Full wwPDB EM Validation Report ⓘ

Nov 4, 2024 – 12:48 AM JST

PDB ID	:	6J5U
EMDB ID	:	EMD-0681
Title	:	Ligand-triggered allosteric ADP release primes a plant NLR complex
Authors	:	Wang, J.Z.; Wang, J.; Meijuan, H.; Wang, H.W.; Zhou, J.M.; Chai, J.J.
Deposited on	:	2019-01-12
Resolution	:	3.90 Å(reported)
Based on initial model	:	3TL8

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:

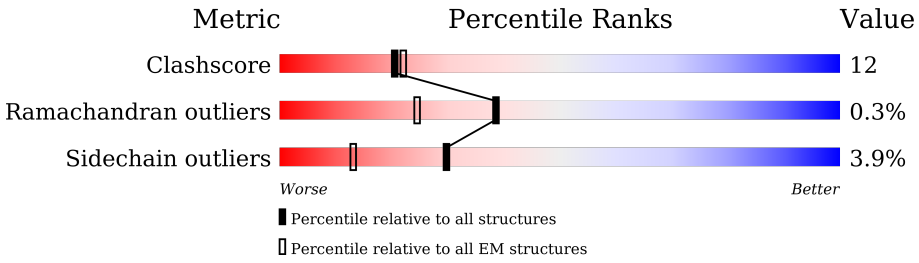
EMDB validation analysis	:	0.0.1.dev113
Mogul	:	1.8.5 (274361), CSD as541be (2020)
MolProbity	:	4.02b-467
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.39

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 3.90 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	210492	15764
Ramachandran outliers	207382	16835
Sidechain outliers	206894	16415

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 <=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	852	10% 54% 23% • 22%
2	C	426	11% 31% 9% • 59%
3	B	351	5% 66% 26% • 7%

2 Entry composition

There are 4 unique types of molecules in this entry. The entry contains 9288 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 Disease resistance RPP13-like protein 4.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	663	5266	3320	900	1010	36	0	0

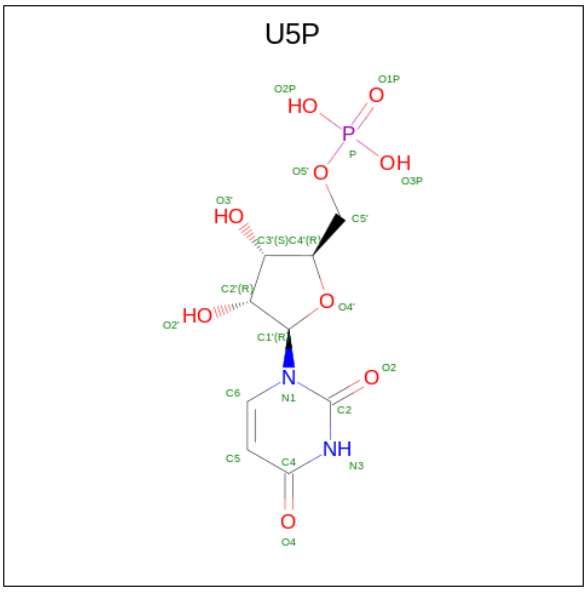
- Molecule 2 is a protein called Probable serine/threonine-protein kinase PBL2.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	C	174	1353	871	234	242	6	0	0

- Molecule 3 is a protein called Protein kinase superfamily protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	B	327	2629	1686	447	479	17	0	0

- Molecule 4 is URIDINE-5'-MONOPHOSPHATE (three-letter code: U5P) (formula: $C_9H_{13}N_2O_9P$).

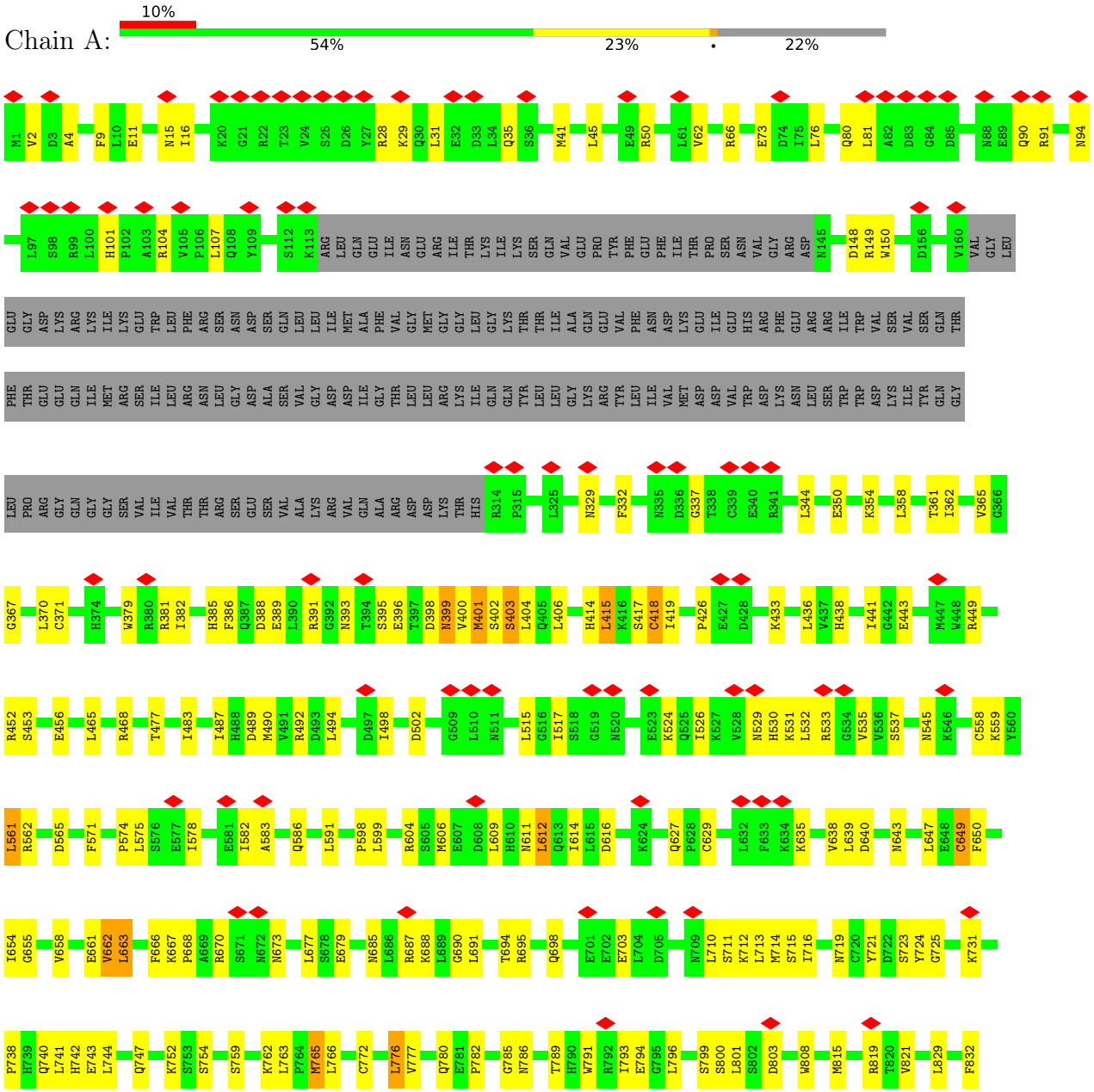


Mol	Chain	Residues	Atoms					AltConf
4	C	1	Total	C	N	O	P	0
			20	9	2	8	1	
4	C	1	Total	C	N	O	P	0
			20	9	2	8	1	

3 Residue-property plots (i)

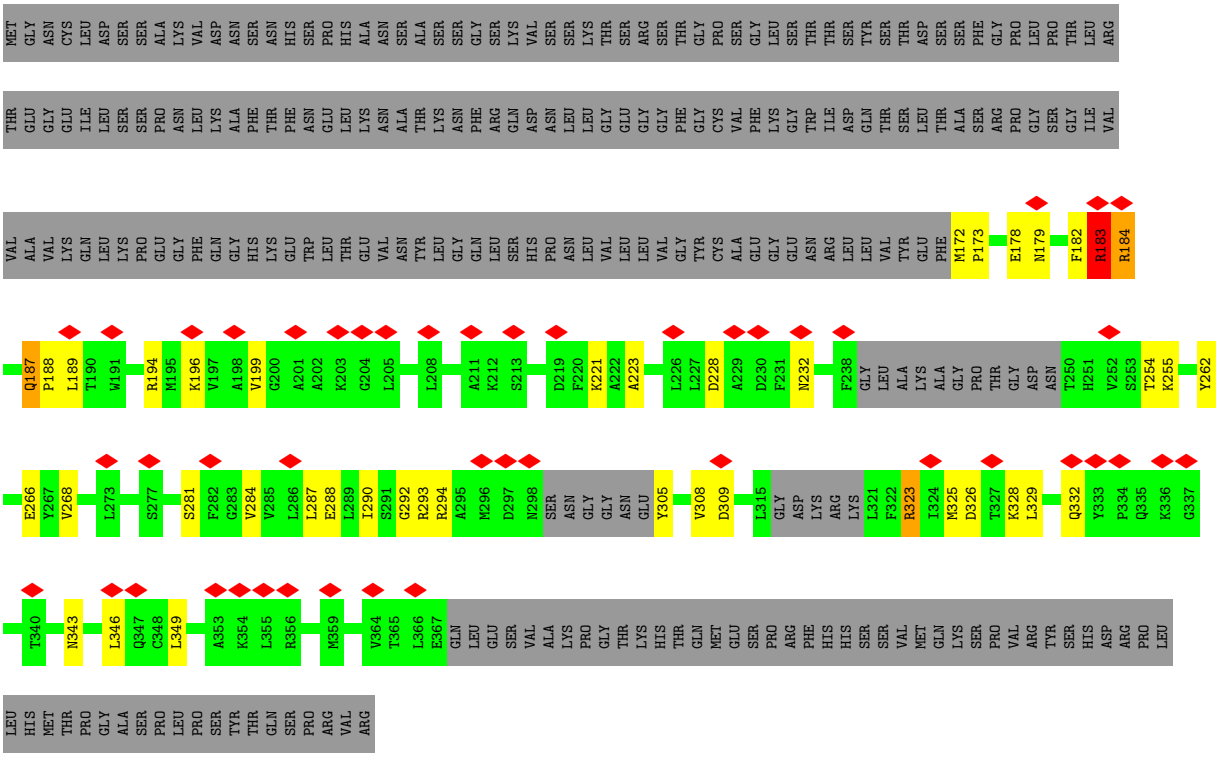
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion 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: Disease resistance RPP13-like protein 4



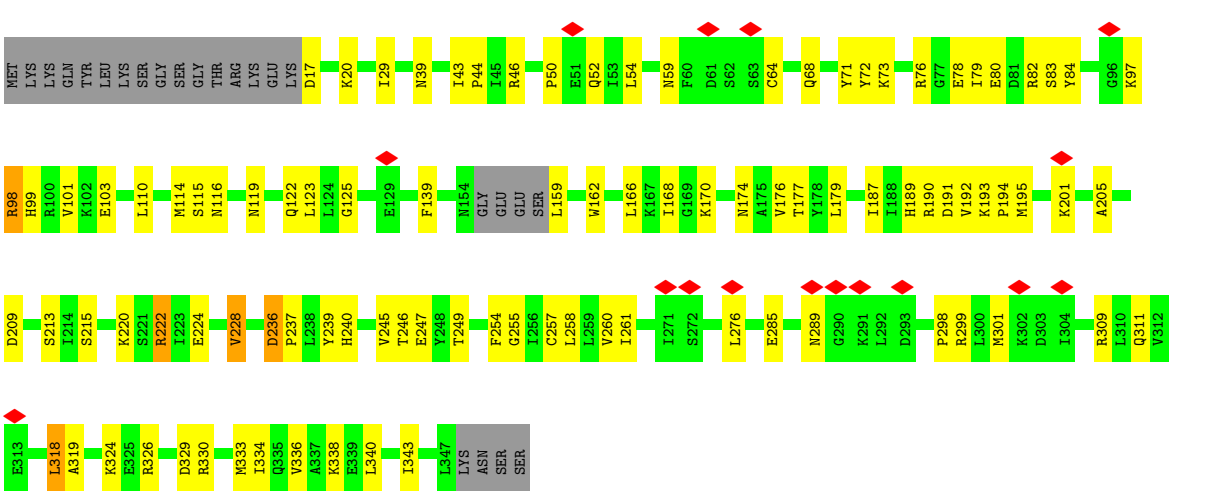
• Molecule 2: Probable serine/threonine-protein kinase PBL2

Chain C:



• Molecule 3: Protein kinase superfamily protein

Chain B:



4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	404311	Depositor
Resolution determination method	Not provided	
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/Å^2$)	50.00	Depositor
Minimum defocus (nm)	700	Depositor
Maximum defocus (nm)	900	Depositor
Magnification	105000	Depositor
Image detector	GATAN K2 SUMMIT (4k x 4k)	Depositor
Maximum map value	0.191	Depositor
Minimum map value	-0.103	Depositor
Average map value	0.001	Depositor
Map value standard deviation	0.007	Depositor
Recommended contour level	0.03	Depositor
Map size (Å)	174.56, 174.56, 174.56	wwPDB
Map dimensions	160, 160, 160	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.091, 1.091, 1.091	Depositor

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: U5P

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	0.39	0/5365	0.75	7/7256 (0.1%)
2	C	0.34	0/1379	0.62	0/1862
3	B	0.44	0/2683	0.75	3/3621 (0.1%)
All	All	0.40	0/9427	0.73	10/12739 (0.1%)

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

Mol	Chain	#Chirality outliers	#Planarity outliers
1	A	0	4
2	C	0	1
3	B	0	1
All	All	0	6

There are no bond length outliers.

All (10) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	663	LEU	CA-CB-CG	6.45	130.13	115.30
1	A	776	LEU	CA-CB-CG	6.03	129.16	115.30
3	B	276	LEU	CA-CB-CG	5.77	128.56	115.30
3	B	318	LEU	CA-CB-CG	5.71	128.44	115.30
1	A	418	CYS	CA-CB-SG	5.58	124.05	114.00
1	A	829	LEU	CA-CB-CG	5.58	128.13	115.30
1	A	801	LEU	CA-CB-CG	5.49	127.92	115.30
3	B	209	ASP	CB-CG-OD1	5.40	123.16	118.30
1	A	415	LEU	CA-CB-CG	5.29	127.46	115.30
1	A	591	LEU	CA-CB-CG	5.03	126.87	115.30

There are no chirality outliers.

All (6) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	426	PRO	Peptide
1	A	531	LYS	Peptide
1	A	561	LEU	Peptide
1	A	649	CYS	Peptide
3	B	228	VAL	Peptide
2	C	266	GLU	Peptide

5.2 Too-close contacts (i)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	5266	0	5258	141	0
2	C	1353	0	1376	29	0
3	B	2629	0	2654	53	0
4	C	40	0	22	0	0
All	All	9288	0	9310	220	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 (220) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:395:SER:O	1:A:399:ASN:CG	1.95	1.04
2:C:182:PHE:O	2:C:184:ARG:N	1.94	0.99
1:A:395:SER:C	1:A:399:ASN:OD1	2.01	0.98
1:A:498:ILE:O	1:A:502:ASP:HB2	1.75	0.85
1:A:358:LEU:HD21	1:A:400:VAL:HG11	1.60	0.82
1:A:358:LEU:HD21	1:A:400:VAL:CG1	2.11	0.81
2:C:183:ARG:HH11	2:C:183:ARG:HG2	1.48	0.77
1:A:395:SER:O	1:A:399:ASN:OD1	2.00	0.77
1:A:395:SER:O	1:A:399:ASN:ND2	2.19	0.75
1:A:358:LEU:HD11	1:A:400:VAL:HG11	1.71	0.72
1:A:4:ALA:HB1	1:A:417:SER:HB2	1.71	0.71

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:832:PHE:HB3	1:A:837:VAL:HG11	1.73	0.71
1:A:399:ASN:ND2	1:A:399:ASN:H	1.90	0.69
2:C:221:LYS:HD3	2:C:223:ALA:H	1.58	0.68
1:A:808:TRP:HB2	1:A:832:PHE:HA	1.76	0.68
1:A:395:SER:C	1:A:399:ASN:CG	2.48	0.68
1:A:614:ILE:HB	1:A:638:VAL:HG12	1.76	0.66
1:A:443:GLU:HA	1:A:562:ARG:HD2	1.79	0.65
2:C:183:ARG:HD3	2:C:183:ARG:C	2.18	0.64
1:A:361:THR:HG21	1:A:400:VAL:HG12	1.78	0.64
1:A:695:ARG:HH22	1:A:724:TYR:H	1.45	0.64
3:B:110:LEU:O	3:B:114:MET:HB2	1.98	0.64
1:A:2:VAL:HG11	1:A:62:VAL:HG22	1.81	0.63
1:A:571:PHE:HB2	1:A:598:PRO:HG2	1.79	0.63
1:A:716:ILE:HG23	1:A:744:LEU:HD23	1.81	0.62
2:C:183:ARG:HD3	2:C:183:ARG:O	2.00	0.61
1:A:332:PHE:HB2	1:A:337:GLY:HA2	1.83	0.61
1:A:2:VAL:HG22	1:A:66:ARG:HB2	1.83	0.61
2:C:183:ARG:HG2	2:C:183:ARG:NH1	2.16	0.61
1:A:744:LEU:H	1:A:766:LEU:HD21	1.65	0.60
1:A:529:ASN:HB3	1:A:532:LEU:HD23	1.84	0.60
1:A:433:LYS:HA	1:A:436:LEU:HD23	1.83	0.59
1:A:400:VAL:HA	1:A:403:SER:HB3	1.83	0.59
1:A:780:GLN:HB3	1:A:782:PRO:HD2	1.85	0.59
1:A:558:CYS:SG	1:A:559:LYS:N	2.75	0.59
1:A:711:SER:O	1:A:740:GLN:NE2	2.36	0.58
3:B:162:TRP:HE1	3:B:311:GLN:HE21	1.50	0.58
1:A:489:ASP:HA	1:A:492:ARG:HG2	1.86	0.58
1:A:402:SER:C	1:A:404:LEU:H	2.07	0.58
1:A:453:SER:N	1:A:456:GLU:OE2	2.37	0.57
1:A:638:VAL:HA	1:A:662:VAL:HG23	1.86	0.57
3:B:119:ASN:ND2	3:B:174:ASN:OD1	2.37	0.57
1:A:396:GLU:N	1:A:399:ASN:OD1	2.27	0.57
1:A:714:MET:O	1:A:742:HIS:N	2.38	0.57
2:C:183:ARG:HA	2:C:183:ARG:NE	2.18	0.57
3:B:115:SER:HB2	3:B:122:GLN:HG2	1.87	0.56
1:A:803:ASP:OD1	1:A:803:ASP:N	2.36	0.56
3:B:187:ILE:HG22	3:B:215:SER:HA	1.88	0.56
3:B:333:MET:HA	3:B:336:VAL:HG12	1.86	0.56
1:A:741:LEU:HB3	1:A:766:LEU:HD23	1.86	0.56
1:A:28:ARG:HH21	1:A:31:LEU:HD11	1.72	0.55
1:A:66:ARG:NH1	1:A:502:ASP:OD1	2.40	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:655:GLY:N	1:A:679:GLU:OE1	2.38	0.55
1:A:786:ASN:ND2	1:A:789:THR:O	2.39	0.54
1:A:776:LEU:N	1:A:803:ASP:OD2	2.40	0.54
1:A:794:GLU:OE2	1:A:819:ARG:NH1	2.40	0.54
3:B:326:ARG:NH2	3:B:329:ASP:OD2	2.40	0.54
1:A:611:ASN:HA	1:A:635:LYS:HD3	1.89	0.54
1:A:658:VAL:O	1:A:685:ASN:ND2	2.36	0.54
1:A:361:THR:HG21	1:A:400:VAL:CG1	2.38	0.53
3:B:246:THR:H	3:B:249:THR:HG1	1.52	0.53
2:C:187:GLN:HA	2:C:187:GLN:OE1	2.08	0.53
3:B:236:ASP:OD1	3:B:330:ARG:NH1	2.38	0.53
1:A:670:ARG:HB2	1:A:673:ASN:HD22	1.74	0.53
3:B:99:HIS:O	3:B:103:GLU:HB2	2.09	0.53
1:A:101:HIS:HA	1:A:104:ARG:HB2	1.91	0.53
1:A:606:MET:HG3	1:A:609:LEU:HD21	1.89	0.53
1:A:747:GLN:HB2	1:A:772:CYS:HB2	1.91	0.52
1:A:90:GLN:O	1:A:94:ASN:ND2	2.42	0.52
1:A:358:LEU:CD2	1:A:400:VAL:HG11	2.37	0.52
1:A:834:ILE:HD13	1:A:842:GLY:H	1.74	0.52
1:A:616:ASP:OD1	1:A:616:ASP:N	2.42	0.52
1:A:575:LEU:HD23	1:A:578:ILE:HD11	1.92	0.52
3:B:97:LYS:HD2	3:B:99:HIS:HE1	1.74	0.52
1:A:419:ILE:HD13	1:A:465:LEU:HD21	1.92	0.52
1:A:666:PHE:N	1:A:690:GLY:O	2.39	0.52
1:A:402:SER:C	1:A:404:LEU:N	2.64	0.51
1:A:639:LEU:HB3	1:A:663:LEU:HD23	1.93	0.51
2:C:196:LYS:HA	2:C:199:VAL:HG22	1.92	0.51
3:B:258:LEU:HD12	3:B:319:ALA:HB2	1.92	0.51
1:A:16:ILE:HG12	1:A:76:LEU:HD21	1.91	0.51
1:A:41:MET:HG3	1:A:104:ARG:HH21	1.75	0.51
3:B:64:CYS:HB2	3:B:76:ARG:HB2	1.92	0.51
3:B:254:PHE:O	3:B:257:CYS:HB3	2.10	0.51
1:A:799:SER:OG	1:A:800:SER:N	2.43	0.51
1:A:666:PHE:HB3	1:A:691:LEU:HB3	1.92	0.51
1:A:685:ASN:OD1	1:A:712:LYS:NZ	2.42	0.51
1:A:389:GLU:O	1:A:393:ASN:ND2	2.44	0.51
1:A:395:SER:O	1:A:399:ASN:N	2.44	0.51
1:A:719:ASN:OD1	1:A:719:ASN:N	2.43	0.51
1:A:785:GLY:O	1:A:789:THR:OG1	2.28	0.50
2:C:288:GLU:O	2:C:292:GLY:N	2.44	0.50
3:B:222:ARG:NH1	3:B:224:GLU:OE2	2.41	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:11:GLU:OE2	1:A:15:ASN:ND2	2.45	0.50
1:A:73:GLU:OE2	1:A:533:ARG:NH2	2.34	0.50
1:A:438:HIS:HA	1:A:441:ILE:HG22	1.93	0.50
2:C:262:TYR:HA	2:C:284:VAL:HG11	1.93	0.50
3:B:285:GLU:O	3:B:289:ASN:ND2	2.44	0.50
1:A:386:PHE:HD1	1:A:406:LEU:HD21	1.77	0.49
1:A:565:ASP:N	1:A:565:ASP:OD1	2.44	0.49
1:A:668:PRO:HG2	1:A:698:GLN:HB3	1.94	0.49
1:A:721:TYR:OH	3:B:122:GLN:NE2	2.44	0.49
2:C:287:LEU:HD22	2:C:290:ILE:HD11	1.94	0.49
1:A:791:TRP:HB3	1:A:793:ILE:HG23	1.93	0.49
1:A:402:SER:O	1:A:404:LEU:N	2.45	0.49
1:A:713:LEU:HB3	1:A:738:PRO:HG2	1.93	0.49
1:A:723:SER:OG	1:A:725:GLY:O	2.31	0.48
2:C:343:ASN:HA	2:C:346:LEU:HD12	1.96	0.48
1:A:395:SER:HB3	1:A:398:ASP:HB2	1.96	0.48
3:B:71:TYR:HB2	3:B:72:TYR:HD1	1.79	0.48
1:A:677:LEU:N	1:A:703:GLU:OE2	2.42	0.47
2:C:178:GLU:HB2	2:C:182:PHE:HB2	1.96	0.47
3:B:123:LEU:HD23	3:B:125:GLY:H	1.79	0.47
1:A:661:GLU:O	1:A:687:ARG:N	2.38	0.47
3:B:78:GLU:HA	3:B:83:SER:HA	1.96	0.47
1:A:695:ARG:N	1:A:698:GLN:OE1	2.48	0.47
3:B:334:ILE:HD11	3:B:338:LYS:HE2	1.96	0.47
1:A:388:ASP:HA	1:A:391:ARG:HE	1.80	0.47
1:A:647:LEU:HG	1:A:649:CYS:H	1.80	0.47
1:A:695:ARG:NH2	1:A:724:TYR:H	2.12	0.47
3:B:50:PRO:O	3:B:54:LEU:HB2	2.15	0.47
1:A:515:LEU:O	1:A:535:VAL:HA	2.14	0.46
1:A:791:TRP:CD1	1:A:815:MET:HG2	2.50	0.46
1:A:710:LEU:O	1:A:740:GLN:NE2	2.48	0.46
1:A:836:ASP:OD1	1:A:836:ASP:N	2.49	0.46
3:B:84:TYR:HA	3:B:139:PHE:HB2	1.97	0.46
2:C:308:VAL:HG22	2:C:349:LEU:HD23	1.98	0.46
1:A:808:TRP:CE2	1:A:833:ALA:HB2	2.51	0.46
1:A:31:LEU:O	1:A:35:GLN:NE2	2.49	0.45
1:A:710:LEU:HB3	1:A:713:LEU:HB2	1.98	0.45
3:B:159:LEU:HB2	3:B:299:ARG:HH22	1.82	0.45
1:A:649:CYS:HB2	1:A:667:LYS:HB3	1.98	0.45
1:A:754:SER:OG	1:A:780:GLN:OE1	2.26	0.45
3:B:193:LYS:HE2	3:B:195:MET:HB3	1.99	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:B:258:LEU:O	3:B:261:ILE:HB	2.16	0.45
3:B:82:ARG:NH1	3:B:83:SER:OG	2.50	0.45
2:C:182:PHE:C	2:C:184:ARG:N	2.62	0.45
1:A:371:CYS:SG	1:A:468:ARG:NE	2.88	0.45
2:C:323:ARG:HH22	2:C:332:GLN:HE21	1.63	0.45
3:B:324:LYS:HD2	3:B:329:ASP:HB2	1.99	0.45
1:A:443:GLU:O	1:A:562:ARG:NH1	2.49	0.45
1:A:796:LEU:HB3	1:A:821:VAL:HG22	1.99	0.45
1:A:379:TRP:HA	1:A:382:ILE:HG13	1.99	0.45
1:A:401:MET:O	1:A:494:LEU:HD12	2.16	0.45
1:A:695:ARG:HH12	1:A:725:GLY:H	1.65	0.45
1:A:9:PHE:HD1	1:A:73:GLU:HB3	1.81	0.44
1:A:358:LEU:CD1	1:A:400:VAL:HG11	2.45	0.44
3:B:189:HIS:HA	3:B:213:SER:HA	1.98	0.44
1:A:361:THR:CG2	1:A:400:VAL:HB	2.48	0.44
1:A:382:ILE:HA	1:A:385:HIS:HB2	1.99	0.44
3:B:191:ASP:N	3:B:191:ASP:OD1	2.48	0.44
1:A:752:LYS:O	1:A:777:VAL:N	2.51	0.44
3:B:52:GLN:HB3	3:B:79:ILE:HD12	2.00	0.44
1:A:149:ARG:HH21	1:A:150:TRP:HE1	1.65	0.44
1:A:517:ILE:HG23	1:A:537:SER:HA	2.00	0.44
2:C:179:ASN:HD22	2:C:183:ARG:NH2	2.16	0.44
3:B:298:PRO:HA	3:B:301:MET:HG2	2.00	0.44
1:A:643:ASN:HA	3:B:44:PRO:HG3	1.99	0.44
2:C:187:GLN:OE1	2:C:188:PRO:HD2	2.18	0.44
3:B:318:LEU:HD21	3:B:336:VAL:HG23	2.00	0.44
1:A:695:ARG:HH12	1:A:724:TYR:H	1.66	0.43
3:B:255:GLY:O	3:B:258:LEU:HB3	2.17	0.43
1:A:765:MET:SD	1:A:765:MET:N	2.92	0.43
3:B:166:LEU:HD21	3:B:343:ILE:HD11	1.99	0.43
1:A:524:LYS:HZ1	1:A:526:ILE:HG13	1.84	0.43
3:B:228:VAL:HG23	3:B:239:TYR:CZ	2.53	0.43
3:B:110:LEU:HD21	3:B:187:ILE:HD13	2.01	0.43
1:A:367:GLY:HA2	1:A:370:LEU:HD23	2.00	0.43
3:B:168:ILE:HG22	3:B:205:ALA:HB2	2.01	0.43
1:A:361:THR:HG22	1:A:403:SER:OG	2.18	0.43
2:C:305:TYR:N	2:C:309:ASP:OD2	2.52	0.43
1:A:104:ARG:HA	1:A:107:LEU:HB2	2.00	0.43
1:A:687:ARG:O	1:A:715:SER:N	2.47	0.43
2:C:189:LEU:H	2:C:328:LYS:HZ1	1.66	0.42
3:B:176:VAL:HA	3:B:179:LEU:HD12	2.01	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:650:PHE:HD1	1:A:650:PHE:HA	1.72	0.42
2:C:329:LEU:HB2	2:C:332:GLN:HB2	2.00	0.42
3:B:79:ILE:HG22	3:B:80:GLU:HG3	2.01	0.42
3:B:98:ARG:HA	3:B:101:VAL:HG12	2.01	0.42
3:B:246:THR:OG1	3:B:247:GLU:N	2.50	0.42
1:A:344:LEU:HB3	1:A:379:TRP:CZ3	2.55	0.42
1:A:575:LEU:HD12	1:A:599:LEU:HD13	2.02	0.42
3:B:245:VAL:HG23	3:B:249:THR:HG21	2.01	0.42
1:A:715:SER:HB2	1:A:743:GLU:HB2	2.01	0.42
3:B:43:ILE:HD11	3:B:116:ASN:HD21	1.83	0.42
1:A:694:THR:OG1	1:A:698:GLN:NE2	2.53	0.42
1:A:662:VAL:HG12	1:A:688:LYS:HB2	2.00	0.42
1:A:752:LYS:HA	1:A:776:LEU:HA	2.02	0.41
3:B:54:LEU:HD12	3:B:59:ASN:HD22	1.85	0.41
1:A:545:ASN:OD1	1:A:545:ASN:N	2.53	0.41
1:A:612:LEU:HD22	1:A:612:LEU:HA	1.87	0.41
1:A:654:ILE:HG21	1:A:666:PHE:HE1	1.84	0.41
2:C:293:ARG:HH12	2:C:326:ASP:HA	1.86	0.41
3:B:174:ASN:HA	3:B:177:THR:HG22	2.02	0.41
2:C:172:MET:SD	2:C:172:MET:N	2.94	0.41
2:C:183:ARG:NH1	2:C:183:ARG:CG	2.80	0.41
1:A:80:GLN:HG3	1:A:81:LEU:HD22	2.03	0.41
1:A:759:SER:OG	1:A:762:LYS:N	2.53	0.41
3:B:17:ASP:N	3:B:20:LYS:HZ1	2.17	0.41
1:A:362:ILE:HA	1:A:365:VAL:HG12	2.03	0.41
1:A:477:THR:HG23	1:A:483:ILE:HD11	2.03	0.41
1:A:616:ASP:HB2	1:A:640:ASP:HB2	2.01	0.41
1:A:627:GLN:HG2	1:A:629:CYS:H	1.86	0.41
1:A:741:LEU:HD23	1:A:741:LEU:HA	1.95	0.41
3:B:68:GLN:HA	3:B:73:LYS:HD3	2.03	0.41
3:B:237:PRO:HA	3:B:240:HIS:HB3	2.03	0.41
1:A:401:MET:O	1:A:401:MET:SD	2.79	0.41
1:A:583:ALA:O	1:A:586:GLN:NE2	2.54	0.41
2:C:184:ARG:HA	2:C:184:ARG:HD2	1.88	0.41
2:C:228:ASP:HB2	2:C:232:ASN:HB2	2.03	0.40
3:B:29:ILE:H	3:B:29:ILE:HG13	1.61	0.40
1:A:574:PRO:HA	1:A:598:PRO:HB2	2.03	0.40
3:B:194:PRO:HG2	3:B:260:VAL:HB	2.04	0.40
2:C:281:SER:HA	2:C:284:VAL:HG12	2.03	0.40
1:A:415:LEU:HA	1:A:418:CYS:HB3	2.04	0.40
2:C:268:VAL:HG22	3:B:240:HIS:ND1	2.37	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:148:ASP:HB2	1:A:414:HIS:HE1	1.86	0.40
1:A:350:GLU:O	1:A:354:LYS:NZ	2.43	0.40
1:A:530:HIS:CE1	1:A:559:LYS:HD3	2.55	0.40
1:A:713:LEU:HD22	1:A:714:MET:H	1.87	0.40

There are no symmetry-related clashes.

5.3 Torsion angles (i)

5.3.1 Protein backbone (i)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	657/852 (77%)	553 (84%)	103 (16%)	1 (0%)	44	75
2	C	166/426 (39%)	140 (84%)	24 (14%)	2 (1%)	11	43
3	B	323/351 (92%)	284 (88%)	38 (12%)	1 (0%)	37	70
All	All	1146/1629 (70%)	977 (85%)	165 (14%)	4 (0%)	38	70

All (4) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	C	183	ARG
1	A	403	SER
2	C	173	PRO
3	B	236	ASP

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	603/772 (78%)	583 (97%)	20 (3%)	33	56
2	C	141/355 (40%)	132 (94%)	9 (6%)	14	39
3	B	293/314 (93%)	282 (96%)	11 (4%)	28	52
All	All	1037/1441 (72%)	997 (96%)	40 (4%)	30	51

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

Mol	Chain	Res	Type
1	A	29	LYS
1	A	45	LEU
1	A	50	ARG
1	A	91	ARG
1	A	329	ASN
1	A	381	ARG
1	A	399	ASN
1	A	401	MET
1	A	449	ARG
1	A	452	ARG
1	A	487	ILE
1	A	490	MET
1	A	561	LEU
1	A	582	ILE
1	A	604	ARG
1	A	612	LEU
1	A	662	VAL
1	A	731	LYS
1	A	763	LEU
1	A	765	MET
2	C	183	ARG
2	C	184	ARG
2	C	187	GLN
2	C	194	ARG
2	C	254	THR
2	C	255	LYS
2	C	294	ARG
2	C	323	ARG
2	C	325	MET
3	B	39	ASN
3	B	46	ARG
3	B	98	ARG
3	B	170	LYS
3	B	190	ARG

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Mol	Chain	Res	Type
3	B	192	VAL
3	B	201	LYS
3	B	220	LYS
3	B	222	ARG
3	B	309	ARG
3	B	340	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (18) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	30	GLN
1	A	35	GLN
1	A	51	GLN
1	A	94	ASN
1	A	329	ASN
1	A	414	HIS
1	A	530	HIS
1	A	611	ASN
1	A	625	GLN
1	A	643	ASN
1	A	673	ASN
1	A	812	GLN
3	B	39	ASN
3	B	59	ASN
3	B	99	HIS
3	B	122	GLN
3	B	240	HIS
3	B	311	GLN

5.3.3 RNA

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains

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

5.5 Carbohydrates

There are no oligosaccharides in this entry.

5.6 Ligand geometry (i)

2 ligands are modelled in this entry.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\| > 2$	Counts	RMSZ	$\#\|Z\| > 2$
4	U5P	C	502	2	19,21,22	1.23	2 (10%)	25,30,33	1.92	7 (28%)
4	U5P	C	501	2	19,21,22	1.93	7 (36%)	25,30,33	1.85	7 (28%)

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
4	U5P	C	502	2	-	2/7/25/26	0/2/2/2
4	U5P	C	501	2	-	3/7/25/26	0/2/2/2

All (9) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	C	501	U5P	C5-C4	-3.52	1.35	1.43
4	C	501	U5P	C4-N3	-3.25	1.32	1.38
4	C	501	U5P	O4-C4	-3.01	1.18	1.24
4	C	501	U5P	O4'-C1'	2.54	1.48	1.42
4	C	502	U5P	C2-N1	2.39	1.42	1.38
4	C	501	U5P	O2-C2	-2.25	1.18	1.23
4	C	501	U5P	C3'-C2'	-2.20	1.47	1.53
4	C	501	U5P	C6-N1	-2.10	1.32	1.38
4	C	502	U5P	C4-N3	-2.02	1.34	1.38

All (14) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	C	501	U5P	C4-N3-C2	-4.79	120.26	126.58
4	C	502	U5P	C4-N3-C2	-3.99	121.31	126.58

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	C	502	U5P	C5-C4-N3	3.71	120.39	114.84
4	C	501	U5P	C5-C4-N3	3.58	120.20	114.84
4	C	501	U5P	N3-C2-N1	3.55	119.61	114.89
4	C	502	U5P	C1'-N1-C2	3.54	123.98	117.57
4	C	502	U5P	O4-C4-C5	-3.41	119.17	125.16
4	C	502	U5P	N3-C2-N1	3.30	119.27	114.89
4	C	501	U5P	O4-C4-C5	-3.06	119.77	125.16
4	C	501	U5P	C3'-C2'-C1'	2.39	105.96	101.43
4	C	502	U5P	C2'-C3'-C4'	2.26	107.04	102.64
4	C	501	U5P	C4'-O4'-C1'	-2.18	104.65	109.47
4	C	502	U5P	C1'-N1-C6	-2.07	116.34	120.84
4	C	501	U5P	O2-C2-N1	-2.03	120.09	122.79

There are no chirality outliers.

All (5) torsion outliers are listed below:

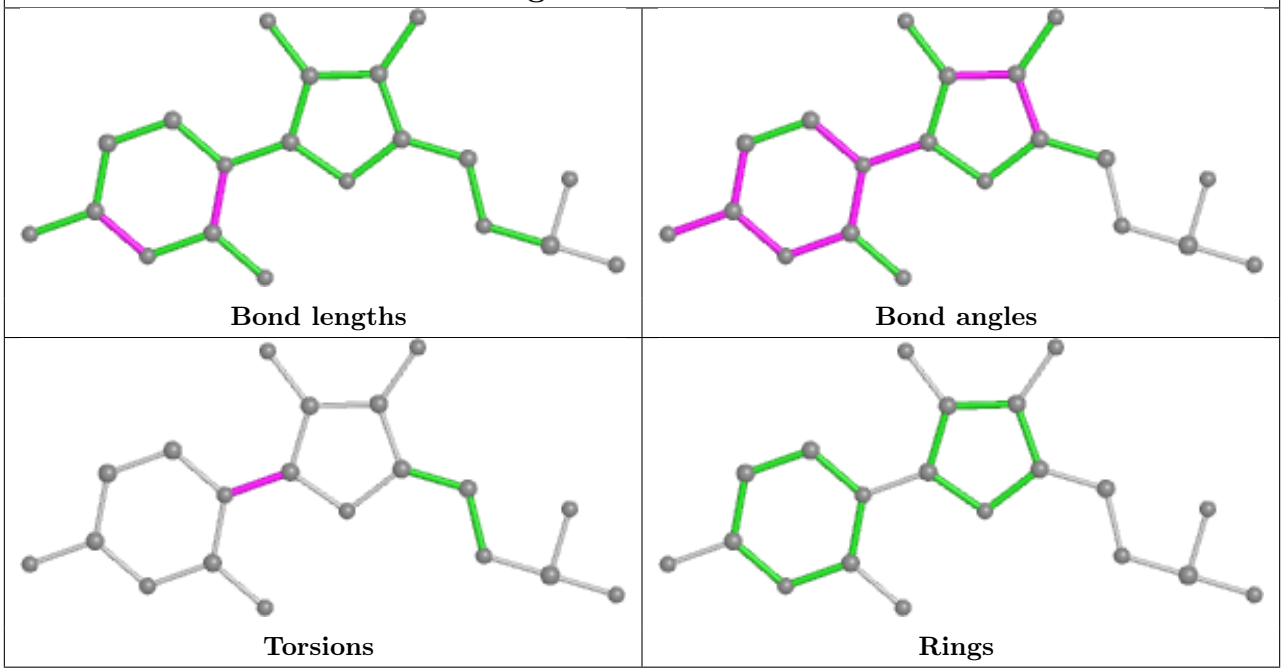
Mol	Chain	Res	Type	Atoms
4	C	502	U5P	O4'-C1'-N1-C2
4	C	502	U5P	O4'-C1'-N1-C6
4	C	501	U5P	C2'-C1'-N1-C6
4	C	501	U5P	O4'-C1'-N1-C6
4	C	501	U5P	O4'-C1'-N1-C2

There are no ring outliers.

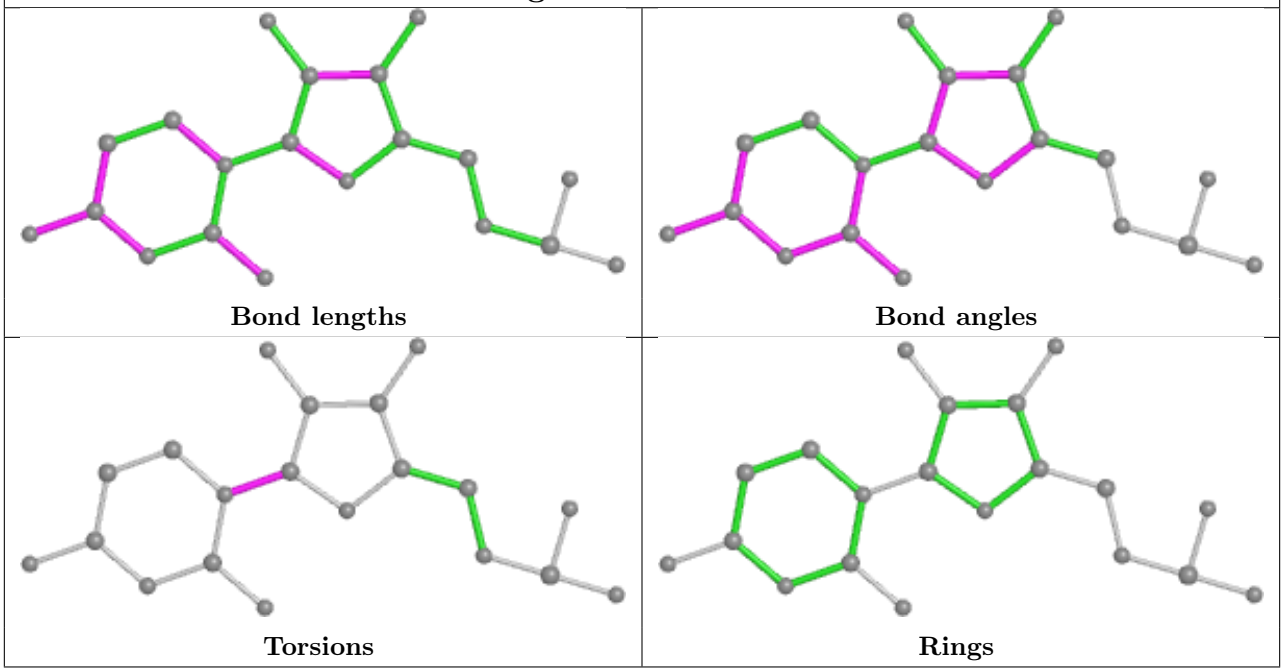
No monomer is involved in short contacts.

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

Ligand U5P C 502



Ligand U5P C 501



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.

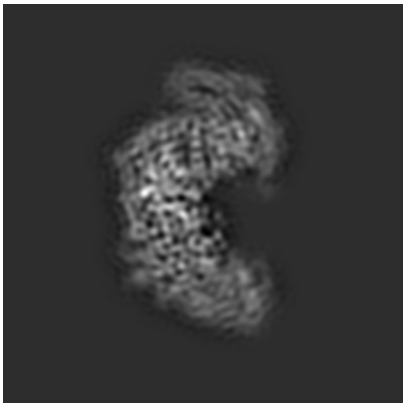
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-0681. These allow visual inspection of the internal detail of the map and identification of artifacts.

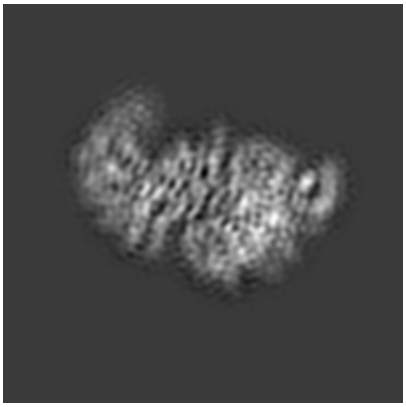
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections

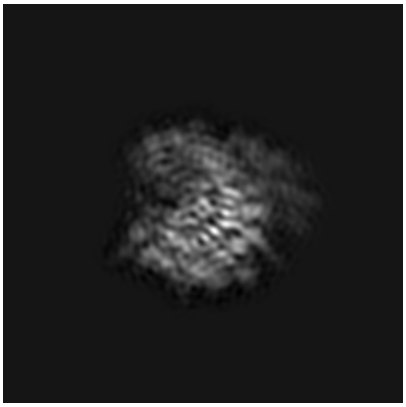
6.1.1 Primary map



X



Y

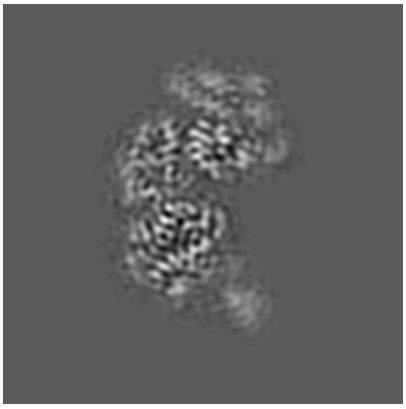


Z

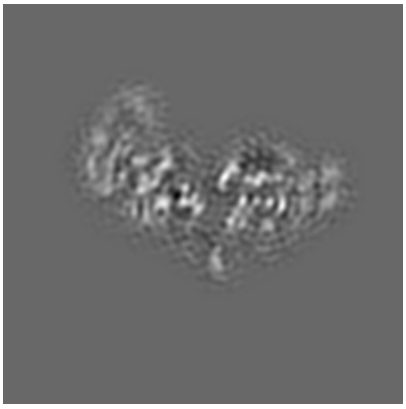
The images above show the map projected in three orthogonal directions.

6.2 Central slices

6.2.1 Primary map



X Index: 80



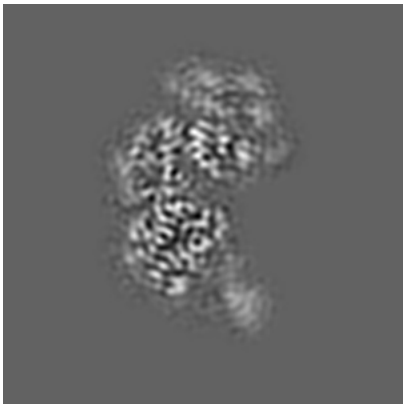
Y Index: 80

Z Index: 80

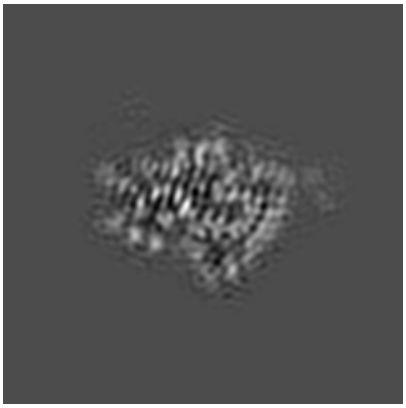
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

6.3.1 Primary map



X Index: 81



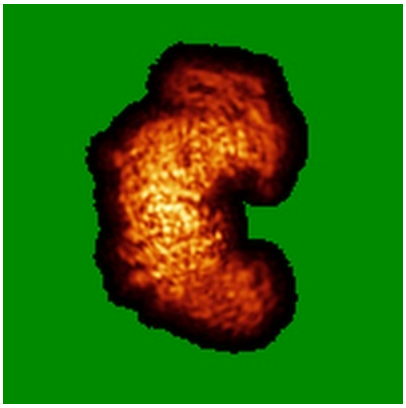
Y Index: 64

Z Index: 92

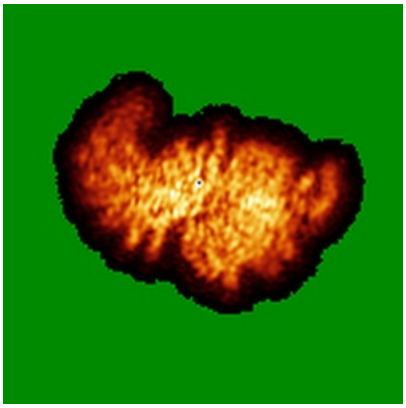
The images above show the largest variance slices of the map in three orthogonal directions.

6.4 Orthogonal standard-deviation projections (False-color) (i)

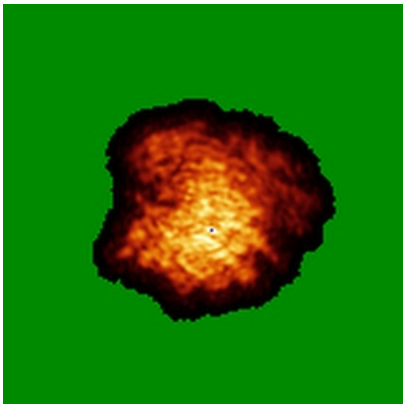
6.4.1 Primary map



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 0.03. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

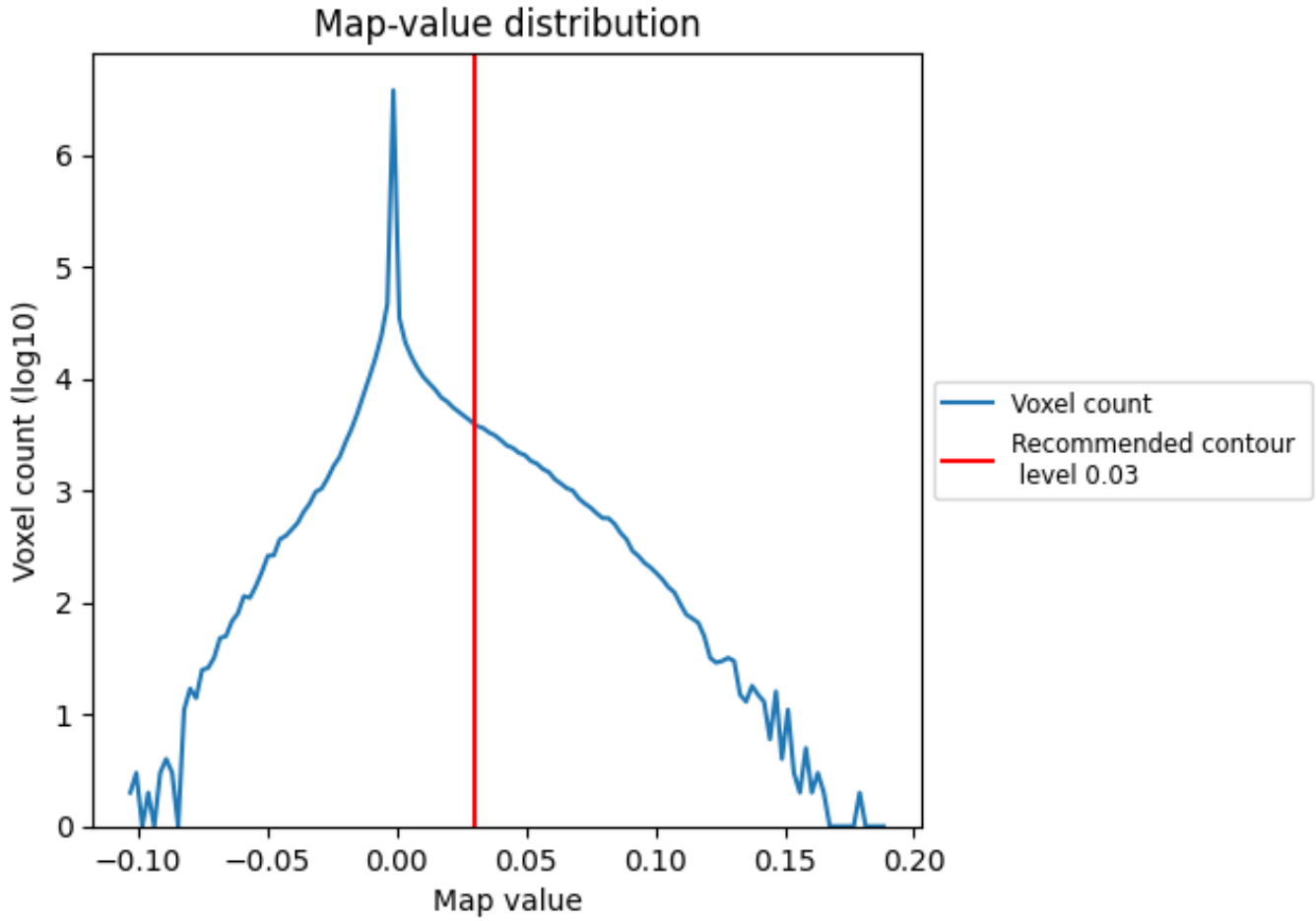
6.6 Mask visualisation (i)

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

7 Map analysis

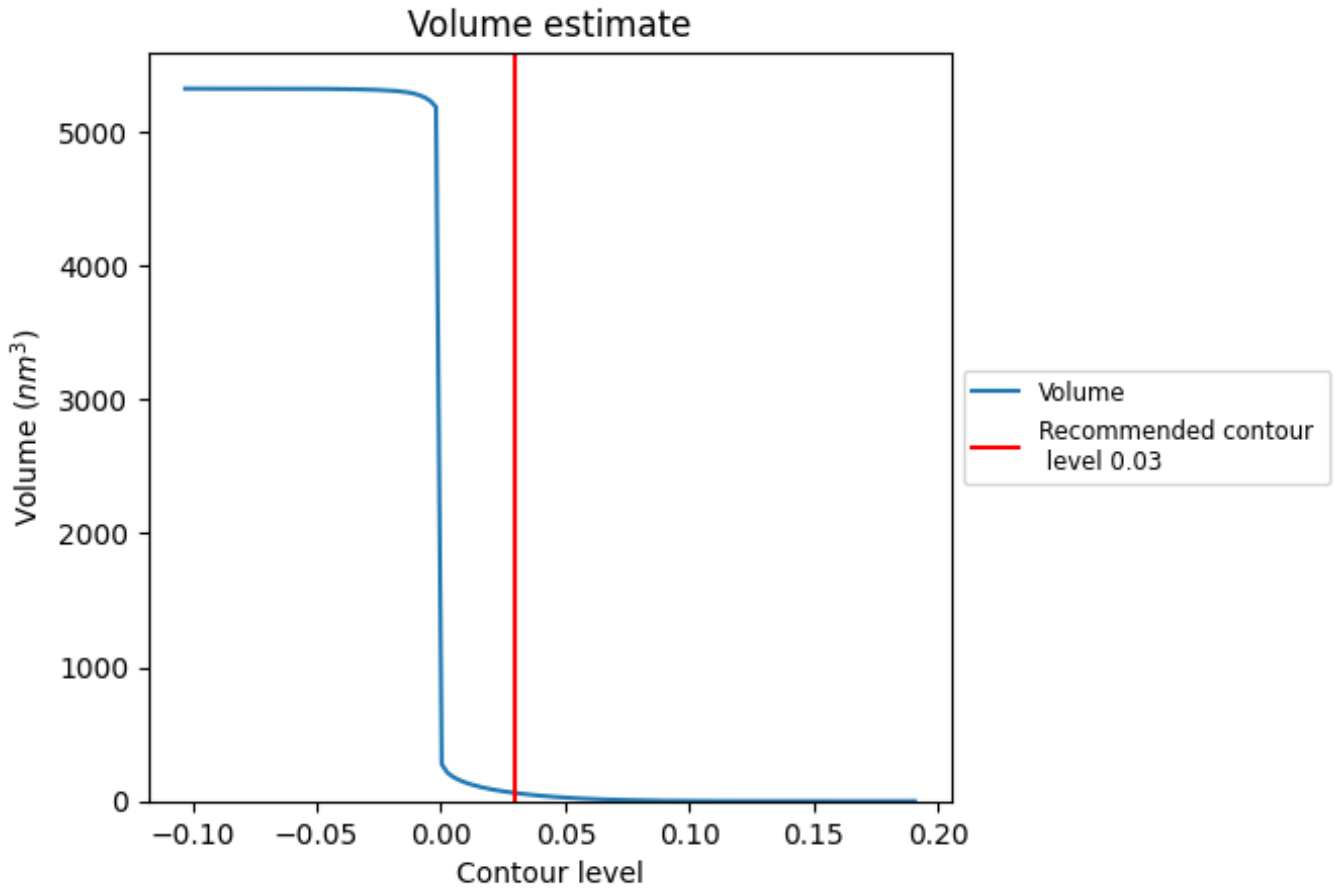
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution



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.

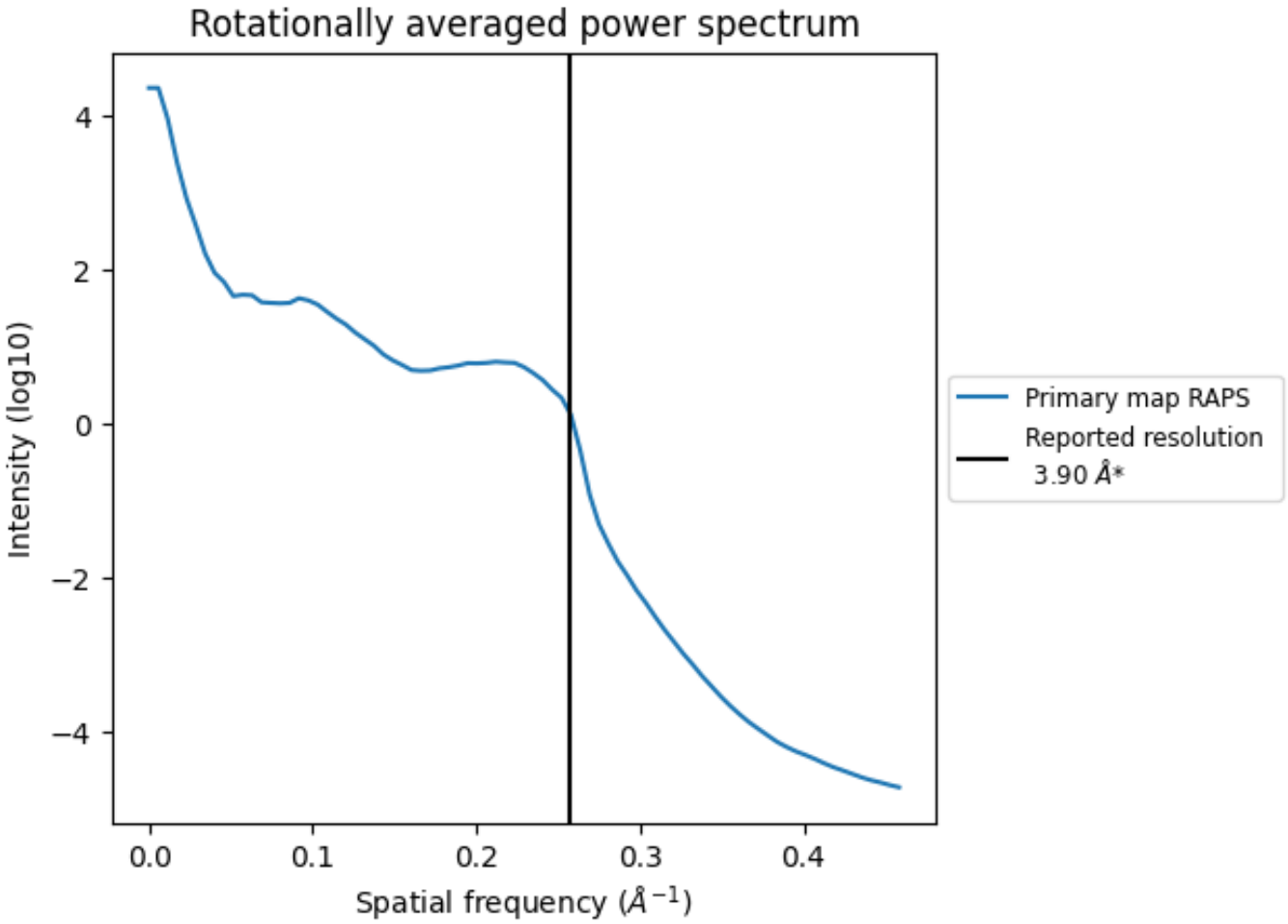
7.2 Volume estimate



The volume at the recommended contour level is 60 nm^3; this corresponds to an approximate mass of 55 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 0.256 Å^{-1}

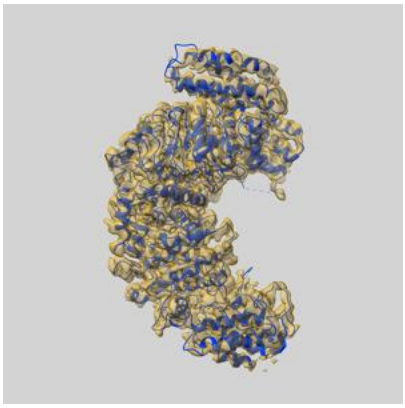
8 Fourier-Shell correlation (i)

This section was not generated. No FSC curve or half-maps provided.

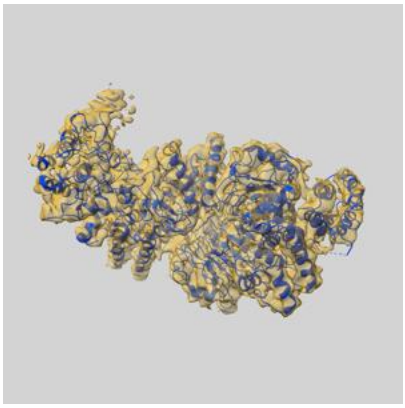
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-0681 and PDB model 6J5U. Per-residue inclusion information can be found in section 3 on page 5.

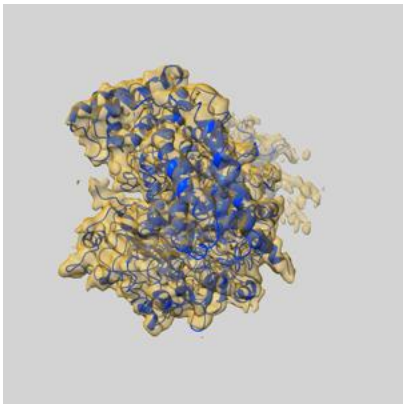
9.1 Map-model overlay



X



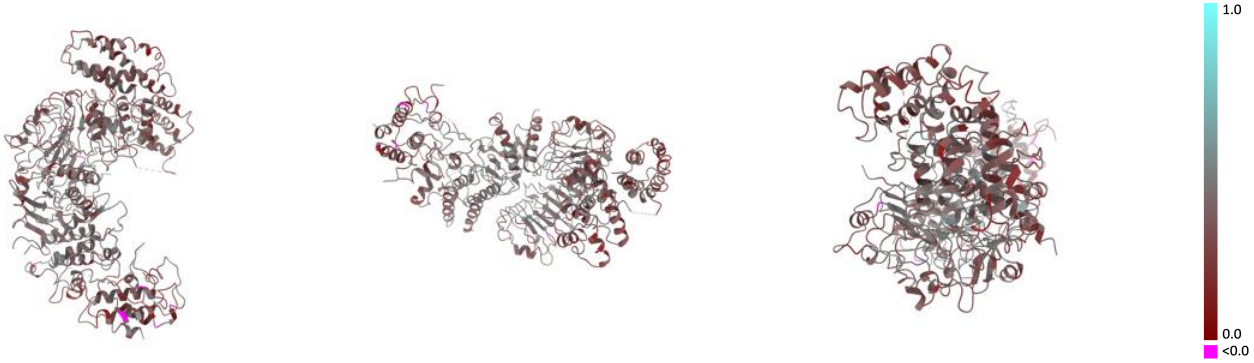
Y



Z

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.

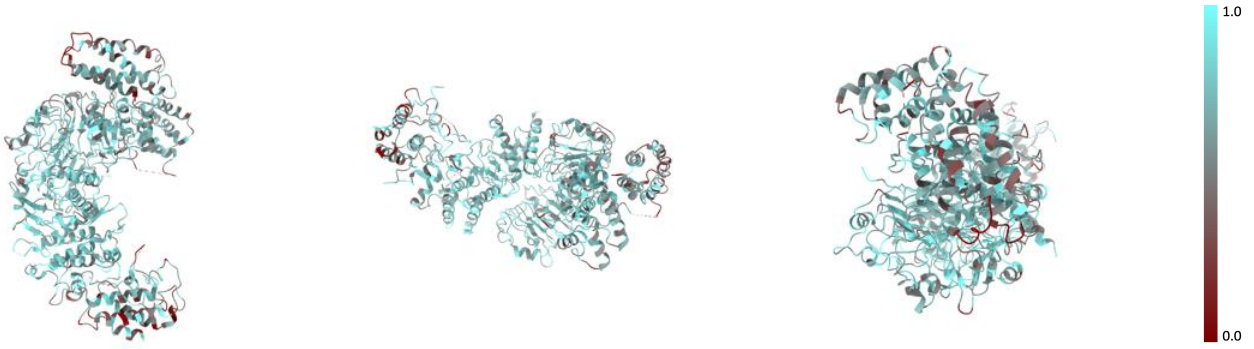
9.2 Q-score mapped to coordinate model (i)



X Y Z

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.

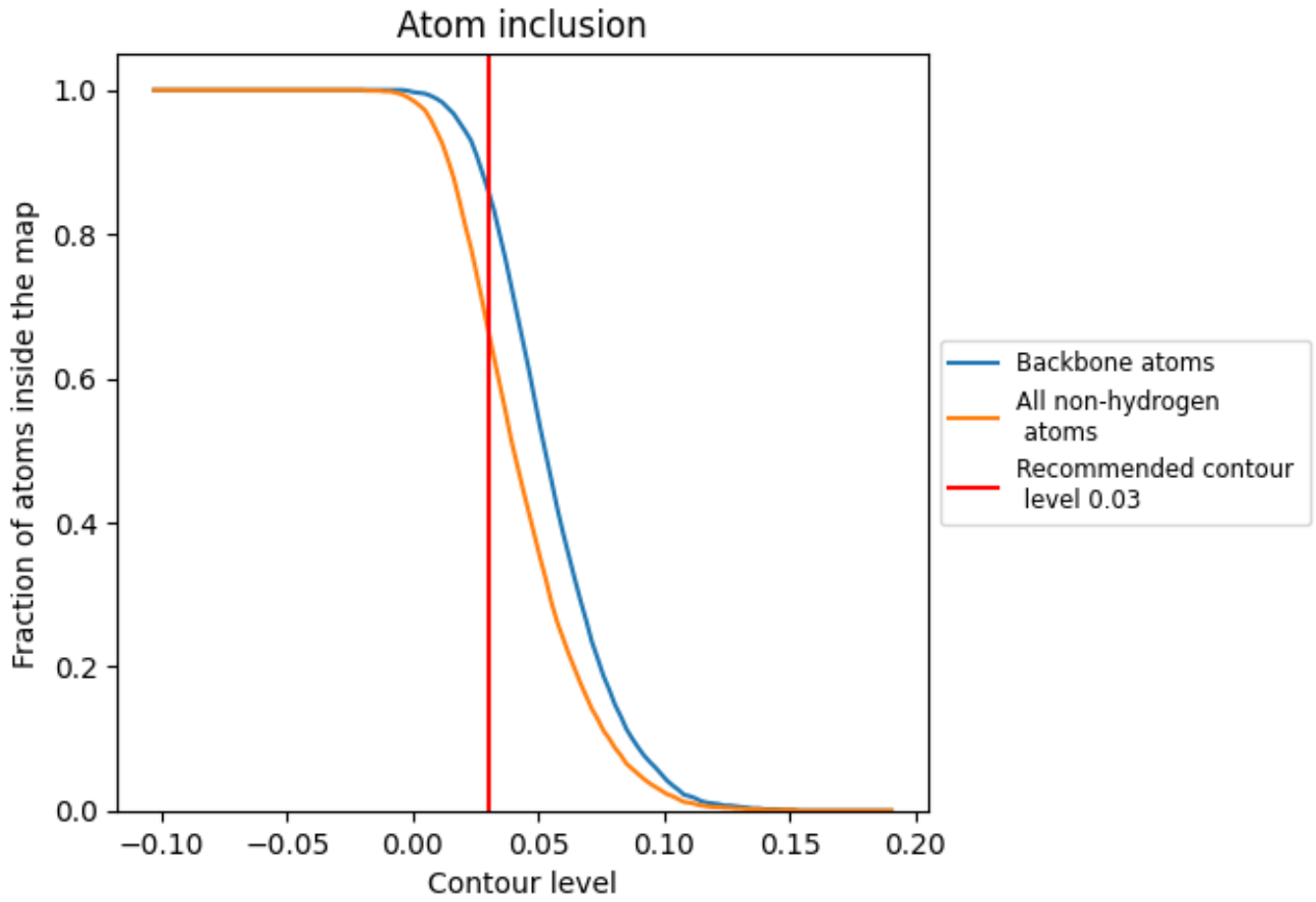
9.3 Atom inclusion mapped to coordinate model (i)



X Y Z

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, 86% of all backbone atoms, 67% 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	0.6680	0.3650
A	0.6600	0.3590
B	0.7410	0.3980
C	0.5640	0.3280