Full wwPDB EM Validation Report ⓘ

Dec 7, 2023 – 06:17 PM JST

PDB ID	:	8J01
EMDB ID	:	EMD-35880
Title	:	Human KCNQ2-CaM in complex with CBD and PIP2
Authors	:	Ma, D.; Li, X.; Guo, J.
Deposited on	:	2023-04-09
Resolution	:	3.10 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:

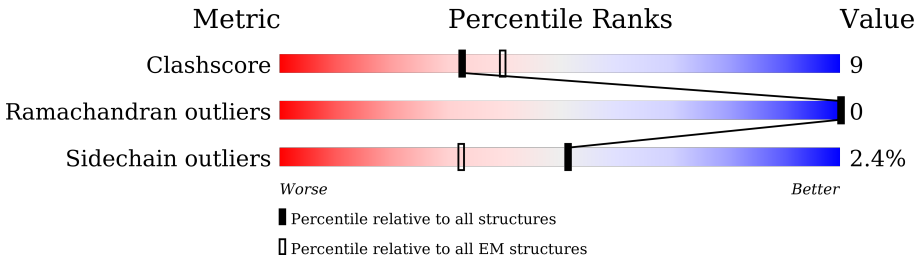
EMDB validation analysis	:	0.0.1.dev70
Mogul	:	1.8.5 (274361), CSD as541be (2020)
MolProbity	:	4.02b-467
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ	:	1.9.9
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.36

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 3.10 Å.

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



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

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

Mol	Chain	Length	Quality of chain
1	A	656	5% 41% 13% 46%
1	B	656	5% 42% 11% 46%
1	D	656	5% 41% 12% 46%
1	G	656	5% 41% 13% 46%
2	C	177	8% 59% 21% • 19%
2	E	177	8% 55% 24% • 19%
2	F	177	8% 57% 23% • 19%
2	H	177	8% 62% 18% • 19%

2 Entry composition (i)

There are 4 unique types of molecules in this entry. The entry contains 32260 atoms, of which 16028 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 voltage-gated channel subfamily KQT member 2.

Mol	Chain	Residues	Atoms						AltConf	Trace
1	A	354	Total	C	H	N	O	S	0	0
			5741	1889	2882	493	464	13		
1	B	354	Total	C	H	N	O	S	0	0
			5741	1889	2882	493	464	13		
1	D	354	Total	C	H	N	O	S	0	0
			5741	1889	2882	493	464	13		
1	G	354	Total	C	H	N	O	S	0	0
			5741	1889	2882	493	464	13		

There are 68 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	63	MET	-	initiating methionine	UNP O43526
A	703	VAL	-	expression tag	UNP O43526
A	704	GLU	-	expression tag	UNP O43526
A	705	GLY	-	expression tag	UNP O43526
A	706	GLY	-	expression tag	UNP O43526
A	707	SER	-	expression tag	UNP O43526
A	708	SER	-	expression tag	UNP O43526
A	709	GLY	-	expression tag	UNP O43526
A	710	GLY	-	expression tag	UNP O43526
A	711	TRP	-	expression tag	UNP O43526
A	712	SER	-	expression tag	UNP O43526
A	713	HIS	-	expression tag	UNP O43526
A	714	PRO	-	expression tag	UNP O43526
A	715	GLN	-	expression tag	UNP O43526
A	716	PHE	-	expression tag	UNP O43526
A	717	GLU	-	expression tag	UNP O43526
A	718	LYS	-	expression tag	UNP O43526
B	63	MET	-	initiating methionine	UNP O43526
B	703	VAL	-	expression tag	UNP O43526
B	704	GLU	-	expression tag	UNP O43526
B	705	GLY	-	expression tag	UNP O43526
B	706	GLY	-	expression tag	UNP O43526

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Chain	Residue	Modelled	Actual	Comment	Reference
B	707	SER	-	expression tag	UNP O43526
B	708	SER	-	expression tag	UNP O43526
B	709	GLY	-	expression tag	UNP O43526
B	710	GLY	-	expression tag	UNP O43526
B	711	TRP	-	expression tag	UNP O43526
B	712	SER	-	expression tag	UNP O43526
B	713	HIS	-	expression tag	UNP O43526
B	714	PRO	-	expression tag	UNP O43526
B	715	GLN	-	expression tag	UNP O43526
B	716	PHE	-	expression tag	UNP O43526
B	717	GLU	-	expression tag	UNP O43526
B	718	LYS	-	expression tag	UNP O43526
D	63	MET	-	initiating methionine	UNP O43526
D	703	VAL	-	expression tag	UNP O43526
D	704	GLU	-	expression tag	UNP O43526
D	705	GLY	-	expression tag	UNP O43526
D	706	GLY	-	expression tag	UNP O43526
D	707	SER	-	expression tag	UNP O43526
D	708	SER	-	expression tag	UNP O43526
D	709	GLY	-	expression tag	UNP O43526
D	710	GLY	-	expression tag	UNP O43526
D	711	TRP	-	expression tag	UNP O43526
D	712	SER	-	expression tag	UNP O43526
D	713	HIS	-	expression tag	UNP O43526
D	714	PRO	-	expression tag	UNP O43526
D	715	GLN	-	expression tag	UNP O43526
D	716	PHE	-	expression tag	UNP O43526
D	717	GLU	-	expression tag	UNP O43526
D	718	LYS	-	expression tag	UNP O43526
G	63	MET	-	initiating methionine	UNP O43526
G	703	VAL	-	expression tag	UNP O43526
G	704	GLU	-	expression tag	UNP O43526
G	705	GLY	-	expression tag	UNP O43526
G	706	GLY	-	expression tag	UNP O43526
G	707	SER	-	expression tag	UNP O43526
G	708	SER	-	expression tag	UNP O43526
G	709	GLY	-	expression tag	UNP O43526
G	710	GLY	-	expression tag	UNP O43526
G	711	TRP	-	expression tag	UNP O43526
G	712	SER	-	expression tag	UNP O43526
G	713	HIS	-	expression tag	UNP O43526
G	714	PRO	-	expression tag	UNP O43526

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Chain	Residue	Modelled	Actual	Comment	Reference
G	715	GLN	-	expression tag	UNP O43526
G	716	PHE	-	expression tag	UNP O43526
G	717	GLU	-	expression tag	UNP O43526
G	718	LYS	-	expression tag	UNP O43526

- Molecule 2 is a protein called Calmodulin-1.

Mol	Chain	Residues	Atoms						AltConf	Trace
2	C	143	Total	C	H	N	O	S	0	0
			2129	681	1023	178	238	9		
2	F	143	Total	C	H	N	O	S	0	0
			2129	681	1023	178	238	9		
2	H	143	Total	C	H	N	O	S	0	0
			2129	681	1023	178	238	9		
2	E	143	Total	C	H	N	O	S	0	0
			2129	681	1023	178	238	9		

There are 112 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
C	150	LEU	-	expression tag	UNP P0DP23
C	151	GLU	-	expression tag	UNP P0DP23
C	152	GLY	-	expression tag	UNP P0DP23
C	153	GLY	-	expression tag	UNP P0DP23
C	154	SER	-	expression tag	UNP P0DP23
C	155	SER	-	expression tag	UNP P0DP23
C	156	GLY	-	expression tag	UNP P0DP23
C	157	GLY	-	expression tag	UNP P0DP23
C	158	LEU	-	expression tag	UNP P0DP23
C	159	VAL	-	expression tag	UNP P0DP23
C	160	PRO	-	expression tag	UNP P0DP23
C	161	ARG	-	expression tag	UNP P0DP23
C	162	GLY	-	expression tag	UNP P0DP23
C	163	SER	-	expression tag	UNP P0DP23
C	164	GLY	-	expression tag	UNP P0DP23
C	165	GLY	-	expression tag	UNP P0DP23
C	166	SER	-	expression tag	UNP P0DP23
C	167	SER	-	expression tag	UNP P0DP23
C	168	GLY	-	expression tag	UNP P0DP23
C	169	GLY	-	expression tag	UNP P0DP23
C	170	HIS	-	expression tag	UNP P0DP23
C	171	HIS	-	expression tag	UNP P0DP23

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Chain	Residue	Modelled	Actual	Comment	Reference
C	172	HIS	-	expression tag	UNP P0DP23
C	173	HIS	-	expression tag	UNP P0DP23
C	174	HIS	-	expression tag	UNP P0DP23
C	175	HIS	-	expression tag	UNP P0DP23
C	176	HIS	-	expression tag	UNP P0DP23
C	177	HIS	-	expression tag	UNP P0DP23
F	150	LEU	-	expression tag	UNP P0DP23
F	151	GLU	-	expression tag	UNP P0DP23
F	152	GLY	-	expression tag	UNP P0DP23
F	153	GLY	-	expression tag	UNP P0DP23
F	154	SER	-	expression tag	UNP P0DP23
F	155	SER	-	expression tag	UNP P0DP23
F	156	GLY	-	expression tag	UNP P0DP23
F	157	GLY	-	expression tag	UNP P0DP23
F	158	LEU	-	expression tag	UNP P0DP23
F	159	VAL	-	expression tag	UNP P0DP23
F	160	PRO	-	expression tag	UNP P0DP23
F	161	ARG	-	expression tag	UNP P0DP23
F	162	GLY	-	expression tag	UNP P0DP23
F	163	SER	-	expression tag	UNP P0DP23
F	164	GLY	-	expression tag	UNP P0DP23
F	165	GLY	-	expression tag	UNP P0DP23
F	166	SER	-	expression tag	UNP P0DP23
F	167	SER	-	expression tag	UNP P0DP23
F	168	GLY	-	expression tag	UNP P0DP23
F	169	GLY	-	expression tag	UNP P0DP23
F	170	HIS	-	expression tag	UNP P0DP23
F	171	HIS	-	expression tag	UNP P0DP23
F	172	HIS	-	expression tag	UNP P0DP23
F	173	HIS	-	expression tag	UNP P0DP23
F	174	HIS	-	expression tag	UNP P0DP23
F	175	HIS	-	expression tag	UNP P0DP23
F	176	HIS	-	expression tag	UNP P0DP23
F	177	HIS	-	expression tag	UNP P0DP23
H	150	LEU	-	expression tag	UNP P0DP23
H	151	GLU	-	expression tag	UNP P0DP23
H	152	GLY	-	expression tag	UNP P0DP23
H	153	GLY	-	expression tag	UNP P0DP23
H	154	SER	-	expression tag	UNP P0DP23
H	155	SER	-	expression tag	UNP P0DP23
H	156	GLY	-	expression tag	UNP P0DP23
H	157	GLY	-	expression tag	UNP P0DP23

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Chain	Residue	Modelled	Actual	Comment	Reference
H	158	LEU	-	expression tag	UNP P0DP23
H	159	VAL	-	expression tag	UNP P0DP23
H	160	PRO	-	expression tag	UNP P0DP23
H	161	ARG	-	expression tag	UNP P0DP23
H	162	GLY	-	expression tag	UNP P0DP23
H	163	SER	-	expression tag	UNP P0DP23
H	164	GLY	-	expression tag	UNP P0DP23
H	165	GLY	-	expression tag	UNP P0DP23
H	166	SER	-	expression tag	UNP P0DP23
H	167	SER	-	expression tag	UNP P0DP23
H	168	GLY	-	expression tag	UNP P0DP23
H	169	GLY	-	expression tag	UNP P0DP23
H	170	HIS	-	expression tag	UNP P0DP23
H	171	HIS	-	expression tag	UNP P0DP23
H	172	HIS	-	expression tag	UNP P0DP23
H	173	HIS	-	expression tag	UNP P0DP23
H	174	HIS	-	expression tag	UNP P0DP23
H	175	HIS	-	expression tag	UNP P0DP23
H	176	HIS	-	expression tag	UNP P0DP23
H	177	HIS	-	expression tag	UNP P0DP23
E	150	LEU	-	expression tag	UNP P0DP23
E	151	GLU	-	expression tag	UNP P0DP23
E	152	GLY	-	expression tag	UNP P0DP23
E	153	GLY	-	expression tag	UNP P0DP23
E	154	SER	-	expression tag	UNP P0DP23
E	155	SER	-	expression tag	UNP P0DP23
E	156	GLY	-	expression tag	UNP P0DP23
E	157	GLY	-	expression tag	UNP P0DP23
E	158	LEU	-	expression tag	UNP P0DP23
E	159	VAL	-	expression tag	UNP P0DP23
E	160	PRO	-	expression tag	UNP P0DP23
E	161	ARG	-	expression tag	UNP P0DP23
E	162	GLY	-	expression tag	UNP P0DP23
E	163	SER	-	expression tag	UNP P0DP23
E	164	GLY	-	expression tag	UNP P0DP23
E	165	GLY	-	expression tag	UNP P0DP23
E	166	SER	-	expression tag	UNP P0DP23
E	167	SER	-	expression tag	UNP P0DP23
E	168	GLY	-	expression tag	UNP P0DP23
E	169	GLY	-	expression tag	UNP P0DP23
E	170	HIS	-	expression tag	UNP P0DP23
E	171	HIS	-	expression tag	UNP P0DP23

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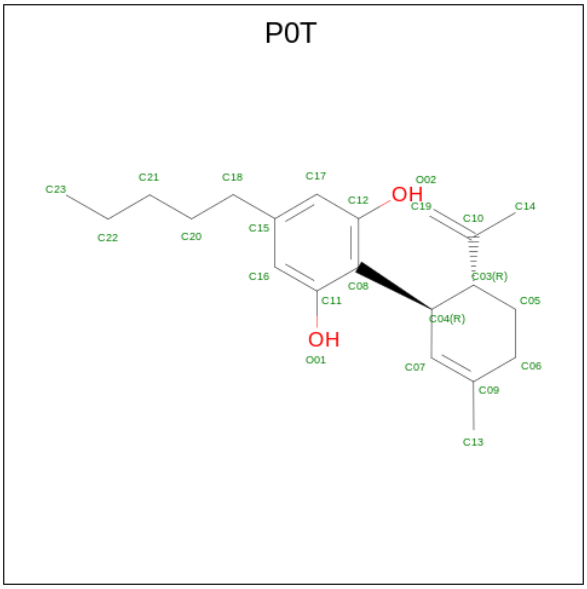
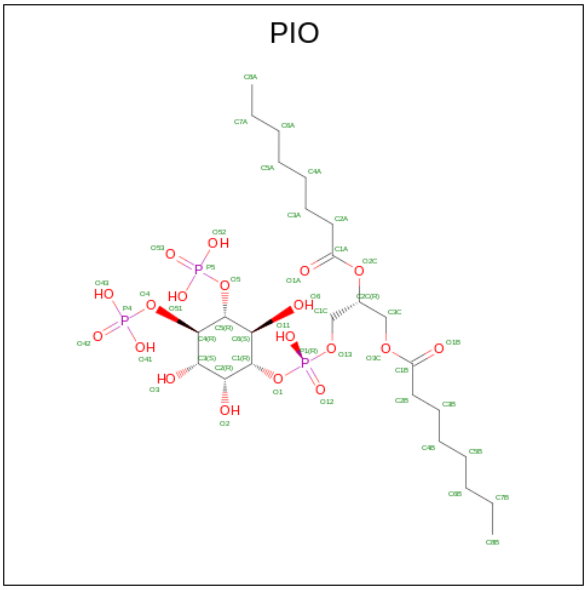
Chain	Residue	Modelled	Actual	Comment	Reference
E	172	HIS	-	expression tag	UNP P0DP23
E	173	HIS	-	expression tag	UNP P0DP23
E	174	HIS	-	expression tag	UNP P0DP23
E	175	HIS	-	expression tag	UNP P0DP23
E	176	HIS	-	expression tag	UNP P0DP23
E	177	HIS	-	expression tag	UNP P0DP23

- Molecule 3 is cannabidiol (three-letter code: P0T) (formula: $C_{21}H_{30}O_2$).



Mol	Chain	Residues	Atoms				AltConf
3	A	1	Total	C	H	O	0
			52	21	29	2	
3	A	1	Total	C	H	O	0
			52	21	29	2	
3	B	1	Total	C	H	O	0
			52	21	29	2	
3	B	1	Total	C	H	O	0
			52	21	29	2	
3	D	1	Total	C	H	O	0
			52	21	29	2	
3	D	1	Total	C	H	O	0
			52	21	29	2	
3	G	1	Total	C	H	O	0
			52	21	29	2	
3	G	1	Total	C	H	O	0
			52	21	29	2	

- Molecule 4 is [(2R)-2-octanoyloxy-3-[oxidanyl-[(1R,2R,3S,4R,5R,6S)-2,3,6-tris(oxidanyl)-4,5-diphosphonooxy-cyclohexyl]oxy-phosphoryl]oxy-propyl] octanoate (three-letter code: PIO) (formula: $C_{25}H_{49}O_{19}P_3$).



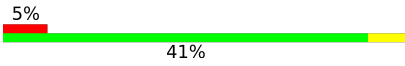
Mol	Chain	Residues	Atoms					AltConf
4	A	1	Total	C	H	O	P	0
			91	25	44	19	3	
4	B	1	Total	C	H	O	P	0
			91	25	44	19	3	
4	D	1	Total	C	H	O	P	0
			91	25	44	19	3	
4	G	1	Total	C	H	O	P	0
			91	25	44	19	3	

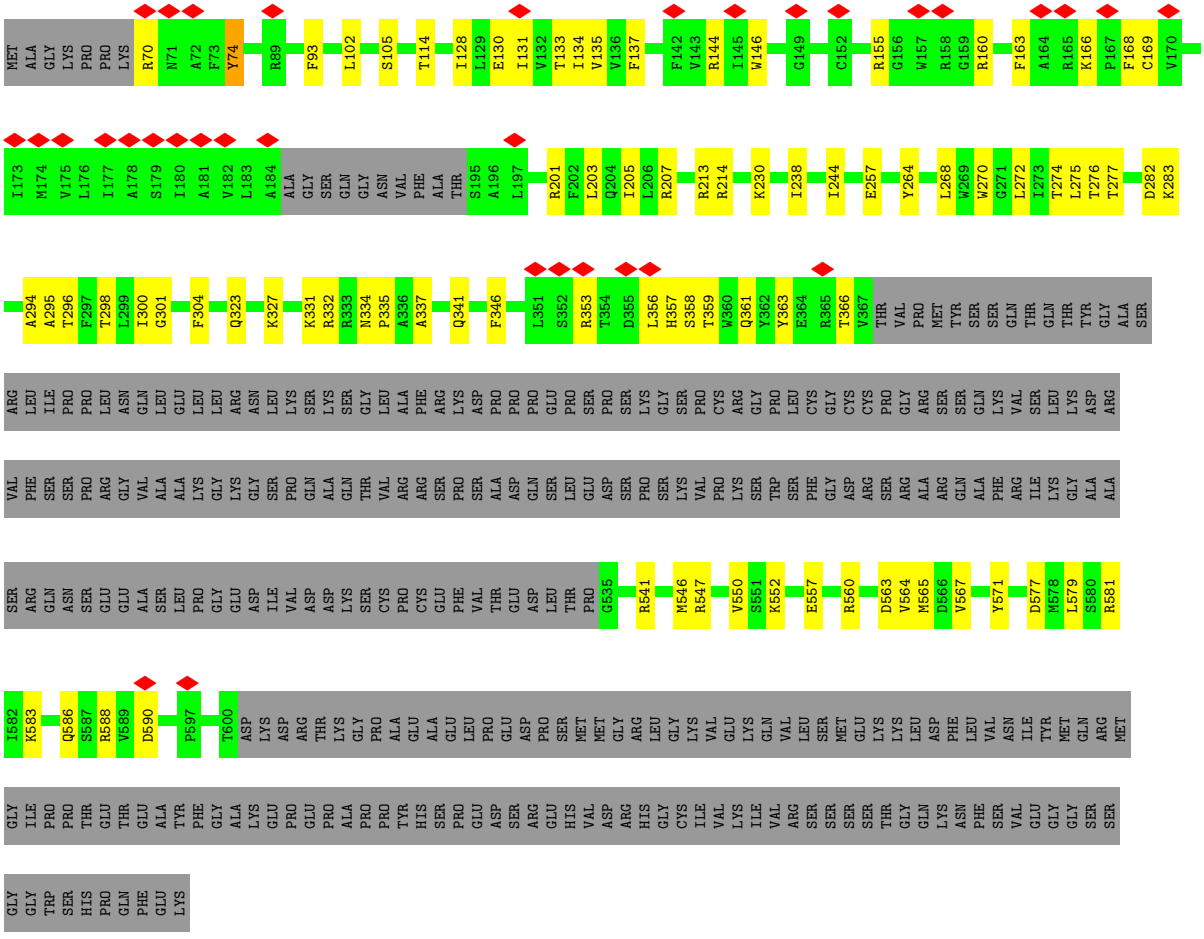
3 Residue-property plots (i)

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion in map density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red diamond above a residue indicates a poor fit to the EM map for this residue (all-atom inclusion < 40%). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

• Molecule 1: Potassium voltage-gated channel subfamily KQT member 2

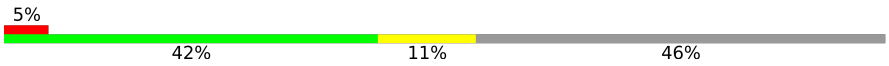
Chain A:

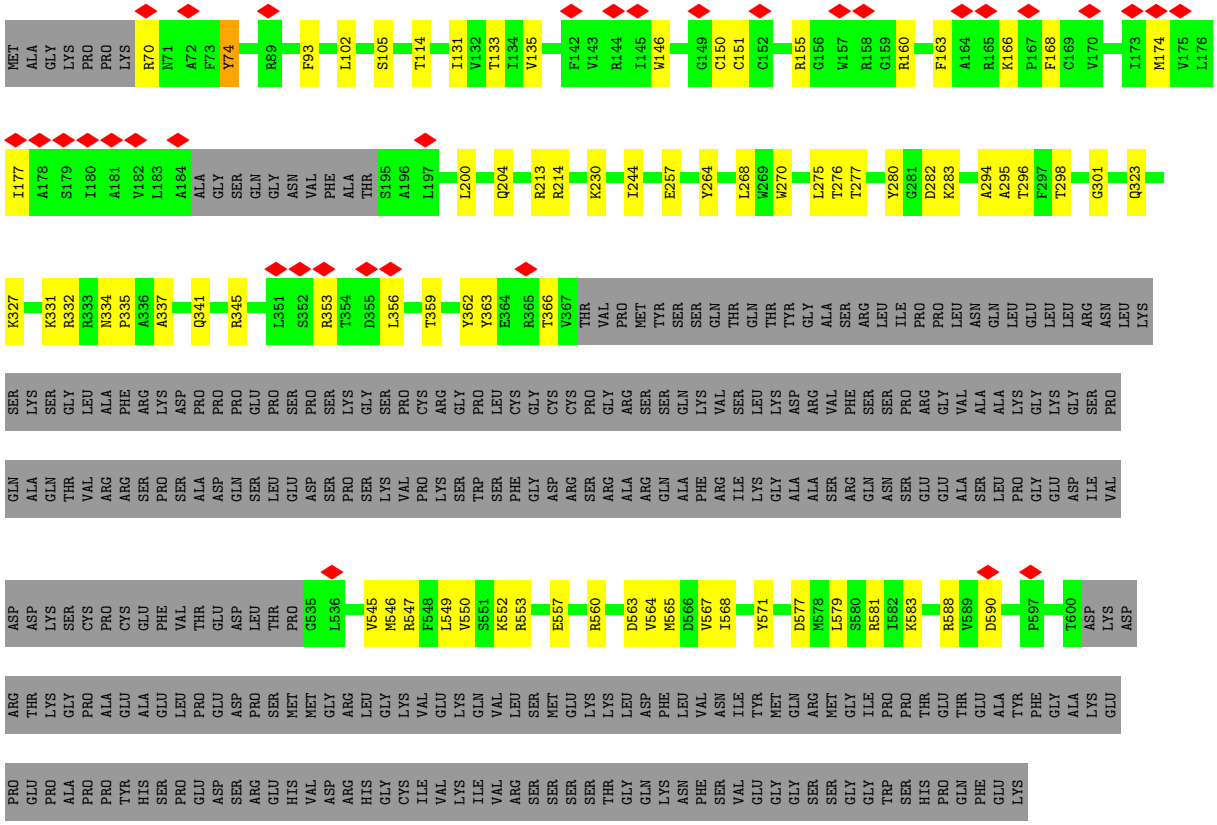




• Molecule 1: Potassium voltage-gated channel subfamily KQT member 2

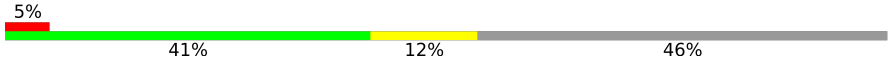
Chain B:

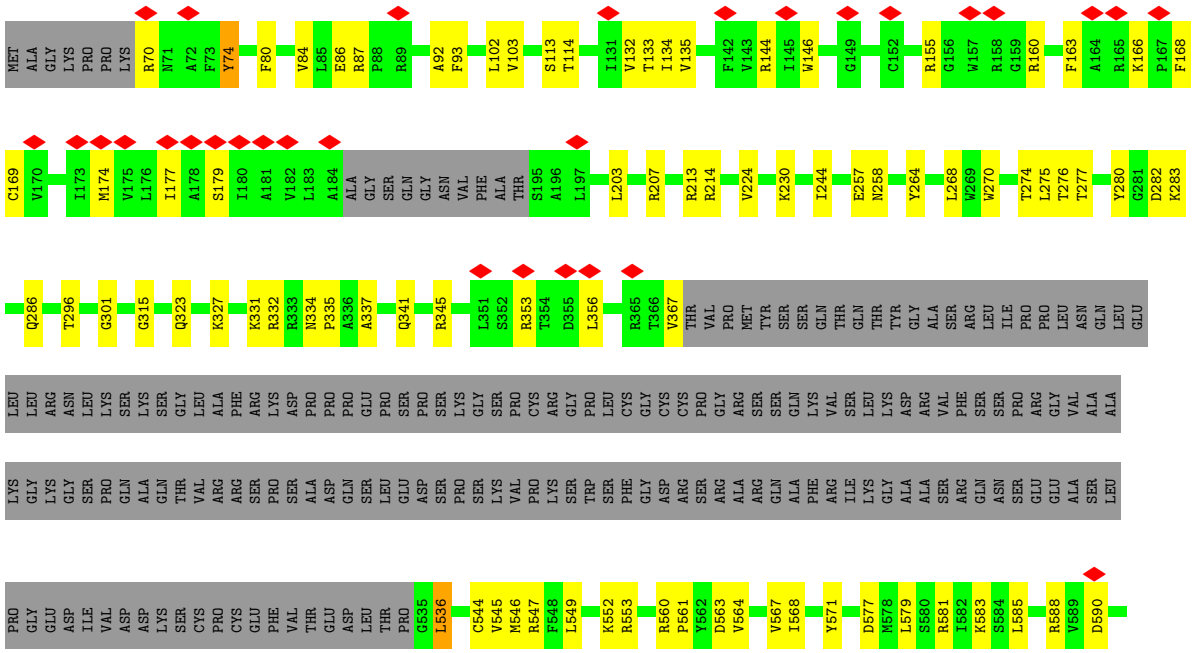


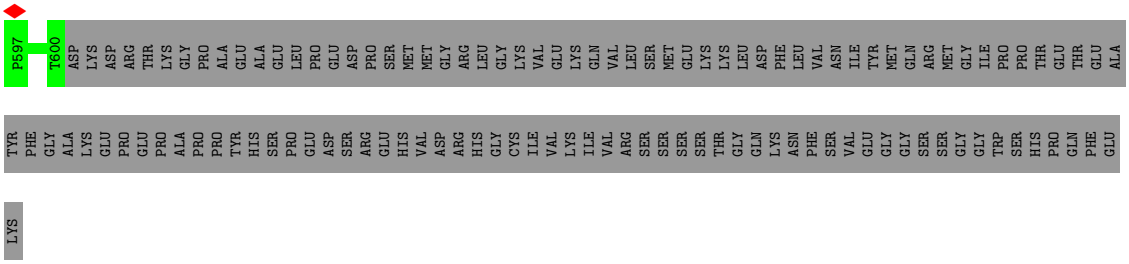


• Molecule 1: Potassium voltage-gated channel subfamily KQT member 2

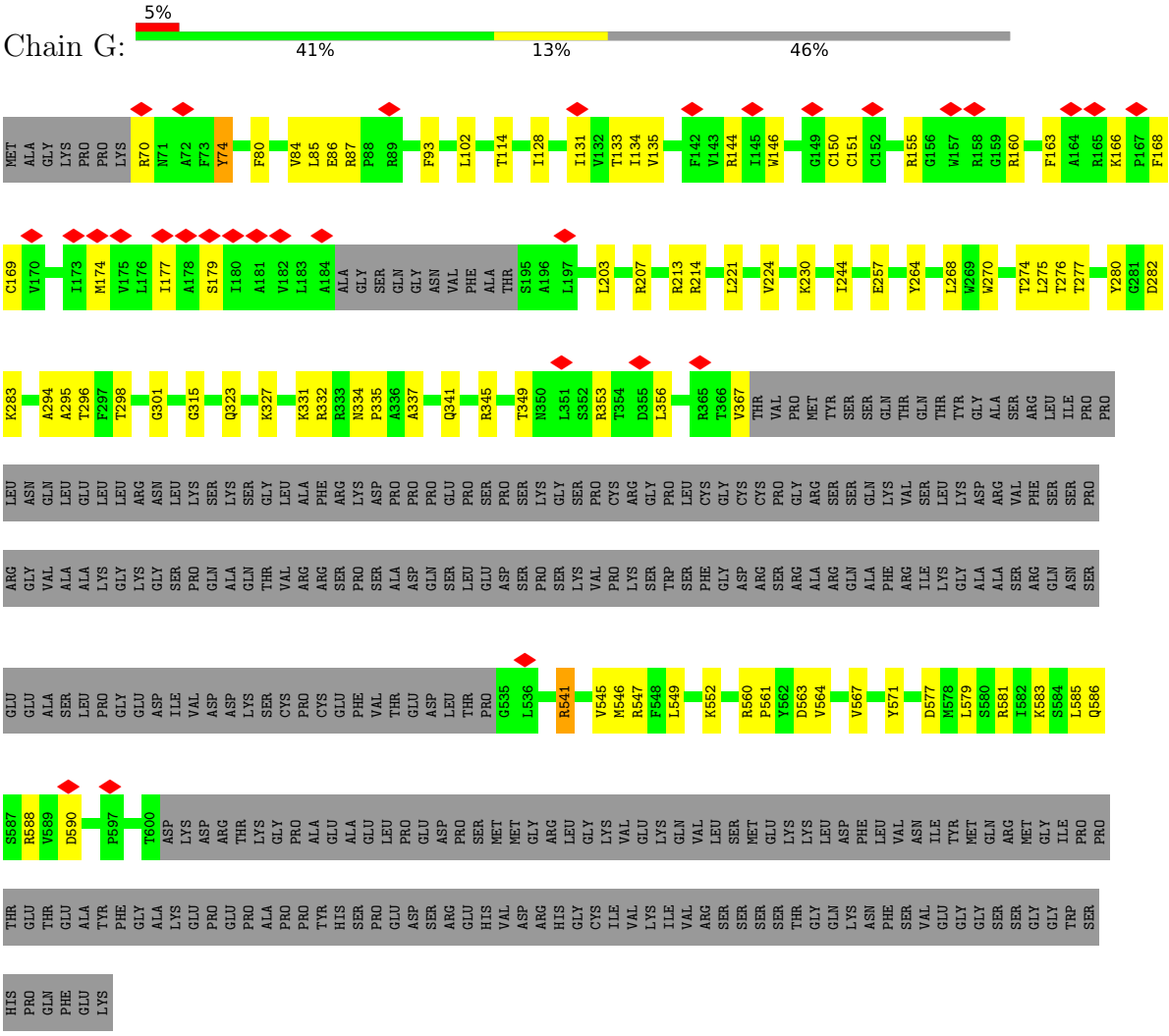
Chain D:



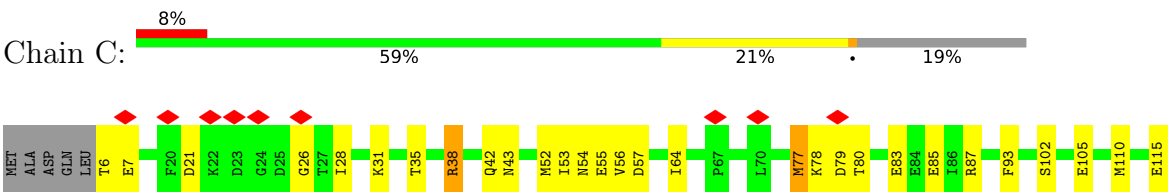


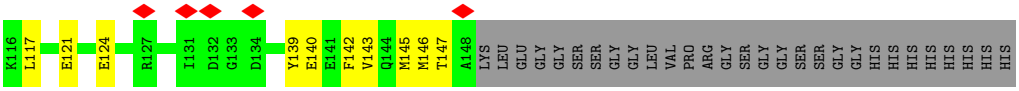


• Molecule 1: Potassium voltage-gated channel subfamily KQT member 2



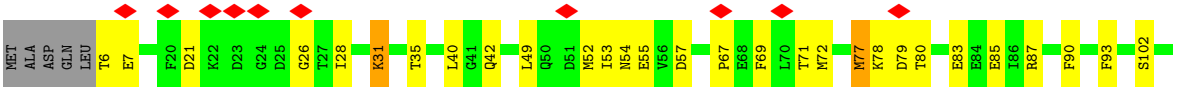
• Molecule 2: Calmodulin-1

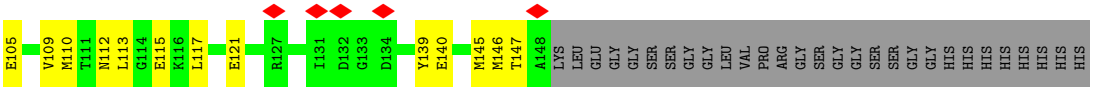




• Molecule 2: Calmodulin-1

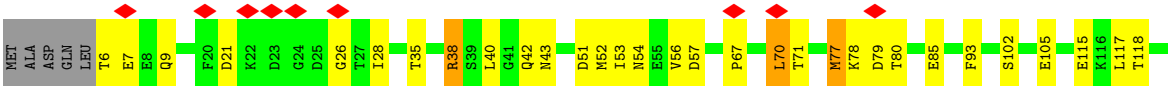
Chain F:

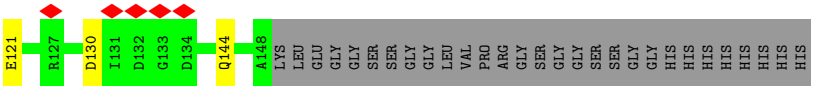




• Molecule 2: Calmodulin-1

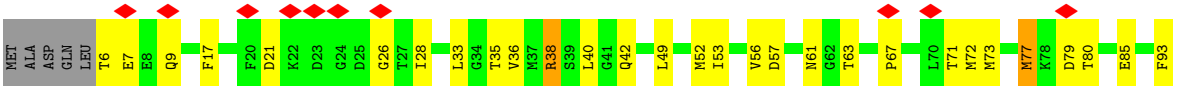
Chain H:

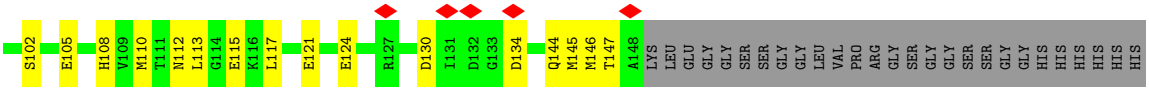




• Molecule 2: Calmodulin-1

Chain E:





4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	66773	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/Å^2$)	52	Depositor
Minimum defocus (nm)	800	Depositor
Maximum defocus (nm)	1500	Depositor
Magnification	Not provided	
Image detector	FEI FALCON IV (4k x 4k)	Depositor
Maximum map value	0.066	Depositor
Minimum map value	-0.031	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.002	Depositor
Recommended contour level	0.009	Depositor
Map size (Å)	223.2, 223.2, 223.2	wwPDB
Map dimensions	240, 240, 240	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.93, 0.93, 0.93	Depositor

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: PIO, P0T

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	0/2930	0.48	0/3948
1	B	0.26	0/2930	0.47	0/3948
1	D	0.26	0/2930	0.47	0/3948
1	G	0.26	0/2930	0.48	0/3948
2	C	0.26	0/1118	0.52	0/1502
2	E	0.26	0/1118	0.52	0/1502
2	F	0.26	0/1118	0.51	0/1502
2	H	0.26	0/1118	0.53	0/1502
All	All	0.26	0/16192	0.49	0/21800

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	2859	2882	2904	60	0
1	B	2859	2882	2904	59	0
1	D	2859	2882	2904	60	0
1	G	2859	2882	2904	61	0
2	C	1106	1023	1023	30	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	E	1106	1023	1023	35	0
2	F	1106	1023	1023	33	0
2	H	1106	1023	1023	27	0
3	A	46	58	0	1	0
3	B	46	58	0	1	0
3	D	46	58	0	1	0
3	G	46	58	0	1	0
4	A	47	44	44	2	0
4	B	47	44	44	2	0
4	D	47	44	44	2	0
4	G	47	44	44	2	0
All	All	16232	16028	15884	299	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 9.

All (299) 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)
2:H:102:SER:OG	2:H:105:GLU:OE1	1.93	0.87
2:F:102:SER:OG	2:F:105:GLU:OE1	1.93	0.86
2:C:102:SER:OG	2:C:105:GLU:OE1	1.95	0.85
2:E:102:SER:OG	2:E:105:GLU:OE1	1.94	0.83
2:F:53:ILE:O	2:F:57:ASP:N	2.13	0.82
2:C:53:ILE:O	2:C:57:ASP:N	2.12	0.81
1:A:294:ALA:O	1:A:298:THR:HG22	1.83	0.78
1:B:296:THR:OG1	3:B:803:P0T:O02	2.01	0.78
1:D:270:TRP:CZ2	1:D:270:TRP:CZ3	2.69	0.78
1:B:270:TRP:CZ2	1:B:270:TRP:CZ3	2.69	0.77
1:A:270:TRP:CZ2	1:A:270:TRP:CZ3	2.69	0.77
2:F:31:LYS:O	2:F:35:THR:HG23	1.86	0.76
1:A:296:THR:OG1	3:A:802:P0T:O02	2.02	0.76
1:G:270:TRP:CZ2	1:G:270:TRP:CZ3	2.69	0.75
1:A:332:ARG:NH2	1:A:560:ARG:O	2.21	0.73
2:H:118:THR:OG1	2:H:121:GLU:OE1	2.03	0.72
2:H:53:ILE:O	2:H:57:ASP:N	2.23	0.72
1:D:332:ARG:NH2	1:D:560:ARG:O	2.22	0.71
1:B:332:ARG:NH2	1:B:560:ARG:O	2.24	0.70
2:E:53:ILE:O	2:E:57:ASP:N	2.25	0.69
1:D:296:THR:OG1	3:D:802:P0T:O02	2.09	0.69
2:F:77:MET:O	2:F:80:THR:OG1	2.11	0.68

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:80:PHE:O	1:D:84:VAL:HG23	1.94	0.68
1:G:332:ARG:NH2	1:G:560:ARG:O	2.25	0.67
1:B:146:TRP:O	1:B:160:ARG:NH2	2.28	0.67
1:G:80:PHE:O	1:G:84:VAL:HG23	1.94	0.67
2:H:77:MET:O	2:H:80:THR:OG1	2.12	0.67
1:G:131:ILE:O	1:G:135:VAL:HG13	1.96	0.66
1:G:296:THR:OG1	3:G:802:P0T:O02	2.10	0.66
1:B:214:ARG:NH2	4:B:801:PIO:O2	2.29	0.66
1:D:214:ARG:NH2	4:D:803:PIO:O2	2.29	0.66
1:A:131:ILE:O	1:A:135:VAL:HG13	1.96	0.65
1:G:214:ARG:NH2	4:G:803:PIO:O2	2.30	0.65
1:A:146:TRP:O	1:A:160:ARG:NH2	2.31	0.64
1:D:341:GLN:OE1	2:F:115:GLU:N	2.31	0.63
2:E:40:LEU:HD12	2:E:40:LEU:O	1.99	0.62
1:D:547:ARG:NH1	2:F:42:GLN:OE1	2.32	0.62
1:A:341:GLN:NE2	2:E:113:LEU:O	2.31	0.62
1:A:341:GLN:OE1	2:E:115:GLU:N	2.32	0.62
1:A:214:ARG:NH2	4:A:803:PIO:O2	2.32	0.61
1:B:362:TYR:OH	2:C:42:GLN:NE2	2.32	0.61
1:D:146:TRP:O	1:D:160:ARG:NH2	2.32	0.61
1:B:553:ARG:NH1	2:C:55:GLU:OE1	2.33	0.61
2:H:53:ILE:HA	2:H:56:VAL:HG12	1.81	0.61
2:C:140:GLU:N	2:C:140:GLU:OE1	2.33	0.60
1:A:577:ASP:OD2	1:A:581:ARG:NH1	2.33	0.60
1:B:276:THR:O	1:B:277:THR:OG1	2.17	0.60
1:B:327:LYS:NZ	4:B:801:PIO:O43	2.34	0.60
1:A:564:VAL:HG22	1:B:565:MET:HG2	1.84	0.60
1:A:102:LEU:HD21	1:A:133:THR:OG1	2.02	0.60
1:B:577:ASP:OD2	1:B:581:ARG:NH1	2.34	0.59
1:G:577:ASP:OD2	1:G:581:ARG:NH1	2.36	0.59
1:A:230:LYS:NZ	1:G:323:GLN:OE1	2.36	0.59
1:D:341:GLN:NE2	2:F:113:LEU:O	2.34	0.59
2:F:6:THR:OG1	2:F:7:GLU:N	2.36	0.59
1:G:102:LEU:HD21	1:G:133:THR:OG1	2.01	0.59
2:H:6:THR:OG1	2:H:7:GLU:N	2.35	0.59
2:C:145:MET:SD	2:C:146:MET:N	2.76	0.59
1:G:294:ALA:O	1:G:298:THR:HG22	2.02	0.59
1:A:323:GLN:OE1	1:B:230:LYS:NZ	2.36	0.58
1:A:588:ARG:NH1	1:B:590:ASP:OD1	2.36	0.58
1:B:102:LEU:HD21	1:B:133:THR:OG1	2.03	0.58
2:F:145:MET:SD	2:F:146:MET:N	2.77	0.58

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:C:6:THR:OG1	2:C:7:GLU:N	2.36	0.58
2:C:85:GLU:N	2:C:85:GLU:OE1	2.36	0.58
1:A:590:ASP:OD1	1:G:588:ARG:NH1	2.36	0.58
1:G:547:ARG:NH1	2:H:42:GLN:OE1	2.35	0.58
1:D:144:ARG:NH1	1:D:169:CYS:SG	2.77	0.58
2:F:77:MET:HE3	2:F:147:THR:HA	1.86	0.58
2:C:117:LEU:HD22	2:C:121:GLU:HG2	1.85	0.57
1:D:577:ASP:OD2	1:D:581:ARG:NH1	2.37	0.57
2:H:117:LEU:HD22	2:H:121:GLU:HG2	1.86	0.57
1:A:547:ARG:NH1	2:E:42:GLN:OE1	2.36	0.57
1:B:547:ARG:NH1	2:C:42:GLN:OE1	2.34	0.57
1:B:131:ILE:O	1:B:135:VAL:HG13	2.05	0.56
2:C:77:MET:O	2:C:80:THR:OG1	2.18	0.56
1:G:146:TRP:O	1:G:160:ARG:NH2	2.38	0.56
1:D:102:LEU:HD21	1:D:133:THR:OG1	2.05	0.56
1:D:588:ARG:NH1	1:G:590:ASP:OD1	2.37	0.56
2:E:145:MET:SD	2:E:146:MET:N	2.79	0.56
1:B:588:ARG:NH1	1:D:590:ASP:OD1	2.39	0.56
1:D:323:GLN:OE1	1:G:230:LYS:NZ	2.39	0.56
1:B:275:LEU:HD22	1:B:301:GLY:HA3	1.88	0.55
1:G:85:LEU:HD21	1:G:144:ARG:HB2	1.88	0.55
1:A:327:LYS:NZ	4:A:803:PIO:O43	2.39	0.54
1:G:353:ARG:HB2	1:G:356:LEU:HD11	1.89	0.54
1:A:264:TYR:HB3	1:G:114:THR:HG21	1.88	0.54
2:F:140:GLU:OE1	2:F:140:GLU:N	2.39	0.54
1:G:563:ASP:OD1	1:G:564:VAL:N	2.40	0.54
2:F:117:LEU:HD22	2:F:121:GLU:HG2	1.89	0.53
2:E:85:GLU:N	2:E:85:GLU:OE1	2.40	0.53
1:B:323:GLN:OE1	1:D:230:LYS:NZ	2.42	0.53
2:F:85:GLU:OE1	2:F:85:GLU:N	2.40	0.53
2:H:9:GLN:N	2:H:9:GLN:OE1	2.40	0.53
1:B:563:ASP:OD1	1:B:564:VAL:N	2.41	0.53
1:G:150:CYS:SG	1:G:151:CYS:N	2.81	0.53
2:E:77:MET:HE3	2:E:147:THR:HA	1.91	0.53
1:A:563:ASP:OD1	1:A:564:VAL:N	2.42	0.53
1:G:144:ARG:NH1	1:G:169:CYS:SG	2.82	0.53
1:G:561:PRO:HB3	1:G:567:VAL:HG13	1.92	0.52
1:B:70:ARG:O	1:B:74:TYR:N	2.42	0.52
1:D:275:LEU:HD22	1:D:301:GLY:HA3	1.90	0.52
2:E:33:LEU:HD21	2:E:49:LEU:HD22	1.92	0.52
1:A:358:SER:O	1:A:361:GLN:NE2	2.41	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:563:ASP:OD1	1:D:564:VAL:N	2.42	0.52
1:D:84:VAL:HG13	1:D:92:ALA:CB	2.40	0.52
1:D:579:LEU:HG	1:D:583:LYS:HE3	1.92	0.52
1:A:552:LYS:NZ	2:E:80:THR:O	2.42	0.51
2:E:6:THR:OG1	2:E:7:GLU:N	2.36	0.51
1:D:552:LYS:NZ	2:F:80:THR:O	2.42	0.51
1:D:70:ARG:O	1:D:74:TYR:N	2.43	0.51
1:A:114:THR:HG21	1:B:264:TYR:HB3	1.91	0.51
1:A:276:THR:O	1:A:277:THR:OG1	2.21	0.51
1:B:200:LEU:HD12	1:B:204:GLN:HE21	1.76	0.51
1:D:84:VAL:HG13	1:D:92:ALA:HB2	1.93	0.51
1:D:244:ILE:HD13	1:D:268:LEU:HD11	1.92	0.51
1:G:275:LEU:HD22	1:G:301:GLY:HA3	1.92	0.51
2:H:85:GLU:N	2:H:85:GLU:OE1	2.44	0.51
1:B:345:ARG:NE	2:C:117:LEU:HD21	2.26	0.50
1:D:546:MET:SD	2:F:52:MET:CG	2.99	0.50
1:A:359:THR:OG1	2:E:124:GLU:OE2	2.27	0.50
1:A:353:ARG:HB2	1:A:356:LEU:HD11	1.94	0.50
2:H:21:ASP:OD2	2:H:26:GLY:N	2.43	0.50
2:H:67:PRO:O	2:H:70:LEU:HD12	2.12	0.50
1:G:545:VAL:O	1:G:549:LEU:HD23	2.12	0.50
1:B:150:CYS:SG	1:B:151:CYS:N	2.85	0.50
1:B:545:VAL:O	1:B:549:LEU:HD23	2.12	0.50
1:A:337:ALA:HB2	2:E:93:PHE:CZ	2.47	0.49
1:B:114:THR:HG21	1:D:264:TYR:HB3	1.92	0.49
2:E:21:ASP:OD2	2:E:26:GLY:N	2.45	0.49
1:A:257:GLU:OE1	1:A:257:GLU:N	2.43	0.49
1:A:275:LEU:HD22	1:A:301:GLY:HA3	1.94	0.49
1:G:70:ARG:O	1:G:74:TYR:N	2.44	0.49
2:H:77:MET:SD	2:H:78:LYS:N	2.85	0.49
1:D:353:ARG:HB2	1:D:356:LEU:HD11	1.95	0.49
1:B:341:GLN:HG3	2:C:110:MET:HE1	1.95	0.49
1:B:546:MET:SD	2:C:52:MET:HG2	2.53	0.49
1:A:546:MET:SD	2:E:52:MET:HG2	2.52	0.49
1:G:244:ILE:HD13	1:G:268:LEU:HD11	1.93	0.49
1:D:546:MET:SD	2:F:52:MET:SD	3.11	0.48
1:A:238:ILE:HD13	1:G:221:LEU:HD22	1.94	0.48
1:D:258:ASN:ND2	1:D:286:GLN:OE1	2.46	0.48
2:H:35:THR:HA	2:H:38:ARG:HE	1.79	0.48
2:E:110:MET:CE	2:E:110:MET:HA	2.43	0.48
1:A:244:ILE:HD13	1:A:268:LEU:HD11	1.96	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:G:546:MET:SD	2:H:52:MET:HG2	2.54	0.48
1:B:353:ARG:HB2	1:B:356:LEU:HD11	1.95	0.48
1:D:536:LEU:HD23	1:D:536:LEU:H	1.79	0.48
2:E:28:ILE:HG23	2:E:28:ILE:O	2.14	0.48
1:A:70:ARG:O	1:A:74:TYR:N	2.44	0.47
1:G:203:LEU:O	1:G:207:ARG:HG2	2.15	0.47
1:B:163:PHE:CE1	1:B:166:LYS:HD2	2.50	0.47
1:G:341:GLN:OE1	2:H:115:GLU:N	2.47	0.47
2:E:33:LEU:CD2	2:E:49:LEU:HD22	2.44	0.47
1:B:552:LYS:NZ	2:C:80:THR:O	2.47	0.47
2:E:117:LEU:HD22	2:E:121:GLU:HG2	1.97	0.47
2:F:77:MET:SD	2:F:78:LYS:N	2.87	0.47
2:C:57:ASP:HA	2:C:64:ILE:HD11	1.98	0.47
2:C:77:MET:HE3	2:C:147:THR:HA	1.97	0.47
2:C:83:GLU:OE2	2:C:87:ARG:NH2	2.49	0.47
1:D:114:THR:HG21	1:G:264:TYR:HB3	1.97	0.47
1:D:327:LYS:NZ	4:D:803:PIO:O43	2.48	0.46
1:A:334:ASN:HB3	1:A:335:PRO:HD3	1.97	0.46
1:G:579:LEU:O	1:G:583:LYS:HG3	2.15	0.46
2:E:53:ILE:HA	2:E:56:VAL:HG12	1.98	0.46
1:G:257:GLU:N	1:G:257:GLU:OE1	2.49	0.46
2:E:56:VAL:HG21	2:E:72:MET:CE	2.45	0.46
1:B:295:ALA:HA	1:B:298:THR:HG22	1.96	0.46
1:G:337:ALA:HB2	2:H:93:PHE:HZ	1.80	0.46
2:H:79:ASP:OD1	2:H:79:ASP:C	2.54	0.46
1:D:367:VAL:HG22	2:F:40:LEU:HA	1.97	0.46
2:F:28:ILE:HG23	2:F:28:ILE:O	2.16	0.46
1:G:276:THR:O	1:G:277:THR:OG1	2.26	0.46
1:A:579:LEU:O	1:A:583:LYS:HG3	2.15	0.46
1:B:334:ASN:HB3	1:B:335:PRO:HD3	1.98	0.46
2:E:79:ASP:OD2	2:E:79:ASP:C	2.54	0.46
2:E:73:MET:HE2	2:E:73:MET:HA	1.97	0.46
1:B:280:TYR:CZ	1:D:274:THR:HG22	2.50	0.46
1:B:294:ALA:O	1:B:298:THR:HG22	2.15	0.46
1:D:280:TYR:CZ	1:G:274:THR:HG22	2.51	0.46
1:G:327:LYS:NZ	4:G:803:PIO:O43	2.49	0.46
1:A:144:ARG:NH1	1:A:169:CYS:SG	2.89	0.45
1:D:561:PRO:HB3	1:D:567:VAL:HG13	1.98	0.45
1:A:201:ARG:O	1:A:205:ILE:HG13	2.16	0.45
1:D:334:ASN:HB3	1:D:335:PRO:HD3	1.99	0.45
1:G:334:ASN:HB3	1:G:335:PRO:HD3	1.98	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:E:6:THR:N	2:E:9:GLN:OE1	2.49	0.45
1:B:579:LEU:O	1:B:583:LYS:HG3	2.16	0.45
1:D:282:ASP:OD1	1:D:283:LYS:N	2.50	0.45
2:E:108:HIS:O	2:E:112:ASN:ND2	2.47	0.45
1:A:274:THR:HG22	1:G:280:TYR:CZ	2.51	0.45
2:F:49:LEU:O	2:F:53:ILE:HG12	2.16	0.45
1:D:168:PHE:CZ	1:D:213:ARG:HA	2.52	0.45
2:F:79:ASP:OD1	2:F:79:ASP:C	2.54	0.45
1:A:300:ILE:HG22	1:A:304:PHE:CE2	2.52	0.45
1:B:557:GLU:OE2	1:B:560:ARG:NE	2.42	0.45
2:C:21:ASP:OD2	2:C:26:GLY:N	2.45	0.45
1:G:349:THR:HG23	1:G:541:ARG:HD2	1.98	0.45
2:E:61:ASN:ND2	2:E:63:THR:OG1	2.50	0.45
1:D:579:LEU:O	1:D:583:LYS:HG3	2.17	0.45
1:G:337:ALA:HB2	2:H:93:PHE:CZ	2.51	0.45
1:A:264:TYR:H	1:G:114:THR:HG21	1.82	0.44
1:A:203:LEU:O	1:A:207:ARG:HG2	2.17	0.44
1:B:168:PHE:CZ	1:B:213:ARG:HA	2.52	0.44
1:D:553:ARG:NH1	2:F:55:GLU:OE1	2.50	0.44
1:D:203:LEU:O	1:D:207:ARG:HG2	2.18	0.44
1:B:337:ALA:HB2	2:C:93:PHE:CZ	2.53	0.44
1:B:363:TYR:O	1:B:366:THR:OG1	2.32	0.44
1:D:276:THR:O	1:D:277:THR:OG1	2.30	0.44
2:F:21:ASP:OD2	2:F:26:GLY:N	2.48	0.44
1:B:282:ASP:OD1	1:B:283:LYS:N	2.49	0.44
2:C:79:ASP:OD2	2:C:79:ASP:C	2.55	0.44
1:D:345:ARG:NE	2:F:117:LEU:HD21	2.32	0.44
2:F:83:GLU:OE2	2:F:87:ARG:NH2	2.51	0.44
2:F:109:VAL:HA	2:F:113:LEU:HD13	2.00	0.44
1:A:363:TYR:O	1:A:366:THR:OG1	2.33	0.44
2:F:112:ASN:C	2:F:113:LEU:HD12	2.38	0.44
1:G:560:ARG:HE	1:G:561:PRO:HD2	1.83	0.44
2:H:28:ILE:O	2:H:28:ILE:HG23	2.18	0.44
1:D:337:ALA:HB2	2:F:93:PHE:CZ	2.53	0.43
1:A:295:ALA:HA	1:A:298:THR:HG22	1.99	0.43
1:A:557:GLU:OE2	1:A:560:ARG:NE	2.45	0.43
1:A:567:VAL:CG2	1:B:568:ILE:HG21	2.48	0.43
2:E:72:MET:HG2	2:E:73:MET:N	2.32	0.43
1:A:114:THR:HG21	1:B:264:TYR:H	1.84	0.43
1:A:168:PHE:CZ	1:A:213:ARG:HA	2.53	0.43
1:A:586:GLN:HG2	1:G:585:LEU:HD21	2.00	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:545:VAL:O	1:D:549:LEU:HD23	2.19	0.43
1:A:282:ASP:OD1	1:A:283:LYS:N	2.51	0.43
1:D:585:LEU:HD21	1:G:586:GLN:HG2	2.00	0.43
1:A:130:GLU:C	1:A:130:GLU:OE1	2.57	0.43
2:H:67:PRO:O	2:H:71:THR:OG1	2.30	0.43
2:E:17:PHE:O	2:E:21:ASP:N	2.44	0.43
1:A:163:PHE:CE1	1:A:166:LYS:HD2	2.54	0.42
1:A:567:VAL:HG21	1:B:568:ILE:HG21	2.00	0.42
2:C:35:THR:HA	2:C:38:ARG:HE	1.83	0.42
2:H:77:MET:SD	2:H:77:MET:C	2.98	0.42
1:A:102:LEU:C	1:A:102:LEU:HD23	2.39	0.42
1:B:567:VAL:HG21	1:D:568:ILE:HG21	2.00	0.42
1:D:257:GLU:OE1	1:D:257:GLU:N	2.52	0.42
1:D:331:LYS:O	1:D:335:PRO:CD	2.67	0.42
2:E:130:ASP:OD1	2:E:134:ASP:N	2.52	0.42
1:A:565:MET:HG2	1:G:564:VAL:HG22	2.01	0.42
1:B:244:ILE:HD13	1:B:268:LEU:HD11	2.01	0.42
1:B:341:GLN:OE1	2:C:115:GLU:N	2.50	0.42
1:G:331:LYS:O	1:G:335:PRO:CD	2.68	0.42
2:E:144:GLN:O	2:E:147:THR:OG1	2.30	0.42
1:G:134:ILE:HD11	1:G:179:SER:OG	2.19	0.42
1:G:579:LEU:HG	1:G:583:LYS:HE3	2.02	0.42
1:B:567:VAL:CG2	1:D:568:ILE:HG21	2.49	0.42
2:C:77:MET:SD	2:C:78:LYS:N	2.93	0.42
1:G:168:PHE:CZ	1:G:213:ARG:HA	2.55	0.42
2:C:28:ILE:O	2:C:28:ILE:HG23	2.19	0.42
2:C:43:ASN:OD1	2:C:43:ASN:C	2.58	0.42
1:D:134:ILE:HD11	1:D:179:SER:OG	2.19	0.42
1:D:224:VAL:HG13	1:D:315:GLY:HA3	2.01	0.42
1:B:331:LYS:O	1:B:335:PRO:CD	2.68	0.42
2:H:43:ASN:OD1	2:H:43:ASN:C	2.58	0.42
1:G:295:ALA:HA	1:G:298:THR:HG22	2.02	0.41
2:E:35:THR:HA	2:E:38:ARG:HE	1.84	0.41
2:C:139:TYR:O	2:C:143:VAL:HG12	2.19	0.41
1:G:552:LYS:NZ	2:H:80:THR:O	2.52	0.41
1:A:272:LEU:HD22	1:B:295:ALA:HB2	2.02	0.41
1:D:163:PHE:CE1	1:D:166:LYS:HD2	2.56	0.41
1:D:345:ARG:HB3	1:D:544:CYS:SG	2.61	0.41
2:H:51:ASP:OD2	2:H:51:ASP:C	2.59	0.41
1:B:337:ALA:HB2	2:C:93:PHE:HZ	1.86	0.41
1:G:345:ARG:NE	2:H:117:LEU:HD21	2.35	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:331:LYS:O	1:A:335:PRO:CD	2.68	0.41
1:B:547:ARG:HA	1:B:550:VAL:HG12	2.03	0.41
2:F:69:PHE:O	2:F:72:MET:HG2	2.21	0.41
1:A:128:ILE:O	1:A:131:ILE:HG22	2.21	0.41
1:B:257:GLU:OE1	1:B:257:GLU:N	2.53	0.41
2:F:110:MET:HA	2:F:110:MET:HE3	2.01	0.41
1:G:174:MET:HA	1:G:177:ILE:HG12	2.03	0.41
1:A:131:ILE:O	1:A:134:ILE:HG22	2.21	0.41
1:A:337:ALA:HB2	2:E:93:PHE:HZ	1.86	0.41
1:B:102:LEU:C	1:B:102:LEU:HD23	2.42	0.41
1:B:546:MET:HE1	2:C:56:VAL:HB	2.03	0.41
1:D:102:LEU:HD23	1:D:103:VAL:N	2.36	0.41
1:G:128:ILE:O	1:G:131:ILE:HG22	2.20	0.41
1:G:224:VAL:HG13	1:G:315:GLY:HA3	2.03	0.41
1:B:174:MET:HA	1:B:177:ILE:HG12	2.03	0.41
1:B:359:THR:OG1	2:C:124:GLU:OE2	2.37	0.41
1:G:102:LEU:HD23	1:G:102:LEU:C	2.42	0.41
2:E:67:PRO:O	2:E:71:THR:OG1	2.32	0.40
2:F:67:PRO:O	2:F:71:THR:OG1	2.31	0.40
1:A:547:ARG:HA	1:A:550:VAL:HG12	2.04	0.40
1:G:86:GLU:O	1:G:87:ARG:C	2.59	0.40
1:G:163:PHE:CE1	1:G:166:LYS:HD2	2.55	0.40
1:D:174:MET:HA	1:D:177:ILE:HG12	2.03	0.40
1:D:337:ALA:HB2	2:F:93:PHE:HZ	1.87	0.40
1:G:282:ASP:OD1	1:G:283:LYS:N	2.55	0.40
2:E:33:LEU:O	2:E:36:VAL:HG12	2.21	0.40
1:B:102:LEU:HD21	1:B:133:THR:HG23	2.04	0.40
1:D:86:GLU:O	1:D:87:ARG:C	2.59	0.40
1:D:132:VAL:O	1:D:135:VAL:HG12	2.22	0.40
2:F:90:PHE:HB3	2:F:139:TYR:CG	2.57	0.40
1:G:367:VAL:HG22	2:H:40:LEU:HA	2.02	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	348/656 (53%)	337 (97%)	11 (3%)	0	100	100
1	B	348/656 (53%)	337 (97%)	11 (3%)	0	100	100
1	D	348/656 (53%)	337 (97%)	11 (3%)	0	100	100
1	G	348/656 (53%)	337 (97%)	11 (3%)	0	100	100
2	C	141/177 (80%)	136 (96%)	5 (4%)	0	100	100
2	E	141/177 (80%)	138 (98%)	3 (2%)	0	100	100
2	F	141/177 (80%)	137 (97%)	4 (3%)	0	100	100
2	H	141/177 (80%)	138 (98%)	3 (2%)	0	100	100
All	All	1956/3332 (59%)	1897 (97%)	59 (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	301/558 (54%)	292 (97%)	9 (3%)	41	71
1	B	301/558 (54%)	296 (98%)	5 (2%)	60	83
1	D	301/558 (54%)	295 (98%)	6 (2%)	55	80
1	G	301/558 (54%)	296 (98%)	5 (2%)	60	83
2	C	118/146 (81%)	113 (96%)	5 (4%)	30	62
2	E	118/146 (81%)	116 (98%)	2 (2%)	60	83
2	F	118/146 (81%)	115 (98%)	3 (2%)	47	75
2	H	118/146 (81%)	112 (95%)	6 (5%)	24	56
All	All	1676/2816 (60%)	1635 (98%)	41 (2%)	51	76

All (41) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	74	TYR
1	A	93	PHE
1	A	105	SER
1	A	137	PHE
1	A	155	ARG
1	A	346	PHE
1	A	357	HIS
1	A	541	ARG
1	A	571	TYR
1	B	74	TYR
1	B	93	PHE
1	B	105	SER
1	B	155	ARG
1	B	571	TYR
2	C	31	LYS
2	C	38	ARG
2	C	54	ASN
2	C	77	MET
2	C	142	PHE
1	D	74	TYR
1	D	93	PHE
1	D	113	SER
1	D	155	ARG
1	D	536	LEU
1	D	571	TYR
2	F	31	LYS
2	F	54	ASN
2	F	77	MET
1	G	74	TYR
1	G	93	PHE
1	G	155	ARG
1	G	541	ARG
1	G	571	TYR
2	H	38	ARG
2	H	54	ASN
2	H	70	LEU
2	H	77	MET
2	H	130	ASP
2	H	144	GLN
2	E	38	ARG
2	E	77	MET

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. There are no such sidechains identified.

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	$\#\|Z\| > 2$
4	PIO	B	801	1	47,47,47	1.37	10 (21%)	61,65,65	1.17	3 (4%)
3	P0T	D	802	-	24,24,24	4.73	11 (45%)	27,33,33	1.54	3 (11%)
4	PIO	A	803	1	47,47,47	1.37	10 (21%)	61,65,65	1.17	3 (4%)
3	P0T	B	803	-	24,24,24	4.73	11 (45%)	27,33,33	1.53	3 (11%)
4	PIO	D	803	1	47,47,47	1.38	10 (21%)	61,65,65	1.17	3 (4%)
3	P0T	A	801	-	24,24,24	4.67	11 (45%)	27,33,33	1.65	3 (11%)
3	P0T	G	801	-	24,24,24	4.66	11 (45%)	27,33,33	1.61	3 (11%)
4	PIO	G	803	1	47,47,47	1.37	10 (21%)	61,65,65	1.17	3 (4%)
3	P0T	D	801	-	24,24,24	4.67	11 (45%)	27,33,33	1.83	3 (11%)
3	P0T	A	802	-	24,24,24	4.72	11 (45%)	27,33,33	1.56	3 (11%)
3	P0T	B	802	-	24,24,24	4.67	11 (45%)	27,33,33	1.60	3 (11%)
3	P0T	G	802	-	24,24,24	4.73	11 (45%)	27,33,33	1.56	3 (11%)

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the

Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
4	PIO	B	801	1	-	21/44/68/68	0/1/1/1
3	P0T	D	802	-	-	7/13/26/26	0/2/2/2
4	PIO	A	803	1	-	20/44/68/68	0/1/1/1
3	P0T	B	803	-	-	7/13/26/26	0/2/2/2
4	PIO	D	803	1	-	22/44/68/68	0/1/1/1
3	P0T	A	801	-	-	2/13/26/26	0/2/2/2
3	P0T	G	801	-	-	2/13/26/26	0/2/2/2
4	PIO	G	803	1	-	20/44/68/68	0/1/1/1
3	P0T	D	801	-	-	2/13/26/26	0/2/2/2
3	P0T	A	802	-	-	7/13/26/26	0/2/2/2
3	P0T	B	802	-	-	2/13/26/26	0/2/2/2
3	P0T	G	802	-	-	7/13/26/26	0/2/2/2

All (128) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	B	803	P0T	C07-C09	16.21	1.60	1.32
3	G	802	P0T	C07-C09	16.11	1.60	1.32
3	D	802	P0T	C07-C09	16.10	1.60	1.32
3	A	802	P0T	C07-C09	16.07	1.60	1.32
3	G	801	P0T	C07-C09	15.94	1.59	1.32
3	D	801	P0T	C07-C09	15.92	1.59	1.32
3	B	802	P0T	C07-C09	15.92	1.59	1.32
3	A	801	P0T	C07-C09	15.87	1.59	1.32
3	D	802	P0T	C05-C03	-9.04	1.36	1.53
3	B	803	P0T	C05-C03	-9.04	1.36	1.53
3	A	802	P0T	C05-C03	-9.02	1.36	1.53
3	G	802	P0T	C05-C03	-9.01	1.36	1.53
3	D	801	P0T	C05-C03	-8.82	1.37	1.53
3	A	801	P0T	C05-C03	-8.79	1.37	1.53
3	B	802	P0T	C05-C03	-8.77	1.37	1.53
3	G	801	P0T	C05-C03	-8.72	1.37	1.53
3	G	802	P0T	C03-C04	8.13	1.67	1.54
3	A	802	P0T	C03-C04	8.08	1.67	1.54
3	D	802	P0T	C03-C04	8.07	1.67	1.54
3	A	801	P0T	C03-C04	8.04	1.67	1.54
3	B	803	P0T	C03-C04	7.99	1.67	1.54
3	B	802	P0T	C03-C04	7.99	1.67	1.54

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	D	801	P0T	C03-C04	7.96	1.67	1.54
3	G	801	P0T	C03-C04	7.89	1.66	1.54
3	D	802	P0T	C05-C06	5.72	1.65	1.52
3	A	802	P0T	C05-C06	5.70	1.65	1.52
3	B	802	P0T	C05-C06	5.68	1.65	1.52
3	D	801	P0T	C05-C06	5.67	1.65	1.52
3	G	801	P0T	C05-C06	5.67	1.65	1.52
3	G	802	P0T	C05-C06	5.67	1.65	1.52
3	A	801	P0T	C05-C06	5.65	1.65	1.52
3	B	803	P0T	C05-C06	5.63	1.65	1.52
3	B	802	P0T	C19-C10	5.28	1.55	1.34
3	D	801	P0T	C19-C10	5.28	1.55	1.34
3	G	801	P0T	C19-C10	5.28	1.55	1.34
3	A	802	P0T	C19-C10	5.26	1.55	1.34
3	A	801	P0T	C19-C10	5.26	1.55	1.34
3	D	802	P0T	C19-C10	5.26	1.55	1.34
3	G	802	P0T	C19-C10	5.25	1.55	1.34
3	B	803	P0T	C19-C10	5.24	1.55	1.34
3	B	803	P0T	C08-C04	4.17	1.57	1.52
3	G	802	P0T	C08-C04	4.11	1.57	1.52
3	D	802	P0T	C08-C04	4.05	1.57	1.52
3	A	802	P0T	C08-C04	4.00	1.57	1.52
3	B	802	P0T	C08-C04	3.86	1.57	1.52
3	A	801	P0T	C08-C04	3.81	1.57	1.52
3	G	801	P0T	C08-C04	3.80	1.57	1.52
3	D	801	P0T	C08-C04	3.74	1.57	1.52
3	B	802	P0T	C03-C10	3.68	1.57	1.51
3	D	801	P0T	C03-C10	3.66	1.57	1.51
3	A	801	P0T	C03-C10	3.65	1.57	1.51
3	G	801	P0T	C03-C10	3.60	1.57	1.51
3	B	802	P0T	C14-C10	-3.44	1.33	1.47
3	D	801	P0T	C14-C10	-3.43	1.33	1.47
3	G	801	P0T	C14-C10	-3.42	1.33	1.47
3	A	801	P0T	C14-C10	-3.42	1.33	1.47
3	D	802	P0T	C14-C10	-3.41	1.33	1.47
3	G	802	P0T	C14-C10	-3.40	1.33	1.47
3	A	802	P0T	C14-C10	-3.39	1.33	1.47
3	B	803	P0T	C14-C10	-3.38	1.33	1.47
3	A	802	P0T	C03-C10	3.36	1.57	1.51
3	G	802	P0T	C03-C10	3.35	1.57	1.51
3	B	803	P0T	C03-C10	3.34	1.57	1.51
3	D	802	P0T	C03-C10	3.33	1.57	1.51

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	B	801	PIO	P5-O5	3.16	1.65	1.59
4	G	803	PIO	P5-O5	3.15	1.65	1.59
4	D	803	PIO	P5-O5	3.15	1.65	1.59
4	A	803	PIO	P5-O5	3.15	1.65	1.59
4	D	803	PIO	P4-O4	3.13	1.65	1.59
4	G	803	PIO	P4-O4	3.12	1.65	1.59
4	B	801	PIO	P4-O4	3.11	1.65	1.59
4	A	803	PIO	P4-O4	3.08	1.65	1.59
3	B	802	P0T	C04-C07	-3.06	1.45	1.50
3	G	801	P0T	C04-C07	-3.05	1.45	1.50
3	A	801	P0T	C04-C07	-3.05	1.45	1.50
3	G	802	P0T	C04-C07	-3.03	1.45	1.50
3	D	802	P0T	C04-C07	-3.02	1.45	1.50
3	B	803	P0T	C04-C07	-3.00	1.45	1.50
3	A	802	P0T	C04-C07	-2.99	1.45	1.50
3	D	801	P0T	C04-C07	-2.91	1.45	1.50
4	A	803	PIO	O2C-C2C	-2.56	1.40	1.46
4	B	801	PIO	O2C-C2C	-2.55	1.40	1.46
4	G	803	PIO	O2C-C2C	-2.54	1.40	1.46
4	D	803	PIO	O2C-C2C	-2.54	1.40	1.46
4	D	803	PIO	O3C-C1B	2.43	1.40	1.33
4	B	801	PIO	O3C-C1B	2.40	1.40	1.33
4	G	803	PIO	O3C-C1B	2.40	1.40	1.33
4	A	803	PIO	O3C-C1B	2.39	1.40	1.33
3	D	801	P0T	O02-C12	2.34	1.41	1.36
3	B	802	P0T	O02-C12	2.33	1.41	1.36
3	A	801	P0T	O02-C12	2.31	1.41	1.36
3	G	801	P0T	O02-C12	2.31	1.41	1.36
3	G	802	P0T	O01-C11	2.29	1.41	1.36
3	B	803	P0T	O02-C12	2.27	1.41	1.36
3	B	803	P0T	O01-C11	2.26	1.41	1.36
3	G	802	P0T	O02-C12	2.26	1.41	1.36
3	D	802	P0T	O02-C12	2.26	1.41	1.36
3	A	802	P0T	O01-C11	2.26	1.41	1.36
3	A	802	P0T	O02-C12	2.24	1.41	1.36
3	D	802	P0T	O01-C11	2.23	1.40	1.36
3	D	801	P0T	O01-C11	2.23	1.40	1.36
3	A	801	P0T	O01-C11	2.21	1.40	1.36
3	G	801	P0T	O01-C11	2.21	1.40	1.36
4	A	803	PIO	P4-O41	-2.21	1.46	1.54
4	D	803	PIO	P4-O41	-2.20	1.46	1.54
4	G	803	PIO	P5-O52	-2.20	1.46	1.54

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	G	803	PIO	P4-O41	-2.20	1.46	1.54
4	A	803	PIO	P5-O52	-2.19	1.46	1.54
4	D	803	PIO	P5-O52	-2.19	1.46	1.54
4	B	801	PIO	P4-O41	-2.19	1.46	1.54
4	B	801	PIO	P5-O52	-2.19	1.46	1.54
4	B	801	PIO	P4-O43	-2.19	1.46	1.54
3	B	802	P0T	O01-C11	2.18	1.40	1.36
4	B	801	PIO	P5-O51	-2.17	1.46	1.54
4	D	803	PIO	P4-O43	-2.17	1.46	1.54
4	G	803	PIO	P5-O51	-2.17	1.46	1.54
4	A	803	PIO	P5-O51	-2.17	1.46	1.54
4	G	803	PIO	P4-O43	-2.16	1.46	1.54
4	D	803	PIO	P5-O51	-2.15	1.46	1.54
4	A	803	PIO	P4-O43	-2.14	1.46	1.54
4	B	801	PIO	O3C-C3C	-2.14	1.40	1.45
4	D	803	PIO	O3C-C3C	-2.12	1.40	1.45
4	A	803	PIO	O3C-C3C	-2.10	1.40	1.45
4	G	803	PIO	O3C-C3C	-2.10	1.40	1.45
4	A	803	PIO	O2C-C1A	2.09	1.40	1.34
4	D	803	PIO	O2C-C1A	2.08	1.40	1.34
4	B	801	PIO	O2C-C1A	2.07	1.40	1.34
4	G	803	PIO	O2C-C1A	2.05	1.40	1.34

All (36) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	D	801	P0T	C06-C09-C07	-7.04	115.91	121.57
3	G	802	P0T	C06-C09-C07	-5.68	117.00	121.57
3	A	801	P0T	C06-C09-C07	-5.63	117.04	121.57
3	A	802	P0T	C06-C09-C07	-5.59	117.07	121.57
3	D	802	P0T	C06-C09-C07	-5.51	117.14	121.57
3	G	801	P0T	C06-C09-C07	-5.40	117.22	121.57
3	B	803	P0T	C06-C09-C07	-5.39	117.23	121.57
3	B	802	P0T	C06-C09-C07	-5.32	117.29	121.57
4	A	803	PIO	O2C-C1A-C2A	4.01	120.14	111.50
4	G	803	PIO	O2C-C1A-C2A	4.00	120.12	111.50
4	B	801	PIO	O2C-C1A-C2A	3.99	120.10	111.50
4	D	803	PIO	O2C-C1A-C2A	3.99	120.09	111.50
3	A	801	P0T	C03-C04-C07	3.51	117.84	110.00
3	B	802	P0T	C03-C04-C07	3.49	117.81	110.00
3	A	801	P0T	C04-C07-C09	-3.40	118.82	124.68
3	D	801	P0T	C03-C04-C07	3.39	117.57	110.00

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	G	801	P0T	C03-C04-C07	3.37	117.52	110.00
3	D	801	P0T	C04-C07-C09	-3.34	118.92	124.68
3	A	802	P0T	C03-C04-C07	3.30	117.38	110.00
3	B	803	P0T	C03-C04-C07	3.29	117.36	110.00
3	B	802	P0T	C04-C07-C09	-3.29	119.00	124.68
3	G	801	P0T	C04-C07-C09	-3.26	119.06	124.68
3	D	802	P0T	C03-C04-C07	3.25	117.27	110.00
3	G	802	P0T	C03-C04-C07	3.22	117.20	110.00
3	B	803	P0T	C04-C07-C09	-2.88	119.70	124.68
3	A	802	P0T	C04-C07-C09	-2.83	119.79	124.68
3	D	802	P0T	C04-C07-C09	-2.80	119.85	124.68
3	G	802	P0T	C04-C07-C09	-2.76	119.92	124.68
4	G	803	PIO	O3C-C1B-C2B	2.65	120.22	111.91
4	D	803	PIO	O3C-C1B-C2B	2.65	120.22	111.91
4	A	803	PIO	O3C-C1B-C2B	2.63	120.17	111.91
4	B	801	PIO	O3C-C1B-C2B	2.63	120.17	111.91
4	D	803	PIO	O11-P1-O12	-2.30	100.85	112.24
4	A	803	PIO	O11-P1-O12	-2.30	100.88	112.24
4	B	801	PIO	O11-P1-O12	-2.29	100.89	112.24
4	G	803	PIO	O11-P1-O12	-2.29	100.91	112.24

There are no chirality outliers.

All (119) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	A	801	P0T	C03-C04-C08-C11
3	B	802	P0T	C03-C04-C08-C11
3	D	801	P0T	C03-C04-C08-C11
3	G	801	P0T	C03-C04-C08-C11
4	A	803	PIO	C1-O1-P1-O13
4	A	803	PIO	C1C-O13-P1-O1
4	A	803	PIO	C3-C4-O4-P4
4	A	803	PIO	C5-C4-O4-P4
4	A	803	PIO	O1A-C1A-O2C-C2C
4	B	801	PIO	C1-O1-P1-O13
4	B	801	PIO	C3-C4-O4-P4
4	B	801	PIO	C5-C4-O4-P4
4	B	801	PIO	O1A-C1A-O2C-C2C
4	D	803	PIO	C1-O1-P1-O13
4	D	803	PIO	C1C-O13-P1-O1
4	D	803	PIO	C3-C4-O4-P4
4	D	803	PIO	C5-C4-O4-P4

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Mol	Chain	Res	Type	Atoms
4	D	803	PIO	O1A-C1A-O2C-C2C
4	D	803	PIO	C2A-C1A-O2C-C2C
4	G	803	PIO	C1-O1-P1-O13
4	G	803	PIO	C3-C4-O4-P4
4	G	803	PIO	C5-C4-O4-P4
4	G	803	PIO	O1A-C1A-O2C-C2C
4	A	803	PIO	C2A-C1A-O2C-C2C
4	B	801	PIO	C2A-C1A-O2C-C2C
4	G	803	PIO	C2A-C1A-O2C-C2C
3	B	803	P0T	C15-C18-C20-C21
4	A	803	PIO	C2B-C1B-O3C-C3C
4	B	801	PIO	C2B-C1B-O3C-C3C
4	D	803	PIO	C2B-C1B-O3C-C3C
4	G	803	PIO	C2B-C1B-O3C-C3C
3	D	802	P0T	C15-C18-C20-C21
4	G	803	PIO	O1B-C1B-O3C-C3C
4	B	801	PIO	O1B-C1B-O3C-C3C
3	A	802	P0T	C15-C18-C20-C21
3	G	802	P0T	C15-C18-C20-C21
4	A	803	PIO	O1B-C1B-O3C-C3C
4	D	803	PIO	O1B-C1B-O3C-C3C
3	G	802	P0T	C18-C20-C21-C22
3	D	802	P0T	C18-C20-C21-C22
3	A	802	P0T	C18-C20-C21-C22
3	B	803	P0T	C18-C20-C21-C22
4	A	803	PIO	O2C-C2C-C3C-O3C
4	B	801	PIO	O2C-C2C-C3C-O3C
4	D	803	PIO	O2C-C2C-C3C-O3C
4	B	801	PIO	C1C-O13-P1-O1
3	D	802	P0T	C20-C21-C22-C23
3	B	803	P0T	C20-C21-C22-C23
4	D	803	PIO	C5B-C6B-C7B-C8B
4	G	803	PIO	C5B-C6B-C7B-C8B
4	A	803	PIO	C5B-C6B-C7B-C8B
4	B	801	PIO	C5B-C6B-C7B-C8B
3	G	802	P0T	C20-C21-C22-C23
3	A	802	P0T	C20-C21-C22-C23
4	G	803	PIO	O2C-C2C-C3C-O3C
4	G	803	PIO	C1B-C2B-C3B-C4B
4	B	801	PIO	C1C-C2C-C3C-O3C
4	A	803	PIO	C1-O1-P1-O12
4	B	801	PIO	C1-O1-P1-O12

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Mol	Chain	Res	Type	Atoms
4	D	803	PIO	C1-O1-P1-O12
4	G	803	PIO	C1-O1-P1-O12
4	A	803	PIO	C2C-C1C-O13-P1
4	B	801	PIO	C2C-C1C-O13-P1
4	D	803	PIO	C2C-C1C-O13-P1
4	G	803	PIO	C2C-C1C-O13-P1
3	A	801	P0T	C20-C21-C22-C23
4	B	801	PIO	C1B-C2B-C3B-C4B
4	D	803	PIO	C1B-C2B-C3B-C4B
3	B	802	P0T	C20-C21-C22-C23
4	A	803	PIO	C1B-C2B-C3B-C4B
4	A	803	PIO	C1C-C2C-C3C-O3C
4	D	803	PIO	C1C-C2C-C3C-O3C
4	A	803	PIO	O13-C1C-C2C-O2C
4	B	801	PIO	O13-C1C-C2C-O2C
4	G	803	PIO	O13-C1C-C2C-O2C
3	G	801	P0T	C20-C21-C22-C23
3	D	801	P0T	C20-C21-C22-C23
4	G	803	PIO	C1C-O13-P1-O1
4	D	803	PIO	O13-C1C-C2C-O2C
4	G	803	PIO	C1C-C2C-C3C-O3C
3	B	803	P0T	C17-C15-C18-C20
3	D	802	P0T	C17-C15-C18-C20
3	B	803	P0T	C16-C15-C18-C20
3	A	802	P0T	C04-C03-C10-C14
3	B	803	P0T	C04-C03-C10-C14
3	D	802	P0T	C04-C03-C10-C14
3	G	802	P0T	C04-C03-C10-C14
4	A	803	PIO	C5A-C6A-C7A-C8A
4	B	801	PIO	C1-O1-P1-O11
4	A	803	PIO	O13-C1C-C2C-C3C
4	B	801	PIO	O13-C1C-C2C-C3C
4	D	803	PIO	O13-C1C-C2C-C3C
4	G	803	PIO	O13-C1C-C2C-C3C
3	D	802	P0T	C16-C15-C18-C20
3	A	802	P0T	C17-C15-C18-C20
3	G	802	P0T	C17-C15-C18-C20
3	A	802	P0T	C16-C15-C18-C20
4	G	803	PIO	C5A-C6A-C7A-C8A
3	G	802	P0T	C16-C15-C18-C20
4	B	801	PIO	C4-O4-P4-O42
4	B	801	PIO	C5-O5-P5-O53

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Mol	Chain	Res	Type	Atoms
4	D	803	PIO	C4-O4-P4-O42
4	D	803	PIO	C5-O5-P5-O53
3	A	802	P0T	C04-C03-C10-C19
3	B	803	P0T	C04-C03-C10-C19
3	D	802	P0T	C04-C03-C10-C19
3	G	802	P0T	C04-C03-C10-C19
4	G	803	PIO	C2A-C3A-C4A-C5A
4	A	803	PIO	C4-O4-P4-O43
4	B	801	PIO	C4-O4-P4-O43
4	D	803	PIO	C4-O4-P4-O43
4	G	803	PIO	C4-O4-P4-O43
4	A	803	PIO	C2A-C3A-C4A-C5A
4	D	803	PIO	C5A-C6A-C7A-C8A
4	D	803	PIO	C2A-C3A-C4A-C5A
4	D	803	PIO	C2B-C3B-C4B-C5B
4	B	801	PIO	C2B-C3B-C4B-C5B
4	G	803	PIO	C2B-C3B-C4B-C5B
4	A	803	PIO	C2B-C3B-C4B-C5B

There are no ring outliers.

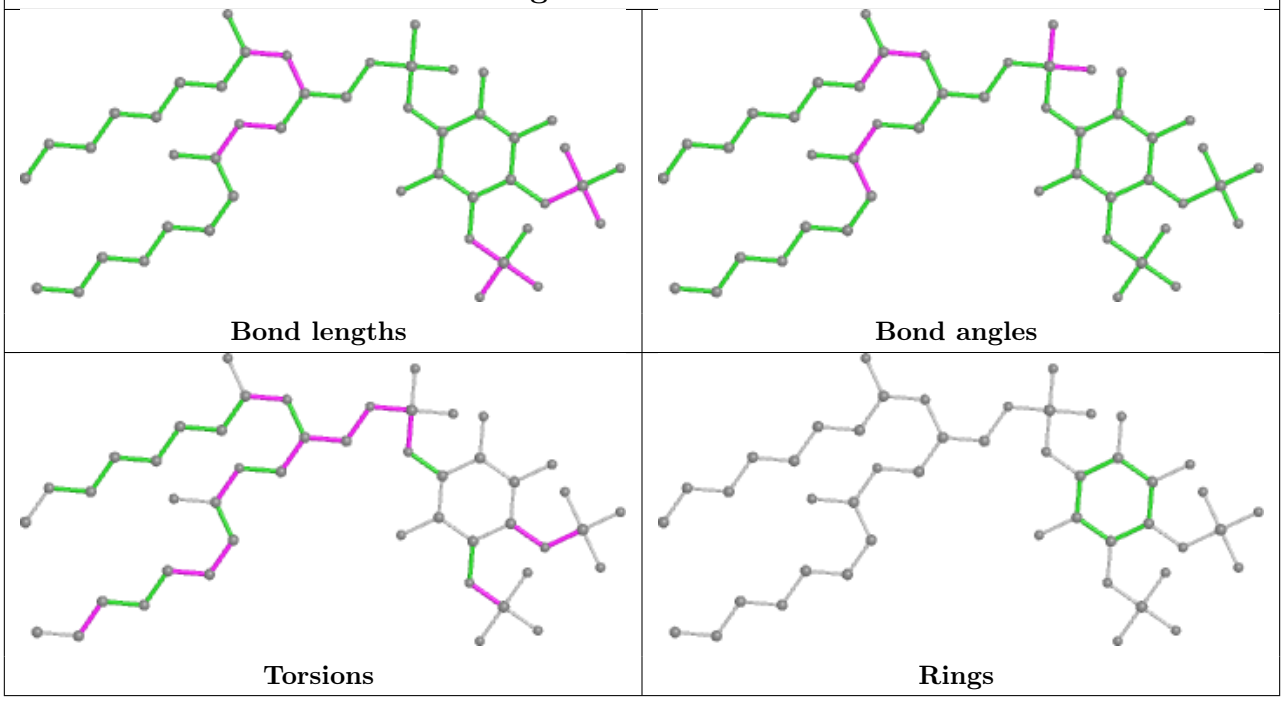
8 monomers are involved in 12 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	B	801	PIO	2	0
3	D	802	P0T	1	0
4	A	803	PIO	2	0
3	B	803	P0T	1	0
4	D	803	PIO	2	0
4	G	803	PIO	2	0
3	A	802	P0T	1	0
3	G	802	P0T	1	0

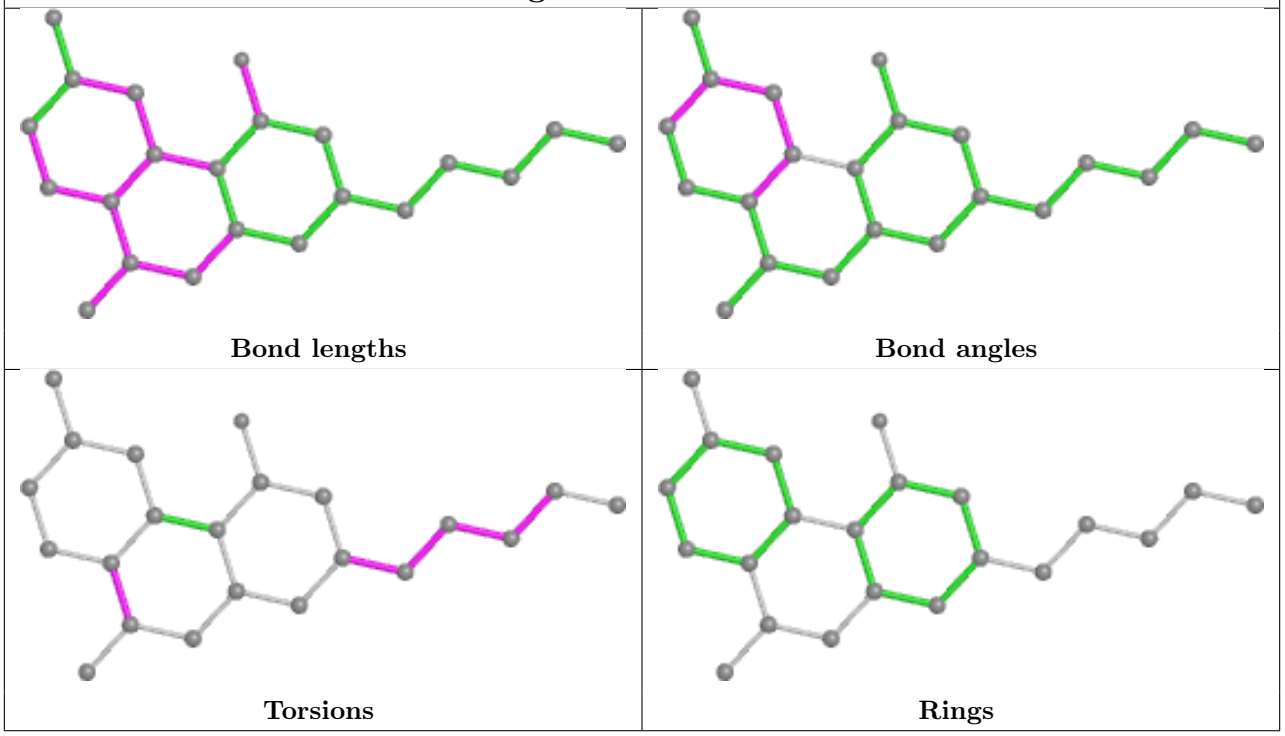
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less then 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier.

The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.

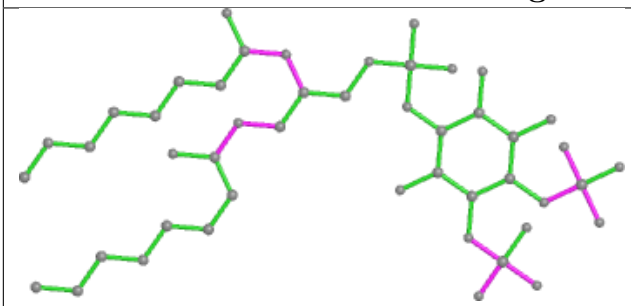
Ligand PIO B 801



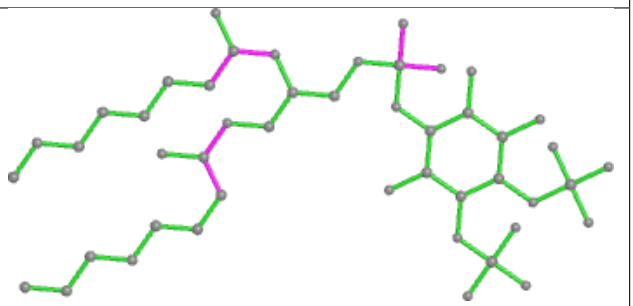
Ligand P0T D 802



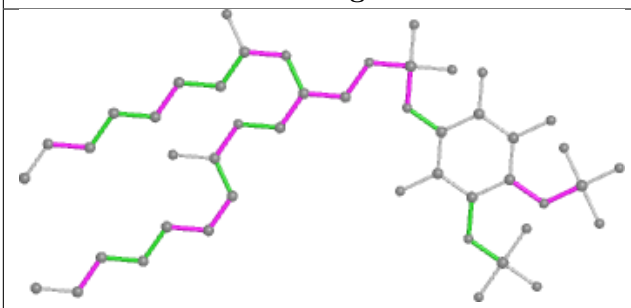
Ligand PIO A 803



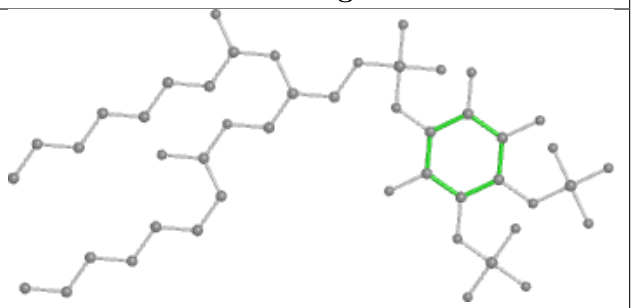
Bond lengths



Bond angles

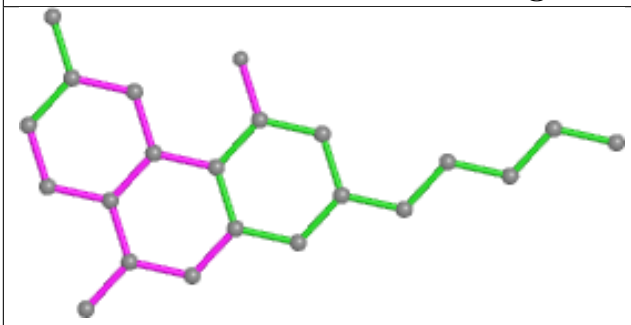


Torsions

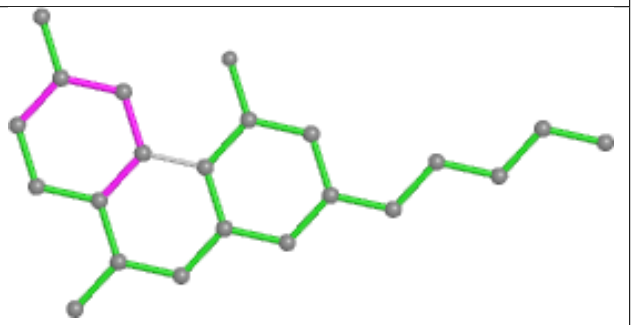


Rings

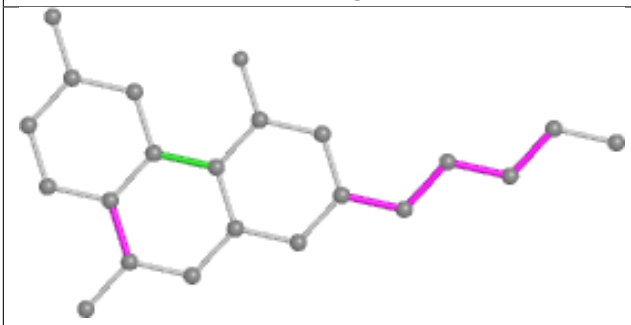
Ligand P0T B 803



Bond lengths



Bond angles



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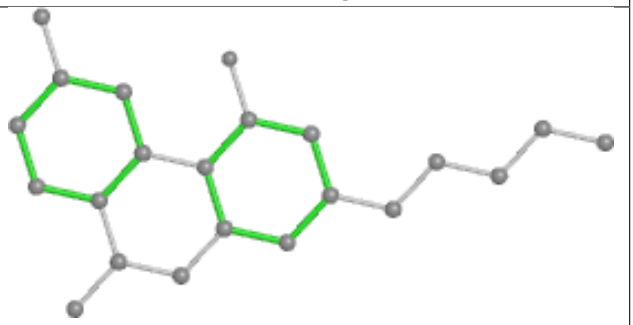
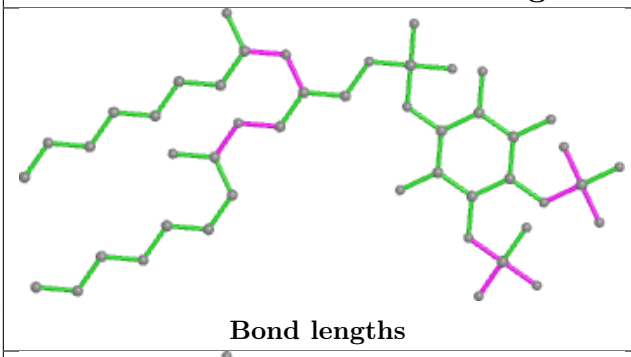
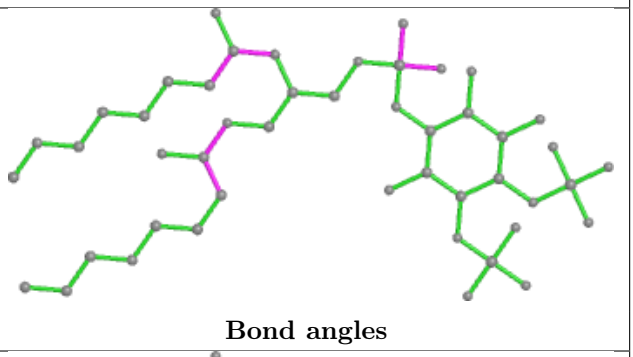


Rings

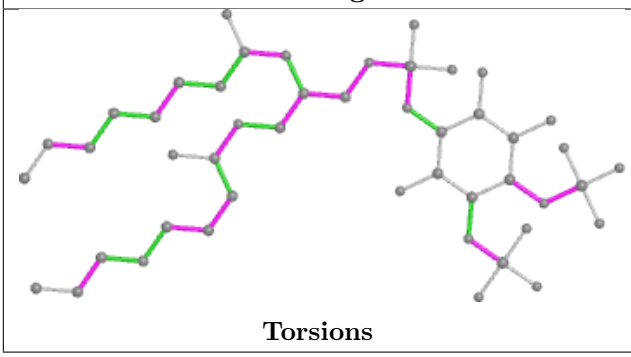
Ligand PIO D 803



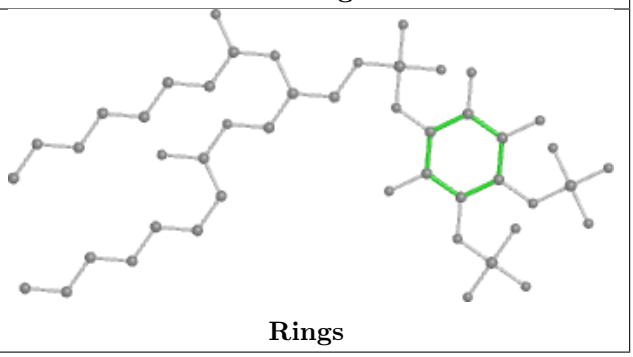
Bond lengths



Bond angles

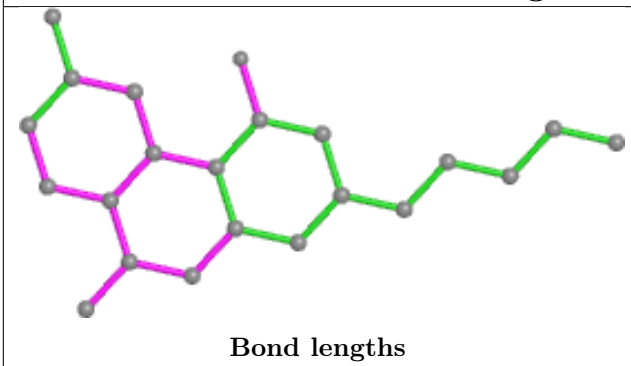


Torsions

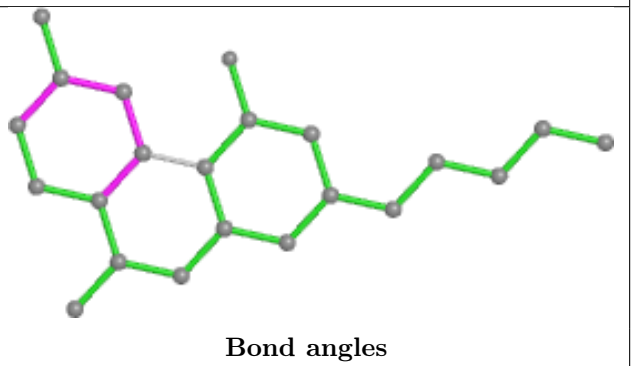


Rings

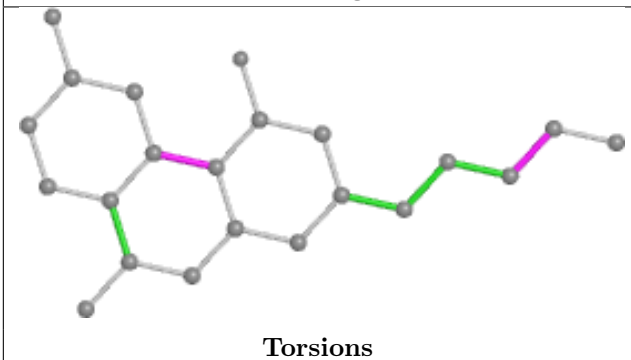
Ligand P0T A 801



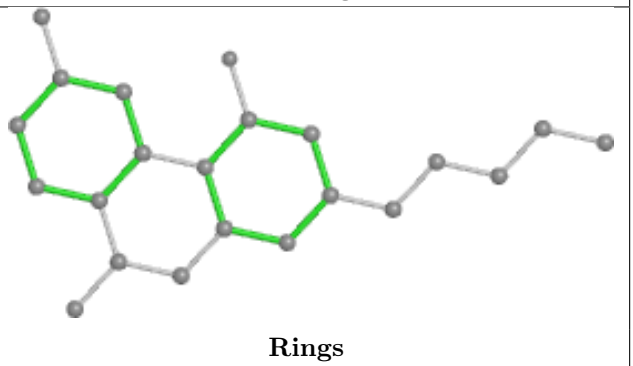
Bond lengths



Bond angles

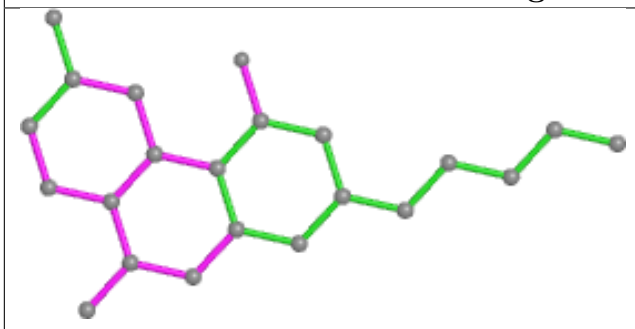


Torsions

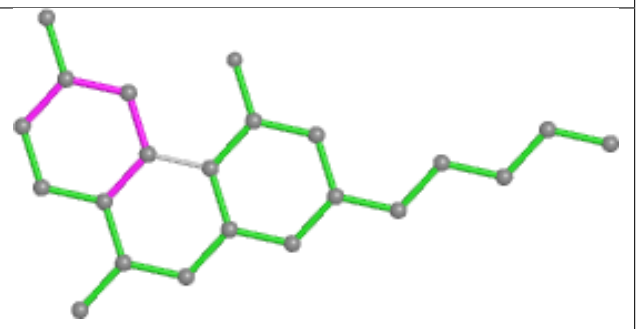


Rings

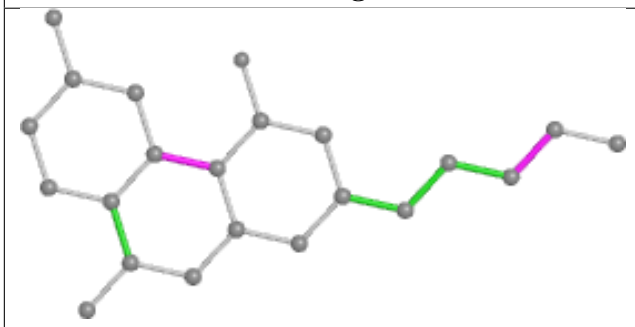
Ligand P0T G 801



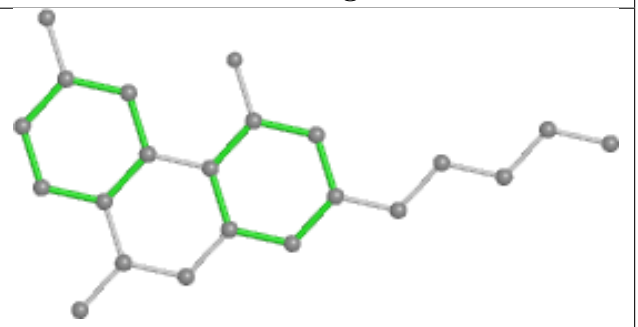
Bond lengths



Bond angles

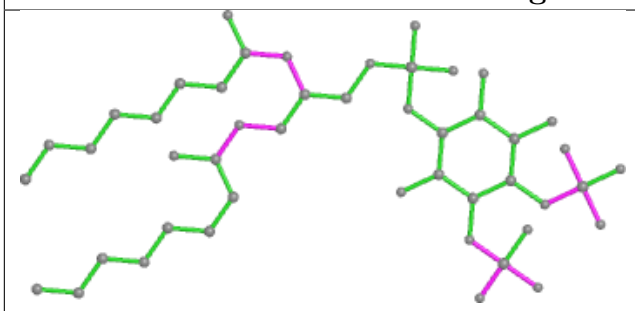


Torsions

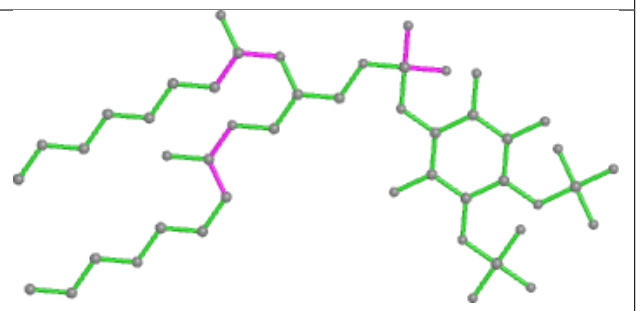


Rings

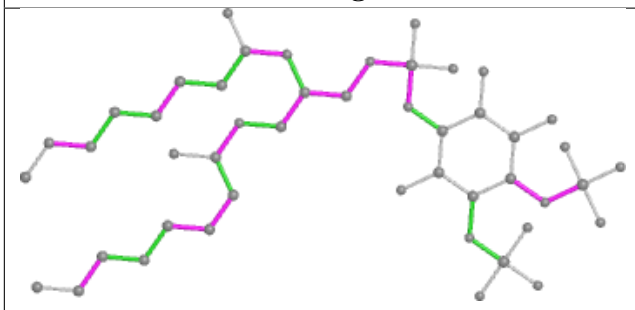
Ligand PIO G 803



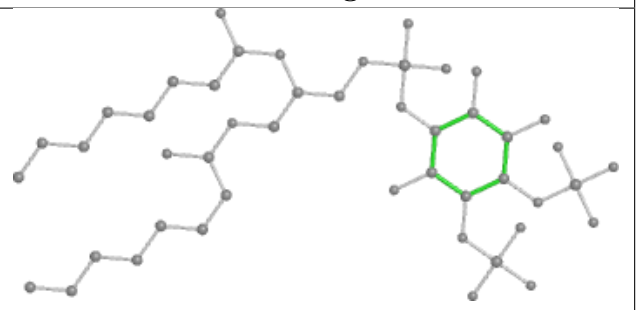
Bond lengths



Bond angles

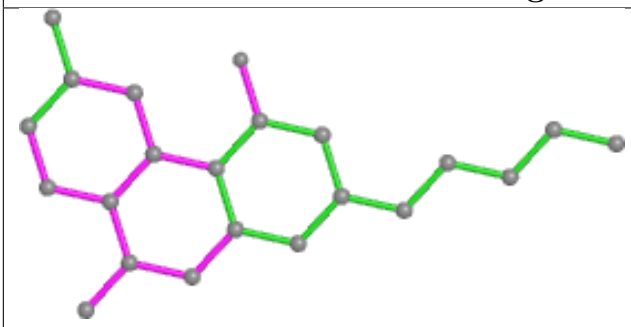


Torsions

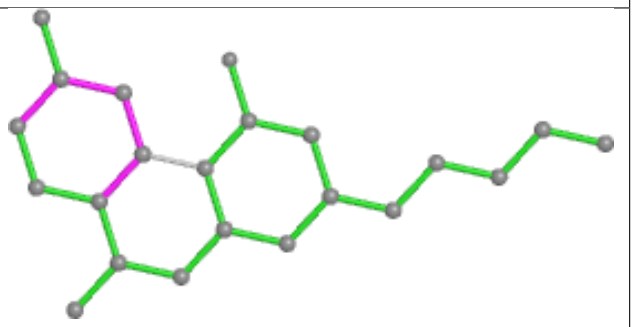


Rings

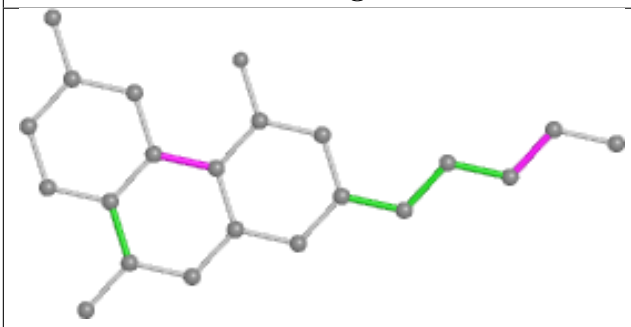
Ligand P0T D 801



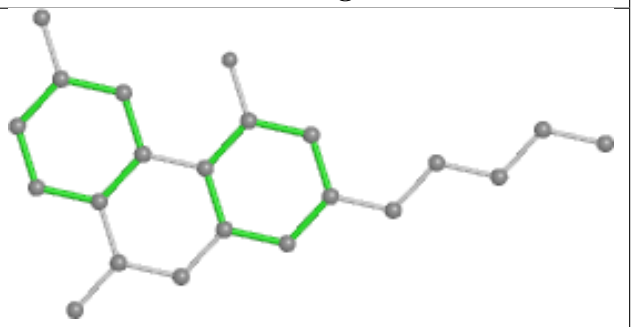
Bond lengths



Bond angles

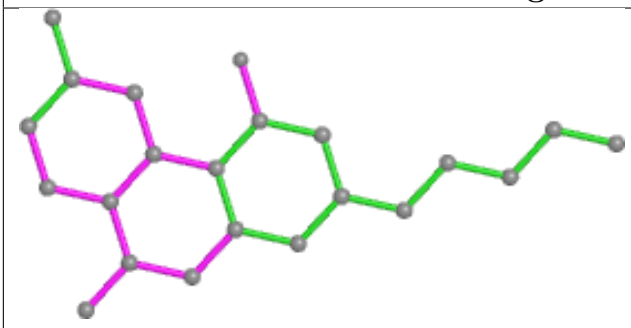


Torsions

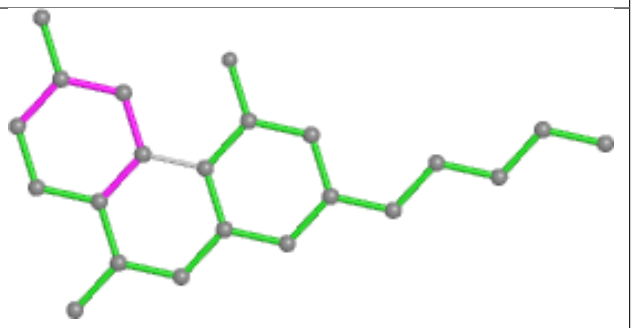


Rings

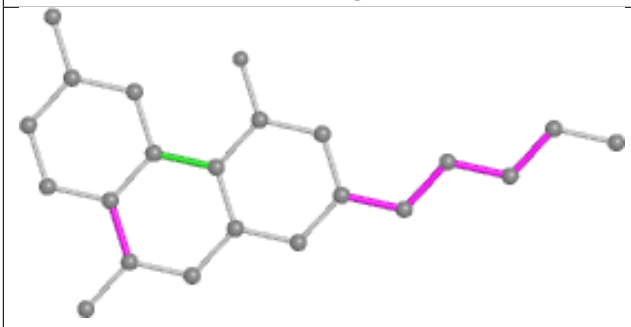
Ligand P0T A 802



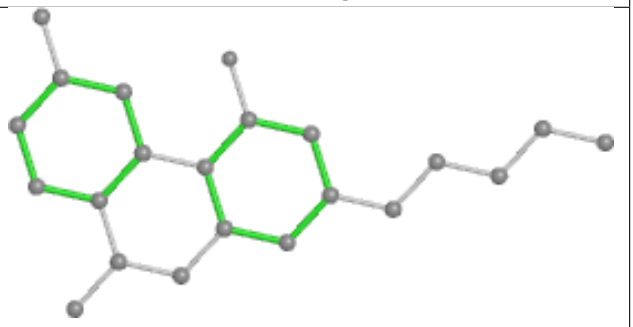
Bond lengths



Bond angles

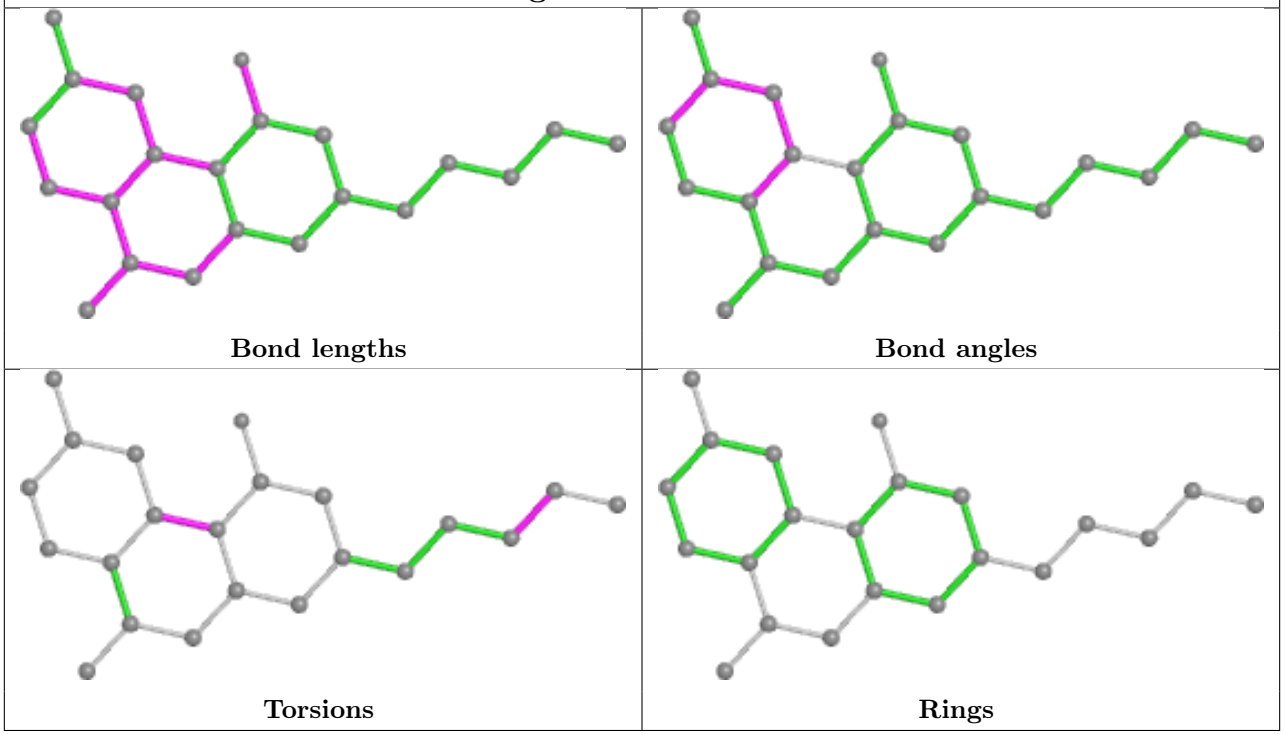


Torsions

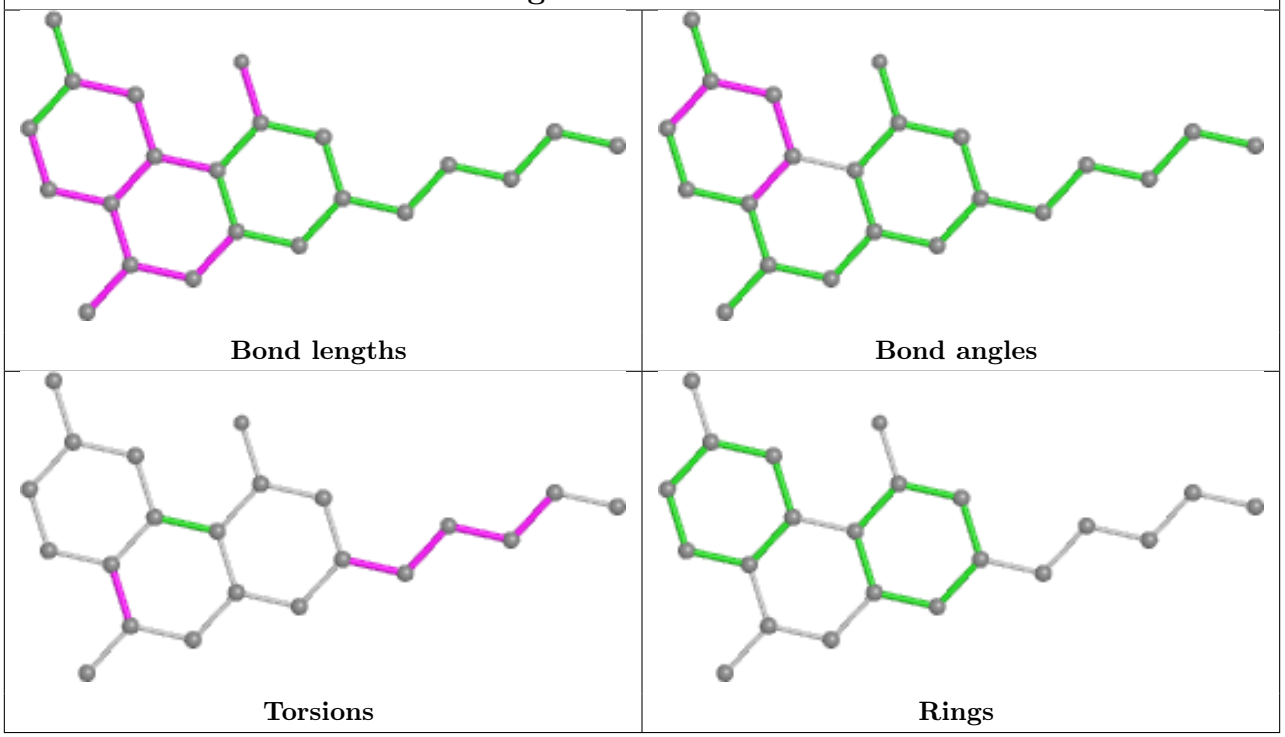


Rings

Ligand P0T B 802



Ligand P0T G 802



5.7 Other polymers (i)

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

There are no chain breaks in this entry.

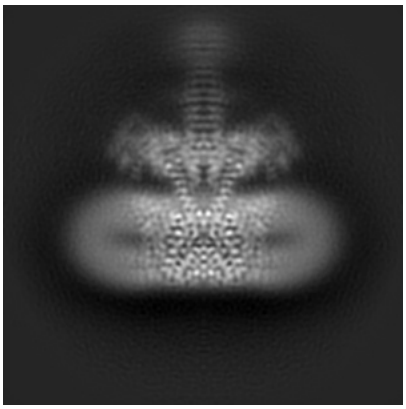
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-35880. These allow visual inspection of the internal detail of the map and identification of artifacts.

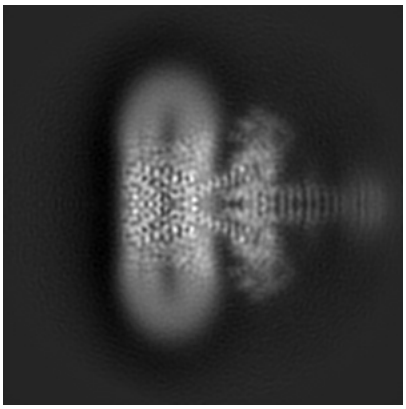
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections

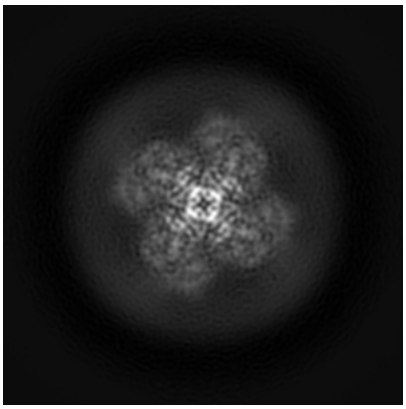
6.1.1 Primary map



X

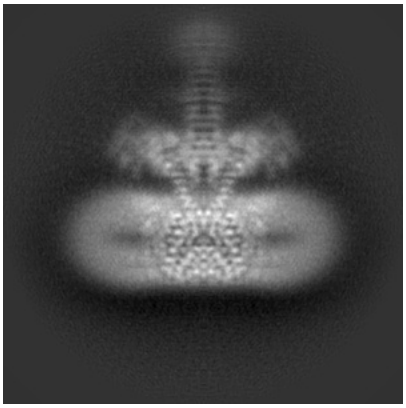


Y

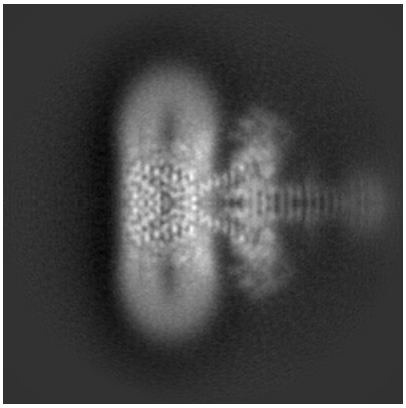


Z

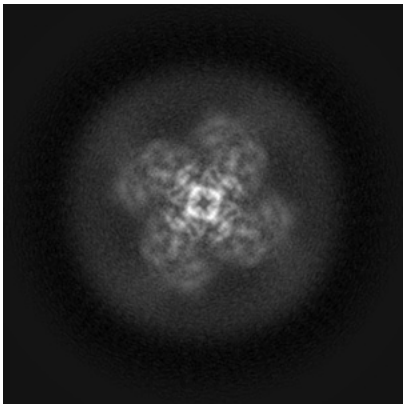
6.1.2 Raw map



X



Y

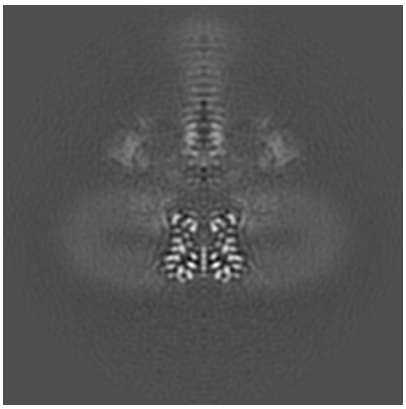


Z

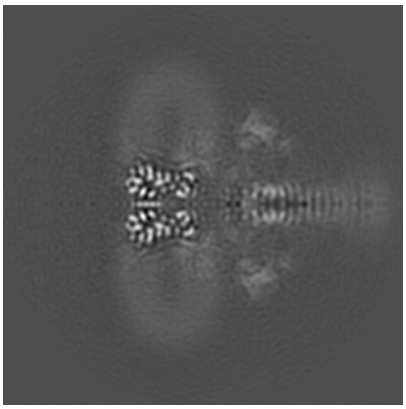
The images above show the map projected in three orthogonal directions.

6.2 Central slices (i)

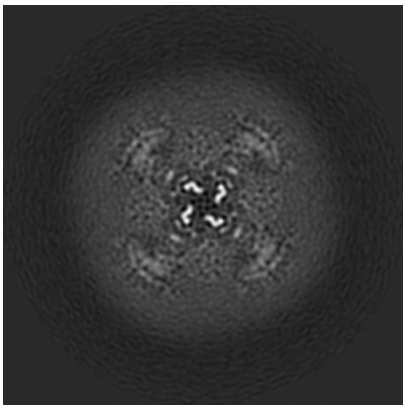
6.2.1 Primary map



X Index: 120

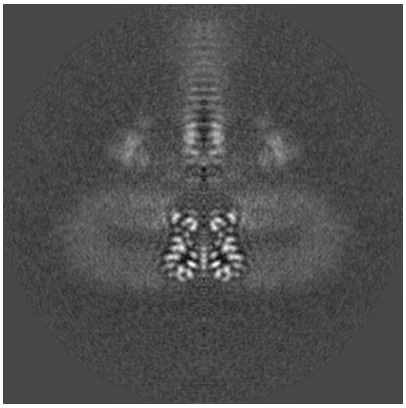


Y Index: 120

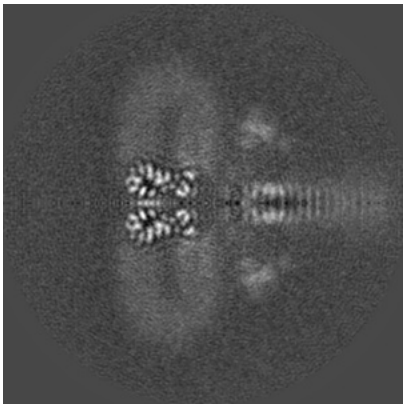


Z Index: 120

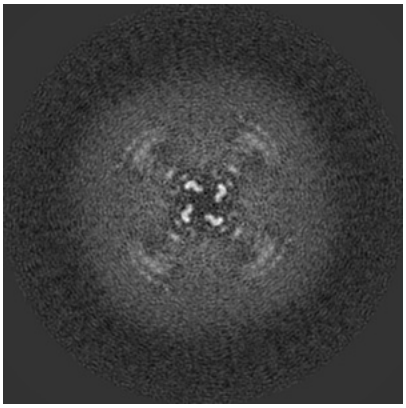
6.2.2 Raw map



X Index: 120



Y Index: 120

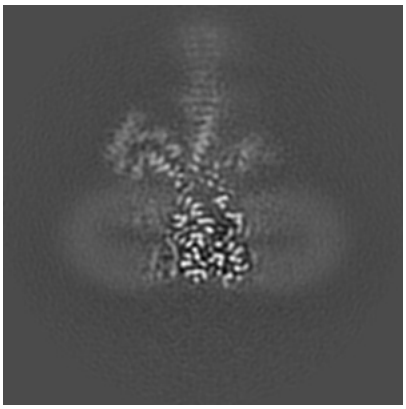


Z Index: 120

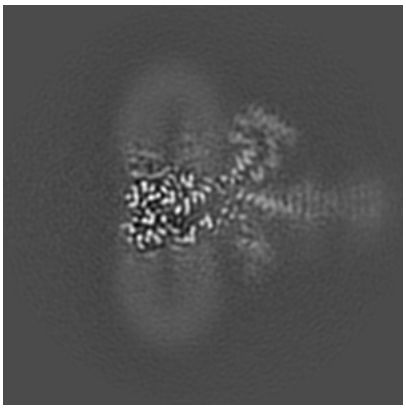
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

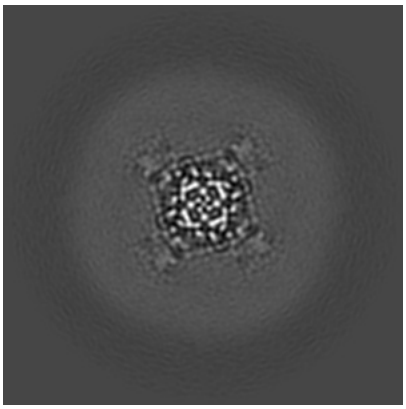
6.3.1 Primary map



X Index: 111

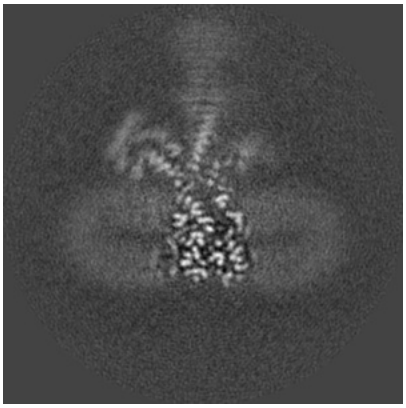


Y Index: 111

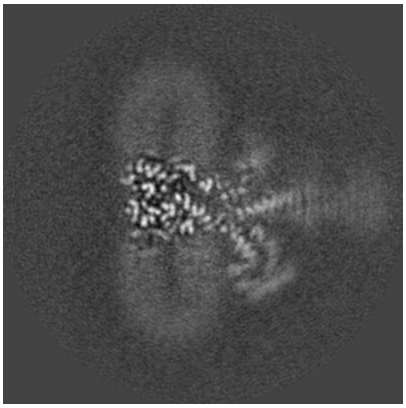


Z Index: 84

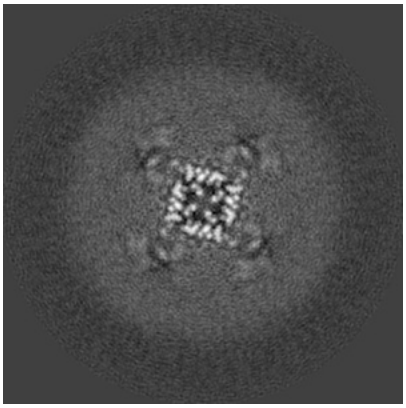
6.3.2 Raw map



X Index: 111



Y Index: 129

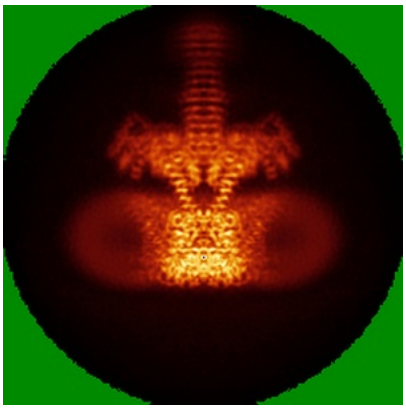


Z Index: 113

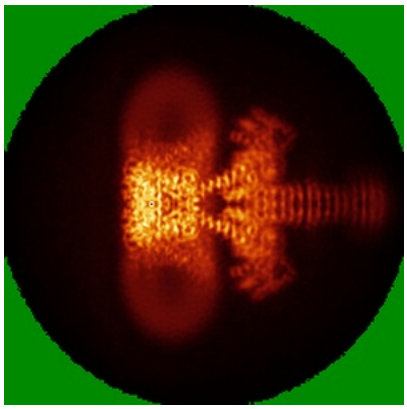
The images above show the largest variance slices of the map in three orthogonal directions.

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

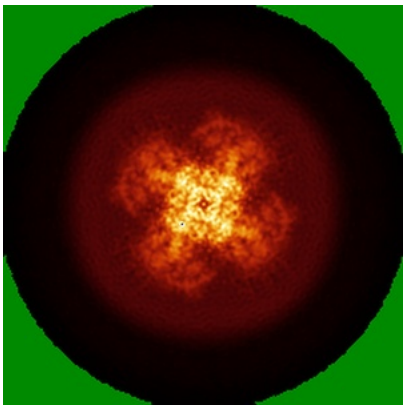
6.4.1 Primary map



X

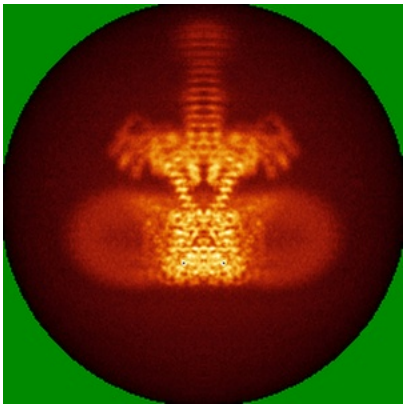


Y

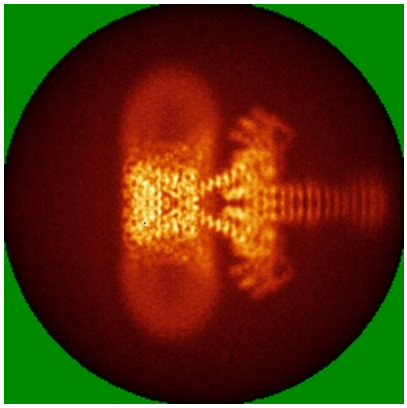


Z

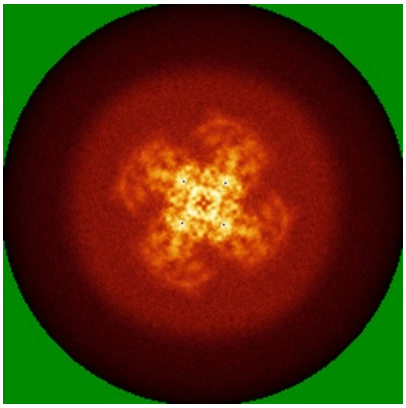
6.4.2 Raw map



X



Y

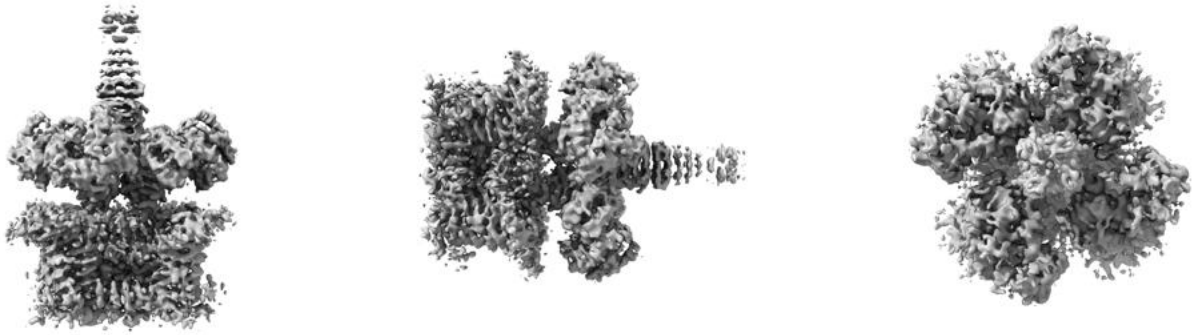


Z

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)

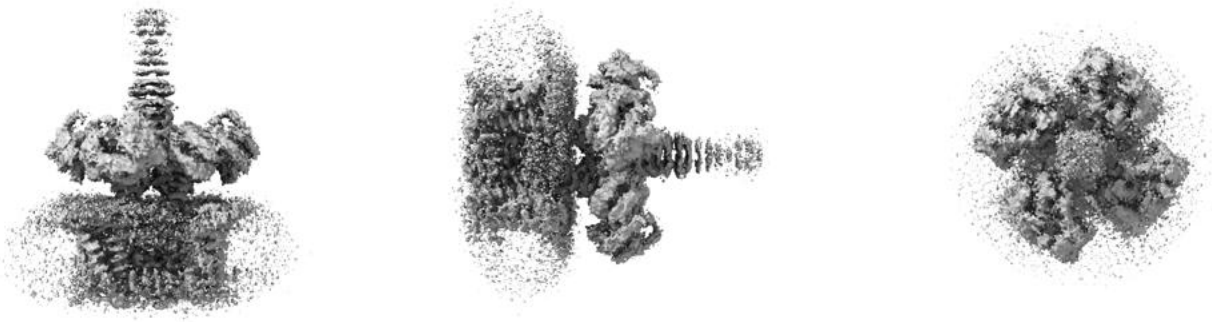
6.5.1 Primary map



X Y Z

The images above show the 3D surface view of the map at the recommended contour level 0.009. 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



X Y Z

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.

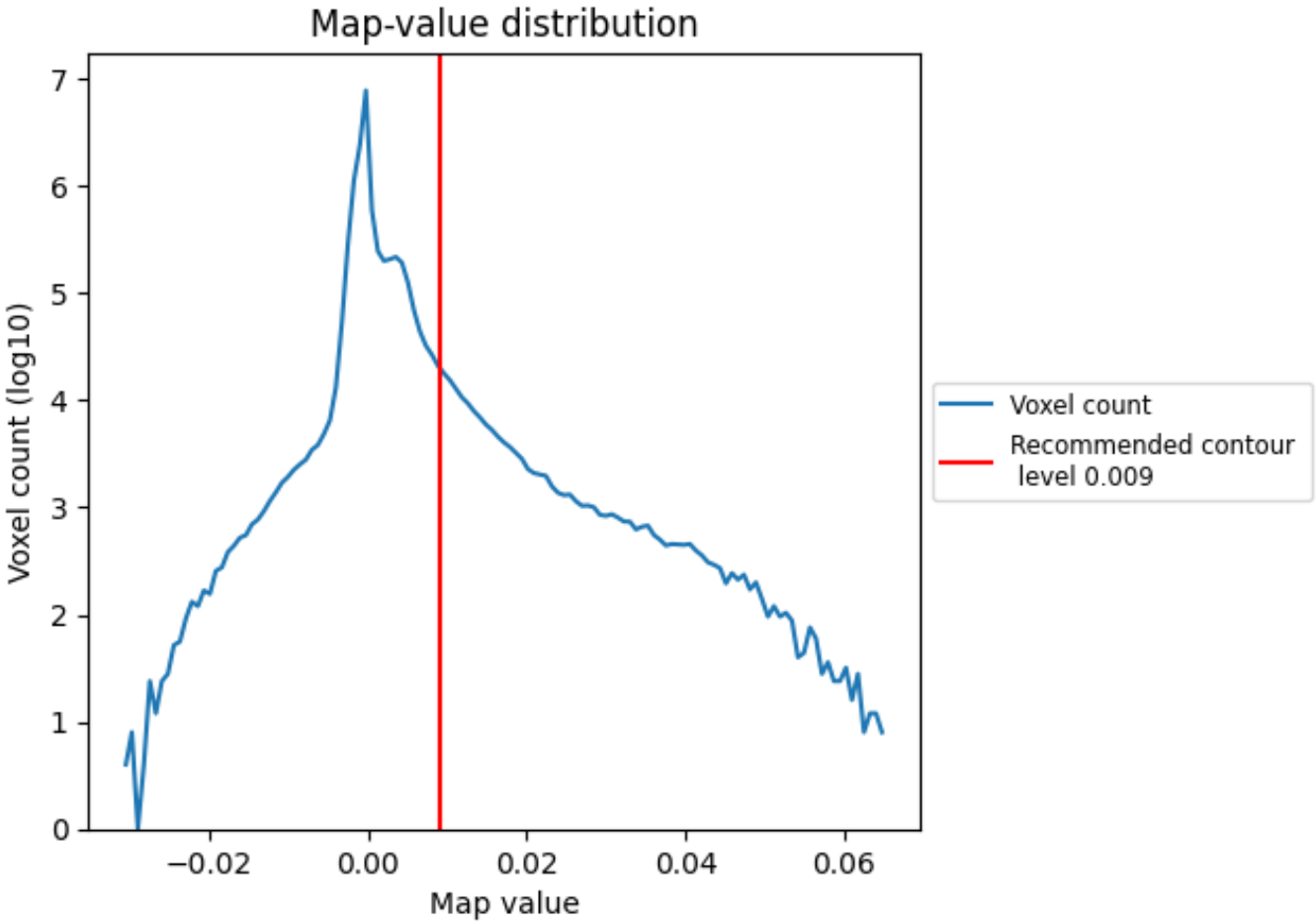
6.6 Mask visualisation (i)

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

7 Map analysis

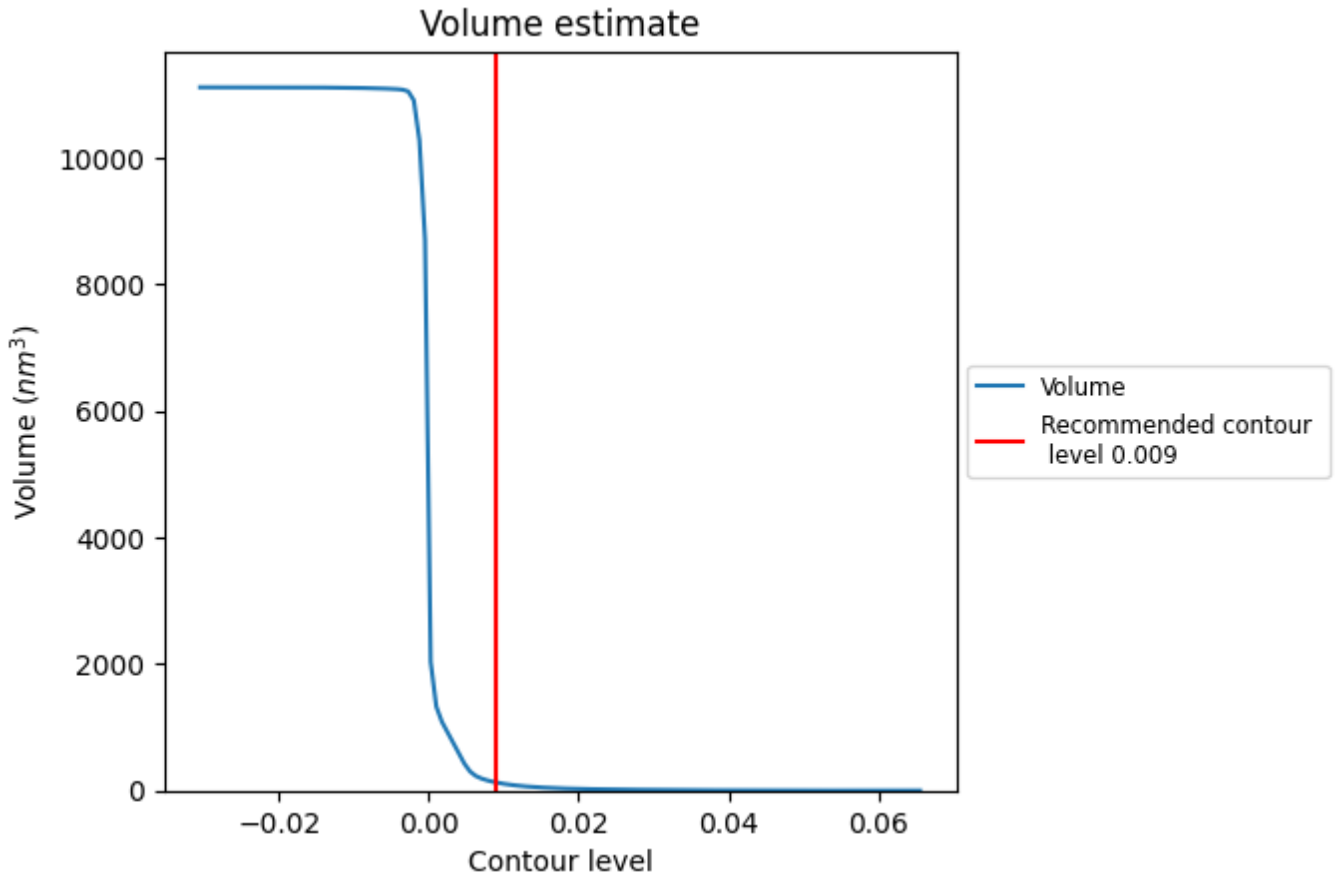
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution



The map-value distribution is plotted in 128 intervals along the x-axis. The y-axis is logarithmic. A spike in this graph at zero usually indicates that the volume has been masked.

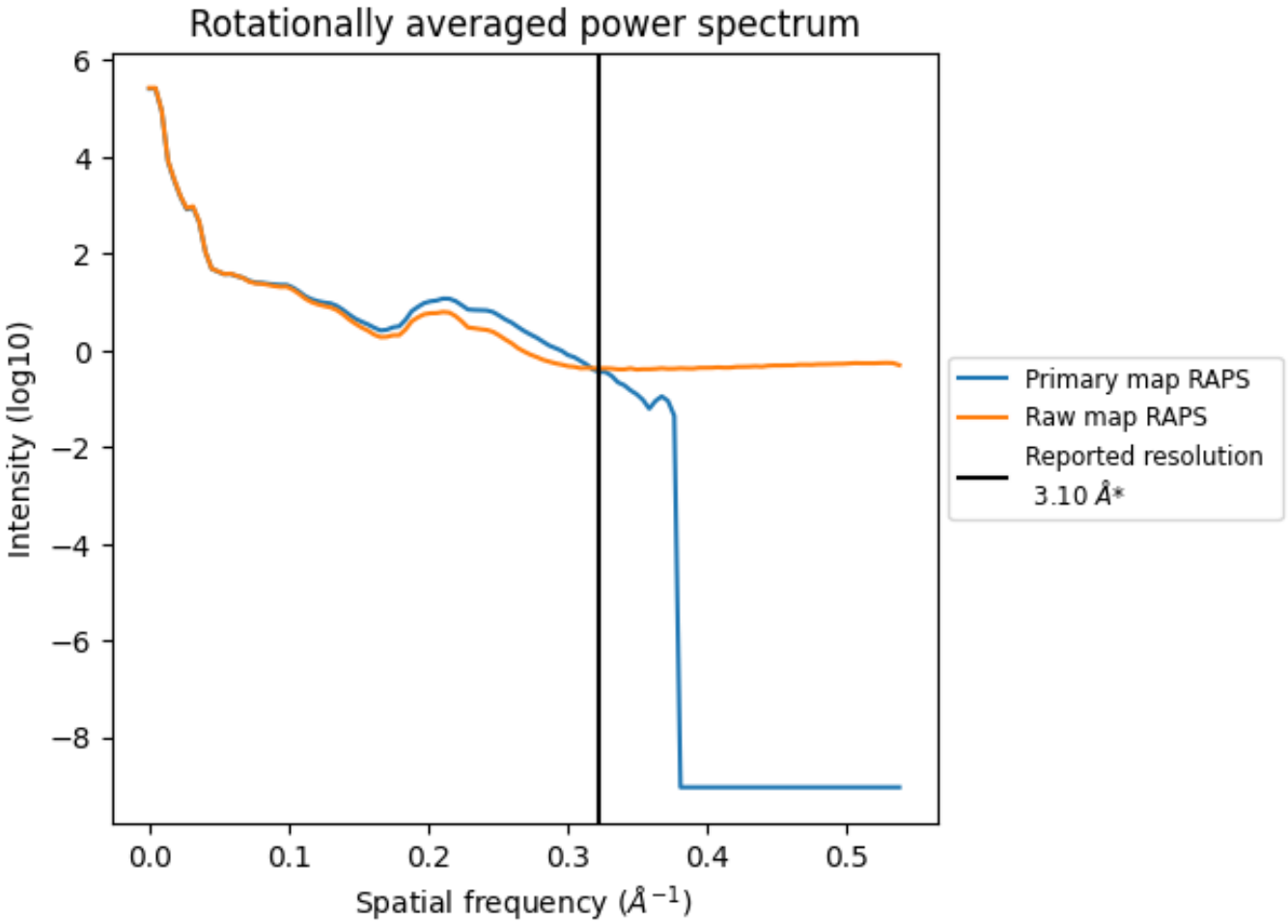
7.2 Volume estimate



The volume at the recommended contour level is 128 nm^3; this corresponds to an approximate mass of 116 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)

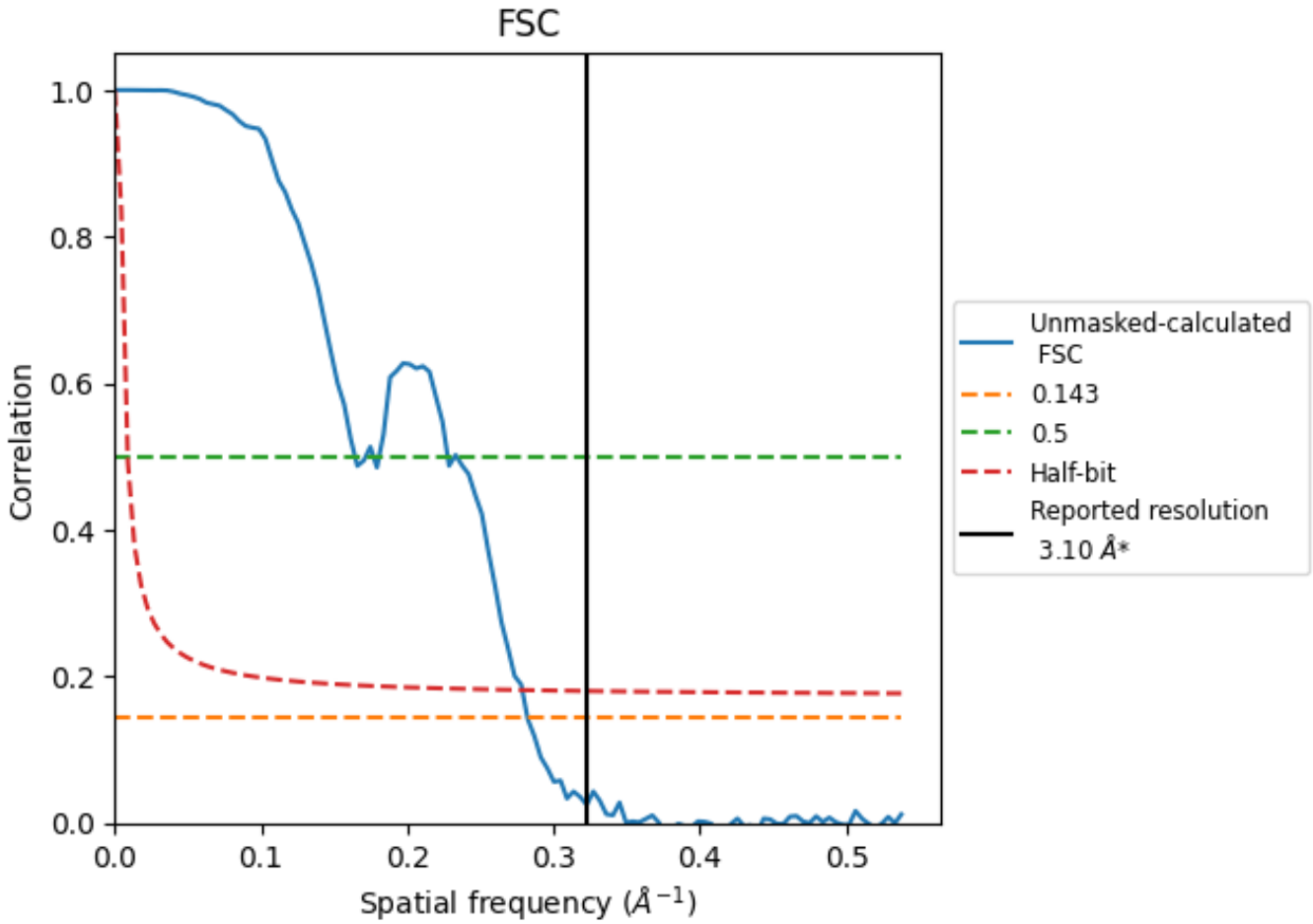


*Reported resolution corresponds to spatial frequency of 0.323 Å^{-1}

8 Fourier-Shell correlation

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



*Reported resolution corresponds to spatial frequency of 0.323 Å^{-1}

8.2 Resolution estimates (i)

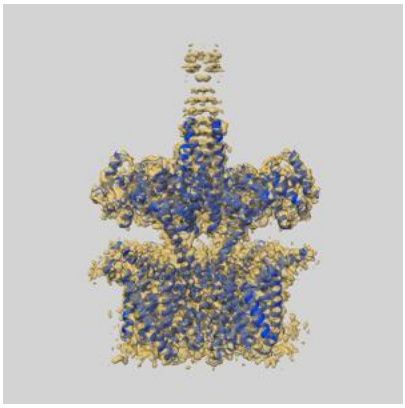
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.10	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	3.54	6.09	3.59

*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 3.54 differs from the reported value 3.1 by more than 10 %

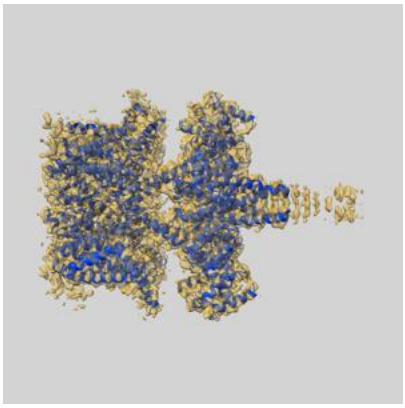
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-35880 and PDB model 8J01. Per-residue inclusion information can be found in section 3 on page 10.

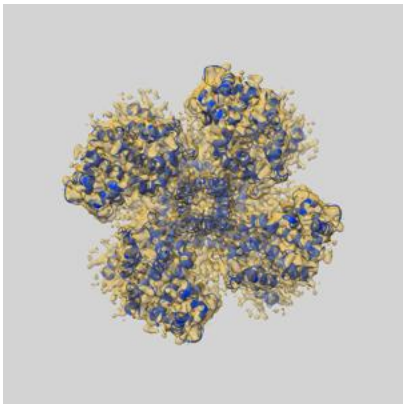
9.1 Map-model overlay



X



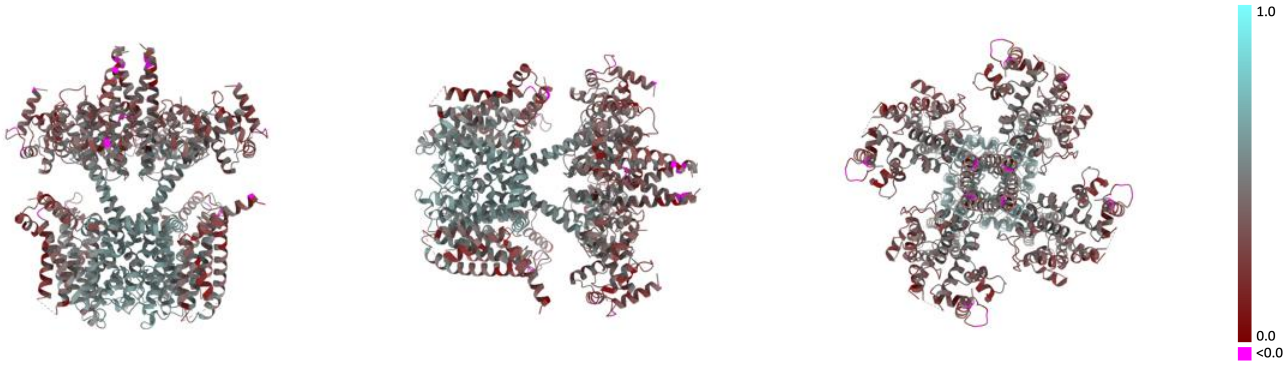
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.009 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

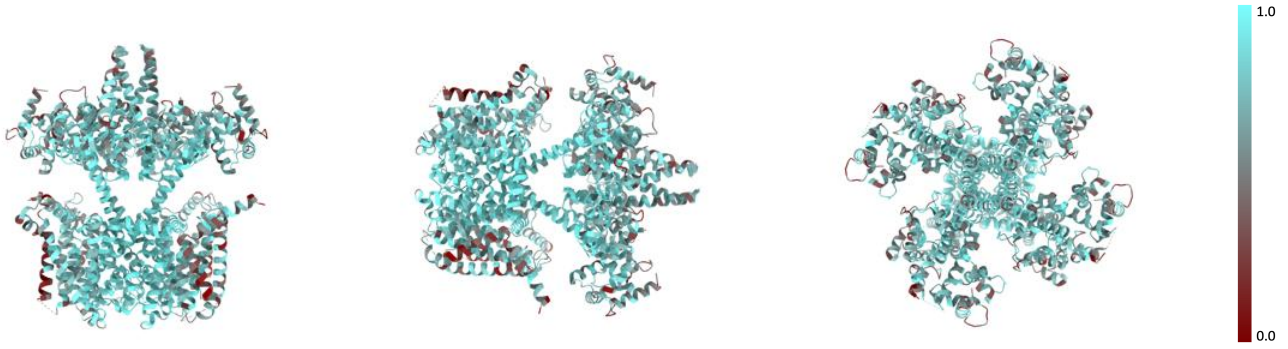
9.2 Q-score mapped to coordinate model (i)



X Y Z

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

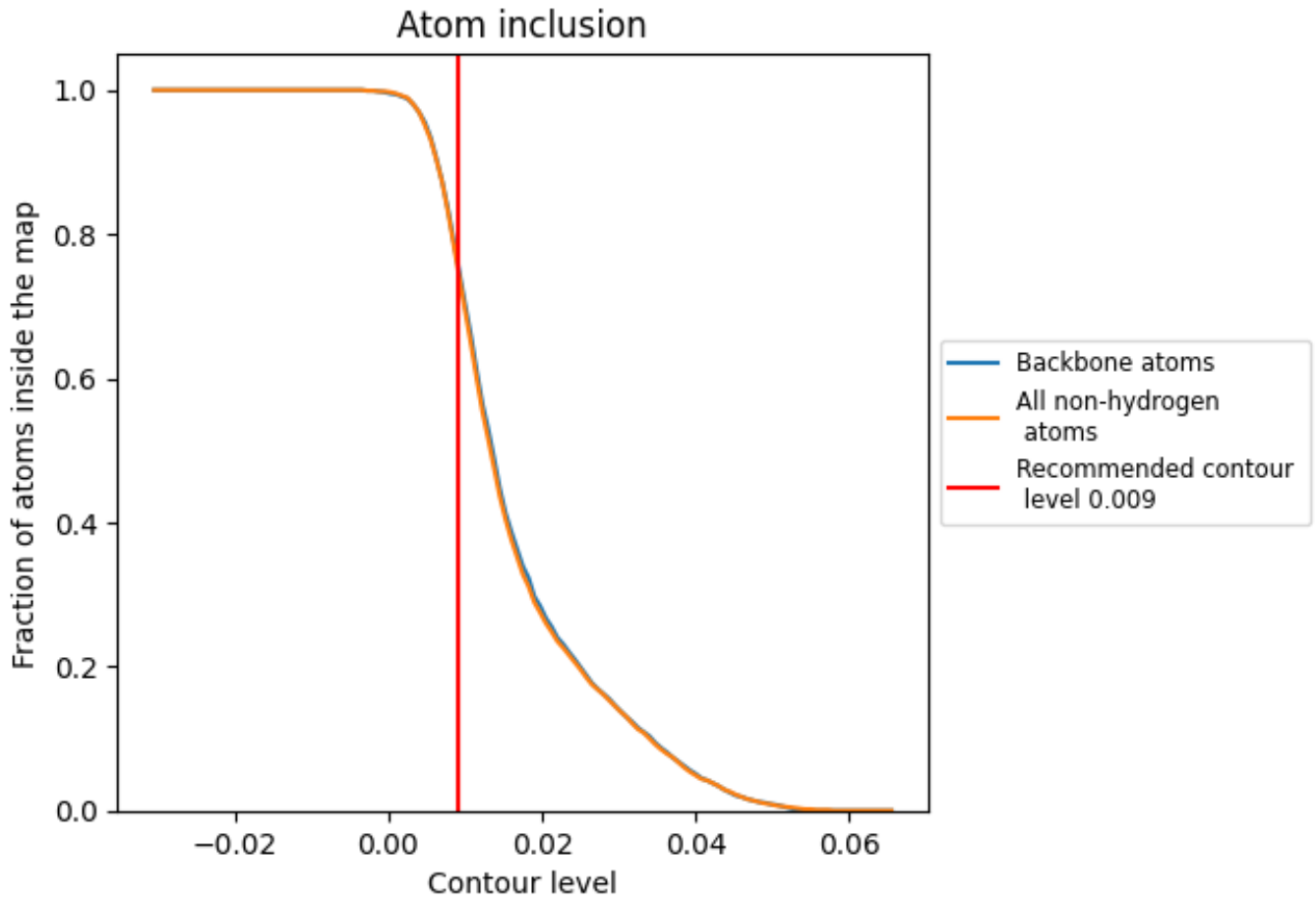
9.3 Atom inclusion mapped to coordinate model (i)



X Y Z

The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.009).

9.4 Atom inclusion (i)



At the recommended contour level, 76% of all backbone atoms, 76% 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 (0.009) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.7550	0.4210
A	0.7890	0.4460
B	0.7890	0.4480
C	0.6920	0.3510
D	0.7940	0.4490
E	0.6920	0.3530
F	0.6870	0.3470
G	0.7940	0.4460
H	0.6880	0.3460