



# Full wwPDB EM Validation Report ⓘ

Dec 28, 2024 – 02:00 PM EST

PDB ID : 7BL6  
EMDB ID : EMD-12219  
Title : 50S-ObgE-GMPPNP particle  
Authors : Hilal, T.; Nikolay, R.; Schmidt, S.; Spahn, C.M.T.  
Deposited on : 2021-01-18  
Resolution : 4.00 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:

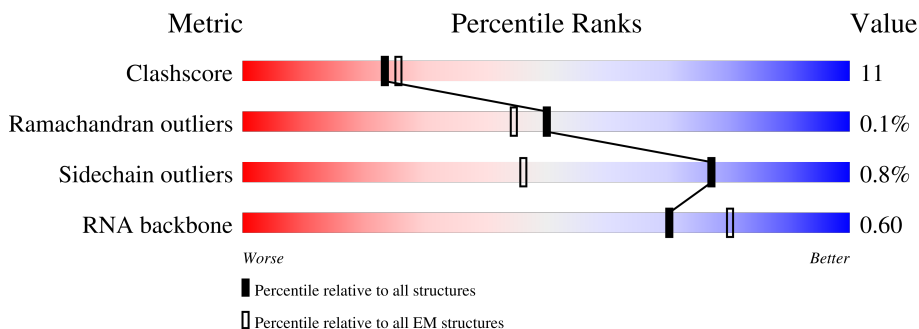
EMDB validation analysis : 0.0.1.dev113  
Mogul : 2022.3.0, CSD as543be (2022)  
MolProbity : 4.02b-467  
buster-report : 1.1.7 (2018)  
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)  
MapQ : 1.9.13  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.40

# 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 4.00 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)
Clashscore	210492	15764
Ramachandran outliers	207382	16835
Sidechain outliers	206894	16415
RNA backbone	6643	2191

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	g	38	
2	C	273	
3	D	209	
4	E	201	
5	F	179	
6	G	177	
7	J	142	

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Mol	Chain	Length	Quality of chain
8	L	144	80% 20%
9	N	120	78% 22%
10	O	117	72% 27%
11	Q	118	81% 18%
12	R	103	76% 24%
13	S	110	71% 29%
14	T	100	64% 29% 7%
15	U	104	82% 16%
16	V	94	74% 24%
17	W	85	72% 18% 11%
18	X	78	71% 28%
19	Y	63	5% 62% 38%
20	Z	59	76% 22%
21	0	57	70% 28%
22	1	55	65% 24% 9%
23	2	46	70% 28%
24	K	123	70% 29%
25	P	115	81% 17%
26	M	136	76% 23%
27	H	149	40% 72% 26%
28	d	70	17% 66% 33%
29	A	2904	48% 47% 6%
30	B	119	48% 49%
31	9	390	7% 71% 16% 13%
32	3	65	71% 26%

## 2 Entry composition [i](#)

There are 36 unique types of molecules in this entry. The entry contains 92769 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 protein called 50S ribosomal protein L36.

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

- Molecule 2 is a protein called 50S ribosomal protein L2.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	C	271	2082	1288	423	364	7	0	0

- Molecule 3 is a protein called 50S ribosomal protein L3.

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

- Molecule 4 is a protein called 50S ribosomal protein L4.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	E	193	1483	932	266	280	5	0	0

- Molecule 5 is a protein called 50S ribosomal protein L5.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	F	177	1410	899	249	256	6	0	0

- Molecule 6 is a protein called 50S ribosomal protein L6.

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

- Molecule 7 is a protein called 50S ribosomal protein L13.

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

- Molecule 8 is a protein called 50S ribosomal protein L15.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
8	L	144	1053	654	207	190	2	0	0

- Molecule 9 is a protein called 50S ribosomal protein L17.

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

- Molecule 10 is a protein called 50S ribosomal protein L18.

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

- Molecule 11 is a protein called 50S ribosomal protein L20.

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

- Molecule 12 is a protein called 50S ribosomal protein L21.

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

- Molecule 13 is a protein called 50S ribosomal protein L22.

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

- Molecule 14 is a protein called 50S ribosomal protein L23.

Mol	Chain	Residues	Atoms					AltConf	Trace
14	T	93	Total	C	N	O	S	0	0
			738	466	139	131	2		

- Molecule 15 is a protein called 50S ribosomal protein L24.

Mol	Chain	Residues	Atoms					AltConf	Trace
15	U	102	Total	C	N	O	S	0	0
			779	492	146	141			

- Molecule 16 is a protein called 50S ribosomal protein L25.

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

- Molecule 17 is a protein called 50S ribosomal protein L27.

Mol	Chain	Residues	Atoms					AltConf	Trace
17	W	76	Total	C	N	O	S	0	0
			577	357	117	102	1		

- Molecule 18 is a protein called 50S ribosomal protein L28.

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

- Molecule 19 is a protein called 50S ribosomal protein L29.

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

- Molecule 20 is a protein called 50S ribosomal protein L30.

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

- Molecule 21 is a protein called 50S ribosomal protein L32.

Mol	Chain	Residues	Atoms					AltConf	Trace
21	0	56	Total	C	N	O	S	0	0
			444	269	94	80	1		

- Molecule 22 is a protein called 50S ribosomal protein L33.

Mol	Chain	Residues	Atoms					AltConf	Trace
22	1	50	Total	C	N	O	S	0	0
			409	263	75	71			

- Molecule 23 is a protein called 50S ribosomal protein L34.

Mol	Chain	Residues	Atoms					AltConf	Trace
23	2	46	Total	C	N	O	S	0	0
			377	228	90	57	2		

- Molecule 24 is a protein called 50S ribosomal protein L14.

Mol	Chain	Residues	Atoms					AltConf	Trace
24	K	122	Total	C	N	O	S	0	0
			938	587	180	165	6		

- Molecule 25 is a protein called 50S ribosomal protein L19.

Mol	Chain	Residues	Atoms					AltConf	Trace
25	P	113	Total	C	N	O	S	0	0
			911	571	178	161	1		

- Molecule 26 is a protein called 50S ribosomal protein L16.

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

- Molecule 27 is a protein called 50S ribosomal protein L9.

Mol	Chain	Residues	Atoms					AltConf	Trace
27	H	149	Total	C	N	O	S	0	0
			1110	699	197	213	1		

- Molecule 28 is a protein called 50S ribosomal protein L31.

Mol	Chain	Residues	Atoms					AltConf	Trace
28	d	47	Total	C	N	O	S	0	0
			364	227	64	67	6		

- Molecule 29 is a RNA chain called 23S ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
29	A	2897	Total	C	N	O	P	0	0
			62195	27745	11446	20107	2897		

- Molecule 30 is a RNA chain called 5S ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
30	B	119	Total	C	N	O	P	0	0
			2548	1135	466	829	118		

- Molecule 31 is a protein called GTPase ObgE/CgtA.

Mol	Chain	Residues	Atoms					AltConf	Trace
31	9	338	Total	C	N	O	S	0	0
			2582	1626	453	490	13		

- Molecule 32 is a protein called 50S ribosomal protein L35.

Mol	Chain	Residues	Atoms					AltConf	Trace
32	3	64	Total	C	N	O	S	0	0
			504	323	105	74	2		

- Molecule 33 is ZINC ION (three-letter code: ZN) (formula: Zn).

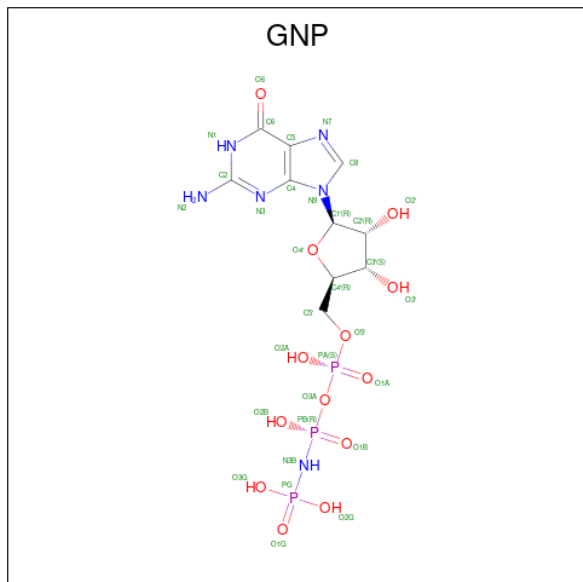
Mol	Chain	Residues	Atoms		AltConf
33	g	1	Total	Zn	0
			1	1	
33	d	1	Total	Zn	0
			1	1	

- Molecule 34 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		AltConf
34	A	1	Total	Mg	0
			1	1	
34	9	1	Total	Mg	0
			1	1	



- Molecule 35 is PHOSPHOAMINOPHOSPHONIC ACID-GUANYLATE ESTER (three-letter code: GNP) (formula:  $C_{10}H_{17}N_6O_{13}P_3$ ).



Mol	Chain	Residues	Atoms					AltConf
			Total	C	N	O	P	
35	9	1	Total	C	N	O	P	0
			32	10	6	13	3	

- Molecule 36 is water.

Mol	Chain	Residues	Atoms		AltConf
36	C	1	Total	O	0
			1	1	
36	F	1	Total	O	0
			1	1	
36	N	3	Total	O	0
			3	3	
36	S	1	Total	O	0
			1	1	
36	A	20	Total	O	0
			20	20	
36	B	1	Total	O	0
			1	1	

### 3 Residue-property plots [i](#)

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion in map density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red diamond above a residue indicates a poor fit to the EM map for this residue (all-atom inclusion < 40%). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

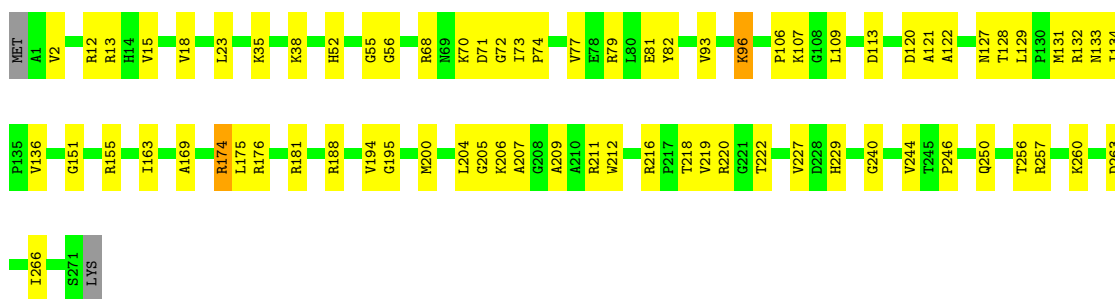
- Molecule 1: 50S ribosomal protein L36

Chain g:  100%

There are no outlier residues recorded for this chain.

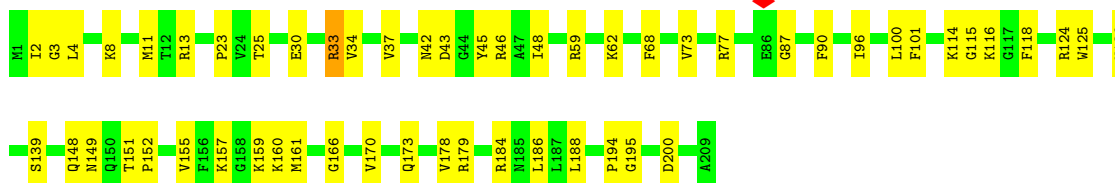
- Molecule 2: 50S ribosomal protein L2

Chain C:  73% 26%



- Molecule 3: 50S ribosomal protein L3

Chain D:  74% 26%



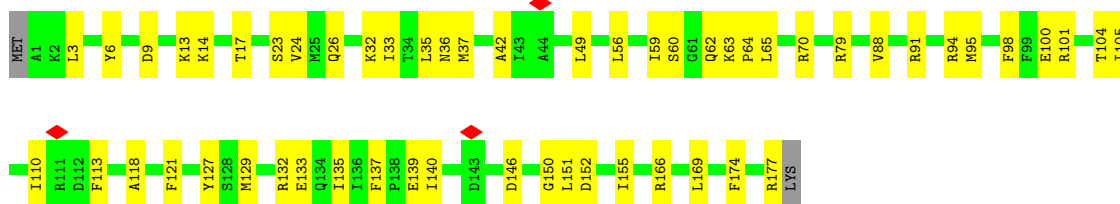
- Molecule 4: 50S ribosomal protein L4

Chain E:  76% 20%

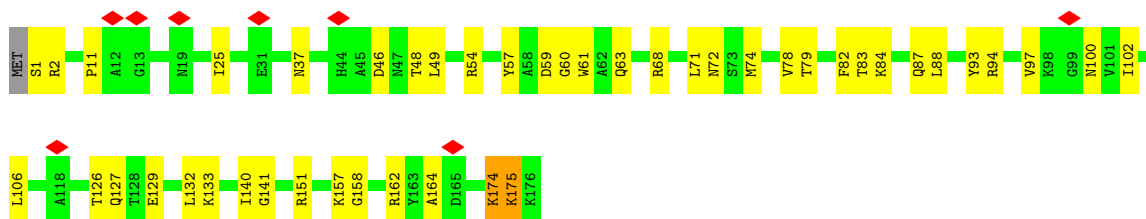
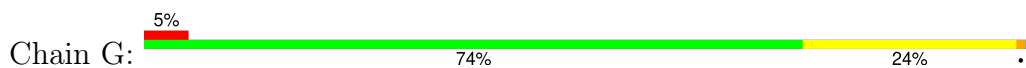




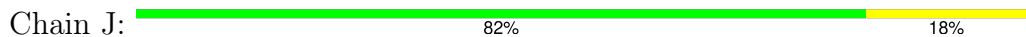
- Molecule 5: 50S ribosomal protein L5



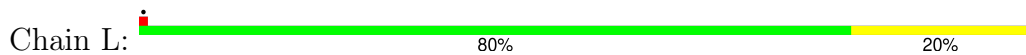
- Molecule 6: 50S ribosomal protein L6



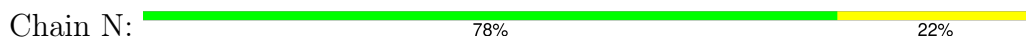
- Molecule 7: 50S ribosomal protein L13



- Molecule 8: 50S ribosomal protein L15



- Molecule 9: 50S ribosomal protein L17

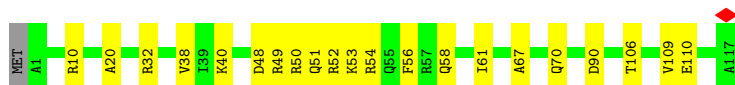
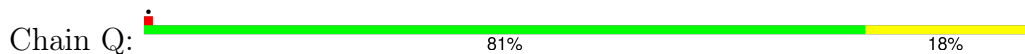


- Molecule 10: 50S ribosomal protein L18

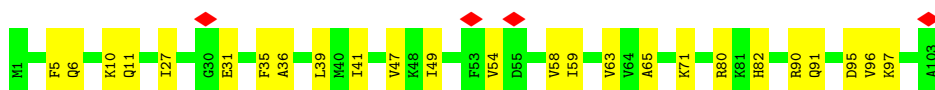
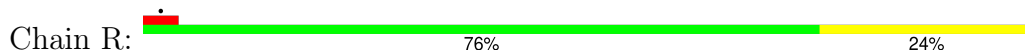




- Molecule 11: 50S ribosomal protein L20



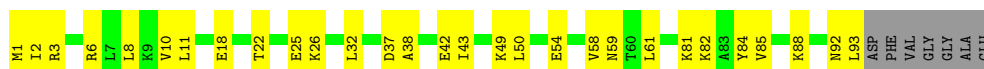
- Molecule 12: 50S ribosomal protein L21



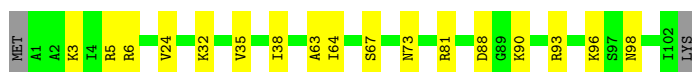
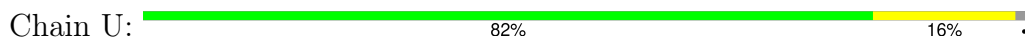
- Molecule 13: 50S ribosomal protein L22



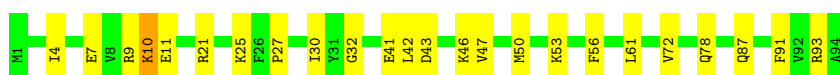
- Molecule 14: 50S ribosomal protein L23



- Molecule 15: 50S ribosomal protein L24

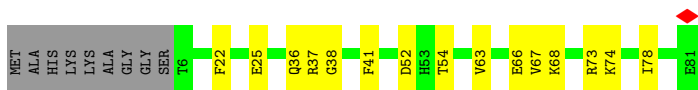


- Molecule 16: 50S ribosomal protein L25

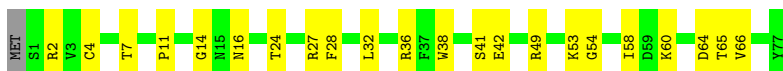


- Molecule 17: 50S ribosomal protein L27

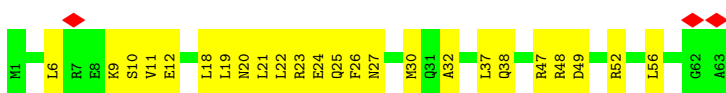




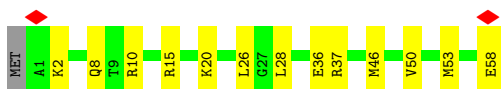
• Molecule 18: 50S ribosomal protein L28



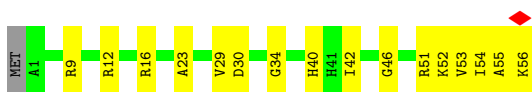
• Molecule 19: 50S ribosomal protein L29



• Molecule 20: 50S ribosomal protein L30



• Molecule 21: 50S ribosomal protein L32



• Molecule 22: 50S ribosomal protein L33



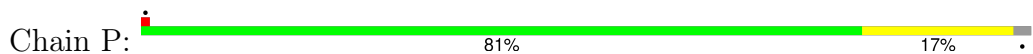
• Molecule 23: 50S ribosomal protein L34



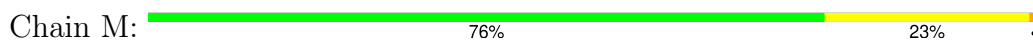
• Molecule 24: 50S ribosomal protein L14



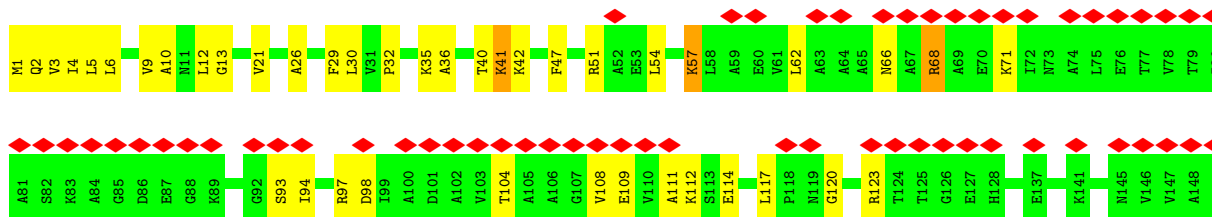
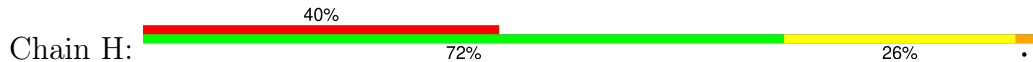
• Molecule 25: 50S ribosomal protein L19



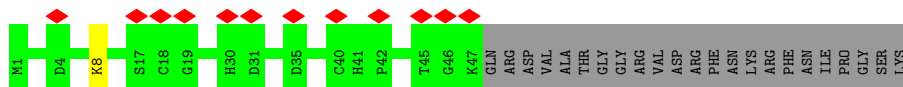
• Molecule 26: 50S ribosomal protein L16



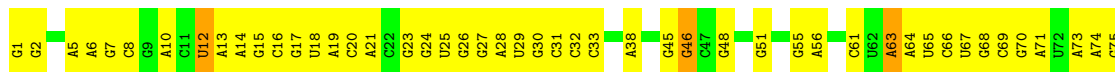
• Molecule 27: 50S ribosomal protein L9



• Molecule 28: 50S ribosomal protein L31



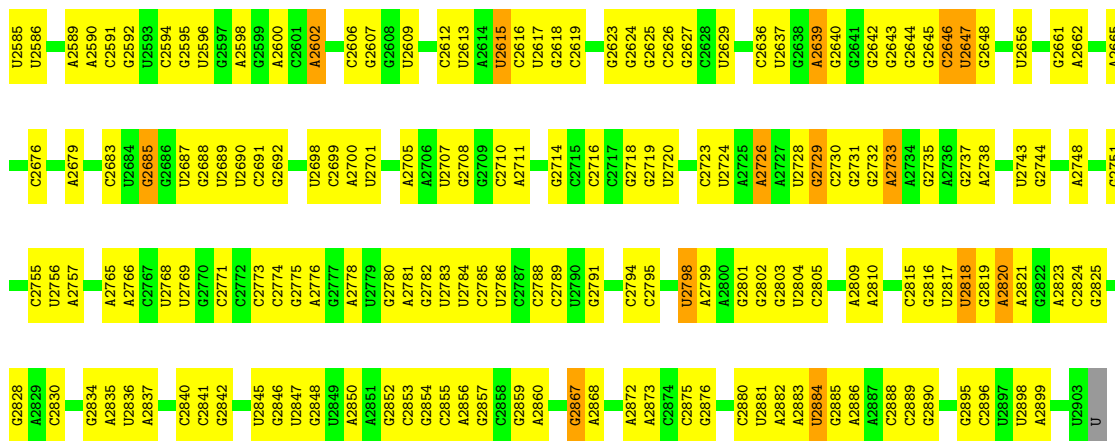
• Molecule 29: 23S ribosomal RNA



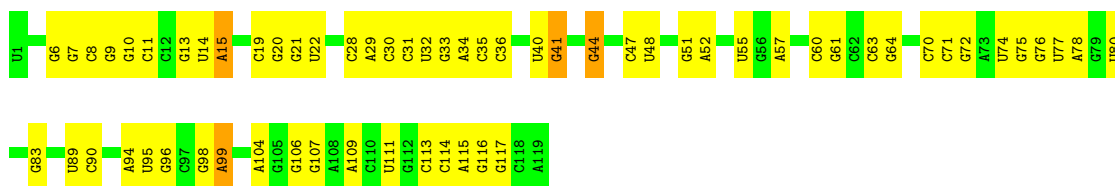
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G1291	G1220	G1136	G1056	G971	A892	U810	A739	C660	A507	C420	C331	A244	A160
G1292	C1221	G1137	G1057	A972	A896	U811	U740	G661	A508	G424	U339	G245	A161
G1293	G1222	G1138	A1057	A973	G812	C812	U741	G654	A509	G424	C509	U162	U162
C1294	G1223	G1139	G1058	G974	G813	U813	U742	A654	C510	G248	A340	G249	C163
C1295	U1224	C1140	U1059	A975	C814	C814	A743	A655	A513	C249	C341	G168	G168
C1298	G1225	U1141	U1060	G976	C817	C817	U744	U660	A514	A430	A342	G169	G169
G1299	A1226	A1142	U1061	G977	G818	G818	G745	A661	A515	A432	A345	U170	U170
G1300	C1229	A1147	U1066	A978	G819	A819	U746	A662	A516	C433	A346	U171	U171
A1301	A1230	G1153	A1067	A979	U820	U820	U747	G663	A517	U434	A347	A172	A172
A1302	U1231	C1154	G1068	C982	A825	C825	U748	G664	C518	U435	A348	A173	A173
A1308	C1232	A1155	A1069	A983	U826	U826	U749	G665	A519	C436	A349	U174	U174
G1309	C1233	G1156	A1070	G987	U827	U827	A751	G666	G520	U437	C351	G175	G175
G1310	U1234	A1157	C1072	C987	U828	U828	A752	A670	A521	A438	A352	A265	A265
G1313	G1235	G1158	G1073	A988	A829	A829	A753	A671	A522	A439	C353	G266	G266
C1314	G1236	A1159	A1074	G989	G830	C830	U754	C672	C523	G442	A354	G267	G177
C1315	U1237	C1161	G1074	G993	G831	G831	C758	C673	A526	U451	A355	G271	G178
C1319	G1238	G1162	C1079	C994	A832	U832	G759	C679	G527	G452	A356	A272	A181
C1320	U1242	G1163	A1080	C995	A833	C833	A764	C679	A528	G453	C364	G273	A182
A1321	C1243	A1165	U1081	A996	G834	U834	G765	G680	A529	A453	U366	A278	C183
U1325	A1244	G1166	G1085	G997	C837	C837	U766	G681	A532	A457	C366	G283	G185
G1326	G1250	C1167	A1088	A1000	U839	U839	U767	G682	G536	U459	C367	U284	A191
G1327	G1251	G1168	A1089	C1005	A845	U845	G768	G683	G537	U459	C368	G285	A196
G1328	G1252	A1169	A1089	C1006	U846	U846	A769	G684	A538	G463	A369	G286	A197
G1329	U1253	C1170	U1087	C1007	U847	U847	G770	G685	A539	U464	U370	G287	C198
U1332	A1254	G1171	A1088	A1008	C848	C848	G771	G686	A541	G465	A371	U288	A199
G1334	U1255	C1172	A1089	C1009	U849	U849	G772	G687	A542	U466	A372	G289	U200
G1335	G1256	A1173	A1098	U932	U850	U850	G773	G688	G543	G467	U373	U290	C201
G1336	C1257	G1174	A1098	A933	C851	C851	G774	C689	G544	G468	A374	U296	U202
G1337	U1258	U1175	G1099	U934	C852	U852	G775	G690	A546	U472	G377	G297	A203
G1338	U1259	C1176	U1101	C935	U853	U853	G776	G691	A547	C475	G386	U298	U206
G1345	U1260	G1177	U1102	C936	C854	C854	G777	G692	A548	G476	A300	G299	A207
G1346	C1261	A1178	A1103	A937	U855	U855	G778	G693	G549	A477	G301	G301	C210
G1347	U1262	G1179	A1104	C938	U856	U856	G779	G694	A550	U478	C392	C302	C211
C1351	G1263	U1180	U1105	C939	U857	U857	G780	G695	A551	A479	U395	G303	G212
G1352	A1264	C1181	U1106	U940	C858	U858	G781	G696	A552	U480	U396	U304	A213
G1353	U1265	G1182	G1107	A941	U859	U859	G782	G697	A553	G481	U397	C305	G214
G1354	A1266	A1183	U1108	C942	U860	U860	A783	G698	A554	A482	A401	U306	G215
G1355	G1267	C1184	U1109	U943	G864	G864	G784	G699	A555	C487	A402	G307	A216
G1356	U1268	G1185	G1110	A944	U864	U864	G785	G711	A556	U488	U403	G308	A221
G1357	A1269	A1186	U1111	C945	U865	U865	G786	G712	A557	A489	A404	A310	A222
G1358	C1270	G1187	A1111	A1026	U866	U866	G787	G713	A558	U490	U405	A311	C225
G1359	U1271	U1188	G1112	A1027	U867	U867	G788	G714	A559	A491	A408	G319	A226
G1361	A1272	C1189	U1113	U1028	C873	U873	A789	G715	A560	A492	G408	A320	G230
G1362	U1273	A1190	G1114	A1028	G874	U874	A792	G716	A561	A493	G411	U321	A231
G1363	G1274	C1191	U1115	U1033	U874	U874	A793	G717	A562	A494	G412	A322	A232
A1365	C1275	G1192	G1116	C1034	U875	U875	G796	G718	A563	A495	G413	C323	G232
G1366	U1282	U1203	U1116	U1035	U876	U876	G797	G719	A564	A496	C414	A324	A233
G1368	G1283	G1212	G1131	C964	U877	U877	G798	U720	A565	A497	A415	G327	C239
U1372	U1284	A1213	U1132	C965	U878	U878	G799	U721	A566	A498	U416	U328	G242
	A1286	A1217	A1133	C966	U879	U879	G805	G724	A567	A499	A417	G329	
	A1287	C1045	G967	U967	U880	U880	G806	G725	A568	G500	A418		
		A1046	G968	U967	U881	U881	G807	G726	A569	A503			
		A1046	G968	U967	U882	U882	G808	G727	A570	A504			
		G1047	G969	U968	U883	U883		A728	A571	A505			
					U884	U884		G729	A572				
					C885	C885		U641	A573				
					A	A		A730	A574				
					U	U		C731	A575				
					C	C		G732	U576				
					C	C		G733	A577				
					C	C		A734	U578				

U2506	U2507	G2508	C2512	A2513	U2514	C2515	A2516	C2517	U2518	U2519	C2520	G2521	U2522	G2525	U2526	G2529	A2530	G2531	G2532	U2533	A2534	U2537	G2543	U2544	A2547	U2548	G2549	G2550	U2554	U2555	A2560	U2561	U2562	U2563	A2564	A2565	A2566	G2567	U2568	G2569	U2570	U2571	A2572	G2576	A2577	G2581	G2582	G2583	U2584				
A2430	A2435	G2436	U2437	U2438	A2439	C2440	U2441	C2442	A2443	G2444	G2445	G2446	G2447	A2448	U2449	A2450	A2451	G2455	U2456	G2457	G2458	A2459	U2460	A2461	C2462	G2463	G2464	C2465	A2468	A2469	G2470	G2471	G2472	U2473	U2474	C2475	A2476	U2477	A2478	G2487	G2488	G2491	U2492	U2493	G2494	C2495	C2496	A2497	C2498	G2502	A2503	U2504	G2505
U2343	U2344	G2345	A2346	C2347	C2350	G2357	C2360	G2361	C2362	G2363	G2365	C2368	A2369	G2370	G2371	U2372	G2373	C2374	A2377	G2383	U2384	C2385	A2386	G2389	U2390	G2391	C2394	U2402	C2403	U2404	G2405	A2406	A2411	G2412	G2413	G2414	G2415	C2416	C2417	A2418	U2419	A2424	A2425	A2426	C2427	G2428	G2429						
U2257	C2258	U2262	C2263	C2264	U2265	A2266	U2267	G2271	C2283	A2284	C2285	C2286	A2287	A2288	G2289	G2290	U2291	G2292	G2293	A2297	A2298	G2304	U2305	G2308	A2311	U2312	C2313	A2314	G2315	C2316	U2317	U2320	U2404	G2405	A2406	G2411	G2412	G2413	A2327	G2428	U2429	U2430	C2431	G2432	A2333	U2334	A2335	A2336	C2339	A2340	G2341	G2342	
U2086	G2087	A2088	C2089	A2090	G2093	C2096	U2099	G2100	A2101	G2102	U2109	G2110	U2111	G2112	G2116	A2117	U2118	G2119	G2120	G2121	U2122	A2126	G2127	C2128	C2129	U2130	U2131	U2132	G2133	A2135	G2136	U2139	G2140	C2145	C2146	A2147	G2148	G2157	A2163	C2164	C2165	U2166	A2170	U2171	A2173								
G1910	A1913	C1914	U1915	A1918	A1919	U1923	U1926	A1927	G1930	U1931	U1936	A1937	C1941	U1943	U1944	C1947	G1948	G1954	U1955	U1956	C1962	C1965	C1967	G1968	A1969	U1970	U1971	G1972	A1977	A1987	G1988	U1991	G1992	U1993	C1996	C1997	A1998	C1999	C2000	C2008	A2009												
G1808	A1809	A1810	G1811	U1812	G1813	C1816	G1817	U1818	A1821	G1822	G1823	G1824	U1825	U1826	U1827	U1828	A1829	C1830	G1831	U1834	U1835	C1838	C1837	U1841	G1842	A1847	A1848	G1849	G1850	U1851	U1852	A1858	U1859	G1862	G1869	C1870	A1871	C1874	G1875	U1880	C1881	A1890	C1893	G1907	A1908	C1909							
G1723	G1724	U1725	C1726	C1727	U1728	U1729	C1730	G1731	C1732	G1733	G1734	U1735	U1736	G1737	G1738	A1739	U1742	G1743	A1744	A1745	C1748	A1749	G1750	U1751	G1752	G1753	A1754	A1757	A1762	G1763	C1764	C1771	A1772	A1773	U1779	A1780	A1784	C1788	A1789	C1790	A1791	U1796	G1797	U1798	G1799	A1800	A1801	A1802	G1807				
A1630	G1631	A1634	A1637	C1638	C1639	G1645	G1646	C1647	U1648	G1649	A1651	G1650	A1652	G1653	A1654	A1655	A1664	A1665	G1666	A1668	G1669	U1671	G1672	G1673	C1674	C1675	A1676	U1677	G1681	G1682	U1688	U1693	G1696	G1699	A1700	C1704	A1705	U1709	G1710	A1711	G1715	U1720	G1721	A1722									
U1443	G1444	A1445	C1446	C1447	G1452	A1453	U1458	G1461	C1462	C1463	G1464	A1465	U1466	U1467	U1468	A1469	G1475	U1476	A1477	G1482	A1490	C1493	A1494	A1495	A1496	U1497	A1498	G1501	A1502	A1503	A1504	A1515	G1516	G1517	C1518	G1519	U1520	G1521	A1522	U1523	G1524	A1528	G1532	U1533	A1535	U1539	G1540						
G1377	A1378	U1379	G1380	G1381	G1382	A1383	C1386	A1387	G1388	G1389	U1390	U1391	A1392	A1393	U1394	A1395	U1396	U1397	C1398	U1399	U1400	A1401	C1404	U1405	U1406	G1407	G1408	U1409	G1410	U1411	U1412	U1413	G1416	C1417	G1418	A1419	A1420	G1424	G1425	C1428	G1429	G1430	A1431	G1432	A1433	A1434	G1435	G1436	C1437	U1438	A1439	U1440	U1442

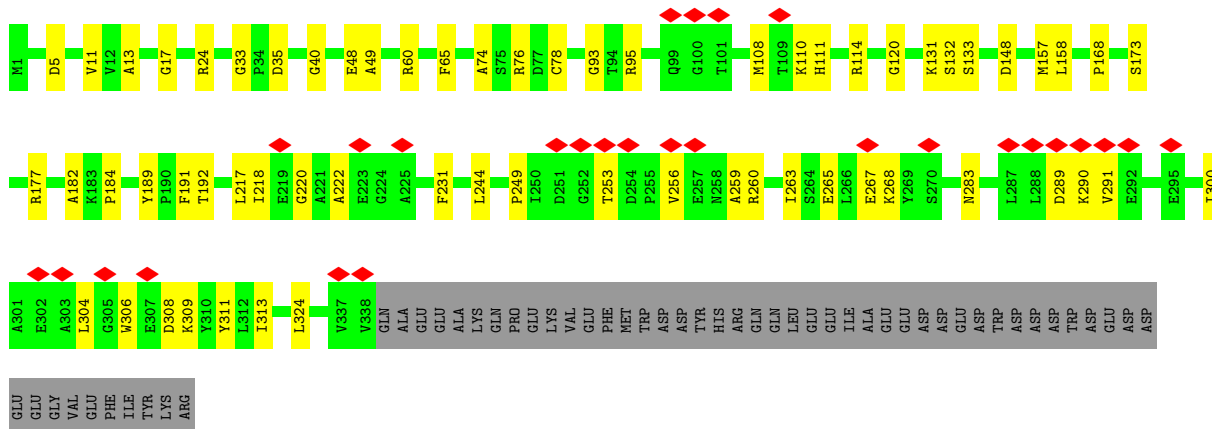




• Molecule 30: 5S ribosomal RNA



• Molecule 31: GTPase ObgE/CgtA



• Molecule 32: 50S ribosomal protein L35



## 4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	45746	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TALOS ARCTICA	Depositor
Voltage (kV)	200	Depositor
Electron dose ( $e^-/\text{\AA}^2$ )	40	Depositor
Minimum defocus (nm)	1000	Depositor
Maximum defocus (nm)	2500	Depositor
Magnification	120000	Depositor
Image detector	FEI FALCON III (4k x 4k)	Depositor
Maximum map value	2.195	Depositor
Minimum map value	-0.000	Depositor
Average map value	0.034	Depositor
Map value standard deviation	0.170	Depositor
Recommended contour level	0.5	Depositor
Map size ( $\text{\AA}$ )	417.6, 417.6, 417.6	wwPDB
Map dimensions	240, 240, 240	wwPDB
Map angles ( $^\circ$ )	90.0, 90.0, 90.0	wwPDB
Pixel spacing ( $\text{\AA}$ )	1.74, 1.74, 1.74	Depositor

## 5 Model quality [i](#)

### 5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: ZN, MG, GNP

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	g	0.23	0/303	0.44	0/397
2	C	0.23	0/2121	0.43	0/2852
3	D	0.24	0/1586	0.45	0/2134
4	E	0.23	0/1499	0.41	0/2016
5	F	0.24	0/1434	0.44	0/1926
6	G	0.24	0/1343	0.45	0/1816
7	J	0.23	0/1152	0.40	0/1551
8	L	0.25	0/1062	0.48	0/1413
9	N	0.24	0/974	0.42	0/1301
10	O	0.25	0/902	0.47	0/1209
11	Q	0.28	0/960	0.40	0/1278
12	R	0.25	0/829	0.46	0/1107
13	S	0.23	0/864	0.41	0/1156
14	T	0.23	0/744	0.44	0/994
15	U	0.24	0/787	0.46	0/1051
16	V	0.25	0/766	0.48	0/1025
17	W	0.25	0/584	0.42	0/772
18	X	0.22	0/635	0.41	0/848
19	Y	0.26	0/510	0.63	0/677
20	Z	0.23	0/453	0.44	0/605
21	0	0.21	0/450	0.48	0/599
22	1	0.24	0/416	0.44	0/554
23	2	0.22	0/380	0.39	0/498
24	K	0.24	0/947	0.47	0/1268
25	P	0.24	0/923	0.42	0/1234
26	M	0.24	0/1093	0.44	0/1460
27	H	0.24	0/1121	0.47	0/1515
28	d	0.24	0/371	0.48	0/496
29	A	0.16	0/69659	0.73	7/108672 (0.0%)
30	B	0.14	0/2847	0.70	0/4440
31	9	0.24	0/2626	0.45	0/3542
32	3	0.23	0/513	0.47	0/676

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z  >5	RMSZ	# Z  >5
All	All	0.18	0/100854	0.67	7/151082 (0.0%)

There are no bond length outliers.

All (7) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
29	A	1313	U	C2-N1-C1'	6.94	126.03	117.70
29	A	1893	C	N3-C2-O2	-6.47	117.37	121.90
29	A	1313	U	N1-C2-O2	5.97	126.98	122.80
29	A	1313	U	N3-C2-O2	-5.66	118.24	122.20
29	A	1893	C	N1-C2-O2	5.39	122.13	118.90
29	A	837	C	N3-C2-O2	-5.09	118.34	121.90
29	A	1378	A	OP1-P-O3'	5.03	116.27	105.20

There are no chirality outliers.

There are no planarity outliers.

## 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	g	302	0	340	0	0
2	C	2082	0	2157	58	0
3	D	1565	0	1616	40	0
4	E	1483	0	1548	25	0
5	F	1410	0	1447	39	0
6	G	1323	0	1374	28	0
7	J	1129	0	1162	19	0
8	L	1053	0	1129	24	0
9	N	961	0	1000	20	0
10	O	892	0	923	22	0
11	Q	947	0	1022	17	0
12	R	816	0	839	18	0
13	S	857	0	922	22	0
14	T	738	0	807	23	0
15	U	779	0	834	14	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
16	V	753	0	780	19	0
17	W	577	0	594	12	0
18	X	625	0	655	15	0
19	Y	509	0	543	20	0
20	Z	449	0	491	9	0
21	0	444	0	461	12	0
22	1	409	0	440	12	0
23	2	377	0	418	11	0
24	K	938	0	1012	24	0
25	P	911	0	957	13	0
26	M	1074	0	1157	20	0
27	H	1110	0	1148	30	0
28	d	364	0	364	0	0
29	A	62195	0	31280	1102	0
30	B	2548	0	1292	55	0
31	9	2582	0	2606	40	0
32	3	504	0	574	14	0
33	d	1	0	0	0	0
33	g	1	0	0	0	0
34	9	1	0	0	0	0
34	A	1	0	0	0	0
35	9	32	0	13	2	0
36	A	20	0	0	0	0
36	B	1	0	0	0	0
36	C	1	0	0	0	0
36	F	1	0	0	0	0
36	N	3	0	0	0	0
36	S	1	0	0	0	0
All	All	92769	0	61905	1601	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 11.

All (1601) 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)
29:A:1433:A:N6	29:A:1560:G:H1	1.63	0.96
29:A:408:G:H1	29:A:419:U:H3	1.08	0.95
29:A:2102:G:H1	29:A:2187:U:H3	1.17	0.92
29:A:2475:C:H42	29:A:2529:G:H22	1.13	0.91
29:A:377:G:H1	29:A:397:U:H3	0.93	0.90

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
29:A:1433:A:H61	29:A:1560:G:H1	0.90	0.89
29:A:2204:G:H1	29:A:2220:U:H3	1.20	0.89
29:A:2475:C:H42	29:A:2529:G:N2	1.71	0.88
29:A:78:U:H3	29:A:108:G:H1	1.24	0.84
29:A:285:G:H1	29:A:355:U:H3	1.23	0.84
29:A:1390:U:H3	29:A:1395:A:H62	1.25	0.83
29:A:1171:G:N1	29:A:1178:C:N3	2.26	0.83
29:A:639:U:H3	29:A:649:G:H1	1.27	0.83
29:A:2475:C:N4	29:A:2529:G:H22	1.79	0.80
29:A:284:U:H3	29:A:356:G:H1	1.28	0.79
29:A:950:G:H1	29:A:967:U:H3	1.31	0.79
10:O:100:HIS:HA	10:O:104:GLN:HE22	1.48	0.78
14:T:25:GLU:HG3	14:T:26:LYS:HG2	1.68	0.75
29:A:1664:A:H61	29:A:1996:C:H42	1.33	0.75
23:2:12:ARG:HH22	29:A:464:U:H4'	1.52	0.74
29:A:2857:G:N2	29:A:2860:A:OP2	2.20	0.73
29:A:2898:U:H2'	29:A:2899:A:H8	1.52	0.73
3:D:46:ARG:HH22	3:D:87:GLY:H	1.36	0.73
31:9:244:LEU:HD22	31:9:283:ASN:HB2	1.70	0.73
29:A:171:U:H2'	29:A:172:A:H8	1.54	0.72
29:A:2093:G:N3	29:A:2198:A:N6	2.36	0.72
30:B:114:C:H2'	30:B:115:A:H8	1.54	0.72
31:9:5:ASP:O	31:9:60:ARG:NH1	2.22	0.72
18:X:32:LEU:HD12	18:X:49:ARG:HG2	1.72	0.71
5:F:129:MET:HA	29:A:2304:G:H4'	1.72	0.71
29:A:1105:U:H2'	29:A:1106:G:H8	1.55	0.71
29:A:1270:C:H5''	29:A:1271:G:H5'	1.71	0.71
29:A:488:G:H22	29:A:491:G:H5''	1.56	0.71
29:A:475:C:O2	29:A:479:A:N6	2.23	0.71
29:A:668:A:H2'	29:A:670:A:H62	1.55	0.71
29:A:1597:A:H5''	29:A:1598:A:H5'	1.72	0.70
29:A:160:A:N3	29:A:2208:C:O2'	2.23	0.70
5:F:3:LEU:HA	5:F:6:TYR:HB3	1.72	0.70
29:A:212:G:H2'	29:A:213:A:C8	2.26	0.70
31:9:217:LEU:HB3	31:9:231:PHE:HZ	1.56	0.70
26:M:77:PRO:HG2	26:M:80:VAL:HG21	1.73	0.70
29:A:463:G:N2	29:A:466:A:OP2	2.25	0.70
5:F:36:ASN:HB3	5:F:152:ASP:HB2	1.74	0.69
29:A:1664:A:H61	29:A:1996:C:N4	1.91	0.69
29:A:1040:A:H61	29:A:1115:G:H1	1.38	0.69
29:A:1992:G:N2	29:A:1996:C:O2'	2.26	0.69

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
29:A:2120:G:H2'	29:A:2121:G:H8	1.57	0.69
29:A:1528:A:OP2	29:A:1543:G:N2	2.26	0.69
29:A:371:A:H61	29:A:401:A:H3'	1.58	0.69
29:A:937:C:H2'	29:A:938:G:H8	1.58	0.68
29:A:629:G:N3	29:A:639:U:O2'	2.27	0.68
29:A:1834:U:H5''	29:A:1835:G:H5'	1.74	0.68
31:9:93:GLY:H	31:9:108:MET:HB2	1.58	0.68
29:A:2595:G:N2	29:A:2598:A:OP2	2.22	0.68
4:E:56:GLY:HA2	4:E:73:ILE:HG12	1.75	0.68
4:E:163:ASN:ND2	29:A:320:A:N3	2.42	0.67
29:A:2233:U:H2'	29:A:2234:G:H8	1.59	0.67
29:A:2645:G:OP2	29:A:2645:G:N2	2.20	0.67
2:C:257:ARG:HB2	29:A:1798:U:H5''	1.76	0.67
22:1:24:LYS:NZ	22:1:25:ASN:O	2.27	0.67
24:K:121:GLU:HG2	24:K:122:VAL:H	1.59	0.67
19:Y:23:ARG:O	19:Y:27:ASN:ND2	2.24	0.67
29:A:177:G:OP2	29:A:177:G:N2	2.18	0.67
29:A:1664:A:N6	29:A:1996:C:H42	1.92	0.67
29:A:2258:C:O2'	29:A:2427:C:OP2	2.13	0.67
29:A:629:G:H1'	29:A:639:U:H1'	1.74	0.67
29:A:1057:A:N6	29:A:1087:G:OP2	2.28	0.67
29:A:1086:A:O2'	29:A:1087:G:N7	2.28	0.67
29:A:2229:U:H2'	29:A:2230:G:H8	1.58	0.67
29:A:2656:U:O2	29:A:2665:A:N7	2.27	0.66
2:C:35:LYS:HE3	29:A:1353:A:H4'	1.77	0.66
11:Q:106:THR:O	11:Q:109:VAL:HG12	1.95	0.66
29:A:2468:A:OP2	29:A:2476:A:N6	2.28	0.66
29:A:2497:A:N3	29:A:2498:C:N4	2.44	0.66
8:L:41:ARG:NH1	29:A:807:U:OP2	2.29	0.66
29:A:2581:G:N2	29:A:2581:G:OP2	2.29	0.66
29:A:373:U:H2'	29:A:374:A:H8	1.61	0.66
29:A:1171:G:N2	29:A:1178:C:O2	2.16	0.66
29:A:1779:U:OP2	29:A:1784:A:N6	2.29	0.66
18:X:58:ILE:HG22	18:X:66:VAL:HG11	1.77	0.65
5:F:9:ASP:O	5:F:13:LYS:NZ	2.28	0.65
29:A:2246:G:H2'	29:A:2247:A:H8	1.62	0.65
31:9:260:ARG:HE	31:9:304:LEU:HA	1.61	0.65
25:P:32:VAL:HG12	25:P:37:LYS:HG2	1.79	0.65
8:L:79:LEU:HD23	8:L:112:LEU:HA	1.79	0.65
29:A:1060:U:H4'	29:A:1061:U:H5'	1.77	0.65
29:A:1800:C:H42	29:A:1817:G:H22	1.44	0.65

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
29:A:2514:U:H3	29:A:2570:G:H1	1.41	0.65
29:A:2515:C:H2'	29:A:2516:A:H8	1.62	0.65
12:R:63:VAL:HG22	12:R:96:VAL:HG12	1.79	0.65
29:A:26:G:H1'	29:A:515:A:H61	1.62	0.65
11:Q:48:ASP:HA	11:Q:51:GLN:HB2	1.79	0.65
29:A:2728:U:HO2'	29:A:2729:G:H8	1.45	0.65
29:A:177:G:H3'	29:A:178:G:H8	1.62	0.64
2:C:220:ARG:NH2	29:A:1788:C:OP1	2.31	0.64
29:A:213:A:H2'	29:A:214:G:C8	2.32	0.64
29:A:2816:G:N3	29:A:2883:A:O2'	2.29	0.64
5:F:3:LEU:HD13	5:F:100:GLU:HG2	1.78	0.64
20:Z:2:LYS:NZ	20:Z:58:GLU:OE2	2.30	0.64
29:A:488:G:N1	29:A:491:G:OP2	2.31	0.64
22:1:5:ARG:NH2	29:A:2285:C:OP2	2.28	0.64
29:A:1696:G:N2	29:A:1977:A:O2'	2.28	0.64
4:E:29:HIS:HA	8:L:6:LEU:HD12	1.79	0.64
3:D:124:ARG:NH1	3:D:161:MET:O	2.31	0.64
29:A:222:A:H61	29:A:232:G:H1'	1.63	0.64
29:A:1351:C:O2'	29:A:1571:A:O2'	2.13	0.64
29:A:832:U:H2'	29:A:833:A:H8	1.62	0.64
29:A:848:C:H2'	29:A:849:A:H8	1.63	0.64
14:T:54:GLU:HG3	14:T:88:LYS:HD2	1.80	0.64
29:A:1668:A:N3	29:A:1670:C:N4	2.44	0.64
29:A:2059:A:H61	29:A:2503:A:H3'	1.63	0.64
29:A:1282:U:H3	29:A:1286:A:H62	1.46	0.64
29:A:99:U:H5''	29:A:100:U:H5'	1.78	0.63
29:A:324:A:OP2	29:A:1205:A:N6	2.32	0.63
3:D:62:LYS:HD3	29:A:2810:A:H4'	1.80	0.63
10:O:30:ARG:NH2	30:B:48:U:OP1	2.31	0.63
29:A:594:U:H3	29:A:663:G:H1	1.46	0.63
29:A:1040:A:N6	29:A:1115:G:H1	1.96	0.63
22:1:25:ASN:OD1	22:1:27:ARG:NH1	2.32	0.63
26:M:55:ARG:HE	29:A:2469:A:H4'	1.64	0.63
29:A:514:A:N3	29:A:581:C:O2'	2.30	0.63
29:A:272:A:H2'	29:A:273:G:H8	1.63	0.63
29:A:1629:U:O4	29:A:1630:A:N6	2.31	0.63
29:A:1351:C:HO2'	29:A:1571:A:HO2'	1.47	0.63
29:A:1724:G:O6	29:A:1737:G:N2	2.30	0.63
29:A:2730:C:H2'	29:A:2731:G:C8	2.34	0.62
6:G:106:LEU:HB3	6:G:151:ARG:HE	1.62	0.62
23:2:29:GLN:NE2	29:A:210:C:OP1	2.31	0.62

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
29:A:839:U:H3	29:A:939:G:H1	1.46	0.62
29:A:2163:A:OP1	29:A:2170:A:O2'	2.17	0.62
3:D:13:ARG:HA	3:D:23:PRO:HA	1.80	0.62
22:1:21:THR:HG21	29:A:2419:U:H4'	1.82	0.62
16:V:4:ILE:HD12	16:V:42:LEU:HD11	1.81	0.62
29:A:571:U:O2'	29:A:573:U:OP2	2.17	0.62
29:A:1826:G:O2'	29:A:1971:U:OP2	2.16	0.62
12:R:10:LYS:NZ	29:A:994:C:O2	2.32	0.62
21:O:9:ARG:NH1	29:A:516:C:OP1	2.32	0.62
24:K:23:LYS:HB3	24:K:40:LYS:HB3	1.81	0.62
4:E:97:ASN:HB2	4:E:100:MET:HG2	1.81	0.62
31:9:309:LYS:NZ	31:9:311:TYR:OH	2.33	0.62
10:O:31:THR:OG1	10:O:34:HIS:O	2.15	0.62
17:W:68:LYS:NZ	30:B:11:C:OP1	2.24	0.62
2:C:120:ASP:OD1	2:C:121:ALA:N	2.28	0.62
6:G:106:LEU:O	6:G:151:ARG:NH2	2.32	0.62
10:O:45:SER:HG	30:B:9:G:HO2'	1.46	0.62
29:A:974:G:O2'	29:A:989:G:N2	2.33	0.62
29:A:1204:A:N6	29:A:1242:U:O4	2.32	0.62
29:A:1830:C:H2'	29:A:1831:G:H8	1.65	0.62
29:A:1999:C:O2	29:A:2687:U:O2'	2.17	0.62
5:F:132:ARG:HA	5:F:150:GLY:HA2	1.80	0.62
15:U:81:ARG:NH1	29:A:300:A:O5'	2.33	0.62
27:H:1:MET:N	27:H:21:VAL:O	2.32	0.62
29:A:371:A:N6	29:A:402:A:OP2	2.33	0.62
29:A:1123:C:H2'	29:A:1124:G:H8	1.64	0.62
29:A:2848:G:O2'	29:A:2867:G:N2	2.33	0.62
29:A:962:G:O2'	29:A:2250:G:N2	2.32	0.61
29:A:1353:A:OP2	29:A:1377:G:N1	2.32	0.61
29:A:1681:G:H21	29:A:1762:A:H3'	1.65	0.61
5:F:24:VAL:HG12	30:B:55:U:H4'	1.82	0.61
10:O:76:LYS:HB3	10:O:109:ALA:HB1	1.81	0.61
29:A:1288:G:OP2	29:A:1288:G:N2	2.33	0.61
20:Z:36:GLU:O	20:Z:37:ARG:NH1	2.33	0.61
29:A:787:C:H5''	29:A:788:A:H5'	1.82	0.61
3:D:42:ASN:ND2	3:D:43:ASP:OD2	2.33	0.61
29:A:1278:C:H2'	29:A:1279:G:C8	2.35	0.61
29:A:2081:U:H2'	29:A:2082:A:H8	1.66	0.61
29:A:818:G:N1	29:A:1188:U:OP2	2.28	0.61
31:9:11:VAL:HG12	31:9:65:PHE:HB2	1.81	0.61
19:Y:22:LEU:HD23	19:Y:23:ARG:HH11	1.65	0.61

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
29:A:1278:C:H2'	29:A:1279:G:H8	1.65	0.61
29:A:1721:G:O2'	29:A:1739:A:N6	2.34	0.61
2:C:174:ARG:NH1	2:C:175:LEU:O	2.34	0.61
4:E:132:LYS:NZ	29:A:320:A:OP2	2.29	0.61
29:A:345:A:N3	29:A:347:A:N6	2.49	0.61
29:A:1165:A:H2'	29:A:1166:G:H8	1.66	0.61
29:A:1363:C:O2'	29:A:1809:A:N3	2.28	0.61
30:B:28:C:H2'	30:B:29:A:H8	1.66	0.61
29:A:370:G:O2'	29:A:424:G:OP1	2.19	0.61
29:A:698:C:O2'	29:A:734:A:N6	2.23	0.61
29:A:1408:G:H1	29:A:1594:U:H3	1.48	0.61
29:A:1936:A:OP2	29:A:1962:C:N4	2.30	0.61
12:R:91:GLN:NE2	29:A:993:G:N3	2.47	0.60
17:W:37:ARG:NH2	29:A:2262:U:OP1	2.34	0.60
23:2:2:LYS:HE2	29:A:687:C:H5''	1.82	0.60
27:H:40:THR:O	27:H:41:LYS:HG3	2.01	0.60
29:A:482:A:O2'	29:A:497:A:N1	2.34	0.60
29:A:1443:U:H2'	29:A:1444:G:H8	1.67	0.60
29:A:1791:A:N6	29:A:1828:G:O2'	2.34	0.60
29:A:2735:G:H1	29:A:2769:U:H3	1.49	0.60
3:D:115:GLY:HA2	3:D:166:GLY:HA3	1.83	0.60
29:A:1463:C:H2'	29:A:1464:G:H8	1.67	0.60
2:C:70:LYS:HD2	2:C:73:ILE:HD12	1.83	0.60
2:C:260:LYS:HE2	29:A:2227:A:H5''	1.83	0.60
6:G:88:LEU:HD23	6:G:93:TYR:HB3	1.82	0.60
26:M:43:ALA:HA	26:M:46:ILE:HD12	1.82	0.60
29:A:2692:G:N3	29:A:2847:U:O2'	2.34	0.60
8:L:29:LYS:HE3	29:A:566:U:H5''	1.83	0.60
29:A:174:U:H2'	29:A:175:G:H8	1.67	0.60
29:A:184:C:H2'	29:A:185:G:H8	1.66	0.60
29:A:576:U:H2'	29:A:577:G:C8	2.37	0.60
2:C:23:LEU:HD21	2:C:82:TYR:HB2	1.83	0.60
31:9:13:ALA:HB3	31:9:148:ASP:H	1.67	0.60
2:C:122:ALA:O	2:C:127:ASN:ND2	2.32	0.59
2:C:244:VAL:HG12	2:C:250:GLN:HA	1.85	0.59
20:Z:8:GLN:HB2	20:Z:28:LEU:HD13	1.84	0.59
29:A:1992:G:O2'	29:A:1997:C:N4	2.34	0.59
19:Y:9:LYS:N	19:Y:12:GLU:OE1	2.34	0.59
26:M:70:ASP:OD2	29:A:907:G:N2	2.35	0.59
27:H:111:ALA:HB3	27:H:114:GLU:HB2	1.85	0.59
29:A:23:G:H2'	29:A:24:G:H8	1.66	0.59

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
6:G:97:VAL:HG22	6:G:102:ILE:HG22	1.83	0.59
10:O:51:ALA:HB3	10:O:78:VAL:HG12	1.84	0.59
13:S:22:ASP:OD1	13:S:25:ARG:NH1	2.33	0.59
29:A:158:U:H3	29:A:168:G:H1	1.50	0.59
29:A:1926:U:O2'	29:A:1927:A:N7	2.30	0.59
4:E:101:TYR:OH	4:E:175:ILE:O	2.21	0.59
29:A:1056:G:H5''	29:A:1057:A:H5'	1.84	0.59
29:A:2591:C:N4	29:A:2592:G:O6	2.35	0.59
2:C:52:HIS:HA	2:C:216:ARG:HB2	1.83	0.59
22:1:25:ASN:ND2	29:A:2285:C:OP1	2.36	0.59
24:K:90:ASN:OD1	24:K:91:SER:N	2.36	0.59
29:A:1420:A:O2'	29:A:2211:A:N7	2.36	0.59
29:A:1432:G:H2'	29:A:1433:A:C8	2.37	0.59
29:A:2564:A:C2	29:A:2647:U:H4'	2.38	0.59
2:C:2:VAL:HG12	2:C:18:VAL:HG22	1.84	0.59
29:A:1016:G:O6	29:A:1147:A:N6	2.36	0.59
29:A:272:A:H2'	29:A:273:G:C8	2.37	0.59
29:A:591:U:O4	29:A:592:A:N6	2.35	0.59
29:A:2776:A:O2'	29:A:2782:G:N7	2.32	0.59
5:F:70:ARG:NH2	29:A:2298:A:OP1	2.32	0.59
6:G:126:THR:HB	6:G:129:GLU:HB3	1.83	0.59
24:K:86:LEU:HB3	24:K:95:ILE:HD12	1.85	0.59
26:M:17:ASN:O	26:M:38:ARG:NH2	2.36	0.59
6:G:71:LEU:HA	6:G:74:MET:HG2	1.84	0.58
5:F:35:LEU:HD22	5:F:151:LEU:HD11	1.85	0.58
5:F:133:GLU:HG3	5:F:135:ILE:HG12	1.86	0.58
24:K:7:MET:HE3	24:K:8:LEU:H	1.68	0.58
29:A:1754:A:N1	29:A:2716:C:O2'	2.35	0.58
29:A:2215:C:H2'	29:A:2216:G:H8	1.67	0.58
24:K:23:LYS:NZ	29:A:2561:U:O2	2.36	0.58
29:A:1812:U:H2'	29:A:1813:G:H8	1.68	0.58
2:C:220:ARG:NH1	29:A:1789:A:OP2	2.37	0.58
10:O:40:ILE:HG12	10:O:47:VAL:HG12	1.84	0.58
29:A:1969:A:H2'	29:A:1972:G:H21	1.68	0.58
29:A:2291:U:H1'	29:A:2374:C:H1'	1.86	0.58
29:A:1386:C:H2'	29:A:1387:A:H8	1.68	0.58
29:A:1390:U:H3	29:A:1395:A:N6	1.99	0.58
29:A:1966:A:N6	31:9:133:SER:OG	2.37	0.58
2:C:68:ARG:NH1	2:C:128:THR:OG1	2.36	0.58
25:P:88:ARG:NH1	25:P:114:ASN:OD1	2.36	0.58
29:A:926:G:H2'	29:A:927:A:C8	2.39	0.58

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
29:A:1681:G:OP2	29:A:1757:A:N6	2.34	0.58
29:A:1852:U:O2	29:A:1890:A:N6	2.32	0.58
24:K:64:ARG:HD3	24:K:102:PRO:HG2	1.86	0.58
27:H:104:THR:HG22	27:H:109:GLU:HA	1.86	0.58
29:A:6:A:H2'	29:A:7:G:H8	1.69	0.58
29:A:1469:A:OP2	29:A:1522:A:N6	2.36	0.58
14:T:37:ASP:OD1	14:T:38:ALA:N	2.31	0.58
25:P:5:LYS:HB3	25:P:9:GLN:HE22	1.68	0.58
2:C:181:ARG:NH1	29:A:1800:C:OP2	2.36	0.58
26:M:6:ARG:NH2	29:A:870:U:OP1	2.37	0.58
29:A:1123:C:H2'	29:A:1124:G:C8	2.39	0.58
31:9:48:GLU:OE2	31:9:114:ARG:NH2	2.37	0.58
5:F:33:ILE:HG12	5:F:95:MET:HG2	1.86	0.57
29:A:2245:U:H5''	29:A:2246:G:H5'	1.86	0.57
29:A:2788:C:O2'	29:A:2809:A:N3	2.32	0.57
2:C:206:LYS:NZ	29:A:729:G:OP2	2.35	0.57
14:T:18:GLU:OE2	29:A:1392:A:N6	2.37	0.57
29:A:1528:A:N6	29:A:1543:G:O2'	2.36	0.57
5:F:63:LYS:HD2	5:F:64:PRO:HD2	1.86	0.57
29:A:1682:G:OP2	29:A:1699:G:N2	2.37	0.57
29:A:2417:C:H2'	29:A:2418:A:C8	2.38	0.57
21:0:12:ARG:NH2	29:A:517:C:OP1	2.35	0.57
29:A:453:A:N3	29:A:457:A:O2'	2.38	0.57
29:A:741:U:H2'	29:A:742:A:H8	1.69	0.57
2:C:128:THR:HG22	2:C:188:ARG:HG2	1.87	0.57
15:U:81:ARG:HH12	29:A:300:A:H3'	1.70	0.57
8:L:96:LYS:HD3	8:L:103:ILE:HA	1.85	0.57
29:A:2246:G:H2'	29:A:2247:A:C8	2.39	0.57
29:A:968:C:H2'	29:A:969:G:C8	2.40	0.57
12:R:35:PHE:HB2	12:R:59:ILE:HB	1.87	0.57
24:K:70:ARG:NH1	29:A:2683:C:O2	2.31	0.57
29:A:633:A:O2'	29:A:2404:U:OP1	2.23	0.57
29:A:2730:C:H2'	29:A:2731:G:H8	1.69	0.57
29:A:2898:U:H2'	29:A:2899:A:C8	2.37	0.57
30:B:14:U:OP2	30:B:70:C:O2'	2.22	0.57
29:A:713:G:H21	29:A:718:A:H62	1.51	0.57
29:A:1386:C:H2'	29:A:1387:A:C8	2.39	0.57
29:A:1430:G:H1	29:A:1563:U:H3	1.53	0.57
29:A:2855:C:H2'	29:A:2856:A:H8	1.68	0.57
8:L:116:VAL:HG11	8:L:134:ALA:HB1	1.87	0.56
29:A:6:A:H2'	29:A:7:G:C8	2.40	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
29:A:1266:G:N2	29:A:2013:A:OP2	2.31	0.56
31:9:313:ILE:HD13	31:9:324:LEU:HD13	1.86	0.56
3:D:136:ASN:ND2	3:D:139:SER:O	2.38	0.56
29:A:1807:G:N2	29:A:1810:A:OP2	2.30	0.56
13:S:99:ARG:NH1	29:A:1262:A:OP1	2.38	0.56
20:Z:10:ARG:HB2	20:Z:53:MET:HB2	1.87	0.56
23:2:25:LYS:HA	23:2:28:ARG:HE	1.70	0.56
24:K:6:THR:HG23	29:A:1666:G:H4'	1.86	0.56
29:A:110:G:H2'	29:A:111:A:H8	1.71	0.56
29:A:377:G:N2	29:A:397:U:O2	2.31	0.56
29:A:948:C:H2'	29:A:949:G:H8	1.70	0.56
29:A:1358:G:N1	29:A:1372:U:OP2	2.31	0.56
29:A:2102:G:O6	29:A:2187:U:O4	2.23	0.56
29:A:2606:C:H2'	29:A:2607:G:C8	2.41	0.56
10:O:80:GLU:HA	10:O:83:LEU:HD12	1.87	0.56
17:W:36:GLN:HE22	17:W:41:PHE:HB2	1.70	0.56
29:A:541:A:N6	29:A:553:G:O6	2.38	0.56
29:A:2327:A:H2'	29:A:2328:A:C8	2.41	0.56
29:A:2443:C:H2'	29:A:2444:G:C8	2.41	0.56
29:A:2818:U:H3	29:A:2828:G:H1	1.54	0.56
2:C:77:VAL:HG12	2:C:93:VAL:HG12	1.88	0.56
29:A:1202:G:O6	29:A:1244:A:N6	2.38	0.56
29:A:2526:G:H1	29:A:2537:U:H3	1.52	0.56
29:A:577:G:O2'	29:A:1254:A:OP1	2.24	0.56
29:A:584:C:N4	29:A:585:G:O6	2.38	0.56
29:A:1196:C:H2'	29:A:1197:G:H8	1.71	0.56
29:A:1812:U:H2'	29:A:1813:G:C8	2.39	0.56
4:E:83:VAL:HB	4:E:86:ALA:HB2	1.87	0.56
14:T:8:LEU:HD12	14:T:50:LEU:HD21	1.87	0.56
29:A:184:C:H2'	29:A:185:G:C8	2.40	0.56
29:A:651:G:H5'	32:3:18:LYS:HG3	1.88	0.56
29:A:1807:G:H2'	29:A:1808:A:H5'	1.88	0.56
11:Q:50:ARG:NH2	29:A:993:G:OP2	2.38	0.56
29:A:935:C:H2'	29:A:936:A:H8	1.71	0.56
29:A:2743:U:OP2	29:A:2755:C:N4	2.39	0.56
4:E:126:VAL:O	4:E:156:ASN:ND2	2.39	0.56
29:A:5:A:H2'	29:A:6:A:H8	1.69	0.56
29:A:727:A:OP2	29:A:1431:A:O2'	2.23	0.56
29:A:780:G:N2	29:A:785:G:N7	2.53	0.56
29:A:2507:C:O3'	31:9:76:ARG:NH2	2.39	0.56
7:J:7:LYS:HG3	29:A:538:A:H4'	1.87	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
18:X:36:ARG:NH2	29:A:2199:A:OP1	2.35	0.56
29:A:2090:A:N6	29:A:2230:G:O6	2.39	0.56
7:J:13:ARG:NH2	7:J:49:ASP:OD2	2.38	0.55
19:Y:20:ASN:HA	19:Y:24:GLU:OE2	2.05	0.55
29:A:213:A:H2'	29:A:214:G:H8	1.72	0.55
29:A:1282:U:O4	29:A:1286:A:N7	2.39	0.55
16:V:7:GLU:HG2	16:V:41:GLU:HB3	1.88	0.55
17:W:63:VAL:HG12	17:W:78:ILE:HG12	1.89	0.55
29:A:631:A:N3	29:A:2415:G:O2'	2.34	0.55
29:A:1429:G:H2'	29:A:1430:G:H8	1.71	0.55
29:A:2345:G:H4'	29:A:2346:A:H3'	1.88	0.55
2:C:155:ARG:HD3	29:A:1818:U:H2'	1.89	0.55
3:D:179:ARG:HB2	3:D:188:LEU:HD12	1.88	0.55
26:M:11:LYS:HD3	26:M:86:LYS:HD3	1.88	0.55
29:A:1438:U:H2'	29:A:1439:A:H8	1.71	0.55
29:A:1709:U:O2'	29:A:2859:G:N3	2.34	0.55
22:1:25:ASN:ND2	22:1:28:THR:OG1	2.40	0.55
29:A:739:A:H1'	29:A:740:C:H5	1.70	0.55
29:A:1539:U:H2'	29:A:1540:G:H8	1.71	0.55
29:A:918:A:N3	30:B:80:U:O2'	2.39	0.55
29:A:1822:C:H2'	29:A:1823:G:H8	1.70	0.55
14:T:92:ASN:OD1	14:T:93:LEU:N	2.39	0.55
22:1:8:ILE:HD13	22:1:24:LYS:HD2	1.88	0.55
29:A:1518:C:H2'	29:A:1519:G:C8	2.41	0.55
31:9:49:ALA:O	31:9:111:HIS:ND1	2.39	0.55
3:D:2:ILE:HD13	3:D:48:ILE:HD11	1.89	0.55
4:E:189:THR:O	4:E:193:VAL:N	2.39	0.55
10:O:63:LYS:NZ	30:B:51:G:OP1	2.36	0.55
16:V:47:VAL:HA	16:V:50:MET:SD	2.46	0.55
29:A:434:U:O2	29:A:435:C:N4	2.33	0.55
29:A:1463:C:H2'	29:A:1464:G:C8	2.42	0.55
10:O:98:GLN:NE2	30:B:47:C:O2'	2.37	0.55
29:A:987:C:O2'	29:A:1000:A:N3	2.37	0.55
29:A:1164:C:H2'	29:A:1165:A:H8	1.72	0.55
29:A:1501:G:H2'	29:A:1502:A:H8	1.71	0.55
29:A:1800:C:H42	29:A:1817:G:N2	2.05	0.55
29:A:2405:G:O2'	29:A:2411:A:N6	2.39	0.55
29:A:968:C:H2'	29:A:969:G:H8	1.71	0.55
29:A:1223:G:N2	29:A:1226:A:OP2	2.24	0.55
29:A:1461:C:H2'	29:A:1462:C:H6	1.72	0.55
29:A:1825:U:H2'	29:A:1826:G:H8	1.72	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
29:A:2192:U:H2'	29:A:2193:G:H8	1.71	0.55
29:A:2707:U:H2'	29:A:2708:G:H8	1.71	0.55
29:A:31:C:O2'	29:A:1238:G:OP1	2.24	0.54
29:A:739:A:N3	29:A:740:C:N4	2.55	0.54
29:A:2417:C:H2'	29:A:2418:A:H8	1.72	0.54
29:A:174:U:H2'	29:A:175:G:C8	2.41	0.54
29:A:2656:U:C2	29:A:2665:A:N7	2.74	0.54
15:U:81:ARG:NH1	29:A:301:G:OP2	2.38	0.54
29:A:244:A:OP2	32:3:7:ARG:NH2	2.40	0.54
29:A:552:U:H2'	29:A:553:G:H8	1.72	0.54
29:A:1400:U:H2'	29:A:1401:G:C8	2.42	0.54
29:A:1589:U:H2'	29:A:1590:A:C8	2.42	0.54
29:A:1688:U:O2'	29:A:1700:A:N7	2.31	0.54
29:A:1907:G:O6	29:A:1923:U:O2	2.24	0.54
5:F:104:THR:HG23	5:F:105:ILE:HG12	1.90	0.54
29:A:2623:G:H2'	29:A:2624:G:H8	1.73	0.54
29:A:2815:C:H2'	29:A:2816:G:H8	1.72	0.54
32:3:5:THR:HG22	32:3:62:PRO:HD2	1.89	0.54
2:C:15:VAL:HG22	2:C:205:GLY:HA3	1.88	0.54
4:E:43:THR:O	29:A:442:G:N2	2.40	0.54
5:F:127:TYR:HB3	5:F:155:ILE:HB	1.90	0.54
6:G:106:LEU:HD12	6:G:151:ARG:HG2	1.89	0.54
17:W:67:VAL:HG22	17:W:74:LYS:HG2	1.90	0.54
7:J:40:HIS:O	11:Q:70:GLN:NE2	2.38	0.54
9:N:103:ARG:NH1	29:A:1287:A:O4'	2.41	0.54
10:O:54:VAL:O	10:O:56:LYS:NZ	2.39	0.54
29:A:45:G:H5'	29:A:46:G:H5'	1.89	0.54
29:A:1433:A:H2'	29:A:1434:A:H8	1.73	0.54
29:A:2070:A:H2'	29:A:2071:A:H8	1.73	0.54
2:C:132:ARG:HH22	27:H:93:SER:HB3	1.72	0.54
9:N:2:ARG:HD2	29:A:1653:G:H5''	1.90	0.54
29:A:1791:A:OP2	29:A:1828:G:N2	2.40	0.54
15:U:3:LYS:O	15:U:93:ARG:NH2	2.40	0.54
15:U:81:ARG:HG3	15:U:96:LYS:HD3	1.89	0.54
29:A:2320:U:O2'	29:A:2322:A:N6	2.41	0.54
3:D:116:LYS:NZ	29:A:2724:U:OP1	2.37	0.54
9:N:12:ARG:O	9:N:17:ARG:NH2	2.41	0.54
21:O:29:VAL:O	29:A:2885:G:N1	2.35	0.54
26:M:69:PRO:HA	26:M:94:ALA:HB2	1.90	0.54
29:A:937:C:H2'	29:A:938:G:C8	2.42	0.54
23:2:39:ARG:NH2	29:A:468:G:O6	2.35	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
29:A:2047:C:H2'	29:A:2048:G:H8	1.72	0.54
30:B:114:C:H2'	30:B:115:A:C8	2.39	0.54
5:F:37:MET:HG2	5:F:56:LEU:HD11	1.89	0.53
29:A:2549:G:H2'	29:A:2550:G:H8	1.73	0.53
29:A:2818:U:H2'	29:A:2819:G:C8	2.43	0.53
3:D:148:GLN:O	29:A:2052:A:H4'	2.08	0.53
11:Q:40:LYS:HE3	29:A:563:A:H4'	1.88	0.53
13:S:17:VAL:HG11	13:S:103:ILE:HG12	1.89	0.53
22:1:36:LYS:HG2	22:1:47:ILE:HD13	1.91	0.53
7:J:102:GLU:HB2	7:J:119:PHE:HE2	1.73	0.53
8:L:30:THR:OG1	29:A:1190:G:OP1	2.26	0.53
15:U:67:SER:OG	29:A:327:G:N2	2.41	0.53
29:A:2070:A:H2'	29:A:2071:A:C8	2.43	0.53
4:E:171:ASP:OD2	4:E:172:ALA:N	2.39	0.53
6:G:46:ASP:O	6:G:48:THR:N	2.38	0.53
15:U:96:LYS:NZ	29:A:299:A:OP1	2.40	0.53
21:0:54:ILE:HG23	21:0:56:LYS:H	1.73	0.53
29:A:742:A:H2'	29:A:743:A:H8	1.74	0.53
30:B:72:G:H21	30:B:104:A:H62	1.56	0.53
3:D:159:LYS:NZ	29:A:2512:C:O2'	2.33	0.53
5:F:42:ALA:HB1	5:F:49:LEU:HD21	1.90	0.53
27:H:71:LYS:HZ3	27:H:108:VAL:HG21	1.73	0.53
29:A:873:C:N4	29:A:874:G:O6	2.42	0.53
29:A:2328:A:H2'	29:A:2329:U:C6	2.44	0.53
3:D:37:VAL:HG22	3:D:48:ILE:HG22	1.91	0.53
7:J:17:VAL:HG22	7:J:55:ILE:HB	1.89	0.53
14:T:2:ILE:HA	14:T:3:ARG:C	2.28	0.53
16:V:32:GLY:O	16:V:93:ARG:NH2	2.36	0.53
29:A:574:A:N6	29:A:2034:U:OP1	2.41	0.53
29:A:742:A:H2'	29:A:743:A:C8	2.44	0.53
29:A:1649:G:O6	29:A:2009:A:N6	2.42	0.53
29:A:2059:A:N6	29:A:2504:U:OP2	2.42	0.53
3:D:151:THR:OG1	29:A:2032:G:N2	2.40	0.53
17:W:38:GLY:HA2	29:A:2330:G:H21	1.74	0.53
27:H:6:LEU:HD13	27:H:36:ALA:HA	1.91	0.53
29:A:222:A:N6	29:A:232:G:H1'	2.24	0.53
29:A:711:G:H1	29:A:720:U:H3	1.57	0.53
29:A:741:U:H2'	29:A:742:A:C8	2.44	0.53
29:A:1161:C:H2'	29:A:1162:G:H8	1.74	0.53
29:A:1170:C:N4	29:A:1171:G:O6	2.42	0.53
29:A:2447:G:H1	29:A:2451:A:H62	1.55	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
29:A:2687:U:H2'	29:A:2688:G:O4'	2.09	0.53
16:V:30:ILE:HD13	16:V:72:VAL:HG11	1.89	0.53
27:H:1:MET:SD	27:H:2:GLN:N	2.82	0.53
29:A:1281:G:H2'	29:A:1282:U:C6	2.44	0.53
29:A:2313:C:H2'	29:A:2314:A:H8	1.73	0.53
30:B:28:C:H2'	30:B:29:A:C8	2.44	0.53
6:G:1:SER:HA	6:G:61:TRP:HB3	1.91	0.53
9:N:114:GLU:HB2	9:N:118:ARG:HD2	1.91	0.53
29:A:796:C:H2'	29:A:797:G:C8	2.44	0.53
29:A:1171:G:O6	29:A:1178:C:N4	2.35	0.53
29:A:2192:U:H2'	29:A:2193:G:C8	2.45	0.53
6:G:158:GLY:O	6:G:162:ARG:NH1	2.41	0.52
13:S:83:LYS:HD2	13:S:95:ARG:HD2	1.91	0.52
13:S:55:ILE:HG23	13:S:66:ILE:HD11	1.92	0.52
25:P:25:VAL:HG22	25:P:85:VAL:HG22	1.91	0.52
29:A:2339:C:H2'	29:A:2340:A:C8	2.44	0.52
29:A:696:G:H1	29:A:766:U:H3	1.57	0.52
29:A:2250:G:O2'	29:A:2496:C:OP1	2.27	0.52
3:D:34:VAL:HG23	3:D:96:ILE:HD11	1.91	0.52
4:E:162:ARG:NE	29:A:322:A:OP1	2.42	0.52
29:A:1048:A:H1'	29:A:1112:G:N2	2.25	0.52
29:A:1310:G:O2'	29:A:1611:C:OP1	2.27	0.52
29:A:2039:U:H2'	29:A:2040:G:C8	2.44	0.52
29:A:2443:C:H2'	29:A:2444:G:H8	1.74	0.52
32:3:51:LYS:HA	32:3:54:LEU:HD23	1.91	0.52
6:G:82:PHE:HB3	6:G:140:ILE:HD13	1.92	0.52
23:2:9:VAL:HG23	29:A:1309:G:H5''	1.90	0.52
29:A:935:C:H2'	29:A:936:A:C8	2.44	0.52
10:O:15:ARG:HH21	30:B:8:C:H5''	1.74	0.52
29:A:373:U:H2'	29:A:374:A:C8	2.42	0.52
29:A:645:C:H2'	29:A:647:G:C8	2.45	0.52
29:A:1013:C:H2'	29:A:1014:A:H8	1.74	0.52
29:A:2028:U:H3	29:A:2033:A:H62	1.57	0.52
29:A:2474:U:H5''	29:A:2475:C:H5	1.74	0.52
5:F:23:SER:OG	30:B:55:U:O2'	2.22	0.52
29:A:20:C:H2'	29:A:21:A:C8	2.44	0.52
29:A:305:C:H2'	29:A:306:U:C6	2.44	0.52
29:A:1161:C:H2'	29:A:1162:G:C8	2.43	0.52
29:A:1176:U:H2'	29:A:1177:G:C8	2.45	0.52
29:A:1380:G:H1'	29:A:1569:A:H61	1.74	0.52
29:A:1681:G:N2	29:A:1763:G:OP2	2.41	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
29:A:1800:C:N4	29:A:1817:G:H22	2.07	0.52
29:A:2728:U:O2'	29:A:2729:G:H8	1.91	0.52
31:9:177:ARG:HH11	31:9:182:ALA:H	1.56	0.52
29:A:145:C:H2'	29:A:146:A:H8	1.75	0.52
29:A:2637:U:H3	29:A:2776:A:H62	1.57	0.52
10:O:33:ARG:HG3	10:O:34:HIS:ND1	2.25	0.52
29:A:1428:C:N4	29:A:1570:A:OP2	2.33	0.52
29:A:1435:G:H2'	29:A:1436:G:H8	1.75	0.52
29:A:2027:G:H2'	29:A:2028:U:C6	2.44	0.52
7:J:21:THR:HG23	7:J:61:LYS:HB3	1.92	0.52
12:R:49:ILE:HG22	12:R:54:VAL:HG23	1.92	0.52
27:H:71:LYS:HE2	27:H:108:VAL:HG11	1.92	0.52
29:A:745:G:O2'	29:A:748:G:H1'	2.09	0.52
29:A:1406:U:H2'	29:A:1407:G:C8	2.45	0.52
29:A:1965:C:H5''	29:A:1966:A:H2'	1.92	0.52
29:A:2372:U:H2'	29:A:2373:G:H8	1.73	0.52
29:A:2819:G:H2'	29:A:2821:A:N7	2.24	0.52
6:G:11:PRO:HG2	6:G:79:THR:HG21	1.91	0.51
29:A:171:U:H2'	29:A:172:A:C8	2.42	0.51
29:A:1748:C:H2'	29:A:1749:A:H8	1.74	0.51
22:1:33:LEU:HD11	29:A:2286:G:C8	2.45	0.51
23:2:1:MET:N	29:A:1620:G:O4'	2.42	0.51
29:A:48:G:H22	29:A:177:G:P	2.32	0.51
29:A:2802:G:H2'	29:A:2803:G:H8	1.75	0.51
2:C:121:ALA:HB3	2:C:129:LEU:HD13	1.90	0.51
29:A:1390:U:O4	29:A:1395:A:N7	2.44	0.51
29:A:1736:U:H3'	29:A:1737:G:C8	2.46	0.51
29:A:2182:U:H2'	29:A:2183:A:H8	1.75	0.51
11:Q:49:ARG:O	11:Q:53:LYS:NZ	2.43	0.51
27:H:117:LEU:HG	27:H:120:GLY:HA2	1.92	0.51
29:A:576:U:H2'	29:A:577:G:H8	1.75	0.51
3:D:118:PHE:O	29:A:1654:A:O2'	2.26	0.51
18:X:49:ARG:NH2	29:A:1364:G:OP2	2.40	0.51
18:X:64:ASP:OD1	18:X:65:THR:N	2.43	0.51
20:Z:8:GLN:NE2	20:Z:10:ARG:O	2.37	0.51
20:Z:15:ARG:O	20:Z:20:LYS:NZ	2.43	0.51
29:A:196:A:H61	29:A:831:G:N2	2.09	0.51
29:A:1137:G:H2'	29:A:1138:G:C8	2.45	0.51
29:A:1138:G:H2'	29:A:1139:G:O4'	2.09	0.51
29:A:2031:A:N3	29:A:2455:G:O2'	2.43	0.51
25:P:112:ARG:HH11	25:P:114:ASN:HD21	1.57	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
29:A:807:U:H2'	29:A:808:G:H8	1.75	0.51
29:A:1281:G:H2'	29:A:1282:U:H6	1.74	0.51
29:A:1417:C:H2'	29:A:1418:G:O4'	2.10	0.51
29:A:1830:C:H2'	29:A:1831:G:C8	2.45	0.51
4:E:147:LEU:HB2	4:E:183:PHE:HD1	1.74	0.51
8:L:63:LYS:HE2	29:A:2394:C:H5''	1.92	0.51
23:2:43:THR:HG23	23:2:45:SER:H	1.76	0.51
25:P:23:ASP:OD1	25:P:89:GLY:N	2.42	0.51
29:A:639:U:H2'	29:A:640:C:C6	2.46	0.51
29:A:1000:A:OP2	29:A:1154:G:N1	2.31	0.51
29:A:2008:C:H2'	29:A:2009:A:H8	1.74	0.51
29:A:2076:U:OP2	29:A:2238:G:N2	2.37	0.51
29:A:2333:A:H5'	29:A:2335:A:H1'	1.93	0.51
29:A:2781:A:H5''	29:A:2782:G:H5'	1.91	0.51
27:H:94:ILE:HG23	27:H:98:ASP:HB2	1.93	0.51
29:A:5:A:H2'	29:A:6:A:C8	2.45	0.51
29:A:459:U:H2'	29:A:460:A:H8	1.76	0.51
29:A:758:C:H2'	29:A:759:G:C8	2.46	0.51
29:A:1406:U:H2'	29:A:1407:G:H8	1.75	0.51
29:A:2385:C:H2'	29:A:2386:A:C8	2.46	0.51
19:Y:19:LEU:HB3	19:Y:23:ARG:NH2	2.26	0.51
29:A:2291:U:O2'	29:A:2374:C:O2	2.27	0.51
29:A:2836:U:H2'	29:A:2837:A:C8	2.46	0.51
29:A:2853:C:H2'	29:A:2854:G:C8	2.45	0.51
30:B:60:C:H2'	30:B:61:G:H8	1.75	0.51
30:B:78:A:H62	30:B:98:G:H21	1.58	0.51
2:C:257:ARG:NH1	2:C:263:ASP:OD2	2.43	0.51
9:N:44:LEU:HD22	9:N:113:ILE:HD13	1.92	0.51
29:A:910:A:H2'	29:A:911:A:C8	2.45	0.51
29:A:1589:U:H2'	29:A:1590:A:H8	1.76	0.51
29:A:2788:C:H2'	29:A:2789:C:C6	2.46	0.51
12:R:27:ILE:HG21	12:R:63:VAL:HG21	1.93	0.50
29:A:758:C:H2'	29:A:759:G:H8	1.75	0.50
29:A:951:C:N4	29:A:952:G:O6	2.44	0.50
29:A:2836:U:H2'	29:A:2837:A:H8	1.77	0.50
31:9:218:ILE:HG23	31:9:220:GLY:H	1.75	0.50
4:E:21:ARG:O	4:E:114:ARG:NH1	2.39	0.50
19:Y:47:ARG:NH1	29:A:61:C:OP2	2.45	0.50
29:A:69:C:O2	29:A:73:A:O2'	2.23	0.50
29:A:414:C:H2'	29:A:415:A:C8	2.46	0.50
29:A:2065:C:H2'	29:A:2066:C:H6	1.76	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
29:A:2131:U:H5'	29:A:2132:U:H5''	1.91	0.50
29:A:2463:C:H2'	29:A:2464:G:H8	1.76	0.50
29:A:2514:U:H2'	29:A:2515:C:C6	2.47	0.50
6:G:94:ARG:HA	6:G:127:GLN:HE22	1.76	0.50
9:N:24:MET:HG3	9:N:44:LEU:HD12	1.93	0.50
12:R:49:ILE:O	12:R:49:ILE:HG13	2.12	0.50
12:R:97:LYS:HE2	12:R:97:LYS:HA	1.93	0.50
16:V:30:ILE:HG12	16:V:91:PHE:HB2	1.92	0.50
16:V:50:MET:HB2	16:V:53:LYS:HZ2	1.76	0.50
25:P:21:PRO:HG3	25:P:49:ILE:HD13	1.93	0.50
26:M:38:ARG:HG2	26:M:98:PRO:HD3	1.92	0.50
29:A:145:C:H2'	29:A:146:A:C8	2.46	0.50
29:A:1518:C:H2'	29:A:1519:G:H8	1.75	0.50
29:A:2698:U:H2'	29:A:2699:C:C6	2.47	0.50
2:C:129:LEU:HD12	2:C:133:ASN:HB2	1.92	0.50
15:U:5:ARG:HG2	15:U:6:ARG:H	1.76	0.50
29:A:750:A:OP1	29:A:1615:C:N4	2.38	0.50
29:A:828:U:H4'	29:A:831:G:N1	2.26	0.50
29:A:1997:C:H2'	29:A:1998:A:H8	1.75	0.50
29:A:2460:U:H2'	29:A:2461:A:H8	1.74	0.50
19:Y:32:ALA:HB2	19:Y:37:LEU:HD13	1.93	0.50
22:1:5:ARG:NH1	22:1:23:THR:O	2.45	0.50
29:A:1432:G:H2'	29:A:1433:A:H8	1.75	0.50
29:A:2233:U:H2'	29:A:2234:G:C8	2.43	0.50
29:A:2241:A:H2'	29:A:2242:G:C8	2.47	0.50
29:A:2841:C:H2'	29:A:2842:G:H8	1.76	0.50
29:A:2848:G:H1'	29:A:2868:A:H61	1.77	0.50
29:A:465:G:N2	29:A:684:G:H1'	2.27	0.50
29:A:825:A:N1	29:A:833:A:N6	2.59	0.50
29:A:911:A:H5''	29:A:912:C:H5''	1.94	0.50
29:A:1672:A:C6	29:A:2582:G:H5'	2.46	0.50
29:A:2329:U:H2'	29:A:2330:G:C8	2.45	0.50
29:A:2855:C:H2'	29:A:2856:A:C8	2.46	0.50
22:1:34:GLU:OE1	22:1:49:LYS:NZ	2.35	0.50
29:A:581:C:H2'	29:A:582:A:C8	2.46	0.50
29:A:639:U:H2'	29:A:640:C:H6	1.77	0.50
5:F:118:ALA:O	5:F:166:ARG:NH1	2.44	0.50
6:G:87:GLN:HE22	6:G:164:ALA:HA	1.76	0.50
29:A:954:G:H1	29:A:963:U:H3	1.59	0.50
29:A:1042:G:H1	29:A:1113:U:H3	1.59	0.50
29:A:2505:G:N2	29:A:2576:G:N7	2.60	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
29:A:2594:C:H2'	29:A:2595:G:C8	2.46	0.50
2:C:106:PRO:HG2	2:C:109:LEU:HB2	1.94	0.50
3:D:149:ASN:O	3:D:152:PRO:HD2	2.12	0.50
12:R:65:ALA:HB3	12:R:95:ASP:HB2	1.94	0.50
12:R:71:LYS:HA	12:R:90:ARG:HG2	1.93	0.50
14:T:38:ALA:HB3	14:T:81:LYS:HD2	1.93	0.50
15:U:32:LYS:HB3	15:U:63:ALA:HB1	1.94	0.50
18:X:53:LYS:NZ	29:A:373:U:OP2	2.36	0.50
19:Y:6:LEU:HD23	19:Y:56:LEU:HD11	1.93	0.50
29:A:23:G:H2'	29:A:24:G:C8	2.46	0.50
29:A:881:G:H2'	29:A:882:G:H8	1.76	0.50
29:A:1026:G:H2'	29:A:1027:A:H8	1.77	0.50
29:A:1073:A:H3'	29:A:1074:G:H5''	1.92	0.50
29:A:1710:G:H2'	29:A:1711:A:C8	2.47	0.50
29:A:2656:U:N3	29:A:2665:A:C8	2.77	0.50
20:Z:50:VAL:HB	20:Z:53:MET:SD	2.52	0.49
26:M:57:VAL:O	26:M:60:GLN:HG3	2.12	0.49
29:A:580:U:H2'	29:A:581:C:C6	2.47	0.49
29:A:1539:U:H2'	29:A:1540:G:C8	2.46	0.49
13:S:31:GLN:O	13:S:35:ILE:HG12	2.13	0.49
21:O:51:ARG:NH1	21:O:53:VAL:HG12	2.27	0.49
29:A:1102:C:H2'	29:A:1103:A:H8	1.77	0.49
29:A:1582:C:O2'	29:A:1585:C:N3	2.42	0.49
8:L:121:THR:HG22	8:L:141:LYS:HB3	1.94	0.49
16:V:56:PHE:CE1	16:V:61:LEU:HD11	2.48	0.49
21:O:52:LYS:HD3	21:O:55:ALA:HA	1.94	0.49
29:A:226:A:H1'	29:A:230:G:N2	2.28	0.49
29:A:308:G:N2	29:A:477:A:N7	2.59	0.49
29:A:351:C:H2'	29:A:352:A:C8	2.47	0.49
29:A:417:C:H2'	29:A:418:C:C6	2.47	0.49
29:A:2036:C:H2'	29:A:2037:A:H8	1.77	0.49
29:A:2685:G:H21	29:A:2726:A:N6	2.10	0.49
9:N:106:ASP:OD1	29:A:1649:G:O2'	2.27	0.49
29:A:175:G:H2'	29:A:176:A:C8	2.47	0.49
29:A:1267:U:H2'	29:A:1268:A:H8	1.77	0.49
29:A:1443:U:H2'	29:A:1444:G:C8	2.46	0.49
29:A:1563:U:H2'	29:A:1564:C:C6	2.48	0.49
30:B:40:U:N3	30:B:44:G:OP2	2.44	0.49
30:B:95:U:H2'	30:B:96:G:H8	1.76	0.49
29:A:13:A:O2'	29:A:15:G:N7	2.46	0.49
29:A:581:C:H2'	29:A:582:A:H8	1.77	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
29:A:767:U:H2'	29:A:768:G:H8	1.77	0.49
29:A:966:G:H4'	29:A:2271:G:H22	1.78	0.49
29:A:1748:C:H2'	29:A:1749:A:C8	2.48	0.49
2:C:151:GLY:O	2:C:155:ARG:NH1	2.32	0.49
29:A:922:C:H2'	29:A:923:G:H8	1.76	0.49
29:A:967:U:H2'	29:A:968:C:C6	2.48	0.49
29:A:1264:A:H4'	29:A:2615:U:H5'	1.95	0.49
29:A:1447:C:O2'	29:A:1544:A:N3	2.42	0.49
29:A:2127:G:H2'	29:A:2128:G:C8	2.48	0.49
30:B:13:G:O2'	30:B:15:A:OP2	2.23	0.49
2:C:71:ASP:OD1	2:C:72:GLY:N	2.46	0.49
17:W:22:PHE:N	17:W:25:GLU:OE2	2.46	0.49
29:A:55:G:H2'	29:A:56:A:H8	1.78	0.49
29:A:230:G:H2'	29:A:231:A:H8	1.78	0.49
29:A:438:G:H2'	29:A:439:A:C8	2.48	0.49
29:A:538:A:H62	29:A:555:G:N2	2.11	0.49
29:A:1315:C:O2'	29:A:1392:A:N3	2.38	0.49
29:A:1431:A:H2'	29:A:1432:G:H8	1.78	0.49
29:A:1441:G:H2'	29:A:1442:U:C6	2.48	0.49
29:A:1726:C:H2'	29:A:1727:C:C6	2.48	0.49
29:A:2109:U:N3	29:A:2110:G:O6	2.45	0.49
31:9:168:PRO:HB3	31:9:191:PHE:H	1.77	0.49
32:3:32:LEU:HD23	32:3:40:LYS:HG2	1.94	0.49
5:F:135:ILE:HA	5:F:140:ILE:HD11	1.95	0.49
6:G:25:ILE:HG23	6:G:78:VAL:HG11	1.94	0.49
25:P:61:ARG:HE	25:P:63:ILE:HD11	1.77	0.49
29:A:953:G:O2'	29:A:2266:A:OP2	2.28	0.49
29:A:1433:A:H2'	29:A:1434:A:C8	2.47	0.49
29:A:1798:U:O2'	29:A:1802:A:N3	2.38	0.49
29:A:1808:A:H3'	29:A:1809:A:C8	2.48	0.49
29:A:2441:U:OP2	29:A:2586:U:O2'	2.31	0.49
29:A:2841:C:H2'	29:A:2842:G:C8	2.48	0.49
3:D:157:LYS:HG2	29:A:2619:C:H5''	1.95	0.49
5:F:110:ILE:HG23	5:F:113:PHE:HB2	1.94	0.49
8:L:112:LEU:O	29:A:627:A:N6	2.39	0.49
29:A:1259:G:H2'	29:A:1260:A:C8	2.47	0.49
29:A:2473:U:OP1	29:A:2529:G:N2	2.45	0.49
29:A:2847:U:H2'	29:A:2848:G:O4'	2.13	0.49
8:L:132:ARG:O	8:L:135:ILE:HG22	2.13	0.49
29:A:1435:G:H2'	29:A:1436:G:C8	2.47	0.49
29:A:2304:G:H22	29:A:2312:U:H3	1.60	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
7:J:3:THR:OG1	29:A:995:C:O2	2.26	0.48
29:A:924:G:H2'	29:A:925:A:H8	1.78	0.48
29:A:1131:G:N2	29:A:1132:U:O4	2.34	0.48
29:A:2737:G:H2'	29:A:2738:A:C8	2.48	0.48
30:B:77:U:O2	30:B:99:A:N7	2.46	0.48
2:C:107:LYS:HA	2:C:195:GLY:HA2	1.95	0.48
3:D:155:VAL:HG21	29:A:2618:G:H21	1.78	0.48
29:A:20:C:H2'	29:A:21:A:H8	1.78	0.48
29:A:249:C:O2	32:3:11:LYS:NZ	2.45	0.48
29:A:299:A:N1	29:A:322:A:O2'	2.41	0.48
29:A:457:A:N7	29:A:472:A:N6	2.60	0.48
29:A:579:G:H2'	29:A:580:U:C6	2.48	0.48
29:A:833:A:H2'	29:A:834:G:C8	2.48	0.48
29:A:1400:U:H2'	29:A:1401:G:H8	1.77	0.48
3:D:4:LEU:HD21	3:D:100:LEU:HD21	1.95	0.48
26:M:3:GLN:HG2	26:M:4:PRO:HD2	1.95	0.48
29:A:306:U:H2'	29:A:307:G:O4'	2.12	0.48
29:A:1704:C:H2'	29:A:1705:A:C8	2.48	0.48
29:A:1801:A:H5'	29:A:2203:U:H2'	1.95	0.48
29:A:2229:U:H2'	29:A:2230:G:C8	2.46	0.48
31:9:13:ALA:HB1	31:9:120:GLY:HA2	1.94	0.48
3:D:45:TYR:OH	29:A:2636:C:O2'	2.30	0.48
3:D:125:TRP:CD1	3:D:160:LYS:HB3	2.48	0.48
12:R:41:ILE:HB	12:R:47:VAL:HB	1.96	0.48
13:S:25:ARG:NH2	13:S:74:ILE:O	2.45	0.48
29:A:499:U:H2'	29:A:500:G:O4'	2.13	0.48
29:A:749:A:H5'	29:A:1271:G:H1'	1.93	0.48
29:A:1434:A:H2'	29:A:1435:G:H8	1.78	0.48
29:A:2120:G:H2'	29:A:2121:G:C8	2.45	0.48
29:A:2637:U:O4	29:A:2776:A:N7	2.46	0.48
30:B:70:C:H2'	30:B:71:C:H6	1.77	0.48
3:D:151:THR:HB	3:D:152:PRO:HD3	1.96	0.48
5:F:118:ALA:HB2	5:F:177:ARG:HA	1.95	0.48
13:S:73:LYS:HB2	13:S:106:VAL:HB	1.94	0.48
29:A:864:G:O2'	29:A:914:G:O6	2.30	0.48
29:A:1038:G:H2'	29:A:1039:A:C8	2.48	0.48
29:A:1207:C:H2'	29:A:1208:C:C6	2.49	0.48
29:A:1637:A:H2'	29:A:1638:C:C6	2.48	0.48
32:3:30:HIS:O	32:3:32:LEU:N	2.45	0.48
13:S:67:ASP:OD2	13:S:68:ASP:N	2.46	0.48
14:T:22:THR:HA	14:T:25:GLU:HG2	1.95	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
29:A:851:C:H2'	29:A:852:U:C6	2.49	0.48
29:A:1013:C:H2'	29:A:1014:A:C8	2.49	0.48
30:B:29:A:H2'	30:B:30:C:C6	2.49	0.48
31:9:290:LYS:HG3	31:9:291:VAL:H	1.79	0.48
2:C:194:VAL:HG22	2:C:195:GLY:H	1.77	0.48
3:D:173:GLN:NE2	29:A:2771:C:O2'	2.42	0.48
7:J:120:ARG:NE	29:A:2780:G:OP2	2.47	0.48
29:A:87:U:H3	29:A:95:A:H61	1.60	0.48
29:A:2439:A:O2'	29:A:2600:A:OP1	2.30	0.48
2:C:74:PRO:HD2	2:C:96:LYS:HG2	1.96	0.48
3:D:8:LYS:NZ	3:D:195:GLY:O	2.42	0.48
6:G:175:LYS:HE2	29:A:2530:A:H5'	1.96	0.48
27:H:62:LEU:O	27:H:66:ASN:ND2	2.47	0.48
29:A:155:A:H2'	29:A:156:A:C8	2.49	0.48
29:A:946:C:H2'	29:A:947:A:C8	2.49	0.48
29:A:1495:A:H2	29:A:1578:U:H1'	1.79	0.48
29:A:1564:C:H2'	29:A:1565:C:C6	2.48	0.48
29:A:2231:U:H2'	29:A:2232:C:C6	2.49	0.48
29:A:2385:C:H2'	29:A:2386:A:H8	1.78	0.48
29:A:2824:C:H3'	29:A:2825:G:H21	1.79	0.48
29:A:877:A:O2'	29:A:900:A:N6	2.47	0.48
29:A:934:U:H2'	29:A:935:C:H6	1.79	0.48
29:A:1441:G:H2'	29:A:1442:U:H6	1.79	0.48
29:A:1444:G:H2'	29:A:1445:G:H8	1.79	0.48
29:A:1936:A:H2	29:A:1943:U:H3	1.62	0.48
29:A:2345:G:H5'	29:A:2347:C:H5'	1.96	0.48
3:D:178:VAL:HG12	3:D:179:ARG:HG3	1.95	0.48
18:X:2:ARG:NH2	29:A:1365:A:OP1	2.41	0.48
24:K:40:LYS:HD2	24:K:57:VAL:HG12	1.96	0.48
29:A:319:G:H2'	29:A:320:A:C8	2.49	0.48
29:A:539:G:H1	29:A:554:U:H3	1.61	0.48
29:A:2840:C:H2'	29:A:2841:C:H6	1.79	0.48
30:B:116:G:H2'	30:B:117:G:H8	1.79	0.48
2:C:222:THR:N	29:A:1826:G:OP1	2.47	0.47
3:D:3:GLY:HA2	3:D:101:PHE:HZ	1.79	0.47
29:A:924:G:H2'	29:A:925:A:C8	2.49	0.47
29:A:2204:G:O6	29:A:2220:U:O4	2.32	0.47
3:D:77:ARG:NH2	3:D:200:ASP:OD1	2.47	0.47
29:A:625:G:H2'	29:A:626:A:C8	2.49	0.47
29:A:1275:A:N1	29:A:1295:C:O2'	2.39	0.47
29:A:1378:A:O2'	29:A:1380:G:OP2	2.30	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
29:A:1709:U:H2'	29:A:1710:G:C8	2.49	0.47
29:A:2719:G:H4'	29:A:2846:G:H4'	1.95	0.47
14:T:8:LEU:HD11	19:Y:26:PHE:HB2	1.97	0.47
16:V:21:ARG:NH1	30:B:77:U:OP1	2.35	0.47
29:A:64:A:H2'	29:A:65:U:H6	1.79	0.47
29:A:2057:G:H2'	29:A:2058:A:C8	2.50	0.47
29:A:2127:G:H21	29:A:2173:A:H1'	1.79	0.47
29:A:2688:G:N1	29:A:2720:U:OP2	2.37	0.47
29:A:2834:G:H1'	29:A:2883:A:H61	1.80	0.47
9:N:3:HIS:ND1	29:A:2820:A:H4'	2.29	0.47
14:T:61:LEU:HD11	14:T:82:LYS:HD3	1.96	0.47
24:K:80:ASP:OD2	25:P:61:ARG:NH1	2.47	0.47
29:A:155:A:H2'	29:A:156:A:H8	1.78	0.47
29:A:172:A:H2'	29:A:173:A:H8	1.79	0.47
29:A:671:C:H2'	29:A:672:C:H6	1.78	0.47
29:A:1357:C:H2'	29:A:1358:G:O4'	2.14	0.47
29:A:2470:G:H2'	29:A:2471:A:H8	1.79	0.47
30:B:6:G:H2'	30:B:7:G:C8	2.49	0.47
4:E:108:ILE:HD12	4:E:181:ILE:HD11	1.97	0.47
12:R:6:GLN:HB3	12:R:11:GLN:HG2	1.95	0.47
24:K:5:GLN:H	24:K:22:ILE:HA	1.78	0.47
25:P:55:HIS:HB3	29:A:2683:C:H5''	1.97	0.47
29:A:419:U:H2'	29:A:420:C:C6	2.48	0.47
29:A:437:U:H2'	29:A:438:G:H8	1.80	0.47
29:A:1346:G:N2	29:A:1347:A:H1'	2.29	0.47
29:A:1438:U:H2'	29:A:1439:A:C8	2.48	0.47
29:A:1520:U:H2'	29:A:1521:G:O4'	2.13	0.47
29:A:2215:C:H2'	29:A:2216:G:C8	2.49	0.47
29:A:2606:C:H2'	29:A:2607:G:H8	1.79	0.47
29:A:2818:U:H2'	29:A:2819:G:H8	1.80	0.47
13:S:3:THR:OG1	13:S:62:ASP:OD2	2.31	0.47
17:W:73:ARG:NH2	29:A:2333:A:OP2	2.47	0.47
29:A:414:C:H2'	29:A:415:A:H8	1.80	0.47
29:A:589:U:H2'	29:A:590:A:H8	1.80	0.47
29:A:948:C:H2'	29:A:949:G:C8	2.49	0.47
29:A:1141:U:H4'	29:A:1142:A:O4'	2.15	0.47
29:A:1353:A:H2'	29:A:1354:A:H8	1.79	0.47
29:A:2577:A:O4'	29:A:2612:C:N4	2.48	0.47
4:E:196:VAL:HA	4:E:199:MET:HG3	1.96	0.47
15:U:38:ILE:HG21	15:U:64:ILE:HG13	1.97	0.47
27:H:47:PHE:O	27:H:51:ARG:NH1	2.48	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
29:A:302:C:H2'	29:A:303:G:C8	2.50	0.47
29:A:996:A:H2'	29:A:997:G:C8	2.50	0.47
29:A:1720:U:H2'	29:A:1721:G:O4'	2.14	0.47
29:A:1801:A:N6	29:A:2201:G:O2'	2.39	0.47
29:A:1930:G:N2	29:A:1969:A:O5'	2.42	0.47
29:A:2039:U:H2'	29:A:2040:G:H8	1.79	0.47
29:A:2064:C:H2'	29:A:2065:C:H6	1.80	0.47
29:A:2372:U:H2'	29:A:2373:G:C8	2.50	0.47
29:A:2636:C:H2'	29:A:2637:U:H6	1.79	0.47
32:3:32:LEU:HA	32:3:35:LYS:HE3	1.97	0.47
9:N:22:ARG:HG3	9:N:70:THR:HA	1.97	0.47
13:S:78:GLU:OE2	29:A:24:G:N2	2.47	0.47
29:A:16:C:H2'	29:A:17:G:H8	1.77	0.47
29:A:1752:C:H2'	29:A:1753:G:C8	2.50	0.47
29:A:2011:U:H2'	29:A:2012:G:O4'	2.14	0.47
29:A:2182:U:H2'	29:A:2183:A:C8	2.50	0.47
29:A:2228:G:H2'	29:A:2229:U:C6	2.50	0.47
3:D:30:GLU:OE1	3:D:33:ARG:NH2	2.47	0.47
8:L:96:LYS:HB3	8:L:103:ILE:HD13	1.96	0.47
10:O:25:ARG:NH1	30:B:8:C:O3'	2.48	0.47
11:Q:54:ARG:HD3	29:A:1155:A:H5''	1.96	0.47
13:S:77:ASP:HB3	29:A:24:G:H1'	1.95	0.47
24:K:18:ARG:NH2	24:K:45:GLU:HG2	2.30	0.47
27:H:97:ARG:HH21	27:H:112:LYS:HZ3	1.62	0.47
29:A:987:C:H2'	29:A:988:A:O4'	2.15	0.47
29:A:1733:G:H2'	29:A:1734:G:C8	2.50	0.47
29:A:2066:C:H2'	29:A:2067:G:C8	2.49	0.47
29:A:2707:U:H2'	29:A:2708:G:C8	2.49	0.47
30:B:51:G:O6	30:B:52:A:N6	2.47	0.47
30:B:83:G:O6	30:B:94:A:N6	2.47	0.47
5:F:98:PHE:HA	5:F:101:ARG:HG2	1.96	0.47
6:G:2:ARG:NH1	29:A:2751:G:OP2	2.46	0.47
29:A:307:G:N2	29:A:309:A:H3'	2.30	0.47
29:A:582:A:H2'	29:A:583:G:H8	1.78	0.47
29:A:996:A:H2'	29:A:997:G:H8	1.79	0.47
29:A:1431:A:H2'	29:A:1432:G:C8	2.49	0.47
29:A:2425:A:H4'	29:A:2426:A:O5'	2.14	0.47
31:9:24:ARG:HB2	31:9:35:ASP:HB2	1.97	0.47
2:C:38:LYS:NZ	2:C:55:GLY:O	2.42	0.46
4:E:52:VAL:HB	4:E:74:LYS:HD2	1.96	0.46
29:A:630:G:N2	29:A:633:A:OP2	2.32	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
29:A:1079:C:H2'	29:A:1080:A:O4'	2.15	0.46
29:A:1821:A:H2'	29:A:1822:C:C6	2.50	0.46
29:A:2329:U:H2'	29:A:2330:G:H8	1.80	0.46
5:F:121:PHE:HE2	5:F:166:ARG:HH12	1.63	0.46
6:G:84:LYS:HB3	6:G:132:LEU:HB2	1.98	0.46
16:V:50:MET:O	16:V:53:LYS:NZ	2.43	0.46
19:Y:26:PHE:O	19:Y:30:MET:HG2	2.15	0.46
29:A:491:G:H3'	29:A:492:A:H8	1.79	0.46
29:A:777:G:H2'	29:A:778:G:H8	1.79	0.46
29:A:1355:G:H2'	29:A:1356:G:H8	1.80	0.46
29:A:2036:C:H2'	29:A:2037:A:C8	2.50	0.46
11:Q:67:ALA:HA	11:Q:70:GLN:OE1	2.15	0.46
13:S:24:ILE:HD13	13:S:36:LEU:HD11	1.96	0.46
16:V:9:ARG:HE	16:V:27:PRO:HB3	1.80	0.46
17:W:66:GLU:OE1	17:W:68:LYS:HG2	2.15	0.46
27:H:97:ARG:NH2	29:A:2220:U:O3'	2.49	0.46
29:A:282:A:H2'	29:A:283:G:C8	2.51	0.46
29:A:979:A:H2'	29:A:982:C:H42	1.80	0.46
29:A:1394:U:H4'	29:A:1603:A:H4'	1.97	0.46
29:A:1809:A:H2'	29:A:1810:A:C8	2.50	0.46
29:A:1847:A:O2'	29:A:1848:A:H8	1.99	0.46
31:9:263:ILE:HG22	31:9:267:GLU:HG3	1.98	0.46
9:N:5:LYS:NZ	29:A:2000:C:OP1	2.47	0.46
10:O:29:HIS:HB3	10:O:36:TYR:HB2	1.96	0.46
29:A:577:G:H2'	29:A:578:G:C8	2.50	0.46
29:A:1114:C:N4	29:A:1115:G:O6	2.48	0.46
29:A:2266:A:H4'	29:A:2267:A:N3	2.30	0.46
29:A:2328:A:H2'	29:A:2329:U:H6	1.80	0.46
29:A:2626:C:H2'	29:A:2627:G:C8	2.50	0.46
30:B:116:G:H2'	30:B:117:G:C8	2.50	0.46
4:E:141:MET:HG2	4:E:143:LEU:HG	1.97	0.46
25:P:5:LYS:HA	25:P:8:GLU:HB2	1.98	0.46
29:A:566:U:H2'	29:A:567:U:C6	2.50	0.46
29:A:903:C:H2'	29:A:904:G:C8	2.50	0.46
29:A:1098:A:H3'	29:A:1099:G:H8	1.81	0.46
29:A:1550:C:H2'	29:A:1551:A:H8	1.81	0.46
29:A:2446:G:N2	29:A:2449:U:O2	2.44	0.46
29:A:2845:U:H2'	29:A:2846:G:C8	2.49	0.46
6:G:59:ASP:OD1	6:G:60:GLY:N	2.40	0.46
19:Y:9:LYS:HD3	19:Y:10:SER:N	2.31	0.46
30:B:9:G:H1	30:B:111:U:H3	1.62	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
31:9:157:MET:HE3	31:9:158:LEU:H	1.79	0.46
31:9:289:ASP:OD1	31:9:289:ASP:N	2.47	0.46
2:C:209:ALA:HA	2:C:212:TRP:CZ2	2.51	0.46
2:C:219:VAL:HG21	29:A:782:A:C8	2.50	0.46
14:T:10:VAL:HG21	14:T:42:GLU:HB3	1.97	0.46
16:V:61:LEU:N	16:V:72:VAL:O	2.46	0.46
27:H:9:VAL:HG22	27:H:10:ALA:H	1.81	0.46
29:A:67:U:C2	29:A:68:G:C8	3.03	0.46
29:A:582:A:H2'	29:A:583:G:C8	2.51	0.46
29:A:970:U:H2'	29:A:971:G:C8	2.51	0.46
29:A:1164:C:H2'	29:A:1165:A:C8	2.50	0.46
29:A:1571:A:H2'	29:A:1572:A:H8	1.81	0.46
29:A:1638:C:O2	29:A:2698:U:O2'	2.34	0.46
31:9:177:ARG:NH2	31:9:184:PRO:HD2	2.30	0.46
18:X:16:ASN:HB2	18:X:24:THR:HB	1.96	0.46
21:O:30:ASP:HB3	21:O:34:GLY:H	1.81	0.46
27:H:4:ILE:HG21	27:H:51:ARG:HH22	1.80	0.46
29:A:732:C:H2'	29:A:733:G:O4'	2.16	0.46
29:A:793:A:OP2	29:A:2071:A:O2'	2.34	0.46
29:A:1665:A:H2'	29:A:1666:G:H8	1.80	0.46
29:A:1826:G:H2'	29:A:1827:U:C6	2.51	0.46
29:A:2030:A:H4'	29:A:2031:A:H8	1.80	0.46
29:A:2047:C:O2'	29:A:2823:A:N1	2.42	0.46
29:A:2241:A:H2'	29:A:2242:G:H8	1.80	0.46
29:A:2414:G:C2	29:A:2415:G:C8	3.04	0.46
29:A:2642:G:H2'	29:A:2643:G:H8	1.81	0.46
2:C:240:GLY:O	29:A:2596:U:O2'	2.34	0.46
4:E:43:THR:HB	29:A:38:A:N3	2.31	0.46
9:N:34:ILE:HD12	29:A:1278:C:H4'	1.97	0.46
10:O:117:PHE:O	29:A:2377:A:O2'	2.34	0.46
11:Q:106:THR:O	11:Q:110:GLU:OE1	2.34	0.46
29:A:1084:A:N3	29:A:1105:U:O2'	2.48	0.46
29:A:1751:U:H2'	29:A:1752:C:C6	2.50	0.46
29:A:1862:G:H1	29:A:1880:U:H3	1.64	0.46
29:A:2364:C:H2'	29:A:2365:G:O4'	2.16	0.46
29:A:2416:C:C2	29:A:2417:C:C5	3.03	0.46
29:A:2625:G:H2'	29:A:2626:C:C6	2.51	0.46
31:9:177:ARG:NH1	31:9:182:ALA:H	2.14	0.46
31:9:306:TRP:CE3	31:9:308:ASP:HB2	2.51	0.46
29:A:24:G:H2'	29:A:25:U:C6	2.50	0.46
29:A:355:U:H2'	29:A:356:G:C8	2.51	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
29:A:680:C:H2'	29:A:681:G:C8	2.50	0.46
29:A:926:G:H2'	29:A:927:A:H8	1.81	0.46
29:A:2391:G:O2'	29:A:2424:C:N4	2.42	0.46
29:A:2457:U:H2'	29:A:2458:G:C8	2.50	0.46
31:9:222:ALA:HB1	31:9:268:LYS:HD2	1.98	0.46
9:N:39:PRO:HG2	29:A:1651:G:H5'	1.98	0.45
19:Y:48:ARG:NH1	29:A:76:C:OP1	2.49	0.45
29:A:419:U:H2'	29:A:420:C:H6	1.82	0.45
29:A:551:G:H2'	29:A:552:U:C6	2.51	0.45
29:A:599:A:H2'	29:A:600:G:C8	2.51	0.45
29:A:695:G:H1	29:A:767:U:H3	1.62	0.45
29:A:832:U:H2'	29:A:833:A:C8	2.48	0.45
29:A:934:U:H2'	29:A:935:C:C6	2.51	0.45
30:B:6:G:H2'	30:B:7:G:H8	1.80	0.45
30:B:70:C:H2'	30:B:71:C:C6	2.51	0.45
4:E:192:ALA:HA	4:E:195:GLN:HE21	1.81	0.45
6:G:157:LYS:HE3	6:G:157:LYS:HB3	1.72	0.45
11:Q:56:PHE:HZ	29:A:536:G:H4'	1.80	0.45
19:Y:49:ASP:HA	19:Y:52:ARG:HG2	1.98	0.45
29:A:106:C:H2'	29:A:107:G:H8	1.81	0.45
29:A:301:G:O2'	29:A:302:C:O5'	2.32	0.45
29:A:523:C:H5''	29:A:540:C:O2'	2.16	0.45
29:A:558:U:H2'	29:A:559:G:H8	1.81	0.45
29:A:589:U:H2'	29:A:590:A:C8	2.51	0.45
29:A:638:G:H2'	29:A:639:U:H6	1.82	0.45
29:A:1298:C:H2'	29:A:1299:G:O4'	2.16	0.45
29:A:1496:A:H2'	29:A:1498:C:C5	2.51	0.45
29:A:2460:U:O2	29:A:2493:U:N3	2.50	0.45
29:A:2731:G:H2'	29:A:2732:G:C8	2.51	0.45
7:J:95:ARG:HG2	7:J:96:ARG:HD3	1.98	0.45
12:R:27:ILE:HG23	12:R:31:GLU:OE2	2.16	0.45
29:A:2254:C:C2	29:A:2255:G:C8	3.05	0.45
29:A:2784:U:H2'	29:A:2785:C:H6	1.81	0.45
30:B:20:G:H2'	30:B:21:G:H8	1.82	0.45
3:D:194:PRO:HB3	29:A:2679:A:H4'	1.97	0.45
29:A:69:C:H2'	29:A:70:G:C8	2.50	0.45
29:A:411:G:OP2	29:A:2406:A:O2'	2.30	0.45
29:A:558:U:H2'	29:A:559:G:C8	2.52	0.45
29:A:1326:U:N3	29:A:1648:U:O2'	2.45	0.45
29:A:2357:G:N2	29:A:2360:G:OP2	2.35	0.45
29:A:2370:G:H2'	29:A:2371:G:C8	2.51	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
29:A:2584:U:H2'	29:A:2585:U:O4'	2.16	0.45
29:A:2623:G:H2'	29:A:2624:G:C8	2.51	0.45
32:3:15:LYS:HD2	32:3:19:GLY:HA2	1.99	0.45
26:M:112:LEU:O	26:M:115:GLU:HG3	2.17	0.45
29:A:341:C:H2'	29:A:342:A:C8	2.52	0.45
29:A:364:C:H2'	29:A:365:U:C6	2.51	0.45
29:A:541:A:H2'	29:A:542:C:C6	2.51	0.45
29:A:946:C:H2'	29:A:947:A:H8	1.82	0.45
29:A:1019:U:OP1	29:A:1035:U:O2'	2.26	0.45
29:A:1841:U:H2'	29:A:1842:G:H8	1.81	0.45
29:A:2023:C:H2'	29:A:2024:G:H8	1.80	0.45
29:A:2315:G:H2'	29:A:2316:G:H8	1.81	0.45
30:B:9:G:C2	30:B:10:G:C8	3.04	0.45
27:H:1:MET:SD	27:H:3:VAL:N	2.89	0.45
29:A:55:G:H2'	29:A:56:A:C8	2.52	0.45
29:A:599:A:H2'	29:A:600:G:H8	1.82	0.45
29:A:807:U:H2'	29:A:808:G:C8	2.51	0.45
29:A:1442:U:H2'	29:A:1443:U:C6	2.52	0.45
29:A:1825:U:H2'	29:A:1826:G:C8	2.50	0.45
29:A:2028:U:O4	29:A:2033:A:N7	2.49	0.45
8:L:23:ILE:HG12	12:R:82:HIS:NE2	2.32	0.45
29:A:2065:C:H2'	29:A:2066:C:C6	2.51	0.45
29:A:2340:A:H2'	29:A:2341:G:H8	1.81	0.45
32:3:27:ASN:O	32:3:32:LEU:HD21	2.17	0.45
2:C:256:THR:OG1	29:A:1797:G:O2'	2.34	0.45
11:Q:20:ALA:HB2	11:Q:38:VAL:HG23	1.99	0.45
27:H:30:LEU:HB3	27:H:36:ALA:HB3	1.99	0.45
29:A:451:U:O2	29:A:453:A:N6	2.50	0.45
29:A:1231:U:H2'	29:A:1232:G:H8	1.81	0.45
29:A:1389:G:H2'	29:A:1390:U:C6	2.52	0.45
29:A:1464:G:H2'	29:A:1465:G:C8	2.52	0.45
29:A:2081:U:H2'	29:A:2082:A:C8	2.49	0.45
6:G:54:ARG:HH11	6:G:57:TYR:HE2	1.65	0.45
25:P:26:GLU:HB2	25:P:86:LYS:NZ	2.32	0.45
29:A:243:U:OP2	32:3:7:ARG:NH1	2.50	0.45
29:A:1005:C:H2'	29:A:1006:C:C6	2.52	0.45
29:A:1222:U:H2'	29:A:1223:G:C8	2.52	0.45
29:A:1361:G:H2'	29:A:1362:C:H6	1.81	0.45
29:A:1409:U:H2'	29:A:1410:G:H8	1.82	0.45
29:A:2339:C:H2'	29:A:2340:A:H8	1.82	0.45
32:3:30:HIS:C	32:3:32:LEU:H	2.17	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
7:J:80:HIS:ND1	7:J:81:ILE:HG22	2.32	0.45
7:J:101:ILE:HD13	7:J:124:VAL:HG21	1.99	0.45
27:H:29:PHE:O	27:H:35:LYS:NZ	2.40	0.45
29:A:639:U:C2	29:A:640:C:C5	3.05	0.45
29:A:727:A:H2'	29:A:728:G:C8	2.52	0.45
29:A:1028:A:OP2	29:A:1126:A:N6	2.50	0.45
29:A:1744:A:H3'	29:A:1745:A:H8	1.82	0.45
29:A:2291:U:H2'	29:A:2292:U:C6	2.52	0.45
29:A:2487:G:H2'	29:A:2488:G:C8	2.52	0.45
29:A:2602:A:H8	31:9:33:GLY:HA2	1.81	0.45
29:A:2804:U:H2'	29:A:2805:C:H6	1.82	0.45
30:B:22:U:H3	30:B:61:G:H1	1.63	0.45
30:B:32:U:H2'	30:B:33:G:C8	2.52	0.45
5:F:14:LYS:O	5:F:17:THR:N	2.49	0.44
26:M:13:HIS:O	26:M:71:LYS:NZ	2.49	0.44
29:A:1434:A:H2'	29:A:1435:G:C8	2.52	0.44
29:A:1874:C:H2'	29:A:1875:G:O4'	2.17	0.44
2:C:204:LEU:HB3	2:C:209:ALA:HB3	1.99	0.44
7:J:102:GLU:HA	7:J:105:VAL:HB	1.98	0.44
9:N:28:LEU:HD22	9:N:44:LEU:HD21	1.99	0.44
18:X:54:GLY:O	18:X:58:ILE:HG23	2.17	0.44
26:M:84:LYS:NZ	29:A:2250:G:OP1	2.41	0.44
29:A:63:A:H2'	29:A:64:A:H8	1.82	0.44
29:A:296:U:H2'	29:A:297:G:C8	2.53	0.44
29:A:743:A:H2'	29:A:744:U:C6	2.51	0.44
29:A:1404:C:H2'	29:A:1405:U:H6	1.83	0.44
29:A:1630:A:N1	29:A:1637:A:N6	2.66	0.44
29:A:2636:C:H2'	29:A:2637:U:C6	2.52	0.44
30:B:30:C:H2'	30:B:31:C:O4'	2.18	0.44
3:D:184:ARG:HB3	3:D:186:LEU:HD13	1.99	0.44
13:S:16:LYS:NZ	29:A:2011:U:OP2	2.44	0.44
18:X:4:CYS:SG	18:X:7:THR:OG1	2.70	0.44
24:K:25:LEU:HD22	29:A:2562:U:H4'	1.99	0.44
27:H:26:ALA:O	27:H:30:LEU:HB2	2.17	0.44
29:A:404:A:H4'	29:A:405:U:O5'	2.16	0.44
29:A:689:A:N3	29:A:779:U:O2'	2.42	0.44
29:A:724:U:H2'	29:A:725:G:O4'	2.18	0.44
29:A:796:C:H2'	29:A:797:G:H8	1.80	0.44
29:A:940:G:H2'	29:A:941:A:O4'	2.16	0.44
29:A:1219:U:H2'	29:A:1220:G:C8	2.53	0.44
29:A:1850:G:H2'	29:A:1851:U:C6	2.52	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
29:A:2087:G:H2'	29:A:2088:A:H8	1.83	0.44
13:S:92:ARG:O	29:A:1614:A:N6	2.46	0.44
24:K:2:ILE:HD12	24:K:8:LEU:HD21	2.00	0.44
29:A:526:A:O2'	29:A:2043:C:O2	2.32	0.44
29:A:595:C:H2'	29:A:596:U:C6	2.53	0.44
29:A:819:A:N6	29:A:1189:A:H1'	2.33	0.44
29:A:2710:C:H2'	29:A:2711:A:C8	2.53	0.44
29:A:2774:C:H2'	29:A:2775:G:O4'	2.17	0.44
29:A:2888:C:H2'	29:A:2889:C:C6	2.53	0.44
31:9:173:SER:N	35:9:402:GNP:O2B	2.39	0.44
31:9:192:THR:N	35:9:402:GNP:O3G	2.39	0.44
10:O:99:TYR:O	10:O:103:VAL:HB	2.18	0.44
14:T:6:ARG:NH2	14:T:37:ASP:OD2	2.51	0.44
29:A:500:G:N1	29:A:503:A:OP2	2.39	0.44
29:A:513:A:H4'	29:A:1217:U:H5'	1.99	0.44
29:A:579:G:H2'	29:A:580:U:H6	1.83	0.44
29:A:967:U:H2'	29:A:968:C:H6	1.81	0.44
29:A:1352:U:H1'	29:A:1570:A:H2	1.82	0.44
29:A:1558:C:H4'	29:A:1559:U:H3'	1.99	0.44
29:A:1749:A:H2'	29:A:1750:G:H8	1.82	0.44
29:A:2582:G:C2	29:A:2583:G:C8	3.05	0.44
5:F:32:LYS:HD3	5:F:91:ARG:HH22	1.82	0.44
5:F:150:GLY:HA3	29:A:2305:U:N3	2.33	0.44
8:L:111:ILE:HG21	29:A:636:G:C6	2.53	0.44
13:S:58:ALA:O	13:S:62:ASP:HB2	2.18	0.44
27:H:5:LEU:HD22	27:H:13:GLY:HA3	1.98	0.44
29:A:201:C:H2'	29:A:202:U:C6	2.53	0.44
29:A:594:U:H2'	29:A:595:C:C6	2.53	0.44
29:A:596:U:H2'	29:A:597:G:C8	2.52	0.44
29:A:680:C:H2'	29:A:681:G:H8	1.83	0.44
3:D:48:ILE:HG21	3:D:90:PHE:HB2	1.99	0.44
3:D:149:ASN:HB3	29:A:2572:A:OP2	2.18	0.44
13:S:46:LEU:O	13:S:50:VAL:HG23	2.17	0.44
26:M:42:THR:HG22	26:M:93:VAL:HG12	2.00	0.44
29:A:16:C:H2'	29:A:17:G:C8	2.52	0.44
29:A:25:U:H2'	29:A:26:G:O4'	2.18	0.44
29:A:686:U:H2'	29:A:788:A:N1	2.33	0.44
29:A:781:A:H5''	29:A:782:A:N7	2.32	0.44
29:A:1066:U:N3	29:A:1069:A:OP2	2.51	0.44
29:A:2130:U:O2'	29:A:2134:A:O4'	2.34	0.44
29:A:2368:C:H2'	29:A:2369:A:H8	1.83	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
29:A:2639:A:H2'	29:A:2640:G:O4'	2.18	0.44
29:A:2705:A:O2'	29:A:2852:G:OP1	2.28	0.44
3:D:170:VAL:HG11	29:A:2679:A:H5'	2.00	0.44
8:L:56:PRO:HG2	8:L:59:ARG:HD3	2.00	0.44
12:R:5:PHE:HA	12:R:39:LEU:HD23	2.00	0.44
29:A:1047:G:N2	29:A:1110:G:O2'	2.47	0.44
29:A:1136:G:H2'	29:A:1137:G:C8	2.52	0.44
29:A:1954:G:O2'	29:A:1956:U:O4	2.28	0.44
29:A:438:G:H2'	29:A:439:A:H8	1.83	0.44
29:A:475:C:H4'	29:A:510:C:H5'	1.99	0.44
29:A:1987:A:H2'	29:A:1988:G:H8	1.82	0.44
29:A:2099:U:H2'	29:A:2100:G:H8	1.83	0.44
29:A:2554:U:H2'	29:A:2555:U:C6	2.53	0.44
29:A:2798:U:O2	29:A:2799:A:N6	2.51	0.44
30:B:74:U:H2'	30:B:75:G:O4'	2.18	0.44
11:Q:90:ASP:N	11:Q:90:ASP:OD1	2.51	0.43
16:V:21:ARG:HA	16:V:25:LYS:O	2.18	0.43
24:K:31:ARG:NH2	29:A:2676:C:OP1	2.48	0.43
29:A:78:U:O4	29:A:108:G:O6	2.35	0.43
29:A:287:G:H1	29:A:353:C:H42	1.66	0.43
29:A:1026:G:H2'	29:A:1027:A:C8	2.52	0.43
29:A:1654:A:H2'	29:A:1655:A:H8	1.84	0.43
29:A:2018:G:H2'	29:A:2019:A:H8	1.83	0.43
29:A:2412:A:H2'	29:A:2413:G:O4'	2.18	0.43
29:A:2470:G:H2'	29:A:2471:A:C8	2.53	0.43
30:B:20:G:H2'	30:B:21:G:C8	2.53	0.43
30:B:40:U:H3'	30:B:41:G:H4'	1.99	0.43
30:B:60:C:H2'	30:B:61:G:C8	2.52	0.43
12:R:36:ALA:HA	12:R:58:VAL:HG23	2.00	0.43
27:H:112:LYS:HZ3	29:A:2220:U:H5'	1.84	0.43
29:A:172:A:H2'	29:A:173:A:C8	2.54	0.43
29:A:285:G:N2	29:A:355:U:O2	2.39	0.43
29:A:289:G:H2'	29:A:290:U:C6	2.53	0.43
29:A:693:A:O2'	29:A:1353:A:N3	2.52	0.43
29:A:1407:G:H2'	29:A:1408:G:H8	1.82	0.43
29:A:1722:A:N6	29:A:1738:G:H1'	2.33	0.43
29:A:2647:U:H2'	29:A:2648:G:H8	1.83	0.43
31:9:249:PRO:HG2	31:9:253:THR:H	1.82	0.43
5:F:33:ILE:HD12	5:F:155:ILE:HD12	2.00	0.43
6:G:83:THR:HG22	6:G:133:LYS:HE3	2.00	0.43
7:J:37:ARG:NH2	29:A:1007:C:H5''	2.33	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
7:J:95:ARG:NH2	29:A:2768:U:O2'	2.51	0.43
9:N:29:VAL:HG13	9:N:75:ILE:HD12	1.98	0.43
29:A:800:A:O4'	29:A:802:A:H5'	2.19	0.43
29:A:813:U:H2'	29:A:814:C:H6	1.83	0.43
29:A:1040:A:N1	29:A:1115:G:N2	2.66	0.43
29:A:1107:G:H2'	29:A:1108:U:C6	2.54	0.43
29:A:1229:C:H2'	29:A:1230:A:C8	2.53	0.43
29:A:1234:U:H2'	29:A:1235:G:O4'	2.18	0.43
29:A:1550:C:H2'	29:A:1551:A:C8	2.53	0.43
29:A:1967:C:H2'	29:A:1968:G:O4'	2.18	0.43
29:A:1987:A:H2'	29:A:1988:G:C8	2.53	0.43
29:A:2315:G:H2'	29:A:2316:G:C8	2.53	0.43
29:A:2785:C:H2'	29:A:2786:U:H6	1.84	0.43
29:A:2848:G:H1'	29:A:2868:A:N6	2.32	0.43
29:A:2875:C:H2'	29:A:2876:G:C8	2.53	0.43
2:C:151:GLY:O	2:C:155:ARG:HD2	2.18	0.43
17:W:73:ARG:HH22	29:A:2333:A:P	2.40	0.43
19:Y:18:LEU:CD2	19:Y:23:ARG:HH12	2.32	0.43
23:2:3:ARG:HD3	23:2:3:ARG:HA	1.87	0.43
26:M:66:ARG:NH2	29:A:906:U:O2'	2.52	0.43
29:A:191:A:O2'	29:A:678:C:O2	2.31	0.43
29:A:311:A:N6	29:A:329:G:OP1	2.51	0.43
29:A:1112:G:H2'	29:A:1113:U:C6	2.54	0.43
29:A:1258:U:H2'	29:A:1259:G:C8	2.54	0.43
29:A:1779:U:H5''	29:A:1780:A:H5''	2.00	0.43
29:A:1880:U:H2'	29:A:1881:C:C6	2.53	0.43
29:A:2027:G:H2'	29:A:2028:U:H6	1.81	0.43
29:A:2087:G:H2'	29:A:2088:A:C8	2.54	0.43
29:A:2589:A:H2'	29:A:2590:A:H8	1.83	0.43
29:A:2804:U:H2'	29:A:2805:C:C6	2.53	0.43
6:G:49:LEU:HD13	6:G:71:LEU:HD23	2.01	0.43
8:L:78:ARG:HH11	29:A:627:A:H5''	1.83	0.43
9:N:4:ARG:NH2	29:A:2875:C:OP1	2.51	0.43
29:A:106:C:H2'	29:A:107:G:C8	2.53	0.43
29:A:128:C:H2'	29:A:129:C:H6	1.82	0.43
29:A:253:C:H2'	29:A:254:G:O4'	2.18	0.43
29:A:923:G:H2'	29:A:924:G:H8	1.83	0.43
29:A:1219:U:H2'	29:A:1220:G:H8	1.84	0.43
29:A:1544:A:H2'	29:A:1545:A:C8	2.54	0.43
29:A:2139:U:H2'	29:A:2140:G:H8	1.82	0.43
6:G:37:ASN:HD22	6:G:63:GLN:CD	2.20	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
23:2:26:ASN:CG	29:A:682:G:H5'	2.39	0.43
29:A:1444:G:H2'	29:A:1445:G:C8	2.54	0.43
29:A:2522:U:O2'	29:A:2647:U:OP1	2.25	0.43
2:C:131:MET:HA	2:C:134:ILE:HD12	2.00	0.43
9:N:71:ARG:HA	9:N:71:ARG:HD2	1.77	0.43
14:T:59:ASN:HB2	14:T:84:TYR:HB2	2.01	0.43
16:V:50:MET:HB2	16:V:53:LYS:NZ	2.33	0.43
29:A:634:C:H2'	29:A:635:C:H6	1.83	0.43
29:A:753:A:H2'	29:A:754:U:C6	2.54	0.43
29:A:817:C:H2'	29:A:818:G:O4'	2.19	0.43
29:A:1168:G:H2'	29:A:1169:A:C8	2.53	0.43
29:A:1412:U:H2'	29:A:1413:A:C8	2.53	0.43
29:A:1721:G:N1	29:A:1738:G:N7	2.67	0.43
29:A:1827:U:H2'	29:A:1828:G:O4'	2.19	0.43
29:A:2289:G:H2'	29:A:2290:G:H8	1.84	0.43
29:A:2505:G:H1'	29:A:2506:U:OP2	2.18	0.43
30:B:115:A:H2'	30:B:116:G:H8	1.82	0.43
31:9:74:ALA:HB3	31:9:78:CYS:HB2	2.00	0.43
4:E:192:ALA:HA	4:E:195:GLN:HG2	2.01	0.43
24:K:42:THR:HG22	24:K:57:VAL:HG22	2.01	0.43
24:K:97:THR:O	24:K:98:ARG:NE	2.49	0.43
29:A:196:A:N6	29:A:831:G:H21	2.17	0.43
29:A:324:A:N6	29:A:339:U:O4'	2.51	0.43
29:A:596:U:H2'	29:A:597:G:H8	1.84	0.43
29:A:629:G:H5''	29:A:650:C:O2'	2.18	0.43
29:A:1395:A:O2'	29:A:1396:U:H3'	2.19	0.43
29:A:1562:U:H2'	29:A:1563:U:C6	2.53	0.43
29:A:1562:U:H2'	29:A:1563:U:H6	1.84	0.43
29:A:1869:G:N2	29:A:1871:A:O2'	2.52	0.43
29:A:2064:C:H2'	29:A:2065:C:C6	2.53	0.43
29:A:2794:C:H2'	29:A:2795:C:C6	2.54	0.43
2:C:207:ALA:HB2	29:A:1790:C:O2'	2.19	0.43
10:O:31:THR:HG21	30:B:28:C:H5''	2.00	0.43
11:Q:32:ARG:O	29:A:1252:G:N2	2.52	0.43
29:A:181:A:H1'	29:A:435:C:H5'	1.99	0.43
29:A:183:C:H1'	29:A:432:A:C2	2.54	0.43
29:A:475:C:N3	29:A:479:A:N7	2.67	0.43
29:A:976:G:H2'	29:A:977:G:H8	1.84	0.43
29:A:1139:G:H2'	29:A:1140:C:C6	2.54	0.43
29:A:2515:C:H2'	29:A:2516:A:C8	2.48	0.43
5:F:13:LYS:O	5:F:17:THR:HG23	2.18	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
13:S:23:LEU:HD22	21:O:23:ALA:HB2	2.01	0.43
13:S:96:ILE:HD11	29:A:2012:G:H4'	2.01	0.43
27:H:54:LEU:O	27:H:57:LYS:HG3	2.19	0.43
29:A:78:U:H2'	29:A:79:C:C6	2.54	0.43
29:A:1207:C:H2'	29:A:1208:C:H6	1.83	0.43
29:A:1291:C:H2'	29:A:1292:G:C8	2.53	0.43
29:A:1424:G:H2'	29:A:1425:G:C8	2.54	0.43
29:A:1440:U:H2'	29:A:1441:G:C8	2.53	0.43
29:A:1476:U:H2'	29:A:1477:A:H8	1.84	0.43
29:A:1796:U:H2'	29:A:1797:G:C8	2.53	0.43
29:A:1858:A:H2'	29:A:1859:U:O4'	2.19	0.43
31:9:17:GLY:N	31:9:40:GLY:O	2.49	0.43
31:9:189:TYR:CE2	31:9:192:THR:HA	2.54	0.43
3:D:68:PHE:HB3	3:D:73:VAL:O	2.19	0.42
3:D:155:VAL:O	29:A:2618:G:O2'	2.34	0.42
5:F:60:SER:HA	5:F:98:PHE:CZ	2.54	0.42
6:G:174:LYS:O	6:G:174:LYS:HD2	2.19	0.42
9:N:35:LYS:HD3	9:N:112:TYR:CZ	2.54	0.42
14:T:50:LEU:HD23	19:Y:26:PHE:CZ	2.54	0.42
26:M:55:ARG:HA	26:M:59:ARG:NH1	2.34	0.42
29:A:76:C:H2'	29:A:77:G:H8	1.84	0.42
29:A:244:A:H2'	29:A:245:G:O4'	2.19	0.42
29:A:1169:A:H2'	29:A:1170:C:C6	2.54	0.42
29:A:1429:G:H2'	29:A:1430:G:C8	2.53	0.42
29:A:1738:G:O2'	29:A:1739:A:H8	2.01	0.42
29:A:2220:U:H2'	29:A:2221:G:H8	1.83	0.42
29:A:2547:A:OP2	29:A:2566:A:O2'	2.29	0.42
29:A:2783:U:H2'	29:A:2784:U:H6	1.84	0.42
29:A:2840:C:H2'	29:A:2841:C:C6	2.53	0.42
30:B:63:C:H2'	30:B:64:G:C8	2.54	0.42
2:C:136:VAL:HG13	2:C:163:ILE:HG22	2.01	0.42
29:A:528:A:H2'	29:A:529:A:H5''	2.00	0.42
29:A:797:G:H2'	29:A:798:G:C8	2.54	0.42
29:A:1276:A:N6	29:A:1645:G:O6	2.52	0.42
29:A:1299:G:O6	29:A:1639:C:H5''	2.19	0.42
29:A:1733:G:H2'	29:A:1734:G:H8	1.83	0.42
29:A:2047:C:H2'	29:A:2048:G:C8	2.53	0.42
29:A:2411:A:H2'	29:A:2412:A:H8	1.84	0.42
2:C:79:ARG:NH2	2:C:81:GLU:OE2	2.52	0.42
2:C:181:ARG:HG3	2:C:266:ILE:HG12	2.01	0.42
5:F:146:ASP:OD1	5:F:146:ASP:N	2.51	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
16:V:21:ARG:HE	16:V:87:GLN:HA	1.84	0.42
19:Y:37:LEU:HD23	19:Y:37:LEU:O	2.19	0.42
29:A:134:G:H2'	29:A:135:U:C6	2.55	0.42
29:A:239:C:N3	29:A:259:G:N1	2.67	0.42
29:A:1106:G:H2'	29:A:1107:G:H8	1.84	0.42
29:A:1336:A:H2'	29:A:1337:G:C8	2.54	0.42
29:A:1941:C:H1'	31:9:131:LYS:O	2.19	0.42
29:A:2018:G:H2'	29:A:2019:A:C8	2.55	0.42
29:A:2316:G:H2'	29:A:2317:A:C8	2.54	0.42
29:A:2888:C:H2'	29:A:2889:C:H6	1.84	0.42
30:B:72:G:N2	30:B:104:A:H62	2.15	0.42
3:D:11:MET:HB2	3:D:25:THR:HA	2.00	0.42
8:L:78:ARG:HG2	8:L:113:ALA:HB3	2.01	0.42
10:O:87:ILE:O	10:O:87:ILE:HG22	2.19	0.42
11:Q:52:ARG:NH2	29:A:994:C:OP1	2.52	0.42
27:H:97:ARG:HH21	27:H:112:LYS:NZ	2.17	0.42
29:A:48:G:N2	29:A:177:G:OP2	2.52	0.42
29:A:136:G:H2'	29:A:137:U:C6	2.54	0.42
29:A:173:A:H2'	29:A:174:U:C6	2.55	0.42
29:A:1198:U:H2'	29:A:1199:U:C6	2.54	0.42
29:A:1361:G:H2'	29:A:1362:C:C6	2.54	0.42
7:J:30:THR:HG21	29:A:1012:U:O4	2.20	0.42
26:M:44:ARG:HA	26:M:47:GLU:OE2	2.20	0.42
27:H:97:ARG:HH22	29:A:2221:G:P	2.41	0.42
29:A:634:C:H2'	29:A:635:C:C6	2.54	0.42
29:A:641:U:O4	29:A:647:G:O6	2.37	0.42
29:A:2700:A:H2'	29:A:2701:U:C6	2.54	0.42
29:A:2815:C:H2'	29:A:2816:G:C8	2.54	0.42
29:A:2881:U:H2'	29:A:2882:A:C8	2.54	0.42
30:B:115:A:H2'	30:B:116:G:C8	2.53	0.42
12:R:80:ARG:NH1	29:A:572:A:OP2	2.53	0.42
29:A:12:U:O2	29:A:2626:C:H4'	2.20	0.42
29:A:128:C:H2'	29:A:129:C:C6	2.53	0.42
29:A:593:U:H2'	29:A:594:U:H6	1.83	0.42
29:A:600:G:H2'	29:A:601:C:H6	1.84	0.42
29:A:903:C:H2'	29:A:904:G:H8	1.83	0.42
29:A:1022:G:N7	29:A:1140:C:N4	2.68	0.42
29:A:1346:G:N1	29:A:1601:G:C6	2.87	0.42
29:A:2086:U:H2'	29:A:2087:G:C8	2.54	0.42
2:C:77:VAL:HG22	2:C:113:ASP:H	1.84	0.42
2:C:169:ALA:HA	27:H:123:ARG:HH22	1.84	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
5:F:64:PRO:HA	5:F:88:VAL:HG22	2.02	0.42
7:J:15:TRP:CE2	7:J:135:GLN:HG2	2.54	0.42
8:L:132:ARG:HG3	8:L:142:ILE:HG13	2.02	0.42
18:X:41:SER:OG	18:X:42:GLU:OE1	2.26	0.42
18:X:60:LYS:HE2	29:A:372:G:C8	2.54	0.42
20:Z:46:MET:O	20:Z:50:VAL:HG22	2.19	0.42
29:A:1:G:H2'	29:A:2:G:H8	1.84	0.42
29:A:18:U:H2'	29:A:19:A:C8	2.54	0.42
29:A:65:U:H2'	29:A:66:C:H6	1.85	0.42
29:A:161:A:OP2	29:A:162:U:O2'	2.28	0.42
29:A:202:U:H2'	29:A:203:A:O4'	2.19	0.42
29:A:543:G:C2	29:A:551:G:C2	3.08	0.42
29:A:769:U:H2'	29:A:770:G:C8	2.55	0.42
29:A:812:C:H5''	29:A:1250:G:O2'	2.20	0.42
29:A:947:A:H2'	29:A:948:C:C6	2.54	0.42
29:A:1319:C:H2'	29:A:1320:C:C6	2.54	0.42
29:A:1464:G:H2'	29:A:1465:G:H8	1.85	0.42
29:A:1630:A:H2'	29:A:1631:G:O4'	2.19	0.42
29:A:1675:C:H2'	29:A:1676:A:O4'	2.19	0.42
29:A:1727:C:H2'	29:A:1728:C:O4'	2.20	0.42
29:A:1771:C:H2'	29:A:1772:A:C8	2.54	0.42
29:A:2691:C:H2'	29:A:2692:G:C8	2.54	0.42
29:A:2788:C:H2'	29:A:2789:C:H6	1.84	0.42
5:F:62:GLN:HG3	5:F:94:ARG:NH2	2.34	0.42
6:G:140:ILE:HG13	6:G:141:GLY:N	2.35	0.42
10:O:30:ARG:HA	10:O:35:ILE:HG22	2.01	0.42
14:T:61:LEU:HB3	29:A:1341:G:H5'	2.02	0.42
16:V:78:GLN:OE1	30:B:76:G:O2'	2.31	0.42
21:O:16:ARG:NE	29:A:1266:G:OP2	2.48	0.42
29:A:481:G:N1	29:A:507:A:H1'	2.35	0.42
29:A:1267:U:H2'	29:A:1268:A:C8	2.54	0.42
29:A:1409:U:H2'	29:A:1410:G:C8	2.55	0.42
29:A:2391:G:C6	29:A:2427:C:H1'	2.55	0.42
29:A:2464:G:H2'	29:A:2465:C:C6	2.55	0.42
29:A:2644:G:N2	29:A:2733:A:OP2	2.52	0.42
29:A:131:A:H2'	29:A:132:G:C8	2.54	0.42
29:A:282:A:N6	29:A:359:G:O6	2.52	0.42
29:A:492:A:H2'	29:A:493:G:O4'	2.20	0.42
29:A:505:A:O2'	29:A:509:C:O2'	2.26	0.42
29:A:565:C:H2'	29:A:566:U:C6	2.55	0.42
29:A:1153:C:H2'	29:A:1154:G:O4'	2.19	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
29:A:1300:G:H4'	29:A:1301:A:H5''	2.01	0.42
29:A:1308:A:H2'	29:A:1309:G:O4'	2.20	0.42
29:A:1386:C:O2'	29:A:1469:A:N3	2.45	0.42
29:A:1475:G:H1'	29:A:1476:U:H5	1.85	0.42
29:A:2216:G:H2'	29:A:2217:G:H8	1.85	0.42
29:A:2773:C:H2'	29:A:2774:C:H6	1.84	0.42
2:C:227:VAL:HG11	29:A:784:G:C4	2.55	0.42
4:E:48:THR:O	4:E:52:VAL:HG23	2.20	0.42
11:Q:10:ARG:NH2	29:A:28:A:N3	2.68	0.42
16:V:43:ASP:OD2	16:V:46:LYS:NZ	2.40	0.42
18:X:38:TRP:CG	27:H:32:PRO:HA	2.55	0.42
21:0:42:ILE:HD12	21:0:46:GLY:HA2	2.02	0.42
22:1:22:THR:HG21	29:A:2286:G:H1	1.85	0.42
27:H:68:ARG:HG3	27:H:71:LYS:HZ2	1.85	0.42
29:A:538:A:H62	29:A:555:G:H21	1.67	0.42
29:A:932:U:O2'	29:A:934:U:O4	2.25	0.42
29:A:1106:G:H2'	29:A:1107:G:C8	2.55	0.42
29:A:1268:A:H1'	29:A:2013:A:H61	1.84	0.42
29:A:1790:C:H2'	29:A:1791:A:C5	2.55	0.42
29:A:1947:C:H2'	29:A:1948:G:H8	1.84	0.42
29:A:2616:C:H2'	29:A:2617:U:C6	2.54	0.42
31:9:132:SER:OG	31:9:133:SER:N	2.53	0.42
2:C:13:ARG:NH2	29:A:1693:U:O2'	2.52	0.41
6:G:25:ILE:HG13	6:G:78:VAL:HG21	2.01	0.41
8:L:32:GLY:HA2	29:A:1190:G:H5''	2.02	0.41
13:S:109:ASP:OD2	13:S:109:ASP:N	2.53	0.41
24:K:99:ILE:HG13	24:K:115:ILE:HG23	2.02	0.41
29:A:146:A:H2'	29:A:147:C:C6	2.54	0.41
29:A:299:A:H2'	29:A:300:A:C4	2.55	0.41
29:A:611:C:H2'	29:A:612:G:O4'	2.20	0.41
29:A:678:C:H2'	29:A:679:C:C6	2.55	0.41
29:A:1398:C:H2'	29:A:1399:C:H6	1.85	0.41
29:A:1442:U:H2'	29:A:1443:U:H6	1.85	0.41
29:A:1749:A:H2'	29:A:1750:G:C8	2.55	0.41
29:A:2314:A:H2'	29:A:2315:G:H8	1.85	0.41
29:A:2362:C:OP1	32:3:39:ARG:HD2	2.20	0.41
7:J:15:TRP:HE3	7:J:55:ILE:HD11	1.86	0.41
9:N:2:ARG:HH22	29:A:2819:G:P	2.43	0.41
14:T:1:MET:C	14:T:3:ARG:HB2	2.41	0.41
14:T:11:LEU:HD11	14:T:32:LEU:HD13	2.02	0.41
20:Z:26:LEU:HD23	20:Z:26:LEU:HA	1.91	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
24:K:12:ASP:N	24:K:12:ASP:OD1	2.53	0.41
29:A:603:A:N6	29:A:655:A:O4'	2.53	0.41
29:A:640:C:H2'	29:A:641:U:C6	2.55	0.41
29:A:1440:U:H2'	29:A:1441:G:H8	1.86	0.41
29:A:2766:A:N3	29:A:2766:A:H2'	2.35	0.41
30:B:113:C:H2'	30:B:114:C:C6	2.55	0.41
8:L:128:THR:HG23	8:L:131:ALA:H	1.85	0.41
10:O:84:GLU:HG2	10:O:85:LYS:HD3	2.02	0.41
13:S:51:LEU:O	13:S:55:ILE:HG12	2.20	0.41
15:U:88:ASP:O	15:U:90:LYS:N	2.54	0.41
24:K:24:VAL:HG13	24:K:39:ILE:HG22	2.01	0.41
26:M:66:ARG:NH1	26:M:104:GLU:OE2	2.53	0.41
29:A:569:U:H2'	29:A:570:G:O4'	2.20	0.41
29:A:600:G:H2'	29:A:601:C:C6	2.55	0.41
29:A:1067:A:H2'	29:A:1067:A:N3	2.34	0.41
29:A:1130:U:N3	29:A:2025:C:OP1	2.50	0.41
29:A:1259:G:H2'	29:A:1260:A:H8	1.85	0.41
29:A:1380:G:H2'	29:A:1381:G:H8	1.84	0.41
29:A:1398:C:H2'	29:A:1399:C:C6	2.55	0.41
29:A:2037:A:H2'	29:A:2038:G:C8	2.55	0.41
29:A:2062:A:H2'	29:A:2063:C:C6	2.55	0.41
29:A:2193:G:H2'	29:A:2194:U:C6	2.55	0.41
29:A:2193:G:H2'	29:A:2194:U:H6	1.85	0.41
29:A:2290:G:H2'	29:A:2291:U:C6	2.55	0.41
31:9:259:ALA:HB1	31:9:304:LEU:HD21	2.02	0.41
31:9:290:LYS:HA	31:9:290:LYS:HD3	1.81	0.41
2:C:200:MET:N	2:C:200:MET:SD	2.93	0.41
14:T:6:ARG:O	14:T:10:VAL:HG23	2.20	0.41
24:K:92:GLU:O	24:K:93:GLN:NE2	2.54	0.41
29:A:32:C:H2'	29:A:33:C:C6	2.55	0.41
29:A:922:C:H2'	29:A:923:G:C8	2.55	0.41
29:A:1652:A:H2'	29:A:1653:G:O4'	2.21	0.41
29:A:1665:A:H2'	29:A:1666:G:C8	2.54	0.41
29:A:1680:U:H2'	29:A:1681:G:O4'	2.21	0.41
29:A:1909:C:H2'	29:A:1910:G:C8	2.55	0.41
29:A:2645:G:H3'	29:A:2646:C:H5'	2.02	0.41
4:E:148:ILE:HB	4:E:169:VAL:HG22	2.01	0.41
8:L:91:ASP:N	8:L:91:ASP:OD1	2.52	0.41
13:S:28:LYS:H	13:S:31:GLN:HE21	1.69	0.41
16:V:72:VAL:HB	16:V:91:PHE:HB3	2.02	0.41
29:A:151:C:H2'	29:A:152:A:H8	1.85	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
29:A:418:C:H2'	29:A:419:U:C6	2.56	0.41
29:A:487:C:H2'	29:A:488:G:O4'	2.19	0.41
29:A:679:C:H2'	29:A:680:C:C6	2.55	0.41
29:A:2292:U:H2'	29:A:2293:G:C8	2.55	0.41
29:A:2533:U:H2'	29:A:2534:A:O4'	2.20	0.41
29:A:2543:G:H2'	29:A:2544:G:C8	2.55	0.41
29:A:2889:C:H2'	29:A:2890:G:O4'	2.21	0.41
2:C:12:ARG:HA	2:C:15:VAL:HG23	2.02	0.41
3:D:59:ARG:HG3	29:A:2830:C:OP1	2.21	0.41
5:F:65:LEU:HD11	30:B:41:G:C8	2.55	0.41
5:F:169:LEU:HB3	5:F:174:PHE:HB3	2.02	0.41
21:O:40:HIS:HE2	29:A:2884:U:P	2.43	0.41
24:K:10:VAL:HG21	24:K:16:ALA:O	2.20	0.41
29:A:242:G:N2	29:A:255:A:OP2	2.36	0.41
29:A:393:C:C2	29:A:394:C:C5	3.09	0.41
29:A:540:C:N4	29:A:541:A:H62	2.18	0.41
29:A:598:U:H2'	29:A:599:A:H8	1.84	0.41
29:A:809:G:H2'	29:A:810:U:C6	2.55	0.41
29:A:858:G:H3'	29:A:859:G:C8	2.55	0.41
29:A:1387:A:H5'	29:A:1469:A:H1'	2.03	0.41
29:A:1667:G:O2'	29:A:1991:U:O4	2.38	0.41
29:A:2247:A:H2'	29:A:2248:C:C6	2.55	0.41
29:A:2368:C:H2'	29:A:2369:A:C8	2.56	0.41
29:A:2462:C:H2'	29:A:2463:C:C6	2.56	0.41
29:A:2508:G:H5'	31:9:76:ARG:HH22	1.86	0.41
29:A:2560:A:H2'	29:A:2561:U:C6	2.55	0.41
29:A:2816:G:H2'	29:A:2817:U:H6	1.84	0.41
2:C:176:ARG:HA	2:C:176:ARG:HD2	1.87	0.41
6:G:100:ASN:O	6:G:100:ASN:OD1	2.39	0.41
19:Y:21:LEU:O	19:Y:25:GLN:HB3	2.21	0.41
29:A:671:C:H2'	29:A:672:C:C6	2.55	0.41
29:A:1264:A:O5'	29:A:1265:A:H2'	2.20	0.41
29:A:2128:G:H2'	29:A:2129:C:C6	2.55	0.41
29:A:2413:G:C4	29:A:2414:G:C8	3.09	0.41
29:A:2425:A:H5''	29:A:2427:C:O4'	2.21	0.41
29:A:2549:G:H2'	29:A:2550:G:C8	2.53	0.41
4:E:105:LEU:HD23	4:E:200:LEU:HD13	2.02	0.41
24:K:66:LYS:HZ3	24:K:80:ASP:HA	1.84	0.41
27:H:10:ALA:O	27:H:12:LEU:HD23	2.21	0.41
29:A:19:A:H2'	29:A:20:C:C6	2.56	0.41
29:A:413:C:H2'	29:A:414:C:C6	2.55	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
29:A:592:A:H2'	29:A:593:U:C6	2.56	0.41
29:A:593:U:H2'	29:A:594:U:C6	2.56	0.41
29:A:638:G:H2'	29:A:639:U:C6	2.56	0.41
29:A:1437:C:O2'	29:A:1516:G:O2'	2.27	0.41
29:A:1841:U:C2	29:A:1842:G:C8	3.08	0.41
29:A:2191:A:H2'	29:A:2192:U:H6	1.84	0.41
29:A:2283:C:OP2	29:A:2389:G:O2'	2.37	0.41
29:A:2644:G:O6	29:A:2771:C:N4	2.54	0.41
2:C:55:GLY:H	29:A:692:C:P	2.44	0.41
2:C:56:GLY:HA2	2:C:212:TRP:HA	2.02	0.41
2:C:218:THR:O	29:A:1789:A:H5''	2.21	0.41
5:F:127:TYR:CE1	5:F:169:LEU:HD21	2.56	0.41
7:J:57:LEU:HD21	7:J:130:HIS:HB3	2.03	0.41
8:L:29:LYS:HB2	12:R:82:HIS:CD2	2.56	0.41
8:L:57:LEU:HD13	8:L:60:ARG:HH11	1.86	0.41
14:T:2:ILE:HG12	14:T:49:LYS:HE3	2.03	0.41
14:T:38:ALA:HB1	14:T:43:ILE:HD11	2.03	0.41
21:O:30:ASP:HB3	21:O:34:GLY:N	2.35	0.41
29:A:7:G:H2'	29:A:8:C:C6	2.55	0.41
29:A:243:U:H2'	29:A:244:A:C8	2.55	0.41
29:A:367:G:C6	29:A:368:A:C6	3.09	0.41
29:A:963:U:H2'	29:A:964:C:C6	2.56	0.41
29:A:1592:C:H2'	29:A:1593:A:C8	2.56	0.41
29:A:1826:G:H2'	29:A:1827:U:H6	1.86	0.41
29:A:1918:A:O2'	29:A:1919:A:N7	2.39	0.41
29:A:2017:U:O2'	29:A:2019:A:OP2	2.35	0.41
29:A:2166:U:O4	29:A:2170:A:N6	2.46	0.41
29:A:2411:A:H2'	29:A:2412:A:C8	2.56	0.41
4:E:146:VAL:HG21	4:E:187:VAL:HG23	2.03	0.41
5:F:118:ALA:HB1	5:F:166:ARG:CZ	2.50	0.41
9:N:37:THR:HA	9:N:109:PRO:O	2.21	0.41
15:U:24:VAL:HA	15:U:35:VAL:HG22	2.02	0.41
17:W:37:ARG:HH12	29:A:2262:U:H5''	1.86	0.41
18:X:14:GLY:HA3	18:X:28:PHE:HE2	1.86	0.41
19:Y:9:LYS:NZ	19:Y:11:VAL:HG23	2.36	0.41
29:A:64:A:H2'	29:A:65:U:C6	2.55	0.41
29:A:116:C:H2'	29:A:117:G:O4'	2.21	0.41
29:A:249:C:OP2	29:A:2394:C:O2'	2.27	0.41
29:A:640:C:C2	29:A:641:U:C5	3.08	0.41
29:A:1880:U:H2'	29:A:1881:C:H6	1.85	0.41
29:A:2615:U:H2'	29:A:2616:C:C6	2.56	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
30:B:33:G:H2'	30:B:34:A:C8	2.56	0.41
5:F:26:GLN:HG3	30:B:57:A:O2'	2.20	0.40
15:U:81:ARG:HH11	29:A:300:A:P	2.44	0.40
25:P:51:ASN:O	29:A:2845:U:H5''	2.21	0.40
26:M:29:GLY:HA2	26:M:106:ASP:OD2	2.20	0.40
29:A:29:U:H2'	29:A:30:G:H8	1.85	0.40
29:A:116:C:H1'	29:A:127:A:N3	2.36	0.40
29:A:175:G:H2'	29:A:176:A:H8	1.84	0.40
29:A:518:G:H2'	29:A:519:U:C6	2.57	0.40
29:A:594:U:H2'	29:A:595:C:H6	1.86	0.40
29:A:660:C:H2'	29:A:661:A:H8	1.87	0.40
29:A:910:A:H1'	29:A:2264:C:O2'	2.21	0.40
29:A:1213:A:H4'	29:A:1238:G:H21	1.85	0.40
29:A:2292:U:H2'	29:A:2293:G:H8	1.86	0.40
29:A:2514:U:H2'	29:A:2515:C:H6	1.86	0.40
32:3:25:HIS:HD1	32:3:43:LEU:HD23	1.85	0.40
5:F:137:PHE:HE2	5:F:151:LEU:HD22	1.86	0.40
7:J:81:ILE:HD11	29:A:2514:U:H4'	2.03	0.40
10:O:43:ASN:OD1	10:O:44:GLY:N	2.54	0.40
14:T:8:LEU:HD21	19:Y:21:LEU:O	2.21	0.40
29:A:225:C:H2'	29:A:226:A:O4'	2.22	0.40
29:A:554:U:H2'	29:A:555:G:O4'	2.20	0.40
29:A:1233:C:H2'	29:A:1234:U:H6	1.86	0.40
29:A:1837:C:O2'	29:A:1927:A:N3	2.41	0.40
29:A:2255:G:C6	29:A:2256:G:C5	3.09	0.40
29:A:2464:G:H2'	29:A:2465:C:H6	1.86	0.40
29:A:2567:G:H2'	29:A:2568:U:C6	2.57	0.40
29:A:2895:G:H2'	29:A:2896:C:C6	2.55	0.40
31:9:256:VAL:HA	31:9:300:ILE:HD11	2.03	0.40
2:C:77:VAL:HG11	2:C:109:LEU:HD21	2.02	0.40
2:C:229:HIS:CD2	2:C:246:PRO:HB3	2.56	0.40
8:L:21:ARG:HD3	8:L:21:ARG:HA	1.91	0.40
9:N:38:LEU:HD23	9:N:109:PRO:HB2	2.03	0.40
11:Q:58:GLN:HA	11:Q:61:ILE:HG22	2.03	0.40
16:V:10:LYS:HD2	16:V:11:GLU:HB2	2.04	0.40
17:W:52:ASP:OD1	17:W:54:THR:OG1	2.37	0.40
19:Y:22:LEU:HD23	19:Y:23:ARG:HD3	2.03	0.40
29:A:63:A:H2'	29:A:64:A:C8	2.55	0.40
29:A:170:U:H2'	29:A:171:U:C6	2.56	0.40
29:A:197:A:H62	29:A:2430:A:H2'	1.86	0.40
29:A:1257:C:H2'	29:A:1258:U:C6	2.57	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
29:A:1649:G:H2'	29:A:1650:A:H8	1.87	0.40
29:A:2191:A:H2'	29:A:2192:U:C6	2.56	0.40
29:A:2313:C:H2'	29:A:2314:A:C8	2.54	0.40
2:C:211:ARG:NH2	29:A:764:A:N3	2.69	0.40
3:D:4:LEU:HD23	3:D:101:PHE:CZ	2.56	0.40
5:F:59:ILE:HD13	5:F:139:GLU:HB2	2.03	0.40
11:Q:54:ARG:HH11	29:A:1155:A:H5''	1.87	0.40
23:2:21:ARG:O	23:2:27:GLY:HA3	2.22	0.40
29:A:206:U:C2	29:A:207:A:C8	3.09	0.40
29:A:1282:U:H2'	29:A:1283:G:O4'	2.22	0.40
29:A:1387:A:H2'	29:A:1388:G:C8	2.57	0.40
29:A:2243:U:H2'	29:A:2244:U:C6	2.55	0.40
29:A:2543:G:H2'	29:A:2544:G:H8	1.87	0.40
29:A:2881:U:H2'	29:A:2882:A:H8	1.87	0.40
30:B:95:U:H2'	30:B:96:G:C8	2.55	0.40
30:B:106:G:H2'	30:B:107:G:O4'	2.20	0.40
31:9:217:LEU:HD11	31:9:265:GLU:OE2	2.21	0.40
2:C:155:ARG:HB2	29:A:1818:U:H2'	2.03	0.40
2:C:211:ARG:HD2	2:C:211:ARG:HA	1.89	0.40
3:D:114:LYS:NZ	29:A:2723:C:OP1	2.43	0.40
14:T:58:VAL:HG22	14:T:85:VAL:HG22	2.03	0.40
15:U:73:ASN:HD21	15:U:98:ASN:ND2	2.20	0.40
18:X:11:PRO:HB2	18:X:27:ARG:HH21	1.85	0.40
29:A:169:G:H2'	29:A:170:U:C6	2.56	0.40
29:A:287:G:O6	29:A:354:A:N6	2.55	0.40
29:A:359:G:H2'	29:A:360:U:C6	2.56	0.40
29:A:521:U:H2'	29:A:522:A:H8	1.87	0.40
29:A:549:G:H5''	29:A:550:C:C6	2.57	0.40
29:A:971:G:H2'	29:A:972:A:O4'	2.22	0.40
29:A:1254:A:H5''	29:A:1255:U:H5''	2.04	0.40
29:A:1380:G:H2'	29:A:1381:G:C8	2.56	0.40
29:A:1462:C:C2	29:A:1463:C:C5	3.09	0.40
29:A:1738:G:HO2'	29:A:1739:A:H8	1.69	0.40
29:A:1742:U:H2'	29:A:1743:G:O4'	2.21	0.40
29:A:2240:U:H2'	29:A:2241:A:H8	1.87	0.40
29:A:2437:G:H2'	29:A:2438:U:C6	2.56	0.40
29:A:2845:U:H2'	29:A:2846:G:H8	1.86	0.40
30:B:19:C:H2'	30:B:20:G:C8	2.56	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	
1	g	36/38 (95%)	35 (97%)	1 (3%)	0	100	100
2	C	269/273 (98%)	258 (96%)	11 (4%)	0	100	100
3	D	207/209 (99%)	195 (94%)	12 (6%)	0	100	100
4	E	189/201 (94%)	180 (95%)	9 (5%)	0	100	100
5	F	175/179 (98%)	163 (93%)	12 (7%)	0	100	100
6	G	174/177 (98%)	165 (95%)	9 (5%)	0	100	100
7	J	140/142 (99%)	136 (97%)	4 (3%)	0	100	100
8	L	142/144 (99%)	129 (91%)	13 (9%)	0	100	100
9	N	118/120 (98%)	112 (95%)	6 (5%)	0	100	100
10	O	114/117 (97%)	109 (96%)	5 (4%)	0	100	100
11	Q	115/118 (98%)	111 (96%)	4 (4%)	0	100	100
12	R	101/103 (98%)	100 (99%)	1 (1%)	0	100	100
13	S	108/110 (98%)	105 (97%)	3 (3%)	0	100	100
14	T	91/100 (91%)	85 (93%)	6 (7%)	0	100	100
15	U	100/104 (96%)	91 (91%)	9 (9%)	0	100	100
16	V	92/94 (98%)	91 (99%)	1 (1%)	0	100	100
17	W	74/85 (87%)	71 (96%)	3 (4%)	0	100	100
18	X	75/78 (96%)	74 (99%)	1 (1%)	0	100	100
19	Y	61/63 (97%)	54 (88%)	7 (12%)	0	100	100
20	Z	56/59 (95%)	55 (98%)	1 (2%)	0	100	100
21	0	54/57 (95%)	52 (96%)	2 (4%)	0	100	100
22	1	48/55 (87%)	48 (100%)	0	0	100	100
23	2	44/46 (96%)	43 (98%)	1 (2%)	0	100	100
24	K	120/123 (98%)	114 (95%)	6 (5%)	0	100	100
25	P	111/115 (96%)	108 (97%)	3 (3%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
26	M	134/136 (98%)	131 (98%)	3 (2%)	0	100	100
27	H	147/149 (99%)	131 (89%)	16 (11%)	0	100	100
28	d	45/70 (64%)	44 (98%)	1 (2%)	0	100	100
31	9	336/390 (86%)	321 (96%)	15 (4%)	0	100	100
32	3	62/65 (95%)	59 (95%)	1 (2%)	2 (3%)	3	26
All	All	3538/3720 (95%)	3370 (95%)	166 (5%)	2 (0%)	50	81

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
32	3	31	ILE
32	3	32	LEU

### 5.3.2 Protein sidechains [i](#)

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	
1	g	34/34 (100%)	34 (100%)	0	100	100
2	C	216/218 (99%)	214 (99%)	2 (1%)	75	83
3	D	164/164 (100%)	163 (99%)	1 (1%)	84	88
4	E	159/165 (96%)	159 (100%)	0	100	100
5	F	148/150 (99%)	147 (99%)	1 (1%)	81	86
6	G	137/138 (99%)	133 (97%)	4 (3%)	37	58
7	J	116/116 (100%)	114 (98%)	2 (2%)	56	72
8	L	103/103 (100%)	103 (100%)	0	100	100
9	N	100/100 (100%)	100 (100%)	0	100	100
10	O	86/87 (99%)	86 (100%)	0	100	100
11	Q	89/90 (99%)	89 (100%)	0	100	100
12	R	84/84 (100%)	84 (100%)	0	100	100
13	S	93/93 (100%)	93 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
14	T	80/84 (95%)	80 (100%)	0	100	100
15	U	83/85 (98%)	83 (100%)	0	100	100
16	V	78/78 (100%)	77 (99%)	1 (1%)	65	77
17	W	57/63 (90%)	57 (100%)	0	100	100
18	X	67/68 (98%)	67 (100%)	0	100	100
19	Y	55/55 (100%)	54 (98%)	1 (2%)	54	71
20	Z	48/49 (98%)	48 (100%)	0	100	100
21	0	47/48 (98%)	47 (100%)	0	100	100
22	1	45/49 (92%)	44 (98%)	1 (2%)	47	65
23	2	38/38 (100%)	37 (97%)	1 (3%)	41	61
24	K	103/104 (99%)	103 (100%)	0	100	100
25	P	98/100 (98%)	98 (100%)	0	100	100
26	M	109/109 (100%)	108 (99%)	1 (1%)	75	83
27	H	114/114 (100%)	110 (96%)	4 (4%)	31	53
28	d	43/62 (69%)	42 (98%)	1 (2%)	45	64
31	9	273/321 (85%)	271 (99%)	2 (1%)	81	86
32	3	51/52 (98%)	51 (100%)	0	100	100
All	All	2918/3021 (97%)	2896 (99%)	22 (1%)	77	84

All (22) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
2	C	96	LYS
2	C	174	ARG
3	D	33	ARG
5	F	79	ARG
6	G	68	ARG
6	G	72	ASN
6	G	174	LYS
6	G	175	LYS
7	J	96	ARG
7	J	128	ASN
16	V	10	LYS
19	Y	38	GLN
22	1	27	ARG
23	2	28	ARG

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Mol	Chain	Res	Type
26	M	60	GLN
27	H	41	LYS
27	H	42	LYS
27	H	57	LYS
27	H	68	ARG
28	d	8	LYS
31	9	95	ARG
31	9	110	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (4) such sidechains are listed below:

Mol	Chain	Res	Type
1	g	37	GLN
5	F	126	ASN
15	U	73	ASN
16	V	87	GLN

### 5.3.3 RNA [i](#)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
29	A	2895/2904 (99%)	390 (13%)	9 (0%)
30	B	118/119 (99%)	9 (7%)	0
All	All	3013/3023 (99%)	399 (13%)	9 (0%)

All (399) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
29	A	10	A
29	A	12	U
29	A	14	A
29	A	27	G
29	A	46	G
29	A	51	G
29	A	63	A
29	A	71	A
29	A	74	A
29	A	75	G
29	A	84	A
29	A	102	U
29	A	103	A

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
29	A	118	A
29	A	120	U
29	A	125	A
29	A	138	U
29	A	139	U
29	A	140	C
29	A	142	A
29	A	160	A
29	A	163	C
29	A	181	A
29	A	196	A
29	A	199	A
29	A	215	G
29	A	216	A
29	A	221	A
29	A	222	A
29	A	230	G
29	A	233	A
29	A	248	G
29	A	255	A
29	A	265	A
29	A	266	G
29	A	267	C
29	A	271	G
29	A	272	A
29	A	278	A
29	A	302	C
29	A	311	A
29	A	329	G
29	A	330	A
29	A	331	C
29	A	352	A
29	A	353	C
29	A	371	A
29	A	372	G
29	A	386	G
29	A	396	G
29	A	401	A
29	A	404	A
29	A	405	U
29	A	411	G
29	A	424	G

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
29	A	430	A
29	A	451	U
29	A	480	A
29	A	481	G
29	A	491	G
29	A	504	A
29	A	505	A
29	A	510	C
29	A	532	A
29	A	543	G
29	A	544	C
29	A	546	U
29	A	547	A
29	A	548	G
29	A	550	C
29	A	563	A
29	A	573	U
29	A	575	A
29	A	586	A
29	A	603	A
29	A	613	A
29	A	615	U
29	A	621	A
29	A	627	A
29	A	637	A
29	A	646	U
29	A	647	G
29	A	654	A
29	A	655	A
29	A	686	U
29	A	726	G
29	A	729	G
29	A	730	A
29	A	747	U
29	A	752	A
29	A	764	A
29	A	775	G
29	A	776	G
29	A	782	A
29	A	784	G
29	A	785	G
29	A	789	A

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
29	A	792	A
29	A	805	G
29	A	812	C
29	A	819	A
29	A	827	U
29	A	828	U
29	A	830	G
29	A	845	A
29	A	846	U
29	A	847	U
29	A	857	G
29	A	860	U
29	A	878	A
29	A	884	U
29	A	885	C
29	A	896	A
29	A	907	G
29	A	910	A
29	A	915	C
29	A	931	U
29	A	941	A
29	A	946	C
29	A	953	G
29	A	961	C
29	A	973	A
29	A	974	G
29	A	983	A
29	A	995	C
29	A	996	A
29	A	1009	A
29	A	1012	U
29	A	1013	C
29	A	1022	G
29	A	1026	G
29	A	1027	A
29	A	1033	U
29	A	1044	C
29	A	1046	A
29	A	1047	G
29	A	1058	U
29	A	1061	U
29	A	1066	U

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
29	A	1068	G
29	A	1069	A
29	A	1070	A
29	A	1071	G
29	A	1074	G
29	A	1081	U
29	A	1087	G
29	A	1089	A
29	A	1098	A
29	A	1101	U
29	A	1110	G
29	A	1112	G
29	A	1116	G
29	A	1132	U
29	A	1133	A
29	A	1135	C
29	A	1136	G
29	A	1141	U
29	A	1142	A
29	A	1157	G
29	A	1171	G
29	A	1172	C
29	A	1173	U
29	A	1175	A
29	A	1176	U
29	A	1180	U
29	A	1212	G
29	A	1225	G
29	A	1236	G
29	A	1238	G
29	A	1250	G
29	A	1253	A
29	A	1256	G
29	A	1266	G
29	A	1272	A
29	A	1294	U
29	A	1300	G
29	A	1301	A
29	A	1302	A
29	A	1314	C
29	A	1321	A
29	A	1325	U

*Continued on next page...*

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
29	A	1329	U
29	A	1345	C
29	A	1365	A
29	A	1368	G
29	A	1378	A
29	A	1379	U
29	A	1383	A
29	A	1416	G
29	A	1419	A
29	A	1420	A
29	A	1428	C
29	A	1452	G
29	A	1453	A
29	A	1458	U
29	A	1461	C
29	A	1467	U
29	A	1482	G
29	A	1490	A
29	A	1493	C
29	A	1504	A
29	A	1515	A
29	A	1523	U
29	A	1524	G
29	A	1533	C
29	A	1535	A
29	A	1548	A
29	A	1555	G
29	A	1556	C
29	A	1566	A
29	A	1569	A
29	A	1583	A
29	A	1585	C
29	A	1603	A
29	A	1607	C
29	A	1608	A
29	A	1634	A
29	A	1646	C
29	A	1647	U
29	A	1648	U
29	A	1654	A
29	A	1667	G
29	A	1674	G

*Continued on next page...*

*Continued from previous page...*

<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
29	A	1715	G
29	A	1729	U
29	A	1730	C
29	A	1732	C
29	A	1736	U
29	A	1737	G
29	A	1738	G
29	A	1764	C
29	A	1773	A
29	A	1791	A
29	A	1800	C
29	A	1801	A
29	A	1808	A
29	A	1816	C
29	A	1829	A
29	A	1870	C
29	A	1914	C
29	A	1926	U
29	A	1927	A
29	A	1930	G
29	A	1931	U
29	A	1937	A
29	A	1944	U
29	A	1955	U
29	A	1967	C
29	A	1970	A
29	A	1971	U
29	A	1972	G
29	A	1991	U
29	A	1992	G
29	A	1993	U
29	A	1997	C
29	A	2013	A
29	A	2021	C
29	A	2022	U
29	A	2023	C
29	A	2025	C
29	A	2030	A
29	A	2031	A
29	A	2043	C
29	A	2055	C
29	A	2056	G

*Continued on next page...*

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
29	A	2060	A
29	A	2061	G
29	A	2062	A
29	A	2069	G
29	A	2072	C
29	A	2093	G
29	A	2096	C
29	A	2102	G
29	A	2110	G
29	A	2111	U
29	A	2112	G
29	A	2116	G
29	A	2117	A
29	A	2118	U
29	A	2119	A
29	A	2122	U
29	A	2126	A
29	A	2128	G
29	A	2132	U
29	A	2133	G
29	A	2136	G
29	A	2147	A
29	A	2148	G
29	A	2157	G
29	A	2164	C
29	A	2165	C
29	A	2170	A
29	A	2171	A
29	A	2172	U
29	A	2173	A
29	A	2178	C
29	A	2198	A
29	A	2199	A
29	A	2204	G
29	A	2211	A
29	A	2225	A
29	A	2226	C
29	A	2238	G
29	A	2239	G
29	A	2283	C
29	A	2287	A
29	A	2288	A

*Continued on next page...*

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
29	A	2297	A
29	A	2305	U
29	A	2308	G
29	A	2311	A
29	A	2325	G
29	A	2327	A
29	A	2333	A
29	A	2335	A
29	A	2336	A
29	A	2343	U
29	A	2344	U
29	A	2350	C
29	A	2361	G
29	A	2383	G
29	A	2385	C
29	A	2402	U
29	A	2406	A
29	A	2425	A
29	A	2426	A
29	A	2428	G
29	A	2429	G
29	A	2430	A
29	A	2435	A
29	A	2441	U
29	A	2447	G
29	A	2448	A
29	A	2475	C
29	A	2476	A
29	A	2478	A
29	A	2491	U
29	A	2494	G
29	A	2498	C
29	A	2502	G
29	A	2504	U
29	A	2505	G
29	A	2506	U
29	A	2513	A
29	A	2518	A
29	A	2520	C
29	A	2525	G
29	A	2529	G
29	A	2531	A

*Continued on next page...*



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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
29	A	2554	U
29	A	2564	A
29	A	2566	A
29	A	2567	G
29	A	2572	A
29	A	2602	A
29	A	2609	U
29	A	2613	U
29	A	2615	U
29	A	2629	U
29	A	2639	A
29	A	2646	C
29	A	2647	U
29	A	2661	G
29	A	2662	A
29	A	2685	G
29	A	2689	U
29	A	2690	U
29	A	2714	G
29	A	2718	G
29	A	2726	A
29	A	2729	G
29	A	2733	A
29	A	2744	G
29	A	2748	A
29	A	2757	A
29	A	2765	A
29	A	2778	A
29	A	2791	G
29	A	2798	U
29	A	2801	G
29	A	2818	U
29	A	2820	A
29	A	2835	A
29	A	2850	A
29	A	2867	G
29	A	2872	A
29	A	2873	A
29	A	2880	C
29	A	2884	U
29	A	2886	A
30	B	15	A

*Continued on next page...*

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Mol	Chain	Res	Type
30	B	35	C
30	B	36	C
30	B	41	G
30	B	44	G
30	B	89	U
30	B	90	C
30	B	99	A
30	B	109	A

All (9) RNA pucker outliers are listed below:

Mol	Chain	Res	Type
29	A	271	G
29	A	404	A
29	A	1057	A
29	A	1328	A
29	A	1378	A
29	A	2127	G
29	A	2425	A
29	A	2505	G
29	A	2756	U

## 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](#)

Of 5 ligands modelled in this entry, 4 are monoatomic - leaving 1 for Mogul analysis.

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
35	GNP	9	402	34	29,34,34	1.66	7 (24%)	33,54,54	2.18	4 (12%)

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
35	GNP	9	402	34	-	2/14/38/38	0/3/3/3

All (7) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
35	9	402	GNP	PB-O3A	4.59	1.64	1.59
35	9	402	GNP	PB-O1B	3.25	1.51	1.46
35	9	402	GNP	C6-N1	3.21	1.38	1.33
35	9	402	GNP	PG-N3B	3.04	1.71	1.63
35	9	402	GNP	PG-O1G	2.84	1.50	1.46
35	9	402	GNP	PB-O2B	-2.27	1.50	1.56
35	9	402	GNP	C5-C6	2.06	1.44	1.41

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
35	9	402	GNP	C5-C6-N1	-8.61	111.91	123.42
35	9	402	GNP	C2-N1-C6	6.63	125.18	115.96
35	9	402	GNP	N3-C2-N1	-2.84	123.60	127.21
35	9	402	GNP	C2-N3-C4	-2.47	112.82	115.48

There are no chirality outliers.

All (2) torsion outliers are listed below:

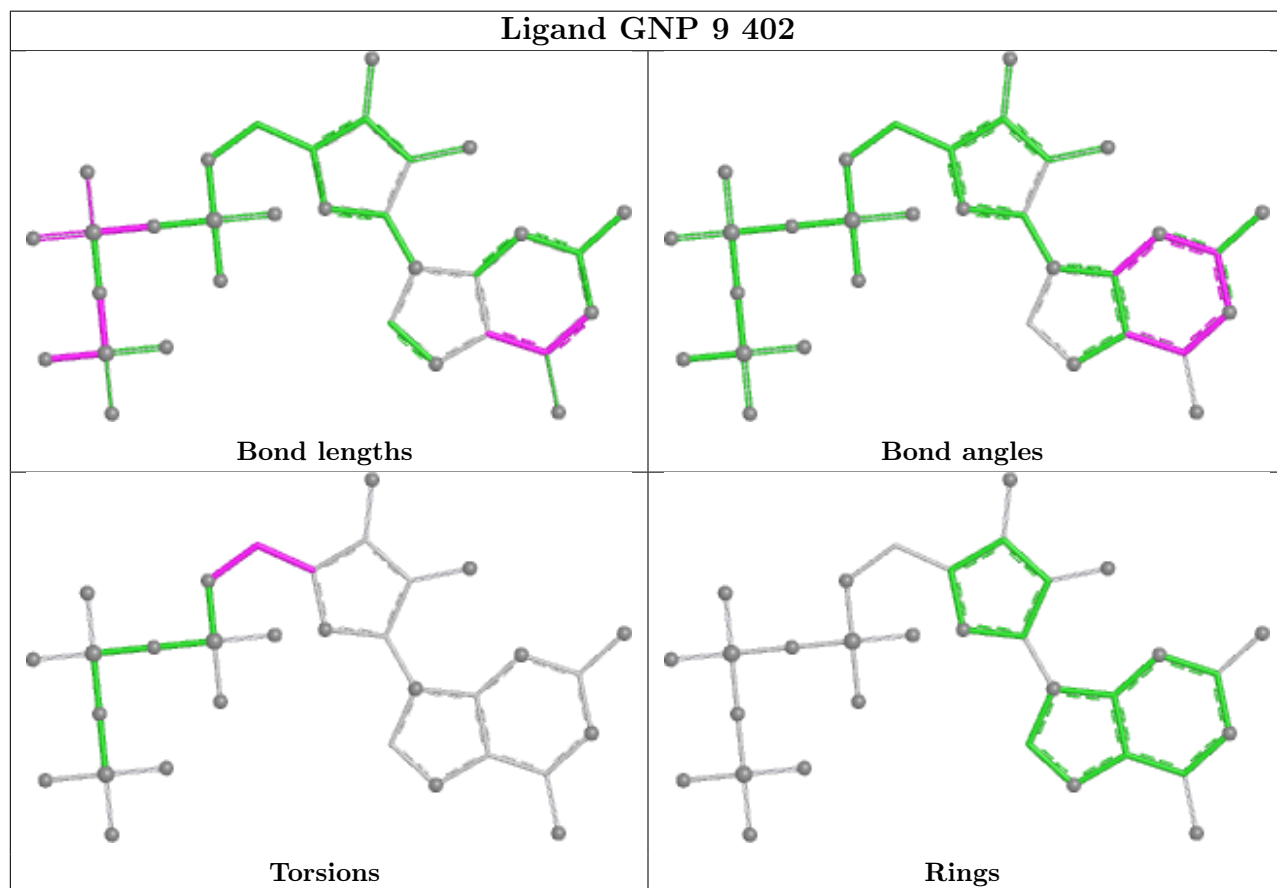
Mol	Chain	Res	Type	Atoms
35	9	402	GNP	C4'-C5'-O5'-PA
35	9	402	GNP	O4'-C4'-C5'-O5'

There are no ring outliers.

1 monomer is involved in 2 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
35	9	402	GNP	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

There are no chain breaks in this entry.

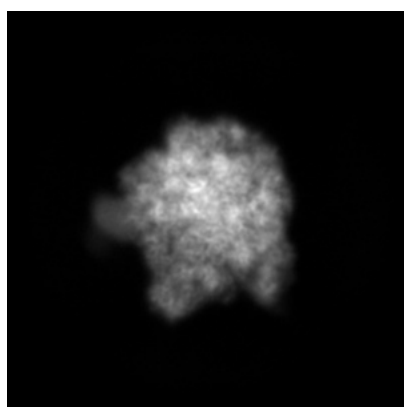
## 6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-12219. These allow visual inspection of the internal detail of the map and identification of artifacts.

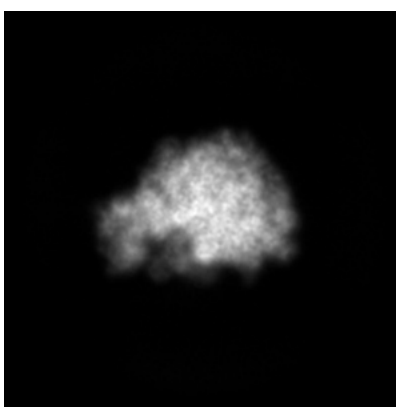
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

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

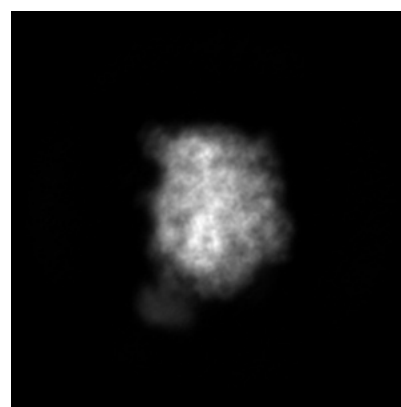
#### 6.1.1 Primary map



X



Y

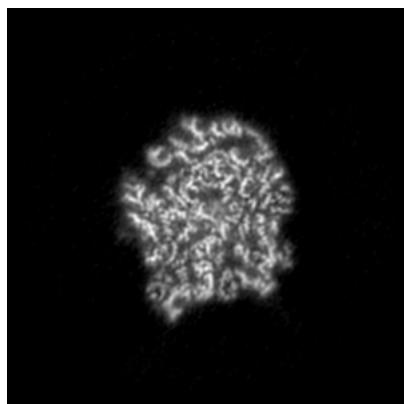


Z

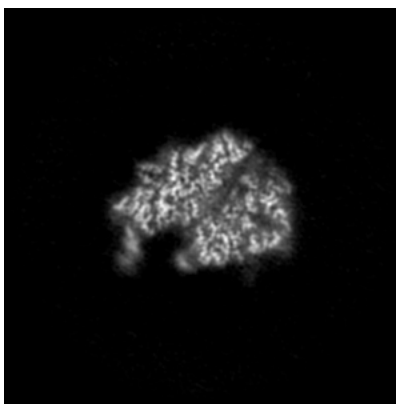
The images above show the map projected in three orthogonal directions.

### 6.2 Central slices [i](#)

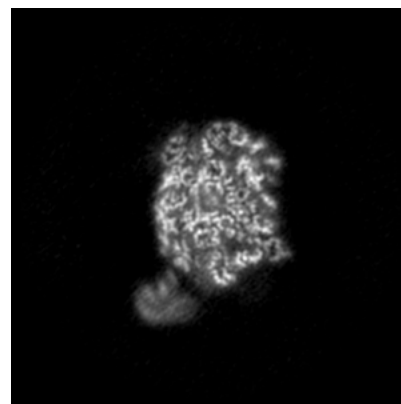
#### 6.2.1 Primary map



X Index: 120



Y Index: 120

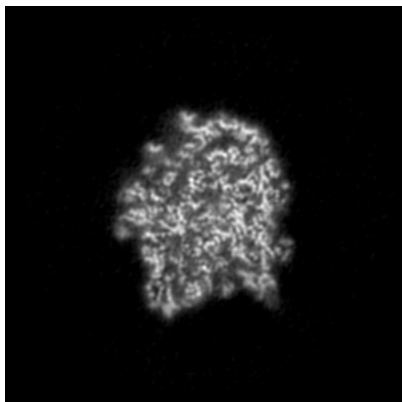


Z Index: 120

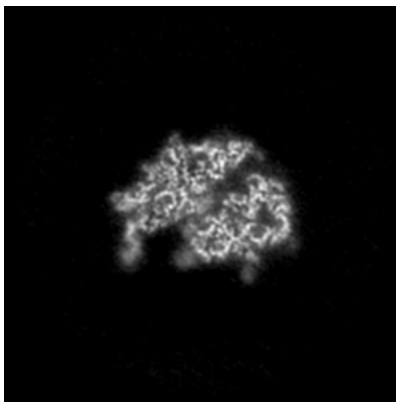
The images above show central slices of the map in three orthogonal directions.

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

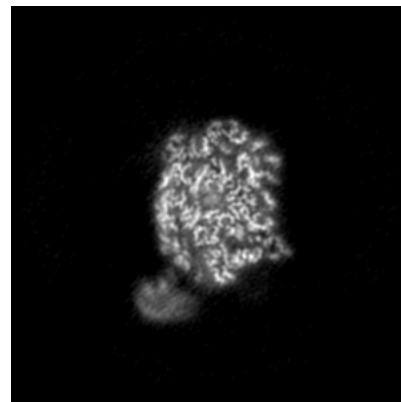
### 6.3.1 Primary map



X Index: 117



Y Index: 123

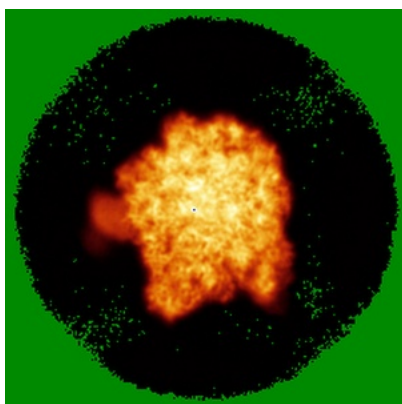


Z Index: 119

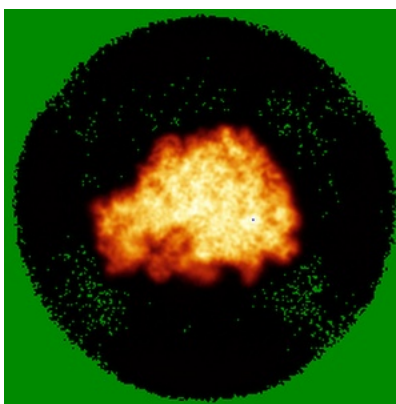
The images above show the largest variance slices of the map in three orthogonal directions.

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

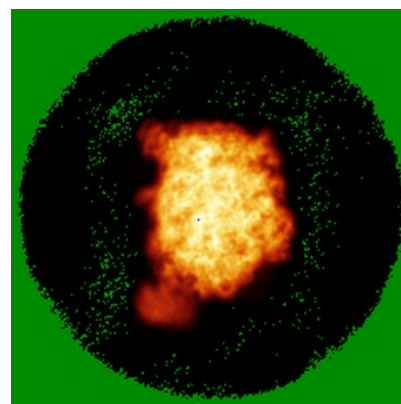
### 6.4.1 Primary map



X



Y

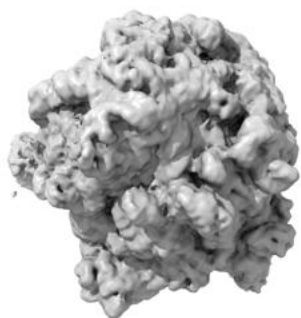


Z

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](#)

### 6.5.1 Primary map



X



Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.5. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

## 6.6 Mask visualisation [i](#)

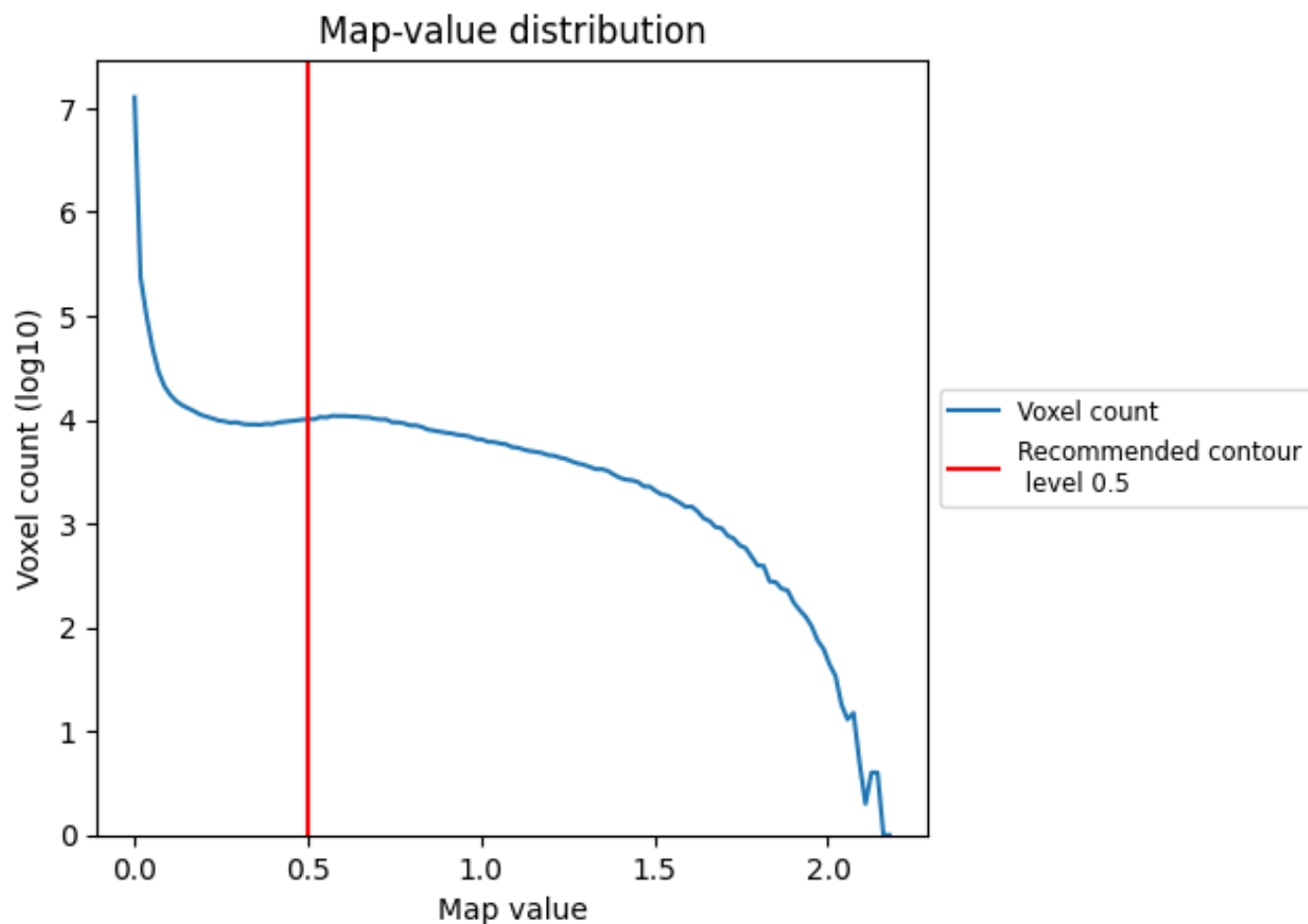
This section was not generated. No masks/segmentation were deposited.



## 7 Map analysis [i](#)

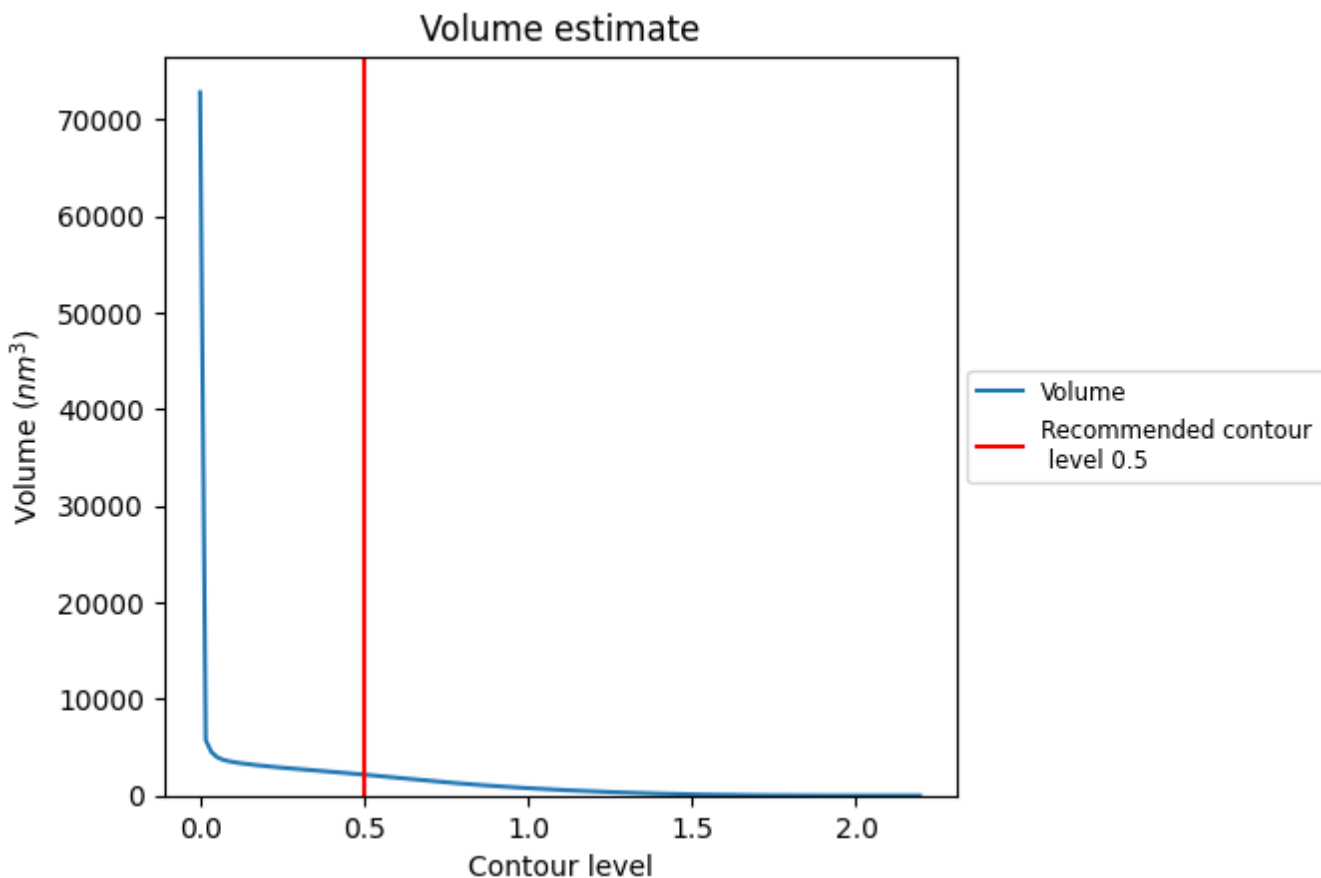
This section contains the results of statistical analysis of the map.

### 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.

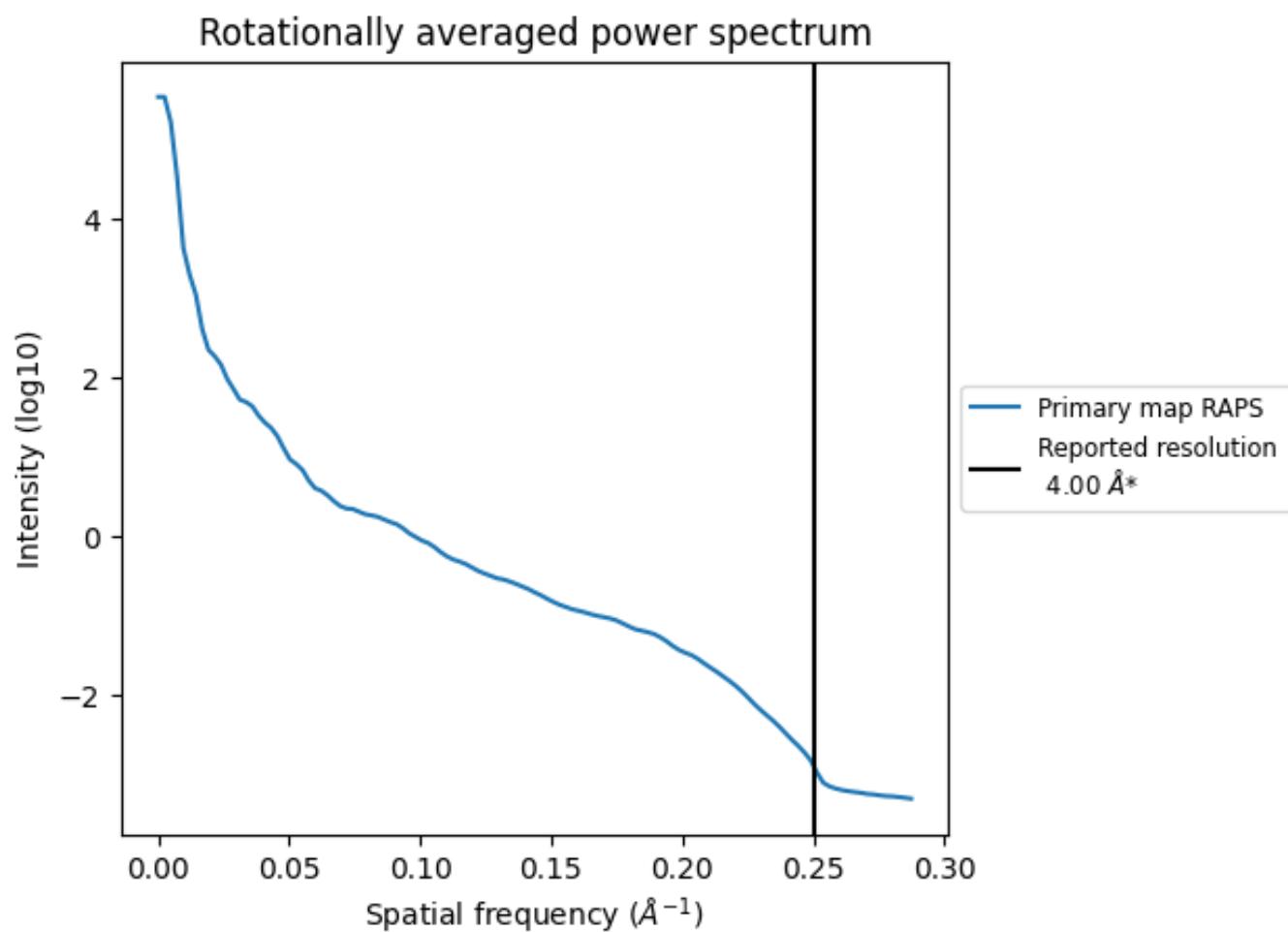
## 7.2 Volume estimate [i](#)



The volume at the recommended contour level is 2171 nm<sup>3</sup>; this corresponds to an approximate mass of 1962 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 i

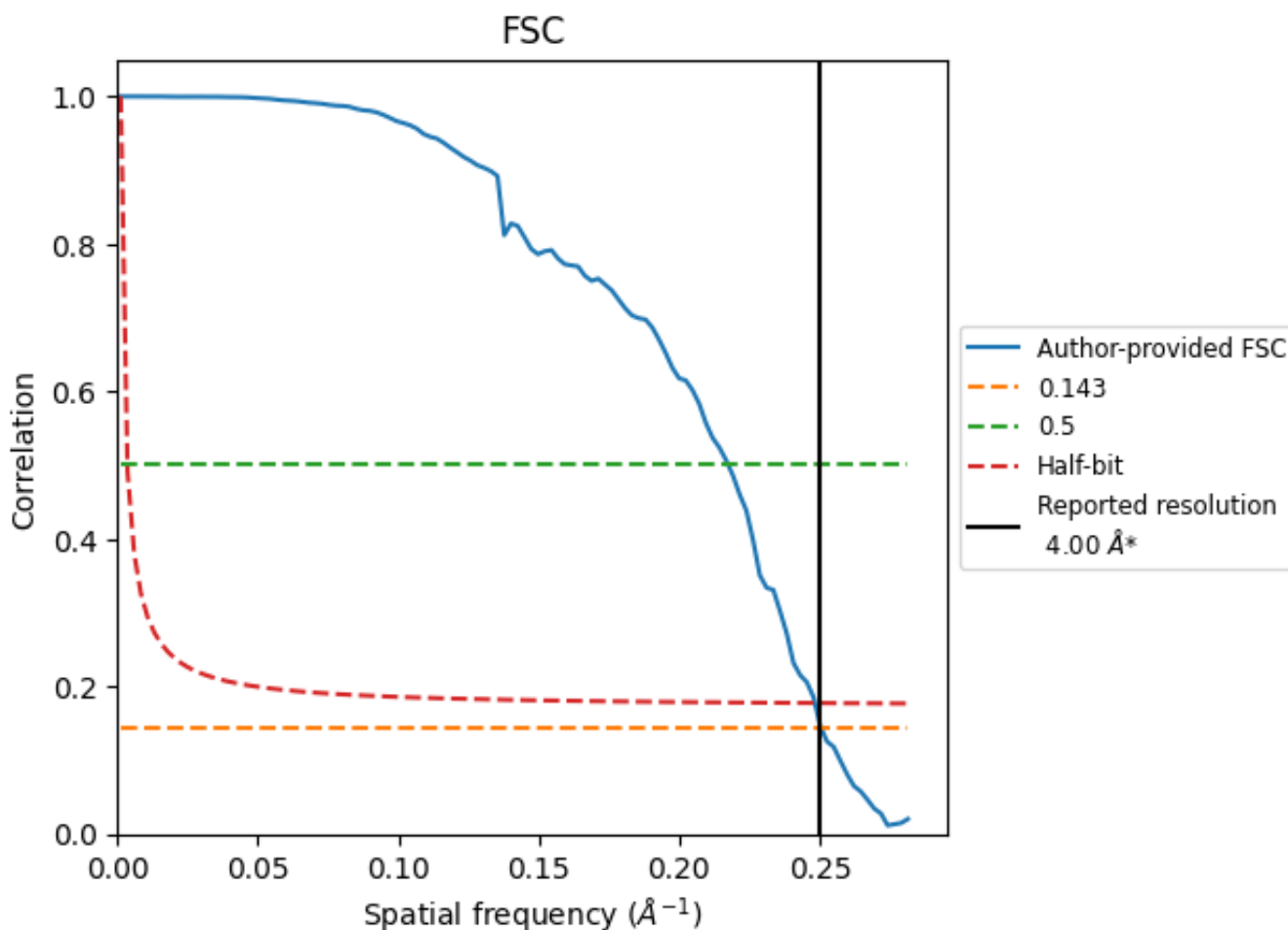


\*Reported resolution corresponds to spatial frequency of 0.250 Å<sup>-1</sup>

## 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 0.250 Å<sup>-1</sup>

## 8.2 Resolution estimates [i](#)

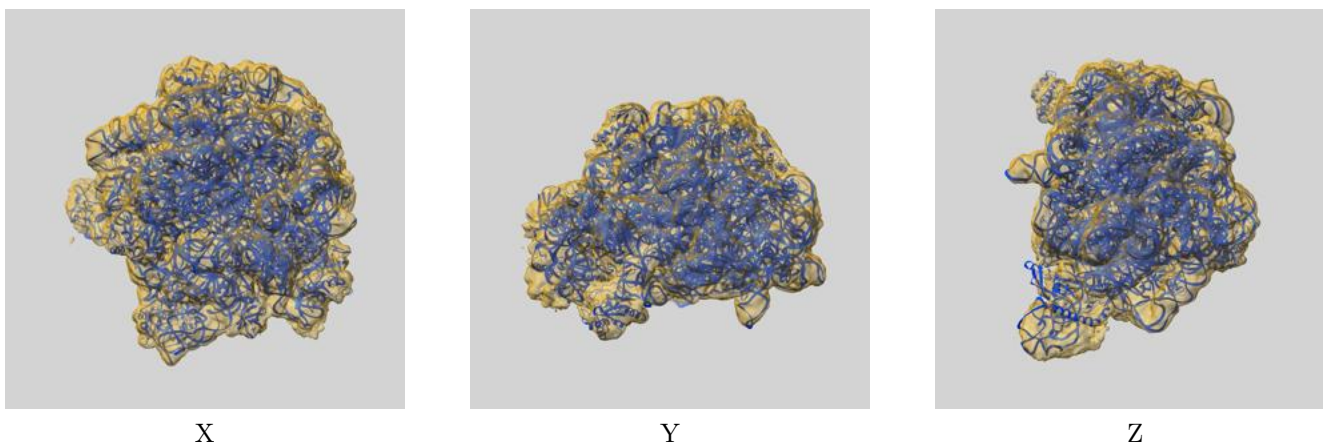
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	4.00	-	-
Author-provided FSC curve	3.99	4.60	4.03
Unmasked-calculated*	-	-	-

\*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps.

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

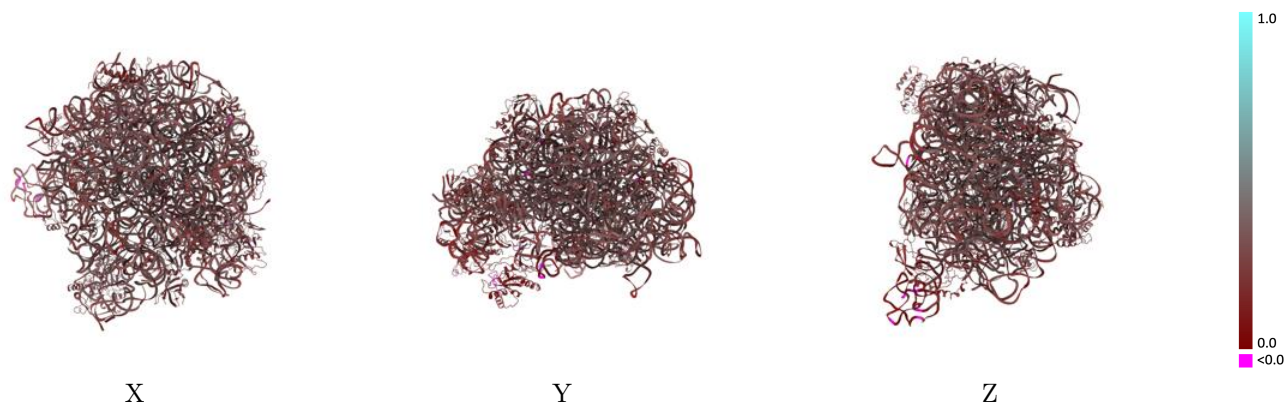
This section contains information regarding the fit between EMDB map EMD-12219 and PDB model 7BL6. Per-residue inclusion information can be found in section 3 on page 10.

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



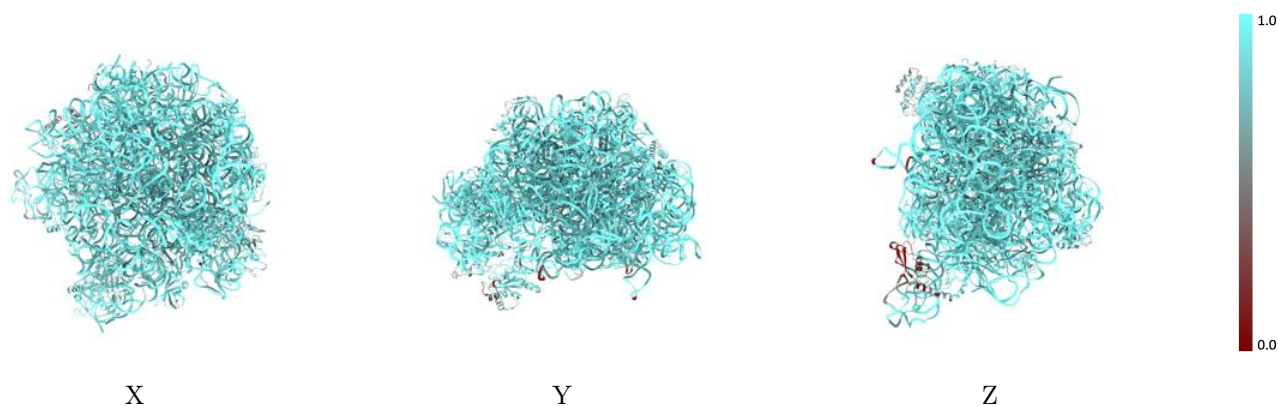
The images above show the 3D surface view of the map at the recommended contour level 0.5 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



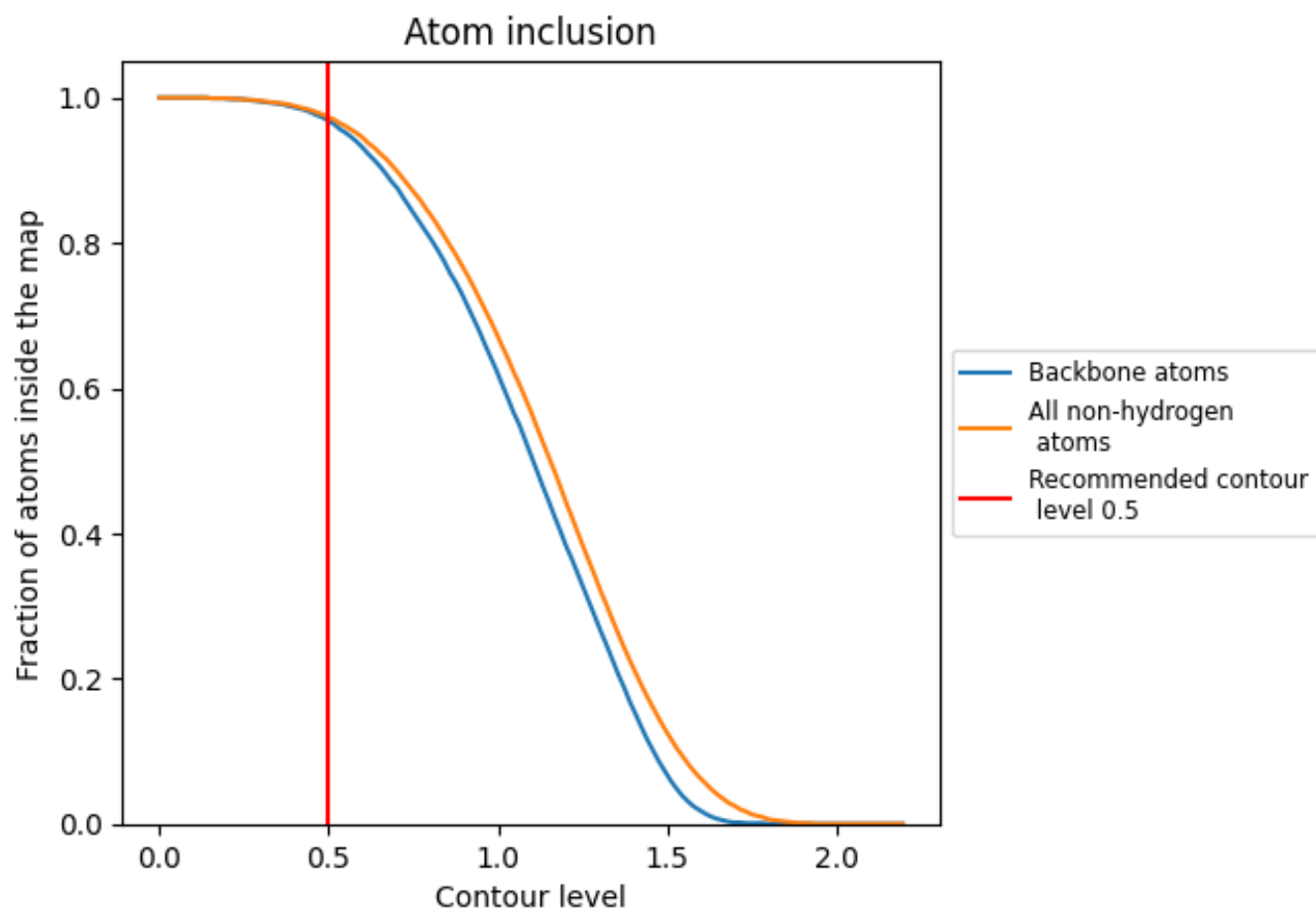
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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](#)



The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.5).

## 9.4 Atom inclusion [i](#)





































































At the recommended contour level, 97% of all backbone atoms, 97% 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 (0.5) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.9730	 0.2890
0	 0.9810	 0.2670
1	 0.9950	 0.2680
2	 0.9970	 0.2870
3	 1.0000	 0.2860
9	 0.8530	 0.1990
A	 0.9900	 0.3010
B	 0.9970	 0.2850
C	 0.9910	 0.3020
D	 0.9700	 0.3000
E	 0.9160	 0.2710
F	 0.8990	 0.2090
G	 0.9000	 0.2490
H	 0.5700	 0.2020
J	 0.9850	 0.2910
K	 0.9770	 0.2810
L	 0.9560	 0.2820
M	 0.9810	 0.2930
N	 0.9920	 0.2700
O	 0.9710	 0.2530
P	 0.9600	 0.2810
Q	 0.9850	 0.2690
R	 0.9270	 0.2820
S	 0.9820	 0.2780
T	 0.9830	 0.2920
U	 0.9620	 0.2600
V	 0.9510	 0.2710
W	 0.9930	 0.2860
X	 0.9900	 0.2870
Y	 0.9500	 0.2140
Z	 0.9410	 0.2580
d	 0.6740	 0.1790
g	 0.9930	 0.2860

