



Full wwPDB EM Validation Report ⓘ

Nov 19, 2022 – 11:38 am GMT

PDB ID : 5M5W
EMDB ID : EMD-3446
Title : RNA Polymerase I open complex
Authors : Tafur, L.; Sadian, Y.; Hoffmann, N.A.; Jakobi, A.J.; Wetzell, R.; Hagen, W.J.H.; Sachse, C.; Muller, C.W.
Deposited on : 2016-10-23
Resolution : 3.80 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.dev43
MolProbity : 4.02b-467
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ : 1.9.9
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.31.2

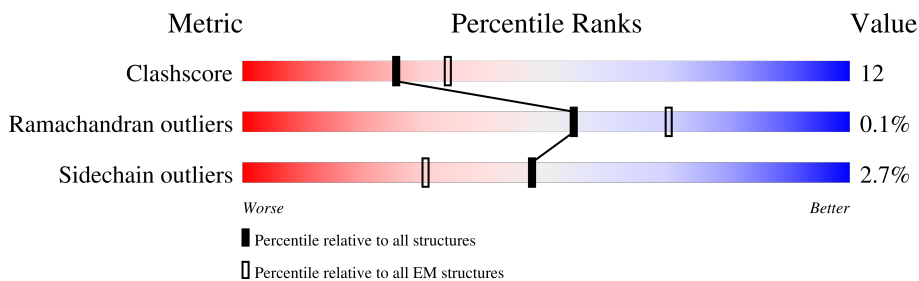
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 3.80 Å.

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



Metric	Whole archive (#Entries)	EM structures (#Entries)
Clashscore	158937	4297
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826

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	1664	
2	B	1203	
3	C	335	
4	D	137	
5	E	215	
6	F	155	
7	G	326	
8	H	146	

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Mol	Chain	Length	Quality of chain
9	I	125	<p>21% 70% 20% 9%</p>
10	J	70	<p>63% 34%</p>
11	K	142	<p>54% 15% 30%</p>
12	L	70	<p>49% 13% 39%</p>
13	M	415	<p>10% 15% 10% 74%</p>
14	N	233	<p>33% 48% 13% 37%</p>
15	S	70	<p>9% 9% 17% 74%</p>
16	T	70	<p>19% 23% 13% 64%</p>

2 Entry composition [i](#)

There are 17 unique types of molecules in this entry. The entry contains 34780 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 I subunit RPA190.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	1493	11760	7424	2048	2226	62	0	0

- Molecule 2 is a protein called DNA-directed RNA polymerase I subunit RPA135.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	B	1183	9389	5936	1642	1760	51	0	0

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	C	304	2418	1536	414	460	8	0	0

- Molecule 4 is a protein called DNA-directed RNA polymerase I subunit RPA14.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
4	D	59	467	293	80	94	0	0

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

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

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
6	F	100	823	522	144	154	3	0	0

- Molecule 7 is a protein called DNA-directed RNA polymerase I subunit RPA43.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
7	G	205	1624	1040	280	299	5	0	0

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
8	H	134	1075	677	182	212	4	0	0

- Molecule 9 is a protein called DNA-directed RNA polymerase I subunit RPA12.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
9	I	114	869	541	146	173	9	0	0

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
10	J	69	569	362	101	100	6	0	0

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
11	K	100	785	491	129	160	5	0	0

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
12	L	43	344	211	69	60	4	0	0

- Molecule 13 is a protein called DNA-directed RNA polymerase I subunit RPA49.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
13	M	107	850	540	141	169	0	0

- Molecule 14 is a protein called DNA-directed RNA polymerase I subunit RPA34.

Mol	Chain	Residues	Atoms					AltConf	Trace
14	N	146	Total	C	N	O	S	0	0
			1164	743	188	229	4		

- Molecule 15 is a DNA chain called Non-template strand.

Mol	Chain	Residues	Atoms					AltConf	Trace
15	S	18	Total	C	N	O	P	0	0
			376	178	77	103	18		

- Molecule 16 is a DNA chain called Template strand.

Mol	Chain	Residues	Atoms					AltConf	Trace
16	T	25	Total	C	N	O	P	0	0
			509	244	86	154	25		

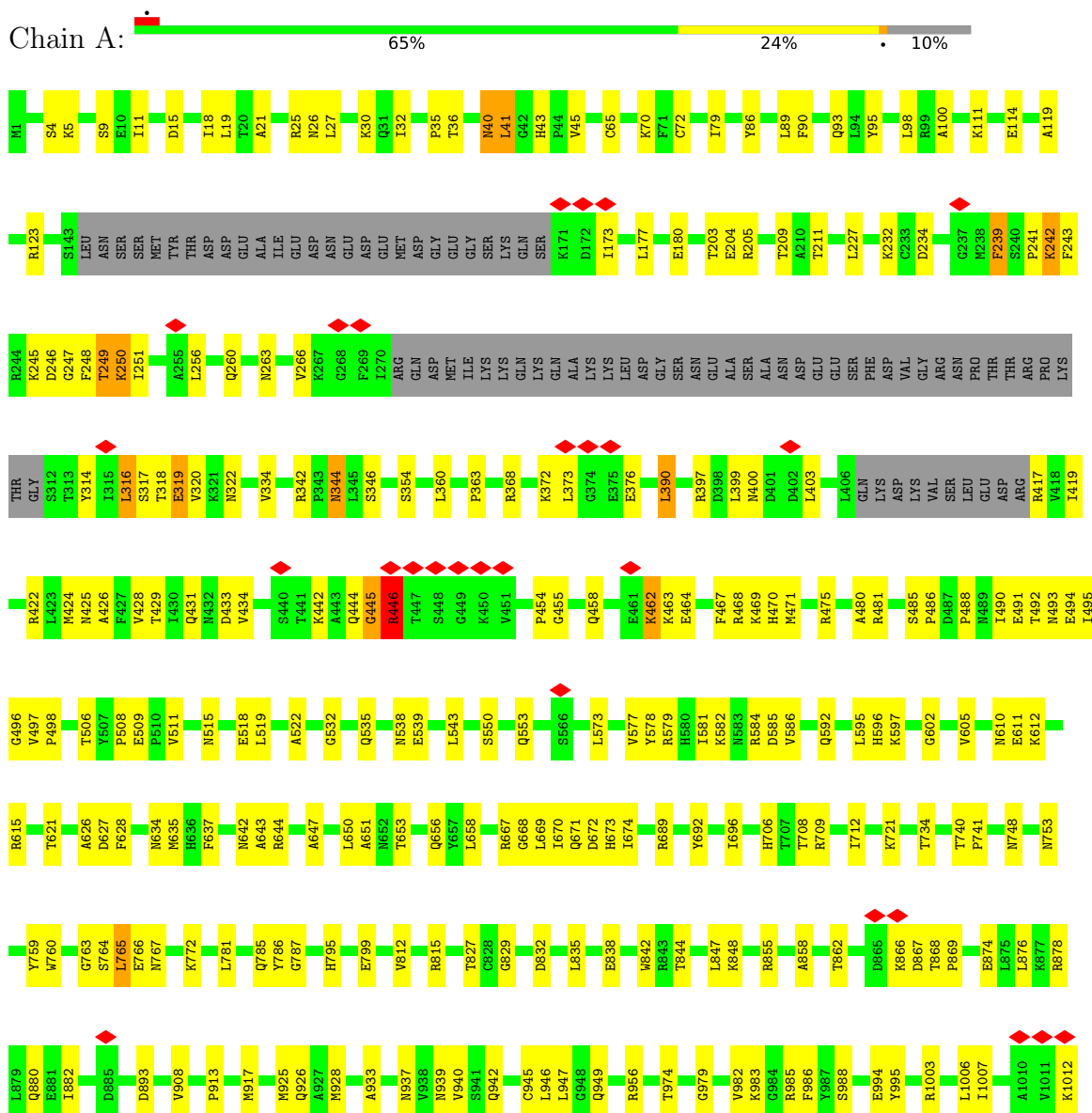
- Molecule 17 is ZINC ION (three-letter code: ZN) (formula: Zn).

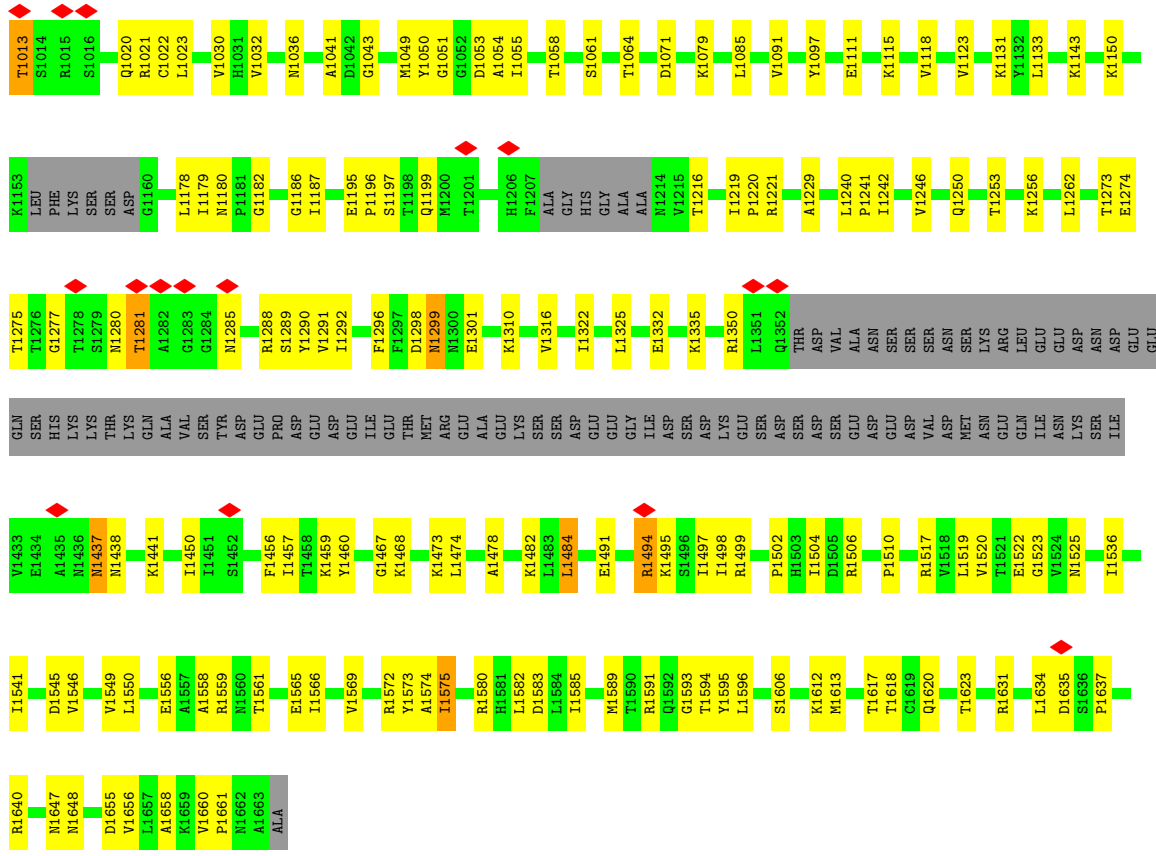
Mol	Chain	Residues	Atoms		AltConf
17	A	2	Total	Zn	0
			2	2	
17	B	1	Total	Zn	0
			1	1	
17	I	2	Total	Zn	0
			2	2	
17	J	1	Total	Zn	0
			1	1	
17	L	1	Total	Zn	0
			1	1	

3 Residue-property plots

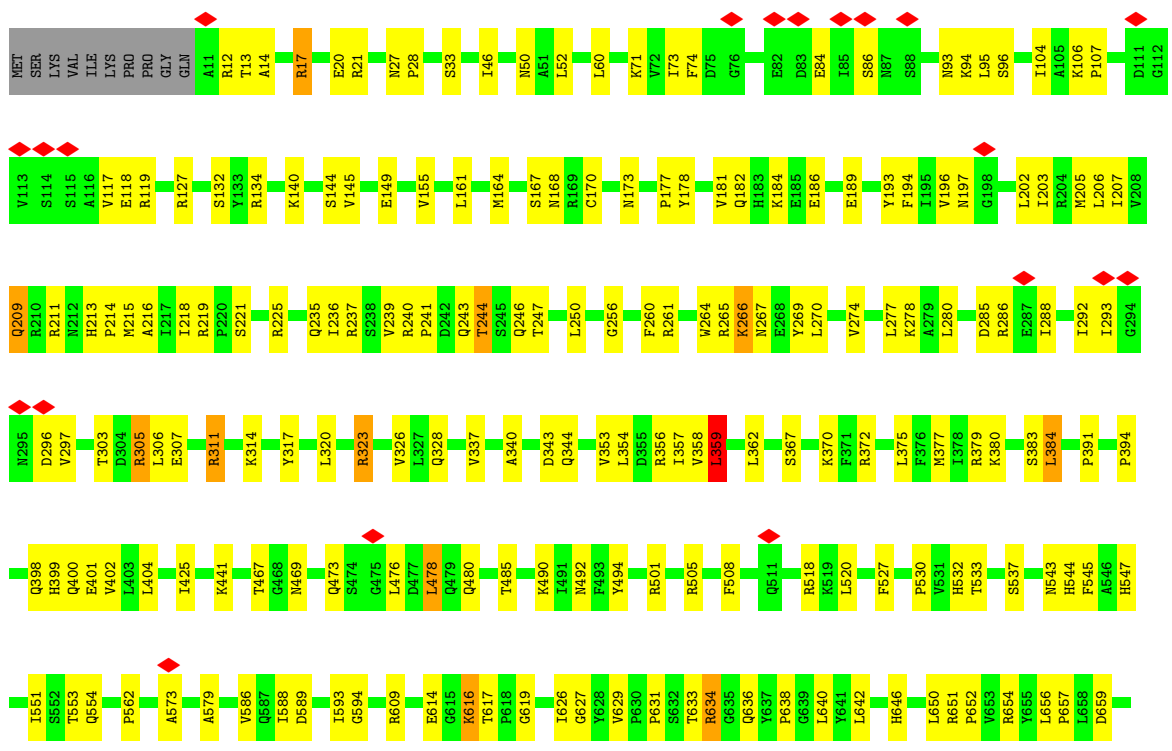
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion 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 I subunit RPA190

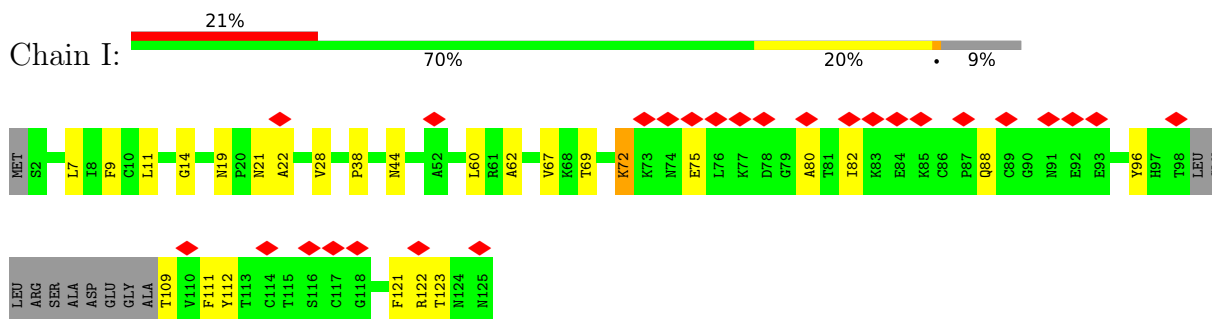




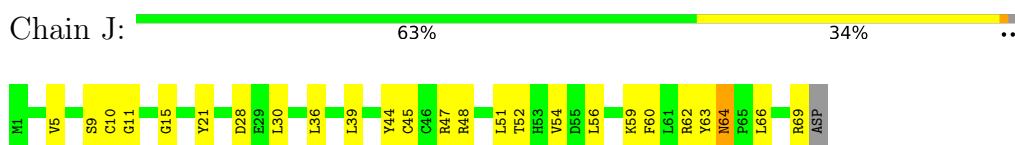
• Molecule 2: DNA-directed RNA polymerase I subunit RPA135



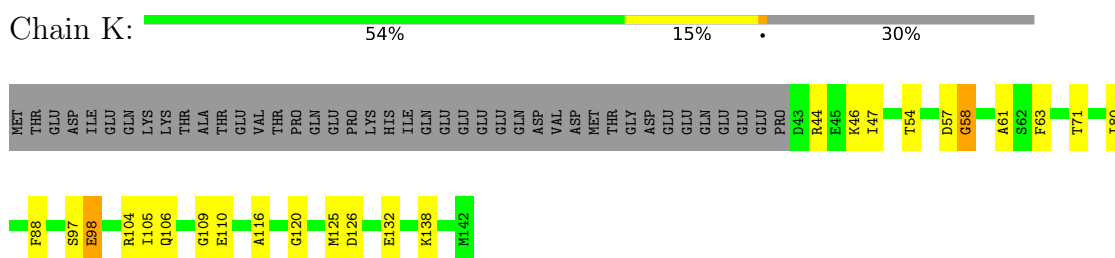
- Molecule 9: DNA-directed RNA polymerase I subunit RPA12



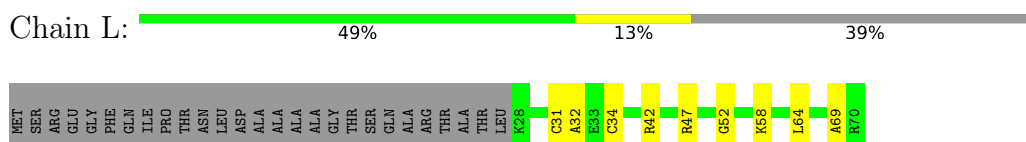
- Molecule 10: DNA-directed RNA polymerases I, II, and III subunit RPABC5



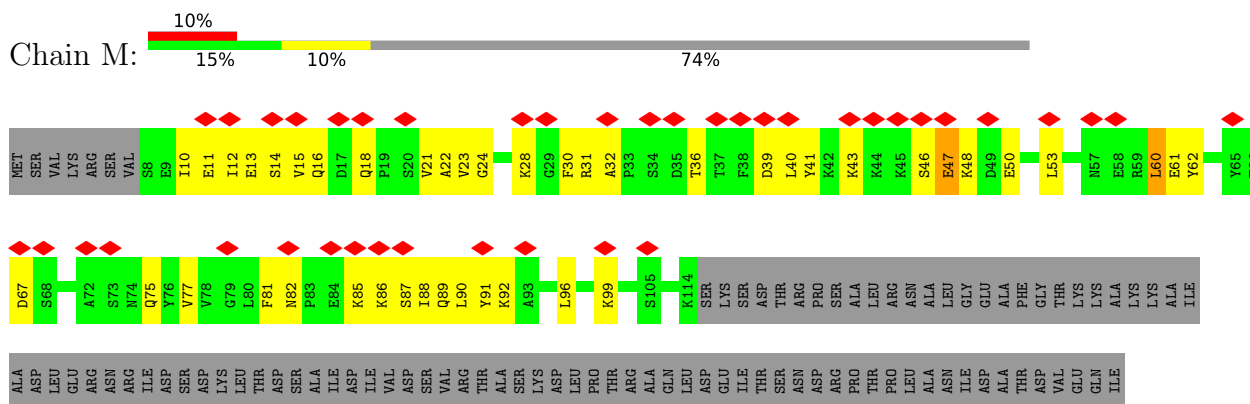
- Molecule 11: DNA-directed RNA polymerases I and III subunit RPAC2



- Molecule 12: DNA-directed RNA polymerases I, II, and III subunit RPABC4



- Molecule 13: DNA-directed RNA polymerase I subunit RPA49



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	98430	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 ($e^-/\text{\AA}^2$)	40	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	0.297	Depositor
Minimum map value	-0.202	Depositor
Average map value	0.001	Depositor
Map value standard deviation	0.013	Depositor
Recommended contour level	0.03	Depositor
Map size (Å)	237.6, 237.6, 237.6	wwPDB
Map dimensions	176, 176, 176	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.35, 1.35, 1.35	Depositor

5 Model quality i

5.1 Standard geometry i

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

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	0.25	1/11976 (0.0%)	0.43	3/16180 (0.0%)
2	B	0.24	0/9596	0.46	4/12971 (0.0%)
3	C	0.24	0/2469	0.41	0/3347
4	D	0.23	0/473	0.44	0/641
5	E	0.24	0/1787	0.41	0/2406
6	F	0.22	0/838	0.38	0/1129
7	G	0.24	0/1662	0.44	0/2260
8	H	0.24	0/1093	0.48	0/1480
9	I	0.24	0/881	0.47	0/1187
10	J	0.22	0/578	0.40	0/775
11	K	0.50	3/795 (0.4%)	0.81	5/1072 (0.5%)
12	L	0.22	0/346	0.45	0/457
13	M	0.24	0/866	0.46	0/1162
14	N	0.24	0/1186	0.44	0/1596
15	S	0.47	0/424	0.81	0/653
16	T	0.48	0/568	0.94	0/874
All	All	0.26	4/35538 (0.0%)	0.47	12/48190 (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
11	K	0	1

All (4) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
11	K	57	ASP	N-CA	10.18	1.66	1.46
1	A	250	LYS	CA-C	-5.97	1.37	1.52

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
11	K	57	ASP	CA-CB	5.24	1.65	1.53
11	K	58	GLY	CA-C	-5.23	1.43	1.51

All (12) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
11	K	57	ASP	N-CA-C	-14.03	73.12	111.00
11	K	57	ASP	CB-CA-C	-11.85	86.70	110.40
2	B	1064	LYS	N-CA-C	-11.72	79.37	111.00
1	A	444	GLN	C-N-CA	-8.56	104.32	122.30
2	B	359	LEU	CA-CB-CG	8.24	134.25	115.30
11	K	57	ASP	N-CA-CB	-8.18	95.88	110.60
2	B	1064	LYS	CB-CA-C	-7.29	95.81	110.40
11	K	58	GLY	N-CA-C	-5.86	98.46	113.10
11	K	58	GLY	CA-C-O	-5.51	110.69	120.60
1	A	250	LYS	N-CA-CB	-5.33	101.00	110.60
1	A	446	ARG	N-CA-C	5.31	125.34	111.00
2	B	1154	ASP	CB-CG-OD2	5.18	122.96	118.30

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
11	K	58	GLY	Mainchain

5.2 Too-close contacts [i](#)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	11760	0	11838	303	0
2	B	9389	0	9269	280	0
3	C	2418	0	2401	47	0
4	D	467	0	468	13	0
5	E	1751	0	1776	37	0
6	F	823	0	841	23	0
7	G	1624	0	1625	52	0
8	H	1075	0	1045	23	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
9	I	869	0	862	22	0
10	J	569	0	585	20	0
11	K	785	0	782	18	0
12	L	344	0	363	9	0
13	M	850	0	850	34	0
14	N	1164	0	1160	27	0
15	S	376	0	202	6	0
16	T	509	0	285	11	0
17	A	2	0	0	0	0
17	B	1	0	0	0	0
17	I	2	0	0	0	0
17	J	1	0	0	0	0
17	L	1	0	0	0	0
All	All	34780	0	34352	795	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 (795) 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)
2:B:1140:LYS:HE2	7:G:17:ILE:CD1	1.46	1.44
1:A:248:PHE:CE1	1:A:442:LYS:NZ	2.04	1.26
2:B:1140:LYS:CE	7:G:17:ILE:HD11	1.75	1.15
1:A:248:PHE:CD1	1:A:442:LYS:NZ	2.17	1.10
10:J:10:CYS:HB3	10:J:45:CYS:SG	1.94	1.07
2:B:1140:LYS:HE2	7:G:17:ILE:HD11	1.09	1.05
1:A:764:SER:O	1:A:766:GLU:N	1.93	0.99
1:A:248:PHE:CE1	1:A:442:LYS:CE	2.46	0.99
2:B:1107:CYS:HB3	2:B:1131:CYS:SG	2.03	0.98
2:B:1104:CYS:HB3	2:B:1107:CYS:SG	2.09	0.92
1:A:248:PHE:CE1	1:A:442:LYS:HE3	2.06	0.87
2:B:1140:LYS:HE2	7:G:17:ILE:HD13	1.55	0.87
2:B:1140:LYS:CE	7:G:17:ILE:CD1	2.39	0.87
2:B:1140:LYS:CD	7:G:17:ILE:HD11	2.04	0.87
1:A:173:ILE:HD12	1:A:173:ILE:O	1.79	0.83
2:B:358:VAL:HG22	2:B:359:LEU:HD12	1.58	0.82
2:B:1063:ARG:HA	2:B:1067:GLY:H	1.44	0.81
2:B:186:GLU:HB3	2:B:189:GLU:HB2	1.62	0.81
3:C:58:ASN:HA	3:C:296:ASN:HB3	1.65	0.78
1:A:1459:LYS:HE2	1:A:1473:LYS:HG2	1.66	0.77

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:760:TRP:HB2	1:A:764:SER:OG	1.82	0.76
2:B:480:GLN:HE22	2:B:508:PHE:H	1.33	0.76
2:B:675:ALA:HB3	2:B:689:VAL:HG12	1.67	0.76
1:A:248:PHE:CZ	1:A:442:LYS:HE3	2.19	0.75
1:A:670:ILE:HG13	1:A:671:GLN:HG3	1.66	0.75
2:B:654:ARG:HD2	2:B:691:PHE:HB3	1.69	0.74
7:G:136:TYR:HB3	7:G:148:LEU:HB2	1.71	0.73
14:N:78:THR:HG21	14:N:89:ILE:HG13	1.71	0.73
2:B:803:MET:HB3	2:B:907:ILE:HB	1.72	0.72
1:A:763:GLY:O	1:A:765:LEU:HD22	1.90	0.72
13:M:16:GLN:HE21	13:M:18:GLN:H	1.37	0.71
1:A:1456:PHE:HB3	1:A:1474:LEU:HG	1.71	0.71
2:B:790:ASN:HB2	2:B:946:ASP:HA	1.74	0.70
16:T:20:DT:H2''	16:T:21:DG:H5'	1.74	0.69
6:F:74:ILE:HB	6:F:144:GLU:HB3	1.74	0.69
14:N:56:ILE:HG12	14:N:137:PHE:HB2	1.75	0.69
2:B:292:ILE:HA	2:B:379:ARG:HD3	1.75	0.69
1:A:462:LYS:HD2	1:A:463:LYS:HG2	1.73	0.69
1:A:764:SER:C	1:A:766:GLU:H	1.95	0.69
14:N:66:LYS:HZ3	14:N:67:LEU:HD23	1.58	0.68
1:A:1240:LEU:HD23	1:A:1519:LEU:HD23	1.75	0.68
1:A:1482:LYS:NZ	2:B:307:GLU:OE1	2.25	0.68
2:B:494:TYR:HD1	2:B:700:LEU:HD22	1.59	0.68
13:M:46:SER:O	13:M:47:GLU:C	2.31	0.68
3:C:301:ASN:HD22	14:N:173:THR:HG22	1.59	0.68
2:B:320:LEU:HB3	2:B:326:VAL:HG12	1.77	0.67
2:B:766:PRO:HG3	10:J:54:VAL:HG11	1.76	0.67
2:B:741:LEU:HB2	2:B:804:TYR:HB2	1.77	0.67
3:C:70:ILE:HD13	11:K:71:THR:HG21	1.77	0.66
1:A:986:PHE:HB3	2:B:960:ILE:HD13	1.77	0.66
2:B:731:VAL:HG11	10:J:59:LYS:HE2	1.76	0.66
5:E:200:ARG:HE	5:E:208:TYR:HD2	1.43	0.66
1:A:249:THR:HG22	1:A:431:GLN:HG2	1.77	0.66
13:M:22:ALA:HB2	13:M:40:LEU:HD21	1.76	0.66
1:A:1003:ARG:HD2	2:B:520:LEU:HB2	1.78	0.65
2:B:216:ALA:HB1	2:B:384:LEU:HD13	1.79	0.65
2:B:726:MET:SD	2:B:1035:ARG:NH1	2.69	0.65
8:H:130:ARG:H	8:H:130:ARG:HD2	1.60	0.65
1:A:316:LEU:HD13	1:A:317:SER:H	1.61	0.65
1:A:490:ILE:HG23	1:A:494:GLU:HG3	1.77	0.65
2:B:285:ASP:OD2	2:B:314:LYS:NZ	2.28	0.65

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:921:HIS:NE2	2:B:965:GLU:OE1	2.29	0.65
2:B:781:TYR:HB2	2:B:788:ILE:HD11	1.78	0.65
3:C:271:ARG:NH1	14:N:175:TYR:OH	2.30	0.65
2:B:588:ILE:HA	2:B:642:LEU:HB2	1.79	0.64
2:B:617:THR:HG22	2:B:619:GLY:H	1.60	0.64
2:B:633:THR:O	2:B:634:ARG:NH2	2.31	0.64
2:B:554:GLN:OE1	2:B:646:HIS:NE2	2.30	0.64
8:H:56:THR:HB	8:H:145:ARG:HB2	1.79	0.64
2:B:240:ARG:NH2	2:B:356:ARG:O	2.30	0.64
1:A:1660:VAL:HG21	7:G:105:ILE:HD13	1.79	0.64
2:B:240:ARG:HD3	2:B:244:THR:HG23	1.78	0.64
7:G:161:ASN:ND2	7:G:247:GLY:O	2.29	0.64
11:K:104:ARG:HH21	11:K:106:GLN:HE21	1.45	0.64
2:B:492:ASN:HD22	2:B:725:THR:HG22	1.63	0.64
1:A:469:LYS:HA	2:B:1070:ARG:HH11	1.62	0.64
2:B:237:ARG:NH1	2:B:401:GLU:OE1	2.30	0.64
7:G:136:TYR:O	7:G:148:LEU:N	2.24	0.64
5:E:151:PRO:HB3	5:E:200:ARG:HB3	1.80	0.63
13:M:46:SER:O	13:M:48:LYS:N	2.31	0.63
16:T:7:DA:H2''	16:T:8:DA:H5''	1.79	0.63
1:A:1550:LEU:HD21	1:A:1594:THR:HB	1.79	0.63
2:B:752:VAL:O	2:B:920:ARG:NH1	2.28	0.63
13:M:16:GLN:NE2	13:M:18:GLN:OE1	2.32	0.63
2:B:28:PRO:HB2	2:B:178:TYR:HA	1.81	0.63
2:B:1104:CYS:CB	2:B:1107:CYS:SG	2.79	0.63
2:B:826:GLY:HA3	12:L:42:ARG:HH22	1.63	0.63
3:C:83:VAL:HG23	12:L:69:ALA:HB2	1.81	0.63
2:B:236:ILE:HD11	2:B:377:MET:HG2	1.81	0.62
2:B:547:HIS:HE1	2:B:702:ASN:HD22	1.47	0.62
1:A:15:ASP:HB3	1:A:1631:ARG:HD2	1.81	0.62
5:E:100:ILE:HG23	5:E:105:PHE:HB2	1.82	0.62
1:A:1635:ASP:O	1:A:1648:ASN:ND2	2.32	0.62
13:M:32:ALA:HB1	14:N:121:ILE:HG21	1.80	0.62
1:A:1350:ARG:NH2	2:B:267:ASN:OD1	2.33	0.62
2:B:906:ARG:NH1	3:C:95:GLU:OE1	2.33	0.62
2:B:394:PRO:O	2:B:400:GLN:NE2	2.33	0.62
2:B:292:ILE:HG22	2:B:293:ILE:H	1.65	0.61
1:A:913:PRO:HB3	1:A:926:GLN:HE22	1.65	0.61
2:B:718:GLN:HE21	2:B:922:GLY:H	1.48	0.61
8:H:16:ASP:HB3	8:H:25:ARG:HB3	1.82	0.61
1:A:445:GLY:O	1:A:446:ARG:HB2	2.01	0.61

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:446:ARG:HE	1:A:446:ARG:N	1.98	0.61
2:B:184:LYS:HE3	2:B:735:HIS:HD2	1.66	0.61
6:F:63:GLN:HG3	6:F:67:LYS:HE3	1.81	0.61
7:G:161:ASN:HD21	7:G:248:THR:HA	1.66	0.61
2:B:52:LEU:HA	2:B:60:LEU:HD23	1.82	0.61
1:A:15:ASP:OD2	2:B:1197:ARG:NH2	2.34	0.61
1:A:995:TYR:OH	2:B:715:ASN:ND2	2.34	0.61
2:B:379:ARG:NH2	2:B:383:SER:OG	2.33	0.61
1:A:611:GLU:HG2	1:A:612:LYS:H	1.66	0.61
1:A:1050:TYR:HB3	1:A:1054:ALA:HA	1.82	0.61
2:B:50:ASN:OD1	2:B:168:ASN:ND2	2.31	0.61
14:N:63:ASP:O	14:N:66:LYS:NZ	2.31	0.61
1:A:939:ASN:ND2	2:B:955:PRO:O	2.31	0.60
1:A:11:ILE:HG12	2:B:1200:VAL:HG22	1.83	0.60
2:B:17:ARG:HG3	2:B:20:GLU:HB3	1.83	0.60
2:B:119:ARG:NH1	12:L:52:GLY:O	2.34	0.60
2:B:986:PHE:HE1	14:N:160:VAL:HG21	1.65	0.60
2:B:1140:LYS:HD3	7:G:13:THR:HG21	1.84	0.60
13:M:77:VAL:HG12	13:M:92:LYS:HA	1.81	0.60
1:A:1187:ILE:HD11	2:B:1077:ASP:HB2	1.84	0.60
1:A:1316:VAL:HG11	1:A:1498:ILE:HA	1.84	0.60
1:A:1593:GLY:HA3	5:E:179:GLN:HE21	1.66	0.60
3:C:222:VAL:HG11	3:C:225:ALA:HB2	1.82	0.60
9:I:72:LYS:HE3	9:I:75:GLU:HG2	1.84	0.60
5:E:4:GLU:OE1	5:E:8:ASN:ND2	2.35	0.59
1:A:462:LYS:HE2	1:A:469:LYS:HB2	1.85	0.59
2:B:718:GLN:OE1	2:B:1034:GLN:NE2	2.34	0.59
1:A:692:TYR:OH	1:A:734:THR:OG1	2.18	0.59
2:B:84:GLU:HG3	2:B:86:SER:H	1.67	0.59
14:N:113:SER:OG	14:N:117:GLU:OE2	2.19	0.59
1:A:1131:LYS:NZ	6:F:81:THR:O	2.34	0.59
1:A:1256:LYS:O	1:A:1499:ARG:NH2	2.35	0.59
1:A:1655:ASP:OD2	7:G:106:LYS:NZ	2.35	0.59
2:B:193:TYR:HA	2:B:202:LEU:HD23	1.84	0.59
3:C:218:LYS:NZ	12:L:69:ALA:O	2.32	0.59
11:K:80:ILE:HG12	11:K:120:GLY:HA3	1.84	0.59
1:A:1573:TYR:HA	9:I:122:ARG:HH21	1.68	0.59
2:B:982:THR:HG23	2:B:985:ILE:HD13	1.85	0.59
6:F:146:TRP:HB3	6:F:151:LEU:HD21	1.85	0.59
7:G:24:VAL:HG11	7:G:126:GLN:HE22	1.68	0.59
2:B:218:ILE:HD11	2:B:384:LEU:HD21	1.83	0.59

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
13:M:23:VAL:HG12	14:N:107:MET:HB2	1.84	0.59
1:A:1574:ALA:HB3	9:I:122:ARG:HG2	1.85	0.59
3:C:100:ARG:NH2	3:C:192:LEU:O	2.36	0.58
12:L:31:CYS:CB	12:L:34:CYS:SG	2.91	0.58
1:A:1656:VAL:HB	6:F:92:ARG:HE	1.69	0.58
1:A:519:LEU:HD21	1:A:577:VAL:HB	1.83	0.58
2:B:292:ILE:HG13	2:B:306:LEU:HD22	1.85	0.58
2:B:845:LEU:HD21	2:B:887:LEU:HD21	1.85	0.58
1:A:203:THR:HG22	1:A:204:GLU:H	1.68	0.58
14:N:63:ASP:HB2	14:N:66:LYS:HD2	1.85	0.58
8:H:64:ASN:O	8:H:87:ARG:NH1	2.36	0.58
8:H:124:ARG:NH1	8:H:126:GLU:OE2	2.37	0.58
1:A:1253:THR:HA	1:A:1256:LYS:HD3	1.84	0.58
2:B:286:ARG:HH22	9:I:9:PHE:HB3	1.69	0.58
5:E:178:ILE:HG22	5:E:214:CYS:HA	1.84	0.58
9:I:112:TYR:HB2	9:I:121:PHE:HB2	1.84	0.58
15:S:63:DT:H2''	15:S:64:DT:H3'	1.86	0.58
1:A:40:ASN:HD22	1:A:41:LEU:H	1.52	0.58
1:A:399:LEU:HD21	1:A:422:ARG:HG3	1.86	0.58
1:A:1180:ASN:HD21	6:F:87:LYS:HG2	1.69	0.58
2:B:656:LEU:HB2	2:B:657:PRO:HD3	1.85	0.58
1:A:1290:TYR:HB2	1:A:1474:LEU:HB2	1.86	0.58
2:B:207:ILE:HD11	2:B:400:GLN:HB3	1.86	0.58
2:B:246:GLN:HE22	2:B:357:ILE:HG22	1.69	0.58
1:A:1566:ILE:HA	1:A:1569:VAL:HG22	1.85	0.57
1:A:1021:ARG:NH2	16:T:19:DA:OP1	2.37	0.57
2:B:209:GLN:O	2:B:237:ARG:NH1	2.37	0.57
2:B:221:SER:OG	2:B:225:ARG:NH1	2.37	0.57
2:B:636:GLN:NE2	2:B:671:TYR:OH	2.37	0.57
3:C:80:ALA:HB3	3:C:102:GLY:HA2	1.84	0.57
1:A:1457:ILE:HG12	1:A:1460:TYR:HB2	1.85	0.57
1:A:245:LYS:HG2	1:A:247:GLY:H	1.69	0.57
2:B:219:ARG:HG2	2:B:221:SER:H	1.69	0.57
2:B:573:ALA:HB2	2:B:594:GLY:HA2	1.87	0.57
2:B:773:VAL:N	2:B:1029:GLY:O	2.32	0.57
1:A:1274:GLU:OE2	1:A:1288:ARG:NH1	2.37	0.57
2:B:182:GLN:O	10:J:69:ARG:NH1	2.38	0.57
1:A:462:LYS:HD3	1:A:469:LYS:HE2	1.86	0.57
5:E:24:LYS:NZ	5:E:32:GLN:OE1	2.38	0.57
13:M:43:LYS:HG3	13:M:50:GLU:HB3	1.86	0.57
1:A:316:LEU:HD12	1:A:318:THR:HG23	1.86	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:17:ARG:O	2:B:21:ARG:NH2	2.38	0.57
1:A:173:ILE:HD12	1:A:173:ILE:C	2.25	0.56
3:C:107:LYS:HG3	3:C:187:ALA:HA	1.87	0.56
7:G:63:LYS:HA	7:G:67:ASN:HD22	1.70	0.56
1:A:709:ARG:NH1	1:A:740:THR:O	2.37	0.56
1:A:1482:LYS:HD3	2:B:311:ARG:HH12	1.71	0.56
3:C:327:TYR:HE2	11:K:46:LYS:HG3	1.69	0.56
7:G:74:ASN:HB3	7:G:77:VAL:HG12	1.87	0.56
13:M:46:SER:O	13:M:48:LYS:O	2.23	0.56
2:B:1116:SER:OG	2:B:1127:CYS:SG	2.64	0.56
1:A:1111:GLU:HG2	1:A:1115:LYS:HB2	1.88	0.56
2:B:237:ARG:HA	2:B:247:THR:HA	1.87	0.56
5:E:88:VAL:O	5:E:117:THR:OG1	2.24	0.56
7:G:159:LYS:HA	7:G:162:ILE:HD12	1.88	0.56
9:I:11:LEU:HD13	13:M:31:ARG:HH12	1.70	0.56
1:A:674:ILE:HD11	1:A:933:ALA:HB2	1.87	0.56
4:D:44:ILE:HD13	4:D:89:LEU:HD22	1.88	0.56
1:A:1051:GLY:HA3	1:A:1580:ARG:HD2	1.87	0.56
1:A:592:GLN:HE22	1:A:634:ASN:HD21	1.54	0.56
2:B:60:LEU:HD11	2:B:243:GLN:HE21	1.71	0.56
2:B:743:ARG:NH2	2:B:804:TYR:OH	2.39	0.56
2:B:935:ASP:HB3	3:C:69:ARG:HH22	1.71	0.56
2:B:96:SER:HB3	2:B:144:SER:HB2	1.86	0.55
5:E:106:GLN:OE1	5:E:107:THR:OG1	2.24	0.55
2:B:976:GLY:HA2	10:J:51:LEU:HD11	1.88	0.55
5:E:80:VAL:HA	5:E:109:ILE:HG23	1.88	0.55
13:M:36:THR:O	14:N:120:LYS:NZ	2.38	0.55
1:A:1647:ASN:OD1	1:A:1648:ASN:N	2.38	0.55
2:B:33:SER:HA	2:B:177:PRO:HG3	1.88	0.55
2:B:196:VAL:HG12	2:B:197:ASN:H	1.71	0.55
1:A:647:ALA:HA	1:A:651:ALA:HB3	1.89	0.55
1:A:464:GLU:OE2	1:A:1617:THR:N	2.39	0.55
1:A:475:ARG:HD3	2:B:1070:ARG:HB2	1.89	0.55
1:A:1350:ARG:HH22	2:B:266:LYS:HD2	1.72	0.55
1:A:481:ARG:HB3	2:B:1045:GLN:HB2	1.89	0.55
5:E:161:LYS:NZ	5:E:193:GLY:O	2.40	0.55
14:N:122:ALA:HB3	14:N:131:LEU:HD23	1.88	0.55
13:M:75:GLN:HE22	14:N:64:ILE:HD11	1.71	0.55
2:B:897:GLU:OE1	2:B:899:GLN:NE2	2.39	0.55
2:B:1076:ARG:HG2	2:B:1088:LEU:HD11	1.89	0.55
4:D:94:ARG:NH2	7:G:151:ASP:OD2	2.39	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
6:F:97:ARG:HG2	6:F:130:ILE:HD12	1.89	0.54
1:A:994:GLU:OE1	1:A:994:GLU:N	2.40	0.54
1:A:1332:GLU:HA	1:A:1335:LYS:HB2	1.88	0.54
2:B:269:TYR:HE2	2:B:337:VAL:HG21	1.72	0.54
2:B:631:PRO:HB3	2:B:638:PRO:HG3	1.90	0.54
6:F:99:LEU:HB3	7:G:112:PRO:HG3	1.88	0.54
2:B:501:ARG:HD2	2:B:545:PHE:HB2	1.89	0.54
2:B:1016:GLY:O	3:C:69:ARG:NH1	2.39	0.54
9:I:11:LEU:HD13	13:M:31:ARG:HH22	1.73	0.54
1:A:35:PRO:HB3	1:A:390:LEU:HB3	1.89	0.54
3:C:301:ASN:ND2	14:N:173:THR:O	2.40	0.54
1:A:9:SER:OG	2:B:1201:GLU:O	2.25	0.54
1:A:584:ARG:NH1	6:F:115:THR:O	2.40	0.54
1:A:27:LEU:HD23	2:B:1130:ARG:HB2	1.89	0.54
2:B:654:ARG:NH2	2:B:659:ASP:OD2	2.41	0.54
4:D:28:PRO:HD2	7:G:23:GLN:HG2	1.89	0.54
5:E:124:VAL:HG23	5:E:125:PRO:HD3	1.90	0.53
1:A:1273:THR:HB	1:A:1291:VAL:HG23	1.89	0.53
1:A:1559:ARG:NH1	1:A:1583:ASP:OD1	2.42	0.53
2:B:127:ARG:NH2	2:B:193:TYR:OH	2.41	0.53
1:A:446:ARG:HE	1:A:446:ARG:H	1.56	0.53
1:A:1240:LEU:HB3	1:A:1519:LEU:HB3	1.90	0.53
1:A:1310:LYS:HZ2	1:A:1467:GLY:HA3	1.72	0.53
1:A:1504:ILE:HA	1:A:1523:GLY:HA3	1.89	0.53
2:B:73:ILE:HD11	2:B:95:LEU:HD22	1.90	0.53
2:B:883:GLU:HG2	2:B:884:GLU:HG2	1.88	0.53
3:C:32:ASN:ND2	3:C:34:GLU:OE2	2.41	0.53
7:G:237:HIS:HB2	7:G:244:SER:HB3	1.90	0.53
2:B:211:ARG:HE	2:B:239:VAL:HG11	1.73	0.53
2:B:362:LEU:HB2	2:B:370:LYS:HD3	1.89	0.53
3:C:212:ILE:HD12	3:C:215:ASP:H	1.74	0.53
13:M:15:VAL:HA	13:M:90:LEU:HD21	1.90	0.53
1:A:1484:LEU:HD23	1:A:1484:LEU:H	1.73	0.53
1:A:1569:VAL:O	1:A:1572:ARG:NE	2.41	0.53
3:C:275:VAL:HG21	3:C:293:ARG:HH21	1.74	0.53
1:A:342:ARG:HE	1:A:1631:ARG:H	1.57	0.53
1:A:360:LEU:HD21	1:A:434:VAL:HG23	1.91	0.53
2:B:398:GLN:HB2	2:B:667:PHE:HD1	1.73	0.53
3:C:134:LEU:HD12	3:C:167:LEU:HB3	1.90	0.53
2:B:809:VAL:HG13	2:B:901:VAL:HG13	1.91	0.53
2:B:71:LYS:HE3	2:B:425:ILE:HD12	1.90	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
6:F:75:PRO:HG2	6:F:78:GLN:HB2	1.91	0.52
13:M:81:PHE:HE1	13:M:86:LYS:HA	1.74	0.52
1:A:1118:VAL:HG11	5:E:154:ILE:HG12	1.90	0.52
2:B:1099:THR:OG1	2:B:1178:ILE:O	2.24	0.52
13:M:21:VAL:N	13:M:91:TYR:OH	2.32	0.52
2:B:307:GLU:HG2	9:I:7:LEU:HG	1.92	0.52
2:B:916:LYS:HB3	2:B:916:LYS:HZ3	1.72	0.52
8:H:33:GLN:HE22	8:H:35:GLN:HB3	1.74	0.52
8:H:93:TYR:CG	8:H:143:LEU:HB3	2.45	0.52
1:A:32:ILE:HB	1:A:79:ILE:HG22	1.91	0.52
1:A:637:PHE:O	2:B:1091:ARG:NH1	2.42	0.52
2:B:280:LEU:HD13	2:B:354:LEU:HD23	1.91	0.52
2:B:731:VAL:HG23	10:J:63:TYR:HE2	1.74	0.52
2:B:1010:ASN:HB3	2:B:1025:ASP:HB2	1.91	0.52
1:A:480:ALA:O	1:A:635:MET:N	2.43	0.52
1:A:829:GLY:N	1:A:832:ASP:OD2	2.41	0.52
2:B:1065:ARG:O	2:B:1066:HIS:HB2	2.10	0.52
1:A:373:LEU:HD12	1:A:376:GLU:H	1.74	0.52
2:B:106:LYS:HG2	2:B:107:PRO:HD2	1.92	0.52
2:B:913:ILE:HD12	2:B:929:ARG:HA	1.91	0.52
1:A:956:ARG:HH11	1:A:979:GLY:HA3	1.74	0.52
2:B:898:LEU:HD23	2:B:898:LEU:H	1.74	0.52
2:B:586:VAL:HG22	2:B:640:LEU:HD13	1.91	0.52
3:C:331:CYS:SG	11:K:44:ARG:NH1	2.83	0.52
6:F:103:MET:HB2	7:G:51:PRO:HG2	1.91	0.52
1:A:669:LEU:HB3	1:A:673:HIS:HB2	1.91	0.52
2:B:501:ARG:HG3	2:B:544:HIS:HB3	1.91	0.52
1:A:498:PRO:HB3	1:A:612:LYS:HA	1.91	0.52
1:A:753:ASN:N	1:A:767:ASN:O	2.43	0.52
2:B:215:MET:HB2	2:B:235:GLN:O	2.10	0.52
2:B:711:GLN:HG2	2:B:713:PRO:HD2	1.92	0.52
1:A:318:THR:O	1:A:320:VAL:N	2.43	0.51
3:C:82:TYR:HD2	3:C:126:PHE:HZ	1.56	0.51
7:G:70:VAL:HG12	7:G:71:MET:HG2	1.92	0.51
11:K:105:ILE:HD11	11:K:116:ALA:HB3	1.93	0.51
1:A:488:PRO:HD2	2:B:781:TYR:CD1	2.45	0.51
1:A:672:ASP:HA	2:B:952:HIS:HE1	1.74	0.51
2:B:203:ILE:HG22	2:B:485:THR:HG22	1.91	0.51
5:E:101:GLN:HE21	5:E:127:ILE:HG13	1.75	0.51
7:G:51:PRO:HA	7:G:54:LEU:HD23	1.91	0.51
7:G:232:THR:N	7:G:248:THR:O	2.43	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
8:H:92:ASP:OD2	8:H:145:ARG:NH2	2.44	0.51
1:A:509:GLU:OE2	1:A:515:ASN:ND2	2.43	0.51
2:B:379:ARG:HG2	2:B:579:ALA:HB1	1.92	0.51
2:B:614:GLU:OE1	2:B:616:LYS:NZ	2.35	0.51
3:C:85:PHE:HE1	3:C:204:LEU:HD22	1.74	0.51
2:B:985:ILE:O	14:N:157:ARG:NH2	2.42	0.51
2:B:1093:LEU:HD13	2:B:1179:PRO:HG3	1.93	0.51
13:M:41:TYR:HE1	14:N:30:LYS:H	1.57	0.51
1:A:550:SER:HB2	1:A:553:GLN:HE22	1.74	0.51
1:A:1041:ALA:HB1	1:A:1648:ASN:HD21	1.75	0.51
2:B:167:SER:H	2:B:170:CYS:HB3	1.76	0.51
1:A:855:ARG:NH1	1:A:867:ASP:O	2.43	0.51
1:A:1617:THR:HG22	1:A:1620:GLN:HB2	1.92	0.51
2:B:782:ASP:N	2:B:782:ASP:OD1	2.44	0.51
6:F:81:THR:OG1	6:F:146:TRP:NE1	2.44	0.51
1:A:1007:ILE:HD11	2:B:518:ARG:HB3	1.92	0.50
1:A:1049:MET:HB3	5:E:208:TYR:HE1	1.75	0.50
3:C:48:ASP:OD1	3:C:49:ALA:N	2.42	0.50
1:A:245:LYS:HA	1:A:251:ILE:HG22	1.92	0.50
1:A:248:PHE:HE1	1:A:442:LYS:NZ	1.92	0.50
1:A:835:LEU:HA	1:A:917:MET:H	1.76	0.50
1:A:426:ALA:HA	1:A:429:THR:HG22	1.93	0.50
1:A:595:LEU:HB3	1:A:1020:GLN:HE22	1.76	0.50
1:A:1296:PHE:N	1:A:1468:LYS:O	2.35	0.50
3:C:33:VAL:HG21	11:K:126:ASP:HB3	1.93	0.50
13:M:13:GLU:OE2	13:M:87:SER:OG	2.28	0.50
1:A:1478:ALA:HB1	9:I:21:ASN:HB2	1.93	0.50
1:A:40:ASN:ND2	1:A:41:LEU:H	2.10	0.50
2:B:1140:LYS:HD3	7:G:17:ILE:HD11	1.90	0.50
5:E:143:ASN:HD22	5:E:144:ILE:N	2.09	0.50
1:A:855:ARG:HD2	1:A:869:PRO:HA	1.92	0.50
2:B:132:SER:HB2	2:B:134:ARG:HH11	1.76	0.50
2:B:831:GLU:OE1	2:B:868:LYS:NZ	2.43	0.50
6:F:57:ASP:O	6:F:61:HIS:ND1	2.35	0.50
1:A:1450:ILE:HG23	1:A:1457:ILE:HG21	1.93	0.50
7:G:140:GLN:OE1	7:G:217:TRP:NE1	2.45	0.50
15:S:65:DG:H2''	15:S:66:DA:C8	2.46	0.50
1:A:643:ALA:HB1	2:B:1087:LEU:HD23	1.93	0.50
1:A:1216:THR:HG23	1:A:1221:ARG:HD3	1.94	0.50
2:B:398:GLN:HG3	2:B:399:HIS:ND1	2.27	0.50
15:S:60:DC:H2''	15:S:61:DA:C8	2.47	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:256:GLY:O	2:B:305:ARG:NH2	2.44	0.49
9:I:28:VAL:HG12	9:I:38:PRO:HD3	1.93	0.49
2:B:184:LYS:HE3	2:B:735:HIS:CD2	2.47	0.49
3:C:260:GLU:HG2	3:C:262:SER:H	1.77	0.49
10:J:5:VAL:HG22	10:J:15:GLY:HA3	1.93	0.49
8:H:6:PHE:HB3	8:H:59:ILE:HB	1.93	0.49
12:L:31:CYS:HB3	12:L:34:CYS:SG	2.52	0.49
1:A:538:ASN:OD1	1:A:539:GLU:N	2.45	0.49
1:A:1003:ARG:HH21	2:B:530:PRO:HA	1.78	0.49
1:A:781:LEU:HA	1:A:785:GLN:HG3	1.94	0.49
1:A:1240:LEU:HG	1:A:1536:ILE:HG21	1.95	0.49
5:E:55:ARG:NH1	5:E:137:GLU:OE2	2.45	0.49
7:G:232:THR:O	7:G:248:THR:N	2.43	0.49
8:H:99:GLY:HA3	8:H:118:PHE:HD1	1.77	0.49
8:H:129:TYR:H	8:H:130:ARG:HH11	1.59	0.49
2:B:404:LEU:HD11	2:B:551:ILE:HG21	1.95	0.49
2:B:518:ARG:NH1	2:B:537:SER:O	2.44	0.49
1:A:602:GLY:N	1:A:651:ALA:O	2.46	0.49
1:A:653:THR:OG1	1:A:667:ARG:NH1	2.45	0.49
2:B:1158:ILE:HD11	2:B:1166:LYS:HB3	1.93	0.49
10:J:64:ASN:HD22	10:J:66:LEU:H	1.61	0.49
1:A:1032:VAL:HG23	1:A:1182:GLY:H	1.77	0.49
3:C:105:PRO:HG2	3:C:187:ALA:HB3	1.93	0.49
3:C:131:THR:HB	3:C:209:ILE:HG22	1.95	0.49
1:A:748:ASN:HB2	1:A:1071:ASP:HB3	1.95	0.49
2:B:367:SER:HA	2:B:370:LYS:HB3	1.95	0.49
2:B:609:ARG:HH12	2:B:664:VAL:HG12	1.77	0.49
2:B:721:MET:HG2	2:B:1036:LEU:HD21	1.94	0.49
2:B:1140:LYS:HD3	7:G:13:THR:CG2	2.43	0.49
15:S:57:DA:H2''	15:S:58:DA:C8	2.47	0.49
1:A:496:GLY:HA3	1:A:615:ARG:HB2	1.94	0.49
1:A:1085:LEU:HD22	6:F:152:ILE:HD13	1.94	0.49
2:B:218:ILE:HD13	2:B:391:PRO:HB3	1.94	0.49
3:C:332:PRO:O	11:K:44:ARG:NH1	2.43	0.49
1:A:4:SER:HB2	1:A:573:LEU:HD13	1.94	0.48
1:A:111:LYS:HG3	1:A:234:ASP:HB3	1.94	0.48
1:A:668:GLY:HA3	1:A:787:GLY:HA2	1.95	0.48
1:A:1006:LEU:HD11	2:B:713:PRO:HB3	1.95	0.48
1:A:1064:THR:HG23	1:A:1143:LYS:HD3	1.94	0.48
1:A:1506:ARG:HB3	1:A:1522:GLU:HB2	1.95	0.48
10:J:9:SER:HB2	10:J:45:CYS:HB2	1.93	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:248:PHE:HE1	1:A:442:LYS:HZ1	1.52	0.48
1:A:263:ASN:HA	1:A:266:VAL:HG22	1.94	0.48
9:I:111:PHE:HB3	9:I:122:ARG:HH11	1.77	0.48
1:A:446:ARG:N	1:A:446:ARG:NE	2.60	0.48
1:A:1572:ARG:HD3	1:A:1573:TYR:HD1	1.78	0.48
1:A:1655:ASP:OD1	1:A:1656:VAL:N	2.46	0.48
2:B:12:ARG:HG2	2:B:13:THR:HG22	1.93	0.48
2:B:790:ASN:HD22	2:B:791:LYS:N	2.12	0.48
6:F:101:ILE:HA	6:F:105:ALA:HB3	1.95	0.48
1:A:89:LEU:HB3	1:A:1623:THR:HG22	1.94	0.48
1:A:90:PHE:HB3	1:A:93:GLN:HE21	1.78	0.48
2:B:261:ARG:HH21	2:B:270:LEU:HD21	1.78	0.48
3:C:91:VAL:HG11	10:J:60:PHE:HB3	1.94	0.48
4:D:48:GLU:OE2	4:D:90:LYS:NZ	2.46	0.48
1:A:1635:ASP:OD1	1:A:1635:ASP:N	2.47	0.48
7:G:137:ILE:HG12	7:G:145:ILE:HD11	1.94	0.48
2:B:225:ARG:HH21	2:B:261:ARG:HH12	1.60	0.48
7:G:226:ASP:OD1	7:G:227:GLY:N	2.44	0.48
7:G:49:LEU:HD12	7:G:105:ILE:HG21	1.93	0.48
7:G:219:ASP:OD1	7:G:220:SER:N	2.45	0.48
1:A:1003:ARG:HH12	2:B:533:THR:HG21	1.79	0.48
3:C:145:ASP:OD1	3:C:146:ALA:N	2.43	0.48
1:A:239:PHE:HD2	1:A:260:GLN:HA	1.79	0.48
1:A:419:ILE:HD12	1:A:422:ARG:HE	1.79	0.48
1:A:1242:ILE:HB	1:A:1517:ARG:HH12	1.78	0.48
1:A:1606:SER:HB3	1:A:1612:LYS:HD3	1.96	0.48
2:B:277:LEU:HD22	2:B:288:ILE:HG13	1.95	0.48
2:B:963:PHE:O	2:B:1027:TYR:OH	2.32	0.48
1:A:1197:SER:HB2	1:A:1219:ILE:HD13	1.96	0.47
1:A:1229:ALA:HB1	1:A:1595:TYR:CE2	2.49	0.47
2:B:853:GLU:HA	2:B:879:PRO:HB3	1.96	0.47
7:G:136:TYR:HD2	7:G:148:LEU:HD13	1.78	0.47
1:A:246:ASP:HB3	1:A:249:THR:O	2.14	0.47
2:B:1107:CYS:HB2	2:B:1130:ARG:HH11	1.79	0.47
7:G:66:LEU:H	7:G:66:LEU:HD23	1.78	0.47
8:H:8:ASP:OD1	8:H:9:ILE:N	2.42	0.47
9:I:109:THR:OG1	9:I:123:THR:O	2.32	0.47
1:A:522:ALA:HA	1:A:532:GLY:HA2	1.97	0.47
1:A:1055:ILE:HD11	1:A:1580:ARG:HH12	1.78	0.47
2:B:280:LEU:O	2:B:323:ARG:NH2	2.48	0.47
7:G:145:ILE:HD12	7:G:217:TRP:HE1	1.79	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:763:GLY:C	1:A:765:LEU:H	2.17	0.47
1:A:1298:ASP:OD1	1:A:1299:ASN:N	2.46	0.47
7:G:162:ILE:HD13	7:G:217:TRP:CH2	2.49	0.47
14:N:149:ASP:OD2	14:N:151:SER:OG	2.31	0.47
1:A:19:LEU:HD22	2:B:1195:ARG:HB2	1.97	0.47
2:B:650:LEU:HD23	2:B:663:ILE:HG21	1.95	0.47
5:E:126:SER:C	5:E:128:PRO:HD3	2.35	0.47
6:F:85:MET:HB2	6:F:151:LEU:HB3	1.97	0.47
12:L:31:CYS:SG	12:L:32:ALA:N	2.87	0.47
13:M:53:LEU:HD23	13:M:96:LEU:HD13	1.96	0.47
1:A:760:TRP:CB	1:A:764:SER:OG	2.58	0.47
1:A:893:ASP:OD2	1:A:956:ARG:N	2.47	0.47
5:E:198:ILE:HB	5:E:210:SER:O	2.15	0.47
13:M:14:SER:OG	13:M:89:GLN:OE1	2.33	0.47
13:M:28:LYS:HG2	14:N:105:SER:HB2	1.95	0.47
2:B:265:ARG:HD3	2:B:473:GLN:HG3	1.97	0.47
2:B:317:TYR:HE1	2:B:320:LEU:HB2	1.79	0.47
2:B:340:ALA:HB1	2:B:344:GLN:HE21	1.78	0.47
2:B:990:ASP:OD1	2:B:990:ASP:N	2.47	0.47
6:F:108:PHE:HB2	6:F:129:LYS:HB3	1.97	0.47
9:I:21:ASN:OD1	9:I:22:ALA:N	2.48	0.47
9:I:62:ALA:HB1	9:I:69:THR:HG21	1.97	0.47
1:A:1277:GLY:HA3	9:I:44:ASN:HA	1.95	0.47
2:B:863:ASP:OD2	2:B:865:THR:OG1	2.22	0.47
2:B:973:ALA:O	10:J:47:ARG:HD2	2.15	0.47
5:E:20:LYS:NZ	5:E:34:GLU:HB3	2.30	0.47
2:B:285:ASP:HA	2:B:288:ILE:HD13	1.97	0.47
2:B:662:ASP:OD1	2:B:663:ILE:N	2.41	0.47
1:A:610:ASN:ND2	11:K:97:SER:OG	2.45	0.47
5:E:127:ILE:N	5:E:128:PRO:HD3	2.30	0.47
2:B:776:ILE:HG12	2:B:1026:ILE:HD12	1.97	0.46
5:E:152:LYS:HG3	5:E:154:ILE:HD11	1.96	0.46
8:H:133:ASN:OD1	8:H:134:ASN:N	2.47	0.46
13:M:60:LEU:HD13	13:M:61:GLU:N	2.30	0.46
5:E:155:ARG:HA	5:E:196:VAL:HG12	1.96	0.46
9:I:88:GLN:OE1	9:I:88:GLN:N	2.47	0.46
2:B:467:THR:OG1	2:B:469:ASN:OD1	2.34	0.46
2:B:1195:ARG:HH12	2:B:1197:ARG:HH11	1.63	0.46
3:C:84:TYR:HB3	12:L:64:LEU:HD11	1.97	0.46
1:A:1196:PRO:HB3	1:A:1575:ILE:HD13	1.96	0.46
13:M:24:GLY:O	14:N:108:THR:N	2.42	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:95:TYR:CZ	1:A:245:LYS:HB2	2.50	0.46
2:B:532:HIS:HE1	2:B:700:LEU:HD12	1.79	0.46
2:B:1042:ASP:HB2	2:B:1043:LYS:HE2	1.96	0.46
2:B:1080:ILE:HG23	2:B:1088:LEU:HD13	1.98	0.46
2:B:1189:LEU:HB3	2:B:1194:ILE:HG23	1.98	0.46
1:A:209:THR:HG23	1:A:211:THR:H	1.81	0.46
1:A:579:ARG:HH12	1:A:584:ARG:HH21	1.63	0.46
1:A:610:ASN:HD22	2:B:929:ARG:HH22	1.63	0.46
1:A:1549:VAL:HG21	1:A:1561:THR:HG21	1.98	0.46
8:H:53:ASP:OD1	8:H:54:SER:N	2.48	0.46
1:A:696:ILE:HG22	1:A:712:ILE:HD11	1.97	0.46
2:B:358:VAL:O	2:B:370:LYS:NZ	2.48	0.46
7:G:111:THR:HG23	7:G:113:PHE:H	1.80	0.46
11:K:54:THR:HA	11:K:61:ALA:HA	1.98	0.46
1:A:585:ASP:OD1	1:A:586:VAL:N	2.42	0.46
1:A:610:ASN:OD1	1:A:611:GLU:N	2.48	0.46
1:A:772:LYS:HE3	8:H:102:TYR:HA	1.97	0.46
1:A:795:HIS:CE1	1:A:1061:SER:HB2	2.51	0.46
2:B:738:ASP:HB2	2:B:741:LEU:HD11	1.97	0.46
1:A:429:THR:O	1:A:433:ASP:HB2	2.15	0.45
1:A:535:GLN:HE21	1:A:543:LEU:HG	1.81	0.45
1:A:908:VAL:HG11	9:I:82:ILE:HG13	1.98	0.45
1:A:1195:GLU:O	1:A:1199:GLN:N	2.42	0.45
2:B:766:PRO:HD2	10:J:56:LEU:HD11	1.98	0.45
3:C:319:ARG:NH2	11:K:132:GLU:OE2	2.49	0.45
7:G:93:ASP:HB3	7:G:104:LEU:HD21	1.98	0.45
8:H:49:VAL:HG11	8:H:55:LEU:HD21	1.97	0.45
1:A:799:GLU:O	1:A:1079:LYS:NZ	2.47	0.45
1:A:1275:THR:HG23	1:A:1289:SER:HB2	1.98	0.45
1:A:1322:ILE:HA	1:A:1325:LEU:HD12	1.98	0.45
1:A:65:CYS:SG	1:A:72:CYS:HB2	2.57	0.45
1:A:763:GLY:C	1:A:765:LEU:N	2.69	0.45
2:B:145:VAL:HG13	2:B:149:GLU:HG2	1.97	0.45
2:B:1099:THR:HG21	2:B:1180:PHE:HB2	1.98	0.45
2:B:1189:LEU:HD12	2:B:1196:LEU:HD11	1.97	0.45
5:E:54:GLN:HG3	5:E:56:LYS:HG2	1.97	0.45
6:F:92:ARG:HH22	7:G:109:PRO:HB3	1.80	0.45
7:G:110:ASP:OD1	7:G:111:THR:N	2.46	0.45
1:A:248:PHE:HE1	1:A:442:LYS:CE	2.17	0.45
2:B:357:ILE:HG13	2:B:358:VAL:N	2.31	0.45
5:E:149:LEU:H	5:E:149:LEU:HD23	1.82	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
8:H:43:ASN:HD21	8:H:46:LEU:HD23	1.81	0.45
1:A:232:LYS:HB2	1:A:239:PHE:HE1	1.82	0.45
1:A:1545:ASP:OD1	1:A:1546:VAL:N	2.49	0.45
1:A:454:PRO:HB3	1:A:458:GLN:HG2	1.97	0.45
1:A:596:HIS:HB3	1:A:1195:GLU:HG2	1.98	0.45
1:A:855:ARG:HA	1:A:974:THR:HG22	1.98	0.45
1:A:1658:ALA:HA	6:F:132:LEU:HD23	1.99	0.45
2:B:920:ARG:HD3	2:B:1032:TYR:HD2	1.81	0.45
1:A:458:GLN:CD	1:A:458:GLN:H	2.19	0.45
1:A:581:ILE:HD11	1:A:605:VAL:HG21	1.99	0.45
4:D:22:ILE:HG23	7:G:76:LYS:HG3	1.98	0.45
4:D:27:LEU:HD23	4:D:27:LEU:H	1.81	0.45
13:M:10:ILE:HD13	13:M:88:ILE:HD11	1.99	0.45
1:A:518:GLU:OE2	1:A:582:LYS:NZ	2.43	0.45
2:B:211:ARG:NH2	2:B:243:GLN:OE1	2.36	0.45
10:J:10:CYS:SG	10:J:11:GLY:N	2.90	0.45
2:B:885:VAL:HG23	12:L:58:LYS:HB3	1.99	0.45
6:F:86:THR:HG23	6:F:88:TYR:H	1.82	0.45
13:M:39:ASP:O	13:M:53:LEU:HA	2.17	0.45
1:A:481:ARG:HA	1:A:634:ASN:HA	1.98	0.44
2:B:750:PRO:HB2	2:B:753:LYS:HB3	2.00	0.44
2:B:1094:ASN:HA	2:B:1098:TYR:HB2	1.98	0.44
2:B:1202:PRO:HG2	4:D:21:VAL:HG21	1.98	0.44
1:A:242:LYS:H	1:A:242:LYS:HD2	1.83	0.44
1:A:481:ARG:HH22	16:T:23:DA:H5'	1.82	0.44
1:A:1262:LEU:HA	1:A:1497:ILE:HA	1.98	0.44
1:A:1585:ILE:O	1:A:1589:MET:HG2	2.17	0.44
2:B:164:MET:HB2	2:B:194:PHE:HE1	1.81	0.44
2:B:205:MET:SD	2:B:404:LEU:HA	2.57	0.44
2:B:286:ARG:HD2	9:I:14:GLY:HA3	1.98	0.44
6:F:64:ILE:HA	6:F:67:LYS:HZ2	1.82	0.44
8:H:126:GLU:N	8:H:126:GLU:OE1	2.51	0.44
2:B:1118:PRO:HD3	2:B:1125:THR:HG21	1.99	0.44
13:M:60:LEU:HD12	13:M:62:TYR:CZ	2.53	0.44
1:A:241:PRO:HB3	1:A:256:LEU:HD13	1.99	0.44
1:A:947:LEU:HB3	1:A:982:VAL:HG21	1.99	0.44
1:A:1030:VAL:HG23	1:A:1186:GLY:HA3	1.98	0.44
1:A:1246:VAL:HA	1:A:1250:GLN:HE21	1.83	0.44
2:B:167:SER:O	2:B:173:ASN:HB2	2.17	0.44
2:B:1133:MET:SD	2:B:1133:MET:N	2.91	0.44
2:B:1140:LYS:HE2	7:G:17:ILE:HD12	1.75	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
8:H:107:VAL:HG12	8:H:108:SER:H	1.82	0.44
14:N:73:ASP:OD1	14:N:74:PHE:N	2.50	0.44
1:A:316:LEU:HD22	1:A:316:LEU:HA	1.87	0.44
1:A:586:VAL:HG22	1:A:644:ARG:HG3	2.00	0.44
1:A:876:LEU:O	1:A:880:GLN:HG2	2.17	0.44
1:A:1441:LYS:HE2	1:A:1441:LYS:HB3	1.88	0.44
2:B:353:VAL:O	2:B:357:ILE:HG12	2.18	0.44
2:B:402:VAL:HG21	2:B:545:PHE:HZ	1.83	0.44
2:B:923:GLN:HE21	2:B:959:THR:HG21	1.82	0.44
3:C:254:GLY:N	14:N:179:ASP:OD2	2.50	0.44
5:E:164:LEU:HD21	5:E:175:LEU:HD21	2.00	0.44
1:A:838:GLU:OE2	1:A:842:TRP:NE1	2.50	0.44
1:A:1658:ALA:HB2	7:G:107:ILE:HD11	1.99	0.44
2:B:250:LEU:HD23	2:B:260:PHE:HA	2.00	0.44
2:B:527:PHE:HE2	2:B:666:PRO:HA	1.81	0.44
14:N:33:LYS:HG2	14:N:34:HIS:CD2	2.53	0.44
1:A:467:PHE:HA	1:A:471:MET:HB2	1.99	0.44
1:A:1241:PRO:HD2	1:A:1541:ILE:HG22	2.00	0.44
1:A:1594:THR:HG23	5:E:179:GLN:HG3	1.99	0.44
7:G:51:PRO:HG3	7:G:112:PRO:HB2	2.00	0.44
1:A:721:LYS:NZ	8:H:93:TYR:O	2.41	0.44
2:B:117:VAL:HG13	2:B:118:GLU:H	1.82	0.44
13:M:12:ILE:HD12	13:M:88:ILE:HB	1.99	0.44
2:B:652:PRO:HA	2:B:662:ASP:O	2.18	0.43
7:G:105:ILE:HG13	7:G:116:THR:HG21	2.00	0.43
14:N:110:LEU:HB2	14:N:119:LEU:HD13	2.00	0.43
16:T:21:DG:OP2	16:T:21:DG:H3'	2.17	0.43
1:A:621:THR:OG1	1:A:626:ALA:O	2.36	0.43
1:A:1298:ASP:HB3	1:A:1301:GLU:HB2	2.00	0.43
2:B:181:VAL:HG11	10:J:62:ARG:HB3	2.00	0.43
3:C:42:VAL:O	11:K:138:LYS:HE3	2.18	0.43
7:G:45:LEU:H	7:G:45:LEU:HD23	1.83	0.43
11:K:109:GLY:O	11:K:110:GLU:HG2	2.18	0.43
16:T:20:DT:C2'	16:T:21:DG:H5'	2.44	0.43
1:A:65:CYS:SG	1:A:72:CYS:CB	2.95	0.43
2:B:1064:LYS:C	2:B:1066:HIS:H	2.22	0.43
8:H:38:LEU:HD12	8:H:125:LEU:HB3	1.99	0.43
1:A:344:ASN:HD22	1:A:346:SER:H	1.67	0.43
1:A:708:THR:HG21	1:A:741:PRO:HA	2.00	0.43
2:B:93:ASN:OD1	2:B:93:ASN:N	2.50	0.43
2:B:94:LYS:HA	2:B:94:LYS:HE2	2.00	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:296:ASP:OD1	2:B:297:VAL:N	2.51	0.43
2:B:104:ILE:HD13	2:B:161:LEU:HD11	2.01	0.43
2:B:562:PRO:HB3	2:B:593:ILE:HD12	2.00	0.43
2:B:586:VAL:HA	2:B:640:LEU:HB2	1.99	0.43
3:C:123:ASP:N	3:C:123:ASP:OD1	2.52	0.43
1:A:98:LEU:HD12	1:A:243:PHE:HE2	1.83	0.43
1:A:470:HIS:HB3	2:B:1181:VAL:HG21	1.98	0.43
1:A:1055:ILE:HA	1:A:1178:LEU:HA	2.00	0.43
1:A:1301:GLU:HG2	9:I:60:LEU:HD21	2.00	0.43
1:A:1482:LYS:HD3	2:B:311:ARG:HH22	1.82	0.43
2:B:328:GLN:OE1	2:B:328:GLN:N	2.45	0.43
5:E:180:ARG:HH21	5:E:192:ARG:HH11	1.67	0.43
1:A:945:CYS:SG	1:A:946:LEU:N	2.92	0.43
1:A:1012:LYS:O	1:A:1013:THR:HG23	2.19	0.43
1:A:1561:THR:O	1:A:1565:GLU:HG3	2.19	0.43
2:B:677:THR:O	2:B:679:GLN:N	2.46	0.43
9:I:111:PHE:CD1	9:I:122:ARG:HD2	2.53	0.43
1:A:100:ALA:HB1	1:A:227:LEU:HB3	1.99	0.43
1:A:658:LEU:HB2	1:A:1058:THR:HG23	1.99	0.43
2:B:71:LYS:HB3	2:B:425:ILE:HD11	2.00	0.43
2:B:241:PRO:O	2:B:243:GLN:NE2	2.49	0.43
2:B:714:ARG:HH22	2:B:957:ARG:HH11	1.67	0.43
2:B:1014:TYR:OH	3:C:293:ARG:NH1	2.51	0.43
4:D:99:LEU:HD21	7:G:136:TYR:HB2	2.00	0.43
8:H:93:TYR:CD2	8:H:145:ARG:HG3	2.54	0.43
10:J:36:LEU:HG	10:J:51:LEU:HD12	2.01	0.43
2:B:720:GLN:O	2:B:724:GLN:HG2	2.18	0.43
2:B:830:ASP:N	2:B:830:ASP:OD1	2.51	0.43
2:B:970:LYS:HD3	2:B:1000:LEU:HD21	2.01	0.43
3:C:117:ASP:OD1	3:C:118:SER:N	2.50	0.43
3:C:132:ILE:HB	3:C:169:PHE:HE1	1.84	0.43
3:C:333:ILE:H	3:C:333:ILE:HG13	1.70	0.43
4:D:83:SER:HA	4:D:86:ILE:HB	2.00	0.43
1:A:712:ILE:HG22	11:K:106:GLN:NE2	2.34	0.43
1:A:759:TYR:CE1	1:A:913:PRO:HG3	2.54	0.43
1:A:1219:ILE:N	1:A:1220:PRO:HD2	2.33	0.43
10:J:28:ASP:HB3	10:J:30:LEU:HG	2.00	0.43
13:M:82:ASN:OD1	13:M:85:LYS:HG2	2.19	0.43
1:A:1280:ASN:O	1:A:1281:THR:HG23	2.18	0.42
4:D:29:GLN:HG2	7:G:40:ARG:HB3	2.00	0.42
5:E:180:ARG:HH22	5:E:191:LYS:HA	1.84	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:403:LEU:HD12	1:A:419:ILE:HG13	2.01	0.42
1:A:1613:MET:HB3	1:A:1618:THR:HG23	2.02	0.42
2:B:372:ARG:HA	2:B:375:LEU:HB3	2.01	0.42
2:B:609:ARG:HG2	2:B:626:ILE:HG21	1.99	0.42
2:B:740:LYS:NZ	2:B:803:MET:SD	2.81	0.42
2:B:841:ASP:OD1	2:B:841:ASP:N	2.52	0.42
1:A:316:LEU:HD13	1:A:317:SER:N	2.32	0.42
1:A:491:GLU:O	1:A:493:ASN:N	2.52	0.42
1:A:495:ILE:HG23	1:A:497:VAL:HG13	2.00	0.42
1:A:508:PRO:HB3	1:A:578:TYR:CE1	2.54	0.42
1:A:858:ALA:O	1:A:862:THR:OG1	2.29	0.42
1:A:1558:ALA:HA	1:A:1561:THR:HG22	2.01	0.42
1:A:1589:MET:O	1:A:1596:LEU:N	2.52	0.42
1:A:1660:VAL:HA	1:A:1661:PRO:HD3	1.93	0.42
2:B:206:LEU:HD11	2:B:480:GLN:HG3	2.01	0.42
2:B:676:VAL:HG12	2:B:693:PRO:HB3	2.01	0.42
2:B:886:ASN:HB2	2:B:902:SER:HB3	2.00	0.42
1:A:468:ARG:O	2:B:1070:ARG:NH1	2.52	0.42
1:A:1510:PRO:HG3	1:A:1520:VAL:HG23	2.00	0.42
2:B:181:VAL:HG13	10:J:63:TYR:CE1	2.55	0.42
4:D:99:LEU:HD12	4:D:100:PRO:HD2	2.00	0.42
16:T:22:DA:H2'	16:T:23:DA:H8	1.84	0.42
1:A:511:VAL:HG12	1:A:519:LEU:HD23	2.01	0.42
1:A:650:LEU:HD13	6:F:91:ALA:HB2	2.01	0.42
2:B:27:ASN:HA	10:J:62:ARG:HH12	1.84	0.42
2:B:476:LEU:HD12	2:B:476:LEU:HA	1.89	0.42
2:B:840:LEU:HA	2:B:846:PRO:HA	2.01	0.42
1:A:363:PRO:HG2	1:A:368:ARG:HD3	2.01	0.42
1:A:399:LEU:HD11	1:A:422:ARG:HD2	2.02	0.42
1:A:485:SER:HA	1:A:486:PRO:HD3	1.90	0.42
1:A:627:ASP:OD1	1:A:628:PHE:N	2.47	0.42
1:A:874:GLU:OE2	1:A:878:ARG:NE	2.52	0.42
1:A:1637:PRO:HA	1:A:1640:ARG:HB2	2.01	0.42
2:B:207:ILE:HG22	2:B:505:ARG:HA	2.00	0.42
2:B:633:THR:C	2:B:634:ARG:HG3	2.40	0.42
2:B:882:ILE:HG12	2:B:905:TYR:CE1	2.55	0.42
2:B:1063:ARG:C	2:B:1066:HIS:H	2.22	0.42
3:C:80:ALA:O	3:C:218:LYS:NZ	2.36	0.42
8:H:93:TYR:CD2	8:H:143:LEU:HB3	2.54	0.42
11:K:88:PHE:O	11:K:106:GLN:N	2.46	0.42
13:M:21:VAL:HG13	14:N:110:LEU:O	2.19	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:812:VAL:HG22	1:A:815:ARG:HH21	1.85	0.42
1:A:1053:ASP:OD2	1:A:1580:ARG:NH1	2.52	0.42
1:A:1491:GLU:OE2	1:A:1494:ARG:NH2	2.53	0.42
2:B:772:VAL:HA	2:B:1030:VAL:HG12	2.00	0.42
2:B:973:ALA:HB1	10:J:44:TYR:HB2	2.00	0.42
3:C:110:PRO:HG2	3:C:308:MET:HE1	2.01	0.42
11:K:98:GLU:H	11:K:98:GLU:HG3	1.64	0.42
16:T:18:DC:H2''	16:T:19:DA:H3'	2.02	0.42
4:D:35:GLU:N	4:D:35:GLU:OE1	2.53	0.42
1:A:942:GLN:HG2	1:A:947:LEU:HA	2.02	0.42
2:B:1047:ARG:HD2	2:B:1066:HIS:O	2.20	0.42
3:C:139:LYS:HG3	3:C:201:GLU:HG3	2.02	0.42
1:A:486:PRO:HG3	1:A:628:PHE:CG	2.55	0.42
2:B:214:PRO:HB2	2:B:380:LYS:NZ	2.35	0.42
2:B:705:PRO:HG2	2:B:921:HIS:HE2	1.85	0.42
5:E:191:LYS:N	5:E:194:GLU:OE2	2.47	0.42
1:A:1012:LYS:H	1:A:1012:LYS:HD3	1.84	0.41
1:A:1437:ASN:ND2	1:A:1438:ASN:H	2.17	0.41
2:B:46:ILE:O	2:B:50:ASN:HB2	2.20	0.41
2:B:211:ARG:HH12	2:B:646:HIS:HB2	1.85	0.41
2:B:553:THR:O	2:B:646:HIS:ND1	2.52	0.41
5:E:79:TRP:NE1	5:E:81:GLU:OE2	2.49	0.41
13:M:67:ASP:N	13:M:67:ASP:OD1	2.53	0.41
1:A:319:GLU:O	1:A:322:ASN:N	2.53	0.41
1:A:827:THR:HA	2:B:951:PRO:HG3	2.02	0.41
1:A:937:ASN:HA	1:A:940:VAL:HG22	2.02	0.41
1:A:177:LEU:HA	1:A:180:GLU:HG3	2.02	0.41
1:A:1292:ILE:HD13	1:A:1474:LEU:HD13	2.02	0.41
2:B:478:LEU:H	2:B:478:LEU:HD23	1.84	0.41
2:B:629:VAL:HB	2:B:638:PRO:HA	2.02	0.41
2:B:986:PHE:CD2	2:B:992:PRO:HB3	2.55	0.41
5:E:61:GLN:HB2	5:E:79:TRP:CE3	2.55	0.41
13:M:30:PHE:CE2	13:M:32:ALA:HB2	2.55	0.41
1:A:245:LYS:HG2	1:A:247:GLY:N	2.33	0.41
2:B:74:PHE:CE2	2:B:343:ASP:HB2	2.55	0.41
2:B:588:ILE:HG22	2:B:589:ASP:OD1	2.20	0.41
2:B:654:ARG:HG2	2:B:689:VAL:O	2.19	0.41
6:F:116:ASP:HB3	6:F:119:ARG:HB3	2.01	0.41
15:S:54:DG:H2'	15:S:55:DT:H71	2.02	0.41
1:A:119:ALA:HB2	1:A:334:VAL:HG22	2.02	0.41
1:A:535:GLN:NE2	1:A:543:LEU:HG	2.35	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:844:THR:O	1:A:848:LYS:HG2	2.20	0.41
1:A:1494:ARG:HD2	1:A:1495:LYS:HG3	2.01	0.41
1:A:1582:LEU:HA	1:A:1585:ILE:HG22	2.02	0.41
2:B:140:LYS:HB3	2:B:155:VAL:HG22	2.01	0.41
2:B:752:VAL:HA	2:B:979:GLN:O	2.20	0.41
13:M:11:GLU:HB2	13:M:87:SER:HB3	2.01	0.41
1:A:36:THR:HB	1:A:45:VAL:HG21	2.03	0.41
1:A:424:MET:O	1:A:428:VAL:HG23	2.21	0.41
1:A:672:ASP:HA	2:B:952:HIS:CE1	2.55	0.41
1:A:706:HIS:CD2	1:A:815:ARG:HH22	2.38	0.41
1:A:925:MET:HA	1:A:928:MET:HE2	2.02	0.41
1:A:1091:VAL:HG13	1:A:1133:LEU:HD22	2.03	0.41
2:B:303:THR:O	2:B:307:GLU:HG3	2.21	0.41
15:S:67:DA:H2''	15:S:68:DG:C8	2.55	0.41
1:A:86:TYR:H	1:A:431:GLN:HE22	1.67	0.41
5:E:140:LEU:HD13	5:E:140:LEU:O	2.20	0.41
1:A:111:LYS:HB2	1:A:114:GLU:OE1	2.21	0.41
1:A:18:ILE:HG21	1:A:354:SER:HB2	2.02	0.41
1:A:26:ASN:ND2	2:B:1130:ARG:O	2.54	0.41
1:A:318:THR:HB	1:A:319:GLU:H	1.68	0.41
1:A:506:THR:HG21	1:A:578:TYR:HB3	2.03	0.41
1:A:1043:GLY:C	5:E:174:GLN:HE21	2.24	0.41
1:A:1575:ILE:H	1:A:1575:ILE:HG13	1.55	0.41
2:B:14:ALA:HB3	2:B:980:ASP:HB3	2.03	0.41
2:B:94:LYS:O	2:B:145:VAL:HA	2.21	0.41
2:B:490:LYS:HG3	2:B:729:PRO:HB3	2.01	0.41
2:B:627:GLY:HA2	2:B:668:GLU:OE1	2.20	0.41
2:B:825:PHE:HE2	2:B:899:GLN:HA	1.86	0.41
2:B:1088:LEU:HG	2:B:1092:LEU:HD13	2.03	0.41
3:C:100:ARG:O	3:C:104:VAL:HG23	2.21	0.41
4:D:29:GLN:OE1	4:D:29:GLN:N	2.54	0.41
5:E:20:LYS:HZ1	5:E:34:GLU:HB3	1.86	0.41
11:K:47:ILE:HD11	11:K:63:PHE:HB3	2.03	0.41
14:N:107:MET:SD	14:N:107:MET:N	2.71	0.41
16:T:21:DG:OP2	16:T:22:DA:OP2	2.38	0.41
1:A:597:LYS:NZ	1:A:656:GLN:HE22	2.19	0.41
1:A:880:GLN:HB3	2:B:634:ARG:NH1	2.36	0.41
1:A:985:ARG:HH11	1:A:988:SER:HB3	1.85	0.41
3:C:192:LEU:HD21	3:C:195:LYS:HE3	2.03	0.41
16:T:6:DC:H2''	16:T:7:DA:C8	2.56	0.41
1:A:847:LEU:HD12	1:A:983:LYS:HD2	2.03	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:882:ILE:HD11	9:I:67:VAL:HG11	2.02	0.40
1:A:1556:GLU:HA	1:A:1559:ARG:HB3	2.03	0.40
2:B:264:TRP:CG	2:B:265:ARG:N	2.88	0.40
2:B:709:PHE:CZ	2:B:992:PRO:HG3	2.56	0.40
2:B:773:VAL:HA	2:B:947:ILE:HG23	2.03	0.40
3:C:322:LYS:HG3	11:K:125:MET:SD	2.61	0.40
7:G:17:ILE:O	7:G:21:LYS:HG2	2.22	0.40
1:A:239:PHE:CD2	1:A:260:GLN:HA	2.57	0.40
1:A:1032:VAL:HG11	1:A:1179:ILE:HD13	2.02	0.40
2:B:213:HIS:HD2	2:B:214:PRO:HD2	1.85	0.40
3:C:55:ASP:OD1	3:C:271:ARG:NH2	2.54	0.40
9:I:80:ALA:HB1	9:I:96:TYR:CE1	2.56	0.40
1:A:866:LYS:HD2	1:A:868:THR:HG22	2.03	0.40
1:A:1097:TYR:CD2	1:A:1123:VAL:HG12	2.57	0.40
1:A:1502:PRO:O	1:A:1525:ASN:ND2	2.47	0.40
2:B:274:VAL:O	2:B:278:LYS:HG2	2.22	0.40
2:B:862:PHE:HD1	2:B:869:THR:HB	1.86	0.40
3:C:212:ILE:H	3:C:212:ILE:HG13	1.78	0.40
13:M:60:LEU:HD12	13:M:62:TYR:CE1	2.56	0.40
14:N:109:LEU:HB3	14:N:131:LEU:HD21	2.03	0.40
16:T:22:DA:H2'	16:T:23:DA:C8	2.56	0.40
1:A:41:LEU:HG	1:A:43:HIS:HD2	1.87	0.40
1:A:455:GLY:H	1:A:458:GLN:HE21	1.69	0.40
1:A:469:LYS:HG2	1:A:470:HIS:CD2	2.56	0.40
1:A:673:HIS:O	1:A:786:TYR:OH	2.38	0.40
1:A:1022:CYS:SG	1:A:1023:LEU:N	2.94	0.40
1:A:1043:GLY:O	5:E:174:GLN:NE2	2.49	0.40
2:B:768:GLY:N	2:B:1032:TYR:OH	2.55	0.40
5:E:81:GLU:HG3	5:E:96:PHE:CE1	2.56	0.40
1:A:21:ALA:O	1:A:25:ARG:HD2	2.22	0.40
1:A:764:SER:C	1:A:766:GLU:N	2.57	0.40
1:A:1242:ILE:HB	1:A:1517:ARG:NH1	2.37	0.40
2:B:827:PHE:CZ	2:B:832:TRP:HB2	2.57	0.40
2:B:1053:ASN:O	2:B:1057:MET:N	2.44	0.40
7:G:80:VAL:HG22	7:G:243:VAL:HG21	2.02	0.40
7:G:131:ASP:O	7:G:233:VAL:HG22	2.21	0.40
10:J:21:TYR:HB2	10:J:39:LEU:HD11	2.03	0.40

There are no symmetry-related clashes.

5.3 Torsion angles

5.3.1 Protein backbone

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	1479/1664 (89%)	1413 (96%)	62 (4%)	4 (0%)	41	74
2	B	1177/1203 (98%)	1118 (95%)	59 (5%)	0	100	100
3	C	300/335 (90%)	292 (97%)	8 (3%)	0	100	100
4	D	55/137 (40%)	55 (100%)	0	0	100	100
5	E	212/215 (99%)	206 (97%)	6 (3%)	0	100	100
6	F	98/155 (63%)	96 (98%)	2 (2%)	0	100	100
7	G	201/326 (62%)	193 (96%)	8 (4%)	0	100	100
8	H	130/146 (89%)	125 (96%)	5 (4%)	0	100	100
9	I	110/125 (88%)	105 (96%)	5 (4%)	0	100	100
10	J	67/70 (96%)	63 (94%)	4 (6%)	0	100	100
11	K	98/142 (69%)	92 (94%)	6 (6%)	0	100	100
12	L	41/70 (59%)	40 (98%)	1 (2%)	0	100	100
13	M	105/415 (25%)	99 (94%)	5 (5%)	1 (1%)	15	52
14	N	138/233 (59%)	129 (94%)	9 (6%)	0	100	100
All	All	4211/5236 (80%)	4026 (96%)	180 (4%)	5 (0%)	54	83

All (5) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	765	LEU
1	A	250	LYS
1	A	319	GLU
13	M	47	GLU
1	A	445	GLY

5.3.2 Protein sidechains [i](#)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	1313/1465 (90%)	1276 (97%)	37 (3%)	43	68
2	B	1034/1053 (98%)	1008 (98%)	26 (2%)	47	70
3	C	269/296 (91%)	266 (99%)	3 (1%)	73	85
4	D	56/116 (48%)	52 (93%)	4 (7%)	14	45
5	E	196/197 (100%)	189 (96%)	7 (4%)	35	63
6	F	90/137 (66%)	90 (100%)	0	100	100
7	G	183/291 (63%)	176 (96%)	7 (4%)	33	61
8	H	117/128 (91%)	111 (95%)	6 (5%)	24	54
9	I	102/110 (93%)	100 (98%)	2 (2%)	55	75
10	J	64/65 (98%)	61 (95%)	3 (5%)	26	56
11	K	90/130 (69%)	89 (99%)	1 (1%)	73	85
12	L	38/57 (67%)	37 (97%)	1 (3%)	46	69
13	M	97/371 (26%)	95 (98%)	2 (2%)	53	74
14	N	136/220 (62%)	132 (97%)	4 (3%)	42	67
All	All	3785/4636 (82%)	3682 (97%)	103 (3%)	48	69

All (103) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	5	LYS
1	A	30	LYS
1	A	40	ASN
1	A	41	LEU
1	A	70	LYS
1	A	123	ARG
1	A	205	ARG
1	A	239	PHE
1	A	242	LYS
1	A	249	THR
1	A	314	TYR

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Mol	Chain	Res	Type
1	A	316	LEU
1	A	344	ASN
1	A	372	LYS
1	A	390	LEU
1	A	397	ARG
1	A	400	ASN
1	A	417	ARG
1	A	425	ASN
1	A	446	ARG
1	A	462	LYS
1	A	492	THR
1	A	642	ASN
1	A	689	ARG
1	A	949	GLN
1	A	1013	THR
1	A	1036	ASN
1	A	1150	LYS
1	A	1281	THR
1	A	1285	ASN
1	A	1299	ASN
1	A	1437	ASN
1	A	1484	LEU
1	A	1494	ARG
1	A	1575	ILE
1	A	1591	ARG
1	A	1634	LEU
2	B	17	ARG
2	B	209	GLN
2	B	244	THR
2	B	266	LYS
2	B	305	ARG
2	B	311	ARG
2	B	323	ARG
2	B	359	LEU
2	B	384	LEU
2	B	441	LYS
2	B	478	LEU
2	B	543	ASN
2	B	616	LYS
2	B	634	ARG
2	B	651	ARG
2	B	721	MET

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Mol	Chain	Res	Type
2	B	739	ASN
2	B	755	ASN
2	B	790	ASN
2	B	841	ASP
2	B	946	ASP
2	B	1018	THR
2	B	1033	TYR
2	B	1039	MET
2	B	1063	ARG
2	B	1133	MET
3	C	240	LYS
3	C	249	LYS
3	C	323	ASN
4	D	17	ASN
4	D	49	ASN
4	D	94	ARG
4	D	97	LYS
5	E	104	ASN
5	E	121	MET
5	E	140	LEU
5	E	143	ASN
5	E	149	LEU
5	E	171	LYS
5	E	200	ARG
7	G	15	ARG
7	G	32	ASN
7	G	97	LYS
7	G	134	GLU
7	G	138	PHE
7	G	234	ARG
7	G	241	ARG
8	H	33	GLN
8	H	77	ARG
8	H	109	LYS
8	H	111	LEU
8	H	125	LEU
8	H	130	ARG
9	I	19	ASN
9	I	72	LYS
10	J	48	ARG
10	J	52	THR
10	J	64	ASN

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Mol	Chain	Res	Type
11	K	98	GLU
12	L	47	ARG
13	M	60	LEU
13	M	99	LYS
14	N	33	LYS
14	N	66	LYS
14	N	107	MET
14	N	152	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (65) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	40	ASN
1	A	43	HIS
1	A	344	ASN
1	A	470	HIS
1	A	535	GLN
1	A	553	GLN
1	A	571	HIS
1	A	592	GLN
1	A	642	ASN
1	A	656	GLN
1	A	671	GLN
1	A	673	HIS
1	A	785	GLN
1	A	795	HIS
1	A	926	GLN
1	A	1020	GLN
1	A	1036	ASN
1	A	1062	HIS
1	A	1141	GLN
1	A	1250	GLN
1	A	1285	ASN
1	A	1299	ASN
1	A	1437	ASN
1	A	1453	HIS
1	A	1601	GLN
2	B	128	GLN
2	B	146	ASN
2	B	213	HIS
2	B	368	GLN
2	B	423	ASN

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Mol	Chain	Res	Type
2	B	532	HIS
2	B	636	GLN
2	B	688	HIS
2	B	702	ASN
2	B	710	ASN
2	B	715	ASN
2	B	718	GLN
2	B	735	HIS
2	B	739	ASN
2	B	790	ASN
2	B	823	GLN
2	B	886	ASN
2	B	923	GLN
2	B	1034	GLN
2	B	1157	GLN
3	C	130	ASN
3	C	207	HIS
3	C	301	ASN
4	D	49	ASN
5	E	101	GLN
5	E	104	ASN
5	E	143	ASN
5	E	179	GLN
7	G	67	ASN
7	G	126	GLN
7	G	144	HIS
8	H	43	ASN
8	H	139	ASN
9	I	19	ASN
10	J	64	ASN
11	K	106	GLN
12	L	53	HIS
13	M	16	GLN
14	N	34	HIS
14	N	132	GLN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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 monosaccharides 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.

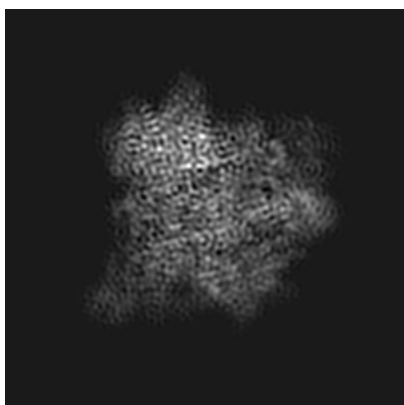
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-3446. These allow visual inspection of the internal detail of the map and identification of artifacts.

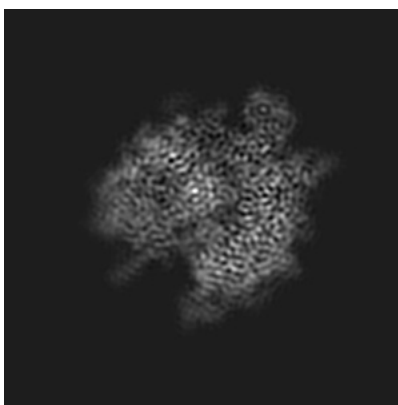
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections [i](#)

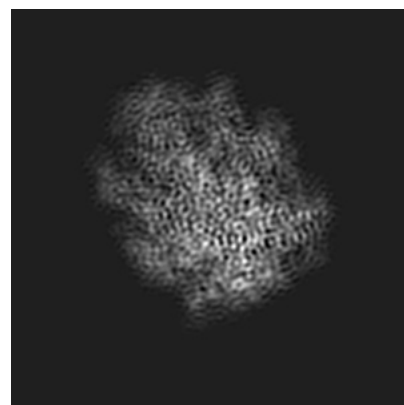
6.1.1 Primary map



X



Y

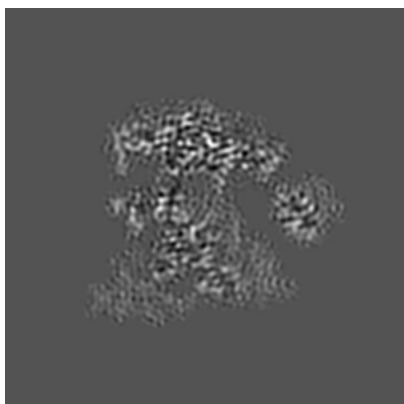


Z

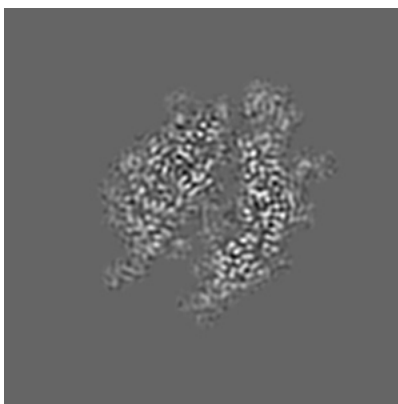
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

6.2.1 Primary map



X Index: 88



Y Index: 88

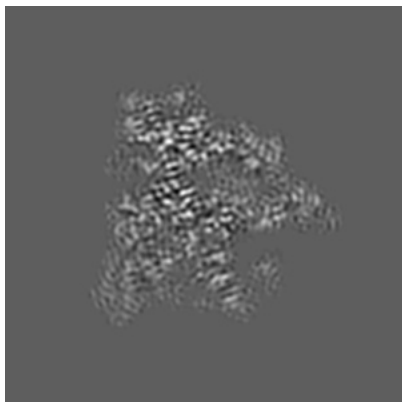


Z Index: 88

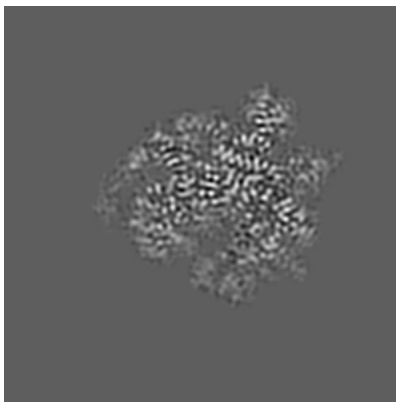
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

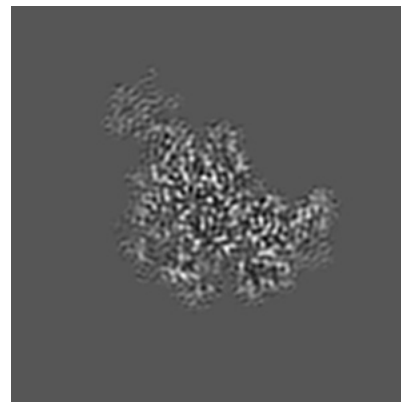
6.3.1 Primary map



X Index: 98



Y Index: 74

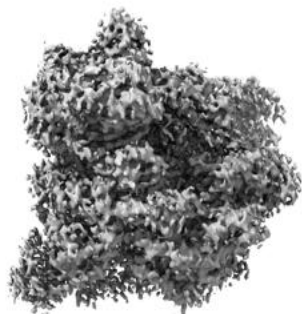


Z Index: 110

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

6.4 Orthogonal surface views [i](#)

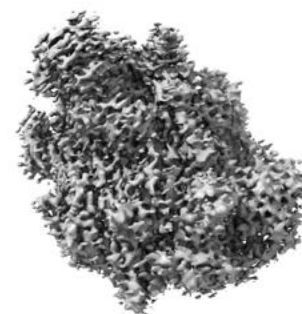
6.4.1 Primary map



X



Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.03. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

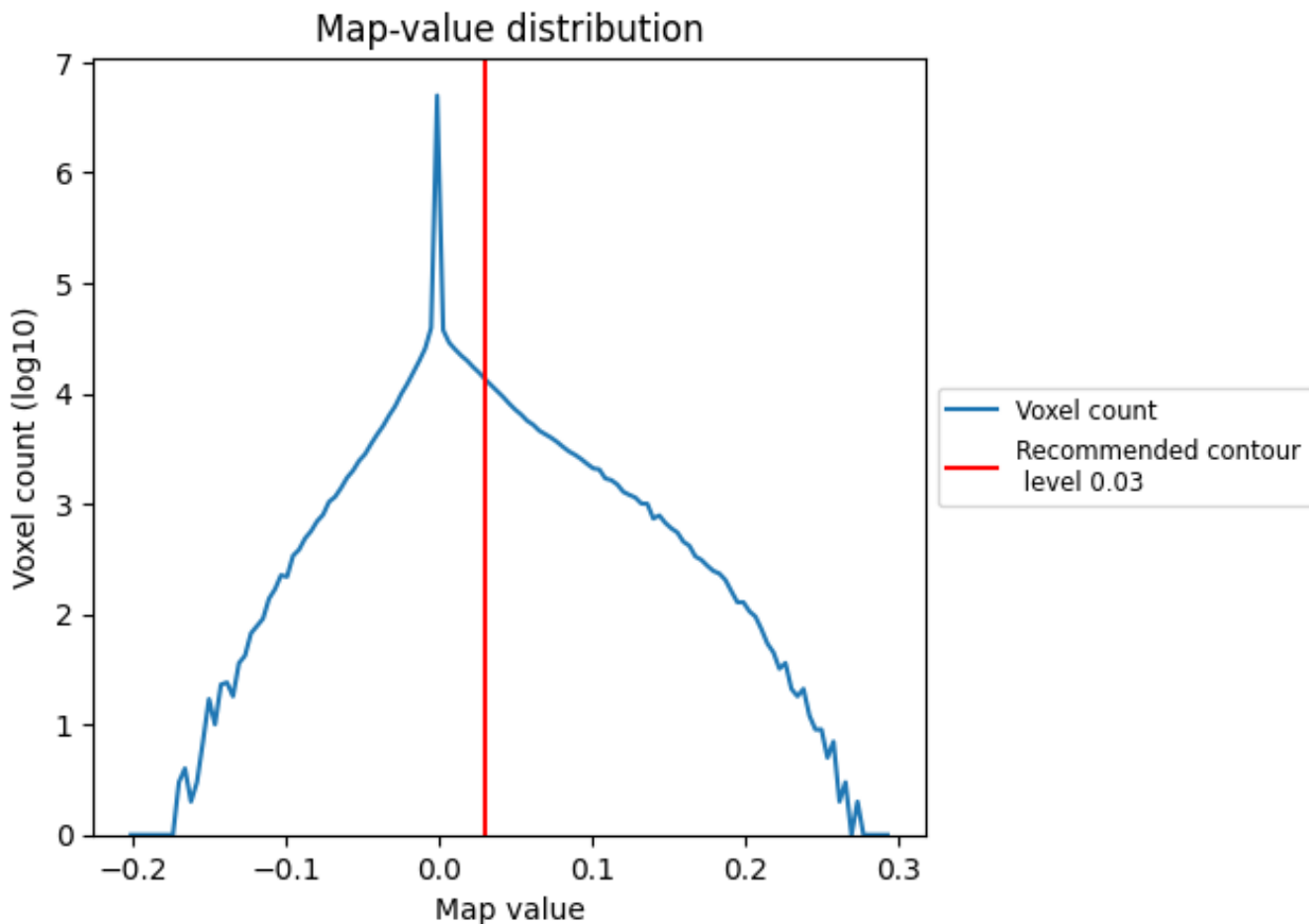
6.5 Mask visualisation

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

7 Map analysis [i](#)

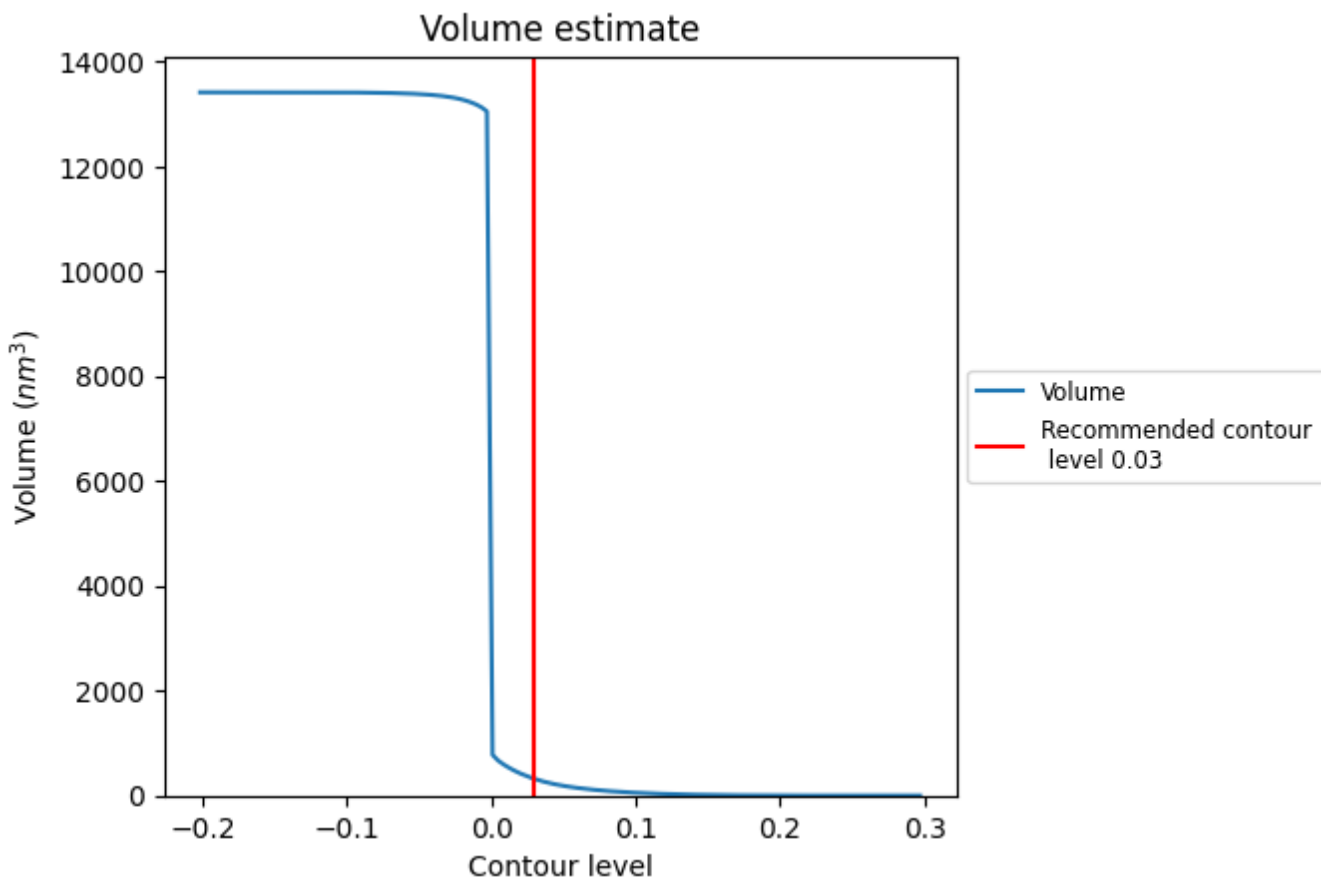
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution [i](#)



The map-value distribution is plotted in 128 intervals along the x-axis. The y-axis is logarithmic. A spike in this graph at zero usually indicates that the volume has been masked.

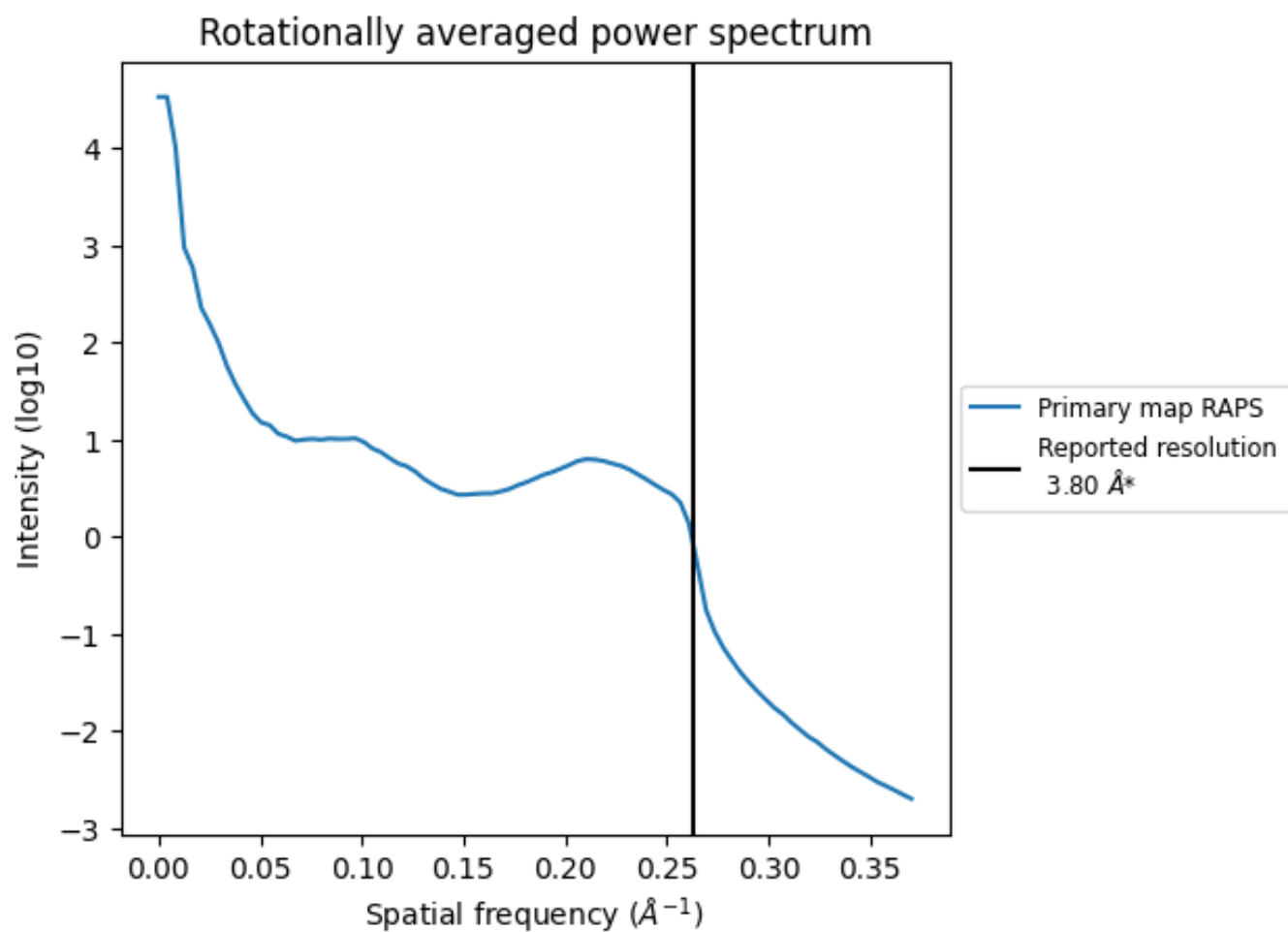
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 317 nm³; this corresponds to an approximate mass of 287 kDa.

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

7.3 Rotationally averaged power spectrum [i](#)

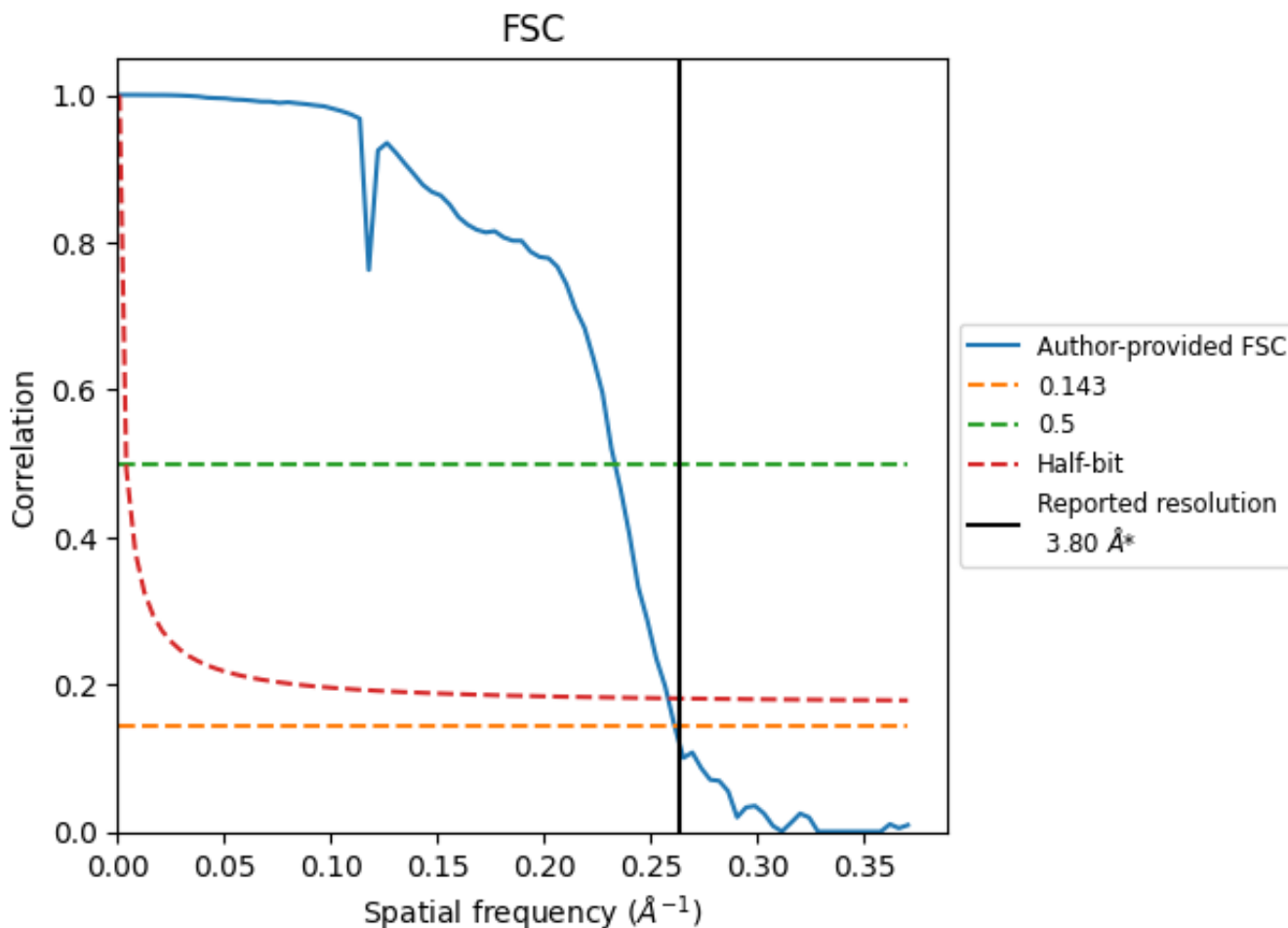


*Reported resolution corresponds to spatial frequency of 0.263\AA^{-1}

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 0.263\AA^{-1}

8.2 Resolution estimates [i](#)

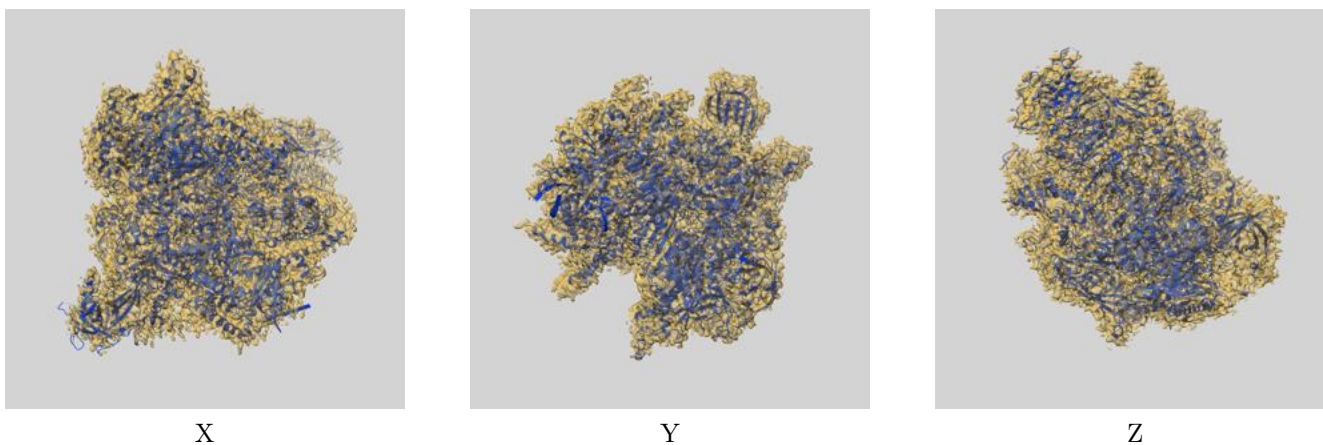
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.80	-	-
Author-provided FSC curve	3.83	4.29	3.88
Unmasked-calculated*	-	-	-

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

9 Map-model fit [i](#)

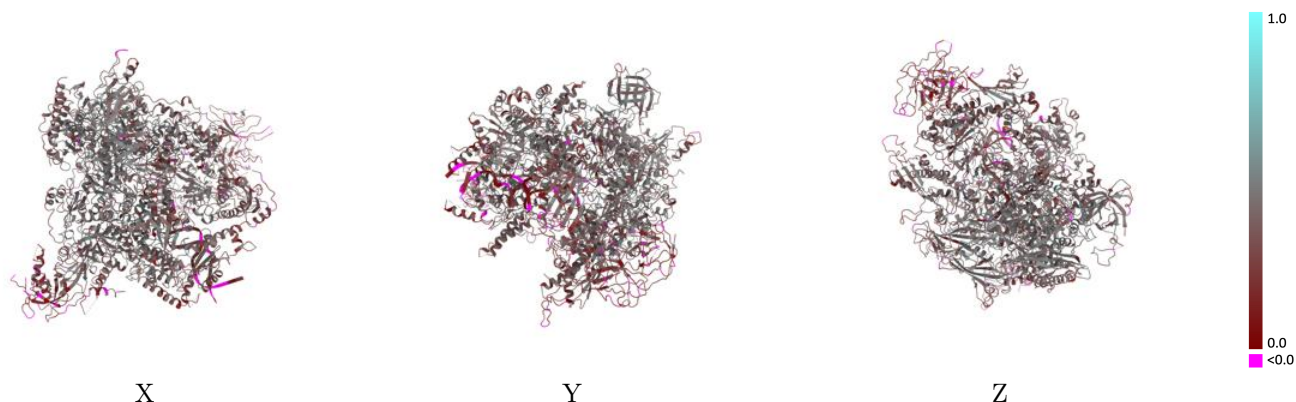
This section contains information regarding the fit between EMDB map EMD-3446 and PDB model 5M5W. Per-residue inclusion information can be found in section [3](#) on page [7](#).

9.1 Map-model overlay [i](#)



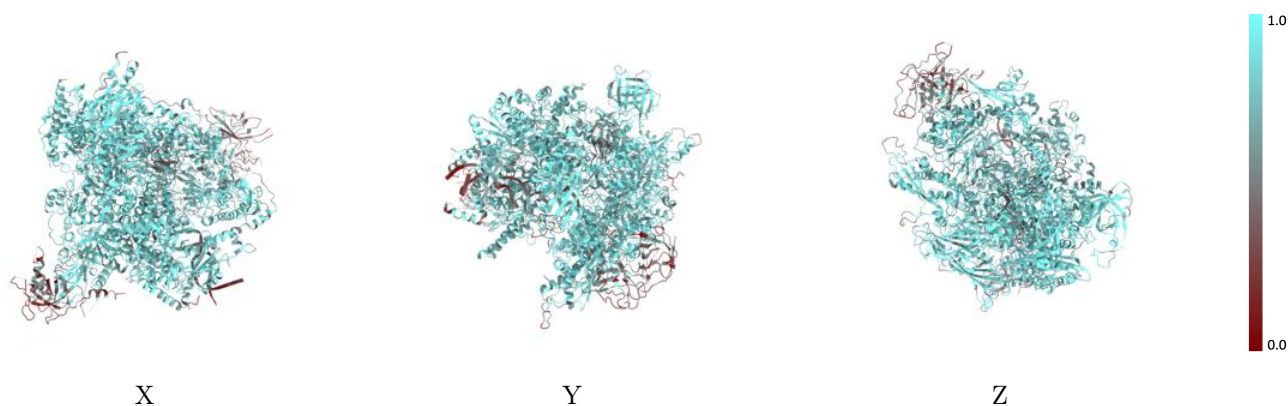
The images above show the 3D surface view of the map at the recommended contour level 0.03 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



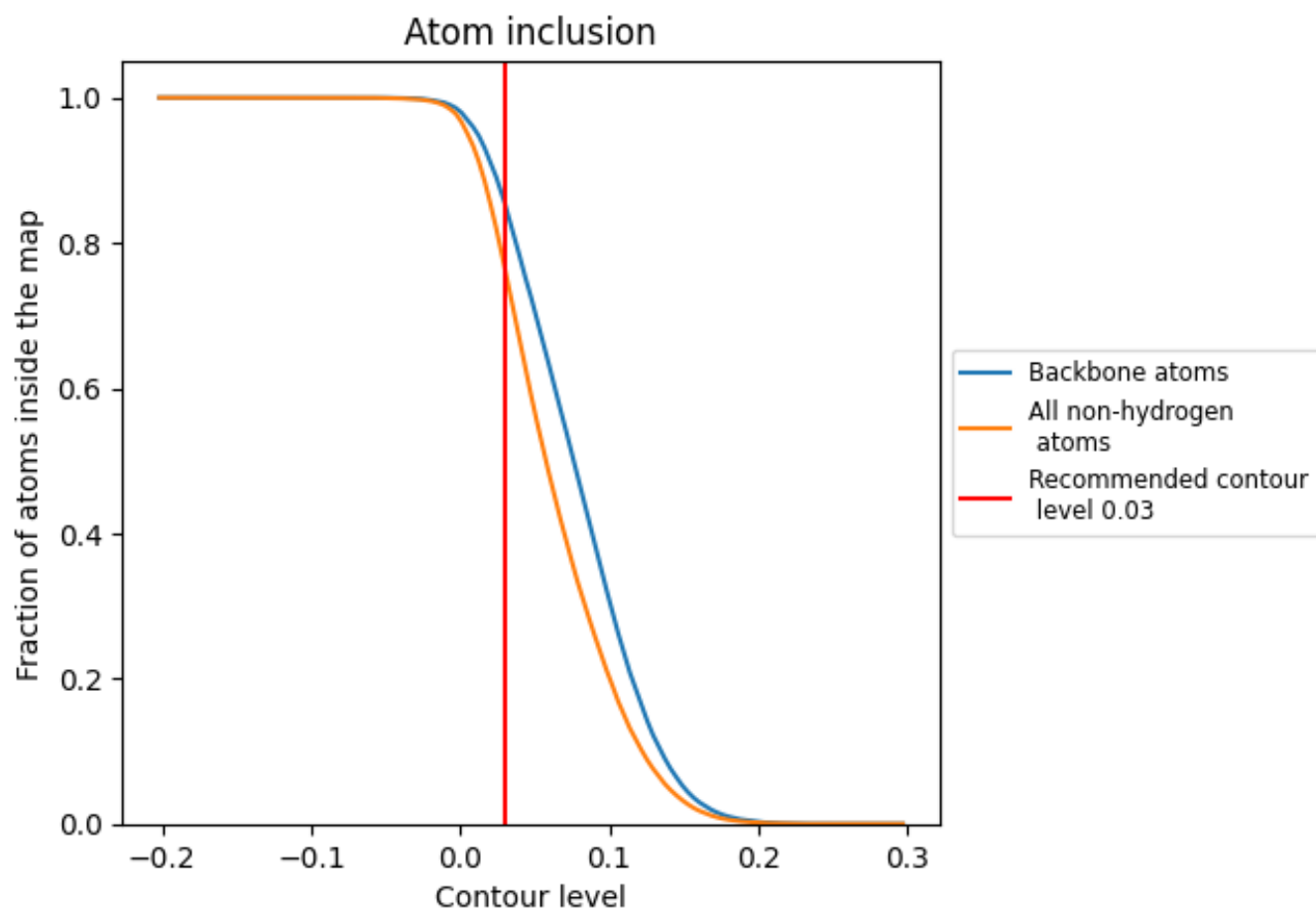
The images above show the model with each residue coloured according its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.03).



































9.4 Atom inclusion [i](#)



At the recommended contour level, 85% of all backbone atoms, 76% 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 (0.03) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.7640	 0.3620
A	 0.8143	 0.3860
B	 0.8094	 0.3810
C	 0.8509	 0.4060
D	 0.5227	 0.2540
E	 0.8290	 0.3850
F	 0.8414	 0.4180
G	 0.5050	 0.2650
H	 0.8424	 0.3900
I	 0.6107	 0.2690
J	 0.8750	 0.4520
K	 0.8441	 0.4160
L	 0.7861	 0.3660
M	 0.4613	 0.2310
N	 0.4074	 0.2370
S	 0.5160	 0.1560
T	 0.4283	 0.0940

