



Full wwPDB EM Validation Report ⓘ

Apr 16, 2026 – 11:08 am BST

PDB ID : 9TZE / pdb_00009tze
EMDB ID : EMD-56466
Title : 70S Coxiella burnetii Ribosome with Doxycycline and HPFcold
Authors : Stuart, W.S.; Isupov, M.N.; Harmer, N.J.
Deposited on : 2026-01-22
Resolution : 2.48 Å (reported)
Based on initial model : .

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

We welcome your comments at 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>.

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

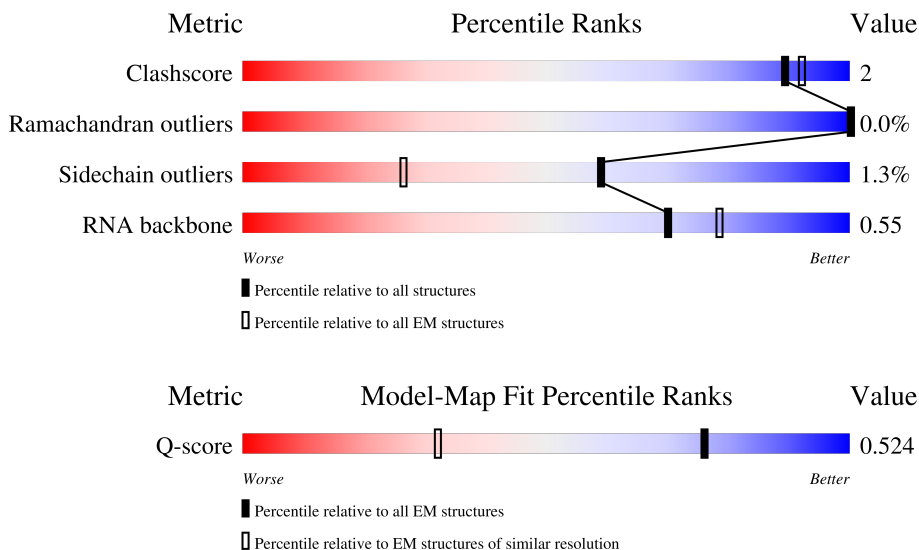
EMDB validation analysis : 0.0.1.dev132
Mogul : 1.8.4, CSD as541be (2020)
MolProbity : 4-5-2 with Phenix2.0
Buster-report : wwPDB partial adaption of 1.1.7 (2018)
Percentile statistics : 20250101.v01 (using entries in the PDB archive January 1st 2025)
EM percentile statistics : 202505.v01 (Using data in the EMDB archive up until May 2025)
MapQ : 1.9.13
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.49

1 Overall quality at a glance i

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

The reported resolution of this entry is 2.48 Å.

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



Metric	Whole archive (#Entries)	EM structures (#Entries)	Similar EM resolution (#Entries, resolution range(Å))
Clashscore	229148	23984	-
Ramachandran outliers	224038	23583	-
Sidechain outliers	223484	23102	-
RNA backbone	8273	3508	-
Q-score	-	25397	6178 (1.98 - 2.98)

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 ≥ 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	A	1535	
2	C	227	
3	D	206	

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Mol	Chain	Length	Quality of chain
4	E	168	14% 91% 6%
5	F	127	35% 83% 17%
6	G	191	67% 82% 15%
7	H	130	18% 99%
8	I	139	58% 88% 10%
9	J	110	75% 79% 13% 7%
10	K	123	23% 94%
11	L	124	30% 99%
12	M	119	67% 92%
13	N	99	64% 63% 29% 6%
14	O	89	30% 98%
15	P	137	29% 76% 23%
16	Q	89	30% 93% 7%
17	R	73	27% 85% 11%
18	S	95	78% 78% 9% 12%
19	T	90	30% 94%
20	U	74	59% 89% 8%
21	Z	21	5% 76% 24%
22	0	70	91% 6%
23	1	107	10% 93% 5%
24	2	117	92% 6%
25	3	40	92% 5%
26	b	117	87% 12%
27	c	115	90% 7%
28	d	217	92% 5%

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Mol	Chain	Length	Quality of chain
29	e	119	97%
30	f	182	48% 93% 6%
31	g	178	24% 88% 9%
32	h	115	90% 10%
33	i	142	96%
34	j	115	90% 6%
35	k	143	93% 7%
36	m	126	90% 6%
37	o	275	96%
38	q	152	17% 28% 70%
39	r	65	9% 89% 8%
40	s	137	96%
41	t	63	86% 11%
42	u	244	26% 75% 22%
43	v	64	75% 9% 16%
44	w	205	5% 93% 7%
45	x	122	95%
46	y	44	100%
47	z	64	94%
48	4	79	13% 11% 87%
49	9	183	86% 91%
50	8	90	77% 9% 14%
51	7	95	88% 7%
52	6	79	5% 90% 8%
53	a	2925	6% 79% 17%

2 Entry composition [i](#)

There are 58 unique types of molecules in this entry. The entry contains 142356 atoms, of which 0 are hydrogens and 0 are deuteriums.

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

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
1	A	1535	32928	14693	6016	10684	1535	0	0

- Molecule 2 is a protein called Small ribosomal subunit protein uS3.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	C	206	1641	1037	314	286	4	0	0

- Molecule 3 is a protein called Small ribosomal subunit protein uS4.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	D	205	1659	1045	309	298	7	0	0

- Molecule 4 is a protein called Small ribosomal subunit protein uS5.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	E	158	1153	723	213	211	6	0	0

- Molecule 5 is a protein called Small ribosomal subunit protein bS6.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	F	106	867	545	159	158	5	0	0

- Molecule 6 is a protein called Small ribosomal subunit protein uS7.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
6	G	162	1291	808	254	224	5	0	0

- Molecule 7 is a protein called Small ribosomal subunit protein uS8.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
7	H	130	1017	634	182	194	7	0	0

- Molecule 8 is a protein called Small ribosomal subunit protein uS9.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
8	I	125	981	607	197	175	2	0	0

- Molecule 9 is a protein called Small ribosomal subunit protein uS10.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
9	J	102	828	517	157	153	1	0	0

- Molecule 10 is a protein called Small ribosomal subunit protein uS11.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
10	K	119	915	558	190	162	5	0	0

- Molecule 11 is a protein called Small ribosomal subunit protein uS12.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
11	L	123	958	586	204	166	2	0	0

- Molecule 12 is a protein called Small ribosomal subunit protein uS13.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
12	M	115	907	557	187	160	3	0	0

- Molecule 13 is a protein called Small ribosomal subunit protein uS14.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
13	N	98	800	496	167	132	5	0	0

- Molecule 14 is a protein called Small ribosomal subunit protein uS15.

Mol	Chain	Residues	Atoms					AltConf	Trace
14	O	88	Total	C	N	O	S	0	0
			716	448	141	125	2		

- Molecule 15 is a protein called Small ribosomal subunit protein bS16.

Mol	Chain	Residues	Atoms					AltConf	Trace
15	P	106	Total	C	N	O	S	0	0
			865	542	174	146	3		

- Molecule 16 is a protein called Small ribosomal subunit protein uS17.

Mol	Chain	Residues	Atoms					AltConf	Trace
16	Q	83	Total	C	N	O	S	0	0
			669	415	131	119	4		

- Molecule 17 is a protein called Small ribosomal subunit protein bS18.

Mol	Chain	Residues	Atoms					AltConf	Trace
17	R	65	Total	C	N	O	S	0	0
			524	331	94	95	4		

- Molecule 18 is a protein called Small ribosomal subunit protein uS19.

Mol	Chain	Residues	Atoms					AltConf	Trace
18	S	84	Total	C	N	O	S	0	0
			668	419	131	114	4		

- Molecule 19 is a protein called Small ribosomal subunit protein bS20.

Mol	Chain	Residues	Atoms				AltConf	Trace
19	T	86	Total	C	N	O	0	0
			669	405	144	120		

- Molecule 20 is a protein called Small ribosomal subunit protein bS21.

Mol	Chain	Residues	Atoms					AltConf	Trace
20	U	68	Total	C	N	O	S	0	0
			565	354	111	97	3		

- Molecule 21 is a protein called Coxiellaceae Large Subunit Peptide (CLaSP).

Mol	Chain	Residues	Atoms				AltConf	Trace
21	Z	16	Total	C	N	O	0	0
			133	82	34	17		

- Molecule 22 is a protein called Large ribosomal subunit protein bL33.

Mol	Chain	Residues	Atoms					AltConf	Trace
22	0	68	Total	C	N	O	S	0	0
			550	349	99	99	3		

- Molecule 23 is a protein called Large ribosomal subunit protein uL24.

Mol	Chain	Residues	Atoms				AltConf	Trace
23	1	105	Total	C	N	O	0	0
			813	512	153	148		

- Molecule 24 is a protein called Large ribosomal subunit protein uL18.

Mol	Chain	Residues	Atoms					AltConf	Trace
24	2	116	Total	C	N	O	S	0	0
			913	566	188	157	2		

- Molecule 25 is a protein called Large ribosomal subunit protein bL36.

Mol	Chain	Residues	Atoms					AltConf	Trace
25	3	38	Total	C	N	O	S	0	0
			307	183	73	46	5		

- Molecule 26 is a RNA chain called 5S ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
26	b	117	Total	C	N	O	P	0	0
			2488	1112	445	815	116		

- Molecule 27 is a protein called Large ribosomal subunit protein bL19.

Mol	Chain	Residues	Atoms				AltConf	Trace
27	c	113	Total	C	N	O	0	0
			919	573	184	162		

- Molecule 28 is a protein called Large ribosomal subunit protein uL3.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
28	d	211	1596	995	298	298	5	0	0

- Molecule 29 is a protein called Large ribosomal subunit protein bL20.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
29	e	118	941	595	194	151	1	0	0

- Molecule 30 is a protein called Large ribosomal subunit protein uL5.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
30	f	182	1457	930	258	261	8	0	0

- Molecule 31 is a protein called Large ribosomal subunit protein uL6.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
31	g	174	1310	818	245	243	4	0	0

- Molecule 32 is a protein called Large ribosomal subunit protein bL21.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
32	h	104	813	511	150	148	4	0	0

- Molecule 33 is a protein called Large ribosomal subunit protein uL13.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
33	i	141	1108	707	206	193	2	0	0

- Molecule 34 is a protein called Large ribosomal subunit protein uL22.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
34	j	110	839	516	165	154	4	0	0

- Molecule 35 is a protein called Large ribosomal subunit protein uL15.

Mol	Chain	Residues	Atoms					AltConf	Trace
35	k	143	Total	C	N	O	S	0	0
			1076	672	217	185	2		

- Molecule 36 is a protein called Large ribosomal subunit protein bL17.

Mol	Chain	Residues	Atoms					AltConf	Trace
36	m	119	Total	C	N	O	S	0	0
			967	605	195	162	5		

- Molecule 37 is a protein called Large ribosomal subunit protein uL2.

Mol	Chain	Residues	Atoms					AltConf	Trace
37	o	274	Total	C	N	O	S	0	0
			2131	1314	443	368	6		

- Molecule 38 is a protein called Large ribosomal subunit protein bL9.

Mol	Chain	Residues	Atoms					AltConf	Trace
38	q	45	Total	C	N	O	S	0	0
			339	221	59	58	1		

- Molecule 39 is a protein called Large ribosomal subunit protein uL29.

Mol	Chain	Residues	Atoms					AltConf	Trace
39	r	63	Total	C	N	O	S	0	0
			522	324	106	91	1		

- Molecule 40 is a protein called Large ribosomal subunit protein uL16.

Mol	Chain	Residues	Atoms					AltConf	Trace
40	s	137	Total	C	N	O	S	0	0
			1090	688	215	182	5		

- Molecule 41 is a protein called Large ribosomal subunit protein uL30.

Mol	Chain	Residues	Atoms					AltConf	Trace
41	t	56	Total	C	N	O	S	0	0
			449	281	86	78	4		

- Molecule 42 is a protein called Large ribosomal subunit protein bL25.

Mol	Chain	Residues	Atoms					AltConf	Trace
42	u	191	Total	C	N	O	S	0	0
			1486	940	260	281	5		

- Molecule 43 is a protein called Large ribosomal subunit protein bL32.

Mol	Chain	Residues	Atoms					AltConf	Trace
43	v	54	Total	C	N	O	S	0	0
			436	263	95	76	2		

- Molecule 44 is a protein called Large ribosomal subunit protein uL4.

Mol	Chain	Residues	Atoms					AltConf	Trace
44	w	205	Total	C	N	O	S	0	0
			1571	974	296	296	5		

- Molecule 45 is a protein called Large ribosomal subunit protein uL14.

Mol	Chain	Residues	Atoms					AltConf	Trace
45	x	122	Total	C	N	O	S	0	0
			948	594	184	165	5		

- Molecule 46 is a protein called Large ribosomal subunit protein bL34.

Mol	Chain	Residues	Atoms					AltConf	Trace
46	y	44	Total	C	N	O	S	0	0
			374	224	91	57	2		

- Molecule 47 is a protein called Large ribosomal subunit protein bL35.

Mol	Chain	Residues	Atoms					AltConf	Trace
47	z	62	Total	C	N	O	S	0	0
			500	308	110	80	2		

- Molecule 48 is a protein called Large ribosomal subunit protein bL31.

Mol	Chain	Residues	Atoms				AltConf	Trace
48	4	10	Total	C	N	O	0	0
			93	61	19	13		

- Molecule 49 is a protein called Ribosome hibernation promoting factor.

Mol	Chain	Residues	Atoms					AltConf	Trace
49	9	175	Total	C	N	O	S	0	0
			1412	892	253	262	5		

- Molecule 50 is a protein called Large ribosomal subunit protein bL27.

Mol	Chain	Residues	Atoms					AltConf	Trace
50	8	77	Total	C	N	O	S	0	0
			613	381	124	105	3		

- Molecule 51 is a protein called Large ribosomal subunit protein uL23.

Mol	Chain	Residues	Atoms					AltConf	Trace
51	7	91	Total	C	N	O	S	0	0
			732	464	135	130	3		

- Molecule 52 is a protein called Large ribosomal subunit protein bL28.

Mol	Chain	Residues	Atoms					AltConf	Trace
52	6	77	Total	C	N	O	S	0	0
			631	395	128	106	2		

- Molecule 53 is a RNA chain called 23S ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
53	a	2873	Total	C	N	O	P	3	0
			61677	27530	11292	19979	2876		

- Molecule 54 is MAGNESIUM ION (CCD ID: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		AltConf
54	A	52	Total	Mg	0
			52	52	
54	b	1	Total	Mg	0
			1	1	
54	d	1	Total	Mg	0
			1	1	
54	o	1	Total	Mg	0
			1	1	
54	9	1	Total	Mg	0
			1	1	
54	a	164	Total	Mg	0
			164	164	

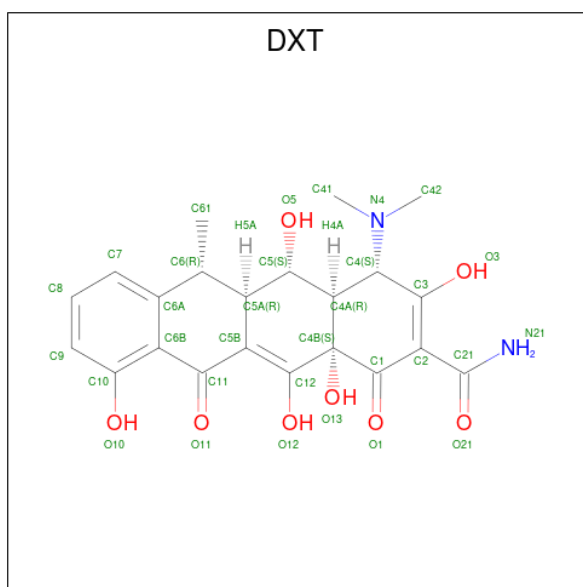
- Molecule 55 is POTASSIUM ION (CCD ID: K) (formula: K).

Mol	Chain	Residues	Atoms	AltConf
55	A	34	Total K 34 34	0
55	b	1	Total K 1 1	0
55	d	1	Total K 1 1	0
55	o	1	Total K 1 1	0
55	s	1	Total K 1 1	0
55	v	1	Total K 1 1	0
55	w	1	Total K 1 1	0
55	a	127	Total K 127 127	0

- Molecule 56 is ZINC ION (CCD ID: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms	AltConf
56	N	1	Total Zn 1 1	0
56	R	1	Total Zn 1 1	0
56	3	1	Total Zn 1 1	0

- Molecule 57 is (4S,4AR,5S,5AR,6R,12AS)-4-(DIMETHYLAMINO)-3,5,10,12,12A-PENTAHYDROXY-6-METHYL-1,11-DIOXO-1,4,4A,5,5A,6,11,12A-OCTAHYDROTETRACENE-2-CARBOXAMIDE (CCD ID: DXT) (formula: C₂₂H₂₄N₂O₈) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms			AltConf	
57	a	1	Total	C	N	O	0
			32	22	2	8	
57	a	1	Total	C	N	O	0
			32	22	2	8	
57	a	1	Total	C	N	O	0
			32	22	2	8	

- Molecule 58 is water.

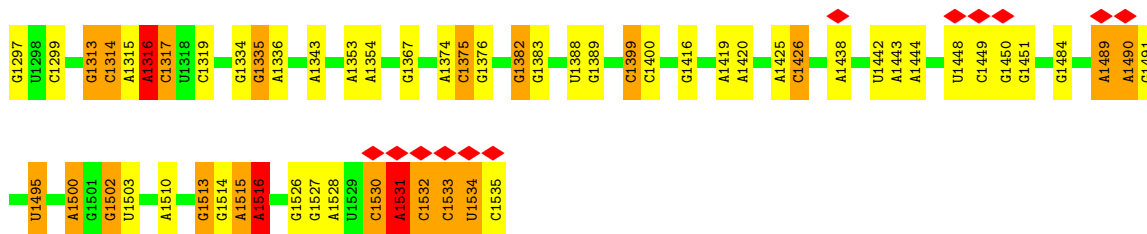
Mol	Chain	Residues	Atoms		AltConf
58	A	6	Total	O	0
			6	6	
58	K	1	Total	O	0
			1	1	
58	M	1	Total	O	0
			1	1	
58	a	7	Total	O	0
			7	7	

3 Residue-property plots

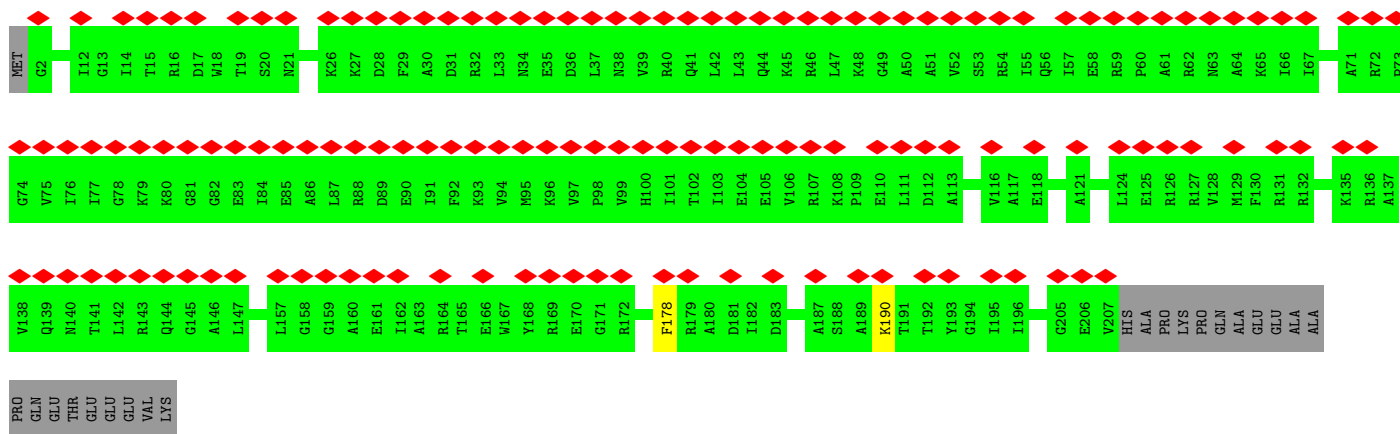
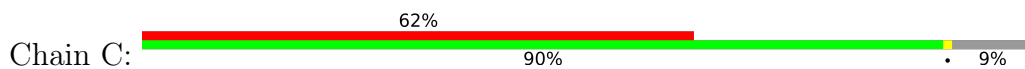
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion 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: 16S ribosomal RNA

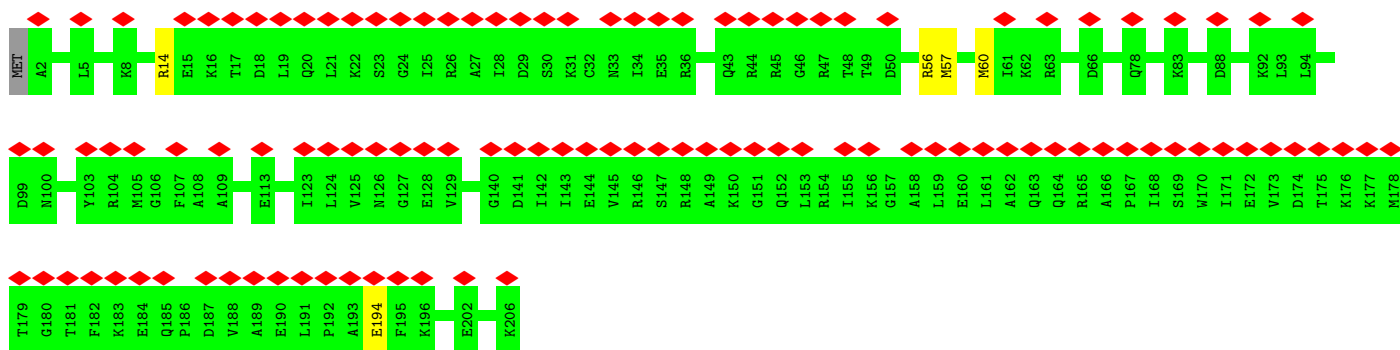




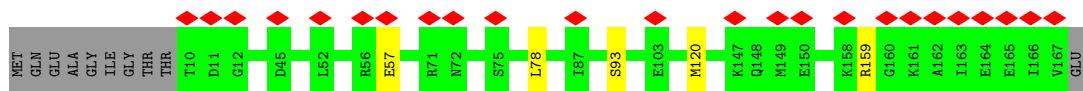
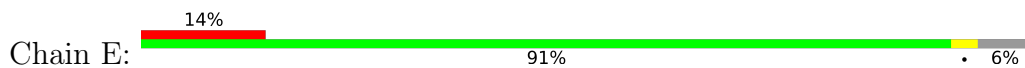
• Molecule 2: Small ribosomal subunit protein uS3



• Molecule 3: Small ribosomal subunit protein uS4



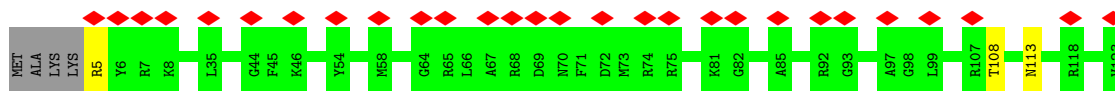
• Molecule 4: Small ribosomal subunit protein uS5



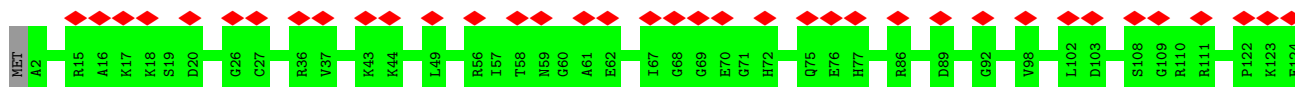
• Molecule 5: Small ribosomal subunit protein bS6



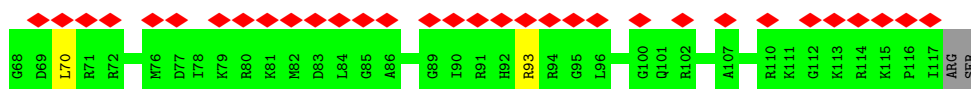
- Molecule 10: Small ribosomal subunit protein uS11



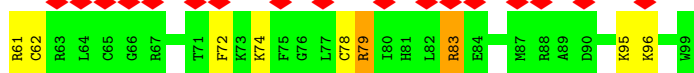
- Molecule 11: Small ribosomal subunit protein uS12



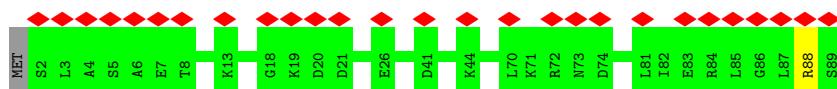
- Molecule 12: Small ribosomal subunit protein uS13



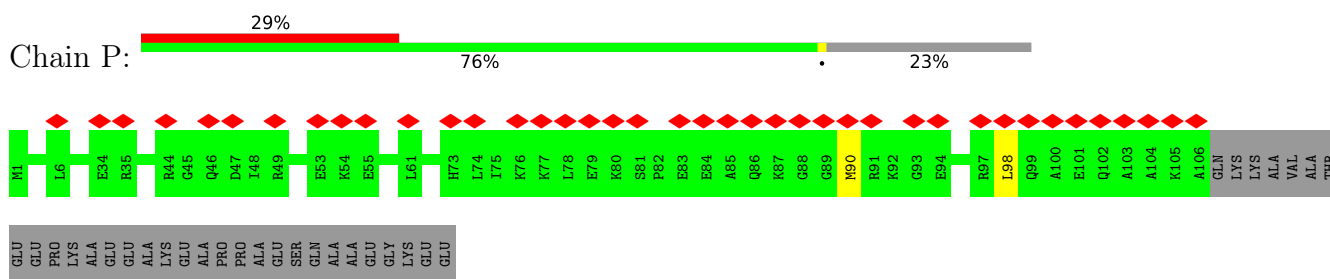
- Molecule 13: Small ribosomal subunit protein uS14



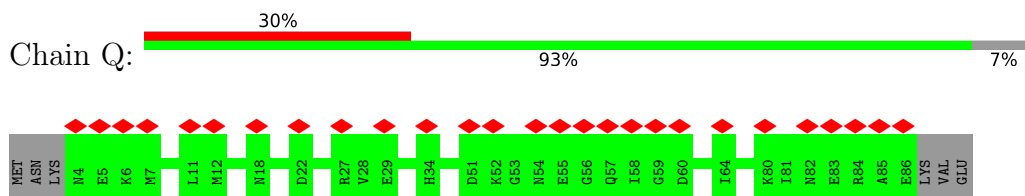
- Molecule 14: Small ribosomal subunit protein uS15



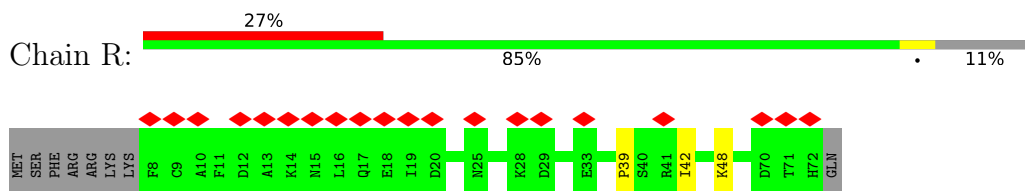
- Molecule 15: Small ribosomal subunit protein bS16



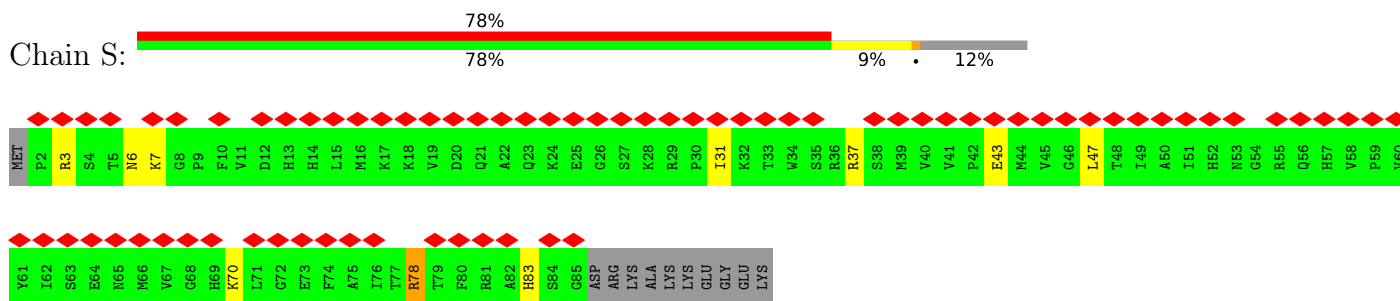
- Molecule 16: Small ribosomal subunit protein uS17



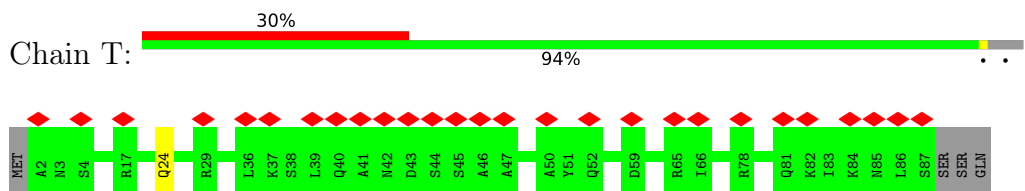
- Molecule 17: Small ribosomal subunit protein bS18



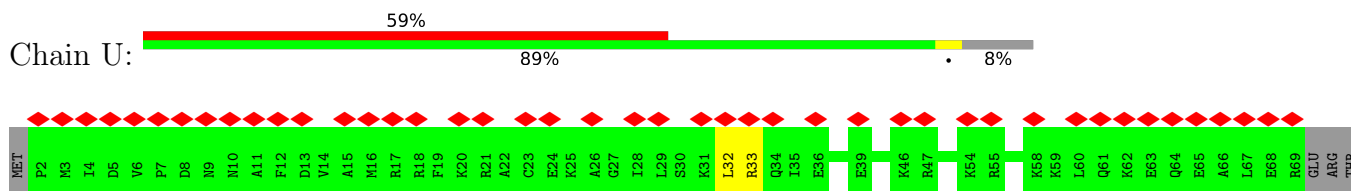
- Molecule 18: Small ribosomal subunit protein uS19



- Molecule 19: Small ribosomal subunit protein bS20

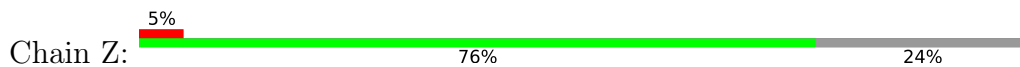


- Molecule 20: Small ribosomal subunit protein bS21



ARG
TYR

- Molecule 21: Coxiellaceae Large Subunit Peptide (CLaSP)



MET P2 N17 LYS LYS SER ARG

- Molecule 22: Large ribosomal subunit protein bL33



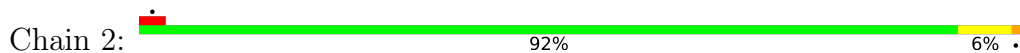
MET ALA V3 L40 M41 I42 W50 S55 K70

- Molecule 23: Large ribosomal subunit protein uL24



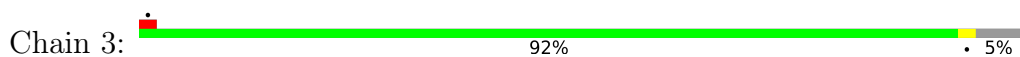
MET A2 P51 N52 K53 N54 E55 Q56 R62 L89 E90 D91 G92 R96 I97 F98 G102 E103 Y104 I105 D106 VAL

- Molecule 24: Large ribosomal subunit protein uL18



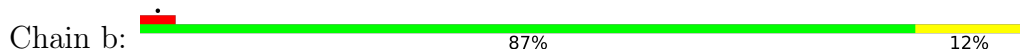
MET P2 C50 T53 L54 E55 V58 R61 I62 K63 H64 G65 I68 R81 R84 E116 F117

- Molecule 25: Large ribosomal subunit protein bL36




M1 R12 R31 G38 GLY LYS

- Molecule 26: 5S ribosomal RNA



U1 C12 A34 U35 U36 U41 A45 G51 G56 A57 A58 A59 A60 A66 G67 C68 U88 A107 U117

- Molecule 27: Large ribosomal subunit protein bL19

Chain c:  90% 7% ..



- Molecule 28: Large ribosomal subunit protein uL3

Chain d:  92% 5% .

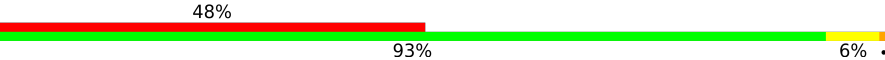


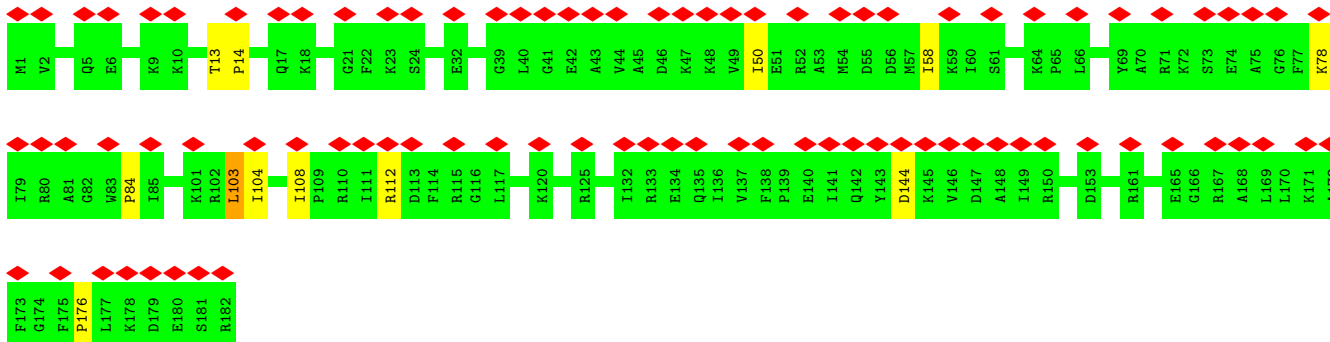
- Molecule 29: Large ribosomal subunit protein bL20

Chain e:  97% ..




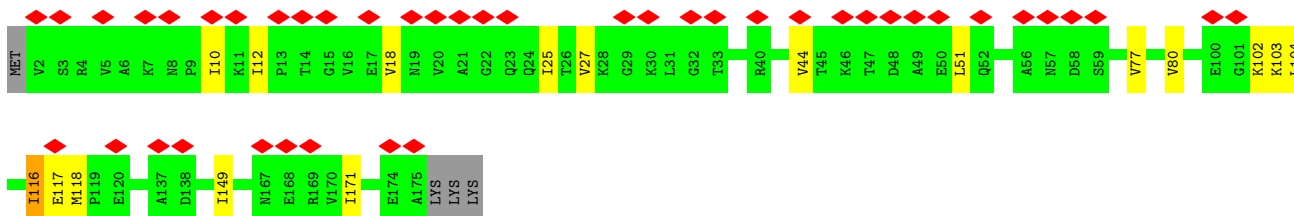
- Molecule 30: Large ribosomal subunit protein uL5

Chain f:  48% 93% 6% .




- Molecule 31: Large ribosomal subunit protein uL6

Chain g:  24% 88% 9% ..

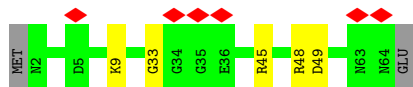
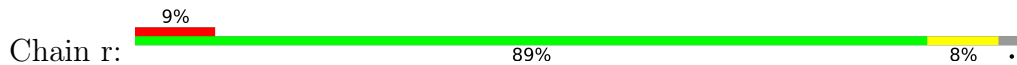


- Molecule 32: Large ribosomal subunit protein bL21

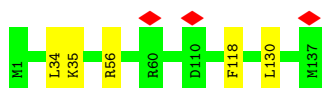
Chain h:  90% 10%

SER
VAL
ASN
VAL
LYS
ILE
GLU
VAL
ALA
PRO
GLU
ASN
SER
ASN
SER

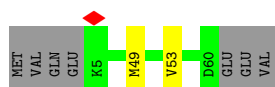
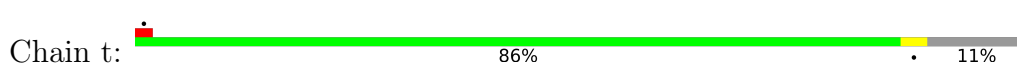
- Molecule 39: Large ribosomal subunit protein uL29



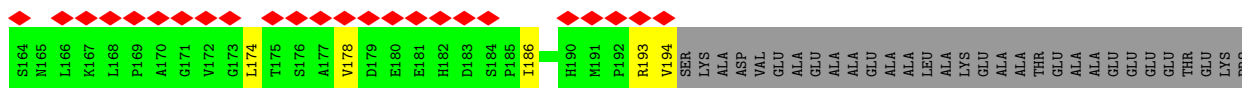
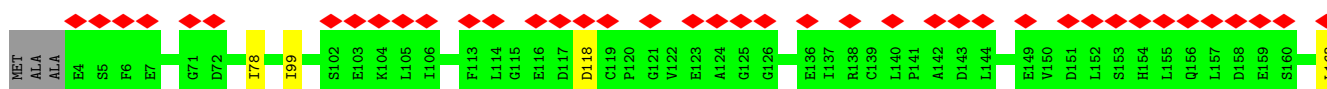
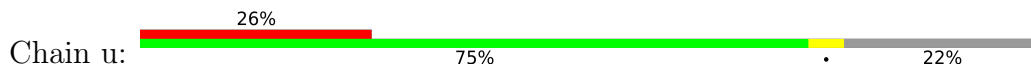
- Molecule 40: Large ribosomal subunit protein uL16



- Molecule 41: Large ribosomal subunit protein uL30



- Molecule 42: Large ribosomal subunit protein bL25



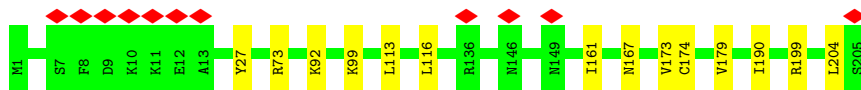
ALA
SER
GLU
ALA
ALA
SER
GLY
ALA
GLU
GLN
ASP
THR
ASP
GLU
SER
LYS
GLU

- Molecule 43: Large ribosomal subunit protein bL32

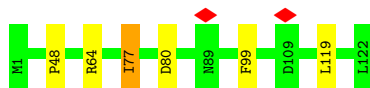


- Molecule 44: Large ribosomal subunit protein uL4





- Molecule 45: Large ribosomal subunit protein uL14



- Molecule 46: Large ribosomal subunit protein bL34

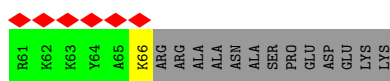


There are no outlier residues recorded for this chain.

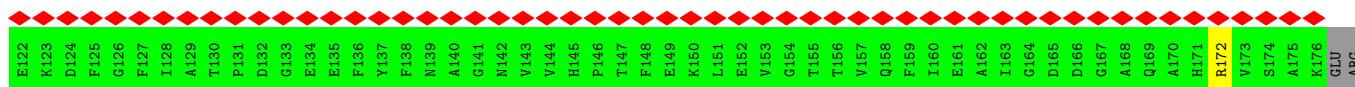
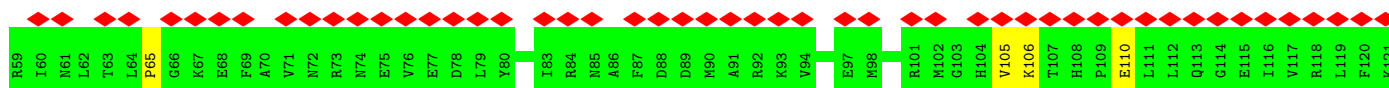
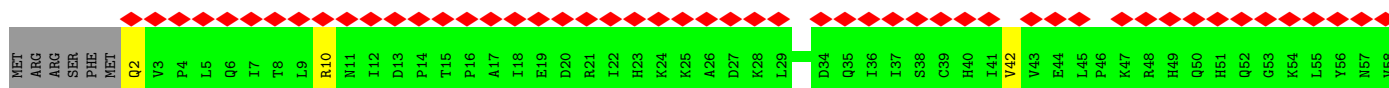
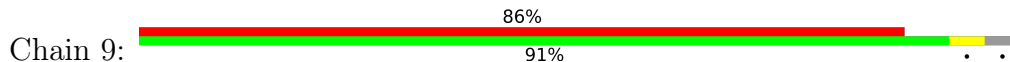
- Molecule 47: Large ribosomal subunit protein bL35



- Molecule 48: Large ribosomal subunit protein bL31



- Molecule 49: Ribosome hibernation promoting factor



- Molecule 50: Large ribosomal subunit protein bL27

4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	44196	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	TFS KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	45	Depositor
Minimum defocus (nm)	800	Depositor
Maximum defocus (nm)	2000	Depositor
Magnification	81000	Depositor
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	0.467	Depositor
Minimum map value	-0.127	Depositor
Average map value	0.002	Depositor
Map value standard deviation	0.018	Depositor
Recommended contour level	0.078	Depositor
Map size (Å)	423.99997, 423.99997, 423.99997	wwPDB
Map dimensions	400, 400, 400	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.06, 1.06, 1.06	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: K, DXT, UR3, 2MA, MG, 2MG, OMU, MA6, 5MC, ZN, OMG, G7M, PSU, 4OC

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	A	0.38	1/36657 (0.0%)	0.77	33/57176 (0.1%)
2	C	0.47	0/1666	1.03	1/2239 (0.0%)
3	D	0.45	0/1684	1.06	0/2258
4	E	0.50	0/1166	1.02	2/1569 (0.1%)
5	F	0.47	0/882	0.99	0/1185
6	G	0.48	0/1308	1.13	0/1752
7	H	0.47	0/1026	0.99	0/1372
8	I	0.48	0/994	1.09	0/1330
9	J	0.51	0/836	1.07	0/1128
10	K	0.50	0/929	1.05	0/1240
11	L	0.50	0/971	0.97	0/1299
12	M	0.49	0/915	1.19	0/1218
13	N	0.45	0/809	1.10	1/1069 (0.1%)
14	O	0.44	0/724	1.11	0/964
15	P	0.46	0/879	1.06	0/1169
16	Q	0.47	0/677	0.89	0/904
17	R	0.47	0/533	1.09	0/718
18	S	0.50	0/684	1.00	0/918
19	T	0.46	0/673	1.23	0/896
20	U	0.43	0/572	1.17	0/757
21	Z	0.45	0/137	0.95	0/178
22	0	0.42	0/561	0.86	0/747
23	1	0.44	0/820	0.92	0/1098
24	2	0.45	0/922	1.06	0/1227
25	3	0.43	0/307	0.91	0/402
26	b	0.38	0/2780	0.73	2/4331 (0.0%)
27	c	0.41	0/929	0.88	0/1241
28	d	0.44	0/1617	0.93	0/2173
29	e	0.42	0/954	1.07	0/1268
30	f	0.46	0/1480	1.05	0/1980
31	g	0.46	0/1325	0.98	0/1791
32	h	0.42	0/822	0.82	0/1098

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
33	i	0.45	0/1132	0.96	0/1526
34	j	0.45	0/845	0.98	0/1131
35	k	0.45	0/1088	0.98	0/1443
36	m	0.44	0/983	1.02	0/1316
37	o	0.47	0/2170	0.96	0/2909
38	q	0.49	0/345	0.98	0/468
39	r	0.38	0/526	1.18	0/697
40	s	0.43	0/1107	0.99	0/1475
41	t	0.44	0/454	0.95	0/605
42	u	0.46	0/1512	0.92	0/2041
43	v	0.46	0/443	0.99	0/589
44	w	0.43	0/1589	1.01	0/2136
45	x	0.41	0/954	0.90	0/1277
46	y	0.40	0/377	1.10	0/493
47	z	0.42	0/505	1.02	0/665
48	4	0.43	0/94	1.14	0/121
49	9	0.49	0/1440	1.02	0/1943
50	8	0.45	0/623	0.89	0/829
51	7	0.44	0/744	0.98	0/999
52	6	0.43	0/640	1.00	0/853
53	a	0.37	1/68862 (0.0%)	0.79	80/107409 (0.1%)
All	All	0.40	2/153672 (0.0%)	0.85	119/229620 (0.1%)

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

Mol	Chain	#Chirality outliers	#Planarity outliers
53	a	0	6

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	1495	UR3	O3'-P	6.41	1.62	1.56
53	a	2568	OMU	O3'-P	5.25	1.61	1.56

All (119) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
53	a	395	U	C4'-C3'-O3'	13.37	129.46	109.40
53	a	1184	U	C2'-C3'-O3'	11.72	127.08	109.50

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
53	a	426	C	C2'-C3'-O3'	11.35	126.52	109.50
26	b	34	A	C2'-C3'-O3'	-10.73	97.60	113.70
1	A	524	G7M	P-O3'-C3'	-10.17	107.49	119.70
1	A	554	G	C2'-C3'-O3'	10.10	128.84	113.70
53	a	2835	A	C4'-C3'-O3'	-9.18	99.24	113.00
53	a	1051	C	C2'-C3'-O3'	8.96	122.94	109.50
53	a	1430	U	C2'-C3'-O3'	8.38	122.08	109.50
53	a	903	C	N1-C1'-C2'	8.18	124.28	112.00
53	a	1388	A	C2'-C3'-O3'	7.83	121.25	109.50
1	A	268	C	C2'-C3'-O3'	7.76	125.34	113.70
53	a	1771	A	C4'-C3'-O3'	-7.73	101.41	113.00
1	A	1314	C	C2'-C3'-O3'	7.67	125.21	113.70
53	a	1744	U	C2'-C3'-O3'	7.64	120.96	109.50
53	a	1562	U	C2'-C3'-O3'	7.58	120.87	109.50
53	a	1956	U	C2'-C3'-O3'	7.56	120.84	109.50
1	A	381	C	C2'-C3'-O3'	7.54	125.02	113.70
1	A	904	A	C2'-C3'-O3'	7.50	120.76	109.50
53	a	1955	U	C1'-C2'-O2'	-7.48	100.58	111.80
53	a	2806	G	C2'-C3'-O3'	7.45	120.67	109.50
1	A	780	C	C2'-C3'-O3'	7.31	124.66	113.70
1	A	1530	C	P-O3'-C3'	-7.21	109.38	120.20
1	A	712	A	C2'-C3'-O3'	7.16	124.43	113.70
1	A	1532	C	C4'-C3'-O3'	7.09	123.64	113.00
53	a	909	C	C2'-C3'-O3'	7.09	124.33	113.70
53	a	964	U	C2'-C3'-O3'	-7.01	103.19	113.70
53	a	1580	C	C2'-C3'-O3'	6.98	119.97	109.50
53	a	834	U	C2'-C3'-O3'	-6.96	103.26	113.70
53	a	1884	C	C4'-C3'-O3'	6.94	123.41	113.00
1	A	459	G	C2'-C3'-O3'	6.91	124.06	113.70
53	a	791	G	C2'-C3'-O3'	-6.90	103.35	113.70
53	a	2172	G	C4'-C3'-O3'	6.78	119.56	109.40
53	a	2779	G	C4'-C3'-O3'	-6.77	102.84	113.00
53	a	906	A	C2'-C3'-O3'	6.70	119.55	109.50
1	A	1030	G	C4'-C3'-O3'	-6.63	103.06	113.00
13	N	15	ARG	CG-CD-NE	6.56	126.43	112.00
53	a	1617	U	C4'-C3'-O3'	6.55	119.22	109.40
53	a	938	U	C4'-C3'-O3'	6.41	119.02	109.40
1	A	529	A	C4'-C3'-O3'	-6.41	103.39	113.00
53	a	364	U	C2'-C3'-O3'	6.34	119.01	109.50
53	a	653	U	C2'-C3'-O3'	6.33	119.00	109.50
53	a	753	U	C2'-C3'-O3'	6.22	118.83	109.50
53	a	2337	G	C2'-C3'-O3'	-6.20	104.39	113.70

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
53	a	395	U	C2'-C3'-O3'	-6.16	100.26	109.50
53	a	788	A	C4'-C3'-O3'	-6.14	103.80	113.00
53	a	1141	C	C4'-C3'-O3'	-6.13	103.81	113.00
1	A	1382	G	C2'-C3'-O3'	6.12	122.88	113.70
1	A	162	C	C2'-C3'-O3'	6.06	118.58	109.50
53	a	208	A	C2'-C3'-O3'	-6.01	100.48	109.50
53	a	1886	C	C2'-C3'-O3'	-6.00	100.50	109.50
1	A	525	C	P-O3'-C3'	-5.96	111.26	120.20
53	a	2518	G	C4'-C3'-O3'	5.92	121.88	113.00
53	a	2303	A	C2'-C3'-O3'	-5.92	100.62	109.50
53	a	2324	G	C2'-C3'-O3'	5.91	118.36	109.50
53	a	552	U	C4'-C3'-O3'	5.84	118.16	109.40
53	a	2735	G	C4'-C3'-O3'	-5.82	104.28	113.00
53	a	203	A	C2'-C3'-O3'	5.80	118.21	109.50
53	a	1982	A	C4'-C3'-O3'	5.79	118.08	109.40
1	A	31	A	C4'-C3'-O3'	-5.78	104.34	113.00
53	a	1710	G	C2'-C3'-O3'	-5.76	105.06	113.70
53	a	2463	G	C4'-C3'-O3'	5.74	118.01	109.40
1	A	103	C	C2'-C3'-O3'	5.66	122.19	113.70
53	a	818	U	C2'-C3'-O3'	5.66	117.99	109.50
53	a	1116	G	C2'-C3'-O3'	5.65	122.17	113.70
1	A	972	A	C4'-C3'-O3'	5.65	117.87	109.40
1	A	476	U	C2'-C3'-O3'	5.62	122.12	113.70
53	a	1617	U	C3'-C2'-O2'	-5.59	106.21	114.60
53	a	2767	G	C2'-C3'-O3'	5.58	117.87	109.50
53	a	458	A	C4'-C3'-O3'	-5.55	104.68	113.00
53	a	2450	A	C4'-C3'-O3'	-5.54	104.69	113.00
53	a	909	C	C4'-C3'-O3'	5.51	121.26	113.00
53	a	1982	A	C3'-C2'-O2'	-5.49	106.36	114.60
53	a	2351	A	C4'-C3'-O3'	-5.49	104.77	113.00
1	A	555	G	C2'-C3'-O3'	-5.49	105.47	113.70
53	a	2806	G	C4'-C3'-O3'	5.48	117.63	109.40
53	a	1374	G	P-O3'-C3'	-5.48	111.98	120.20
53	a	1621	A	C4'-C3'-O3'	-5.48	104.78	113.00
53	a	2772	U	C4'-C3'-O3'	5.48	117.62	109.40
53	a	1368	G	C2'-C3'-O3'	5.47	121.91	113.70
26	b	88	U	C4'-C3'-O3'	-5.46	104.81	113.00
1	A	493	A	C2'-C3'-O3'	-5.45	105.52	113.70
1	A	1316	A	C2'-C3'-O3'	5.45	117.67	109.50
53	a	2368	A	P-O3'-C3'	-5.45	112.03	120.20
53	a	986	A	N9-C1'-C2'	5.43	120.15	112.00
1	A	1502	G	C2'-C3'-O3'	-5.40	105.59	113.70

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
53	a	1744	U	C3'-C2'-O2'	5.38	122.68	114.60
53	a	1518	A	C4'-C3'-O3'	-5.38	104.93	113.00
1	A	4	U	C2'-C3'-O3'	-5.37	101.45	109.50
53	a	2748	G	C4'-C3'-O3'	5.36	117.45	109.40
53	a	600	U	C4'-C3'-O3'	-5.34	104.99	113.00
1	A	522	C	P-O3'-C3'	-5.34	112.19	120.20
53	a	484	A	C2'-C3'-O3'	-5.29	101.56	109.50
53	a	199	A	C4'-C3'-O3'	-5.28	105.09	113.00
4	E	57	GLU	CA-C-N	5.27	124.55	120.33
4	E	57	GLU	C-N-CA	5.27	124.55	120.33
1	A	1030	G	N9-C1'-C2'	5.20	119.80	112.00
53	a	1148	C	C2'-C3'-O3'	-5.19	105.91	113.70
2	C	178	PHE	CA-CB-CG	5.18	118.98	113.80
1	A	1531	A	P-O3'-C3'	-5.18	112.42	120.20
53	a	1580	C	C4'-C3'-O3'	-5.17	101.65	109.40
1	A	682	G	C4'-C3'-O3'	-5.16	105.26	113.00
53	a	2036	A	C4'-C3'-O3'	-5.16	105.27	113.00
53	a	1051	C	C4'-C3'-O3'	5.12	117.08	109.40
53	a	1648	G	C4'-C3'-O3'	-5.11	105.33	113.00
1	A	875	C	C2'-C3'-O3'	5.11	121.37	113.70
53	a	1388	A	C1'-C2'-O2'	5.09	119.43	111.80
53	a	1309	G	C2'-C3'-O3'	-5.08	106.08	113.70
53	a	2243	A	C3'-C2'-O2'	5.08	118.32	110.70
53	a	2922	A	N9-C1'-C2'	5.08	119.62	112.00
53	a	1545	A	C2'-C3'-O3'	-5.08	106.08	113.70
53	a	1547	C	N1-C1'-C2'	5.08	119.61	112.00
1	A	1382	G	C4'-C3'-O3'	5.06	120.59	113.00
53	a	1745	G	N9-C1'-C2'	5.03	119.55	112.00
53	a	2613	G	C4'-C3'-O3'	-5.03	105.46	113.00
53	a	965	A	N9-C1'-C2'	5.02	119.53	112.00
1	A	71	G	C4'-C3'-O3'	5.01	120.51	113.00
53	a	230	A	N9-C1'-C2'	5.00	119.51	112.00
1	A	1534	U	C2'-C3'-O3'	5.00	117.00	109.50

There are no chirality outliers.

All (6) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
53	a	1246	G	Sidechain
53	a	1996	G	Sidechain
53	a	2559	G	Sidechain
53	a	2922	A	Sidechain

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Mol	Chain	Res	Type	Group
53	a	517	G	Sidechain
53	a	990	G	Sidechain

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	A	32928	0	16586	131	0
2	C	1641	0	1721	1	0
3	D	1659	0	1726	5	0
4	E	1153	0	1213	3	0
5	F	867	0	878	0	0
6	G	1291	0	1351	9	0
7	H	1017	0	1073	1	0
8	I	981	0	1004	0	0
9	J	828	0	875	16	0
10	K	915	0	935	8	0
11	L	958	0	1016	0	0
12	M	907	0	966	4	0
13	N	800	0	876	26	0
14	O	716	0	766	2	0
15	P	865	0	908	1	0
16	Q	669	0	708	0	0
17	R	524	0	528	1	0
18	S	668	0	681	9	0
19	T	669	0	715	0	0
20	U	565	0	602	1	0
21	Z	133	0	143	0	0
22	0	550	0	580	2	0
23	1	813	0	884	4	0
24	2	913	0	974	5	0
25	3	307	0	342	0	0
26	b	2488	0	1265	3	0
27	c	919	0	966	7	0
28	d	1596	0	1647	9	0
29	e	941	0	1015	2	0
30	f	1457	0	1530	6	0
31	g	1310	0	1389	10	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
32	h	813	0	849	0	0
33	i	1108	0	1150	2	0
34	j	839	0	881	3	0
35	k	1076	0	1162	5	0
36	m	967	0	1018	4	0
37	o	2131	0	2231	7	0
38	q	339	0	367	1	0
39	r	522	0	559	3	0
40	s	1090	0	1163	4	0
41	t	449	0	481	1	0
42	u	1486	0	1523	4	0
43	v	436	0	447	7	0
44	w	1571	0	1631	7	0
45	x	948	0	1033	6	0
46	y	374	0	412	0	0
47	z	500	0	557	2	0
48	4	93	0	102	1	0
49	9	1412	0	1404	12	0
50	8	613	0	635	8	0
51	7	732	0	764	9	0
52	6	631	0	677	7	0
53	a	61677	0	30997	175	0
54	9	1	0	0	0	0
54	A	52	0	0	0	0
54	a	164	0	0	0	0
54	b	1	0	0	0	0
54	d	1	0	0	0	0
54	o	1	0	0	0	0
55	A	34	0	0	0	0
55	a	127	0	0	0	0
55	b	1	0	0	0	0
55	d	1	0	0	0	0
55	o	1	0	0	0	0
55	s	1	0	0	0	0
55	v	1	0	0	0	0
55	w	1	0	0	0	0
56	3	1	0	0	0	0
56	N	1	0	0	0	0
56	R	1	0	0	0	0
57	a	96	0	65	5	0
58	A	6	0	0	1	0
58	K	1	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
58	M	1	0	0	0	0
58	a	7	0	0	0	0
All	All	142356	0	95971	413	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 2.

All (413) 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)
1:A:1419:A:H5''	45:x:48:PRO:HB3	1.45	0.98
33:i:59:VAL:HG21	33:i:124:ILE:HG23	1.52	0.90
1:A:198:G:H21	1:A:466:U:H1'	1.35	0.88
53:a:1048:G:H1	53:a:1119:U:H3	1.22	0.86
1:A:714:C:H4'	10:K:113:ASN:HD22	1.40	0.84
1:A:951:U:O2'	18:S:83:HIS:HD2	1.62	0.83
27:c:92:ASP:HB2	27:c:114:LYS:HB3	1.61	0.81
27:c:4:ILE:HD11	28:d:27:VAL:HG11	1.64	0.78
1:A:1495:UR3:H4'	1:A:1516:MA6:H2	1.65	0.78
26:b:12:C:O2'	50:8:74:PRO:HA	1.83	0.78
1:A:714:C:C4'	10:K:113:ASN:HD22	1.98	0.77
1:A:714:C:H4'	10:K:113:ASN:ND2	2.00	0.75
42:u:78:ILE:HG23	42:u:99:ILE:HD11	1.69	0.75
1:A:1419:A:H2'	1:A:1420:A:C8	2.21	0.75
51:7:70:ARG:HH12	53:a:466:C:P	2.09	0.74
37:o:130:LEU:HD12	37:o:192:ILE:HD11	1.67	0.74
1:A:1490:A:C8	53:a:1929:A:N6	2.55	0.73
43:v:16:ARG:HA	53:a:2062:G:H5'	1.70	0.73
1:A:1419:A:H5''	45:x:48:PRO:CB	2.19	0.73
24:2:53:THR:HG21	24:2:65:GLY:HA3	1.71	0.73
1:A:1317:C:OP1	18:S:70:LYS:HE3	1.89	0.72
53:a:790:A:H2'	53:a:791:G:C5'	2.20	0.72
53:a:20:U:H2'	53:a:20:U:O2	1.91	0.71
10:K:5:ARG:NH2	53:a:2159:C:OP1	2.24	0.71
1:A:59:A:H4'	1:A:60:G:H5'	1.72	0.71
6:G:116:GLY:N	49:9:110:GLU:OE2	2.24	0.70
31:g:27:VAL:HG12	31:g:80:VAL:HG21	1.74	0.69
1:A:409:A:H62	1:A:428:A:H61	1.41	0.69
1:A:922:G:H1'	49:9:105:VAL:HG23	1.75	0.68
1:A:321:G:N7	58:A:1701:HOH:O	2.28	0.67
9:J:66:TYR:OH	13:N:83:ARG:HG2	1.95	0.66

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
52:6:34:LYS:NZ	53:a:2245:U:O2	2.29	0.66
1:A:991:C:H5'	13:N:8:GLU:HG2	1.78	0.66
9:J:55:SER:O	13:N:79:ARG:NH2	2.28	0.66
53:a:1547:C:O2	53:a:1547:C:H2'	1.96	0.65
1:A:1419:A:H2'	1:A:1420:A:H8	1.61	0.65
1:A:481:G:H4'	1:A:482:U:H5'	1.79	0.65
53:a:790:A:H2'	53:a:791:G:H5''	1.78	0.65
1:A:661:G:H22	1:A:738:G:H1	1.45	0.64
37:o:119:GLY:O	37:o:130:LEU:HD23	1.98	0.64
1:A:470:U:H2'	1:A:471:G:H5'	1.80	0.63
1:A:1495:UR3:C4'	1:A:1516:MA6:H2	2.29	0.63
45:x:64:ARG:NH1	45:x:99:PHE:O	2.31	0.63
12:M:93:ARG:HH11	53:a:894:C:H5''	1.64	0.63
1:A:59:A:C4'	1:A:60:G:H5'	2.30	0.62
53:a:790:A:H2'	53:a:791:G:H5'	1.83	0.61
1:A:198:G:N2	1:A:466:U:H1'	2.14	0.61
51:7:70:ARG:NH1	53:a:466:C:P	2.73	0.61
52:6:26:ASN:ND2	53:a:194:A:OP1	2.22	0.61
52:6:19:SER:HB2	53:a:2096:A:OP1	2.00	0.61
13:N:27:LEU:HD21	13:N:45:LYS:HD3	1.82	0.60
1:A:59:A:H4'	1:A:60:G:C5'	2.32	0.60
12:M:4:ARG:HH22	30:f:112:ARG:NH1	2.00	0.60
10:K:5:ARG:NH1	53:a:2159:C:OP1	2.35	0.59
31:g:25:ILE:HD11	31:g:44:VAL:HG21	1.83	0.59
50:8:35:ASN:ND2	53:a:2369:G:O2'	2.35	0.59
1:A:1426:C:H4'	53:a:1718:G:O2'	2.03	0.59
35:k:116:LEU:HD21	35:k:120:VAL:HG22	1.84	0.59
53:a:1046:A:H2	53:a:1121:G:H22	1.49	0.59
44:w:113:LEU:HD12	44:w:204:LEU:HD11	1.85	0.59
1:A:523:C:C4	1:A:524:G7M:H1'	2.38	0.58
1:A:1388:U:H2'	1:A:1389:G:C8	2.38	0.58
23:1:62:ARG:HH21	23:1:62:ARG:HB2	1.68	0.58
35:k:108:VAL:HB	35:k:125:LEU:HD22	1.84	0.58
53:a:790:A:C2'	53:a:791:G:H5''	2.34	0.58
53:a:2625[B]:U:O2'	57:a:3302:DXT:H8	2.03	0.58
1:A:97:G:O2'	1:A:98:A:C8	2.56	0.58
1:A:465:A:H3'	1:A:466:U:C6	2.39	0.58
1:A:1530:C:H2'	1:A:1531:A:C8	2.39	0.57
30:f:103:LEU:HD23	30:f:104:ILE:HG13	1.86	0.57
1:A:1088:A:H5''	6:G:4:ARG:NH2	2.19	0.57
45:x:119:LEU:HD23	45:x:119:LEU:H	1.68	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
53:a:784:A:N1	53:a:794:U:H5	2.02	0.57
14:O:88:ARG:NH1	53:a:721:U:O4	2.37	0.57
1:A:670:G:H2'	1:A:671:G:C8	2.40	0.56
9:J:55:SER:HB2	9:J:56:PRO:HD2	1.87	0.56
1:A:1495:UR3:H6	1:A:1495:UR3:O5'	2.05	0.56
36:m:112:ILE:HD11	43:v:54:LEU:HD11	1.87	0.56
51:7:78:LYS:NZ	53:a:1350:U:OP2	2.38	0.56
53:a:148:A:N3	53:a:148:A:C5'	2.68	0.56
18:S:31:ILE:HG13	18:S:47:LEU:HD21	1.87	0.56
53:a:2623:G:H2'	53:a:2624[B]:G:C8	2.41	0.56
1:A:296:G:H2'	1:A:297:A:C8	2.41	0.56
1:A:1335:G:H21	49:9:2:GLN:HE22	1.54	0.56
27:c:73:ARG:HD2	45:x:77:ILE:CD1	2.36	0.56
1:A:468:C:H2'	1:A:469:U:C6	2.41	0.56
15:P:90:MET:HE1	15:P:98:LEU:HD12	1.87	0.56
14:O:88:ARG:NH2	53:a:723:A:OP1	2.38	0.55
43:v:9:THR:CG2	53:a:2036:A:H5'	2.36	0.55
53:a:2307:U:H2'	53:a:2308:A:C8	2.41	0.55
44:w:161:ILE:HG22	44:w:173:VAL:HG21	1.88	0.55
53:a:148:A:N3	53:a:148:A:H5'	2.22	0.55
53:a:2201:U:H2'	53:a:2202:G:C8	2.41	0.55
1:A:766:G:H4'	1:A:1510:A:H4'	1.88	0.55
27:c:4:ILE:CD1	28:d:27:VAL:HG11	2.35	0.55
39:r:45:ARG:NH2	39:r:49:ASP:OD2	2.40	0.55
40:s:34:LEU:HD13	40:s:118:PHE:HB3	1.88	0.55
3:D:60:MET:HE1	3:D:194:GLU:CB	2.36	0.54
24:2:53:THR:HG21	24:2:65:GLY:CA	2.37	0.54
53:a:1034:A:N6	53:a:1131:G:H2'	2.22	0.54
1:A:1490:A:H8	53:a:1929:A:N6	2.00	0.54
53:a:1120:C:H2'	53:a:1121:G:C8	2.43	0.54
1:A:1149:A:H5'	9:J:73:ARG:HH12	1.71	0.54
27:c:73:ARG:HD2	45:x:77:ILE:HD13	1.89	0.54
53:a:543:A:C2'	53:a:544:G:H5'	2.37	0.54
1:A:110:G:H1'	1:A:351:G:H5'	1.90	0.54
50:8:56:ASP:OD1	53:a:2380:C:H4'	2.08	0.54
53:a:1052:A:C2	53:a:1119:U:H1'	2.43	0.54
28:d:184:ASP:HB3	28:d:189:LEU:HB2	1.90	0.53
37:o:207:LYS:HB2	53:a:736:G:C6	2.42	0.53
41:t:49:MET:O	41:t:53:VAL:HG22	2.08	0.53
37:o:16:VAL:HG22	37:o:206:GLY:HA3	1.89	0.53
51:7:80:TYR:OH	53:a:1350:U:OP1	2.25	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
53:a:2922:A:N6	53:a:2923:A:C6	2.76	0.53
51:7:70:ARG:NH1	53:a:466:C:OP1	2.42	0.53
52:6:34:LYS:HE3	53:a:2107:C:H1'	1.91	0.53
53:a:641:C:H2'	53:a:642:C:C6	2.44	0.53
53:a:396:A:H1'	53:a:416:G:O4'	2.09	0.53
1:A:1530:C:H2'	1:A:1531:A:H8	1.74	0.52
26:b:59:A:H2'	26:b:60:A:C8	2.44	0.52
53:a:148:A:H2'	53:a:149:G:O4'	2.09	0.52
53:a:2143:G:H2'	53:a:2144:G:C8	2.44	0.52
53:a:2625[B]:U:H5'	57:a:3301:DXT:H9	1.90	0.52
13:N:22:LYS:O	13:N:26:GLU:HG2	2.09	0.52
51:7:18:LYS:NZ	53:a:1350:U:OP1	2.41	0.52
34:j:24:VAL:HG23	34:j:32:ALA:HB1	1.91	0.52
1:A:710:A:H2'	1:A:711:G:C8	2.45	0.52
1:A:1316:A:OP2	18:S:3:ARG:NH2	2.32	0.52
3:D:60:MET:HE1	3:D:194:GLU:HB2	1.92	0.52
1:A:1513:2MG:HM21	1:A:1516:MA6:N7	2.25	0.52
47:z:63:ARG:HG2	47:z:63:ARG:HH21	1.75	0.52
53:a:1052:A:N1	53:a:1119:U:H1'	2.25	0.52
13:N:30:ILE:HG23	13:N:38:GLU:HB3	1.92	0.52
53:a:2191:C:N4	53:a:2192:A:C2	2.78	0.52
1:A:929:G:OP2	6:G:3:ARG:HB2	2.10	0.51
1:A:1313:G:H4'	13:N:56:VAL:HG21	1.91	0.51
1:A:1425:A:H2'	1:A:1426:C:O4'	2.10	0.51
1:A:462:A:N3	1:A:462:A:H2'	2.25	0.51
10:K:5:ARG:CZ	53:a:2159:C:OP1	2.58	0.51
28:d:149:ILE:HG12	53:a:2067:U:H4'	1.91	0.51
26:b:12:C:HO2'	50:8:74:PRO:HA	1.75	0.51
13:N:40:GLU:HA	13:N:43:LEU:HD12	1.92	0.51
1:A:1490:A:H1'	53:a:1929:A:N1	2.26	0.51
53:a:7:A:H2'	53:a:8:U:C6	2.46	0.51
1:A:1088:A:H5''	6:G:4:ARG:HH22	1.76	0.51
53:a:2164:G:H2'	53:a:2165:C:C6	2.46	0.51
1:A:1056:U:H4'	9:J:55:SER:HB3	1.93	0.51
31:g:27:VAL:CG1	31:g:80:VAL:HG21	2.40	0.51
6:G:115:VAL:HG13	49:9:110:GLU:HG2	1.93	0.51
1:A:213:U:H1'	1:A:463:A:H61	1.75	0.50
1:A:1353:A:H2'	1:A:1354:A:C8	2.45	0.50
28:d:32:LEU:HB3	28:d:34:ARG:HH21	1.75	0.50
1:A:1313:G:N7	18:S:7:LYS:NZ	2.59	0.50
53:a:311:G:H22	53:a:314:A:H5'	1.77	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
53:a:2625[A]:U:H1'	53:a:2626[A]:C:C5	2.46	0.50
1:A:712:A:H2'	1:A:713:A:C8	2.46	0.50
40:s:35:LYS:HE2	40:s:130:LEU:HD23	1.93	0.50
44:w:73:ARG:HD3	53:a:681:G:H1'	1.93	0.50
1:A:213:U:H1'	1:A:463:A:N6	2.26	0.50
31:g:118:MET:HE1	31:g:149:ILE:HD11	1.92	0.50
37:o:124:ILE:HA	37:o:192:ILE:HD13	1.92	0.50
53:a:2626[B]:C:O3'	57:a:3303:DXT:H8	2.10	0.50
1:A:1202:U:H5''	2:C:190:LYS:HE2	1.93	0.50
1:A:1141:G:N2	1:A:1143:A:H62	2.10	0.49
50:8:44:HIS:HD2	53:a:2347:G:OP1	1.95	0.49
52:6:36:ARG:NH2	53:a:2215:A:O2'	2.45	0.49
1:A:925:G:H5''	49:9:172:ARG:NH2	2.27	0.49
40:s:56:ARG:CD	53:a:2485:A:H4'	2.43	0.49
1:A:1056:U:C4'	9:J:55:SER:HB3	2.43	0.49
53:a:1117:A:H1'	53:a:1118:G:H4'	1.95	0.49
9:J:79:GLU:N	9:J:80:PRO:HD3	2.28	0.49
44:w:116:LEU:HD13	44:w:190:ILE:HD12	1.94	0.49
53:a:2344:A:H2'	53:a:2345:A:C8	2.47	0.49
53:a:646:U:H2'	53:a:647:C:C6	2.48	0.49
1:A:933:A:O2'	1:A:934:A:H8	1.95	0.49
1:A:1399:4OC:HM43	1:A:1400:C:N3	2.28	0.49
18:S:6:ASN:OD1	48:4:66:LYS:HD2	2.12	0.49
53:a:790:A:C2'	53:a:791:G:C5'	2.88	0.49
53:a:2625[A]:U:H2'	53:a:2625[A]:U:O2	2.12	0.49
53:a:1117:A:H1'	53:a:1118:G:C4'	2.43	0.49
53:a:2191:C:H2'	53:a:2192:A:O4'	2.13	0.49
31:g:10:ILE:CG2	31:g:77:VAL:HG21	2.43	0.48
53:a:587:U:H2'	53:a:588:C:C6	2.48	0.48
53:a:2289:A:H2'	53:a:2290:A:C8	2.48	0.48
53:a:1547:C:O2	53:a:1547:C:C2'	2.58	0.48
53:a:1760:A:H2'	53:a:1761:A:C8	2.49	0.48
1:A:1335:G:N2	49:9:2:GLN:HE22	2.10	0.48
31:g:103:LYS:NZ	31:g:117:GLU:OE1	2.47	0.48
34:j:11:ARG:HH11	34:j:98:LYS:HE3	1.79	0.48
1:A:1515:MA6:H2'	1:A:1516:MA6:H8	1.96	0.48
53:a:1883:C:H2'	53:a:1884:C:O4'	2.14	0.48
1:A:951:U:O2'	18:S:83:HIS:CD2	2.53	0.48
1:A:1515:MA6:H2'	1:A:1516:MA6:C8	2.43	0.48
13:N:10:ASN:O	13:N:14:VAL:HG23	2.13	0.48
24:2:58:VAL:O	24:2:62:ILE:HG22	2.13	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:144:G:H2'	1:A:145:G:C8	2.49	0.48
43:v:26:MET:HE3	43:v:27:LEU:H	1.79	0.48
53:a:2626[A]:C:O3'	57:a:3303:DXT:H8	2.13	0.48
53:a:803:U:H2'	53:a:804:C:C6	2.49	0.48
1:A:942:A:H2'	1:A:943:G:C8	2.49	0.47
9:J:48:GLU:OE1	13:N:74:LYS:HE3	2.14	0.47
1:A:521:G:H2'	1:A:522:C:C6	2.49	0.47
31:g:102:LYS:HB3	31:g:117:GLU:OE1	2.14	0.47
36:m:112:ILE:CD1	43:v:54:LEU:HD11	2.44	0.47
53:a:1051:C:H1'	53:a:1052:A:OP2	2.13	0.47
1:A:1001:A:C5	1:A:1002:C:H1'	2.50	0.47
1:A:1489:A:N6	53:a:1929:A:C8	2.83	0.47
53:a:902:A:C8	53:a:903:C:C6	3.02	0.47
53:a:2190:C:H2'	53:a:2191:C:C6	2.49	0.47
1:A:961:U:C5	49:9:10:ARG:HD3	2.50	0.47
22:0:50:TRP:CZ2	22:0:55:SER:HA	2.49	0.47
1:A:97:G:O2'	1:A:98:A:H8	1.97	0.47
1:A:465:A:H3'	1:A:466:U:C5	2.50	0.47
3:D:57:MET:HE3	3:D:57:MET:HA	1.97	0.47
12:M:4:ARG:HH22	30:f:112:ARG:CZ	2.27	0.47
53:a:539:U:H2'	53:a:540:A:C8	2.50	0.47
53:a:2144:G:H2'	53:a:2145:C:C6	2.50	0.47
1:A:929:G:N7	6:G:3:ARG:HD2	2.29	0.47
30:f:13:THR:HB	30:f:14:PRO:HD3	1.96	0.47
36:m:5:LYS:NZ	53:a:2016:C:OP1	2.42	0.47
53:a:907:A:H2'	53:a:908:C:O4'	2.14	0.47
53:a:1545:A:N6	53:a:1551:U:C4	2.83	0.47
42:u:163:LEU:HD23	42:u:186:ILE:HD11	1.96	0.47
1:A:1335:G:H2'	1:A:1336:A:C8	2.50	0.47
53:a:651:A:H2'	53:a:652:A:C8	2.50	0.47
53:a:675:A:H2'	53:a:677:A:H62	1.80	0.47
39:r:33:GLY:HA3	51:7:13:PRO:HG2	1.96	0.47
53:a:20:U:O2	53:a:20:U:C2'	2.62	0.47
1:A:1375:C:H5'	6:G:127:ARG:HH22	1.80	0.46
1:A:1222:A:H2'	1:A:1223:C:C5	2.51	0.46
13:N:62:CYS:HB2	13:N:78:CYS:HB3	1.97	0.46
50:8:20:MET:SD	53:a:2372:U:O3'	2.73	0.46
1:A:1056:U:H4'	9:J:54:ILE:HG13	1.97	0.46
9:J:58:ILE:O	9:J:60:LYS:N	2.49	0.46
9:J:85:VAL:HG12	9:J:89:MET:HE2	1.98	0.46
50:8:43:THR:CG2	53:a:2352:A:H61	2.28	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:480:C:H2'	1:A:481:G:N7	2.30	0.46
1:A:266:U:H2'	1:A:267:A:C8	2.51	0.46
53:a:2183:U:H2'	53:a:2184:G:O4'	2.16	0.46
28:d:28:VAL:HG11	28:d:206:ILE:HD11	1.96	0.46
53:a:664:U:H2'	53:a:665:U:C6	2.50	0.46
1:A:522:C:H2'	1:A:523:C:O4'	2.16	0.46
1:A:1056:U:O2'	9:J:59:ASP:OD2	2.28	0.46
10:K:5:ARG:HH22	53:a:2159:C:H5''	1.81	0.46
13:N:12:LYS:O	13:N:15:ARG:NH2	2.49	0.46
52:6:32:ASN:HB2	53:a:402:A:H5''	1.97	0.46
53:a:781:A:H2	53:a:794:U:O2'	1.98	0.46
53:a:898:G:H3'	53:a:899:C:H5''	1.98	0.46
53:a:2563:A:H2'	53:a:2564:U:C6	2.51	0.46
1:A:1426:C:O3'	53:a:1719:U:H5'	2.16	0.46
9:J:52:VAL:HG12	13:N:72:PHE:CZ	2.51	0.46
24:2:50:CYS:O	24:2:81:ARG:NH1	2.49	0.46
27:c:18:ILE:HD13	27:c:77:LEU:HD21	1.98	0.46
1:A:499:A:H2'	1:A:500:C:O4'	2.16	0.46
1:A:1222:A:H2'	1:A:1223:C:C6	2.50	0.46
1:A:1448:U:H2'	1:A:1448:U:O2	2.16	0.46
53:a:201:A:N6	53:a:2446:A:H2'	2.31	0.46
53:a:866:U:O2	53:a:866:U:O4'	2.33	0.46
53:a:2623:G:H2'	53:a:2624[A]:G:C8	2.51	0.46
13:N:13:ARG:HD3	13:N:57:ARG:HB2	1.98	0.45
38:q:7:GLU:HA	38:q:15:ILE:HG12	1.98	0.45
43:v:9:THR:HG21	53:a:2036:A:H5'	1.99	0.45
53:a:790:A:N3	53:a:791:G:H5'	2.31	0.45
1:A:349:C:H4'	1:A:351:G:OP1	2.16	0.45
43:v:52:GLN:NE2	43:v:54:LEU:O	2.50	0.45
1:A:1500:A:H1'	49:9:106:LYS:NZ	2.31	0.45
13:N:22:LYS:HE3	13:N:22:LYS:HB3	1.89	0.45
1:A:961:U:O2'	49:9:42:VAL:HG11	2.16	0.45
1:A:1500:A:H1'	49:9:106:LYS:HZ2	1.82	0.45
37:o:207:LYS:HB2	53:a:736:G:C5	2.52	0.45
53:a:2090:U:H2'	53:a:2091:U:C6	2.52	0.45
1:A:1388:U:H2'	1:A:1389:G:H8	1.81	0.45
34:j:75:MET:HE3	53:a:523:G:H21	1.82	0.45
1:A:459:G:H2'	1:A:460:G:C8	2.52	0.45
1:A:470:U:C2'	1:A:471:G:H5'	2.46	0.44
44:w:99:LYS:HG2	53:a:666:G:H4'	1.98	0.44
53:a:148:A:H2'	53:a:149:G:C8	2.52	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
53:a:211:A:H2'	53:a:212:C:O4'	2.17	0.44
53:a:2153:C:H2'	53:a:2154:U:C1'	2.46	0.44
53:a:2205:U:H2'	53:a:2206:G:C8	2.52	0.44
1:A:1164:A:H8	1:A:1164:A:H5'	1.81	0.44
9:J:52:VAL:HG12	13:N:72:PHE:CE2	2.51	0.44
17:R:39:PRO:HD2	17:R:42:ILE:HD12	1.99	0.44
53:a:1338:A:H2'	53:a:1340:C:C4	2.53	0.44
1:A:536:A:H2'	1:A:537:G:C8	2.52	0.44
27:c:80:PRO:HG2	28:d:20:GLY:HA2	1.99	0.44
1:A:1220:C:P	18:S:78:ARG:HH21	2.41	0.44
12:M:17:ARG:HD3	12:M:32:LEU:HD21	1.99	0.44
31:g:104:LEU:HD23	31:g:116:ILE:HD12	1.99	0.44
1:A:466:U:H2'	1:A:467:C:O4'	2.17	0.44
36:m:103:ARG:O	36:m:107:SER:HA	2.18	0.44
1:A:389:C:O2'	1:A:480:C:H4'	2.18	0.44
1:A:1217:G:P	13:N:51:ARG:HH22	2.41	0.44
22:0:40:LEU:HD22	22:0:42:ILE:HD11	1.99	0.44
53:a:543:A:H2'	53:a:544:G:H5'	1.99	0.44
1:A:840:C:H2'	1:A:842:C:C5	2.53	0.44
1:A:1215:U:H2'	1:A:1216:A:C8	2.52	0.44
53:a:699:U:H2'	53:a:700:A:C8	2.52	0.44
53:a:2078:A:C2	57:a:3301:DXT:C21	3.01	0.44
1:A:1043:G:H5''	13:N:4:LEU:HD12	1.99	0.44
1:A:1516:MA6:H8	1:A:1516:MA6:OP2	2.18	0.44
30:f:108:ILE:HG21	30:f:176:PRO:HG3	2.00	0.44
53:a:1905:A:H2'	53:a:1906:A:C8	2.53	0.44
53:a:1516:U:H2'	53:a:1517:C:C6	2.53	0.43
1:A:199:G:H1'	1:A:465:A:H8	1.82	0.43
4:E:159:ARG:HD3	7:H:44:TYR:CZ	2.53	0.43
50:8:42:GLY:N	53:a:2346:G:H21	2.15	0.43
53:a:1660:G:H5''	53:a:1661:C:H5'	2.00	0.43
53:a:2087:A:H2'	53:a:2088:C:C6	2.53	0.43
13:N:33:LYS:HE3	13:N:33:LYS:HB2	1.65	0.43
39:r:48:ARG:NH1	53:a:83:G:H4'	2.34	0.43
13:N:59:ARG:HG2	13:N:61:ARG:HG3	1.99	0.43
53:a:1051:C:C6	53:a:1117:A:N1	2.87	0.43
1:A:387:U:H2'	1:A:388:C:C6	2.53	0.43
53:a:2695:A:H2'	53:a:2696:C:O4'	2.18	0.43
1:A:1164:A:H5'	1:A:1164:A:C8	2.53	0.43
40:s:56:ARG:HD2	53:a:2485:A:H4'	2.00	0.43
53:a:1742:C:H2'	53:a:1743:U:O4'	2.18	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:975:C:H42	13:N:56:VAL:HG12	1.83	0.43
1:A:1067:C:H2'	1:A:1068:G:C8	2.54	0.43
53:a:1276:G:O2'	53:a:2028:G:O6	2.36	0.43
1:A:933:A:O2'	1:A:934:A:C8	2.67	0.43
53:a:2714:U:H2'	53:a:2715:C:C6	2.54	0.43
53:a:1585:A:H2'	53:a:1586:A:C8	2.54	0.42
1:A:426:U:O2	1:A:426:U:C2'	2.67	0.42
53:a:2804:C:H2'	53:a:2805:C:C6	2.54	0.42
1:A:540:U:OP1	3:D:14:ARG:HD3	2.20	0.42
35:k:78:ARG:HG2	35:k:113:ALA:HB3	2.02	0.42
51:7:55:ARG:NH2	53:a:1408:C:OP1	2.43	0.42
13:N:30:ILE:CG2	13:N:38:GLU:HB3	2.48	0.42
44:w:167:ASN:HB2	53:a:326:A:OP2	2.19	0.42
13:N:12:LYS:HE3	13:N:16:LYS:HD2	2.02	0.42
13:N:51:ARG:HH21	18:S:37:ARG:NH2	2.17	0.42
53:a:2192:A:C2	53:a:2193:C:C5	3.07	0.42
1:A:212:C:H2'	1:A:213:U:C6	2.53	0.42
1:A:1375:C:OP2	6:G:6:ALA:HB2	2.19	0.42
53:a:787:G:H2'	53:a:789:A:N7	2.35	0.42
1:A:381:C:H2'	1:A:382:C:C6	2.54	0.42
53:a:784:A:N1	53:a:794:U:C5	2.85	0.42
30:f:50:ILE:HD13	30:f:84:PRO:HB2	2.01	0.42
10:K:108:THR:HG21	20:U:32:LEU:HD11	2.01	0.42
42:u:193:ARG:HH12	53:a:903:C:H5''	1.85	0.42
53:a:313:A:H2'	53:a:314:A:H5''	2.02	0.42
53:a:846:U:H2'	53:a:847:C:C6	2.55	0.42
1:A:498:C:H2'	1:A:499:A:C8	2.55	0.42
1:A:1533:C:O2	1:A:1533:C:C2'	2.68	0.42
3:D:60:MET:HE1	3:D:194:GLU:HB3	2.02	0.42
53:a:294:U:H2'	53:a:295:U:C6	2.55	0.42
53:a:862:G:H2'	53:a:863:G:C8	2.55	0.42
53:a:1443:A:H2'	53:a:1444:A:C8	2.54	0.42
1:A:157:A:H2'	1:A:158:A:O4'	2.20	0.41
1:A:1149:A:H5'	9:J:73:ARG:NH1	2.35	0.41
4:E:78:LEU:HD21	4:E:120:MET:HE2	2.00	0.41
23:1:103:GLU:OE1	23:1:103:GLU:N	2.53	0.41
53:a:2330:G:H2'	53:a:2331:U:C6	2.55	0.41
1:A:711:G:H2'	1:A:712:A:C8	2.55	0.41
28:d:109:VAL:CG1	28:d:177:SER:HA	2.50	0.41
35:k:1:MET:HE3	44:w:27:TYR:CE1	2.56	0.41
53:a:577:G:H2'	53:a:2046:A:N7	2.36	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
53:a:1557:C:N4	53:a:1558:A:C6	2.88	0.41
53:a:1772:U:C5	53:a:2712:U:H5'	2.55	0.41
53:a:1792:U:H2'	53:a:1798:A:N6	2.35	0.41
53:a:2144:G:H2'	53:a:2145:C:H6	1.85	0.41
53:a:2249:U:H2'	53:a:2250:G:C8	2.55	0.41
1:A:18:C:H5''	4:E:93:SER:HB2	2.02	0.41
1:A:480:C:H3'	1:A:481:G:H8	1.85	0.41
51:7:82:MET:HE3	53:a:1409:C:OP1	2.21	0.41
1:A:483:U:H2'	1:A:484:A:C8	2.55	0.41
28:d:158:VAL:HG21	53:a:2634:G:H21	1.85	0.41
53:a:419:C:H2'	53:a:420:A:C8	2.56	0.41
53:a:1553:C:O4'	53:a:1554:G:C8	2.73	0.41
53:a:1606:U:H2'	53:a:1607:U:C6	2.55	0.41
53:a:2623:G:C6	53:a:2624[B]:G:C6	3.08	0.41
1:A:1375:C:H5'	6:G:127:ARG:NH2	2.36	0.41
24:2:55:GLU:HB2	24:2:58:VAL:HG22	2.02	0.41
53:a:2120:A:H2'	53:a:2121:U:O4'	2.20	0.41
33:i:89:PHE:CE2	33:i:100:ILE:HD13	2.56	0.41
1:A:110:G:C1'	1:A:351:G:H5'	2.51	0.41
1:A:977:U:OP1	13:N:9:ARG:NH1	2.54	0.41
1:A:1146:C:H2'	1:A:1147:U:C6	2.56	0.41
1:A:1335:G:N2	49:9:2:GLN:NE2	2.68	0.41
29:e:31:VAL:HG13	53:a:587:U:O3'	2.20	0.41
53:a:2343:A:H2'	53:a:2344:A:C8	2.55	0.41
23:1:96:ARG:HB3	23:1:105:ILE:HD12	2.02	0.41
29:e:30:ARG:NH1	53:a:26:C:OP1	2.54	0.41
31:g:10:ILE:HB	31:g:51:LEU:HB2	2.03	0.41
31:g:12:ILE:HG12	31:g:18:VAL:HG21	2.03	0.41
53:a:1052:A:N7	53:a:1117:A:N1	2.69	0.41
53:a:1055:C:N3	53:a:1056:A:C6	2.88	0.41
53:a:2119:U:H2'	53:a:2120:A:O4'	2.21	0.41
53:a:2120:A:H1'	53:a:2202:G:N2	2.35	0.41
42:u:174:LEU:HD13	42:u:178:VAL:HG21	2.03	0.41
53:a:1058:C:O2	53:a:1058:C:H2'	2.20	0.41
37:o:14:ARG:NH1	53:a:1708:U:O2'	2.54	0.40
53:a:146:C:O2	53:a:146:C:O4'	2.38	0.40
53:a:2198:G:H2'	53:a:2199:C:O4'	2.20	0.40
53:a:2359:U:H2'	53:a:2360:U:C6	2.56	0.40
1:A:1030:G:H2'	1:A:1031:A:O4'	2.21	0.40
9:J:66:TYR:OH	13:N:83:ARG:CG	2.68	0.40
52:6:29:PHE:HB3	53:a:401:G:H1'	2.03	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
53:a:543:A:H2'	53:a:544:G:O4'	2.20	0.40
53:a:1415:U:H2'	53:a:1416:U:C6	2.56	0.40
53:a:2623:G:C6	53:a:2624[A]:G:C6	3.09	0.40
1:A:961:U:H2'	49:9:10:ARG:CZ	2.52	0.40
35:k:123:ARG:NH2	35:k:143:GLU:OE2	2.54	0.40
53:a:781:A:O2'	53:a:782:G:C8	2.70	0.40
53:a:1886:C:O2	53:a:1886:C:H2'	2.21	0.40
53:a:2772:U:H1'	53:a:2773:A:H5''	2.04	0.40
53:a:2901:A:H2'	53:a:2902:A:C8	2.56	0.40
23:1:98:PHE:O	23:1:102:GLY:N	2.53	0.40
47:z:63:ARG:HH21	47:z:63:ARG:CG	2.34	0.40
1:A:55:U:H2'	1:A:56:G:C8	2.56	0.40
53:a:749:A:H2'	53:a:750:A:C8	2.57	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	
2	C	204/227 (90%)	198 (97%)	6 (3%)	0	100	100
3	D	203/206 (98%)	199 (98%)	4 (2%)	0	100	100
4	E	156/168 (93%)	154 (99%)	2 (1%)	0	100	100
5	F	104/127 (82%)	104 (100%)	0	0	100	100
6	G	158/191 (83%)	158 (100%)	0	0	100	100
7	H	128/130 (98%)	126 (98%)	2 (2%)	0	100	100
8	I	121/139 (87%)	119 (98%)	2 (2%)	0	100	100
9	J	100/110 (91%)	96 (96%)	4 (4%)	0	100	100
10	K	117/123 (95%)	115 (98%)	2 (2%)	0	100	100
11	L	121/124 (98%)	118 (98%)	3 (2%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
12	M	113/119 (95%)	109 (96%)	4 (4%)	0	100	100
13	N	96/99 (97%)	89 (93%)	7 (7%)	0	100	100
14	O	86/89 (97%)	84 (98%)	2 (2%)	0	100	100
15	P	104/137 (76%)	103 (99%)	1 (1%)	0	100	100
16	Q	81/89 (91%)	78 (96%)	3 (4%)	0	100	100
17	R	63/73 (86%)	63 (100%)	0	0	100	100
18	S	82/95 (86%)	80 (98%)	2 (2%)	0	100	100
19	T	84/90 (93%)	84 (100%)	0	0	100	100
20	U	66/74 (89%)	66 (100%)	0	0	100	100
21	Z	14/21 (67%)	14 (100%)	0	0	100	100
22	0	66/70 (94%)	66 (100%)	0	0	100	100
23	1	103/107 (96%)	100 (97%)	3 (3%)	0	100	100
24	2	114/117 (97%)	112 (98%)	2 (2%)	0	100	100
25	3	36/40 (90%)	36 (100%)	0	0	100	100
27	c	111/115 (96%)	108 (97%)	3 (3%)	0	100	100
28	d	209/217 (96%)	203 (97%)	6 (3%)	0	100	100
29	e	116/119 (98%)	116 (100%)	0	0	100	100
30	f	180/182 (99%)	174 (97%)	6 (3%)	0	100	100
31	g	172/178 (97%)	166 (96%)	6 (4%)	0	100	100
32	h	102/115 (89%)	102 (100%)	0	0	100	100
33	i	139/142 (98%)	138 (99%)	1 (1%)	0	100	100
34	j	108/115 (94%)	107 (99%)	1 (1%)	0	100	100
35	k	141/143 (99%)	135 (96%)	6 (4%)	0	100	100
36	m	117/126 (93%)	111 (95%)	6 (5%)	0	100	100
37	o	272/275 (99%)	264 (97%)	7 (3%)	1 (0%)	30	46
38	q	43/152 (28%)	41 (95%)	2 (5%)	0	100	100
39	r	61/65 (94%)	60 (98%)	1 (2%)	0	100	100
40	s	135/137 (98%)	131 (97%)	4 (3%)	0	100	100
41	t	54/63 (86%)	52 (96%)	2 (4%)	0	100	100
42	u	189/244 (78%)	182 (96%)	7 (4%)	0	100	100
43	v	52/64 (81%)	51 (98%)	1 (2%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
44	w	203/205 (99%)	201 (99%)	2 (1%)	0	100	100
45	x	120/122 (98%)	116 (97%)	4 (3%)	0	100	100
46	y	42/44 (96%)	42 (100%)	0	0	100	100
47	z	60/64 (94%)	59 (98%)	1 (2%)	0	100	100
48	4	8/79 (10%)	7 (88%)	1 (12%)	0	100	100
49	9	173/183 (94%)	167 (96%)	5 (3%)	1 (1%)	21	35
50	8	75/90 (83%)	73 (97%)	2 (3%)	0	100	100
51	7	89/95 (94%)	88 (99%)	1 (1%)	0	100	100
52	6	75/79 (95%)	75 (100%)	0	0	100	100
All	All	5566/6178 (90%)	5440 (98%)	124 (2%)	2 (0%)	100	100

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
49	9	65	PRO
37	o	155	VAL

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	
2	C	169/186 (91%)	169 (100%)	0	100	100
3	D	177/178 (99%)	176 (99%)	1 (1%)	78	90
4	E	119/126 (94%)	119 (100%)	0	100	100
5	F	95/110 (86%)	94 (99%)	1 (1%)	65	83
6	G	131/150 (87%)	131 (100%)	0	100	100
7	H	114/114 (100%)	114 (100%)	0	100	100
8	I	101/108 (94%)	99 (98%)	2 (2%)	48	72
9	J	92/98 (94%)	90 (98%)	2 (2%)	45	70
10	K	94/97 (97%)	94 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
11	L	100/101 (99%)	100 (100%)	0	100	100
12	M	93/96 (97%)	92 (99%)	1 (1%)	65	83
13	N	86/87 (99%)	72 (84%)	14 (16%)	2	4
14	O	78/79 (99%)	78 (100%)	0	100	100
15	P	88/110 (80%)	88 (100%)	0	100	100
16	Q	76/82 (93%)	76 (100%)	0	100	100
17	R	57/65 (88%)	56 (98%)	1 (2%)	51	74
18	S	73/82 (89%)	71 (97%)	2 (3%)	39	64
19	T	69/73 (94%)	68 (99%)	1 (1%)	59	79
20	U	58/64 (91%)	57 (98%)	1 (2%)	53	75
21	Z	13/18 (72%)	13 (100%)	0	100	100
22	0	62/63 (98%)	62 (100%)	0	100	100
23	1	91/93 (98%)	90 (99%)	1 (1%)	65	83
24	2	92/93 (99%)	90 (98%)	2 (2%)	45	70
25	3	34/35 (97%)	33 (97%)	1 (3%)	37	62
27	c	98/100 (98%)	95 (97%)	3 (3%)	35	60
28	d	169/175 (97%)	168 (99%)	1 (1%)	78	90
29	e	88/89 (99%)	87 (99%)	1 (1%)	65	83
30	f	155/155 (100%)	151 (97%)	4 (3%)	40	65
31	g	142/146 (97%)	140 (99%)	2 (1%)	59	79
32	h	85/93 (91%)	85 (100%)	0	100	100
33	i	115/116 (99%)	114 (99%)	1 (1%)	70	86
34	j	86/91 (94%)	84 (98%)	2 (2%)	44	69
35	k	107/107 (100%)	106 (99%)	1 (1%)	70	86
36	m	102/109 (94%)	101 (99%)	1 (1%)	68	84
37	o	223/224 (100%)	221 (99%)	2 (1%)	70	86
38	q	36/123 (29%)	36 (100%)	0	100	100
39	r	56/58 (97%)	55 (98%)	1 (2%)	51	74
40	s	111/111 (100%)	111 (100%)	0	100	100
41	t	50/57 (88%)	50 (100%)	0	100	100
42	u	167/201 (83%)	165 (99%)	2 (1%)	63	81

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
43	v	46/56 (82%)	46 (100%)	0	100	100
44	w	169/169 (100%)	165 (98%)	4 (2%)	43	67
45	x	105/105 (100%)	103 (98%)	2 (2%)	50	73
46	y	38/38 (100%)	38 (100%)	0	100	100
47	z	54/56 (96%)	52 (96%)	2 (4%)	30	54
48	4	9/69 (13%)	9 (100%)	0	100	100
49	9	153/161 (95%)	153 (100%)	0	100	100
50	8	64/73 (88%)	63 (98%)	1 (2%)	55	77
51	7	79/81 (98%)	79 (100%)	0	100	100
52	6	70/72 (97%)	70 (100%)	0	100	100
All	All	4739/5143 (92%)	4679 (99%)	60 (1%)	59	80

All (60) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
3	D	56	ARG
5	F	94	HIS
8	I	70	VAL
8	I	125	VAL
9	J	58	ILE
9	J	64	ASP
12	M	70	LEU
13	N	5	SER
13	N	8	GLU
13	N	15	ARG
13	N	17	SER
13	N	21	ARG
13	N	29	LYS
13	N	33	LYS
13	N	38	GLU
13	N	49	ARG
13	N	57	ARG
13	N	79	ARG
13	N	83	ARG
13	N	95	LYS
13	N	96	LYS
17	R	48	LYS
18	S	43	GLU

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Mol	Chain	Res	Type
18	S	78	ARG
19	T	24	GLN
20	U	33	ARG
23	1	62	ARG
24	2	68	ILE
24	2	81	ARG
25	3	31	ARG
27	c	4	ILE
27	c	54	ARG
27	c	101	LEU
28	d	34	ARG
29	e	112	LYS
30	f	58	ILE
30	f	78	LYS
30	f	103	LEU
30	f	144	ASP
31	g	116	ILE
31	g	171	ILE
33	i	31	ARG
34	j	70	LYS
34	j	85	PHE
35	k	68	SER
36	m	35	LYS
37	o	13	ARG
37	o	168	GLU
39	r	9	LYS
42	u	118	ASP
42	u	194	VAL
44	w	92	LYS
44	w	174	CYS
44	w	179	VAL
44	w	199	ARG
45	x	77	ILE
45	x	80	ASP
47	z	6	THR
47	z	63	ARG
50	8	80	VAL

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (60) such sidechains are listed below:

Mol	Chain	Res	Type
2	C	3	GLN

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Mol	Chain	Res	Type
2	C	21	ASN
2	C	34	ASN
5	F	104	GLN
6	G	121	GLN
7	H	58	GLN
8	I	78	GLN
9	J	105	ASN
10	K	57	GLN
10	K	70	ASN
10	K	112	HIS
10	K	113	ASN
11	L	72	HIS
12	M	15	HIS
13	N	18	GLN
15	P	99	GLN
17	R	15	ASN
17	R	52	GLN
18	S	14	HIS
18	S	57	HIS
18	S	83	HIS
19	T	24	GLN
19	T	53	HIS
20	U	10	ASN
24	2	64	HIS
27	c	88	ASN
28	d	37	GLN
28	d	128	HIS
28	d	188	ASN
30	f	5	GLN
31	g	115	ASN
33	i	19	ASN
33	i	58	ASN
33	i	133	GLN
34	j	94	ASN
36	m	2	HIS
36	m	9	HIS
37	o	111	HIS
37	o	134	ASN
37	o	143	ASN
38	q	14	ASN
42	u	97	GLN
42	u	190	HIS

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Mol	Chain	Res	Type
44	w	98	GLN
44	w	149	ASN
44	w	162	ASN
44	w	167	ASN
45	x	3	GLN
45	x	92	GLN
47	z	28	ASN
47	z	48	HIS
49	9	2	GLN
49	9	6	GLN
49	9	31	GLN
49	9	72	ASN
49	9	108	HIS
50	8	35	ASN
50	8	44	HIS
50	8	78	ASN
52	6	22	ASN

5.3.3 RNA [i](#)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
1	A	1534/1535 (99%)	234 (15%)	48 (3%)
26	b	116/117 (99%)	11 (9%)	0
53	a	2868/2925 (98%)	349 (12%)	0
All	All	4518/4577 (98%)	594 (13%)	48 (1%)

All (594) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
1	A	4	U
1	A	8	G
1	A	21	G
1	A	31	A
1	A	38	G
1	A	46	C
1	A	47	U
1	A	50	A
1	A	61	U
1	A	65	A
1	A	68	G
1	A	71	G

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Mol	Chain	Res	Type
1	A	72	C
1	A	80	G
1	A	81	C
1	A	84	G
1	A	85	C
1	A	91	G
1	A	95	G
1	A	97	G
1	A	98	A
1	A	116	A
1	A	117	A
1	A	118	U
1	A	127	A
1	A	128	U
1	A	136	G
1	A	160	C
1	A	163	G
1	A	185	U
1	A	186	U
1	A	187	G
1	A	188	G
1	A	194	A
1	A	203	U
1	A	204	C
1	A	209	G
1	A	214	C
1	A	215	G
1	A	242	U
1	A	244	G
1	A	248	G
1	A	263	G
1	A	264	C
1	A	269	C
1	A	286	G
1	A	325	C
1	A	326	A
1	A	329	G
1	A	344	G
1	A	349	C
1	A	351	G
1	A	364	U
1	A	369	C

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Mol	Chain	Res	Type
1	A	381	C
1	A	382	C
1	A	394	A
1	A	395	U
1	A	403	G
1	A	407	G
1	A	408	A
1	A	409	A
1	A	410	G
1	A	411	A
1	A	412	A
1	A	420	G
1	A	421	G
1	A	426	U
1	A	435	U
1	A	436	U
1	A	450	A
1	A	454	U
1	A	455	C
1	A	459	G
1	A	460	G
1	A	462	A
1	A	463	A
1	A	464	U
1	A	465	A
1	A	466	U
1	A	467	C
1	A	470	U
1	A	471	G
1	A	475	G
1	A	476	U
1	A	477	U
1	A	482	U
1	A	483	U
1	A	484	A
1	A	493	A
1	A	494	G
1	A	495	A
1	A	496	A
1	A	508	C
1	A	509	U
1	A	515	C

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Mol	Chain	Res	Type
1	A	524	G7M
1	A	528	U
1	A	529	A
1	A	544	A
1	A	545	G
1	A	554	G
1	A	555	G
1	A	556	A
1	A	559	C
1	A	561	C
1	A	563	G
1	A	569	A
1	A	570	A
1	A	573	C
1	A	574	G
1	A	629	U
1	A	630	G
1	A	650	U
1	A	651	G
1	A	662	A
1	A	684	A
1	A	685	G
1	A	712	A
1	A	713	A
1	A	715	A
1	A	716	C
1	A	718	A
1	A	720	U
1	A	752	A
1	A	774	A
1	A	780	C
1	A	781	A
1	A	787	A
1	A	790	G
1	A	791	A
1	A	798	U
1	A	811	C
1	A	812	A
1	A	814	C
1	A	825	A
1	A	855	A
1	A	863	G

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Mol	Chain	Res	Type
1	A	868	A
1	A	886	G
1	A	898	G
1	A	905	A
1	A	930	C
1	A	931	A
1	A	934	A
1	A	956	U
1	A	957	U
1	A	963	5MC
1	A	964	A
1	A	965	A
1	A	971	A
1	A	972	A
1	A	973	A
1	A	980	C
1	A	988	U
1	A	989	G
1	A	990	A
1	A	1000	A
1	A	1016	U
1	A	1022	G
1	A	1023	C
1	A	1026	U
1	A	1028	G
1	A	1031	A
1	A	1032	A
1	A	1040	A
1	A	1061	U
1	A	1090	G
1	A	1091	U
1	A	1097	A
1	A	1132	U
1	A	1133	C
1	A	1134	A
1	A	1136	G
1	A	1137	U
1	A	1149	A
1	A	1156	U
1	A	1164	A
1	A	1165	U
1	A	1193	A

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Mol	Chain	Res	Type
1	A	1194	A
1	A	1210	A
1	A	1211	C
1	A	1224	A
1	A	1225	C
1	A	1235	A
1	A	1236	A
1	A	1245	A
1	A	1254	U
1	A	1255	G
1	A	1276	A
1	A	1277	A
1	A	1284	A
1	A	1297	G
1	A	1299	C
1	A	1313	G
1	A	1315	A
1	A	1317	C
1	A	1319	C
1	A	1334	G
1	A	1335	G
1	A	1343	A
1	A	1367	G
1	A	1374	A
1	A	1375	C
1	A	1376	G
1	A	1382	G
1	A	1383	G
1	A	1416	G
1	A	1426	C
1	A	1438	A
1	A	1442	U
1	A	1443	A
1	A	1444	A
1	A	1449	C
1	A	1450	G
1	A	1451	G
1	A	1484	G
1	A	1489	A
1	A	1490	A
1	A	1491	G
1	A	1500	A

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Mol	Chain	Res	Type
1	A	1502	G
1	A	1503	U
1	A	1514	G
1	A	1516	MA6
1	A	1526	G
1	A	1527	G
1	A	1528	A
1	A	1531	A
1	A	1532	C
1	A	1533	C
1	A	1534	U
1	A	1535	C
26	b	35	U
26	b	36	U
26	b	45	A
26	b	51	G
26	b	56	G
26	b	57	A
26	b	66	A
26	b	67	G
26	b	68	C
26	b	88	U
26	b	107	A
53	a	2	G
53	a	23	G
53	a	42	U
53	a	57	A
53	a	79	A
53	a	82	A
53	a	83	G
53	a	93	G
53	a	126	A
53	a	127	A
53	a	128	U
53	a	133	A
53	a	134	A
53	a	145	U
53	a	146	C
53	a	147	G
53	a	148	A
53	a	167	U
53	a	185	A

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Mol	Chain	Res	Type
53	a	194	A
53	a	200	A
53	a	203	A
53	a	219	G
53	a	220	A
53	a	225	A
53	a	226	A
53	a	237	A
53	a	249	G
53	a	252	G
53	a	256	G
53	a	270	G
53	a	275	G
53	a	299	G
53	a	305	U
53	a	315	A
53	a	328	C
53	a	334	A
53	a	364	U
53	a	365	G
53	a	372	G
53	a	391	G
53	a	416	G
53	a	417	A
53	a	427	A
53	a	453	U
53	a	461	C
53	a	462	A
53	a	480	U
53	a	486	G
53	a	496	G
53	a	509	U
53	a	510	A
53	a	514	C
53	a	536	C
53	a	537	A
53	a	543	A
53	a	544	G
53	a	553	C
53	a	555	G
53	a	570	A
53	a	580	U

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Mol	Chain	Res	Type
53	a	582	A
53	a	610	A
53	a	611	G
53	a	620	U
53	a	622	U
53	a	634	A
53	a	644	A
53	a	653	U
53	a	654	G
53	a	660	U
53	a	661	U
53	a	692	A
53	a	693	U
53	a	716	U
53	a	722	A
53	a	723	A
53	a	724	C
53	a	726	C
53	a	737	C
53	a	753	U
53	a	754	U
53	a	771	A
53	a	772	G
53	a	782	G
53	a	783	G
53	a	789	A
53	a	792	G
53	a	796	A
53	a	799	A
53	a	812	G
53	a	819	C
53	a	835	U
53	a	837	G
53	a	865	G
53	a	872	A
53	a	885	G
53	a	886	G
53	a	887	G
53	a	888	G
53	a	889	G
53	a	892	A
53	a	894	C

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Mol	Chain	Res	Type
53	a	896	C
53	a	897	G
53	a	899	C
53	a	900	C
53	a	901	U
53	a	902	A
53	a	903	C
53	a	905	A
53	a	907	A
53	a	909	C
53	a	910	G
53	a	916	A
53	a	937	U
53	a	939	A
53	a	952	C
53	a	965	A
53	a	967	G
53	a	980	A
53	a	989	A
53	a	1002	A
53	a	1018	U
53	a	1019	C
53	a	1028	G
53	a	1032	A
53	a	1048	G
53	a	1051	C
53	a	1052	A
53	a	1054	A
53	a	1055	C
53	a	1057	G
53	a	1058	C
53	a	1113	G
53	a	1114	U
53	a	1117	A
53	a	1118	G
53	a	1121	G
53	a	1126	G
53	a	1135	A
53	a	1136	U
53	a	1138	U
53	a	1139	A
53	a	1140	A

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Mol	Chain	Res	Type
53	a	1141	C
53	a	1142	G
53	a	1149	A
53	a	1162	A
53	a	1183	C
53	a	1184	U
53	a	1185	G
53	a	1237	G
53	a	1263	A
53	a	1266	G
53	a	1281	G
53	a	1282	A
53	a	1296	A
53	a	1297	A
53	a	1311	A
53	a	1362	U
53	a	1375	A
53	a	1378	U
53	a	1386	C
53	a	1389	U
53	a	1393	A
53	a	1395	A
53	a	1396	C
53	a	1425	U
53	a	1426	G
53	a	1427	C
53	a	1429	A
53	a	1430	U
53	a	1431	G
53	a	1438	C
53	a	1462	G
53	a	1463	A
53	a	1470	U
53	a	1492	G
53	a	1503	C
53	a	1518	A
53	a	1520	U
53	a	1545	A
53	a	1546	A
53	a	1547	C
53	a	1548	U
53	a	1550	G

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Mol	Chain	Res	Type
53	a	1551	U
53	a	1553	C
53	a	1554	G
53	a	1555	U
53	a	1556	G
53	a	1557	C
53	a	1559	A
53	a	1563	G
53	a	1575	G
53	a	1580	C
53	a	1581	A
53	a	1584	A
53	a	1593	U
53	a	1600	C
53	a	1622	U
53	a	1623	A
53	a	1624	A
53	a	1632	C
53	a	1663	U
53	a	1689	G
53	a	1711	G
53	a	1715	A
53	a	1716	A
53	a	1745	G
53	a	1777	G
53	a	1778	G
53	a	1787	A
53	a	1796	U
53	a	1805	A
53	a	1814	C
53	a	1815	A
53	a	1825	G
53	a	1830	C
53	a	1843	A
53	a	1862	A
53	a	1885	U
53	a	1886	C
53	a	1887	G
53	a	1888	G
53	a	1930	C
53	a	1946	G
53	a	1953	A

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Mol	Chain	Res	Type
53	a	1954	A
53	a	1957	C
53	a	1971	U
53	a	1979	U
53	a	1980	G
53	a	1983	C
53	a	1986	A
53	a	1987	U
53	a	1988	G
53	a	1998	U
53	a	2009	U
53	a	2013	C
53	a	2039	C
53	a	2047	A
53	a	2049	A
53	a	2059	C
53	a	2062	G
53	a	2071	C
53	a	2072	G
53	a	2076	A
53	a	2077	G
53	a	2078	A
53	a	2079	C
53	a	2085	G
53	a	2096	A
53	a	2128	G
53	a	2132	G
53	a	2135	A
53	a	2140	G
53	a	2141	G
53	a	2143	G
53	a	2150	A
53	a	2151	A
53	a	2154	U
53	a	2163	A
53	a	2164	G
53	a	2173	G
53	a	2188	U
53	a	2189	A
53	a	2214	A
53	a	2219	U
53	a	2220	G

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Mol	Chain	Res	Type
53	a	2227	A
53	a	2228	A
53	a	2241	A
53	a	2254	G
53	a	2255	G
53	a	2291	C
53	a	2292	G
53	a	2294	A
53	a	2298	G
53	a	2299	U
53	a	2303	A
53	a	2324	G
53	a	2325	A
53	a	2343	A
53	a	2349	A
53	a	2351	A
53	a	2352	A
53	a	2363	C
53	a	2366	C
53	a	2377	A
53	a	2395	G
53	a	2398	G
53	a	2399	G
53	a	2401	C
53	a	2412	G
53	a	2418	C
53	a	2422	U
53	a	2440	C
53	a	2441	A
53	a	2445	G
53	a	2446	A
53	a	2447	U
53	a	2450	A
53	a	2451	A
53	a	2457	U
53	a	2463	G
53	a	2464	A
53	a	2485	A
53	a	2490	U
53	a	2507	U
53	a	2518	G
53	a	2519	2MA

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Mol	Chain	Res	Type
53	a	2521	G
53	a	2534	A
53	a	2536	C
53	a	2570	U
53	a	2582	A
53	a	2583	G
53	a	2589	C
53	a	2594	G
53	a	2629	U
53	a	2645	U
53	a	2679	G
53	a	2705	U
53	a	2706	U
53	a	2707	C
53	a	2730	G
53	a	2742	A
53	a	2749	A
53	a	2767	G
53	a	2768	C
53	a	2773	A
53	a	2774	A
53	a	2781	A
53	a	2794	A
53	a	2806	G
53	a	2807	G
53	a	2812	U
53	a	2813	U
53	a	2815	A
53	a	2823	A
53	a	2835	A
53	a	2836	A
53	a	2882	A
53	a	2883	A
53	a	2899	U
53	a	2909	G
53	a	2910	A

All (48) RNA pucker outliers are listed below:

Mol	Chain	Res	Type
1	A	46	C
1	A	47	U

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Mol	Chain	Res	Type
1	A	80	G
1	A	91	G
1	A	103	C
1	A	116	A
1	A	162	C
1	A	186	U
1	A	268	C
1	A	326	A
1	A	364	U
1	A	381	C
1	A	408	A
1	A	409	A
1	A	411	A
1	A	435	U
1	A	454	U
1	A	459	G
1	A	462	A
1	A	476	U
1	A	494	G
1	A	552	U
1	A	554	G
1	A	572	G
1	A	629	U
1	A	650	U
1	A	692	A
1	A	712	A
1	A	715	A
1	A	780	C
1	A	886	G
1	A	904	A
1	A	972	A
1	A	1125	C
1	A	1221	U
1	A	1236	A
1	A	1296	A
1	A	1314	C
1	A	1316	A
1	A	1334	G
1	A	1382	G
1	A	1442	U
1	A	1489	A
1	A	1490	A

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Mol	Chain	Res	Type
1	A	1502	G
1	A	1526	G
1	A	1532	C
1	A	1533	C

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

17 non-standard protein/DNA/RNA residues are modelled in this entry.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
53	OMG	a	2267	53,55	23,26,27	1.21	3 (13%)	33,38,41	2.08	9 (27%)
1	UR3	A	1495	1	19,22,23	1.26	3 (15%)	26,32,35	1.76	6 (23%)
53	PSU	a	961	53	18,21,22	1.41	3 (16%)	22,30,33	1.88	4 (18%)
53	PSU	a	1933	53	18,21,22	1.44	3 (16%)	22,30,33	1.85	5 (22%)
53	2MA	a	2519	53,54	22,25,26	1.55	4 (18%)	33,37,40	2.12	8 (24%)
1	2MG	A	962	1	23,26,27	1.25	2 (8%)	32,38,41	2.37	8 (25%)
1	5MC	A	963	1	18,22,23	1.05	1 (5%)	26,32,35	1.31	4 (15%)
53	OMU	a	2568	53,54	19,22,23	1.20	2 (10%)	26,31,34	1.84	6 (23%)
1	MA6	A	1515	1	23,26,27	1.57	5 (21%)	34,38,41	2.15	11 (32%)
1	4OC	A	1399	1	20,23,24	0.89	1 (5%)	26,32,35	1.26	4 (15%)
1	2MG	A	1513	1	23,26,27	1.26	3 (13%)	32,38,41	2.37	9 (28%)
53	PSU	a	2596	53,55	18,21,22	1.49	2 (11%)	22,30,33	1.81	5 (22%)
53	PSU	a	2621	53	18,21,22	1.41	3 (16%)	22,30,33	1.87	5 (22%)
53	PSU	a	1927	53	18,21,22	1.44	2 (11%)	22,30,33	1.77	4 (18%)
1	G7M	A	524	1	23,26,27	2.33	5 (21%)	35,39,42	2.99	10 (28%)
53	PSU	a	2520	53,55	18,21,22	1.86	4 (22%)	22,30,33	3.28	6 (27%)
1	MA6	A	1516	1	23,26,27	1.66	4 (17%)	34,38,41	2.23	11 (32%)

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
53	OMG	a	2267	53,55	-	1/9/27/28	0/3/3/3
1	UR3	A	1495	1	-	0/7/25/26	0/2/2/2
53	PSU	a	961	53	-	0/7/25/26	0/2/2/2
53	PSU	a	1933	53	-	0/7/25/26	0/2/2/2
53	2MA	a	2519	53,54	-	2/7/25/26	0/3/3/3
1	2MG	A	962	1	-	3/9/27/28	0/3/3/3
1	5MC	A	963	1	-	2/7/25/26	0/2/2/2
53	OMU	a	2568	53,54	-	0/9/27/28	0/2/2/2
1	MA6	A	1515	1	-	3/11/29/30	0/3/3/3
1	4OC	A	1399	1	-	0/9/29/30	0/2/2/2
1	2MG	A	1513	1	-	2/9/27/28	0/3/3/3
53	PSU	a	2596	53,55	-	0/7/25/26	0/2/2/2
53	PSU	a	2621	53	-	2/7/25/26	0/2/2/2
53	PSU	a	1927	53	-	0/7/25/26	0/2/2/2
1	G7M	A	524	1	-	3/7/25/26	0/3/3/3
53	PSU	a	2520	53,55	-	0/7/25/26	0/2/2/2
1	MA6	A	1516	1	-	6/11/29/30	0/3/3/3

All (50) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	524	G7M	C8-N7	7.30	1.46	1.33
53	a	2520	PSU	O2-C2	5.37	1.34	1.23
1	A	1516	MA6	C5-C4	4.91	1.48	1.39
1	A	1515	MA6	C5-C4	4.83	1.48	1.39
1	A	524	G7M	C5-N7	-4.82	1.33	1.39
53	a	1927	PSU	C6-C5	4.70	1.40	1.35
53	a	1933	PSU	C6-C5	4.53	1.40	1.35
53	a	2519	2MA	C5-C4	4.52	1.47	1.39
53	a	2596	PSU	C6-C5	4.43	1.40	1.35
53	a	2621	PSU	C6-C5	4.16	1.40	1.35
53	a	961	PSU	C6-C5	4.15	1.40	1.35
1	A	524	G7M	C8-N9	3.99	1.46	1.35
1	A	524	G7M	C5-C4	3.66	1.47	1.38
53	a	2520	PSU	C6-C5	3.42	1.39	1.35
1	A	1516	MA6	C5-C6	3.41	1.50	1.41
53	a	2267	OMG	C5-C4	3.17	1.47	1.38
1	A	1495	UR3	C2-N1	3.16	1.43	1.38
1	A	1513	2MG	C5-C4	3.13	1.47	1.38

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	963	5MC	C6-C5	3.06	1.39	1.34
1	A	962	2MG	C5-C4	3.05	1.47	1.38
1	A	1515	MA6	C5-C6	3.04	1.49	1.41
53	a	2519	2MA	C5-C6	2.92	1.49	1.41
53	a	2596	PSU	C4-N3	-2.77	1.33	1.38
53	a	2568	OMU	C2-N1	2.75	1.42	1.38
1	A	1516	MA6	C8-N7	2.64	1.36	1.31
53	a	2519	2MA	C8-N7	2.45	1.36	1.31
1	A	524	G7M	C6-N1	-2.44	1.34	1.38
1	A	1515	MA6	C8-N7	2.42	1.36	1.31
1	A	1513	2MG	C2-N3	2.37	1.36	1.31
1	A	962	2MG	C2-N3	2.35	1.36	1.31
53	a	961	PSU	C4-N3	-2.34	1.34	1.38
53	a	2621	PSU	C4-N3	-2.33	1.34	1.38
53	a	2520	PSU	C2-N1	-2.32	1.33	1.36
53	a	2520	PSU	C4-C5	2.26	1.50	1.44
1	A	1516	MA6	C5-N7	-2.24	1.34	1.39
53	a	2519	2MA	C5-N7	-2.21	1.34	1.39
53	a	2621	PSU	C4-C5	2.20	1.50	1.44
53	a	2568	OMU	C4-N3	-2.15	1.34	1.38
53	a	1927	PSU	C4-C5	2.14	1.50	1.44
53	a	2267	OMG	C5-N7	-2.14	1.34	1.39
53	a	2267	OMG	C6-N1	-2.12	1.34	1.38
53	a	1933	PSU	C4-C5	2.12	1.50	1.44
53	a	1933	PSU	C4-N3	-2.07	1.35	1.38
1	A	1495	UR3	C6-C5	2.06	1.39	1.35
53	a	961	PSU	C4-C5	2.05	1.50	1.44
1	A	1495	UR3	C2-N3	2.05	1.43	1.39
1	A	1515	MA6	C5-N7	-2.05	1.35	1.39
1	A	1399	4OC	C4-N3	2.04	1.36	1.32
1	A	1515	MA6	C4-N9	-2.04	1.33	1.37
1	A	1513	2MG	C5-N7	-2.00	1.35	1.39

All (115) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
53	a	2520	PSU	O2-C2-N1	-12.02	109.55	122.79
1	A	1513	2MG	C2-N3-C4	7.90	121.83	112.04
1	A	962	2MG	C2-N3-C4	7.85	121.78	112.04
1	A	524	G7M	CN7-N7-C8	-7.67	113.00	124.84
53	a	2519	2MA	C5-C4-N3	-7.18	119.11	127.19
1	A	524	G7M	N9-C8-N7	-6.67	95.71	112.21

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	524	G7M	N9-C4-N3	6.62	139.22	125.94
1	A	524	G7M	C8-N7-C5	6.61	116.05	107.78
53	a	2520	PSU	O2-C2-N3	6.59	134.24	121.82
53	a	2267	OMG	C5-C4-N3	-6.08	118.59	128.46
53	a	961	PSU	N1-C2-N3	5.81	121.72	115.13
1	A	1513	2MG	C5-C4-N3	-5.81	119.04	128.46
1	A	1495	UR3	C4-N3-C2	-5.78	119.12	124.56
53	a	1933	PSU	N1-C2-N3	5.65	121.53	115.13
53	a	2519	2MA	N3-C4-N9	5.58	134.74	126.99
1	A	1516	MA6	C5-C4-N3	-5.58	119.47	126.75
53	a	2621	PSU	N1-C2-N3	5.56	121.43	115.13
1	A	962	2MG	C5-C4-N3	-5.53	119.48	128.46
1	A	524	G7M	C5-C4-N3	-5.52	117.57	128.15
53	a	1927	PSU	N1-C2-N3	5.40	121.24	115.13
1	A	1515	MA6	C5-C4-N3	-5.21	119.96	126.75
53	a	2267	OMG	C2-N3-C4	5.12	121.43	112.30
53	a	2596	PSU	N1-C2-N3	5.10	120.91	115.13
1	A	1515	MA6	C2-N1-C6	4.92	123.36	111.75
1	A	1516	MA6	C4-C5-N7	-4.78	104.80	110.62
53	a	2520	PSU	C6-C5-C4	-4.71	114.91	118.20
1	A	1516	MA6	C2-N1-C6	4.65	122.73	111.75
53	a	2267	OMG	N9-C4-N3	4.51	134.99	125.94
1	A	524	G7M	C8-N9-C4	4.30	118.05	107.16
1	A	524	G7M	C2-N3-C4	4.28	119.92	112.30
53	a	2568	OMU	C4-N3-C2	-4.20	121.05	126.58
1	A	524	G7M	C1'-N9-C8	-4.13	112.81	126.74
1	A	962	2MG	C6-C5-N7	4.01	137.71	130.25
1	A	962	2MG	N9-C4-N3	4.00	133.96	125.94
53	a	2568	OMU	N3-C2-N1	3.99	120.19	114.89
1	A	1515	MA6	N1-C2-N3	-3.95	122.42	128.60
1	A	1513	2MG	C6-C5-N7	3.91	137.52	130.25
1	A	1515	MA6	C2-N3-C4	3.89	120.95	111.75
1	A	1513	2MG	N9-C4-N3	3.87	133.72	125.94
53	a	2568	OMU	C5-C4-N3	3.84	120.59	114.84
53	a	961	PSU	C4-N3-C2	-3.79	120.88	126.34
1	A	1515	MA6	N3-C4-N9	3.76	133.27	127.08
1	A	1516	MA6	C2-N3-C4	3.73	120.56	111.75
53	a	1933	PSU	C4-N3-C2	-3.66	121.07	126.34
53	a	2621	PSU	C4-N3-C2	-3.58	121.19	126.34
53	a	1927	PSU	C4-N3-C2	-3.51	121.29	126.34
1	A	1515	MA6	C4-C5-N7	-3.43	106.44	110.62
53	a	2267	OMG	C6-C5-N7	3.43	136.62	130.25

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	1516	MA6	C5-N7-C8	3.42	108.36	103.51
1	A	524	G7M	CN7-N7-C5	3.37	130.95	126.77
53	a	2568	OMU	C2'-C1'-N1	-3.36	107.70	114.22
53	a	2519	2MA	C4-C5-N7	-3.26	106.65	110.62
53	a	961	PSU	O2-C2-N1	-3.22	119.25	122.79
1	A	1516	MA6	N3-C4-N9	3.15	132.28	127.08
1	A	1516	MA6	C6-C5-N7	3.14	138.55	133.28
1	A	962	2MG	C2'-C1'-N9	-3.13	104.35	113.22
53	a	2621	PSU	O2-C2-N1	-3.07	119.41	122.79
53	a	2596	PSU	C3'-C2'-C1'	3.02	105.16	101.64
53	a	2568	OMU	O4-C4-C5	-3.01	119.87	125.16
53	a	1933	PSU	O2-C2-N1	-2.98	119.52	122.79
53	a	2596	PSU	C4-N3-C2	-2.96	122.08	126.34
1	A	1513	2MG	C4-C5-N7	-2.95	106.05	110.72
1	A	1516	MA6	N1-C2-N3	-2.94	124.00	128.60
53	a	1927	PSU	O2-C2-N1	-2.94	119.56	122.79
1	A	963	5MC	O2-C2-N3	-2.89	117.63	122.33
53	a	2621	PSU	C6-C5-C4	-2.87	116.19	118.20
1	A	1515	MA6	N1-C6-N6	2.87	120.22	117.08
1	A	1495	UR3	C3'-C2'-C1'	2.85	106.85	101.43
53	a	2519	2MA	C2-N1-C6	2.81	122.46	118.08
53	a	2519	2MA	C5-N7-C8	2.80	107.48	103.51
53	a	1927	PSU	C6-C5-C4	-2.79	116.25	118.20
1	A	963	5MC	C5-C4-N3	-2.77	118.69	121.67
1	A	962	2MG	C4-C5-N7	-2.76	106.35	110.72
53	a	2519	2MA	C4-N9-C8	2.76	108.72	105.73
53	a	2520	PSU	C6-N1-C2	2.74	125.49	122.68
53	a	2519	2MA	C6-C5-N7	2.72	137.09	132.02
1	A	1516	MA6	O4'-C1'-N9	2.72	113.42	108.06
53	a	2596	PSU	O2-C2-N3	-2.71	116.70	121.82
1	A	1399	4OC	O2-C2-N3	-2.70	117.94	122.33
1	A	524	G7M	O6-C6-C5	-2.68	122.02	128.06
53	a	2568	OMU	O4'-C1'-N1	2.68	114.48	108.36
53	a	2596	PSU	C6-C5-C4	-2.65	116.35	118.20
1	A	1513	2MG	C2'-C1'-N9	-2.63	105.76	113.22
53	a	2267	OMG	C4-C5-N7	-2.63	106.57	110.72
1	A	1495	UR3	C6-N1-C2	-2.56	119.50	121.79
1	A	1515	MA6	C5-N7-C8	2.53	107.11	103.51
53	a	2267	OMG	O2'-C2'-C1'	2.49	113.93	109.08
53	a	2267	OMG	C2'-C1'-N9	-2.45	109.46	114.22
1	A	1515	MA6	C6-C5-N7	2.36	137.25	133.28
53	a	1933	PSU	C3'-C2'-C1'	2.36	104.38	101.64

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
53	a	961	PSU	C6-C5-C4	-2.32	116.57	118.20
1	A	962	2MG	O6-C6-C5	-2.29	120.53	126.60
1	A	1399	4OC	O4'-C1'-N1	2.28	113.57	108.36
1	A	963	5MC	O4'-C1'-N1	2.28	113.57	108.36
1	A	1515	MA6	O4'-C1'-N9	2.25	112.50	108.06
53	a	1933	PSU	C6-C5-C4	-2.25	116.63	118.20
1	A	1513	2MG	CM2-N2-C2	-2.24	118.91	123.86
53	a	2520	PSU	C4-N3-C2	-2.24	123.11	126.34
53	a	2267	OMG	O6-C6-C5	-2.22	120.71	126.60
1	A	1516	MA6	O4'-C4'-C5'	2.21	116.64	109.37
53	a	2621	PSU	C3'-C2'-C1'	2.21	104.21	101.64
1	A	1495	UR3	C1'-N1-C2	2.21	120.71	116.99
1	A	1399	4OC	C2'-C1'-N1	-2.19	109.97	114.22
1	A	1513	2MG	O6-C6-C5	-2.19	120.80	126.60
1	A	1399	4OC	C5-C4-N4	-2.15	118.23	122.61
1	A	1515	MA6	C4-N9-C8	2.15	108.06	105.73
1	A	962	2MG	C5-C6-N1	2.14	118.62	113.19
53	a	2519	2MA	N9-C8-N7	-2.13	111.00	113.91
1	A	963	5MC	CM5-C5-C6	-2.13	120.00	122.85
1	A	1516	MA6	C5-C4-N9	2.12	108.25	105.78
1	A	1495	UR3	O4'-C4'-C3'	2.10	109.26	105.11
53	a	2267	OMG	C5-C6-N1	2.09	118.49	113.19
1	A	1513	2MG	C5-C6-N1	2.07	118.44	113.19
53	a	2520	PSU	C3'-C2'-C1'	2.05	104.03	101.64
1	A	1495	UR3	O4-C4-C5	-2.00	118.35	124.37

There are no chirality outliers.

All (24) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
1	A	524	G7M	C3'-C4'-C5'-O5'
1	A	962	2MG	N1-C2-N2-CM2
1	A	962	2MG	N3-C2-N2-CM2
1	A	963	5MC	O4'-C4'-C5'-O5'
1	A	1513	2MG	N1-C2-N2-CM2
1	A	1513	2MG	N3-C2-N2-CM2
1	A	1515	MA6	C5-C6-N6-C10
1	A	1516	MA6	C3'-C4'-C5'-O5'
1	A	1516	MA6	C5-C6-N6-C10
1	A	1516	MA6	N1-C6-N6-C10
53	a	2267	OMG	C1'-C2'-O2'-CM2
53	a	2621	PSU	O4'-C1'-C5-C4

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Mol	Chain	Res	Type	Atoms
53	a	2621	PSU	O4'-C1'-C5-C6
1	A	963	5MC	C3'-C4'-C5'-O5'
53	a	2519	2MA	O4'-C4'-C5'-O5'
1	A	1516	MA6	O4'-C4'-C5'-O5'
1	A	1515	MA6	N1-C6-N6-C10
1	A	524	G7M	C4'-C5'-O5'-P
1	A	524	G7M	O4'-C4'-C5'-O5'
1	A	1515	MA6	C5-C6-N6-C9
53	a	2519	2MA	C3'-C4'-C5'-O5'
1	A	1516	MA6	C4'-C5'-O5'-P
1	A	1516	MA6	C5-C6-N6-C9
1	A	962	2MG	C4'-C5'-O5'-P

There are no ring outliers.

6 monomers are involved in 9 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
1	A	1495	UR3	3	0
1	A	1515	MA6	2	0
1	A	1399	4OC	1	0
1	A	1513	2MG	1	0
1	A	524	G7M	1	0
1	A	1516	MA6	6	0

5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 393 ligands modelled in this entry, 390 are monoatomic - leaving 3 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
57	DXT	a	3303	54	33,35,35	1.31	3 (9%)	42,57,57	1.20	5 (11%)
57	DXT	a	3302	54	33,35,35	1.00	2 (6%)	42,57,57	1.47	8 (19%)
57	DXT	a	3301	54	33,35,35	1.19	3 (9%)	42,57,57	1.49	9 (21%)

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
57	DXT	a	3303	54	-	8/8/74/74	0/4/4/4
57	DXT	a	3302	54	-	8/8/74/74	0/4/4/4
57	DXT	a	3301	54	-	6/8/74/74	0/4/4/4

All (8) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
57	a	3303	DXT	C4B-C1	-3.63	1.50	1.55
57	a	3303	DXT	C4B-C12	-3.62	1.48	1.52
57	a	3302	DXT	C21-N21	3.33	1.42	1.33
57	a	3301	DXT	C21-N21	3.31	1.42	1.33
57	a	3301	DXT	C4B-C1	-3.29	1.50	1.55
57	a	3303	DXT	C21-N21	3.29	1.42	1.33
57	a	3302	DXT	C4B-C1	-2.31	1.52	1.55
57	a	3301	DXT	C4B-C12	-2.08	1.50	1.52

All (22) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
57	a	3301	DXT	C11-C5B-C12	-3.86	115.75	118.80
57	a	3303	DXT	C1-C4B-C12	-3.82	105.41	109.88
57	a	3302	DXT	C10-C6B-C6A	3.65	122.83	118.97
57	a	3302	DXT	O11-C11-C6B	-3.64	115.10	121.99
57	a	3301	DXT	C5A-C5-C4A	3.24	116.03	110.62
57	a	3301	DXT	O12-C12-C4B	3.13	117.90	113.37
57	a	3301	DXT	O21-C21-N21	-2.87	116.18	122.88
57	a	3303	DXT	C5A-C5-C4A	2.79	115.28	110.62
57	a	3301	DXT	C10-C6B-C6A	2.76	121.89	118.97
57	a	3302	DXT	O12-C12-C4B	2.72	117.31	113.37
57	a	3302	DXT	O12-C12-C5B	-2.71	120.18	123.90
57	a	3302	DXT	C21-C2-C1	-2.54	117.97	120.97

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
57	a	3301	DXT	C4B-C4A-C5	2.33	112.43	110.59
57	a	3301	DXT	O12-C12-C5B	-2.32	120.72	123.90
57	a	3303	DXT	C10-C6B-C6A	2.31	121.42	118.97
57	a	3302	DXT	O3-C3-C2	-2.20	119.10	122.96
57	a	3303	DXT	O3-C3-C2	-2.12	119.23	122.96
57	a	3302	DXT	C10-C6B-C11	-2.11	118.37	121.47
57	a	3303	DXT	C4B-C4A-C5	2.11	112.26	110.59
57	a	3301	DXT	C10-C6B-C11	-2.04	118.47	121.47
57	a	3302	DXT	C42-N4-C4	-2.03	109.32	114.09
57	a	3301	DXT	O3-C3-C2	-2.02	119.41	122.96

There are no chirality outliers.

All (22) torsion outliers are listed below:

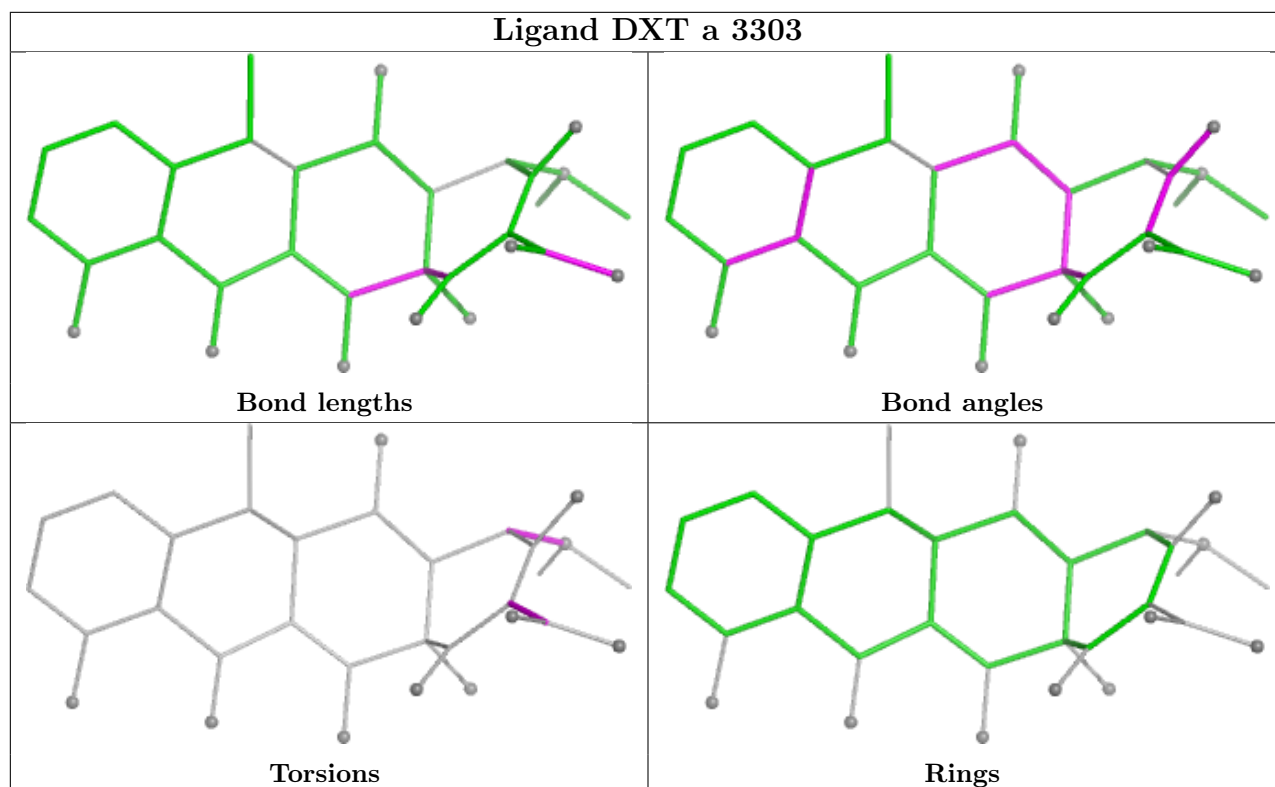
Mol	Chain	Res	Type	Atoms
57	a	3301	DXT	C1-C2-C21-O21
57	a	3301	DXT	C1-C2-C21-N21
57	a	3301	DXT	C3-C2-C21-O21
57	a	3301	DXT	C3-C2-C21-N21
57	a	3301	DXT	C4A-C4-N4-C42
57	a	3302	DXT	C1-C2-C21-O21
57	a	3302	DXT	C1-C2-C21-N21
57	a	3302	DXT	C3-C2-C21-O21
57	a	3302	DXT	C3-C2-C21-N21
57	a	3302	DXT	C3-C4-N4-C41
57	a	3302	DXT	C3-C4-N4-C42
57	a	3303	DXT	C1-C2-C21-O21
57	a	3303	DXT	C1-C2-C21-N21
57	a	3303	DXT	C3-C4-N4-C42
57	a	3303	DXT	C4A-C4-N4-C41
57	a	3301	DXT	C3-C4-N4-C41
57	a	3302	DXT	C4A-C4-N4-C41
57	a	3302	DXT	C4A-C4-N4-C42
57	a	3303	DXT	C3-C4-N4-C41
57	a	3303	DXT	C4A-C4-N4-C42
57	a	3303	DXT	C3-C2-C21-N21
57	a	3303	DXT	C3-C2-C21-O21

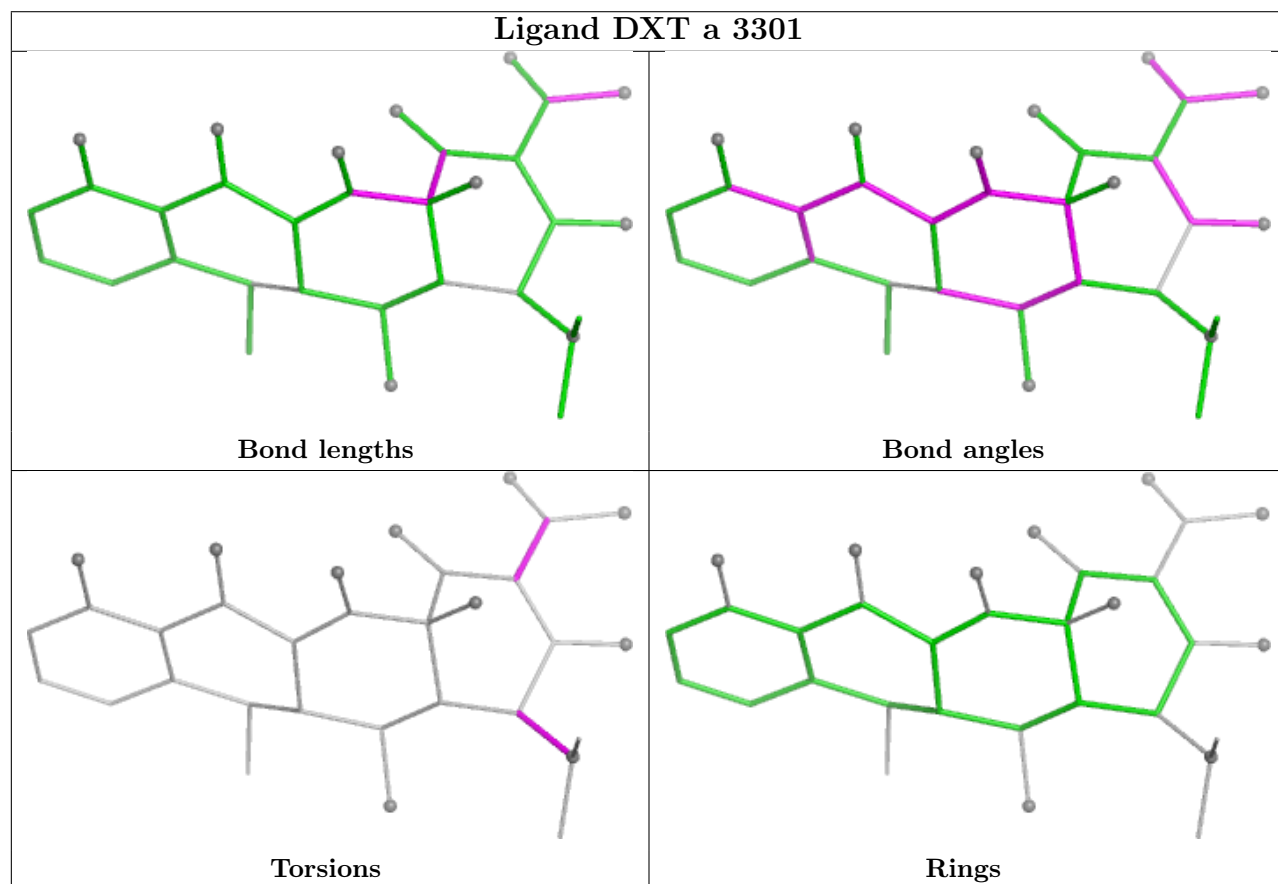
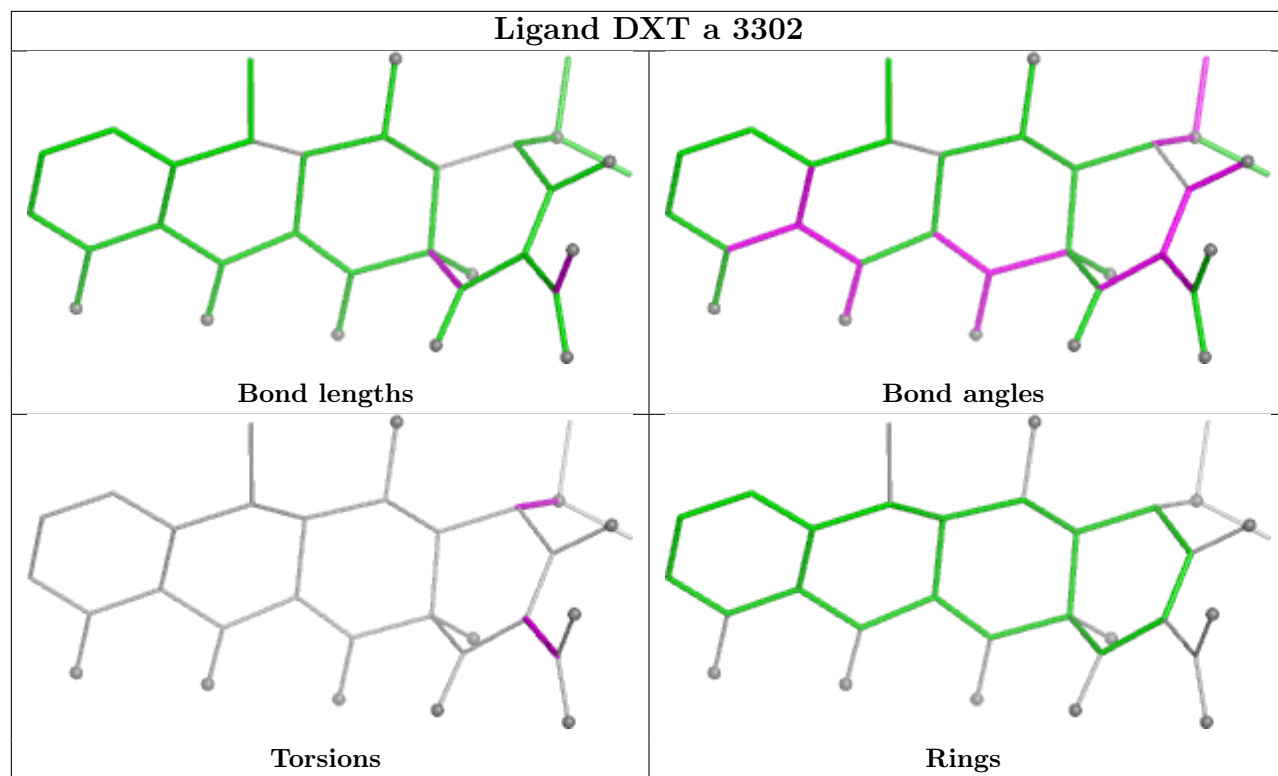
There are no ring outliers.

3 monomers are involved in 5 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
57	a	3303	DXT	2	0
57	a	3302	DXT	1	0
57	a	3301	DXT	2	0

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





5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

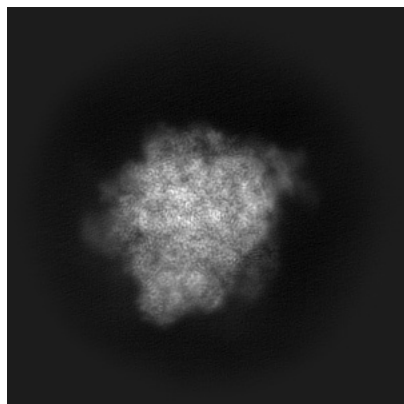
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-56466. These allow visual inspection of the internal detail of the map and identification of artifacts.

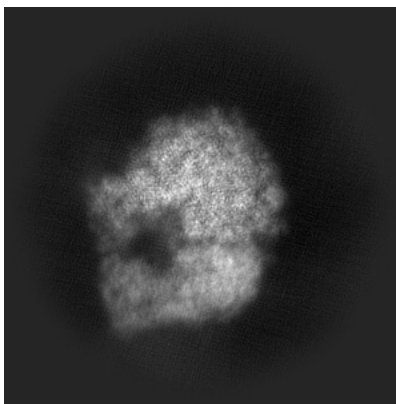
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

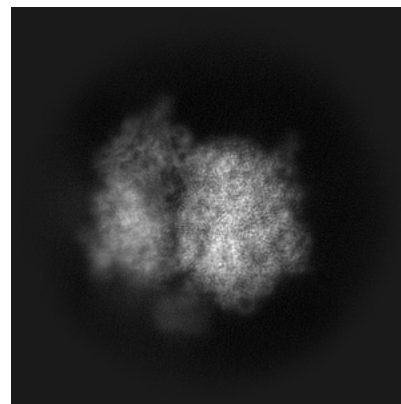
6.1.1 Primary map



X

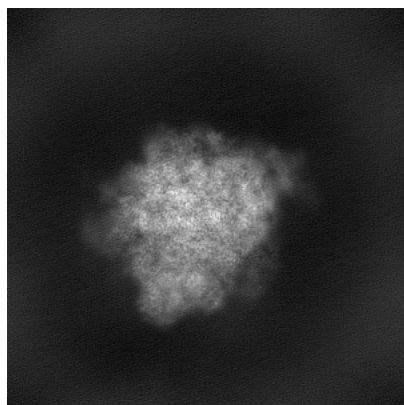


Y

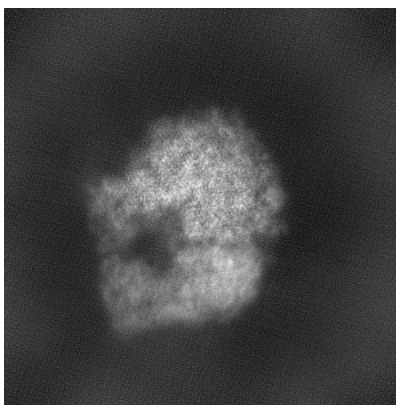


Z

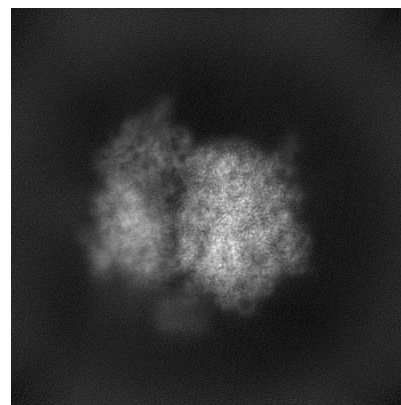
6.1.2 Raw map



X



Y

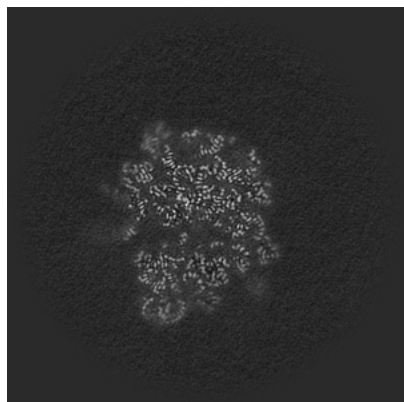


Z

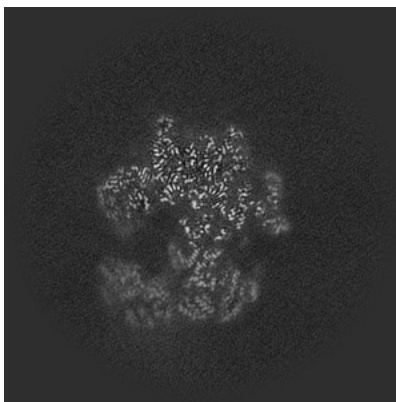
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

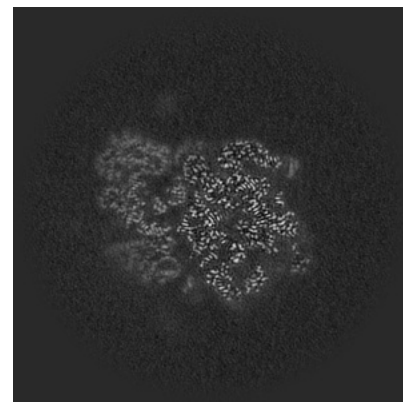
6.2.1 Primary map



X Index: 200

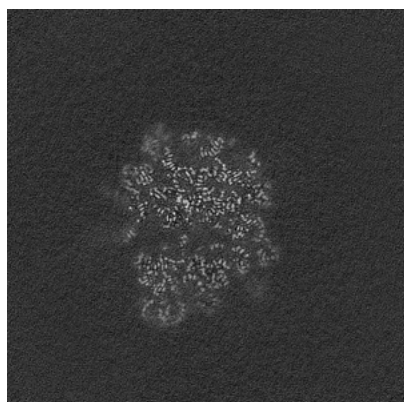


Y Index: 200

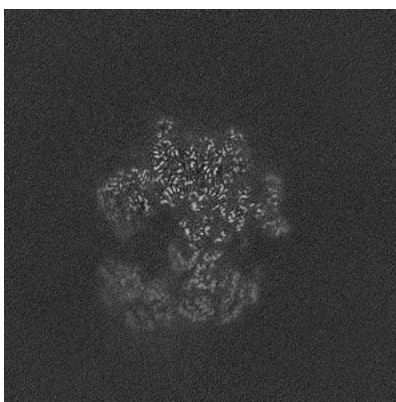


Z Index: 200

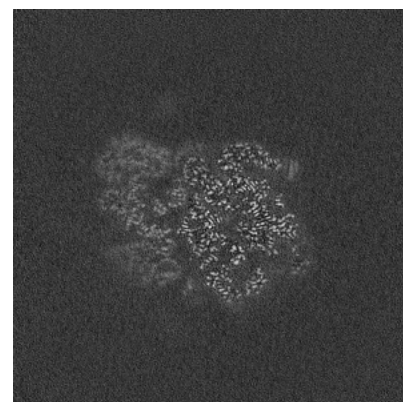
6.2.2 Raw map



X Index: 200



Y Index: 200

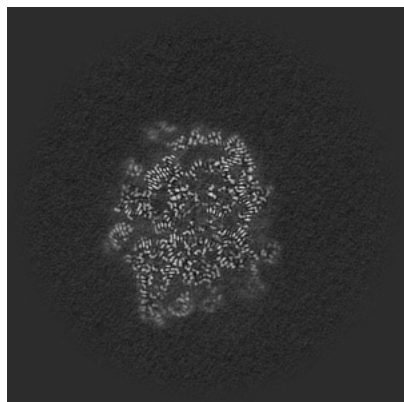


Z Index: 200

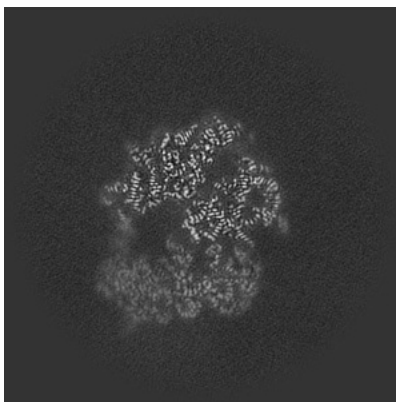
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

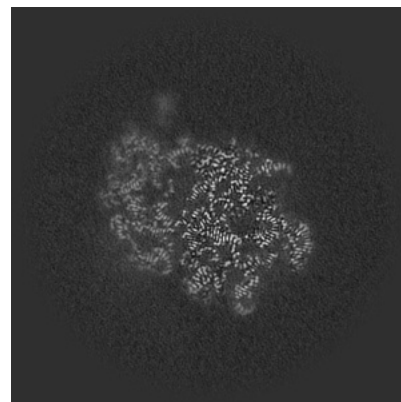
6.3.1 Primary map



X Index: 209

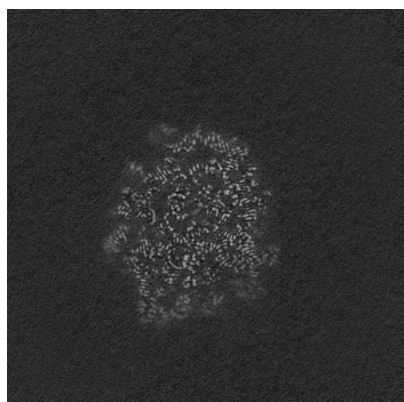


Y Index: 185

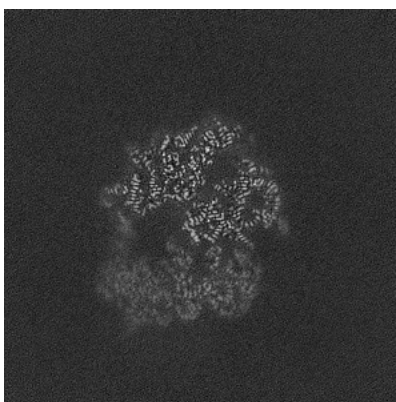


Z Index: 209

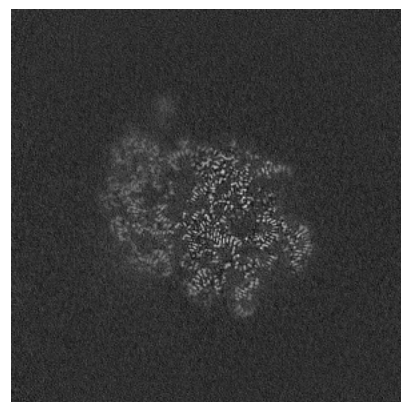
6.3.2 Raw map



X Index: 211



Y Index: 185

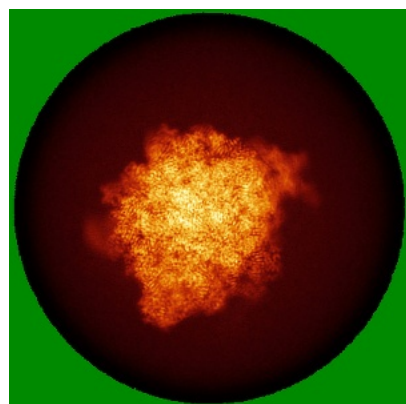


Z Index: 209

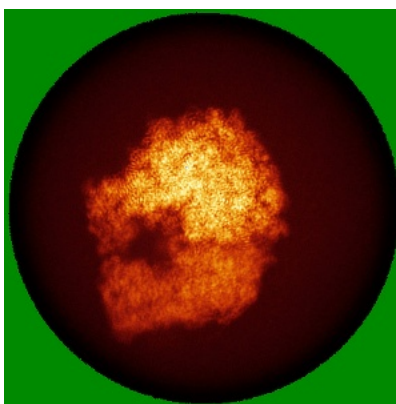
The images above show the largest variance slices of the map in three orthogonal directions.

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

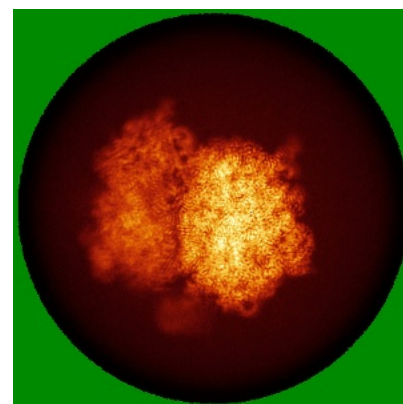
6.4.1 Primary map



X

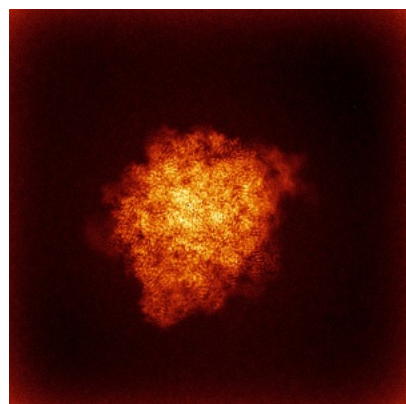


Y

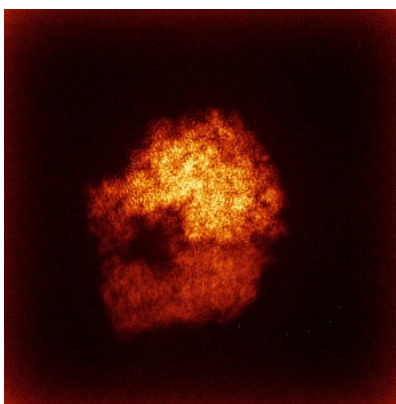


Z

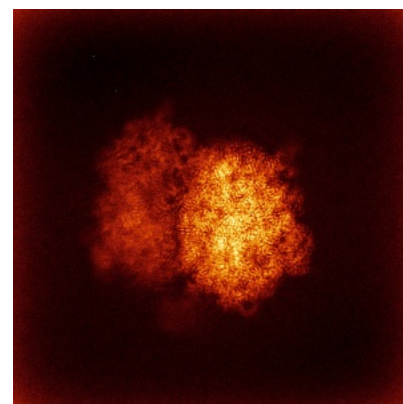
6.4.2 Raw map



X



Y

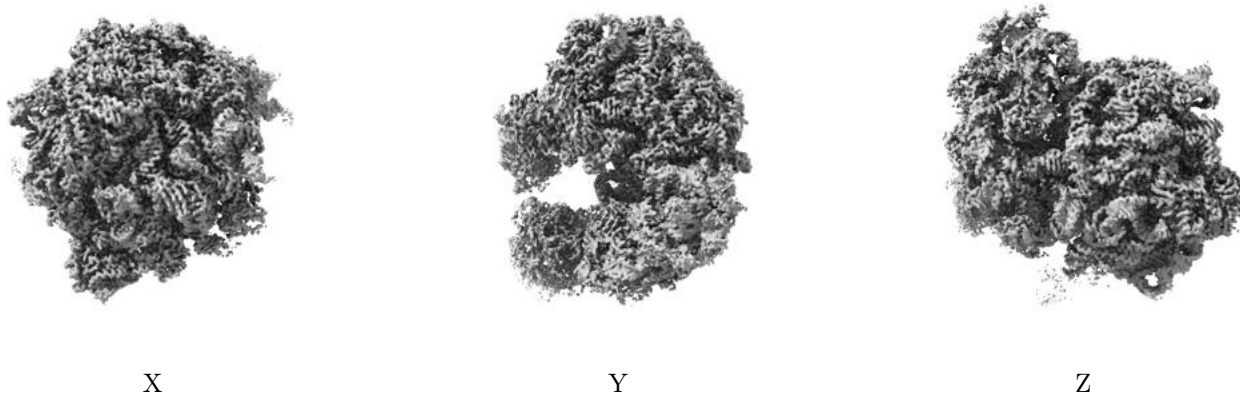


Z

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.

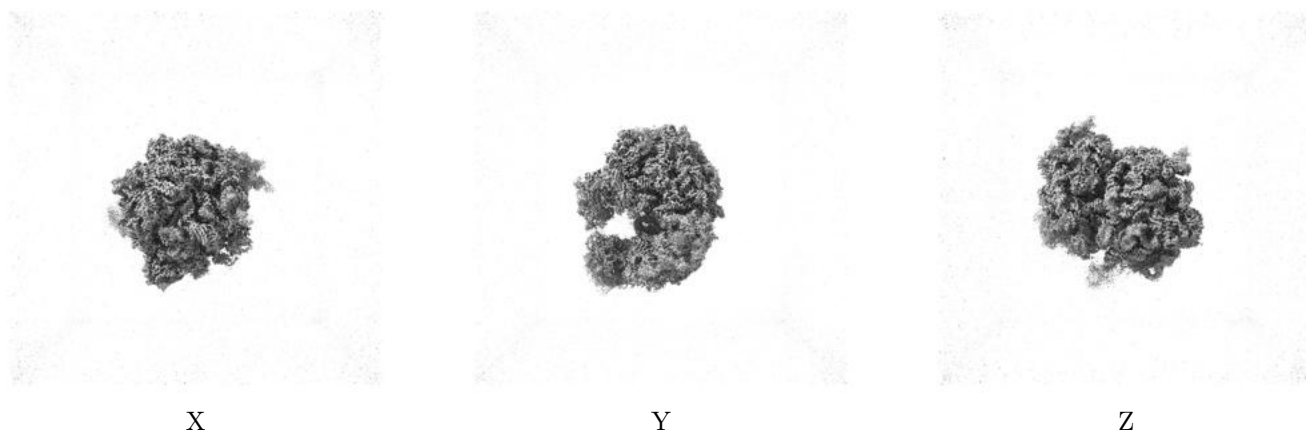
6.5 Orthogonal surface views [i](#)

6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.078. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.5.2 Raw map



These images show the 3D surface of the raw map. The raw map's contour level was selected so that its surface encloses the same volume as the primary map does at its recommended contour level.

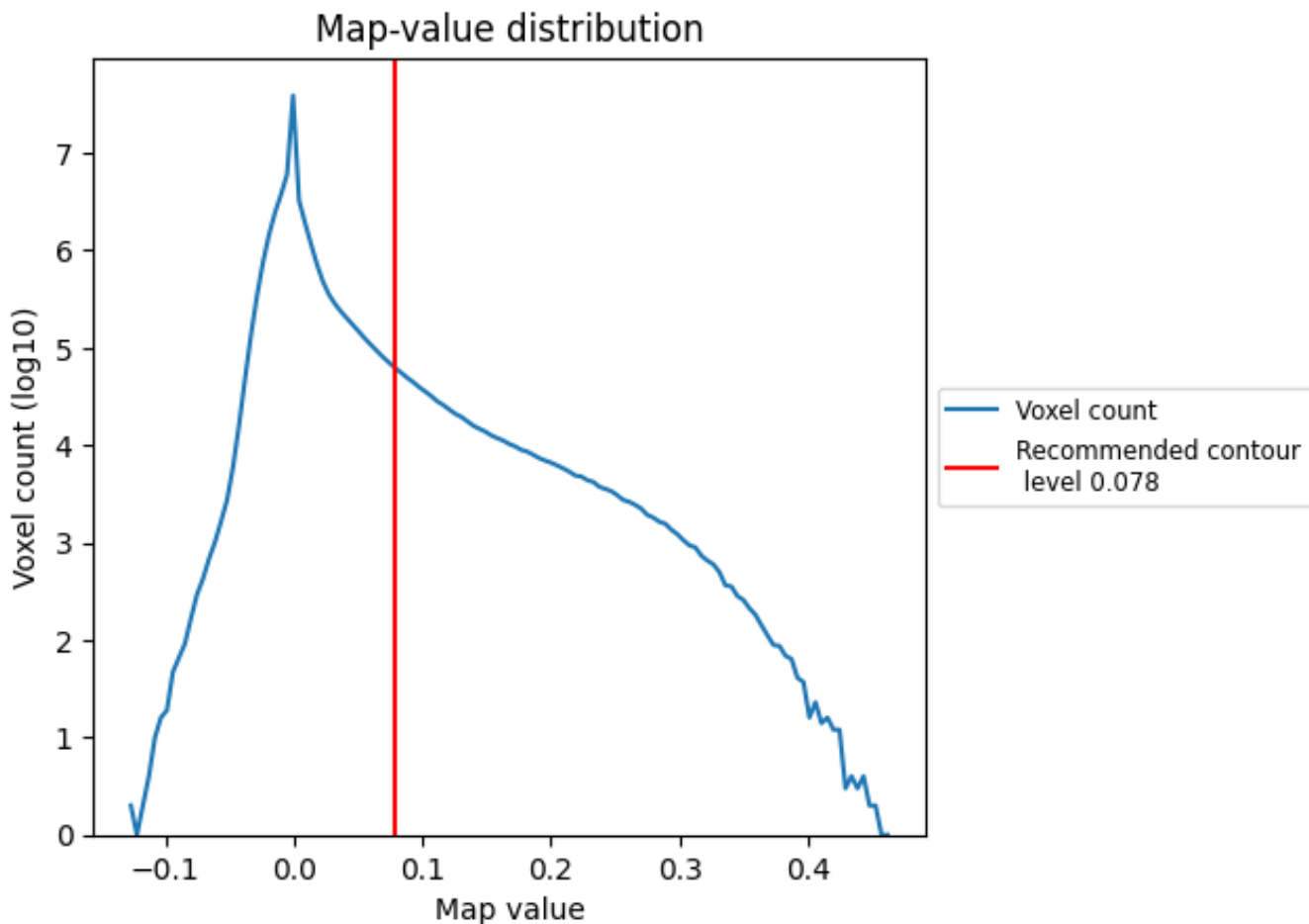
6.6 Mask visualisation [i](#)

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

7 Map analysis [i](#)

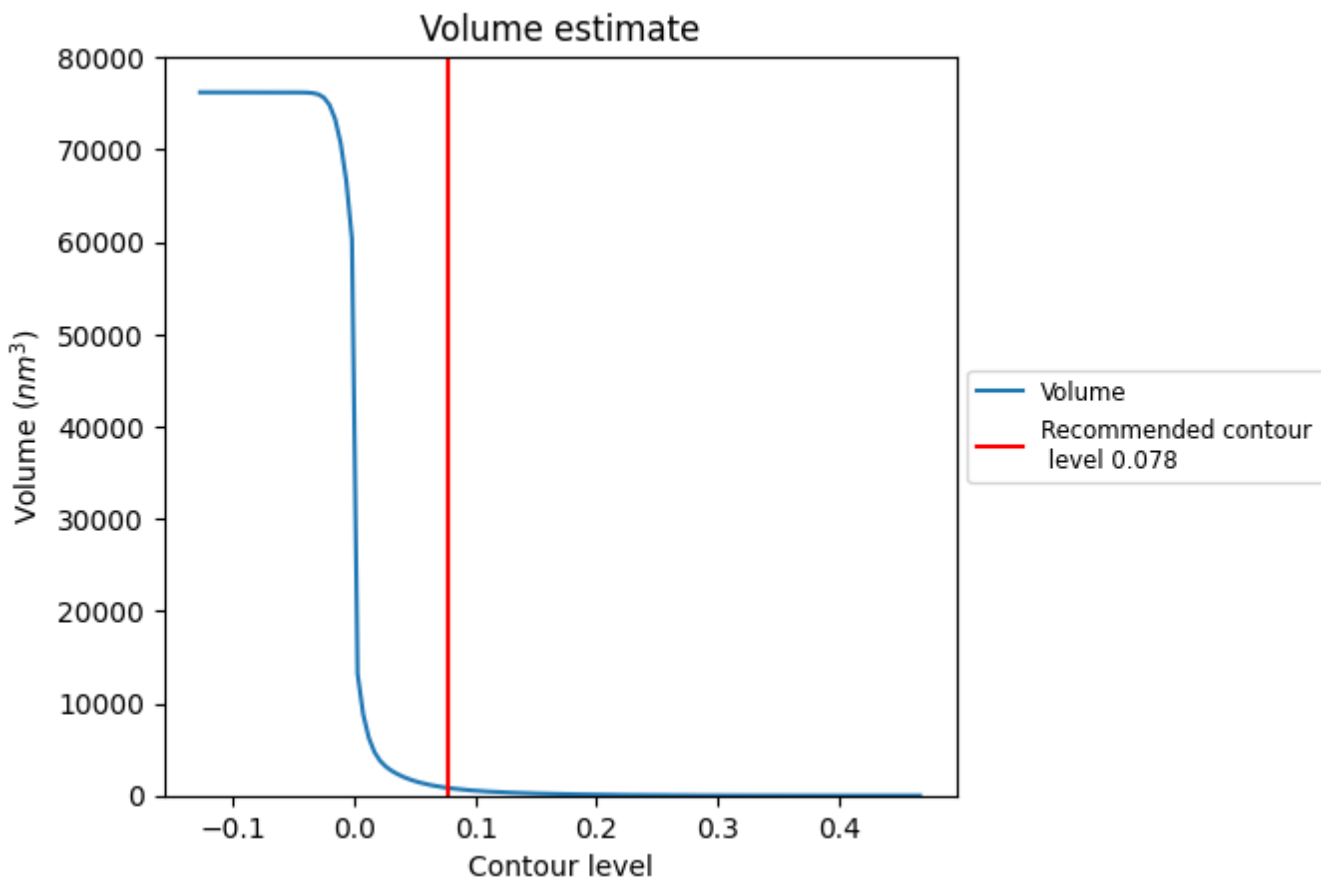
This section contains the results of statistical analysis of the map.

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.

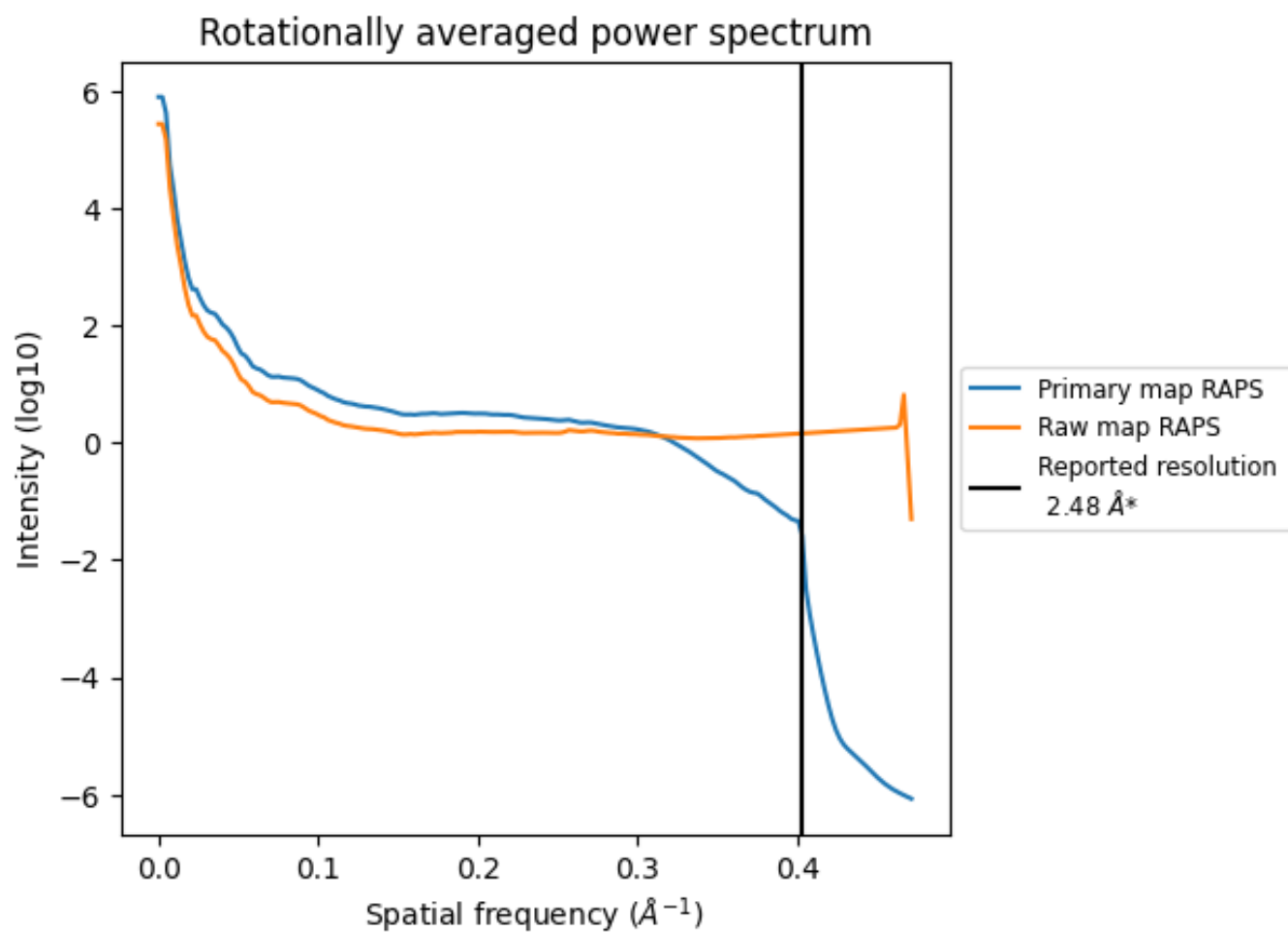
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 819 nm³; this corresponds to an approximate mass of 740 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

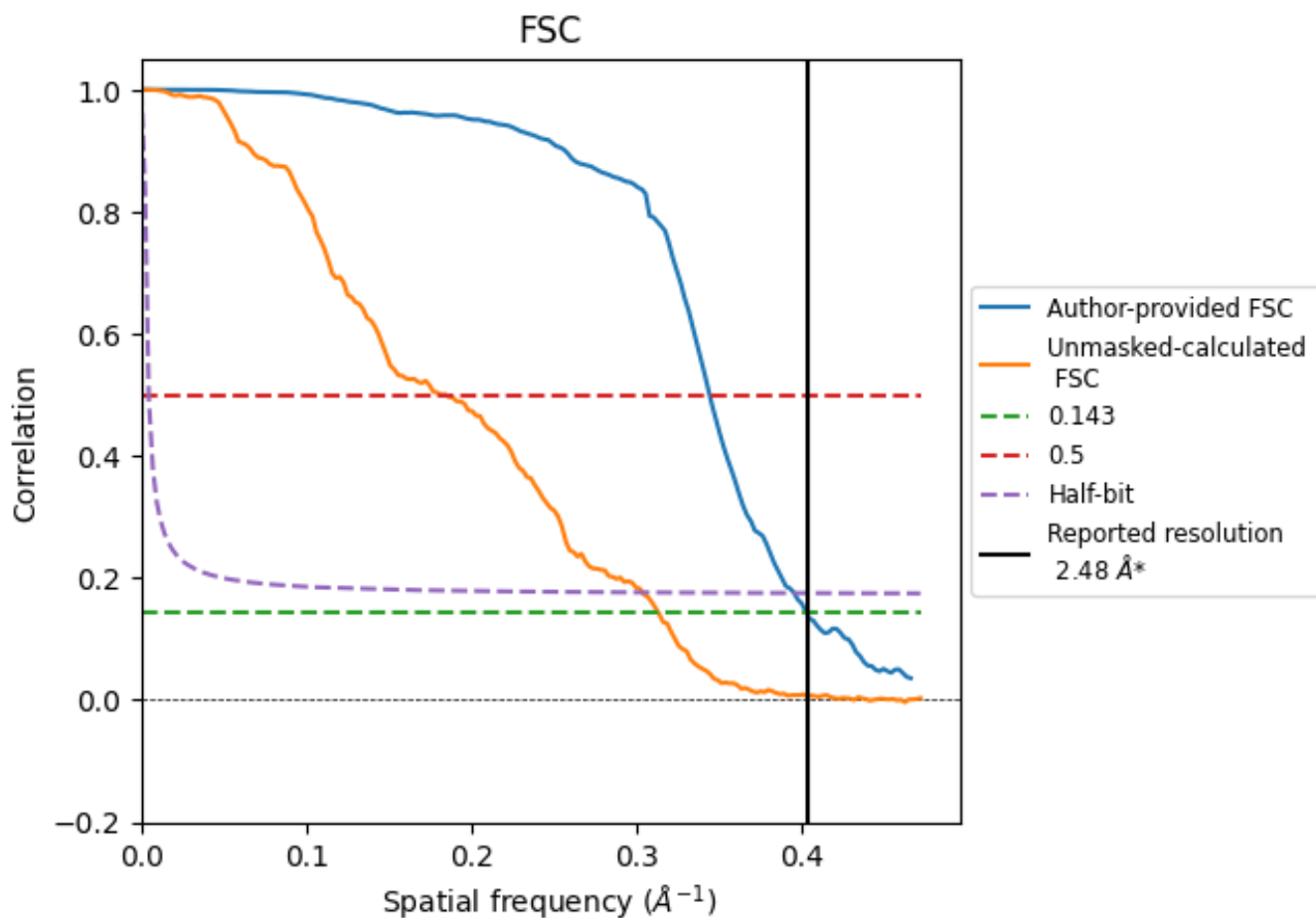


*Reported resolution corresponds to spatial frequency of 0.403 Å⁻¹

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 0.403 Å⁻¹

8.2 Resolution estimates [i](#)

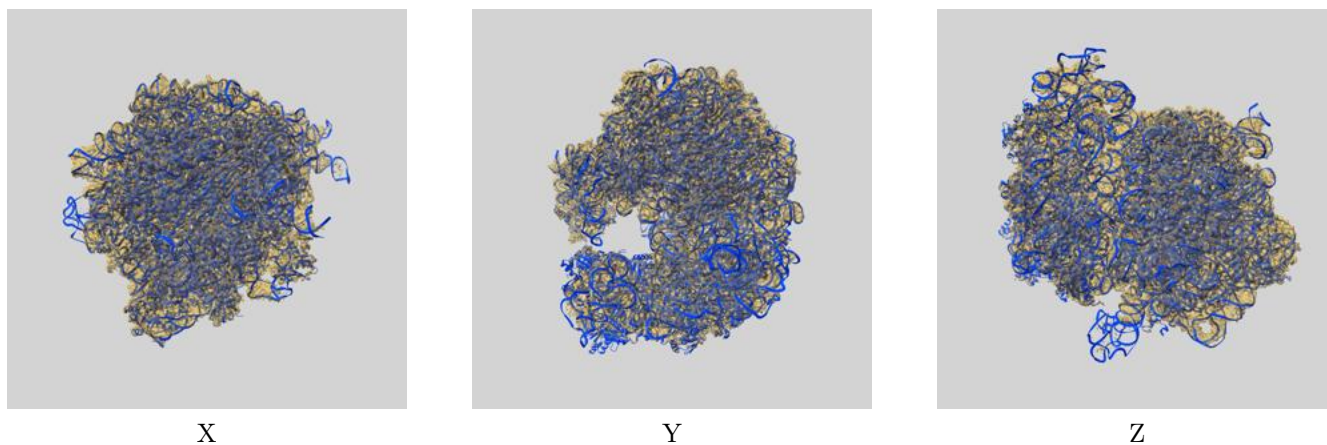
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	2.48	-	-
Author-provided FSC curve	2.48	2.91	2.53
Unmasked-calculated*	3.19	5.51	3.30

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 3.19 differs from the reported value 2.48 by more than 10 %

9 Map-model fit [i](#)

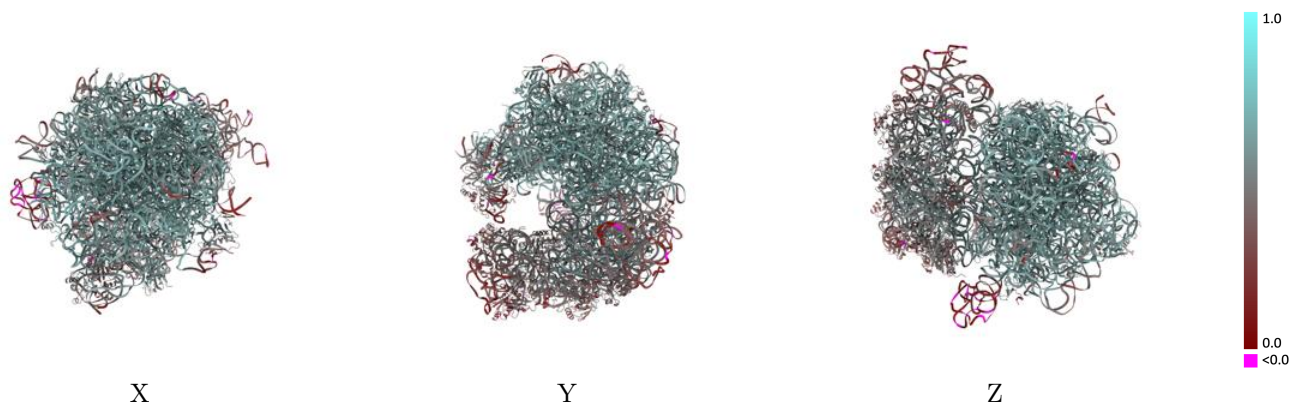
This section contains information regarding the fit between EMDB map EMD-56466 and PDB model 9TZE. Per-residue inclusion information can be found in section 3 on page 15.

9.1 Map-model overlay [i](#)



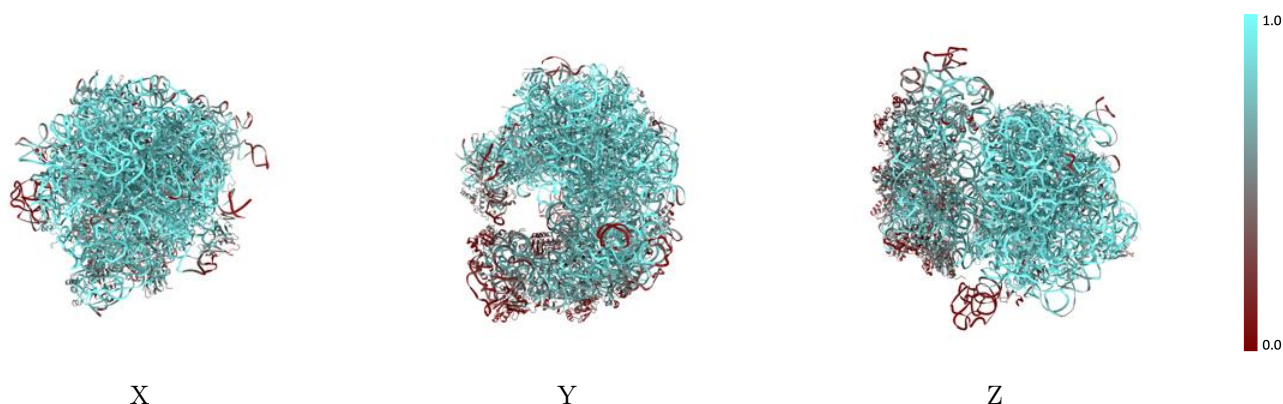
The images above show the 3D surface view of the map at the recommended contour level 0.078 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



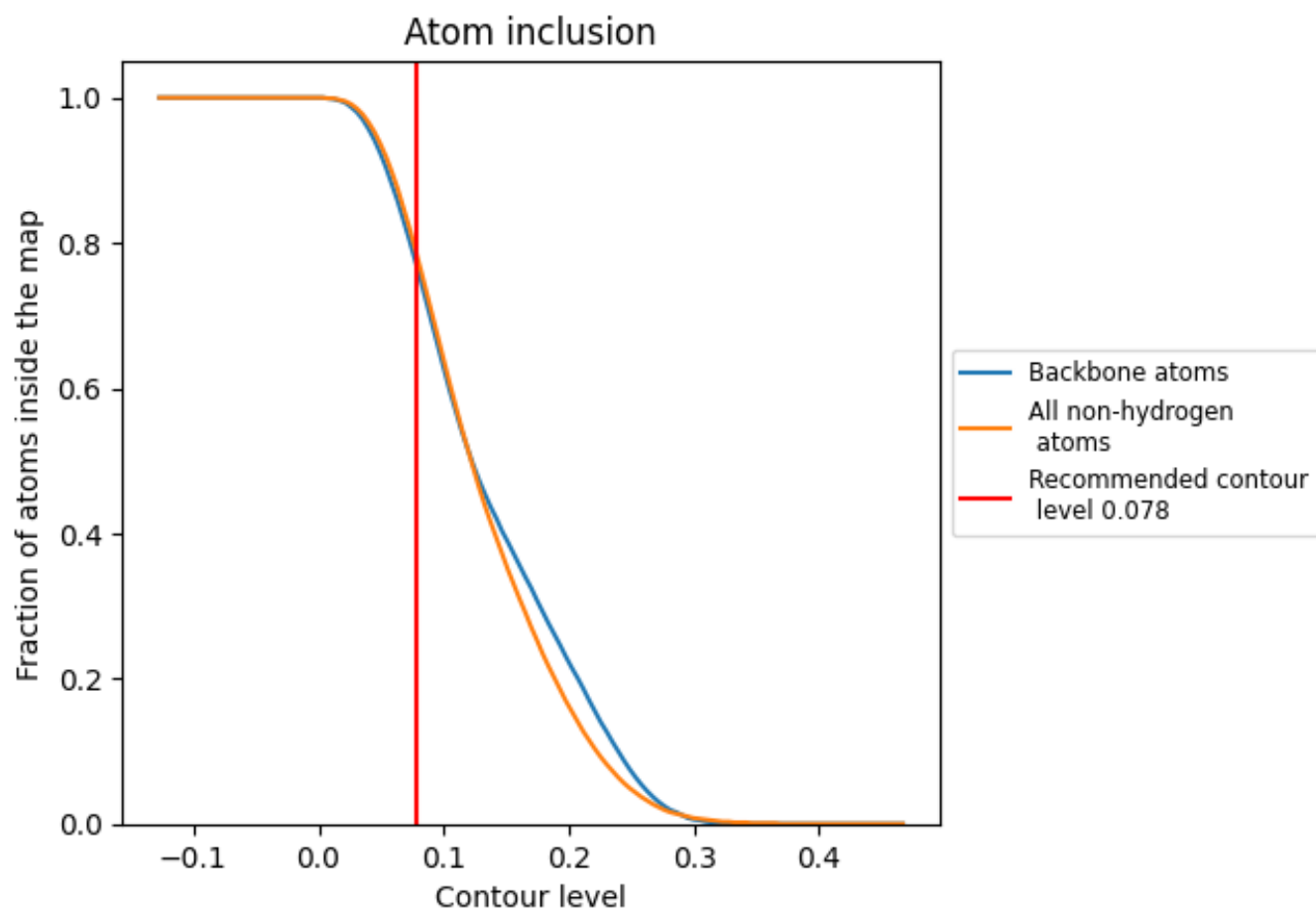
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.078).







































































9.4 Atom inclusion [i](#)



At the recommended contour level, 77% of all backbone atoms, 79% 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 (0.078) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.7870	 0.5240
0	 0.8210	 0.5780
1	 0.7010	 0.5230
2	 0.7280	 0.5020
3	 0.8970	 0.5930
4	 0.0570	 0.1560
6	 0.8420	 0.5820
7	 0.8230	 0.5670
8	 0.8950	 0.5990
9	 0.1220	 0.3340
A	 0.7710	 0.4670
C	 0.3040	 0.3520
D	 0.3920	 0.4020
E	 0.5950	 0.4860
F	 0.4220	 0.3930
G	 0.2440	 0.3440
H	 0.5750	 0.4720
I	 0.3160	 0.3390
J	 0.2170	 0.2940
K	 0.5290	 0.4530
L	 0.5330	 0.4730
M	 0.3100	 0.3720
N	 0.3600	 0.3590
O	 0.5680	 0.4720
P	 0.4730	 0.4100
Q	 0.5110	 0.4640
R	 0.5190	 0.4300
S	 0.1690	 0.3150
T	 0.5030	 0.4190
U	 0.3180	 0.3690
Z	 0.8960	 0.6030
a	 0.9150	 0.5810
b	 0.8860	 0.5050
c	 0.8250	 0.5670
d	 0.8930	 0.6050



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Chain	Atom inclusion	Q-score
e	 0.9290	 0.6190
f	 0.4120	 0.2910
g	 0.5460	 0.4740
h	 0.8320	 0.5910
i	 0.9170	 0.6100
j	 0.8760	 0.6000
k	 0.8640	 0.5870
m	 0.9260	 0.6160
o	 0.8920	 0.6110
q	 0.3390	 0.4610
r	 0.7190	 0.5080
s	 0.8450	 0.5960
t	 0.8940	 0.5990
u	 0.5550	 0.4950
v	 0.9020	 0.6080
w	 0.8220	 0.5740
x	 0.8470	 0.5850
y	 0.9520	 0.6370
z	 0.9400	 0.6220