



Full wwPDB EM Validation Report ⓘ

Mar 24, 2026 – 05:21 AM UTC

PDB ID : 6F41 / pdb_00006f41
EMDB ID : EMD-4181
Title : RNA Polymerase III initially transcribing complex
Authors : Vorlaender, M.K.; Khatter, H.; Wetzel, R.; Hagen, W.J.H.; Mueller, C.W.
Deposited on : 2017-11-29
Resolution : 4.30 Å(reported)

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

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

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

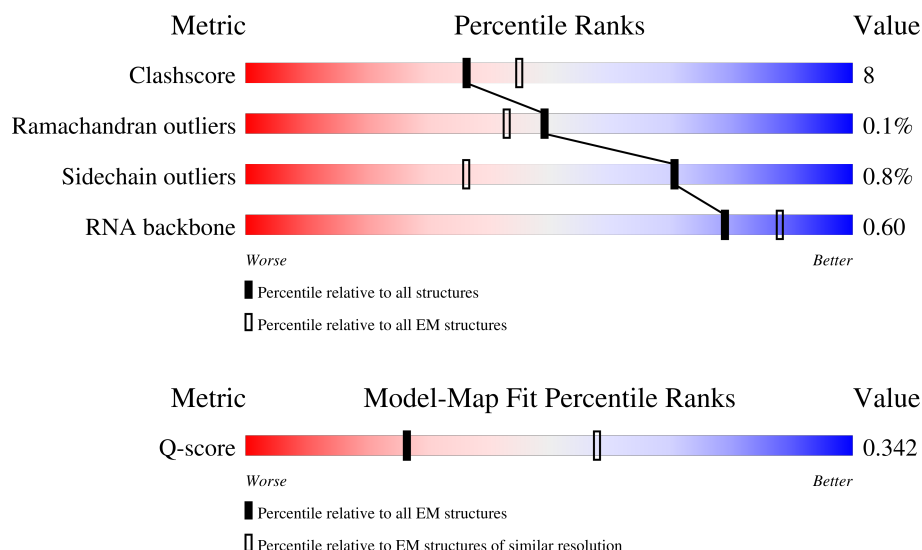
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 4.30 Å.

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



Metric	Whole archive (#Entries)	EM structures (#Entries)	Similar EM resolution (#Entries, resolution range(Å))
Clashscore	229148	23984	-
Ramachandran outliers	224038	23583	-
Sidechain outliers	223484	23102	-
RNA backbone	8273	3508	-
Q-score	-	25397	4585 (3.80 - 4.80)

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

Mol	Chain	Length	Quality of chain
1	A	1460	
2	B	1149	
3	C	335	

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Mol	Chain	Length	Quality of chain
4	D	161	
5	E	215	
6	F	155	
7	G	212	
8	H	146	
9	I	110	
10	J	70	
11	K	142	
12	L	70	
13	M	282	
14	N	422	
15	O	654	
16	P	317	
17	Q	251	
18	U	240	
19	V	596	
20	W	594	
21	R	6	
22	X	81	
23	Y	81	

2 Entry composition

There are 24 unique types of molecules in this entry. The entry contains 47788 atoms, of which 0 are hydrogens and 0 are deuteriums.

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

- Molecule 1 is a protein called DNA-directed RNA polymerase III subunit RPC1.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	1398	Total	C	N	O	S	0	0
			10972	6919	1936	2059	58		

- Molecule 2 is a protein called DNA-directed RNA polymerase III subunit RPC2.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	B	1114	Total	C	N	O	S	0	0
			8788	5558	1516	1654	60		

- Molecule 3 is a protein called DNA-directed RNA polymerases I and III subunit RPAC1.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	C	335	Total	C	N	O	S	0	0
			2655	1681	454	511	9		

- Molecule 4 is a protein called DNA-directed RNA polymerase III subunit RPC9.

Mol	Chain	Residues	Atoms					AltConf	Trace
4	D	119	Total	C	N	O	S	0	0
			977	628	156	187	6		

- Molecule 5 is a protein called DNA-directed RNA polymerases I, II, and III subunit RPABC1.

Mol	Chain	Residues	Atoms					AltConf	Trace
5	E	214	Total	C	N	O	S	0	0
			1751	1111	309	320	11		

- Molecule 6 is a protein called DNA-directed RNA polymerases I, II, and III subunit RPABC2.

Mol	Chain	Residues	Atoms					AltConf	Trace
6	F	83	Total	C	N	O	S	0	0
			671	429	114	125	3		

- Molecule 7 is a protein called DNA-directed RNA polymerase III subunit RPC8.

Mol	Chain	Residues	Atoms					AltConf	Trace
7	G	180	Total	C	N	O	S	0	0
			1448	950	231	261	6		

- Molecule 8 is a protein called DNA-directed RNA polymerases I, II, and III subunit RPABC3.

Mol	Chain	Residues	Atoms					AltConf	Trace
8	H	140	Total	C	N	O	S	0	0
			1120	703	188	224	5		

- Molecule 9 is a protein called DNA-directed RNA polymerase III subunit RPC10.

Mol	Chain	Residues	Atoms					AltConf	Trace
9	I	34	Total	C	N	O	S	0	0
			255	161	39	49	6		

- Molecule 10 is a protein called DNA-directed RNA polymerases I, II, and III subunit RPABC5.

Mol	Chain	Residues	Atoms					AltConf	Trace
10	J	67	Total	C	N	O	S	0	0
			549	350	95	98	6		

- Molecule 11 is a protein called DNA-directed RNA polymerases I and III subunit RPAC2.

Mol	Chain	Residues	Atoms					AltConf	Trace
11	K	101	Total	C	N	O	S	0	0
			792	496	130	161	5		

- Molecule 12 is a protein called DNA-directed RNA polymerases I, II, and III subunit RPABC4.

Mol	Chain	Residues	Atoms					AltConf	Trace
12	L	45	Total	C	N	O	S	0	0
			358	221	71	62	4		

- Molecule 13 is a protein called DNA-directed RNA polymerase III subunit RPC5.

Mol	Chain	Residues	Atoms					AltConf	Trace
13	M	183	Total	C	N	O	S	0	0
			1484	942	257	283	2		

- Molecule 14 is a protein called DNA-directed RNA polymerase III subunit RPC4.

Mol	Chain	Residues	Atoms					AltConf	Trace
14	N	104	Total	C	N	O	S	0	0
			797	505	143	146	3		

- Molecule 15 is a protein called DNA-directed RNA polymerase III subunit RPC3.

Mol	Chain	Residues	Atoms					AltConf	Trace
15	O	534	Total	C	N	O	S	0	0
			4293	2733	736	806	18		

- Molecule 16 is a protein called DNA-directed RNA polymerase III subunit RPC6.

Mol	Chain	Residues	Atoms					AltConf	Trace
16	P	246	Total	C	N	O	S	0	0
			1990	1276	326	377	11		

- Molecule 17 is a protein called DNA-directed RNA polymerase III subunit RPC7.

Mol	Chain	Residues	Atoms				AltConf	Trace
17	Q	35	Total	C	N	O	0	0
			273	181	45	47		

- Molecule 18 is a protein called TATA-box-binding protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
18	U	180	Total	C	N	O	S	0	0
			1416	921	242	247	6		

- Molecule 19 is a protein called Transcription factor IIIB 70 kDa subunit.

Mol	Chain	Residues	Atoms					AltConf	Trace
19	V	337	Total	C	N	O	S	0	0
			2686	1682	486	504	14		

- Molecule 20 is a protein called Transcription factor TFIIB component B”.

Mol	Chain	Residues	Atoms					AltConf	Trace
20	W	218	Total	C	N	O	S	0	0
			1798	1131	319	339	9		

- Molecule 21 is a RNA chain called RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
21	R	6	Total	C	N	O	P	0	0
			126	56	20	44	6		

- Molecule 22 is a DNA chain called Non-Template DNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
22	X	60	Total	C	N	O	P	0	0
			1221	588	204	369	60		

- Molecule 23 is a DNA chain called Template-DNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
23	Y	66	Total	C	N	O	P	0	0
			1361	649	260	386	66		

- Molecule 24 is ZINC ION (CCD ID: ZN) (formula: Zn).

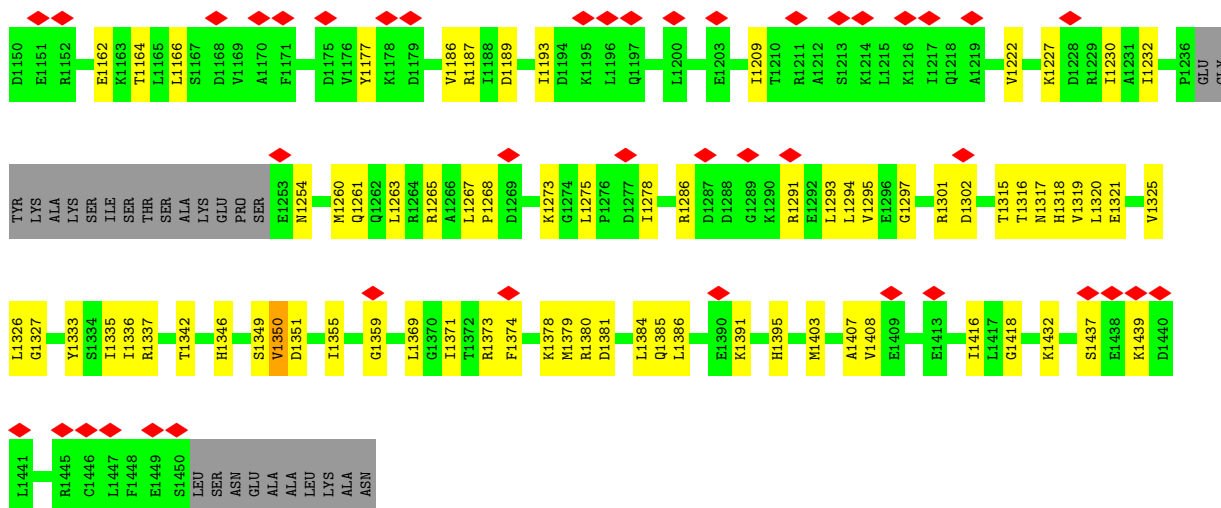
Mol	Chain	Residues	Atoms		AltConf
24	A	2	Total	Zn	0
			2	2	
24	B	1	Total	Zn	0
			1	1	
24	I	1	Total	Zn	0
			1	1	
24	J	1	Total	Zn	0
			1	1	
24	L	1	Total	Zn	0
			1	1	
24	V	1	Total	Zn	0
			1	1	

3 Residue-property plots

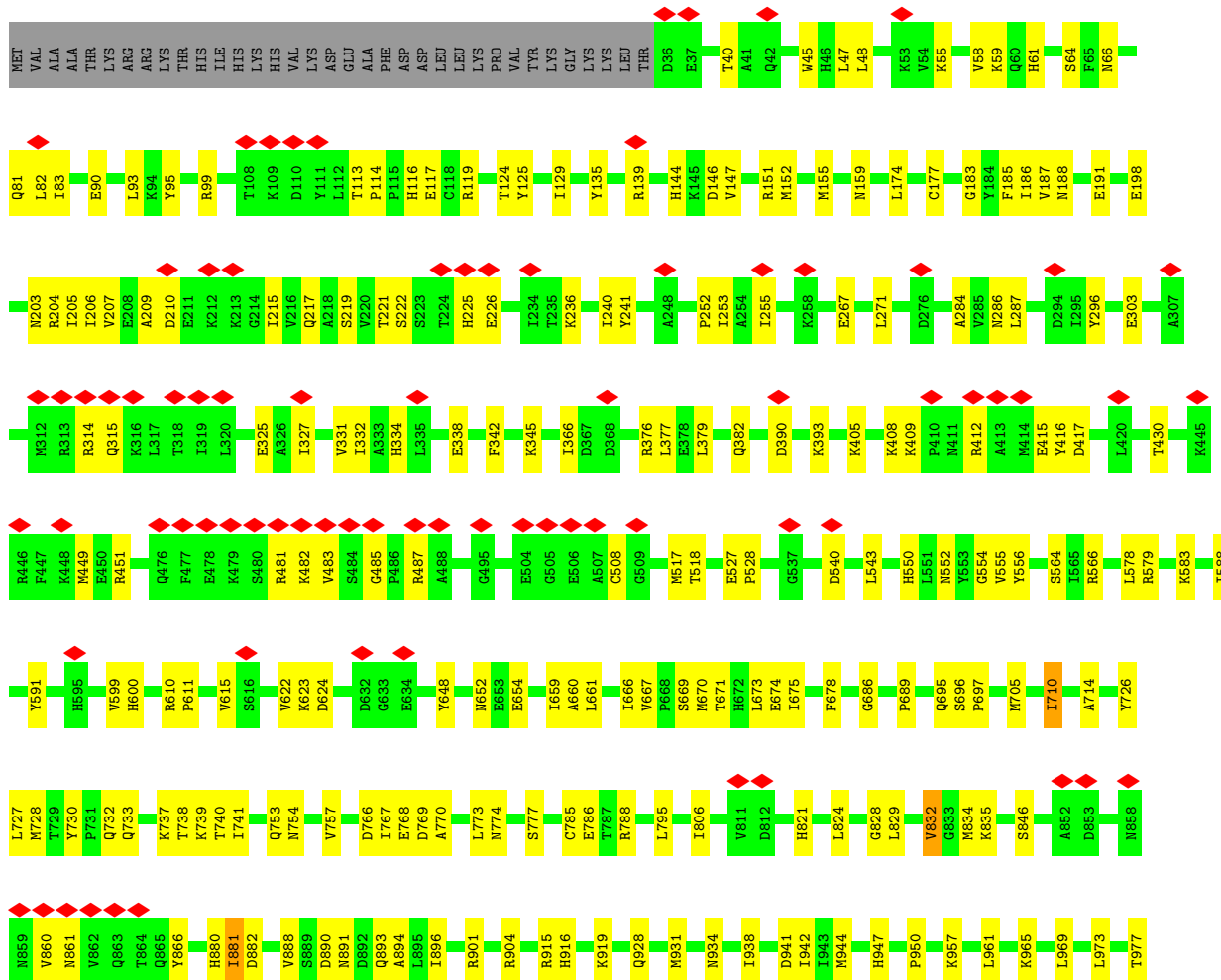
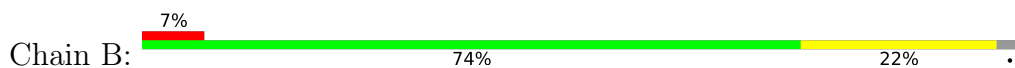
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion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

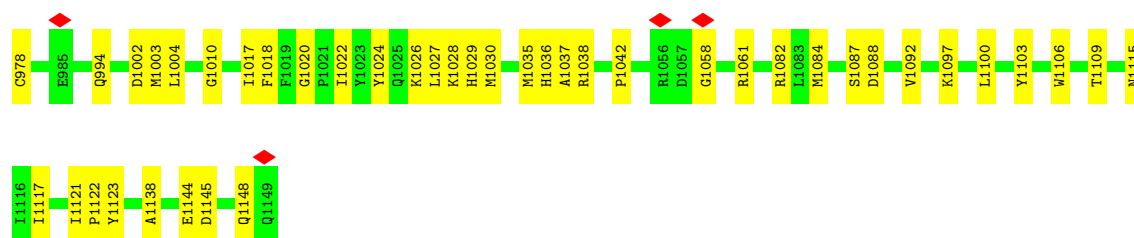
- Molecule 1: DNA-directed RNA polymerase III subunit RPC1



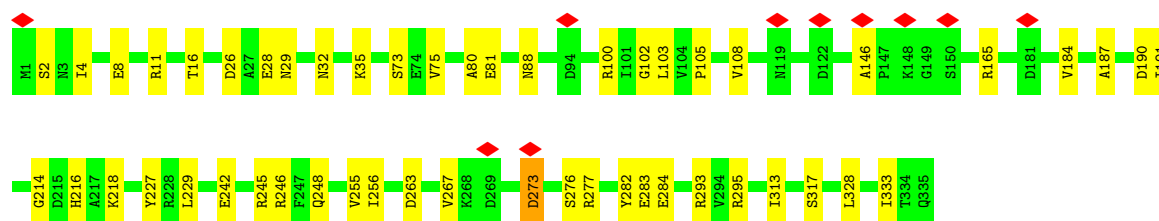
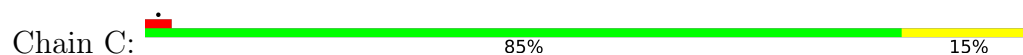


• Molecule 2: DNA-directed RNA polymerase III subunit RPC2

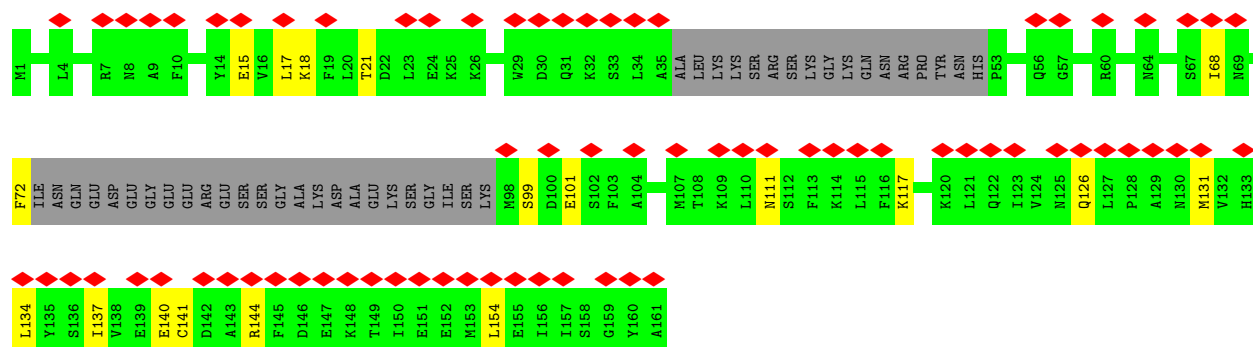




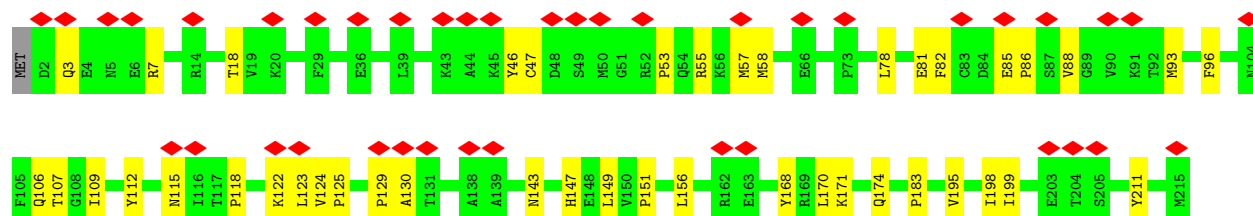
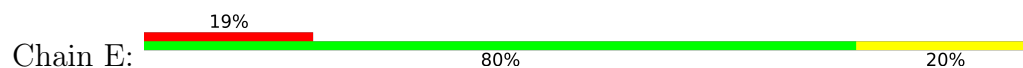
- Molecule 3: DNA-directed RNA polymerases I and III subunit RPAC1



- Molecule 4: DNA-directed RNA polymerase III subunit RPC9



- Molecule 5: DNA-directed RNA polymerases I, II, and III subunit RPABC1



- Molecule 6: DNA-directed RNA polymerases I, II, and III subunit RPABC2



MET SER ASP GLU ALA PHE ASP GLY ASN GLU ASN PHE ASP GLU VAL HIS PHE SER ASP GLU THR TVR GLU LYS PRO PHE GLN LYS ASP GLY THR THR ASP ALA ASN LYS THR ILE VAL THR GLY GLY ASN ASN PRO GLU ASP PHE GLN


HIS GLU GLN ILE ARG LYS THR LEU LYS E71 K72 A73 I74 P75 K76 D77 Q78 T81 Y84 M85 A91 L99 M103 N104 T115 D116 D140 E144 L151 I152 V153 ASP LEU

- Molecule 7: DNA-directed RNA polymerase III subunit RPC8

Chain G: 

MET F2 I3 L4 L10 T27 N31 A35 I38 I39 F40 M41 C45 I46 L59 D63 N69 R73 A74 V75 V76 F77 K78 P79 F80 L81 I84 V85 T86 G87 K88 S89 S90 K91 C92 T93 A94 E95 K98 V99 S100 L101 L102 G103 I104 F105 D106 D107 I108 F109 I110 P111 Q112 M113 M114 L115 L116 E117 G118 C119 Y120 Y121 P123 E124 E125 S126 A127 W128 I129 W130 P131 MET ASP GLU GLU THR K137 L138 Y139 F140 D141 V142 N143 E144 K145 I146 R147 F148 R149 I150 E151 R152 E153 V154 F155 V156 D157 V158 K159 P160 K161 S162 PRO LYS GLU ARG GLU LEU GLU ARG ALA GLN LEU GLU ASN ILE GLU GLY LYS ASN GLU THR PRO GLN E189 K190 P191 P192 A193 Y194 A195 L196 L197 G198 S199 C200 Q201 T202 D203 G204 M205 G206 L207 V208 S209 W210 W211 W212 E212

- Molecule 8: DNA-directed RNA polymerases I, II, and III subunit RPABC3

Chain H: 


M1 S2 D7 Q11 V12 N21 K22 A28 A29 L38 E45 T56 V57 T58 L63 E66 D67 THR PRO ALA ASN ASP SER S74 A75 G85 D86 R87 S88 L89 V96 M97 E106 V107 S108 K109 D110 L111 I112 G119 G120 M123 R124 L125 N139 L143 L144 R145 R146

- Molecule 9: DNA-directed RNA polymerase III subunit RPC10

Chain I: 

M1 L2 S3 S7 L12 L13 G17 D18 S19 G20 R27 F34 ILE GLU GLY ILE GLU ILE TYR ASP ARG LYS LYS LEU PRO ARG LYS GLU VAL ASP ASP VAL LEU GLY GLY TRP ASP ASN VAL ASP GLN THR LYS THR GLN CYS PRO ASN TYR ASP CYS GLY THR LYS ASP

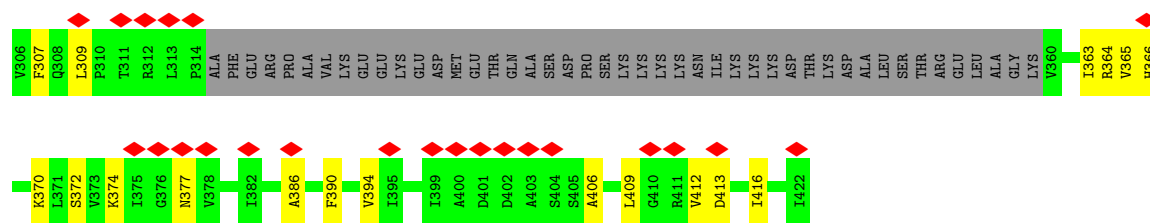
- Molecule 10: DNA-directed RNA polymerases I, II, and III subunit RPABC5

Chain J: 

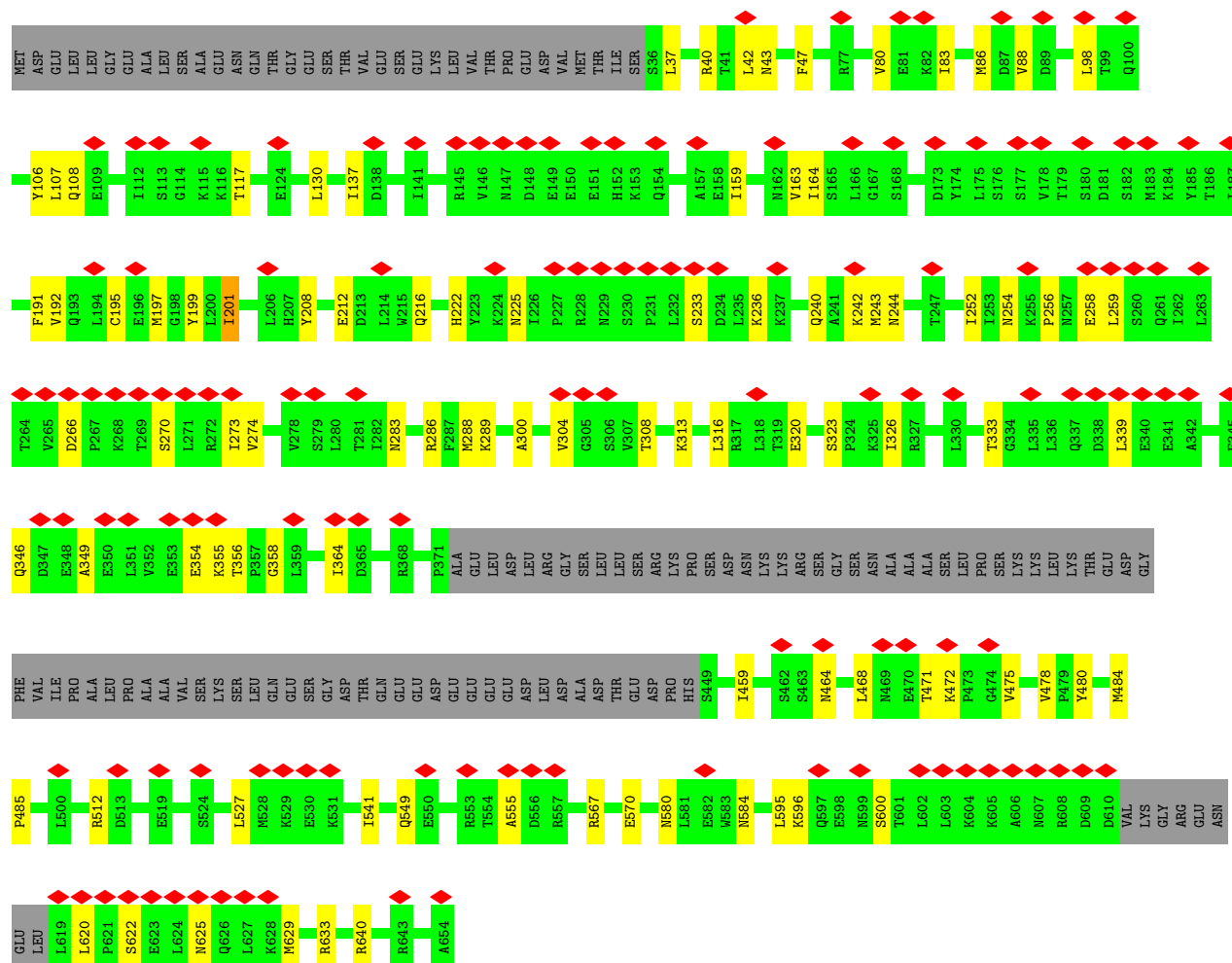
M1 R6 C10 G11 G15 D16 K17 Q26 E27 D31 T34 L39 G40 L41 Y44 C45 C46 T52 E67 LYS ARG ASP

- Molecule 11: DNA-directed RNA polymerases I and III subunit RPAC2

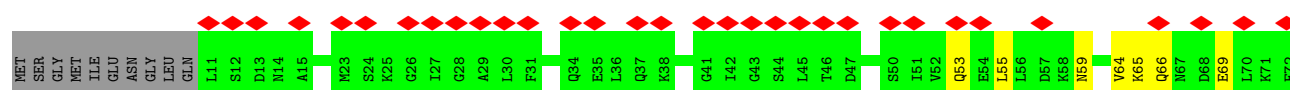


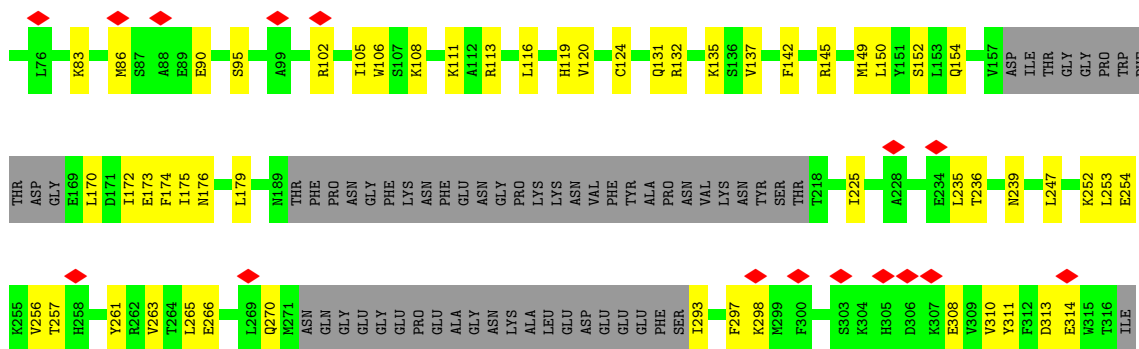


• Molecule 15: DNA-directed RNA polymerase III subunit RPC3

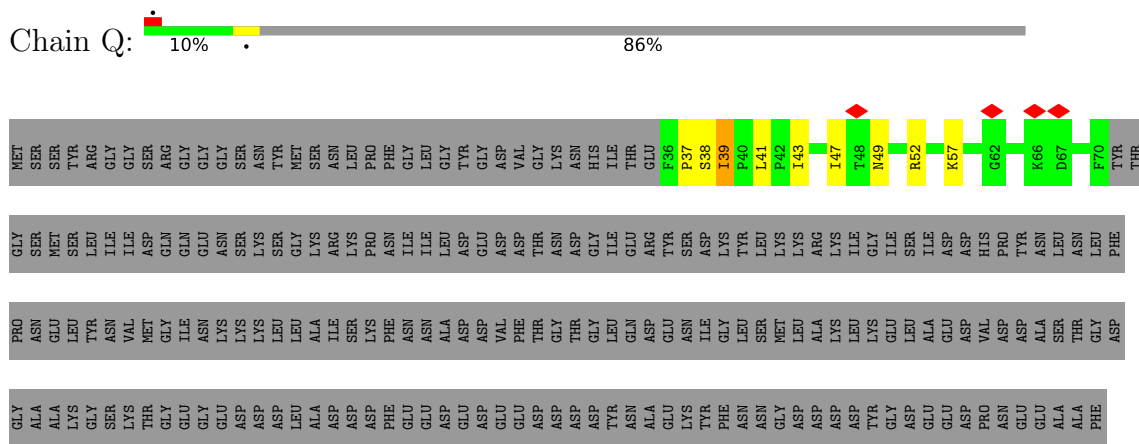


• Molecule 16: DNA-directed RNA polymerase III subunit RPC6

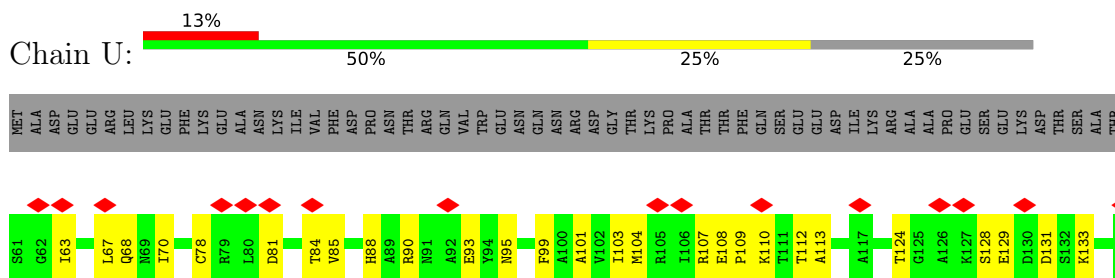




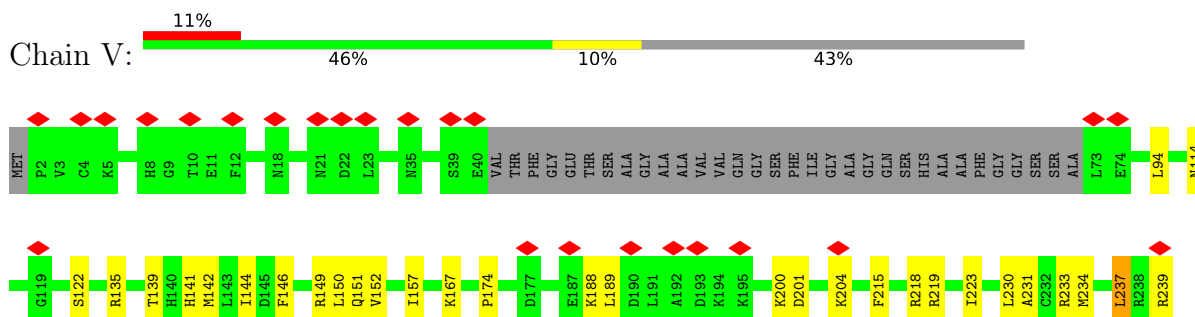
• Molecule 17: DNA-directed RNA polymerase III subunit RPC7

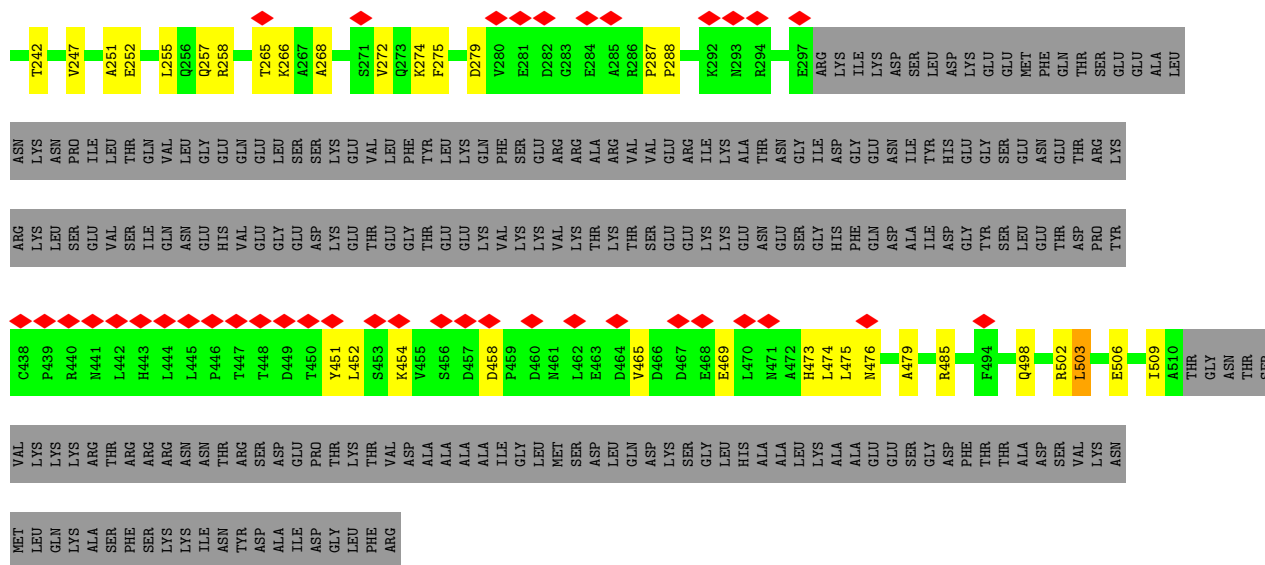


• Molecule 18: TATA-box-binding protein

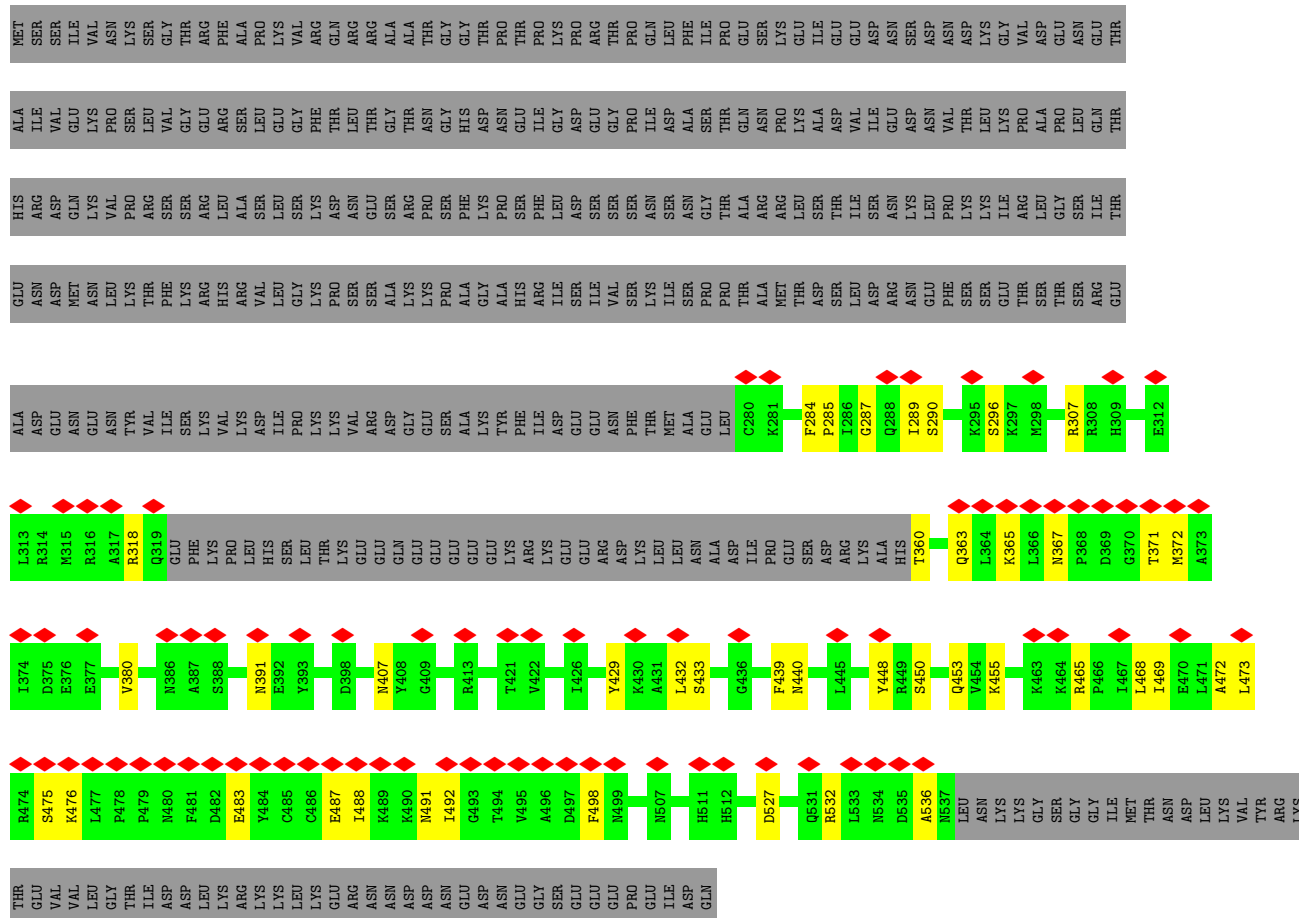


• Molecule 19: Transcription factor IIIB 70 kDa subunit

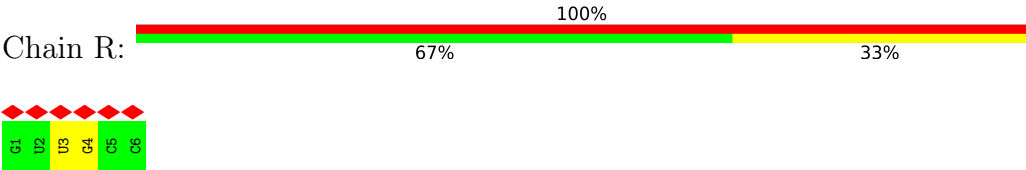




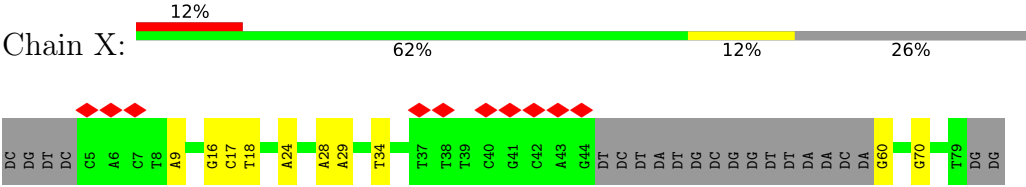
• Molecule 20: Transcription factor TFIIB component B''



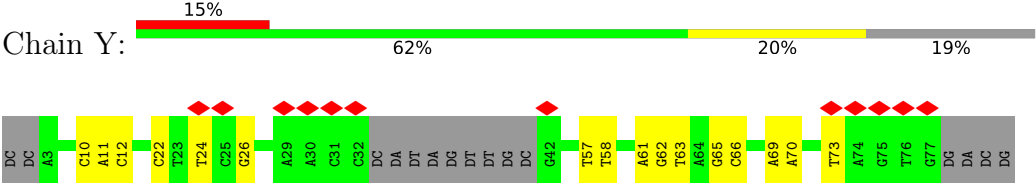
• Molecule 21: RNA



● Molecule 22: Non-Template DNA



● Molecule 23: Template-DNA



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	29951	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	61.3	Depositor
Minimum defocus (nm)	Not provided	
Maximum defocus (nm)	Not provided	
Magnification	Not provided	
Image detector	GATAN K2 SUMMIT (4k x 4k)	Depositor
Maximum map value	0.210	Depositor
Minimum map value	-0.120	Depositor
Average map value	0.001	Depositor
Map value standard deviation	0.008	Depositor
Recommended contour level	0.045	Depositor
Map size (\AA)	324.0, 324.0, 324.0	wwPDB
Map dimensions	240, 240, 240	wwPDB
Map angles ($^\circ$)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (\AA)	1.35, 1.35, 1.35	Depositor

5 Model quality

5.1 Standard geometry

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

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

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
1	A	0.10	0/11168	0.39	0/15086
2	B	0.10	0/8943	0.40	0/12068
3	C	0.10	0/2711	0.39	0/3676
4	D	0.08	0/991	0.31	0/1328
5	E	0.09	0/1787	0.35	0/2406
6	F	0.09	0/683	0.37	0/923
7	G	0.08	0/1486	0.30	0/2017
8	H	0.09	0/1138	0.39	0/1540
9	I	0.09	0/261	0.43	0/354
10	J	0.09	0/558	0.34	0/750
11	K	0.07	0/803	0.30	0/1083
12	L	0.10	0/360	0.40	0/478
13	M	0.08	0/1518	0.37	0/2054
14	N	0.10	0/805	0.39	0/1081
15	O	0.09	0/4358	0.35	1/5879 (0.0%)
16	P	0.10	0/2020	0.39	0/2718
17	Q	0.12	0/281	0.39	0/381
18	U	0.10	0/1443	0.37	0/1942
19	V	0.09	0/2728	0.34	0/3676
20	W	0.09	0/1831	0.38	0/2454
21	R	0.05	0/139	0.10	0/214
22	X	0.21	0/1363	0.45	0/2098
23	Y	0.20	0/1530	0.40	0/2357
All	All	0.10	0/48905	0.38	1/66563 (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
1	A	0	1
3	C	0	2
18	U	0	1
All	All	0	4

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed($^{\circ}$)	Ideal($^{\circ}$)
15	O	364	ILE	N-CA-C	-6.38	107.65	113.71

There are no chirality outliers.

All (4) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	70	CYS	Peptide
3	C	146	ALA	Peptide
3	C	273	ASP	Peptide
18	U	70	ILE	Peptide

5.2 Too-close contacts

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	10972	0	11096	177	0
2	B	8788	0	8904	170	0
3	C	2655	0	2628	34	0
4	D	977	0	983	11	0
5	E	1751	0	1776	28	0
6	F	671	0	692	9	0
7	G	1448	0	1446	18	0
8	H	1120	0	1089	20	0
9	I	255	0	242	5	0
10	J	549	0	559	11	0
11	K	792	0	790	16	0
12	L	358	0	383	9	0
13	M	1484	0	1448	39	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
14	N	797	0	846	21	0
15	O	4293	0	4456	58	0
16	P	1990	0	2030	43	0
17	Q	273	0	285	6	0
18	U	1416	0	1493	43	0
19	V	2686	0	2703	52	0
20	W	1798	0	1789	35	0
21	R	126	0	65	1	0
22	X	1221	0	686	8	0
23	Y	1361	0	744	16	0
24	A	2	0	0	0	0
24	B	1	0	0	0	0
24	I	1	0	0	0	0
24	J	1	0	0	0	0
24	L	1	0	0	0	0
24	V	1	0	0	0	0
All	All	47788	0	47133	716	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 8.

All (716) 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)
3:C:88:ASN:H	12:L:60:ARG:HH22	1.19	0.88
15:O:201:ILE:HD13	15:O:283:ASN:HD22	1.48	0.79
16:P:256:VAL:HG22	16:P:257:THR:HG23	1.67	0.76
1:A:666:LYS:HD2	1:A:670:GLY:HA3	1.66	0.76
13:M:148:LEU:HA	13:M:182:PHE:H	1.52	0.75
11:K:66:VAL:HG12	11:K:67:GLU:HG3	1.69	0.75
2:B:705:MET:HE1	2:B:919:LYS:HD3	1.69	0.75
2:B:904:ARG:NH1	2:B:1030:MET:SD	2.61	0.74
13:M:140:TRP:HD1	13:M:142:GLY:H	1.37	0.73
13:M:164:LYS:HB3	13:M:167:GLN:HB2	1.69	0.73
13:M:111:ARG:HB3	13:M:120:GLU:HB3	1.70	0.73
5:E:3:GLN:HE21	5:E:7:ARG:HH22	1.35	0.73
19:V:146:PHE:O	19:V:149:ARG:NH1	2.21	0.73
20:W:407:ASN:ND2	23:Y:65:DG:OP1	2.22	0.73
15:O:549:GLN:HE21	15:O:567:ARG:HH22	1.38	0.72
5:E:151:PRO:HG2	5:E:198:ILE:HD11	1.72	0.72
14:N:366:HIS:HB2	14:N:370:LYS:HB2	1.72	0.71

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1162:GLU:HA	1:A:1278:ILE:HD11	1.72	0.71
1:A:520:HIS:HB3	2:B:1082:ARG:HH12	1.56	0.70
1:A:577:THR:HG21	11:K:89:CYS:H	1.56	0.70
2:B:695:GLN:HG2	2:B:697:PRO:HD2	1.73	0.70
6:F:75:PRO:HD2	6:F:78:GLN:HE21	1.57	0.68
15:O:40:ARG:NH2	16:P:314:GLU:OE1	2.25	0.68
1:A:217:ARG:HH22	15:O:555:ALA:HA	1.59	0.68
1:A:1369:LEU:HD11	1:A:1379:MET:HG3	1.77	0.67
13:M:92:ASN:HD21	13:M:181:PRO:HG3	1.60	0.67
20:W:450:SER:H	20:W:453:GLN:HE22	1.42	0.66
1:A:373:VAL:HG23	2:B:1087:SER:HB3	1.77	0.66
2:B:667:VAL:HG12	2:B:669:SER:H	1.59	0.66
1:A:1023:ARG:NH2	1:A:1028:MET:SD	2.69	0.66
15:O:233:SER:HB2	15:O:236:LYS:HD3	1.78	0.66
19:V:237:LEU:HB3	20:W:290:SER:HB3	1.78	0.66
1:A:476:ARG:HD3	1:A:517:MET:HE2	1.78	0.65
1:A:630:ASN:ND2	1:A:650:GLY:O	2.28	0.65
9:I:7:SER:O	13:M:146:GLN:NE2	2.28	0.65
1:A:124:LEU:HA	1:A:127:LEU:HD23	1.80	0.64
19:V:215:PHE:HB3	19:V:223:ILE:HG21	1.78	0.64
2:B:1061:ARG:NH1	23:Y:26:DG:OP2	2.30	0.64
15:O:163:VAL:HG13	15:O:164:ILE:HG23	1.79	0.64
18:U:84:THR:O	18:U:88:HIS:NE2	2.29	0.64
15:O:512:ARG:NH1	15:O:570:GLU:OE1	2.30	0.64
1:A:1177:TYR:OH	1:A:1260:MET:SD	2.56	0.64
15:O:580:ASN:O	15:O:584:ASN:ND2	2.31	0.64
7:G:130:TRP:HE3	7:G:137:LYS:HB3	1.61	0.63
3:C:8:GLU:OE2	3:C:11:ARG:NE	2.30	0.63
16:P:135:LYS:NZ	16:P:150:LEU:O	2.28	0.63
18:U:68:GLN:NE2	18:U:163:SER:OG	2.31	0.63
1:A:251:GLY:HA2	1:A:1403:MET:HE1	1.80	0.63
2:B:221:THR:HG21	2:B:334:HIS:H	1.62	0.63
18:U:175:LEU:HD11	18:U:193:LEU:HD21	1.81	0.63
16:P:170:LEU:HD13	16:P:172:ILE:H	1.64	0.62
6:F:99:LEU:HG	6:F:103:MET:HE2	1.80	0.62
1:A:366:GLY:HA2	2:B:1061:ARG:HH21	1.65	0.62
2:B:83:ILE:HD11	2:B:93:LEU:HB2	1.81	0.62
1:A:264:PRO:O	1:A:269:ARG:NH1	2.32	0.62
1:A:473:LEU:HB2	1:A:520:HIS:HB2	1.81	0.62
2:B:610:ARG:NH2	2:B:654:GLU:OE2	2.32	0.62
15:O:289:LYS:HD2	15:O:323:SER:HB2	1.82	0.62

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
18:U:104:MET:HB2	18:U:113:ALA:HB3	1.82	0.61
5:E:168:TYR:HB2	5:E:170:LEU:HD22	1.82	0.61
16:P:173:GLU:CD	16:P:174:PHE:H	2.08	0.61
1:A:389:ILE:HG22	1:A:537:VAL:HG11	1.82	0.61
2:B:888:VAL:HG11	12:L:54:ARG:HH21	1.64	0.61
2:B:1145:ASP:OD2	2:B:1148:GLN:NE2	2.34	0.61
2:B:766:ASP:HA	2:B:770:ALA:HB3	1.82	0.61
18:U:107:ARG:NH2	20:W:469:ILE:O	2.29	0.61
3:C:81:GLU:OE2	12:L:70:ARG:NH2	2.30	0.61
16:P:142:PHE:HB3	16:P:145:ARG:HD2	1.81	0.61
1:A:1045:ASP:O	1:A:1053:LYS:NZ	2.34	0.60
2:B:66:ASN:HD21	2:B:159:ASN:HD21	1.49	0.60
1:A:1261:GLN:OE1	1:A:1265:ARG:NH1	2.34	0.60
3:C:248:GLN:HA	3:C:256:ILE:HD11	1.83	0.60
13:M:218:SER:HB2	20:W:380:VAL:HG12	1.81	0.60
2:B:55:LYS:HG2	2:B:59:LYS:HD3	1.83	0.60
2:B:1028:LYS:HG2	2:B:1029:HIS:H	1.66	0.60
11:K:62:SER:OG	11:K:104:ARG:NH1	2.34	0.60
19:V:258:ARG:NH2	23:Y:63:DT:OP2	2.35	0.60
1:A:117:GLU:HG2	15:O:212:GLU:HG2	1.82	0.59
2:B:944:MET:SD	2:B:1024:TYR:OH	2.60	0.59
1:A:1187:ARG:NH1	1:A:1189:ASP:OD1	2.35	0.59
16:P:86:MET:HE1	16:P:131:GLN:HG3	1.85	0.59
11:K:64:GLN:HE22	11:K:100:LEU:HD13	1.67	0.59
1:A:348:LYS:HG3	1:A:349:PRO:HD3	1.84	0.59
1:A:1166:LEU:HD21	1:A:1268:PRO:HA	1.85	0.59
15:O:288:MET:HG3	15:O:326:ILE:HD13	1.85	0.58
1:A:559:THR:HG21	2:B:947:HIS:HE1	1.69	0.58
16:P:313:ASP:O	16:P:314:GLU:HG3	2.04	0.58
1:A:70:CYS:SG	1:A:71:HIS:N	2.76	0.58
14:N:394:VAL:HG23	14:N:412:VAL:HB	1.84	0.58
18:U:129:GLU:HG2	18:U:133:LYS:HE2	1.86	0.58
1:A:668:VAL:HG22	1:A:677:VAL:HG23	1.84	0.58
22:X:9:DA:H61	23:Y:73:DT:H3	1.50	0.58
1:A:895:ASP:OD1	1:A:1380:ARG:NH2	2.36	0.58
2:B:47:LEU:HD11	2:B:675:ILE:HD11	1.86	0.58
1:A:546:SER:OG	1:A:1349:SER:O	2.20	0.58
6:F:85:MET:HB2	6:F:151:LEU:HB3	1.86	0.57
17:Q:49:ASN:HA	17:Q:52:ARG:HG2	1.86	0.57
18:U:193:LEU:HD23	18:U:206:ILE:HD11	1.85	0.57
20:W:465:ARG:HD3	20:W:468:LEU:HD22	1.84	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:568:ASP:O	8:H:22:LYS:NZ	2.36	0.57
2:B:829:LEU:HD11	2:B:896:ILE:HD12	1.87	0.57
18:U:107:ARG:HA	18:U:110:LYS:HA	1.84	0.57
1:A:599:LYS:HB2	8:H:96:VAL:HG22	1.86	0.57
2:B:686:GLY:HA3	2:B:740:THR:HG21	1.87	0.57
2:B:785:CYS:SG	2:B:1026:LYS:NZ	2.74	0.57
2:B:832:VAL:HA	2:B:881:ILE:HD11	1.86	0.57
2:B:1097:LYS:NZ	2:B:1115:ASN:OD1	2.35	0.57
20:W:450:SER:H	20:W:453:GLN:NE2	2.03	0.57
3:C:73:SER:O	3:C:214:GLY:N	2.38	0.57
18:U:93:GLU:OE2	20:W:439:PHE:N	2.32	0.57
18:U:195:TYR:HD2	18:U:204:LEU:HD21	1.70	0.57
1:A:1374:PHE:O	1:A:1378:LYS:NZ	2.37	0.56
8:H:63:LEU:HG	8:H:89:LEU:HD23	1.86	0.56
1:A:475:ASN:HA	1:A:508:TYR:HE1	1.70	0.56
1:A:714:ILE:HA	1:A:717:VAL:HG12	1.87	0.56
5:E:112:TYR:OH	5:E:115:ASN:O	2.23	0.56
15:O:199:TYR:HA	15:O:283:ASN:HB3	1.87	0.56
2:B:58:VAL:HG12	2:B:61:HIS:HB2	1.85	0.56
2:B:1038:ARG:NH2	2:B:1042:PRO:O	2.30	0.56
9:I:3:SER:HB2	9:I:12:LEU:HB2	1.87	0.56
1:A:252:ARG:HB2	15:O:42:LEU:HD12	1.87	0.56
1:A:1350:VAL:HG23	1:A:1351:ASP:H	1.71	0.56
7:G:39:ILE:HD11	7:G:45:CYS:HB3	1.87	0.56
16:P:154:GLN:NE2	20:W:527:ASP:OD1	2.39	0.56
1:A:632:VAL:HG23	1:A:633:PHE:H	1.71	0.56
2:B:124:THR:HG22	2:B:188:ASN:H	1.71	0.56
13:M:217:LYS:NZ	20:W:360:THR:O	2.37	0.55
2:B:961:LEU:HD23	2:B:1018:PHE:CE2	2.41	0.55
19:V:275:PHE:CE2	19:V:279:ASP:HB2	2.41	0.55
15:O:468:LEU:HD22	15:O:478:VAL:HB	1.87	0.55
3:C:80:ALA:HB3	3:C:102:GLY:HA2	1.87	0.55
5:E:47:CYS:HB2	5:E:53:PRO:HA	1.89	0.55
2:B:207:VAL:HG23	2:B:366:ILE:HD12	1.88	0.55
14:N:291:LEU:HD12	14:N:294:LEU:HD11	1.88	0.55
17:Q:38:SER:C	17:Q:39:ILE:HG13	2.31	0.55
1:A:166:LYS:HA	1:A:178:ILE:HG22	1.89	0.55
1:A:1092:ILE:HA	1:A:1095:GLN:HE21	1.72	0.55
2:B:332:ILE:O	2:B:345:LYS:NZ	2.36	0.55
3:C:165:ARG:NH2	3:C:190:ASP:OD1	2.40	0.55
3:C:229:LEU:HB2	3:C:293:ARG:HD3	1.89	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
16:P:172:ILE:HG22	16:P:173:GLU:H	1.72	0.55
2:B:821:HIS:HA	2:B:824:LEU:HD13	1.89	0.55
3:C:282:TYR:O	3:C:283:GLU:HG3	2.07	0.54
13:M:250:GLY:O	13:M:251:THR:HG22	2.08	0.54
14:N:299:ASN:C	14:N:300:LYS:HD2	2.33	0.54
3:C:28:GLU:CD	3:C:29:ASN:H	2.15	0.54
1:A:1050:ASP:HA	1:A:1053:LYS:HE2	1.90	0.54
2:B:1100:LEU:HD21	2:B:1109:THR:HG21	1.88	0.54
14:N:305:MET:HA	14:N:412:VAL:HG13	1.88	0.54
1:A:999:ASP:OD1	1:A:1002:ARG:NH1	2.41	0.54
8:H:11:GLN:O	8:H:29:ALA:N	2.40	0.54
1:A:1373:ARG:HD3	1:A:1391:LYS:HD3	1.90	0.54
2:B:773:LEU:HB3	2:B:942:ILE:HG12	1.89	0.54
1:A:1355:ILE:O	1:A:1359:GLY:N	2.40	0.54
22:X:60:DG:H1	23:Y:22:DC:H2'	1.72	0.54
2:B:1036:HIS:CE1	2:B:1058:GLY:HA3	2.43	0.54
11:K:88:PHE:HB3	11:K:106:GLN:HB3	1.89	0.54
2:B:757:VAL:HG11	2:B:944:MET:HE2	1.89	0.53
2:B:1027:LEU:HD23	2:B:1028:LYS:H	1.72	0.53
13:M:110:ALA:HB3	13:M:245:LEU:HB2	1.90	0.53
15:O:199:TYR:HB3	15:O:286:ARG:HB3	1.91	0.53
19:V:188:LYS:HD2	19:V:247:VAL:HG13	1.89	0.53
1:A:834:HIS:NE2	2:B:674:GLU:OE2	2.41	0.53
1:A:1038:GLU:OE1	1:A:1039:LEU:HD13	2.08	0.53
2:B:129:ILE:HD11	2:B:152:MET:HB2	1.90	0.53
2:B:252:PRO:HG2	2:B:255:ILE:HD13	1.89	0.53
8:H:106:GLU:HA	8:H:112:ILE:HA	1.90	0.53
2:B:591:TYR:HB2	2:B:652:ASN:HB3	1.89	0.53
13:M:95:ARG:HH11	14:N:390:PHE:HE2	1.57	0.53
13:M:137:GLU:O	13:M:141:ASN:ND2	2.42	0.53
16:P:253:LEU:HD12	16:P:261:TYR:HB3	1.90	0.53
1:A:789:ASN:ND2	1:A:791:PRO:HD2	2.24	0.53
1:A:1148:ASP:O	1:A:1291:ARG:NH1	2.42	0.53
15:O:640:ARG:NH2	16:P:308:GLU:O	2.42	0.53
2:B:678:PHE:HB2	2:B:978:CYS:HB2	1.90	0.53
5:E:55:ARG:HA	5:E:58:MET:HE1	1.90	0.53
12:L:31:CYS:SG	12:L:32:ALA:N	2.82	0.53
1:A:1121:LEU:O	1:A:1342:THR:OG1	2.27	0.53
2:B:666:ILE:HD11	2:B:673:LEU:HD12	1.89	0.53
3:C:11:ARG:HH22	8:H:21:ASN:HB3	1.74	0.53
1:A:1141:ILE:HD11	1:A:1295:VAL:HB	1.92	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:948:ASN:OD1	1:A:950:GLN:NE2	2.42	0.52
1:A:554:THR:OG1	1:A:555:GLN:OE1	2.25	0.52
1:A:974:LEU:HD21	1:A:1002:ARG:HH21	1.74	0.52
4:D:141:CYS:SG	4:D:144:ARG:NH2	2.83	0.52
13:M:74:PHE:N	14:N:363:ILE:O	2.33	0.52
1:A:553:ALA:HB2	1:A:697:MET:HE1	1.90	0.52
18:U:109:PRO:O	18:U:110:LYS:HG3	2.10	0.52
19:V:265:THR:HG23	19:V:266:LYS:H	1.74	0.52
4:D:15:GLU:HA	4:D:18:LYS:HB3	1.92	0.52
19:V:231:ALA:HA	19:V:234:MET:HE2	1.91	0.52
4:D:131:MET:HE3	4:D:154:LEU:HD23	1.91	0.52
1:A:859:PRO:HD3	2:B:661:LEU:HD21	1.90	0.52
1:A:884:TYR:OH	1:A:888:ARG:NH2	2.42	0.52
2:B:151:ARG:H	2:B:430:THR:HG22	1.74	0.52
2:B:210:ASP:H	2:B:215:ILE:HG22	1.74	0.52
8:H:38:LEU:HB3	8:H:125:LEU:HB3	1.92	0.52
18:U:112:THR:OG1	18:U:124:THR:O	2.26	0.52
18:U:159:ASN:HD21	18:U:216:GLY:H	1.58	0.52
2:B:59:LYS:NZ	2:B:518:THR:O	2.42	0.52
2:B:730:TYR:OH	3:C:100:ARG:NH1	2.43	0.52
5:E:156:LEU:HD21	5:E:195:VAL:HG23	1.91	0.52
2:B:754:ASN:HD21	10:J:52:THR:HG21	1.75	0.52
1:A:1186:VAL:HG23	1:A:1230:ILE:HG23	1.91	0.52
19:V:251:ALA:HB2	20:W:407:ASN:HD22	1.74	0.52
15:O:192:VAL:HG22	15:O:274:VAL:HG13	1.92	0.51
1:A:19:SER:O	2:B:1138:ALA:N	2.37	0.51
1:A:386:ASN:O	1:A:699:LYS:NZ	2.43	0.51
1:A:464:ARG:NH1	1:A:467:GLU:OE2	2.43	0.51
1:A:502:GLU:HG2	2:B:767:ILE:HG13	1.92	0.51
1:A:550:ILE:HD12	1:A:551:ILE:HD12	1.92	0.51
1:A:716:ASP:O	1:A:789:ASN:ND2	2.38	0.51
1:A:1278:ILE:HG22	1:A:1297:GLY:HA3	1.91	0.51
1:A:1301:ARG:HE	1:A:1325:VAL:HG13	1.75	0.51
13:M:105:PRO:HB2	13:M:123:ILE:HD11	1.93	0.51
14:N:374:LYS:NZ	14:N:377:ASN:O	2.29	0.51
18:U:164:CYS:SG	18:U:165:ASP:N	2.83	0.51
5:E:107:THR:HB	5:E:130:ALA:HB3	1.92	0.51
15:O:354:GLU:HG2	15:O:355:LYS:HG2	1.93	0.51
1:A:921:LEU:HD11	1:A:926:MET:HE3	1.92	0.51
5:E:78:LEU:HD11	5:E:109:ILE:HD12	1.93	0.51
1:A:607:LYS:NZ	8:H:119:GLY:O	2.43	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:C:105:PRO:HB2	3:C:187:ALA:HB3	1.92	0.51
12:L:48:CYS:HB3	12:L:56:LEU:HD21	1.91	0.51
17:Q:47:ILE:O	17:Q:52:ARG:NH2	2.44	0.51
1:A:12:ARG:N	2:B:1144:GLU:O	2.42	0.51
1:A:475:ASN:HB3	1:A:485:ILE:HG13	1.93	0.51
1:A:508:TYR:HB3	1:A:517:MET:HE1	1.92	0.51
10:J:31:ASP:HB3	10:J:34:THR:HG22	1.93	0.51
2:B:113:THR:OG1	2:B:117:GLU:OE1	2.29	0.51
2:B:806:ILE:HG22	2:B:828:GLY:HA3	1.92	0.51
1:A:1315:THR:OG1	1:A:1337:ARG:NH2	2.44	0.50
18:U:88:HIS:HB2	19:V:475:LEU:HD22	1.91	0.50
18:U:133:LYS:HE3	19:V:452:LEU:HA	1.93	0.50
2:B:969:LEU:HD11	2:B:994:GLN:HG2	1.94	0.50
19:V:239:ARG:NH2	20:W:285:PRO:HD2	2.26	0.50
20:W:483:GLU:O	20:W:487:GLU:N	2.43	0.50
1:A:1335:ILE:HD11	1:A:1359:GLY:HA2	1.94	0.50
2:B:198:GLU:HB3	2:B:377:LEU:HD23	1.93	0.50
7:G:207:LEU:HG	7:G:209:SER:H	1.76	0.50
2:B:81:GLN:NE2	2:B:95:TYR:O	2.45	0.50
2:B:483:VAL:HG12	2:B:485:GLY:H	1.76	0.50
2:B:846:SER:HB3	2:B:866:TYR:HB3	1.92	0.50
3:C:16:THR:O	3:C:295:ARG:NH1	2.45	0.50
19:V:200:LYS:HG3	19:V:204:LYS:NZ	2.26	0.50
15:O:130:LEU:HD23	15:O:130:LEU:H	1.75	0.50
18:U:188:GLU:O	19:V:219:ARG:NH2	2.40	0.50
2:B:409:LYS:HB2	2:B:412:ARG:HB3	1.94	0.50
2:B:961:LEU:HB2	2:B:1022:ILE:HD11	1.94	0.50
13:M:195:GLN:HG3	13:M:199:ARG:HH11	1.77	0.50
8:H:7:ASP:OD1	8:H:58:THR:OG1	2.23	0.50
1:A:379:THR:HG22	2:B:1035:MET:HA	1.94	0.49
19:V:201:ASP:HA	19:V:204:LYS:HE2	1.93	0.49
1:A:117:GLU:HA	1:A:120:LYS:HE3	1.94	0.49
1:A:1275:LEU:HD11	1:A:1302:ASP:HB3	1.93	0.49
1:A:153:ARG:HH12	15:O:339:LEU:HB3	1.77	0.49
2:B:271:LEU:O	2:B:550:HIS:NE2	2.44	0.49
13:M:95:ARG:NH1	14:N:412:VAL:O	2.42	0.49
15:O:464:ASN:ND2	16:P:254:GLU:OE2	2.45	0.49
1:A:703:ARG:NH2	11:K:93:ILE:O	2.41	0.49
2:B:705:MET:HB3	2:B:1027:LEU:HD11	1.93	0.49
2:B:738:THR:HG23	2:B:977:THR:HA	1.95	0.49
3:C:191:ILE:HG23	10:J:15:GLY:HA3	1.95	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
5:E:118:PRO:O	5:E:122:LYS:NZ	2.44	0.49
16:P:102:ARG:HH21	16:P:154:GLN:HE21	1.61	0.49
16:P:311:TYR:CD2	17:Q:37:PRO:HG2	2.47	0.49
3:C:245:ARG:NH1	3:C:263:ASP:OD2	2.44	0.49
15:O:37:LEU:HA	15:O:40:ARG:HE	1.77	0.49
15:O:222:HIS:HA	15:O:225:ASN:HD22	1.78	0.49
18:U:169:PRO:O	18:U:239:LYS:NZ	2.30	0.49
2:B:615:VAL:HB	2:B:671:THR:HA	1.94	0.49
4:D:140:GLU:HG3	4:D:144:ARG:HH12	1.77	0.49
8:H:56:THR:HB	8:H:145:ARG:HG2	1.93	0.49
16:P:236:THR:HG23	16:P:239:ASN:H	1.76	0.49
18:U:196:ARG:HG3	18:U:203:VAL:HG12	1.94	0.49
19:V:485:ARG:HG3	20:W:498:PHE:HB2	1.94	0.49
1:A:90:VAL:HG21	1:A:323:VAL:HG11	1.95	0.49
1:A:583:MET:HB2	1:A:696:ARG:HG2	1.94	0.49
1:A:1432:LYS:HB2	7:G:59:LEU:HD11	1.95	0.49
2:B:527:GLU:HG2	2:B:528:PRO:HD3	1.94	0.49
1:A:787:ASN:ND2	8:H:21:ASN:OD1	2.45	0.48
2:B:155:MET:HE3	2:B:183:GLY:HA2	1.95	0.48
2:B:186:ILE:HA	2:B:191:GLU:HA	1.94	0.48
4:D:99:SER:OG	4:D:101:GLU:OE1	2.30	0.48
16:P:225:ILE:HD12	16:P:235:LEU:HG	1.94	0.48
16:P:297:PHE:O	16:P:298:LYS:HD3	2.13	0.48
1:A:1384:LEU:HD23	1:A:1416:ILE:HD11	1.94	0.48
15:O:43:ASN:HB3	15:O:47:PHE:HB2	1.95	0.48
15:O:83:ILE:HD13	15:O:86:MET:HB2	1.95	0.48
18:U:128:SER:HB2	18:U:131:ASP:HB2	1.95	0.48
19:V:451:TYR:HA	19:V:454:LYS:HG2	1.95	0.48
2:B:240:ILE:HG12	2:B:286:ASN:HD21	1.77	0.48
2:B:928:GLN:HA	2:B:931:MET:HE1	1.95	0.48
5:E:170:LEU:HB2	5:E:174:GLN:HE21	1.77	0.48
13:M:123:ILE:HG22	13:M:146:GLN:HB3	1.93	0.48
2:B:379:LEU:HD23	2:B:379:LEU:H	1.77	0.48
2:B:1004:LEU:HD23	2:B:1017:ILE:HB	1.95	0.48
15:O:625:ASN:HB3	15:O:629:MET:HE1	1.95	0.48
1:A:91:PHE:CE2	1:A:224:PRO:HG3	2.49	0.48
2:B:965:LYS:HA	10:J:44:TYR:OH	2.13	0.48
15:O:80:VAL:HG21	15:O:88:VAL:HG22	1.96	0.48
1:A:1373:ARG:NH2	23:Y:22:DC:O5'	2.45	0.48
7:G:4:LEU:HD13	7:G:73:ARG:HG3	1.95	0.48
1:A:530:GLU:HG2	6:F:91:ALA:HB1	1.95	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:997:GLN:HG3	1:A:998:TYR:HD1	1.78	0.48
1:A:1286:ARG:HH12	1:A:1291:ARG:HA	1.77	0.48
2:B:412:ARG:HE	2:B:416:TYR:HB2	1.79	0.48
2:B:1088:ASP:OD2	2:B:1123:TYR:N	2.47	0.48
13:M:174:GLU:OE1	13:M:175:ARG:NH1	2.46	0.48
15:O:254:ASN:O	15:O:258:GLU:N	2.46	0.48
2:B:296:TYR:OH	9:I:27:ARG:NH2	2.46	0.48
2:B:390:ASP:HA	2:B:393:LYS:HE3	1.94	0.48
7:G:46:ILE:HB	7:G:75:VAL:HG23	1.94	0.48
16:P:105:ILE:HD11	16:P:113:ARG:HH22	1.79	0.48
19:V:275:PHE:HE2	19:V:279:ASP:HB2	1.79	0.48
1:A:406:GLU:OE2	1:A:412:ASN:ND2	2.47	0.48
19:V:257:GLN:OE1	19:V:258:ARG:NH1	2.47	0.48
2:B:314:ARG:O	2:B:315:GLN:HG2	2.14	0.48
2:B:730:TYR:O	2:B:753:GLN:NE2	2.28	0.48
7:G:149:ARG:HH21	7:G:201:GLN:HG2	1.79	0.48
13:M:163:VAL:HG23	13:M:168:VAL:HB	1.96	0.48
1:A:794:MET:SD	2:B:950:PRO:HG2	2.54	0.47
1:A:1320:LEU:HD23	1:A:1320:LEU:H	1.78	0.47
2:B:240:ILE:HG22	2:B:253:ILE:HG13	1.95	0.47
2:B:338:GLU:HG3	2:B:342:PHE:CD1	2.49	0.47
5:E:81:GLU:HB2	5:E:96:PHE:HE1	1.78	0.47
15:O:266:ASP:HB3	15:O:270:SER:HB3	1.96	0.47
19:V:200:LYS:HG3	19:V:204:LYS:HZ3	1.78	0.47
1:A:903:THR:HG23	1:A:914:PHE:HA	1.95	0.47
3:C:313:ILE:O	3:C:317:SER:N	2.46	0.47
4:D:126:GLN:HE22	7:G:86:THR:HG23	1.79	0.47
1:A:111:SER:HB2	1:A:234:ILE:HG22	1.95	0.47
1:A:468:ASP:OD1	1:A:468:ASP:N	2.47	0.47
14:N:366:HIS:NE2	14:N:372:SER:OG	2.34	0.47
16:P:53:GLN:NE2	20:W:363:GLN:OE1	2.42	0.47
1:A:11:LYS:HD2	2:B:1117:ILE:HG21	1.96	0.47
2:B:236:LYS:HB2	2:B:241:TYR:CE2	2.49	0.47
5:E:46:TYR:HA	5:E:57:MET:HE1	1.96	0.47
19:V:122:SER:HB3	22:X:34:DT:H5"	1.97	0.47
20:W:307:ARG:NH2	23:Y:66:DC:OP2	2.47	0.47
20:W:532:ARG:HH12	20:W:536:ALA:HB2	1.79	0.47
1:A:433:LEU:HD23	1:A:444:LEU:HD21	1.95	0.47
2:B:934:ASN:HD21	2:B:938:ILE:HD13	1.78	0.47
4:D:15:GLU:HG3	4:D:18:LYS:HE3	1.97	0.47
16:P:247:LEU:HD12	16:P:252:LYS:HG3	1.97	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:393:ALA:HB3	1:A:499:ARG:HB2	1.96	0.47
15:O:595:LEU:HD11	15:O:633:ARG:HH21	1.79	0.47
18:U:85:VAL:HG12	18:U:146:ILE:HD13	1.97	0.47
19:V:458:ASP:OD1	19:V:458:ASP:N	2.46	0.47
1:A:815:GLN:NE2	1:A:816:GLN:O	2.48	0.47
1:A:895:ASP:OD1	1:A:895:ASP:N	2.45	0.47
1:A:1066:SER:O	1:A:1070:PHE:N	2.44	0.47
2:B:417:ASP:H	19:V:151:GLN:HE22	1.62	0.47
2:B:795:LEU:HD12	2:B:894:ALA:HB3	1.96	0.47
16:P:106:TRP:CG	16:P:145:ARG:HH11	2.33	0.47
18:U:78:CYS:HB2	18:U:149:ALA:HB3	1.96	0.47
1:A:409:THR:HG22	1:A:410:ARG:HD2	1.96	0.47
2:B:116:HIS:HA	2:B:119:ARG:HG2	1.97	0.47
2:B:667:VAL:HB	2:B:670:MET:HB2	1.96	0.47
2:B:1084:MET:HE2	2:B:1122:PRO:HD3	1.95	0.47
11:K:85:ASP:O	11:K:107:THR:OG1	2.30	0.47
18:U:192:GLY:HA3	18:U:205:LEU:HD21	1.97	0.47
1:A:470:ASP:HA	1:A:528:ARG:HH11	1.80	0.47
2:B:552:ASN:OD1	2:B:566:ARG:HD2	2.15	0.47
2:B:578:LEU:HD22	2:B:583:LYS:HD3	1.97	0.47
2:B:622:VAL:HG23	2:B:623:LYS:H	1.79	0.47
2:B:891:ASN:CG	2:B:893:GLN:HE22	2.23	0.47
7:G:27:THR:HG22	7:G:31:ASN:HD21	1.80	0.47
1:A:374:ASP:OD1	2:B:1038:ARG:NE	2.48	0.47
1:A:683:ARG:HH12	1:A:925:GLU:HG2	1.80	0.47
16:P:111:LYS:HG2	16:P:116:LEU:O	2.15	0.47
23:Y:62:DG:H2"	23:Y:63:DT:H5"	1.96	0.47
10:J:10:CYS:SG	10:J:11:GLY:N	2.87	0.46
1:A:41:ASP:HB3	1:A:48:PRO:HB2	1.97	0.46
20:W:487:GLU:O	20:W:491:ASN:ND2	2.48	0.46
2:B:1103:TYR:HH	2:B:1106:TRP:CD1	2.33	0.46
3:C:256:ILE:HG22	3:C:267:VAL:HA	1.96	0.46
6:F:115:THR:HG22	6:F:116:ASP:H	1.80	0.46
3:C:242:GLU:OE1	3:C:246:ARG:NH2	2.48	0.46
1:A:757:ASN:HD22	1:A:760:GLN:NE2	2.13	0.46
1:A:1064:GLU:OE2	1:A:1068:ARG:NE	2.42	0.46
1:A:1254:ASN:HD21	9:I:13:LEU:HD21	1.80	0.46
2:B:835:LYS:HB3	2:B:880:HIS:CE1	2.51	0.46
2:B:99:ARG:NH2	2:B:146:ASP:OD1	2.49	0.46
19:V:498:GLN:OE1	19:V:502:ARG:NH1	2.48	0.46
2:B:81:GLN:HG3	2:B:95:TYR:H	1.81	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
8:H:58:THR:HB	8:H:143:LEU:HB2	1.98	0.46
15:O:212:GLU:OE2	15:O:216:GLN:NE2	2.42	0.46
15:O:346:GLN:HA	15:O:349:ALA:HB3	1.97	0.46
20:W:365:LYS:NZ	20:W:367:ASN:OD1	2.48	0.46
1:A:1316:THR:OG1	1:A:1317:ASN:N	2.49	0.46
2:B:961:LEU:HD11	2:B:1020:GLY:HA3	1.96	0.46
3:C:229:LEU:HD23	3:C:295:ARG:HA	1.97	0.46
3:C:276:SER:O	3:C:277:ARG:HD2	2.15	0.46
16:P:266:GLU:O	16:P:270:GLN:N	2.45	0.46
1:A:555:GLN:NE2	2:B:768:GLU:HB3	2.31	0.46
2:B:284:ALA:HA	2:B:287:LEU:HD13	1.98	0.46
19:V:114:ASN:O	19:V:167:LYS:NZ	2.40	0.46
1:A:1437:SER:H	1:A:1439:LYS:HZ3	1.64	0.46
2:B:81:GLN:HG2	2:B:82:LEU:HD12	1.98	0.46
10:J:26:GLN:HG2	10:J:27:GLU:N	2.31	0.46
15:O:259:LEU:HD23	15:O:259:LEU:H	1.81	0.46
16:P:59:ASN:HB2	16:P:83:LYS:HZ1	1.80	0.46
18:U:185:TYR:CD1	18:U:193:LEU:HD13	2.51	0.46
19:V:149:ARG:NH1	19:V:150:LEU:HD13	2.31	0.46
1:A:1092:ILE:O	1:A:1095:GLN:NE2	2.48	0.45
2:B:125:TYR:HB2	2:B:186:ILE:HD11	1.98	0.45
2:B:139:ARG:H	2:B:139:ARG:HD3	1.81	0.45
19:V:503:LEU:HD22	19:V:506:GLU:HB3	1.98	0.45
2:B:40:THR:HB	2:B:624:ASP:HB3	1.98	0.45
18:U:162:GLY:O	18:U:214:LEU:N	2.40	0.45
19:V:135:ARG:NH2	19:V:174:PRO:O	2.49	0.45
1:A:398:VAL:HG23	2:B:1037:ALA:HB2	1.97	0.45
2:B:689:PRO:HG3	2:B:915:ARG:NH2	2.31	0.45
13:M:100:LYS:HD3	13:M:101:PRO:HD2	1.98	0.45
15:O:316:LEU:O	15:O:320:GLU:HG3	2.16	0.45
15:O:527:LEU:HD23	16:P:175:ILE:HG21	1.98	0.45
20:W:371:THR:HG22	20:W:372:MET:HG3	1.98	0.45
1:A:95:TYR:O	1:A:99:THR:N	2.50	0.45
5:E:124:VAL:HB	5:E:125:PRO:HD3	1.97	0.45
15:O:197:MET:HE2	15:O:199:TYR:HE1	1.81	0.45
16:P:132:ARG:HD2	19:V:503:LEU:HD21	1.98	0.45
16:P:263:VAL:HG12	16:P:265:LEU:H	1.81	0.45
18:U:204:LEU:HB3	18:U:214:LEU:HD13	1.99	0.45
1:A:12:ARG:HG2	1:A:13:ILE:H	1.81	0.45
2:B:204:ARG:CZ	2:B:376:ARG:HH21	2.30	0.45
2:B:832:VAL:HG13	12:L:60:ARG:HA	1.99	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:1010:GLY:O	3:C:227:TYR:OH	2.33	0.45
13:M:216:VAL:HG11	16:P:95:SER:OG	2.17	0.45
15:O:191:PHE:O	15:O:195:CYS:N	2.47	0.45
2:B:144:HIS:HD2	2:B:147:VAL:HG22	1.81	0.45
11:K:47:ILE:H	11:K:47:ILE:HD12	1.82	0.45
18:U:219:GLN:HG3	18:U:221:GLU:H	1.82	0.45
23:Y:69:DA:H2"	23:Y:70:DA:C8	2.52	0.45
1:A:434:LEU:HD21	1:A:441:ARG:HG2	1.98	0.45
1:A:440:ALA:O	1:A:441:ARG:HG3	2.17	0.45
3:C:255:VAL:HG13	3:C:256:ILE:HG23	1.98	0.45
7:G:115:LEU:HD11	7:G:200:CYS:HB2	1.97	0.45
19:V:274:LYS:HG2	19:V:275:PHE:H	1.82	0.45
22:X:18:DT:O2	23:Y:65:DG:N2	2.50	0.45
2:B:696:SER:OG	2:B:697:PRO:HD3	2.16	0.45
8:H:12:VAL:HA	8:H:28:ALA:HA	1.99	0.45
15:O:484:MET:HG3	15:O:485:PRO:HD3	1.98	0.45
1:A:1319:VAL:HG21	1:A:1335:ILE:HG22	1.99	0.45
1:A:1333:TYR:HD2	5:E:149:LEU:HD13	1.82	0.45
2:B:48:LEU:HD23	2:B:517:MET:HE3	1.98	0.45
2:B:331:VAL:HA	2:B:334:HIS:CE1	2.52	0.45
2:B:890:ASP:OD1	2:B:890:ASP:N	2.49	0.45
2:B:1027:LEU:HD23	2:B:1028:LYS:N	2.31	0.45
4:D:134:LEU:HD13	4:D:137:ILE:HD12	1.98	0.45
13:M:137:GLU:OE2	13:M:143:VAL:HG11	2.17	0.45
13:M:161:ALA:HB2	13:M:170:LEU:HG	1.98	0.45
1:A:352:GLY:H	1:A:355:GLN:HB2	1.82	0.45
2:B:916:HIS:HD1	2:B:957:LYS:HG3	1.82	0.45
15:O:222:HIS:HA	15:O:225:ASN:ND2	2.31	0.45
15:O:471:THR:OG1	15:O:475:VAL:O	2.29	0.45
19:V:268:ALA:O	19:V:272:VAL:HG23	2.17	0.45
1:A:579:LEU:HD23	1:A:609:VAL:HG21	1.98	0.44
1:A:757:ASN:HD22	1:A:760:GLN:HE21	1.65	0.44
1:A:1318:HIS:O	1:A:1321:GLU:HG3	2.17	0.44
8:H:123:MET:HE3	8:H:125:LEU:HD23	1.99	0.44
5:E:58:MET:HE2	5:E:82:PHE:CD2	2.53	0.44
14:N:386:ALA:HB2	14:N:416:ILE:HG22	1.99	0.44
18:U:197:MET:HB3	18:U:202:ILE:HG22	1.98	0.44
19:V:476:ASN:HB3	19:V:479:ALA:HB3	2.00	0.44
1:A:105:GLY:HA2	1:A:148:CYS:SG	2.57	0.44
1:A:949:ASN:HA	1:A:1061:ARG:NH2	2.32	0.44
3:C:26:ASP:OD1	3:C:26:ASP:N	2.50	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
10:J:26:GLN:HG2	10:J:27:GLU:H	1.82	0.44
11:K:55:SER:HB3	11:K:60:SER:HB2	1.99	0.44
15:O:242:LYS:HE3	15:O:243:MET:HE1	1.99	0.44
18:U:81:ASP:HB3	18:U:84:THR:HG22	2.00	0.44
18:U:138:LYS:NZ	19:V:465:VAL:O	2.42	0.44
19:V:242:THR:OG1	20:W:296:SER:OG	2.26	0.44
19:V:474:LEU:HD22	19:V:475:LEU:H	1.82	0.44
2:B:405:LYS:HA	2:B:408:LYS:HE3	1.99	0.44
2:B:412:ARG:HH22	2:B:415:GLU:HG2	1.82	0.44
10:J:17:LYS:HB3	10:J:39:LEU:HD21	2.00	0.44
13:M:89:GLN:HG2	14:N:394:VAL:HG12	1.99	0.44
13:M:96:LEU:HA	13:M:101:PRO:HA	2.00	0.44
18:U:88:HIS:HB2	19:V:475:LEU:HD13	1.98	0.44
18:U:103:ILE:HD11	18:U:112:THR:HB	2.00	0.44
1:A:929:ASN:O	1:A:931:GLN:NE2	2.50	0.44
18:U:108:GLU:HA	18:U:109:PRO:HA	1.89	0.44
19:V:237:LEU:HG	20:W:287:GLY:H	1.82	0.44
20:W:472:ALA:O	20:W:475:SER:OG	2.26	0.44
1:A:4:VAL:HA	7:G:38:ILE:HG22	1.99	0.44
2:B:206:ILE:O	2:B:217:GLN:HB2	2.17	0.44
2:B:555:VAL:HA	2:B:599:VAL:HG23	2.00	0.44
3:C:216:HIS:CE1	3:C:218:LYS:HG3	2.53	0.44
13:M:79:SER:HB2	13:M:258:THR:HG23	1.99	0.44
13:M:245:LEU:HD12	14:N:406:ALA:HB2	2.00	0.44
1:A:763:GLU:HG2	1:A:822:ARG:HE	1.83	0.43
2:B:1002:ASP:OD1	2:B:1003:MET:N	2.50	0.43
3:C:103:LEU:HB3	10:J:6:ARG:HE	1.83	0.43
11:K:126:ASP:HA	11:K:129:ASP:HB2	1.99	0.43
15:O:596:LYS:O	15:O:600:SER:OG	2.36	0.43
16:P:102:ARG:NH1	16:P:152:SER:OG	2.50	0.43
16:P:176:ASN:HA	16:P:179:LEU:HB3	1.99	0.43
1:A:15:GLY:HA3	1:A:1407:ALA:HA	2.00	0.43
1:A:597:ILE:HG22	8:H:97:MET:HG2	2.00	0.43
1:A:1125:ARG:HH22	1:A:1129:ILE:HD11	1.83	0.43
2:B:556:TYR:HD2	2:B:600:HIS:CE1	2.37	0.43
2:B:579:ARG:NH1	2:B:588:ILE:O	2.51	0.43
2:B:710:ILE:HD13	2:B:726:TYR:HB3	2.00	0.43
2:B:728:MET:HE2	2:B:753:GLN:HE22	1.83	0.43
13:M:71:ILE:N	14:N:365:VAL:O	2.51	0.43
1:A:822:ARG:HH12	1:A:845:LYS:HD2	1.81	0.43
1:A:894:GLU:OE2	1:A:1385:GLN:NE2	2.52	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:1004:LEU:HB2	2:B:1017:ILE:HD12	1.99	0.43
11:K:95:HIS:CD2	11:K:97:SER:HB3	2.54	0.43
15:O:212:GLU:OE1	15:O:333:THR:OG1	2.32	0.43
15:O:356:THR:HG22	15:O:358:GLY:H	1.83	0.43
16:P:106:TRP:CD1	16:P:145:ARG:HE	2.36	0.43
2:B:327:ILE:O	2:B:331:VAL:HG22	2.19	0.43
2:B:834:MET:HE1	12:L:63:ARG:HD2	2.00	0.43
7:G:93:THR:HG22	7:G:94:ALA:H	1.83	0.43
12:L:26:THR:O	12:L:62:LYS:NZ	2.51	0.43
13:M:160:ALA:HB2	13:M:173:ILE:HD11	2.00	0.43
14:N:303:ARG:HD2	14:N:413:ASP:HB2	1.99	0.43
19:V:252:GLU:O	19:V:255:LEU:HG	2.18	0.43
1:A:880:ALA:HA	23:Y:24:DT:C2	2.54	0.43
2:B:90:GLU:HB2	20:W:391:ASN:HD21	1.84	0.43
15:O:308:THR:HG21	15:O:459:ILE:HD11	1.99	0.43
3:C:103:LEU:HD23	3:C:218:LYS:HG2	2.00	0.43
16:P:66:GLN:HB3	16:P:69:GLU:OE2	2.18	0.43
1:A:1122:GLY:HA2	1:A:1346:HIS:HE1	1.83	0.43
5:E:147:HIS:HE1	5:E:149:LEU:HD23	1.82	0.43
13:M:251:THR:HA	14:N:409:LEU:HD22	2.00	0.43
18:U:99:PHE:HE2	18:U:101:ALA:HB3	1.84	0.43
15:O:192:VAL:HG21	15:O:273:ILE:HA	2.01	0.43
15:O:472:LYS:HB3	15:O:475:VAL:HG12	2.00	0.43
23:Y:58:DT:H6	23:Y:58:DT:H2'	1.68	0.43
1:A:134:ASN:HB3	1:A:1381:ASP:OD2	2.19	0.43
1:A:949:ASN:HA	1:A:1061:ARG:HH21	1.84	0.43
1:A:1227:LYS:H	1:A:1227:LYS:HD2	1.83	0.43
2:B:860:VAL:HG23	2:B:861:ASN:H	1.83	0.43
16:P:137:VAL:HG21	16:P:149:MET:HE2	2.01	0.43
19:V:218:ARG:HH22	19:V:288:PRO:HG2	1.83	0.43
20:W:289:ILE:HD12	20:W:289:ILE:H	1.83	0.43
1:A:146:ASP:HA	1:A:149:LYS:NZ	2.34	0.43
1:A:1418:GLY:HA3	2:B:1084:MET:HE3	2.01	0.43
7:G:120:TYR:O	7:G:128:TRP:HB3	2.18	0.43
11:K:47:ILE:HG13	11:K:65:ILE:HG12	2.01	0.43
13:M:125:LEU:HD21	13:M:146:GLN:HB2	2.01	0.43
1:A:832:LEU:HD13	1:A:833:PRO:HD2	2.00	0.42
2:B:727:LEU:O	2:B:786:GLU:N	2.50	0.42
10:J:41:LEU:HD22	10:J:46:CYS:HB3	2.00	0.42
11:K:126:ASP:OD1	11:K:126:ASP:N	2.52	0.42
18:U:107:ARG:NH1	20:W:469:ILE:HG22	2.34	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
19:V:237:LEU:HD13	19:V:237:LEU:O	2.19	0.42
19:V:287:PRO:HA	19:V:288:PRO:HD3	1.86	0.42
2:B:408:LYS:HB2	16:P:119:HIS:CD2	2.55	0.42
14:N:285:ALA:O	14:N:289:HIS:ND1	2.34	0.42
18:U:95:ASN:ND2	20:W:440:ASN:OD1	2.52	0.42
22:X:28:DA:H4'	22:X:29:DA:OP1	2.19	0.42
1:A:591:ASP:OD1	1:A:591:ASP:N	2.52	0.42
2:B:788:ARG:NH1	2:B:882:ASP:OD2	2.51	0.42
15:O:106:TYR:CE1	15:O:208:TYR:HE2	2.37	0.42
15:O:199:TYR:CD1	15:O:286:ARG:HD2	2.55	0.42
19:V:139:THR:HG23	19:V:141:HIS:H	1.85	0.42
2:B:114:PRO:HB3	2:B:174:LEU:HD22	2.00	0.42
5:E:3:GLN:HB3	5:E:7:ARG:NH2	2.34	0.42
5:E:85:GLU:HA	5:E:86:PRO:HD3	1.91	0.42
18:U:67:LEU:HD12	18:U:160:ILE:HG13	2.00	0.42
1:A:1261:GLN:HG3	1:A:1265:ARG:HH12	1.84	0.42
2:B:135:TYR:OH	2:B:417:ASP:OD1	2.25	0.42
2:B:449:MET:HE1	2:B:451:ARG:NE	2.35	0.42
2:B:487:ARG:HD2	2:B:508:CYS:HB2	2.01	0.42
3:C:282:TYR:C	3:C:284:GLU:H	2.28	0.42
13:M:256:LYS:HD2	13:M:259:ILE:HB	2.01	0.42
19:V:94:LEU:HG	19:V:146:PHE:HE1	1.85	0.42
20:W:318:ARG:NH1	20:W:448:TYR:HB2	2.35	0.42
15:O:300:ALA:O	15:O:304:VAL:HG12	2.20	0.42
15:O:313:LYS:HE2	15:O:313:LYS:HB3	1.94	0.42
20:W:429:TYR:O	20:W:433:SER:N	2.53	0.42
1:A:91:PHE:CD2	1:A:224:PRO:HG3	2.55	0.42
1:A:914:PHE:HE2	5:E:211:TYR:H	1.68	0.42
13:M:78:ILE:HG22	13:M:170:LEU:HB2	2.00	0.42
1:A:410:ARG:NE	6:F:104:ASN:OD1	2.53	0.42
1:A:1076:PHE:CZ	1:A:1080:LYS:HD2	2.55	0.42
1:A:1325:VAL:HG12	1:A:1326:LEU:HD22	2.00	0.42
2:B:737:LYS:HB3	2:B:741:ILE:HD11	2.01	0.42
9:I:18:ASP:OD1	9:I:18:ASP:N	2.53	0.42
15:O:480:TYR:HB3	15:O:484:MET:HE3	2.01	0.42
16:P:173:GLU:O	16:P:174:PHE:HB2	2.20	0.42
18:U:107:ARG:HH21	20:W:473:LEU:HB2	1.85	0.42
18:U:175:LEU:HB3	18:U:237:PHE:CE2	2.54	0.42
18:U:238:ARG:C	18:U:239:LYS:HD3	2.45	0.42
20:W:455:LYS:NZ	23:Y:57:DT:OP2	2.36	0.42
22:X:70:DG:H1	23:Y:12:DC:H42	1.67	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
23:Y:61:DA:H4'	23:Y:62:DG:OP1	2.19	0.42
1:A:135:LEU:HD21	1:A:1378:LYS:HG2	2.00	0.42
1:A:558:ILE:HG12	1:A:666:LYS:HB2	2.01	0.42
1:A:610:PHE:CD1	1:A:613:LEU:HD21	2.55	0.42
1:A:856:LEU:HD23	1:A:861:PHE:HA	2.01	0.42
2:B:267:GLU:HG3	2:B:271:LEU:HD23	2.02	0.42
2:B:303:GLU:HA	2:B:325:GLU:HG2	2.01	0.42
8:H:107:VAL:N	8:H:111:LEU:O	2.52	0.42
19:V:142:MET:HE1	19:V:144:ILE:HG12	2.00	0.42
19:V:509:ILE:H	19:V:509:ILE:HG13	1.71	0.42
2:B:540:ASP:HB3	2:B:543:LEU:HD13	2.01	0.42
2:B:777:SER:OG	2:B:941:ASP:OD1	2.37	0.42
15:O:159:ILE:HD13	15:O:159:ILE:HA	1.94	0.42
22:X:16:DG:H2''	22:X:17:DC:OP2	2.20	0.42
1:A:585:ASP:OD1	1:A:585:ASP:N	2.53	0.41
2:B:205:ILE:HG22	2:B:219:SER:HB2	2.00	0.41
2:B:225:HIS:O	2:B:226:GLU:HG2	2.20	0.41
2:B:732:GLN:HB2	2:B:753:GLN:HA	2.01	0.41
3:C:255:VAL:HG21	3:C:273:ASP:OD2	2.20	0.41
7:G:88:TRP:HE1	7:G:145:LYS:HG2	1.85	0.41
15:O:201:ILE:HG21	15:O:256:PRO:HB2	2.02	0.41
18:U:203:VAL:HG21	22:X:24:DA:H5'	2.01	0.41
20:W:488:ILE:HG22	20:W:492:ILE:HG23	2.01	0.41
1:A:498:PHE:HZ	1:A:519:LEU:HD22	1.85	0.41
1:A:1222:VAL:HG22	1:A:1232:ILE:HD13	2.03	0.41
2:B:203:ASN:HD21	2:B:222:SER:H	1.68	0.41
2:B:611:PRO:HA	2:B:648:TYR:HA	2.02	0.41
2:B:774:ASN:HB3	2:B:931:MET:HE3	2.02	0.41
5:E:147:HIS:CE1	5:E:149:LEU:HD23	2.55	0.41
6:F:81:THR:OG1	6:F:144:GLU:OE2	2.25	0.41
13:M:170:LEU:HD21	14:N:307:PHE:CZ	2.54	0.41
16:P:90:GLU:HA	16:P:124:CYS:SG	2.60	0.41
1:A:429:GLY:O	1:A:465:HIS:ND1	2.53	0.41
1:A:808:GLN:HA	1:A:812:VAL:O	2.21	0.41
2:B:554:GLY:HA2	2:B:564:SER:HA	2.01	0.41
2:B:766:ASP:OD1	2:B:766:ASP:N	2.48	0.41
5:E:106:GLN:HA	5:E:129:PRO:HG2	2.02	0.41
14:N:297:MET:HE2	14:N:303:ARG:HB3	2.01	0.41
15:O:108:GLN:HG2	15:O:117:THR:O	2.19	0.41
18:U:90:ARG:HB3	19:V:473:HIS:CE1	2.55	0.41
19:V:233:ARG:HH21	20:W:285:PRO:HG3	1.85	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:607:LYS:HB3	1:A:659:ILE:HB	2.01	0.41
2:B:733:GLN:HG2	10:J:52:THR:O	2.20	0.41
3:C:328:LEU:HG	11:K:121:LEU:HD21	2.02	0.41
15:O:240:GLN:O	15:O:244:ASN:ND2	2.53	0.41
15:O:620:LEU:HD23	15:O:622:SER:H	1.85	0.41
2:B:325:GLU:OE1	2:B:325:GLU:N	2.54	0.41
3:C:2:SER:O	3:C:4:ILE:HG13	2.20	0.41
1:A:15:GLY:HA2	1:A:1408:VAL:HG22	2.03	0.41
1:A:823:VAL:HG11	1:A:863:PHE:CD1	2.55	0.41
3:C:276:SER:C	3:C:277:ARG:HD2	2.45	0.41
4:D:111:ASN:HB2	4:D:117:LYS:HE3	2.01	0.41
6:F:74:ILE:HG23	6:F:78:GLN:HG3	2.01	0.41
13:M:121:ILE:O	13:M:148:LEU:HD23	2.21	0.41
1:A:892:SER:HB2	1:A:1371:ILE:HG23	2.03	0.41
1:A:1301:ARG:HH21	1:A:1325:VAL:HA	1.86	0.41
1:A:1336:ILE:HD13	1:A:1355:ILE:HG22	2.02	0.41
2:B:379:LEU:HD23	2:B:382:GLN:NE2	2.36	0.41
2:B:882:ASP:HB2	2:B:901:ARG:HB2	2.02	0.41
7:G:31:ASN:O	7:G:35:ALA:N	2.53	0.41
16:P:106:TRP:CZ3	16:P:108:LYS:HB3	2.55	0.41
19:V:230:LEU:HD22	19:V:233:ARG:HD3	2.02	0.41
21:R:3:U:H2'	21:R:4:G:C8	2.56	0.41
1:A:11:LYS:HA	2:B:1145:ASP:HA	2.02	0.41
1:A:113:ILE:H	1:A:113:ILE:HG13	1.68	0.41
1:A:498:PHE:CZ	1:A:519:LEU:HD22	2.56	0.41
1:A:511:ASP:N	1:A:511:ASP:OD1	2.54	0.41
1:A:607:LYS:NZ	8:H:120:GLY:HA3	2.36	0.41
1:A:1327:GLY:HA2	5:E:183:PRO:HD2	2.03	0.41
2:B:45:TRP:CE2	2:B:739:LYS:HD3	2.55	0.41
3:C:108:VAL:HB	3:C:184:VAL:HG12	2.03	0.41
7:G:100:SER:HB2	7:G:108:ILE:HB	2.02	0.41
7:G:124:GLU:O	7:G:125:GLU:HG2	2.20	0.41
8:H:108:SER:OG	8:H:111:LEU:HD12	2.21	0.41
13:M:164:LYS:N	13:M:167:GLN:O	2.41	0.41
14:N:364:ARG:HH22	14:N:374:LYS:HB2	1.85	0.41
18:U:113:ALA:HB2	18:U:139:TYR:CE2	2.56	0.41
19:V:189:LEU:O	19:V:189:LEU:HD23	2.21	0.41
1:A:974:LEU:HG	1:A:1002:ARG:HE	1.87	0.41
2:B:185:PHE:HB3	2:B:187:VAL:HG23	2.03	0.41
13:M:242:ASN:OD1	13:M:243:ILE:N	2.54	0.41
15:O:137:ILE:HG21	17:Q:57:LYS:HG2	2.03	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1079:ARG:HD3	6:F:84:TYR:CE2	2.56	0.40
2:B:64:SER:HB2	2:B:379:LEU:CD1	2.50	0.40
2:B:660:ALA:O	2:B:674:GLU:N	2.54	0.40
2:B:916:HIS:ND1	2:B:957:LYS:HG3	2.36	0.40
5:E:199:ILE:H	5:E:199:ILE:HG13	1.79	0.40
11:K:79:VAL:HG21	11:K:124:LEU:HB3	2.03	0.40
11:K:93:ILE:HA	11:K:94:PRO:HD3	1.95	0.40
13:M:164:LYS:HG3	13:M:165:ASP:N	2.36	0.40
1:A:39:LEU:HD12	1:A:53:ALA:HB1	2.03	0.40
1:A:580:LEU:HD11	1:A:590:PHE:CG	2.56	0.40
1:A:974:LEU:HD22	1:A:975:VAL:H	1.86	0.40
3:C:32:ASN:HB3	3:C:35:LYS:HB2	2.03	0.40
8:H:22:LYS:HD2	8:H:45:GLU:OE1	2.21	0.40
1:A:818:ILE:HD12	1:A:823:VAL:HA	2.02	0.40
2:B:209:ALA:HA	2:B:215:ILE:HG22	2.04	0.40
16:P:64:VAL:HG22	16:P:65:LYS:H	1.86	0.40
16:P:310:VAL:HG12	17:Q:41:LEU:HD23	2.02	0.40
19:V:152:VAL:HG21	19:V:157:ILE:HD11	2.04	0.40
19:V:239:ARG:HH22	20:W:284:PHE:H	1.70	0.40
19:V:469:GLU:OE2	20:W:476:LYS:HG3	2.22	0.40
23:Y:10:DC:H2''	23:Y:11:DA:C8	2.57	0.40
1:A:520:HIS:CB	2:B:1082:ARG:HH12	2.31	0.40
1:A:789:ASN:HD22	1:A:790:ALA:N	2.20	0.40
1:A:1164:THR:OG1	1:A:1273:LYS:O	2.29	0.40
1:A:1386:LEU:HB3	1:A:1395:HIS:ND1	2.37	0.40
2:B:177:CYS:HB2	2:B:714:ALA:HB1	2.04	0.40
2:B:1092:VAL:HG21	2:B:1121:ILE:HD11	2.03	0.40
4:D:17:LEU:O	4:D:21:THR:OG1	2.34	0.40
4:D:68:ILE:HG23	4:D:72:PHE:HD2	1.86	0.40
5:E:171:LYS:H	5:E:174:GLN:NE2	2.20	0.40
7:G:10:LEU:HA	7:G:69:ASN:HA	2.04	0.40
13:M:159:TYR:CE2	14:N:309:LEU:HB2	2.56	0.40
16:P:116:LEU:HB3	16:P:120:VAL:HG13	2.03	0.40
16:P:179:LEU:HG	16:P:247:LEU:HD21	2.03	0.40
1:A:840:LYS:HG2	1:A:845:LYS:NZ	2.37	0.40
2:B:203:ASN:ND2	2:B:221:THR:OG1	2.54	0.40
2:B:481:ARG:NH2	2:B:482:LYS:HB2	2.37	0.40
5:E:18:THR:HG23	5:E:143:ASN:HB3	2.04	0.40
5:E:88:VAL:HG13	5:E:112:TYR:CE1	2.56	0.40
5:E:93:MET:HB3	5:E:123:LEU:HD11	2.03	0.40
8:H:58:THR:O	8:H:143:LEU:N	2.55	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
12:L:26:THR:OG1	12:L:27:LEU:N	2.54	0.40
16:P:102:ARG:NH2	16:P:154:GLN:HB2	2.37	0.40

There are no symmetry-related clashes.

5.3 Torsion angles [i](#)

5.3.1 Protein backbone [i](#)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	1388/1460 (95%)	1233 (89%)	155 (11%)	0	100	100
2	B	1112/1149 (97%)	983 (88%)	128 (12%)	1 (0%)	48	83
3	C	333/335 (99%)	303 (91%)	30 (9%)	0	100	100
4	D	113/161 (70%)	101 (89%)	12 (11%)	0	100	100
5	E	212/215 (99%)	192 (91%)	20 (9%)	0	100	100
6	F	81/155 (52%)	72 (89%)	9 (11%)	0	100	100
7	G	174/212 (82%)	151 (87%)	22 (13%)	1 (1%)	21	58
8	H	136/146 (93%)	121 (89%)	14 (10%)	1 (1%)	18	55
9	I	32/110 (29%)	27 (84%)	5 (16%)	0	100	100
10	J	65/70 (93%)	59 (91%)	6 (9%)	0	100	100
11	K	99/142 (70%)	93 (94%)	6 (6%)	0	100	100
12	L	43/70 (61%)	39 (91%)	4 (9%)	0	100	100
13	M	179/282 (64%)	160 (89%)	19 (11%)	0	100	100
14	N	100/422 (24%)	93 (93%)	7 (7%)	0	100	100
15	O	528/654 (81%)	496 (94%)	32 (6%)	0	100	100
16	P	238/317 (75%)	219 (92%)	19 (8%)	0	100	100
17	Q	33/251 (13%)	29 (88%)	4 (12%)	0	100	100
18	U	178/240 (74%)	163 (92%)	15 (8%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
19	V	331/596 (56%)	305 (92%)	26 (8%)	0	100	100
20	W	214/594 (36%)	195 (91%)	19 (9%)	0	100	100
All	All	5589/7581 (74%)	5034 (90%)	552 (10%)	3 (0%)	49	83

All (3) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
7	G	79	PRO
2	B	769	ASP
8	H	110	ASP

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	
1	A	1214/1257 (97%)	1198 (99%)	16 (1%)	61	72
2	B	975/1006 (97%)	970 (100%)	5 (0%)	81	81
3	C	296/296 (100%)	294 (99%)	2 (1%)	76	79
4	D	110/145 (76%)	110 (100%)	0	100	100
5	E	196/197 (100%)	196 (100%)	0	100	100
6	F	73/137 (53%)	73 (100%)	0	100	100
7	G	160/190 (84%)	160 (100%)	0	100	100
8	H	123/128 (96%)	122 (99%)	1 (1%)	73	77
9	I	31/98 (32%)	30 (97%)	1 (3%)	34	56
10	J	62/65 (95%)	62 (100%)	0	100	100
11	K	91/130 (70%)	91 (100%)	0	100	100
12	L	40/57 (70%)	40 (100%)	0	100	100
13	M	160/249 (64%)	159 (99%)	1 (1%)	78	80
14	N	88/360 (24%)	88 (100%)	0	100	100
15	O	490/593 (83%)	485 (99%)	5 (1%)	68	76

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
16	P	227/285 (80%)	225 (99%)	2 (1%)	70	76
17	Q	31/212 (15%)	29 (94%)	2 (6%)	15	38
18	U	152/205 (74%)	150 (99%)	2 (1%)	61	72
19	V	295/513 (58%)	293 (99%)	2 (1%)	76	79
20	W	194/534 (36%)	193 (100%)	1 (0%)	81	81
All	All	5008/6657 (75%)	4968 (99%)	40 (1%)	70	77

All (40) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	60	VAL
1	A	303	LEU
1	A	483	LEU
1	A	550	ILE
1	A	832	LEU
1	A	848	VAL
1	A	933	VAL
1	A	1039	LEU
1	A	1130	ILE
1	A	1193	ILE
1	A	1209	ILE
1	A	1263	LEU
1	A	1267	LEU
1	A	1293	LEU
1	A	1294	LEU
1	A	1350	VAL
2	B	659	ILE
2	B	710	ILE
2	B	832	VAL
2	B	881	ILE
2	B	973	LEU
3	C	75	VAL
3	C	333	ILE
8	H	22	LYS
9	I	2	LEU
13	M	163	VAL
15	O	98	LEU
15	O	107	LEU
15	O	201	ILE
15	O	252	ILE

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Mol	Chain	Res	Type
15	O	541	ILE
16	P	55	LEU
16	P	293	ILE
17	Q	39	ILE
17	Q	43	ILE
18	U	63	ILE
18	U	157	ILE
19	V	237	LEU
19	V	503	LEU
20	W	432	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (101) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	147	GLN
1	A	207	HIS
1	A	367	ASN
1	A	477	GLN
1	A	481	HIS
1	A	488	HIS
1	A	520	HIS
1	A	540	ASN
1	A	578	GLN
1	A	688	GLN
1	A	760	GLN
1	A	783	ASN
1	A	815	GLN
1	A	828	GLN
1	A	931	GLN
1	A	950	GLN
1	A	1095	GLN
1	A	1131	ASN
1	A	1197	GLN
1	A	1223	ASN
1	A	1254	ASN
1	A	1346	HIS
1	A	1354	HIS
1	A	1419	GLN
2	B	144	HIS
2	B	159	ASN
2	B	203	ASN
2	B	225	HIS

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Mol	Chain	Res	Type
2	B	245	ASN
2	B	298	GLN
2	B	334	HIS
2	B	428	ASN
2	B	434	ASN
2	B	519	HIS
2	B	595	HIS
2	B	596	GLN
2	B	600	HIS
2	B	693	HIS
2	B	695	GLN
2	B	801	HIS
2	B	821	HIS
2	B	893	GLN
2	B	947	HIS
2	B	970	ASN
2	B	994	GLN
2	B	1029	HIS
2	B	1136	ASN
3	C	87	ASN
3	C	172	GLN
3	C	296	ASN
4	D	61	ASN
4	D	71	ASN
4	D	125	ASN
4	D	130	ASN
5	E	3	GLN
5	E	174	GLN
5	E	179	GLN
6	F	78	GLN
7	G	31	ASN
7	G	113	ASN
8	H	133	ASN
9	I	9	ASN
10	J	53	HIS
11	K	64	GLN
11	K	95	HIS
13	M	92	ASN
13	M	117	HIS
13	M	141	ASN
13	M	144	ASN
13	M	190	ASN

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Mol	Chain	Res	Type
13	M	220	ASN
13	M	224	GLN
15	O	100	GLN
15	O	152	HIS
15	O	154	GLN
15	O	161	GLN
15	O	283	ASN
15	O	295	GLN
15	O	549	GLN
15	O	580	ASN
15	O	631	ASN
15	O	636	ASN
16	P	73	GLN
16	P	81	GLN
16	P	154	GLN
16	P	189	ASN
16	P	239	ASN
18	U	91	ASN
18	U	159	ASN
19	V	114	ASN
19	V	140	HIS
19	V	151	GLN
19	V	264	ASN
19	V	443	HIS
19	V	473	HIS
19	V	505	GLN
20	W	292	ASN
20	W	391	ASN
20	W	400	ASN
20	W	506	GLN
20	W	511	HIS

5.3.3 RNA ⓘ

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
21	R	5/6 (83%)	0	0

There are no RNA backbone outliers to report.

There are no RNA pucker outliers to report.

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

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

5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 7 ligands modelled in this entry, 7 are monoatomic - leaving 0 for Mogul analysis.

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

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.

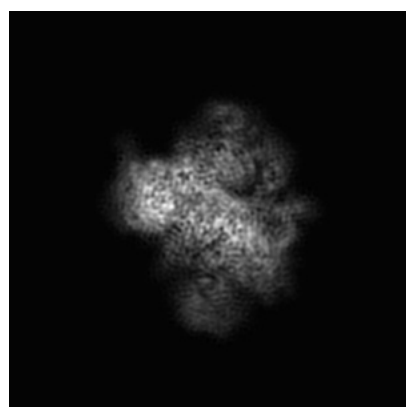
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-4181. These allow visual inspection of the internal detail of the map and identification of artifacts.

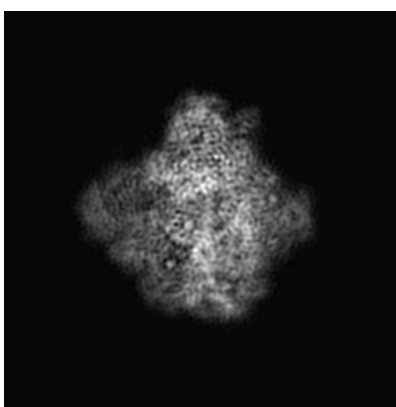
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections [i](#)

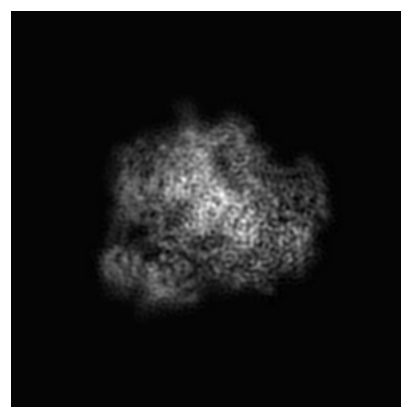
6.1.1 Primary map



X



Y

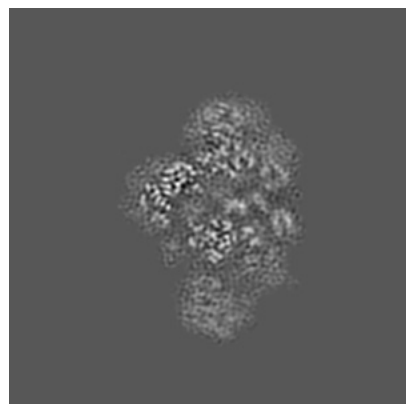


Z

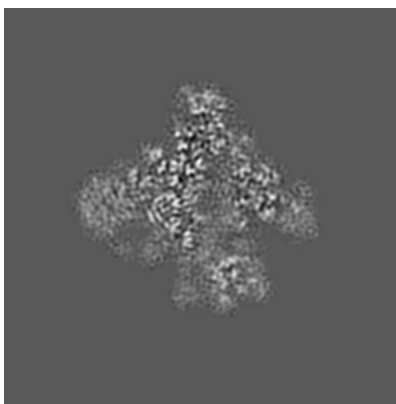
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

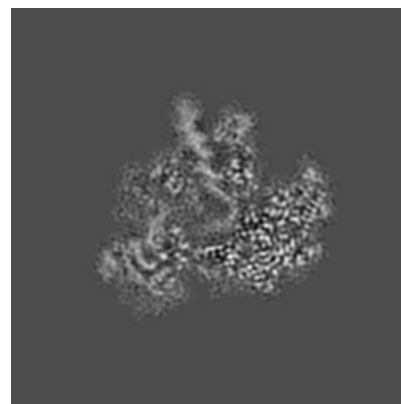
6.2.1 Primary map



X Index: 120



Y Index: 120

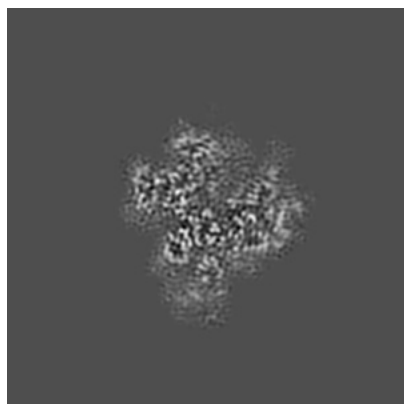


Z Index: 120

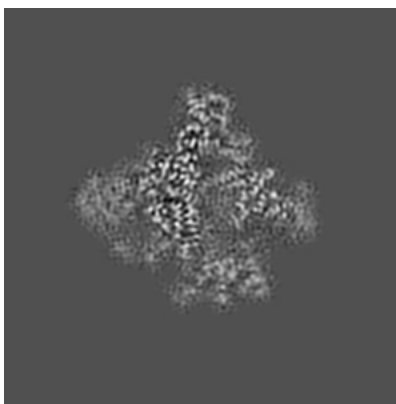
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

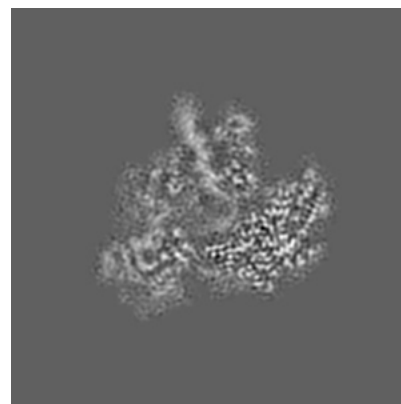
6.3.1 Primary map



X Index: 138



Y Index: 123

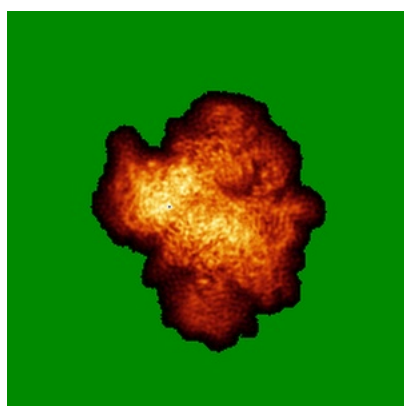


Z Index: 121

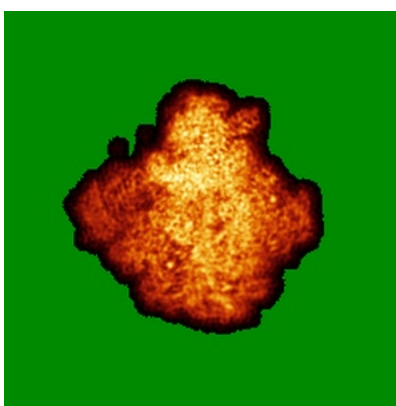
The images above show the largest variance slices of the map in three orthogonal directions.

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

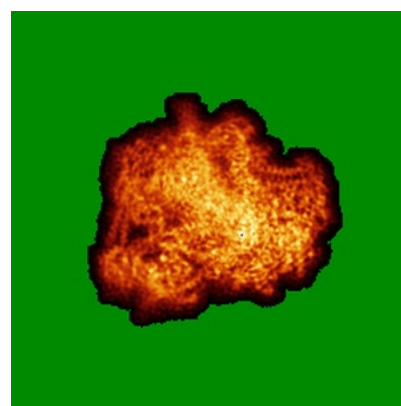
6.4.1 Primary map



X



Y



Z

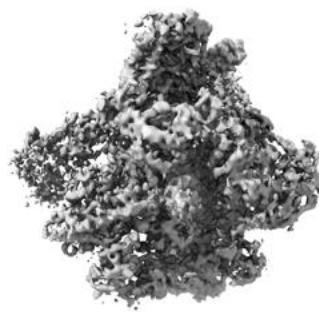
The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

6.5 Orthogonal surface views [i](#)

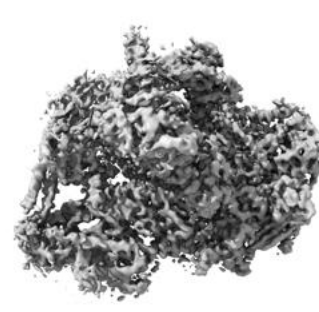
6.5.1 Primary map



X



Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.045. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

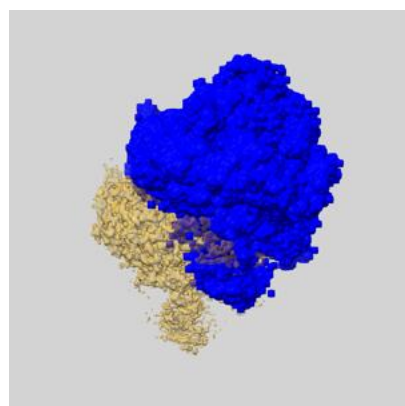
6.6 Mask visualisation [i](#)

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

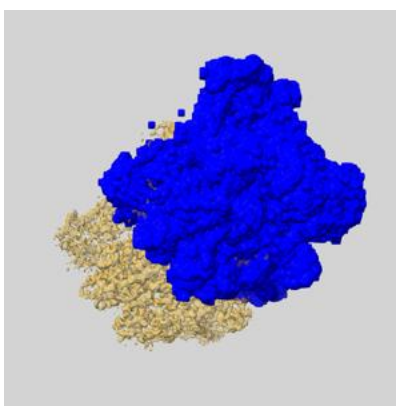
A mask typically either:

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

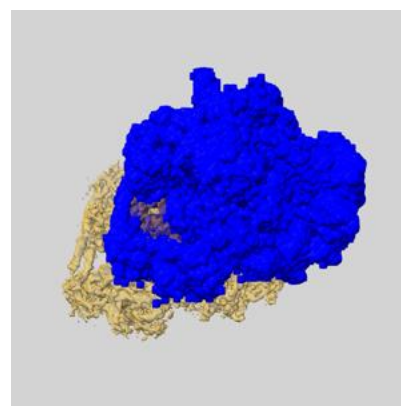
6.6.1 emd_4181_msk_1.map [i](#)



X



Y

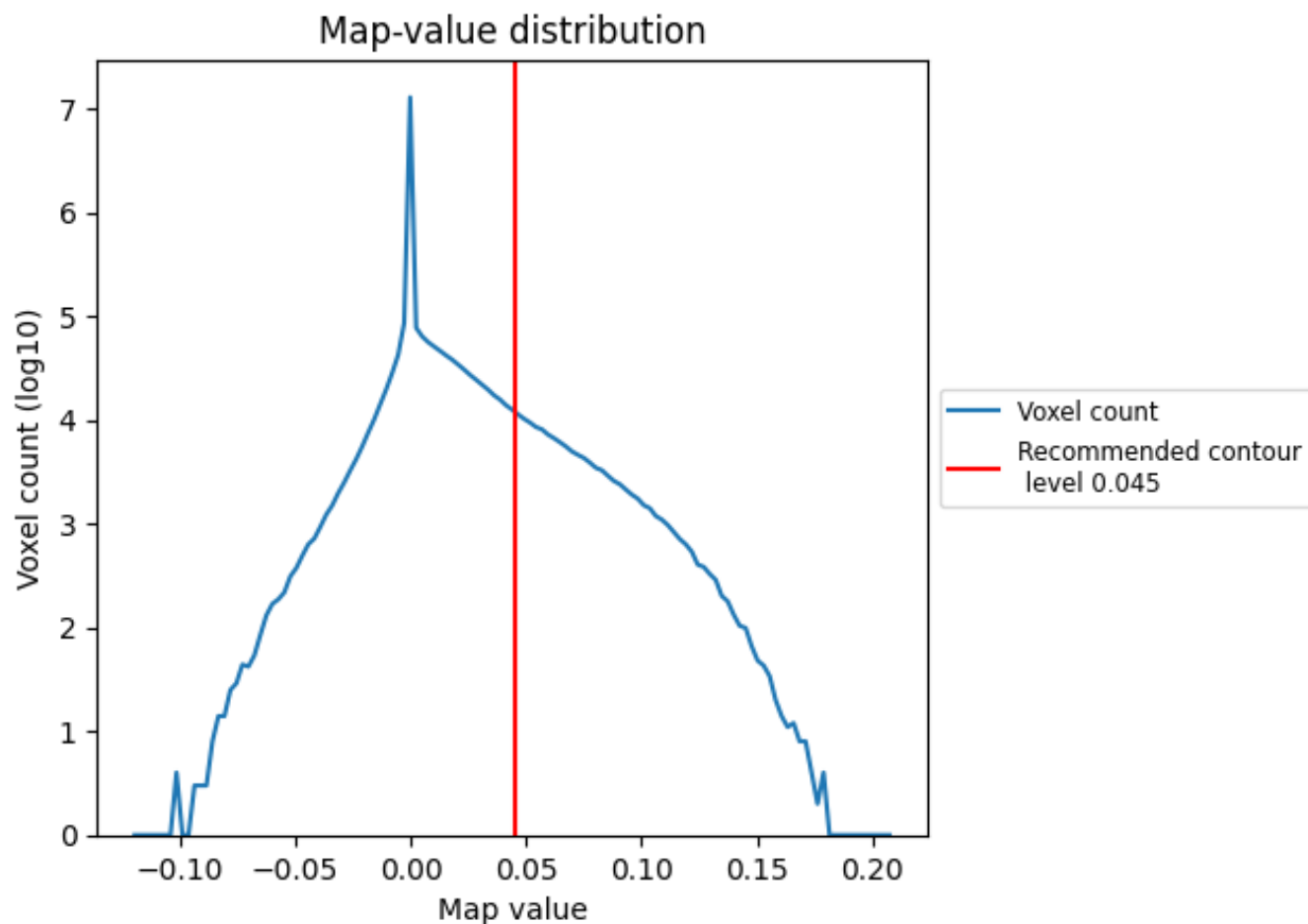


Z

7 Map analysis [i](#)

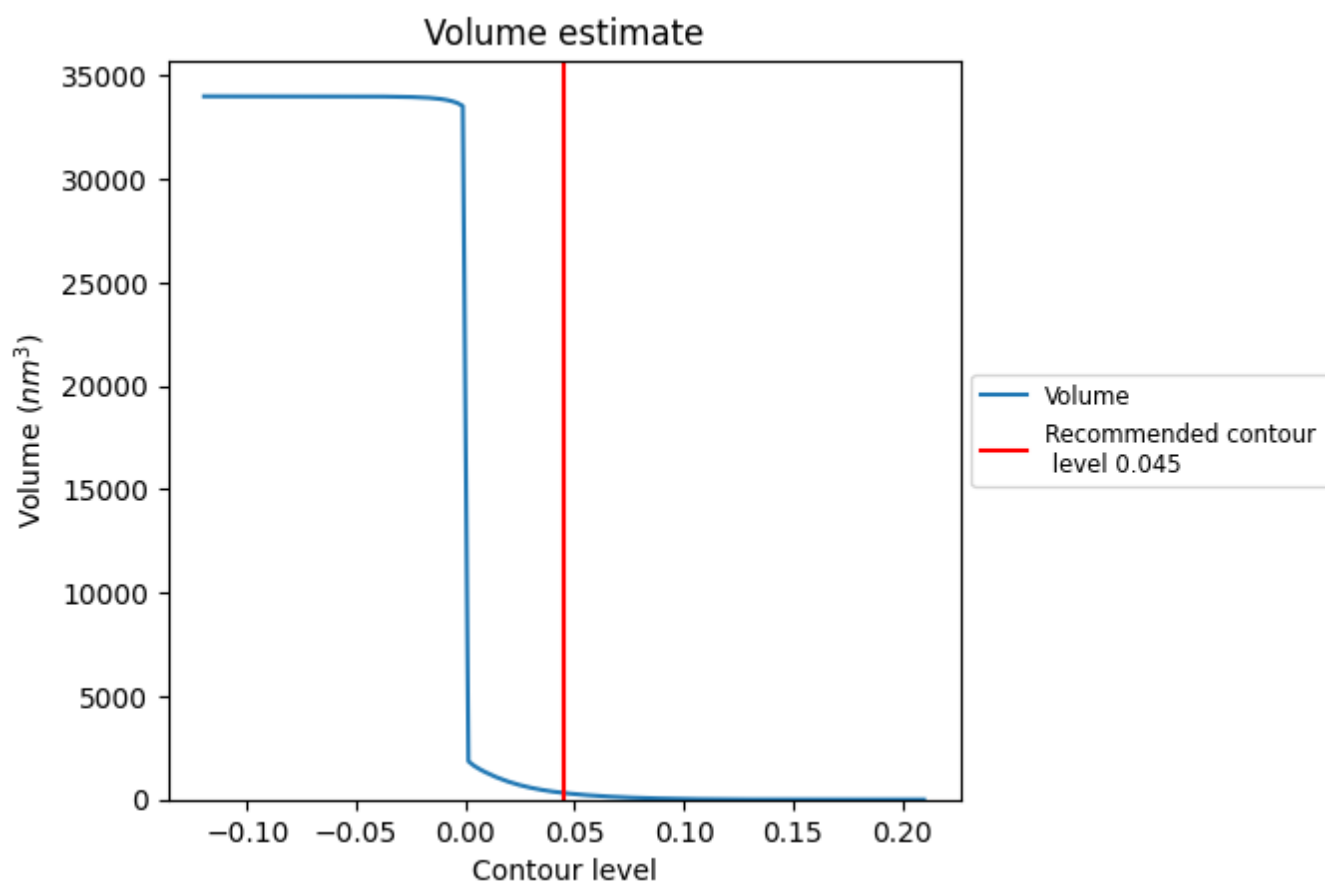
This section contains the results of statistical analysis of the map.

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.

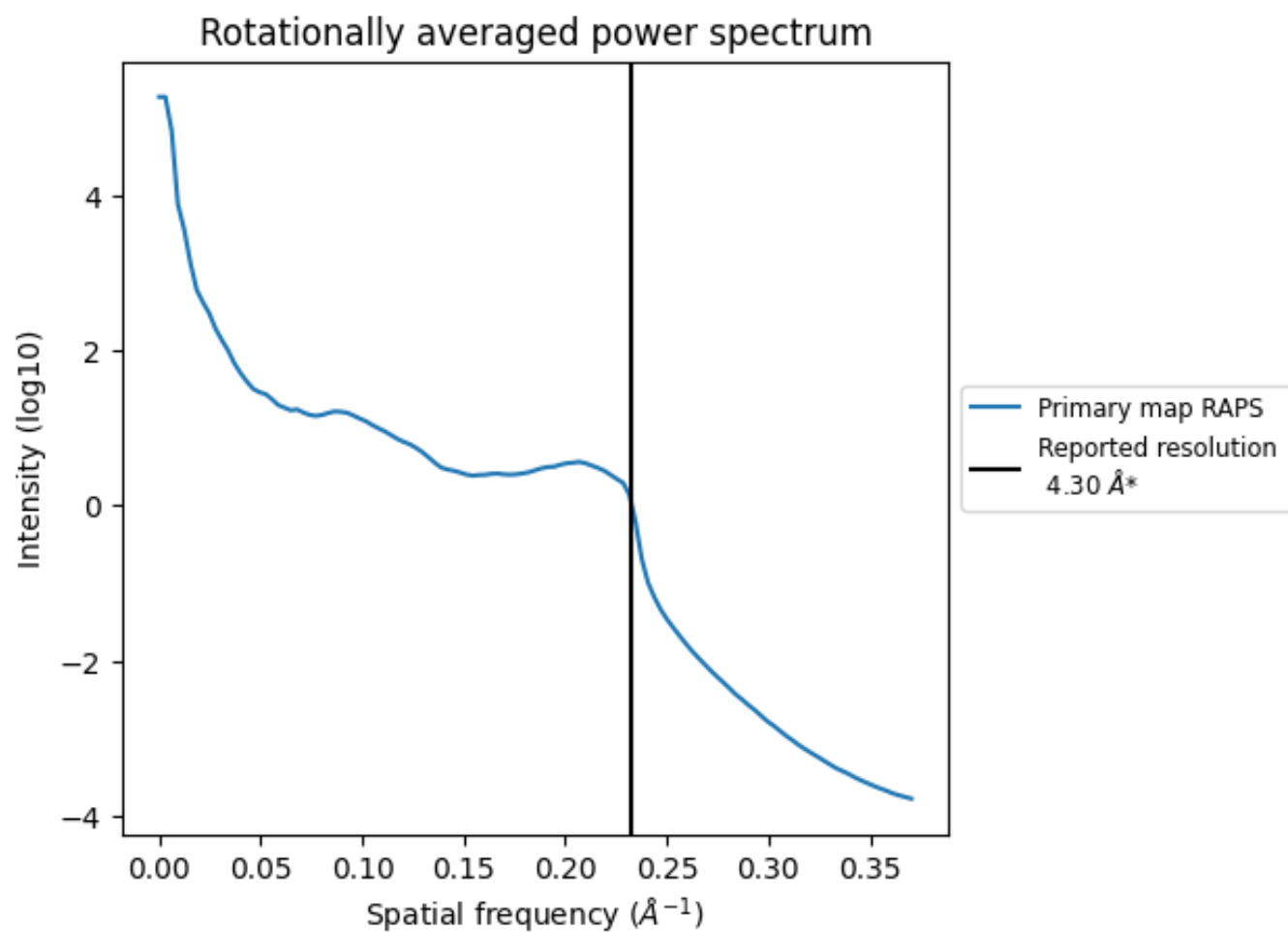
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 319 nm³; this corresponds to an approximate mass of 288 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 ⓘ

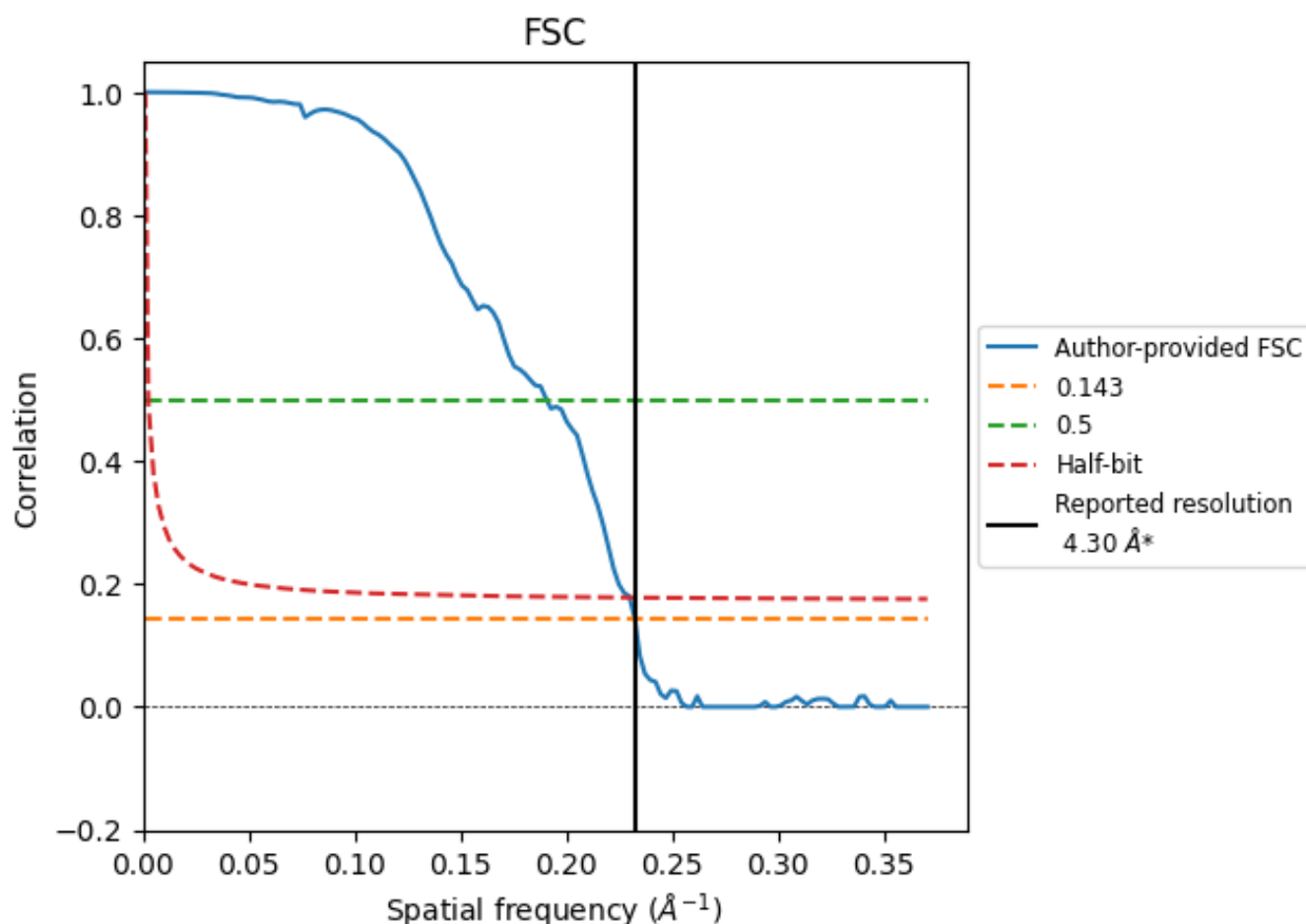


*Reported resolution corresponds to spatial frequency of 0.233 Å⁻¹

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 0.233 Å⁻¹

8.2 Resolution estimates [i](#)

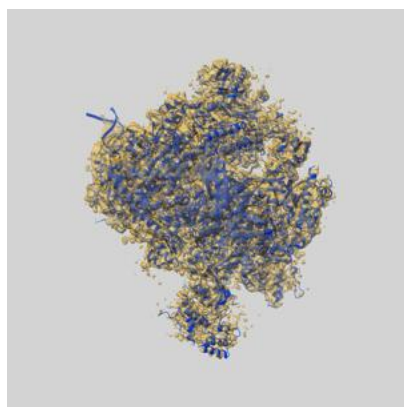
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	4.30	-	-
Author-provided FSC curve	4.31	5.25	4.35
Unmasked-calculated*	-	-	-

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

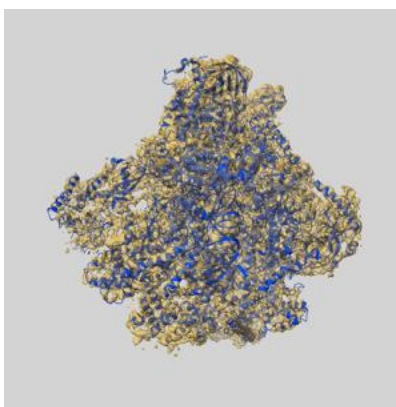
9 Map-model fit [i](#)

This section contains information regarding the fit between EMDB map EMD-4181 and PDB model 6F41. Per-residue inclusion information can be found in section 3 on page 8.

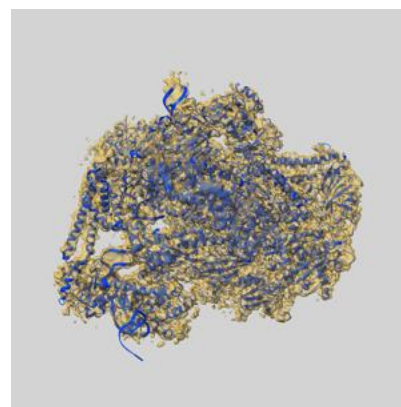
9.1 Map-model overlay [i](#)



X



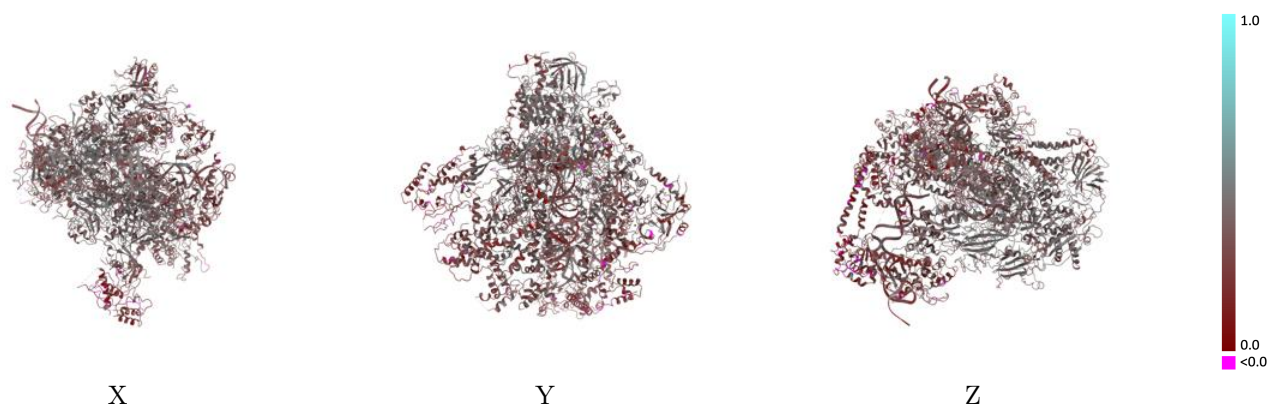
Y



Z

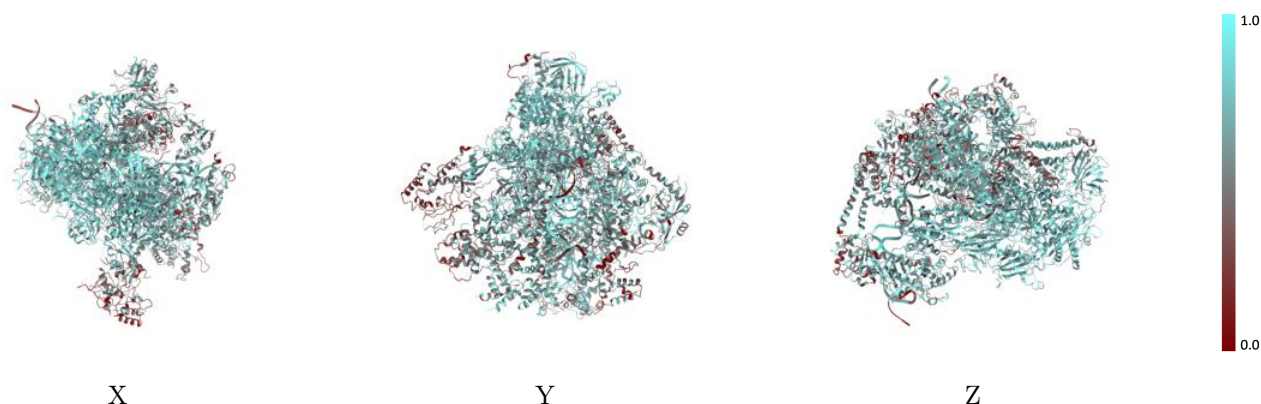
The images above show the 3D surface view of the map at the recommended contour level 0.045 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



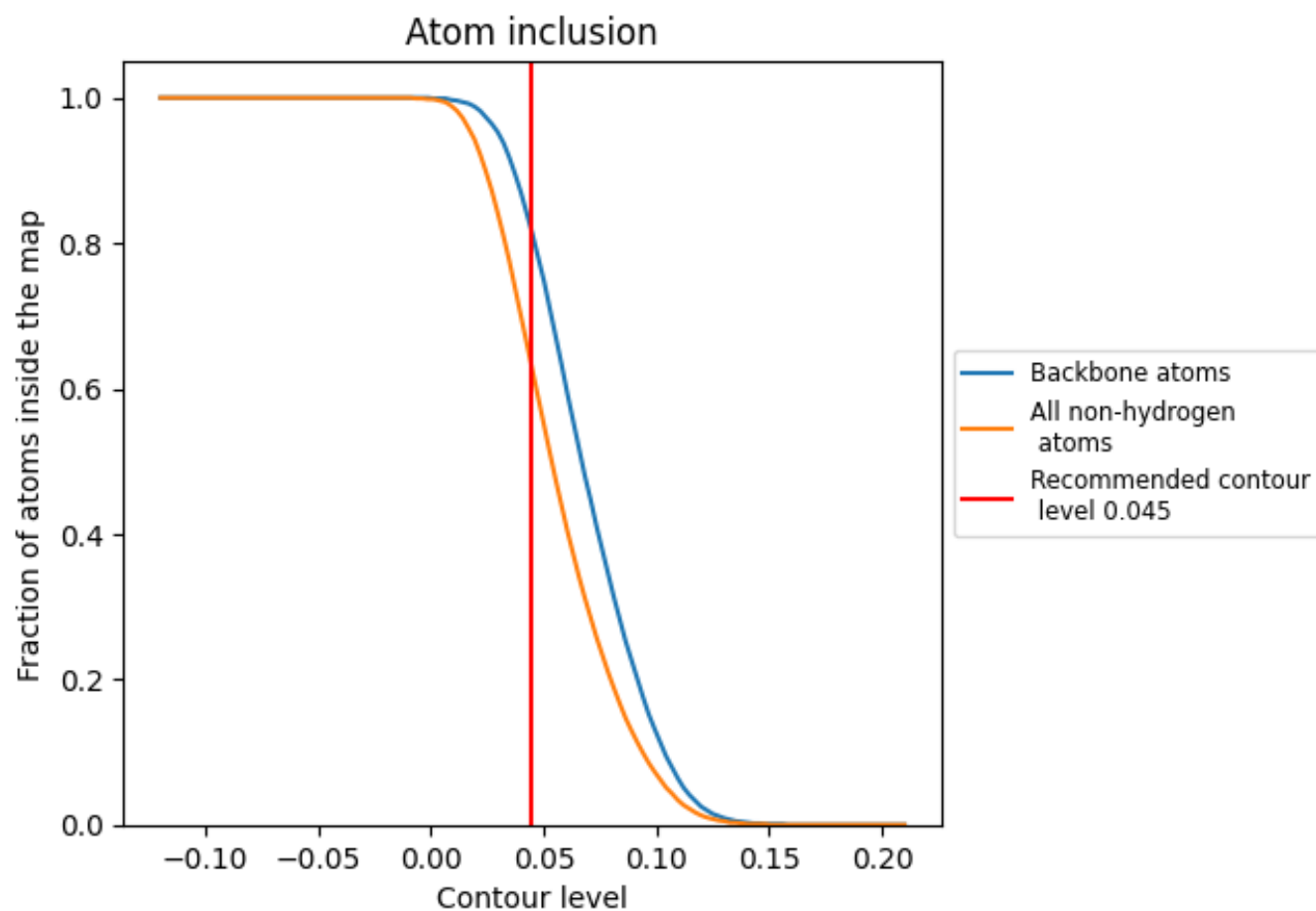
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.045).

















































9.4 Atom inclusion [i](#)



At the recommended contour level, 81% of all backbone atoms, 62% 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 (0.045) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.6250	 0.3420
A	 0.6490	 0.3770
B	 0.7000	 0.4000
C	 0.7620	 0.4010
D	 0.3030	 0.2050
E	 0.5970	 0.3160
F	 0.7380	 0.3910
G	 0.3810	 0.2370
H	 0.7070	 0.3970
I	 0.6390	 0.3130
J	 0.7660	 0.3960
K	 0.7680	 0.4030
L	 0.6910	 0.4000
M	 0.5060	 0.2970
N	 0.5440	 0.3140
O	 0.5400	 0.3180
P	 0.5830	 0.2950
Q	 0.6480	 0.3090
R	 0.1510	 0.2700
U	 0.5760	 0.2410
V	 0.6010	 0.2920
W	 0.4740	 0.2310
X	 0.7040	 0.3030
Y	 0.6980	 0.3030

