



Full wwPDB EM Validation Report ⓘ

Mar 9, 2026 – 06:13 AM UTC

PDB ID : 6LOD / pdb_00006lod
EMDB ID : EMD-0936
Title : Cryo-EM structure of the air-oxidized photosynthetic alternative complex III
from Roseiflexus castenholzii
Authors : Shi, Y.; Xin, Y.Y.; Wang, C.; Blankenship, R.E.; Sun, F.; Xu, X.L.
Deposited on : 2020-01-05
Resolution : 3.20 Å(reported)

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

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

A user guide is available at

<https://www.wwpdb.org/validation/2017/EMValidationReportHelp>
with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

The following versions of software and data (see [references ⓘ](#)) were used in the production of this report:

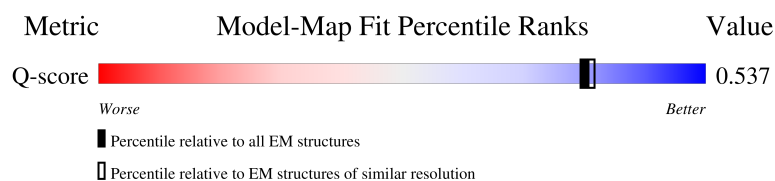
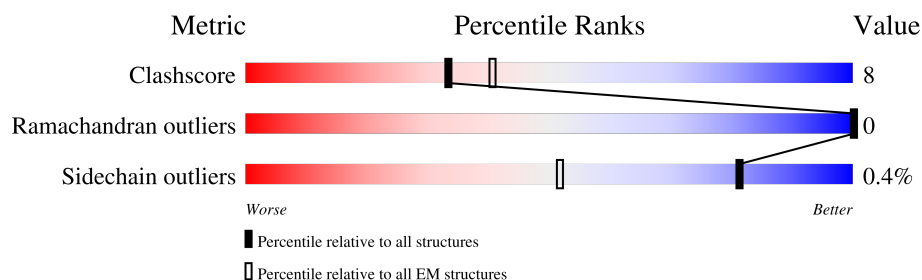
EMDB validation analysis : 0.0.1.dev132
Mogul : 2022.3.0, CSD as543be (2022)
MolProbity : 4-5-2 with Phenix2.0
Buster-report : wwPDB partial adaption of 1.1.7 (2018)
Percentile statistics : 20250101.v01 (using entries in the PDB archive January 1st 2025)
EM percentile statistics : 202505.v01 (Using data in the EMDB archive up until May 2025)
MapQ : 1.9.13
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.49

1 Overall quality at a glance

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

The reported resolution of this entry is 3.20 Å.

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



Metric	Whole archive (#Entries)	EM structures (#Entries)	Similar EM resolution (#Entries, resolution range(Å))
Clashscore	229148	23984	-
Ramachandran outliers	224038	23583	-
Sidechain outliers	223484	23102	-
Q-score	-	25397	15020 (2.70 - 3.70)

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	226	7% 77% 19% .
2	B	933	5% 77% 22%
3	C	471	6% 77% 20% .
4	D	192	19% 70% 20% 9%

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Mol	Chain	Length	Quality of chain
5	E	162	
6	F	414	

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
9	SF4	B	1103	-	-	X	-
9	SF4	B	1104	-	-	X	-
9	SF4	B	1105	-	-	X	-

2 Entry composition

There are 10 unique types of molecules in this entry. The entry contains 18785 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 MULTIHEME_CYTC domain-containing protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	218	Total	C	N	O	S	0	0
			1763	1123	322	303	15		

- Molecule 2 is a protein called Fe-S-cluster-containing hydrogenase components 1-like protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	B	929	Total	C	N	O	S	0	0
			7176	4519	1264	1358	35		

- Molecule 3 is a protein called Polysulphide reductase NrfD.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	C	456	Total	C	N	O	S	0	0
			3728	2531	589	595	13		

- Molecule 4 is a protein called Uncharacterized protein ActD.

Mol	Chain	Residues	Atoms					AltConf	Trace
4	D	174	Total	C	N	O	S	0	0
			1348	884	218	239	7		

- Molecule 5 is a protein called Cytochrome c domain-containing protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
5	E	158	Total	C	N	O	S	0	0
			1253	783	234	230	6		

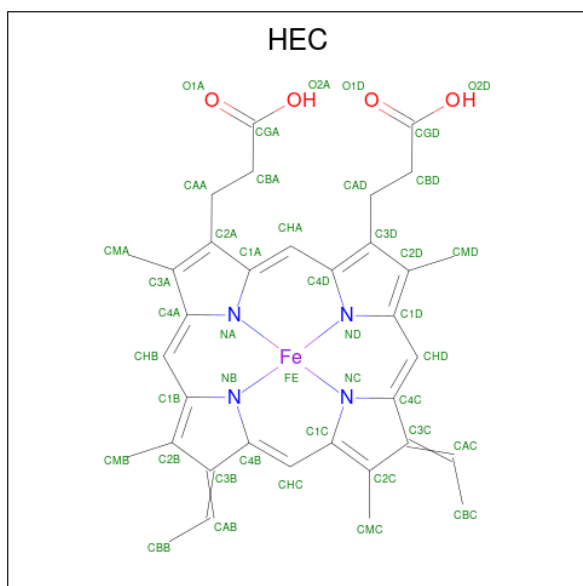
There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
E	32	ACE	-	acetylation	UNP A7NJ91

- Molecule 6 is a protein called Uncharacterized protein ActF.

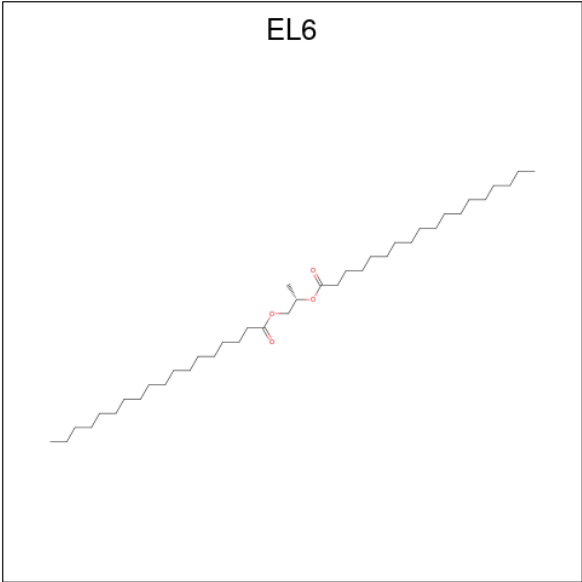
Mol	Chain	Residues	Atoms					AltConf	Trace
6	F	395	Total	C	N	O	S	0	0
			3159	2130	512	503	14		

- Molecule 7 is HEME C (CCD ID: HEC) (formula: $C_{34}H_{34}FeN_4O_4$) (labeled as "Ligand of Interest" by depositor).



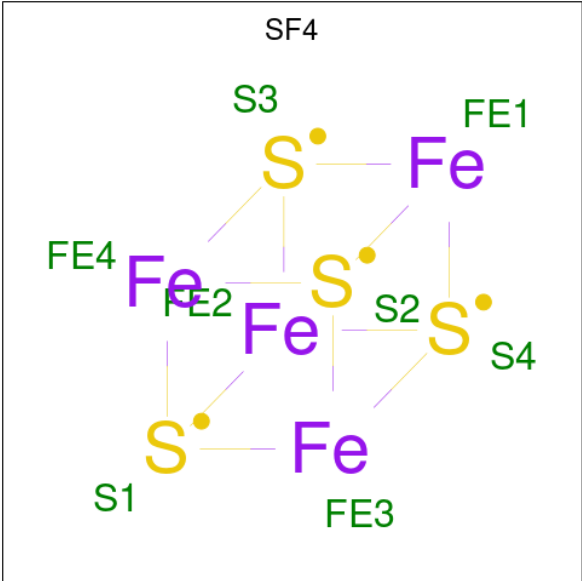
Mol	Chain	Residues	Atoms					AltConf
7	A	1	Total	C	Fe	N	O	0
			43	34	1	4	4	
7	A	1	Total	C	Fe	N	O	0
			43	34	1	4	4	
7	A	1	Total	C	Fe	N	O	0
			43	34	1	4	4	
7	A	1	Total	C	Fe	N	O	0
			43	34	1	4	4	
7	B	1	Total	C	Fe	N	O	0
			43	34	1	4	4	
7	E	1	Total	C	Fe	N	O	0
			43	34	1	4	4	

- Molecule 8 is [(2S)-2-octadecanoyloxypropyl] octadecanoate (CCD ID: EL6) (formula: $C_{39}H_{76}O_4$).



Mol	Chain	Residues	Atoms			AltConf
8	B	1	Total	C	O	0
			26	22	4	
8	E	1	Total	C	O	0
			43	39	4	

- Molecule 9 is IRON/SULFUR CLUSTER (CCD ID: SF4) (formula: Fe₄S₄) (labeled as "Ligand of Interest" by depositor).



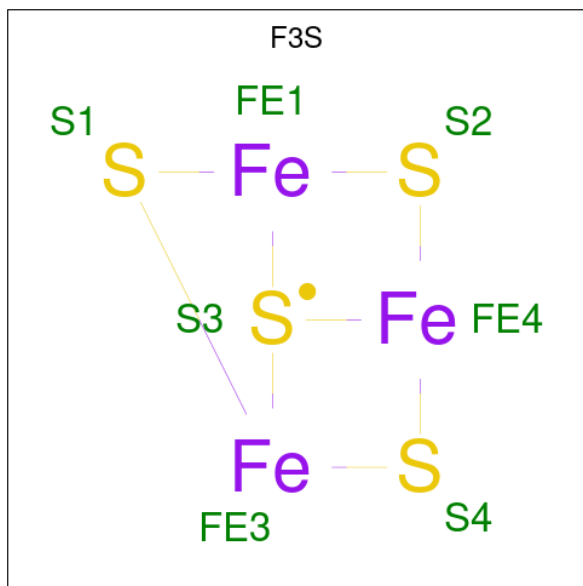
Mol	Chain	Residues	Atoms			AltConf
9	B	1	Total	Fe	S	0
			8	4	4	

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Mol	Chain	Residues	Atoms			AltConf
9	B	1	Total	Fe	S	0
			8	4	4	
9	B	1	Total	Fe	S	0
			8	4	4	

- Molecule 10 is FE3-S4 CLUSTER (CCD ID: F3S) (formula: Fe_3S_4) (labeled as "Ligand of Interest" by depositor).

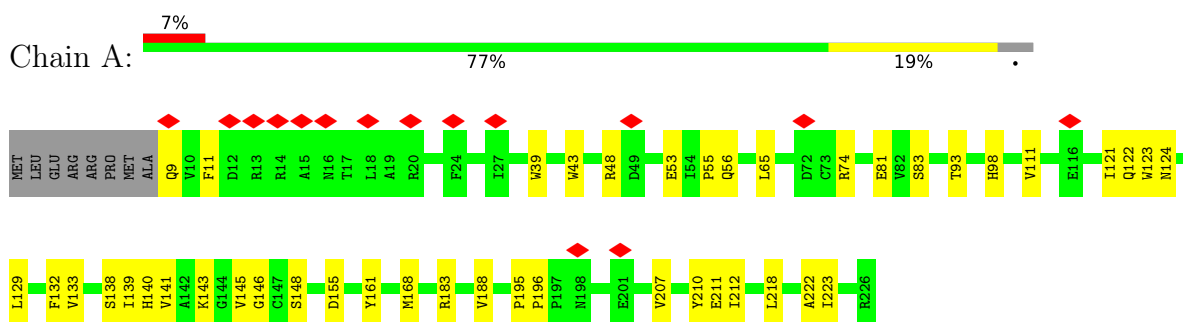


Mol	Chain	Residues	Atoms			AltConf
10	B	1	Total	Fe	S	0
			7	3	4	

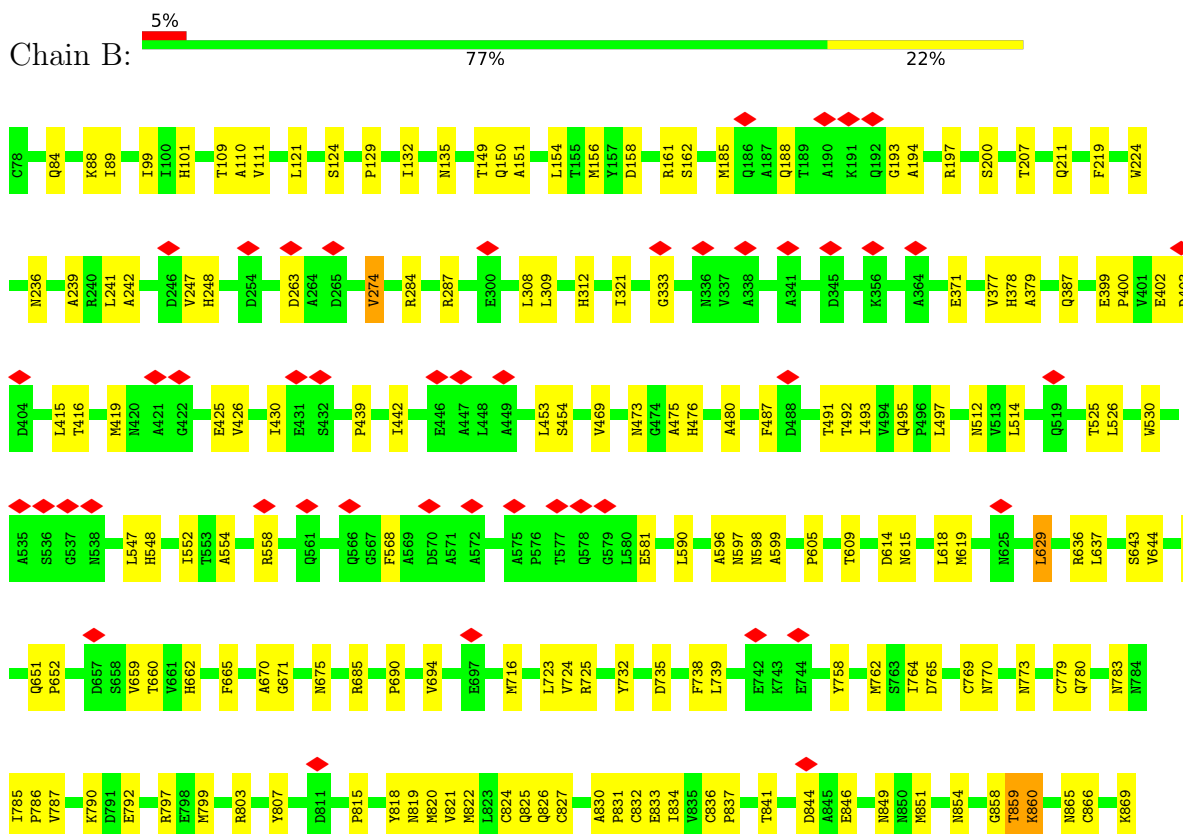
3 Residue-property plots

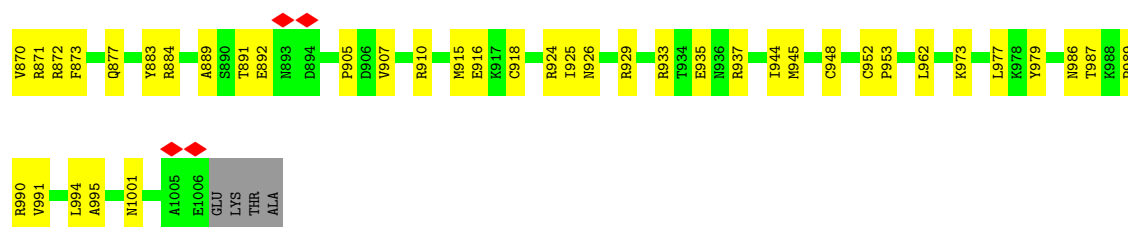
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion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

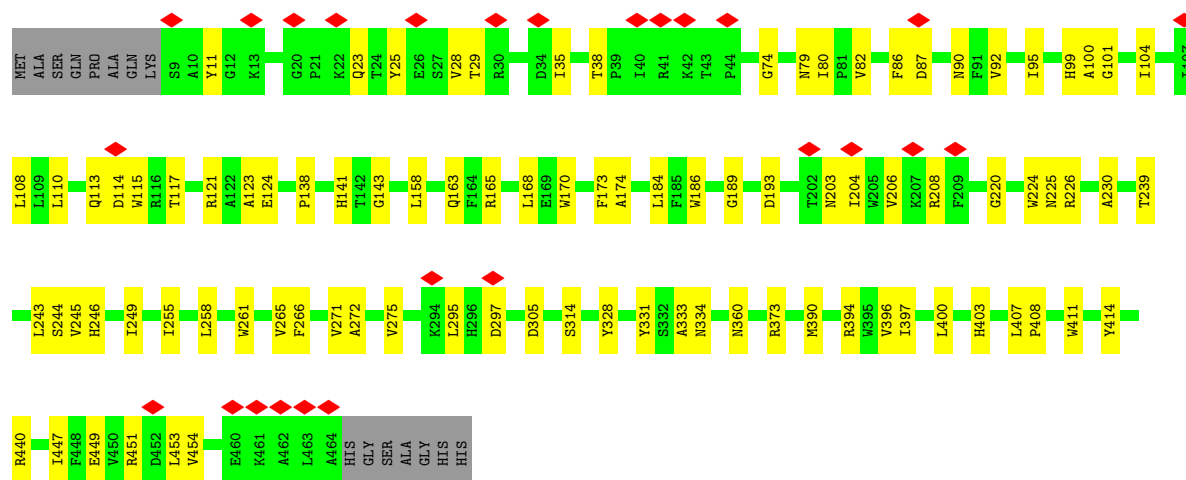
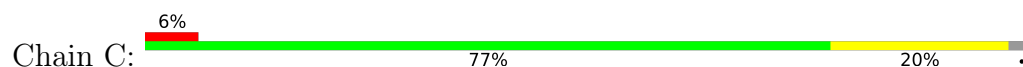


- Molecule 2: Fe-S-cluster-containing hydrogenase components 1-like protein

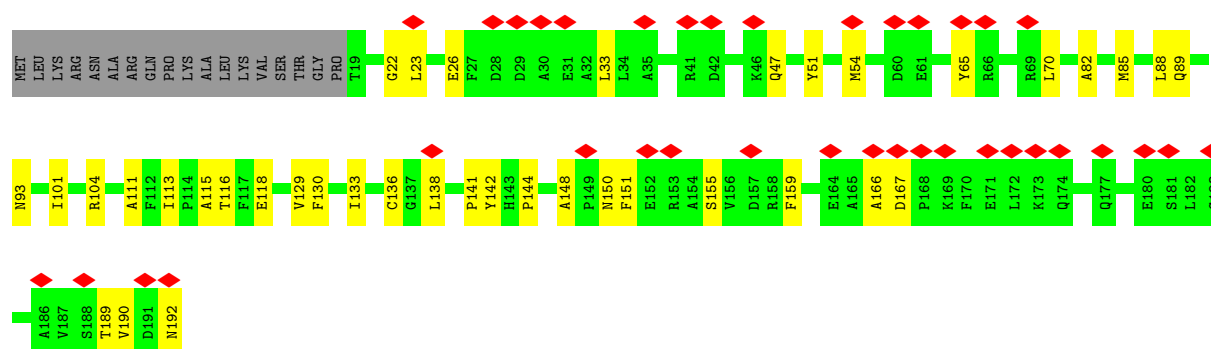




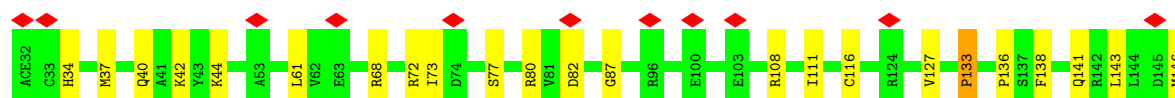
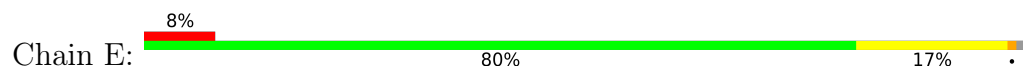
• Molecule 3: Polysulphide reductase NrfD



• Molecule 4: Uncharacterized protein ActD

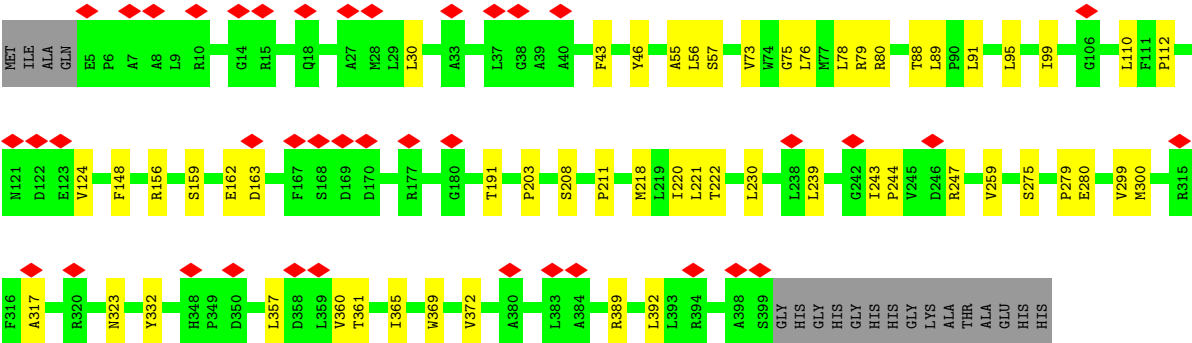
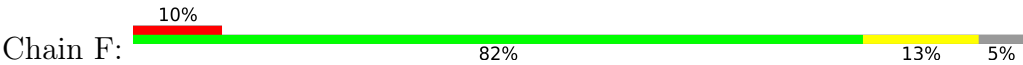


• Molecule 5: Cytochrome c domain-containing protein





• Molecule 6: Uncharacterized protein ActF



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	177489	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 ($e^-/\text{\AA}^2$)	59	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	0.387	Depositor
Minimum map value	-0.164	Depositor
Average map value	0.002	Depositor
Map value standard deviation	0.012	Depositor
Recommended contour level	0.0398	Depositor
Map size (Å)	203.84, 203.84, 203.84	wwPDB
Map dimensions	196, 196, 196	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.04, 1.04, 1.04	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: ACE, HEC, EL6, SF4, F3S

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	0.29	0/1820	0.58	0/2479
2	B	0.31	0/7337	0.56	0/10002
3	C	0.31	0/3869	0.56	0/5299
4	D	0.25	0/1389	0.57	0/1892
5	E	0.39	0/1280	0.72	3/1738 (0.2%)
6	F	0.26	0/3265	0.53	0/4460
All	All	0.30	0/18960	0.57	3/25870 (0.0%)

There are no bond length outliers.

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	E	133	PRO	N-CA-C	-7.81	96.38	112.47
5	E	138	PHE	N-CA-C	-7.74	100.10	110.55
5	E	138	PHE	CA-C-O	-6.17	114.52	121.81

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts [i](#)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	1763	0	1692	34	0
2	B	7176	0	7053	142	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	C	3728	0	3740	72	0
4	D	1348	0	1319	38	0
5	E	1253	0	1227	27	0
6	F	3159	0	3214	37	0
7	A	172	0	121	4	0
7	B	43	0	32	4	0
7	E	43	0	30	6	0
8	B	26	0	0	0	0
8	E	43	0	0	0	0
9	B	24	0	0	7	0
10	B	7	0	0	1	0
All	All	18785	0	18428	304	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 (304) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:C:173:PHE:HE2	4:D:85:MET:HE3	1.42	0.83
3:C:173:PHE:HE2	4:D:85:MET:CE	1.91	0.83
3:C:173:PHE:CE2	4:D:85:MET:HE3	2.14	0.83
5:E:136:PRO:HD3	7:E:202:HEC:HAD2	1.68	0.76
3:C:173:PHE:CE2	4:D:85:MET:CE	2.70	0.75
3:C:173:PHE:HE2	4:D:85:MET:SD	2.15	0.69
2:B:124:SER:HB3	2:B:497:LEU:HD23	1.73	0.69
3:C:95:ILE:HG21	3:C:249:ILE:HG13	1.77	0.67
4:D:148:ALA:HB3	4:D:151:PHE:HB2	1.78	0.66
1:A:98:HIS:HE1	7:A:301:HEC:ND	1.96	0.64
2:B:765:ASP:HA	2:B:994:LEU:HB2	1.80	0.64
2:B:716:MET:HG3	2:B:723:LEU:HD12	1.81	0.63
4:D:85:MET:HG2	4:D:115:ALA:O	2.00	0.62
2:B:832:CYS:SG	9:B:1105:SF4:S1	2.96	0.62
5:E:133:PRO:HG2	5:E:161:THR:HG21	1.83	0.61
1:A:138:SER:HA	1:A:141:VAL:HG22	1.82	0.61
4:D:22:GLY:HA3	4:D:190:VAL:H	1.66	0.61
1:A:122:GLN:HB3	2:B:88:LYS:HD2	1.83	0.60
2:B:619:MET:HG2	2:B:659:VAL:HG22	1.83	0.60
3:C:184:LEU:HB3	4:D:129:VAL:HG21	1.83	0.60
3:C:110:LEU:HD11	3:C:239:THR:HG21	1.83	0.60
2:B:826:GLN:NE2	2:B:918:CYS:O	2.34	0.60

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:836:CYS:HA	10:B:1106:F3S:S2	2.42	0.60
4:D:104:ARG:NH2	6:F:275:SER:O	2.31	0.60
2:B:135:ASN:OD1	5:E:68:ARG:NH2	2.34	0.60
4:D:33:LEU:HD22	4:D:159:PHE:HB3	1.83	0.60
1:A:93:THR:HA	5:E:168:ARG:HH21	1.68	0.59
2:B:832:CYS:HG	9:B:1105:SF4:FE2	1.16	0.59
2:B:834:ILE:HA	3:C:163:GLN:HE22	1.67	0.59
5:E:80:ARG:HD3	5:E:87:GLY:H	1.66	0.59
2:B:859:THR:O	2:B:859:THR:OG1	2.18	0.58
1:A:148:SER:HB2	1:A:183:ARG:HH22	1.68	0.58
2:B:780:GLN:HG3	2:B:785:ILE:HB	1.85	0.58
2:B:925:ILE:HA	2:B:944:ILE:HD13	1.85	0.58
3:C:100:ALA:HB2	3:C:275:VAL:HA	1.84	0.58
4:D:144:PRO:HB3	4:D:192:ASN:HA	1.85	0.58
3:C:173:PHE:CE2	4:D:85:MET:SD	2.97	0.58
4:D:23:LEU:H	4:D:189:THR:HA	1.69	0.57
6:F:80:ARG:NH1	6:F:159:SER:OG	2.38	0.57
3:C:220:GLY:HA2	4:D:51:TYR:H	1.69	0.57
2:B:605:PRO:O	2:B:773:ASN:ND2	2.38	0.57
2:B:735:ASP:HB3	2:B:738:PHE:HB3	1.87	0.57
5:E:136:PRO:HD2	7:E:202:HEC:CHA	2.35	0.57
1:A:56:GLN:HE21	1:A:123:TRP:HE3	1.53	0.57
2:B:762:MET:HB3	2:B:991:VAL:HG22	1.85	0.57
2:B:548:HIS:NE2	5:E:68:ARG:O	2.37	0.57
2:B:837:PRO:HG3	3:C:168:LEU:HB3	1.87	0.57
3:C:113:GLN:OE1	3:C:115:TRP:NE1	2.37	0.57
3:C:360:ASN:ND2	3:C:390:MET:SD	2.78	0.56
1:A:53:GLU:H	1:A:161:TYR:HB3	1.70	0.56
1:A:222:ALA:O	2:B:926:ASN:ND2	2.38	0.56
5:E:136:PRO:HG2	7:E:202:HEC:HAA1	1.87	0.56
2:B:193:GLY:HA3	2:B:219:PHE:HB3	1.86	0.56
2:B:154:LEU:HD22	2:B:599:ALA:H	1.70	0.56
3:C:400:LEU:HA	3:C:403:HIS:HD2	1.71	0.56
2:B:200:SER:HB3	2:B:430:ILE:HD12	1.88	0.56
2:B:671:GLY:O	2:B:675:ASN:ND2	2.39	0.55
3:C:258:LEU:HB2	3:C:261:TRP:HB2	1.89	0.55
2:B:833:GLU:HB3	4:D:101:ILE:HG13	1.89	0.55
3:C:87:ASP:OD1	3:C:87:ASP:N	2.39	0.55
3:C:79:ASN:HD21	3:C:414:TYR:H	1.54	0.55
2:B:236:ASN:ND2	2:B:402:GLU:OE2	2.40	0.54
4:D:133:ILE:HG22	4:D:138:LEU:HD12	1.88	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:56:GLN:HE22	1:A:124:ASN:H	1.54	0.54
5:E:72:ARG:HD3	5:E:77:SER:HB3	1.87	0.54
2:B:841:THR:HG21	2:B:871:ARG:HH12	1.72	0.54
3:C:396:VAL:HA	3:C:400:LEU:HD13	1.90	0.54
2:B:194:ALA:O	2:B:197:ARG:NH1	2.40	0.54
4:D:26:GLU:OE1	4:D:150:ASN:ND2	2.41	0.54
1:A:139:ILE:HG12	7:B:1101:HEC:HAA2	1.89	0.54
2:B:614:ASP:OD2	2:B:790:LYS:NZ	2.40	0.54
5:E:82:ASP:N	5:E:82:ASP:OD1	2.40	0.54
2:B:929:ARG:NH1	7:B:1101:HEC:O2A	2.41	0.54
4:D:113:ILE:HA	4:D:116:THR:HG22	1.90	0.54
6:F:55:ALA:HB1	6:F:218:MET:HG2	1.90	0.54
2:B:581:GLU:HA	2:B:694:VAL:HA	1.90	0.53
6:F:43:PHE:HB3	6:F:110:LEU:HG	1.90	0.53
7:A:302:HEC:O2A	5:E:34:HIS:NE2	2.40	0.53
2:B:454:SER:HB2	2:B:469:VAL:H	1.72	0.53
1:A:146:GLY:HA2	1:A:188:VAL:HG13	1.91	0.53
2:B:725:ARG:HB3	2:B:739:LEU:HD22	1.89	0.53
2:B:274:VAL:HG12	2:B:953:PRO:HB3	1.91	0.53
2:B:844:ASP:HB3	2:B:846:GLU:H	1.74	0.53
2:B:188:GLN:NE2	2:B:425:GLU:OE2	2.42	0.52
2:B:475:ALA:HB1	2:B:480:ALA:HB2	1.91	0.52
3:C:451:ARG:HB3	4:D:54:MET:HE2	1.91	0.52
2:B:962:LEU:HD21	2:B:973:LYS:HD3	1.90	0.52
3:C:121:ARG:NH2	3:C:189:GLY:O	2.42	0.52
2:B:333:GLY:O	2:B:387:GLN:NE2	2.43	0.52
3:C:184:LEU:HD22	4:D:129:VAL:HG11	1.91	0.52
2:B:924:ARG:NH1	2:B:945:MET:O	2.43	0.52
3:C:117:THR:HG23	3:C:449:GLU:HB3	1.91	0.52
3:C:265:VAL:HB	6:F:208:SER:HB3	1.91	0.52
2:B:426:VAL:HG13	2:B:453:LEU:HD23	1.91	0.52
6:F:79:ARG:NH1	6:F:162:GLU:OE2	2.43	0.52
2:B:860:LYS:H	2:B:860:LYS:CE	2.23	0.52
3:C:11:TYR:HB2	6:F:392:LEU:HD11	1.91	0.52
3:C:101:GLY:HA2	3:C:123:ALA:HB1	1.91	0.51
3:C:138:PRO:HA	3:C:141:HIS:HD2	1.75	0.51
1:A:55:PRO:O	1:A:124:ASN:ND2	2.43	0.51
3:C:226:ARG:NE	4:D:65:TYR:OH	2.42	0.51
1:A:132:PHE:HB2	2:B:854:ASN:HD22	1.74	0.51
6:F:357:LEU:HA	6:F:360:VAL:HG12	1.92	0.51
2:B:952:CYS:HG	9:B:1103:SF4:FE2	1.27	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:C:38:THR:O	3:C:440:ARG:NH2	2.44	0.51
2:B:162:SER:O	2:B:473:ASN:ND2	2.43	0.51
3:C:334:ASN:ND2	6:F:280:GLU:OE2	2.44	0.51
1:A:211:GLU:O	2:B:933:ARG:NH2	2.40	0.50
3:C:243:LEU:HA	3:C:271:VAL:HG21	1.91	0.50
2:B:822:MET:HE3	3:C:407:LEU:HD21	1.93	0.50
3:C:305:ASP:OD1	3:C:373:ARG:NH1	2.44	0.50
2:B:873:PHE:HB2	2:B:915:MET:HE2	1.93	0.50
2:B:211:GLN:NE2	2:B:512:ASN:OD1	2.45	0.50
2:B:866:CYS:O	2:B:869:LYS:NZ	2.44	0.50
6:F:191:THR:HG22	6:F:211:PRO:HB2	1.93	0.50
3:C:165:ARG:HA	4:D:111:ALA:HB1	1.93	0.50
3:C:174:ALA:HB1	3:C:245:VAL:HG22	1.94	0.50
3:C:203:ASN:HB3	3:C:206:VAL:HG12	1.93	0.50
1:A:81:GLU:OE1	5:E:108:ARG:NH2	2.45	0.49
2:B:973:LYS:NZ	2:B:990:ARG:O	2.42	0.49
2:B:99:ILE:HD11	5:E:61:LEU:HG	1.93	0.49
3:C:333:ALA:HB3	6:F:124:VAL:HG23	1.93	0.49
1:A:218:LEU:HD21	7:B:1101:HEC:HBD2	1.94	0.49
1:A:223:ILE:HG23	7:B:1101:HEC:HBA2	1.95	0.49
2:B:825:GLN:HB3	2:B:989:PRO:HB3	1.94	0.49
4:D:82:ALA:O	4:D:116:THR:OG1	2.31	0.49
3:C:124:GLU:HB3	3:C:186:TRP:HB2	1.94	0.49
1:A:9:GLN:HE22	4:D:142:TYR:HA	1.78	0.49
2:B:597:ASN:ND2	2:B:670:ALA:O	2.46	0.49
2:B:132:ILE:O	2:B:150:GLN:NE2	2.46	0.48
2:B:158:ASP:OD1	2:B:883:TYR:OH	2.26	0.48
2:B:858:GLY:HA3	3:C:143:GLY:H	1.77	0.48
3:C:104:ILE:HA	3:C:108:LEU:HD12	1.94	0.48
1:A:143:LYS:NZ	1:A:210:TYR:O	2.45	0.48
6:F:112:PRO:HG2	6:F:203:PRO:HG3	1.95	0.48
2:B:284:ARG:NH1	2:B:309:LEU:O	2.41	0.48
2:B:779:CYS:HG	9:B:1104:SF4:FE3	1.29	0.48
2:B:758:TYR:HB2	2:B:846:GLU:HG3	1.95	0.48
2:B:831:PRO:O	2:B:865:ASN:ND2	2.47	0.48
2:B:905:PRO:HA	5:E:42:LYS:HD2	1.94	0.48
1:A:168:MET:HB3	3:C:158:LEU:HA	1.96	0.48
1:A:65:LEU:HD21	7:A:301:HEC:HAD1	1.96	0.47
2:B:803:ARG:HH21	2:B:872:ARG:HH22	1.62	0.47
2:B:129:PRO:HB3	2:B:497:LEU:HD22	1.96	0.47
3:C:244:SER:OG	4:D:118:GLU:OE2	2.27	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:C:86:PHE:O	3:C:90:ASN:ND2	2.47	0.47
3:C:121:ARG:HH22	3:C:193:ASP:HB2	1.79	0.47
2:B:493:ILE:HD11	2:B:552:ILE:HD11	1.96	0.47
2:B:910:ARG:HD2	2:B:916:GLU:HG2	1.97	0.47
3:C:225:ASN:HD22	4:D:65:TYR:HD2	1.62	0.47
2:B:439:PRO:HD2	2:B:442:ILE:HD12	1.97	0.47
3:C:25:TYR:HB3	3:C:451:ARG:HD3	1.97	0.47
6:F:95:LEU:HD13	6:F:365:ILE:HG23	1.97	0.47
6:F:89:LEU:HD13	6:F:148:PHE:HB3	1.95	0.47
6:F:91:LEU:HD13	6:F:372:VAL:HG21	1.95	0.47
1:A:39:TRP:HA	1:A:43:TRP:HB2	1.96	0.47
3:C:29:THR:HG23	3:C:447:ILE:HG21	1.97	0.47
3:C:272:ALA:O	3:C:314:SER:OG	2.33	0.47
5:E:37:MET:O	5:E:40:GLN:NE2	2.43	0.47
1:A:48:ARG:NH2	7:A:302:HEC:O2D	2.49	0.46
2:B:287:ARG:O	2:B:732:TYR:OH	2.32	0.46
2:B:200:SER:OG	2:B:224:TRP:NE1	2.49	0.46
2:B:248:HIS:HB2	2:B:400:PRO:HA	1.98	0.46
2:B:636:ARG:HG2	2:B:643:SER:HB3	1.97	0.46
6:F:46:TYR:HA	6:F:361:THR:HG21	1.98	0.46
3:C:226:ARG:NH1	4:D:136:CYS:SG	2.88	0.46
2:B:207:THR:HG21	2:B:526:LEU:HD12	1.96	0.46
5:E:146:MET:O	5:E:183:ARG:NH2	2.44	0.46
5:E:159:ARG:HG2	7:E:202:HEC:HBA2	1.97	0.46
1:A:155:ASP:OD1	1:A:155:ASP:N	2.48	0.46
2:B:724:VAL:HG11	2:B:818:TYR:HB3	1.97	0.46
2:B:824:CYS:HA	2:B:870:VAL:HG21	1.97	0.46
3:C:165:ARG:NH2	4:D:93:ASN:OD1	2.48	0.46
6:F:80:ARG:NH2	6:F:163:ASP:OD2	2.47	0.46
2:B:877:GLN:HG3	2:B:884:ARG:HH22	1.81	0.45
1:A:11:PHE:HB3	4:D:141:PRO:HB2	1.98	0.45
2:B:877:GLN:HG2	2:B:892:GLU:HG3	1.98	0.45
2:B:889:ALA:HA	2:B:892:GLU:HB2	1.97	0.45
2:B:977:LEU:HB3	2:B:995:ALA:H	1.81	0.45
2:B:312:HIS:CE1	2:B:1001:ASN:H	2.34	0.45
3:C:163:GLN:HG3	4:D:101:ILE:HD13	1.99	0.45
3:C:255:ILE:HG23	6:F:275:SER:HB3	1.98	0.45
6:F:30:LEU:HD23	6:F:360:VAL:HG21	1.98	0.45
6:F:230:LEU:HB3	6:F:243:ILE:HD11	1.98	0.45
2:B:263:ASP:HB2	2:B:321:ILE:HD13	1.97	0.45
2:B:977:LEU:HD12	2:B:995:ALA:HB3	1.98	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:935:GLU:HG3	2:B:937:ARG:HG2	1.99	0.45
5:E:133:PRO:CG	5:E:161:THR:HG21	2.47	0.45
6:F:56:LEU:HD12	6:F:222:THR:HG22	1.98	0.45
6:F:75:GLY:O	6:F:79:ARG:N	2.50	0.45
2:B:986:ASN:HB2	6:F:279:PRO:HG3	1.98	0.44
2:B:618:LEU:HB2	2:B:660:THR:HB	1.98	0.44
2:B:884:ARG:HD3	2:B:891:THR:HG23	1.98	0.44
5:E:116:CYS:HB3	5:E:127:VAL:HB	1.99	0.44
2:B:124:SER:O	2:B:124:SER:OG	2.35	0.44
2:B:827:CYS:HB2	2:B:830:ALA:HA	1.99	0.44
6:F:88:THR:OG1	6:F:369:TRP:NE1	2.50	0.44
6:F:220:ILE:HD11	6:F:259:VAL:HA	1.99	0.44
6:F:244:PRO:HG2	6:F:247:ARG:HB2	1.98	0.44
2:B:952:CYS:SG	9:B:1103:SF4:S3	3.15	0.44
4:D:167:ASP:OD1	4:D:167:ASP:N	2.41	0.44
2:B:242:ALA:HB2	2:B:379:ALA:HB1	2.00	0.44
2:B:403:ASP:N	2:B:403:ASP:OD1	2.49	0.44
2:B:779:CYS:SG	2:B:783:ASN:ND2	2.90	0.44
5:E:44:LYS:HA	5:E:44:LYS:HD2	1.70	0.44
2:B:248:HIS:HE1	2:B:487:PHE:HB2	1.83	0.44
2:B:723:LEU:HD13	2:B:807:TYR:CZ	2.53	0.44
3:C:204:ILE:HG12	3:C:208:ARG:HE	1.83	0.44
2:B:495:GLN:NE2	2:B:547:LEU:O	2.51	0.43
2:B:769:CYS:O	2:B:819:ASN:ND2	2.50	0.43
3:C:92:VAL:HG12	3:C:394:ARG:HE	1.82	0.43
3:C:245:VAL:O	3:C:249:ILE:HG12	2.18	0.43
2:B:416:THR:HA	2:B:419:MET:HB2	1.99	0.43
2:B:454:SER:H	2:B:469:VAL:HB	1.83	0.43
2:B:786:PRO:HG2	2:B:799:MET:HG3	1.99	0.43
4:D:155:SER:O	4:D:155:SER:OG	2.34	0.43
2:B:109:THR:OG1	2:B:110:ALA:N	2.51	0.43
3:C:328:TYR:HA	3:C:331:TYR:HB3	2.00	0.43
2:B:609:THR:O	2:B:609:THR:OG1	2.35	0.43
2:B:652:PRO:HB2	2:B:815:PRO:HG3	1.99	0.43
5:E:136:PRO:HB2	5:E:143:LEU:HD11	2.01	0.43
2:B:619:MET:O	2:B:651:GLN:N	2.51	0.43
2:B:860:LYS:H	2:B:860:LYS:HE2	1.81	0.43
6:F:57:SER:HB3	6:F:369:TRP:HE1	1.83	0.43
2:B:491:THR:HG21	2:B:530:TRP:HZ2	1.82	0.43
2:B:552:ILE:HG22	2:B:554:ALA:H	1.83	0.43
2:B:851:MET:SD	2:B:871:ARG:NH2	2.92	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:C:114:ASP:HB3	3:C:453:LEU:HD13	2.01	0.43
4:D:85:MET:O	4:D:89:GLN:HG3	2.18	0.43
2:B:615:ASN:HD22	2:B:665:PHE:HB2	1.83	0.43
2:B:111:VAL:HG11	2:B:149:THR:HG23	2.00	0.43
5:E:136:PRO:CD	7:E:202:HEC:HAD2	2.45	0.43
6:F:73:VAL:HB	6:F:247:ARG:HD2	2.01	0.43
6:F:221:LEU:O	6:F:332:TYR:OH	2.32	0.43
1:A:140:HIS:HB3	1:A:145:VAL:HB	1.99	0.43
3:C:35:ILE:HD11	3:C:295:LEU:HD21	2.01	0.43
5:E:161:THR:HG23	7:E:202:HEC:HMD3	2.00	0.43
6:F:99:ILE:HG23	6:F:110:LEU:HD13	2.00	0.42
2:B:833:GLU:OE2	2:B:849:ASN:ND2	2.52	0.42
6:F:156:ARG:HD2	6:F:156:ARG:HA	1.82	0.42
2:B:512:ASN:HD21	2:B:525:THR:HG21	1.84	0.42
3:C:261:TRP:NE1	3:C:397:ILE:O	2.48	0.42
6:F:317:ALA:HA	6:F:323:ASN:HB2	2.01	0.42
6:F:239:LEU:HD23	6:F:239:LEU:HA	1.93	0.42
2:B:807:TYR:HE2	2:B:820:MET:HE2	1.85	0.42
3:C:297:ASP:OD1	3:C:297:ASP:N	2.46	0.42
1:A:183:ARG:HD2	1:A:188:VAL:HA	2.02	0.42
2:B:308:LEU:HG	2:B:819:ASN:HD21	1.84	0.42
3:C:80:ILE:HA	3:C:80:ILE:HD12	1.79	0.42
1:A:111:VAL:HG23	1:A:121:ILE:HD11	2.02	0.42
1:A:195:PRO:HA	1:A:196:PRO:HD3	1.85	0.42
2:B:629:LEU:HD13	2:B:648:VAL:HG11	2.01	0.42
2:B:723:LEU:O	2:B:979:TYR:OH	2.35	0.42
3:C:95:ILE:O	3:C:99:HIS:ND1	2.44	0.42
6:F:88:THR:HG22	6:F:372:VAL:HG12	2.01	0.42
2:B:797:ARG:NH1	3:C:74:GLY:O	2.39	0.42
3:C:23:GLN:NE2	3:C:297:ASP:OD2	2.53	0.42
5:E:159:ARG:HG3	5:E:160:ARG:H	1.84	0.42
2:B:121:LEU:HD12	2:B:121:LEU:HA	1.92	0.42
2:B:185:MET:HE3	2:B:514:LEU:HD22	2.02	0.42
2:B:948:CYS:HB3	9:B:1104:SF4:S2	2.59	0.42
3:C:440:ARG:O	3:C:440:ARG:NH1	2.47	0.42
1:A:129:LEU:HD13	1:A:133:VAL:HG11	2.01	0.41
2:B:84:GLN:H	2:B:84:GLN:HG2	1.72	0.41
2:B:309:LEU:HG	2:B:770:ASN:HB3	2.02	0.41
2:B:637:LEU:HB2	2:B:644:VAL:HG12	2.00	0.41
2:B:783:ASN:HA	2:B:907:VAL:HG21	2.02	0.41
4:D:47:GLN:HG2	4:D:166:ALA:HB3	2.02	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:74:ARG:HB2	5:E:111:ILE:HG21	2.01	0.41
2:B:399:GLU:OE1	2:B:558:ARG:NH2	2.53	0.41
3:C:28:VAL:HG21	3:C:454:VAL:HG21	2.02	0.41
3:C:220:GLY:O	3:C:224:TRP:N	2.49	0.41
3:C:230:ALA:HB2	4:D:70:LEU:HD21	2.02	0.41
2:B:764:ILE:HG21	2:B:821:VAL:HB	2.02	0.41
2:B:239:ALA:HB1	2:B:247:VAL:HG12	2.02	0.41
2:B:371:GLU:HA	2:B:378:HIS:HE1	1.86	0.41
4:D:85:MET:SD	4:D:88:LEU:HD23	2.60	0.41
2:B:151:ALA:O	2:B:598:ASN:ND2	2.53	0.41
3:C:170:TRP:O	3:C:174:ALA:N	2.47	0.41
1:A:83:SER:OG	2:B:101:HIS:O	2.26	0.41
2:B:599:ALA:HB1	2:B:787:VAL:HG11	2.01	0.41
2:B:869:LYS:O	2:B:872:ARG:NH1	2.54	0.41
6:F:299:VAL:HG12	6:F:300:MET:HE2	2.01	0.41
1:A:207:VAL:HG13	1:A:212:ILE:HB	2.02	0.41
2:B:415:LEU:O	2:B:419:MET:N	2.51	0.41
2:B:792:GLU:OE1	2:B:797:ARG:NH1	2.50	0.41
2:B:200:SER:HA	2:B:430:ILE:HB	2.03	0.41
2:B:590:LEU:HD22	2:B:596:ALA:HA	2.03	0.41
2:B:779:CYS:SG	9:B:1104:SF4:S4	3.19	0.41
5:E:73:ILE:HD12	5:E:73:ILE:HA	1.91	0.41
6:F:75:GLY:HA2	6:F:78:LEU:HB2	2.03	0.41
6:F:76:LEU:HD22	6:F:389:ARG:HB2	2.03	0.41
2:B:161:ARG:HE	2:B:161:ARG:HB3	1.71	0.41
2:B:156:MET:HB2	2:B:476:HIS:CE1	2.56	0.40
5:E:141:GLN:OE1	5:E:141:GLN:HA	2.20	0.40
4:D:130:PHE:HA	4:D:133:ILE:HG12	2.03	0.40
2:B:89:ILE:HD13	2:B:89:ILE:HA	1.99	0.40
2:B:615:ASN:ND2	2:B:662:HIS:O	2.41	0.40
2:B:685:ARG:HH21	2:B:690:PRO:HB2	1.87	0.40
1:A:218:LEU:HD23	1:A:218:LEU:HA	1.88	0.40
2:B:827:CYS:HB3	2:B:987:THR:HB	2.03	0.40
3:C:99:HIS:NE2	3:C:246:HIS:HB2	2.37	0.40
2:B:241:LEU:HD23	2:B:568:PHE:HB2	2.02	0.40
3:C:408:PRO:HA	3:C:411:TRP:CE2	2.56	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	216/226 (96%)	187 (87%)	29 (13%)	0	100	100
2	B	927/933 (99%)	834 (90%)	93 (10%)	0	100	100
3	C	454/471 (96%)	435 (96%)	19 (4%)	0	100	100
4	D	172/192 (90%)	156 (91%)	16 (9%)	0	100	100
5	E	156/162 (96%)	142 (91%)	14 (9%)	0	100	100
6	F	393/414 (95%)	375 (95%)	18 (5%)	0	100	100
All	All	2318/2398 (97%)	2129 (92%)	189 (8%)	0	100	100

There are no Ramachandran outliers to report.

5.3.2 Protein sidechains

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	191/198 (96%)	191 (100%)	0	100	100
2	B	763/766 (100%)	757 (99%)	6 (1%)	73	82
3	C	384/394 (98%)	382 (100%)	2 (0%)	81	85
4	D	135/150 (90%)	135 (100%)	0	100	100
5	E	131/135 (97%)	131 (100%)	0	100	100
6	F	320/332 (96%)	320 (100%)	0	100	100
All	All	1924/1975 (97%)	1916 (100%)	8 (0%)	81	86

All (8) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
2	B	274	VAL
2	B	377	VAL
2	B	492	THR
2	B	629	LEU
2	B	859	THR
2	B	860	LYS
3	C	82	VAL
3	C	266	PHE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (46) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	56	GLN
1	A	87	ASN
1	A	122	GLN
1	A	127	HIS
1	A	136	ASN
1	A	190	ASN
1	A	199	GLN
1	A	208	GLN
2	B	86	GLN
2	B	138	HIS
2	B	167	ASN
2	B	188	GLN
2	B	192	GLN
2	B	211	GLN
2	B	221	GLN
2	B	234	ASN
2	B	248	HIS
2	B	361	ASN
2	B	373	GLN
2	B	378	HIS
2	B	420	ASN
2	B	495	GLN
2	B	512	ASN
2	B	561	GLN
2	B	631	ASN
2	B	704	ASN
2	B	767	ASN
2	B	813	HIS
2	B	854	ASN

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Mol	Chain	Res	Type
2	B	879	GLN
2	B	955	GLN
2	B	975	GLN
3	C	23	GLN
3	C	79	ASN
3	C	141	HIS
3	C	163	GLN
3	C	225	ASN
3	C	387	ASN
4	D	174	GLN
4	D	192	ASN
5	E	64	HIS
6	F	44	HIS
6	F	68	HIS
6	F	108	HIS
6	F	323	ASN
6	F	353	HIS

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 oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

12 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
8	EL6	B	1102	-	25,25,42	1.23	4 (16%)	27,27,44	1.39	2 (7%)
8	EL6	E	201	-	42,42,42	0.96	4 (9%)	44,44,44	1.17	2 (4%)
7	HEC	A	301	1	46,50,50	1.82	5 (10%)	58,82,82	1.79	6 (10%)
9	SF4	B	1104	2	0,12,12	-	-	-	-	-
9	SF4	B	1103	2	0,12,12	-	-	-	-	-
7	HEC	B	1101	1	46,50,50	1.88	6 (13%)	58,82,82	1.82	12 (20%)
7	HEC	E	202	5	46,50,50	1.82	5 (10%)	58,82,82	2.01	7 (12%)
9	SF4	B	1105	2	0,12,12	-	-	-	-	-
10	F3S	B	1106	2	0,9,9	-	-	-	-	-
7	HEC	A	303	1	46,50,50	1.78	5 (10%)	58,82,82	2.09	8 (13%)
7	HEC	A	302	1	46,50,50	1.83	5 (10%)	58,82,82	1.86	10 (17%)
7	HEC	A	304	1	46,50,50	1.81	5 (10%)	58,82,82	1.89	9 (15%)

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
8	EL6	B	1102	-	-	8/26/26/43	-
8	EL6	E	201	-	-	9/43/43/43	-
7	HEC	A	301	1	-	7/14/54/54	-
9	SF4	B	1104	2	-	-	0/6/5/5
9	SF4	B	1103	2	-	-	0/6/5/5
7	HEC	B	1101	1	-	4/14/54/54	-
7	HEC	E	202	5	-	5/14/54/54	-
9	SF4	B	1105	2	-	-	0/6/5/5
10	F3S	B	1106	2	-	-	0/3/3/3
7	HEC	A	303	1	-	5/14/54/54	-
7	HEC	A	302	1	-	2/14/54/54	-
7	HEC	A	304	1	-	7/14/54/54	-

All (39) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
7	A	302	HEC	CAB-C3B	6.41	1.55	1.35
7	A	304	HEC	CAC-C3C	6.35	1.55	1.35
7	B	1101	HEC	CAB-C3B	6.29	1.55	1.35
7	B	1101	HEC	CAC-C3C	6.27	1.55	1.35

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
7	A	303	HEC	CAC-C3C	6.27	1.55	1.35
7	A	301	HEC	CAC-C3C	6.21	1.55	1.35
7	E	202	HEC	CAC-C3C	6.13	1.54	1.35
7	A	304	HEC	CAB-C3B	5.98	1.54	1.35
7	A	302	HEC	CAC-C3C	5.97	1.54	1.35
7	A	301	HEC	CAB-C3B	5.92	1.54	1.35
7	E	202	HEC	CAB-C3B	5.75	1.53	1.35
7	A	303	HEC	CAB-C3B	5.75	1.53	1.35
7	A	301	HEC	C3D-C2D	5.54	1.53	1.38
7	E	202	HEC	C3D-C2D	5.52	1.53	1.38
7	B	1101	HEC	C3D-C2D	5.45	1.53	1.38
7	A	302	HEC	C3D-C2D	5.36	1.52	1.38
7	A	304	HEC	C3D-C2D	5.22	1.52	1.38
7	A	303	HEC	C3D-C2D	4.91	1.51	1.38
8	E	201	EL6	O21-C2	-4.01	1.40	1.47
8	B	1102	EL6	O21-C2	-3.91	1.40	1.47
7	B	1101	HEC	C3B-C2B	-2.55	1.32	1.41
7	A	302	HEC	C3B-C2B	-2.55	1.32	1.41
8	E	201	EL6	O31-C31	2.38	1.40	1.33
7	A	303	HEC	C3B-C2B	-2.37	1.33	1.41
8	B	1102	EL6	O31-C31	2.35	1.40	1.33
7	E	202	HEC	C3B-C2B	-2.33	1.33	1.41
7	A	301	HEC	C3B-C2B	-2.31	1.33	1.41
7	A	303	HEC	C3C-C2C	-2.27	1.33	1.41
8	B	1102	EL6	O31-C3	-2.23	1.40	1.45
8	E	201	EL6	O31-C3	-2.19	1.40	1.45
7	A	304	HEC	C3B-C2B	-2.18	1.33	1.41
7	A	302	HEC	C3C-C2C	-2.17	1.33	1.41
8	B	1102	EL6	O21-C21	2.15	1.40	1.34
7	E	202	HEC	C3C-C2C	-2.14	1.34	1.41
8	E	201	EL6	O21-C21	2.10	1.40	1.34
7	A	304	HEC	CMC-C2C	2.09	1.55	1.50
7	B	1101	HEC	C2A-C3A	-2.07	1.32	1.36
7	A	301	HEC	C3C-C2C	-2.00	1.34	1.41
7	B	1101	HEC	CMC-C2C	2.00	1.54	1.50

All (56) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
7	A	303	HEC	CBB-CAB-C3B	-10.81	105.83	127.43
7	A	304	HEC	CBB-CAB-C3B	-9.40	108.64	127.43
7	E	202	HEC	CBC-CAC-C3C	-8.84	109.77	127.43

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
7	A	301	HEC	CBB-CAB-C3B	-8.42	110.60	127.43
7	E	202	HEC	CBB-CAB-C3B	-8.25	110.95	127.43
7	A	302	HEC	CBC-CAC-C3C	-8.16	111.13	127.43
7	B	1101	HEC	CBC-CAC-C3C	-6.75	113.94	127.43
7	A	303	HEC	CBC-CAC-C3C	-6.56	114.33	127.43
7	A	301	HEC	CBC-CAC-C3C	-6.09	115.27	127.43
7	B	1101	HEC	CBB-CAB-C3B	-5.72	116.01	127.43
7	A	304	HEC	CBC-CAC-C3C	-4.82	117.80	127.43
7	A	302	HEC	CBB-CAB-C3B	-4.27	118.89	127.43
8	B	1102	EL6	O21-C21-C22	4.13	120.42	111.48
7	B	1101	HEC	CMC-C2C-C1C	-3.98	119.36	125.42
7	A	302	HEC	CHC-C4B-C3B	3.81	131.63	125.21
7	A	302	HEC	CHC-C4B-NB	-3.75	120.37	124.45
8	E	201	EL6	O21-C21-C22	3.60	119.28	111.48
7	A	303	HEC	CMC-C2C-C1C	-3.52	120.06	125.42
7	E	202	HEC	C4D-ND-C1D	3.51	111.54	105.82
7	A	301	HEC	C4D-ND-C1D	3.49	111.51	105.82
7	E	202	HEC	CMC-C2C-C1C	-3.43	120.19	125.42
7	A	304	HEC	CBD-CAD-C3D	-3.41	103.11	112.53
7	A	303	HEC	CAA-CBA-CGA	-3.40	104.64	113.67
7	A	302	HEC	CMC-C2C-C1C	-3.38	120.27	125.42
7	A	304	HEC	C4D-ND-C1D	3.21	111.05	105.82
7	B	1101	HEC	CHC-C4B-C3B	3.19	130.58	125.21
7	B	1101	HEC	CAA-CBA-CGA	-3.07	105.53	113.67
7	A	302	HEC	C4D-ND-C1D	2.93	110.59	105.82
7	A	303	HEC	CHA-C1A-NA	2.91	127.62	124.45
7	A	303	HEC	CBD-CAD-C3D	-2.87	104.59	112.53
7	A	302	HEC	CHB-C4A-NA	2.86	127.57	124.45
7	B	1101	HEC	C4D-ND-C1D	2.83	110.43	105.82
8	E	201	EL6	O31-C31-C32	2.76	120.27	111.83
8	B	1102	EL6	O31-C31-C32	2.76	120.24	111.83
7	A	303	HEC	C4D-ND-C1D	2.64	110.12	105.82
7	A	301	HEC	C2A-C1A-NA	-2.59	107.82	110.32
7	B	1101	HEC	CHA-C1A-NA	2.59	127.27	124.45
7	B	1101	HEC	CHC-C4B-NB	-2.57	121.65	124.45
7	A	304	HEC	C2A-C1A-NA	-2.56	107.85	110.32
7	A	304	HEC	CAA-CBA-CGA	-2.56	106.88	113.67
7	A	304	HEC	CMD-C2D-C1D	2.52	129.25	125.42
7	E	202	HEC	CAD-C3D-C4D	2.49	129.81	124.94
7	E	202	HEC	CHC-C4B-NB	2.49	127.16	124.45
7	A	302	HEC	CHD-C4C-NC	2.42	127.08	124.45
7	A	304	HEC	CHA-C1A-NA	2.41	127.08	124.45

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
7	A	301	HEC	CMC-C2C-C1C	-2.37	121.81	125.42
7	B	1101	HEC	C2A-C1A-NA	-2.28	108.13	110.32
7	E	202	HEC	C2A-C1A-NA	-2.25	108.15	110.32
7	A	302	HEC	CBD-CAD-C3D	-2.23	106.37	112.53
7	B	1101	HEC	CHB-C4A-NA	2.22	126.87	124.45
7	A	304	HEC	CMC-C2C-C1C	-2.18	122.10	125.42
7	A	303	HEC	CHC-C1C-NC	2.17	127.79	123.86
7	B	1101	HEC	CHD-C4C-NC	2.14	126.79	124.45
7	A	302	HEC	CHC-C1C-NC	2.11	127.69	123.86
7	A	301	HEC	CHC-C4B-NB	2.01	126.64	124.45
7	B	1101	HEC	CMC-C2C-C3C	2.01	131.27	126.55

There are no chirality outliers.

All (47) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
7	A	301	HEC	C2C-C3C-CAC-CBC
7	A	301	HEC	C4C-C3C-CAC-CBC
7	A	302	HEC	C2C-C3C-CAC-CBC
7	A	303	HEC	C2C-C3C-CAC-CBC
7	A	303	HEC	C4C-C3C-CAC-CBC
7	A	304	HEC	C2C-C3C-CAC-CBC
7	A	304	HEC	C4C-C3C-CAC-CBC
7	B	1101	HEC	C2B-C3B-CAB-CBB
7	B	1101	HEC	C4B-C3B-CAB-CBB
7	B	1101	HEC	C2C-C3C-CAC-CBC
7	B	1101	HEC	C4C-C3C-CAC-CBC
7	E	202	HEC	C2C-C3C-CAC-CBC
7	A	303	HEC	C2A-CAA-CBA-CGA
8	E	201	EL6	C31-C32-C33-C34
8	B	1102	EL6	C22-C21-O21-C2
7	A	304	HEC	C3D-CAD-CBD-CGD
8	E	201	EL6	C27-C28-C29-C2A
8	B	1102	EL6	O22-C21-O21-C2
8	B	1102	EL6	C26-C27-C28-C29
8	E	201	EL6	C23-C24-C25-C26
8	E	201	EL6	C2C-C2D-C2E-C2F
8	B	1102	EL6	C33-C34-C35-C36
8	B	1102	EL6	C22-C23-C24-C25
7	A	302	HEC	C4C-C3C-CAC-CBC
7	E	202	HEC	C4C-C3C-CAC-CBC
7	A	301	HEC	C2B-C3B-CAB-CBB

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Mol	Chain	Res	Type	Atoms
7	A	303	HEC	C2B-C3B-CAB-CBB
7	A	304	HEC	C2B-C3B-CAB-CBB
7	E	202	HEC	C2B-C3B-CAB-CBB
8	E	201	EL6	C3E-C3F-C3G-C3H
8	E	201	EL6	C28-C29-C2A-C2B
7	A	304	HEC	CAA-CBA-CGA-O1A
8	B	1102	EL6	O21-C21-C22-C23
8	B	1102	EL6	C32-C31-O31-C3
7	A	304	HEC	CAA-CBA-CGA-O2A
7	A	301	HEC	C3D-CAD-CBD-CGD
8	B	1102	EL6	O32-C31-O31-C3
8	E	201	EL6	O21-C21-C22-C23
8	E	201	EL6	C2A-C2B-C2C-C2D
8	E	201	EL6	C3B-C3C-C3D-C3E
7	A	301	HEC	CAD-CBD-CGD-O2D
7	A	301	HEC	C4B-C3B-CAB-CBB
7	A	303	HEC	C4B-C3B-CAB-CBB
7	A	304	HEC	C4B-C3B-CAB-CBB
7	E	202	HEC	C4B-C3B-CAB-CBB
7	E	202	HEC	CAD-CBD-CGD-O2D
7	A	301	HEC	CAD-CBD-CGD-O1D

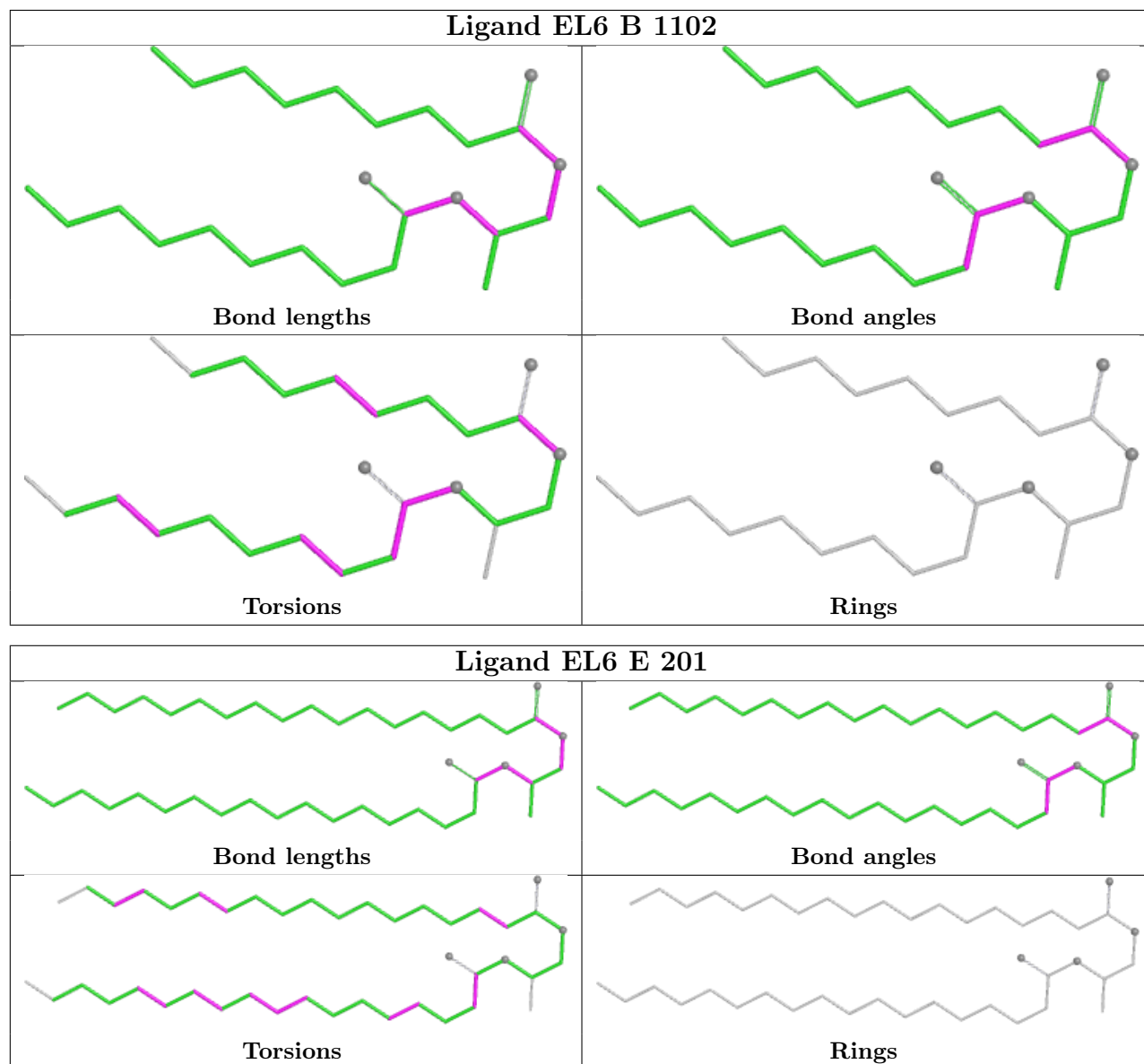
There are no ring outliers.

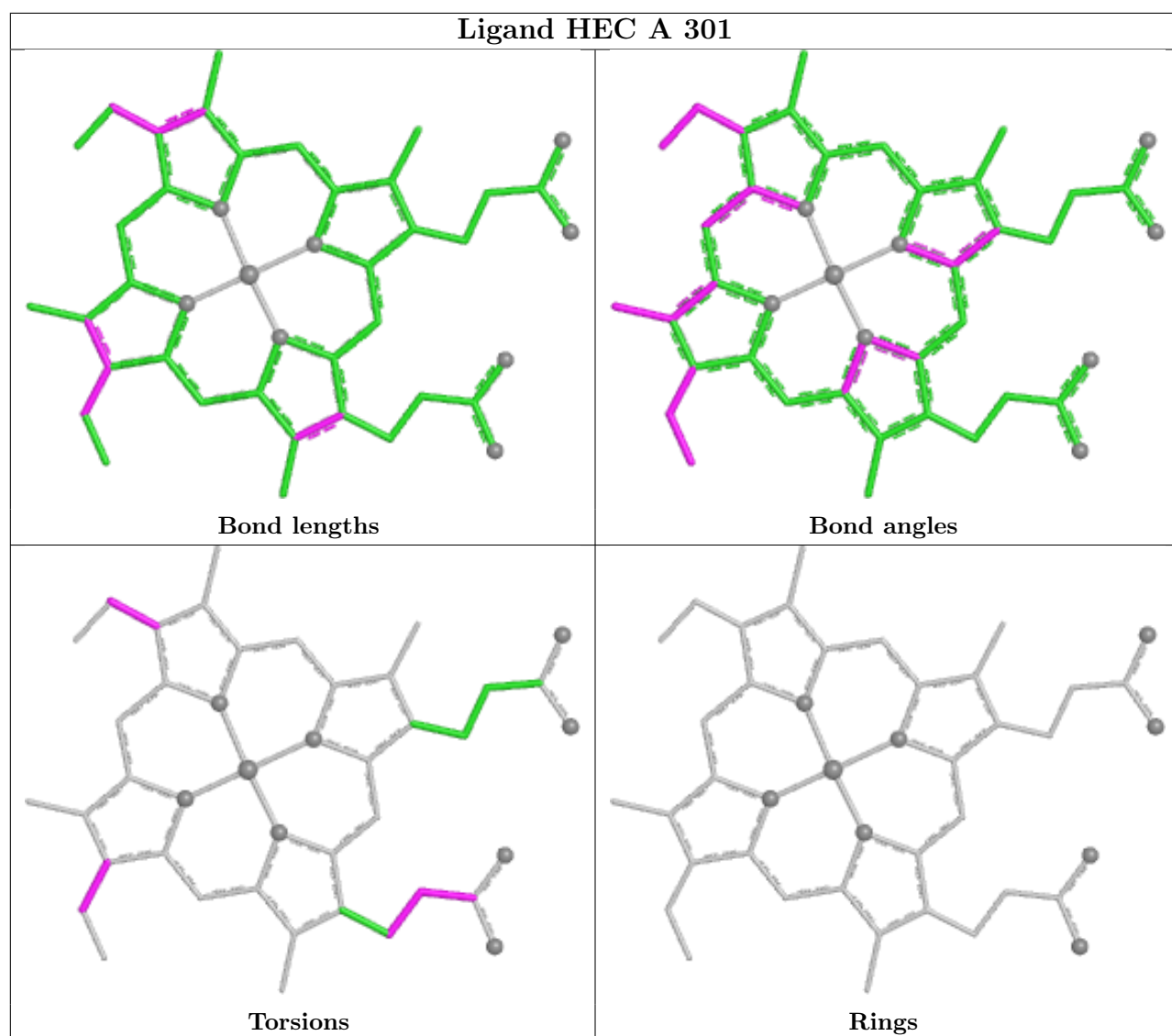
8 monomers are involved in 22 short contacts:

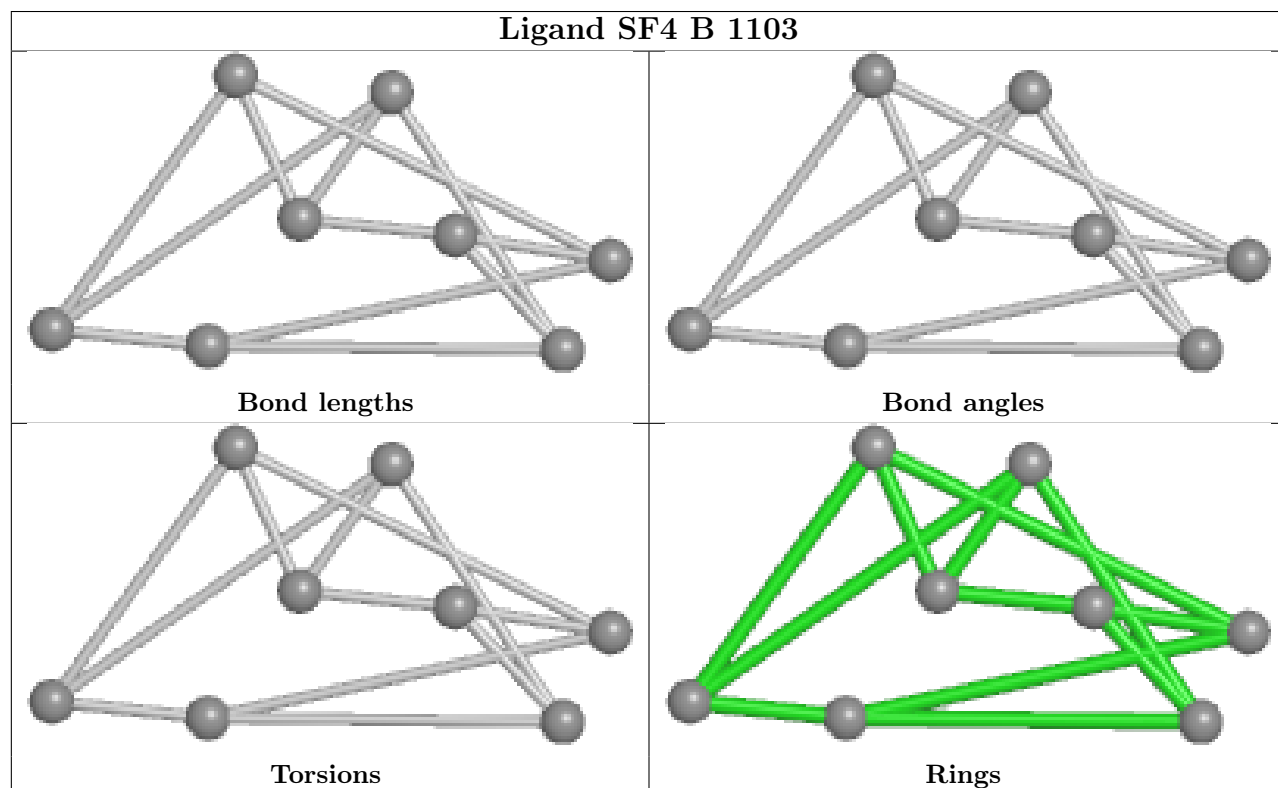
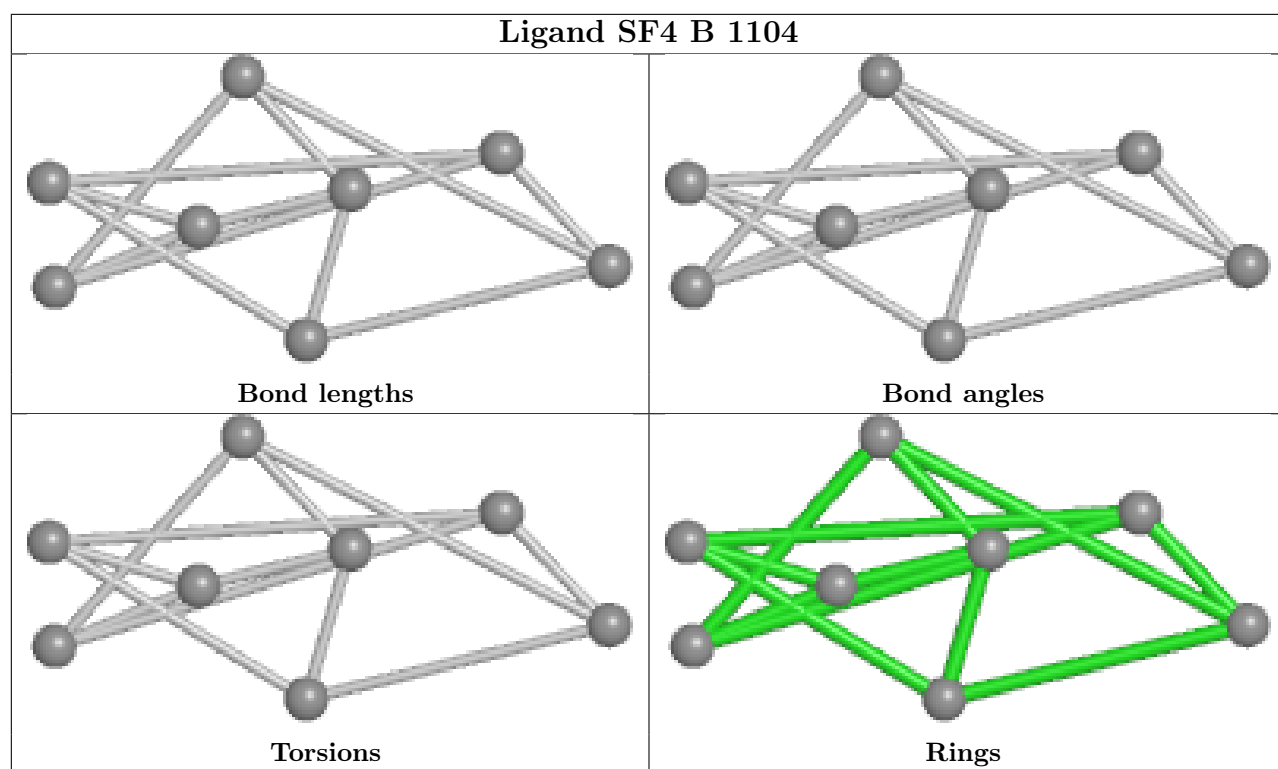
Mol	Chain	Res	Type	Clashes	Symm-Clashes
7	A	301	HEC	2	0
9	B	1104	SF4	3	0
9	B	1103	SF4	2	0
7	B	1101	HEC	4	0
7	E	202	HEC	6	0
9	B	1105	SF4	2	0
10	B	1106	F3S	1	0
7	A	302	HEC	2	0

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 than 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

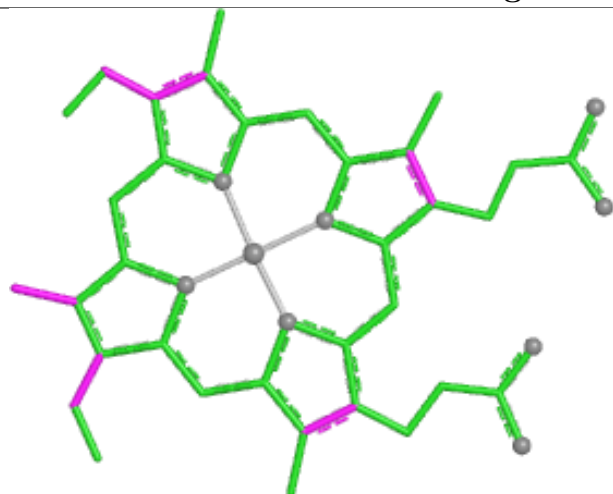
in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.



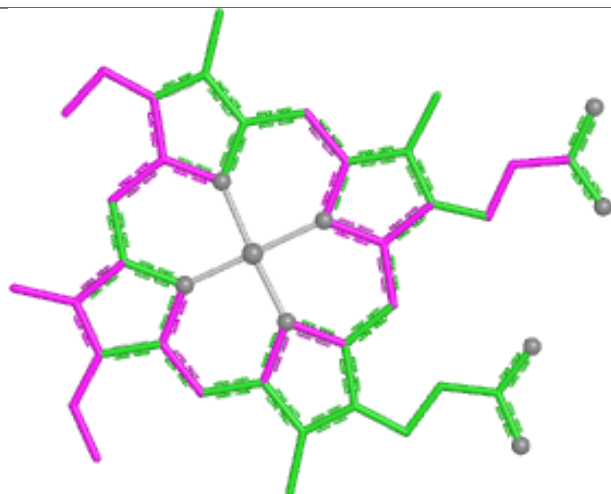




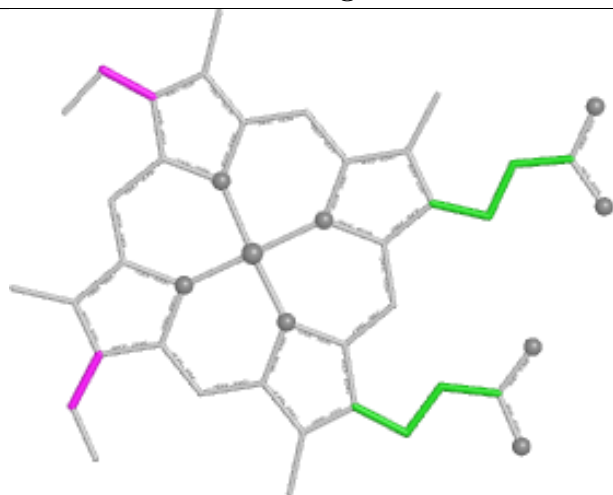
Ligand HEC B 1101



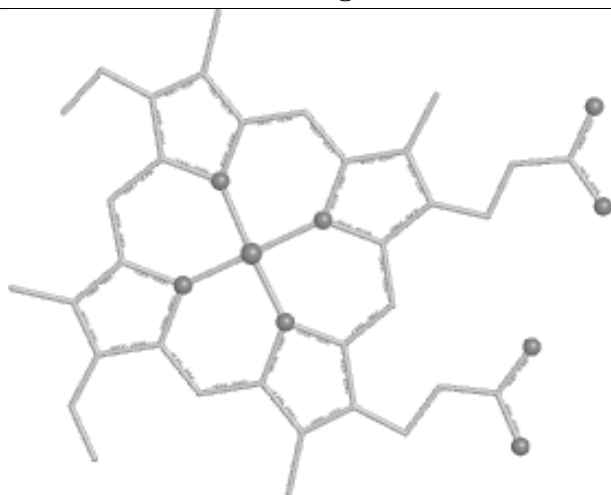
Bond lengths



Bond angles

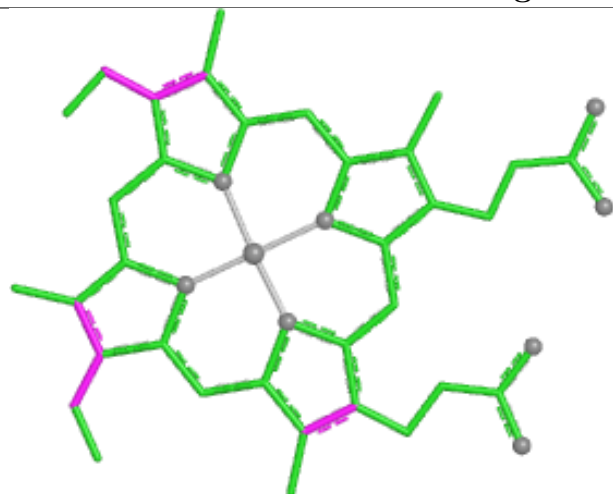


Torsions

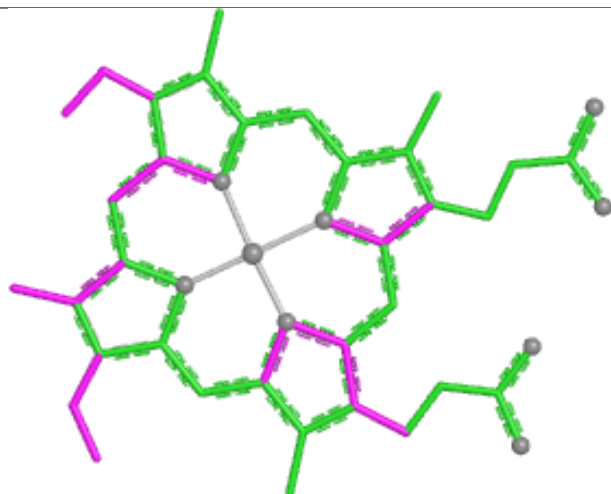


Rings

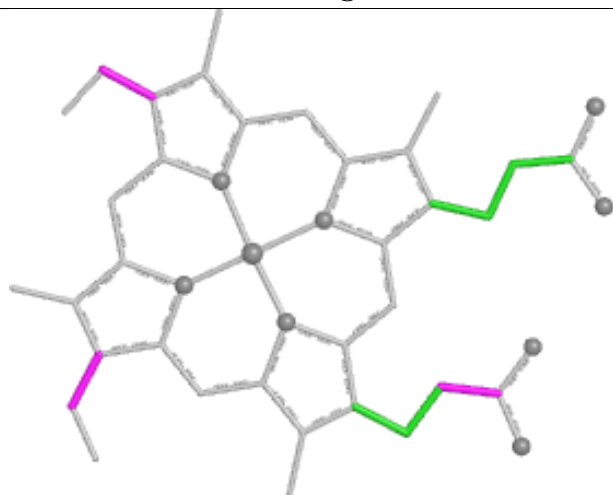
Ligand HEC E 202



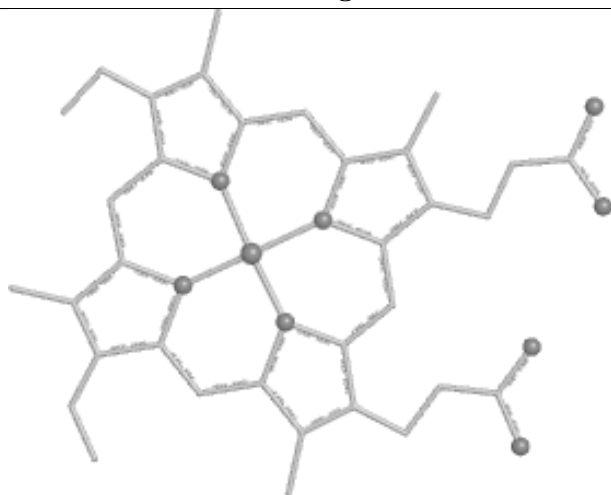
Bond lengths



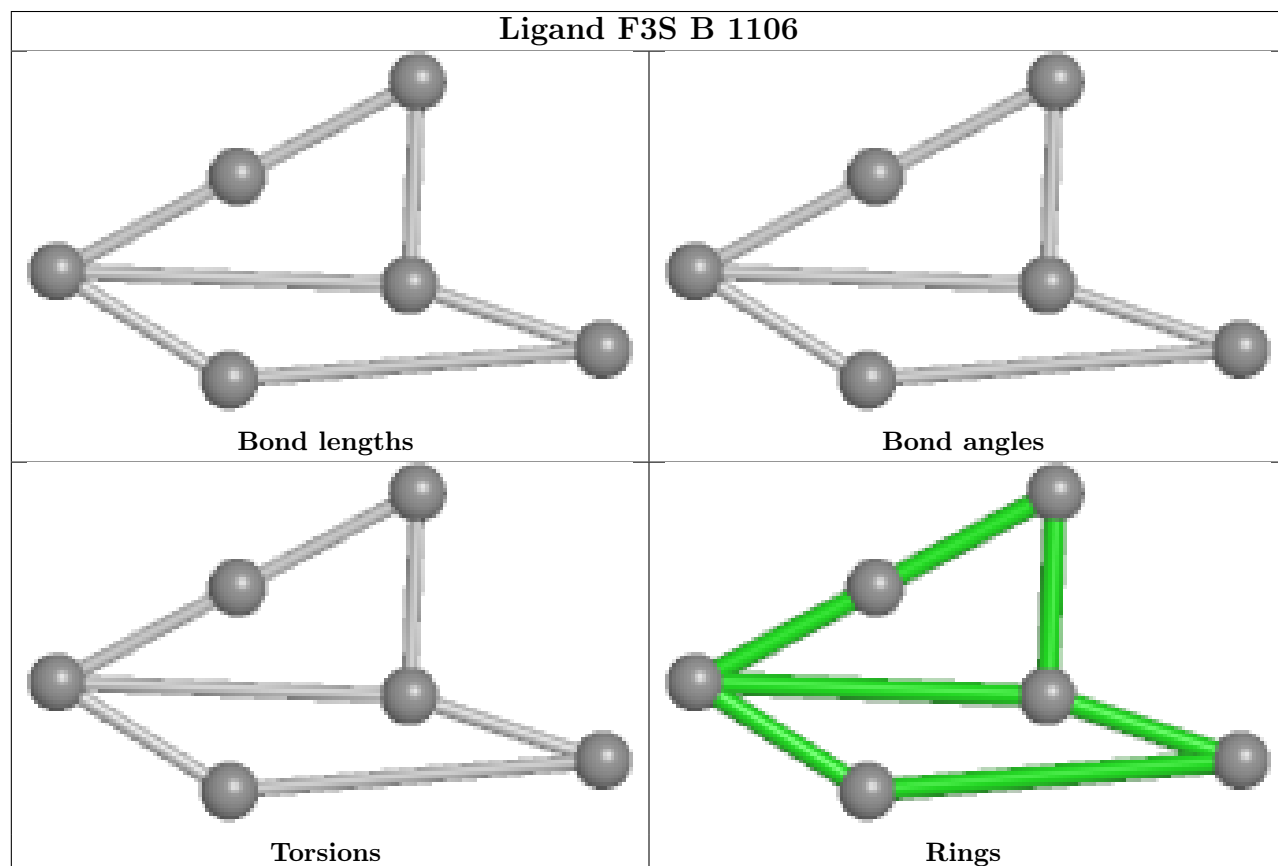
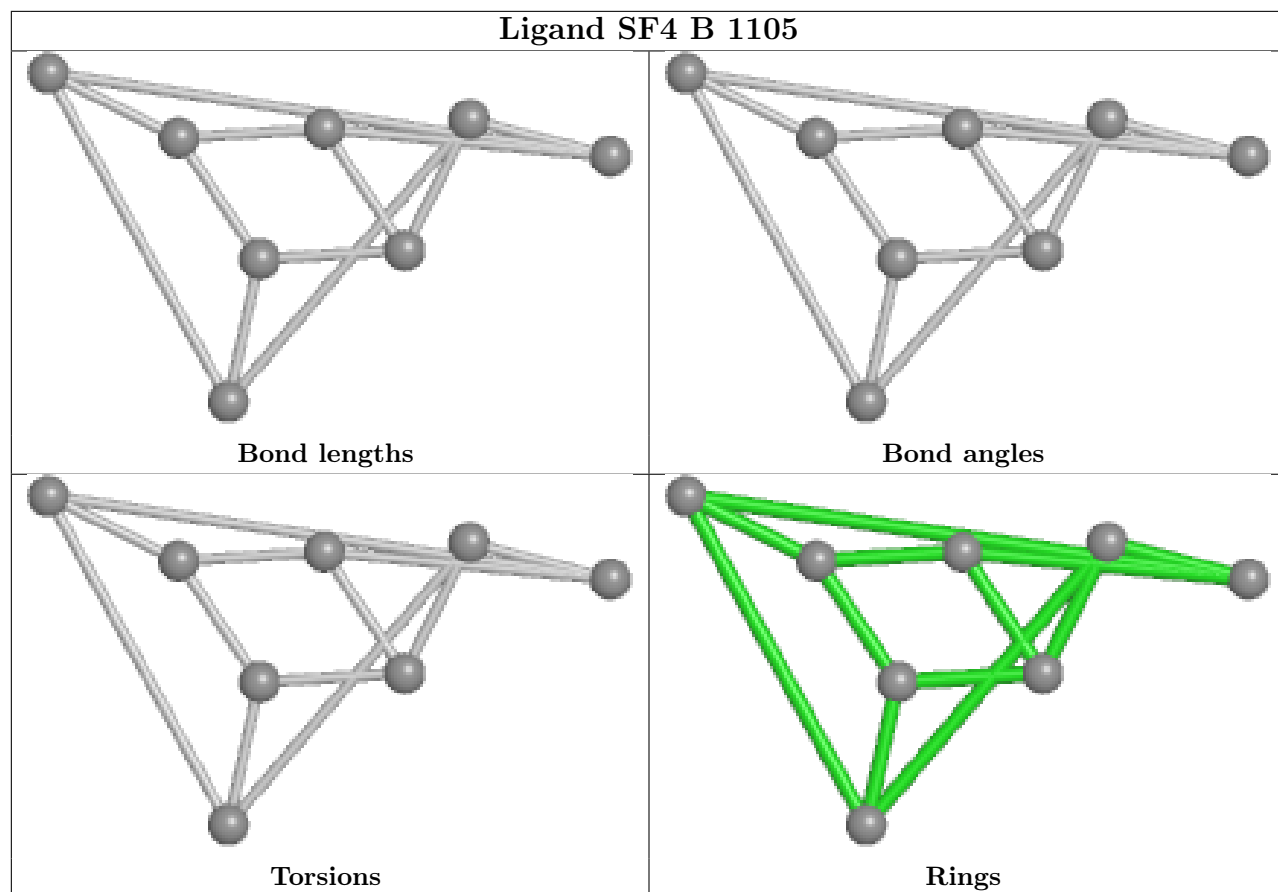
Bond angles

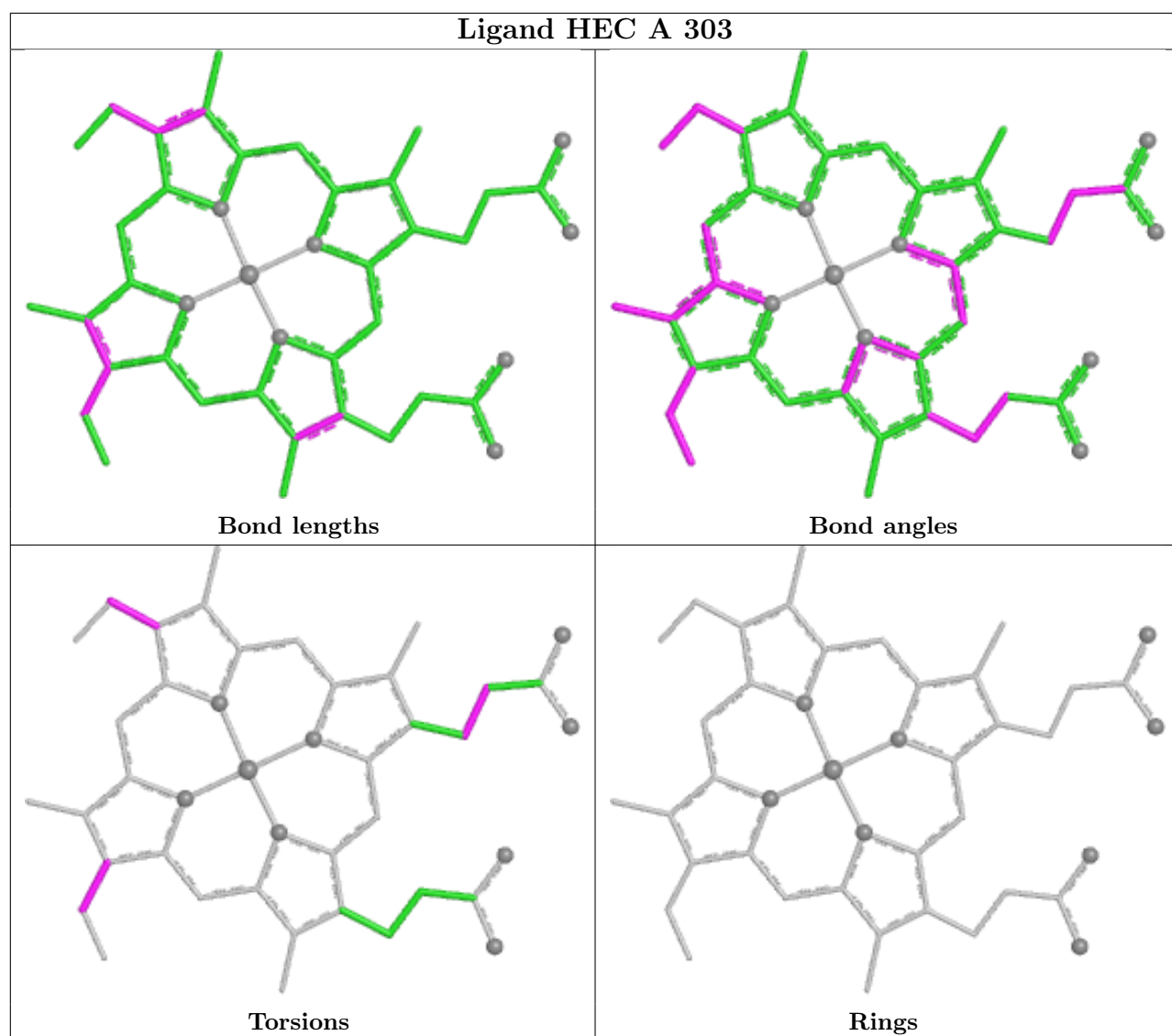


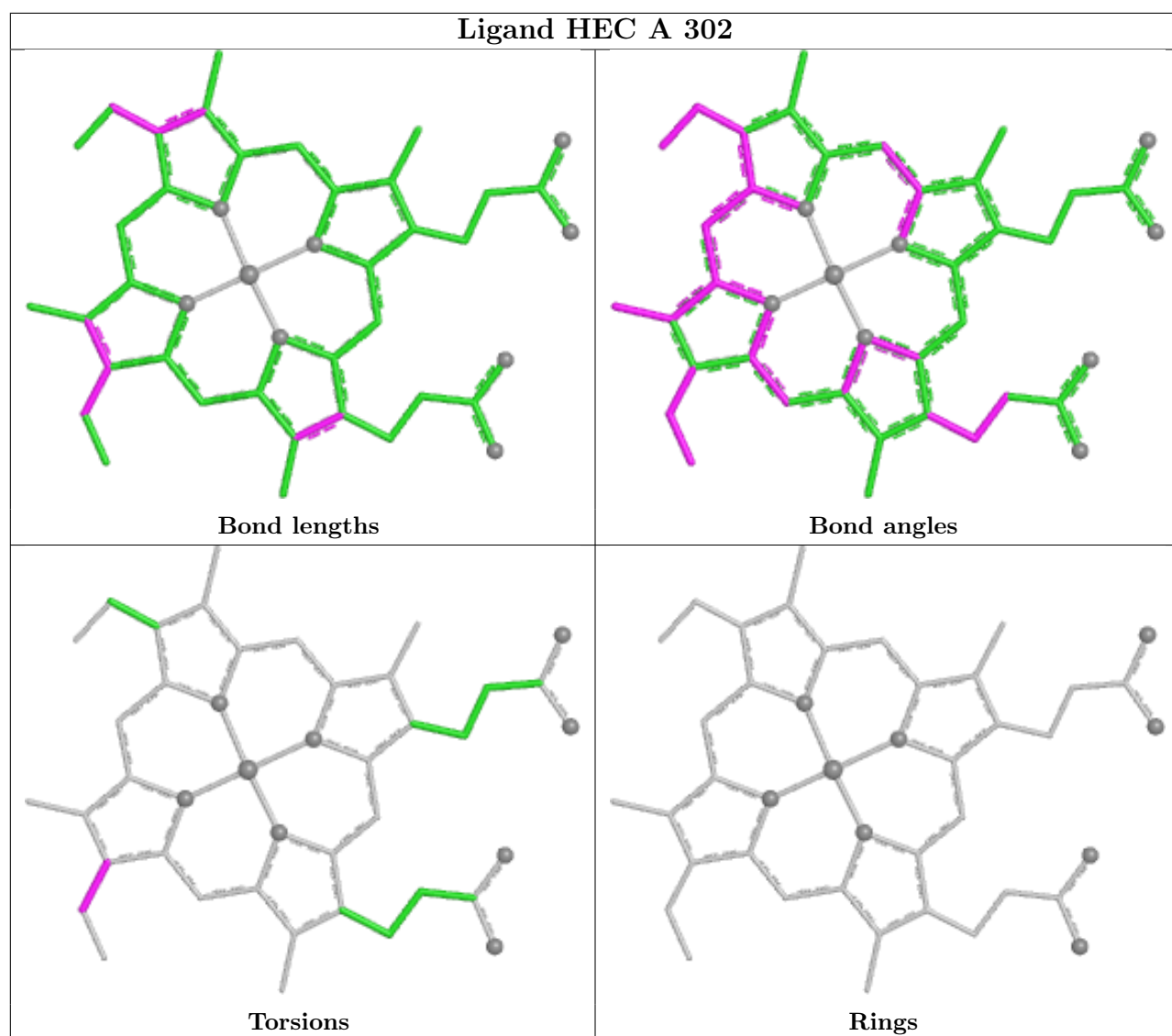
Torsions

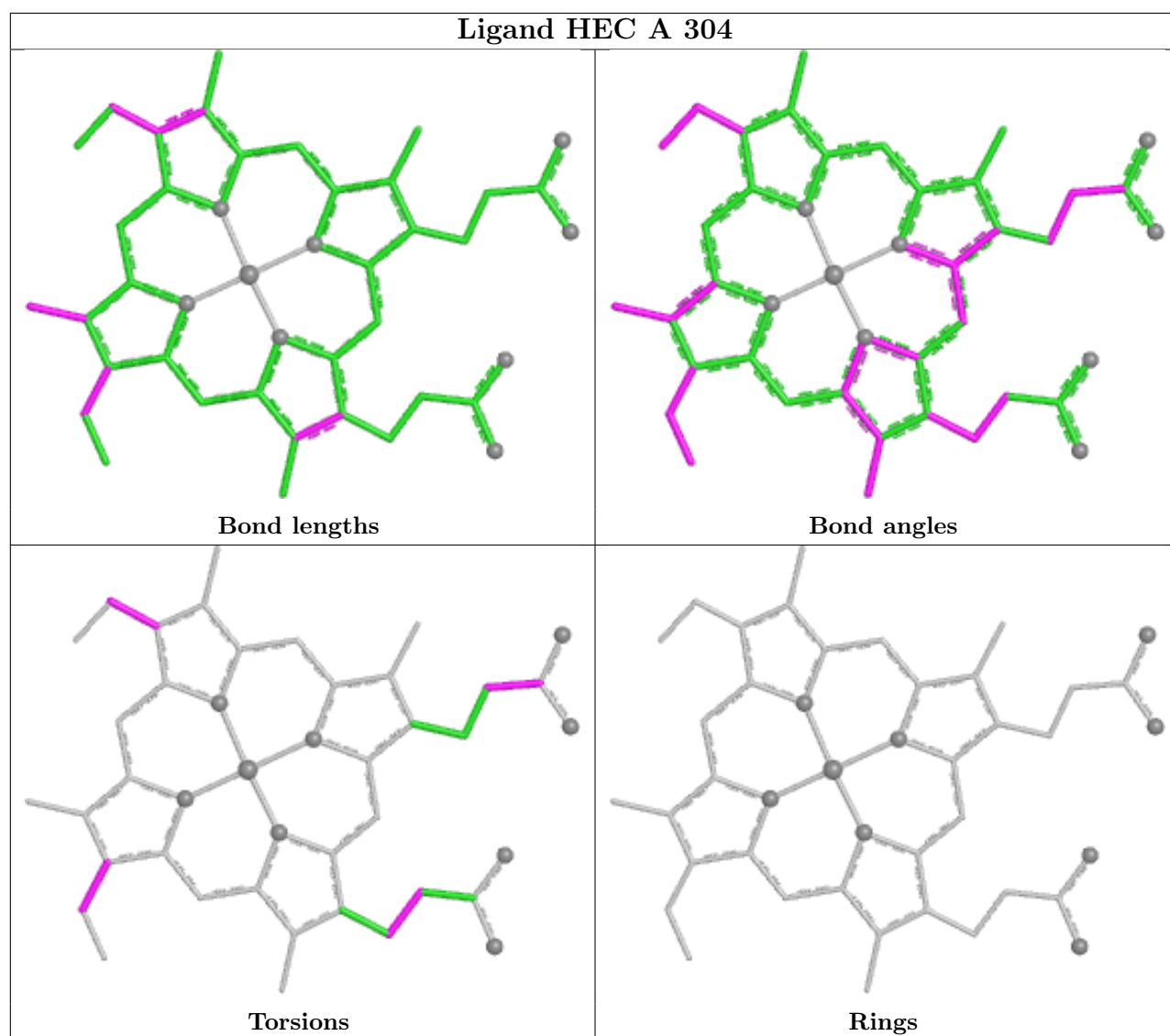


Rings









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.

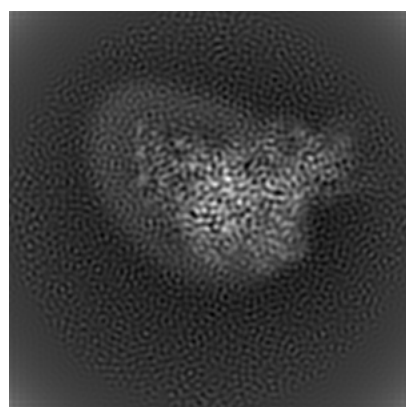
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-0936. These allow visual inspection of the internal detail of the map and identification of artifacts.

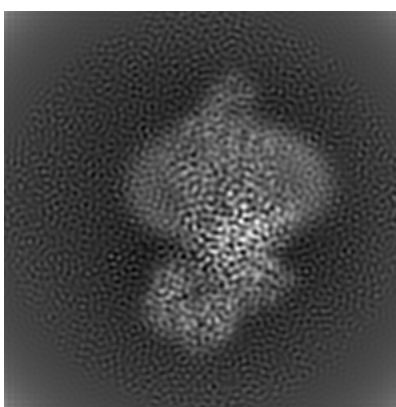
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections [i](#)

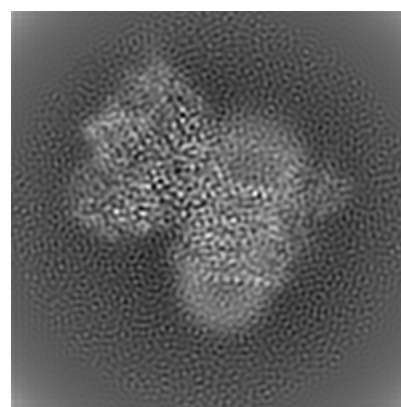
6.1.1 Primary map



X



Y

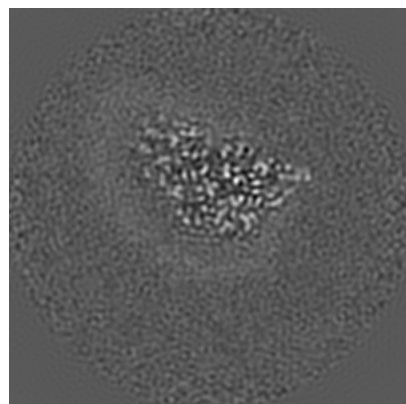


Z

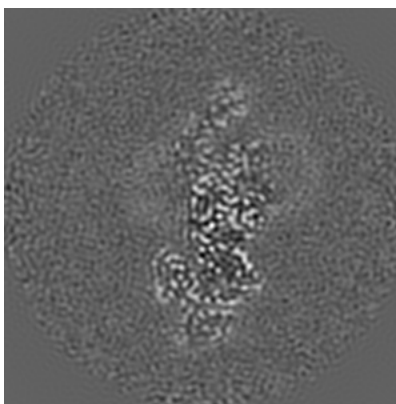
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

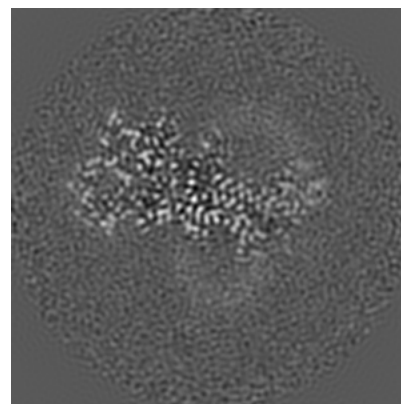
6.2.1 Primary map



X Index: 98



Y Index: 98

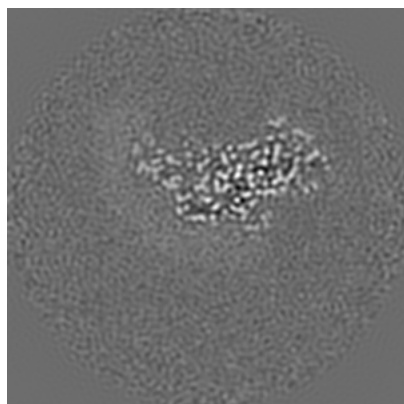


Z Index: 98

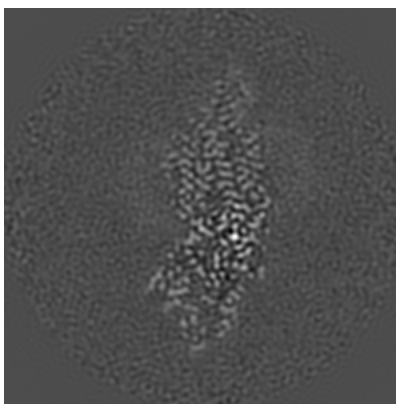
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

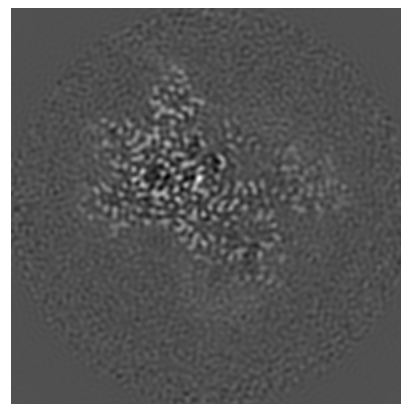
6.3.1 Primary map



X Index: 89



Y Index: 106

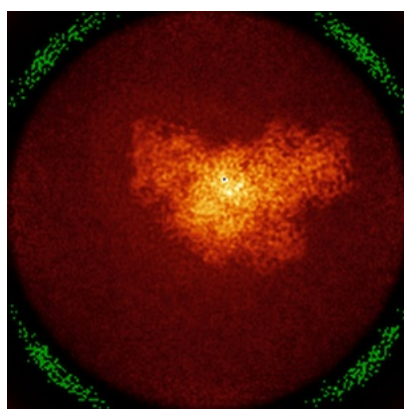


Z Index: 108

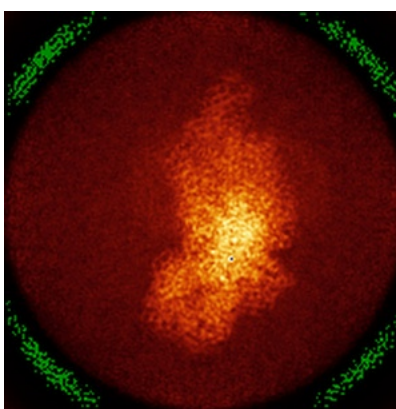
The images above show the largest variance slices of the map in three orthogonal directions.

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

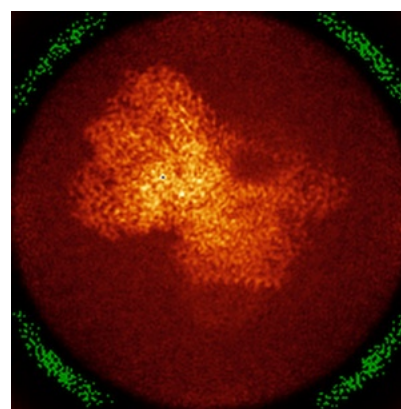
6.4.1 Primary map



X



Y

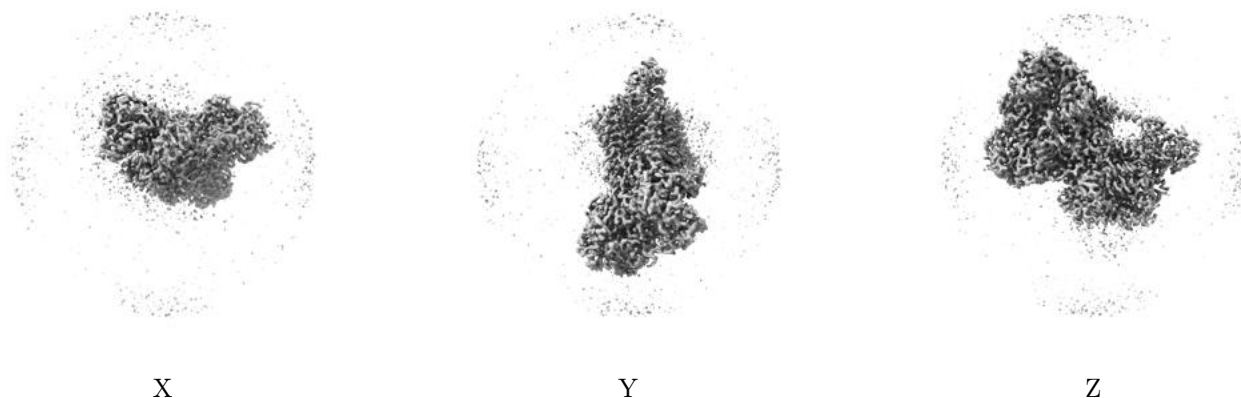


Z

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



The images above show the 3D surface view of the map at the recommended contour level 0.0398. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

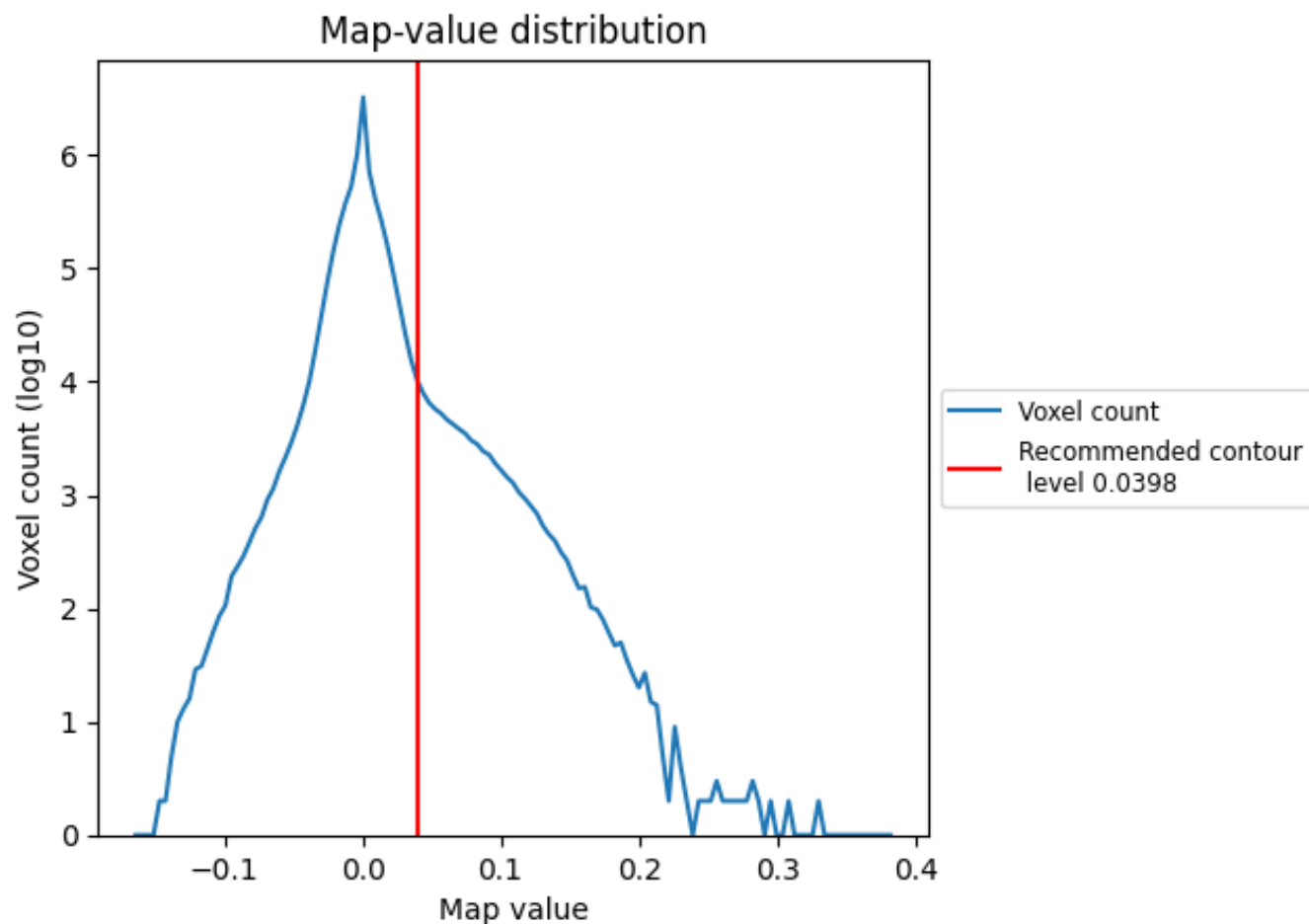
6.6 Mask visualisation [i](#)

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

7 Map analysis [i](#)

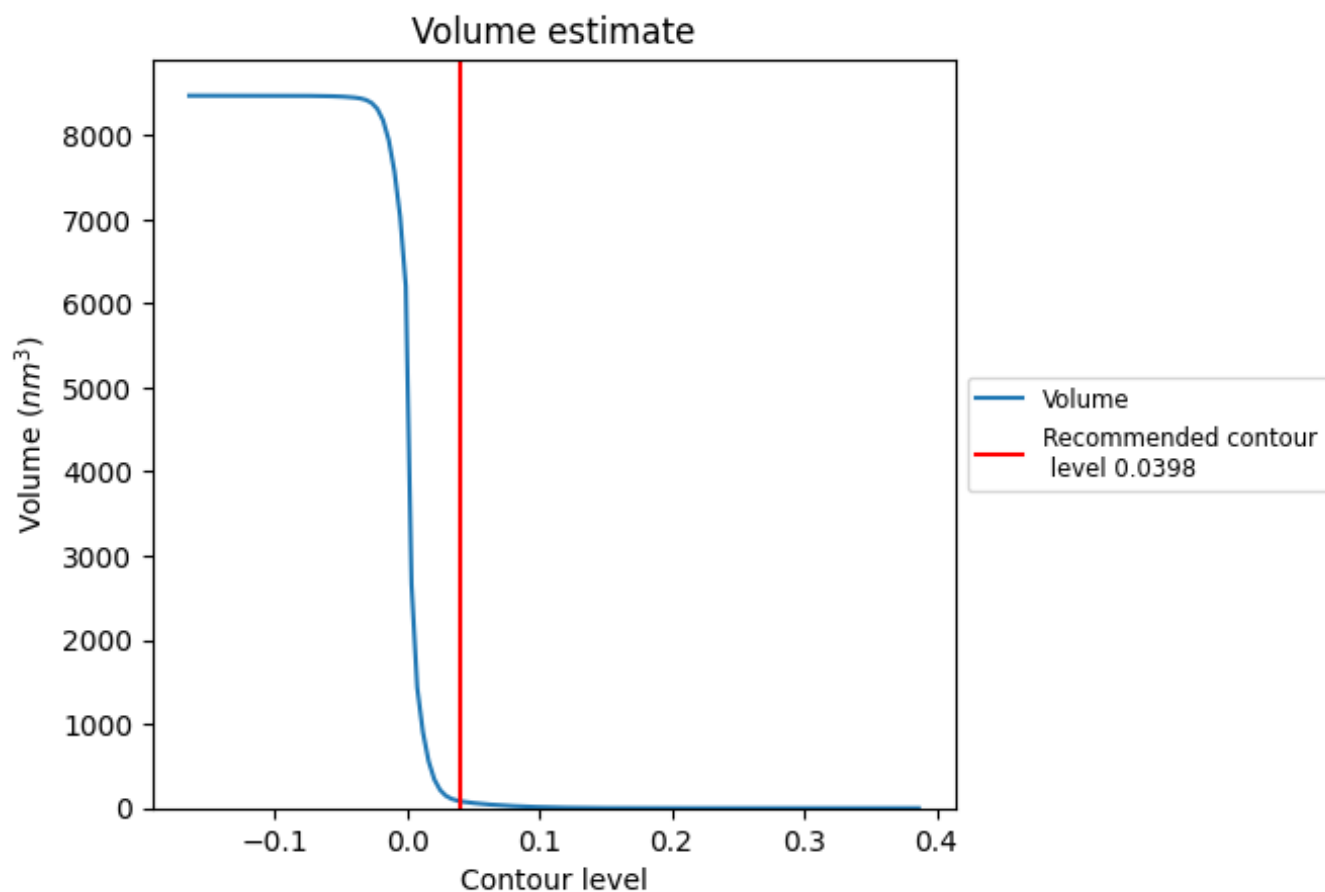
This section contains the results of statistical analysis of the map.

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.

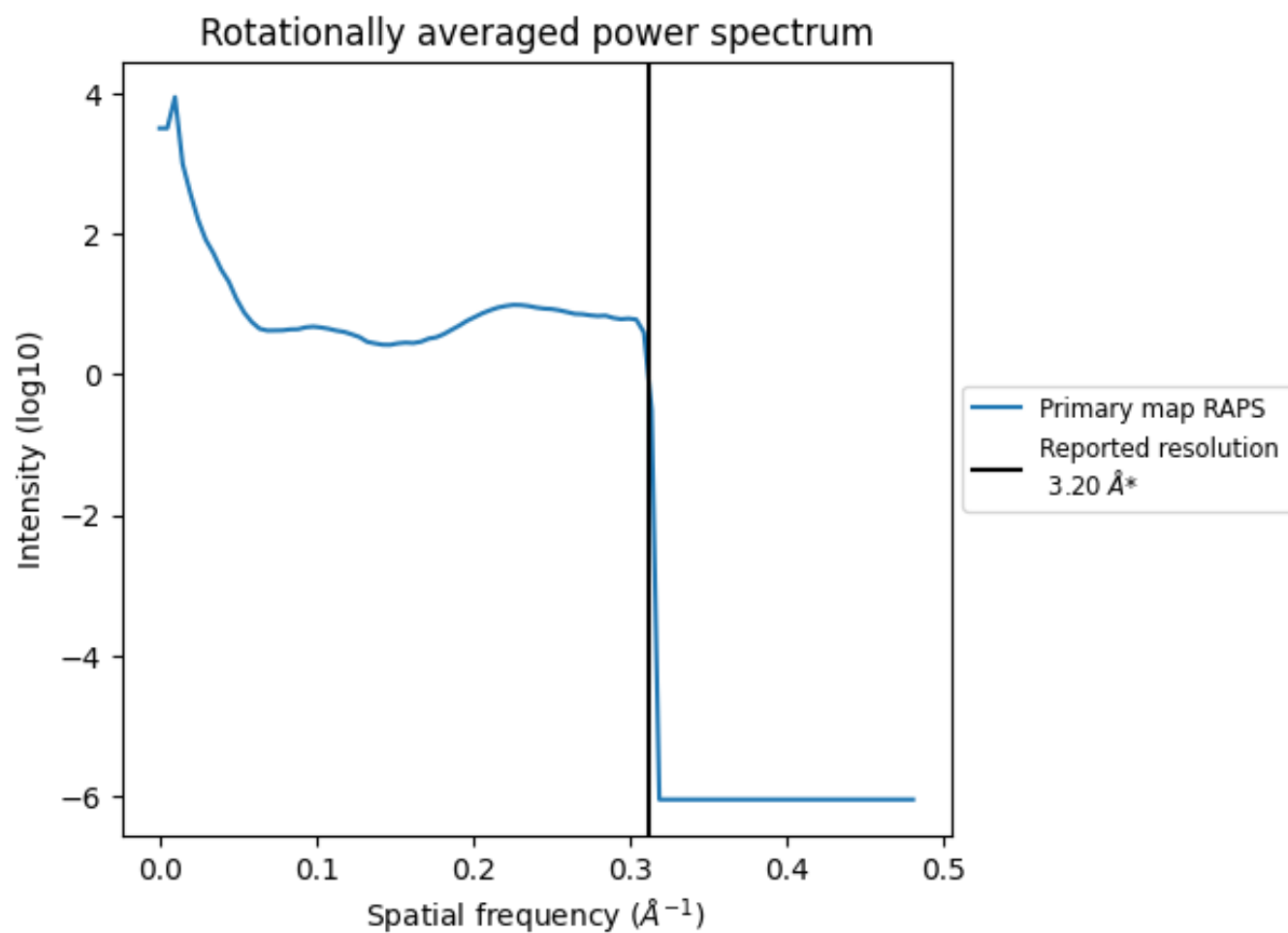
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 85 nm³; this corresponds to an approximate mass of 77 kDa.

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

7.3 Rotationally averaged power spectrum ⓘ



*Reported resolution corresponds to spatial frequency of 0.312 Å⁻¹

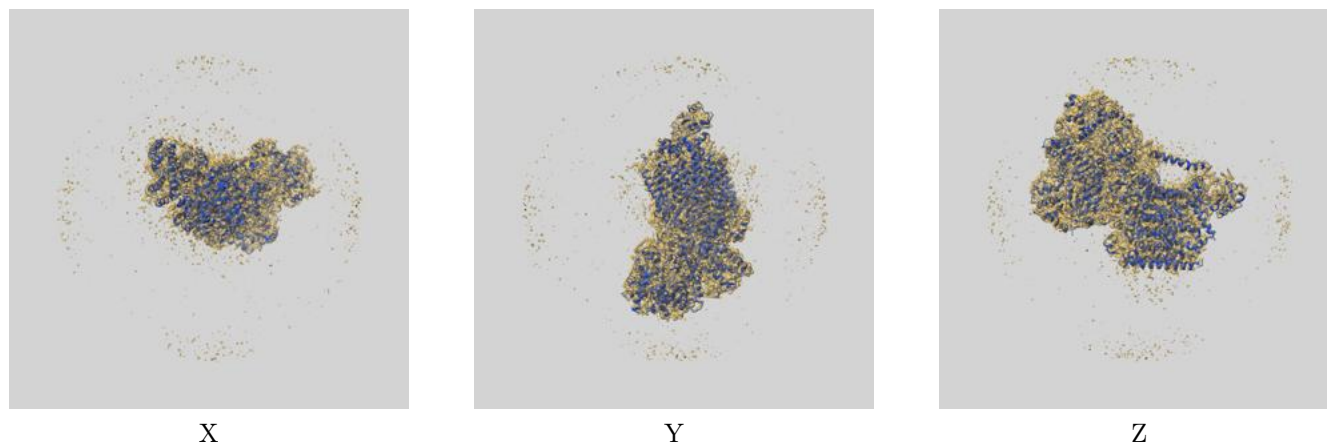
8 Fourier-Shell correlation ⓘ

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

9 Map-model fit [i](#)

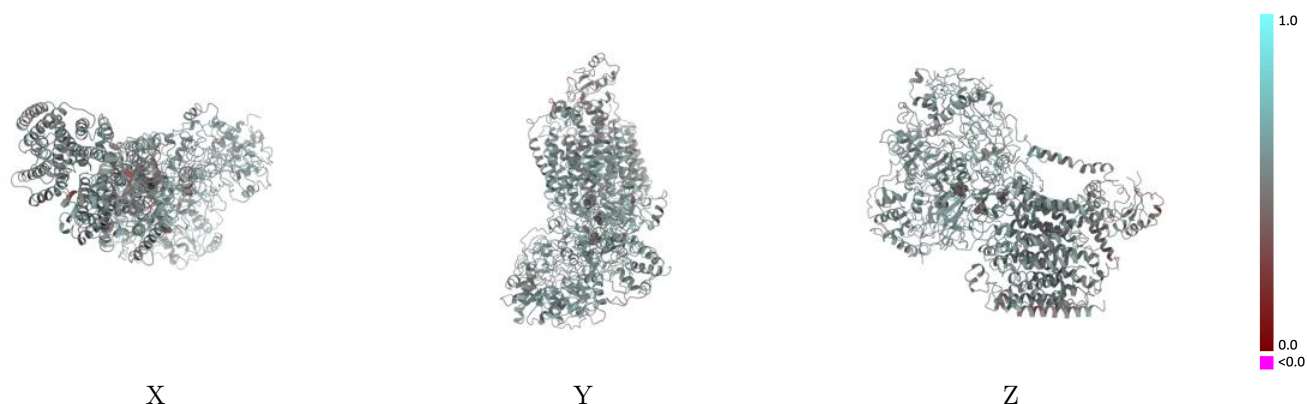
This section contains information regarding the fit between EMDB map EMD-0936 and PDB model 6LOD. Per-residue inclusion information can be found in section 3 on page 8.

9.1 Map-model overlay [i](#)



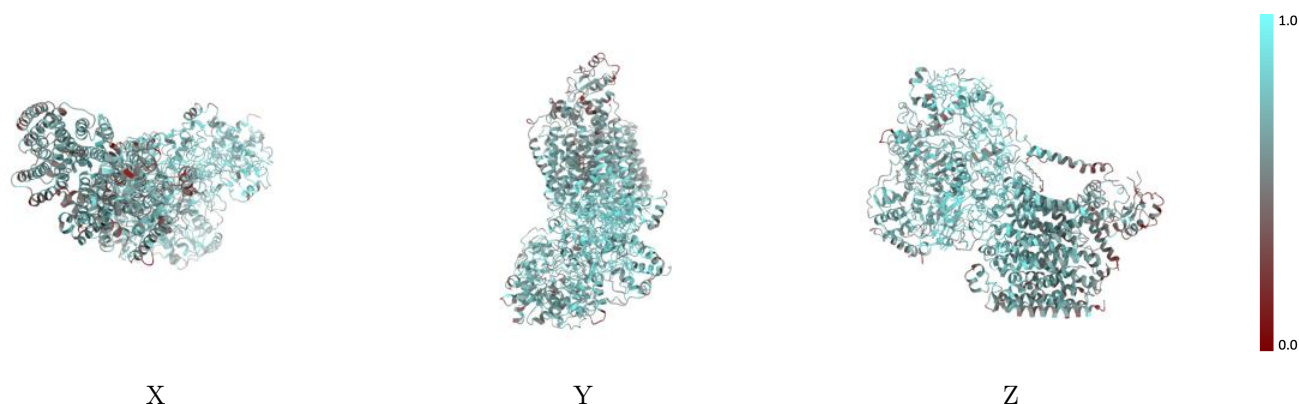
The images above show the 3D surface view of the map at the recommended contour level 0.0398 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



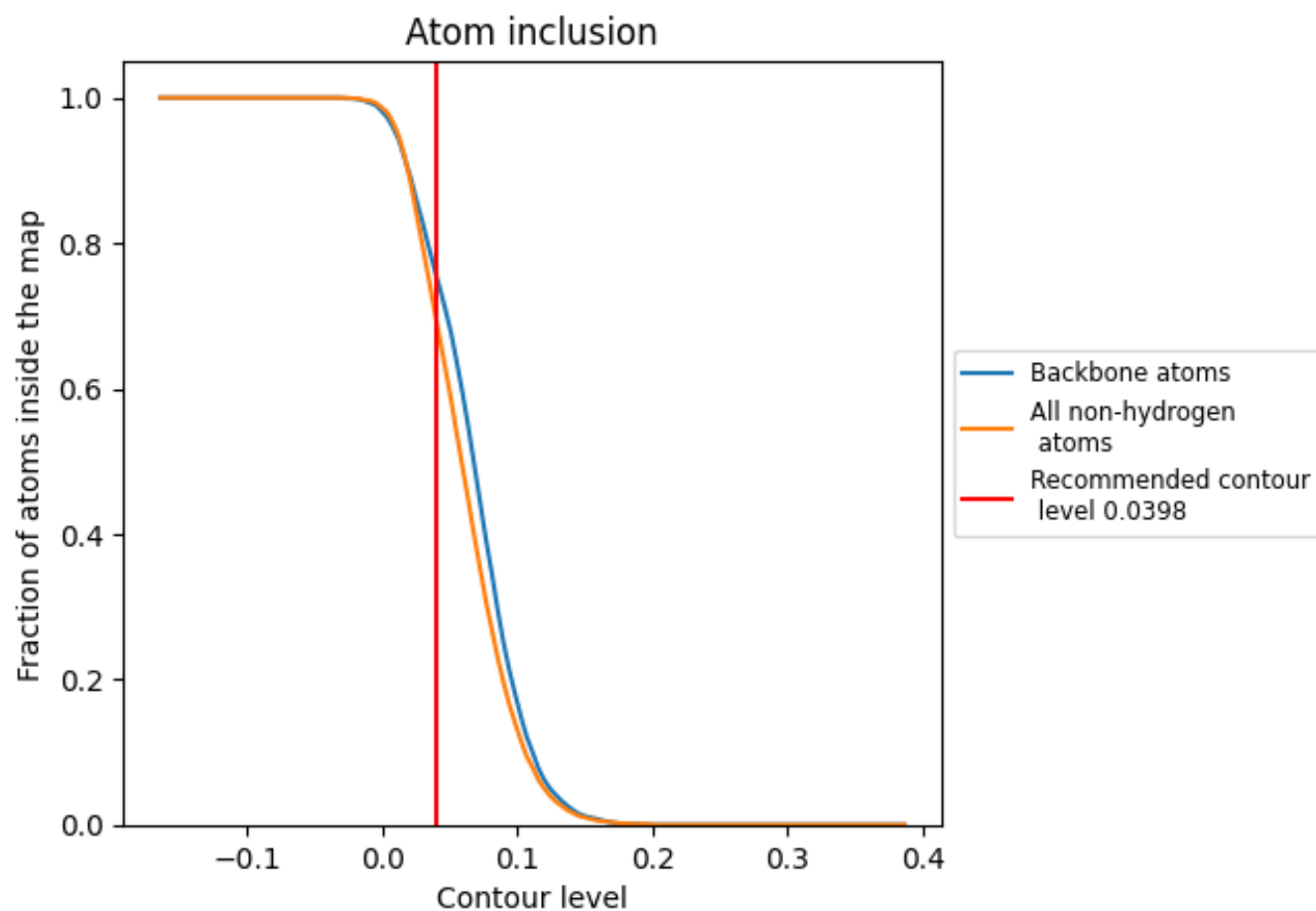
The images above show the model with each residue coloured according its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.0398).

9.4 Atom inclusion ⓘ



At the recommended contour level, 76% of all backbone atoms, 70% 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 (0.0398) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.6950	0.5370
A	0.7410	0.5400
B	0.7230	0.5470
C	0.6950	0.5390
D	0.5770	0.5000
E	0.6940	0.5280
F	0.6560	0.5280

1.0

0.0

<0.0