:LEU:O    | 39:G:116:LEU:HB3 | 2.22                     | 0.40              |
| 39:G:211:LEU:HD12 | 39:G:211:LEU:C   | 2.47                     | 0.40              |
| 52:T:68:TYR:O     | 52:T:72:LYS:N    | 2.55                     | 0.40              |
| 56:X:46:LEU:HD23  | 56:X:46:LEU:HA   | 1.91                     | 0.40              |
| 57:Y:9:ARG:NH1    | 57:Y:12:GLN:OE1  | 2.54                     | 0.40              |
| 1:3:151:A:H2'     | 1:3:152:A:O4'    | 2.21                     | 0.40              |
| 1:3:695:A:H2'     | 1:3:696:A:O4'    | 2.22                     | 0.40              |
| 1:3:1071:C:H2'    | 1:3:1072:G:H8    | 1.86                     | 0.40              |
| 2:1:151:C:H2'     | 2:1:152:A:C8     | 2.57                     | 0.40              |
| 2:1:484:C:OP2     | 25:u:46:LYS:NZ   | 2.55                     | 0.40              |
| 2:1:660:C:H5''    | 8:d:94:GLN:NE2   | 2.37                     | 0.40              |
| 2:1:1081:U:H5'    | 2:1:1082:U:C5    | 2.50                     | 0.40              |
| 2:1:1104:C:H3'    | 2:1:1105:U:H5''  | 2.04                     | 0.40              |
| 2:1:1180:U:H2'    | 2:1:1181:U:C5    | 2.57                     | 0.40              |
| 2:1:1294:U:H2'    | 2:1:1295:C:O4'   | 2.22                     | 0.40              |
| 2:1:1335:C:H2'    | 2:1:1336:A:C8    | 2.56                     | 0.40              |
| 2:1:1526:C:H2'    | 2:1:1527:G:O4'   | 2.21                     | 0.40              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 2:1:1593:A:H2'    | 2:1:1594:U:O4'    | 2.22                     | 0.40              |
| 2:1:2855:C:H2'    | 2:1:2856:A:C8     | 2.57                     | 0.40              |
| 4:8:473:MET:HA    | 4:8:477:PHE:HB2   | 2.04                     | 0.40              |
| 4:8:518:VAL:HB    | 4:8:578:LEU:HD11  | 2.03                     | 0.40              |
| 14:j:142:ILE:HD12 | 14:j:142:ILE:HA   | 2.00                     | 0.40              |
| 15:k:1:MET:N      | 15:k:65:THR:HG21  | 2.37                     | 0.40              |
| 26:v:36:ALA:O     | 26:v:93:ARG:NH2   | 2.42                     | 0.40              |
| 41:I:94:GLU:HA    | 41:I:99:ASN:ND2   | 2.36                     | 0.40              |
| 41:I:109:THR:HG23 | 41:I:111:ALA:H    | 1.87                     | 0.40              |
| 42:J:153:ALA:HB2  | 42:J:163:ILE:HD11 | 2.04                     | 0.40              |

There are no symmetry-related clashes.

## 5.3 Torsion angles [i](#)

### 5.3.1 Protein backbone [i](#)

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all PDB entries followed by that with respect to all EM entries.

The Analysed column shows the number of residues for which the backbone conformation was analysed, and the total number of residues.

| Mol | Chain | Analysed      | Favoured  | Allowed  | Outliers | Percentiles |     |
|-----|-------|---------------|-----------|----------|----------|-------------|-----|
| 4   | 8     | 662/697 (95%) | 595 (90%) | 65 (10%) | 2 (0%)   | 36          | 65  |
| 6   | b     | 269/271 (99%) | 234 (87%) | 33 (12%) | 2 (1%)   | 18          | 49  |
| 7   | c     | 207/209 (99%) | 190 (92%) | 16 (8%)  | 1 (0%)   | 24          | 55  |
| 8   | d     | 199/201 (99%) | 173 (87%) | 25 (13%) | 1 (0%)   | 24          | 55  |
| 9   | e     | 175/177 (99%) | 152 (87%) | 23 (13%) | 0        | 100         | 100 |
| 10  | f     | 174/176 (99%) | 152 (87%) | 22 (13%) | 0        | 100         | 100 |
| 11  | g     | 147/149 (99%) | 128 (87%) | 19 (13%) | 0        | 100         | 100 |
| 12  | a     | 130/234 (56%) | 118 (91%) | 12 (9%)  | 0        | 100         | 100 |
| 13  | i     | 139/142 (98%) | 115 (83%) | 24 (17%) | 0        | 100         | 100 |
| 14  | j     | 140/142 (99%) | 128 (91%) | 12 (9%)  | 0        | 100         | 100 |
| 15  | k     | 120/122 (98%) | 106 (88%) | 13 (11%) | 1 (1%)   | 16          | 45  |
| 16  | l     | 141/143 (99%) | 120 (85%) | 20 (14%) | 1 (1%)   | 18          | 49  |

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| Mol | Chain | Analysed      | Favoured  | Allowed  | Outliers | Percentiles |     |
|-----|-------|---------------|-----------|----------|----------|-------------|-----|
| 17  | m     | 134/136 (98%) | 114 (85%) | 18 (13%) | 2 (2%)   | 8           | 32  |
| 18  | n     | 118/120 (98%) | 102 (86%) | 16 (14%) | 0        | 100         | 100 |
| 19  | o     | 114/116 (98%) | 111 (97%) | 3 (3%)   | 0        | 100         | 100 |
| 20  | p     | 112/114 (98%) | 97 (87%)  | 15 (13%) | 0        | 100         | 100 |
| 21  | q     | 115/117 (98%) | 113 (98%) | 2 (2%)   | 0        | 100         | 100 |
| 22  | r     | 101/103 (98%) | 88 (87%)  | 13 (13%) | 0        | 100         | 100 |
| 23  | s     | 108/110 (98%) | 102 (94%) | 6 (6%)   | 0        | 100         | 100 |
| 24  | t     | 91/93 (98%)   | 80 (88%)  | 11 (12%) | 0        | 100         | 100 |
| 25  | u     | 100/102 (98%) | 89 (89%)  | 11 (11%) | 0        | 100         | 100 |
| 26  | v     | 92/94 (98%)   | 81 (88%)  | 11 (12%) | 0        | 100         | 100 |
| 27  | w     | 73/75 (97%)   | 64 (88%)  | 9 (12%)  | 0        | 100         | 100 |
| 28  | x     | 75/77 (97%)   | 67 (89%)  | 8 (11%)  | 0        | 100         | 100 |
| 29  | y     | 61/63 (97%)   | 60 (98%)  | 1 (2%)   | 0        | 100         | 100 |
| 30  | z     | 56/58 (97%)   | 49 (88%)  | 7 (12%)  | 0        | 100         | 100 |
| 31  | A     | 44/66 (67%)   | 35 (80%)  | 9 (20%)  | 0        | 100         | 100 |
| 32  | B     | 54/56 (96%)   | 49 (91%)  | 5 (9%)   | 0        | 100         | 100 |
| 33  | C     | 48/50 (96%)   | 47 (98%)  | 1 (2%)   | 0        | 100         | 100 |
| 34  | D     | 44/46 (96%)   | 38 (86%)  | 6 (14%)  | 0        | 100         | 100 |
| 35  | E     | 62/64 (97%)   | 51 (82%)  | 9 (14%)  | 2 (3%)   | 3           | 19  |
| 36  | F     | 36/38 (95%)   | 30 (83%)  | 6 (17%)  | 0        | 100         | 100 |
| 39  | G     | 216/225 (96%) | 179 (83%) | 28 (13%) | 9 (4%)   | 2           | 14  |
| 40  | H     | 204/206 (99%) | 193 (95%) | 11 (5%)  | 0        | 100         | 100 |
| 41  | I     | 203/205 (99%) | 180 (89%) | 22 (11%) | 1 (0%)   | 24          | 55  |
| 42  | J     | 155/157 (99%) | 108 (70%) | 32 (21%) | 15 (10%) | 0           | 3   |
| 43  | K     | 98/100 (98%)  | 79 (81%)  | 18 (18%) | 1 (1%)   | 12          | 40  |
| 44  | L     | 149/151 (99%) | 132 (89%) | 17 (11%) | 0        | 100         | 100 |
| 45  | M     | 127/129 (98%) | 114 (90%) | 13 (10%) | 0        | 100         | 100 |
| 46  | N     | 125/127 (98%) | 107 (86%) | 18 (14%) | 0        | 100         | 100 |
| 47  | O     | 96/98 (98%)   | 78 (81%)  | 18 (19%) | 0        | 100         | 100 |
| 48  | P     | 114/116 (98%) | 99 (87%)  | 14 (12%) | 1 (1%)   | 14          | 43  |
| 49  | Q     | 121/123 (98%) | 94 (78%)  | 23 (19%) | 4 (3%)   | 3           | 19  |

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| Mol | Chain | Analysed        | Favoured   | Allowed   | Outliers | Percentiles |     |
|-----|-------|-----------------|------------|-----------|----------|-------------|-----|
| 50  | R     | 112/114 (98%)   | 101 (90%)  | 11 (10%)  | 0        | 100         | 100 |
| 51  | S     | 98/100 (98%)    | 91 (93%)   | 7 (7%)    | 0        | 100         | 100 |
| 52  | T     | 86/88 (98%)     | 79 (92%)   | 7 (8%)    | 0        | 100         | 100 |
| 53  | U     | 80/82 (98%)     | 64 (80%)   | 15 (19%)  | 1 (1%)   | 9           | 35  |
| 54  | V     | 78/80 (98%)     | 68 (87%)   | 10 (13%)  | 0        | 100         | 100 |
| 55  | W     | 63/65 (97%)     | 59 (94%)   | 4 (6%)    | 0        | 100         | 100 |
| 56  | X     | 77/79 (98%)     | 64 (83%)   | 13 (17%)  | 0        | 100         | 100 |
| 57  | Y     | 83/85 (98%)     | 77 (93%)   | 6 (7%)    | 0        | 100         | 100 |
| 58  | Z     | 63/65 (97%)     | 48 (76%)   | 14 (22%)  | 1 (2%)   | 7           | 31  |
| All | All   | 6489/6756 (96%) | 5692 (88%) | 752 (12%) | 45 (1%)  | 20          | 49  |

All (45) Ramachandran outliers are listed below:

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 35  | E     | 31  | ILE  |
| 39  | G     | 18  | GLN  |
| 39  | G     | 34  | ARG  |
| 42  | J     | 87  | VAL  |
| 42  | J     | 160 | VAL  |
| 4   | 8     | 196 | ALA  |
| 7   | c     | 134 | HIS  |
| 35  | E     | 32  | LEU  |
| 39  | G     | 33  | ALA  |
| 39  | G     | 87  | ASP  |
| 42  | J     | 11  | GLN  |
| 42  | J     | 86  | GLY  |
| 42  | J     | 89  | THR  |
| 42  | J     | 93  | VAL  |
| 42  | J     | 99  | SER  |
| 42  | J     | 122 | VAL  |
| 42  | J     | 133 | ILE  |
| 42  | J     | 157 | GLY  |
| 48  | P     | 125 | LYS  |
| 49  | Q     | 73  | LEU  |
| 49  | Q     | 102 | ASP  |
| 39  | G     | 22  | TRP  |
| 42  | J     | 132 | PRO  |
| 49  | Q     | 74  | GLN  |
| 53  | U     | 28  | ARG  |

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| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 15  | k     | 25  | LEU  |
| 17  | m     | 82  | MET  |
| 17  | m     | 83  | GLY  |
| 42  | J     | 97  | PRO  |
| 58  | Z     | 8   | ASN  |
| 6   | b     | 149 | LYS  |
| 8   | d     | 61  | ARG  |
| 16  | l     | 103 | ILE  |
| 42  | J     | 77  | ASN  |
| 6   | b     | 150 | GLY  |
| 39  | G     | 47  | PRO  |
| 42  | J     | 50  | GLY  |
| 43  | K     | 54  | LEU  |
| 39  | G     | 27  | LYS  |
| 49  | Q     | 27  | PRO  |
| 39  | G     | 157 | PRO  |
| 4   | 8     | 624 | PRO  |
| 39  | G     | 123 | GLY  |
| 41  | I     | 131 | ILE  |
| 42  | J     | 20  | VAL  |

### 5.3.2 Protein sidechains ⓘ

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all PDB entries followed by that with respect to all EM entries.

The Analysed column shows the number of residues for which the sidechain conformation was analysed, and the total number of residues.

| Mol | Chain | Analysed       | Rotameric  | Outliers | Percentiles |     |
|-----|-------|----------------|------------|----------|-------------|-----|
| 4   | 8     | 548/574 (96%)  | 545 (100%) | 3 (0%)   | 81          | 83  |
| 6   | b     | 216/216 (100%) | 214 (99%)  | 2 (1%)   | 70          | 78  |
| 7   | c     | 164/164 (100%) | 163 (99%)  | 1 (1%)   | 78          | 81  |
| 8   | d     | 165/165 (100%) | 163 (99%)  | 2 (1%)   | 63          | 75  |
| 9   | e     | 148/148 (100%) | 147 (99%)  | 1 (1%)   | 76          | 80  |
| 10  | f     | 137/137 (100%) | 135 (98%)  | 2 (2%)   | 57          | 72  |
| 11  | g     | 114/114 (100%) | 114 (100%) | 0        | 100         | 100 |
| 12  | a     | 110/181 (61%)  | 107 (97%)  | 3 (3%)   | 39          | 63  |

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| Mol | Chain | Analysed       | Rotameric  | Outliers | Percentiles |     |
|-----|-------|----------------|------------|----------|-------------|-----|
| 13  | i     | 109/110 (99%)  | 106 (97%)  | 3 (3%)   | 38          | 62  |
| 14  | j     | 116/116 (100%) | 116 (100%) | 0        | 100         | 100 |
| 15  | k     | 103/103 (100%) | 100 (97%)  | 3 (3%)   | 37          | 62  |
| 16  | l     | 102/102 (100%) | 101 (99%)  | 1 (1%)   | 68          | 76  |
| 17  | m     | 109/109 (100%) | 107 (98%)  | 2 (2%)   | 51          | 70  |
| 18  | n     | 100/100 (100%) | 99 (99%)   | 1 (1%)   | 68          | 76  |
| 19  | o     | 86/86 (100%)   | 84 (98%)   | 2 (2%)   | 44          | 66  |
| 20  | p     | 99/99 (100%)   | 98 (99%)   | 1 (1%)   | 68          | 76  |
| 21  | q     | 89/89 (100%)   | 88 (99%)   | 1 (1%)   | 65          | 76  |
| 22  | r     | 84/84 (100%)   | 81 (96%)   | 3 (4%)   | 31          | 58  |
| 23  | s     | 93/93 (100%)   | 93 (100%)  | 0        | 100         | 100 |
| 24  | t     | 80/80 (100%)   | 78 (98%)   | 2 (2%)   | 42          | 64  |
| 25  | u     | 83/83 (100%)   | 83 (100%)  | 0        | 100         | 100 |
| 26  | v     | 78/78 (100%)   | 78 (100%)  | 0        | 100         | 100 |
| 27  | w     | 57/57 (100%)   | 57 (100%)  | 0        | 100         | 100 |
| 28  | x     | 67/67 (100%)   | 67 (100%)  | 0        | 100         | 100 |
| 29  | y     | 55/55 (100%)   | 55 (100%)  | 0        | 100         | 100 |
| 30  | z     | 48/48 (100%)   | 48 (100%)  | 0        | 100         | 100 |
| 31  | A     | 42/59 (71%)    | 42 (100%)  | 0        | 100         | 100 |
| 32  | B     | 47/47 (100%)   | 46 (98%)   | 1 (2%)   | 47          | 67  |
| 33  | C     | 45/45 (100%)   | 45 (100%)  | 0        | 100         | 100 |
| 34  | D     | 38/38 (100%)   | 38 (100%)  | 0        | 100         | 100 |
| 35  | E     | 51/51 (100%)   | 50 (98%)   | 1 (2%)   | 48          | 68  |
| 36  | F     | 34/34 (100%)   | 34 (100%)  | 0        | 100         | 100 |
| 39  | G     | 180/186 (97%)  | 176 (98%)  | 4 (2%)   | 45          | 66  |
| 40  | H     | 170/170 (100%) | 167 (98%)  | 3 (2%)   | 51          | 70  |
| 41  | I     | 172/172 (100%) | 171 (99%)  | 1 (1%)   | 78          | 81  |
| 42  | J     | 119/119 (100%) | 116 (98%)  | 3 (2%)   | 42          | 64  |
| 43  | K     | 87/87 (100%)   | 86 (99%)   | 1 (1%)   | 65          | 76  |
| 44  | L     | 124/124 (100%) | 123 (99%)  | 1 (1%)   | 73          | 79  |
| 45  | M     | 104/104 (100%) | 104 (100%) | 0        | 100         | 100 |

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| Mol | Chain | Analysed        | Rotameric  | Outliers | Percentiles |     |
|-----|-------|-----------------|------------|----------|-------------|-----|
| 46  | N     | 105/105 (100%)  | 103 (98%)  | 2 (2%)   | 50          | 68  |
| 47  | O     | 86/86 (100%)    | 85 (99%)   | 1 (1%)   | 63          | 75  |
| 48  | P     | 89/89 (100%)    | 88 (99%)   | 1 (1%)   | 65          | 76  |
| 49  | Q     | 103/103 (100%)  | 100 (97%)  | 3 (3%)   | 37          | 62  |
| 50  | R     | 92/92 (100%)    | 90 (98%)   | 2 (2%)   | 45          | 66  |
| 51  | S     | 83/83 (100%)    | 83 (100%)  | 0        | 100         | 100 |
| 52  | T     | 76/76 (100%)    | 76 (100%)  | 0        | 100         | 100 |
| 53  | U     | 65/65 (100%)    | 65 (100%)  | 0        | 100         | 100 |
| 54  | V     | 74/74 (100%)    | 74 (100%)  | 0        | 100         | 100 |
| 55  | W     | 56/56 (100%)    | 56 (100%)  | 0        | 100         | 100 |
| 56  | X     | 70/70 (100%)    | 69 (99%)   | 1 (1%)   | 59          | 73  |
| 57  | Y     | 65/65 (100%)    | 65 (100%)  | 0        | 100         | 100 |
| 58  | Z     | 55/55 (100%)    | 55 (100%)  | 0        | 100         | 100 |
| All | All   | 5392/5513 (98%) | 5334 (99%) | 58 (1%)  | 63          | 76  |

All (58) residues with a non-rotameric sidechain are listed below:

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 4   | 8     | 182 | VAL  |
| 4   | 8     | 518 | VAL  |
| 4   | 8     | 537 | ILE  |
| 6   | b     | 8   | THR  |
| 6   | b     | 128 | THR  |
| 7   | c     | 180 | VAL  |
| 8   | d     | 146 | VAL  |
| 8   | d     | 187 | VAL  |
| 9   | e     | 49  | LEU  |
| 10  | f     | 10  | VAL  |
| 10  | f     | 131 | VAL  |
| 12  | a     | 42  | VAL  |
| 12  | a     | 161 | VAL  |
| 12  | a     | 216 | THR  |
| 13  | i     | 48  | ILE  |
| 13  | i     | 58  | ILE  |
| 13  | i     | 97  | VAL  |
| 15  | k     | 61  | VAL  |
| 15  | k     | 62  | VAL  |

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| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 15  | k     | 99  | ILE  |
| 16  | l     | 94  | THR  |
| 17  | m     | 13  | HIS  |
| 17  | m     | 135 | VAL  |
| 18  | n     | 38  | LEU  |
| 19  | o     | 47  | VAL  |
| 19  | o     | 53  | THR  |
| 20  | p     | 23  | ASP  |
| 21  | q     | 89  | ILE  |
| 22  | r     | 51  | VAL  |
| 22  | r     | 54  | VAL  |
| 22  | r     | 72  | VAL  |
| 24  | t     | 2   | ILE  |
| 24  | t     | 34  | VAL  |
| 32  | B     | 2   | VAL  |
| 35  | E     | 53  | ASP  |
| 39  | G     | 42  | LEU  |
| 39  | G     | 65  | LYS  |
| 39  | G     | 188 | THR  |
| 39  | G     | 222 | GLU  |
| 40  | H     | 152 | VAL  |
| 40  | H     | 194 | VAL  |
| 40  | H     | 199 | VAL  |
| 41  | I     | 129 | VAL  |
| 42  | J     | 30  | PHE  |
| 42  | J     | 132 | PRO  |
| 42  | J     | 146 | MET  |
| 43  | K     | 54  | LEU  |
| 44  | L     | 112 | ASP  |
| 46  | N     | 54  | VAL  |
| 46  | N     | 65  | THR  |
| 47  | O     | 57  | VAL  |
| 48  | P     | 107 | THR  |
| 49  | Q     | 23  | LEU  |
| 49  | Q     | 66  | ILE  |
| 49  | Q     | 86  | VAL  |
| 50  | R     | 24  | VAL  |
| 50  | R     | 64  | VAL  |
| 56  | X     | 4   | LEU  |

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (111) such sidechains are listed below:



| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 4   | 8     | 129 | GLN  |
| 4   | 8     | 192 | ASN  |
| 4   | 8     | 221 | ASN  |
| 4   | 8     | 351 | ASN  |
| 4   | 8     | 496 | GLN  |
| 4   | 8     | 505 | HIS  |
| 4   | 8     | 560 | GLN  |
| 4   | 8     | 627 | ASN  |
| 6   | b     | 57  | HIS  |
| 6   | b     | 69  | ASN  |
| 6   | b     | 89  | ASN  |
| 6   | b     | 114 | GLN  |
| 6   | b     | 152 | GLN  |
| 6   | b     | 196 | ASN  |
| 6   | b     | 250 | GLN  |
| 7   | c     | 36  | GLN  |
| 7   | c     | 49  | GLN  |
| 7   | c     | 94  | GLN  |
| 7   | c     | 130 | GLN  |
| 7   | c     | 148 | GLN  |
| 8   | d     | 9   | GLN  |
| 8   | d     | 94  | GLN  |
| 8   | d     | 97  | ASN  |
| 8   | d     | 156 | ASN  |
| 8   | d     | 163 | ASN  |
| 8   | d     | 195 | GLN  |
| 9   | e     | 22  | ASN  |
| 9   | e     | 36  | ASN  |
| 10  | f     | 29  | ASN  |
| 10  | f     | 87  | GLN  |
| 10  | f     | 115 | GLN  |
| 10  | f     | 127 | GLN  |
| 11  | g     | 2   | GLN  |
| 12  | a     | 188 | ASN  |
| 13  | i     | 18  | ASN  |
| 13  | i     | 104 | GLN  |
| 13  | i     | 110 | GLN  |
| 14  | j     | 40  | HIS  |
| 14  | j     | 132 | HIS  |
| 14  | j     | 136 | GLN  |
| 15  | k     | 3   | GLN  |
| 16  | l     | 38  | GLN  |
| 17  | m     | 13  | HIS  |

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| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 17  | m     | 17  | ASN  |
| 18  | n     | 11  | ASN  |
| 19  | o     | 61  | GLN  |
| 20  | p     | 2   | ASN  |
| 20  | p     | 9   | GLN  |
| 20  | p     | 114 | ASN  |
| 21  | q     | 43  | GLN  |
| 22  | r     | 11  | GLN  |
| 22  | r     | 18  | GLN  |
| 22  | r     | 82  | HIS  |
| 23  | s     | 7   | HIS  |
| 23  | s     | 15  | GLN  |
| 23  | s     | 60  | HIS  |
| 24  | t     | 15  | HIS  |
| 24  | t     | 48  | GLN  |
| 24  | t     | 72  | GLN  |
| 25  | u     | 68  | ASN  |
| 26  | v     | 12  | GLN  |
| 26  | v     | 75  | GLN  |
| 29  | y     | 58  | ASN  |
| 31  | A     | 33  | ASN  |
| 31  | A     | 41  | HIS  |
| 34  | D     | 16  | HIS  |
| 39  | G     | 17  | HIS  |
| 39  | G     | 145 | ASN  |
| 39  | G     | 176 | ASN  |
| 39  | G     | 177 | ASN  |
| 39  | G     | 202 | ASN  |
| 40  | H     | 7   | ASN  |
| 40  | H     | 184 | ASN  |
| 41  | I     | 39  | GLN  |
| 41  | I     | 88  | ASN  |
| 41  | I     | 99  | ASN  |
| 41  | I     | 115 | GLN  |
| 41  | I     | 163 | GLN  |
| 41  | I     | 195 | ASN  |
| 42  | J     | 69  | ASN  |
| 42  | J     | 72  | ASN  |
| 42  | J     | 76  | ASN  |
| 42  | J     | 77  | ASN  |
| 42  | J     | 81  | GLN  |
| 42  | J     | 131 | ASN  |

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| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 42  | J     | 145 | ASN  |
| 43  | K     | 63  | ASN  |
| 45  | M     | 3   | GLN  |
| 45  | M     | 17  | GLN  |
| 45  | M     | 66  | GLN  |
| 46  | N     | 24  | ASN  |
| 47  | O     | 15  | HIS  |
| 47  | O     | 64  | GLN  |
| 48  | P     | 23  | HIS  |
| 48  | P     | 39  | ASN  |
| 49  | Q     | 4   | ASN  |
| 49  | Q     | 71  | HIS  |
| 49  | Q     | 72  | ASN  |
| 50  | R     | 7   | ASN  |
| 51  | S     | 59  | GLN  |
| 51  | S     | 70  | HIS  |
| 52  | T     | 27  | GLN  |
| 52  | T     | 36  | ASN  |
| 53  | U     | 59  | HIS  |
| 54  | V     | 8   | GLN  |
| 54  | V     | 46  | HIS  |
| 55  | W     | 51  | GLN  |
| 56  | X     | 51  | HIS  |
| 57  | Y     | 2   | ASN  |
| 57  | Y     | 67  | HIS  |
| 57  | Y     | 69  | ASN  |

### 5.3.3 RNA ⓘ

| Mol | Chain | Analysed        | Backbone Outliers | Pucker Outliers |
|-----|-------|-----------------|-------------------|-----------------|
| 1   | 3     | 1538/1539 (99%) | 201 (13%)         | 2 (0%)          |
| 2   | 1     | 2902/2903 (99%) | 383 (13%)         | 9 (0%)          |
| 3   | 2     | 119/120 (99%)   | 12 (10%)          | 1 (0%)          |
| 37  | 4     | 14/39 (35%)     | 2 (14%)           | 0               |
| 38  | 5     | 76/77 (98%)     | 17 (22%)          | 0               |
| 5   | 6     | 76/77 (98%)     | 17 (22%)          | 0               |
| All | All   | 4725/4755 (99%) | 632 (13%)         | 12 (0%)         |

All (632) RNA backbone outliers are listed below:

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 1   | 3     | 5   | U    |
| 1   | 3     | 9   | G    |
| 1   | 3     | 22  | G    |
| 1   | 3     | 30  | U    |
| 1   | 3     | 31  | G    |
| 1   | 3     | 32  | A    |
| 1   | 3     | 39  | G    |
| 1   | 3     | 47  | C    |
| 1   | 3     | 48  | C    |
| 1   | 3     | 49  | U    |
| 1   | 3     | 51  | A    |
| 1   | 3     | 66  | A    |
| 1   | 3     | 71  | A    |
| 1   | 3     | 82  | G    |
| 1   | 3     | 83  | C    |
| 1   | 3     | 94  | G    |
| 1   | 3     | 110 | C    |
| 1   | 3     | 116 | A    |
| 1   | 3     | 130 | A    |
| 1   | 3     | 131 | A    |
| 1   | 3     | 164 | G    |
| 1   | 3     | 168 | G    |
| 1   | 3     | 183 | C    |
| 1   | 3     | 184 | G    |
| 1   | 3     | 209 | U    |
| 1   | 3     | 210 | C    |
| 1   | 3     | 212 | G    |
| 1   | 3     | 238 | A    |
| 1   | 3     | 247 | G    |
| 1   | 3     | 251 | G    |
| 1   | 3     | 266 | G    |
| 1   | 3     | 267 | C    |
| 1   | 3     | 281 | G    |
| 1   | 3     | 289 | G    |
| 1   | 3     | 298 | A    |
| 1   | 3     | 316 | C    |
| 1   | 3     | 328 | C    |
| 1   | 3     | 329 | A    |
| 1   | 3     | 330 | C    |
| 1   | 3     | 345 | C    |
| 1   | 3     | 346 | G    |
| 1   | 3     | 347 | G    |
| 1   | 3     | 348 | G    |

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| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 1   | 3     | 352 | C    |
| 1   | 3     | 354 | G    |
| 1   | 3     | 367 | U    |
| 1   | 3     | 372 | C    |
| 1   | 3     | 381 | C    |
| 1   | 3     | 387 | U    |
| 1   | 3     | 392 | C    |
| 1   | 3     | 397 | A    |
| 1   | 3     | 398 | U    |
| 1   | 3     | 411 | A    |
| 1   | 3     | 412 | A    |
| 1   | 3     | 413 | G    |
| 1   | 3     | 414 | A    |
| 1   | 3     | 421 | U    |
| 1   | 3     | 423 | G    |
| 1   | 3     | 429 | U    |
| 1   | 3     | 439 | U    |
| 1   | 3     | 441 | A    |
| 1   | 3     | 467 | U    |
| 1   | 3     | 474 | G    |
| 1   | 3     | 486 | U    |
| 1   | 3     | 497 | G    |
| 1   | 3     | 508 | U    |
| 1   | 3     | 509 | A    |
| 1   | 3     | 518 | C    |
| 1   | 3     | 532 | A    |
| 1   | 3     | 533 | A    |
| 1   | 3     | 542 | G    |
| 1   | 3     | 547 | A    |
| 1   | 3     | 561 | U    |
| 1   | 3     | 562 | U    |
| 1   | 3     | 572 | A    |
| 1   | 3     | 573 | A    |
| 1   | 3     | 576 | C    |
| 1   | 3     | 577 | G    |
| 1   | 3     | 618 | C    |
| 1   | 3     | 633 | G    |
| 1   | 3     | 665 | A    |
| 1   | 3     | 687 | A    |
| 1   | 3     | 688 | G    |
| 1   | 3     | 690 | G    |
| 1   | 3     | 702 | A    |

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| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 1   | 3     | 703  | G    |
| 1   | 3     | 718  | A    |
| 1   | 3     | 721  | G    |
| 1   | 3     | 723  | U    |
| 1   | 3     | 724  | G    |
| 1   | 3     | 733  | G    |
| 1   | 3     | 747  | A    |
| 1   | 3     | 755  | G    |
| 1   | 3     | 776  | G    |
| 1   | 3     | 777  | A    |
| 1   | 3     | 781  | A    |
| 1   | 3     | 793  | U    |
| 1   | 3     | 794  | A    |
| 1   | 3     | 796  | C    |
| 1   | 3     | 814  | A    |
| 1   | 3     | 817  | C    |
| 1   | 3     | 818  | G    |
| 1   | 3     | 819  | A    |
| 1   | 3     | 821  | G    |
| 1   | 3     | 842  | U    |
| 1   | 3     | 843  | U    |
| 1   | 3     | 844  | G    |
| 1   | 3     | 846  | G    |
| 1   | 3     | 872  | A    |
| 1   | 3     | 875  | U    |
| 1   | 3     | 902  | G    |
| 1   | 3     | 915  | A    |
| 1   | 3     | 934  | C    |
| 1   | 3     | 935  | A    |
| 1   | 3     | 960  | U    |
| 1   | 3     | 969  | A    |
| 1   | 3     | 976  | G    |
| 1   | 3     | 977  | A    |
| 1   | 3     | 978  | A    |
| 1   | 3     | 979  | C    |
| 1   | 3     | 981  | U    |
| 1   | 3     | 992  | U    |
| 1   | 3     | 993  | G    |
| 1   | 3     | 994  | A    |
| 1   | 3     | 1004 | A    |
| 1   | 3     | 1011 | C    |
| 1   | 3     | 1033 | G    |

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| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 1   | 3     | 1034 | G    |
| 1   | 3     | 1036 | A    |
| 1   | 3     | 1054 | C    |
| 1   | 3     | 1055 | A    |
| 1   | 3     | 1064 | G    |
| 1   | 3     | 1065 | U    |
| 1   | 3     | 1091 | U    |
| 1   | 3     | 1092 | A    |
| 1   | 3     | 1094 | G    |
| 1   | 3     | 1095 | U    |
| 1   | 3     | 1101 | A    |
| 1   | 3     | 1114 | C    |
| 1   | 3     | 1115 | U    |
| 1   | 3     | 1119 | C    |
| 1   | 3     | 1136 | C    |
| 1   | 3     | 1137 | C    |
| 1   | 3     | 1138 | G    |
| 1   | 3     | 1139 | G    |
| 1   | 3     | 1159 | U    |
| 1   | 3     | 1160 | G    |
| 1   | 3     | 1165 | U    |
| 1   | 3     | 1168 | U    |
| 1   | 3     | 1169 | A    |
| 1   | 3     | 1171 | A    |
| 1   | 3     | 1173 | U    |
| 1   | 3     | 1182 | G    |
| 1   | 3     | 1183 | U    |
| 1   | 3     | 1190 | G    |
| 1   | 3     | 1196 | A    |
| 1   | 3     | 1201 | A    |
| 1   | 3     | 1212 | U    |
| 1   | 3     | 1213 | A    |
| 1   | 3     | 1217 | C    |
| 1   | 3     | 1225 | A    |
| 1   | 3     | 1226 | C    |
| 1   | 3     | 1238 | A    |
| 1   | 3     | 1256 | A    |
| 1   | 3     | 1257 | A    |
| 1   | 3     | 1258 | G    |
| 1   | 3     | 1275 | A    |
| 1   | 3     | 1278 | G    |
| 1   | 3     | 1280 | A    |

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| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 1   | 3     | 1282 | C    |
| 1   | 3     | 1286 | U    |
| 1   | 3     | 1287 | A    |
| 1   | 3     | 1290 | G    |
| 1   | 3     | 1291 | U    |
| 1   | 3     | 1300 | G    |
| 1   | 3     | 1308 | U    |
| 1   | 3     | 1320 | C    |
| 1   | 3     | 1321 | U    |
| 1   | 3     | 1322 | C    |
| 1   | 3     | 1323 | G    |
| 1   | 3     | 1331 | G    |
| 1   | 3     | 1342 | C    |
| 1   | 3     | 1346 | A    |
| 1   | 3     | 1363 | A    |
| 1   | 3     | 1364 | U    |
| 1   | 3     | 1378 | C    |
| 1   | 3     | 1389 | C    |
| 1   | 3     | 1394 | A    |
| 1   | 3     | 1441 | A    |
| 1   | 3     | 1446 | A    |
| 1   | 3     | 1452 | C    |
| 1   | 3     | 1492 | A    |
| 1   | 3     | 1493 | A    |
| 1   | 3     | 1497 | G    |
| 1   | 3     | 1503 | A    |
| 1   | 3     | 1506 | U    |
| 1   | 3     | 1517 | G    |
| 1   | 3     | 1518 | A    |
| 1   | 3     | 1529 | G    |
| 1   | 3     | 1530 | G    |
| 1   | 3     | 1534 | A    |
| 2   | 1     | 10   | A    |
| 2   | 1     | 12   | U    |
| 2   | 1     | 13   | A    |
| 2   | 1     | 34   | U    |
| 2   | 1     | 35   | G    |
| 2   | 1     | 39   | G    |
| 2   | 1     | 46   | G    |
| 2   | 1     | 51   | G    |
| 2   | 1     | 71   | A    |
| 2   | 1     | 74   | A    |

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| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 2   | 1     | 75  | G    |
| 2   | 1     | 84  | A    |
| 2   | 1     | 119 | A    |
| 2   | 1     | 120 | U    |
| 2   | 1     | 121 | G    |
| 2   | 1     | 125 | A    |
| 2   | 1     | 140 | C    |
| 2   | 1     | 141 | G    |
| 2   | 1     | 142 | A    |
| 2   | 1     | 162 | U    |
| 2   | 1     | 163 | C    |
| 2   | 1     | 181 | A    |
| 2   | 1     | 196 | A    |
| 2   | 1     | 216 | A    |
| 2   | 1     | 221 | A    |
| 2   | 1     | 222 | A    |
| 2   | 1     | 228 | C    |
| 2   | 1     | 229 | C    |
| 2   | 1     | 248 | G    |
| 2   | 1     | 250 | G    |
| 2   | 1     | 255 | A    |
| 2   | 1     | 264 | C    |
| 2   | 1     | 266 | G    |
| 2   | 1     | 276 | U    |
| 2   | 1     | 281 | C    |
| 2   | 1     | 311 | A    |
| 2   | 1     | 323 | C    |
| 2   | 1     | 324 | A    |
| 2   | 1     | 329 | G    |
| 2   | 1     | 330 | A    |
| 2   | 1     | 346 | A    |
| 2   | 1     | 361 | G    |
| 2   | 1     | 371 | A    |
| 2   | 1     | 372 | G    |
| 2   | 1     | 386 | G    |
| 2   | 1     | 387 | U    |
| 2   | 1     | 389 | G    |
| 2   | 1     | 396 | G    |
| 2   | 1     | 404 | A    |
| 2   | 1     | 406 | G    |
| 2   | 1     | 411 | G    |
| 2   | 1     | 424 | G    |

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| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 2   | 1     | 448 | U    |
| 2   | 1     | 449 | A    |
| 2   | 1     | 457 | A    |
| 2   | 1     | 481 | G    |
| 2   | 1     | 490 | C    |
| 2   | 1     | 491 | G    |
| 2   | 1     | 501 | A    |
| 2   | 1     | 504 | A    |
| 2   | 1     | 505 | A    |
| 2   | 1     | 509 | C    |
| 2   | 1     | 510 | C    |
| 2   | 1     | 529 | A    |
| 2   | 1     | 530 | G    |
| 2   | 1     | 531 | C    |
| 2   | 1     | 532 | A    |
| 2   | 1     | 548 | G    |
| 2   | 1     | 549 | G    |
| 2   | 1     | 563 | A    |
| 2   | 1     | 573 | U    |
| 2   | 1     | 588 | U    |
| 2   | 1     | 603 | A    |
| 2   | 1     | 613 | A    |
| 2   | 1     | 614 | A    |
| 2   | 1     | 616 | A    |
| 2   | 1     | 627 | A    |
| 2   | 1     | 631 | A    |
| 2   | 1     | 637 | A    |
| 2   | 1     | 645 | C    |
| 2   | 1     | 646 | U    |
| 2   | 1     | 648 | G    |
| 2   | 1     | 654 | A    |
| 2   | 1     | 655 | A    |
| 2   | 1     | 669 | G    |
| 2   | 1     | 686 | U    |
| 2   | 1     | 695 | G    |
| 2   | 1     | 717 | C    |
| 2   | 1     | 729 | G    |
| 2   | 1     | 730 | A    |
| 2   | 1     | 747 | C    |
| 2   | 1     | 762 | U    |
| 2   | 1     | 764 | A    |
| 2   | 1     | 773 | U    |

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| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 2   | 1     | 776  | G    |
| 2   | 1     | 782  | A    |
| 2   | 1     | 784  | G    |
| 2   | 1     | 785  | G    |
| 2   | 1     | 789  | A    |
| 2   | 1     | 800  | A    |
| 2   | 1     | 804  | A    |
| 2   | 1     | 805  | G    |
| 2   | 1     | 811  | U    |
| 2   | 1     | 812  | C    |
| 2   | 1     | 819  | A    |
| 2   | 1     | 827  | U    |
| 2   | 1     | 845  | A    |
| 2   | 1     | 846  | U    |
| 2   | 1     | 847  | U    |
| 2   | 1     | 858  | G    |
| 2   | 1     | 859  | G    |
| 2   | 1     | 878  | A    |
| 2   | 1     | 883  | G    |
| 2   | 1     | 885  | C    |
| 2   | 1     | 886  | A    |
| 2   | 1     | 887  | U    |
| 2   | 1     | 891  | G    |
| 2   | 1     | 896  | A    |
| 2   | 1     | 897  | C    |
| 2   | 1     | 898  | C    |
| 2   | 1     | 910  | A    |
| 2   | 1     | 932  | U    |
| 2   | 1     | 941  | A    |
| 2   | 1     | 946  | C    |
| 2   | 1     | 953  | G    |
| 2   | 1     | 961  | C    |
| 2   | 1     | 962  | G    |
| 2   | 1     | 974  | G    |
| 2   | 1     | 975  | A    |
| 2   | 1     | 983  | A    |
| 2   | 1     | 985  | C    |
| 2   | 1     | 990  | A    |
| 2   | 1     | 995  | C    |
| 2   | 1     | 996  | A    |
| 2   | 1     | 1012 | U    |
| 2   | 1     | 1013 | C    |

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| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 2   | 1     | 1022 | G    |
| 2   | 1     | 1023 | U    |
| 2   | 1     | 1024 | G    |
| 2   | 1     | 1033 | U    |
| 2   | 1     | 1045 | C    |
| 2   | 1     | 1057 | A    |
| 2   | 1     | 1058 | U    |
| 2   | 1     | 1061 | U    |
| 2   | 1     | 1062 | G    |
| 2   | 1     | 1065 | U    |
| 2   | 1     | 1066 | U    |
| 2   | 1     | 1070 | A    |
| 2   | 1     | 1071 | G    |
| 2   | 1     | 1081 | U    |
| 2   | 1     | 1082 | U    |
| 2   | 1     | 1084 | A    |
| 2   | 1     | 1085 | A    |
| 2   | 1     | 1088 | A    |
| 2   | 1     | 1104 | C    |
| 2   | 1     | 1111 | A    |
| 2   | 1     | 1131 | G    |
| 2   | 1     | 1134 | A    |
| 2   | 1     | 1135 | C    |
| 2   | 1     | 1142 | A    |
| 2   | 1     | 1143 | A    |
| 2   | 1     | 1169 | A    |
| 2   | 1     | 1171 | G    |
| 2   | 1     | 1174 | U    |
| 2   | 1     | 1175 | A    |
| 2   | 1     | 1176 | U    |
| 2   | 1     | 1177 | G    |
| 2   | 1     | 1178 | C    |
| 2   | 1     | 1180 | U    |
| 2   | 1     | 1186 | G    |
| 2   | 1     | 1204 | A    |
| 2   | 1     | 1212 | G    |
| 2   | 1     | 1238 | G    |
| 2   | 1     | 1251 | C    |
| 2   | 1     | 1253 | A    |
| 2   | 1     | 1255 | U    |
| 2   | 1     | 1256 | G    |
| 2   | 1     | 1271 | G    |

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| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 2   | 1     | 1272 | A    |
| 2   | 1     | 1273 | U    |
| 2   | 1     | 1275 | A    |
| 2   | 1     | 1293 | C    |
| 2   | 1     | 1301 | A    |
| 2   | 1     | 1321 | A    |
| 2   | 1     | 1329 | U    |
| 2   | 1     | 1341 | G    |
| 2   | 1     | 1345 | C    |
| 2   | 1     | 1352 | U    |
| 2   | 1     | 1365 | A    |
| 2   | 1     | 1378 | A    |
| 2   | 1     | 1379 | U    |
| 2   | 1     | 1383 | A    |
| 2   | 1     | 1395 | A    |
| 2   | 1     | 1403 | A    |
| 2   | 1     | 1416 | G    |
| 2   | 1     | 1419 | A    |
| 2   | 1     | 1420 | A    |
| 2   | 1     | 1427 | A    |
| 2   | 1     | 1428 | C    |
| 2   | 1     | 1454 | C    |
| 2   | 1     | 1461 | C    |
| 2   | 1     | 1475 | G    |
| 2   | 1     | 1482 | G    |
| 2   | 1     | 1490 | A    |
| 2   | 1     | 1494 | A    |
| 2   | 1     | 1503 | A    |
| 2   | 1     | 1510 | G    |
| 2   | 1     | 1515 | A    |
| 2   | 1     | 1524 | G    |
| 2   | 1     | 1535 | A    |
| 2   | 1     | 1536 | C    |
| 2   | 1     | 1537 | G    |
| 2   | 1     | 1547 | C    |
| 2   | 1     | 1558 | C    |
| 2   | 1     | 1560 | G    |
| 2   | 1     | 1567 | G    |
| 2   | 1     | 1584 | U    |
| 2   | 1     | 1585 | C    |
| 2   | 1     | 1608 | A    |
| 2   | 1     | 1616 | A    |

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| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 2   | 1     | 1618 | A    |
| 2   | 1     | 1627 | G    |
| 2   | 1     | 1634 | A    |
| 2   | 1     | 1647 | U    |
| 2   | 1     | 1648 | U    |
| 2   | 1     | 1660 | G    |
| 2   | 1     | 1674 | G    |
| 2   | 1     | 1700 | A    |
| 2   | 1     | 1706 | C    |
| 2   | 1     | 1707 | G    |
| 2   | 1     | 1713 | A    |
| 2   | 1     | 1715 | G    |
| 2   | 1     | 1729 | U    |
| 2   | 1     | 1730 | C    |
| 2   | 1     | 1731 | G    |
| 2   | 1     | 1732 | C    |
| 2   | 1     | 1738 | G    |
| 2   | 1     | 1758 | U    |
| 2   | 1     | 1764 | C    |
| 2   | 1     | 1773 | A    |
| 2   | 1     | 1800 | C    |
| 2   | 1     | 1801 | A    |
| 2   | 1     | 1808 | A    |
| 2   | 1     | 1813 | G    |
| 2   | 1     | 1816 | C    |
| 2   | 1     | 1819 | A    |
| 2   | 1     | 1829 | A    |
| 2   | 1     | 1851 | U    |
| 2   | 1     | 1901 | A    |
| 2   | 1     | 1906 | G    |
| 2   | 1     | 1913 | A    |
| 2   | 1     | 1914 | C    |
| 2   | 1     | 1929 | G    |
| 2   | 1     | 1931 | U    |
| 2   | 1     | 1938 | A    |
| 2   | 1     | 1939 | U    |
| 2   | 1     | 1940 | U    |
| 2   | 1     | 1944 | U    |
| 2   | 1     | 1945 | G    |
| 2   | 1     | 1955 | U    |
| 2   | 1     | 1963 | U    |
| 2   | 1     | 1964 | G    |

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| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 2   | 1     | 1967 | C    |
| 2   | 1     | 1969 | A    |
| 2   | 1     | 1970 | A    |
| 2   | 1     | 1971 | U    |
| 2   | 1     | 1972 | G    |
| 2   | 1     | 1982 | U    |
| 2   | 1     | 1993 | U    |
| 2   | 1     | 1997 | C    |
| 2   | 1     | 2002 | G    |
| 2   | 1     | 2022 | U    |
| 2   | 1     | 2023 | C    |
| 2   | 1     | 2030 | A    |
| 2   | 1     | 2031 | A    |
| 2   | 1     | 2033 | A    |
| 2   | 1     | 2043 | C    |
| 2   | 1     | 2049 | G    |
| 2   | 1     | 2055 | C    |
| 2   | 1     | 2056 | G    |
| 2   | 1     | 2060 | A    |
| 2   | 1     | 2061 | G    |
| 2   | 1     | 2062 | A    |
| 2   | 1     | 2069 | G    |
| 2   | 1     | 2072 | C    |
| 2   | 1     | 2087 | G    |
| 2   | 1     | 2096 | C    |
| 2   | 1     | 2100 | G    |
| 2   | 1     | 2110 | G    |
| 2   | 1     | 2111 | U    |
| 2   | 1     | 2112 | G    |
| 2   | 1     | 2118 | U    |
| 2   | 1     | 2119 | A    |
| 2   | 1     | 2132 | U    |
| 2   | 1     | 2134 | A    |
| 2   | 1     | 2145 | C    |
| 2   | 1     | 2147 | A    |
| 2   | 1     | 2166 | U    |
| 2   | 1     | 2172 | U    |
| 2   | 1     | 2173 | A    |
| 2   | 1     | 2181 | U    |
| 2   | 1     | 2189 | U    |
| 2   | 1     | 2198 | A    |
| 2   | 1     | 2204 | G    |

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| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 2   | 1     | 2211 | A    |
| 2   | 1     | 2213 | U    |
| 2   | 1     | 2225 | A    |
| 2   | 1     | 2238 | G    |
| 2   | 1     | 2239 | G    |
| 2   | 1     | 2243 | U    |
| 2   | 1     | 2279 | G    |
| 2   | 1     | 2283 | C    |
| 2   | 1     | 2287 | A    |
| 2   | 1     | 2305 | U    |
| 2   | 1     | 2309 | A    |
| 2   | 1     | 2325 | G    |
| 2   | 1     | 2327 | A    |
| 2   | 1     | 2333 | A    |
| 2   | 1     | 2347 | C    |
| 2   | 1     | 2350 | C    |
| 2   | 1     | 2373 | G    |
| 2   | 1     | 2383 | G    |
| 2   | 1     | 2385 | C    |
| 2   | 1     | 2388 | A    |
| 2   | 1     | 2391 | G    |
| 2   | 1     | 2392 | A    |
| 2   | 1     | 2402 | U    |
| 2   | 1     | 2406 | A    |
| 2   | 1     | 2423 | U    |
| 2   | 1     | 2425 | A    |
| 2   | 1     | 2429 | G    |
| 2   | 1     | 2441 | U    |
| 2   | 1     | 2448 | A    |
| 2   | 1     | 2476 | A    |
| 2   | 1     | 2490 | G    |
| 2   | 1     | 2498 | C    |
| 2   | 1     | 2502 | G    |
| 2   | 1     | 2504 | U    |
| 2   | 1     | 2505 | G    |
| 2   | 1     | 2518 | A    |
| 2   | 1     | 2520 | C    |
| 2   | 1     | 2529 | G    |
| 2   | 1     | 2530 | A    |
| 2   | 1     | 2547 | A    |
| 2   | 1     | 2554 | U    |
| 2   | 1     | 2566 | A    |

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| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 2   | 1     | 2567 | G    |
| 2   | 1     | 2573 | C    |
| 2   | 1     | 2574 | G    |
| 2   | 1     | 2602 | A    |
| 2   | 1     | 2603 | G    |
| 2   | 1     | 2609 | U    |
| 2   | 1     | 2613 | U    |
| 2   | 1     | 2629 | U    |
| 2   | 1     | 2630 | G    |
| 2   | 1     | 2645 | G    |
| 2   | 1     | 2646 | C    |
| 2   | 1     | 2660 | A    |
| 2   | 1     | 2682 | A    |
| 2   | 1     | 2689 | U    |
| 2   | 1     | 2690 | U    |
| 2   | 1     | 2713 | U    |
| 2   | 1     | 2714 | G    |
| 2   | 1     | 2716 | C    |
| 2   | 1     | 2733 | A    |
| 2   | 1     | 2744 | G    |
| 2   | 1     | 2748 | A    |
| 2   | 1     | 2778 | A    |
| 2   | 1     | 2779 | U    |
| 2   | 1     | 2791 | G    |
| 2   | 1     | 2794 | C    |
| 2   | 1     | 2797 | U    |
| 2   | 1     | 2799 | A    |
| 2   | 1     | 2800 | A    |
| 2   | 1     | 2820 | A    |
| 2   | 1     | 2821 | A    |
| 2   | 1     | 2833 | U    |
| 2   | 1     | 2866 | U    |
| 2   | 1     | 2867 | G    |
| 2   | 1     | 2868 | A    |
| 2   | 1     | 2883 | A    |
| 2   | 1     | 2884 | U    |
| 2   | 1     | 2893 | A    |
| 3   | 2     | 2    | G    |
| 3   | 2     | 4    | C    |
| 3   | 2     | 15   | A    |
| 3   | 2     | 24   | G    |
| 3   | 2     | 35   | C    |

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| Mol | Chain | Res   | Type |
|-----|-------|-------|------|
| 3   | 2     | 41    | G    |
| 3   | 2     | 44    | G    |
| 3   | 2     | 53    | A    |
| 3   | 2     | 84    | G    |
| 3   | 2     | 89    | U    |
| 3   | 2     | 90    | C    |
| 3   | 2     | 109   | A    |
| 5   | 6     | 8     | U    |
| 5   | 6     | 9     | G    |
| 5   | 6     | 10    | G    |
| 5   | 6     | 14    | A    |
| 5   | 6     | 16    | C    |
| 5   | 6     | 17(A) | U    |
| 5   | 6     | 19    | G    |
| 5   | 6     | 20    | U    |
| 5   | 6     | 21    | A    |
| 5   | 6     | 22    | G    |
| 5   | 6     | 28    | C    |
| 5   | 6     | 41    | C    |
| 5   | 6     | 45    | G    |
| 5   | 6     | 46    | G    |
| 5   | 6     | 47    | U    |
| 5   | 6     | 58    | A    |
| 5   | 6     | 61    | C    |
| 37  | 4     | 9     | G    |
| 37  | 4     | 16    | A    |
| 38  | 5     | 3     | G    |
| 38  | 5     | 4     | C    |
| 38  | 5     | 5     | G    |
| 38  | 5     | 6     | A    |
| 38  | 5     | 8     | U    |
| 38  | 5     | 16    | C    |
| 38  | 5     | 17(A) | U    |
| 38  | 5     | 18    | G    |
| 38  | 5     | 19    | G    |
| 38  | 5     | 20    | U    |
| 38  | 5     | 22    | G    |
| 38  | 5     | 46    | G    |
| 38  | 5     | 48    | C    |
| 38  | 5     | 49    | G    |
| 38  | 5     | 61    | C    |
| 38  | 5     | 73    | A    |

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| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 38  | 5     | 76  | A    |

All (12) RNA pucker outliers are listed below:

| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 1   | 3     | 70   | U    |
| 1   | 3     | 1257 | A    |
| 2   | 1     | 490  | C    |
| 2   | 1     | 784  | G    |
| 2   | 1     | 896  | A    |
| 2   | 1     | 1130 | U    |
| 2   | 1     | 1730 | C    |
| 2   | 1     | 1930 | G    |
| 2   | 1     | 2326 | C    |
| 2   | 1     | 2391 | G    |
| 2   | 1     | 2519 | U    |
| 3   | 2     | 88   | C    |

## 5.4 Non-standard residues in protein, DNA, RNA chains [i](#)

There are no non-standard protein/DNA/RNA residues in this entry.

## 5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

## 5.6 Ligand geometry [i](#)

1 ligand is modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with  $|Z| > 2$  is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

| Mol | Type | Chain | Res | Link | Bond lengths |      |             | Bond angles |      |             |
|-----|------|-------|-----|------|--------------|------|-------------|-------------|------|-------------|
|     |      |       |     |      | Counts       | RMSZ | $\# Z  > 2$ | Counts      | RMSZ | $\# Z  > 2$ |
| 59  | GDP  | 8     | 801 | -    | 29,30,30     | 1.17 | 3 (10%)     | 45,47,47    | 1.82 | 7 (15%)     |

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

| Mol | Type | Chain | Res | Link | Chirals | Torsions   | Rings   |
|-----|------|-------|-----|------|---------|------------|---------|
| 59  | GDP  | 8     | 801 | -    | -       | 4/16/32/32 | 0/3/3/3 |

All (3) bond length outliers are listed below:

| Mol | Chain | Res | Type | Atoms | Z     | Observed(Å) | Ideal(Å) |
|-----|-------|-----|------|-------|-------|-------------|----------|
| 59  | 8     | 801 | GDP  | C5-C4 | 2.91  | 1.46        | 1.38     |
| 59  | 8     | 801 | GDP  | C6-N1 | -2.78 | 1.33        | 1.38     |
| 59  | 8     | 801 | GDP  | C5-N7 | -2.13 | 1.34        | 1.39     |

All (7) bond angle outliers are listed below:

| Mol | Chain | Res | Type | Atoms       | Z     | Observed(°) | Ideal(°) |
|-----|-------|-----|------|-------------|-------|-------------|----------|
| 59  | 8     | 801 | GDP  | C5-C4-N3    | -6.42 | 118.17      | 128.39   |
| 59  | 8     | 801 | GDP  | C2-N3-C4    | 5.35  | 121.51      | 112.30   |
| 59  | 8     | 801 | GDP  | N9-C4-N3    | 4.62  | 135.18      | 125.95   |
| 59  | 8     | 801 | GDP  | C6-C5-N7    | 3.09  | 135.91      | 130.29   |
| 59  | 8     | 801 | GDP  | C4-C5-N7    | -2.53 | 106.67      | 110.67   |
| 59  | 8     | 801 | GDP  | C3'-C2'-C1' | 2.17  | 105.57      | 101.46   |
| 59  | 8     | 801 | GDP  | O6-C6-C5    | -2.09 | 121.01      | 126.53   |

There are no chirality outliers.

All (4) torsion outliers are listed below:

| Mol | Chain | Res | Type | Atoms           |
|-----|-------|-----|------|-----------------|
| 59  | 8     | 801 | GDP  | C5'-O5'-PA-O1A  |
| 59  | 8     | 801 | GDP  | C5'-O5'-PA-O3A  |
| 59  | 8     | 801 | GDP  | C5'-O5'-PA-O2A  |
| 59  | 8     | 801 | GDP  | O4'-C4'-C5'-O5' |

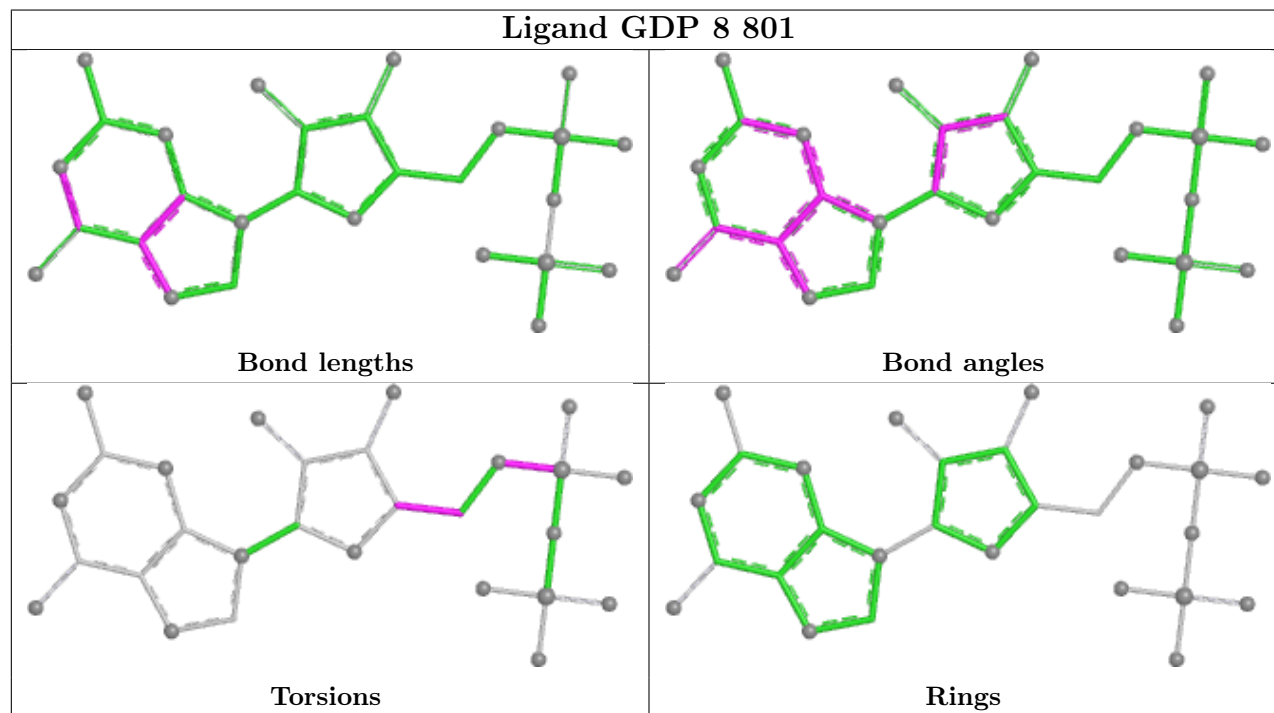
There are no ring outliers.

1 monomer is involved in 2 short contacts:

| Mol | Chain | Res | Type | Clashes | Symm-Clashes |
|-----|-------|-----|------|---------|--------------|
| 59  | 8     | 801 | GDP  | 2       | 0            |

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In

addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.



## 5.7 Other polymers [i](#)

There are no such residues in this entry.

## 5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

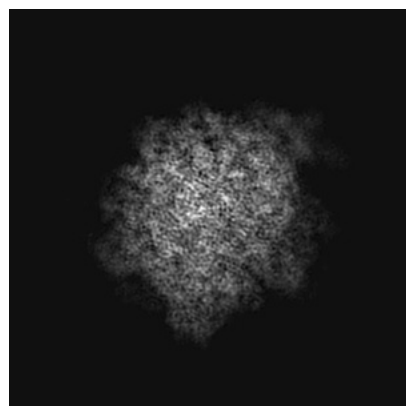
## 6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-25407. These allow visual inspection of the internal detail of the map and identification of artifacts.

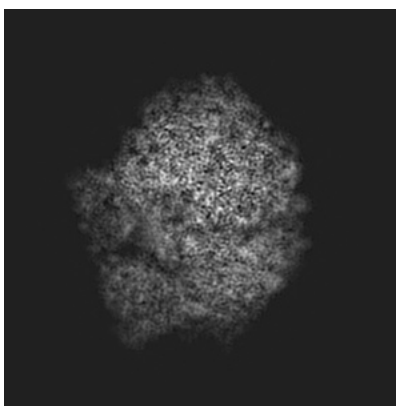
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

### 6.1 Orthogonal projections [i](#)

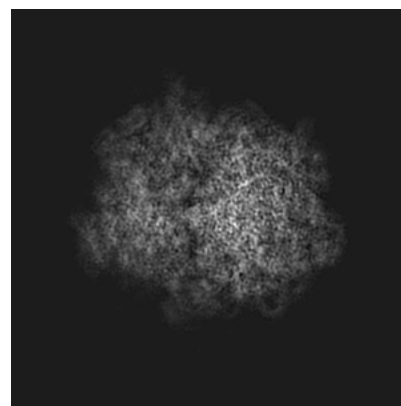
#### 6.1.1 Primary map



X

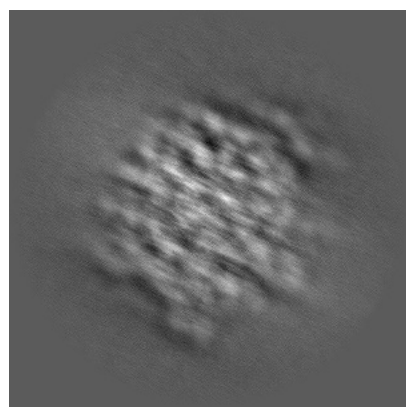


Y

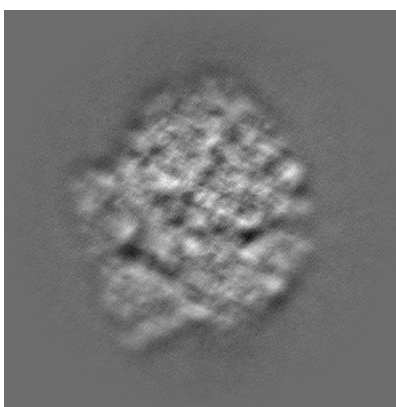


Z

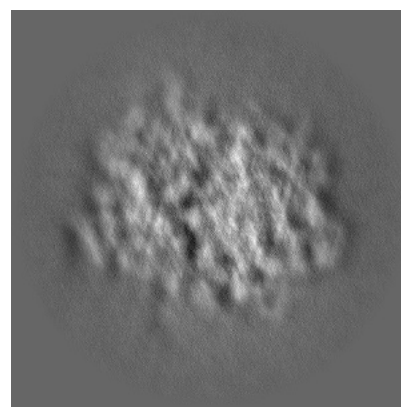
#### 6.1.2 Raw map



X



Y

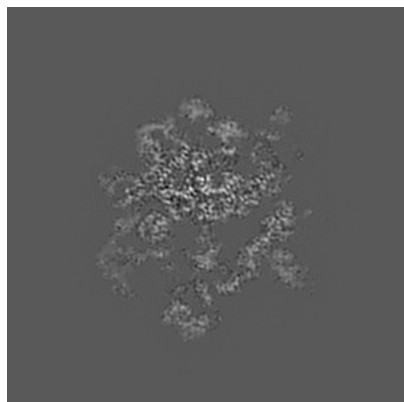


Z

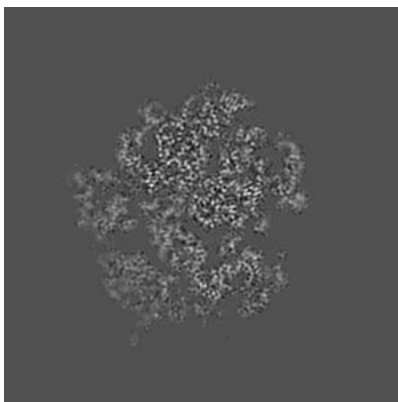
The images above show the map projected in three orthogonal directions.

## 6.2 Central slices [i](#)

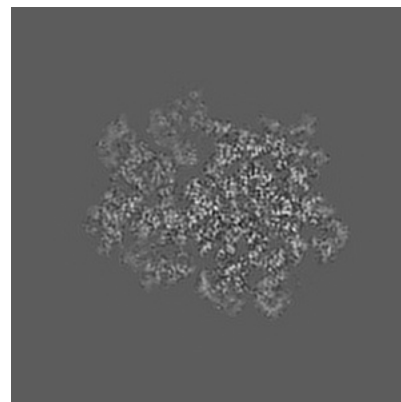
### 6.2.1 Primary map



X Index: 224

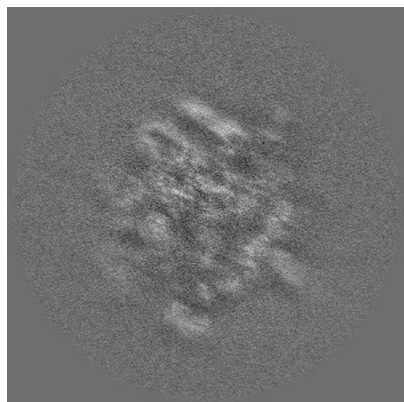


Y Index: 224

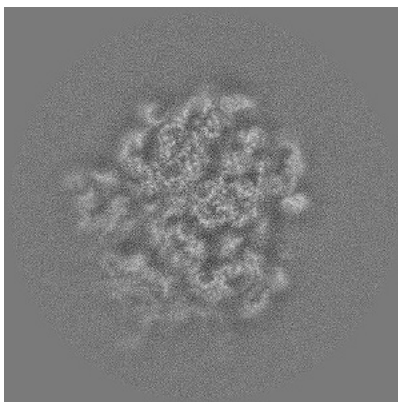


Z Index: 224

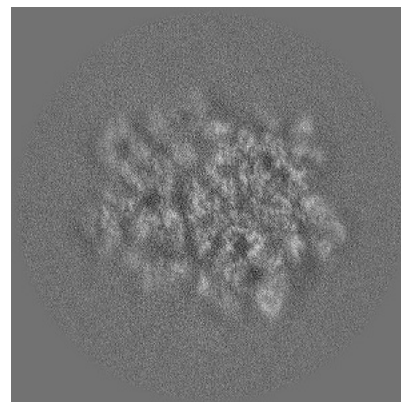
### 6.2.2 Raw map



X Index: 224



Y Index: 224



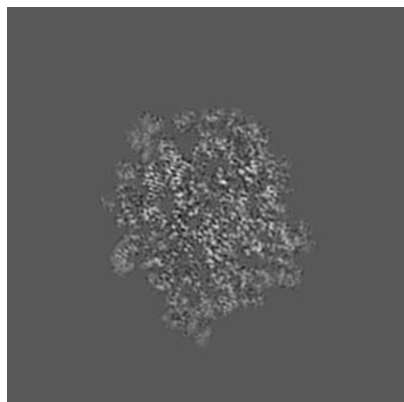
Z Index: 224

The images above show central slices of the map in three orthogonal directions.

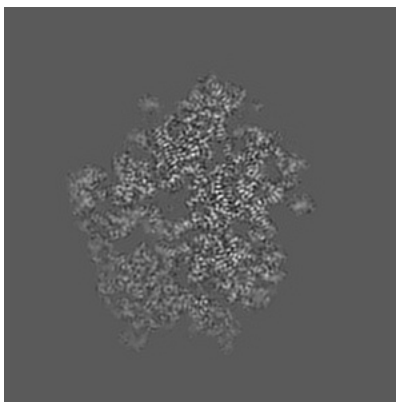


## 6.3 Largest variance slices [i](#)

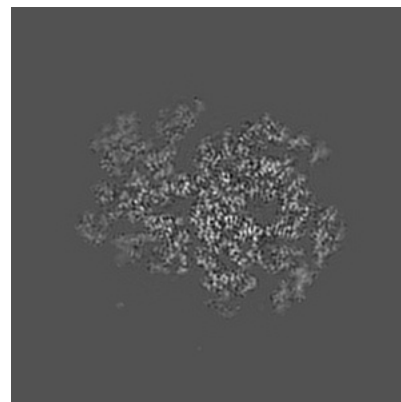
### 6.3.1 Primary map



X Index: 257

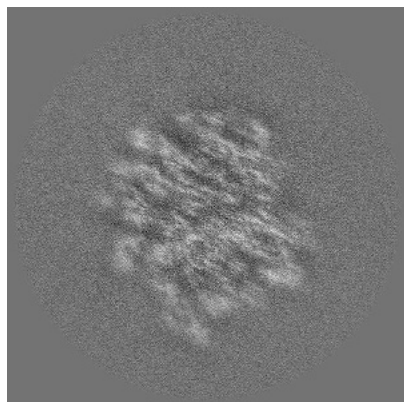


Y Index: 210

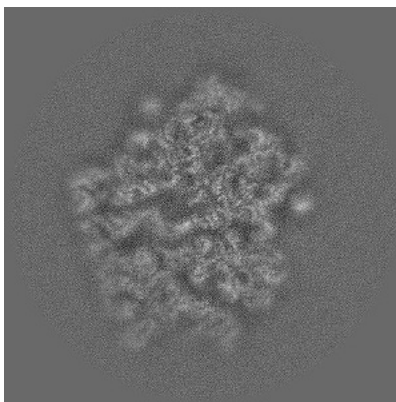


Z Index: 238

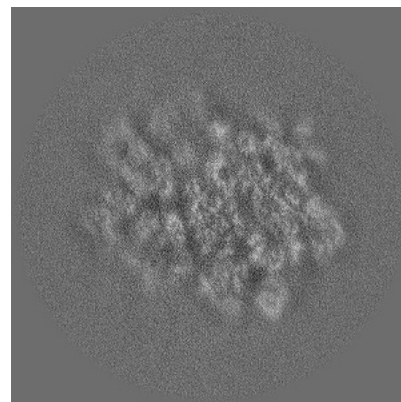
### 6.3.2 Raw map



X Index: 252



Y Index: 210



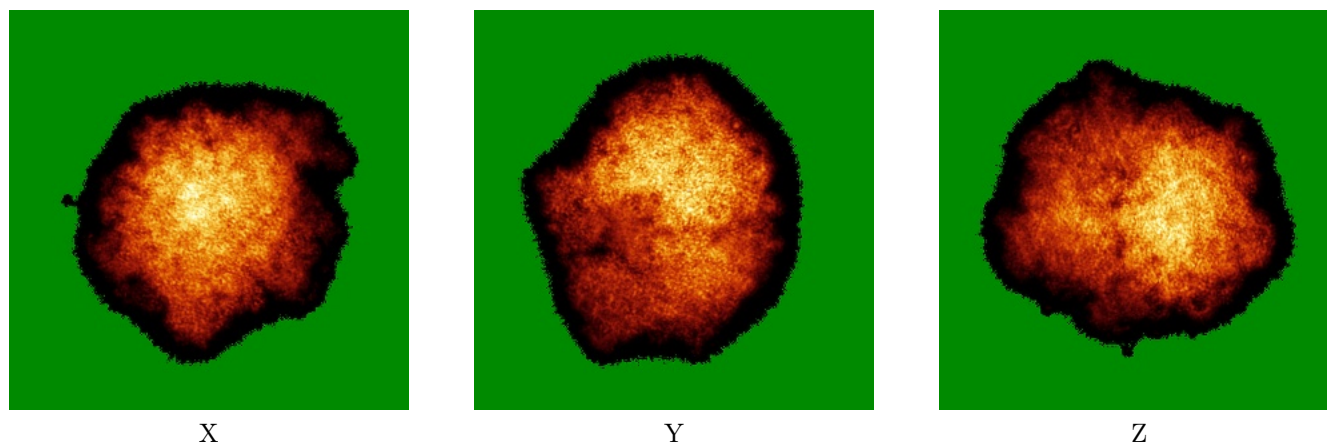
Z Index: 227

The images above show the largest variance slices of the map in three orthogonal directions.

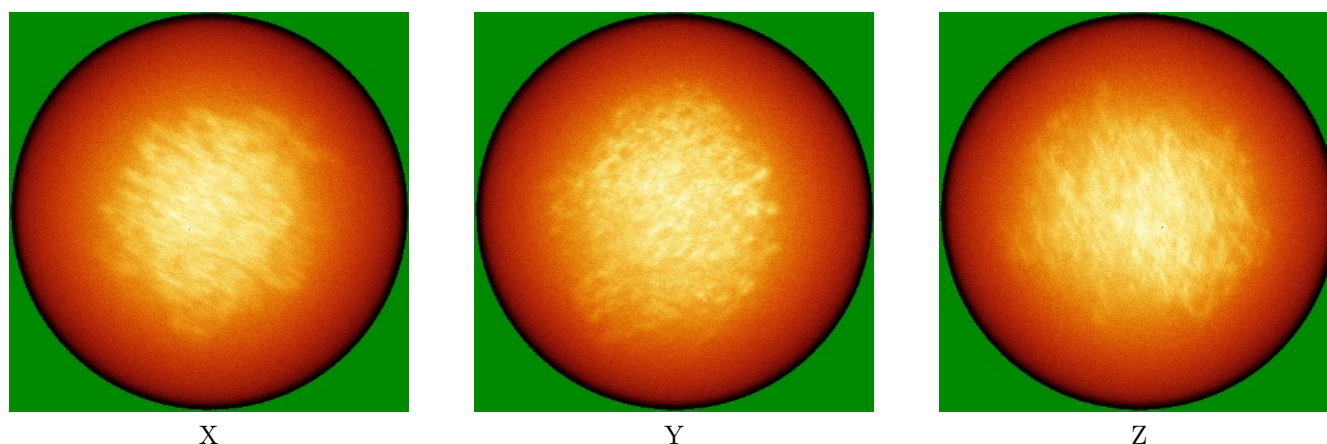


## 6.4 Orthogonal standard-deviation projections (False-color) [i](#)

### 6.4.1 Primary map



### 6.4.2 Raw map



The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

## 6.5 Orthogonal surface views [i](#)

This section was not generated.

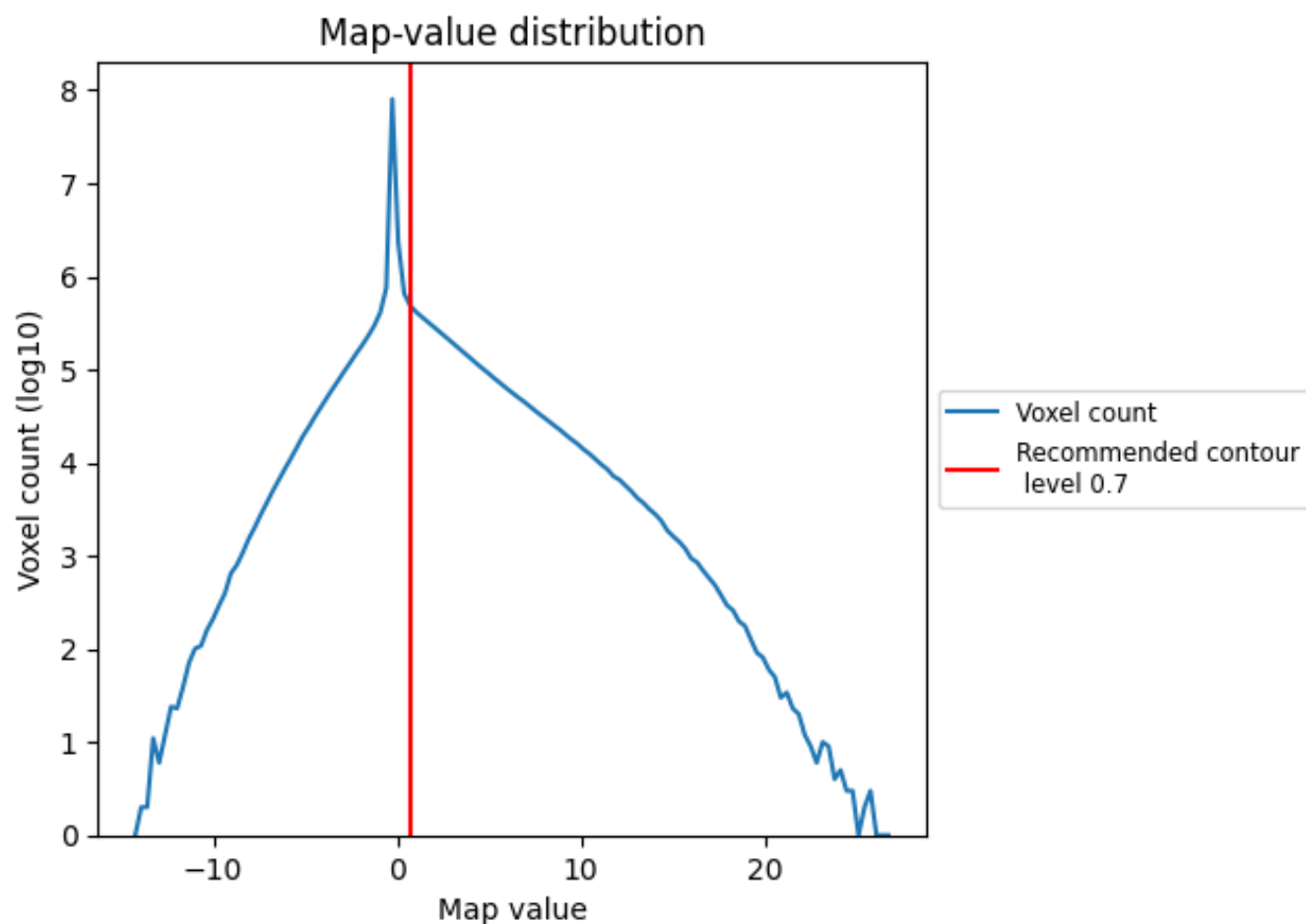
## 6.6 Mask visualisation [i](#)

This section was not generated. No masks/segmentation were deposited.

## 7 Map analysis [i](#)

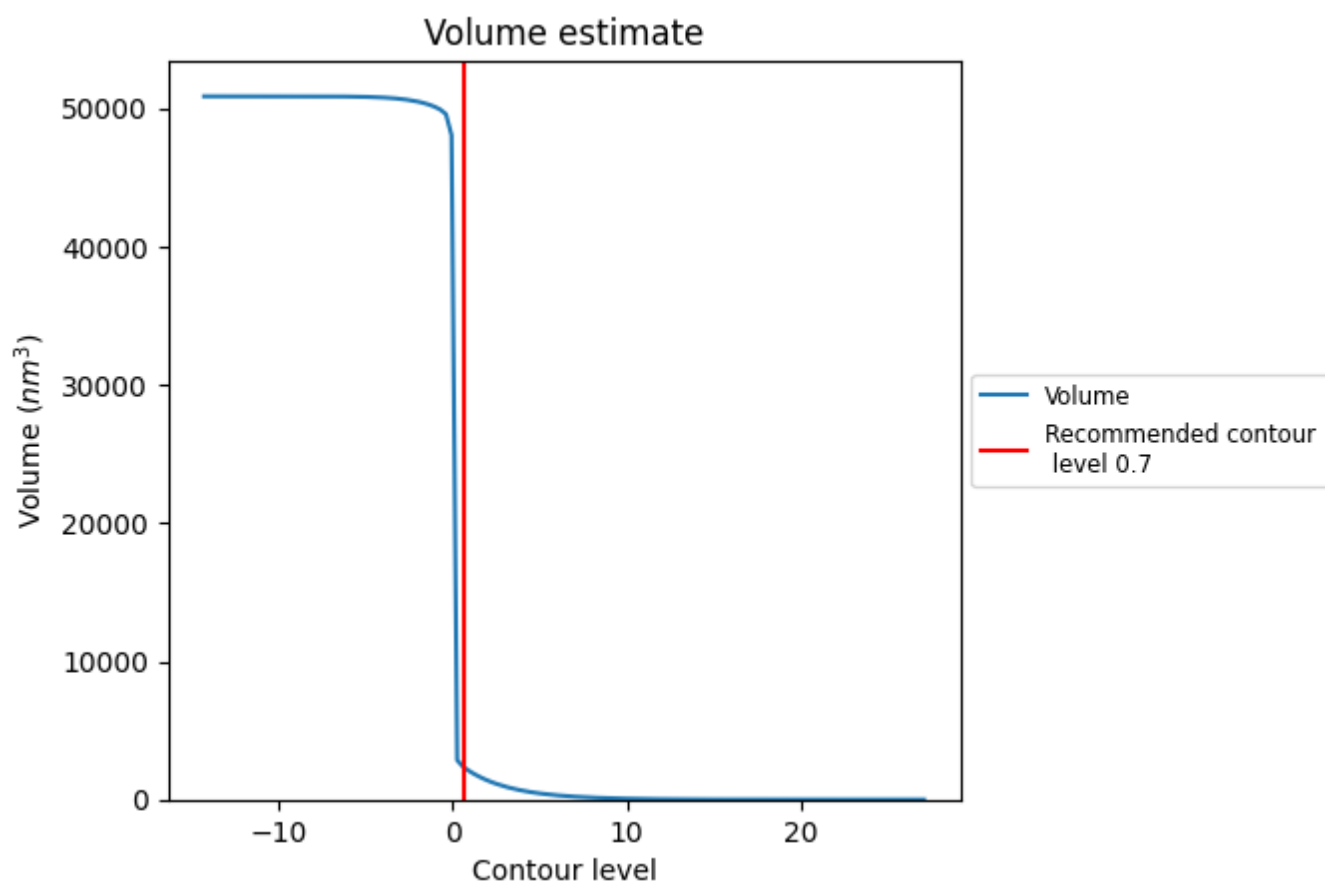
This section contains the results of statistical analysis of the map.

### 7.1 Map-value distribution [i](#)



The map-value distribution is plotted in 128 intervals along the x-axis. The y-axis is logarithmic. A spike in this graph at zero usually indicates that the volume has been masked.

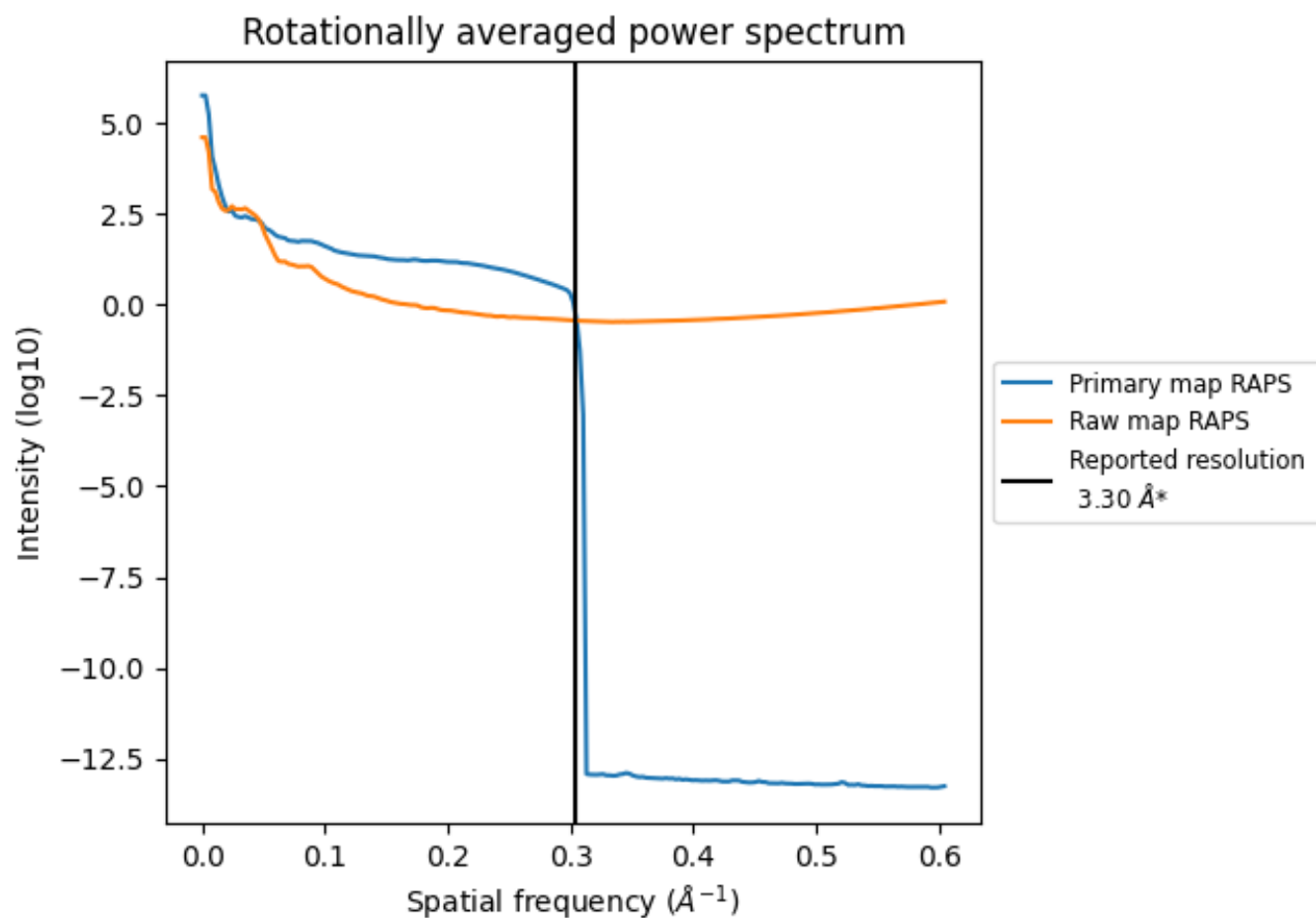
## 7.2 Volume estimate [i](#)



The volume at the recommended contour level is 2300  $\text{nm}^3$ ; this corresponds to an approximate mass of 2078 kDa.

The volume estimate graph shows how the enclosed volume varies with the contour level. The recommended contour level is shown as a vertical line and the intersection between the line and the curve gives the volume of the enclosed surface at the given level.

### 7.3 Rotationally averaged power spectrum ⓘ

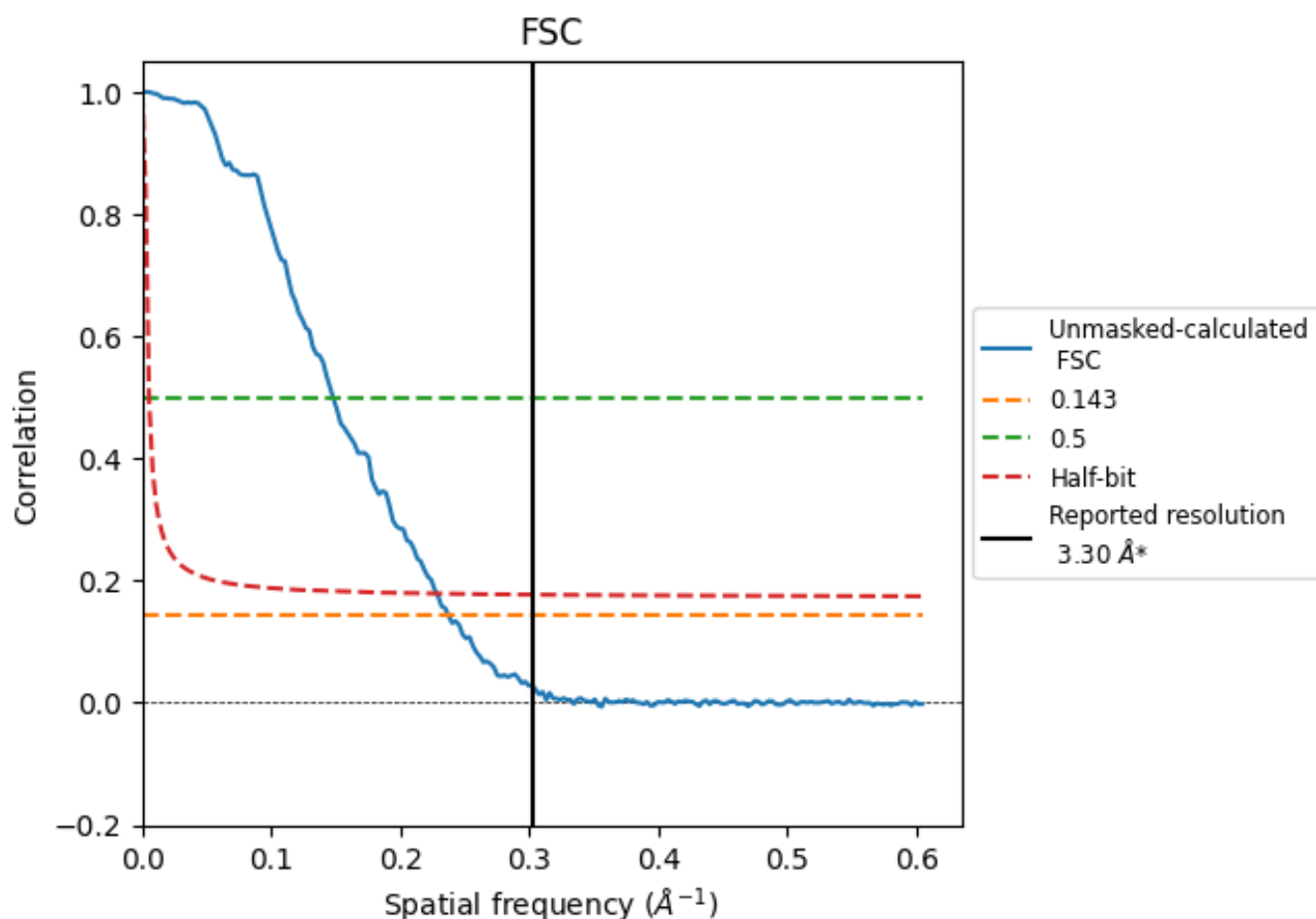


\*Reported resolution corresponds to spatial frequency of 0.303 Å<sup>-1</sup>

## 8 Fourier-Shell correlation [i](#)

Fourier-Shell Correlation (FSC) is the most commonly used method to estimate the resolution of single-particle and subtomogram-averaged maps. The shape of the curve depends on the imposed symmetry, mask and whether or not the two 3D reconstructions used were processed from a common reference. The reported resolution is shown as a black line. A curve is displayed for the half-bit criterion in addition to lines showing the 0.143 gold standard cut-off and 0.5 cut-off.

### 8.1 FSC [i](#)



\*Reported resolution corresponds to spatial frequency of 0.303  $\text{\AA}^{-1}$

## 8.2 Resolution estimates [i](#)

| Resolution estimate (Å)   | Estimation criterion (FSC cut-off) |      |          |
|---------------------------|------------------------------------|------|----------|
|                           | 0.143                              | 0.5  | Half-bit |
| Reported by author        | 3.30                               | -    | -        |
| Author-provided FSC curve | -                                  | -    | -        |
| Unmasked-calculated*      | 4.21                               | 6.76 | 4.38     |

\*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 4.21 differs from the reported value 3.3 by more than 10 %

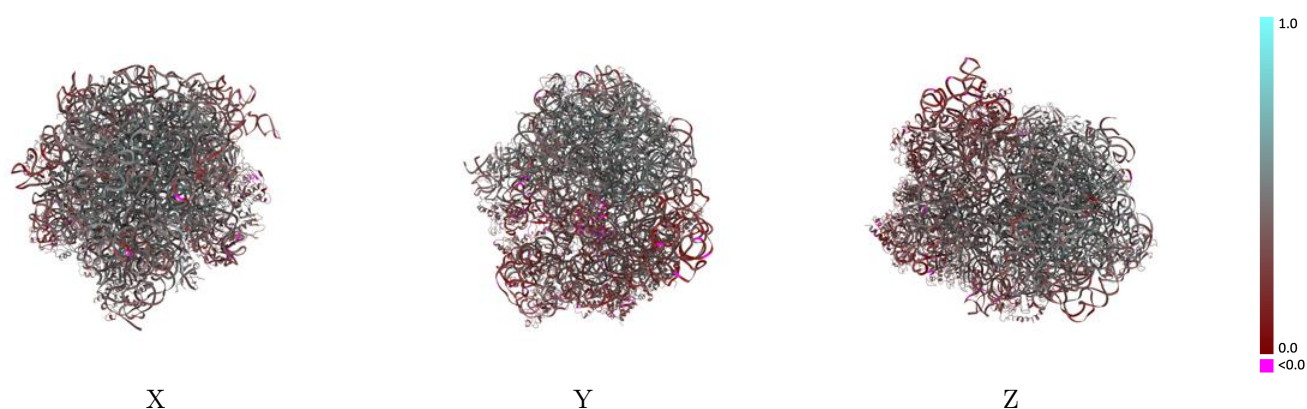
## 9 Map-model fit [i](#)

This section contains information regarding the fit between EMDB map EMD-25407 and PDB model 7SSD. Per-residue inclusion information can be found in section 3 on page 16.

### 9.1 Map-model overlay [i](#)

This section was not generated.

### 9.2 Q-score mapped to coordinate model [i](#)

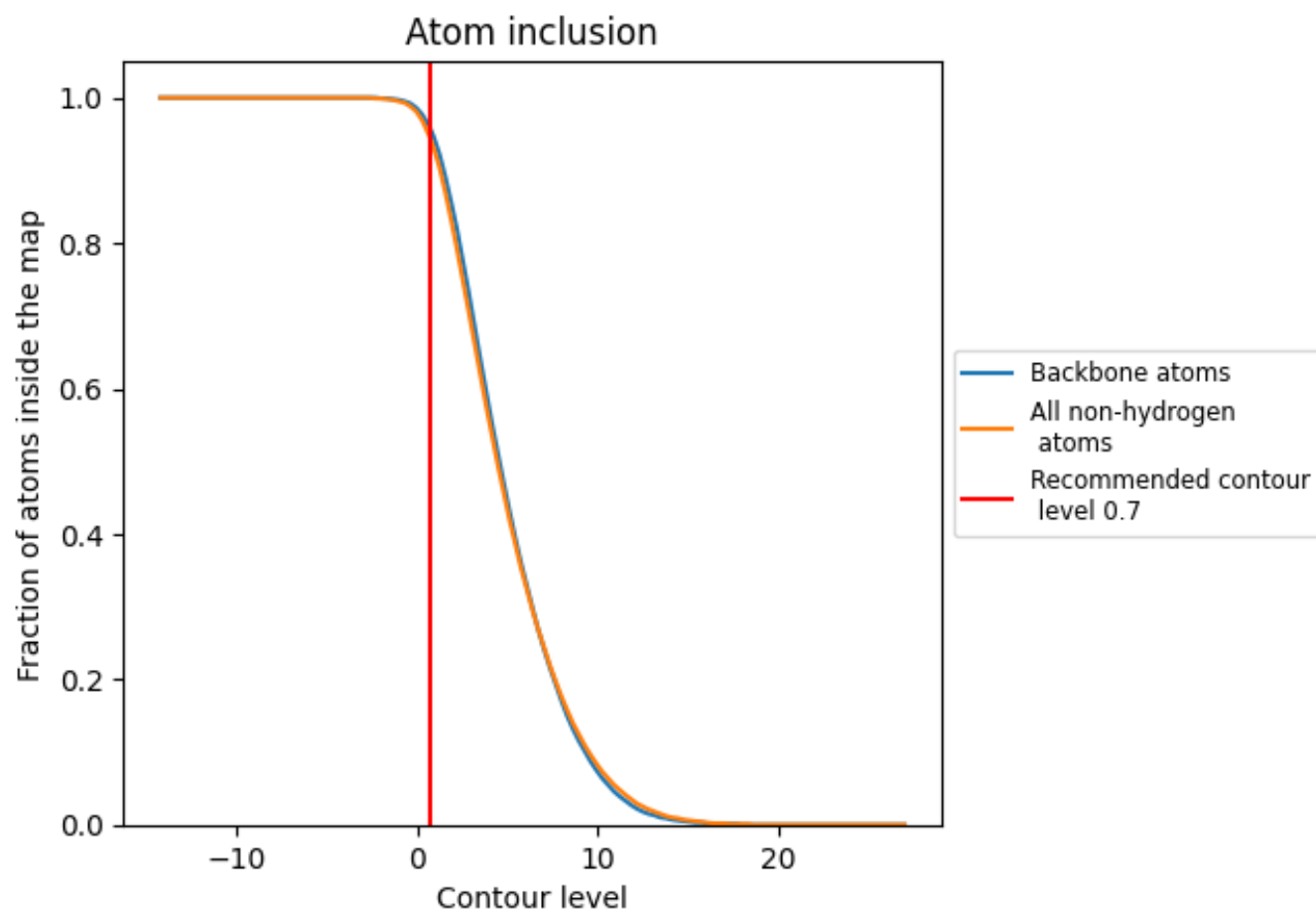


The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions at which atoms can be resolved. Low Q-score values may therefore be expected for many entries.

### 9.3 Atom inclusion mapped to coordinate model [i](#)

This section was not generated.

## 9.4 Atom inclusion [i](#)









































































At the recommended contour level, 96% of all backbone atoms, 95% of all non-hydrogen atoms, are inside the map.



## 9.5 Map-model fit summary

















































The table lists the average atom inclusion at the recommended contour level (0.7) and Q-score for the entire model and for each chain.

| Chain | Atom inclusion                                                                             | Q-score                                                                                    |
|-------|--------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|
| All   |  0.9460   |  0.3850   |
| 1     |  0.9740   |  0.4280   |
| 2     |  0.9770   |  0.3950   |
| 3     |  0.9420   |  0.3230   |
| 4     |  0.8170   |  0.1920   |
| 5     |  0.9450   |  0.3160   |
| 6     |  0.9450   |  0.3080   |
| 8     |  0.8230   |  0.2730   |
| A     |  0.9260   |  0.3310   |
| B     |  0.9740   |  0.4740   |
| C     |  0.8860   |  0.3930   |
| D     |  0.9580   |  0.5160   |
| E     |  0.9720   |  0.5020   |
| F     |  0.9450   |  0.4570   |
| G     |  0.8510  |  0.2790  |
| H     |  0.8920 |  0.3170 |
| I     |  0.9040 |  0.2880 |
| J     |  0.9370 |  0.3710 |
| K     |  0.9490 |  0.3490 |
| L     |  0.8520 |  0.2810 |
| M     |  0.9500 |  0.4130 |
| N     |  0.8800 |  0.3240 |
| O     |  0.8400 |  0.2630 |
| P     |  0.9490 |  0.3980 |
| Q     |  0.9030 |  0.3800 |
| R     |  0.8620 |  0.2820 |
| S     |  0.9100 |  0.3160 |
| T     |  0.9540 |  0.3960 |
| U     |  0.9250 |  0.3660 |
| V     |  0.9380 |  0.3650 |
| W     |  0.9610 |  0.4030 |
| X     |  0.8670 |  0.2880 |
| Y     |  0.9420 |  0.3570 |
| Z     |  0.9130 |  0.3540 |
| a     |  0.8540 |  0.2550 |



*Continued on next page...*

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| Chain | Atom inclusion                                                                             | Q-score                                                                                    |
|-------|--------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|
| b     |  0.9670   |  0.4920   |
| c     |  0.9620   |  0.4710   |
| d     |  0.9590   |  0.4490   |
| e     |  0.9190   |  0.3470   |
| f     |  0.9540   |  0.4090   |
| g     |  0.7910   |  0.2970   |
| i     |  0.7430   |  0.2190   |
| j     |  0.9650   |  0.4840   |
| k     |  0.9640   |  0.4720   |
| l     |  0.9710   |  0.4640   |
| m     |  0.9590   |  0.4640   |
| n     |  0.9580   |  0.4670   |
| o     |  0.9570   |  0.4220   |
| p     |  0.9610   |  0.4690   |
| q     |  0.9690   |  0.4820   |
| r     |  0.9610   |  0.4440   |
| s     |  0.9810   |  0.4840   |
| t     |  0.9650  |  0.4670  |
| u     |  0.9580 |  0.4140 |
| v     |  0.9620 |  0.4350 |
| w     |  0.9590 |  0.4860 |
| x     |  0.9670 |  0.4770 |
| y     |  0.9380 |  0.4040 |
| z     |  0.9680 |  0.4630 |