



Full wwPDB EM Validation Report ⓘ

Mar 8, 2026 – 03:33 PM UTC

PDB ID : 7WTS / pdb_00007wts
EMDB ID : EMD-32799
Title : Cryo-EM structure of a human pre-40S ribosomal subunit - State UTP14
Authors : Cheng, J.; Lau, B.; Thoms, M.; Ameismeier, M.; Berninghausen, O.; Hurt, E.; Beckmann, R.
Deposited on : 2022-02-05
Resolution : 3.20 Å(reported)

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

We welcome your comments at validation@mail.wwpdb.org

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
MolProbity : 4-5-2 with Phenix2.0
Percentile statistics : 20250101.v01 (using entries in the PDB archive January 1st 2025)
EM percentile statistics : 202505.v01 (Using data in the EMDB archive up until May 2025)
MapQ : 1.9.13
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.49

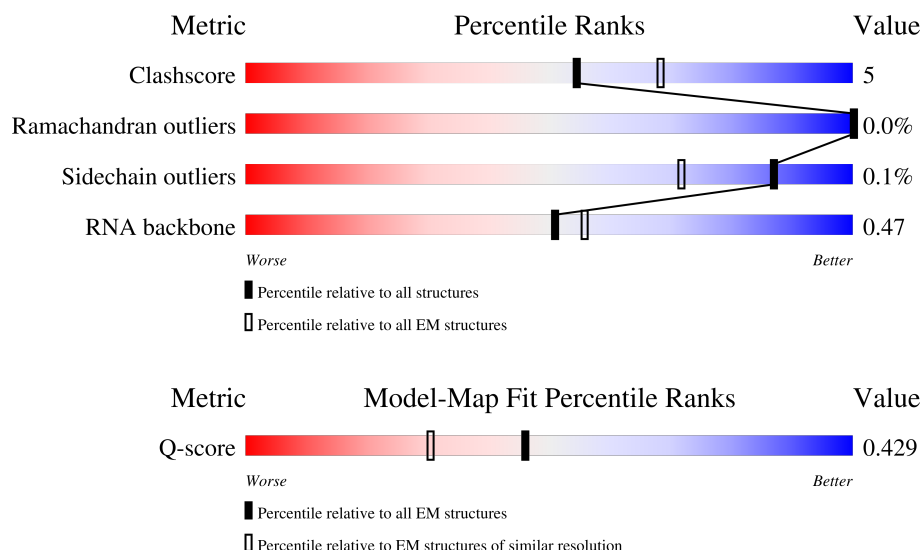
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 3.20 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.



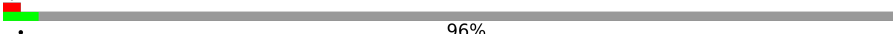
Metric	Whole archive (#Entries)	EM structures (#Entries)	Similar EM resolution (#Entries, resolution range(Å))
Clashscore	229148	23984	-
Ramachandran outliers	224038	23583	-
Sidechain outliers	223484	23102	-
RNA backbone	8273	3508	-
Q-score	-	25397	15020 (2.70 - 3.70)

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	2	1873	
2	b	84	
3	B	264	

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Mol	Chain	Length	Quality of chain
4	E	263	
5	e	59	
6	H	194	
7	G	249	
8	Y	133	
9	x	252	
10	X	143	
11	W	130	
12	u	804	
13	O	151	
14	N	151	
15	L	158	
16	J	194	
17	I	208	
18	r	125	
19	q	281	
20	K	1297	
21	z	230	
22	5	771	
23	3	313	

2 Entry composition [i](#)

There are 23 unique types of molecules in this entry. The entry contains 61945 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 18S rRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	2	1481	Total	C	N	O	P	0	0
			31620	14112	5672	10355	1481		

- Molecule 2 is a protein called 40S ribosomal protein S27.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	b	82	Total	C	N	O	S	0	0
			640	402	118	113	7		

- Molecule 3 is a protein called 40S ribosomal protein S3a.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	B	213	Total	C	N	O	S	0	0
			1729	1098	309	308	14		

- Molecule 4 is a protein called 40S ribosomal protein S4, X isoform.

Mol	Chain	Residues	Atoms					AltConf	Trace
4	E	262	Total	C	N	O	S	0	0
			2076	1324	386	358	8		

- Molecule 5 is a protein called 40S ribosomal protein S30.

Mol	Chain	Residues	Atoms					AltConf	Trace
5	e	20	Total	C	N	O	S	0	0
			179	110	43	25	1		

- Molecule 6 is a protein called 40S ribosomal protein S7.

Mol	Chain	Residues	Atoms					AltConf	Trace
6	H	186	Total	C	N	O	S	0	0
			1501	957	276	267	1		

- Molecule 7 is a protein called 40S ribosomal protein S6.

Mol	Chain	Residues	Atoms					AltConf	Trace
7	G	230	Total	C	N	O	S	0	0
			1862	1164	371	320	7		

- Molecule 8 is a protein called 40S ribosomal protein S24.

Mol	Chain	Residues	Atoms					AltConf	Trace
8	Y	124	Total	C	N	O	S	0	0
			1014	641	198	170	5		

- Molecule 9 is a protein called RNA-binding protein PNO1.

Mol	Chain	Residues	Atoms					AltConf	Trace
9	x	175	Total	C	N	O	S	0	0
			1372	881	249	238	4		

- Molecule 10 is a protein called 40S ribosomal protein S23.

Mol	Chain	Residues	Atoms					AltConf	Trace
10	X	141	Total	C	N	O	S	0	0
			1098	693	219	183	3		

- Molecule 11 is a protein called 40S ribosomal protein S15a.

Mol	Chain	Residues	Atoms					AltConf	Trace
11	W	129	Total	C	N	O	S	0	0
			1033	659	193	175	6		

- Molecule 12 is a protein called Pre-rRNA-processing protein TSR1 homolog.

Mol	Chain	Residues	Atoms					AltConf	Trace
12	u	628	Total	C	N	O	S	0	0
			5060	3245	911	880	24		

- Molecule 13 is a protein called 40S ribosomal protein S14.

Mol	Chain	Residues	Atoms					AltConf	Trace
13	O	135	Total	C	N	O	S	0	0
			1009	618	198	187	6		

- Molecule 14 is a protein called 40S ribosomal protein S13.

Mol	Chain	Residues	Atoms					AltConf	Trace
14	N	149	Total	C	N	O	S	0	0
			1202	770	228	203	1		

- Molecule 15 is a protein called 40S ribosomal protein S11.

Mol	Chain	Residues	Atoms					AltConf	Trace
15	L	151	Total	C	N	O	S	0	0
			1229	782	230	211	6		

- Molecule 16 is a protein called 40S ribosomal protein S9.

Mol	Chain	Residues	Atoms					AltConf	Trace
16	J	180	Total	C	N	O	S	0	0
			1499	955	300	242	2		

- Molecule 17 is a protein called 40S ribosomal protein S8.

Mol	Chain	Residues	Atoms					AltConf	Trace
17	I	205	Total	C	N	O	S	0	0
			1682	1056	331	290	5		

- Molecule 18 is a protein called Multifunctional methyltransferase subunit TRM112-like protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
18	r	118	Total	C	N	O	S	0	0
			940	601	166	166	7		

- Molecule 19 is a protein called Probable 18S rRNA (guanine-N(7))-methyltransferase.

Mol	Chain	Residues	Atoms					AltConf	Trace
19	q	226	Total	C	N	O	S	0	0
			1799	1140	316	332	11		

- Molecule 20 is a protein called RRP12-like protein.

Mol	Chain	Residues	Atoms				AltConf	Trace
20	K	58	Total	C	N	O	0	0
			468	296	86	86		

- Molecule 21 is a protein called Ribosome biogenesis protein SLX9 homolog.

Mol	Chain	Residues	Atoms					AltConf	Trace
21	z	30	Total	C	N	O	S	0	0
			263	169	52	41	1		

- Molecule 22 is a protein called U3 small nucleolar RNA-associated protein 14 homolog A.

Mol	Chain	Residues	Atoms					AltConf	Trace
22	5	58	Total	C	N	O	S	0	0
			470	301	96	72	1		

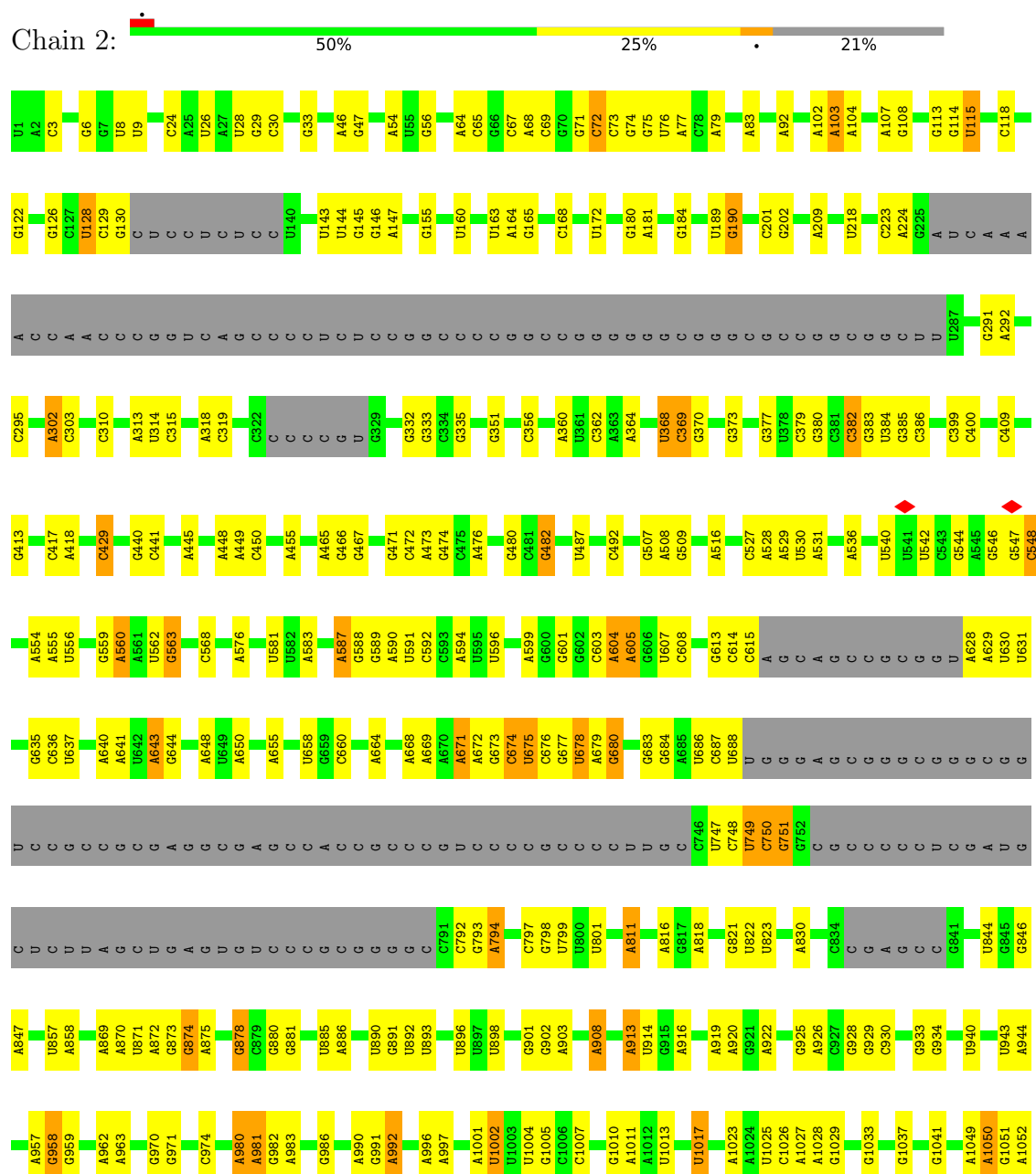
- Molecule 23 is a protein called Probable dimethyladenosine transferase.

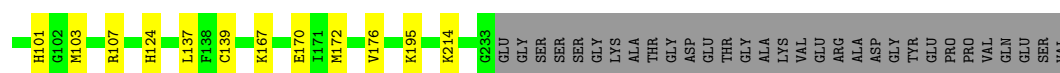
Mol	Chain	Residues	Atoms					AltConf	Trace
23	3	277	Total	C	N	O	S	0	0
			2200	1420	389	382	9		

3 Residue-property plots

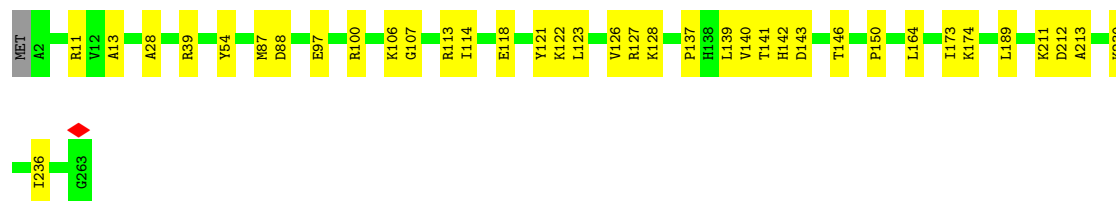
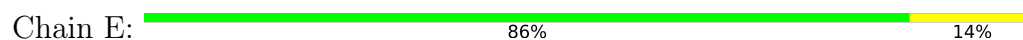
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion 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: 18S rRNA

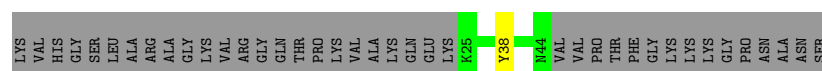




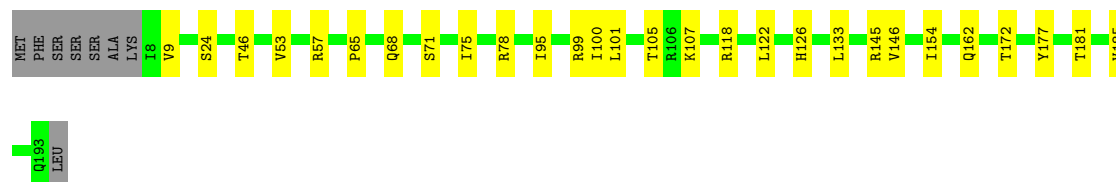
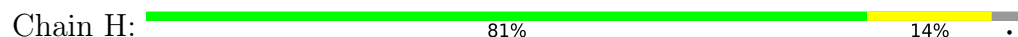
- Molecule 4: 40S ribosomal protein S4, X isoform



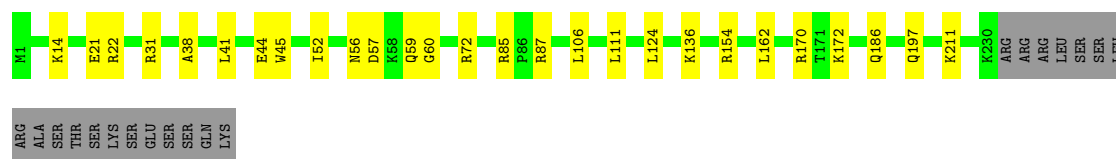
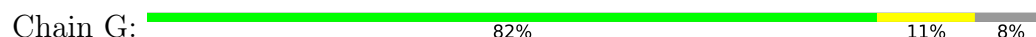
- Molecule 5: 40S ribosomal protein S30



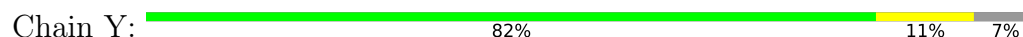
- Molecule 6: 40S ribosomal protein S7



- Molecule 7: 40S ribosomal protein S6

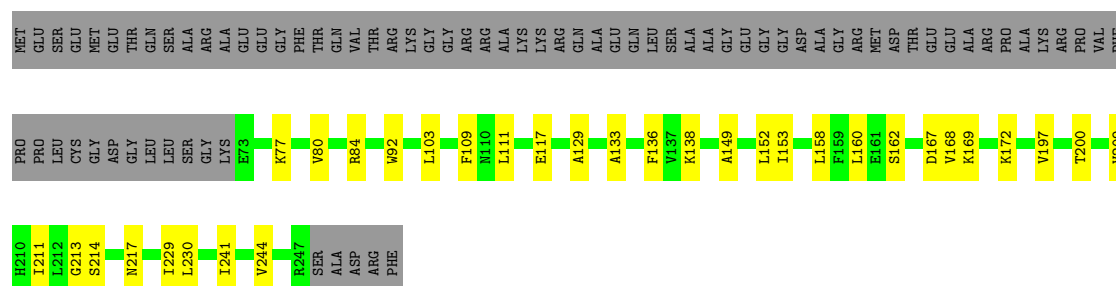


- Molecule 8: 40S ribosomal protein S24



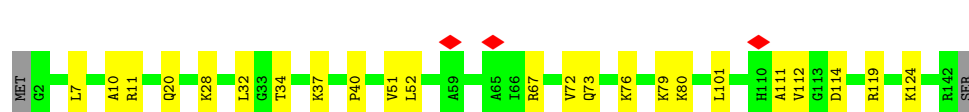
- Molecule 9: RNA-binding protein PNO1

Chain x:  56% 13% 31%



- Molecule 10: 40S ribosomal protein S23

Chain X:  83% 16%



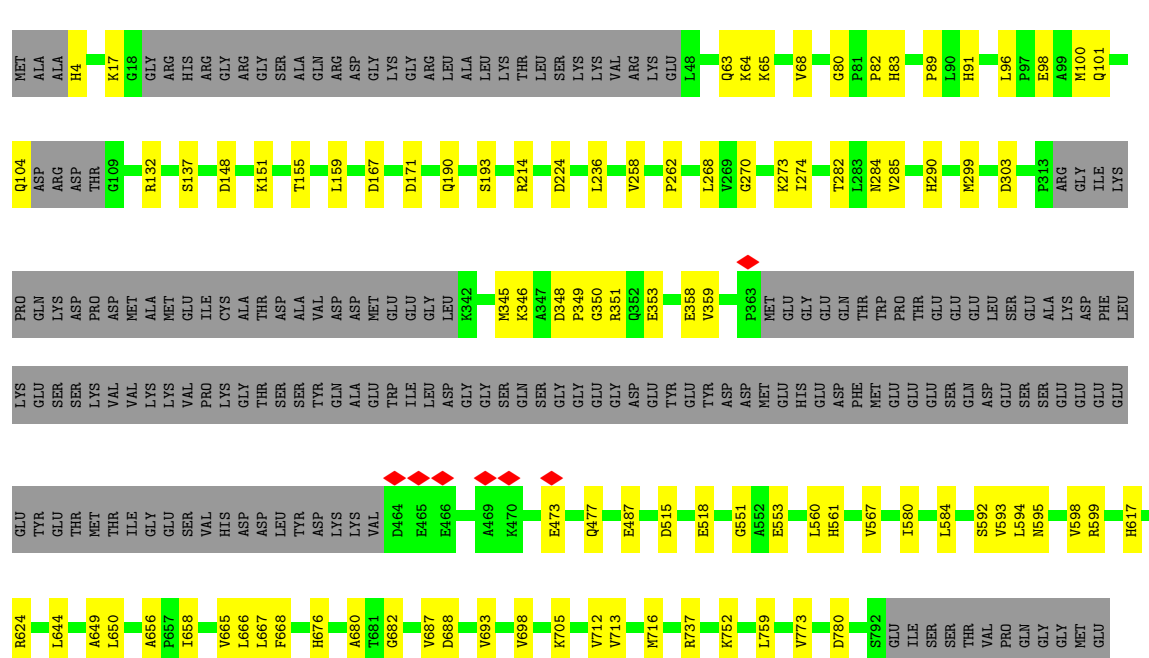
- Molecule 11: 40S ribosomal protein S15a

Chain W:  86% 13%



- Molecule 12: Pre-rRNA-processing protein TSR1 homolog

Chain u:  66% 12% 22%



- Molecule 13: 40S ribosomal protein S14



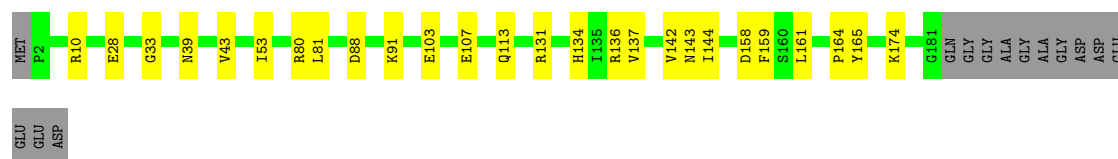
- Chain N: 91% 8%



- Chain L: 81% 15% .

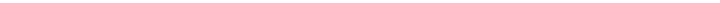


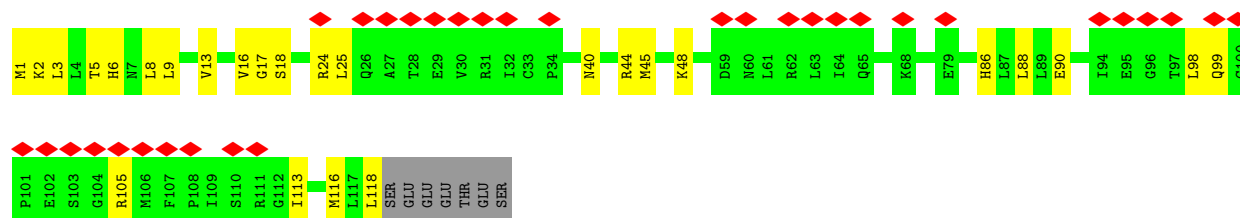
- Chain J: 79% 13% 7%

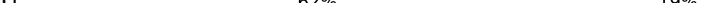


- Chain I:  84% 14%



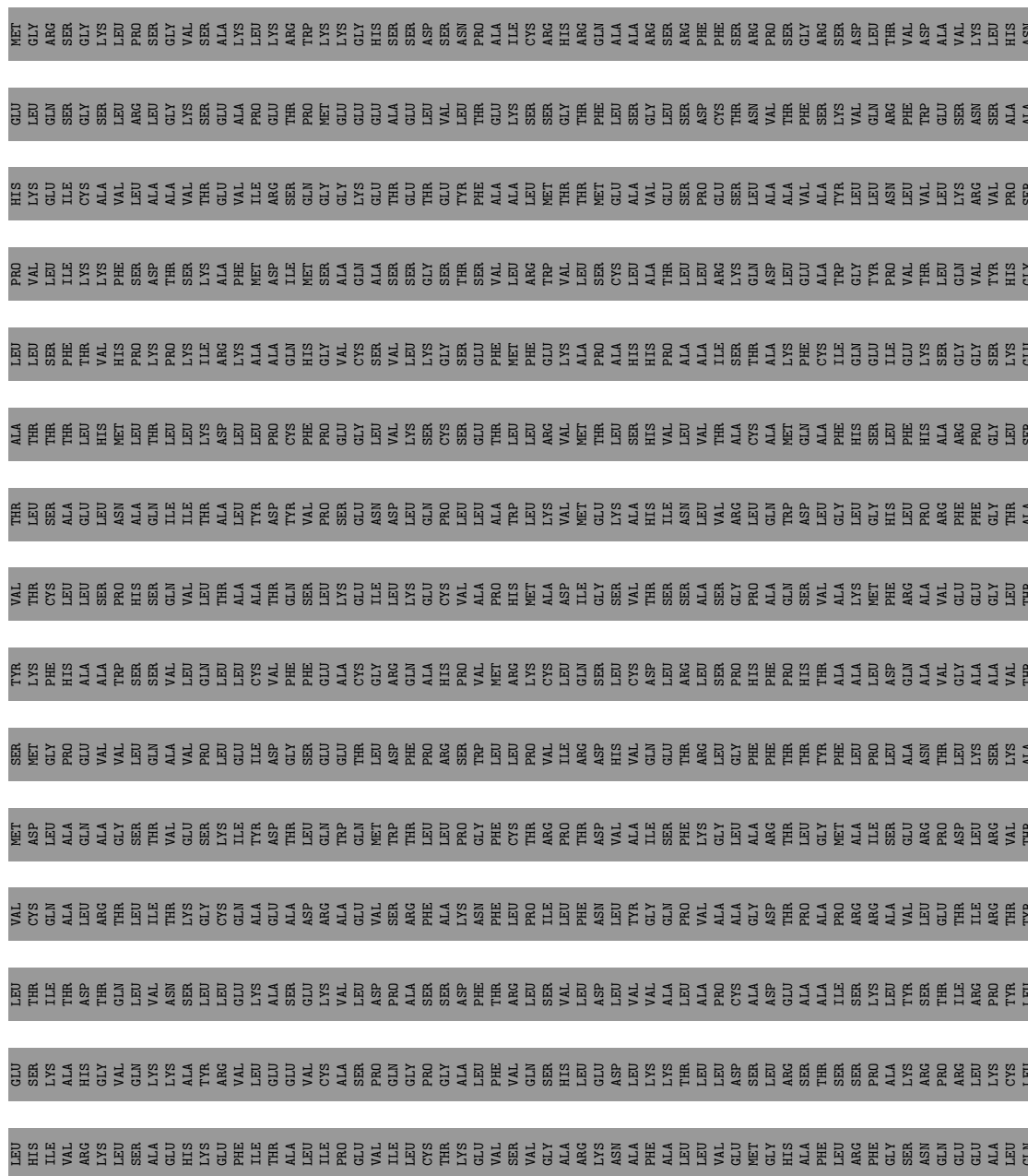
- Chain r:  26% 74% 21% 6%

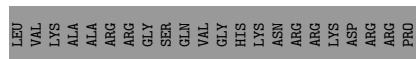


- Chain q:  62% 19% 20%

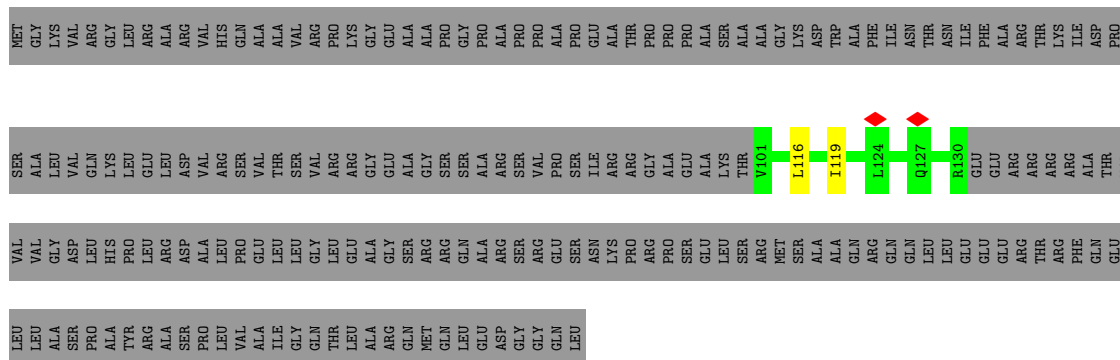
- Molecule 20: RRP12-like protein

Chain K: 96%

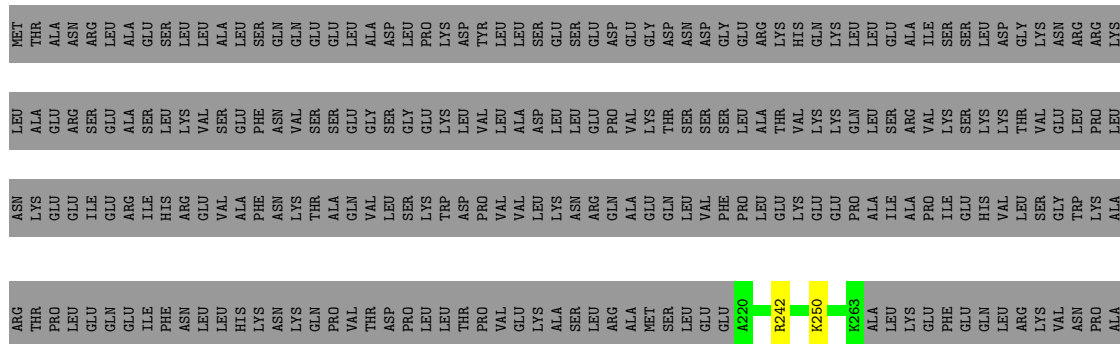




- Chain z: 12% 87%



- Chain 5: 7% 92%



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	8843	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION; Relion	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	44	Depositor
Minimum defocus (nm)	800	Depositor
Maximum defocus (nm)	2500	Depositor
Magnification	Not provided	
Image detector	GATAN K2 SUMMIT (4k x 4k)	Depositor
Maximum map value	0.599	Depositor
Minimum map value	-0.263	Depositor
Average map value	0.001	Depositor
Map value standard deviation	0.011	Depositor
Recommended contour level	0.02	Depositor
Map size ($\text{\AA}$)	381.24, 381.24, 381.24	wwPDB
Map dimensions	360, 360, 360	wwPDB
Map angles ($^\circ$)	90.0, 90.0, 90.0	wwPDB
Pixel spacing ($\text{\AA}$)	1.059, 1.059, 1.059	Depositor

5 Model quality ⓘ

5.1 Standard geometry ⓘ

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	2	0.27	1/35348 (0.0%)	0.40	0/55069
2	b	0.22	0/653	0.51	0/876
3	B	0.25	0/1756	0.56	0/2350
4	E	0.30	0/2118	0.51	0/2849
5	e	0.20	0/180	0.34	0/232
6	H	0.22	0/1524	0.49	0/2042
7	G	0.23	0/1885	0.48	1/2510 (0.0%)
8	Y	0.27	0/1031	0.42	0/1370
9	x	0.25	0/1394	0.54	0/1880
10	X	0.28	0/1116	0.55	0/1490
11	W	0.31	0/1050	0.60	0/1406
12	u	0.23	0/5185	0.51	0/7003
13	O	0.25	0/1022	0.58	0/1372
14	N	0.23	0/1226	0.48	0/1649
15	L	0.30	0/1250	0.49	0/1673
16	J	0.29	0/1524	0.57	2/2035 (0.1%)
17	I	0.27	0/1711	0.51	0/2282
18	r	0.21	0/961	0.55	0/1301
19	q	0.18	0/1836	0.50	0/2471
20	K	0.23	0/478	0.49	0/635
21	z	0.17	0/266	0.44	0/350
22	5	0.19	0/477	0.51	0/626
23	3	0.21	0/2248	0.47	0/3045
All	All	0.26	1/66239 (0.0%)	0.45	3/96516 (0.0%)

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

Mol	Chain	#Chirality outliers	#Planarity outliers
12	u	0	2
17	I	0	1

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Mol	Chain	#Chirality outliers	#Planarity outliers
All	All	0	3

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	2	1639	G	C1'-N9	8.63	1.59	1.47

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
7	G	197	GLN	CA-CB-CG	6.01	126.11	114.10
16	J	137	VAL	CA-C-N	5.30	131.66	121.54
16	J	137	VAL	C-N-CA	5.30	131.66	121.54

There are no chirality outliers.

All (3) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
17	I	140	LYS	Peptide
12	u	345	MET	Peptide
12	u	348	ASP	Peptide

5.2 Too-close contacts [i](#)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	2	31620	0	15971	254	0
2	b	640	0	665	7	0
3	B	1729	0	1803	20	0
4	E	2076	0	2177	26	0
5	e	179	0	200	1	0
6	H	1501	0	1593	18	0
7	G	1862	0	2018	16	0
8	Y	1014	0	1082	12	0
9	x	1372	0	1453	24	0
10	X	1098	0	1167	16	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
11	W	1033	0	1080	15	0
12	u	5060	0	5131	57	0
13	O	1009	0	1034	15	0
14	N	1202	0	1289	10	0
15	L	1229	0	1302	15	0
16	J	1499	0	1618	19	0
17	I	1682	0	1769	20	0
18	r	940	0	958	19	0
19	q	1799	0	1788	36	0
20	K	468	0	476	4	0
21	z	263	0	295	2	0
22	5	470	0	516	5	0
23	3	2200	0	2293	22	0
All	All	61945	0	47678	543	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 5.

All (543) 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)
11:W:101:PHE:O	11:W:128:PHE:HA	1.35	1.20
13:O:42:VAL:O	13:O:55:ARG:HA	1.43	1.16
1:2:748:C:H42	1:2:794:A:N6	1.45	1.14
1:2:536:A:H61	1:2:548:C:N4	1.47	1.13
1:2:536:A:N6	1:2:548:C:H42	1.47	1.13
1:2:748:C:N4	1:2:794:A:H61	1.45	1.12
1:2:1609:C:H42	1:2:1630:A:N6	1.50	1.09
1:2:24:C:H42	1:2:650:A:N6	1.52	1.08
1:2:1609:C:N4	1:2:1630:A:H61	1.50	1.08
1:2:24:C:N4	1:2:650:A:H61	1.53	1.05
1:2:1710:C:N4	1:2:1823:A:C6	2.31	0.98
1:2:678:U:H3	1:2:1027:A:H62	1.07	0.92
1:2:615:C:H42	1:2:628:A:N6	1.68	0.89
1:2:1710:C:N4	1:2:1823:A:N6	2.24	0.86
1:2:614:C:H42	1:2:629:A:N6	1.74	0.85
1:2:1652:G:H1	1:2:1672:U:H3	1.24	0.84
1:2:1215:C:H42	1:2:1220:A:H61	1.27	0.83
1:2:878:G:H1	1:2:908:A:H61	1.28	0.82
1:2:615:C:N4	1:2:628:A:H61	1.78	0.81
1:2:678:U:O4	1:2:1027:A:N7	2.13	0.81

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:2:1534:C:C2	1:2:1598:G:N2	2.49	0.81
1:2:614:C:N4	1:2:629:A:N6	2.31	0.79
1:2:615:C:H42	1:2:628:A:H61	1.34	0.75
6:H:177:TYR:O	6:H:181:THR:HB	1.87	0.75
1:2:748:C:H42	1:2:794:A:H61	0.77	0.75
1:2:925:G:H1	1:2:1017:U:H3	1.34	0.75
9:x:168:VAL:HG23	13:O:149:ARG:HH11	1.50	0.75
1:2:678:U:H3	1:2:1027:A:N6	1.82	0.74
9:x:133:ALA:O	9:x:136:PHE:HB3	1.88	0.74
1:2:1609:C:N3	1:2:1630:A:N1	2.36	0.73
1:2:1335:G:H1	1:2:1492:U:H3	1.37	0.73
1:2:749:U:O4	1:2:793:G:O6	2.08	0.72
10:X:112:VAL:HG12	10:X:114:ASP:H	1.53	0.72
1:2:103:A:OP2	1:2:356:C:N4	2.24	0.71
1:2:957:A:H3'	1:2:958:G:H21	1.55	0.70
1:2:536:A:N1	1:2:548:C:N3	2.40	0.70
16:J:159:PHE:HE2	16:J:165:TYR:HB2	1.57	0.70
1:2:1215:C:H42	1:2:1220:A:N6	1.89	0.69
1:2:1296:U:H3	1:2:1301:A:H62	1.39	0.68
1:2:1215:C:N4	1:2:1220:A:H61	1.90	0.68
1:2:919:A:OP2	14:N:64:ARG:NH2	2.27	0.68
12:u:644:LEU:HD12	12:u:650:LEU:HD12	1.75	0.68
1:2:614:C:N4	1:2:629:A:H61	1.90	0.67
17:I:57:ALA:HB2	17:I:183:GLY:HA2	1.76	0.67
3:B:124:HIS:HA	3:B:137:LEU:O	1.95	0.67
12:u:667:LEU:HB2	12:u:680:ALA:HB3	1.78	0.66
1:2:536:A:H61	1:2:548:C:H42	0.74	0.66
9:x:214:SER:OG	9:x:217:ASN:ND2	2.28	0.66
1:2:677:G:OP1	14:N:124:ARG:NH1	2.29	0.65
12:u:285:VAL:HA	12:u:299:MET:HE3	1.78	0.65
1:2:1757:G:C6	1:2:1776:G:C2	2.85	0.65
1:2:1275:G:O6	1:2:1324:G:C2	2.49	0.65
1:2:1629:C:H2'	1:2:1630:A:H8	1.62	0.65
10:X:10:ALA:HB2	15:L:101:ARG:HB2	1.79	0.65
1:2:748:C:N4	1:2:794:A:N6	2.19	0.64
1:2:643:A:OP1	16:J:39:ASN:ND2	2.30	0.64
1:2:671:A:O2'	1:2:1089:G:OP2	2.14	0.64
1:2:64:A:H2	1:2:83:A:H62	1.44	0.64
1:2:1236:G:H21	1:2:1522:A:H62	1.44	0.64
9:x:136:PHE:HB2	9:x:153:ILE:HD11	1.80	0.63
1:2:507:G:OP1	8:Y:108:LYS:NZ	2.32	0.63

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:2:77:A:N7	7:G:154:ARG:NH1	2.46	0.62
10:X:11:ARG:NH2	15:L:104:LYS:O	2.32	0.62
4:E:127:ARG:HD2	4:E:142:HIS:HA	1.82	0.62
1:2:878:G:H1	1:2:908:A:N6	1.95	0.62
10:X:28:LYS:O	10:X:32:LEU:HB2	2.00	0.62
1:2:1156:U:OP1	11:W:71:LYS:NZ	2.32	0.62
1:2:1332:A:C6	1:2:1497:G:N1	2.68	0.61
12:u:487:GLU:HA	12:u:698:VAL:HB	1.82	0.61
1:2:943:U:H2'	1:2:944:A:H8	1.65	0.61
1:2:1534:C:C2	1:2:1598:G:C2	2.88	0.61
12:u:148:ASP:HB3	12:u:580:ILE:HD12	1.82	0.61
4:E:13:ALA:O	4:E:39:ARG:NH2	2.33	0.61
1:2:615:C:N3	1:2:628:A:N1	2.49	0.61
6:H:53:VAL:O	6:H:57:ARG:HB2	2.00	0.61
1:2:913:A:H2	6:H:99:ARG:H	1.48	0.61
3:B:33:VAL:HA	3:B:96:CYS:HB2	1.82	0.60
3:B:59:SER:HB3	3:B:63:LYS:HE2	1.82	0.60
6:H:105:THR:HG23	6:H:107:LYS:H	1.65	0.60
1:2:1606:G:H22	1:2:1632:G:H1'	1.66	0.60
3:B:49:VAL:HG21	3:B:62:LEU:HD12	1.84	0.60
6:H:154:ILE:HB	6:H:185:VAL:HG22	1.81	0.60
15:L:21:LYS:NZ	17:I:157:LYS:O	2.35	0.60
2:b:4:ALA:HA	11:W:23:ARG:HD3	1.83	0.60
12:u:258:VAL:HG22	12:u:274:ILE:HG22	1.84	0.60
12:u:171:ASP:OD1	12:u:214:ARG:NH2	2.34	0.60
12:u:617:HIS:HB2	12:u:666:LEU:HB2	1.82	0.60
2:b:3:LEU:HD22	11:W:22:LYS:HD3	1.84	0.60
1:2:429:C:O2'	1:2:811:A:N1	2.34	0.59
1:2:1232:U:H2'	1:2:1233:G:H8	1.66	0.59
12:u:303:ASP:OD2	12:u:561:HIS:NE2	2.31	0.59
3:B:139:CYS:HB3	3:B:172:MET:HE1	1.84	0.59
1:2:8:U:OP1	19:q:255:LYS:NZ	2.35	0.59
12:u:598:VAL:HB	12:u:680:ALA:HB1	1.85	0.59
3:B:27:LYS:O	3:B:51:ARG:NE	2.36	0.59
1:2:1119:A:O2'	2:b:72:ARG:NH2	2.36	0.59
15:L:38:LYS:NZ	15:L:66:VAL:O	2.33	0.59
7:G:56:ASN:ND2	7:G:60:GLY:O	2.36	0.59
1:2:373:G:H4'	15:L:85:THR:HG21	1.85	0.59
1:2:1761:U:O2	1:2:1771:G:N2	2.35	0.58
10:X:101:LEU:HB3	10:X:124:LYS:HB2	1.85	0.58
9:x:229:ILE:O	13:O:149:ARG:NH2	2.36	0.58

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:2:885:U:O2	1:2:901:G:O6	2.20	0.58
1:2:674:C:H2'	1:2:675:U:C6	2.38	0.58
1:2:1761:U:H3	1:2:1771:G:H1	1.50	0.58
1:2:1091:C:HO2'	11:W:2:VAL:N	2.01	0.58
19:q:125:VAL:HG11	19:q:161:LEU:HD23	1.85	0.58
1:2:560:A:H5'	16:J:174:LYS:HE3	1.86	0.58
4:E:97:GLU:OE2	4:E:113:ARG:NH1	2.37	0.58
12:u:80:GLY:O	12:u:132:ARG:NH2	2.37	0.58
1:2:615:C:N4	1:2:628:A:N6	2.38	0.57
1:2:507:G:OP2	8:Y:104:ARG:NH2	2.35	0.57
1:2:1226:G:H22	1:2:1640:A:H2	1.53	0.57
10:X:51:VAL:HA	10:X:72:VAL:HG12	1.85	0.57
10:X:111:ALA:HB2	10:X:119:ARG:HE	1.70	0.57
15:L:42:LEU:HD13	15:L:72:ILE:HD11	1.86	0.57
3:B:52:THR:HG22	3:B:54:GLY:H	1.69	0.57
23:3:275:LYS:HD2	23:3:278:GLN:HE21	1.69	0.57
1:2:943:U:H2'	1:2:944:A:C8	2.40	0.56
23:3:193:LYS:HB2	23:3:200:PRO:HD2	1.87	0.56
1:2:1033:G:N1	1:2:1080:A:O2'	2.32	0.56
3:B:82:ARG:HD3	3:B:103:MET:HE3	1.86	0.56
9:x:167:ASP:O	13:O:142:ARG:NH2	2.38	0.56
1:2:846:G:OP1	4:E:106:LYS:NZ	2.38	0.56
1:2:928:G:H1	1:2:1013:U:H3	1.52	0.56
1:2:630:U:OP1	19:q:249:ARG:NH1	2.39	0.56
7:G:85:ARG:O	7:G:87:ARG:NH1	2.39	0.56
1:2:1084:A:OP1	1:2:1858:G:O2'	2.22	0.56
9:x:138:LYS:HE2	9:x:160:LEU:HD11	1.86	0.56
19:q:190:ASP:O	19:q:198:LYS:HA	2.06	0.56
1:2:8:U:H3	1:2:1196:A:H62	1.54	0.56
4:E:100:ARG:NH2	4:E:121:TYR:O	2.39	0.56
1:2:749:U:C4	1:2:750:C:N4	2.74	0.56
1:2:1302:G:C6	1:2:1306:U:O4	2.59	0.56
11:W:87:GLU:O	11:W:91:ASN:ND2	2.39	0.56
1:2:1277:C:O2	1:2:1322:G:N2	2.39	0.56
1:2:1722:G:O6	1:2:1812:U:O2	2.24	0.56
16:J:107:GLU:O	16:J:113:GLN:NE2	2.35	0.56
18:r:116:MET:HG3	19:q:110:PRO:HG3	1.87	0.56
1:2:1811:C:O2'	12:u:63:GLN:OE1	2.20	0.55
12:u:592:SER:OG	12:u:593:VAL:N	2.39	0.55
16:J:159:PHE:CE2	16:J:165:TYR:HB2	2.39	0.55
1:2:677:G:O2'	1:2:1029:G:N2	2.40	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:E:88:ASP:OD1	4:E:122:LYS:NZ	2.39	0.55
4:E:122:LYS:HD2	4:E:164:LEU:HD21	1.88	0.55
1:2:1858:G:OP2	13:O:146:ARG:NH2	2.39	0.55
12:u:594:LEU:HG	12:u:687:VAL:HG22	1.89	0.55
1:2:24:C:H42	1:2:650:A:H61	0.71	0.55
1:2:587:A:H5'	1:2:592:C:H41	1.72	0.55
1:2:1302:G:O6	1:2:1307:U:O4	2.25	0.55
1:2:1562:C:H2'	1:2:1563:G:H8	1.72	0.55
15:L:65:ASN:O	15:L:132:ARG:NH1	2.40	0.55
17:I:162:LEU:HD11	17:I:191:GLU:HG2	1.89	0.54
1:2:24:C:N3	1:2:650:A:N1	2.55	0.54
12:u:705:LYS:HB2	12:u:712:VAL:HB	1.88	0.54
1:2:594:A:H61	1:2:643:A:H5''	1.72	0.54
18:r:8:LEU:HD13	19:q:115:THR:HG23	1.88	0.54
4:E:173:ILE:HG23	4:E:230:LYS:HD3	1.90	0.54
12:u:737:ARG:HE	12:u:759:LEU:HD23	1.72	0.54
1:2:218:U:O2	17:I:184:ARG:NH2	2.40	0.54
1:2:1698:C:O2	12:u:4:HIS:N	2.41	0.54
1:2:1707:U:O2'	23:3:195:ASN:OD1	2.25	0.54
7:G:21:GLU:OE1	7:G:22:ARG:NH2	2.38	0.54
19:q:18:TYR:HB3	19:q:87:MET:HE3	1.89	0.54
1:2:818:A:OP1	16:J:80:ARG:NH2	2.39	0.54
4:E:107:GLY:HA2	4:E:189:LEU:HG	1.89	0.54
12:u:100:MET:HE3	12:u:137:SER:HB3	1.90	0.54
1:2:925:G:OP1	14:N:121:ARG:NH1	2.34	0.54
8:Y:5:VAL:HA	8:Y:28:LEU:O	2.08	0.54
9:x:77:LYS:NZ	9:x:117:GLU:OE2	2.34	0.54
1:2:1277:C:C2	1:2:1322:G:N2	2.76	0.54
1:2:190:G:O2'	1:2:209:A:N6	2.42	0.53
1:2:1332:A:N6	1:2:1497:G:C6	2.76	0.53
12:u:284:ASN:OD1	12:u:346:LYS:NZ	2.40	0.53
15:L:91:ASP:HB3	15:L:104:LYS:HE2	1.90	0.53
1:2:928:G:H2'	1:2:929:G:C8	2.43	0.53
1:2:368:U:OP1	1:2:369:C:O2'	2.25	0.53
1:2:992:A:OP1	22:5:242:ARG:NH1	2.41	0.53
12:u:101:GLN:OE1	12:u:104:GLN:NE2	2.41	0.53
16:J:131:ARG:NH1	16:J:143:ASN:O	2.42	0.53
2:b:5:LYS:O	11:W:23:ARG:NH1	2.41	0.53
12:u:358:GLU:HG2	12:u:359:VAL:HG23	1.90	0.53
3:B:137:LEU:HD11	3:B:176:VAL:HG21	1.90	0.53
18:r:24:ARG:HD3	18:r:99:GLN:HE21	1.73	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
9:x:230:LEU:HA	13:O:149:ARG:HE	1.74	0.53
12:u:599:ARG:HD2	12:u:649:ALA:HB2	1.90	0.53
1:2:303:C:O2	17:I:184:ARG:NH1	2.42	0.53
1:2:614:C:N3	1:2:629:A:N1	2.57	0.53
1:2:885:U:O2	1:2:902:G:C6	2.62	0.53
1:2:943:U:OP1	3:B:214:LYS:NZ	2.37	0.53
1:2:677:G:H1'	1:2:1029:G:H22	1.74	0.53
1:2:1701:C:H2'	1:2:1702:G:H8	1.73	0.53
1:2:318:A:H61	7:G:186:GLN:HE22	1.57	0.52
3:B:83:LYS:NZ	13:O:130:GLU:OE2	2.40	0.52
1:2:1286:G:N2	1:2:1312:G:O2'	2.43	0.52
1:2:1610:G:O6	1:2:1630:A:N6	2.42	0.52
14:N:3:ARG:HH12	14:N:10:GLY:H	1.56	0.52
16:J:134:HIS:HE1	16:J:164:PRO:HD2	1.73	0.52
18:r:3:LEU:HB3	18:r:88:LEU:HA	1.91	0.52
1:2:1568:C:O2	1:2:1627:C:O2'	2.28	0.52
4:E:212:ASP:OD1	4:E:213:ALA:N	2.40	0.52
8:Y:37:LYS:HD2	8:Y:57:VAL:HG23	1.91	0.52
18:r:116:MET:HE3	19:q:103:GLY:HA3	1.91	0.52
3:B:62:LEU:HD22	3:B:91:VAL:HB	1.91	0.52
12:u:346:LYS:HD2	12:u:551:GLY:HA2	1.91	0.52
3:B:75:GLN:HB3	3:B:78:GLU:HB2	1.91	0.52
12:u:262:PRO:HA	12:u:270:GLY:HA3	1.91	0.52
13:O:35:ALA:HB2	13:O:112:ALA:HB2	1.92	0.52
15:L:136:LYS:NZ	17:I:11:ARG:O	2.34	0.52
1:2:1013:U:OP1	1:2:1129:G:O2'	2.28	0.52
17:I:62:VAL:HG11	17:I:75:LYS:HE2	1.91	0.52
12:u:98:GLU:OE2	12:u:190:GLN:NE2	2.42	0.52
4:E:139:LEU:O	4:E:146:THR:HA	2.09	0.51
15:L:75:GLY:HA3	15:L:88:ILE:HD12	1.92	0.51
19:q:191:TYR:HB3	19:q:194:SER:HB2	1.92	0.51
1:2:1331:C:N4	1:2:1499:U:H3	2.08	0.51
12:u:155:THR:HG21	12:u:236:LEU:HD22	1.91	0.51
12:u:274:ILE:HG13	12:u:560:LEU:HB2	1.93	0.51
1:2:30:C:O2'	1:2:596:U:OP1	2.27	0.51
1:2:122:G:H21	4:E:146:THR:HG21	1.75	0.51
6:H:9:VAL:HG23	6:H:24:SER:HB3	1.92	0.51
12:u:273:LYS:HE3	12:u:561:HIS:CG	2.45	0.51
19:q:175:THR:OG1	20:K:1207:GLU:OE2	2.28	0.51
23:3:188:LEU:HD11	23:3:208:ARG:HB2	1.92	0.51
1:2:1007:C:O2'	14:N:104:ARG:NH2	2.44	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
10:X:28:LYS:HG2	10:X:32:LEU:HD22	1.93	0.51
18:r:116:MET:N	19:q:102:LEU:O	2.41	0.51
1:2:528:A:H2'	1:2:529:A:H8	1.76	0.51
1:2:913:A:OP2	6:H:99:ARG:NH2	2.41	0.51
1:2:1199:A:H5''	22:5:250:LYS:HE3	1.93	0.51
1:2:1550:G:H3'	1:2:1579:A:H61	1.76	0.51
19:q:162:GLN:HE21	19:q:199:LYS:HB3	1.74	0.51
12:u:594:LEU:HD13	12:u:656:ALA:HB3	1.92	0.51
1:2:164:A:H3'	1:2:165:G:H21	1.75	0.51
1:2:1025:U:OP1	1:2:1090:C:O2'	2.27	0.51
7:G:59:GLN:OE1	7:G:72:ARG:NH2	2.44	0.51
12:u:282:THR:HA	12:u:553:GLU:HA	1.93	0.51
19:q:114:GLY:HA2	19:q:154:VAL:HA	1.92	0.51
23:3:162:ARG:O	23:3:176:SER:OG	2.22	0.51
23:3:48:ILE:HG23	23:3:152:ILE:HG21	1.92	0.51
1:2:675:U:C2	1:2:676:C:H5	2.29	0.50
4:E:100:ARG:NH1	4:E:118:GLU:OE2	2.44	0.50
9:x:103:LEU:HD22	9:x:129:ALA:HB1	1.92	0.50
1:2:1649:U:H2'	1:2:1650:A:H8	1.77	0.50
12:u:595:ASN:ND2	12:u:688:ASP:OD1	2.45	0.50
1:2:640:A:H2'	1:2:641:A:C8	2.46	0.50
1:2:1227:G:N2	1:2:1635:C:O2'	2.44	0.50
10:X:7:LEU:HG	11:W:77:PRO:HB2	1.93	0.50
1:2:980:A:H2'	1:2:981:A:C8	2.46	0.50
1:2:1329:U:O2	1:2:1500:G:O6	2.30	0.50
1:2:1228:A:O2'	1:2:1634:A:N3	2.40	0.50
1:2:668:A:OP1	12:u:17:LYS:NZ	2.36	0.50
1:2:1605:G:H21	1:2:1634:A:H62	1.60	0.49
4:E:87:MET:HE1	4:E:236:ILE:HD13	1.94	0.49
12:u:83:HIS:NE2	12:u:155:THR:OG1	2.32	0.49
1:2:981:A:H2'	1:2:982:G:C8	2.47	0.49
17:I:106:SER:HB3	17:I:171:LEU:HG	1.94	0.49
1:2:1296:U:O4	1:2:1301:A:N7	2.46	0.49
1:2:1050:A:OP1	1:2:1846:G:N2	2.40	0.49
4:E:87:MET:HE3	4:E:123:LEU:HB2	1.95	0.49
6:H:46:THR:HG23	6:H:65:PRO:HD3	1.95	0.49
7:G:162:LEU:HB2	7:G:170:ARG:O	2.13	0.49
12:u:515:ASP:HB3	12:u:518:GLU:HB2	1.95	0.49
18:r:6:HIS:CE1	18:r:25:LEU:HD11	2.47	0.49
23:3:60:VAL:HA	23:3:124:THR:O	2.12	0.49
12:u:624:ARG:NH2	12:u:780:ASP:OD2	2.44	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
21:z:116:LEU:HA	21:z:119:ILE:HD12	1.95	0.49
23:3:238:LEU:HD12	23:3:285:PHE:HB3	1.93	0.49
1:2:530:U:H2'	1:2:531:A:H8	1.77	0.49
1:2:1589:A:N3	1:2:1653:U:O2'	2.40	0.49
2:b:7:LEU:HD12	11:W:24:GLN:HG2	1.94	0.49
17:I:103:LEU:HD22	17:I:170:LYS:HB3	1.94	0.49
1:2:189:U:OP1	17:I:152:ARG:NH2	2.45	0.48
1:2:201:C:H3'	1:2:202:G:H8	1.78	0.48
1:2:1232:U:H3	1:2:1526:G:H1	1.59	0.48
18:r:40:ASN:HD21	18:r:44:ARG:HH21	1.61	0.48
4:E:54:TYR:O	8:Y:15:ASN:ND2	2.46	0.48
12:u:658:ILE:HG12	12:u:687:VAL:HG11	1.94	0.48
1:2:28:U:H2'	1:2:29:G:H8	1.78	0.48
9:x:200:THR:HG22	9:x:213:GLY:HA3	1.95	0.48
4:E:128:LYS:HG2	4:E:140:VAL:HB	1.96	0.48
12:u:96:LEU:HD21	12:u:137:SER:HB2	1.95	0.48
12:u:350:GLY:HA2	12:u:353:GLU:HB3	1.95	0.48
16:J:88:ASP:HB3	16:J:91:LYS:HG2	1.96	0.48
1:2:983:A:OP1	1:2:1073:U:O2'	2.25	0.48
4:E:174:LYS:HE3	4:E:174:LYS:HB3	1.69	0.48
1:2:115:U:OP1	1:2:382:C:O2'	2.28	0.47
1:2:528:A:H2'	1:2:529:A:C8	2.49	0.47
1:2:1275:G:O6	1:2:1324:G:N3	2.47	0.47
1:2:1332:A:C6	1:2:1497:G:C6	3.02	0.47
16:J:103:GLU:O	16:J:107:GLU:HG2	2.14	0.47
1:2:8:U:OP1	19:q:258:ARG:NH1	2.46	0.47
1:2:874:G:H2'	1:2:875:A:H8	1.79	0.47
1:2:974:C:O2	13:O:55:ARG:NH1	2.48	0.47
1:2:1331:C:H2'	1:2:1332:A:C8	2.49	0.47
1:2:1776:G:H2'	1:2:1777:G:C8	2.49	0.47
1:2:1286:G:H21	1:2:1313:A:H62	1.60	0.47
3:B:35:ALA:HB3	3:B:42:ARG:HA	1.96	0.47
14:N:133:ARG:HA	14:N:133:ARG:HD3	1.80	0.47
15:L:23:VAL:HG23	15:L:26:GLY:H	1.77	0.47
1:2:1726:G:H2'	1:2:1727:G:H8	1.79	0.47
1:2:1228:A:H2'	1:2:1229:G:C8	2.49	0.47
1:2:1701:C:H2'	1:2:1702:G:C8	2.50	0.47
3:B:57:ILE:HG13	3:B:60:ASP:H	1.80	0.47
12:u:285:VAL:HG12	12:u:346:LYS:HE2	1.95	0.47
14:N:86:GLU:O	14:N:90:HIS:ND1	2.47	0.47
1:2:379:C:H5'	17:I:33:ALA:HA	1.97	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:2:47:G:O2'	12:u:65:LYS:NZ	2.44	0.47
1:2:1776:G:H2'	1:2:1777:G:H8	1.80	0.47
1:2:1778:C:H2'	1:2:1779:G:C8	2.50	0.47
17:I:101:ILE:HD12	17:I:190:LEU:HD11	1.97	0.47
1:2:107:A:H2'	1:2:108:G:C8	2.50	0.47
1:2:380:G:N1	1:2:383:G:OP2	2.37	0.47
1:2:686:U:O2	6:H:118:ARG:NH2	2.36	0.47
1:2:857:U:H2'	1:2:858:A:C8	2.50	0.47
3:B:39:PHE:CE2	3:B:74:LEU:HD13	2.50	0.47
1:2:118:C:H1'	1:2:445:A:C5	2.50	0.46
1:2:1236:G:N2	1:2:1522:A:H62	2.09	0.46
19:q:128:LEU:HD22	19:q:141:ARG:HH21	1.80	0.46
1:2:1534:C:N3	1:2:1598:G:C2	2.83	0.46
1:2:1759:G:H2'	1:2:1760:G:C8	2.50	0.46
1:2:482:G:H5'	10:X:76:LYS:HB3	1.98	0.46
1:2:1536:G:H2'	1:2:1537:A:C8	2.51	0.46
18:r:116:MET:HE2	19:q:110:PRO:HD3	1.97	0.46
19:q:186:GLY:HA2	20:K:1256:LEU:HG	1.98	0.46
1:2:1010:G:H2'	1:2:1011:A:C8	2.50	0.46
1:2:1746:U:OP1	7:G:31:ARG:NH2	2.44	0.46
12:u:273:LYS:HE3	12:u:561:HIS:CD2	2.51	0.46
18:r:1:MET:HE1	18:r:98:LEU:HD21	1.98	0.46
1:2:1778:C:H2'	1:2:1779:G:H8	1.81	0.46
10:X:52:LEU:HD11	10:X:73:GLN:HB2	1.98	0.46
12:u:712:VAL:HG22	12:u:752:LYS:HG3	1.97	0.46
19:q:23:ALA:HB1	19:q:90:GLU:HG3	1.98	0.46
1:2:65:C:OP1	7:G:136:LYS:NZ	2.45	0.46
12:u:693:VAL:HB	12:u:773:VAL:O	2.16	0.46
1:2:1295:A:H2'	1:2:1296:U:H6	1.81	0.46
1:2:145:G:H2'	1:2:146:G:C8	2.51	0.46
1:2:1271:C:O2'	1:2:1303:C:O2	2.32	0.46
1:2:1297:U:N3	1:2:1300:U:OP2	2.49	0.46
7:G:52:ILE:HA	7:G:111:LEU:HD23	1.98	0.46
1:2:658:U:N3	10:X:20:GLN:O	2.41	0.45
9:x:160:LEU:HA	9:x:211:ILE:O	2.16	0.45
17:I:141:ARG:HD2	17:I:146:GLN:CD	2.41	0.45
4:E:100:ARG:HB2	4:E:114:ILE:HD13	1.96	0.45
12:u:268:LEU:HD22	12:u:567:VAL:HG11	1.97	0.45
1:2:1854:U:OP1	13:O:147:ARG:NH1	2.49	0.45
3:B:167:LYS:HA	3:B:170:GLU:HG2	1.97	0.45
19:q:163:LEU:HG	19:q:165:PRO:HD3	1.99	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
20:K:1233:TYR:HA	20:K:1244:LYS:HZ3	1.81	0.45
1:2:562:U:H2'	1:2:563:G:C8	2.51	0.45
1:2:1639:G:H5''	19:q:17:PHE:CG	2.52	0.45
1:2:1871:C:OP1	1:2:1873:G:N1	2.49	0.45
12:u:713:VAL:HG11	12:u:716:MET:HE2	1.98	0.45
1:2:1145:A:N3	22:5:250:LYS:NZ	2.65	0.45
1:2:1199:A:H2'	1:2:1200:A:C8	2.51	0.45
17:I:83:TYR:HB3	17:I:101:ILE:HB	1.99	0.45
18:r:105:ARG:HH12	18:r:118:LEU:HA	1.81	0.45
1:2:1332:A:N6	1:2:1497:G:O6	2.50	0.45
23:3:192:GLY:O	23:3:195:ASN:ND2	2.45	0.45
1:2:823:U:H5	16:J:143:ASN:HB2	1.82	0.45
2:b:8:LEU:HG	11:W:62:VAL:HG11	1.98	0.45
19:q:161:LEU:HD22	19:q:202:LEU:HD23	1.98	0.45
1:2:1228:A:H2'	1:2:1229:G:H8	1.81	0.45
9:x:152:LEU:HA	9:x:158:LEU:HD12	1.99	0.45
1:2:223:C:H2'	1:2:224:A:C8	2.51	0.44
1:2:1264:C:O2'	1:2:1265:A:O5'	2.34	0.44
7:G:211:LYS:HB3	7:G:211:LYS:HE2	1.83	0.44
19:q:123:SER:O	19:q:127:TRP:NE1	2.45	0.44
1:2:384:U:O4	17:I:5:ARG:NH2	2.47	0.44
1:2:527:C:H2'	1:2:528:A:H8	1.82	0.44
1:2:986:G:OP1	1:2:1001:A:O2'	2.34	0.44
7:G:38:ALA:HB1	7:G:41:LEU:HD23	1.98	0.44
7:G:57:ASP:HA	7:G:106:LEU:HA	1.99	0.44
19:q:258:ARG:O	19:q:262:GLN:HG3	2.16	0.44
4:E:211:LYS:HE3	4:E:211:LYS:HB3	1.83	0.44
15:L:40:ILE:HD11	15:L:143:LEU:HD22	1.98	0.44
1:2:507:G:P	8:Y:104:ARG:HH22	2.40	0.44
18:r:2:LYS:HB2	18:r:5:THR:HG23	1.98	0.44
20:K:1249:ASP:OD1	20:K:1249:ASP:N	2.49	0.44
1:2:940:U:H3	1:2:1002:U:H3	1.66	0.44
1:2:1207:G:C2	1:2:1695:A:N6	2.86	0.44
1:2:1331:C:H42	1:2:1499:U:H3	1.64	0.44
1:2:1714:U:C2	1:2:1820:G:C2	3.04	0.44
2:b:82:LYS:HE3	14:N:25:TRP:CD2	2.53	0.44
19:q:69:SER:OG	19:q:94:ARG:NH2	2.50	0.44
1:2:54:A:OP1	8:Y:111:LYS:NZ	2.36	0.44
11:W:99:PHE:HZ	21:z:119:ILE:HG12	1.83	0.44
1:2:581:U:H4'	8:Y:66:GLY:HA2	1.99	0.44
1:2:1545:A:N3	1:2:1671:G:O2'	2.41	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:2:1753:C:H2'	1:2:1754:G:H8	1.83	0.44
6:H:126:HIS:CE1	6:H:181:THR:HG23	2.53	0.44
19:q:83:ILE:HD12	19:q:104:ASP:HB2	2.00	0.44
19:q:154:VAL:HG12	19:q:157:SER:HB3	2.00	0.44
23:3:98:VAL:HG11	23:3:107:LEU:HD22	1.99	0.44
1:2:1113:A:H5'	1:2:1114:U:H4'	1.99	0.44
18:r:3:LEU:HD23	18:r:88:LEU:HD23	1.99	0.44
23:3:197:ARG:HA	23:3:198:PRO:HA	1.81	0.44
1:2:1605:G:N2	1:2:1634:A:H62	2.15	0.44
6:H:146:VAL:HG12	11:W:42:MET:HE1	1.99	0.44
8:Y:86:GLU:OE1	8:Y:90:ARG:HD2	2.18	0.44
10:X:34:THR:HA	10:X:37:LYS:HB2	2.00	0.44
18:r:113:ILE:HG21	19:q:88:LEU:HD13	1.99	0.44
1:2:560:A:H5'	16:J:174:LYS:HB2	1.99	0.43
1:2:1098:C:H2'	1:2:1099:G:C8	2.53	0.43
1:2:1597:C:N4	1:2:1598:G:O6	2.51	0.43
3:B:195:LYS:HB3	3:B:195:LYS:HE3	1.77	0.43
6:H:53:VAL:HG21	6:H:172:THR:HA	1.99	0.43
6:H:68:GLN:O	6:H:71:SER:OG	2.23	0.43
9:x:111:LEU:HD21	22:5:631:TRP:HE3	1.83	0.43
23:3:125:CYS:O	23:3:151:ALA:HA	2.18	0.43
6:H:100:ILE:HD12	6:H:122:LEU:HD12	1.99	0.43
10:X:40:PRO:HA	10:X:79:LYS:HD2	2.01	0.43
12:u:290:HIS:HB2	12:u:584:LEU:HD11	1.99	0.43
1:2:1275:G:O6	1:2:1324:G:N2	2.51	0.43
9:x:136:PHE:HD1	9:x:149:ALA:HB1	1.84	0.43
12:u:665:VAL:N	12:u:682:GLY:O	2.52	0.43
16:J:136:ARG:HE	16:J:158:ASP:HB3	1.82	0.43
1:2:1707:U:H5'	23:3:194:ASN:HD22	1.83	0.43
4:E:126:VAL:HA	4:E:141:THR:HA	2.00	0.43
6:H:95:ILE:HD11	6:H:133:LEU:HD13	2.00	0.43
9:x:84:ARG:HD2	9:x:84:ARG:HA	1.74	0.43
1:2:1289:U:H2'	1:2:1290:G:C8	2.54	0.43
3:B:107:ARG:NH1	13:O:133:THR:O	2.52	0.43
8:Y:99:LYS:HE3	8:Y:99:LYS:HB2	1.85	0.43
1:2:1217:A:H2'	1:2:1218:C:H6	1.84	0.43
1:2:1726:G:H2'	1:2:1727:G:C8	2.53	0.43
12:u:668:PHE:HB3	12:u:676:HIS:HB3	2.01	0.43
15:L:126:VAL:HG12	15:L:145:VAL:HG22	2.00	0.43
18:r:86:HIS:HA	18:r:90:GLU:HB2	2.01	0.43
23:3:222:GLU:HG3	23:3:302:LEU:HD11	2.00	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:E:87:MET:HG2	4:E:123:LEU:O	2.19	0.43
23:3:239:SER:O	23:3:243:LYS:HG2	2.19	0.43
1:2:104:A:H62	1:2:356:C:H5	1.66	0.42
1:2:1037:G:H4'	1:2:1845:A:H4'	2.01	0.42
1:2:1748:G:H2'	1:2:1749:G:H8	1.83	0.42
9:x:241:ILE:HA	9:x:244:VAL:HG12	1.99	0.42
15:L:40:ILE:HD11	15:L:68:ILE:HG13	2.00	0.42
18:r:13:VAL:HB	18:r:16:VAL:HG22	2.02	0.42
1:2:65:C:H4'	7:G:172:LYS:HD3	2.02	0.42
8:Y:37:LYS:HA	8:Y:40:ILE:HD12	2.02	0.42
13:O:43:HIS:HA	13:O:55:ARG:HB3	2.02	0.42
19:q:78:TRP:HH2	19:q:96:ILE:HD12	1.84	0.42
1:2:1822:A:H2'	1:2:1823:A:C8	2.54	0.42
9:x:80:VAL:HG11	9:x:109:PHE:HZ	1.85	0.42
23:3:157:ARG:HG3	23:3:203:GLU:HB2	2.00	0.42
9:x:169:LYS:HB3	13:O:149:ARG:CZ	2.49	0.42
1:2:747:U:H2'	1:2:748:C:C6	2.55	0.42
1:2:1297:U:H3	1:2:1299:A:H3'	1.84	0.42
19:q:15:GLU:HB3	19:q:83:ILE:HG23	2.01	0.42
23:3:163:LEU:HG	23:3:185:VAL:HG21	2.02	0.42
9:x:92:TRP:NE1	22:5:629:PRO:O	2.45	0.42
16:J:53:ILE:HD13	16:J:81:LEU:HD21	2.01	0.42
18:r:6:HIS:HA	18:r:9:LEU:HB2	2.00	0.42
19:q:116:PHE:HB2	19:q:153:LEU:HD23	2.02	0.42
1:2:1710:C:H41	1:2:1823:A:N6	2.14	0.42
18:r:45:MET:HG3	18:r:48:LYS:HD3	2.02	0.42
1:2:455:A:O2'	1:2:1735:A:N3	2.42	0.42
8:Y:114:MET:O	8:Y:122:LYS:NZ	2.42	0.42
9:x:197:VAL:HG11	9:x:241:ILE:HG13	2.01	0.42
12:u:82:PRO:HB3	12:u:132:ARG:HG2	2.02	0.42
14:N:4:MET:HE3	14:N:124:ARG:CZ	2.49	0.42
1:2:480:G:H4'	12:u:68:VAL:HG11	2.02	0.41
1:2:1051:G:H2'	1:2:1052:A:C8	2.55	0.41
4:E:137:PRO:HB2	4:E:150:PRO:HD2	2.01	0.41
4:E:143:ASP:OD1	4:E:143:ASP:N	2.53	0.41
12:u:473:GLU:OE2	12:u:477:GLN:NE2	2.53	0.41
18:r:17:GLY:HA2	18:r:18:SER:HA	1.68	0.41
4:E:164:LEU:HD23	4:E:164:LEU:HA	1.89	0.41
9:x:172:LYS:HE2	9:x:172:LYS:HB2	1.75	0.41
17:I:76:THR:HG21	17:I:104:ILE:HD12	2.02	0.41
19:q:35:ILE:HD12	19:q:35:ILE:HA	1.95	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:2:1272:C:OP1	1:2:1303:C:O2'	2.38	0.41
1:2:1848:U:O4	23:3:174:ARG:NE	2.53	0.41
12:u:89:PRO:HA	12:u:159:LEU:HB2	2.02	0.41
17:I:135:GLU:O	17:I:139:LYS:HB3	2.20	0.41
1:2:1593:C:H2'	1:2:1594:A:H8	1.84	0.41
6:H:101:LEU:HD23	6:H:101:LEU:HA	1.93	0.41
9:x:169:LYS:HB3	13:O:149:ARG:NH1	2.35	0.41
1:2:71:G:H2'	1:2:72:C:O4'	2.21	0.41
1:2:399:C:H5	1:2:680:G:H5'	1.85	0.41
1:2:540:U:H2'	1:2:542:U:H5	1.86	0.41
1:2:1536:G:H2'	1:2:1537:A:H8	1.86	0.41
12:u:193:SER:OG	12:u:224:ASP:OD2	2.37	0.41
17:I:87:ASN:HB3	17:I:90:LEU:HG	2.02	0.41
17:I:157:LYS:HD2	17:I:157:LYS:HA	1.80	0.41
23:3:254:ASN:ND2	23:3:311:HIS:O	2.42	0.41
1:2:816:A:OP2	16:J:10:ARG:NH2	2.45	0.41
1:2:1206:G:C6	1:2:1207:G:H1'	2.56	0.41
1:2:1562:C:H2'	1:2:1563:G:C8	2.54	0.41
1:2:1797:U:H2'	1:2:1798:C:C6	2.56	0.41
4:E:11:ARG:HA	4:E:28:ALA:HB2	2.01	0.41
6:H:145:ARG:HD2	11:W:51:GLU:HB2	2.01	0.41
10:X:73:GLN:OE1	10:X:80:LYS:NZ	2.48	0.41
1:2:368:U:H3'	1:2:369:C:H2'	2.02	0.41
5:e:38:TYR:CG	16:J:33:GLY:HA3	2.56	0.41
1:2:28:U:H2'	1:2:29:G:C8	2.56	0.41
1:2:302:A:O5'	17:I:74:ARG:NH2	2.53	0.41
1:2:1325:G:O2'	1:2:1327:G:OP2	2.29	0.41
1:2:1712:A:N1	1:2:1822:A:N6	2.69	0.41
14:N:5:HIS:NE2	14:N:121:ARG:HG3	2.36	0.41
16:J:28:GLU:HG2	16:J:43:VAL:HG11	2.02	0.41
1:2:1565:C:H2'	1:2:1566:G:C8	2.55	0.41
1:2:1710:C:H2'	1:2:1711:U:C6	2.56	0.41
1:2:1798:C:H2'	1:2:1799:G:O4'	2.21	0.41
7:G:14:LYS:HE2	7:G:124:LEU:HG	2.01	0.41
16:J:134:HIS:CE1	16:J:164:PRO:HD2	2.53	0.41
1:2:128:U:H5'	1:2:129:C:H5	1.86	0.41
1:2:1606:G:H1	1:2:1632:G:H1'	1.86	0.41
7:G:44:GLU:HG2	7:G:45:TRP:CD1	2.56	0.41
11:W:71:LYS:O	11:W:129:PHE:HA	2.21	0.41
19:q:47:LEU:HA	19:q:158:ARG:HD2	2.03	0.41
23:3:130:PRO:HD2	23:3:133:ILE:HD11	2.02	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:2:750:C:H2'	1:2:751:G:C8	2.56	0.40
1:2:885:U:O2	1:2:901:G:C6	2.75	0.40
1:2:962:A:N1	1:2:1055:A:O2'	2.54	0.40
1:2:1221:G:H2'	1:2:1222:G:H8	1.86	0.40
1:2:1334:G:H2'	1:2:1335:G:H8	1.86	0.40
12:u:91:HIS:NE2	12:u:167:ASP:OD1	2.54	0.40
16:J:142:VAL:HG12	16:J:144:ILE:H	1.86	0.40
19:q:91:ALA:HB1	19:q:96:ILE:HD13	2.02	0.40
19:q:270:THR:OG1	19:q:271:GLN:N	2.52	0.40
1:2:1004:U:H2'	1:2:1005:G:C8	2.56	0.40
1:2:1051:G:H2'	1:2:1052:A:H8	1.86	0.40
1:2:1207:G:N2	1:2:1695:A:N6	2.69	0.40
3:B:87:ILE:HG22	3:B:101:HIS:HB2	2.03	0.40
6:H:75:ILE:HA	6:H:78:ARG:HH21	1.86	0.40
12:u:349:PRO:HB2	12:u:351:ARG:HD2	2.03	0.40
1:2:382:C:H2'	1:2:383:G:H8	1.87	0.40
1:2:508:A:H3'	1:2:509:G:H8	1.87	0.40
1:2:604:A:H2'	1:2:605:A:C8	2.57	0.40
1:2:675:U:C2	1:2:676:C:C5	3.09	0.40
15:L:111:VAL:HG12	15:L:140:PHE:HB2	2.03	0.40
19:q:15:GLU:HG2	19:q:16:LEU:HD22	2.03	0.40
23:3:91:VAL:HG13	23:3:109:VAL:HG11	2.03	0.40
1:2:996:A:H2'	1:2:997:A:C8	2.55	0.40
12:u:148:ASP:HA	12:u:151:LYS:HG2	2.03	0.40
19:q:260:ARG:HH22	19:q:269:ASP:HB2	1.87	0.40
23:3:60:VAL:HG11	23:3:74:LEU:HD22	2.02	0.40
9:x:162:SER:HA	9:x:209:VAL:O	2.22	0.40
10:X:67:ARG:HA	10:X:67:ARG:HD2	1.83	0.40
11:W:14:ILE:HG13	11:W:27:ILE:HD11	2.03	0.40
12:u:64:LYS:HB3	12:u:64:LYS:HE3	1.83	0.40
13:O:57:THR:H	13:O:60:MET:HE3	1.87	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	b	80/84 (95%)	78 (98%)	2 (2%)	0	100	100
3	B	211/264 (80%)	202 (96%)	9 (4%)	0	100	100
4	E	260/263 (99%)	250 (96%)	10 (4%)	0	100	100
5	e	18/59 (30%)	18 (100%)	0	0	100	100
6	H	184/194 (95%)	176 (96%)	8 (4%)	0	100	100
7	G	228/249 (92%)	224 (98%)	4 (2%)	0	100	100
8	Y	122/133 (92%)	119 (98%)	3 (2%)	0	100	100
9	x	173/252 (69%)	166 (96%)	7 (4%)	0	100	100
10	X	139/143 (97%)	133 (96%)	6 (4%)	0	100	100
11	W	127/130 (98%)	120 (94%)	7 (6%)	0	100	100
12	u	618/804 (77%)	593 (96%)	25 (4%)	0	100	100
13	O	133/151 (88%)	121 (91%)	12 (9%)	0	100	100
14	N	147/151 (97%)	145 (99%)	2 (1%)	0	100	100
15	L	149/158 (94%)	139 (93%)	10 (7%)	0	100	100
16	J	178/194 (92%)	173 (97%)	4 (2%)	1 (1%)	21	56
17	I	203/208 (98%)	200 (98%)	3 (2%)	0	100	100
18	r	116/125 (93%)	107 (92%)	9 (8%)	0	100	100
19	q	222/281 (79%)	216 (97%)	6 (3%)	0	100	100
20	K	54/1297 (4%)	52 (96%)	2 (4%)	0	100	100
21	z	28/230 (12%)	28 (100%)	0	0	100	100
22	5	54/771 (7%)	51 (94%)	3 (6%)	0	100	100
23	3	275/313 (88%)	267 (97%)	8 (3%)	0	100	100
All	All	3719/6454 (58%)	3578 (96%)	140 (4%)	1 (0%)	100	100

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
16	J	161	LEU

5.3.2 Protein sidechains ⓘ

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
2	b	74/76 (97%)	74 (100%)	0	100	100
3	B	194/231 (84%)	194 (100%)	0	100	100
4	E	224/225 (100%)	224 (100%)	0	100	100
5	e	18/48 (38%)	18 (100%)	0	100	100
6	H	167/174 (96%)	166 (99%)	1 (1%)	78	84
7	G	200/218 (92%)	200 (100%)	0	100	100
8	Y	108/115 (94%)	108 (100%)	0	100	100
9	x	148/208 (71%)	148 (100%)	0	100	100
10	X	113/115 (98%)	113 (100%)	0	100	100
11	W	112/113 (99%)	112 (100%)	0	100	100
12	u	550/705 (78%)	550 (100%)	0	100	100
13	O	105/119 (88%)	105 (100%)	0	100	100
14	N	130/131 (99%)	130 (100%)	0	100	100
15	L	135/142 (95%)	135 (100%)	0	100	100
16	J	160/168 (95%)	160 (100%)	0	100	100
17	I	178/180 (99%)	177 (99%)	1 (1%)	78	84
18	r	105/112 (94%)	105 (100%)	0	100	100
19	q	191/240 (80%)	191 (100%)	0	100	100
20	K	47/1094 (4%)	47 (100%)	0	100	100
21	z	28/185 (15%)	28 (100%)	0	100	100
22	5	44/686 (6%)	44 (100%)	0	100	100
23	3	248/276 (90%)	247 (100%)	1 (0%)	84	86
All	All	3279/5561 (59%)	3276 (100%)	3 (0%)	87	91

All (3) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
6	H	162	GLN
17	I	99	ASN
23	3	202	VAL

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (34) such sidechains are listed below:

Mol	Chain	Res	Type
3	B	186	ASN
4	E	142	HIS
4	E	188	ASN
6	H	97	GLN
6	H	114	GLN
6	H	162	GLN
6	H	165	ASN
7	G	70	HIS
7	G	110	ASN
7	G	186	GLN
9	x	91	ASN
9	x	106	GLN
9	x	217	ASN
11	W	56	HIS
12	u	242	GLN
12	u	477	GLN
12	u	670	GLN
12	u	719	ASN
13	O	20	GLN
14	N	69	ASN
15	L	19	ASN
15	L	141	ASN
16	J	111	GLN
17	I	52	ASN
17	I	138	ASN
18	r	7	ASN
18	r	99	GLN
19	q	162	GLN
22	5	228	GLN
23	3	108	GLN
23	3	144	HIS
23	3	248	GLN
23	3	258	HIS
23	3	262	HIS

5.3.3 RNA ⓘ

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
1	2	1465/1873 (78%)	321 (21%)	28 (1%)

All (321) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
1	2	3	C
1	2	6	G
1	2	9	U
1	2	26	U
1	2	33	G
1	2	46	A
1	2	56	G
1	2	67	C
1	2	68	A
1	2	69	C
1	2	72	C
1	2	73	C
1	2	74	G
1	2	75	G
1	2	76	U
1	2	79	A
1	2	92	A
1	2	103	A
1	2	113	G
1	2	114	G
1	2	115	U
1	2	126	G
1	2	128	U
1	2	130	G
1	2	143	U
1	2	144	U
1	2	147	A
1	2	155	G
1	2	160	U
1	2	163	U
1	2	168	C
1	2	172	U
1	2	181	A
1	2	184	G
1	2	190	G
1	2	291	G

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Mol	Chain	Res	Type
1	2	292	A
1	2	295	C
1	2	302	A
1	2	310	C
1	2	313	A
1	2	315	C
1	2	319	C
1	2	332	G
1	2	333	G
1	2	335	G
1	2	351	G
1	2	360	A
1	2	362	C
1	2	364	A
1	2	368	U
1	2	369	C
1	2	370	G
1	2	377	G
1	2	382	C
1	2	385	G
1	2	386	C
1	2	400	C
1	2	409	C
1	2	413	G
1	2	418	A
1	2	429	C
1	2	441	C
1	2	448	A
1	2	449	A
1	2	450	C
1	2	465	A
1	2	466	G
1	2	467	G
1	2	471	G
1	2	472	C
1	2	473	A
1	2	474	G
1	2	476	A
1	2	482	G
1	2	487	U
1	2	492	C
1	2	516	A

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Mol	Chain	Res	Type
1	2	544	G
1	2	546	G
1	2	547	G
1	2	548	C
1	2	554	A
1	2	555	A
1	2	556	U
1	2	559	G
1	2	560	A
1	2	563	G
1	2	568	C
1	2	576	A
1	2	583	A
1	2	587	A
1	2	588	G
1	2	589	G
1	2	590	A
1	2	591	U
1	2	599	A
1	2	601	G
1	2	603	C
1	2	604	A
1	2	605	A
1	2	607	U
1	2	608	C
1	2	613	G
1	2	631	U
1	2	635	G
1	2	637	U
1	2	643	A
1	2	644	G
1	2	648	A
1	2	655	A
1	2	660	C
1	2	664	A
1	2	669	A
1	2	671	A
1	2	672	A
1	2	673	G
1	2	674	C
1	2	675	U
1	2	678	U

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Mol	Chain	Res	Type
1	2	679	A
1	2	680	G
1	2	683	G
1	2	684	G
1	2	687	C
1	2	688	U
1	2	749	U
1	2	750	C
1	2	751	G
1	2	792	C
1	2	794	A
1	2	797	C
1	2	798	G
1	2	799	U
1	2	801	U
1	2	811	A
1	2	821	G
1	2	822	U
1	2	830	A
1	2	844	U
1	2	847	A
1	2	869	A
1	2	870	A
1	2	871	U
1	2	872	A
1	2	873	G
1	2	874	G
1	2	878	G
1	2	880	G
1	2	881	G
1	2	886	A
1	2	890	U
1	2	891	G
1	2	892	U
1	2	893	U
1	2	896	U
1	2	898	U
1	2	903	A
1	2	908	A
1	2	913	A
1	2	914	U
1	2	916	A

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Mol	Chain	Res	Type
1	2	920	A
1	2	922	A
1	2	926	A
1	2	930	C
1	2	933	G
1	2	934	G
1	2	959	G
1	2	963	A
1	2	970	G
1	2	971	G
1	2	981	A
1	2	990	A
1	2	991	G
1	2	992	A
1	2	1002	U
1	2	1017	U
1	2	1023	A
1	2	1026	C
1	2	1028	A
1	2	1041	G
1	2	1049	A
1	2	1050	A
1	2	1071	G
1	2	1078	C
1	2	1083	A
1	2	1085	C
1	2	1089	G
1	2	1099	G
1	2	1114	U
1	2	1116	C
1	2	1117	C
1	2	1118	C
1	2	1121	G
1	2	1123	C
1	2	1138	C
1	2	1149	A
1	2	1153	C
1	2	1154	U
1	2	1157	G
1	2	1171	G
1	2	1195	A
1	2	1200	A

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Mol	Chain	Res	Type
1	2	1201	U
1	2	1203	G
1	2	1204	A
1	2	1206	G
1	2	1207	G
1	2	1210	G
1	2	1211	G
1	2	1215	C
1	2	1217	A
1	2	1221	G
1	2	1224	G
1	2	1227	G
1	2	1232	U
1	2	1234	C
1	2	1235	G
1	2	1242	U
1	2	1243	U
1	2	1265	A
1	2	1271	C
1	2	1273	C
1	2	1274	G
1	2	1275	G
1	2	1284	A
1	2	1285	G
1	2	1286	G
1	2	1296	U
1	2	1299	A
1	2	1301	A
1	2	1302	G
1	2	1303	C
1	2	1305	C
1	2	1307	U
1	2	1308	U
1	2	1309	C
1	2	1312	G
1	2	1313	A
1	2	1315	U
1	2	1317	C
1	2	1322	G
1	2	1323	U
1	2	1325	G
1	2	1327	G

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Mol	Chain	Res	Type
1	2	1335	G
1	2	1487	A
1	2	1489	A
1	2	1490	G
1	2	1491	G
1	2	1494	U
1	2	1495	G
1	2	1498	A
1	2	1512	C
1	2	1519	U
1	2	1523	C
1	2	1531	A
1	2	1533	A
1	2	1534	C
1	2	1535	U
1	2	1551	U
1	2	1559	C
1	2	1560	U
1	2	1566	G
1	2	1569	A
1	2	1570	G
1	2	1580	A
1	2	1584	G
1	2	1585	U
1	2	1586	U
1	2	1588	A
1	2	1601	A
1	2	1602	U
1	2	1606	G
1	2	1617	G
1	2	1618	C
1	2	1621	U
1	2	1623	A
1	2	1639	G
1	2	1640	A
1	2	1642	U
1	2	1647	A
1	2	1648	G
1	2	1654	G
1	2	1661	A
1	2	1662	U
1	2	1663	A

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Mol	Chain	Res	Type
1	2	1664	A
1	2	1665	G
1	2	1666	C
1	2	1669	G
1	2	1675	A
1	2	1683	C
1	2	1694	U
1	2	1695	A
1	2	1704	C
1	2	1710	C
1	2	1721	U
1	2	1722	G
1	2	1723	G
1	2	1727	G
1	2	1729	U
1	2	1744	G
1	2	1756	C
1	2	1761	U
1	2	1772	C
1	2	1783	C
1	2	1784	G
1	2	1801	A
1	2	1805	G
1	2	1824	A
1	2	1825	A
1	2	1839	U
1	2	1841	C
1	2	1846	G
1	2	1861	G
1	2	1864	U
1	2	1865	C
1	2	1872	G
1	2	1873	G

All (28) RNA pucker outliers are listed below:

Mol	Chain	Res	Type
1	2	102	A
1	2	114	G
1	2	143	U
1	2	180	G
1	2	291	G

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Mol	Chain	Res	Type
1	2	314	U
1	2	332	G
1	2	417	C
1	2	440	G
1	2	465	A
1	2	604	A
1	2	636	C
1	2	750	C
1	2	870	A
1	2	958	G
1	2	980	A
1	2	1231	C
1	2	1264	C
1	2	1295	A
1	2	1304	U
1	2	1494	U
1	2	1497	G
1	2	1511	U
1	2	1534	C
1	2	1565	C
1	2	1601	A
1	2	1693	G
1	2	1726	G

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

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

5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

There are no ligands in this entry.

5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues ⓘ

There are no chain breaks in this entry.

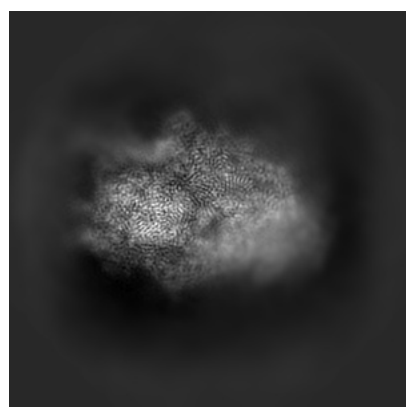
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-32799. These allow visual inspection of the internal detail of the map and identification of artifacts.

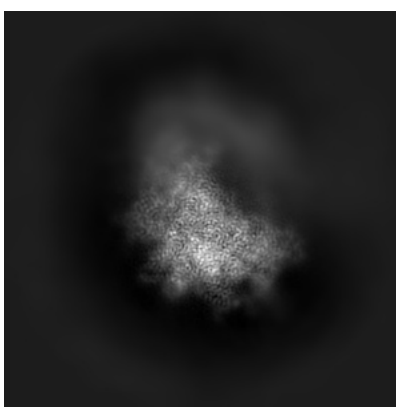
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections [i](#)

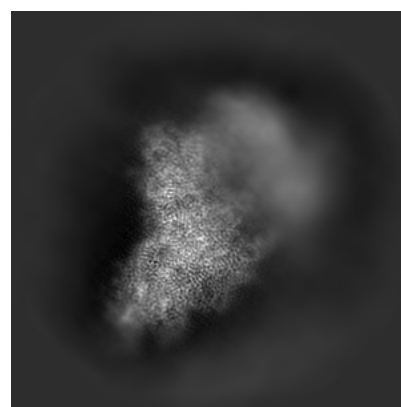
6.1.1 Primary map



X



Y

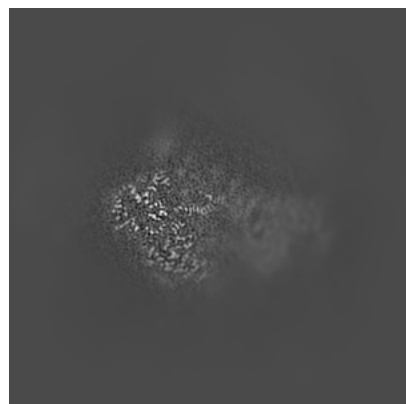


Z

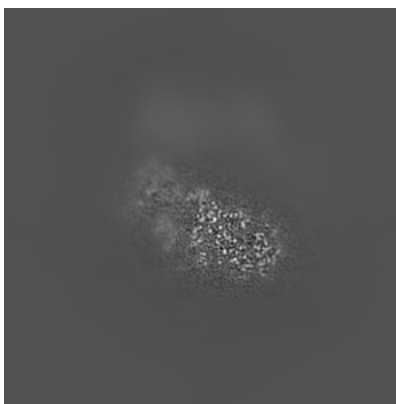
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

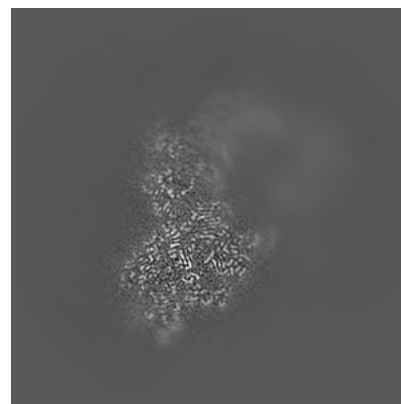
6.2.1 Primary map



X Index: 180



Y Index: 180

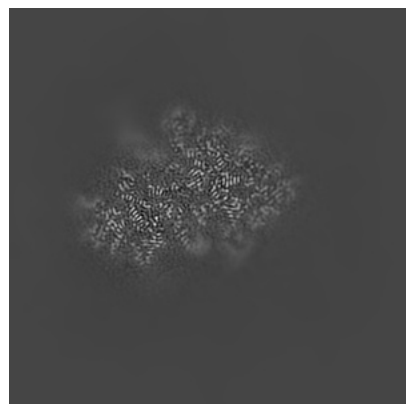


Z Index: 180

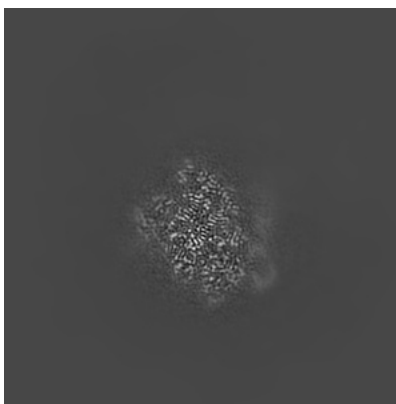
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

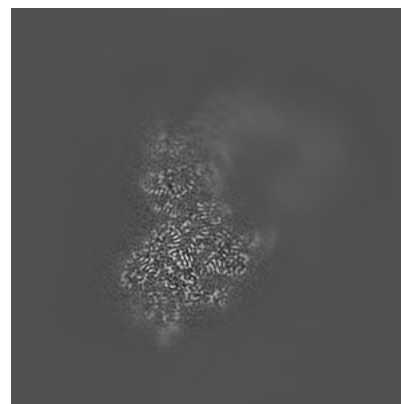
6.3.1 Primary map



X Index: 143



Y Index: 132

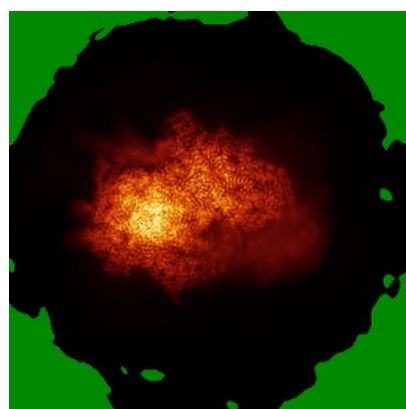


Z Index: 181

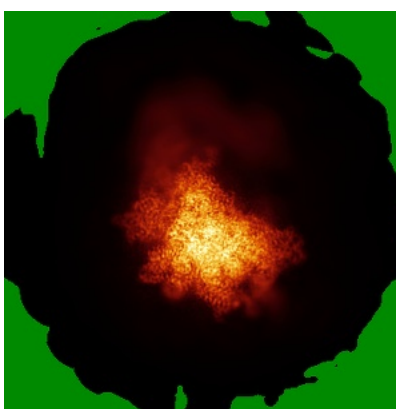
The images above show the largest variance slices of the map in three orthogonal directions.

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

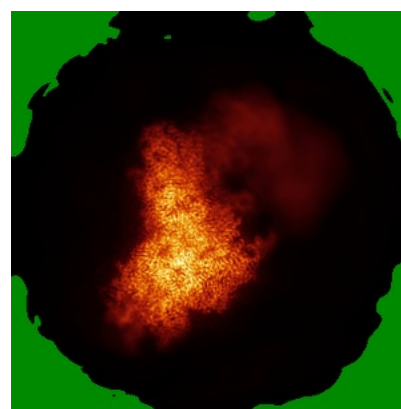
6.4.1 Primary map



X



Y



Z

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

6.5 Orthogonal surface views

This section was not generated.

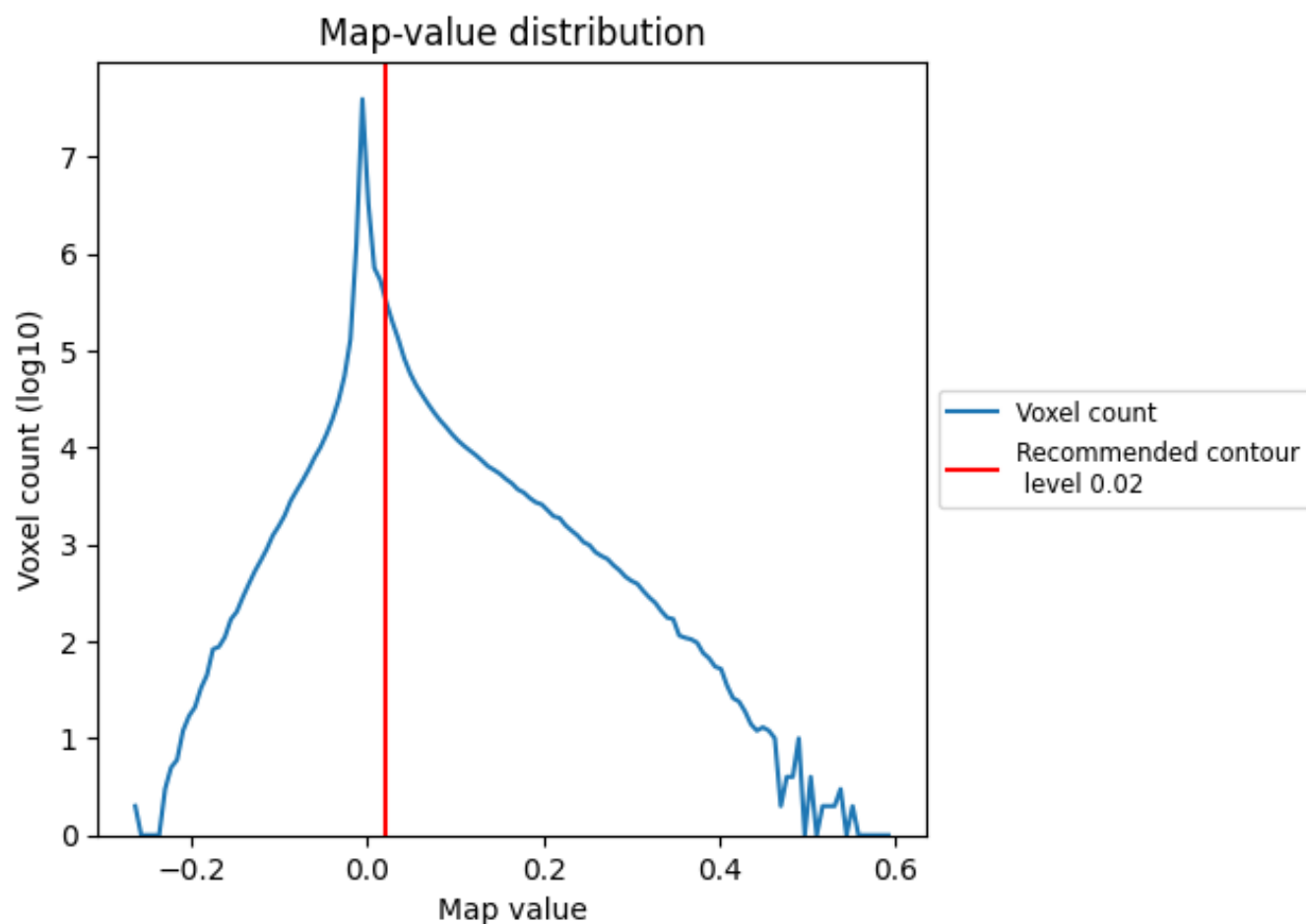
6.6 Mask visualisation

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

7 Map analysis [i](#)

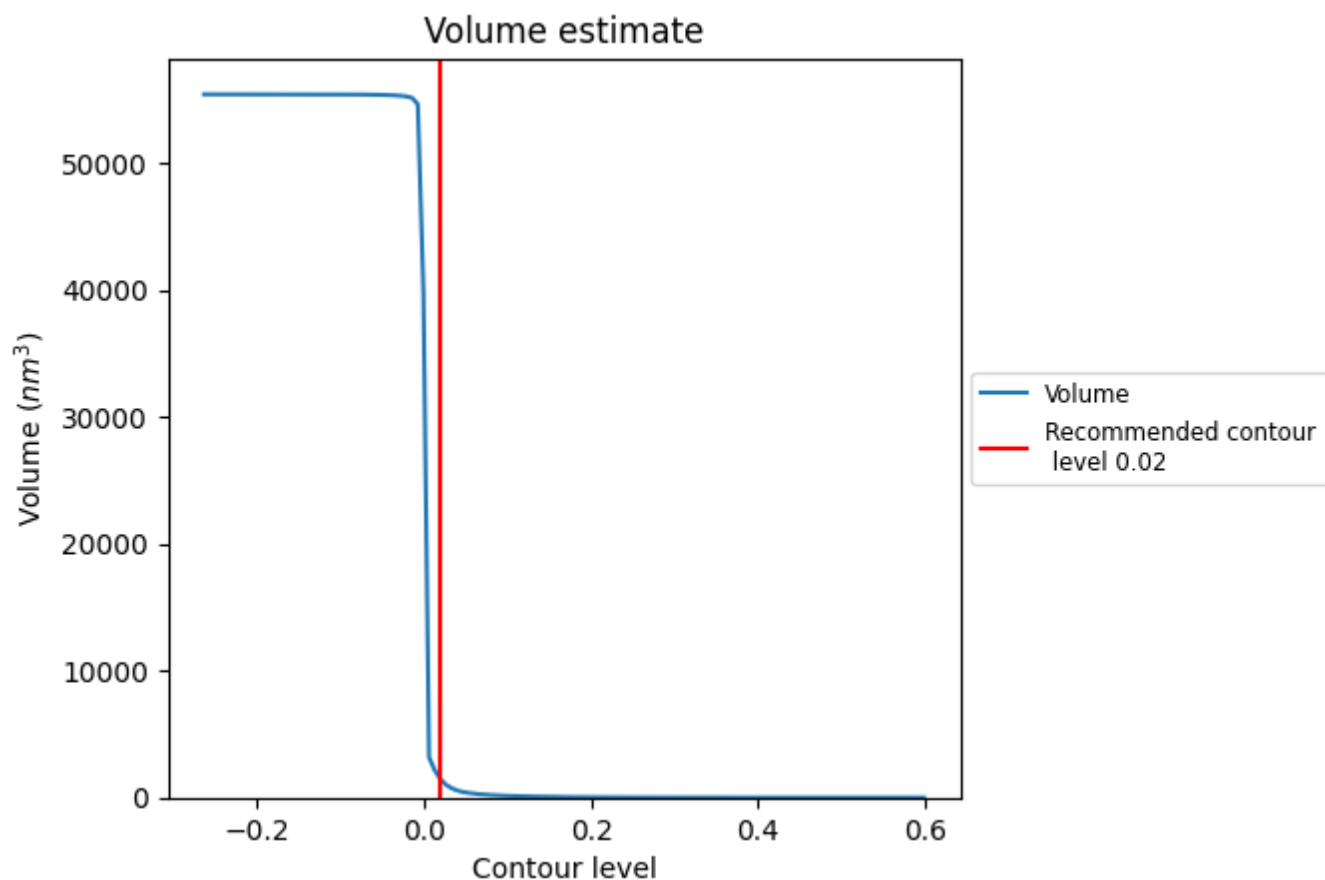
This section contains the results of statistical analysis of the map.

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.

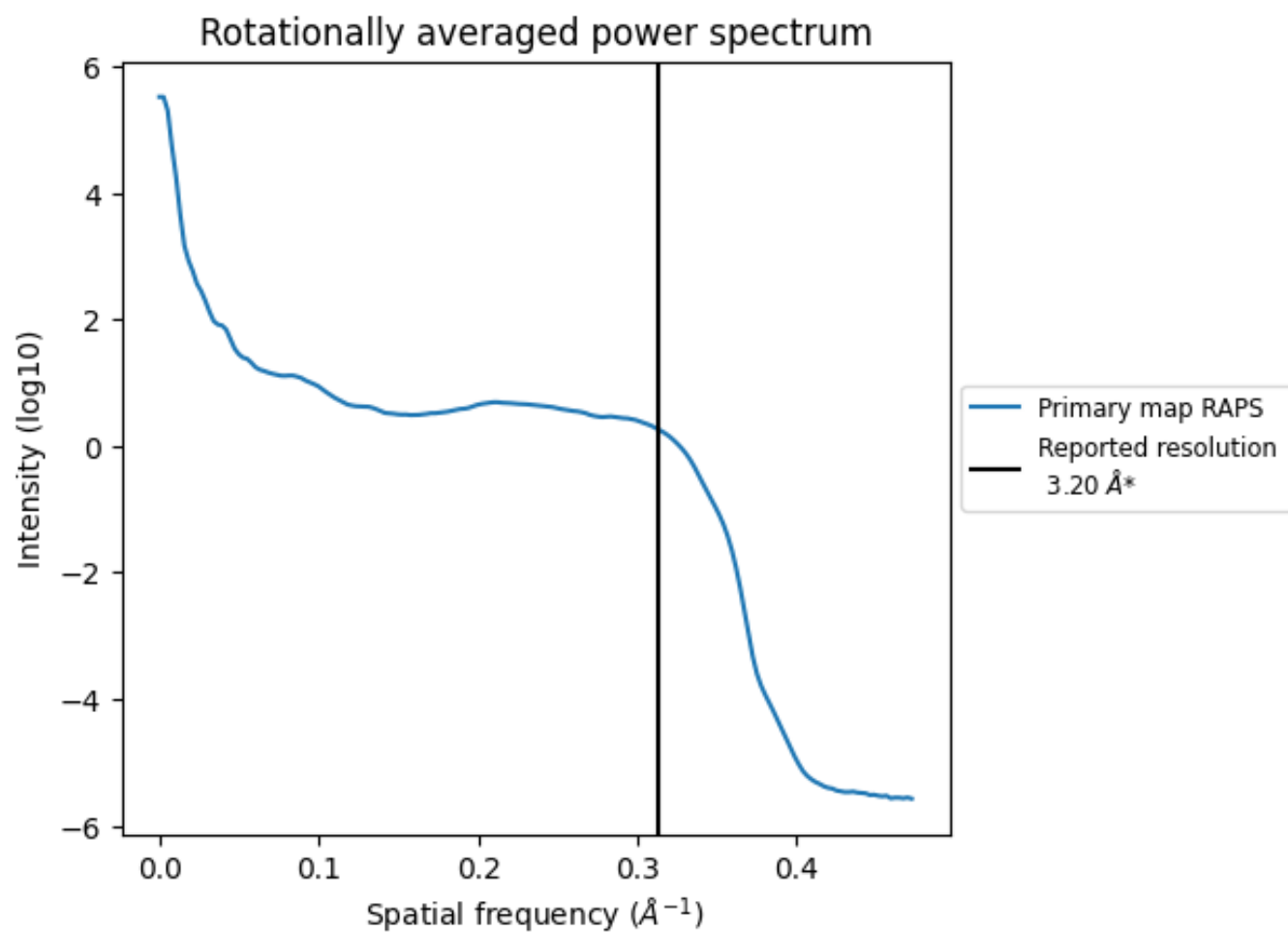
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 1425 nm^3 ; this corresponds to an approximate mass of 1288 kDa.

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

7.3 Rotationally averaged power spectrum ⓘ

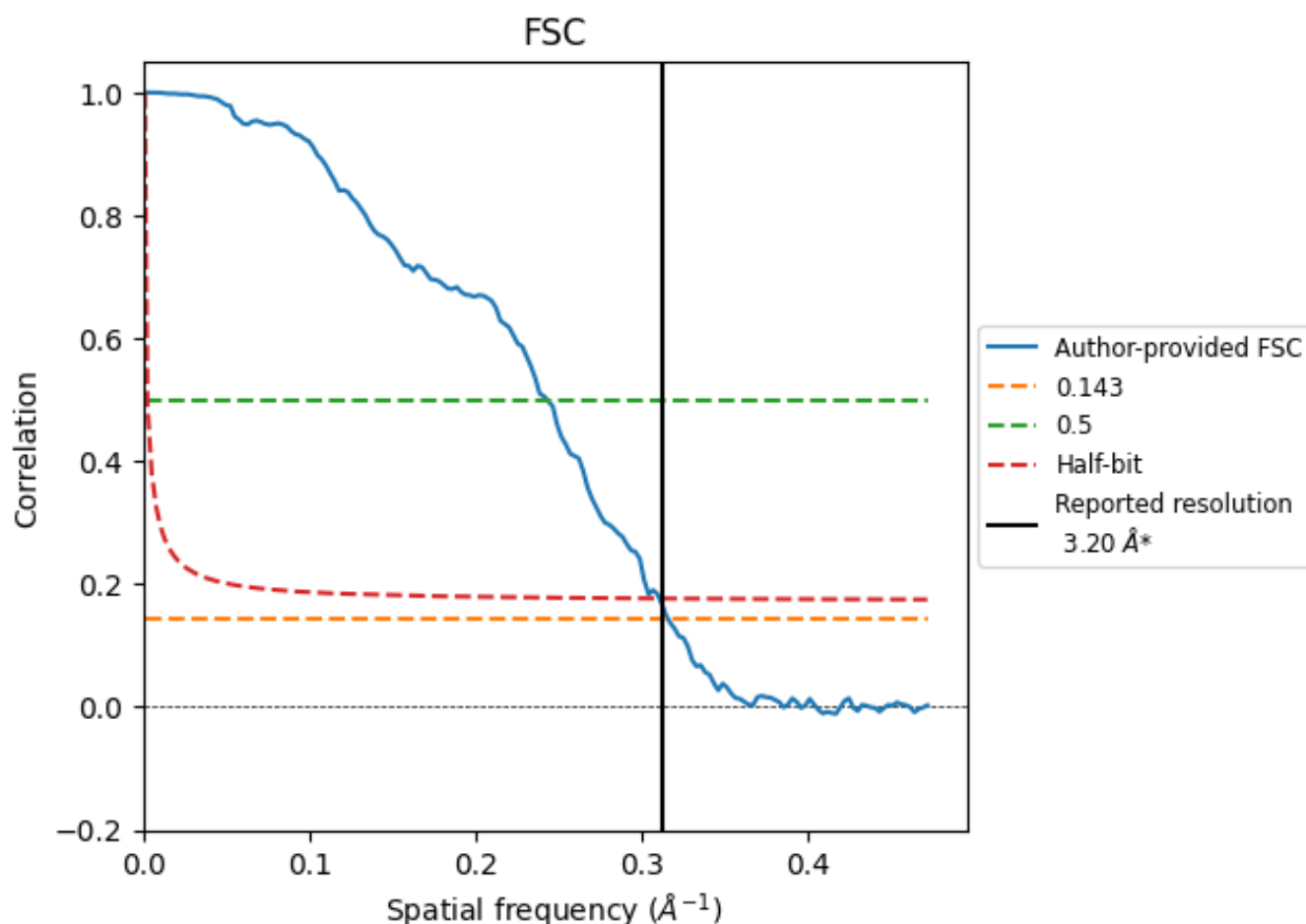


*Reported resolution corresponds to spatial frequency of 0.312 Å⁻¹

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 0.312 Å⁻¹

8.2 Resolution estimates [i](#)

Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.20	-	-
Author-provided FSC curve	3.16	4.11	3.22
Unmasked-calculated*	-	-	-

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

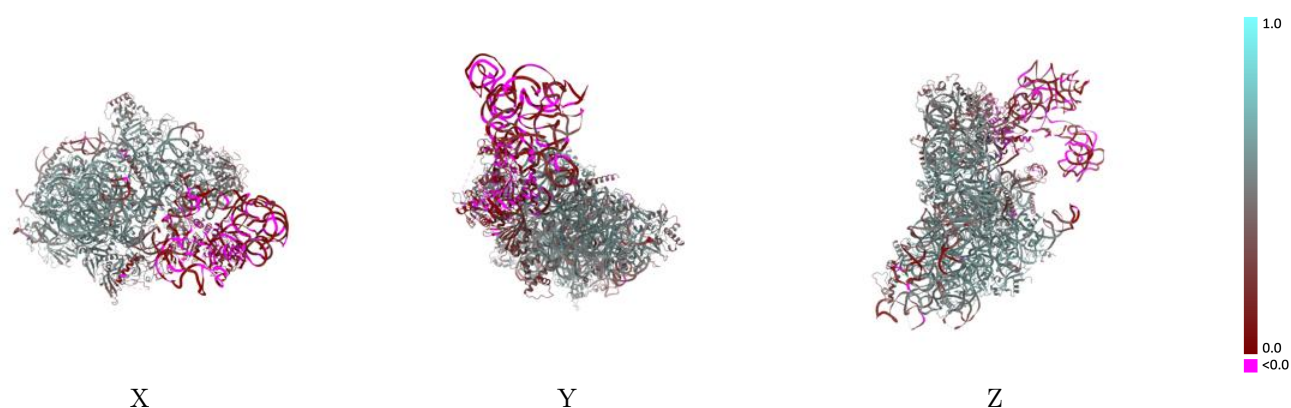
9 Map-model fit [i](#)

This section contains information regarding the fit between EMDB map EMD-32799 and PDB model 7WTS. Per-residue inclusion information can be found in section 3 on page 8.

9.1 Map-model overlay [i](#)

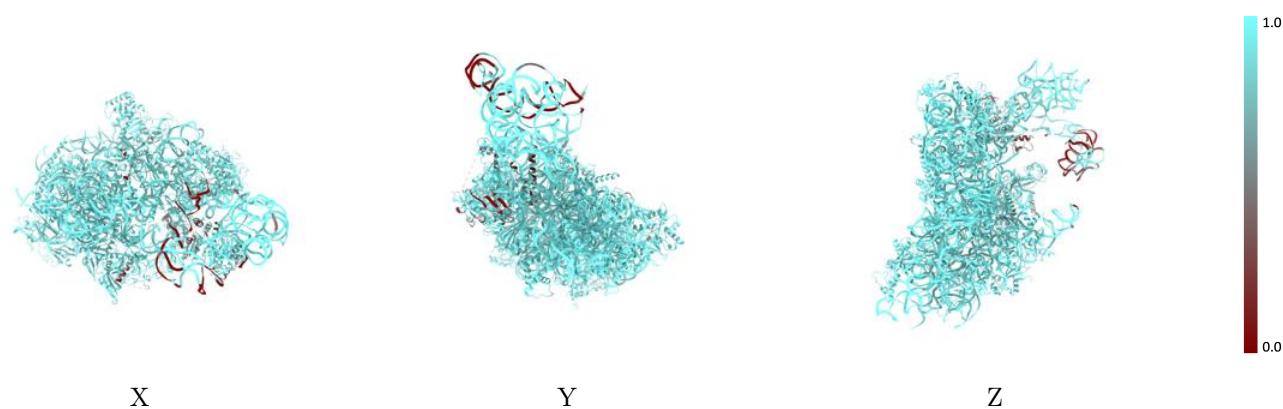
This section was not generated.

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



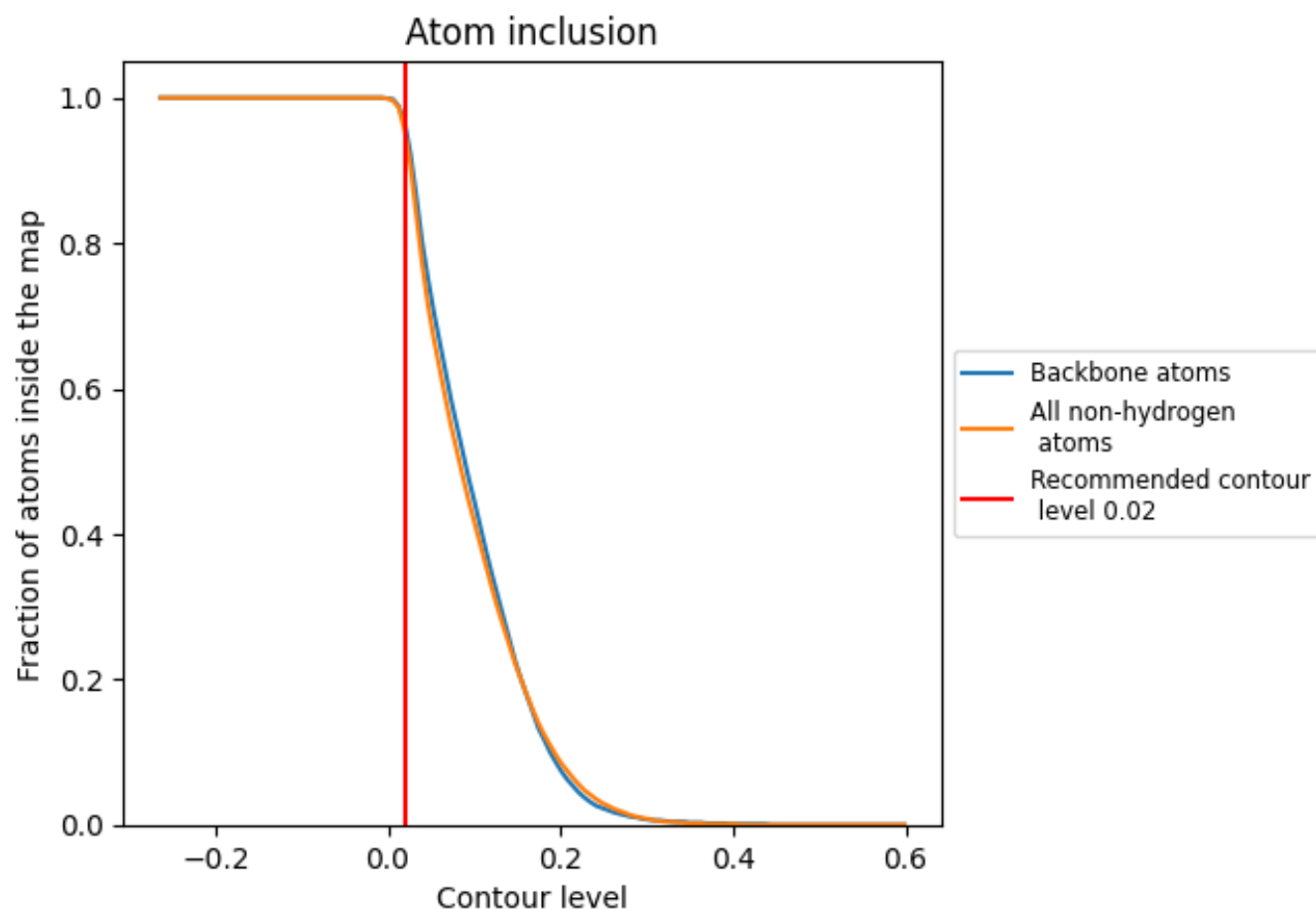
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions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

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



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 (0.02).

9.4 Atom inclusion [i](#)



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

9.5 Map-model fit summary ⓘ

The table lists the average atom inclusion at the recommended contour level (0.02) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.9520	 0.4290
2	 0.9540	 0.4190
3	 0.9300	 0.2860
5	 0.9540	 0.4520
B	 0.9790	 0.4840
E	 0.9910	 0.5850
G	 0.9890	 0.5070
H	 0.9700	 0.4340
I	 0.9860	 0.5400
J	 0.9960	 0.5710
K	 0.4440	 0.0430
L	 0.9800	 0.5660
N	 0.9880	 0.5430
O	 0.9670	 0.4500
W	 0.9960	 0.5720
X	 0.9620	 0.5150
Y	 0.9920	 0.5680
b	 0.9630	 0.5110
e	 1.0000	 0.5740
q	 0.9140	 0.1080
r	 0.6490	 0.0580
u	 0.9570	 0.4190
x	 0.9810	 0.4740
z	 0.7850	 0.3270

