Full wwPDB EM Validation Report (i)

Nov 19, 2022 – 11:25 pm GMT

PDB ID	:	6FN1
EMDB ID	:	EMD-4281
Title	:	Zosuquidar and UIC2 Fab complex of human-mouse chimeric ABCB1 (ABCB1HM)
Authors	:	Alam, A.; Locher, K.P.
Deposited on	:	2018-02-02
Resolution	:	3.58 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 (i) 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 (1)) were used in the production of this report:

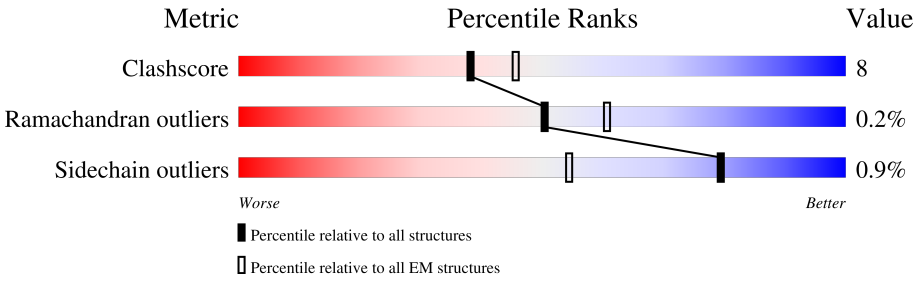
EMDB validation analysis	:	0.0.1.dev43
Mogul	:	1.8.4, CSD as541be (2020)
MolProbity	:	4.02b-467
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ	:	1.9.9
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.31.2

1 Overall quality at a glance (i)

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

The reported resolution of this entry is 3.58 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 <=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	1249	10% 74% 20% • 5%
2	B	220	• 77% 21% •
3	C	225	• 84% 16%

2 Entry composition (i)

There are 5 unique types of molecules in this entry. The entry contains 12739 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 Human-mouse chimeric ABCB1 (ABCBHM).

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	1182	9186	5915	1553	1685	33	0	0

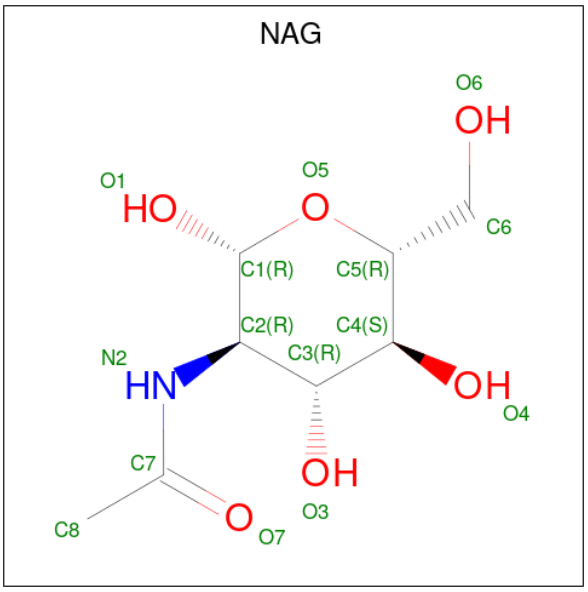
- Molecule 2 is a protein called UIC2 Antigen Binding Fragment Light chain.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	B	220	1713	1071	292	342	8	1	0

- Molecule 3 is a protein called UIC2 Antigen Binding Fragment Heavy Chain.

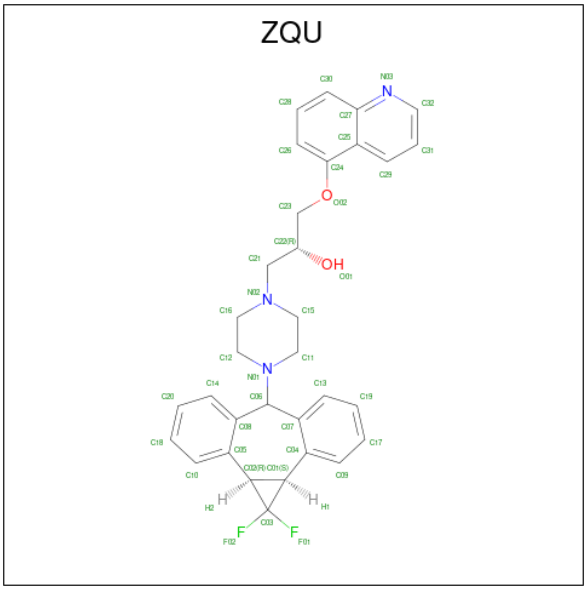
Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	C	225	1720	1100	274	337	9	1	0

- Molecule 4 is 2-acetamido-2-deoxy-beta-D-glucopyranose (three-letter code: NAG) (formula: $C_8H_{15}NO_6$).



Mol	Chain	Residues	Atoms				AltConf
4	A	1	Total 42	C 24	N 3	O 15	0
4	A	1	Total 42	C 24	N 3	O 15	0
4	A	1	Total 42	C 24	N 3	O 15	0

- Molecule 5 is Zosuquidar (three-letter code: ZQU) (formula: $C_{32}H_{31}F_2N_3O_2$).



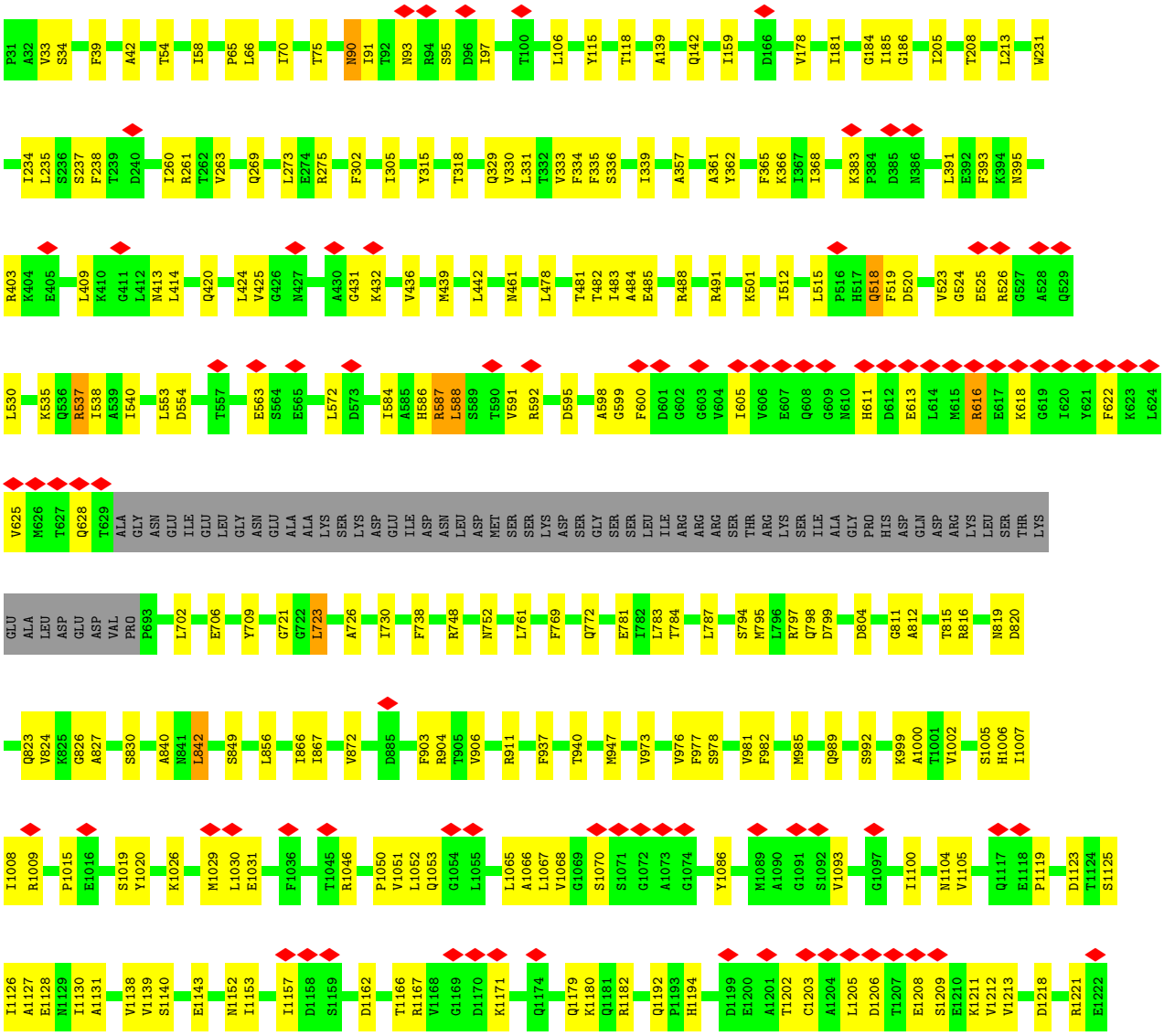
Mol	Chain	Residues	Atoms					AltConf
5	A	1	Total 78	C 64	F 4	N 6	O 4	0
5	A	1	Total 78	C 64	F 4	N 6	O 4	0

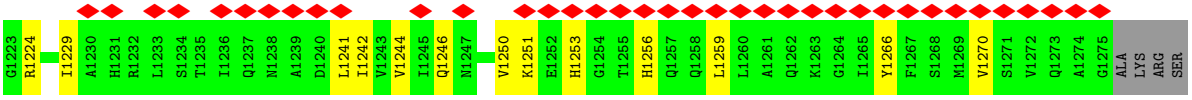
3 Residue-property plots (i)

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: Human-mouse chimeric ABCB1 (ABCBHM)

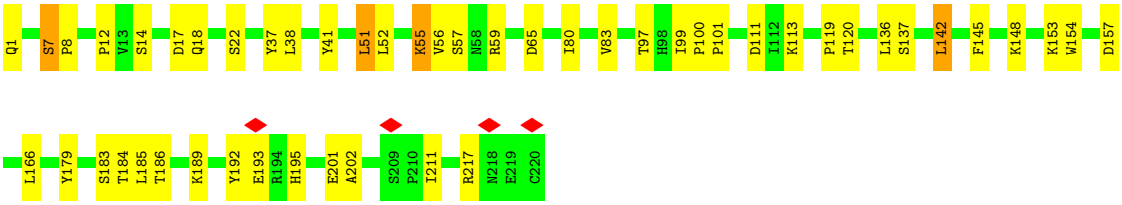
Chain A: 10% 74% 20% • 5%





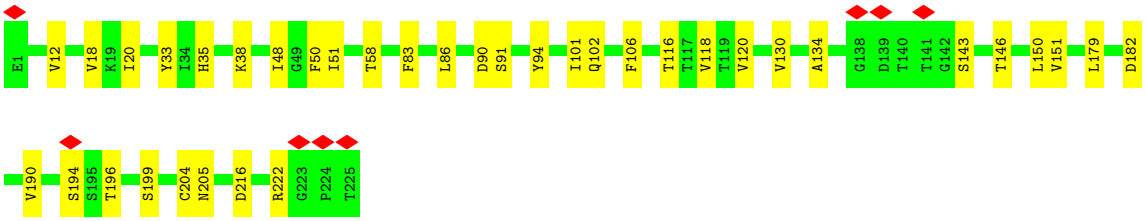
• Molecule 2: UIC2 Antigen Binding Fragment Light chain

Chain B:



• Molecule 3: UIC2 Antigen Binding Fragment Heavy Chain

Chain C:



4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	231969	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 ($e^-/Å^2$)	1.54	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	0.226	Depositor
Minimum map value	-0.138	Depositor
Average map value	-0.000	Depositor
Map value standard deviation	0.005	Depositor
Recommended contour level	0.025	Depositor
Map size (Å)	294.0, 294.0, 294.0	wwPDB
Map dimensions	350, 350, 350	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.84, 0.84, 0.84	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: NAG, ZQU

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	0.41	0/9356	0.66	5/12650 (0.0%)
2	B	0.49	0/1757	0.75	5/2384 (0.2%)
3	C	0.50	0/1773	0.64	1/2420 (0.0%)
All	All	0.43	0/12886	0.67	11/17454 (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	2
2	B	0	3
All	All	0	5

There are no bond length outliers.

All (11) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	723	LEU	CA-CB-CG	10.20	138.77	115.30
2	B	38	LEU	CA-CB-CG	7.52	132.59	115.30
1	A	723	LEU	CB-CG-CD2	-7.02	99.07	111.00
2	B	38	LEU	CB-CG-CD2	-6.48	99.98	111.00
1	A	106	LEU	CA-CB-CG	6.29	129.77	115.30
3	C	150	LEU	CA-CB-CG	5.93	128.94	115.30
2	B	51	LEU	CA-CB-CG	5.87	128.81	115.30
2	B	142	LEU	CA-CB-CG	5.75	128.53	115.30
1	A	237	SER	C-N-CA	5.67	135.87	121.70
1	A	588	LEU	CA-CB-CG	5.38	127.68	115.30
2	B	52	LEU	CB-CG-CD1	-5.09	102.34	111.00

There are no chirality outliers.

All (5) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	1138	VAL	Peptide
1	A	93	ASN	Peptide
2	B	55	LYS	Peptide
2	B	7	SER	Peptide,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	9186	0	9357	159	0
2	B	1713	0	1656	28	0
3	C	1720	0	1660	19	0
4	A	42	0	39	4	0
5	A	78	0	0	0	0
All	All	12739	0	12712	204	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 8.

All (204) 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:90:ASN:ND2	4:A:1302:NAG:C1	2.28	0.97
1:A:90:ASN:HD21	4:A:1302:NAG:C1	1.79	0.95
2:B:18:GLN:HA	2:B:80:ILE:O	1.68	0.94
2:B:137:SER:HA	2:B:185:LEU:O	1.81	0.80
1:A:525:GLU:OE2	1:A:526:ARG:NH1	2.17	0.78
1:A:425:VAL:O	1:A:599:GLY:HA2	1.85	0.76
1:A:1179:GLN:HG2	1:A:1182:ARG:HH21	1.52	0.75
1:A:588:LEU:O	1:A:592:ARG:NH1	2.21	0.73
1:A:797:ARG:HG2	1:A:1015:PRO:HG2	1.72	0.72
1:A:1005:SER:O	1:A:1009:ARG:HB2	1.90	0.71
2:B:136:LEU:O	2:B:186:THR:HA	1.89	0.71
2:B:59:ARG:NH1	2:B:65:ASP:OD1	2.23	0.70

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:599:GLY:O	1:A:605:ILE:HA	1.91	0.70
1:A:1093:VAL:HG12	1:A:1100:ILE:HD13	1.73	0.69
1:A:586:HIS:HE1	1:A:1205:LEU:HG	1.58	0.68
2:B:153:LYS:HB3	2:B:201:GLU:HB2	1.75	0.68
2:B:120:THR:O	2:B:142:LEU:HA	1.94	0.67
1:A:563:GLU:HG2	1:A:1070:SER:HB2	1.78	0.66
2:B:202:ALA:HB3	2:B:211:ILE:HB	1.78	0.65
1:A:1050:PRO:HB2	1:A:1053:GLN:HE21	1.62	0.65
1:A:1125:SER:OG	1:A:1128:GLU:OE1	2.15	0.64
1:A:481:THR:HG22	1:A:482:THR:H	1.62	0.64
1:A:1182:ARG:HG3	1:A:1213:VAL:HG12	1.80	0.63
2:B:37:TYR:HB2	2:B:97:THR:HG22	1.79	0.63
1:A:820:ASP:O	1:A:1007:ILE:HD11	1.99	0.63
1:A:872:VAL:HG23	1:A:992:SER:HB2	1.80	0.63
1:A:1152:ASN:O	1:A:1182:ARG:NH1	2.32	0.62
1:A:706:GLU:HB2	1:A:709:TYR:HD2	1.65	0.62
1:A:1218:ASP:OD1	1:A:1221:ARG:NH2	2.33	0.62
1:A:1206:ASP:OD2	1:A:1209:SER:N	2.28	0.61
1:A:978:SER:O	1:A:982:PHE:HB2	2.01	0.61
2:B:14:SER:HB3	2:B:113:LYS:HD3	1.83	0.61
1:A:738:PHE:O	3:C:102:GLN:NE2	2.34	0.60
1:A:1006:HIS:HD2	1:A:1009:ARG:HH21	1.46	0.60
1:A:824:VAL:HG21	1:A:1007:ILE:HD12	1.82	0.60
1:A:1192:GLN:OE1	1:A:1224:ARG:NH2	2.34	0.60
1:A:39:PHE:HE1	1:A:185:ILE:HD11	1.68	0.59
2:B:7:SER:O	2:B:22:SER:HB3	2.02	0.59
2:B:189:LYS:NZ	2:B:193:GLU:OE2	2.36	0.58
1:A:330:VAL:O	1:A:334:PHE:HB3	2.02	0.58
1:A:391:LEU:HD21	1:A:439:MET:HE1	1.85	0.58
1:A:1162:ASP:O	1:A:1166:THR:OG1	2.11	0.58
1:A:159:ILE:HG21	1:A:442:LEU:HB3	1.86	0.57
1:A:783:LEU:O	1:A:787:LEU:HB2	2.05	0.56
1:A:409:LEU:HD11	1:A:431:GLY:HA2	1.87	0.56
2:B:41:TYR:HE1	2:B:51:LEU:HD23	1.69	0.56
1:A:1167:ARG:HH12	1:A:1171:LYS:H	1.52	0.56
2:B:41:TYR:CE1	2:B:51:LEU:HD23	2.40	0.56
2:B:166:LEU:O	2:B:183:SER:HA	2.06	0.56
1:A:75:THR:HG21	1:A:331:LEU:HD12	1.86	0.56
2:B:192:TYR:O	2:B:217:ARG:NH1	2.38	0.55
1:A:205:ILE:HA	1:A:208:THR:HG22	1.88	0.55
1:A:269:GLN:O	1:A:273:LEU:HB2	2.07	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:622:PHE:HA	1:A:625:VAL:HG12	1.89	0.55
1:A:1067:LEU:HD11	1:A:1229:ILE:HG22	1.89	0.55
1:A:261:ARG:NH2	1:A:804:ASP:OD1	2.40	0.54
1:A:811:GLY:O	1:A:815:THR:HB	2.08	0.54
1:A:588:LEU:HD23	1:A:591:VAL:HG11	1.90	0.54
1:A:723:LEU:HB2	1:A:761:LEU:HD11	1.90	0.54
2:B:99:ILE:HB	2:B:100:PRO:HA	1.89	0.54
1:A:799:ASP:OD1	1:A:799:ASP:N	2.40	0.54
2:B:119:PRO:HB3	2:B:145:PHE:HB3	1.88	0.54
1:A:781:GLU:HA	1:A:784:THR:HG22	1.89	0.54
1:A:361:ALA:O	1:A:365:PHE:HB2	2.07	0.54
1:A:856:LEU:HD21	1:A:973:VAL:HG23	1.89	0.54
1:A:977:PHE:O	1:A:981:VAL:HB	2.09	0.53
1:A:420:GLN:NE2	1:A:595:ASP:OD2	2.29	0.53
1:A:520:ASP:OD1	1:A:520:ASP:N	2.42	0.53
1:A:804:ASP:OD2	1:A:1086:TYR:OH	2.26	0.53
1:A:1066:ALA:O	1:A:1242:ILE:HA	2.08	0.52
2:B:55:LYS:O	2:B:57:SER:N	2.42	0.52
1:A:1068:VAL:HG23	1:A:1244:VAL:HG22	1.92	0.52
1:A:903:PHE:HA	1:A:906:VAL:HG12	1.92	0.52
1:A:159:ILE:HD11	1:A:904:ARG:HD2	1.92	0.51
3:C:20:ILE:HD11	3:C:116:THR:HB	1.91	0.51
1:A:726:ALA:O	1:A:730:ILE:HG12	2.11	0.51
1:A:769:PHE:HA	1:A:772:GLN:HB3	1.92	0.51
1:A:424:LEU:HB3	1:A:600:PHE:HE2	1.75	0.51
1:A:365:PHE:HA	1:A:368:ILE:HG12	1.91	0.51
1:A:1065:LEU:HA	1:A:1241:LEU:O	2.11	0.51
1:A:1050:PRO:HB2	1:A:1053:GLN:NE2	2.25	0.51
1:A:812:ALA:O	1:A:816:ARG:HB2	2.11	0.50
3:C:130:VAL:HG22	3:C:151:VAL:HG22	1.93	0.50
1:A:1123:ASP:OD1	1:A:1167:ARG:NH2	2.43	0.50
2:B:1:GLN:HG3	2:B:101:PRO:HG2	1.92	0.50
1:A:812:ALA:O	1:A:816:ARG:CB	2.59	0.50
1:A:425:VAL:HG21	1:A:588:LEU:HD11	1.94	0.49
1:A:554:ASP:OD1	1:A:554:ASP:N	2.42	0.49
1:A:1068:VAL:O	1:A:1244:VAL:HA	2.13	0.49
3:C:146:THR:HA	3:C:190:VAL:O	2.12	0.49
1:A:478:LEU:HD11	1:A:538:ILE:HD11	1.95	0.49
1:A:530:LEU:O	1:A:535:LYS:NZ	2.45	0.49
1:A:315:TYR:HA	1:A:318:THR:HG22	1.95	0.49
1:A:205:ILE:HD11	1:A:336:SER:CB	2.42	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:483:ILE:HG21	1:A:512:ILE:HD11	1.94	0.48
1:A:65:PRO:HG3	1:A:339:ILE:HD11	1.93	0.48
1:A:213:LEU:HD22	1:A:333:VAL:HG13	1.95	0.48
1:A:491:ARG:HA	1:A:911:ARG:HH21	1.78	0.48
1:A:795:MET:HA	1:A:798:GLN:OE1	2.13	0.48
1:A:1153:ILE:HG22	1:A:1157:ILE:HG13	1.96	0.48
1:A:484:ALA:O	1:A:488:ARG:HG2	2.14	0.48
1:A:139:ALA:HB2	1:A:186:GLY:HA3	1.94	0.48
1:A:1256:HIS:HE1	1:A:1270:VAL:HG21	1.79	0.48
1:A:537:ARG:HA	1:A:540:ILE:HD12	1.96	0.48
3:C:83:PHE:HE2	3:C:90:ASP:HB3	1.78	0.48
1:A:985:MET:O	1:A:989:GLN:NE2	2.48	0.47
1:A:1019:SER:HA	1:A:1105:VAL:HG21	1.96	0.47
1:A:184:GLY:HA3	1:A:357:ALA:HB2	1.95	0.47
1:A:1209:SER:HA	1:A:1212:VAL:HG22	1.95	0.47
1:A:1030:LEU:HD23	1:A:1194:HIS:NE2	2.29	0.47
1:A:794:SER:O	1:A:798:GLN:NE2	2.48	0.47
1:A:1002:VAL:O	1:A:1006:HIS:ND1	2.47	0.47
1:A:260:ILE:HA	1:A:263:VAL:HG12	1.96	0.47
1:A:391:LEU:HD11	1:A:439:MET:HE3	1.96	0.47
1:A:937:PHE:HA	1:A:940:THR:HG22	1.97	0.47
1:A:91:ILE:O	1:A:95:SER:OG	2.32	0.47
1:A:797:ARG:HB2	1:A:1020:TYR:CE2	2.49	0.47
3:C:51:ILE:HG22	3:C:58:THR:HG22	1.97	0.47
3:C:86:LEU:HD13	3:C:120:VAL:HG22	1.96	0.47
1:A:234:ILE:O	1:A:238:PHE:HB2	2.16	0.46
1:A:592:ARG:HG3	1:A:611:HIS:ND1	2.30	0.46
1:A:1259:LEU:HD13	1:A:1266:TYR:CE2	2.50	0.46
1:A:436:VAL:HG21	1:A:554:ASP:HB3	1.97	0.46
1:A:1029:MET:HG2	1:A:1031:GLU:OE1	2.16	0.46
2:B:166:LEU:HB2	2:B:184:THR:HB	1.97	0.46
1:A:826:GLY:O	1:A:830:SER:OG	2.34	0.46
1:A:178:VAL:HA	1:A:181:ILE:HG22	1.98	0.46
1:A:721:GLY:HA3	1:A:840:ALA:HB3	1.98	0.46
1:A:1246:GLN:HE22	1:A:1251:LYS:HB2	1.81	0.46
2:B:37:TYR:HE1	2:B:55:LYS:HE3	1.80	0.46
1:A:362:TYR:O	1:A:366:LYS:HB2	2.17	0.45
1:A:383:LYS:HE2	1:A:461:ASN:HD22	1.82	0.45
1:A:393:PHE:HD2	1:A:414:LEU:HD13	1.80	0.45
1:A:1244:VAL:HG23	1:A:1266:TYR:CZ	2.51	0.45
3:C:179:LEU:HD11	3:C:182:ASP:HA	1.99	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1002:VAL:HG22	1:A:1006:HIS:CE1	2.52	0.45
1:A:592:ARG:HG3	1:A:611:HIS:CE1	2.52	0.44
2:B:12:PRO:HA	2:B:111:ASP:HB3	1.99	0.44
2:B:37:TYR:CZ	3:C:106:PHE:HD1	2.36	0.44
1:A:518:GLN:HG2	1:A:519:PHE:H	1.82	0.44
1:A:329:GLN:O	1:A:333:VAL:HG12	2.18	0.44
1:A:391:LEU:HD21	1:A:439:MET:CE	2.46	0.44
1:A:592:ARG:HG3	1:A:611:HIS:CG	2.52	0.44
1:A:613:GLU:HA	1:A:616:ARG:HG3	2.00	0.44
1:A:97:ILE:HG12	4:A:1303:NAG:O7	2.18	0.44
3:C:143:SER:O	3:C:194:SER:N	2.50	0.44
1:A:302:PHE:HA	1:A:305:ILE:HG12	1.99	0.44
1:A:592:ARG:HH21	1:A:625:VAL:HG23	1.83	0.44
2:B:17:ASP:H	2:B:83:VAL:HG12	1.82	0.44
1:A:395:ASN:N	1:A:413:ASN:OD1	2.44	0.44
2:B:37:TYR:CE1	2:B:55:LYS:HE3	2.53	0.44
3:C:12:VAL:HG21	3:C:18:VAL:HB	2.00	0.43
3:C:196:THR:O	3:C:199:SER:OG	2.36	0.43
1:A:827:ALA:HB2	1:A:1000:ALA:HB1	2.00	0.43
1:A:598:ALA:HB1	1:A:605:ILE:HD13	2.00	0.43
1:A:523:VAL:HG12	1:A:524:GLY:H	1.83	0.43
1:A:1140:SER:N	1:A:1143:GLU:OE1	2.45	0.43
1:A:115:TYR:HA	1:A:118:THR:HG22	2.00	0.43
1:A:618:LYS:HG2	1:A:622:PHE:CD2	2.54	0.43
3:C:35:HIS:ND1	3:C:50:PHE:HB3	2.33	0.43
3:C:91:SER:HA	3:C:118:VAL:O	2.19	0.43
1:A:391:LEU:HD22	1:A:391:LEU:HA	1.80	0.43
1:A:33:VAL:HG12	1:A:34:SER:O	2.19	0.43
1:A:485:GLU:HA	1:A:488:ARG:HG2	2.00	0.43
1:A:1005:SER:O	1:A:1009:ARG:CB	2.62	0.43
1:A:1051:VAL:HG22	1:A:1052:LEU:HD22	2.00	0.43
1:A:1202:THR:HA	1:A:1203:CYS:HA	1.78	0.42
1:A:1127:ALA:O	1:A:1131:ALA:CB	2.67	0.42
1:A:867:ILE:HD13	1:A:981:VAL:HG13	2.00	0.42
1:A:584:ILE:HD13	1:A:584:ILE:HA	1.85	0.42
3:C:33:TYR:CZ	3:C:101:ILE:HG13	2.53	0.42
1:A:39:PHE:CE1	1:A:185:ILE:HD11	2.52	0.42
1:A:425:VAL:HG11	1:A:588:LEU:HD21	2.01	0.42
1:A:231:TRP:CZ2	1:A:235:LEU:HD12	2.55	0.42
1:A:842:LEU:HA	1:A:842:LEU:HD22	1.80	0.42
3:C:38:LYS:HG3	3:C:94:TYR:HE1	1.85	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:866:ILE:HG21	1:A:947:MET:HG3	2.02	0.41
1:A:973:VAL:O	1:A:977:PHE:HB3	2.21	0.41
1:A:97:ILE:HG23	4:A:1303:NAG:H2	2.02	0.41
3:C:134:ALA:HB3	3:C:222:ARG:HG3	2.02	0.41
1:A:553:LEU:HD21	1:A:572:LEU:HD22	2.02	0.41
2:B:157:ASP:OD2	2:B:195:HIS:ND1	2.40	0.41
1:A:849:SER:HA	1:A:976:VAL:HG12	2.03	0.41
1:A:1026:LYS:NZ	1:A:1104:ASN:HD22	2.18	0.41
1:A:1206:ASP:OD2	1:A:1208:GLU:HG2	2.21	0.41
1:A:269:GLN:O	1:A:273:LEU:CB	2.68	0.41
2:B:154:TRP:NE1	2:B:183:SER:OG	2.38	0.41
1:A:432:LYS:HB3	1:A:584:ILE:HG23	2.02	0.41
1:A:587:ARG:HA	1:A:628:GLN:HE22	1.85	0.41
1:A:748:ARG:NH1	1:A:752:ASN:OD1	2.53	0.41
1:A:702:LEU:HD12	1:A:1008:ILE:HD12	2.03	0.41
3:C:38:LYS:HB2	3:C:48:ILE:HD11	2.03	0.41
1:A:1119:PRO:HG2	1:A:1180:LYS:HB3	2.02	0.40
1:A:1250:VAL:HG11	1:A:1253:HIS:NE2	2.35	0.40
1:A:331:LEU:O	1:A:335:PHE:HB2	2.22	0.40
2:B:148:LYS:HB3	2:B:179:TYR:CE2	2.56	0.40
1:A:54:THR:O	1:A:58:ILE:HG12	2.21	0.40
1:A:66:LEU:O	1:A:70:ILE:HG12	2.21	0.40
3:C:205:ASN:ND2	3:C:216:ASP:OD1	2.44	0.40
1:A:42:ALA:HB2	1:A:142:GLN:HE21	1.85	0.40
1:A:587:ARG:O	1:A:587:ARG:HD3	2.22	0.40
1:A:819:ASN:O	1:A:823:GLN:HG2	2.22	0.40
1:A:999:LYS:HA	1:A:1002:VAL:HG12	2.04	0.40
1:A:1126:ILE:HG23	1:A:1130:ILE:HD13	2.03	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	1178/1249 (94%)	1118 (95%)	58 (5%)	2 (0%)	47	80
2	B	219/220 (100%)	199 (91%)	18 (8%)	2 (1%)	17	57
3	C	224/225 (100%)	197 (88%)	27 (12%)	0	100	100
All	All	1621/1694 (96%)	1514 (93%)	103 (6%)	4 (0%)	50	80

All (4) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	B	56	VAL
1	A	518	GLN
2	B	8	PRO
1	A	1139	VAL

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	972/1029 (94%)	961 (99%)	11 (1%)	73	88
2	B	200/199 (100%)	200 (100%)	0	100	100
3	C	196/195 (100%)	194 (99%)	2 (1%)	76	89
All	All	1368/1423 (96%)	1355 (99%)	13 (1%)	79	89

All (13) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	90	ASN
1	A	275	ARG
1	A	403	ARG
1	A	501	LYS
1	A	515	LEU
1	A	537	ARG
1	A	587	ARG
1	A	616	ARG
1	A	842	LEU

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Mol	Chain	Res	Type
1	A	1046	ARG
1	A	1211	LYS
3	C	204[A]	CYS
3	C	204[B]	CYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (11) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	90	ASN
1	A	152	HIS
1	A	586	HIS
1	A	611	HIS
1	A	798	GLN
1	A	838	ASN
1	A	935	HIS
1	A	989	GLN
1	A	1053	GLN
1	A	1256	HIS
2	B	172	GLN

5.3.3 RNA (i)

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)

5 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	$\#\|Z\| > 2$
5	ZQU	A	1304	-	45,45,45	0.81	0	61,67,67	1.23	6 (9%)
4	NAG	A	1302	-	14,14,15	2.24	4 (28%)	17,19,21	1.37	2 (11%)
4	NAG	A	1301	1	14,14,15	2.23	4 (28%)	17,19,21	1.37	2 (11%)
4	NAG	A	1303	1	14,14,15	2.23	4 (28%)	17,19,21	1.38	2 (11%)
5	ZQU	A	1305	-	45,45,45	0.76	0	61,67,67	1.23	6 (9%)

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
5	ZQU	A	1304	-	-	5/13/52/52	0/7/7/7
4	NAG	A	1302	-	-	1/6/23/26	0/1/1/1
4	NAG	A	1301	1	-	1/6/23/26	0/1/1/1
4	NAG	A	1303	1	-	1/6/23/26	0/1/1/1
5	ZQU	A	1305	-	-	6/13/52/52	0/7/7/7

All (12) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	A	1301	NAG	O5-C1	5.08	1.51	1.43
4	A	1302	NAG	O5-C1	5.08	1.51	1.43
4	A	1303	NAG	O5-C1	5.07	1.51	1.43
4	A	1303	NAG	C7-N2	4.11	1.48	1.34
4	A	1302	NAG	C7-N2	4.11	1.48	1.34
4	A	1301	NAG	C7-N2	4.10	1.48	1.34
4	A	1302	NAG	O7-C7	-2.84	1.16	1.23
4	A	1301	NAG	O7-C7	-2.82	1.16	1.23
4	A	1303	NAG	O7-C7	-2.79	1.16	1.23
4	A	1301	NAG	C2-N2	2.78	1.51	1.46
4	A	1302	NAG	C2-N2	2.78	1.51	1.46
4	A	1303	NAG	C2-N2	2.77	1.51	1.46

All (18) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
5	A	1305	ZQU	C01-C03-C02	-3.85	60.06	63.95
5	A	1304	ZQU	C01-C03-C02	-3.54	60.37	63.95
5	A	1305	ZQU	C07-C06-N01	3.54	117.18	111.45
5	A	1304	ZQU	C08-C06-N01	3.09	116.46	111.45
4	A	1303	NAG	C2-N2-C7	-3.05	118.56	122.90
4	A	1301	NAG	C2-N2-C7	-3.05	118.56	122.90
4	A	1302	NAG	C2-N2-C7	-3.02	118.60	122.90
5	A	1305	ZQU	O02-C24-C26	-2.89	118.09	124.46
4	A	1303	NAG	C8-C7-N2	2.85	120.92	116.10
4	A	1301	NAG	C8-C7-N2	2.84	120.91	116.10
4	A	1302	NAG	C8-C7-N2	2.84	120.90	116.10
5	A	1304	ZQU	C05-C08-C06	2.70	123.85	119.89
5	A	1305	ZQU	C05-C08-C06	2.65	123.77	119.89
5	A	1304	ZQU	C07-C06-N01	2.57	115.61	111.45
5	A	1304	ZQU	O02-C24-C26	-2.38	119.22	124.46
5	A	1305	ZQU	O02-C24-C25	2.34	121.56	115.01
5	A	1305	ZQU	F02-C03-C02	2.14	125.41	119.79
5	A	1304	ZQU	O02-C24-C25	2.02	120.65	115.01

There are no chirality outliers.

All (14) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
5	A	1304	ZQU	C08-C06-N01-C12
5	A	1305	ZQU	C21-C22-C23-O02
5	A	1305	ZQU	O01-C22-C23-O02
5	A	1305	ZQU	C25-C24-O02-C23
5	A	1304	ZQU	C21-C22-C23-O02
5	A	1305	ZQU	C26-C24-O02-C23
4	A	1301	NAG	O5-C5-C6-O6
4	A	1302	NAG	O5-C5-C6-O6
4	A	1303	NAG	O5-C5-C6-O6
5	A	1304	ZQU	O01-C22-C23-O02
5	A	1305	ZQU	C22-C21-N02-C15
5	A	1304	ZQU	C22-C23-O02-C24
5	A	1305	ZQU	C22-C21-N02-C16
5	A	1304	ZQU	N02-C21-C22-O01

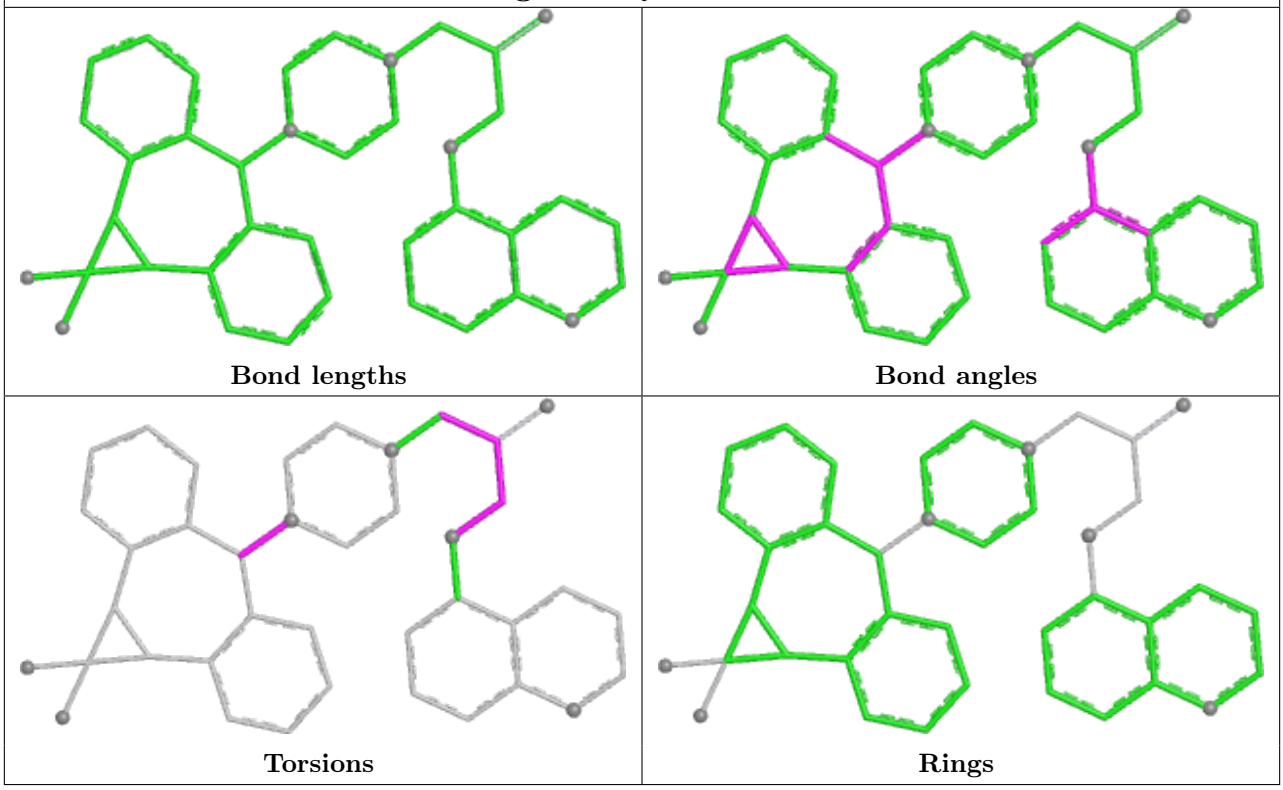
There are no ring outliers.

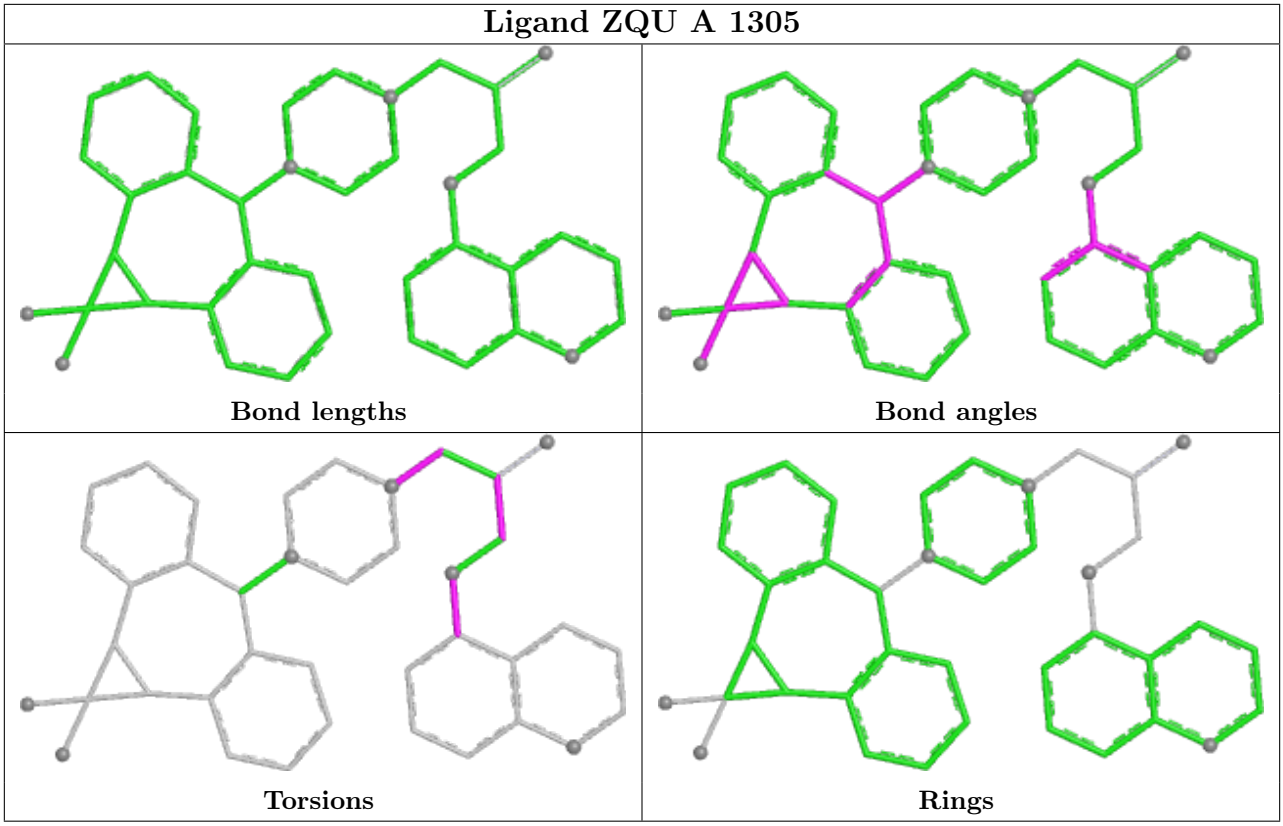
2 monomers are involved in 4 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	A	1302	NAG	2	0
4	A	1303	NAG	2	0

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 ZQU A 1304





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.

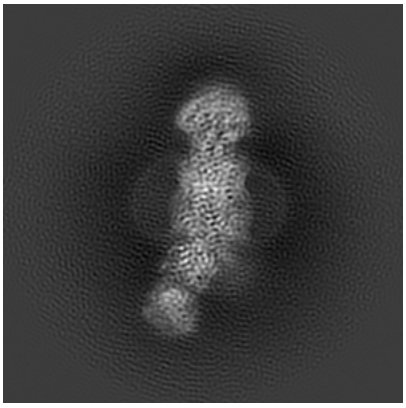
6 Map visualisation (i)

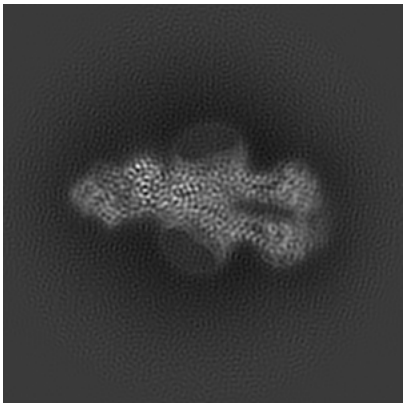
This section contains visualisations of the EMDB entry EMD-4281. These allow visual inspection of the internal detail of the map and identification of artifacts.

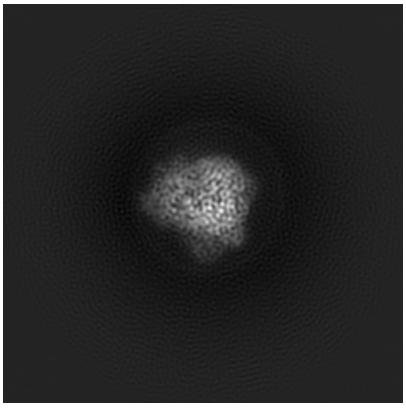
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections (i)

6.1.1 Primary map


X

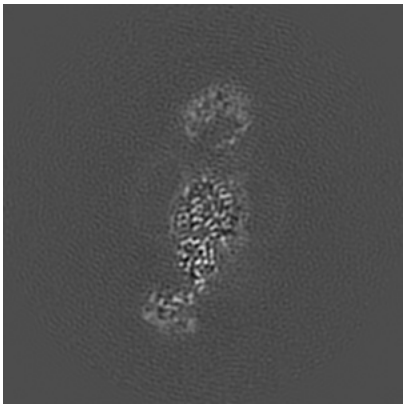

Y

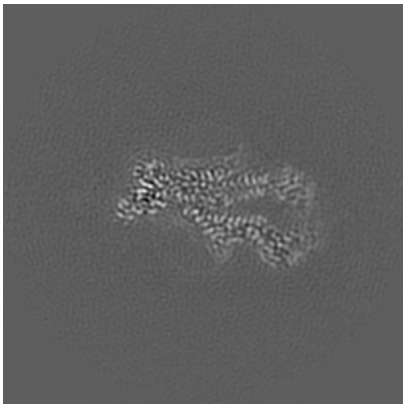

Z

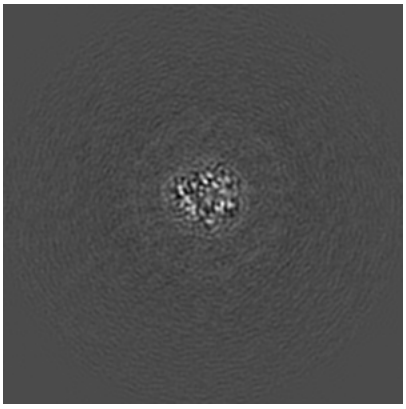
The images above show the map projected in three orthogonal directions.

6.2 Central slices (i)

6.2.1 Primary map


X Index: 175

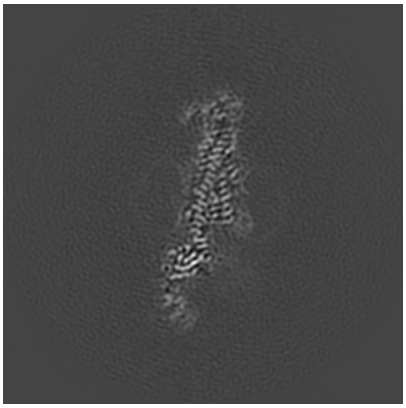

Y Index: 175


Z Index: 175

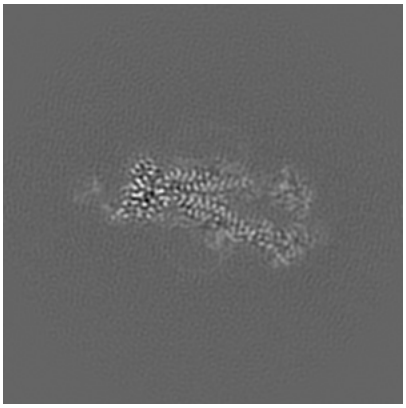
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

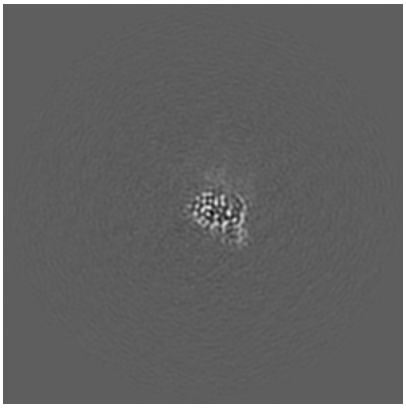
6.3.1 Primary map



X Index: 197



Y Index: 169



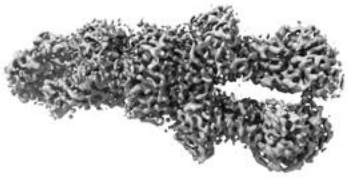
Z Index: 123

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

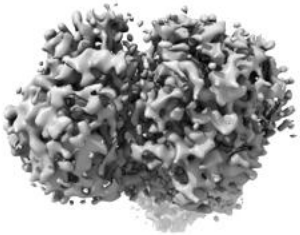
6.4 Orthogonal surface views (i)

6.4.1 Primary map

X



Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.025. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

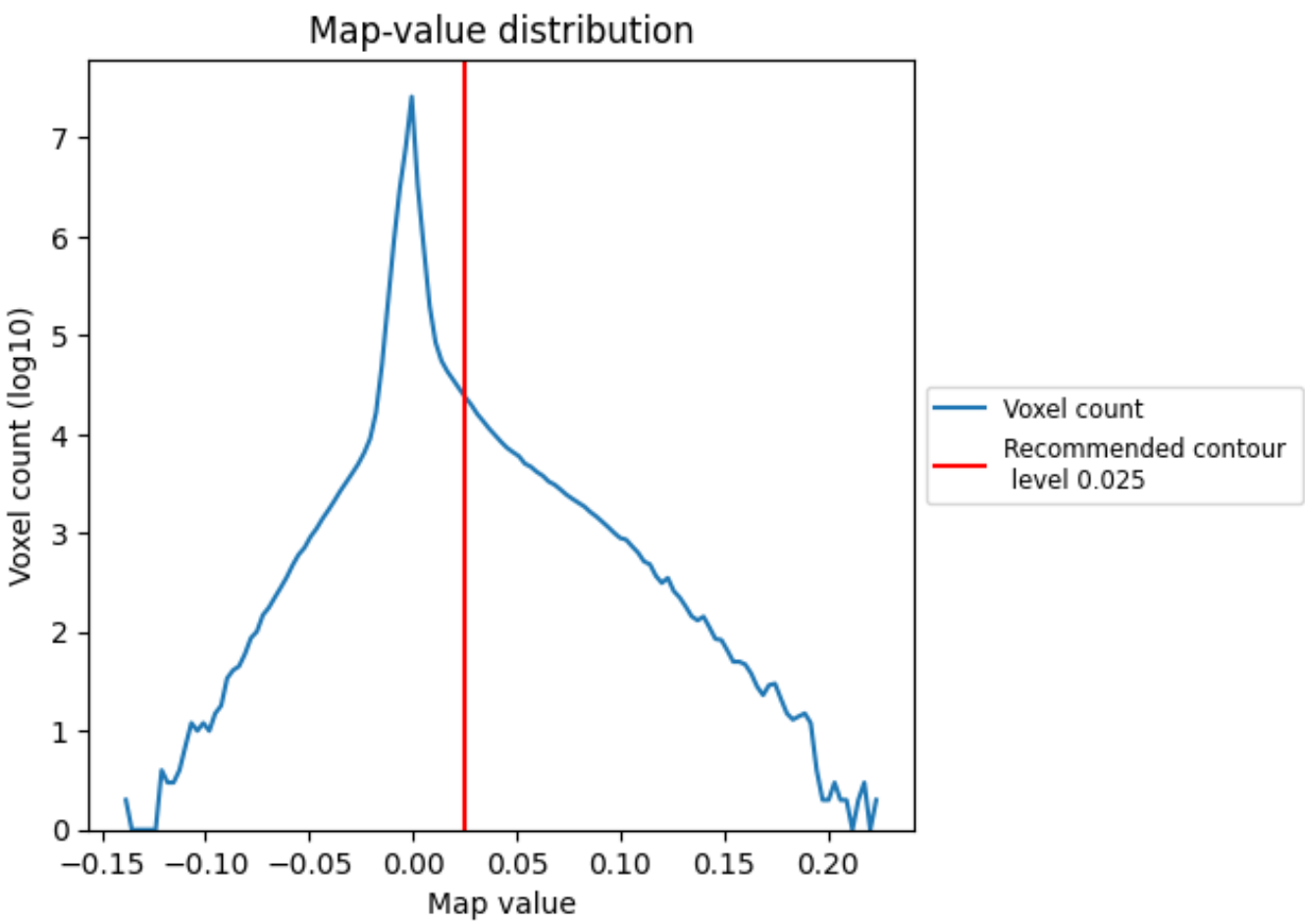
6.5 Mask visualisation (i)

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

7 Map analysis (i)

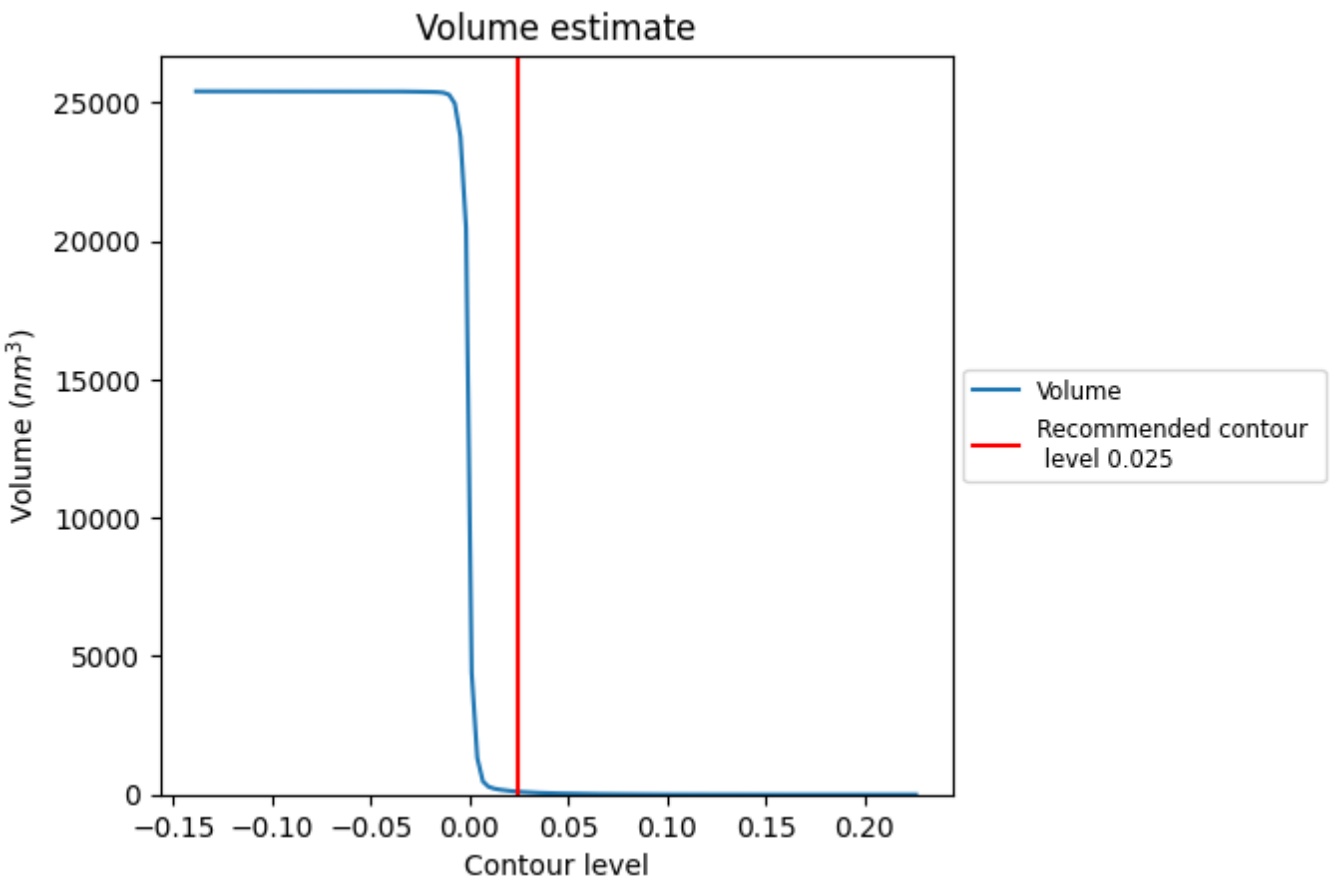
This section contains the results of statistical analysis of the map.

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.

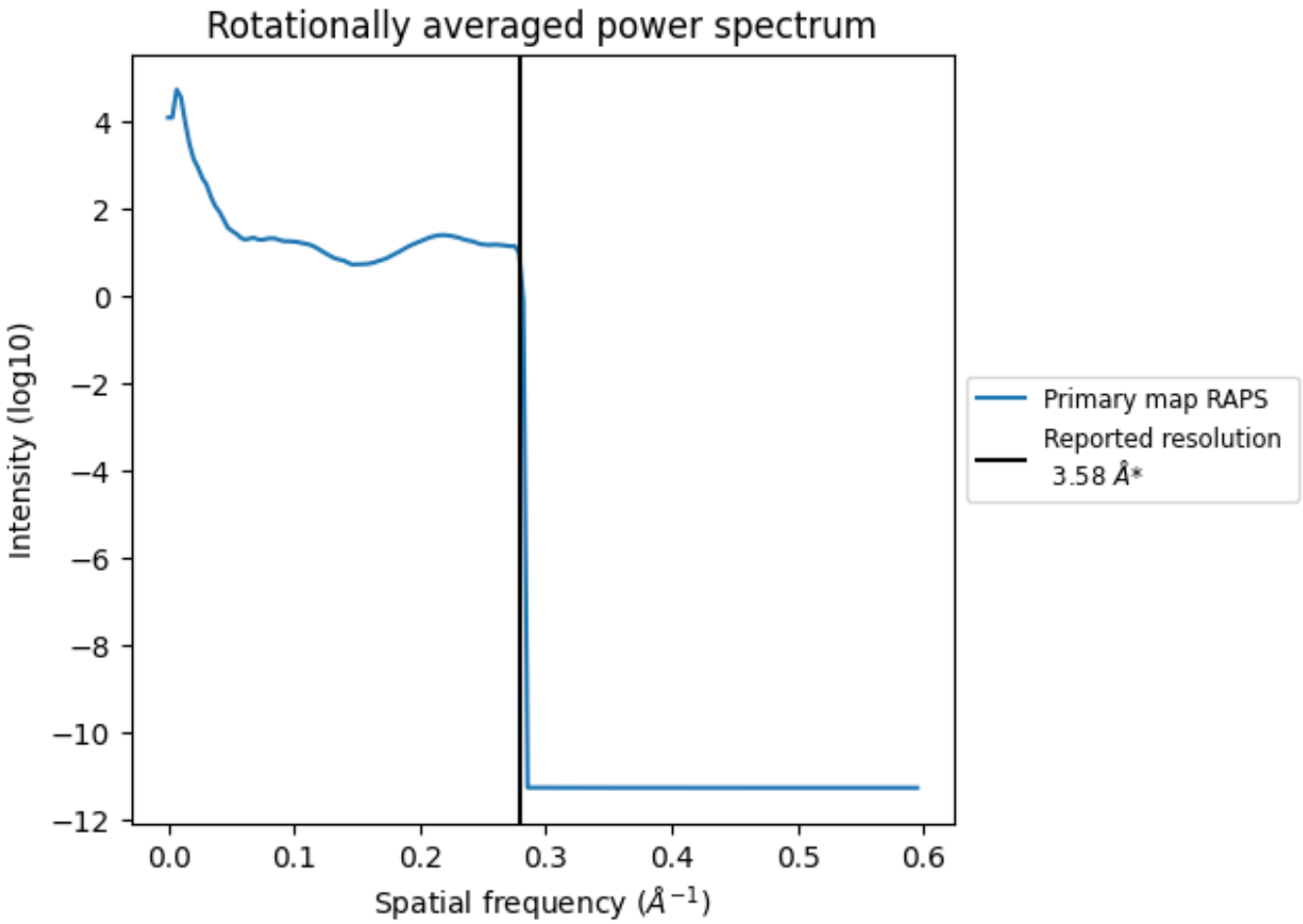
7.2 Volume estimate (i)



The volume at the recommended contour level is 103 nm^3; this corresponds to an approximate mass of 93 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 0.279 Å^{-1}

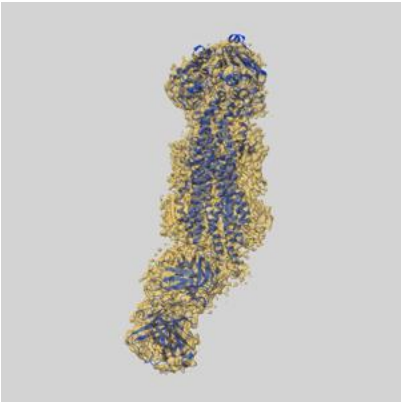
8 Fourier-Shell correlation (i)

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

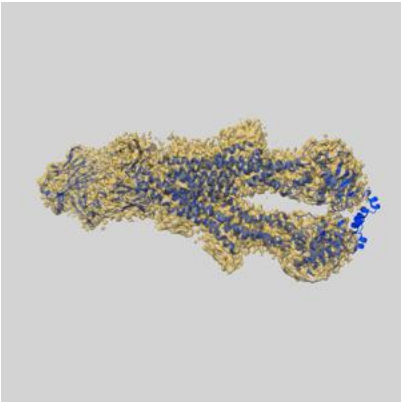
9 Map-model fit (i)

This section contains information regarding the fit between EMDB map EMD-4281 and PDB model 6FN1. Per-residue inclusion information can be found in section 3 on page 5.

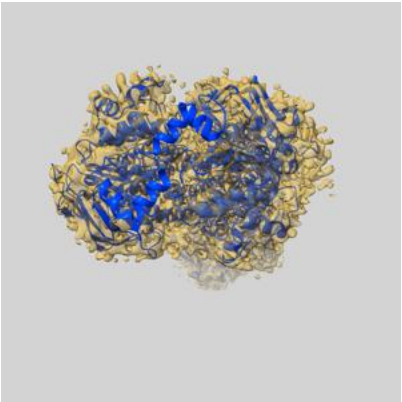
9.1 Map-model overlay (i)



X



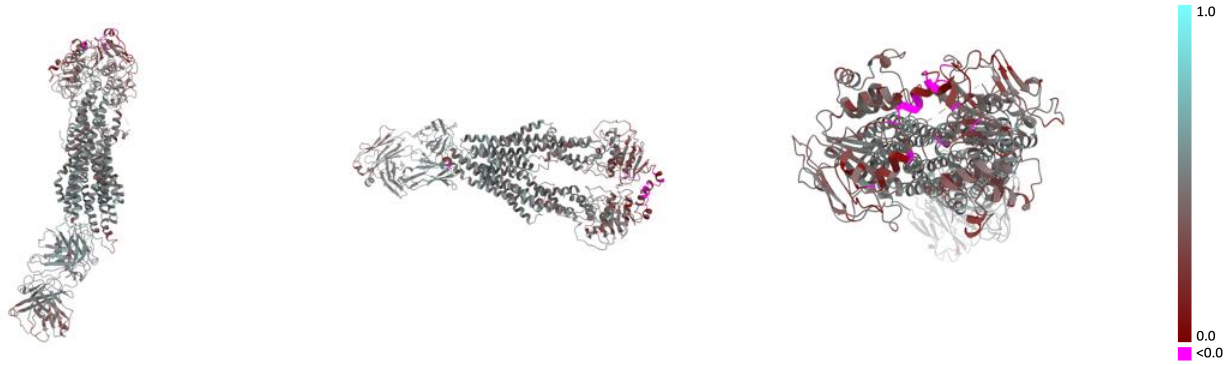
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.025 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.

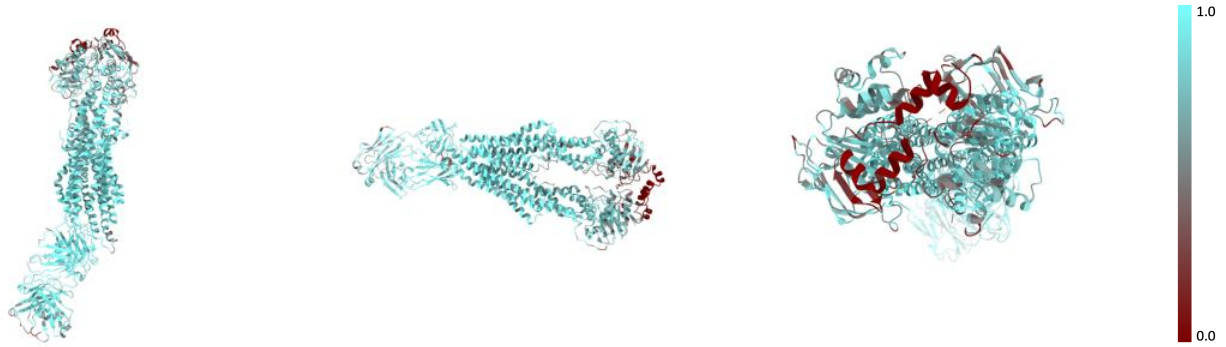
9.2 Q-score mapped to coordinate model (i)



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.

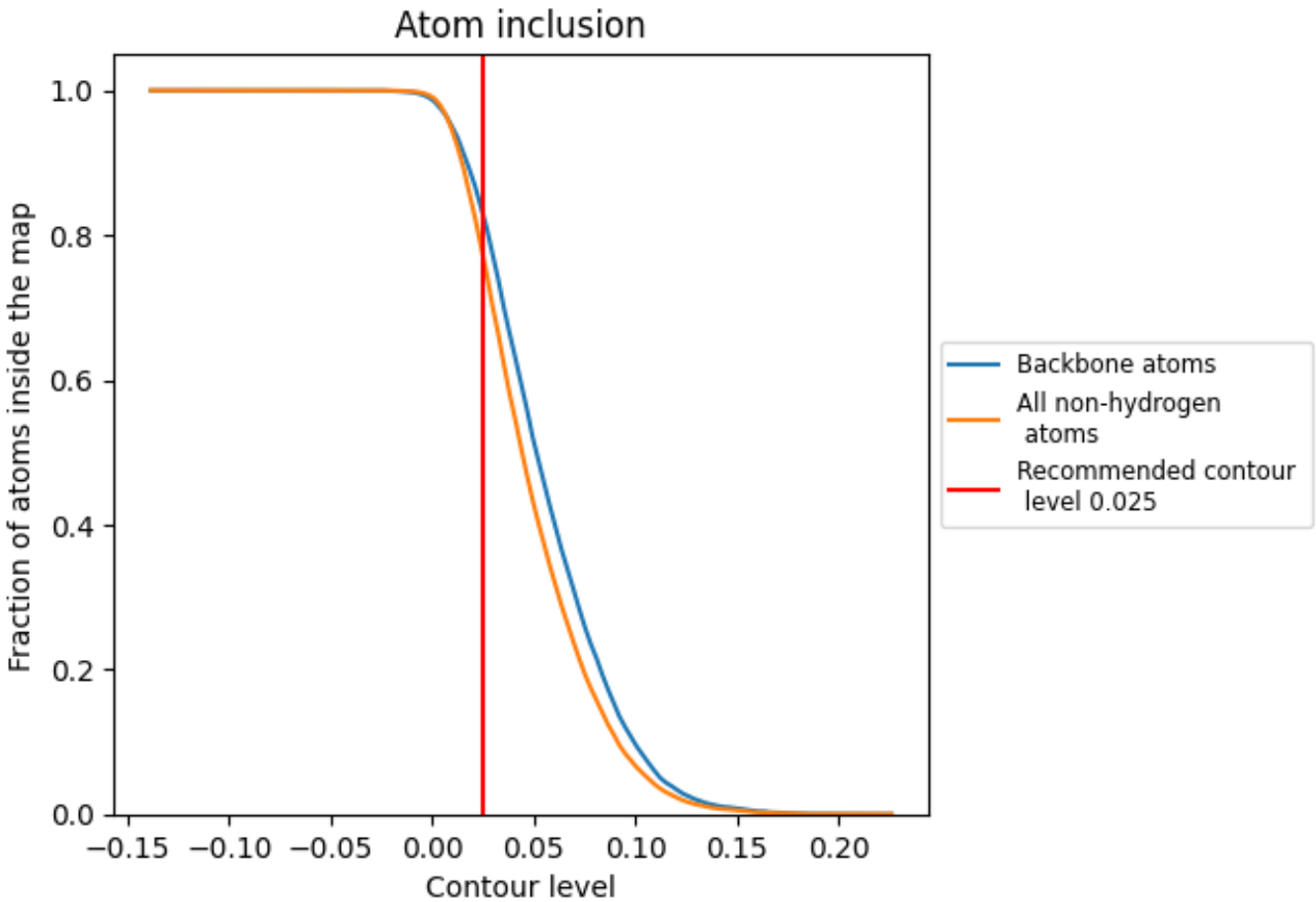
9.3 Atom inclusion mapped to coordinate model (i)



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 (0.025).

9.4 Atom inclusion (i)



At the recommended contour level, 83% of all backbone atoms, 77% of all non-hydrogen atoms, are inside the map.

9.5 Map-model fit summary (i)

The table lists the average atom inclusion at the recommended contour level (0.025) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.7729	0.4420
A	0.7427	0.4280
B	0.8430	0.4660
C	0.8667	0.4950