



Full wwPDB EM Validation Report ⓘ

Mar 5, 2026 – 11:24 AM UTC

PDB ID : 9JGZ / pdb_00009jgz
EMDB ID : EMD-61467
Title : Cryo-EM Structure of Human Kcnk13.
Authors : Baobin, L.; Ran, Z.; Jin, W.
Deposited on : 2024-09-08
Resolution : 2.74 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

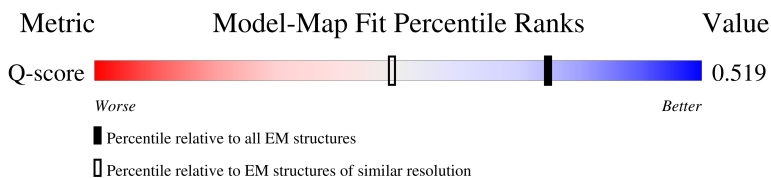
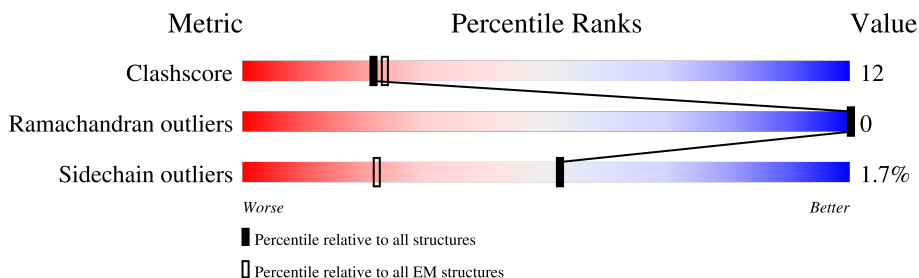
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 2.74 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	10492 (2.24 - 3.24)

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	395	
1	B	395	

2 Entry composition ⓘ

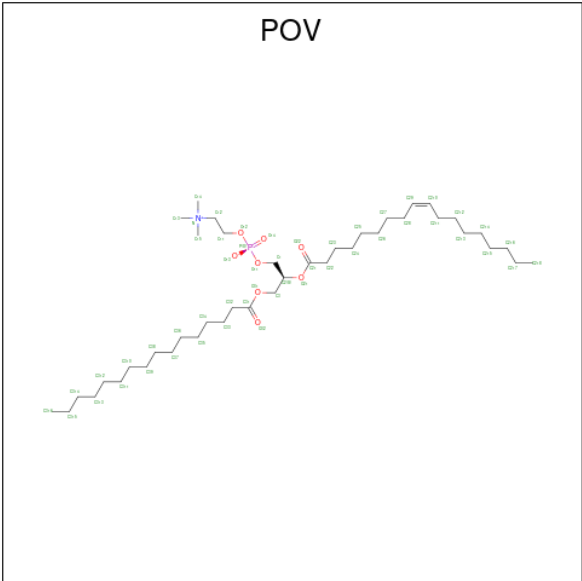
There are 6 unique types of molecules in this entry. The entry contains 4904 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 Potassium channel subfamily K member 13.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	287	Total	C	N	O	S	0	0
			2285	1487	388	392	18		
1	B	287	Total	C	N	O	S	0	0
			2285	1487	388	392	18		

- Molecule 2 is (2S)-3-(hexadecanoyloxy)-2-[(9Z)-octadec-9-enoyloxy]propyl 2-(trimethylamm onio)ethyl phosphate (CCD ID: POV) (formula: C₄₂H₈₂NO₈P).



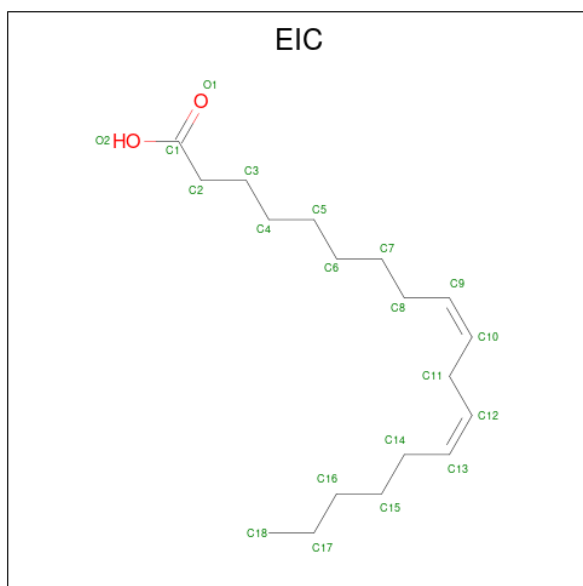
Mol	Chain	Residues	Atoms			AltConf
2	A	1	Total	C	O	0
			15	13	2	
2	A	1	Total	C	O	0
			15	13	2	
2	A	1	Total	C	O	0
			15	13	2	
2	A	1	Total	C	O	0
			15	13	2	

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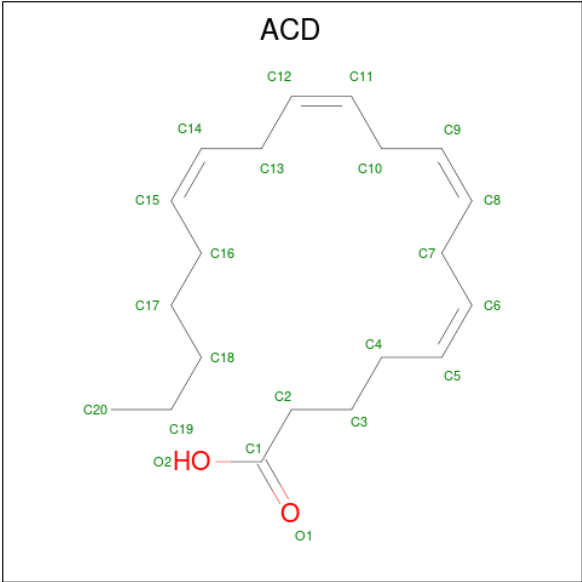
Mol	Chain	Residues	Atoms			AltConf
2	A	1	Total	C	O	0
			15	13	2	
2	A	1	Total	C	O	0
			15	13	2	
2	B	1	Total	C	O	0
			15	13	2	
2	B	1	Total	C	O	0
			15	13	2	
2	B	1	Total	C	O	0
			15	13	2	
2	B	1	Total	C	O	0
			15	13	2	
2	B	1	Total	C	O	0
			15	13	2	

- Molecule 3 is LINOLEIC ACID (CCD ID: EIC) (formula: $C_{18}H_{32}O_2$).



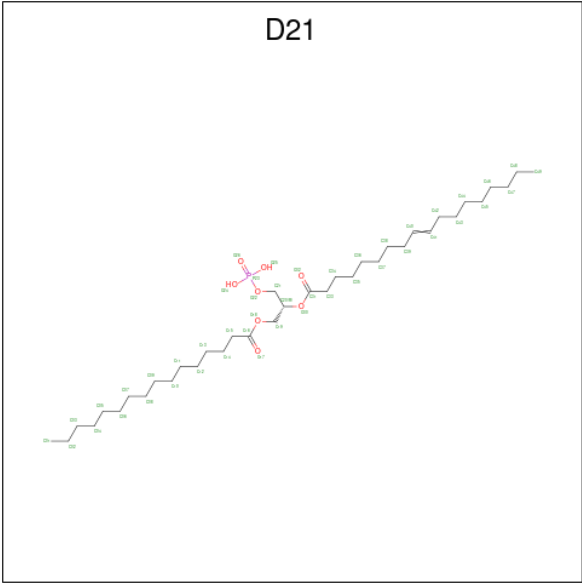
Mol	Chain	Residues	Atoms			AltConf
3	A	1	Total	C	O	0
			20	18	2	
3	B	1	Total	C	O	0
			20	18	2	

- Molecule 4 is ARACHIDONIC ACID (CCD ID: ACD) (formula: $C_{20}H_{32}O_2$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms			AltConf
4	A	1	Total	C	O	0
			22	20	2	
4	B	1	Total	C	O	0
			22	20	2	

- Molecule 5 is (2R)-1-(hexadecanoyloxy)-3-(phosphonoxy)propan-2-yl (9Z)-octadec-9-enoate (CCD ID: D21) (formula: C₃₇H₇₁O₈P).



Mol	Chain	Residues	Atoms				AltConf
5	A	1	Total	C	O	P	0
			33	24	8	1	

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Mol	Chain	Residues	Atoms				AltConf
5	B	1	Total	C	O	P	0
			33	24	8	1	

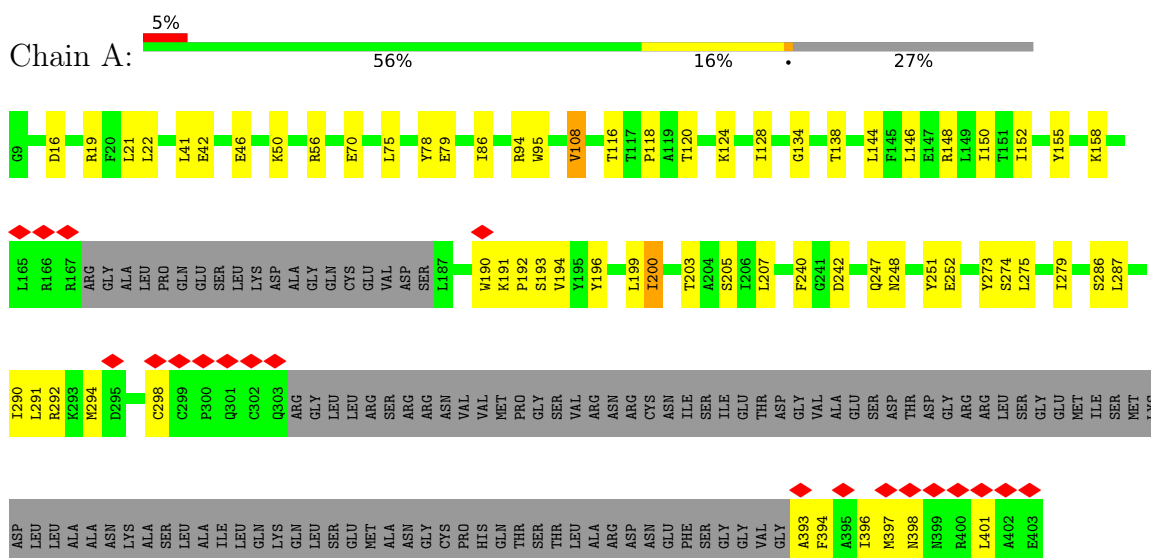
- Molecule 6 is POTASSIUM ION (CCD ID: K) (formula: K).

Mol	Chain	Residues	Atoms		AltConf
6	A	2	Total	K	0
			2	2	
6	B	2	Total	K	0
			2	2	

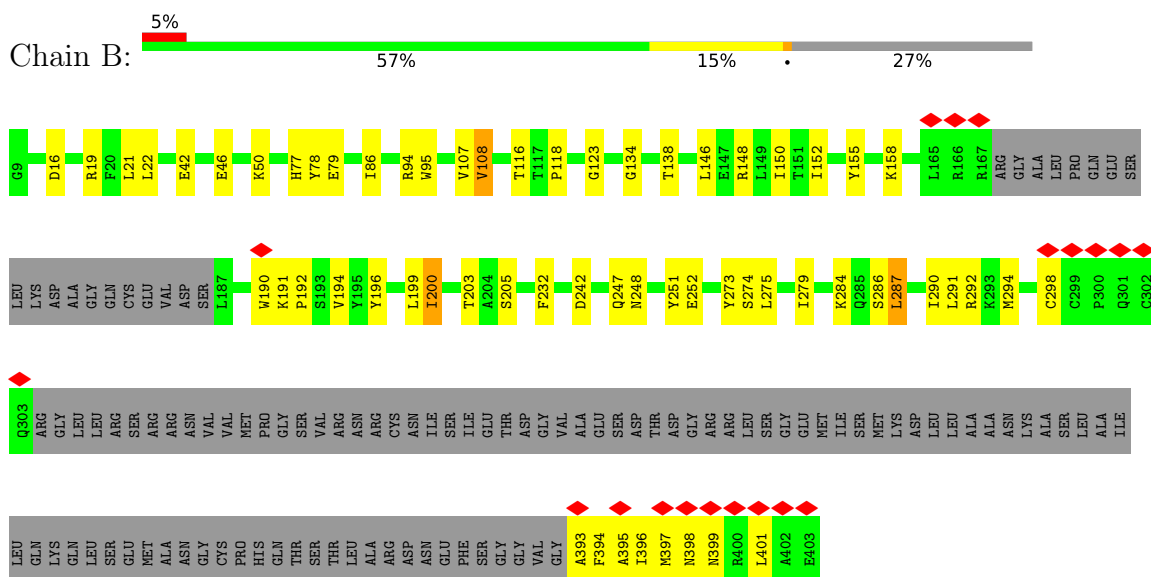
3 Residue-property plots

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: Potassium channel subfamily K member 13



• Molecule 1: Potassium channel subfamily K member 13



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	237767	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	NONE	Depositor
Microscope	FEI TECNAI SPIRIT	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	50	Depositor
Minimum defocus (nm)	1000	Depositor
Maximum defocus (nm)	2200	Depositor
Magnification	Not provided	
Image detector	FEI FALCON IV (4k x 4k)	Depositor
Maximum map value	2.349	Depositor
Minimum map value	-1.236	Depositor
Average map value	0.002	Depositor
Map value standard deviation	0.059	Depositor
Recommended contour level	0.3	Depositor
Map size ($\text{\AA}$)	223.68, 223.68, 223.68	wwPDB
Map dimensions	240, 240, 240	wwPDB
Map angles ($^\circ$)	90.0, 90.0, 90.0	wwPDB
Pixel spacing ($\text{\AA}$)	0.932, 0.932, 0.932	Depositor

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: K, EIC, D21, POV, ACD

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	0.15	0/2340	0.31	0/3163
1	B	0.15	0/2340	0.31	0/3163
All	All	0.15	0/4680	0.31	0/6326

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

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	2285	0	2277	71	0
1	B	2285	0	2277	73	0
2	A	90	0	120	6	0
2	B	90	0	120	7	0
3	A	20	0	31	0	0
3	B	20	0	31	0	0
4	A	22	0	31	0	0
4	B	22	0	31	0	0
5	A	33	0	0	0	0
5	B	33	0	0	0	0
6	A	2	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
6	B	2	0	0	0	0
All	All	4904	0	4918	115	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 12.

All (115) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:397:MET:O	1:B:191:LYS:NZ	1.67	1.26
1:A:191:LYS:NZ	1:B:397:MET:O	1.73	1.21
1:A:158:LYS:HE2	1:A:190:TRP:HB3	1.63	0.81
1:A:78:TYR:OH	1:B:79:GLU:OE2	2.00	0.80
1:B:394:PHE:HA	1:B:397:MET:HB3	1.65	0.79
1:B:158:LYS:HE2	1:B:190:TRP:HB3	1.63	0.79
1:A:394:PHE:HA	1:A:397:MET:HB3	1.65	0.77
1:A:46:GLU:OE1	1:B:95:TRP:N	2.20	0.75
1:A:94:ARG:NH1	1:A:247:GLN:OE1	2.22	0.72
1:A:146:LEU:HD13	1:A:274:SER:HB3	1.72	0.71
1:B:94:ARG:NH1	1:B:247:GLN:OE1	2.21	0.71
1:A:79:GLU:OE2	1:B:78:TYR:OH	2.10	0.70
1:B:146:LEU:HD13	1:B:274:SER:HB3	1.72	0.70
1:B:294:MET:HA	1:B:298:CYS:HB2	1.74	0.69
1:A:294:MET:HA	1:A:298:CYS:HB2	1.74	0.68
1:A:273:TYR:OH	1:B:273:TYR:OH	2.07	0.67
1:A:191:LYS:HE3	1:B:401:LEU:HB2	1.77	0.67
1:B:397:MET:O	1:B:397:MET:HE3	1.97	0.65
1:B:196:TYR:O	1:B:200:ILE:HD12	1.97	0.65
1:A:196:TYR:O	1:A:200:ILE:HD12	1.97	0.65
1:A:16:ASP:OD1	1:A:19:ARG:NH1	2.30	0.64
1:B:158:LYS:NZ	1:B:190:TRP:H	1.96	0.64
1:B:16:ASP:OD1	1:B:19:ARG:NH1	2.30	0.64
1:A:158:LYS:NZ	1:A:190:TRP:H	1.96	0.63
1:A:397:MET:O	1:A:397:MET:HE3	1.97	0.63
1:A:191:LYS:HE3	1:B:401:LEU:CB	2.30	0.62
1:A:158:LYS:HZ3	1:A:190:TRP:H	1.49	0.61
1:A:95:TRP:N	1:B:46:GLU:OE1	2.34	0.60
1:A:191:LYS:CE	1:B:401:LEU:HB2	2.33	0.58
1:B:252:GLU:OE2	1:B:252:GLU:HA	2.05	0.57
1:A:42:GLU:OE2	1:B:118:PRO:HA	2.04	0.56
1:B:286:SER:O	1:B:290:ILE:HG22	2.05	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:401:LEU:CB	1:B:191:LYS:HE3	2.35	0.56
1:B:393:ALA:O	1:B:397:MET:HB2	2.06	0.56
1:A:150:ILE:HD13	1:B:398:ASN:HB3	1.88	0.56
1:A:286:SER:O	1:A:290:ILE:HG22	2.05	0.56
1:A:393:ALA:O	1:A:397:MET:HB2	2.06	0.55
1:B:94:ARG:HG3	1:B:116:THR:HG23	1.88	0.55
1:A:86:ILE:HD11	1:B:50:LYS:HD3	1.87	0.55
1:A:401:LEU:HB2	1:B:191:LYS:HE3	1.88	0.55
1:A:94:ARG:HG3	1:A:116:THR:HG23	1.88	0.55
1:A:199:LEU:O	1:A:203:THR:HG22	2.07	0.55
1:A:252:GLU:OE2	1:A:252:GLU:HA	2.05	0.54
1:B:199:LEU:O	1:B:203:THR:HG22	2.07	0.53
1:A:108:VAL:HG13	1:A:138:THR:OG1	2.08	0.53
1:B:158:LYS:HZ3	1:B:190:TRP:H	1.56	0.53
1:B:108:VAL:HG13	1:B:138:THR:OG1	2.08	0.53
1:A:148:ARG:NH1	1:B:16:ASP:OD2	2.40	0.53
1:A:398:ASN:HA	1:B:191:LYS:HZ2	1.74	0.52
1:A:292:ARG:HB2	1:A:292:ARG:CZ	2.41	0.51
1:B:242:ASP:N	1:B:242:ASP:OD1	2.43	0.51
1:A:242:ASP:OD1	1:A:242:ASP:N	2.43	0.51
1:A:398:ASN:HA	1:B:191:LYS:NZ	2.25	0.51
1:B:292:ARG:CZ	1:B:292:ARG:HB2	2.41	0.51
1:A:401:LEU:HB2	1:B:191:LYS:CE	2.40	0.50
1:A:398:ASN:HB3	1:B:150:ILE:HD13	1.94	0.50
1:A:394:PHE:CA	1:A:397:MET:HB3	2.40	0.50
1:A:152:ILE:HD11	2:A:506:POV:C31	2.42	0.49
1:B:394:PHE:CA	1:B:397:MET:HB3	2.39	0.49
1:A:193:SER:HA	1:B:401:LEU:HD12	1.94	0.49
1:B:152:ILE:HD11	2:B:508:POV:C31	2.42	0.49
1:A:134:GLY:O	1:A:138:THR:OG1	2.30	0.49
1:A:75:LEU:HD13	1:B:78:TYR:CE2	2.47	0.49
1:A:118:PRO:HA	1:B:42:GLU:OE2	2.13	0.49
1:A:21:LEU:HD21	2:A:509:POV:H34A	1.96	0.48
1:B:248:ASN:HB2	1:B:251:TYR:CZ	2.49	0.47
1:A:144:LEU:HD21	1:B:284:LYS:HE2	1.96	0.47
2:B:503:POV:H36	2:B:503:POV:H39A	1.71	0.47
1:A:46:GLU:OE1	1:B:94:ARG:HB3	2.16	0.46
1:A:248:ASN:HB2	1:A:251:TYR:CZ	2.49	0.46
2:B:501:POV:H38A	2:B:501:POV:H311	1.53	0.46
1:A:194:VAL:HG22	1:B:398:ASN:HD22	1.81	0.46
1:A:240:PHE:HZ	1:B:107:VAL:HG22	1.81	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:22:LEU:HD22	1:B:291:LEU:HD13	1.98	0.45
1:B:155:TYR:CD1	1:B:155:TYR:C	2.94	0.45
1:A:155:TYR:C	1:A:155:TYR:CD1	2.94	0.45
1:A:398:ASN:HD22	1:B:194:VAL:HG22	1.81	0.45
1:A:94:ARG:HB3	1:B:46:GLU:OE1	2.17	0.45
1:B:148:ARG:HG2	1:B:148:ARG:HH11	1.82	0.44
1:A:275:LEU:O	1:A:279:ILE:HG13	2.17	0.44
1:A:50:LYS:HD3	1:B:86:ILE:HD11	1.99	0.44
1:A:148:ARG:HH11	1:A:148:ARG:HG2	1.82	0.44
2:A:501:POV:H38	2:A:501:POV:H311	1.77	0.44
1:A:191:LYS:HG3	1:A:192:PRO:HD2	1.99	0.44
1:B:21:LEU:HD21	2:B:502:POV:H34A	1.99	0.44
2:B:503:POV:H36A	2:B:503:POV:H33A	1.67	0.44
1:B:275:LEU:O	1:B:279:ILE:HG13	2.17	0.44
1:A:22:LEU:HD22	1:A:291:LEU:HD13	1.99	0.44
2:A:508:POV:H38A	2:A:508:POV:H311	1.53	0.43
1:B:191:LYS:HG3	1:B:192:PRO:HD2	1.99	0.43
1:A:16:ASP:OD2	1:B:148:ARG:NH1	2.50	0.43
2:A:501:POV:H33A	2:A:501:POV:H36A	1.66	0.42
1:A:128:ILE:HA	1:B:232:PHE:CE2	2.54	0.42
1:A:94:ARG:HA	1:A:94:ARG:HD3	1.80	0.42
1:A:240:PHE:CZ	1:B:107:VAL:HG22	2.54	0.42
1:A:41:LEU:HD23	1:B:123:GLY:HA2	2.01	0.42
1:B:94:ARG:HD3	1:B:94:ARG:HA	1.80	0.42
2:B:503:POV:H38	2:B:503:POV:H311	1.77	0.42
1:B:291:LEU:HD12	1:B:291:LEU:HA	1.91	0.42
1:B:396:ILE:C	1:B:396:ILE:HD12	2.46	0.41
1:A:396:ILE:HD12	1:A:396:ILE:C	2.45	0.41
1:B:397:MET:HE3	1:B:397:MET:C	2.45	0.41
2:A:501:POV:H39A	2:A:501:POV:H36	1.71	0.41
1:B:134:GLY:O	1:B:138:THR:OG1	2.30	0.41
1:A:70:GLU:H	1:A:70:GLU:CD	2.27	0.41
1:A:150:ILE:HG21	1:B:397:MET:HE2	2.03	0.41
1:A:207:LEU:HD23	1:A:207:LEU:HA	1.90	0.41
1:A:397:MET:HE3	1:A:397:MET:C	2.45	0.41
1:B:287:LEU:HD12	1:B:287:LEU:HA	1.95	0.41
1:A:56:ARG:HD2	1:B:77:HIS:CG	2.56	0.41
1:A:396:ILE:HG21	1:B:396:ILE:HG21	2.03	0.41
1:B:21:LEU:HD21	2:B:502:POV:H37A	2.03	0.41
1:B:395:ALA:O	1:B:399:ASN:HB3	2.22	0.40
1:A:120:THR:O	1:A:124:LYS:HG3	2.21	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:190:TRP:C	1:B:190:TRP:CD1	3.00	0.40

There are no symmetry-related clashes.

5.3 Torsion angles [i](#)

5.3.1 Protein backbone [i](#)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	281/395 (71%)	273 (97%)	8 (3%)	0	100	100
1	B	281/395 (71%)	273 (97%)	8 (3%)	0	100	100
All	All	562/790 (71%)	546 (97%)	16 (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	241/329 (73%)	237 (98%)	4 (2%)	53	71
1	B	241/329 (73%)	237 (98%)	4 (2%)	53	71
All	All	482/658 (73%)	474 (98%)	8 (2%)	52	71

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

Mol	Chain	Res	Type
1	A	108	VAL
1	A	200	ILE
1	A	205	SER
1	A	287	LEU
1	B	108	VAL
1	B	200	ILE
1	B	205	SER
1	B	287	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (2) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	162	GLN
1	B	162	GLN

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains [i](#)

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

5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 22 ligands modelled in this entry, 4 are monoatomic - leaving 18 for Mogul analysis.

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
3	EIC	A	503	-	19,19,19	1.34	2 (10%)	19,19,19	0.94	0
2	POV	A	507	-	14,14,51	1.47	1 (7%)	14,14,59	2.85	1 (7%)
2	POV	A	508	-	14,14,51	1.45	1 (7%)	14,14,59	2.85	1 (7%)
2	POV	B	501	-	14,14,51	1.45	1 (7%)	14,14,59	2.85	1 (7%)
2	POV	B	504	-	14,14,51	1.47	1 (7%)	14,14,59	2.87	1 (7%)
4	ACD	A	504	-	21,21,21	1.74	4 (19%)	21,21,21	1.06	0
5	D21	A	505	-	32,32,45	1.24	5 (15%)	35,37,50	1.15	2 (5%)
2	POV	A	506	-	14,14,51	1.46	1 (7%)	14,14,59	2.83	1 (7%)
5	D21	B	507	-	32,32,45	1.24	5 (15%)	35,37,50	1.15	2 (5%)
2	POV	B	503	-	14,14,51	1.47	1 (7%)	14,14,59	2.83	1 (7%)
3	EIC	B	505	-	19,19,19	1.34	2 (10%)	19,19,19	0.94	0
2	POV	B	508	-	14,14,51	1.46	1 (7%)	14,14,59	2.83	1 (7%)
2	POV	B	502	-	14,14,51	1.46	1 (7%)	14,14,59	2.86	1 (7%)
2	POV	A	509	-	14,14,51	1.46	1 (7%)	14,14,59	2.86	1 (7%)
4	ACD	B	506	-	21,21,21	1.74	4 (19%)	21,21,21	1.06	0
2	POV	B	509	-	14,14,51	1.47	1 (7%)	14,14,59	2.85	1 (7%)
2	POV	A	501	-	14,14,51	1.47	1 (7%)	14,14,59	2.83	1 (7%)
2	POV	A	502	-	14,14,51	1.47	1 (7%)	14,14,59	2.87	1 (7%)

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
3	EIC	A	503	-	-	9/17/17/17	-
2	POV	A	507	-	-	9/12/12/55	-
2	POV	A	508	-	-	9/12/12/55	-
2	POV	B	501	-	-	9/12/12/55	-
2	POV	B	504	-	-	7/12/12/55	-
4	ACD	A	504	-	-	7/19/19/19	-
5	D21	A	505	-	-	15/34/34/47	-
2	POV	A	506	-	-	5/12/12/55	-
5	D21	B	507	-	-	15/34/34/47	-
2	POV	B	503	-	-	9/12/12/55	-
3	EIC	B	505	-	-	9/17/17/17	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	POV	B	508	-	-	5/12/12/55	-
2	POV	B	502	-	-	7/12/12/55	-
2	POV	A	509	-	-	7/12/12/55	-
4	ACD	B	506	-	-	7/19/19/19	-
2	POV	B	509	-	-	9/12/12/55	-
2	POV	A	501	-	-	9/12/12/55	-
2	POV	A	502	-	-	7/12/12/55	-

All (34) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	502	POV	C313-C312	-4.33	1.19	1.50
2	B	504	POV	C313-C312	-4.32	1.19	1.50
2	B	509	POV	C313-C312	-4.29	1.19	1.50
2	A	507	POV	C313-C312	-4.29	1.19	1.50
2	B	502	POV	C313-C312	-4.28	1.19	1.50
2	A	509	POV	C313-C312	-4.28	1.19	1.50
2	A	501	POV	C313-C312	-4.27	1.19	1.50
2	A	506	POV	C313-C312	-4.27	1.19	1.50
2	B	503	POV	C313-C312	-4.27	1.19	1.50
2	B	508	POV	C313-C312	-4.27	1.20	1.50
2	B	501	POV	C313-C312	-4.19	1.20	1.50
2	A	508	POV	C313-C312	-4.18	1.20	1.50
5	B	507	D21	C41-C40	3.78	1.53	1.31
4	B	506	ACD	C6-C5	3.78	1.53	1.31
4	A	504	ACD	C9-C8	3.78	1.53	1.31
4	A	504	ACD	C6-C5	3.78	1.53	1.31
4	B	506	ACD	C12-C11	3.77	1.53	1.31
4	B	506	ACD	C15-C14	3.77	1.53	1.31
5	A	505	D21	C41-C40	3.77	1.53	1.31
4	A	504	ACD	C15-C14	3.77	1.53	1.31
4	A	504	ACD	C12-C11	3.77	1.53	1.31
4	B	506	ACD	C9-C8	3.76	1.53	1.31
3	B	505	EIC	C10-C9	3.76	1.53	1.31
3	A	503	EIC	C13-C12	3.75	1.53	1.31
3	A	503	EIC	C10-C9	3.75	1.53	1.31
3	B	505	EIC	C13-C12	3.74	1.53	1.31
5	A	505	D21	O30-C20	-2.66	1.40	1.46
5	B	507	D21	O30-C20	-2.61	1.40	1.46
5	A	505	D21	O18-C16	2.40	1.40	1.33
5	B	507	D21	O18-C16	2.37	1.40	1.33

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	A	505	D21	O30-C31	2.22	1.40	1.34
5	B	507	D21	O30-C31	2.19	1.40	1.34
5	B	507	D21	O18-C19	-2.18	1.40	1.45
5	A	505	D21	O18-C19	-2.14	1.40	1.45

All (16) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	504	POV	C313-C312-C311	9.86	179.96	113.36
2	A	502	POV	C313-C312-C311	9.86	179.94	113.36
2	B	501	POV	C313-C312-C311	9.83	179.73	113.36
2	A	508	POV	C313-C312-C311	9.82	179.68	113.36
2	B	502	POV	C313-C312-C311	9.81	179.57	113.36
2	A	509	POV	C313-C312-C311	9.80	179.54	113.36
2	B	509	POV	C313-C312-C311	9.78	179.38	113.36
2	A	507	POV	C313-C312-C311	9.78	179.37	113.36
2	B	503	POV	C313-C312-C311	9.76	179.28	113.36
2	A	501	POV	C313-C312-C311	9.76	179.26	113.36
2	A	506	POV	C313-C312-C311	9.71	178.94	113.36
2	B	508	POV	C313-C312-C311	9.71	178.91	113.36
5	A	505	D21	O30-C31-C33	4.03	120.19	111.48
5	B	507	D21	O30-C31-C33	4.01	120.16	111.48
5	B	507	D21	O18-C16-C15	2.67	119.96	111.83
5	A	505	D21	O18-C16-C15	2.66	119.96	111.83

There are no chirality outliers.

All (154) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
5	A	505	D21	O18-C19-C20-O30
5	B	507	D21	O18-C19-C20-O30
3	A	503	EIC	C11-C12-C13-C14
3	B	505	EIC	C11-C12-C13-C14
5	A	505	D21	C39-C40-C41-C42
5	B	507	D21	C39-C40-C41-C42
3	A	503	EIC	C5-C6-C7-C8
3	B	505	EIC	C5-C6-C7-C8
5	A	505	D21	C33-C34-C35-C36
5	B	507	D21	C33-C34-C35-C36
3	A	503	EIC	C1-C2-C3-C4
3	B	505	EIC	C1-C2-C3-C4
5	A	505	D21	C31-C33-C34-C35

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Mol	Chain	Res	Type	Atoms
5	B	507	D21	C31-C33-C34-C35
4	A	504	ACD	C10-C11-C12-C13
4	B	506	ACD	C10-C11-C12-C13
4	A	504	ACD	C4-C5-C6-C7
4	B	506	ACD	C4-C5-C6-C7
2	A	508	POV	C33-C34-C35-C36
2	B	501	POV	C33-C34-C35-C36
4	A	504	ACD	C13-C14-C15-C16
4	B	506	ACD	C13-C14-C15-C16
2	A	502	POV	C33-C34-C35-C36
2	B	504	POV	C33-C34-C35-C36
2	B	501	POV	C37-C38-C39-C310
2	A	508	POV	C37-C38-C39-C310
5	A	505	D21	C34-C35-C36-C37
5	B	507	D21	C34-C35-C36-C37
2	B	504	POV	C310-C311-C312-C313
2	B	508	POV	C32-C33-C34-C35
2	A	506	POV	C32-C33-C34-C35
2	A	506	POV	C35-C36-C37-C38
2	B	508	POV	C35-C36-C37-C38
5	A	505	D21	C37-C38-C39-C40
5	B	507	D21	C37-C38-C39-C40
2	A	508	POV	C32-C33-C34-C35
2	B	501	POV	C32-C33-C34-C35
4	A	504	ACD	C14-C15-C16-C17
4	B	506	ACD	C14-C15-C16-C17
2	A	509	POV	C36-C37-C38-C39
2	B	502	POV	C36-C37-C38-C39
2	A	507	POV	C310-C311-C312-C313
2	A	508	POV	C311-C310-C39-C38
2	B	501	POV	C311-C310-C39-C38
2	B	502	POV	C310-C311-C312-C313
2	B	509	POV	C310-C311-C312-C313
2	A	501	POV	C39-C310-C311-C312
2	B	503	POV	C39-C310-C311-C312
5	A	505	D21	C13-C14-C15-C16
5	B	507	D21	C13-C14-C15-C16
2	A	502	POV	C36-C37-C38-C39
2	B	504	POV	C36-C37-C38-C39
5	A	505	D21	C38-C39-C40-C41
5	B	507	D21	C38-C39-C40-C41
5	A	505	D21	C12-C13-C14-C15

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Mol	Chain	Res	Type	Atoms
5	B	507	D21	C12-C13-C14-C15
2	B	503	POV	C34-C35-C36-C37
2	A	501	POV	C34-C35-C36-C37
3	A	503	EIC	C2-C3-C4-C5
3	B	505	EIC	C2-C3-C4-C5
3	A	503	EIC	C11-C10-C9-C8
3	B	505	EIC	C11-C10-C9-C8
2	A	509	POV	C37-C38-C39-C310
2	B	502	POV	C37-C38-C39-C310
5	A	505	D21	C41-C42-C43-C44
5	B	507	D21	C41-C42-C43-C44
2	B	504	POV	C39-C310-C311-C312
2	B	508	POV	C310-C311-C312-C313
2	A	502	POV	C39-C310-C311-C312
2	A	509	POV	C310-C311-C312-C313
2	A	502	POV	C310-C311-C312-C313
2	A	506	POV	C37-C38-C39-C310
2	B	508	POV	C37-C38-C39-C310
4	A	504	ACD	C6-C7-C8-C9
4	B	506	ACD	C6-C7-C8-C9
2	A	506	POV	C310-C311-C312-C313
2	A	508	POV	C39-C310-C311-C312
2	B	501	POV	C39-C310-C311-C312
5	A	505	D21	O18-C19-C20-C21
5	B	507	D21	O18-C19-C20-C21
2	A	501	POV	C33-C34-C35-C36
2	B	503	POV	C33-C34-C35-C36
2	A	507	POV	C32-C33-C34-C35
2	B	509	POV	C32-C33-C34-C35
2	A	507	POV	C36-C37-C38-C39
2	A	509	POV	C35-C36-C37-C38
2	B	509	POV	C36-C37-C38-C39
2	B	502	POV	C35-C36-C37-C38
5	A	505	D21	C10-C11-C12-C13
5	B	507	D21	C10-C11-C12-C13
2	A	501	POV	C311-C310-C39-C38
2	B	503	POV	C311-C310-C39-C38
2	A	507	POV	C35-C36-C37-C38
2	B	509	POV	C35-C36-C37-C38
2	B	503	POV	C31-C32-C33-C34
2	A	501	POV	C31-C32-C33-C34
2	A	508	POV	C310-C311-C312-C313

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Mol	Chain	Res	Type	Atoms
3	A	503	EIC	C12-C13-C14-C15
3	B	505	EIC	C12-C13-C14-C15
2	B	501	POV	C310-C311-C312-C313
2	B	509	POV	C34-C35-C36-C37
2	A	507	POV	C34-C35-C36-C37
3	A	503	EIC	O2-C1-C2-C3
3	B	505	EIC	O2-C1-C2-C3
2	B	501	POV	O32-C31-C32-C33
2	B	509	POV	C311-C310-C39-C38
2	A	508	POV	O32-C31-C32-C33
3	A	503	EIC	O1-C1-C2-C3
3	B	505	EIC	O1-C1-C2-C3
2	A	507	POV	C311-C310-C39-C38
2	A	501	POV	O32-C31-C32-C33
2	A	501	POV	C35-C36-C37-C38
2	B	503	POV	C35-C36-C37-C38
2	A	508	POV	O31-C31-C32-C33
2	B	501	POV	O31-C31-C32-C33
2	B	503	POV	O32-C31-C32-C33
2	A	501	POV	O31-C31-C32-C33
2	B	503	POV	O31-C31-C32-C33
4	A	504	ACD	C11-C10-C9-C8
4	B	506	ACD	C11-C10-C9-C8
5	B	507	D21	C15-C16-O18-C19
5	A	505	D21	C15-C16-O18-C19
5	A	505	D21	C20-C21-O22-P23
5	B	507	D21	C20-C21-O22-P23
5	A	505	D21	O17-C16-O18-C19
5	B	507	D21	O17-C16-O18-C19
3	A	503	EIC	C7-C8-C9-C10
3	B	505	EIC	C7-C8-C9-C10
4	B	506	ACD	C17-C18-C19-C20
2	B	509	POV	O31-C31-C32-C33
4	A	504	ACD	C17-C18-C19-C20
2	A	507	POV	O31-C31-C32-C33
2	A	509	POV	O31-C31-C32-C33
2	B	502	POV	O31-C31-C32-C33
2	A	507	POV	O32-C31-C32-C33
2	A	509	POV	O32-C31-C32-C33
2	B	502	POV	O32-C31-C32-C33
2	B	509	POV	O32-C31-C32-C33
2	A	509	POV	C39-C310-C311-C312

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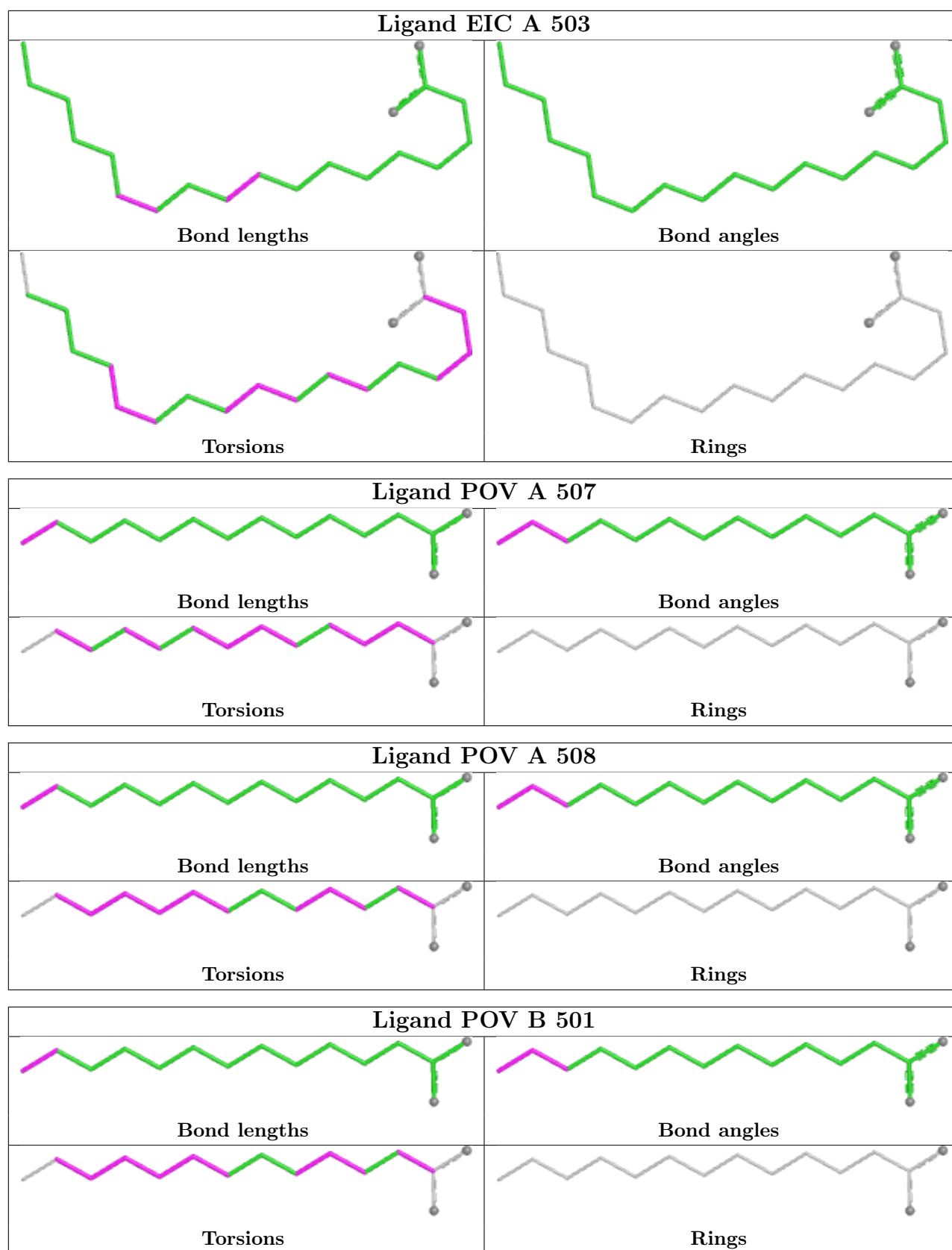
Mol	Chain	Res	Type	Atoms
2	B	502	POV	C39-C310-C311-C312
2	B	501	POV	C36-C37-C38-C39
2	A	508	POV	C36-C37-C38-C39
2	A	507	POV	C31-C32-C33-C34
2	B	509	POV	C31-C32-C33-C34
2	B	508	POV	C39-C310-C311-C312
2	A	506	POV	C39-C310-C311-C312
2	B	504	POV	C34-C35-C36-C37
2	A	502	POV	C34-C35-C36-C37
2	B	503	POV	C36-C37-C38-C39
2	A	501	POV	C36-C37-C38-C39
2	A	502	POV	O31-C31-C32-C33
2	B	504	POV	O31-C31-C32-C33
2	A	502	POV	O32-C31-C32-C33
2	B	504	POV	O32-C31-C32-C33

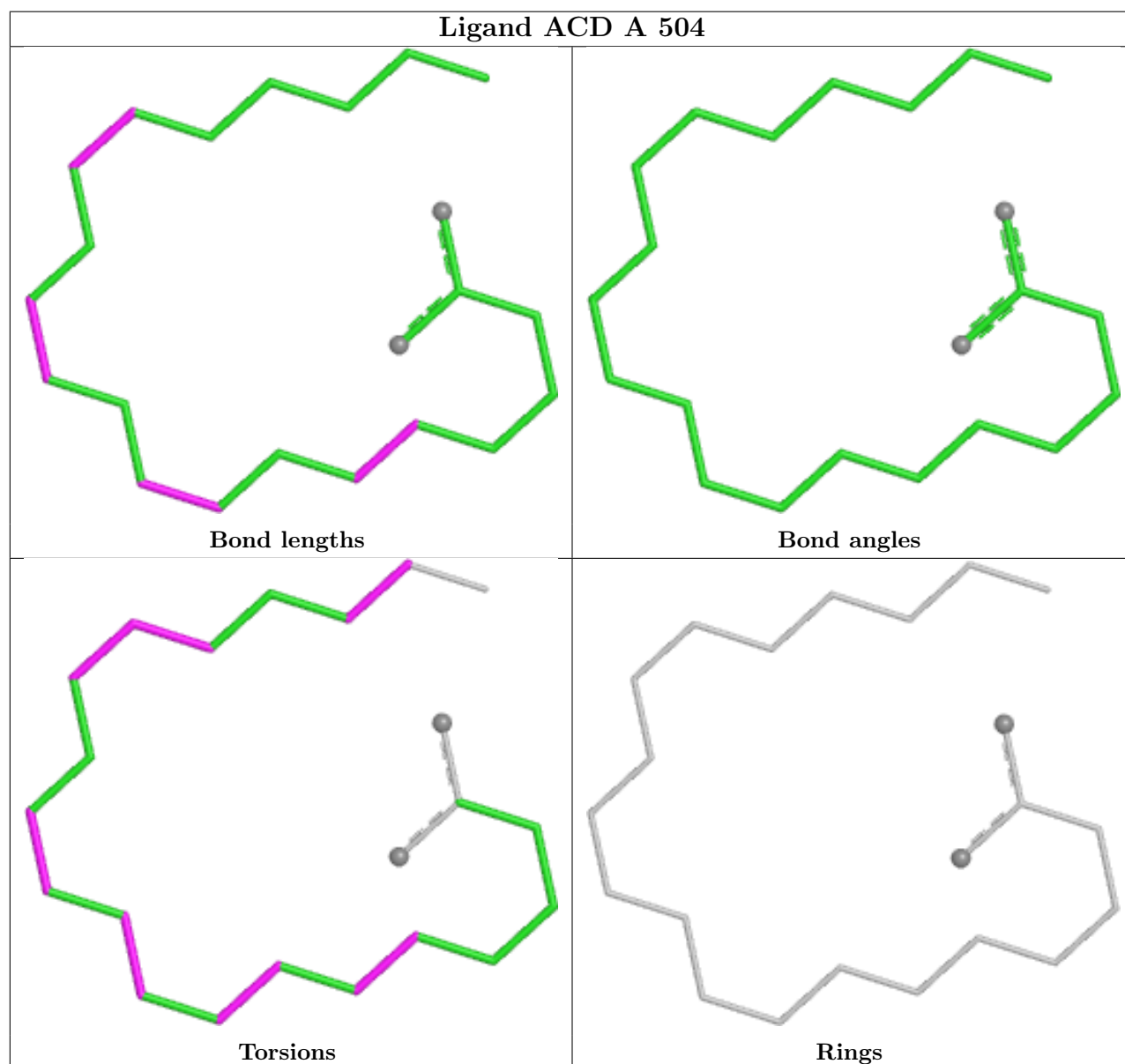
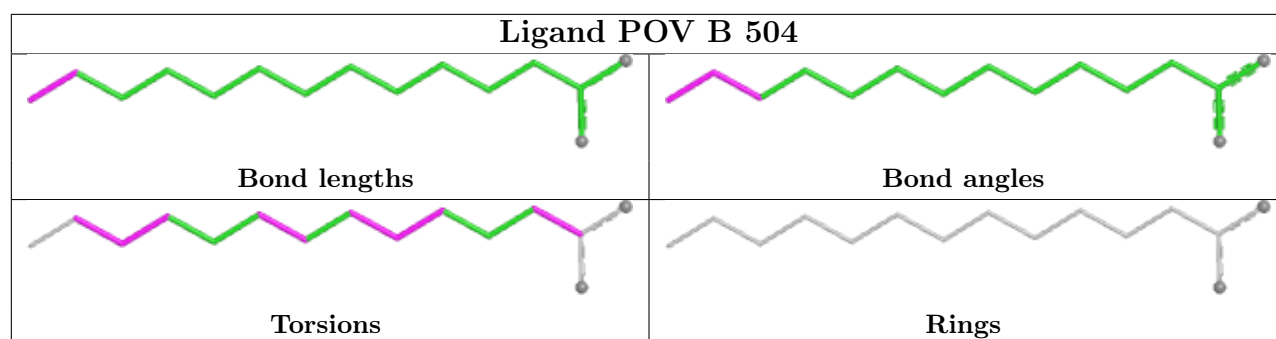
There are no ring outliers.

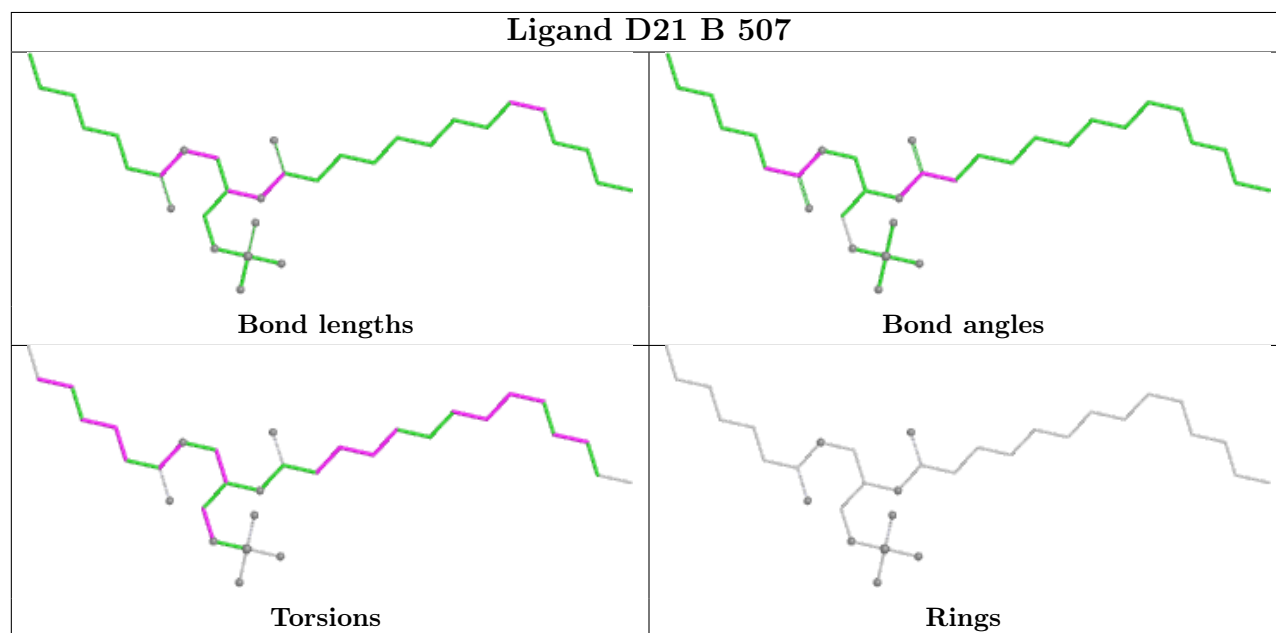
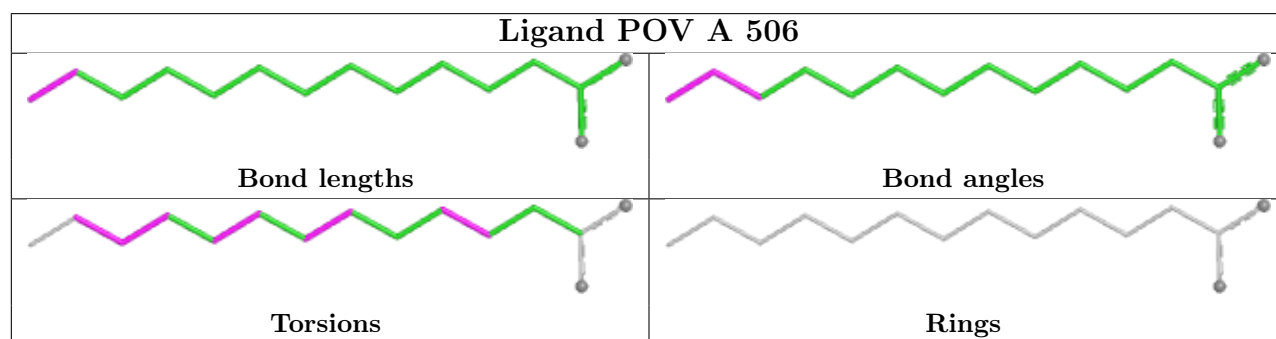
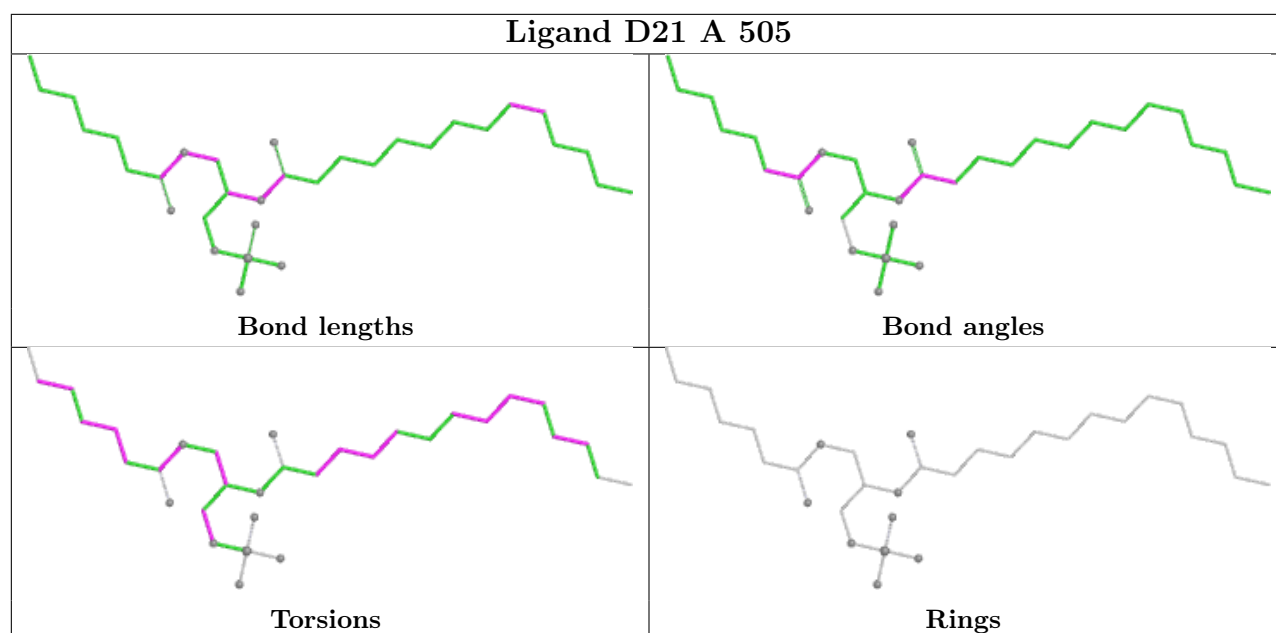
8 monomers are involved in 13 short contacts:

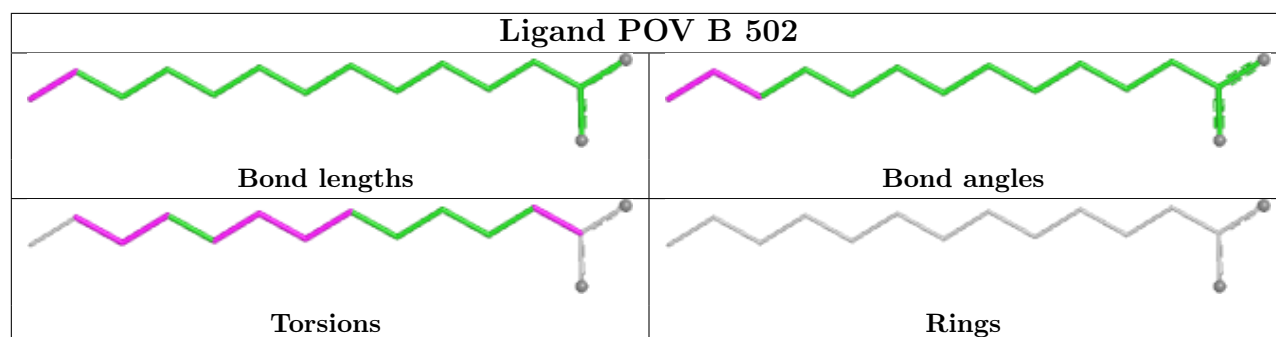
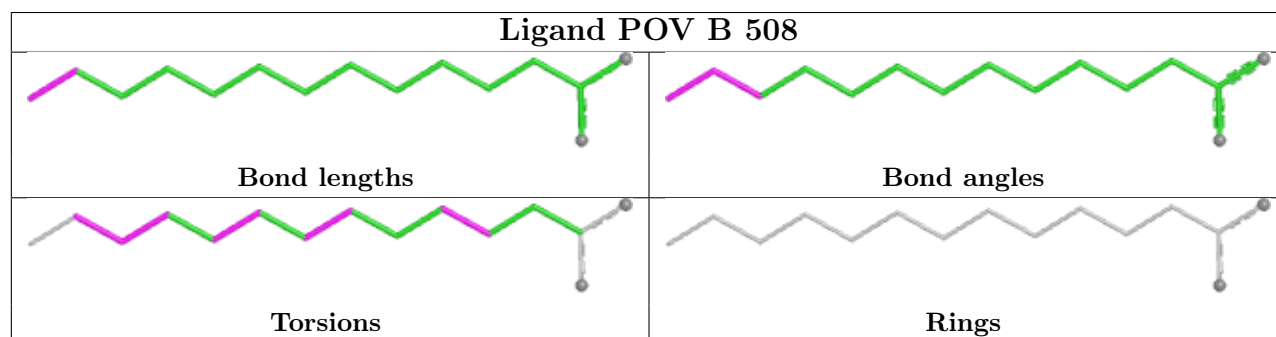
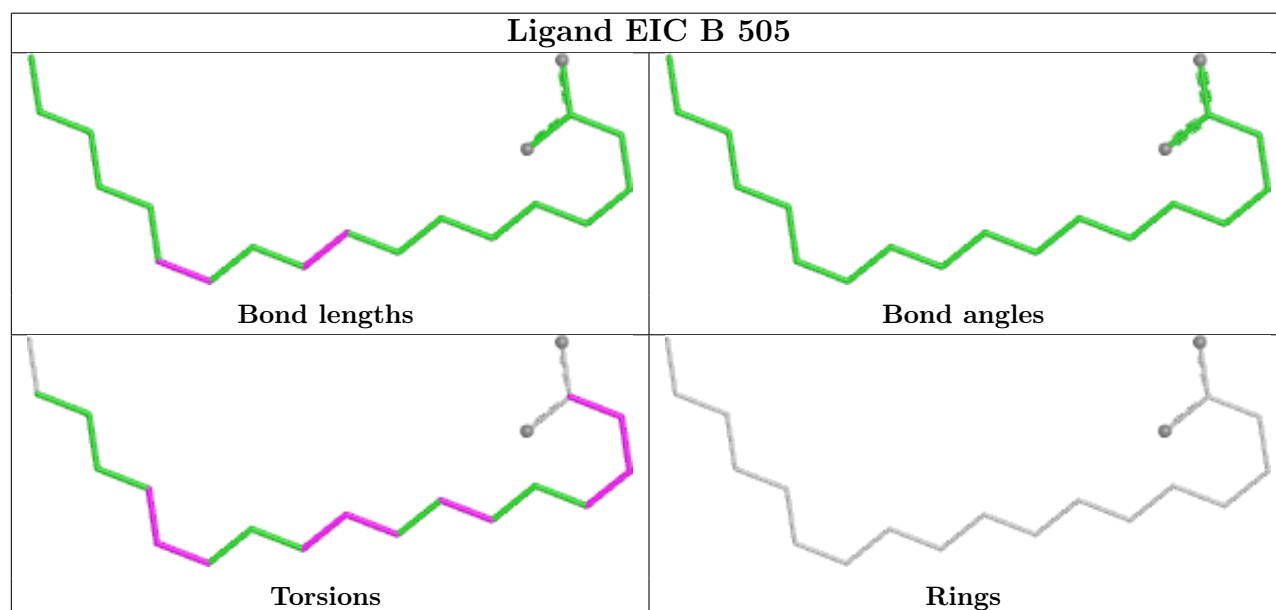
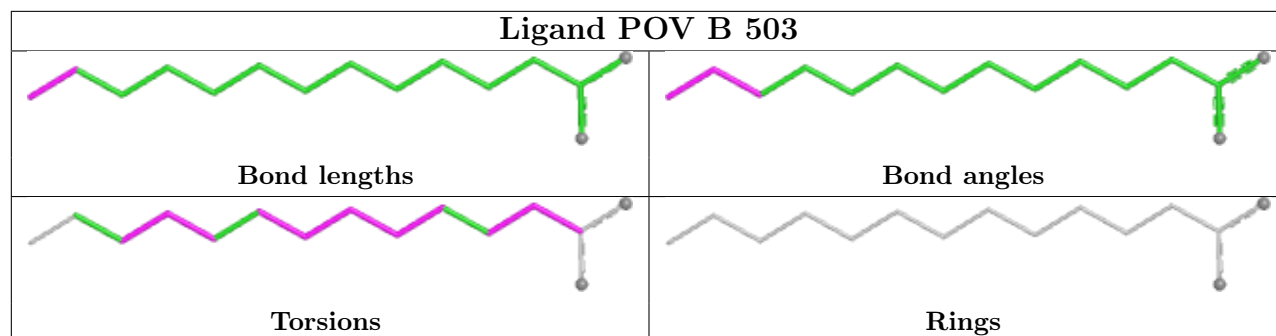
Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	508	POV	1	0
2	B	501	POV	1	0
2	A	506	POV	1	0
2	B	503	POV	3	0
2	B	508	POV	1	0
2	B	502	POV	2	0
2	A	509	POV	1	0
2	A	501	POV	3	0

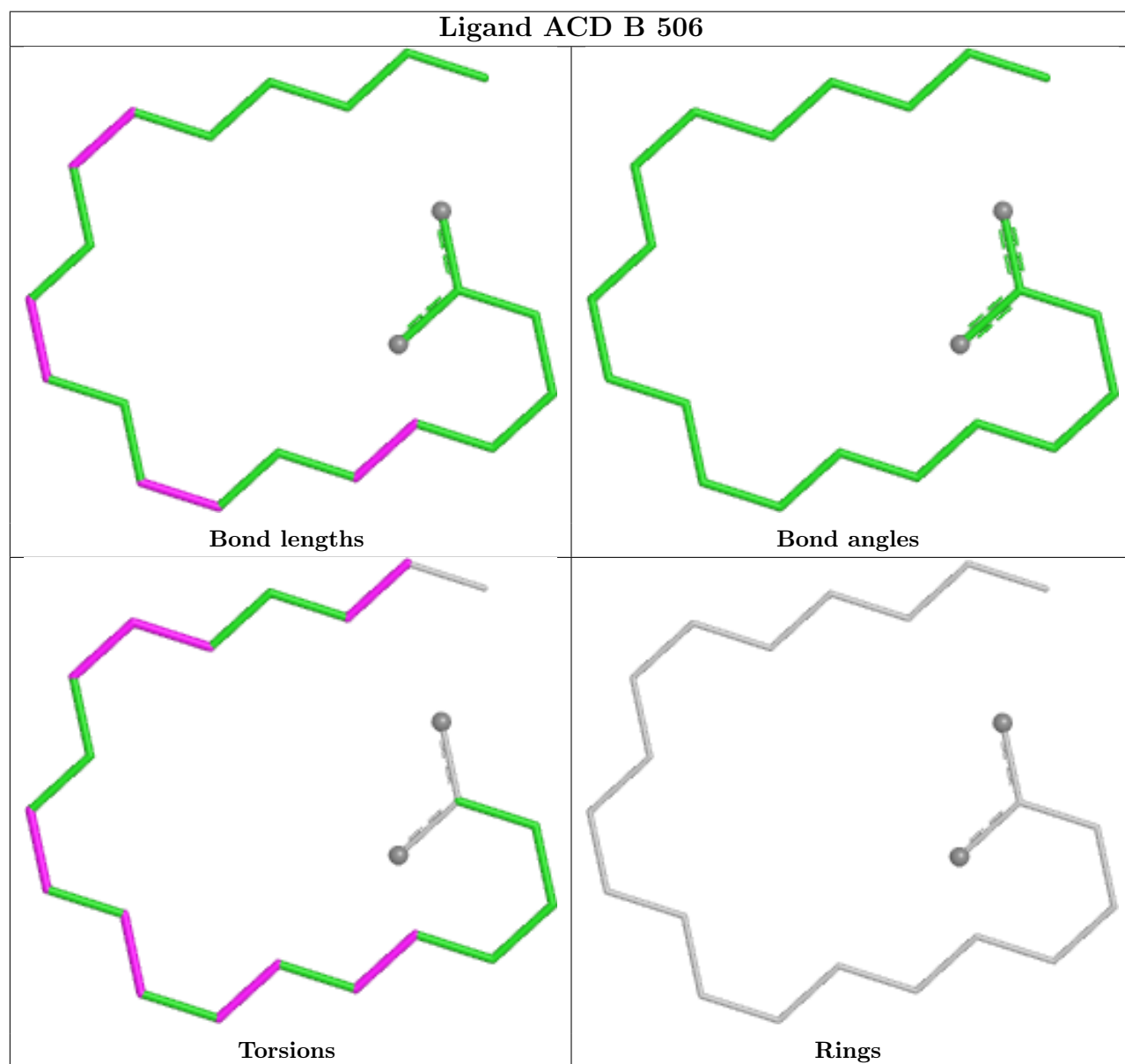
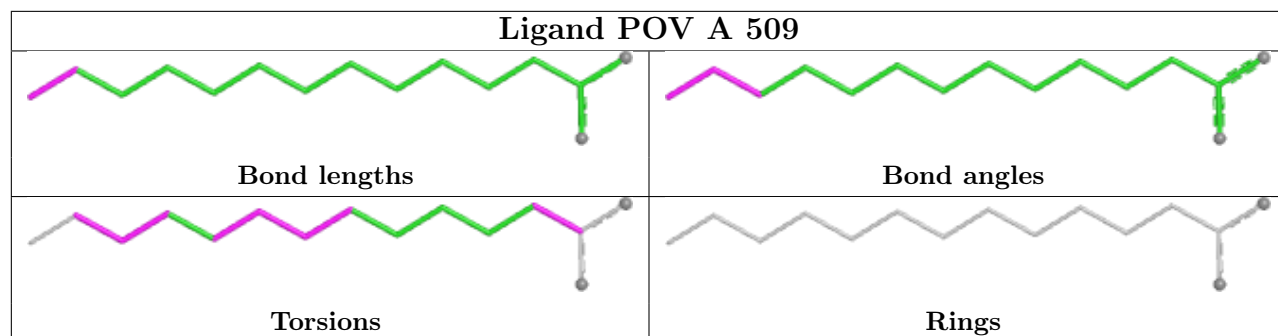
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included.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

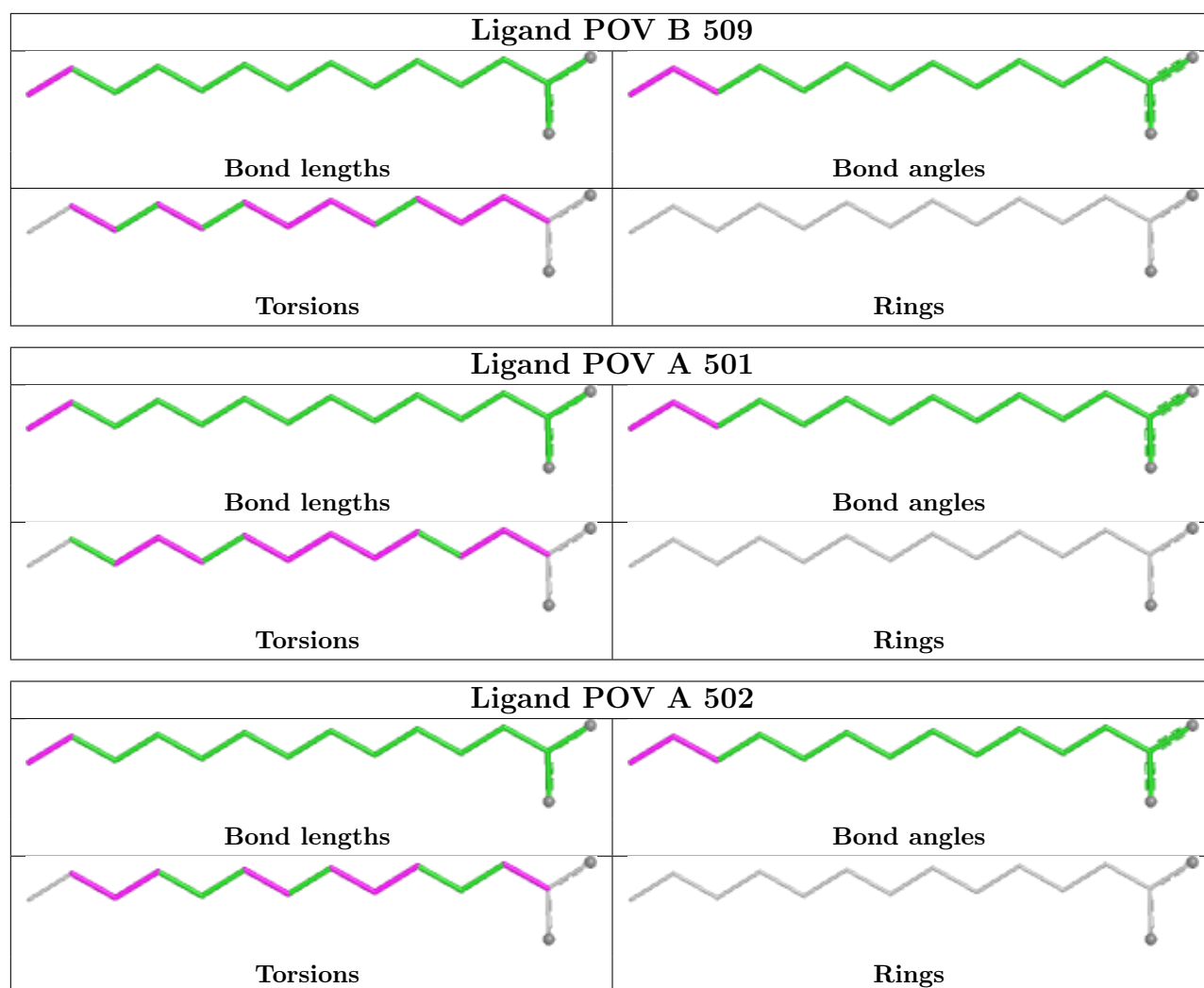












5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

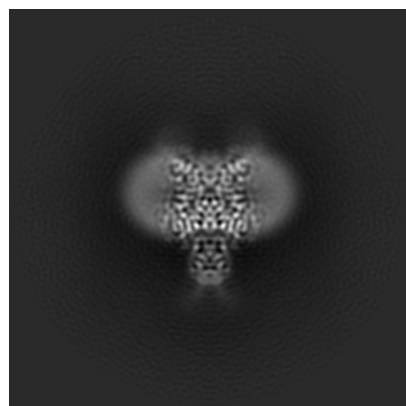
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-61467. These allow visual inspection of the internal detail of the map and identification of artifacts.

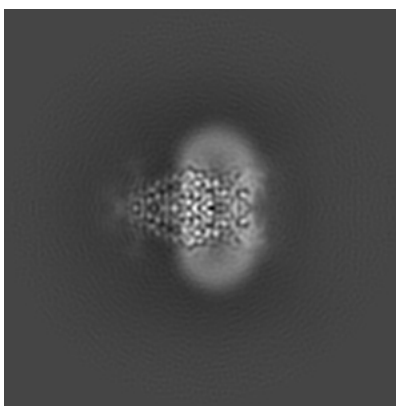
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

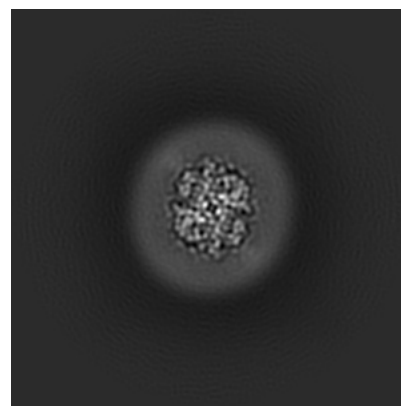
6.1.1 Primary map



X

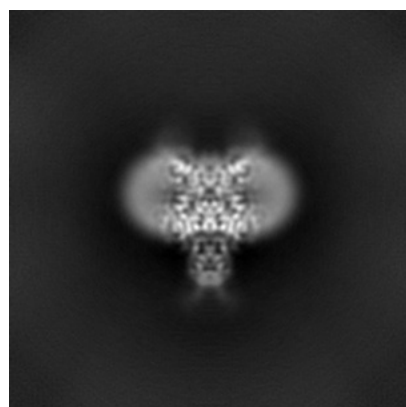


Y

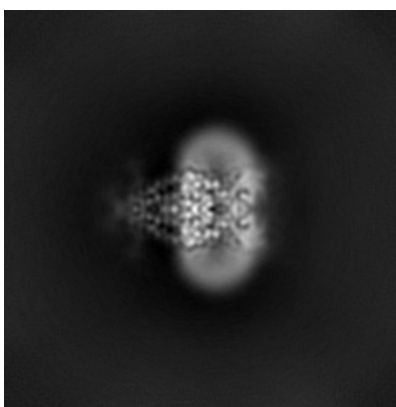


Z

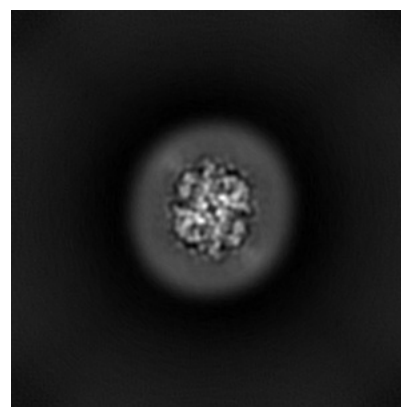
6.1.2 Raw map



X



Y

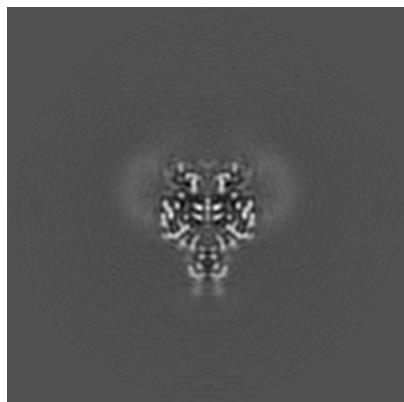


Z

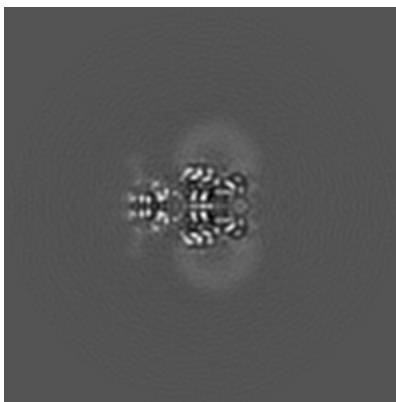
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

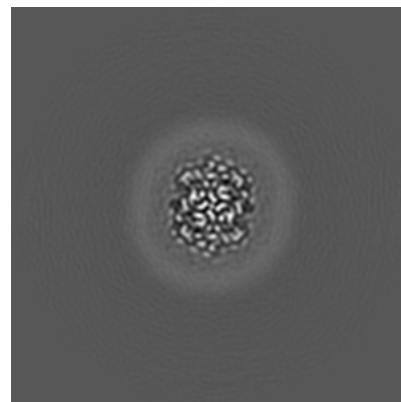
6.2.1 Primary map



X Index: 120

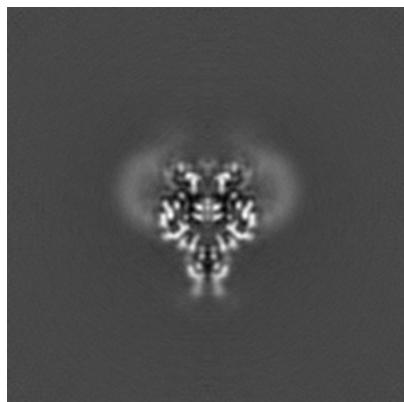


Y Index: 120

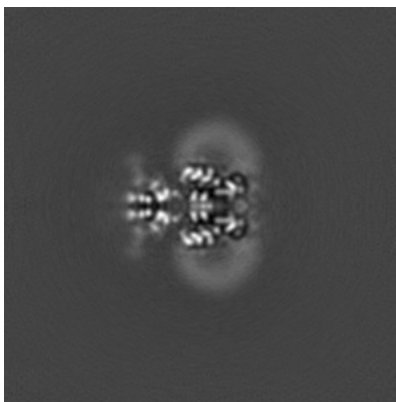


Z Index: 120

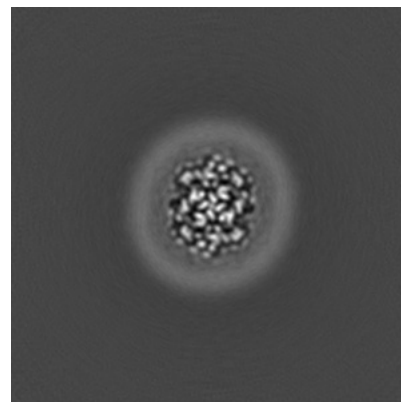
6.2.2 Raw map



X Index: 120



Y Index: 120

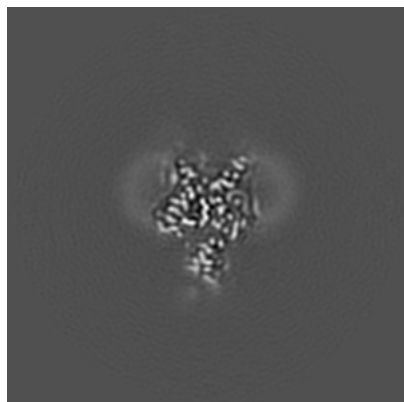


Z Index: 120

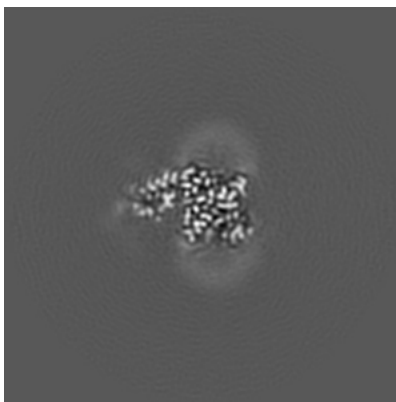
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

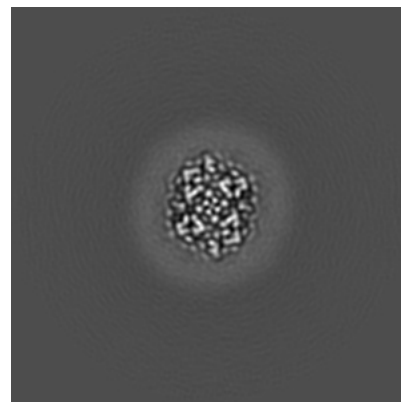
6.3.1 Primary map



X Index: 124

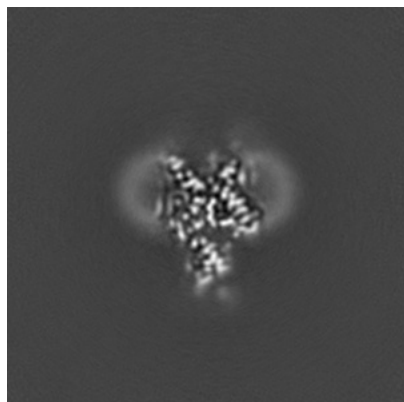


Y Index: 128

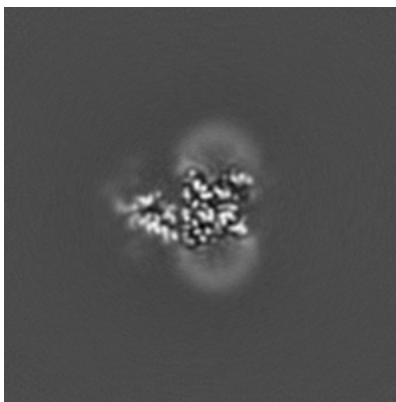


Z Index: 115

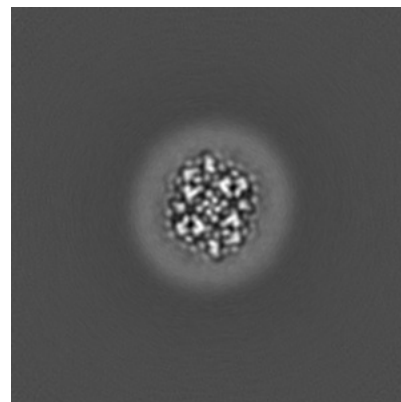
6.3.2 Raw map



X Index: 116



Y Index: 113

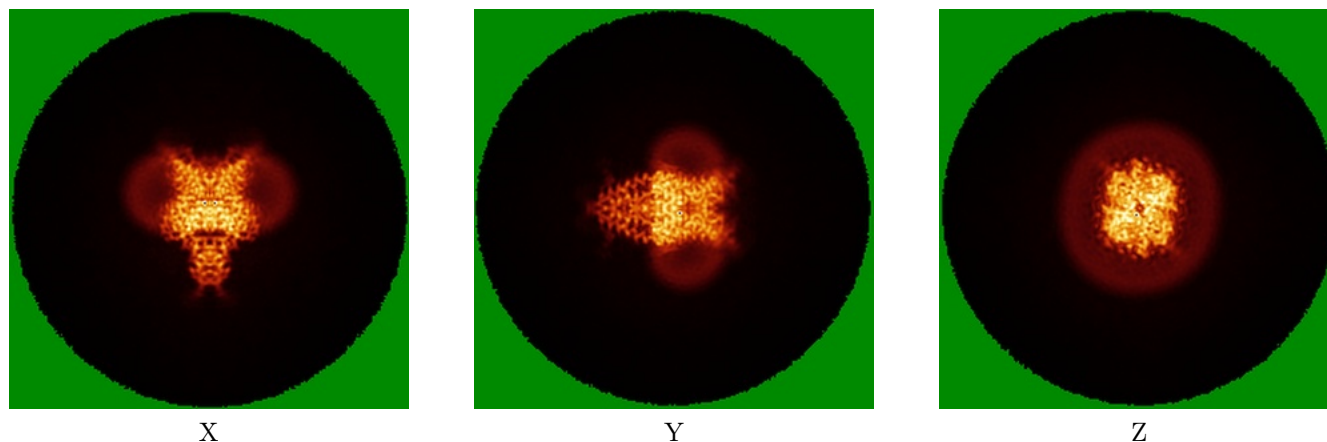


Z Index: 115

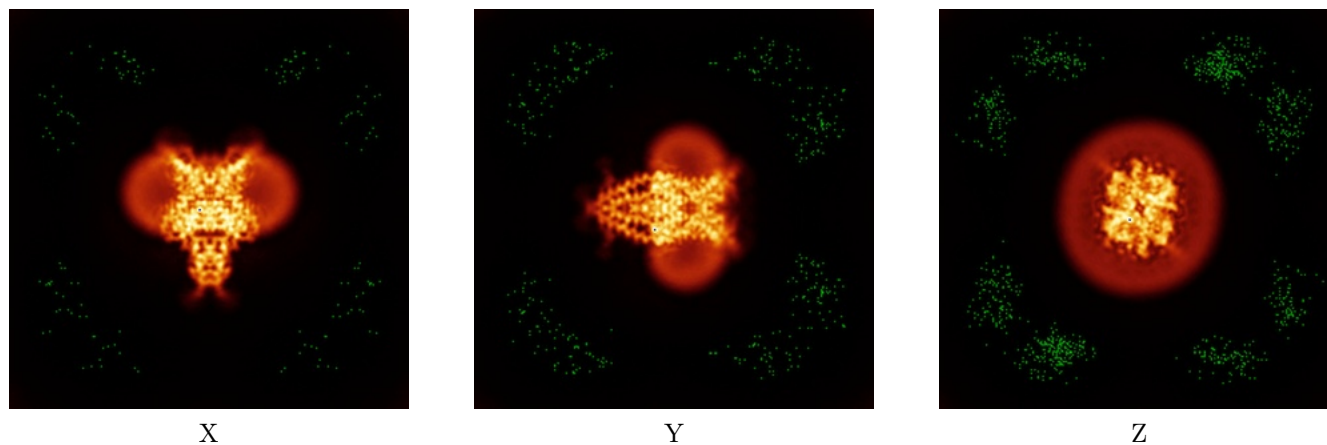
The images above show the largest variance slices of the map in three orthogonal directions.

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

6.4.1 Primary map



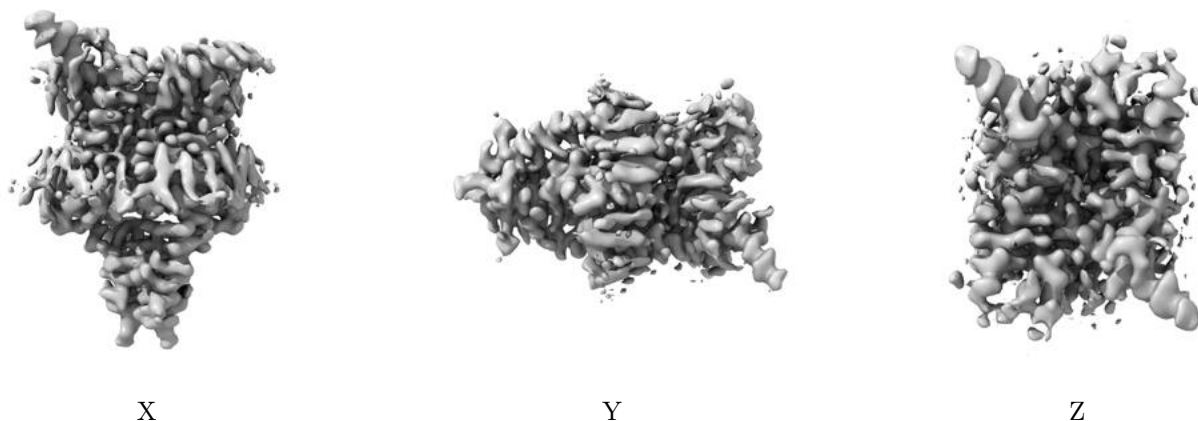
6.4.2 Raw map



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

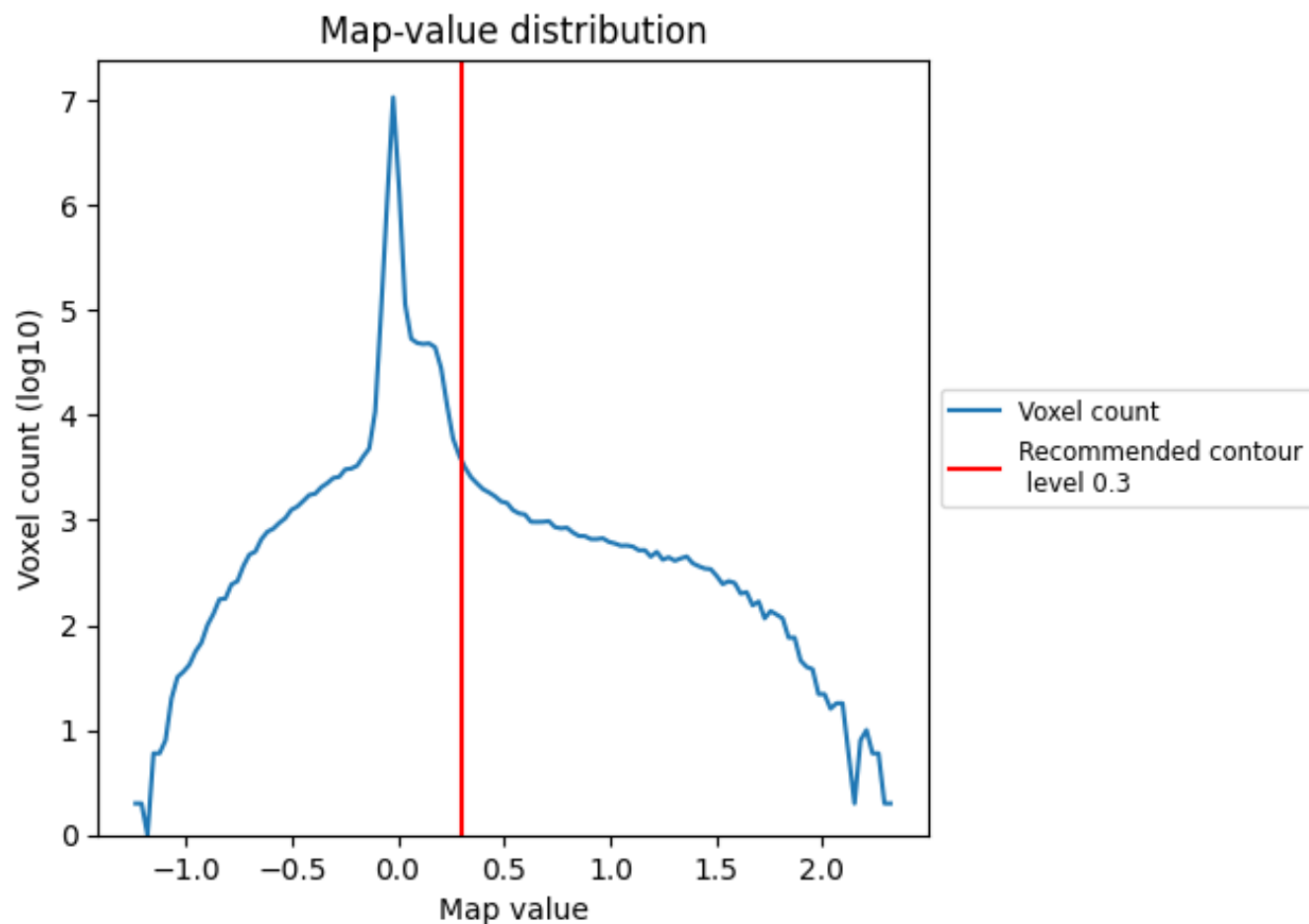
6.6 Mask visualisation [i](#)

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

7 Map analysis [i](#)

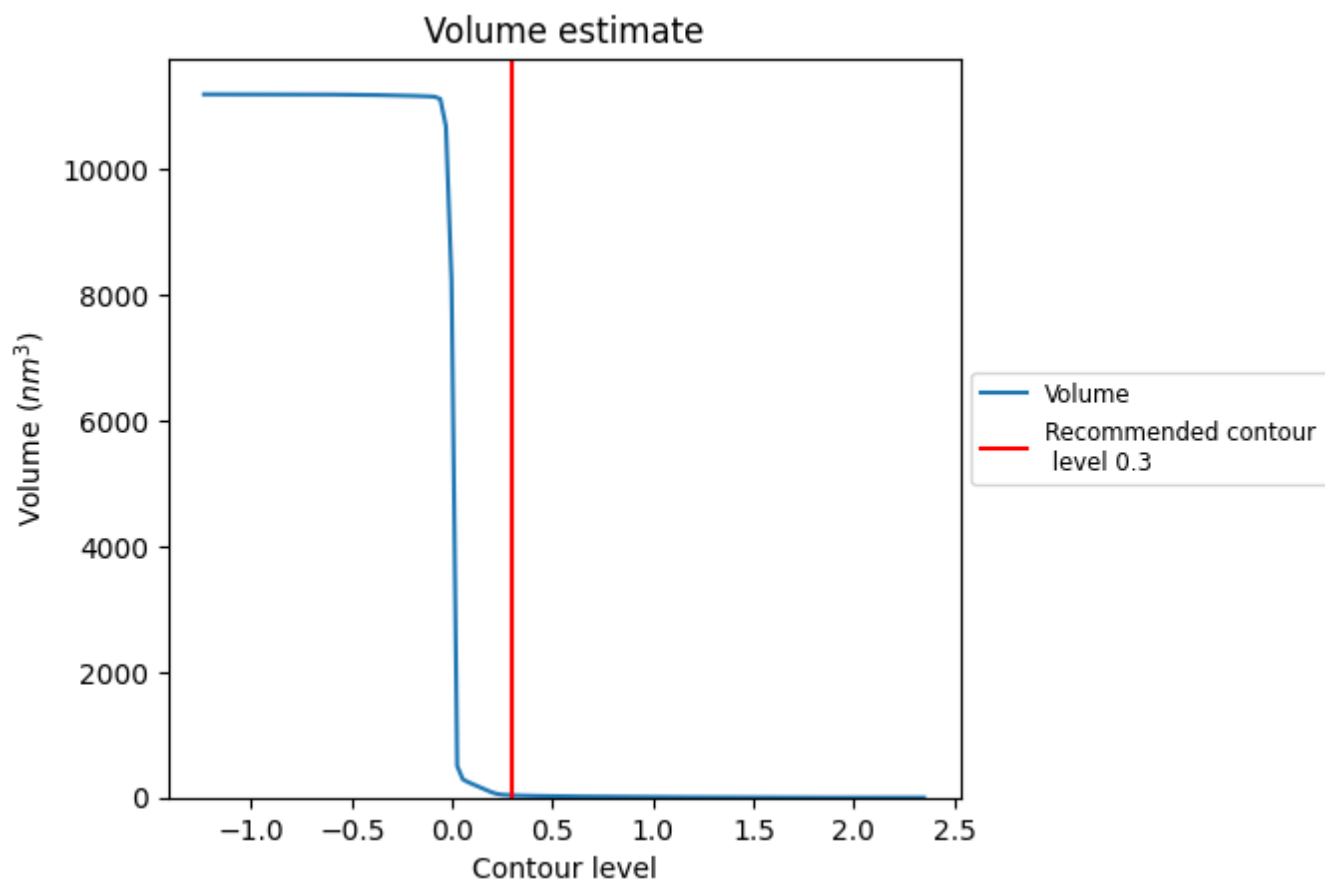
This section contains the results of statistical analysis of the map.

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.

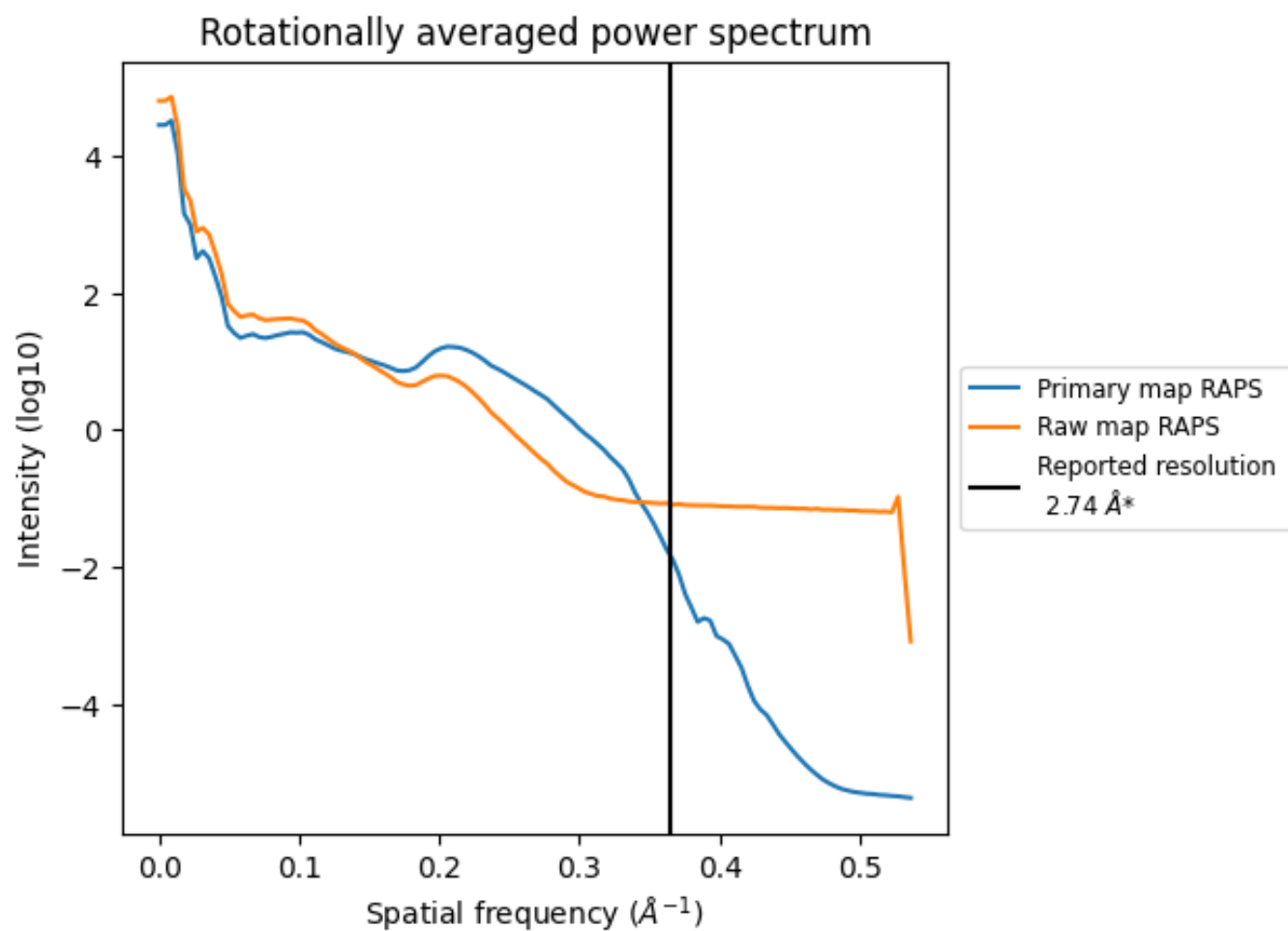
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 36 nm^3 ; this corresponds to an approximate mass of 32 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 ⓘ

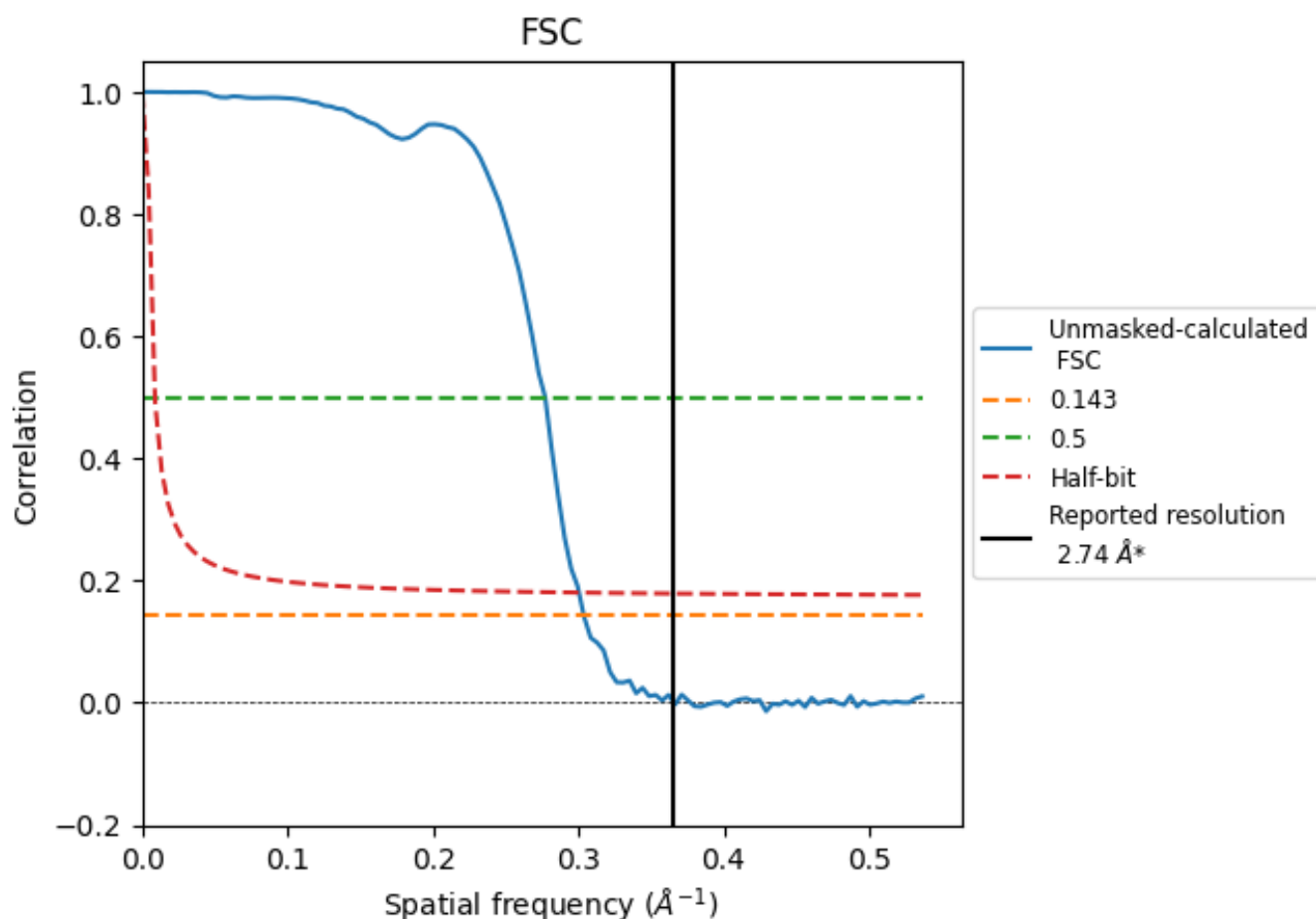


*Reported resolution corresponds to spatial frequency of 0.365 Å⁻¹

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 0.365 Å⁻¹

8.2 Resolution estimates [i](#)

Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	2.74	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	3.29	3.61	3.33

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 3.29 differs from the reported value 2.74 by more than 10 %

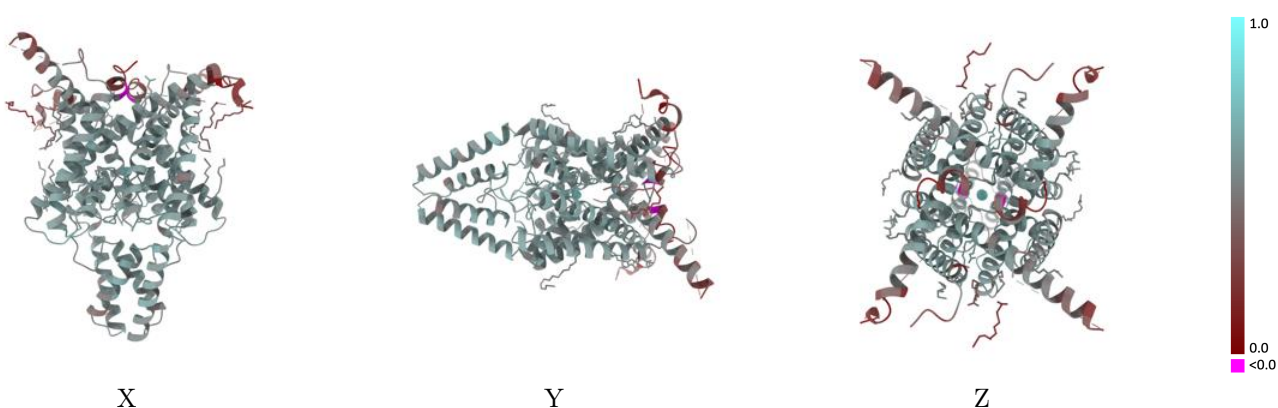
9 Map-model fit [i](#)

This section contains information regarding the fit between EMDB map EMD-61467 and PDB model 9JGZ. Per-residue inclusion information can be found in section 3 on page 7.

9.1 Map-model overlay [i](#)

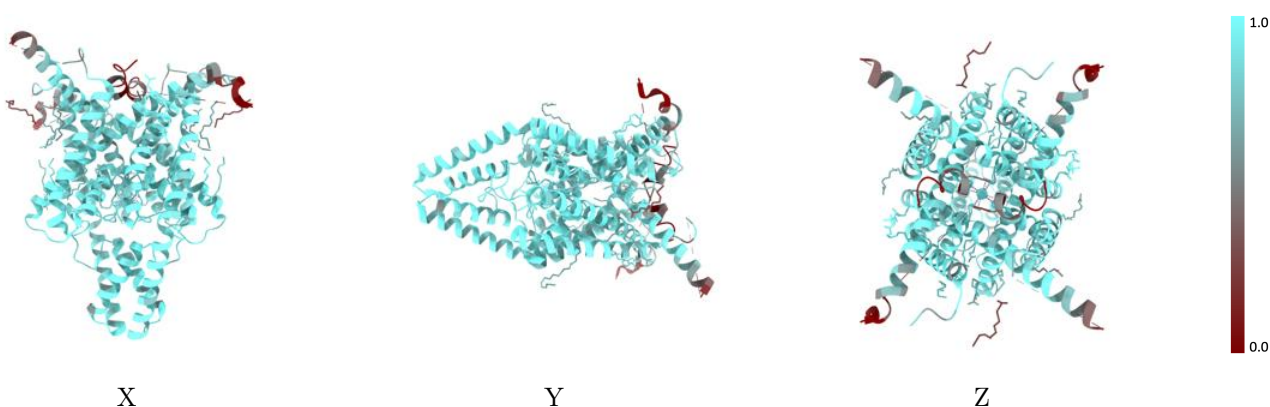
This section was not generated.

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



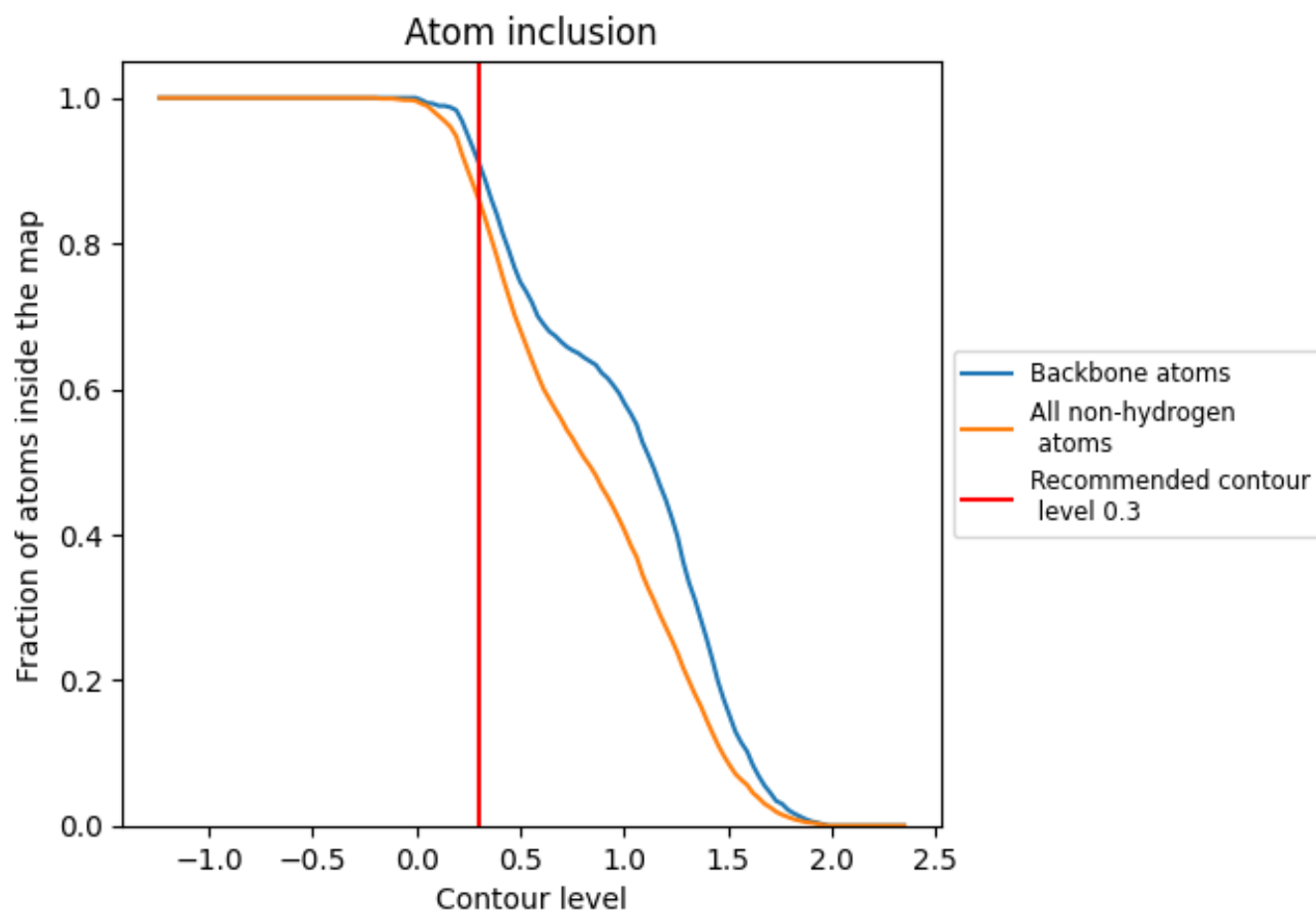
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.3).

9.4 Atom inclusion [i](#)



At the recommended contour level, 91% of all backbone atoms, 86% 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 (0.3) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.8610	0.5190
A	0.8600	0.5190
B	0.8610	0.5200

