



Full wwPDB EM Validation Report ⓘ

Mar 25, 2026 – 07:36 PM UTC

PDB ID : 8K4E / pdb_00008k4e
EMDB ID : EMD-36883
Title : Cryo-EM structure of 30S ribosome with cleaved AP-mRNA bound complex-II
Authors : Ramachandran, R.; Afsar, M.; Shukla, A.
Deposited on : 2023-07-18
Resolution : 3.40 Å (reported)
Based on initial model : 7NAT

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:

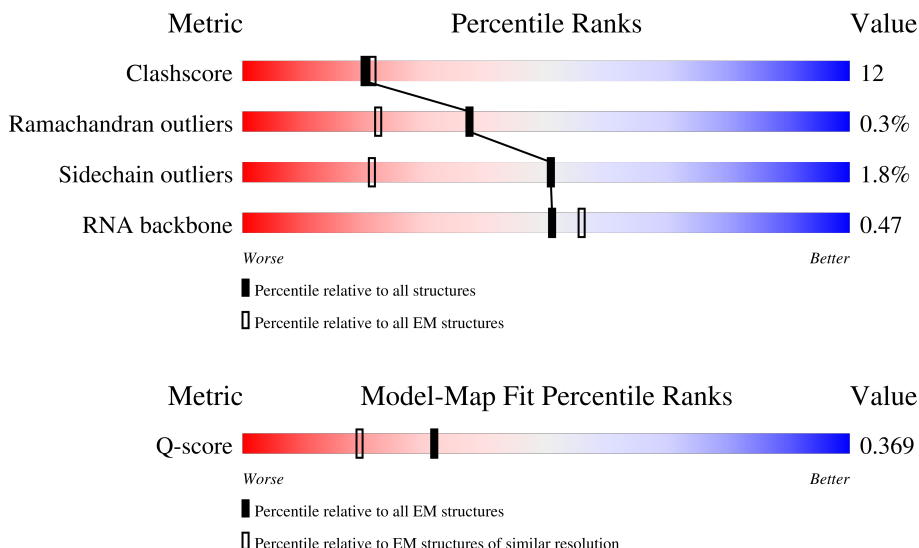
EMDB validation analysis : 0.0.1.dev132
MolProbity : 4-5-2 with Phenix2.0
Percentile statistics : 20250101.v01 (using entries in the PDB archive January 1st 2025)
EM percentile statistics : 202505.v01 (Using data in the EMDB archive up until May 2025)
MapQ : 1.9.13
Ideal geometry (proteins) : Engh &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

1 Overall quality at a glance i

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

The reported resolution of this entry is 3.40 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.



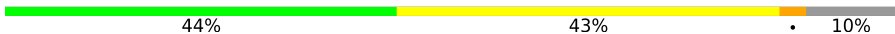
Metric	Whole archive (#Entries)	EM structures (#Entries)	Similar EM resolution (#Entries, resolution range(Å))
Clashscore	229148	23984	-
Ramachandran outliers	224038	23583	-
Sidechain outliers	223484	23102	-
RNA backbone	8273	3508	-
Q-score	-	25397	14717 (2.90 - 3.90)

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	V	72	93%
2	B	241	55% 34% 10%
3	C	233	53% 35% 12%

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Mol	Chain	Length	Quality of chain
4	D	206	
5	E	167	
6	F	135	
7	G	179	
8	H	130	
9	I	130	
10	J	103	
11	K	129	
12	L	124	
13	M	118	
14	O	89	
15	P	82	
16	Q	84	
17	R	75	
18	S	92	
19	T	87	
20	X	71	
21	A	1554	
22	N	101	

2 Entry composition

There are 22 unique types of molecules in this entry. The entry contains 49243 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 AP-mRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	V	5	Total	C	N	O	P	0	0
			107	48	19	35	5		

- Molecule 2 is a protein called 30S ribosomal protein S2.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	B	218	Total	C	N	O	S	0	0
			1704	1081	305	311	7		

- Molecule 3 is a protein called 30S ribosomal protein S3.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	C	206	Total	C	N	O	S	0	0
			1624	1028	305	288	3		

- Molecule 4 is a protein called 30S ribosomal protein S4.

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

- Molecule 5 is a protein called 30S ribosomal protein S5.

Mol	Chain	Residues	Atoms					AltConf	Trace
5	E	156	Total	C	N	O	S	0	0
			1152	717	217	212	6		

- Molecule 6 is a protein called 30S ribosomal protein S6, fully modified isoform.

Mol	Chain	Residues	Atoms					AltConf	Trace
6	F	104	Total	C	N	O	S	0	0
			848	536	153	152	7		

- Molecule 7 is a protein called 30S ribosomal protein S7.

Mol	Chain	Residues	Atoms					AltConf	Trace
7	G	149	Total	C	N	O	S	0	0
			1163	724	222	213	4		

- Molecule 8 is a protein called 30S ribosomal protein S8.

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

- Molecule 9 is a protein called 30S ribosomal protein S9.

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

- Molecule 10 is a protein called 30S ribosomal protein S10.

Mol	Chain	Residues	Atoms					AltConf	Trace
10	J	98	Total	C	N	O	S	0	0
			786	493	150	142	1		

- Molecule 11 is a protein called 30S ribosomal protein S11.

Mol	Chain	Residues	Atoms					AltConf	Trace
11	K	116	Total	C	N	O	S	0	0
			869	535	173	158	3		

- Molecule 12 is a protein called 30S ribosomal protein S12.

Mol	Chain	Residues	Atoms					AltConf	Trace
12	L	122	Total	C	N	O	S	0	0
			949	587	195	163	4		

- Molecule 13 is a protein called 30S ribosomal protein S13.

Mol	Chain	Residues	Atoms					AltConf	Trace
13	M	97	Total	C	N	O	S	0	0
			747	466	144	134	3		

- Molecule 14 is a protein called 30S ribosomal protein S15.

Mol	Chain	Residues	Atoms					AltConf	Trace
14	O	87	Total	C	N	O	S	0	0
			708	436	143	128	1		

- Molecule 15 is a protein called 30S ribosomal protein S16.

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

- Molecule 16 is a protein called 30S ribosomal protein S17.

Mol	Chain	Residues	Atoms					AltConf	Trace
16	Q	80	Total	C	N	O	S	0	0
			648	411	121	113	3		

- Molecule 17 is a protein called 30S ribosomal protein S18.

Mol	Chain	Residues	Atoms					AltConf	Trace
17	R	66	Total	C	N	O	S	0	0
			545	344	102	98	1		

- Molecule 18 is a protein called 30S ribosomal protein S19.

Mol	Chain	Residues	Atoms					AltConf	Trace
18	S	79	Total	C	N	O	S	0	0
			637	408	120	107	2		

- Molecule 19 is a protein called 30S ribosomal protein S20.

Mol	Chain	Residues	Atoms					AltConf	Trace
19	T	85	Total	C	N	O	S	0	0
			664	411	137	113	3		

- Molecule 20 is a protein called 30S ribosomal protein S21.

Mol	Chain	Residues	Atoms					AltConf	Trace
20	X	51	Total	C	N	O	S	0	0
			425	265	86	73	1		

- Molecule 21 is a RNA chain called 16S rRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
21	A	1426	Total	C	N	O	P	0	0
			30600	13647	5618	9909	1426		

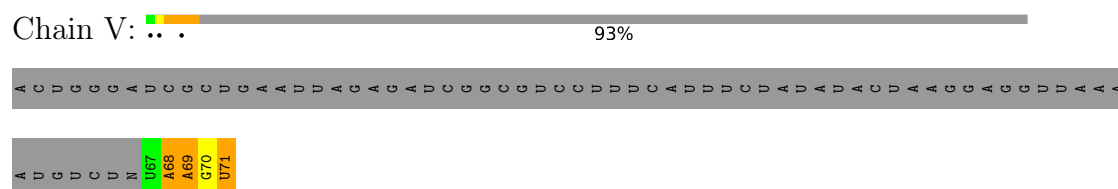
- Molecule 22 is a protein called 30S ribosomal protein S14.

Mol	Chain	Residues	Atoms					AltConf	Trace
22	N	96	Total	C	N	O	S	0	0
			774	483	160	128	3		

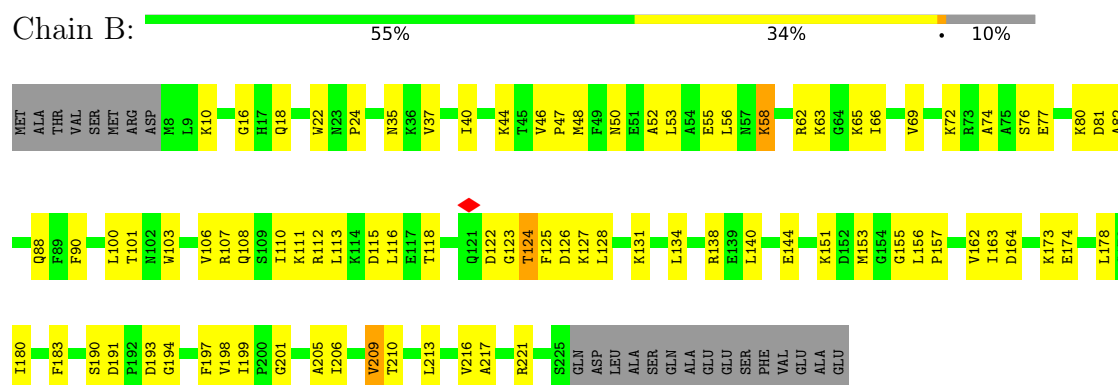
3 Residue-property plots

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.

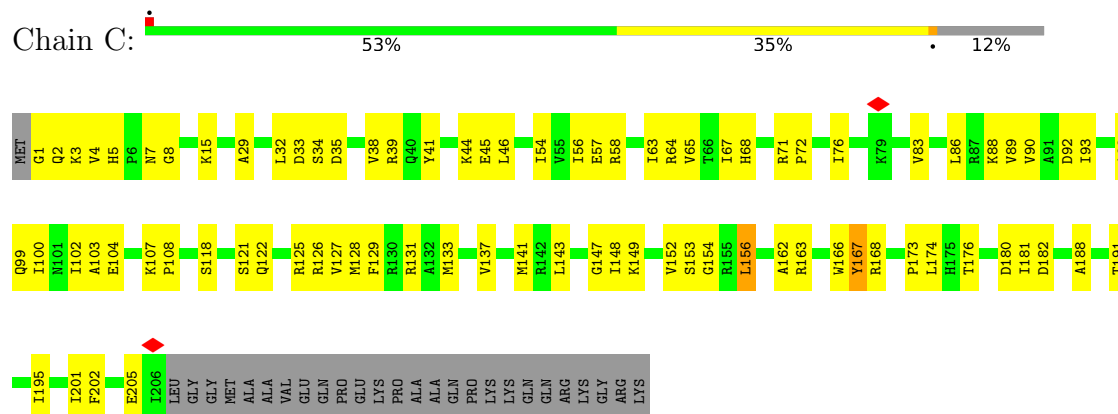
• Molecule 1: AP-mRNA



• Molecule 2: 30S ribosomal protein S2

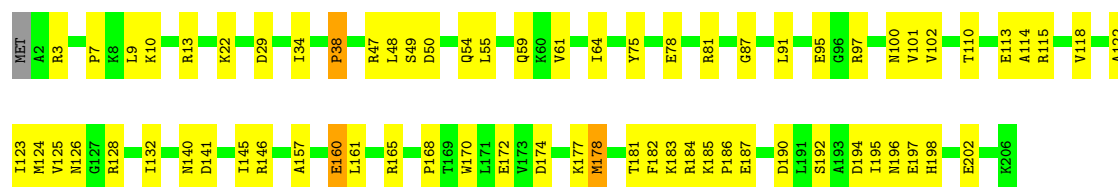


• Molecule 3: 30S ribosomal protein S3



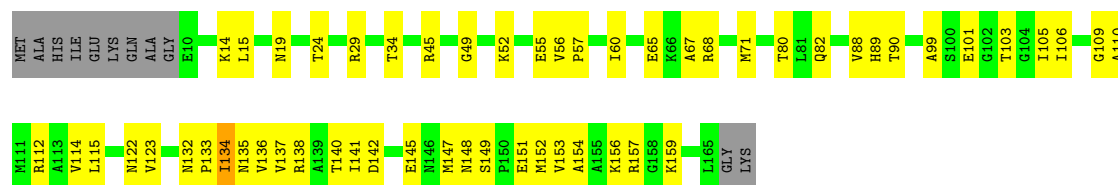
• Molecule 4: 30S ribosomal protein S4

Chain D: 



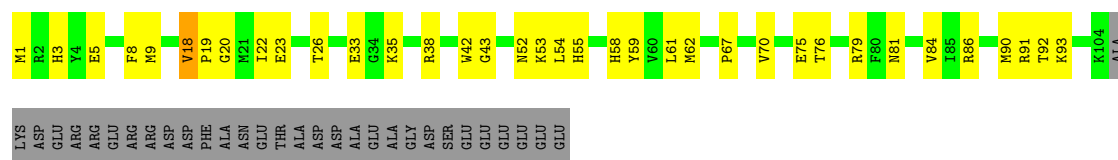
- Molecule 5: 30S ribosomal protein S5

Chain E: 



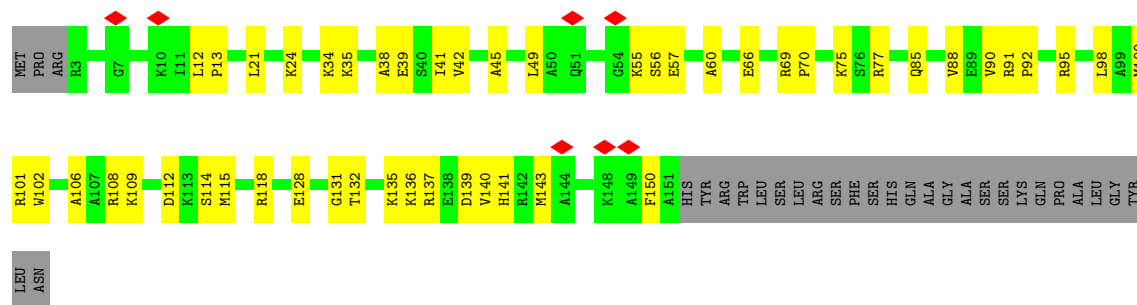
- Molecule 6: 30S ribosomal protein S6, fully modified isoform

Chain F: 



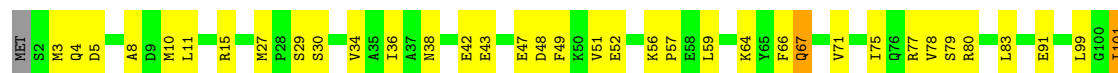
- Molecule 7: 30S ribosomal protein S7

Chain G: 



- Molecule 8: 30S ribosomal protein S8

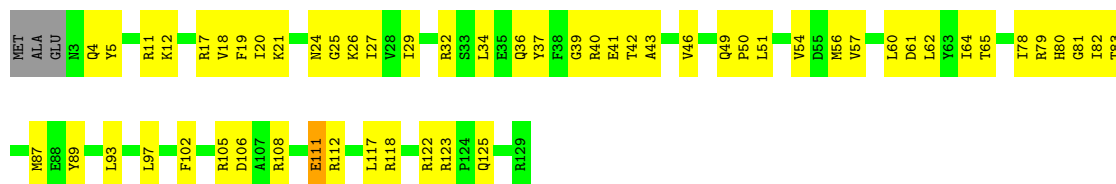
Chain H: 





• Molecule 9: 30S ribosomal protein S9

Chain I: 55% 42% ..



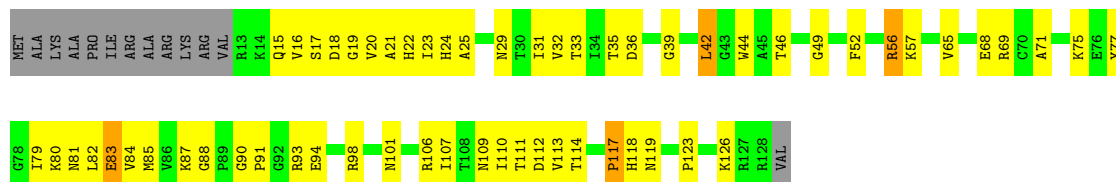
• Molecule 10: 30S ribosomal protein S10

Chain J: 58% 37% 5%



• Molecule 11: 30S ribosomal protein S11

Chain K: 44% 43% 10%



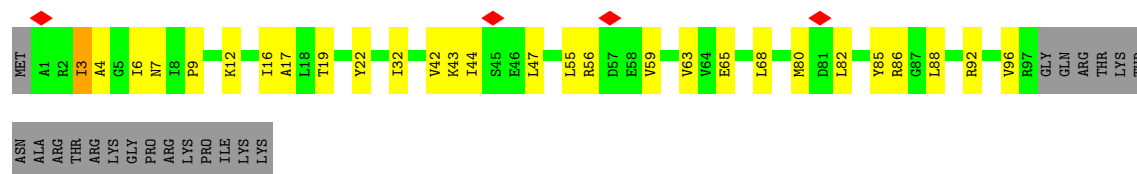
• Molecule 12: 30S ribosomal protein S12

Chain L: 71% 27%



• Molecule 13: 30S ribosomal protein S13

Chain M: 58% 23% 18%



- Molecule 14: 30S ribosomal protein S15

Chain O: 63% 35% .



- Molecule 15: 30S ribosomal protein S16

Chain P: 72% 28%



- Molecule 16: 30S ribosomal protein S17

Chain Q: 76% 19% 5%



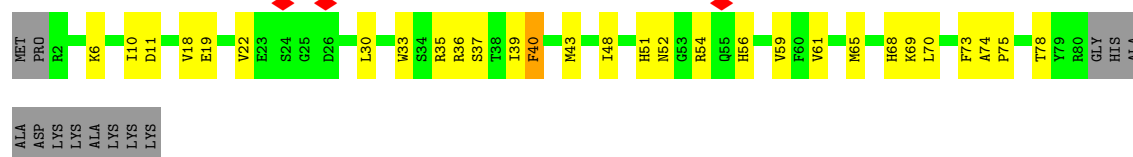
- Molecule 17: 30S ribosomal protein S18

Chain R: 57% 31% 12%



- Molecule 18: 30S ribosomal protein S19

Chain S: 54% 30% 14%



- Molecule 19: 30S ribosomal protein S20

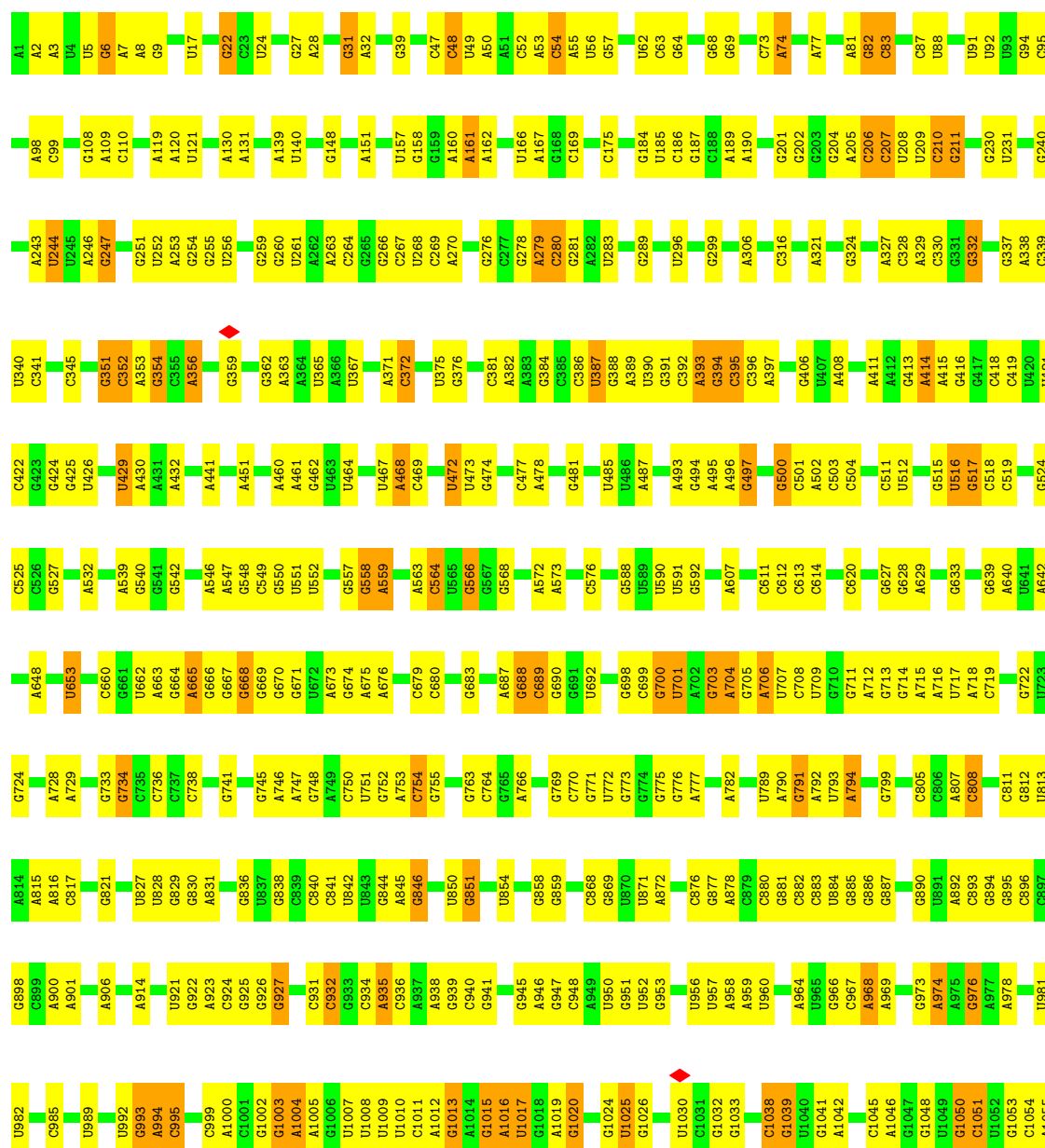
Chain T: 63% 34% .

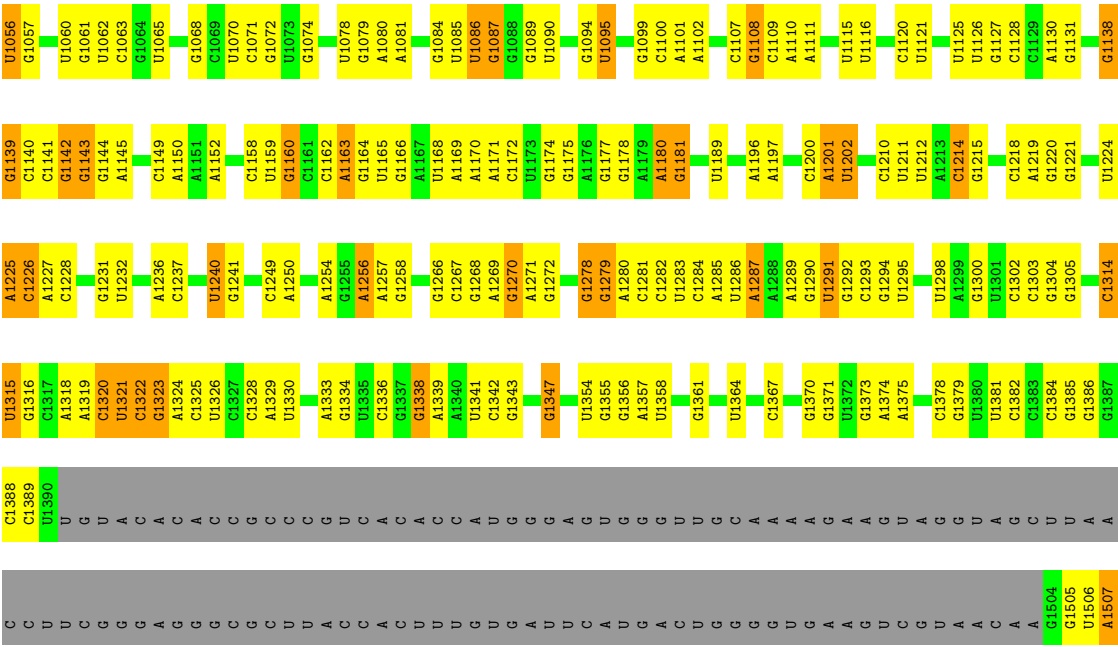


- Molecule 20: 30S ribosomal protein S21



- Molecule 21: 16S rRNA





● Molecule 22: 30S ribosomal protein S14



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	42320	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING ONLY	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	41.53	Depositor
Minimum defocus (nm)	500	Depositor
Maximum defocus (nm)	2500	Depositor
Magnification	Not provided	
Image detector	FEI FALCON III (4k x 4k)	Depositor
Maximum map value	0.389	Depositor
Minimum map value	-0.223	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.014	Depositor
Recommended contour level	0.02	Depositor
Map size ($\text{\AA}$)	353.28, 353.28, 353.28	wwPDB
Map dimensions	256, 256, 256	wwPDB
Map angles ($^\circ$)	90.0, 90.0, 90.0	wwPDB
Pixel spacing ($\text{\AA}$)	1.38, 1.38, 1.38	Depositor

5 Model quality [i](#)

5.1 Standard geometry [i](#)

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	V	0.33	0/119	0.94	0/183
2	B	0.27	0/1735	0.65	0/2338
3	C	0.26	0/1651	0.60	0/2225
4	D	0.30	0/1665	0.59	2/2227 (0.1%)
5	E	0.36	0/1165	0.63	0/1568
6	F	0.36	1/867 (0.1%)	0.71	1/1171 (0.1%)
7	G	0.21	0/1176	0.50	0/1577
8	H	0.32	0/989	0.63	2/1326 (0.2%)
9	I	0.27	0/1034	0.63	1/1375 (0.1%)
10	J	0.23	0/796	0.58	0/1077
11	K	0.36	0/885	0.76	2/1195 (0.2%)
12	L	0.33	0/963	0.61	0/1293
13	M	0.23	0/754	0.55	0/1010
14	O	0.27	0/716	0.53	0/956
15	P	0.40	1/659 (0.2%)	0.58	0/884
16	Q	0.28	0/657	0.56	0/881
17	R	0.29	0/554	0.57	0/743
18	S	0.19	0/652	0.48	0/877
19	T	0.25	0/670	0.55	0/888
20	X	0.33	0/430	0.68	0/570
21	A	0.24	0/34263	0.37	0/53449
22	N	0.24	0/785	0.57	0/1043
All	All	0.26	2/53185 (0.0%)	0.46	8/78856 (0.0%)

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
15	P	10	GLY	C-O	-6.00	1.20	1.24
6	F	18	VAL	CA-CB	-5.09	1.51	1.54

All (8) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
11	K	117	PRO	CA-N-CD	-7.41	101.62	112.00
4	D	38	PRO	CA-N-CD	-7.33	101.74	112.00
9	I	50	PRO	CA-N-CD	-6.87	102.39	112.00
8	H	4	GLN	CA-C-N	-6.80	114.78	122.26
8	H	4	GLN	C-N-CA	-6.80	114.78	122.26
4	D	178	MET	CB-CG-SD	6.16	131.17	112.70
6	F	33	GLU	CA-CB-CG	6.00	126.11	114.10
11	K	56	ARG	CA-CB-CG	5.38	124.86	114.10

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts [i](#)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	V	107	0	54	3	0
2	B	1704	0	1732	64	0
3	C	1624	0	1699	61	0
4	D	1643	0	1707	53	0
5	E	1152	0	1196	54	0
6	F	848	0	846	24	0
7	G	1163	0	1217	38	0
8	H	979	0	1031	43	0
9	I	1022	0	1070	43	0
10	J	786	0	828	27	0
11	K	869	0	878	58	0
12	L	949	0	1011	31	0
13	M	747	0	793	18	0
14	O	708	0	729	19	0
15	P	649	0	666	20	0
16	Q	648	0	691	13	0
17	R	545	0	560	20	0
18	S	637	0	665	33	0
19	T	664	0	714	26	0
20	X	425	0	449	19	0
21	A	30600	0	15402	446	0
22	N	774	0	827	26	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
All	All	49243	0	34765	1022	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 12.

All (1022) 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)
5:E:55:GLU:HG3	5:E:57:PRO:HD2	1.41	1.02
5:E:82:GLN:H	5:E:147:MET:HE1	1.35	0.92
8:H:67:GLN:O	8:H:67:GLN:NE2	2.04	0.90
18:S:18:VAL:HG11	18:S:43:MET:HG3	1.58	0.86
6:F:38:ARG:HH21	6:F:61:LEU:HD21	1.40	0.85
2:B:50:ASN:HA	2:B:53:LEU:HD12	1.58	0.84
4:D:178:MET:HE3	4:D:178:MET:O	1.77	0.84
21:A:989:U:O2'	21:A:1016:A:N6	2.10	0.83
4:D:145:ILE:H	4:D:178:MET:HE1	1.45	0.82
21:A:1013:G:N2	21:A:1015:G:OP2	2.13	0.82
8:H:64:LYS:HB3	8:H:71:VAL:HG21	1.59	0.81
21:A:713:G:H2'	21:A:714:G:C8	2.16	0.81
21:A:1139:G:N1	21:A:1143:G:O6	2.13	0.79
15:P:8:ARG:HH21	21:A:391:G:H5''	1.46	0.79
21:A:689:C:H2'	21:A:690:G:C8	2.17	0.79
21:A:789:U:H2'	21:A:790:A:H2'	1.66	0.78
21:A:898:G:N2	21:A:901:A:OP2	2.16	0.78
11:K:85:MET:SD	11:K:111:THR:OG1	2.42	0.77
19:T:74:ARG:NH1	21:A:261:U:OP2	2.17	0.77
10:J:10:LEU:HB3	10:J:72:ARG:HB2	1.67	0.77
19:T:67:ILE:HD12	19:T:71:LYS:HG3	1.66	0.77
10:J:52:LEU:HB2	22:N:80:ARG:HD2	1.65	0.77
21:A:187:G:N2	21:A:190:A:OP2	2.17	0.76
7:G:75:LYS:HE3	7:G:88:VAL:HG21	1.67	0.76
10:J:76:ILE:HD11	10:J:78:GLU:HG2	1.67	0.76
21:A:745:G:H2'	21:A:746:A:H8	1.52	0.75
21:A:712:A:H2'	21:A:713:G:C8	2.22	0.75
7:G:55:LYS:NZ	7:G:56:SER:O	2.19	0.75
3:C:107:LYS:HB2	3:C:143:LEU:HD23	1.67	0.74
7:G:128:GLU:OE1	7:G:128:GLU:N	2.21	0.74
11:K:20:VAL:HG23	11:K:83:GLU:HB3	1.70	0.74
9:I:42:THR:OG1	9:I:43:ALA:N	2.21	0.74
21:A:56:U:H2'	21:A:57:G:C8	2.22	0.73

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
12:L:80:ILE:HD12	12:L:81:LEU:H	1.53	0.73
21:A:890:G:O2'	21:A:906:A:N6	2.21	0.73
21:A:1236:A:H4'	21:A:1304:G:H4'	1.69	0.73
9:I:27:ILE:HB	9:I:34:LEU:HD22	1.68	0.73
5:E:156:LYS:O	5:E:156:LYS:NZ	2.21	0.73
2:B:55:GLU:HA	2:B:58:LYS:HD3	1.71	0.73
6:F:9:MET:HG2	6:F:86:ARG:HB3	1.69	0.73
6:F:19:PRO:HD2	6:F:20:GLY:H	1.54	0.72
10:J:43:PRO:HG3	21:A:1150:A:H4'	1.71	0.72
21:A:688:G:H2'	21:A:689:C:H6	1.55	0.72
12:L:47:SER:OG	21:A:519:C:OP2	2.07	0.72
3:C:35:ASP:OD1	3:C:58:ARG:NH1	2.22	0.71
19:T:24:ARG:HH22	19:T:64:LYS:HD2	1.54	0.71
8:H:67:GLN:HE21	8:H:67:GLN:C	1.98	0.71
21:A:362:G:N2	21:A:365:U:OP2	2.24	0.71
9:I:24:ASN:ND2	9:I:61:ASP:OD2	2.23	0.71
15:P:25:ARG:O	21:A:110:C:O2'	2.08	0.71
7:G:101:ARG:NH2	21:A:1375:A:O2'	2.24	0.71
21:A:713:G:H2'	21:A:714:G:H8	1.56	0.71
21:A:546:A:HO2'	21:A:548:G:HO2'	1.37	0.70
21:A:766:A:OP2	21:A:812:G:N2	2.25	0.70
11:K:56:ARG:O	11:K:56:ARG:NH1	2.22	0.70
21:A:1071:C:H2'	21:A:1072:G:H8	1.55	0.70
21:A:1507:A:H2'	21:A:1508:A:C8	2.26	0.70
21:A:1278:G:H4'	21:A:1279:G:H5''	1.73	0.70
19:T:48:GLN:O	19:T:52:ASN:ND2	2.25	0.70
21:A:1266:G:N2	21:A:1269:A:OP2	2.20	0.70
11:K:44:TRP:HZ3	11:K:46:THR:HG23	1.57	0.69
20:X:39:LYS:NZ	21:A:1530:G:O6	2.25	0.69
18:S:33:TRP:HD1	18:S:51:HIS:HB2	1.56	0.69
3:C:4:VAL:HG11	21:A:1189:U:H5''	1.74	0.69
21:A:673:A:H2'	21:A:674:G:C8	2.28	0.69
7:G:90:VAL:O	7:G:95:ARG:NH2	2.25	0.69
21:A:337:G:H2'	21:A:338:A:H8	1.59	0.68
21:A:1279:G:H1'	21:A:1282:C:N4	2.07	0.68
5:E:90:THR:OG1	5:E:135:ASN:ND2	2.26	0.68
10:J:40:ILE:HD12	10:J:41:PRO:HD2	1.76	0.68
17:R:51:TYR:O	17:R:55:LEU:HG	1.94	0.68
8:H:47:GLU:HG2	8:H:64:LYS:HG3	1.75	0.68
2:B:221:ARG:HA	2:B:221:ARG:NH1	2.09	0.68
4:D:61:VAL:HA	4:D:64:ILE:HG22	1.75	0.68

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
18:S:54:ARG:HH21	18:S:78:THR:HG21	1.58	0.68
14:O:33:THR:HG22	14:O:63:ARG:HH11	1.58	0.68
19:T:29:ARG:O	19:T:33:LYS:HG2	1.94	0.67
19:T:74:ARG:NH2	21:A:263:A:OP2	2.27	0.67
21:A:667:G:H2'	21:A:668:G:H8	1.59	0.67
21:A:981:U:OP1	22:N:8:ARG:NH1	2.26	0.67
12:L:5:ASN:O	12:L:9:ARG:HG3	1.94	0.67
7:G:35:LYS:NZ	21:A:1373:G:OP1	2.22	0.67
13:M:22:TYR:HB3	13:M:65:GLU:HB2	1.75	0.67
21:A:662:U:H2'	21:A:663:A:C8	2.29	0.67
4:D:170:TRP:CD2	4:D:186:PRO:HB3	2.30	0.67
21:A:712:A:H2'	21:A:713:G:H8	1.59	0.67
17:R:13:PHE:CZ	17:R:55:LEU:HD21	2.30	0.66
2:B:190:SER:OG	2:B:191:ASP:N	2.29	0.66
11:K:84:VAL:HG12	11:K:110:ILE:HG12	1.77	0.66
21:A:674:G:N2	21:A:717:U:O2	2.29	0.66
21:A:746:A:H2'	21:A:747:A:C8	2.30	0.66
1:V:69:A:H2'	1:V:69:A:N3	2.11	0.65
9:I:18:VAL:HG12	9:I:64:ILE:HG12	1.78	0.65
21:A:28:A:O2'	21:A:296:U:OP1	2.14	0.65
10:J:22:THR:O	10:J:26:VAL:HG23	1.96	0.65
12:L:33:VAL:HG22	12:L:79:VAL:HG12	1.79	0.65
11:K:65:VAL:HA	11:K:68:GLU:OE1	1.97	0.65
22:N:5:MET:SD	22:N:62:ARG:NH2	2.70	0.65
4:D:126:ASN:ND2	4:D:141:ASP:OD1	2.28	0.65
21:A:1355:G:H2'	21:A:1356:G:H8	1.61	0.65
21:A:976:G:OP2	21:A:1358:U:O2'	2.14	0.65
21:A:210:C:O2'	21:A:211:G:N2	2.31	0.64
21:A:665:A:H1'	21:A:733:G:H5'	1.80	0.64
18:S:33:TRP:CD1	18:S:51:HIS:HB2	2.32	0.64
2:B:103:TRP:CZ3	2:B:107:ARG:HD3	2.33	0.64
15:P:8:ARG:HB3	15:P:28:ARG:NH2	2.13	0.64
7:G:112:ASP:HB2	7:G:118:ARG:HB3	1.80	0.64
3:C:76:ILE:HA	3:C:83:VAL:HG23	1.80	0.64
11:K:87:LYS:HB2	11:K:114:THR:HA	1.80	0.63
21:A:714:G:H2'	21:A:715:A:C8	2.33	0.63
7:G:45:ALA:O	7:G:49:LEU:HD23	1.99	0.63
15:P:70:ARG:HD3	21:A:375:U:OP1	1.98	0.63
4:D:183:LYS:HD2	4:D:184:ARG:HG2	1.78	0.63
21:A:877:G:O6	21:A:878:A:N6	2.31	0.63
5:E:157:ARG:HH21	8:H:43:GLU:HB3	1.62	0.63

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
5:E:115:LEU:HD12	5:E:123:VAL:HG11	1.81	0.63
7:G:69:ARG:HB3	7:G:95:ARG:HG2	1.80	0.63
13:M:12:LYS:O	13:M:44:ILE:HG12	1.98	0.63
21:A:269:C:H2'	21:A:270:A:H8	1.63	0.63
4:D:102:VAL:HG13	4:D:114:ALA:HB1	1.80	0.63
12:L:115:SER:OG	21:A:502:A:OP1	2.16	0.63
18:S:36:ARG:NH1	21:A:1220:G:H5''	2.13	0.63
21:A:952:U:H2'	21:A:953:G:H8	1.64	0.63
12:L:83:ARG:O	21:A:552:U:O2'	2.16	0.63
8:H:29:SER:HB3	8:H:57:PRO:HB2	1.81	0.62
21:A:386:C:O2'	21:A:387:U:H4'	1.99	0.62
12:L:30:LYS:HB3	12:L:57:LEU:HD23	1.81	0.62
15:P:8:ARG:NH2	21:A:391:G:H5''	2.15	0.62
4:D:124:MET:HE3	4:D:146:ARG:HD3	1.81	0.62
5:E:136:VAL:O	5:E:140:THR:HG22	1.99	0.62
15:P:69:ASP:OD1	15:P:70:ARG:N	2.33	0.62
21:A:1218:C:H2'	21:A:1219:A:H8	1.64	0.62
5:E:133:PRO:O	5:E:137:VAL:HG23	1.99	0.62
12:L:76:GLU:OE2	12:L:76:GLU:N	2.31	0.62
21:A:501:C:H2'	21:A:502:A:C8	2.34	0.62
5:E:45:ARG:HG2	5:E:71:MET:HE2	1.80	0.62
18:S:36:ARG:HH22	21:A:1221:G:P	2.22	0.62
21:A:967:C:H2'	21:A:968:A:C2	2.34	0.62
5:E:151:GLU:CD	5:E:151:GLU:H	2.07	0.61
3:C:188:ALA:HB3	3:C:195:ILE:HB	1.82	0.61
4:D:157:ALA:O	4:D:161:LEU:HD23	1.99	0.61
21:A:1149:C:H2'	21:A:1150:A:C8	2.36	0.61
14:O:48:LYS:NZ	21:A:808:C:OP2	2.32	0.61
21:A:1314:C:O2'	21:A:1315:U:O5'	2.17	0.61
14:O:32:LEU:O	14:O:36:ILE:HG12	2.01	0.61
4:D:110:THR:HG23	4:D:113:GLU:H	1.66	0.61
7:G:70:PRO:HG3	7:G:98:LEU:HD22	1.81	0.61
3:C:58:ARG:HB3	3:C:63:ILE:HG12	1.81	0.61
10:J:76:ILE:HD12	10:J:77:VAL:H	1.66	0.61
21:A:1225:A:H2'	21:A:1225:A:N3	2.15	0.61
18:S:35:ARG:NH2	21:A:1320:C:N3	2.49	0.61
2:B:46:VAL:HG12	2:B:47:PRO:HD3	1.83	0.60
14:O:88:ARG:HE	14:O:89:ARG:HB2	1.65	0.60
4:D:192:SER:OG	4:D:194:ASP:OD1	2.19	0.60
19:T:57:ILE:O	19:T:61:GLN:HG2	2.00	0.60
8:H:5:ASP:OD1	8:H:77:ARG:NH1	2.35	0.60

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
21:A:745:G:H2'	21:A:746:A:C8	2.33	0.60
3:C:141:MET:HE3	3:C:148:ILE:HG22	1.84	0.60
9:I:79:ARG:O	9:I:83:THR:OG1	2.17	0.60
17:R:29:LEU:HD21	17:R:68:LEU:HD11	1.83	0.60
15:P:51:ARG:NH2	21:A:627:G:OP1	2.34	0.60
21:A:1056:U:H2'	21:A:1057:G:H8	1.65	0.60
3:C:166:TRP:O	3:C:167:TYR:HB2	2.02	0.60
21:A:711:G:H2'	21:A:712:A:H8	1.65	0.60
20:X:34:ARG:NH1	20:X:35:GLU:O	2.27	0.59
21:A:958:A:N3	21:A:985:C:O2'	2.33	0.59
22:N:24:ALA:HA	22:N:27:LYS:HD2	1.84	0.59
14:O:78:TYR:O	14:O:82:ILE:HG12	2.02	0.59
21:A:563:A:O2'	21:A:566:G:O2'	2.19	0.59
21:A:830:G:H2'	21:A:831:A:H8	1.67	0.59
21:A:1381:U:H2'	21:A:1382:C:O4'	2.02	0.59
8:H:91:GLU:N	8:H:91:GLU:OE1	2.34	0.59
13:M:88:LEU:O	13:M:92:ARG:HG3	2.03	0.59
21:A:339:C:H2'	21:A:340:U:C6	2.36	0.59
21:A:1355:G:H2'	21:A:1356:G:C8	2.37	0.59
8:H:79:SER:HB2	8:H:125:ILE:O	2.01	0.59
21:A:688:G:H2'	21:A:689:C:C6	2.35	0.59
21:A:558:G:OP2	21:A:559:A:O2'	2.19	0.59
21:A:1517:G:OP2	21:A:1517:G:N2	2.23	0.59
21:A:524:G:H2'	21:A:525:C:C6	2.38	0.59
3:C:153:SER:OG	21:A:1057:G:OP1	2.20	0.59
6:F:9:MET:HE3	6:F:9:MET:HA	1.85	0.59
10:J:46:LYS:HZ2	10:J:68:ARG:HG2	1.67	0.59
21:A:148:G:N2	21:A:175:C:O2	2.36	0.59
2:B:217:ALA:O	2:B:221:ARG:HG2	2.03	0.59
11:K:71:ALA:O	11:K:75:LYS:HD3	2.03	0.59
11:K:94:GLU:OE1	11:K:94:GLU:N	2.32	0.59
4:D:13:ARG:NH2	21:A:429:U:OP2	2.34	0.59
14:O:21:ASP:OD2	21:A:750:C:O2'	2.21	0.59
18:S:59:VAL:HG21	18:S:73:PHE:HD2	1.68	0.59
3:C:118:SER:O	3:C:122:GLN:HG2	2.03	0.59
21:A:52:C:H2'	21:A:53:A:C8	2.37	0.59
21:A:976:G:H5''	21:A:1358:U:O2'	2.03	0.59
21:A:1141:C:H2'	21:A:1142:G:H8	1.67	0.59
21:A:82:G:N2	21:A:83:C:O4'	2.37	0.58
6:F:91:ARG:NH2	21:A:738:C:OP1	2.34	0.58
21:A:1316:G:N1	21:A:1319:A:OP2	2.33	0.58

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
6:F:5:GLU:N	6:F:5:GLU:OE2	2.36	0.58
21:A:394:G:H2'	21:A:395:C:H4'	1.84	0.58
4:D:50:ASP:O	4:D:54:GLN:HG3	2.03	0.58
21:A:701:U:H1'	21:A:703:G:C2	2.38	0.58
2:B:144:GLU:HA	2:B:151:LYS:HZ1	1.68	0.58
9:I:49:GLN:HG3	9:I:102:PHE:CZ	2.38	0.58
15:P:71:VAL:O	15:P:75:ILE:HG12	2.04	0.58
21:A:952:U:H2'	21:A:953:G:C8	2.39	0.58
11:K:31:ILE:HG21	21:A:706:A:H4'	1.86	0.58
21:A:500:G:H2'	21:A:501:C:C6	2.39	0.58
4:D:187:GLU:OE2	4:D:190:ASP:N	2.37	0.58
7:G:77:ARG:HG3	21:A:1381:U:C2	2.38	0.58
8:H:5:ASP:OD2	8:H:8:ALA:N	2.22	0.58
21:A:1107:C:C4	21:A:1108:G:C8	2.91	0.58
1:V:71:U:H5'	4:D:47:ARG:HD2	1.86	0.57
11:K:117:PRO:HB3	21:A:676:A:O2'	2.03	0.57
21:A:160:A:H2'	21:A:161:A:C8	2.39	0.57
21:A:1005:A:OP2	21:A:1024:G:N2	2.37	0.57
14:O:8:THR:HG23	14:O:31:LEU:HD21	1.86	0.57
2:B:199:ILE:HG22	2:B:201:GLY:H	1.67	0.57
8:H:101:ILE:HD12	8:H:112:THR:HB	1.86	0.57
21:A:1004:A:N6	21:A:1026:G:H1'	2.19	0.57
6:F:90:MET:SD	17:R:61:ARG:NH1	2.78	0.57
18:S:10:ILE:O	22:N:46:LYS:HE2	2.03	0.57
2:B:156:LEU:HD22	2:B:157:PRO:HD2	1.86	0.57
3:C:133:MET:O	3:C:137:VAL:HG12	2.05	0.57
6:F:8:PHE:HE2	6:F:62:MET:HE1	1.69	0.57
11:K:24:HIS:HB3	11:K:31:ILE:HB	1.87	0.57
3:C:29:ALA:HB1	22:N:64:ARG:HH12	1.70	0.57
4:D:97:ARG:O	4:D:101:VAL:HG23	2.03	0.57
21:A:690:G:O5'	21:A:690:G:H8	1.88	0.57
2:B:116:LEU:HB3	2:B:140:LEU:HD21	1.87	0.57
4:D:55:LEU:HD11	4:D:59:GLN:HE21	1.70	0.57
11:K:91:PRO:O	11:K:93:ARG:NH1	2.35	0.57
21:A:660:C:N3	21:A:746:A:N6	2.53	0.57
21:A:1180:A:O2'	21:A:1181:G:OP1	2.22	0.57
7:G:136:LYS:O	7:G:140:VAL:HG13	2.05	0.56
21:A:473:U:H2'	21:A:474:G:H8	1.70	0.56
10:J:53:ILE:HD13	10:J:63:ASP:HB2	1.87	0.56
11:K:80:LYS:HE2	11:K:80:LYS:HA	1.87	0.56
17:R:13:PHE:HZ	17:R:55:LEU:HD21	1.70	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
5:E:89:HIS:CD2	5:E:138:ARG:HB3	2.40	0.56
21:A:973:G:H3'	21:A:974:A:H5''	1.87	0.56
11:K:29:ASN:ND2	21:A:690:G:OP2	2.29	0.56
18:S:65:MET:HE3	18:S:73:PHE:CZ	2.41	0.56
19:T:49:LYS:HA	19:T:52:ASN:HD22	1.70	0.56
21:A:1231:G:H2'	21:A:1232:U:C6	2.41	0.56
21:A:925:G:H2'	21:A:926:G:O4'	2.06	0.56
21:A:1131:G:H1	21:A:1143:G:N2	2.03	0.56
13:M:17:ALA:HB2	13:M:44:ILE:HD13	1.87	0.56
15:P:51:ARG:HG3	15:P:51:ARG:HH11	1.70	0.56
2:B:127:LYS:HG3	2:B:128:LEU:HG	1.87	0.56
2:B:153:MET:SD	2:B:155:GLY:N	2.75	0.56
4:D:184:ARG:NH1	4:D:185:LYS:O	2.39	0.56
21:A:269:C:H2'	21:A:270:A:C8	2.39	0.56
2:B:46:VAL:CG1	2:B:47:PRO:HD3	2.36	0.56
8:H:56:LYS:NZ	21:A:653:U:OP1	2.26	0.56
18:S:37:SER:O	18:S:70:LEU:HD12	2.06	0.56
21:A:31:G:O2'	21:A:48:C:N4	2.35	0.56
21:A:337:G:H2'	21:A:338:A:C8	2.41	0.56
2:B:77:GLU:H	2:B:77:GLU:CD	2.14	0.55
21:A:339:C:H2'	21:A:340:U:H6	1.71	0.55
21:A:351:G:H4'	21:A:352:C:OP1	2.06	0.55
21:A:1125:U:H2'	21:A:1126:U:H2'	1.87	0.55
8:H:3:MET:HE3	8:H:5:ASP:H	1.71	0.55
18:S:35:ARG:HG3	21:A:1320:C:H42	1.72	0.55
21:A:504:C:C2	21:A:542:G:N2	2.74	0.55
9:I:32:ARG:HD2	9:I:36:GLN:HB2	1.89	0.55
18:S:52:ASN:HD22	18:S:74:ALA:HB1	1.71	0.55
18:S:65:MET:HE3	18:S:73:PHE:HZ	1.70	0.55
21:A:1120:C:H2'	21:A:1121:U:H6	1.70	0.55
2:B:72:LYS:HD2	2:B:74:ALA:H	1.71	0.55
18:S:35:ARG:HG3	21:A:1320:C:N4	2.22	0.55
10:J:47:GLU:OE1	10:J:48:ARG:N	2.39	0.55
21:A:516:U:O2'	21:A:519:C:N3	2.35	0.55
21:A:1071:C:H2'	21:A:1072:G:C8	2.40	0.55
21:A:1384:C:H2'	21:A:1385:G:C8	2.41	0.55
5:E:142:ASP:HA	5:E:145:GLU:HG2	1.87	0.55
9:I:21:LYS:HG3	9:I:61:ASP:HB3	1.88	0.55
11:K:87:LYS:NZ	21:A:707:U:OP1	2.24	0.55
21:A:204:G:H2'	21:A:205:A:H8	1.72	0.55
21:A:1158:C:C5	21:A:1160:G:HI'	2.41	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:D:47:ARG:NH1	4:D:48:LEU:O	2.40	0.55
9:I:56:MET:SD	9:I:57:VAL:N	2.79	0.55
21:A:773:G:O6	21:A:807:A:N6	2.40	0.55
21:A:1236:A:H2'	21:A:1237:C:C6	2.42	0.55
6:F:18:VAL:O	6:F:22:ILE:HG13	2.07	0.55
7:G:102:TRP:HB3	7:G:136:LYS:NZ	2.22	0.55
17:R:38:LYS:HE2	21:A:718:A:C2	2.42	0.55
21:A:260:G:H2'	21:A:261:U:H6	1.71	0.55
3:C:5:HIS:ND1	3:C:7:ASN:OD1	2.40	0.54
5:E:101:GLU:HA	5:E:122:ASN:ND2	2.23	0.54
3:C:126:ARG:HB2	3:C:126:ARG:NH1	2.22	0.54
4:D:202:GLU:OE2	5:E:105:ILE:HG22	2.07	0.54
4:D:110:THR:HG21	21:A:408:A:OP1	2.07	0.54
10:J:40:ILE:HG12	21:A:1125:U:C6	2.42	0.54
16:Q:61:ILE:HA	16:Q:75:LEU:HA	1.89	0.54
21:A:775:G:H2'	21:A:776:G:O4'	2.07	0.54
7:G:39:GLU:HA	7:G:42:VAL:HG22	1.89	0.54
20:X:5:VAL:HG21	20:X:15:LEU:HD21	1.89	0.54
21:A:6:G:O2'	21:A:7:A:H8	1.90	0.54
21:A:354:G:H2'	21:A:354:G:N3	2.22	0.54
21:A:974:A:OP1	21:A:974:A:H8	1.91	0.54
21:A:1079:G:H2'	21:A:1080:A:C8	2.43	0.54
21:A:1385:G:H2'	21:A:1386:G:C8	2.43	0.54
22:N:15:LEU:HD11	22:N:53:ASP:HB3	1.89	0.54
4:D:122:ALA:O	4:D:146:ARG:HG2	2.08	0.54
4:D:157:ALA:HA	4:D:160:GLU:OE1	2.07	0.54
10:J:46:LYS:NZ	10:J:68:ARG:HG2	2.23	0.54
6:F:1:MET:HE1	6:F:67:PRO:HB3	1.90	0.54
21:A:763:G:H2'	21:A:764:C:C6	2.42	0.54
4:D:7:PRO:HG2	4:D:10:LYS:HD2	1.89	0.53
9:I:87:MET:HE1	9:I:97:LEU:HB2	1.89	0.53
11:K:106:ARG:HE	11:K:106:ARG:C	2.16	0.53
12:L:12:ARG:NE	21:A:564:C:OP1	2.27	0.53
12:L:54:ARG:NH2	12:L:62:GLU:OE2	2.40	0.53
17:R:48:ARG:HB3	17:R:51:TYR:HD2	1.73	0.53
21:A:477:C:H2'	21:A:478:A:C8	2.43	0.53
11:K:117:PRO:HD2	11:K:117:PRO:O	2.08	0.53
3:C:56:ILE:HA	3:C:65:VAL:HG12	1.91	0.53
5:E:156:LYS:CE	8:H:71:VAL:HG22	2.39	0.53
7:G:137:ARG:NH2	7:G:141:HIS:HD2	2.06	0.53
2:B:55:GLU:HB3	2:B:58:LYS:HZ1	1.73	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
7:G:137:ARG:HH22	7:G:141:HIS:HD2	1.56	0.53
7:G:139:ASP:O	7:G:143:MET:HG3	2.08	0.53
18:S:36:ARG:HH12	21:A:1220:G:H5''	1.72	0.53
2:B:193:ASP:OD1	2:B:194:GLY:N	2.42	0.53
5:E:157:ARG:HH22	8:H:101:ILE:HG13	1.74	0.53
10:J:40:ILE:HD12	10:J:41:PRO:CD	2.38	0.53
12:L:28:PRO:HD2	21:A:363:A:C6	2.44	0.53
21:A:82:G:N2	21:A:82:G:OP2	2.39	0.53
21:A:539:A:H2'	21:A:540:G:C8	2.44	0.53
9:I:51:LEU:HG	9:I:56:MET:HA	1.89	0.53
10:J:9:ARG:HB3	10:J:99:GLN:HB2	1.90	0.53
21:A:753:A:H4'	21:A:754:C:O5'	2.09	0.53
21:A:1130:A:N6	21:A:1144:G:H21	2.07	0.53
7:G:92:PRO:HA	7:G:95:ARG:HB2	1.91	0.53
21:A:1314:C:H2'	21:A:1315:U:C6	2.42	0.53
12:L:21:VAL:HG23	12:L:21:VAL:O	2.07	0.53
21:A:1218:C:H2'	21:A:1219:A:C8	2.44	0.53
2:B:106:VAL:O	2:B:110:ILE:HG13	2.09	0.53
7:G:102:TRP:HB3	7:G:136:LYS:HZ1	1.74	0.53
15:P:35:ARG:HG2	15:P:35:ARG:HH11	1.74	0.53
2:B:108:GLN:HA	2:B:111:LYS:HG2	1.90	0.52
7:G:115:MET:HB2	21:A:1240:U:P	2.49	0.52
21:A:246:A:H62	21:A:281:G:N2	2.06	0.52
22:N:85:GLU:O	22:N:89:ARG:HG3	2.09	0.52
7:G:137:ARG:HH22	7:G:141:HIS:CD2	2.27	0.52
8:H:125:ILE:O	8:H:125:ILE:HG13	2.09	0.52
21:A:501:C:H2'	21:A:502:A:H8	1.73	0.52
2:B:107:ARG:HA	2:B:110:ILE:HD12	1.91	0.52
2:B:115:ASP:O	2:B:118:THR:OG1	2.23	0.52
4:D:50:ASP:OD1	4:D:50:ASP:N	2.41	0.52
6:F:81:ASN:HB3	6:F:84:VAL:HG13	1.91	0.52
11:K:65:VAL:O	11:K:69:ARG:HG3	2.09	0.52
18:S:6:LYS:NZ	22:N:32:ASP:OD1	2.41	0.52
2:B:44:LYS:C	2:B:47:PRO:HD2	2.35	0.52
9:I:39:GLY:O	9:I:40:ARG:HG2	2.09	0.52
18:S:35:ARG:NH1	21:A:1221:G:OP1	2.42	0.52
19:T:50:ALA:HA	19:T:53:GLU:HG2	1.92	0.52
4:D:38:PRO:HD2	4:D:38:PRO:O	2.09	0.52
21:A:98:A:H2'	21:A:99:C:C6	2.45	0.52
21:A:1224:U:O2'	21:A:1225:A:OP1	2.28	0.52
21:A:324:G:N1	21:A:327:A:OP2	2.43	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:198:VAL:C	2:B:199:ILE:HD12	2.35	0.52
3:C:137:VAL:HG23	3:C:148:ILE:HG23	1.92	0.52
5:E:56:VAL:HG22	5:E:57:PRO:HD3	1.92	0.52
5:E:56:VAL:O	5:E:60:ILE:HG23	2.10	0.52
9:I:18:VAL:HG21	9:I:81:GLY:C	2.35	0.52
15:P:1:MET:HE3	15:P:2:VAL:N	2.24	0.52
17:R:60:LYS:HA	17:R:63:ARG:HG3	1.91	0.52
21:A:935:A:H2'	21:A:936:C:H6	1.75	0.52
9:I:11:ARG:HD3	9:I:12:LYS:HB2	1.92	0.52
18:S:6:LYS:HD3	22:N:40:ARG:CZ	2.39	0.52
3:C:153:SER:OG	3:C:154:GLY:N	2.32	0.52
4:D:132:ILE:HD13	21:A:620:C:C2	2.45	0.52
12:L:70:GLU:OE1	12:L:110:ARG:NH2	2.33	0.52
19:T:54:MET:HE2	19:T:54:MET:HA	1.91	0.52
21:A:511:C:O2'	21:A:512:U:OP2	2.24	0.52
2:B:116:LEU:HD23	2:B:140:LEU:HG	1.92	0.51
3:C:63:ILE:O	3:C:98:ALA:HA	2.10	0.51
8:H:83:LEU:O	8:H:83:LEU:HD12	2.10	0.51
10:J:26:VAL:HG13	10:J:36:VAL:HG11	1.92	0.51
11:K:106:ARG:HE	11:K:107:ILE:N	2.08	0.51
18:S:52:ASN:HD21	18:S:75:PRO:C	2.18	0.51
21:A:161:A:H2'	21:A:162:A:C8	2.44	0.51
21:A:935:A:H2'	21:A:936:C:C6	2.45	0.51
11:K:29:ASN:OD1	11:K:57:LYS:HD2	2.10	0.51
11:K:39:GLY:O	21:A:683:G:N2	2.40	0.51
14:O:48:LYS:HB3	21:A:668:G:H4'	1.92	0.51
14:O:85:LEU:HB2	14:O:87:LEU:HD13	1.91	0.51
21:A:950:U:H2'	21:A:951:G:C8	2.45	0.51
2:B:58:LYS:HB2	2:B:62:ARG:HH12	1.75	0.51
21:A:185:U:H2'	21:A:186:C:C6	2.45	0.51
21:A:338:A:H2'	21:A:339:C:H6	1.76	0.51
21:A:667:G:H2'	21:A:668:G:C8	2.43	0.51
21:A:993:G:O2'	21:A:994:A:N7	2.43	0.51
21:A:208:U:O2'	21:A:209:U:H2'	2.10	0.51
21:A:830:G:H2'	21:A:831:A:C8	2.45	0.51
21:A:1385:G:H2'	21:A:1386:G:H8	1.76	0.51
3:C:147:GLY:O	3:C:202:PHE:N	2.36	0.51
21:A:1149:C:H2'	21:A:1150:A:H8	1.76	0.51
11:K:31:ILE:HD13	11:K:46:THR:HG22	1.93	0.51
12:L:9:ARG:HH12	21:A:880:C:H5''	1.74	0.51
7:G:24:LYS:HE3	7:G:100:MET:HE1	1.92	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
16:Q:72:SER:O	16:Q:72:SER:OG	2.26	0.51
18:S:40:PHE:H	18:S:43:MET:HE2	1.76	0.51
21:A:502:A:H2'	21:A:503:C:C6	2.46	0.51
21:A:921:U:H2'	21:A:922:G:O4'	2.10	0.51
2:B:163:ILE:HG13	2:B:164:ASP:N	2.26	0.51
21:A:493:A:H2'	21:A:494:G:C8	2.46	0.51
21:A:1507:A:OP2	21:A:1530:G:N2	2.39	0.51
6:F:42:TRP:HH2	17:R:24:LYS:HD2	1.76	0.51
7:G:85:GLN:HG2	7:G:150:PHE:HE2	1.75	0.51
18:S:39:ILE:HG22	18:S:68:HIS:O	2.10	0.51
22:N:7:ALA:O	22:N:11:LYS:HG3	2.10	0.51
2:B:55:GLU:HG3	2:B:197:PHE:CE2	2.46	0.50
8:H:83:LEU:HD23	12:L:4:VAL:HG11	1.92	0.50
10:J:62:ARG:NH1	21:A:1367:C:H5'	2.26	0.50
12:L:114:ARG:NH2	21:A:501:C:OP1	2.33	0.50
13:M:42:VAL:HG21	13:M:47:LEU:HD21	1.93	0.50
21:A:978:A:C4	21:A:1319:A:C2	2.99	0.50
3:C:39:ARG:HH11	3:C:54:ILE:HG23	1.75	0.50
3:C:86:LEU:HA	3:C:89:VAL:HG12	1.92	0.50
21:A:496:A:H5'	21:A:497:G:OP2	2.10	0.50
22:N:79:SER:O	22:N:82:LYS:N	2.43	0.50
3:C:154:GLY:HA2	3:C:163:ARG:H	1.76	0.50
4:D:75:TYR:OH	4:D:97:ARG:NH1	2.43	0.50
8:H:11:LEU:HD22	8:H:75:ILE:HG12	1.93	0.50
11:K:90:GLY:C	11:K:93:ARG:HD3	2.36	0.50
21:A:773:G:C6	21:A:807:A:C6	2.99	0.50
21:A:1316:G:H22	21:A:1319:A:H5'	1.77	0.50
22:N:78:LEU:HB2	22:N:83:VAL:HG12	1.93	0.50
5:E:24:THR:HG22	5:E:24:THR:O	2.11	0.50
12:L:12:ARG:HH21	21:A:564:C:P	2.35	0.50
21:A:664:G:H22	21:A:741:G:H1	1.58	0.50
2:B:144:GLU:HA	2:B:151:LYS:NZ	2.27	0.50
3:C:129:PHE:CE1	3:C:156:LEU:HD13	2.46	0.50
4:D:49:SER:OG	4:D:50:ASP:OD1	2.29	0.50
5:E:19:ASN:ND2	21:A:17:U:OP1	2.28	0.50
5:E:138:ARG:NH1	21:A:1078:U:H4'	2.27	0.50
9:I:83:THR:O	9:I:87:MET:HG2	2.11	0.50
11:K:109:ASN:ND2	20:X:6:ARG:HD3	2.27	0.50
20:X:45:LYS:O	20:X:45:LYS:NZ	2.35	0.50
21:A:472:U:H2'	21:A:473:U:C6	2.46	0.50
21:A:1319:A:C8	21:A:1323:G:C6	2.99	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:D:3:ARG:NH1	4:D:115:ARG:HD3	2.26	0.50
9:I:108:ARG:HD3	21:A:1347:G:H5'	1.92	0.50
11:K:21:ALA:N	11:K:83:GLU:O	2.41	0.50
17:R:38:LYS:HB3	21:A:719:C:O2'	2.11	0.50
8:H:64:LYS:HE2	8:H:71:VAL:HG21	1.94	0.50
9:I:117:LEU:HG	9:I:123:ARG:HA	1.92	0.50
12:L:84:GLY:HA2	12:L:95:TYR:HA	1.93	0.50
21:A:1095:U:H5'	21:A:1109:C:O2	2.11	0.50
2:B:81:ASP:OD1	2:B:82:ALA:N	2.45	0.50
3:C:67:ILE:HD11	3:C:100:ILE:HB	1.94	0.50
11:K:36:ASP:HB3	11:K:42:LEU:HD21	1.93	0.50
21:A:868:C:H2'	21:A:869:G:O4'	2.12	0.50
7:G:91:ARG:HD2	7:G:91:ARG:N	2.26	0.49
7:G:131:GLY:O	7:G:135:LYS:HG2	2.12	0.49
8:H:78:VAL:HG23	8:H:127:CYS:HA	1.93	0.49
3:C:149:LYS:HD3	3:C:168:ARG:HD2	1.95	0.49
8:H:38:ASN:O	8:H:42:GLU:HG3	2.13	0.49
5:E:132:ASN:O	5:E:136:VAL:HG23	2.11	0.49
21:A:1356:G:H2'	21:A:1357:A:C8	2.47	0.49
4:D:170:TRP:HA	4:D:183:LYS:NZ	2.27	0.49
11:K:110:ILE:O	20:X:5:VAL:HG12	2.13	0.49
19:T:79:LEU:O	19:T:83:ILE:HG13	2.12	0.49
21:A:669:G:H2'	21:A:670:G:H8	1.77	0.49
9:I:39:GLY:O	9:I:41:GLU:HG3	2.13	0.49
9:I:4:GLN:HE22	9:I:21:LYS:HE2	1.78	0.49
3:C:166:TRP:CD1	3:C:167:TYR:H	2.30	0.49
9:I:80:HIS:NE2	9:I:105:ARG:HA	2.28	0.49
12:L:57:LEU:HD11	12:L:63:VAL:HG22	1.95	0.49
20:X:5:VAL:HG23	20:X:15:LEU:HD11	1.94	0.49
21:A:52:C:H2'	21:A:53:A:H8	1.78	0.49
21:A:1041:G:H2'	21:A:1042:A:H8	1.78	0.49
5:E:89:HIS:ND1	5:E:90:THR:HG23	2.28	0.49
9:I:17:ARG:N	9:I:65:THR:O	2.43	0.49
17:R:39:ILE:HG12	17:R:59:ILE:HD11	1.94	0.49
21:A:690:G:N2	21:A:698:G:C6	2.81	0.49
2:B:22:TRP:CZ3	2:B:24:PRO:HA	2.48	0.49
10:J:30:LYS:O	10:J:30:LYS:HG3	2.13	0.49
11:K:112:ASP:OD1	11:K:112:ASP:N	2.41	0.49
21:A:158:G:N3	21:A:158:G:H2'	2.28	0.49
21:A:1166:G:O2'	21:A:1170:A:N6	2.45	0.49
21:A:1256:A:H61	21:A:1278:G:H2'	1.77	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
5:E:157:ARG:NH2	8:H:43:GLU:HB3	2.26	0.48
21:A:202:G:HO2'	21:A:468:A:H8	1.60	0.48
21:A:1127:G:H2'	21:A:1128:C:C6	2.47	0.48
21:A:1163:A:H2'	21:A:1164:G:H8	1.78	0.48
21:A:688:G:C4	21:A:689:C:C5	3.01	0.48
11:K:21:ALA:HB3	11:K:84:VAL:HG23	1.95	0.48
22:N:84:ARG:O	22:N:88:MET:HG2	2.13	0.48
9:I:105:ARG:NH2	9:I:106:ASP:O	2.46	0.48
21:A:924:C:H2'	21:A:925:G:C8	2.48	0.48
2:B:62:ARG:O	2:B:63:LYS:HG2	2.13	0.48
4:D:29:ASP:HA	4:D:34:ILE:HD11	1.96	0.48
7:G:21:LEU:O	7:G:24:LYS:HG2	2.13	0.48
8:H:10:MET:HG3	8:H:27:MET:SD	2.53	0.48
14:O:42:HIS:CE1	14:O:46:HIS:ND1	2.82	0.48
21:A:54:C:H42	21:A:356:A:N6	2.12	0.48
2:B:88:GLN:HA	2:B:88:GLN:OE1	2.13	0.48
3:C:1:GLY:HA3	21:A:1061:G:OP2	2.13	0.48
5:E:138:ARG:CZ	21:A:1078:U:H4'	2.44	0.48
5:E:149:SER:H	5:E:152:MET:HE2	1.79	0.48
11:K:113:VAL:O	11:K:113:VAL:HG12	2.13	0.48
21:A:1220:G:H2'	21:A:1221:G:H8	1.79	0.48
7:G:70:PRO:CG	7:G:98:LEU:HD22	2.43	0.48
8:H:66:PHE:CE1	8:H:67:GLN:HG3	2.49	0.48
21:A:62:U:H2'	21:A:63:C:C6	2.48	0.48
21:A:252:U:H2'	21:A:253:A:C8	2.49	0.48
2:B:10:LYS:HD3	2:B:10:LYS:HA	1.70	0.48
2:B:206:ILE:HA	2:B:209:VAL:HG22	1.94	0.48
11:K:123:PRO:HG2	20:X:34:ARG:HA	1.96	0.48
13:M:80:MET:HE2	13:M:80:MET:HB2	1.71	0.48
14:O:57:LEU:HA	14:O:60:VAL:HG22	1.95	0.48
14:O:89:ARG:NE	14:O:89:ARG:HA	2.28	0.48
5:E:99:ALA:HB1	5:E:103:THR:HG21	1.95	0.48
17:R:60:LYS:HE2	17:R:60:LYS:HB3	1.61	0.48
21:A:994:A:O2'	21:A:995:C:OP1	2.31	0.48
5:E:65:GLU:HA	5:E:68:ARG:HG3	1.96	0.47
10:J:44:THR:HG23	10:J:70:HIS:HA	1.96	0.47
10:J:87:LEU:HD23	10:J:100:ILE:HD13	1.95	0.47
13:M:56:ARG:HA	13:M:59:VAL:HG23	1.95	0.47
21:A:1004:A:OP2	21:A:1025:U:N3	2.46	0.47
22:N:50:LEU:HD12	22:N:51:PRO:HD3	1.94	0.47
2:B:221:ARG:HA	2:B:221:ARG:HH11	1.79	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
11:K:20:VAL:HG13	11:K:35:THR:HB	1.95	0.47
13:M:3:ILE:HG23	13:M:4:ALA:H	1.80	0.47
19:T:37:ALA:HA	19:T:40:GLU:HG3	1.97	0.47
21:A:1163:A:H2'	21:A:1164:G:C8	2.50	0.47
9:I:51:LEU:HB2	9:I:82:ILE:HD11	1.96	0.47
12:L:18:LYS:HB2	12:L:18:LYS:NZ	2.28	0.47
12:L:80:ILE:CD1	12:L:81:LEU:H	2.26	0.47
18:S:37:SER:O	18:S:69:LYS:HG2	2.14	0.47
21:A:516:U:H3'	21:A:517:G:C8	2.49	0.47
3:C:57:GLU:OE2	3:C:64:ARG:HD2	2.14	0.47
11:K:16:VAL:HG12	11:K:77:TYR:O	2.14	0.47
21:A:1210:C:H1'	21:A:1214:C:H5	1.79	0.47
2:B:69:VAL:HB	2:B:162:VAL:HG23	1.96	0.47
3:C:72:PRO:HG3	3:C:104:GLU:CD	2.39	0.47
5:E:141:ILE:HA	5:E:141:ILE:HD12	1.75	0.47
6:F:67:PRO:O	6:F:70:VAL:HG22	2.15	0.47
18:S:51:HIS:HA	18:S:56:HIS:CD2	2.49	0.47
18:S:78:THR:OG1	21:A:957:U:H4'	2.15	0.47
21:A:1115:U:H2'	21:A:1116:U:C6	2.49	0.47
21:A:1219:A:H2'	21:A:1220:G:C8	2.49	0.47
21:A:1325:C:H2'	21:A:1326:U:C6	2.49	0.47
9:I:4:GLN:HG2	9:I:19:PHE:HD2	1.79	0.47
9:I:5:TYR:CE1	9:I:89:TYR:HD1	2.32	0.47
13:M:82:LEU:HD11	18:S:73:PHE:HZ	1.78	0.47
21:A:91:U:H2'	21:A:92:U:C6	2.49	0.47
21:A:515:G:H2'	21:A:516:U:H6	1.80	0.47
21:A:539:A:H2'	21:A:540:G:H8	1.79	0.47
2:B:16:GLY:HA2	2:B:40:ILE:HD12	1.97	0.47
2:B:198:VAL:O	2:B:199:ILE:HD12	2.15	0.47
7:G:66:GLU:HA	7:G:69:ARG:HG3	1.95	0.47
11:K:84:VAL:CG1	11:K:110:ILE:HG12	2.43	0.47
21:A:151:A:OP2	21:A:169:C:N4	2.40	0.47
21:A:230:G:H2'	21:A:231:U:C6	2.50	0.47
21:A:1084:G:OP1	21:A:1086:U:N3	2.47	0.47
3:C:34:SER:O	3:C:38:VAL:HG12	2.14	0.47
5:E:134:ILE:O	5:E:138:ARG:HG2	2.15	0.47
8:H:15:ARG:HH12	21:A:876:C:P	2.38	0.47
9:I:29:ILE:HG22	9:I:64:ILE:HD12	1.96	0.47
21:A:2:A:N7	21:A:3:A:C6	2.83	0.47
21:A:299:G:O5'	21:A:299:G:H8	1.98	0.47
21:A:711:G:H2'	21:A:712:A:C8	2.47	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:D:3:ARG:HD3	4:D:115:ARG:NE	2.30	0.47
4:D:95:GLU:HG2	4:D:100:ASN:OD1	2.15	0.47
7:G:108:ARG:O	7:G:109:LYS:HD3	2.15	0.47
21:A:1269:A:H1'	21:A:1326:U:H1'	1.97	0.47
2:B:52:ALA:O	2:B:56:LEU:HD23	2.15	0.47
8:H:48:ASP:OD1	8:H:49:PHE:N	2.48	0.47
9:I:46:VAL:HG23	9:I:79:ARG:HH21	1.80	0.47
15:P:8:ARG:HH21	21:A:391:G:C5'	2.20	0.47
20:X:45:LYS:HZ1	20:X:48:LYS:HB3	1.80	0.47
21:A:389:A:H3'	21:A:390:U:H6	1.80	0.47
2:B:122:ASP:OD1	2:B:124:THR:HG23	2.15	0.46
8:H:66:PHE:CD1	8:H:67:GLN:HG3	2.49	0.46
12:L:9:ARG:HH22	21:A:881:G:P	2.39	0.46
21:A:73:C:C2'	21:A:74:A:H5'	2.46	0.46
21:A:415:A:C4	21:A:416:G:C8	3.03	0.46
21:A:845:A:H5'	21:A:846:G:H8	1.80	0.46
21:A:931:C:H2'	21:A:932:C:C6	2.49	0.46
5:E:147:MET:HE2	5:E:147:MET:HB3	1.69	0.46
8:H:51:VAL:HG12	8:H:59:LEU:HD12	1.98	0.46
12:L:67:ILE:HA	12:L:97:THR:HG22	1.96	0.46
16:Q:65:ARG:HG2	21:A:130:A:C8	2.50	0.46
21:A:201:G:O2'	21:A:469:C:O2'	2.32	0.46
2:B:80:LYS:HD3	2:B:90:PHE:CZ	2.51	0.46
2:B:134:LEU:HD21	2:B:138:ARG:NH2	2.31	0.46
3:C:122:GLN:O	3:C:127:VAL:HG12	2.15	0.46
5:E:156:LYS:HA	5:E:156:LYS:HD2	1.83	0.46
15:P:1:MET:HB3	15:P:2:VAL:H	1.62	0.46
15:P:21:VAL:HG23	15:P:33:ILE:HB	1.97	0.46
21:A:109:A:H5'	21:A:110:C:C5	2.50	0.46
21:A:1002:G:H2'	21:A:1003:G:C8	2.51	0.46
3:C:45:GLU:HG3	3:C:46:LEU:HG	1.98	0.46
8:H:83:LEU:CD2	12:L:4:VAL:HG11	2.46	0.46
10:J:45:ARG:NH1	21:A:1254:A:OP2	2.46	0.46
10:J:53:ILE:HG23	21:A:1060:U:H4'	1.97	0.46
21:A:673:A:C6	21:A:734:G:C6	3.04	0.46
21:A:1321:U:H2'	21:A:1322:C:C2	2.50	0.46
13:M:43:LYS:HB3	13:M:43:LYS:HE3	1.54	0.46
16:Q:9:GLN:HG2	16:Q:60:GLU:HB2	1.97	0.46
21:A:166:U:H2'	21:A:167:A:H8	1.79	0.46
21:A:1004:A:H2'	21:A:1005:A:O4'	2.16	0.46
21:A:1070:U:H2'	21:A:1071:C:C6	2.50	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
21:A:1338:G:H2'	21:A:1339:A:O4'	2.15	0.46
2:B:206:ILE:O	2:B:210:THR:HG23	2.14	0.46
4:D:161:LEU:O	4:D:165:ARG:HG3	2.15	0.46
12:L:51:LYS:HB3	12:L:67:ILE:HD13	1.98	0.46
21:A:671:G:N1	21:A:736:C:N3	2.64	0.46
21:A:850:U:H2'	21:A:851:G:H5''	1.98	0.46
21:A:1225:A:H5''	21:A:1226:C:C5	2.51	0.46
2:B:125:PHE:C	2:B:127:LYS:H	2.24	0.46
3:C:88:LYS:HD3	3:C:88:LYS:C	2.40	0.46
11:K:22:HIS:HB2	11:K:33:THR:OG1	2.16	0.46
11:K:126:LYS:HG2	20:X:33:ARG:HB2	1.96	0.46
14:O:24:SER:O	14:O:27:VAL:HG22	2.16	0.46
19:T:12:ILE:O	19:T:15:GLU:HG2	2.16	0.46
20:X:32:ARG:O	20:X:32:ARG:HD3	2.16	0.46
21:A:769:G:N1	21:A:811:C:O2	2.48	0.46
2:B:131:LYS:HD2	21:A:1158:C:H5''	1.98	0.46
21:A:371:A:H2'	21:A:372:C:O4'	2.16	0.46
21:A:1358:U:OP1	22:N:74:ARG:HG2	2.15	0.46
3:C:181:ILE:HG22	3:C:202:PHE:HD2	1.81	0.46
9:I:51:LEU:O	9:I:56:MET:HB3	2.16	0.46
10:J:46:LYS:NZ	10:J:66:GLU:HG3	2.31	0.46
14:O:31:LEU:O	14:O:35:GLN:HG3	2.16	0.46
21:A:982:U:OP2	22:N:62:ARG:NH1	2.44	0.46
21:A:1210:C:H1'	21:A:1214:C:C5	2.50	0.46
21:A:1283:U:H2'	21:A:1284:C:C6	2.51	0.46
3:C:2:GLN:HG2	3:C:3:LYS:HG2	1.98	0.46
4:D:118:VAL:HG23	4:D:123:ILE:HG13	1.98	0.46
6:F:9:MET:HB2	6:F:86:ARG:H	1.81	0.46
15:P:36:VAL:HG21	15:P:57:ILE:HD11	1.98	0.46
21:A:674:G:H2'	21:A:675:A:H8	1.81	0.46
21:A:1070:U:H2'	21:A:1071:C:H6	1.80	0.46
3:C:154:GLY:HA3	3:C:162:ALA:HB1	1.98	0.45
9:I:25:GLY:HA2	9:I:60:LEU:O	2.17	0.45
21:A:81:A:O2'	21:A:82:G:H5'	2.15	0.45
17:R:57:ARG:HD2	17:R:61:ARG:NH2	2.30	0.45
21:A:393:A:H2	21:A:394:G:O4'	1.98	0.45
21:A:1019:A:H2'	21:A:1020:G:O4'	2.16	0.45
21:A:1050:G:C2'	21:A:1051:C:H5'	2.46	0.45
21:A:1158:C:C6	21:A:1160:G:H1'	2.51	0.45
21:A:1328:C:C2	21:A:1329:A:C8	3.03	0.45
21:A:429:U:O4'	21:A:430:A:H8	2.00	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
21:A:782:A:H4'	21:A:1514:G:O2'	2.16	0.45
21:A:939:G:H2'	21:A:940:C:C6	2.52	0.45
21:A:950:U:H2'	21:A:951:G:H8	1.81	0.45
21:A:1171:A:H2'	21:A:1172:C:C6	2.52	0.45
21:A:1219:A:H2'	21:A:1220:G:H8	1.81	0.45
5:E:56:VAL:CG2	5:E:57:PRO:HD3	2.47	0.45
9:I:51:LEU:C	9:I:56:MET:HB3	2.41	0.45
20:X:14:ALA:C	20:X:15:LEU:HD23	2.41	0.45
21:A:956:U:H2'	21:A:957:U:C6	2.52	0.45
3:C:137:VAL:HG23	3:C:148:ILE:CG2	2.47	0.45
8:H:103:VAL:HG23	8:H:126:ILE:HB	1.99	0.45
19:T:78:ASN:HD21	21:A:259:G:P	2.39	0.45
21:A:951:G:H2'	21:A:952:U:O4'	2.16	0.45
5:E:34:THR:HG22	5:E:52:LYS:HG2	1.97	0.45
6:F:90:MET:HE2	6:F:90:MET:HB2	1.91	0.45
11:K:106:ARG:HH21	11:K:107:ILE:HG22	1.82	0.45
21:A:1354:U:H2'	21:A:1355:G:H8	1.80	0.45
22:N:63:CYS:HB3	22:N:68:ARG:N	2.32	0.45
18:S:51:HIS:CE1	21:A:1220:G:O2'	2.70	0.45
21:A:166:U:H2'	21:A:167:A:C8	2.52	0.45
21:A:414:A:C4	21:A:415:A:C8	3.04	0.45
21:A:418:C:H2'	21:A:419:C:C6	2.52	0.45
21:A:940:C:H2'	21:A:941:G:C8	2.51	0.45
2:B:101:THR:HG22	2:B:174:GLU:OE2	2.17	0.45
4:D:140:ASN:N	4:D:182:PHE:O	2.50	0.45
5:E:159:LYS:HE2	8:H:43:GLU:HA	1.98	0.45
10:J:15:HIS:HD2	21:A:1152:A:H4'	1.81	0.45
19:T:4:ILE:HG22	21:A:332:G:OP2	2.17	0.45
21:A:1370:G:H2'	21:A:1371:G:H8	1.80	0.45
2:B:35:ASN:O	2:B:37:VAL:HG23	2.16	0.45
3:C:29:ALA:O	3:C:32:LEU:HG	2.17	0.45
7:G:106:ALA:HB1	7:G:132:THR:HB	1.99	0.45
11:K:25:ALA:HB3	11:K:88:GLY:HA3	1.97	0.45
11:K:49:GLY:HA3	11:K:69:ARG:HH12	1.81	0.45
17:R:63:ARG:HH12	21:A:718:A:N6	2.15	0.45
21:A:1169:A:C6	21:A:1170:A:C5	3.05	0.45
2:B:103:TRP:O	2:B:107:ARG:HG3	2.17	0.45
5:E:49:GLY:HA3	5:E:67:ALA:HB2	1.98	0.45
5:E:149:SER:HB3	5:E:152:MET:HE2	1.99	0.45
8:H:36:ILE:HG22	8:H:110:VAL:HG11	1.99	0.45
10:J:24:GLU:HA	10:J:27:GLU:HG2	1.99	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
20:X:36:PHE:CE2	20:X:38:GLU:HB2	2.52	0.45
21:A:56:U:H2'	21:A:57:G:N7	2.31	0.45
21:A:858:G:N2	21:A:859:G:N7	2.65	0.45
21:A:1041:G:H2'	21:A:1042:A:C8	2.52	0.45
21:A:1160:G:N3	21:A:1160:G:H2'	2.30	0.45
21:A:1266:G:C2	21:A:1270:G:C6	3.05	0.45
21:A:1291:U:C2	21:A:1292:G:C8	3.05	0.45
3:C:129:PHE:CD2	3:C:152:VAL:HG21	2.52	0.44
4:D:128:ARG:HH11	4:D:128:ARG:HG2	1.82	0.44
5:E:106:ILE:HG23	21:A:8:A:C8	2.52	0.44
7:G:34:LYS:NZ	21:A:1289:A:O2'	2.51	0.44
9:I:54:VAL:HG11	9:I:93:LEU:HD21	1.99	0.44
9:I:78:ILE:O	9:I:82:ILE:HG22	2.17	0.44
21:A:204:G:H2'	21:A:205:A:C8	2.52	0.44
21:A:461:A:H2'	21:A:462:G:H8	1.82	0.44
21:A:923:A:H2'	21:A:924:C:C6	2.52	0.44
2:B:55:GLU:HB3	2:B:58:LYS:NZ	2.32	0.44
3:C:8:GLY:HA3	22:N:88:MET:HE3	1.99	0.44
21:A:57:G:N3	21:A:57:G:H2'	2.32	0.44
3:C:90:VAL:HA	3:C:93:ILE:HG22	1.98	0.44
4:D:61:VAL:HA	4:D:64:ILE:CG2	2.44	0.44
21:A:247:G:C6	21:A:278:G:C2	3.04	0.44
21:A:1329:A:C5	21:A:1330:U:C5	3.05	0.44
14:O:37:ASN:OD1	14:O:37:ASN:N	2.51	0.44
21:A:189:A:H2'	21:A:190:A:C8	2.53	0.44
21:A:590:U:H2'	21:A:591:U:C6	2.52	0.44
21:A:1099:G:H2'	21:A:1100:C:O4'	2.17	0.44
21:A:1347:G:N2	21:A:1374:A:OP2	2.37	0.44
15:P:58:ALA:HA	15:P:61:VAL:HG12	2.00	0.44
21:A:109:A:H5'	21:A:110:C:H5	1.83	0.44
21:A:613:C:H2'	21:A:614:C:H6	1.83	0.44
21:A:1010:U:H2'	21:A:1011:C:C6	2.53	0.44
3:C:33:ASP:HB2	22:N:64:ARG:HD3	1.99	0.44
3:C:173:PRO:HB2	3:C:176:THR:HG23	1.99	0.44
12:L:79:VAL:O	12:L:103:ASP:OD1	2.36	0.44
21:A:926:G:H3'	21:A:927:G:H5''	1.99	0.44
21:A:1095:U:OP2	21:A:1108:G:N1	2.45	0.44
4:D:196:ASN:OD1	4:D:196:ASN:O	2.34	0.44
9:I:20:ILE:HG23	9:I:60:LEU:HD22	2.00	0.44
11:K:46:THR:O	11:K:69:ARG:NH2	2.51	0.44
16:Q:18:GLU:OE1	16:Q:18:GLU:N	2.46	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
19:T:24:ARG:O	19:T:27:MET:HG3	2.17	0.44
21:A:502:A:H2'	21:A:503:C:H6	1.81	0.44
21:A:1507:A:P	21:A:1530:G:H22	2.38	0.44
3:C:126:ARG:HH21	3:C:191:THR:HB	1.83	0.44
9:I:111:GLU:HG2	9:I:112:ARG:O	2.17	0.44
9:I:125:GLN:HB2	21:A:1342:C:O2'	2.18	0.44
16:Q:49:GLU:HA	16:Q:49:GLU:OE2	2.17	0.44
18:S:65:MET:SD	18:S:65:MET:N	2.90	0.44
19:T:79:LEU:HD13	19:T:79:LEU:HA	1.73	0.44
21:A:263:A:H2'	21:A:264:C:C6	2.52	0.44
21:A:775:G:N2	21:A:805:C:N3	2.66	0.44
4:D:172:GLU:O	4:D:181:THR:N	2.49	0.44
11:K:118:HIS:CE1	21:A:675:A:H1'	2.53	0.44
15:P:13:LYS:NZ	21:A:392:C:O3'	2.49	0.44
21:A:773:G:C6	21:A:807:A:N6	2.86	0.44
21:A:938:A:C6	21:A:939:G:C5	3.05	0.44
21:A:945:G:C2	21:A:946:A:C8	3.06	0.44
21:A:989:U:HO2'	21:A:1016:A:H61	1.54	0.44
21:A:1061:G:H2'	21:A:1062:U:H6	1.81	0.44
21:A:1304:G:N2	21:A:1334:G:C6	2.85	0.44
17:R:20:GLU:OE1	17:R:21:ILE:N	2.51	0.43
19:T:34:LYS:NZ	19:T:34:LYS:HB3	2.33	0.43
21:A:1303:C:H2'	21:A:1304:G:C8	2.53	0.43
21:A:1315:U:H2'	21:A:1316:G:O4'	2.18	0.43
11:K:21:ALA:O	11:K:84:VAL:HA	2.19	0.43
19:T:4:ILE:HD12	19:T:5:LYS:H	1.83	0.43
3:C:64:ARG:HB2	3:C:99:GLN:HE21	1.82	0.43
5:E:24:THR:HB	21:A:921:U:O2	2.18	0.43
6:F:52:ASN:O	6:F:53:LYS:HG2	2.18	0.43
11:K:106:ARG:NH2	11:K:107:ILE:O	2.51	0.43
18:S:30:LEU:HD23	18:S:48:ILE:HG13	2.00	0.43
21:A:338:A:H2'	21:A:339:C:C6	2.52	0.43
21:A:674:G:H2'	21:A:675:A:C8	2.53	0.43
21:A:845:A:H5'	21:A:846:G:C8	2.53	0.43
2:B:126:ASP:OD1	2:B:126:ASP:N	2.51	0.43
5:E:153:VAL:HG11	8:H:99:LEU:HD22	1.99	0.43
15:P:74:LEU:O	15:P:78:VAL:HG13	2.17	0.43
21:A:279:A:H5'	21:A:281:G:O4'	2.18	0.43
21:A:791:G:N3	21:A:791:G:H2'	2.33	0.43
9:I:5:TYR:HE1	9:I:89:TYR:HD1	1.66	0.43
11:K:23:ILE:HG22	11:K:32:VAL:HG12	1.99	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
12:L:3:THR:OG1	12:L:6:GLN:HG3	2.19	0.43
21:A:255:G:H2'	21:A:256:U:C6	2.53	0.43
21:A:394:G:O2'	21:A:395:C:OP1	2.33	0.43
21:A:592:G:C6	21:A:648:A:C6	3.06	0.43
21:A:1007:U:H2'	21:A:1008:U:H6	1.84	0.43
3:C:67:ILE:HD12	3:C:67:ILE:H	1.83	0.43
17:R:22:ASP:OD1	17:R:24:LYS:NZ	2.51	0.43
21:A:206:C:C4	21:A:207:C:C4	3.06	0.43
21:A:515:G:H2'	21:A:516:U:C6	2.54	0.43
21:A:1201:A:H4'	21:A:1202:U:O5'	2.18	0.43
21:A:1250:A:C6	21:A:1287:A:C4	3.06	0.43
3:C:121:SER:O	3:C:125:ARG:HG2	2.18	0.43
9:I:83:THR:HG23	9:I:97:LEU:HD22	1.99	0.43
16:Q:11:ARG:HH22	16:Q:26:GLU:HG2	1.83	0.43
21:A:628:G:H2'	21:A:629:A:C8	2.54	0.43
21:A:679:C:H2'	21:A:680:C:C6	2.54	0.43
21:A:688:G:O2'	21:A:689:C:OP1	2.34	0.43
21:A:885:G:C2	21:A:886:G:C8	3.06	0.43
21:A:1512:U:H2'	21:A:1513:A:C8	2.53	0.43
4:D:168:PRO:HB3	4:D:170:TRP:CH2	2.54	0.43
8:H:30:SER:O	8:H:34:VAL:HG13	2.18	0.43
11:K:52:PHE:CE2	11:K:65:VAL:HG11	2.54	0.43
21:A:1138:G:O2'	21:A:1139:G:OP1	2.32	0.43
2:B:100:LEU:HD11	2:B:180:ILE:HD13	2.01	0.43
3:C:41:TYR:O	3:C:44:LYS:HG2	2.19	0.43
4:D:172:GLU:OE2	4:D:172:GLU:N	2.52	0.43
5:E:109:GLY:O	5:E:112:ARG:HB3	2.19	0.43
6:F:9:MET:HE1	6:F:59:TYR:CD1	2.54	0.43
11:K:52:PHE:HE2	11:K:65:VAL:HG11	1.84	0.43
17:R:45:THR:OG1	17:R:47:THR:HG23	2.19	0.43
20:X:45:LYS:NZ	20:X:48:LYS:HB3	2.34	0.43
21:A:952:U:O3'	21:A:964:A:N6	2.45	0.43
5:E:110:ALA:O	5:E:114:VAL:HG23	2.18	0.43
7:G:69:ARG:HD2	7:G:95:ARG:HG2	2.01	0.43
21:A:393:A:N3	21:A:393:A:H2'	2.34	0.43
21:A:613:C:H2'	21:A:614:C:C6	2.54	0.43
2:B:123:GLY:O	2:B:125:PHE:N	2.52	0.42
3:C:67:ILE:HD12	3:C:67:ILE:N	2.34	0.42
3:C:128:MET:HG2	3:C:131:ARG:HB3	2.00	0.42
15:P:77:GLU:HA	15:P:77:GLU:OE2	2.18	0.42
19:T:43:ASP:CG	19:T:46:ALA:H	2.27	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
21:A:957:U:H2'	21:A:959:A:OP2	2.19	0.42
21:A:1166:G:N1	21:A:1169:A:OP2	2.48	0.42
21:A:1355:G:N3	21:A:1356:G:C8	2.87	0.42
2:B:65:LYS:HD2	2:B:153:MET:HE1	2.01	0.42
3:C:89:VAL:HA	3:C:92:ASP:OD2	2.19	0.42
5:E:80:THR:OG1	5:E:122:ASN:OD1	2.37	0.42
14:O:36:ILE:HG23	14:O:56:LEU:HD11	2.01	0.42
15:P:51:ARG:HG3	15:P:51:ARG:NH1	2.33	0.42
19:T:49:LYS:HA	19:T:52:ASN:ND2	2.33	0.42
21:A:340:U:H2'	21:A:341:C:H6	1.83	0.42
21:A:1062:U:H2'	21:A:1063:C:C6	2.54	0.42
21:A:1314:C:H2'	21:A:1315:U:C5	2.55	0.42
21:A:1355:G:C2	21:A:1356:G:C5	3.07	0.42
3:C:71:ARG:HH22	3:C:108:PRO:HG3	1.84	0.42
10:J:17:LEU:HD12	10:J:17:LEU:HA	1.76	0.42
12:L:89:ASP:C	12:L:90:LEU:HD23	2.44	0.42
21:A:588:G:C5	21:A:753:A:C5	3.07	0.42
21:A:689:C:C4	21:A:690:G:C6	3.07	0.42
21:A:763:G:H2'	21:A:764:C:H6	1.83	0.42
4:D:9:LEU:HD11	4:D:22:LYS:HG2	2.00	0.42
4:D:202:GLU:CD	5:E:105:ILE:HG22	2.44	0.42
21:A:27:G:C6	21:A:557:G:C2	3.08	0.42
21:A:1056:U:H2'	21:A:1057:G:C8	2.51	0.42
21:A:1320:C:O2	21:A:1320:C:H2'	2.19	0.42
2:B:44:LYS:O	2:B:48:MET:HG2	2.19	0.42
2:B:112:ARG:HG3	2:B:112:ARG:HH11	1.84	0.42
2:B:205:ALA:O	2:B:209:VAL:HG13	2.19	0.42
4:D:197:GLU:HG2	4:D:198:HIS:N	2.34	0.42
6:F:43:GLY:HA2	6:F:58:HIS:CE1	2.54	0.42
7:G:38:ALA:O	7:G:41:ILE:HG22	2.19	0.42
8:H:75:ILE:HD11	8:H:129:VAL:HG22	2.01	0.42
9:I:108:ARG:O	9:I:108:ARG:HG3	2.19	0.42
11:K:119:ASN:ND2	21:A:718:A:H5'	2.34	0.42
21:A:6:G:O2'	21:A:7:A:C8	2.72	0.42
21:A:62:U:H2'	21:A:63:C:H6	1.84	0.42
21:A:268:U:H2'	21:A:269:C:C6	2.55	0.42
21:A:840:C:O2'	21:A:842:U:H5''	2.19	0.42
21:A:1011:C:H2'	21:A:1012:A:H8	1.85	0.42
21:A:1061:G:H2'	21:A:1062:U:C6	2.54	0.42
22:N:4:SER:O	22:N:8:ARG:HG2	2.19	0.42
22:N:82:LYS:HD2	22:N:85:GLU:HG3	2.01	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:183:PHE:HD1	2:B:197:PHE:HB2	1.85	0.42
4:D:195:ILE:HD12	4:D:195:ILE:HA	1.87	0.42
8:H:108:LYS:HG2	8:H:121:LEU:HD11	2.01	0.42
11:K:101:ASN:ND2	20:X:12:ASP:OD1	2.52	0.42
19:T:25:ARG:O	19:T:29:ARG:HG3	2.19	0.42
21:A:1174:G:C6	21:A:1175:G:C5	3.08	0.42
2:B:110:ILE:HG13	2:B:110:ILE:H	1.73	0.42
9:I:56:MET:SD	9:I:57:VAL:HB	2.59	0.42
12:L:9:ARG:NH2	21:A:881:G:OP2	2.47	0.42
18:S:39:ILE:HD13	18:S:61:VAL:HG21	2.01	0.42
3:C:39:ARG:NH1	3:C:54:ILE:O	2.53	0.42
5:E:149:SER:H	5:E:152:MET:CE	2.32	0.42
17:R:12:ARG:O	17:R:16:GLU:HG2	2.20	0.42
21:A:1513:A:H2'	21:A:1514:G:H8	1.84	0.42
4:D:87:GLY:O	4:D:91:LEU:HD23	2.19	0.42
12:L:57:LEU:HD21	12:L:82:ILE:HD11	2.02	0.42
16:Q:27:ARG:HH11	16:Q:27:ARG:HG2	1.84	0.42
16:Q:57:ASP:OD1	16:Q:81:LYS:HA	2.20	0.42
21:A:139:A:H2'	21:A:140:U:C6	2.55	0.42
21:A:813:U:H5	21:A:816:A:N1	2.18	0.42
21:A:1319:A:H61	21:A:1361:G:N2	2.18	0.42
2:B:100:LEU:HD22	2:B:178:LEU:HG	2.01	0.42
5:E:106:ILE:HG23	21:A:8:A:H8	1.85	0.42
9:I:32:ARG:HG3	9:I:37:TYR:HB2	2.01	0.42
9:I:118:ARG:N	9:I:122:ARG:O	2.49	0.42
11:K:31:ILE:HD13	11:K:31:ILE:HA	1.91	0.42
13:M:63:VAL:HG21	13:M:68:LEU:HD13	2.02	0.42
21:A:883:C:O2'	21:A:884:U:H5'	2.20	0.42
21:A:1053:G:H4'	21:A:1054:C:H3'	2.01	0.42
21:A:1087:G:H22	21:A:1099:G:H1'	1.84	0.42
21:A:1127:G:C6	21:A:1128:C:N4	2.88	0.42
21:A:1210:C:N4	21:A:1211:U:O4	2.53	0.42
6:F:19:PRO:HD2	6:F:20:GLY:N	2.28	0.41
7:G:114:SER:O	7:G:118:ARG:HG2	2.20	0.41
10:J:57:VAL:HB	10:J:58:ASN:OD1	2.19	0.41
18:S:11:ASP:C	22:N:46:LYS:HZ3	2.28	0.41
20:X:39:LYS:HE3	20:X:39:LYS:HB2	1.89	0.41
21:A:669:G:H2'	21:A:670:G:C8	2.55	0.41
4:D:125:VAL:O	4:D:128:ARG:N	2.54	0.41
5:E:105:ILE:HG23	5:E:105:ILE:O	2.21	0.41
7:G:115:MET:HB2	21:A:1240:U:OP1	2.20	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
11:K:19:GLY:C	11:K:82:LEU:HD23	2.45	0.41
21:A:679:C:H2'	21:A:680:C:H6	1.85	0.41
21:A:830:G:C4	21:A:831:A:C8	3.09	0.41
21:A:895:G:H2'	21:A:896:C:H6	1.85	0.41
21:A:1131:G:N1	21:A:1143:G:N2	2.68	0.41
21:A:1177:G:H2'	21:A:1178:G:C8	2.55	0.41
4:D:13:ARG:HD2	4:D:38:PRO:HB3	2.01	0.41
11:K:107:ILE:HD12	11:K:107:ILE:HA	1.73	0.41
13:M:12:LYS:HA	13:M:12:LYS:HD3	1.88	0.41
13:M:86:ARG:HA	13:M:96:VAL:HG21	2.01	0.41
21:A:441:A:H1'	21:A:497:G:N2	2.36	0.41
21:A:703:G:H4'	21:A:704:A:H5'	2.02	0.41
21:A:772:U:C4	21:A:773:G:N7	2.88	0.41
21:A:881:G:H2'	21:A:882:C:O4'	2.19	0.41
2:B:76:SER:OG	2:B:77:GLU:N	2.53	0.41
8:H:15:ARG:HD3	8:H:75:ILE:HG22	2.02	0.41
20:X:28:LEU:H	20:X:31:VAL:HG23	1.85	0.41
21:A:17:U:O2'	21:A:1079:G:H1'	2.21	0.41
21:A:24:U:O2'	21:A:524:G:O2'	2.34	0.41
21:A:699:C:H3'	21:A:700:G:H5''	2.03	0.41
21:A:1016:A:H3'	21:A:1017:U:C5'	2.50	0.41
21:A:1524:C:C4	21:A:1525:G:N7	2.88	0.41
3:C:68:HIS:HA	3:C:103:ALA:O	2.21	0.41
4:D:13:ARG:HH22	21:A:429:U:P	2.41	0.41
5:E:14:LYS:HB3	5:E:14:LYS:HE2	1.72	0.41
6:F:42:TRP:CH2	17:R:24:LYS:HD2	2.55	0.41
6:F:62:MET:SD	6:F:62:MET:N	2.94	0.41
8:H:77:ARG:NH2	8:H:79:SER:O	2.54	0.41
11:K:18:ASP:CG	11:K:81:ASN:HB2	2.45	0.41
11:K:118:HIS:ND1	21:A:675:A:H1'	2.35	0.41
13:M:32:ILE:CG2	13:M:55:LEU:HD21	2.51	0.41
18:S:69:LYS:HD2	21:A:1320:C:C6	2.56	0.41
21:A:728:A:H2'	21:A:729:A:C8	2.55	0.41
21:A:793:U:H2'	21:A:794:A:H5'	2.03	0.41
21:A:1508:A:H2'	21:A:1509:C:O4'	2.20	0.41
22:N:24:ALA:HA	22:N:27:LYS:HG3	2.03	0.41
3:C:86:LEU:HA	3:C:89:VAL:CG1	2.51	0.41
3:C:126:ARG:HB2	3:C:126:ARG:CZ	2.51	0.41
13:M:16:ILE:O	13:M:19:THR:HG22	2.20	0.41
21:A:279:A:H5''	21:A:280:C:H3'	2.02	0.41
21:A:425:G:C5	21:A:426:U:C4	3.09	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
21:A:751:U:C5	21:A:752:G:C5	3.09	0.41
21:A:1250:A:N1	21:A:1287:A:C2	2.89	0.41
5:E:29:ARG:HH22	21:A:1535:C:P	2.44	0.41
5:E:142:ASP:OD1	5:E:142:ASP:N	2.53	0.41
6:F:92:THR:OG1	6:F:93:LYS:N	2.54	0.41
11:K:21:ALA:O	11:K:85:MET:N	2.50	0.41
13:M:7:ASN:OD1	13:M:9:PRO:HD3	2.21	0.41
21:A:22:G:H4'	21:A:885:G:C8	2.56	0.41
21:A:550:G:H2'	21:A:551:U:C6	2.55	0.41
21:A:708:C:H2'	21:A:709:U:C6	2.55	0.41
21:A:1007:U:H2'	21:A:1008:U:C6	2.56	0.41
21:A:1025:U:H4'	21:A:1026:G:H8	1.84	0.41
21:A:1095:U:P	21:A:1108:G:H1	2.43	0.41
5:E:154:ALA:HB1	5:E:159:LYS:O	2.20	0.41
9:I:27:ILE:HD12	9:I:62:LEU:HB2	2.03	0.41
10:J:14:ASP:OD1	10:J:17:LEU:HB2	2.21	0.41
19:T:24:ARG:NH2	19:T:64:LYS:HD2	2.29	0.41
21:A:1120:C:H2'	21:A:1121:U:C6	2.53	0.41
21:A:1125:U:C4	21:A:1127:G:C4	3.09	0.41
21:A:1507:A:H2	21:A:1528:U:O4	2.03	0.41
22:N:9:GLU:OE1	22:N:9:GLU:HA	2.20	0.41
2:B:116:LEU:HB3	2:B:140:LEU:HD11	2.02	0.41
3:C:154:GLY:HA2	3:C:163:ARG:O	2.21	0.41
5:E:114:VAL:HG21	5:E:137:VAL:HG13	2.02	0.41
5:E:148:ASN:HA	5:E:152:MET:HE3	2.03	0.41
11:K:94:GLU:O	11:K:98:ARG:HG2	2.21	0.41
11:K:119:ASN:HD21	21:A:717:U:H4'	1.86	0.41
14:O:6:GLU:OE2	14:O:6:GLU:HA	2.21	0.41
17:R:28:THR:O	17:R:32:TYR:HD1	2.04	0.41
19:T:48:GLN:HA	19:T:48:GLN:OE1	2.21	0.41
21:A:53:A:C2	21:A:54:C:H1'	2.56	0.41
21:A:611:C:C4	21:A:612:C:C5	3.09	0.41
21:A:639:G:C6	21:A:640:A:N7	2.88	0.41
21:A:892:A:H2'	21:A:893:C:C6	2.56	0.41
21:A:921:U:C4	21:A:922:G:N7	2.89	0.41
21:A:1110:A:H2'	21:A:1111:A:C8	2.56	0.41
21:A:1165:U:H2'	21:A:1166:G:O4'	2.21	0.41
21:A:1323:G:H2'	21:A:1324:A:C8	2.56	0.41
21:A:1333:A:H2'	21:A:1334:G:O4'	2.21	0.41
22:N:81:ILE:H	22:N:81:ILE:HG12	1.68	0.41
14:O:74:ASP:OD1	14:O:77:ARG:NE	2.46	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
18:S:19:GLU:HA	18:S:22:VAL:HG12	2.02	0.41
21:A:1038:C:C4	21:A:1039:G:N7	2.89	0.41
21:A:1236:A:H2'	21:A:1237:C:H6	1.86	0.41
21:A:1342:C:H2'	21:A:1343:G:C8	2.56	0.41
2:B:173:LYS:HD2	2:B:173:LYS:O	2.21	0.40
3:C:15:LYS:HD3	3:C:15:LYS:O	2.21	0.40
3:C:180:ASP:OD1	3:C:205:GLU:HA	2.21	0.40
6:F:23:GLU:HA	6:F:26:THR:HG22	2.03	0.40
6:F:75:GLU:OE1	6:F:79:ARG:NH1	2.53	0.40
8:H:80:ARG:HD3	21:A:878:A:P	2.61	0.40
13:M:85:TYR:O	13:M:88:LEU:HG	2.21	0.40
16:Q:17:MET:HE2	21:A:276:G:C5'	2.50	0.40
19:T:28:MET:HE3	19:T:61:GLN:HG3	2.03	0.40
21:A:854:U:H3'	21:A:871:U:O4	2.21	0.40
2:B:213:LEU:O	2:B:216:VAL:HG22	2.21	0.40
3:C:67:ILE:HD13	3:C:102:ILE:HD13	2.02	0.40
4:D:78:GLU:CD	4:D:81:ARG:HH12	2.29	0.40
5:E:134:ILE:HG13	5:E:135:ASN:H	1.86	0.40
11:K:15:GLN:HA	11:K:15:GLN:OE1	2.21	0.40
14:O:43:PHE:HE2	14:O:56:LEU:HD22	1.86	0.40
16:Q:71:LYS:NZ	21:A:254:G:O3'	2.45	0.40
19:T:43:ASP:OD1	19:T:43:ASP:C	2.64	0.40
20:X:16:ARG:HG3	20:X:16:ARG:NH1	2.36	0.40
21:A:243:A:H4'	21:A:244:U:O5'	2.20	0.40
21:A:244:U:C4	21:A:894:G:C6	3.09	0.40
21:A:246:A:H62	21:A:281:G:H21	1.69	0.40
21:A:549:C:C4	21:A:550:G:N7	2.90	0.40
3:C:2:GLN:CG	3:C:3:LYS:HG2	2.51	0.40
13:M:17:ALA:CB	13:M:44:ILE:HD13	2.51	0.40
21:A:770:C:H1'	21:A:900:A:C2	2.56	0.40
21:A:1388:C:H2'	21:A:1389:C:H6	1.85	0.40
1:V:68:A:N3	1:V:68:A:H3'	2.36	0.40
4:D:174:ASP:OD1	4:D:177:LYS:HB2	2.21	0.40
7:G:12:LEU:HA	7:G:13:PRO:HD2	1.95	0.40
7:G:57:GLU:CD	7:G:60:ALA:HB3	2.47	0.40
12:L:5:ASN:OD1	16:Q:36:LYS:HE3	2.21	0.40
21:A:999:C:H2'	21:A:1000:A:H8	1.87	0.40
7:G:70:PRO:HD2	7:G:95:ARG:HG3	2.02	0.40
8:H:11:LEU:HD22	8:H:75:ILE:CG1	2.51	0.40
8:H:101:ILE:HD13	8:H:101:ILE:HA	1.91	0.40
8:H:107:SER:HA	21:A:642:A:N7	2.37	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
9:I:24:ASN:O	9:I:26:LYS:N	2.49	0.40
16:Q:71:LYS:NZ	21:A:255:G:OP1	2.54	0.40
20:X:5:VAL:CG2	20:X:15:LEU:HD21	2.50	0.40
21:A:715:A:H2'	21:A:716:A:C8	2.56	0.40
21:A:1271:A:H2'	21:A:1272:G:H8	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	216/241 (90%)	192 (89%)	22 (10%)	2 (1%)	14	42
3	C	204/233 (88%)	188 (92%)	15 (7%)	1 (0%)	24	54
4	D	203/206 (98%)	198 (98%)	5 (2%)	0	100	100
5	E	154/167 (92%)	138 (90%)	16 (10%)	0	100	100
6	F	102/135 (76%)	98 (96%)	4 (4%)	0	100	100
7	G	147/179 (82%)	141 (96%)	6 (4%)	0	100	100
8	H	127/130 (98%)	123 (97%)	4 (3%)	0	100	100
9	I	125/130 (96%)	110 (88%)	15 (12%)	0	100	100
10	J	96/103 (93%)	84 (88%)	11 (12%)	1 (1%)	12	40
11	K	114/129 (88%)	103 (90%)	10 (9%)	1 (1%)	14	42
12	L	120/124 (97%)	109 (91%)	11 (9%)	0	100	100
13	M	95/118 (80%)	88 (93%)	7 (7%)	0	100	100
14	O	85/89 (96%)	80 (94%)	5 (6%)	0	100	100
15	P	80/82 (98%)	79 (99%)	1 (1%)	0	100	100
16	Q	78/84 (93%)	74 (95%)	4 (5%)	0	100	100
17	R	64/75 (85%)	61 (95%)	3 (5%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
18	S	77/92 (84%)	71 (92%)	6 (8%)	0	100	100
19	T	83/87 (95%)	82 (99%)	1 (1%)	0	100	100
20	X	49/71 (69%)	40 (82%)	9 (18%)	0	100	100
22	N	92/101 (91%)	86 (94%)	5 (5%)	1 (1%)	11	38
All	All	2311/2576 (90%)	2145 (93%)	160 (7%)	6 (0%)	37	65

All (6) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	B	124	THR
22	N	80	ARG
3	C	167	TYR
11	K	17	SER
2	B	18	GLN
10	J	93	ALA

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	180/199 (90%)	176 (98%)	4 (2%)	45	63
3	C	170/190 (90%)	166 (98%)	4 (2%)	43	62
4	D	172/173 (99%)	171 (99%)	1 (1%)	78	80
5	E	119/126 (94%)	116 (98%)	3 (2%)	42	62
6	F	91/116 (78%)	86 (94%)	5 (6%)	19	46
7	G	122/147 (83%)	122 (100%)	0	100	100
8	H	104/105 (99%)	101 (97%)	3 (3%)	37	60
9	I	105/107 (98%)	104 (99%)	1 (1%)	68	75
10	J	86/90 (96%)	84 (98%)	2 (2%)	44	63
11	K	89/99 (90%)	86 (97%)	3 (3%)	32	57
12	L	103/104 (99%)	103 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
13	M	78/96 (81%)	76 (97%)	2 (3%)	40	61
14	O	75/77 (97%)	71 (95%)	4 (5%)	20	47
15	P	65/65 (100%)	64 (98%)	1 (2%)	57	69
16	Q	74/78 (95%)	74 (100%)	0	100	100
17	R	57/65 (88%)	57 (100%)	0	100	100
18	S	70/79 (89%)	69 (99%)	1 (1%)	59	70
19	T	65/66 (98%)	65 (100%)	0	100	100
20	X	44/61 (72%)	44 (100%)	0	100	100
22	N	79/84 (94%)	78 (99%)	1 (1%)	61	71
All	All	1948/2127 (92%)	1913 (98%)	35 (2%)	51	67

All (35) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
2	B	58	LYS
2	B	66	ILE
2	B	113	LEU
2	B	209	VAL
3	C	156	LEU
3	C	174	LEU
3	C	182	ASP
3	C	201	ILE
4	D	160	GLU
5	E	15	LEU
5	E	88	VAL
5	E	134	ILE
6	F	3	HIS
6	F	35	LYS
6	F	54	LEU
6	F	55	HIS
6	F	76	THR
8	H	52	GLU
8	H	67	GLN
8	H	101	ILE
9	I	111	GLU
10	J	64	GLN
10	J	75	ASP
11	K	42	LEU
11	K	79	ILE

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Mol	Chain	Res	Type
11	K	83	GLU
13	M	3	ILE
13	M	6	ILE
14	O	13	SER
14	O	38	HIS
14	O	47	LYS
14	O	80	GLN
15	P	63	GLN
18	S	40	PHE
22	N	81	ILE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (22) such sidechains are listed below:

Mol	Chain	Res	Type
2	B	35	ASN
3	C	2	GLN
3	C	99	GLN
4	D	41	HIS
4	D	196	ASN
5	E	77	ASN
5	E	121	HIS
6	F	94	HIS
7	G	121	ASN
8	H	4	GLN
9	I	4	GLN
10	J	15	HIS
11	K	119	ASN
13	M	11	HIS
14	O	42	HIS
18	S	13	HIS
18	S	51	HIS
18	S	52	ASN
18	S	56	HIS
19	T	48	GLN
19	T	52	ASN
19	T	78	ASN

5.3.3 RNA ⓘ

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
1	V	4/72 (5%)	4 (100%)	1 (25%)
21	A	1424/1554 (91%)	272 (19%)	16 (1%)
All	All	1428/1626 (87%)	276 (19%)	17 (1%)

All (276) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
1	V	68	A
1	V	69	A
1	V	70	G
1	V	71	U
21	A	5	U
21	A	6	G
21	A	9	G
21	A	22	G
21	A	31	G
21	A	32	A
21	A	39	G
21	A	47	C
21	A	48	C
21	A	49	U
21	A	50	A
21	A	54	C
21	A	55	A
21	A	64	G
21	A	68	G
21	A	69	G
21	A	74	A
21	A	77	A
21	A	82	G
21	A	83	C
21	A	87	C
21	A	88	U
21	A	94	G
21	A	95	C
21	A	108	G
21	A	119	A
21	A	120	A
21	A	121	U
21	A	131	A
21	A	157	U
21	A	161	A
21	A	184	G

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Mol	Chain	Res	Type
21	A	207	C
21	A	210	C
21	A	211	G
21	A	240	G
21	A	244	U
21	A	247	G
21	A	251	G
21	A	266	G
21	A	267	C
21	A	279	A
21	A	280	C
21	A	283	U
21	A	289	G
21	A	306	A
21	A	316	C
21	A	321	A
21	A	328	C
21	A	329	A
21	A	330	C
21	A	332	G
21	A	345	C
21	A	352	C
21	A	353	A
21	A	354	G
21	A	356	A
21	A	359	G
21	A	367	U
21	A	372	C
21	A	376	G
21	A	382	A
21	A	384	G
21	A	387	U
21	A	388	G
21	A	393	A
21	A	395	C
21	A	396	C
21	A	397	A
21	A	406	G
21	A	411	A
21	A	413	G
21	A	414	A
21	A	421	U

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Mol	Chain	Res	Type
21	A	422	C
21	A	424	G
21	A	429	U
21	A	432	A
21	A	451	A
21	A	460	A
21	A	464	U
21	A	467	U
21	A	468	A
21	A	472	U
21	A	481	G
21	A	485	U
21	A	487	A
21	A	495	A
21	A	497	G
21	A	500	G
21	A	516	U
21	A	517	G
21	A	518	C
21	A	527	G
21	A	532	A
21	A	547	A
21	A	558	G
21	A	559	A
21	A	564	C
21	A	566	G
21	A	568	G
21	A	572	A
21	A	573	A
21	A	576	C
21	A	607	A
21	A	633	G
21	A	653	U
21	A	665	A
21	A	666	G
21	A	668	G
21	A	687	A
21	A	689	C
21	A	692	U
21	A	700	G
21	A	701	U
21	A	703	G

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Mol	Chain	Res	Type
21	A	704	A
21	A	706	A
21	A	722	G
21	A	724	G
21	A	734	G
21	A	748	G
21	A	754	C
21	A	755	G
21	A	771	G
21	A	777	A
21	A	791	G
21	A	792	A
21	A	794	A
21	A	799	G
21	A	808	C
21	A	815	A
21	A	817	C
21	A	821	G
21	A	827	U
21	A	828	U
21	A	829	G
21	A	836	G
21	A	838	G
21	A	841	C
21	A	844	G
21	A	846	G
21	A	851	G
21	A	872	A
21	A	887	G
21	A	914	A
21	A	927	G
21	A	932	C
21	A	934	C
21	A	935	A
21	A	947	G
21	A	948	C
21	A	960	U
21	A	966	G
21	A	968	A
21	A	969	A
21	A	974	A
21	A	976	G

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Mol	Chain	Res	Type
21	A	992	U
21	A	993	G
21	A	995	C
21	A	1004	A
21	A	1009	U
21	A	1013	G
21	A	1015	G
21	A	1016	A
21	A	1017	U
21	A	1020	G
21	A	1025	U
21	A	1030	U
21	A	1032	G
21	A	1033	G
21	A	1038	C
21	A	1039	G
21	A	1045	C
21	A	1046	A
21	A	1048	G
21	A	1050	G
21	A	1051	C
21	A	1055	A
21	A	1056	U
21	A	1065	U
21	A	1068	G
21	A	1074	G
21	A	1081	A
21	A	1085	U
21	A	1086	U
21	A	1087	G
21	A	1089	G
21	A	1090	U
21	A	1094	G
21	A	1095	U
21	A	1101	A
21	A	1102	A
21	A	1108	G
21	A	1138	G
21	A	1139	G
21	A	1140	C
21	A	1142	G
21	A	1143	G

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Mol	Chain	Res	Type
21	A	1145	A
21	A	1159	U
21	A	1160	G
21	A	1162	C
21	A	1163	A
21	A	1168	U
21	A	1181	G
21	A	1196	A
21	A	1197	A
21	A	1200	C
21	A	1202	U
21	A	1212	U
21	A	1214	C
21	A	1215	G
21	A	1225	A
21	A	1226	C
21	A	1227	A
21	A	1228	C
21	A	1240	U
21	A	1241	G
21	A	1249	C
21	A	1256	A
21	A	1257	A
21	A	1258	G
21	A	1267	C
21	A	1268	G
21	A	1270	G
21	A	1278	G
21	A	1279	G
21	A	1280	A
21	A	1281	C
21	A	1285	A
21	A	1286	U
21	A	1287	A
21	A	1290	G
21	A	1291	U
21	A	1293	C
21	A	1294	G
21	A	1295	U
21	A	1298	U
21	A	1300	G
21	A	1302	C

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Mol	Chain	Res	Type
21	A	1305	G
21	A	1315	U
21	A	1318	A
21	A	1320	C
21	A	1321	U
21	A	1322	C
21	A	1323	G
21	A	1336	C
21	A	1338	G
21	A	1341	U
21	A	1347	G
21	A	1364	U
21	A	1378	C
21	A	1379	G
21	A	1505	G
21	A	1506	U
21	A	1507	A
21	A	1509	C
21	A	1510	C
21	A	1516	G
21	A	1519	A
21	A	1520	C
21	A	1522	U
21	A	1529	G
21	A	1530	G
21	A	1532	U
21	A	1535	C
21	A	1536	C
21	A	1537	U
21	A	1539	C

All (17) RNA pucker outliers are listed below:

Mol	Chain	Res	Type
1	V	69	A
21	A	206	C
21	A	351	G
21	A	381	C
21	A	387	U
21	A	394	G
21	A	688	G
21	A	705	G

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Mol	Chain	Res	Type
21	A	994	A
21	A	1003	G
21	A	1101	A
21	A	1138	G
21	A	1180	A
21	A	1201	A
21	A	1314	C
21	A	1320	C
21	A	1531	A

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 [i](#)

There are no chain breaks in this entry.

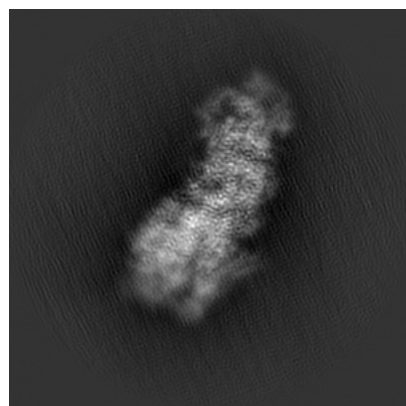
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-36883. These allow visual inspection of the internal detail of the map and identification of artifacts.

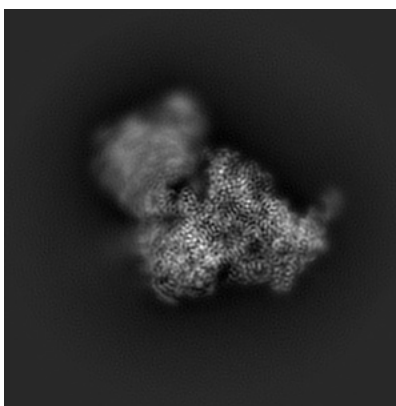
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

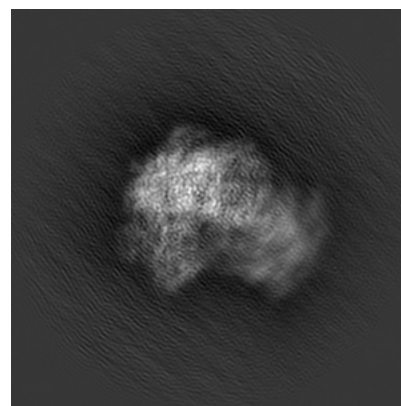
6.1.1 Primary map



X

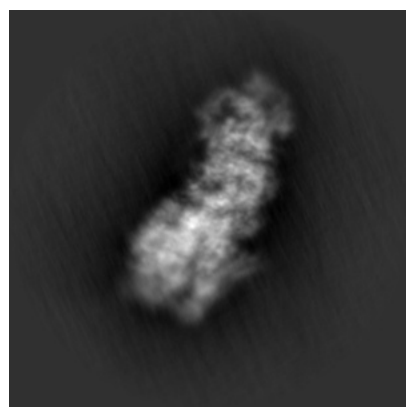


Y

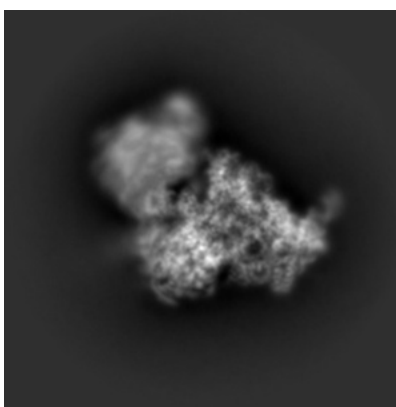


Z

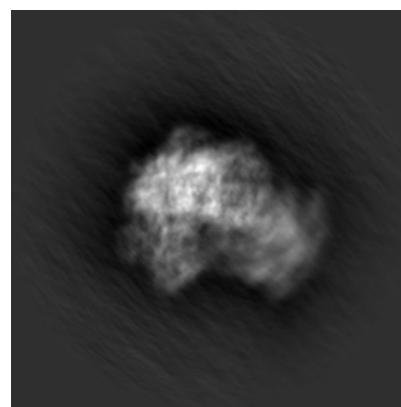
6.1.2 Raw map



X



Y

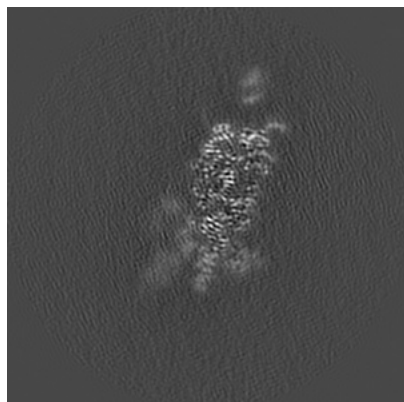


Z

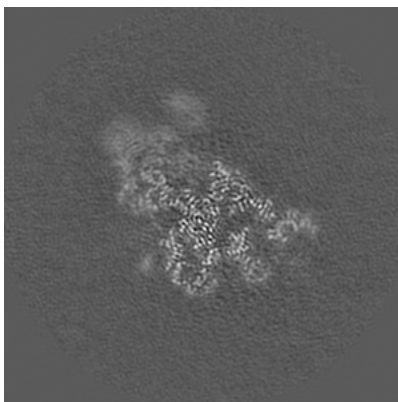
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

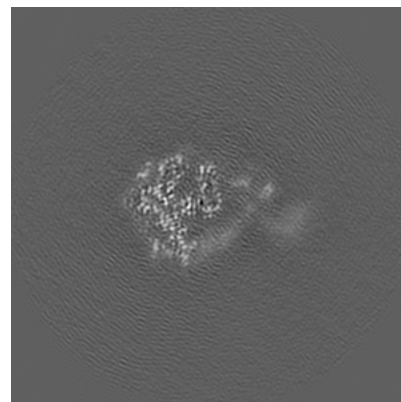
6.2.1 Primary map



X Index: 128

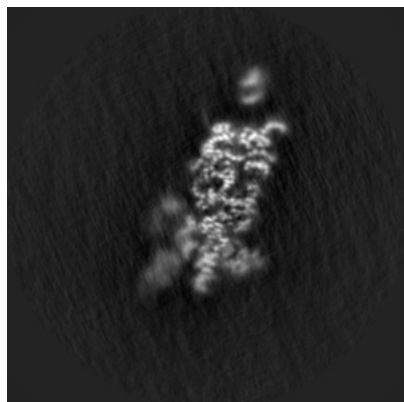


Y Index: 128

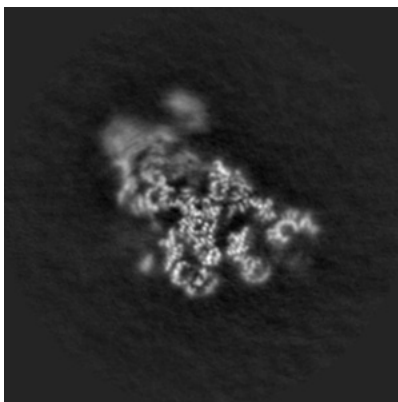


Z Index: 128

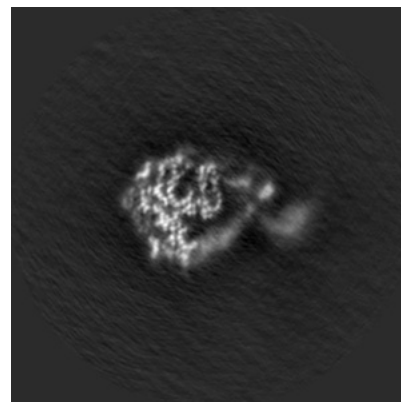
6.2.2 Raw map



X Index: 128



Y Index: 128

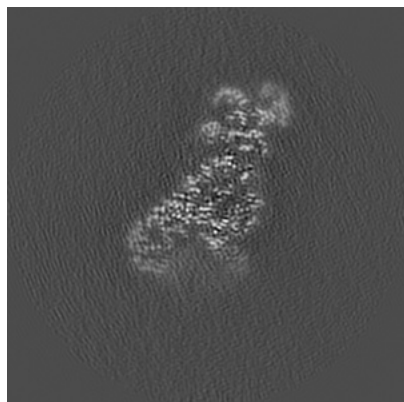


Z Index: 128

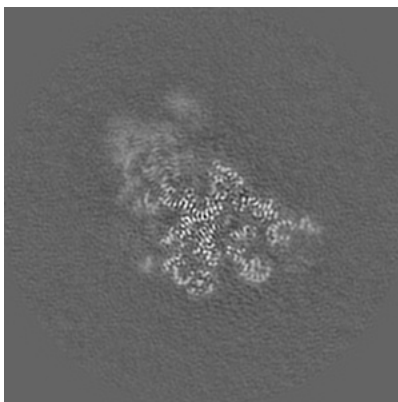
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

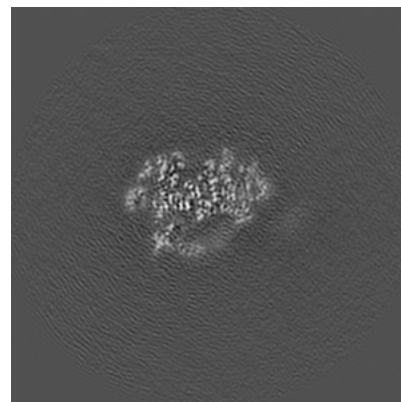
6.3.1 Primary map



X Index: 107

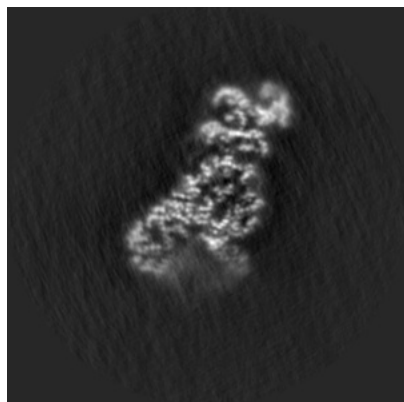


Y Index: 130

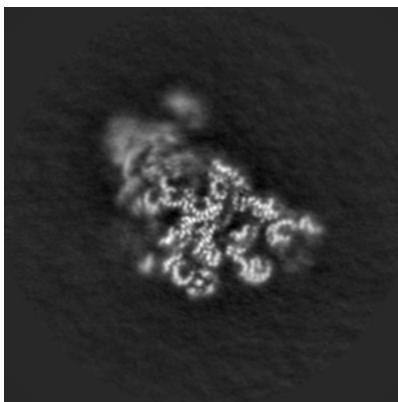


Z Index: 132

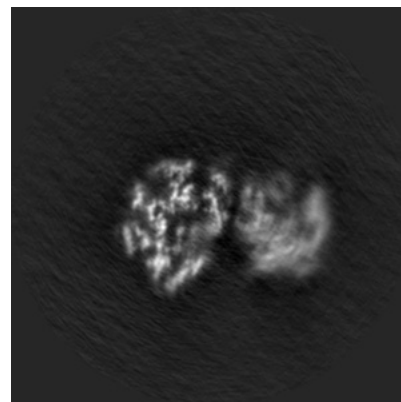
6.3.2 Raw map



X Index: 107



Y Index: 130

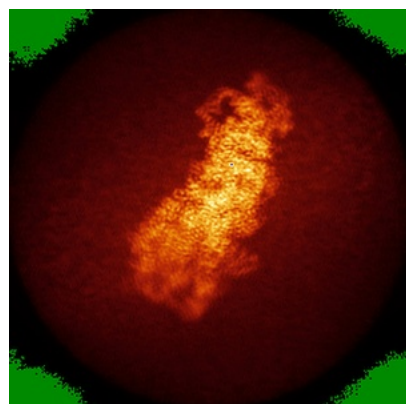


Z Index: 112

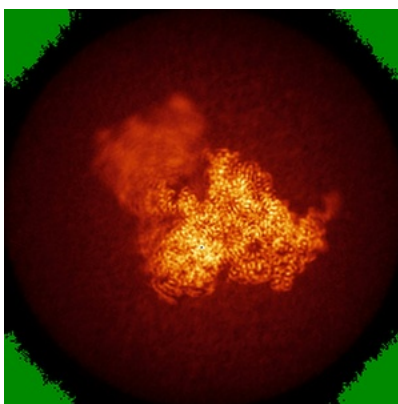
The images above show the largest variance slices of the map in three orthogonal directions.

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

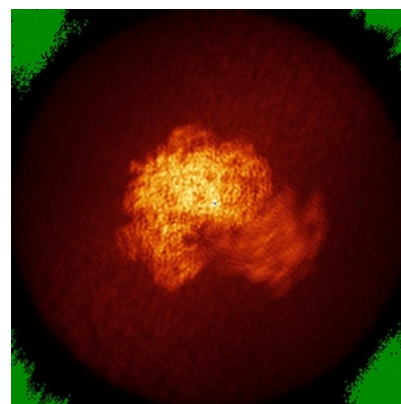
6.4.1 Primary map



X



Y



Z

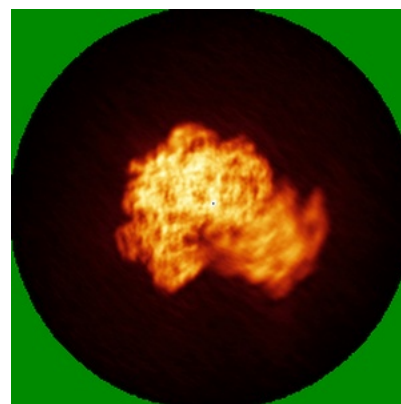
6.4.2 Raw map



X



Y

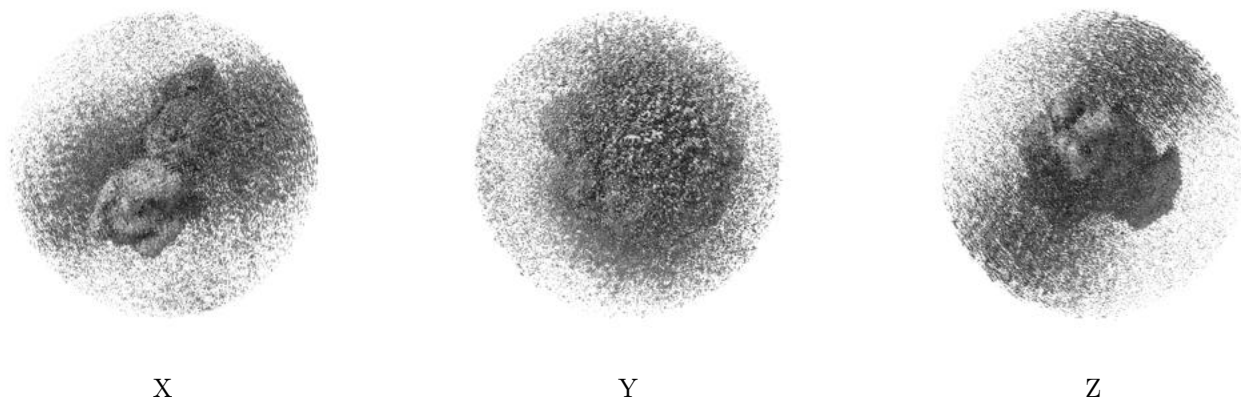


Z

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.

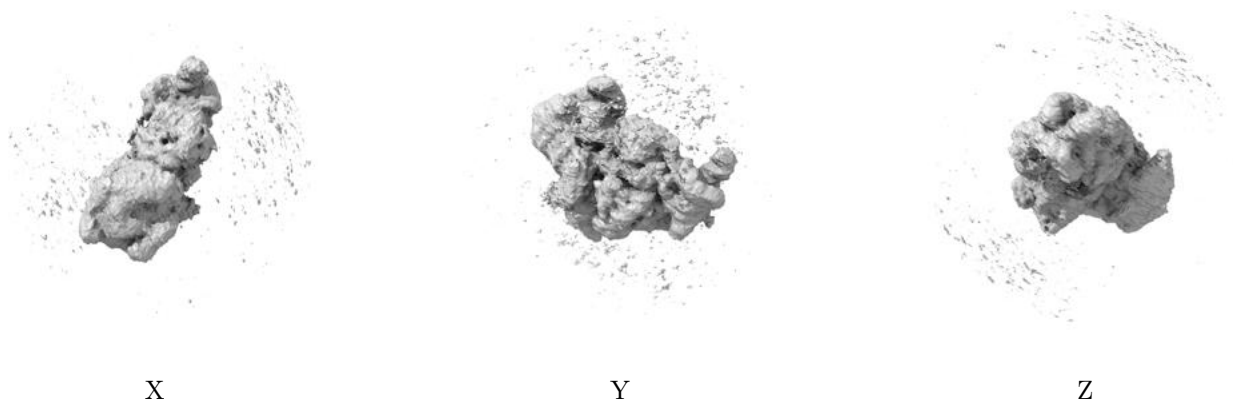
6.5 Orthogonal surface views [i](#)

6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.02. 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.

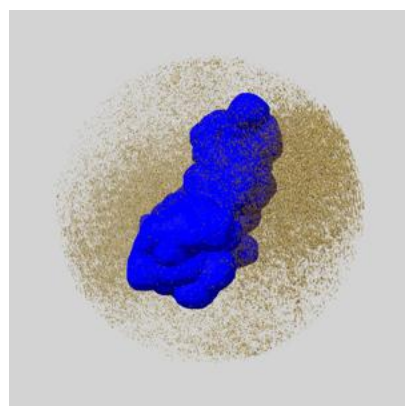
6.6 Mask visualisation [i](#)

This section shows the 3D surface view of the primary map at 50% transparency overlaid with the specified mask at 0% transparency

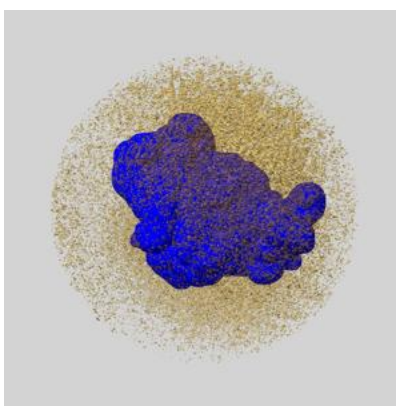
A mask typically either:

- Encompasses the whole structure
- Separates out a domain, a functional unit, a monomer or an area of interest from a larger structure

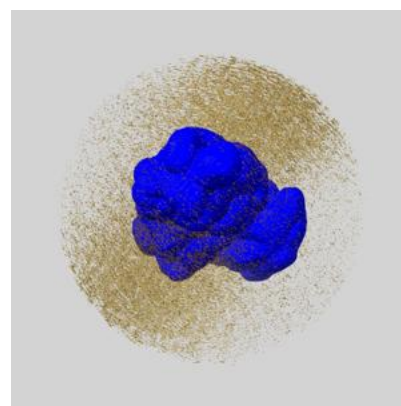
6.6.1 emd_36883_msk_1.map [i](#)



X



Y

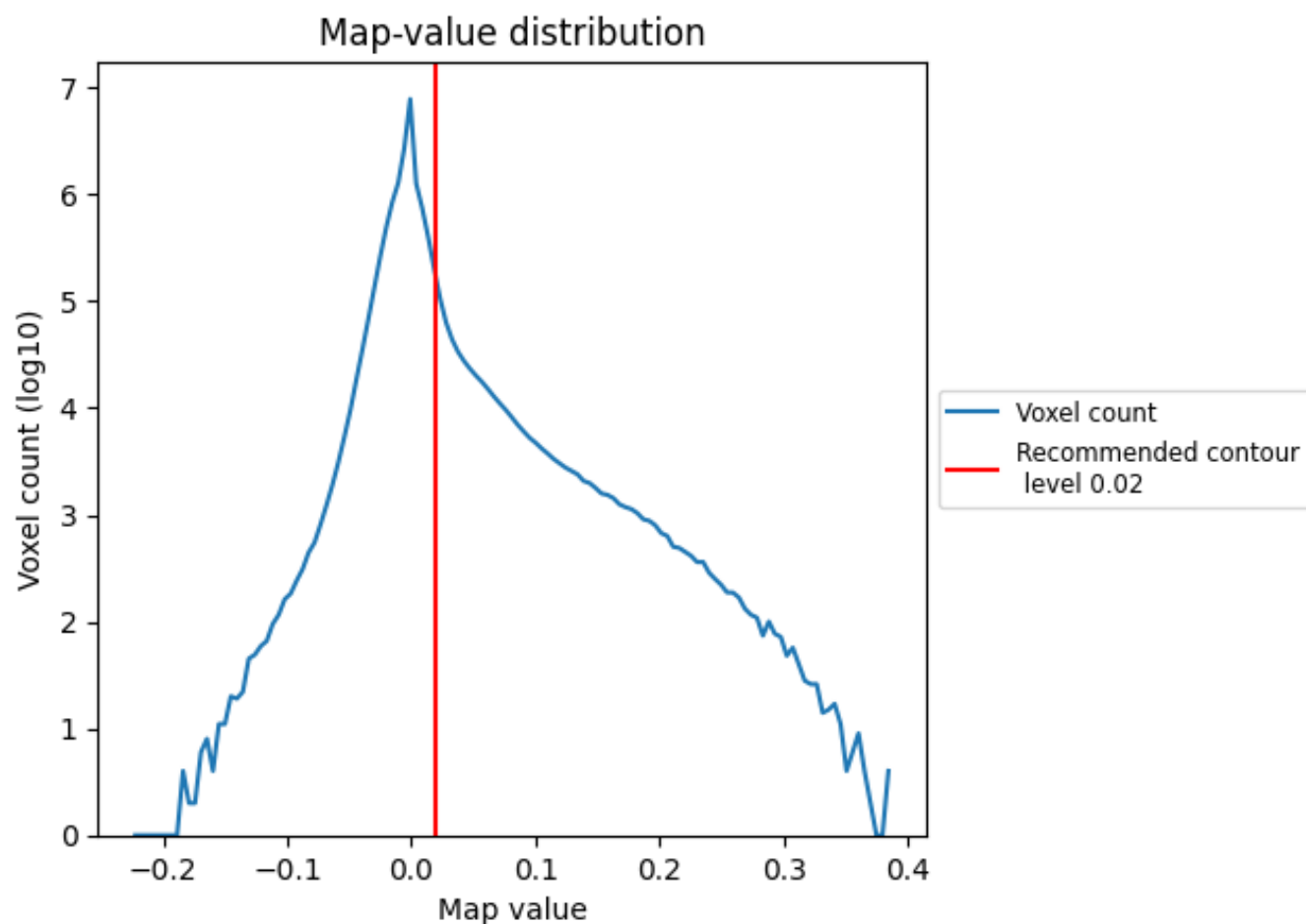


Z

7 Map analysis [i](#)

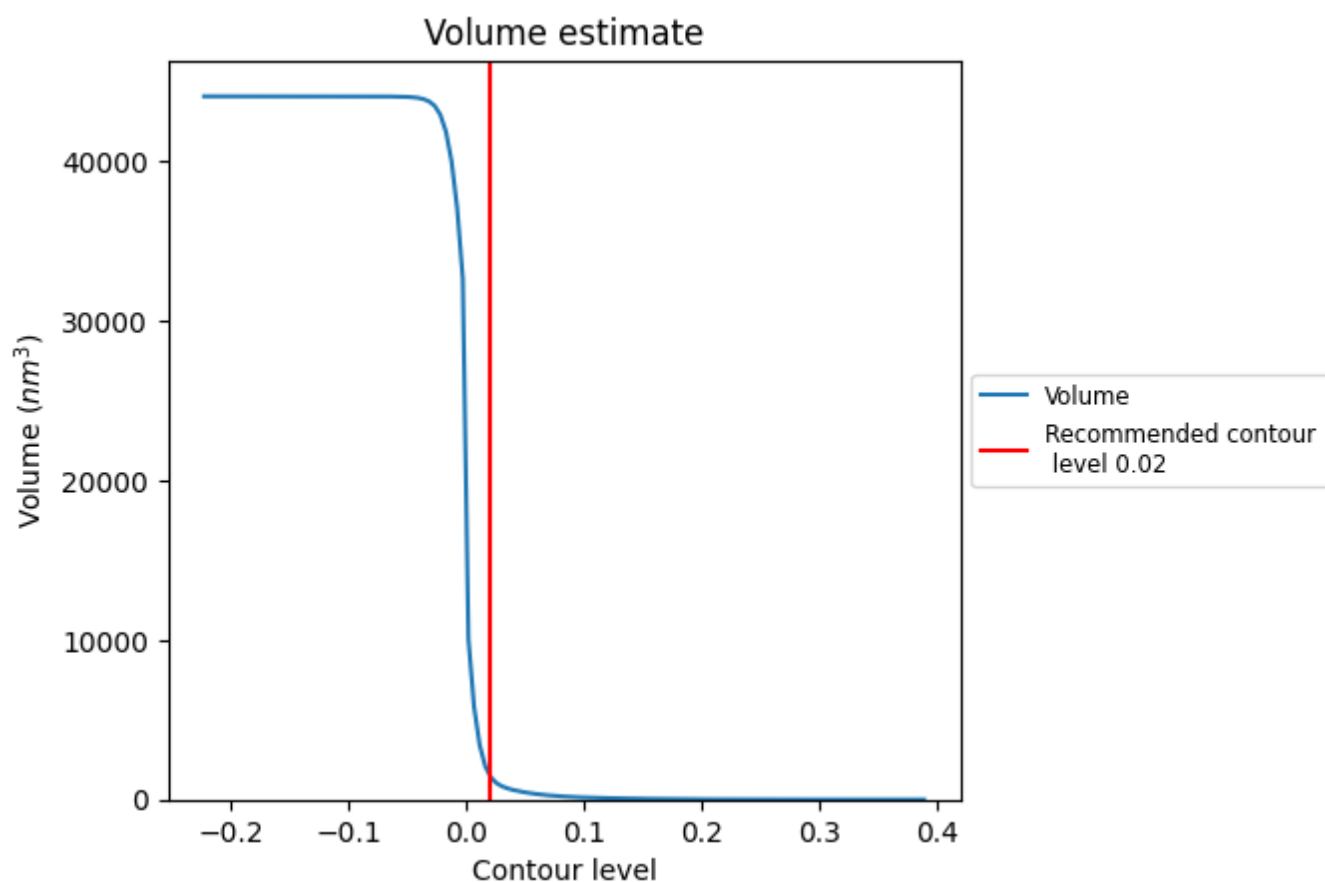
This section contains the results of statistical analysis of the map.

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.

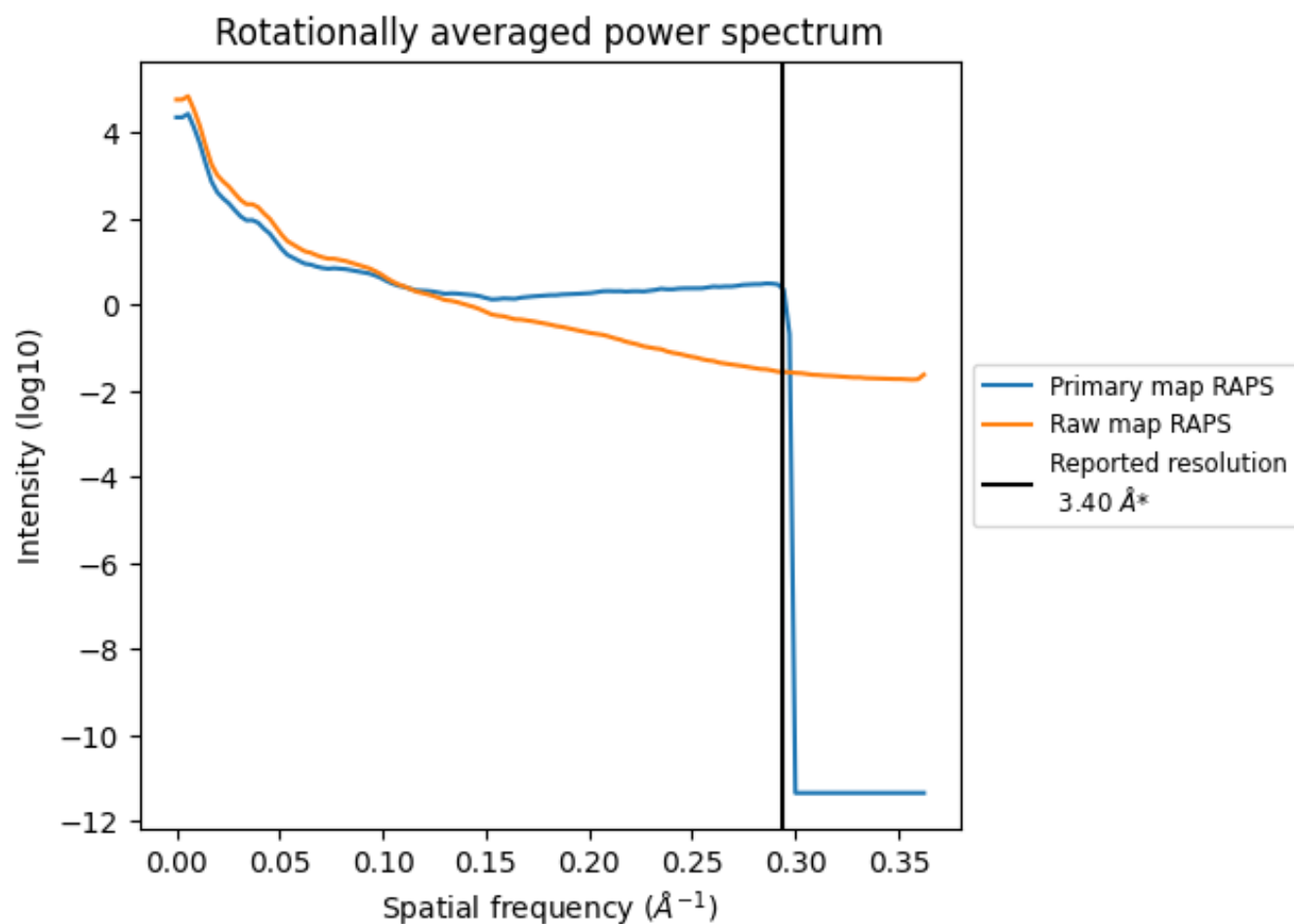
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 1548 nm³; this corresponds to an approximate mass of 1398 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 ⓘ

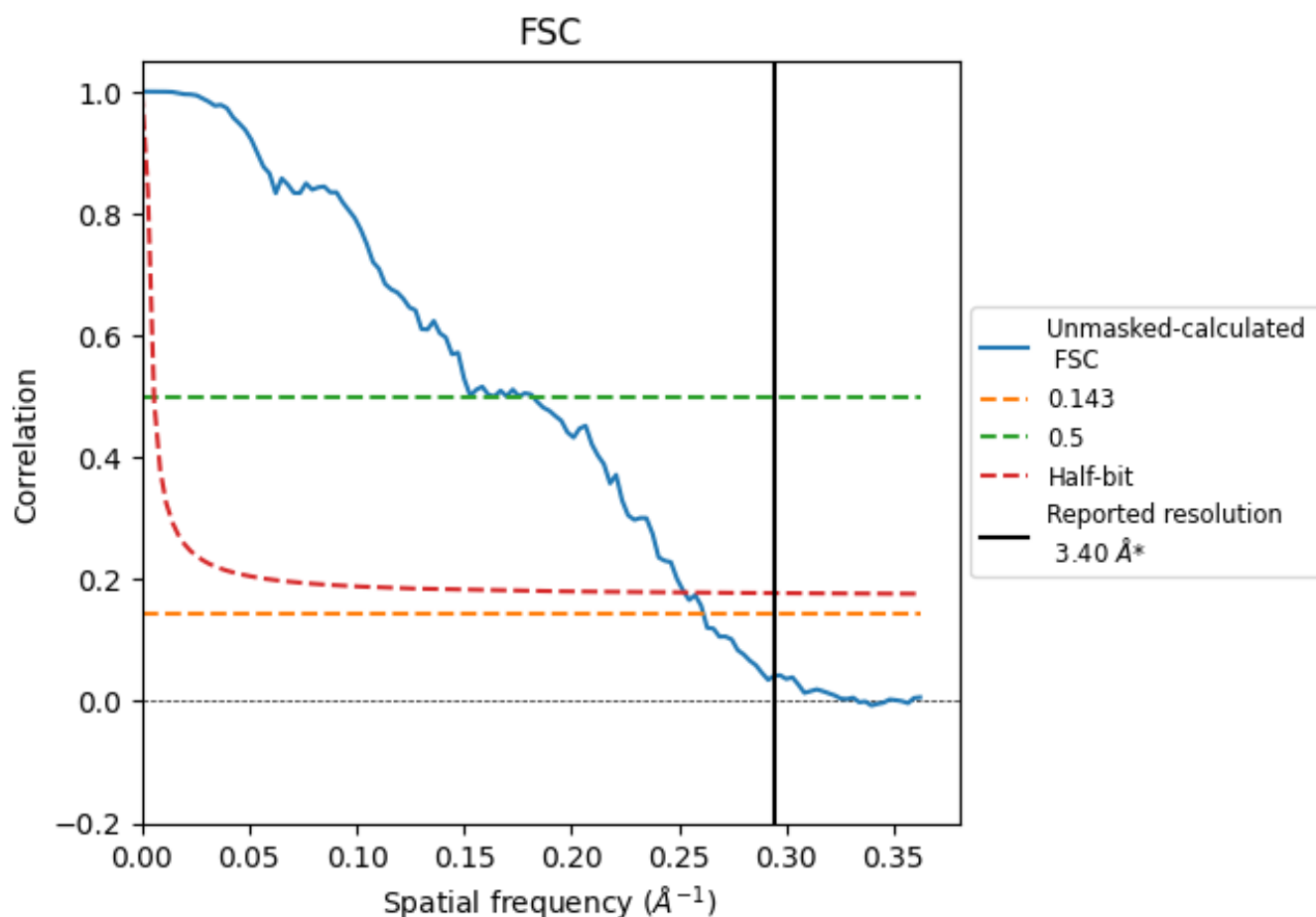


*Reported resolution corresponds to spatial frequency of 0.294 Å⁻¹

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 0.294 Å⁻¹

8.2 Resolution estimates [i](#)

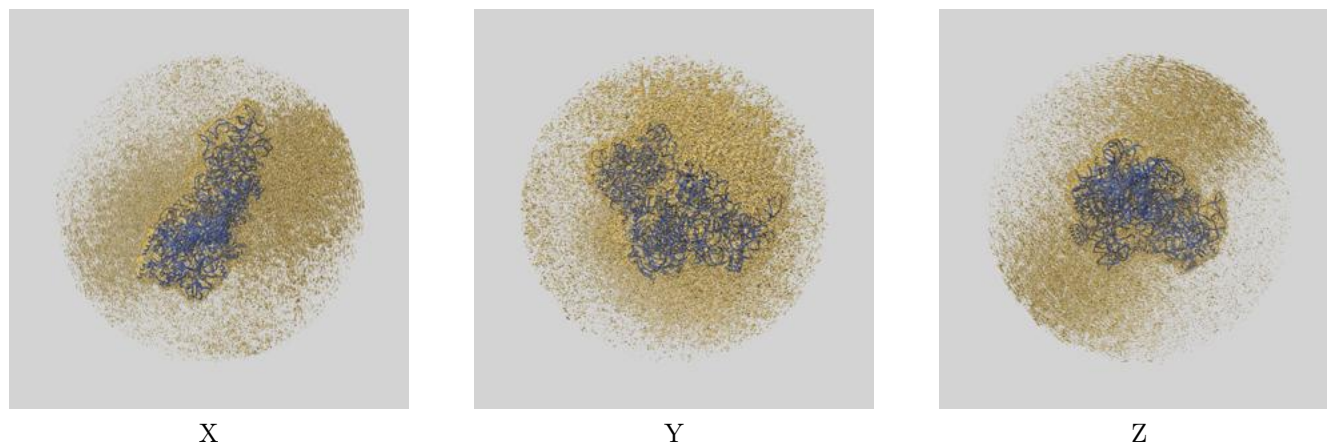
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.40	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	3.82	6.09	3.96

*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 3.82 differs from the reported value 3.4 by more than 10 %

9 Map-model fit [i](#)

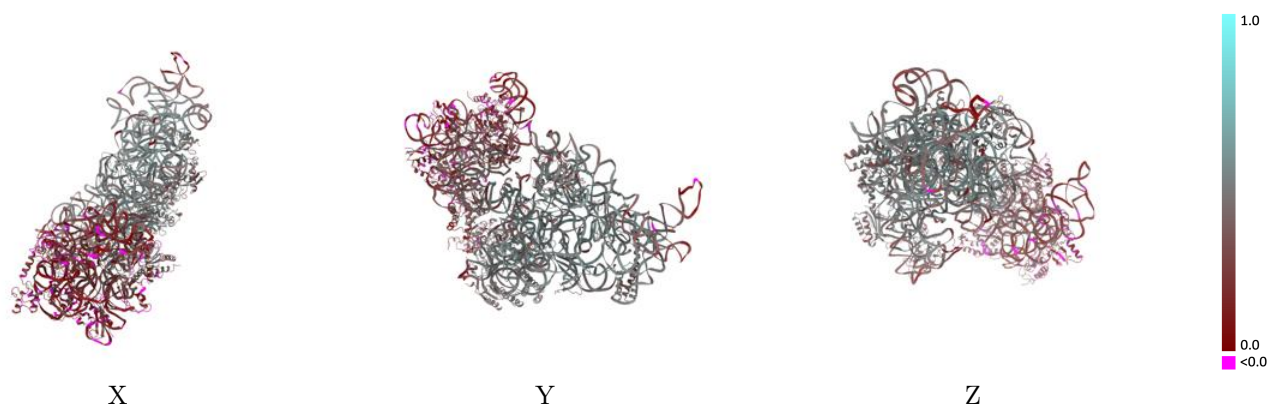
This section contains information regarding the fit between EMDB map EMD-36883 and PDB model 8K4E. Per-residue inclusion information can be found in section [3](#) on page [8](#).

9.1 Map-model overlay [i](#)



The images above show the 3D surface view of the map at the recommended contour level 0.02 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](#)



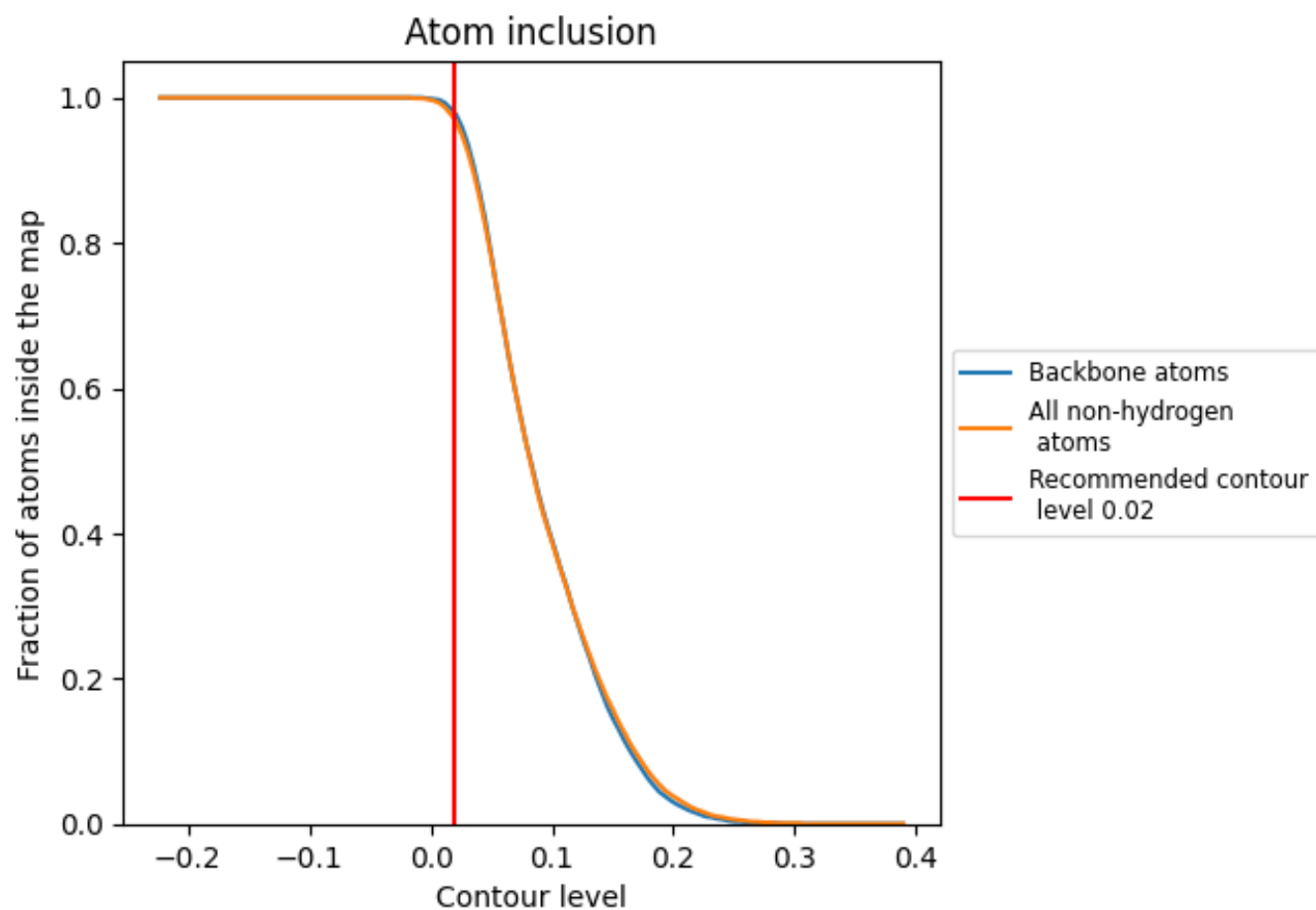
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.02).

9.4 Atom inclusion [i](#)



At the recommended contour level, 98% of all backbone atoms, 97% of all non-hydrogen atoms, are inside the map.

9.5 Map-model fit summary

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

Chain	Atom inclusion	Q-score
All	 0.9700	 0.3690
A	 0.9870	 0.3870
B	 0.9260	 0.3290
C	 0.9320	 0.2710
D	 0.9740	 0.4490
E	 0.9690	 0.4790
F	 0.9470	 0.3880
G	 0.8620	 0.1230
H	 0.9700	 0.4970
I	 0.9470	 0.1620
J	 0.8760	 0.1860
K	 0.9720	 0.3350
L	 0.9670	 0.4930
M	 0.8730	 0.1550
N	 0.9660	 0.2230
O	 0.9780	 0.4670
P	 0.9700	 0.4970
Q	 0.9840	 0.4990
R	 0.9520	 0.4060
S	 0.9080	 0.1250
T	 0.9890	 0.4540
V	 0.7290	 0.2830
X	 0.8280	 0.2340

