



Full wwPDB EM Validation Report ⓘ

Jul 3, 2023 – 04:38 PM EDT

PDB ID : 8FCB
EMDB ID : EMD-28976
Title : Cryo-EM structure of the human TRPV4 - RhoA in complex with GSK1016790A
Authors : Kwon, D.H.; Lee, S.-Y.; Zhang, F.
Deposited on : 2022-12-01
Resolution : 3.52 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.dev50
Mogul : 1.8.5 (274361), 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) : 2.34

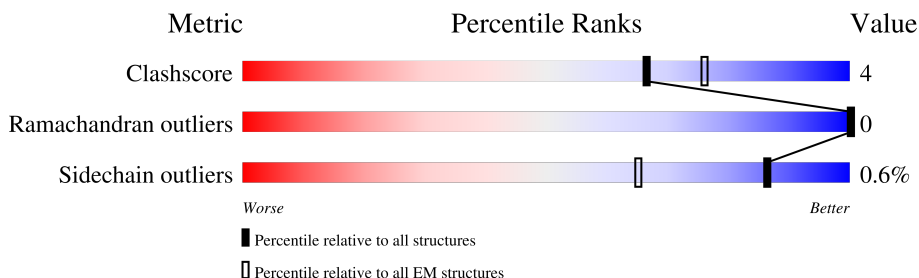
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 3.52 Å.

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



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

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

Mol	Chain	Length	Quality of chain
1	A	871	
1	B	871	
1	C	871	
1	D	871	
2	E	193	
2	F	193	
2	G	193	
2	H	193	

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
5	GSP	E	301	-	-	X	-
5	GSP	F	301	-	-	X	-
5	GSP	G	301	-	-	X	-
5	GSP	H	301	-	-	X	-

2 Entry composition [i](#)

There are 5 unique types of molecules in this entry. The entry contains 45156 atoms, of which 19924 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 Transient receptor potential cation channel subfamily V member 4.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
1	A	617	9711	3175	4846	805	859	26	0	0
1	B	617	9711	3175	4846	805	859	26	0	0
1	C	617	9711	3175	4846	805	859	26	0	0
1	D	617	9711	3175	4846	805	859	26	0	0

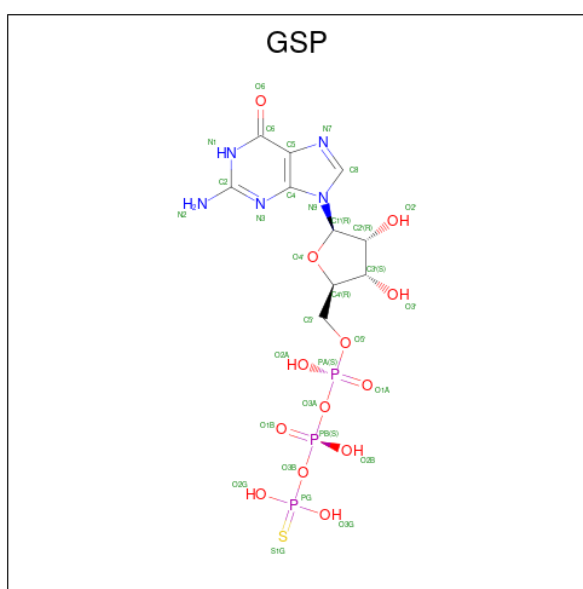
- Molecule 2 is a protein called Transforming protein RhoA.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
2	E	190	1375	850	41	233	244	7	0	0
2	F	190	1375	850	41	233	244	7	0	0
2	G	190	1375	850	41	233	244	7	0	0
2	H	190	1375	850	41	233	244	7	0	0

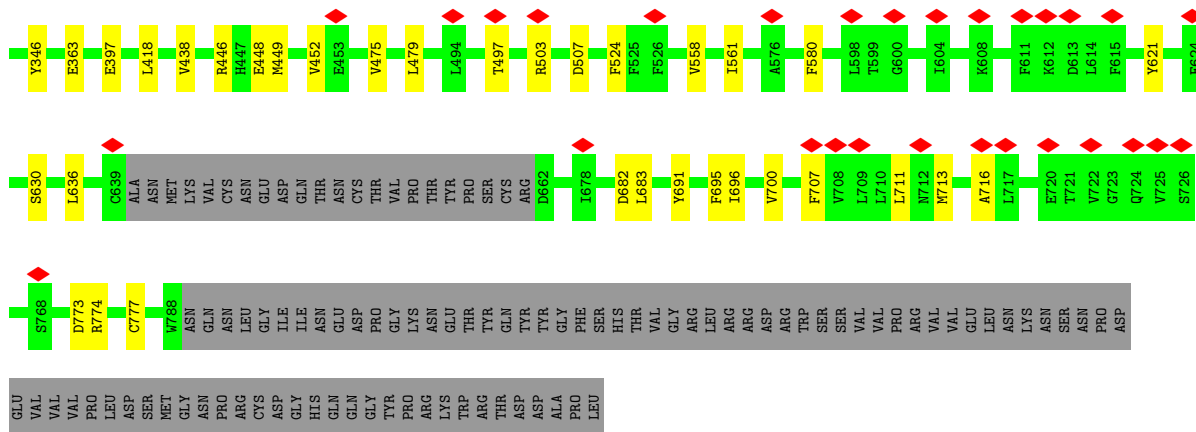
- Molecule 3 is N-[(2S)-1-{4-[N-(2,4-dichlorobenzene-1-sulfonyl)-L-seryl]piperazin-1-yl}-4-methyl-1-oxopentan-2-yl]-1-benzothiophene-2-carboxamide (three-letter code: XQ3) (formula: C₂₈H₃₂Cl₂N₄O₆S₂) (labeled as "Ligand of Interest" by depositor).

Mol	Chain	Residues	Atoms				AltConf
			Total	C	H	O	
4	B	1	Total 84	C 31	H 49	O 4	0
4	C	1	Total 84	C 31	H 49	O 4	0
4	C	1	Total 84	C 31	H 49	O 4	0
4	D	1	Total 84	C 31	H 49	O 4	0

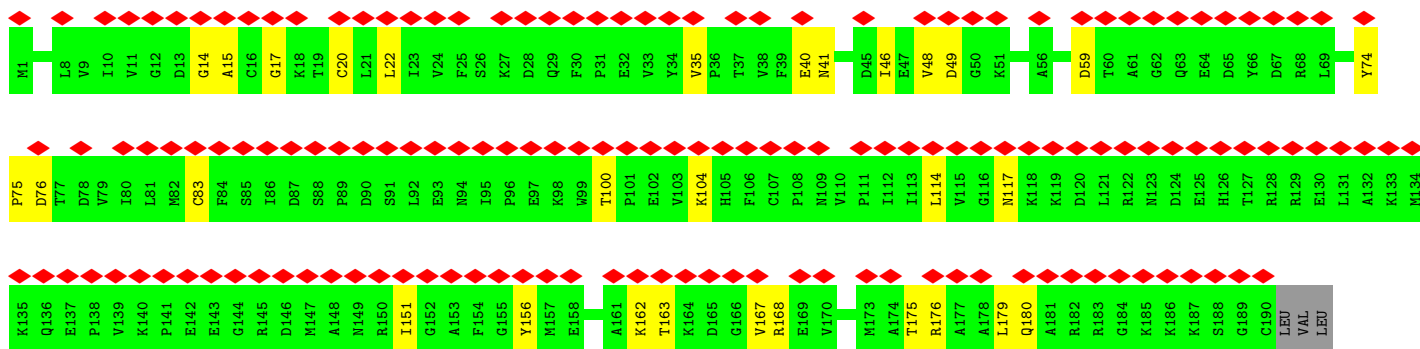
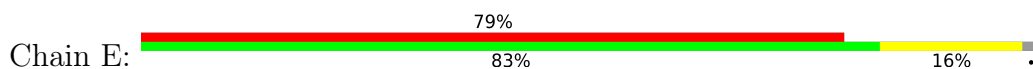
- Molecule 5 is 5'-GUANOSINE-DIPHOSPHATE-MONOTHIOPHOSPHATE (three-letter code: GSP) (formula: C₁₀H₁₆N₅O₁₃P₃S).



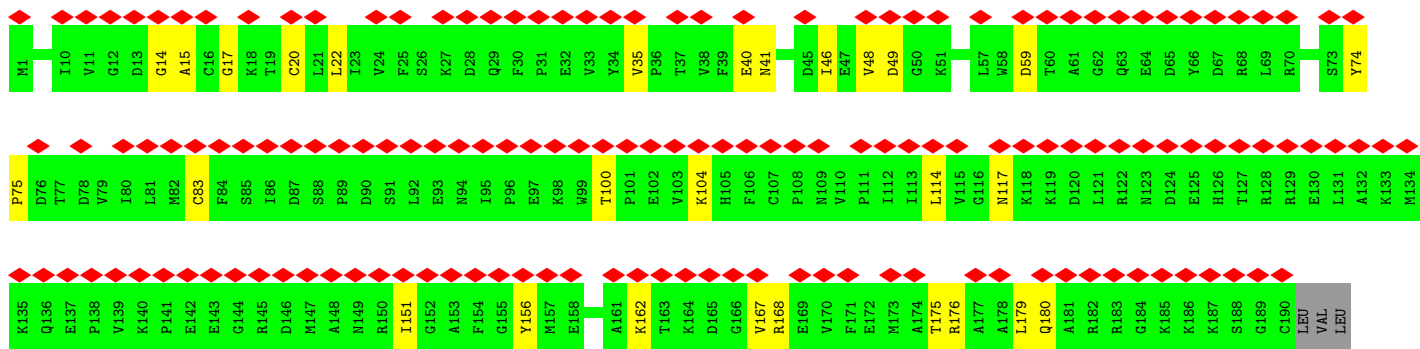
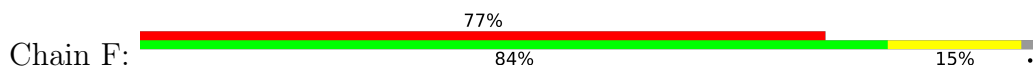
Mol	Chain	Residues	Atoms						AltConf	
			Total	C	H	N	O	P		S
5	E	1	Total 45	C 10	H 13	N 5	O 13	P 3	S 1	0
5	F	1	Total 45	C 10	H 13	N 5	O 13	P 3	S 1	0
5	G	1	Total 45	C 10	H 13	N 5	O 13	P 3	S 1	0
5	H	1	Total 45	C 10	H 13	N 5	O 13	P 3	S 1	0



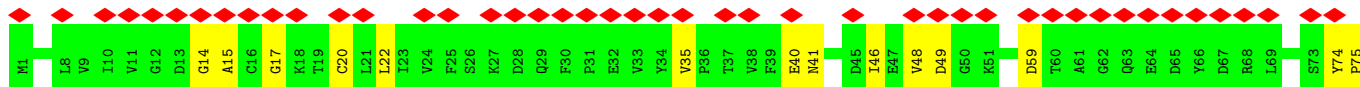
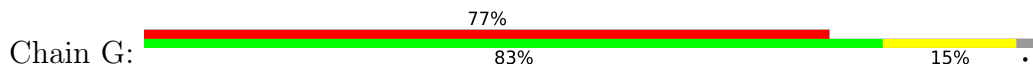
• Molecule 2: Transforming protein RhoA



• Molecule 2: Transforming protein RhoA

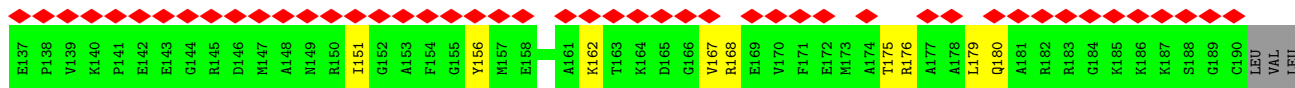
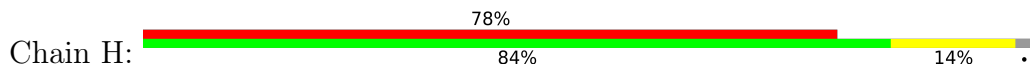


• Molecule 2: Transforming protein RhoA





• Molecule 2: Transforming protein RhoA



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, POINT, POINT, POINT, POINT, POINT, POINT, POINT	Depositor
Number of particles used	207645, 207645, 207645, 207645, 207645, 207645, 207645, 207645	Depositor
Resolution determination method	FSC 0.143 CUT-OFF, FSC 0.143 CUT-OFF, FSC 0.143 CUT-OFF, FSC 0.143 CUT-OFF, FSC 0.143 CUT-OFF, FSC 0.143 CUT-OFF, FSC 0.143 CUT-OFF, FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION, PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	60.00	Depositor
Minimum defocus (nm)	800	Depositor
Maximum defocus (nm)	2000	Depositor
Magnification	Not provided	
Image detector	GATAN K3 BIOQUANTUM (6k x 4k)	Depositor
Maximum map value	4.176	Depositor
Minimum map value	-2.362	Depositor
Average map value	0.010	Depositor
Map value standard deviation	0.091	Depositor
Recommended contour level	0.313	Depositor
Map size (Å)	276.48, 276.48, 276.48	wwPDB
Map dimensions	256, 256, 256	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.08, 1.08, 1.08	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: GSP, Y01, XQ3

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	0.26	0/4981	0.46	0/6767
1	B	0.26	0/4981	0.46	0/6767
1	C	0.26	0/4981	0.46	0/6767
1	D	0.26	0/4981	0.46	0/6767
2	E	0.25	0/1361	0.49	0/1860
2	F	0.25	0/1361	0.49	0/1860
2	G	0.25	0/1361	0.50	0/1860
2	H	0.25	0/1361	0.49	0/1860
All	All	0.26	0/25368	0.47	0/34508

There are no bond length outliers.

There are no bond angle outliers.

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	4865	4846	4846	29	0
1	B	4865	4846	4846	26	0
1	C	4865	4846	4846	26	0
1	D	4865	4846	4846	28	0
2	E	1334	41	1216	29	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	F	1334	41	1216	26	0
2	G	1334	41	1216	26	0
2	H	1334	41	1216	24	0
3	A	42	32	0	1	0
3	B	42	32	0	1	0
3	C	42	32	0	1	0
3	D	42	32	0	1	0
4	B	35	49	49	3	0
4	C	70	98	98	8	0
4	D	35	49	49	2	0
5	E	32	13	11	10	0
5	F	32	13	11	9	0
5	G	32	13	11	9	0
5	H	32	13	11	9	0
All	All	25232	19924	24488	199	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 4.

All (199) 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:C:225:GLU:OE2	2:F:40:GLU:O	1.65	1.14
1:A:225:GLU:OE2	2:E:40:GLU:O	1.71	1.09
1:B:225:GLU:OE2	2:G:40:GLU:O	1.78	1.02
1:D:225:GLU:OE2	2:H:40:GLU:O	1.82	0.98
1:C:225:GLU:OE1	2:F:41:ASN:ND2	2.15	0.80
1:B:225:GLU:OE1	2:G:41:ASN:ND2	2.13	0.77
1:D:225:GLU:OE1	2:H:41:ASN:ND2	2.19	0.74
2:G:20:CYS:SG	5:G:301:GSP:H3'	2.32	0.70
2:H:20:CYS:SG	5:H:301:GSP:H3'	2.32	0.70
2:E:20:CYS:SG	5:E:301:GSP:H3'	2.32	0.70
2:F:20:CYS:SG	5:F:301:GSP:H3'	2.32	0.70
1:A:314:MET:SD	1:A:314:MET:N	2.68	0.67
1:D:314:MET:N	1:D:314:MET:SD	2.68	0.66
1:C:314:MET:SD	1:C:314:MET:N	2.68	0.66
1:B:314:MET:SD	1:B:314:MET:N	2.68	0.66
1:A:700:VAL:HG21	4:C:1001:Y01:HAE2	1.79	0.65
1:D:700:VAL:HG21	4:D:902:Y01:HAE2	1.79	0.64
1:B:700:VAL:HG21	4:B:902:Y01:HAE2	1.79	0.64
1:C:700:VAL:HG21	4:C:1003:Y01:HAE2	1.79	0.64

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:G:162:LYS:HD3	5:G:301:GSP:N1	2.14	0.63
2:E:162:LYS:HD3	5:E:301:GSP:N1	2.14	0.62
1:A:397:GLU:OE1	1:A:397:GLU:N	2.33	0.62
2:F:162:LYS:HD3	5:F:301:GSP:N1	2.14	0.61
2:H:162:LYS:HD3	5:H:301:GSP:N1	2.14	0.61
1:B:397:GLU:N	1:B:397:GLU:OE1	2.33	0.61
1:D:397:GLU:N	1:D:397:GLU:OE1	2.33	0.61
1:C:397:GLU:N	1:C:397:GLU:OE1	2.33	0.61
1:C:225:GLU:OE1	2:F:41:ASN:HB2	2.04	0.57
1:C:670:LEU:HD23	4:C:1001:Y01:HAK2	1.85	0.57
1:D:269:ARG:CZ	2:H:76:ASP:OD2	2.52	0.57
2:H:17:GLY:HA2	5:H:301:GSP:H5'1	1.91	0.53
2:E:162:LYS:HD3	5:E:301:GSP:HN1	1.73	0.53
2:G:17:GLY:HA2	5:G:301:GSP:H5'1	1.91	0.53
2:F:17:GLY:HA2	5:F:301:GSP:H5'1	1.90	0.53
1:D:333:ASP:OD1	1:D:334:ASN:N	2.42	0.53
1:A:225:GLU:CD	2:E:40:GLU:O	2.45	0.53
2:F:162:LYS:HD3	5:F:301:GSP:HN1	1.73	0.53
2:E:17:GLY:HA2	5:E:301:GSP:H5'1	1.91	0.53
1:A:333:ASP:OD1	1:A:334:ASN:N	2.42	0.53
1:C:333:ASP:OD1	1:C:334:ASN:N	2.42	0.52
1:C:682:ASP:OD1	1:C:683:LEU:N	2.43	0.52
1:A:682:ASP:OD1	1:A:683:LEU:N	2.43	0.52
1:D:682:ASP:OD1	1:D:683:LEU:N	2.43	0.52
2:H:162:LYS:HD3	5:H:301:GSP:HN1	1.73	0.52
1:B:333:ASP:OD1	1:B:334:ASN:N	2.42	0.52
1:B:682:ASP:OD1	1:B:683:LEU:N	2.43	0.52
2:F:48:VAL:HG23	2:F:49:ASP:N	2.26	0.51
2:G:162:LYS:HD3	5:G:301:GSP:HN1	1.73	0.51
2:E:48:VAL:HG23	2:E:49:ASP:N	2.26	0.51
2:G:48:VAL:HG23	2:G:49:ASP:N	2.26	0.51
2:H:48:VAL:HG23	2:H:49:ASP:N	2.26	0.51
1:C:475:VAL:O	1:C:479:LEU:HD23	2.12	0.50
2:E:48:VAL:HG23	2:E:49:ASP:H	1.77	0.50
1:B:475:VAL:O	1:B:479:LEU:HD23	2.12	0.50
1:A:773:ASP:OD1	1:A:774:ARG:N	2.44	0.50
2:F:48:VAL:HG23	2:F:49:ASP:H	1.77	0.50
1:A:503:ARG:N	1:A:507:ASP:OD2	2.45	0.50
1:C:503:ARG:N	1:C:507:ASP:OD2	2.45	0.50
2:G:48:VAL:HG23	2:G:49:ASP:H	1.77	0.49
1:A:572:GLU:O	1:D:691:TYR:OH	2.30	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:503:ARG:N	1:B:507:ASP:OD2	2.45	0.49
1:C:636:LEU:HD12	1:C:636:LEU:O	2.13	0.49
1:B:636:LEU:HD12	1:B:636:LEU:O	2.13	0.49
2:H:48:VAL:HG23	2:H:49:ASP:H	1.77	0.49
1:A:475:VAL:O	1:A:479:LEU:HD23	2.12	0.49
1:D:503:ARG:N	1:D:507:ASP:OD2	2.45	0.49
2:E:35:VAL:HG23	2:E:35:VAL:O	2.13	0.49
2:F:35:VAL:HG23	2:F:35:VAL:O	2.13	0.49
1:B:448:GLU:OE1	1:B:448:GLU:N	2.44	0.49
1:D:475:VAL:O	1:D:479:LEU:HD23	2.12	0.49
2:H:35:VAL:O	2:H:35:VAL:HG23	2.13	0.49
1:A:225:GLU:OE1	2:E:41:ASN:HB2	2.13	0.48
1:D:636:LEU:HD12	1:D:636:LEU:O	2.13	0.48
1:B:773:ASP:OD1	1:B:774:ARG:N	2.44	0.48
2:G:100:THR:O	2:G:104:LYS:HG2	2.14	0.48
2:F:74:TYR:N	2:F:75:PRO:HD2	2.29	0.48
2:G:35:VAL:O	2:G:35:VAL:HG23	2.13	0.48
2:H:100:THR:O	2:H:104:LYS:HG2	2.14	0.48
1:A:636:LEU:O	1:A:636:LEU:HD12	2.13	0.48
2:E:100:THR:O	2:E:104:LYS:HG2	2.14	0.47
2:G:74:TYR:N	2:G:75:PRO:HD2	2.29	0.47
2:E:74:TYR:N	2:E:75:PRO:HD2	2.29	0.47
1:B:621:TYR:CE2	4:C:1003:Y01:HAB3	2.48	0.47
2:E:83:CYS:SG	2:E:117:ASN:ND2	2.78	0.47
2:F:100:THR:O	2:F:104:LYS:HG2	2.14	0.47
1:C:274:GLN:OE1	1:C:320:ARG:NH2	2.48	0.47
1:C:448:GLU:OE1	1:C:448:GLU:N	2.44	0.47
1:D:274:GLN:OE1	1:D:320:ARG:NH2	2.48	0.47
1:D:448:GLU:OE1	1:D:448:GLU:N	2.44	0.47
2:G:17:GLY:HA2	5:G:301:GSP:C5'	2.45	0.47
1:A:225:GLU:OE1	2:E:41:ASN:ND2	2.41	0.47
1:B:274:GLN:OE1	1:B:320:ARG:NH2	2.48	0.46
2:H:17:GLY:HA2	5:H:301:GSP:C5'	2.45	0.46
1:A:274:GLN:OE1	1:A:320:ARG:NH2	2.48	0.46
1:C:438:VAL:O	1:C:446:ARG:NH1	2.49	0.46
2:H:74:TYR:N	2:H:75:PRO:HD2	2.29	0.46
2:F:17:GLY:HA2	5:F:301:GSP:C5'	2.45	0.46
2:G:83:CYS:SG	2:G:117:ASN:ND2	2.78	0.46
2:G:162:LYS:CE	5:G:301:GSP:HN1	2.29	0.46
1:B:438:VAL:O	1:B:446:ARG:NH1	2.49	0.45
1:D:773:ASP:OD1	1:D:774:ARG:N	2.44	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:E:17:GLY:HA2	5:E:301:GSP:C5'	2.45	0.45
2:E:162:LYS:CE	5:E:301:GSP:HN1	2.29	0.45
1:D:438:VAL:O	1:D:446:ARG:NH1	2.49	0.45
1:C:773:ASP:OD1	1:C:774:ARG:N	2.44	0.45
2:F:162:LYS:CE	5:F:301:GSP:HN1	2.29	0.45
1:A:269:ARG:CZ	2:E:76:ASP:OD2	2.65	0.45
1:A:438:VAL:O	1:A:446:ARG:NH1	2.49	0.45
1:A:448:GLU:OE1	1:A:448:GLU:N	2.44	0.45
2:G:114:LEU:O	2:G:156:TYR:HA	2.17	0.45
2:H:114:LEU:O	2:H:156:TYR:HA	2.17	0.45
2:E:114:LEU:O	2:E:156:TYR:HA	2.17	0.44
2:E:22:LEU:HD22	2:E:59:ASP:OD1	2.18	0.44
2:G:14:GLY:HA2	5:G:301:GSP:O2G	2.18	0.44
2:G:46:ILE:HG21	2:G:175:THR:HG21	2.00	0.44
1:C:621:TYR:CE2	4:C:1001:Y01:HAB3	2.53	0.44
2:F:83:CYS:SG	2:F:117:ASN:ND2	2.78	0.44
2:H:175:THR:O	2:H:179:LEU:HD23	2.18	0.44
1:D:497:THR:O	1:D:497:THR:HG23	2.18	0.44
2:E:175:THR:O	2:E:179:LEU:HD23	2.18	0.44
2:F:114:LEU:O	2:F:156:TYR:HA	2.17	0.44
2:H:14:GLY:HA2	5:H:301:GSP:O2G	2.18	0.44
1:B:497:THR:HG23	1:B:497:THR:O	2.18	0.44
2:E:14:GLY:HA2	5:E:301:GSP:O2G	2.18	0.44
2:F:15:ALA:HA	5:F:301:GSP:O3A	2.18	0.44
2:F:22:LEU:HD22	2:F:59:ASP:OD1	2.18	0.44
2:F:175:THR:O	2:F:179:LEU:HD23	2.18	0.44
2:H:162:LYS:CE	5:H:301:GSP:HN1	2.29	0.44
2:H:22:LEU:HD22	2:H:59:ASP:OD1	2.18	0.43
1:A:497:THR:HG23	1:A:497:THR:O	2.18	0.43
2:H:46:ILE:HG21	2:H:175:THR:HG21	2.00	0.43
1:A:722:VAL:HB	1:D:716:ALA:HB1	2.00	0.43
1:C:497:THR:O	1:C:497:THR:HG23	2.18	0.43
2:F:46:ILE:HG21	2:F:175:THR:HG21	2.00	0.43
2:G:15:ALA:HA	5:G:301:GSP:O3A	2.18	0.43
2:F:151:ILE:O	2:F:151:ILE:HG22	2.19	0.43
2:G:22:LEU:HD22	2:G:59:ASP:OD1	2.18	0.43
2:H:15:ALA:HA	5:H:301:GSP:O3A	2.18	0.43
2:H:151:ILE:HG22	2:H:151:ILE:O	2.19	0.43
1:B:170:LEU:HB3	1:B:171:PRO:HD3	2.01	0.43
4:C:1001:Y01:HAC1	4:C:1001:Y01:HAU2	2.01	0.43
2:G:167:VAL:HG23	2:G:168:ARG:N	2.34	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:524:PHE:CE1	3:D:901:XQ3:C35	3.02	0.43
4:D:902:Y01:HAC1	4:D:902:Y01:HAU2	2.01	0.43
2:F:14:GLY:HA2	5:F:301:GSP:O2G	2.18	0.43
2:H:167:VAL:HG23	2:H:168:ARG:N	2.34	0.43
2:G:151:ILE:HG22	2:G:151:ILE:O	2.19	0.43
1:D:170:LEU:HB3	1:D:171:PRO:HD3	2.01	0.42
2:G:20:CYS:SG	5:G:301:GSP:H5'1	2.59	0.42
2:G:175:THR:O	2:G:179:LEU:HD23	2.18	0.42
1:B:670:LEU:HD23	4:C:1003:Y01:HAK2	2.01	0.42
1:A:486:THR:HG23	1:D:630:SER:HB2	2.01	0.42
2:E:15:ALA:HA	5:E:301:GSP:O3A	2.17	0.42
2:E:46:ILE:HG21	2:E:175:THR:HG21	2.00	0.42
2:G:176:ARG:O	2:G:180:GLN:HG3	2.20	0.42
4:C:1003:Y01:HAC1	4:C:1003:Y01:HAU2	2.01	0.42
2:E:167:VAL:HG23	2:E:168:ARG:N	2.34	0.42
1:B:225:GLU:OE1	2:G:41:ASN:HB2	2.20	0.42
2:E:151:ILE:HG22	2:E:151:ILE:O	2.19	0.42
2:H:176:ARG:O	2:H:180:GLN:HG3	2.20	0.42
1:A:524:PHE:CE1	3:A:901:XQ3:C35	3.02	0.42
1:B:524:PHE:CE1	3:B:901:XQ3:C35	3.02	0.42
2:F:167:VAL:HG23	2:F:168:ARG:N	2.34	0.42
4:B:902:Y01:HAU2	4:B:902:Y01:HAC1	2.01	0.42
1:C:170:LEU:HB3	1:C:171:PRO:HD3	2.01	0.42
2:F:20:CYS:SG	5:F:301:GSP:H5'1	2.59	0.42
1:A:170:LEU:HB3	1:A:171:PRO:HD3	2.01	0.42
2:E:20:CYS:SG	5:E:301:GSP:H5'1	2.59	0.42
1:C:418:LEU:HD21	1:C:777:CYS:CB	2.50	0.42
1:C:449:MET:O	1:C:452:VAL:HG23	2.20	0.42
2:F:176:ARG:O	2:F:180:GLN:HG3	2.20	0.42
2:H:20:CYS:SG	5:H:301:GSP:H5'1	2.59	0.42
1:C:524:PHE:CE1	3:C:1002:XQ3:C35	3.02	0.42
1:A:696:ILE:O	1:A:700:VAL:HG23	2.20	0.41
2:E:176:ARG:O	2:E:180:GLN:HG3	2.20	0.41
1:B:696:ILE:O	1:B:700:VAL:HG23	2.20	0.41
1:D:696:ILE:O	1:D:700:VAL:HG23	2.20	0.41
4:B:902:Y01:HAB3	1:D:621:TYR:CE2	2.55	0.41
1:C:225:GLU:CD	2:F:40:GLU:O	2.52	0.41
1:D:346:TYR:OH	1:D:363:GLU:OE2	2.36	0.41
1:B:269:ARG:CZ	2:G:76:ASP:OD2	2.68	0.41
1:C:346:TYR:OH	1:C:363:GLU:OE2	2.36	0.41
1:A:202:LEU:N	1:A:202:LEU:HD23	2.36	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:418:LEU:HD21	1:A:777:CYS:CB	2.50	0.41
1:C:696:ILE:O	1:C:700:VAL:HG23	2.20	0.41
1:D:449:MET:O	1:D:452:VAL:HG23	2.20	0.41
1:B:449:MET:O	1:B:452:VAL:HG23	2.20	0.41
1:C:202:LEU:N	1:C:202:LEU:HD23	2.36	0.41
1:D:418:LEU:HD21	1:D:777:CYS:CB	2.50	0.41
1:A:449:MET:O	1:A:452:VAL:HG23	2.20	0.41
1:A:558:VAL:O	1:A:561:ILE:HG22	2.21	0.41
1:A:707:PHE:O	1:A:711:LEU:HB3	2.21	0.41
1:D:707:PHE:O	1:D:711:LEU:HB3	2.21	0.41
1:B:346:TYR:OH	1:B:363:GLU:OE2	2.36	0.40
1:B:418:LEU:HD21	1:B:777:CYS:CB	2.50	0.40
1:D:558:VAL:O	1:D:561:ILE:HG22	2.21	0.40
2:E:162:LYS:HG3	2:E:163:THR:HG23	2.04	0.40
2:E:162:LYS:CD	5:E:301:GSP:HN1	2.35	0.40
1:B:202:LEU:HD23	1:B:202:LEU:N	2.36	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	613/871 (70%)	596 (97%)	17 (3%)	0	100	100
1	B	613/871 (70%)	595 (97%)	18 (3%)	0	100	100
1	C	613/871 (70%)	596 (97%)	17 (3%)	0	100	100
1	D	613/871 (70%)	595 (97%)	18 (3%)	0	100	100
2	E	188/193 (97%)	180 (96%)	8 (4%)	0	100	100
2	F	188/193 (97%)	180 (96%)	8 (4%)	0	100	100
2	G	188/193 (97%)	180 (96%)	8 (4%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
2	H	188/193 (97%)	180 (96%)	8 (4%)	0	100	100
All	All	3204/4256 (75%)	3102 (97%)	102 (3%)	0	100	100

There are no Ramachandran outliers to report.

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	515/761 (68%)	511 (99%)	4 (1%)	81	91
1	B	515/761 (68%)	511 (99%)	4 (1%)	81	91
1	C	515/761 (68%)	511 (99%)	4 (1%)	81	91
1	D	515/761 (68%)	511 (99%)	4 (1%)	81	91
2	E	119/167 (71%)	119 (100%)	0	100	100
2	F	119/167 (71%)	119 (100%)	0	100	100
2	G	119/167 (71%)	119 (100%)	0	100	100
2	H	119/167 (71%)	119 (100%)	0	100	100
All	All	2536/3712 (68%)	2520 (99%)	16 (1%)	86	94

All (16) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	341	PHE
1	A	580	PHE
1	A	695	PHE
1	A	713	MET
1	B	341	PHE
1	B	580	PHE
1	B	695	PHE
1	B	713	MET
1	C	341	PHE
1	C	580	PHE

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Mol	Chain	Res	Type
1	C	695	PHE
1	C	713	MET
1	D	341	PHE
1	D	580	PHE
1	D	695	PHE
1	D	713	MET

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (5) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	712	ASN
1	B	712	ASN
1	C	712	ASN
1	D	474	ASN
1	D	712	ASN

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](#)

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
5	GSP	F	301	-	26,34,34	2.84	13 (50%)	27,54,54	1.47	5 (18%)
4	Y01	C	1001	-	38,38,38	1.12	3 (7%)	57,57,57	2.25	15 (26%)
4	Y01	B	902	-	38,38,38	1.12	3 (7%)	57,57,57	2.25	14 (24%)
5	GSP	G	301	-	26,34,34	2.84	13 (50%)	27,54,54	1.47	5 (18%)
3	XQ3	C	1002	-	41,45,45	2.91	12 (29%)	54,65,65	2.53	14 (25%)
5	GSP	E	301	-	26,34,34	2.83	13 (50%)	27,54,54	1.47	5 (18%)
3	XQ3	D	901	-	41,45,45	2.91	12 (29%)	54,65,65	2.53	14 (25%)
5	GSP	H	301	-	26,34,34	2.83	13 (50%)	27,54,54	1.47	5 (18%)
4	Y01	C	1003	-	38,38,38	1.11	3 (7%)	57,57,57	2.25	15 (26%)
3	XQ3	A	901	-	41,45,45	2.91	12 (29%)	54,65,65	2.53	14 (25%)
4	Y01	D	902	-	38,38,38	1.12	3 (7%)	57,57,57	2.25	14 (24%)
3	XQ3	B	901	-	41,45,45	2.91	12 (29%)	54,65,65	2.52	14 (25%)

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	GSP	F	301	-	-	2/17/38/38	0/3/3/3
4	Y01	C	1001	-	-	14/19/77/77	0/4/4/4
4	Y01	B	902	-	-	14/19/77/77	0/4/4/4
5	GSP	G	301	-	-	2/17/38/38	0/3/3/3
3	XQ3	C	1002	-	-	8/39/51/51	0/4/4/4
5	GSP	E	301	-	-	2/17/38/38	0/3/3/3
3	XQ3	D	901	-	-	8/39/51/51	0/4/4/4
5	GSP	H	301	-	-	2/17/38/38	0/3/3/3
4	Y01	C	1003	-	-	14/19/77/77	0/4/4/4
3	XQ3	A	901	-	-	8/39/51/51	0/4/4/4
4	Y01	D	902	-	-	14/19/77/77	0/4/4/4
3	XQ3	B	901	-	-	8/39/51/51	0/4/4/4

All (112) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	B	901	XQ3	C25-N22	10.35	1.49	1.34
3	D	901	XQ3	C25-N22	10.34	1.49	1.34

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	901	XQ3	C25-N22	10.32	1.49	1.34
3	C	1002	XQ3	C25-N22	10.30	1.49	1.34
3	C	1002	XQ3	C18-N19	9.19	1.48	1.34
3	A	901	XQ3	C18-N19	9.17	1.48	1.34
3	B	901	XQ3	C18-N19	9.16	1.48	1.34
3	D	901	XQ3	C18-N19	9.16	1.48	1.34
3	D	901	XQ3	C07-N06	6.18	1.47	1.34
3	A	901	XQ3	C07-N06	6.17	1.47	1.34
3	C	1002	XQ3	C07-N06	6.14	1.47	1.34
3	B	901	XQ3	C07-N06	6.14	1.47	1.34
5	G	301	GSP	O4'-C4'	-5.72	1.32	1.45
5	E	301	GSP	O4'-C4'	-5.70	1.32	1.45
5	H	301	GSP	O4'-C4'	-5.69	1.32	1.45
5	F	301	GSP	O4'-C4'	-5.69	1.32	1.45
5	H	301	GSP	C2-N3	5.66	1.47	1.33
5	G	301	GSP	C2-N3	5.65	1.46	1.33
5	F	301	GSP	C2-N3	5.63	1.46	1.33
5	E	301	GSP	C2-N3	5.63	1.46	1.33
3	D	901	XQ3	C32-S30	5.25	1.85	1.77
3	C	1002	XQ3	C32-S30	5.25	1.85	1.77
3	A	901	XQ3	C32-S30	5.24	1.85	1.77
3	B	901	XQ3	C32-S30	5.22	1.85	1.77
5	F	301	GSP	C4-N3	5.19	1.50	1.37
5	H	301	GSP	C4-N3	5.17	1.49	1.37
5	E	301	GSP	C4-N3	5.16	1.49	1.37
5	G	301	GSP	C4-N3	5.14	1.49	1.37
5	F	301	GSP	C2-N2	5.09	1.46	1.34
5	E	301	GSP	C2-N2	5.08	1.46	1.34
3	D	901	XQ3	S30-N29	5.07	1.70	1.61
3	C	1002	XQ3	S30-N29	5.07	1.70	1.61
3	A	901	XQ3	S30-N29	5.07	1.70	1.61
5	H	301	GSP	C2-N2	5.07	1.46	1.34
5	G	301	GSP	C2-N2	5.05	1.46	1.34
3	B	901	XQ3	S30-N29	5.04	1.70	1.61
5	F	301	GSP	C6-N1	4.03	1.43	1.37
5	G	301	GSP	C6-N1	4.02	1.43	1.37
5	H	301	GSP	C6-N1	4.00	1.43	1.37
5	E	301	GSP	C6-N1	3.99	1.43	1.37
3	C	1002	XQ3	C08-S16	-3.38	1.68	1.72
3	B	901	XQ3	C08-S16	-3.37	1.68	1.72
5	G	301	GSP	PG-O3G	3.35	1.65	1.54
3	D	901	XQ3	C08-S16	-3.35	1.68	1.72

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	901	XQ3	C08-S16	-3.34	1.68	1.72
5	F	301	GSP	PG-O3G	3.34	1.65	1.54
5	H	301	GSP	PG-O3G	3.33	1.65	1.54
5	E	301	GSP	PG-O3G	3.33	1.65	1.54
5	H	301	GSP	C5-C6	3.32	1.54	1.47
4	C	1003	Y01	OAW-CAY	3.31	1.43	1.34
5	E	301	GSP	C5-C6	3.31	1.54	1.47
5	G	301	GSP	C5-C6	3.31	1.54	1.47
4	C	1001	Y01	OAW-CAY	3.30	1.43	1.34
4	B	902	Y01	OAW-CAY	3.29	1.43	1.34
4	D	902	Y01	OAW-CAY	3.29	1.43	1.34
5	F	301	GSP	C5-C6	3.29	1.54	1.47
5	F	301	GSP	PG-O2G	3.17	1.65	1.54
5	G	301	GSP	PG-O2G	3.16	1.65	1.54
5	E	301	GSP	PG-O2G	3.16	1.65	1.54
5	H	301	GSP	PG-O2G	3.15	1.65	1.54
5	H	301	GSP	O3'-C3'	-3.08	1.35	1.43
5	G	301	GSP	O3'-C3'	-3.08	1.35	1.43
5	E	301	GSP	O3'-C3'	-3.07	1.35	1.43
3	B	901	XQ3	O31-S30	3.07	1.47	1.43
3	D	901	XQ3	O31-S30	3.07	1.47	1.43
5	F	301	GSP	O3'-C3'	-3.06	1.35	1.43
3	A	901	XQ3	O31-S30	3.06	1.47	1.43
3	C	1002	XQ3	O31-S30	3.04	1.47	1.43
4	D	902	Y01	OAH-CAX	-2.77	1.21	1.30
4	C	1001	Y01	OAH-CAX	-2.77	1.21	1.30
5	G	301	GSP	C2-N1	2.76	1.44	1.37
4	C	1003	Y01	OAH-CAX	-2.76	1.21	1.30
4	B	902	Y01	OAH-CAX	-2.75	1.21	1.30
5	E	301	GSP	C2-N1	2.75	1.44	1.37
5	F	301	GSP	C2-N1	2.75	1.44	1.37
5	H	301	GSP	C2-N1	2.73	1.44	1.37
5	E	301	GSP	O2'-C2'	2.71	1.49	1.43
5	F	301	GSP	O2'-C2'	2.71	1.49	1.43
3	D	901	XQ3	O40-S30	2.71	1.46	1.43
5	G	301	GSP	O2'-C2'	2.71	1.49	1.43
3	A	901	XQ3	O40-S30	2.70	1.46	1.43
5	H	301	GSP	O2'-C2'	2.69	1.49	1.43
3	B	901	XQ3	O40-S30	2.69	1.46	1.43
3	C	1002	XQ3	O40-S30	2.68	1.46	1.43
3	C	1002	XQ3	C33-CL34	2.46	1.79	1.73
5	F	301	GSP	C5-C4	-2.45	1.36	1.43

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	901	XQ3	C33-CL34	2.44	1.79	1.73
5	H	301	GSP	C5-C4	-2.43	1.36	1.43
3	D	901	XQ3	C33-CL34	2.43	1.79	1.73
5	E	301	GSP	C5-C4	-2.43	1.36	1.43
3	B	901	XQ3	C33-CL34	2.43	1.79	1.73
5	G	301	GSP	C5-C4	-2.42	1.36	1.43
3	D	901	XQ3	C09-C10	2.27	1.49	1.41
3	C	1002	XQ3	C09-C10	2.27	1.49	1.41
3	B	901	XQ3	C09-C10	2.27	1.49	1.41
3	A	901	XQ3	C09-C10	2.27	1.49	1.41
5	G	301	GSP	O6-C6	-2.21	1.18	1.23
5	H	301	GSP	O6-C6	-2.18	1.18	1.23
5	F	301	GSP	O6-C6	-2.18	1.18	1.23
5	E	301	GSP	O6-C6	-2.18	1.18	1.23
3	B	901	XQ3	O17-C07	-2.14	1.18	1.23
3	C	1002	XQ3	O17-C07	-2.14	1.18	1.23
3	D	901	XQ3	O17-C07	-2.14	1.18	1.23
3	A	901	XQ3	O17-C07	-2.14	1.18	1.23
3	B	901	XQ3	O42-C18	-2.08	1.18	1.22
4	D	902	Y01	CAK-CAI	2.07	1.54	1.50
4	C	1001	Y01	CAK-CAI	2.06	1.54	1.50
3	C	1002	XQ3	O42-C18	-2.05	1.18	1.22
4	B	902	Y01	CAK-CAI	2.05	1.54	1.50
3	A	901	XQ3	O42-C18	-2.05	1.18	1.22
4	C	1003	Y01	CAK-CAI	2.04	1.54	1.50
3	D	901	XQ3	O42-C18	-2.04	1.18	1.22

All (134) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	C	1002	XQ3	O40-S30-O31	-14.16	102.14	119.55
3	A	901	XQ3	O40-S30-O31	-14.15	102.16	119.55
3	D	901	XQ3	O40-S30-O31	-14.15	102.16	119.55
3	B	901	XQ3	O40-S30-O31	-14.14	102.17	119.55
4	D	902	Y01	CAT-CBH-CBF	-9.58	95.35	108.73
4	B	902	Y01	CAT-CBH-CBF	-9.57	95.36	108.73
4	C	1001	Y01	CAT-CBH-CBF	-9.56	95.37	108.73
4	C	1003	Y01	CAT-CBH-CBF	-9.56	95.37	108.73
4	B	902	Y01	CAV-CAZ-CAI	6.45	129.90	120.61
4	C	1003	Y01	CAV-CAZ-CAI	6.44	129.88	120.61
4	C	1001	Y01	CAV-CAZ-CAI	6.44	129.88	120.61
4	D	902	Y01	CAV-CAZ-CAI	6.43	129.87	120.61

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	B	901	XQ3	C33-C32-S30	-6.01	119.32	123.25
3	A	901	XQ3	C33-C32-S30	-5.99	119.33	123.25
3	C	1002	XQ3	C33-C32-S30	-5.99	119.33	123.25
3	D	901	XQ3	C33-C32-S30	-5.96	119.36	123.25
4	B	902	Y01	CBH-CBF-CBD	-4.22	106.41	112.73
4	C	1003	Y01	CBH-CBF-CBD	-4.22	106.41	112.73
4	C	1001	Y01	CBH-CBF-CBD	-4.20	106.44	112.73
4	D	902	Y01	CBH-CBF-CBD	-4.19	106.45	112.73
4	B	902	Y01	OAW-CAY-CAM	4.02	120.16	111.50
4	C	1003	Y01	OAW-CAY-CAM	4.01	120.14	111.50
4	C	1001	Y01	OAW-CAY-CAM	4.01	120.14	111.50
4	D	902	Y01	OAW-CAY-CAM	3.98	120.09	111.50
4	B	902	Y01	CBH-CAZ-CAI	-3.90	116.94	122.90
4	C	1003	Y01	CBH-CAZ-CAI	-3.89	116.95	122.90
4	C	1001	Y01	CBH-CAZ-CAI	-3.89	116.96	122.90
4	D	902	Y01	CBH-CAZ-CAI	-3.88	116.97	122.90
4	C	1003	Y01	CAD-CBH-CBF	3.85	116.27	111.68
4	C	1001	Y01	CAD-CBH-CBF	3.84	116.26	111.68
4	B	902	Y01	CAD-CBH-CBF	3.83	116.25	111.68
4	D	902	Y01	CAD-CBH-CBF	3.83	116.25	111.68
3	D	901	XQ3	C23-C24-N19	3.82	118.64	110.44
3	C	1002	XQ3	C23-C24-N19	3.82	118.62	110.44
3	A	901	XQ3	C23-C24-N19	3.82	118.62	110.44
3	B	901	XQ3	C23-C24-N19	3.80	118.59	110.44
5	E	301	GSP	C5-C6-N1	3.47	120.08	113.95
5	F	301	GSP	C5-C6-N1	3.46	120.07	113.95
5	G	301	GSP	C5-C6-N1	3.46	120.07	113.95
5	H	301	GSP	C5-C6-N1	3.45	120.05	113.95
3	C	1002	XQ3	O40-S30-N29	3.05	112.41	106.88
3	D	901	XQ3	O40-S30-N29	3.05	112.40	106.88
3	A	901	XQ3	O40-S30-N29	3.04	112.39	106.88
5	F	301	GSP	C2-N1-C6	-3.04	119.50	125.10
3	B	901	XQ3	O40-S30-N29	3.03	112.37	106.88
5	G	301	GSP	C2-N1-C6	-3.03	119.53	125.10
5	E	301	GSP	C2-N1-C6	-3.03	119.53	125.10
5	H	301	GSP	C2-N1-C6	-3.00	119.58	125.10
3	C	1002	XQ3	O42-C18-N19	-2.92	118.25	121.67
5	F	301	GSP	PA-O3A-PB	-2.92	122.82	132.83
5	E	301	GSP	PA-O3A-PB	-2.91	122.84	132.83
5	H	301	GSP	PA-O3A-PB	-2.91	122.84	132.83
5	G	301	GSP	PA-O3A-PB	-2.90	122.86	132.83
4	D	902	Y01	CAD-CBH-CAZ	2.89	113.02	108.34

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	C	1003	Y01	CAD-CBH-CAZ	2.88	113.00	108.34
3	A	901	XQ3	O42-C18-N19	-2.88	118.30	121.67
3	D	901	XQ3	O42-C18-N19	-2.87	118.30	121.67
4	B	902	Y01	CAD-CBH-CAZ	2.87	112.99	108.34
4	C	1001	Y01	CAD-CBH-CAZ	2.87	112.99	108.34
3	C	1002	XQ3	O40-S30-C32	2.86	112.37	107.66
3	D	901	XQ3	O40-S30-C32	2.86	112.36	107.66
3	A	901	XQ3	O40-S30-C32	2.86	112.36	107.66
3	B	901	XQ3	O40-S30-C32	2.85	112.36	107.66
3	B	901	XQ3	O42-C18-N19	-2.85	118.33	121.67
5	G	301	GSP	C8-N7-C5	2.79	108.30	102.99
5	E	301	GSP	C8-N7-C5	2.78	108.29	102.99
5	H	301	GSP	C8-N7-C5	2.78	108.28	102.99
5	F	301	GSP	C8-N7-C5	2.75	108.24	102.99
4	D	902	Y01	CAP-CBE-CBB	-2.72	107.94	112.15
4	C	1003	Y01	CAP-CBE-CBB	-2.71	107.95	112.15
4	B	902	Y01	CAP-CBE-CBB	-2.70	107.97	112.15
4	C	1001	Y01	CAP-CBE-CBB	-2.69	107.97	112.15
3	B	901	XQ3	C24-C23-N22	2.68	116.19	110.44
3	C	1002	XQ3	C24-C23-N22	2.68	116.18	110.44
3	A	901	XQ3	C24-C23-N22	2.67	116.17	110.44
3	D	901	XQ3	C24-C23-N22	2.67	116.15	110.44
4	C	1003	Y01	CAU-CAS-CBF	2.63	117.67	113.11
4	C	1001	Y01	CAU-CAS-CBF	2.62	117.66	113.11
4	D	902	Y01	CAU-CAS-CBF	2.61	117.65	113.11
4	B	902	Y01	CAU-CAS-CBF	2.61	117.64	113.11
4	C	1001	Y01	CAP-CBE-CBI	-2.58	100.74	103.84
4	B	902	Y01	CAP-CBE-CBI	-2.57	100.75	103.84
4	C	1003	Y01	CAP-CBE-CBI	-2.56	100.75	103.84
4	B	902	Y01	CAK-CBD-CBF	-2.55	106.62	109.71
4	B	902	Y01	CAU-CBI-CBE	-2.55	112.76	116.57
4	C	1001	Y01	CAK-CBD-CBF	-2.54	106.63	109.71
4	D	902	Y01	CAP-CBE-CBI	-2.54	100.78	103.84
3	C	1002	XQ3	C26-C25-N22	2.54	122.70	118.87
4	D	902	Y01	CAK-CBD-CBF	-2.53	106.64	109.71
3	D	901	XQ3	C26-C25-N22	2.53	122.70	118.87
4	C	1001	Y01	CAU-CBI-CBE	-2.53	112.78	116.57
4	C	1003	Y01	CAK-CBD-CBF	-2.53	106.65	109.71
4	C	1003	Y01	CAU-CBI-CBE	-2.53	112.79	116.57
3	A	901	XQ3	C26-C25-N22	2.53	122.68	118.87
4	D	902	Y01	CAU-CBI-CBE	-2.52	112.80	116.57
3	B	901	XQ3	C26-C25-N22	2.51	122.67	118.87

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	D	901	XQ3	C11-C10-C09	-2.51	124.48	133.00
3	C	1002	XQ3	C11-C10-C09	-2.51	124.49	133.00
3	A	901	XQ3	C11-C10-C09	-2.50	124.51	133.00
3	C	1002	XQ3	O41-C25-N22	-2.49	118.75	121.67
3	B	901	XQ3	C11-C10-C09	-2.49	124.54	133.00
3	B	901	XQ3	O41-C25-N22	-2.48	118.76	121.67
3	A	901	XQ3	O41-C25-N22	-2.47	118.77	121.67
4	C	1001	Y01	CAV-CAZ-CBH	-2.47	113.14	116.42
3	D	901	XQ3	O41-C25-N22	-2.46	118.78	121.67
4	B	902	Y01	CAV-CAZ-CBH	-2.46	113.14	116.42
4	D	902	Y01	CAV-CAZ-CBH	-2.46	113.14	116.42
4	C	1003	Y01	CAV-CAZ-CBH	-2.46	113.15	116.42
3	D	901	XQ3	C05-C18-N19	2.44	122.56	118.87
3	D	901	XQ3	O31-S30-N29	2.44	111.30	106.88
3	C	1002	XQ3	O31-S30-N29	2.44	111.30	106.88
3	C	1002	XQ3	C05-C18-N19	2.43	122.54	118.87
3	A	901	XQ3	O31-S30-N29	2.43	111.28	106.88
3	A	901	XQ3	C05-C18-N19	2.43	122.54	118.87
3	B	901	XQ3	O31-S30-N29	2.41	111.25	106.88
3	B	901	XQ3	C05-C18-N19	2.40	122.49	118.87
4	B	902	Y01	CAT-CAR-CBC	2.34	114.32	110.33
4	C	1001	Y01	CAT-CAR-CBC	2.33	114.31	110.33
4	C	1003	Y01	CAT-CAR-CBC	2.31	114.27	110.33
4	D	902	Y01	CAT-CAR-CBC	2.31	114.27	110.33
5	H	301	GSP	O6-C6-C5	-2.28	119.92	124.37
5	E	301	GSP	O6-C6-C5	-2.28	119.92	124.37
5	G	301	GSP	O6-C6-C5	-2.26	119.96	124.37
5	F	301	GSP	O6-C6-C5	-2.25	119.97	124.37
3	C	1002	XQ3	O31-S30-C32	2.24	111.35	107.66
3	D	901	XQ3	C39-C32-S30	2.24	120.46	117.42
3	B	901	XQ3	O31-S30-C32	2.23	111.34	107.66
3	A	901	XQ3	O31-S30-C32	2.23	111.33	107.66
3	A	901	XQ3	C39-C32-S30	2.23	120.45	117.42
3	D	901	XQ3	O31-S30-C32	2.23	111.33	107.66
3	B	901	XQ3	C39-C32-S30	2.22	120.44	117.42
3	C	1002	XQ3	C39-C32-S30	2.22	120.43	117.42
4	C	1003	Y01	CAS-CBF-CBH	-2.01	110.43	113.08
4	C	1001	Y01	CAS-CBF-CBH	-2.00	110.44	113.08

There are no chirality outliers.

All (96) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	B	902	Y01	CAV-CBC-OAW-CAY
4	B	902	Y01	CAM-CAY-OAW-CBC
4	C	1001	Y01	CAV-CBC-OAW-CAY
4	C	1001	Y01	CAM-CAY-OAW-CBC
4	C	1003	Y01	CAV-CBC-OAW-CAY
4	C	1003	Y01	CAM-CAY-OAW-CBC
4	D	902	Y01	CAV-CBC-OAW-CAY
4	D	902	Y01	CAM-CAY-OAW-CBC
4	B	902	Y01	OAG-CAY-OAW-CBC
4	C	1001	Y01	OAG-CAY-OAW-CBC
4	C	1003	Y01	OAG-CAY-OAW-CBC
4	D	902	Y01	OAG-CAY-OAW-CBC
3	A	901	XQ3	C26-N29-S30-O31
3	B	901	XQ3	C26-N29-S30-O31
3	C	1002	XQ3	C26-N29-S30-O31
3	D	901	XQ3	C26-N29-S30-O31
3	A	901	XQ3	C26-N29-S30-C32
3	B	901	XQ3	C26-N29-S30-C32
3	C	1002	XQ3	C26-N29-S30-C32
3	D	901	XQ3	C26-N29-S30-C32
4	B	902	Y01	CAX-CAL-CAM-CAY
4	C	1001	Y01	CAX-CAL-CAM-CAY
4	C	1003	Y01	CAX-CAL-CAM-CAY
4	D	902	Y01	CAX-CAL-CAM-CAY
4	B	902	Y01	CAO-CBB-CBE-CAP
4	C	1001	Y01	CAO-CBB-CBE-CAP
4	C	1003	Y01	CAO-CBB-CBE-CAP
4	D	902	Y01	CAO-CBB-CBE-CAP
4	B	902	Y01	CAN-CAJ-CAO-CBB
4	C	1001	Y01	CAN-CAJ-CAO-CBB
4	C	1003	Y01	CAN-CAJ-CAO-CBB
4	D	902	Y01	CAN-CAJ-CAO-CBB
4	B	902	Y01	CAJ-CAN-CBA-CAA
4	C	1001	Y01	CAJ-CAN-CBA-CAA
4	C	1003	Y01	CAJ-CAN-CBA-CAA
4	D	902	Y01	CAJ-CAN-CBA-CAA
3	A	901	XQ3	C33-C32-S30-O31
3	B	901	XQ3	C33-C32-S30-O31
3	C	1002	XQ3	C33-C32-S30-O31
3	D	901	XQ3	C33-C32-S30-O31
5	E	301	GSP	PA-O3A-PB-O1B
5	F	301	GSP	PA-O3A-PB-O1B
5	G	301	GSP	PA-O3A-PB-O1B

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Mol	Chain	Res	Type	Atoms
5	H	301	GSP	PA-O3A-PB-O1B
4	B	902	Y01	CAJ-CAN-CBA-CAB
4	C	1001	Y01	CAJ-CAN-CBA-CAB
4	C	1003	Y01	CAJ-CAN-CBA-CAB
4	D	902	Y01	CAJ-CAN-CBA-CAB
4	B	902	Y01	CAO-CAJ-CAN-CBA
4	C	1001	Y01	CAO-CAJ-CAN-CBA
4	C	1003	Y01	CAO-CAJ-CAN-CBA
4	D	902	Y01	CAO-CAJ-CAN-CBA
4	B	902	Y01	CAJ-CAO-CBB-CAC
4	C	1001	Y01	CAJ-CAO-CBB-CAC
4	C	1003	Y01	CAJ-CAO-CBB-CAC
4	D	902	Y01	CAJ-CAO-CBB-CAC
4	B	902	Y01	CAJ-CAO-CBB-CBE
4	C	1001	Y01	CAJ-CAO-CBB-CBE
4	C	1003	Y01	CAJ-CAO-CBB-CBE
4	D	902	Y01	CAJ-CAO-CBB-CBE
3	B	901	XQ3	C01-C02-C04-C05
3	C	1002	XQ3	C01-C02-C04-C05
3	A	901	XQ3	C01-C02-C04-C05
3	D	901	XQ3	C01-C02-C04-C05
5	E	301	GSP	O4'-C4'-C5'-O5'
5	F	301	GSP	O4'-C4'-C5'-O5'
5	G	301	GSP	O4'-C4'-C5'-O5'
5	H	301	GSP	O4'-C4'-C5'-O5'
3	A	901	XQ3	C04-C05-C18-O42
3	B	901	XQ3	C04-C05-C18-O42
3	C	1002	XQ3	C04-C05-C18-O42
3	D	901	XQ3	C04-C05-C18-O42
4	B	902	Y01	CAC-CBB-CBE-CAP
4	C	1001	Y01	CAC-CBB-CBE-CAP
4	C	1003	Y01	CAC-CBB-CBE-CAP
4	D	902	Y01	CAC-CBB-CBE-CAP
3	A	901	XQ3	C04-C05-C18-N19
3	B	901	XQ3	C04-C05-C18-N19
3	C	1002	XQ3	C04-C05-C18-N19
3	D	901	XQ3	C04-C05-C18-N19
3	A	901	XQ3	N06-C05-C18-O42
3	B	901	XQ3	N06-C05-C18-O42
3	C	1002	XQ3	N06-C05-C18-O42
3	D	901	XQ3	N06-C05-C18-O42
4	B	902	Y01	CAM-CAL-CAX-OAH

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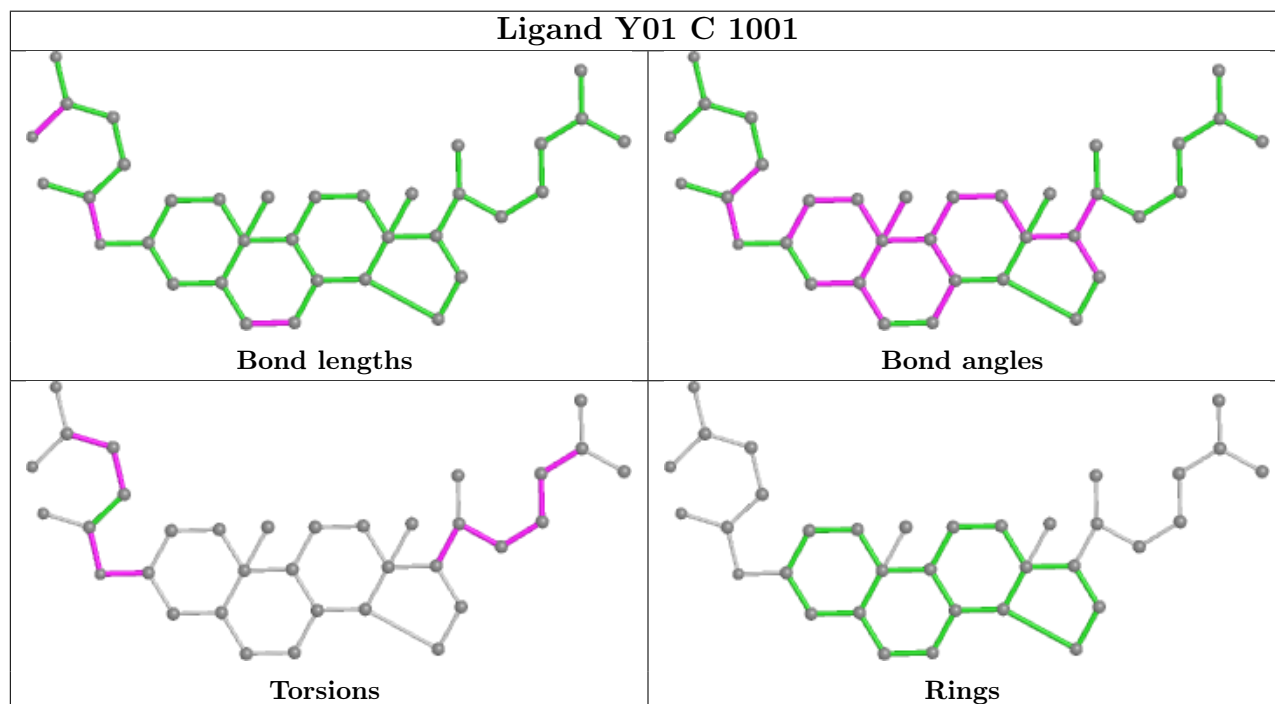
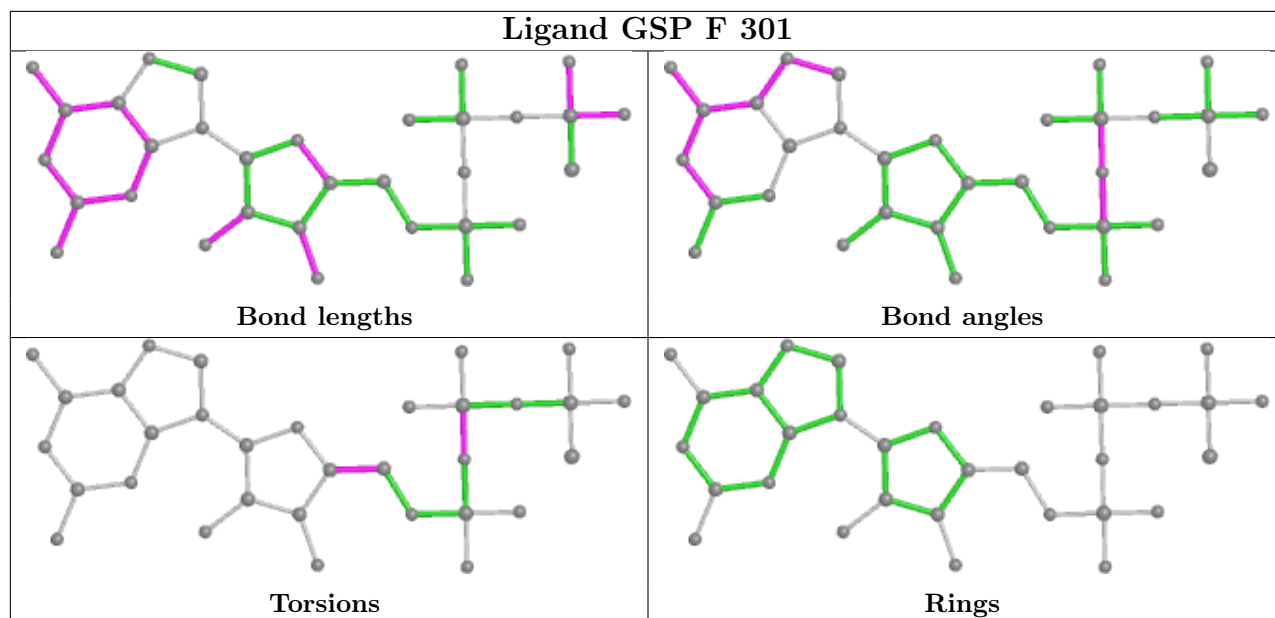
Mol	Chain	Res	Type	Atoms
4	C	1001	Y01	CAM-CAL-CAX-OAH
4	D	902	Y01	CAM-CAL-CAX-OAH
4	C	1003	Y01	CAM-CAL-CAX-OAH
3	A	901	XQ3	N06-C05-C18-N19
3	B	901	XQ3	N06-C05-C18-N19
3	C	1002	XQ3	N06-C05-C18-N19
3	D	901	XQ3	N06-C05-C18-N19
4	B	902	Y01	CAM-CAL-CAX-OAF
4	C	1001	Y01	CAM-CAL-CAX-OAF
4	C	1003	Y01	CAM-CAL-CAX-OAF
4	D	902	Y01	CAM-CAL-CAX-OAF

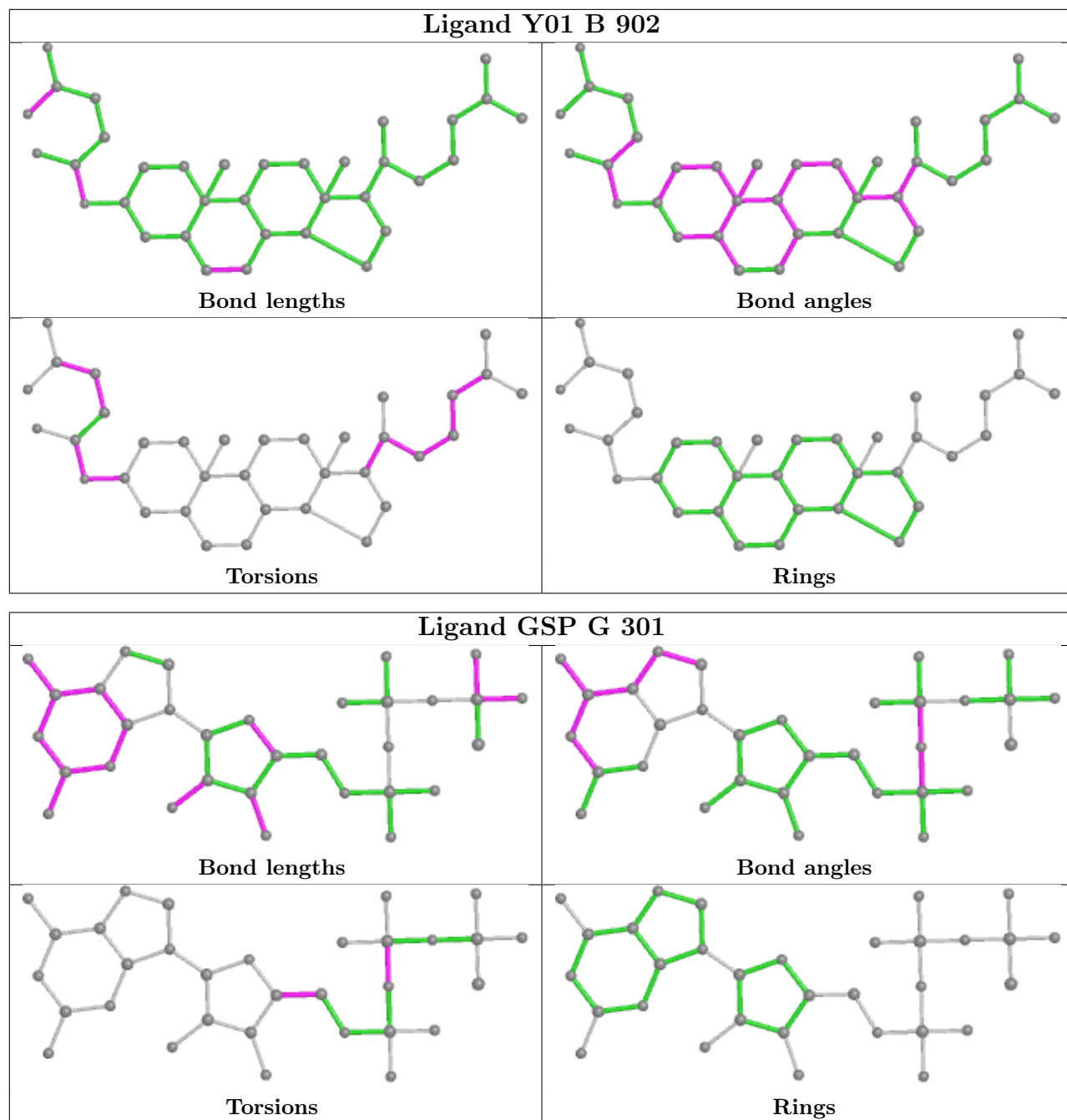
There are no ring outliers.

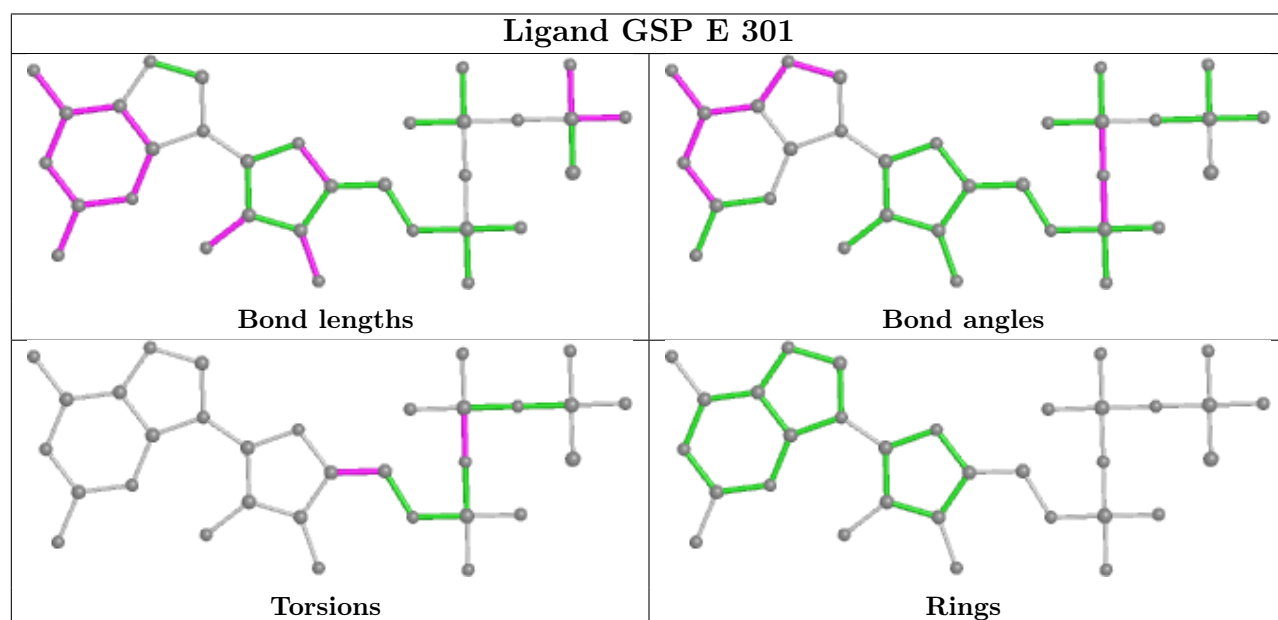
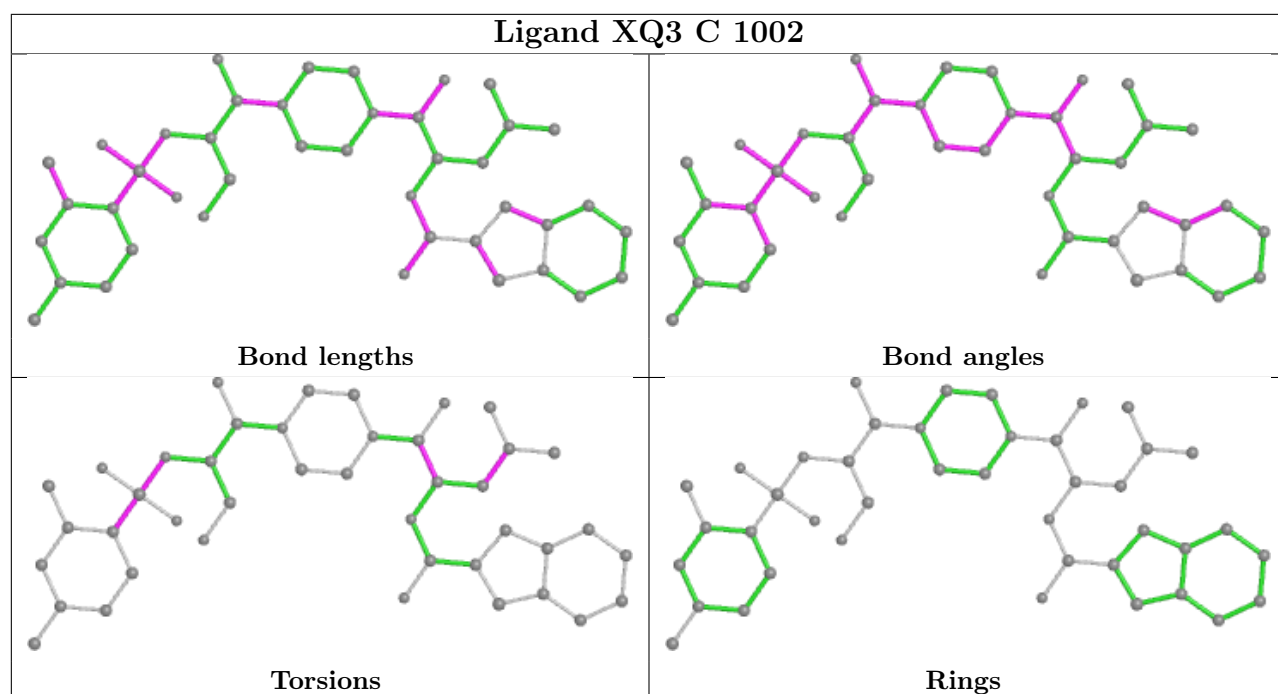
12 monomers are involved in 54 short contacts:

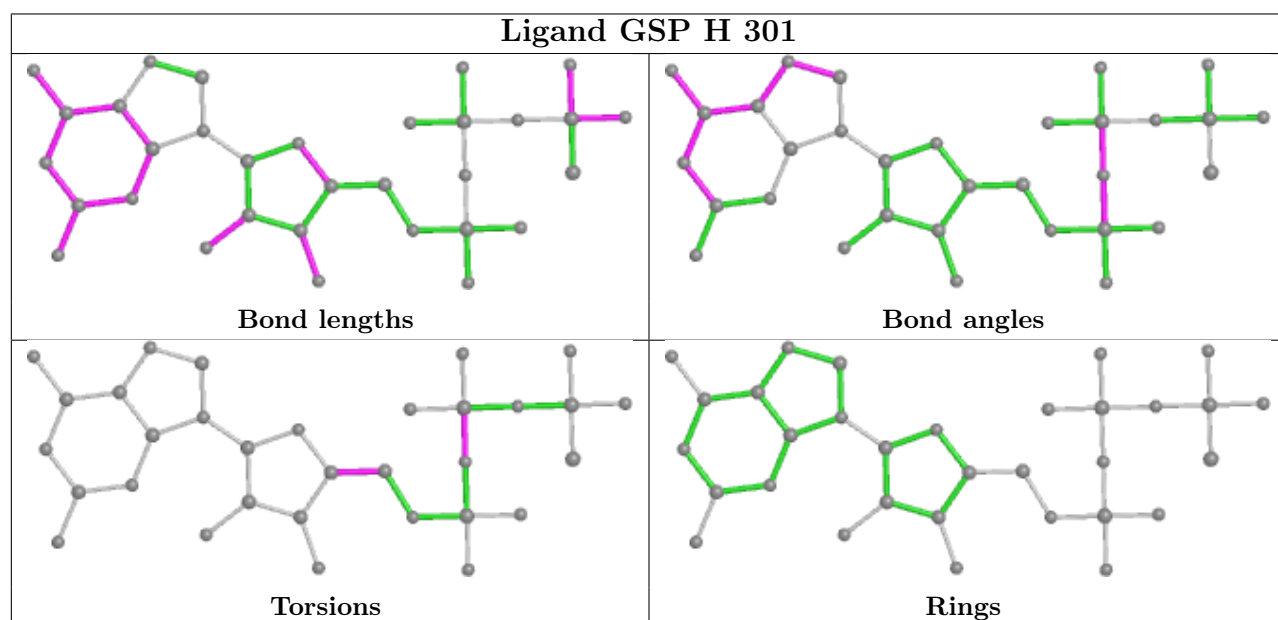
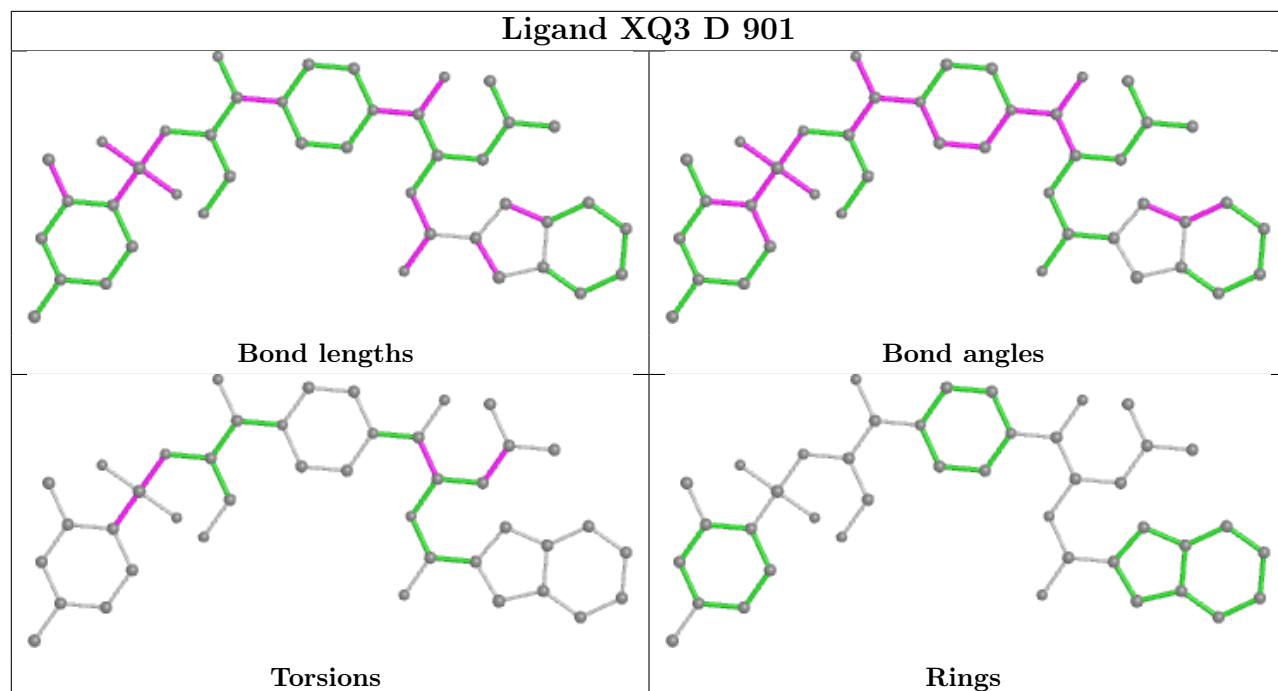
Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	F	301	GSP	9	0
4	C	1001	Y01	4	0
4	B	902	Y01	3	0
5	G	301	GSP	9	0
3	C	1002	XQ3	1	0
5	E	301	GSP	10	0
3	D	901	XQ3	1	0
5	H	301	GSP	9	0
4	C	1003	Y01	4	0
3	A	901	XQ3	1	0
4	D	902	Y01	2	0
3	B	901	XQ3	1	0

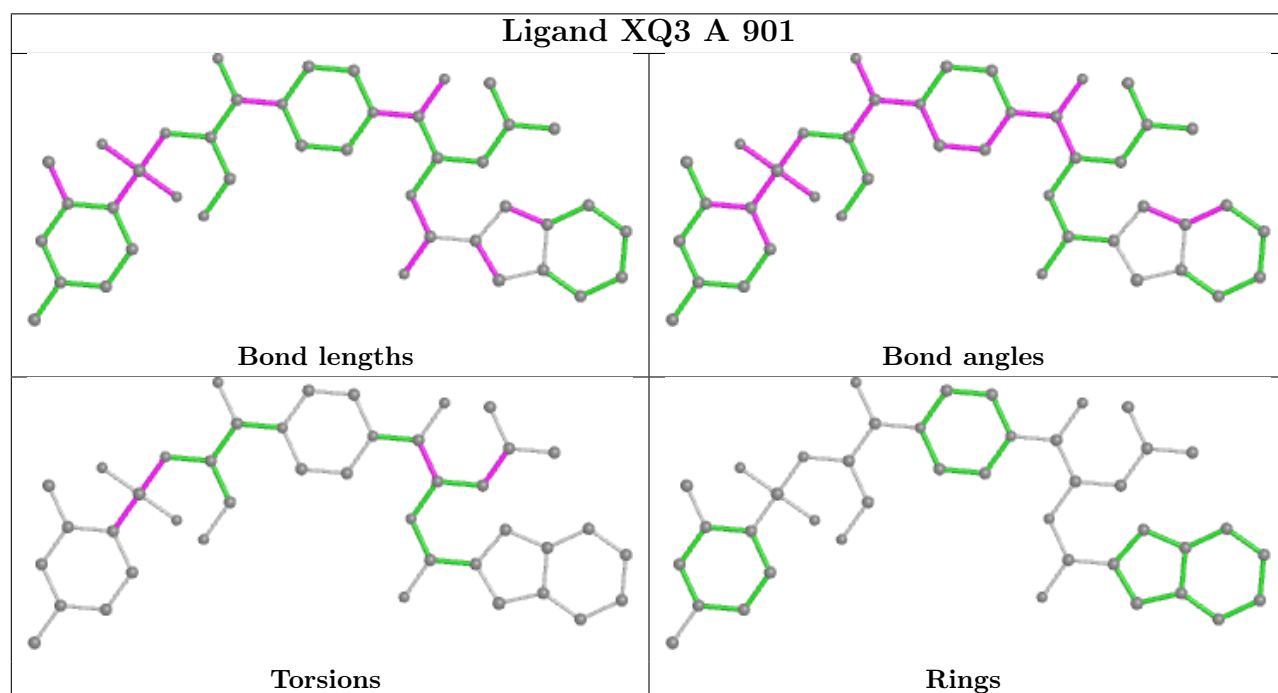
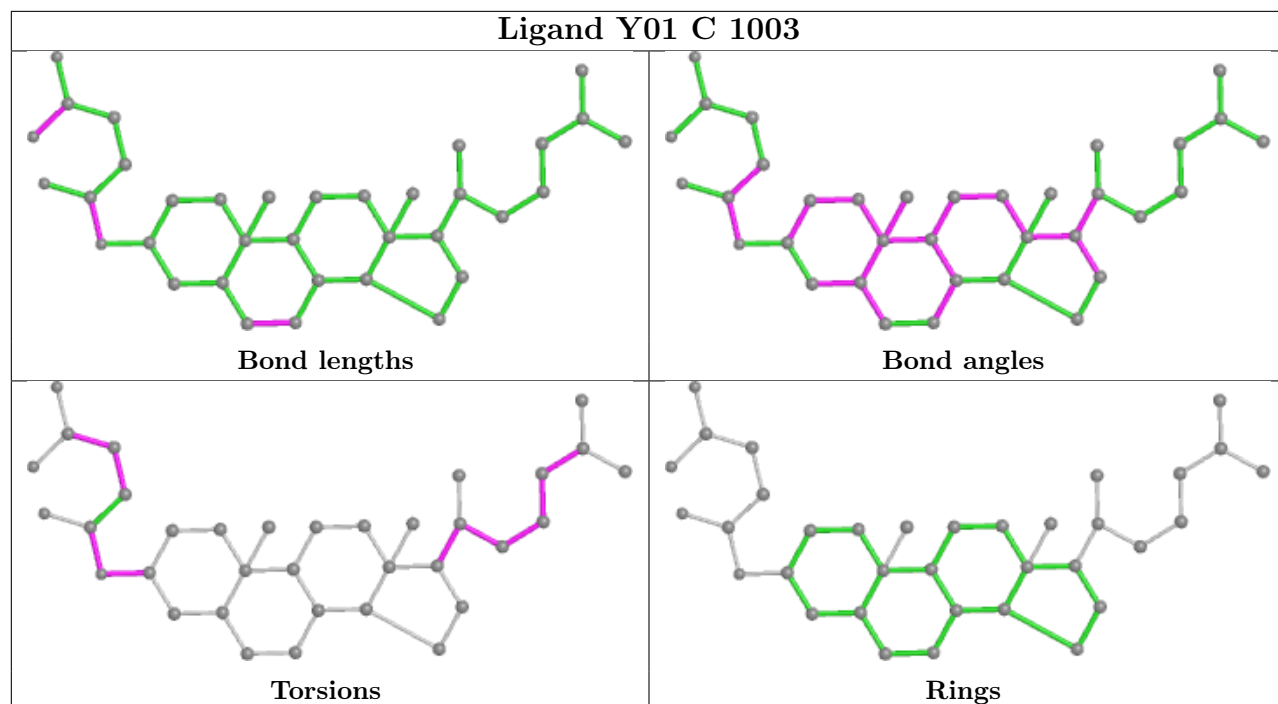
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. 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.

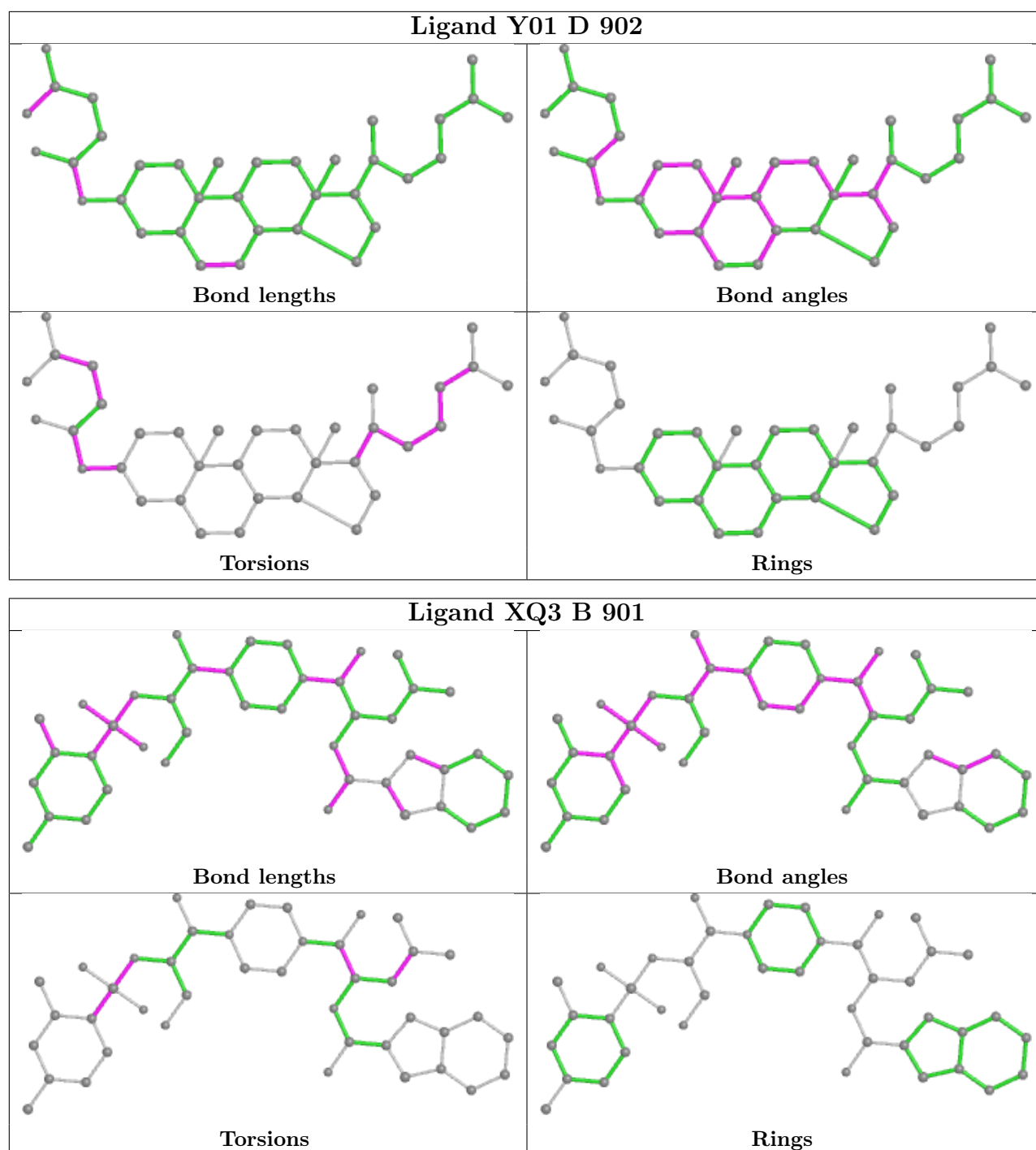












5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

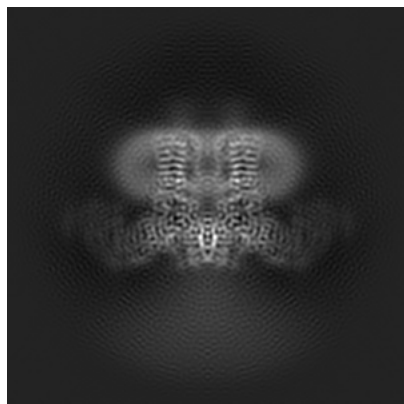
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-28976. These allow visual inspection of the internal detail of the map and identification of artifacts.

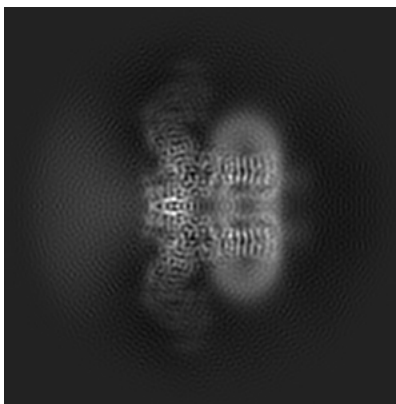
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

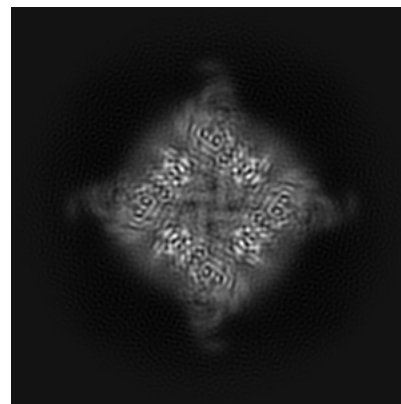
6.1.1 Primary map



X

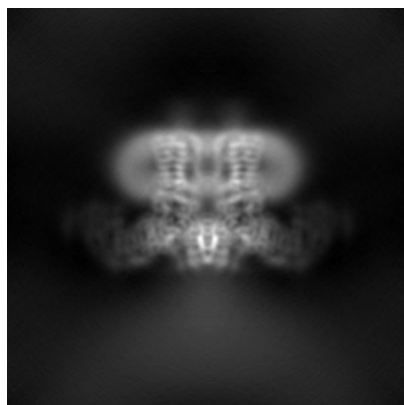


Y

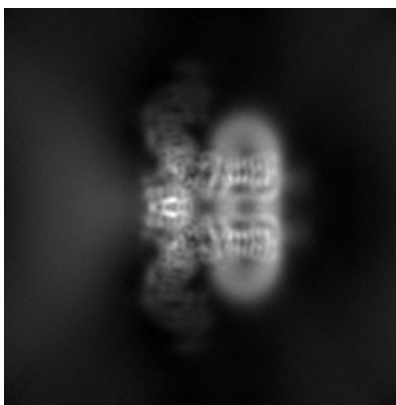


Z

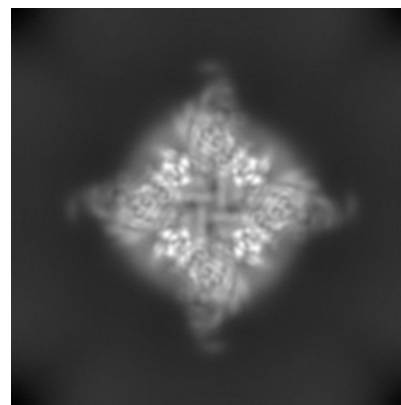
6.1.2 Raw map



X



Y

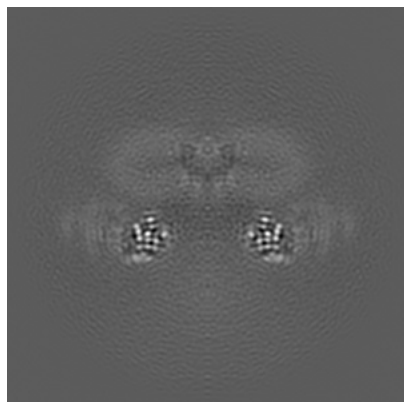


Z

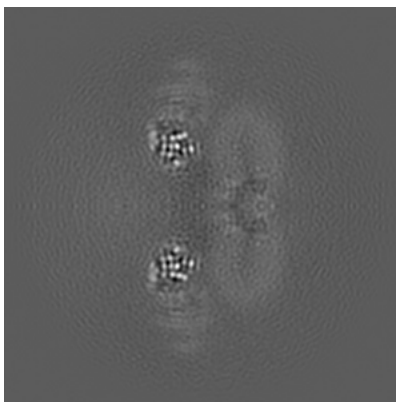
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

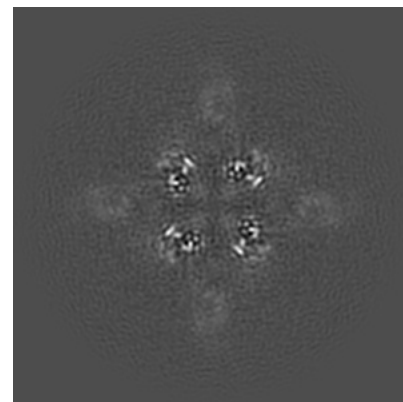
6.2.1 Primary map



X Index: 128

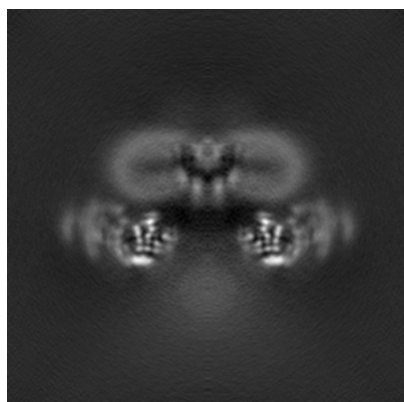


Y Index: 128

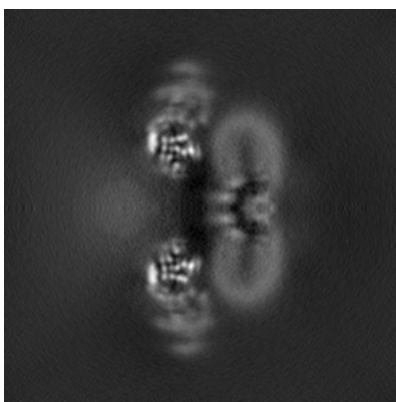


Z Index: 128

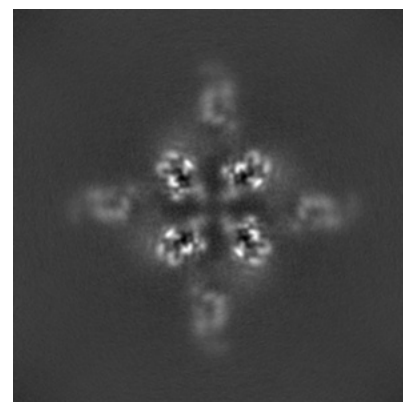
6.2.2 Raw map



X Index: 128



Y Index: 128

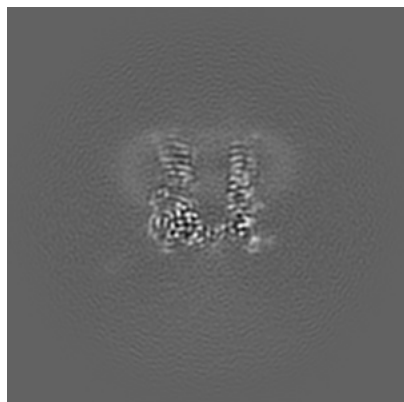


Z Index: 128

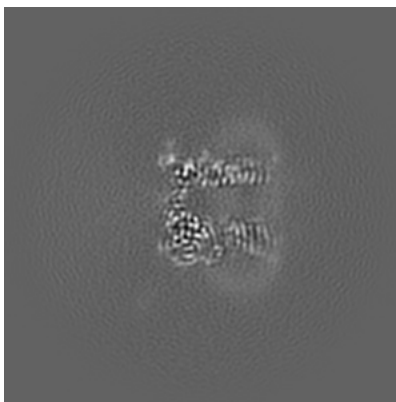
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

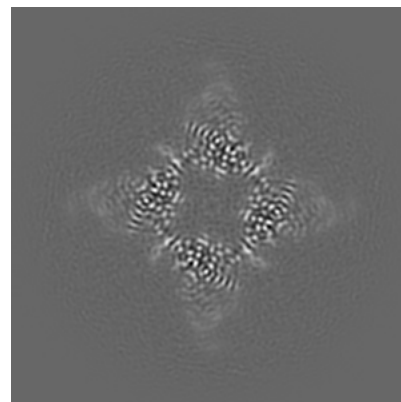
6.3.1 Primary map



X Index: 155

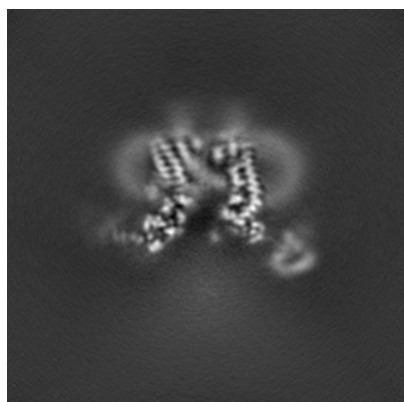


Y Index: 101

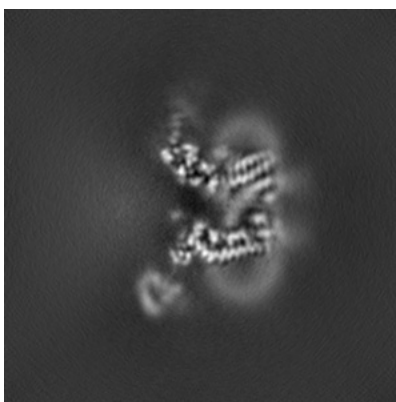


Z Index: 110

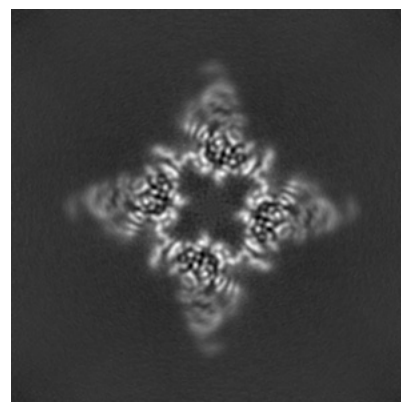
6.3.2 Raw map



X Index: 111



Y Index: 111

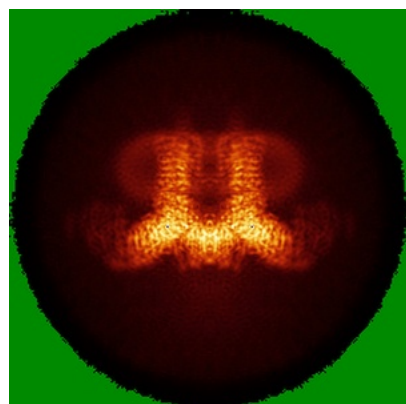


Z Index: 109

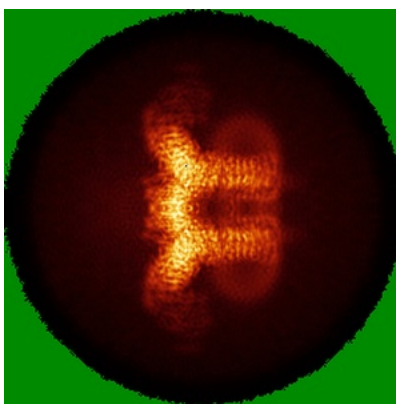
The images above show the largest variance slices of the map in three orthogonal directions.

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

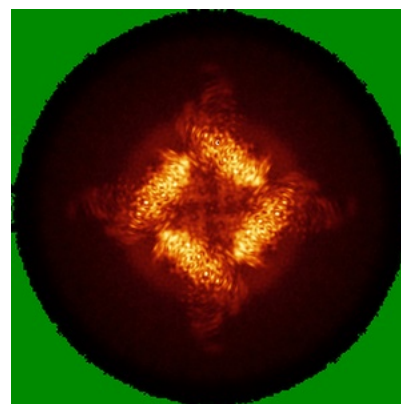
6.4.1 Primary map



X

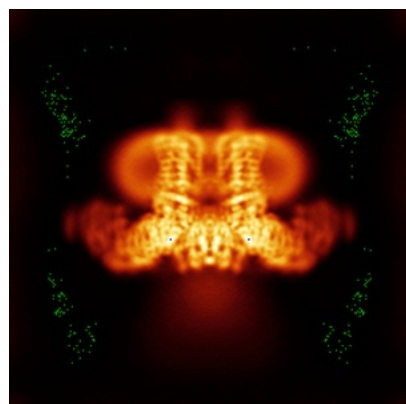


Y

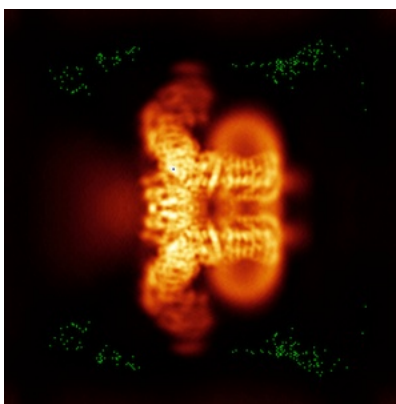


Z

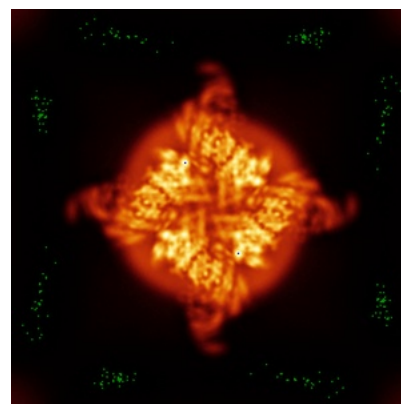
6.4.2 Raw map



X



Y

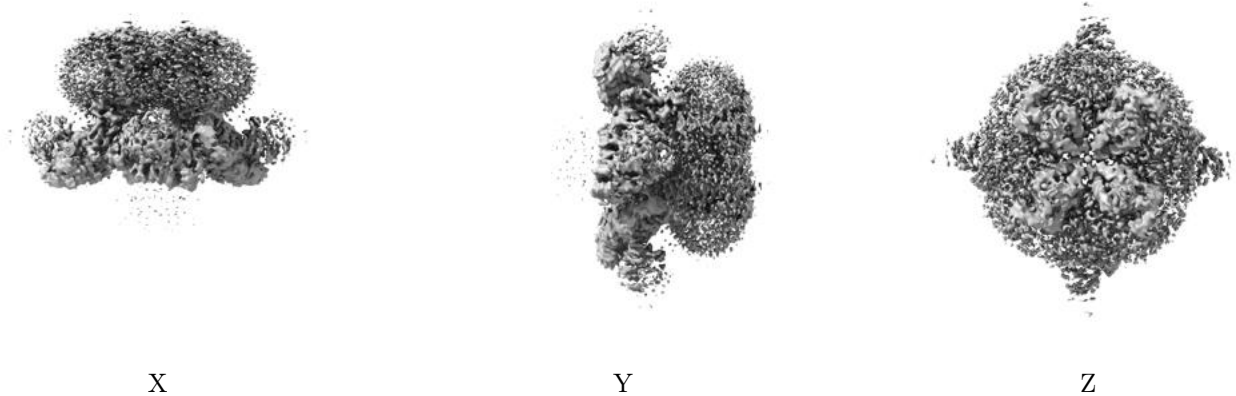


Z

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.

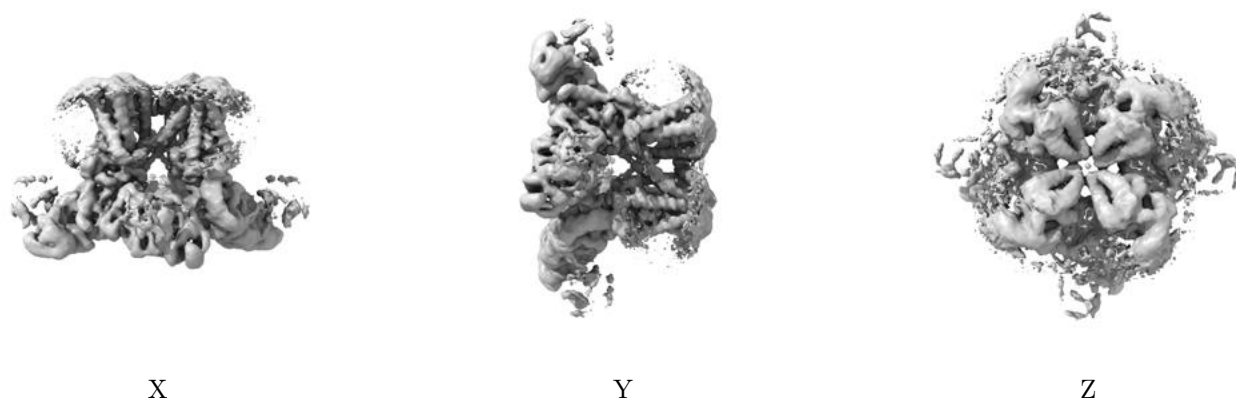
6.5 Orthogonal surface views [i](#)

6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.313. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.5.2 Raw map



These images show the 3D surface of the raw map. The raw map's contour level was selected so that its surface encloses the same volume as the primary map does at its recommended contour level.

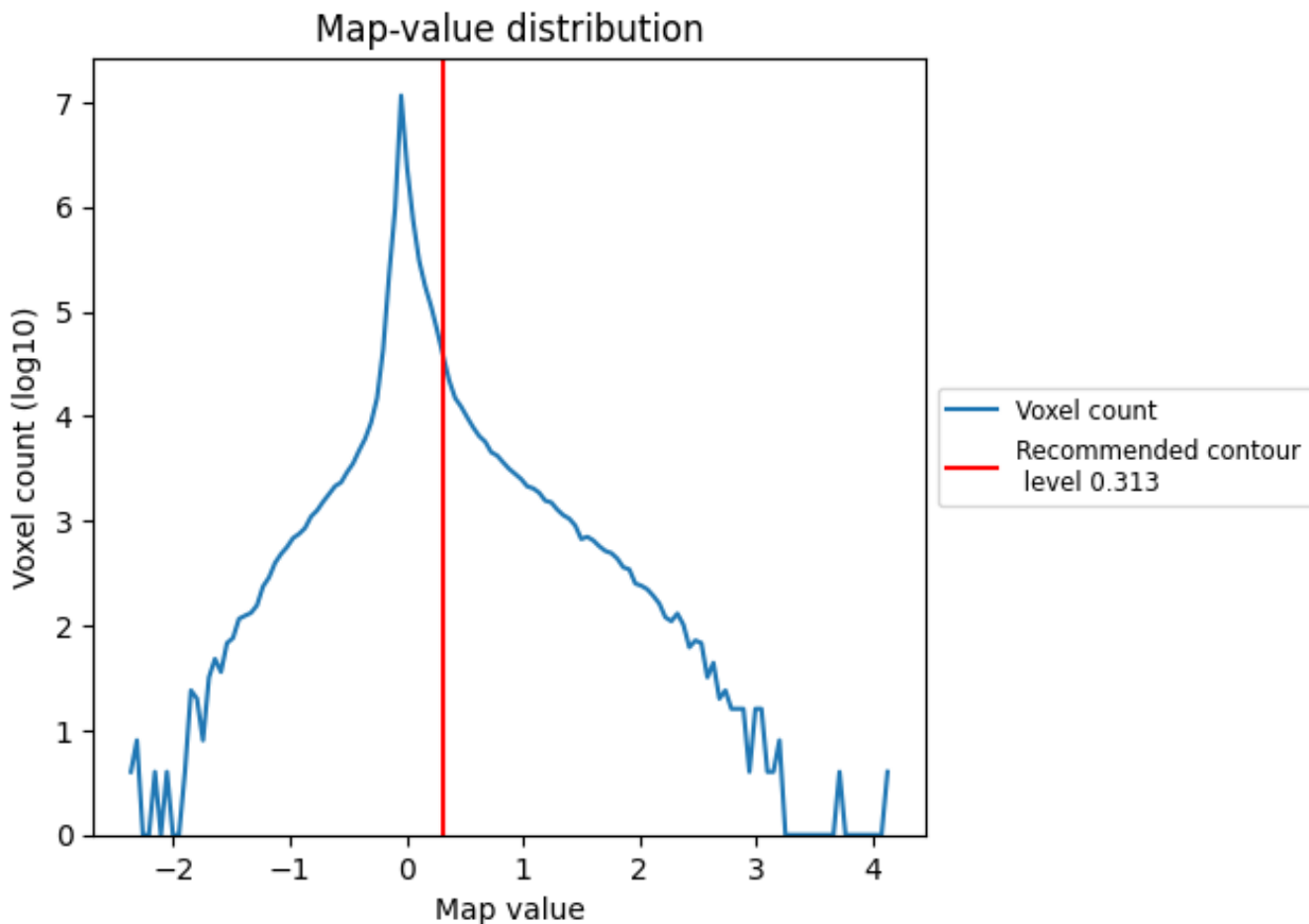
6.6 Mask visualisation [i](#)

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

7 Map analysis [i](#)

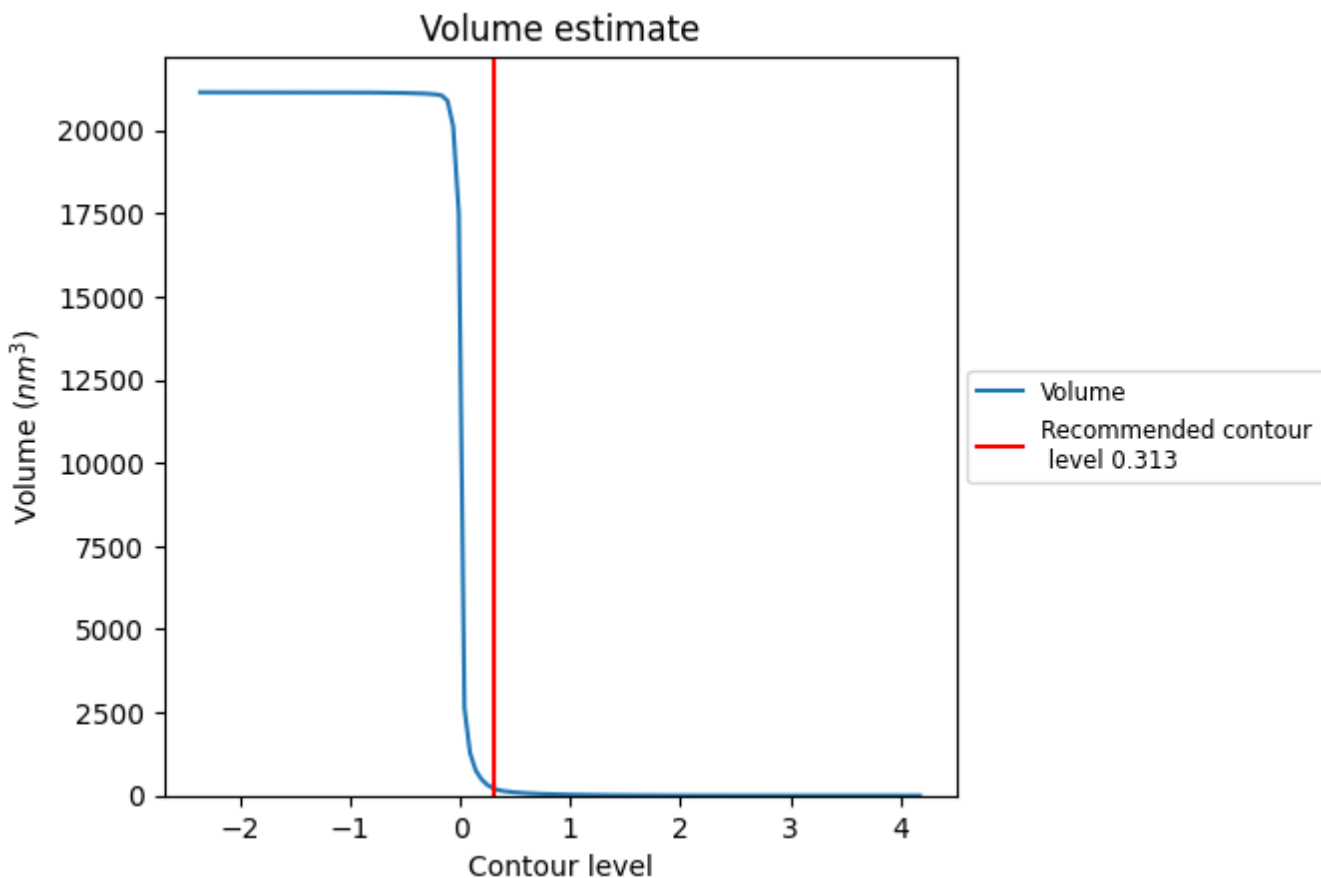
This section contains the results of statistical analysis of the map.

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.

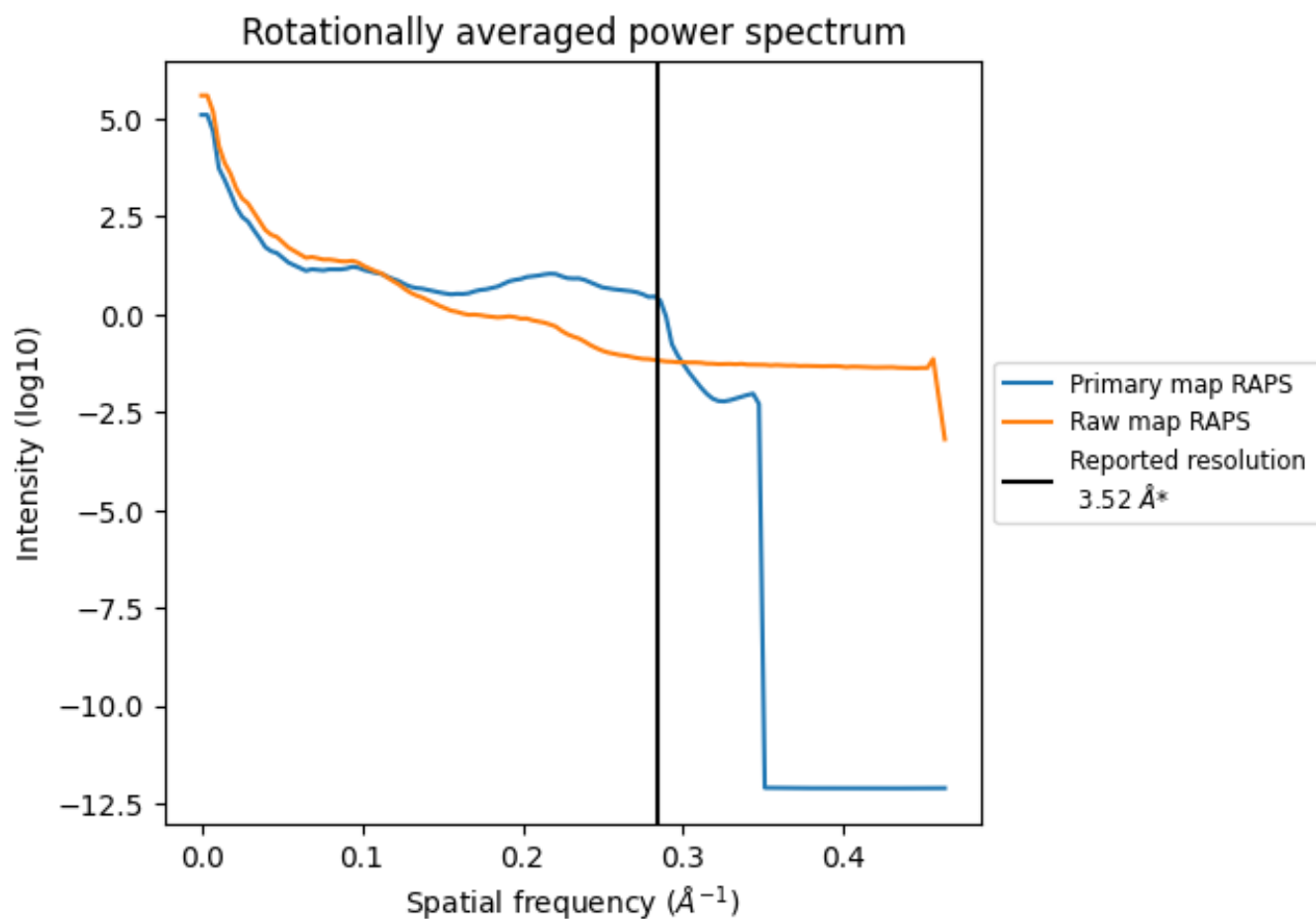
7.2 Volume estimate [\(i\)](#)



The volume at the recommended contour level is 205 nm^3 ; this corresponds to an approximate mass of 185 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

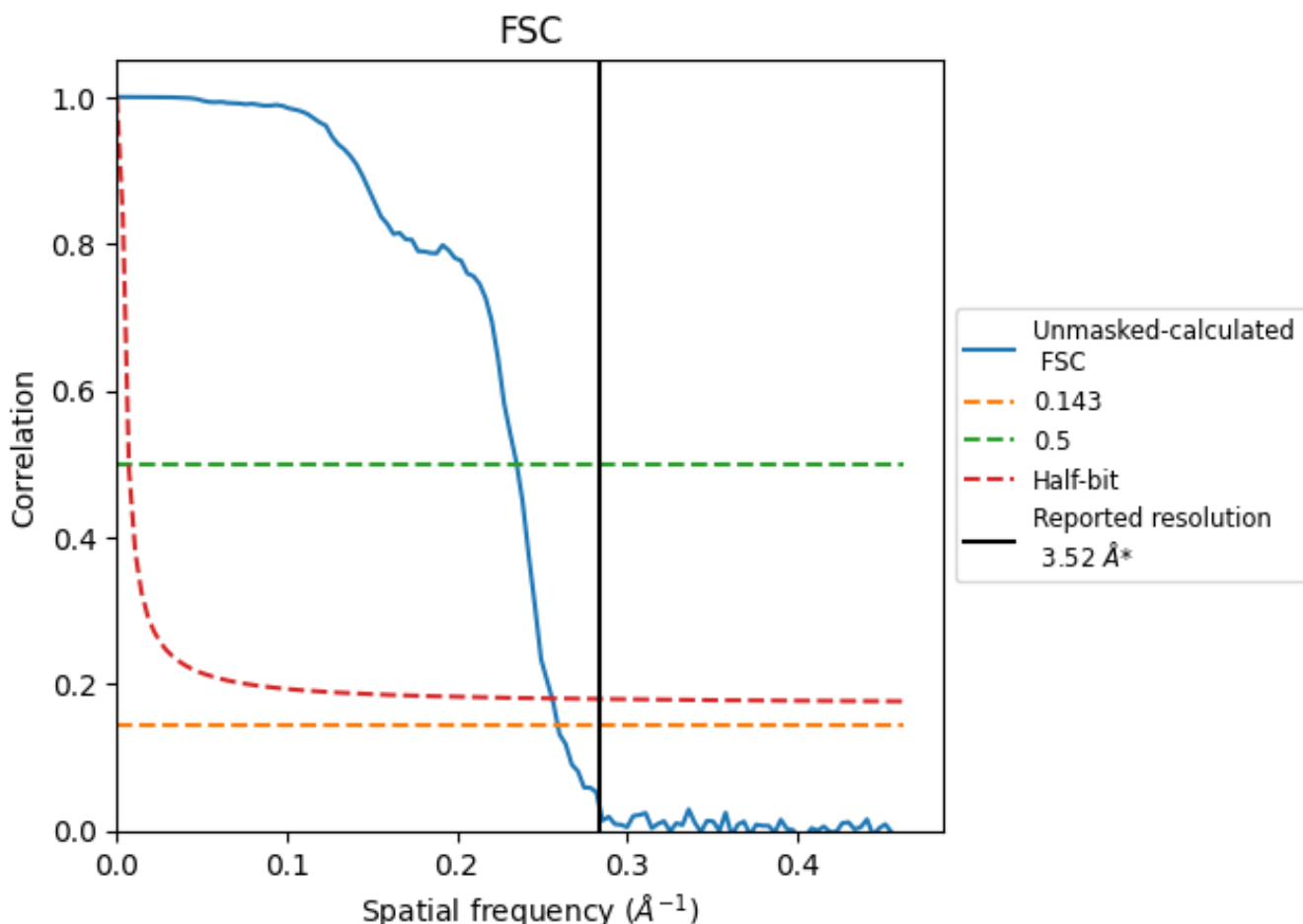


*Reported resolution corresponds to spatial frequency of 0.284 Å⁻¹

8 Fourier-Shell correlation [i](#)

Fourier-Shell Correlation (FSC) is the most commonly used method to estimate the resolution of single-particle and subtomogram-averaged maps. The shape of the curve depends on the imposed symmetry, mask and whether or not the two 3D reconstructions used were processed from a common reference. The reported resolution is shown as a black line. A curve is displayed for the half-bit criterion in addition to lines showing the 0.143 gold standard cut-off and 0.5 cut-off.

8.1 FSC [i](#)



*Reported resolution corresponds to spatial frequency of 0.284 Å⁻¹

8.2 Resolution estimates [i](#)

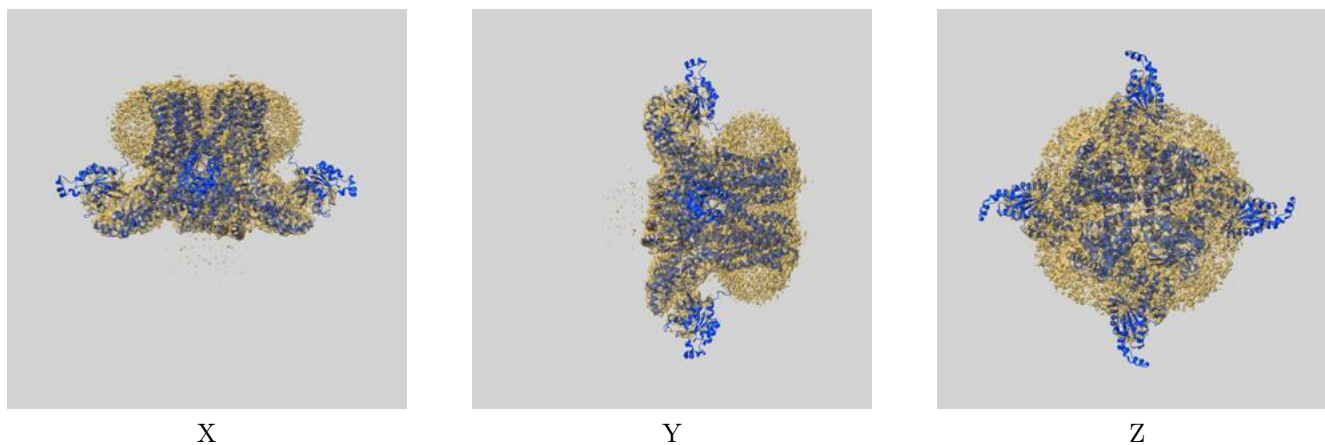
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	-	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	3.86	4.25	3.90

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

9 Map-model fit [i](#)

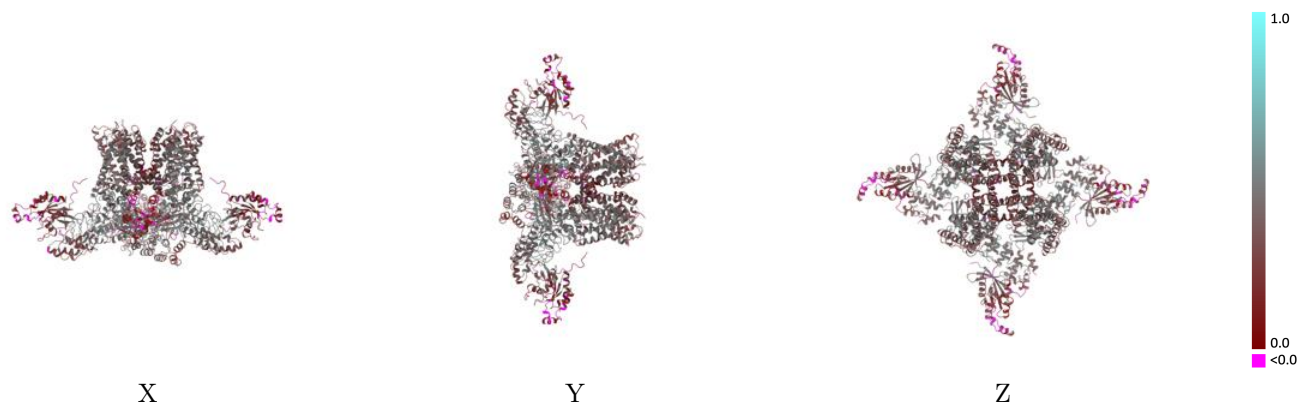
This section contains information regarding the fit between EMDB map EMD-28976 and PDB model 8FCB. Per-residue inclusion information can be found in section 3 on page 7.

9.1 Map-model overlay [i](#)



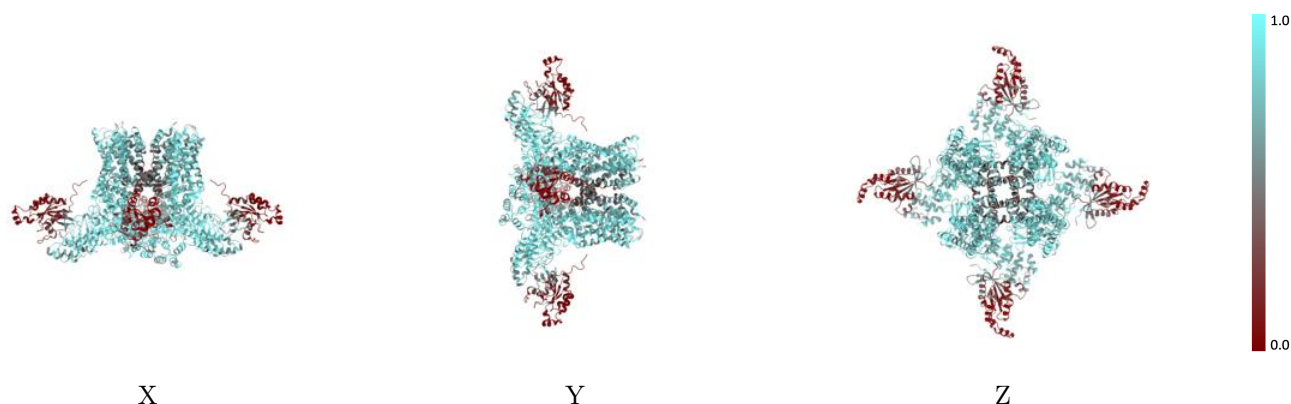
The images above show the 3D surface view of the map at the recommended contour level 0.313 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



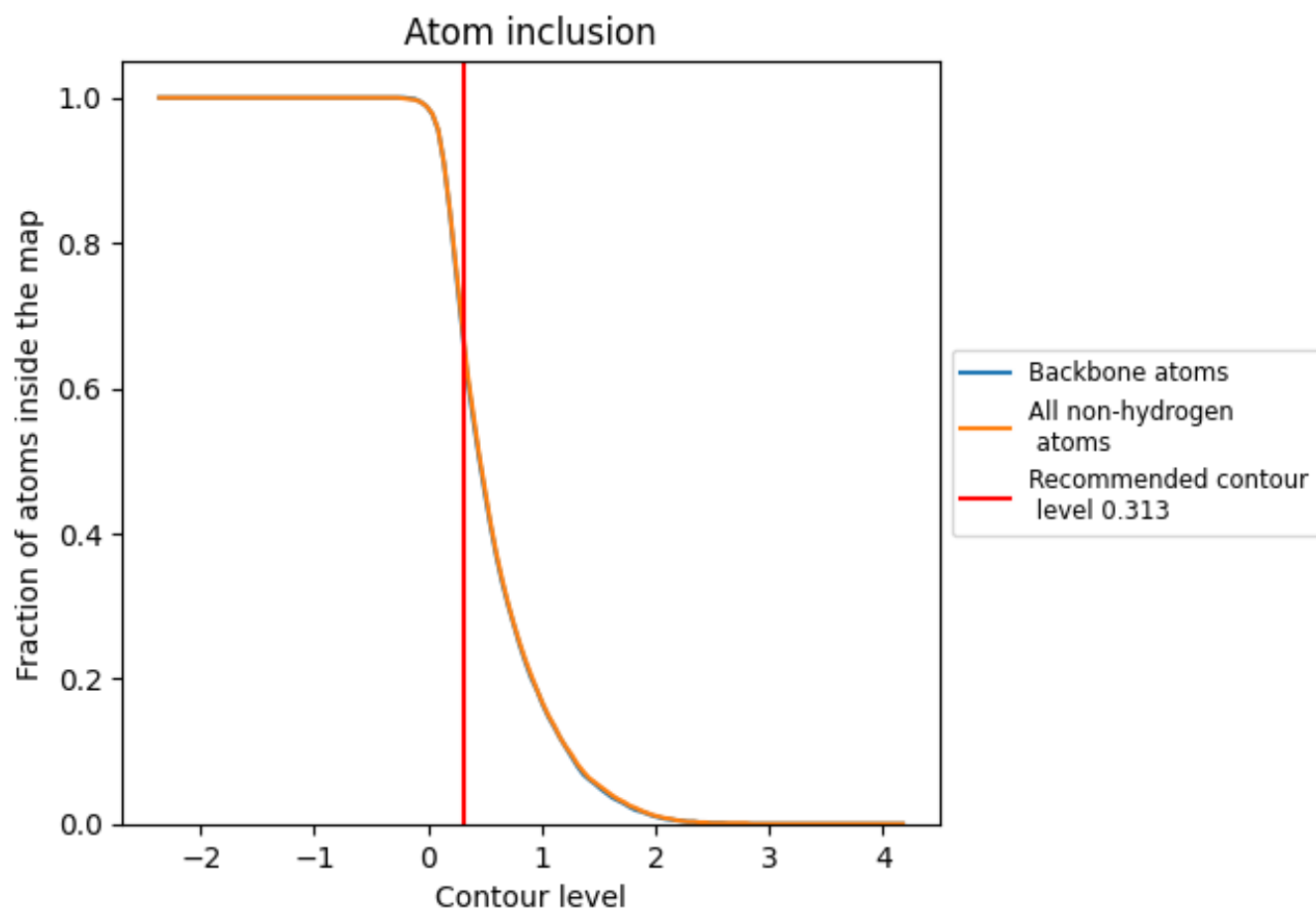
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions at which atoms can be resolved. Low Q-score values may therefore be expected for many entries.

9.3 Atom inclusion mapped to coordinate model [i](#)



The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.313).



















9.4 Atom inclusion [i](#)



At the recommended contour level, 66% 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 (0.313) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.6660	 0.3650
A	 0.8010	 0.4080
B	 0.7930	 0.4030
C	 0.7920	 0.4000
D	 0.7910	 0.4010
E	 0.2190	 0.2250
F	 0.2230	 0.2310
G	 0.2170	 0.2270
H	 0.2210	 0.2280

