



Full wwPDB EM Validation Report ⓘ

May 27, 2024 – 04:32 AM EDT

PDB ID : 7TJ5
EMDB ID : EMD-25916
Title : SthK closed state, cAMP-bound in the presence of POPA
Authors : Schmidpeter, P.A.; Nimigean, C.M.
Deposited on : 2022-01-14
Resolution : 2.41 Å (reported)
Based on initial model : 6CJQ

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.dev92
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 : 1.9.13
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.36.2

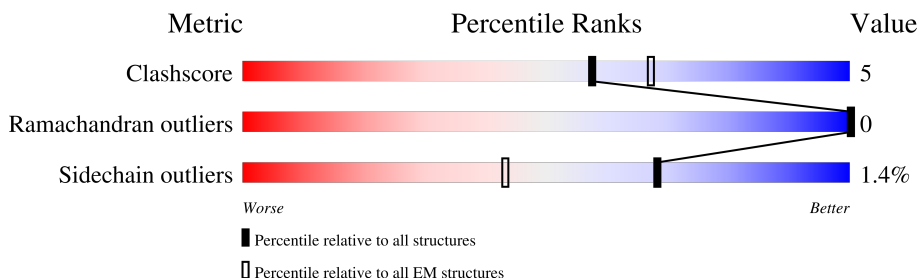
1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 2.41 Å.

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



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

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

Mol	Chain	Length	Quality of chain
1	A	456	
1	B	456	
1	C	456	
1	D	456	

2 Entry composition i

There are 3 unique types of molecules in this entry. The entry contains 13152 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 Putative transcriptional regulator, Crp/Fnr family.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	392	3121	2047	517	550	7	0	0
1	B	392	3121	2047	517	550	7	0	0
1	C	392	3121	2047	517	550	7	0	0
1	D	392	3121	2047	517	550	7	0	0

There are 144 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-18	MET	-	initiating methionine	UNP G0GA88
A	-17	ALA	-	expression tag	UNP G0GA88
A	-16	LYS	-	expression tag	UNP G0GA88
A	-15	ASP	-	expression tag	UNP G0GA88
A	-14	ILE	-	expression tag	UNP G0GA88
A	-13	GLY	-	expression tag	UNP G0GA88
A	-12	ILE	-	expression tag	UNP G0GA88
A	-11	ASN	-	expression tag	UNP G0GA88
A	-10	SER	-	expression tag	UNP G0GA88
A	-9	ASP	-	expression tag	UNP G0GA88
A	-8	PRO	-	expression tag	UNP G0GA88
A	-7	ASN	-	expression tag	UNP G0GA88
A	-6	SER	-	expression tag	UNP G0GA88
A	-5	SER	-	expression tag	UNP G0GA88
A	-4	SER	-	expression tag	UNP G0GA88
A	-3	VAL	-	expression tag	UNP G0GA88
A	-2	ASP	-	expression tag	UNP G0GA88
A	-1	LYS	-	expression tag	UNP G0GA88
A	0	LEU	-	expression tag	UNP G0GA88
A	421	LEU	-	expression tag	UNP G0GA88
A	422	GLU	-	expression tag	UNP G0GA88
A	423	SER	-	expression tag	UNP G0GA88

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Chain	Residue	Modelled	Actual	Comment	Reference
A	424	SER	-	expression tag	UNP G0GA88
A	425	GLY	-	expression tag	UNP G0GA88
A	426	LEU	-	expression tag	UNP G0GA88
A	427	VAL	-	expression tag	UNP G0GA88
A	428	PRO	-	expression tag	UNP G0GA88
A	429	ARG	-	expression tag	UNP G0GA88
A	430	GLY	-	expression tag	UNP G0GA88
A	431	SER	-	expression tag	UNP G0GA88
A	432	VAL	-	expression tag	UNP G0GA88
A	433	LYS	-	expression tag	UNP G0GA88
A	434	HIS	-	expression tag	UNP G0GA88
A	435	HIS	-	expression tag	UNP G0GA88
A	436	HIS	-	expression tag	UNP G0GA88
A	437	HIS	-	expression tag	UNP G0GA88
B	-18	MET	-	initiating methionine	UNP G0GA88
B	-17	ALA	-	expression tag	UNP G0GA88
B	-16	LYS	-	expression tag	UNP G0GA88
B	-15	ASP	-	expression tag	UNP G0GA88
B	-14	ILE	-	expression tag	UNP G0GA88
B	-13	GLY	-	expression tag	UNP G0GA88
B	-12	ILE	-	expression tag	UNP G0GA88
B	-11	ASN	-	expression tag	UNP G0GA88
B	-10	SER	-	expression tag	UNP G0GA88
B	-9	ASP	-	expression tag	UNP G0GA88
B	-8	PRO	-	expression tag	UNP G0GA88
B	-7	ASN	-	expression tag	UNP G0GA88
B	-6	SER	-	expression tag	UNP G0GA88
B	-5	SER	-	expression tag	UNP G0GA88
B	-4	SER	-	expression tag	UNP G0GA88
B	-3	VAL	-	expression tag	UNP G0GA88
B	-2	ASP	-	expression tag	UNP G0GA88
B	-1	LYS	-	expression tag	UNP G0GA88
B	0	LEU	-	expression tag	UNP G0GA88
B	421	LEU	-	expression tag	UNP G0GA88
B	422	GLU	-	expression tag	UNP G0GA88
B	423	SER	-	expression tag	UNP G0GA88
B	424	SER	-	expression tag	UNP G0GA88
B	425	GLY	-	expression tag	UNP G0GA88
B	426	LEU	-	expression tag	UNP G0GA88
B	427	VAL	-	expression tag	UNP G0GA88
B	428	PRO	-	expression tag	UNP G0GA88
B	429	ARG	-	expression tag	UNP G0GA88

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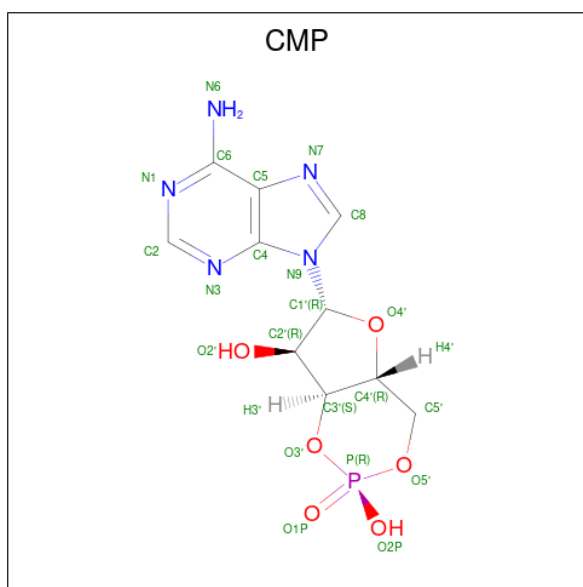
Chain	Residue	Modelled	Actual	Comment	Reference
B	430	GLY	-	expression tag	UNP G0GA88
B	431	SER	-	expression tag	UNP G0GA88
B	432	VAL	-	expression tag	UNP G0GA88
B	433	LYS	-	expression tag	UNP G0GA88
B	434	HIS	-	expression tag	UNP G0GA88
B	435	HIS	-	expression tag	UNP G0GA88
B	436	HIS	-	expression tag	UNP G0GA88
B	437	HIS	-	expression tag	UNP G0GA88
C	-18	MET	-	initiating methionine	UNP G0GA88
C	-17	ALA	-	expression tag	UNP G0GA88
C	-16	LYS	-	expression tag	UNP G0GA88
C	-15	ASP	-	expression tag	UNP G0GA88
C	-14	ILE	-	expression tag	UNP G0GA88
C	-13	GLY	-	expression tag	UNP G0GA88
C	-12	ILE	-	expression tag	UNP G0GA88
C	-11	ASN	-	expression tag	UNP G0GA88
C	-10	SER	-	expression tag	UNP G0GA88
C	-9	ASP	-	expression tag	UNP G0GA88
C	-8	PRO	-	expression tag	UNP G0GA88
C	-7	ASN	-	expression tag	UNP G0GA88
C	-6	SER	-	expression tag	UNP G0GA88
C	-5	SER	-	expression tag	UNP G0GA88
C	-4	SER	-	expression tag	UNP G0GA88
C	-3	VAL	-	expression tag	UNP G0GA88
C	-2	ASP	-	expression tag	UNP G0GA88
C	-1	LYS	-	expression tag	UNP G0GA88
C	0	LEU	-	expression tag	UNP G0GA88
C	421	LEU	-	expression tag	UNP G0GA88
C	422	GLU	-	expression tag	UNP G0GA88
C	423	SER	-	expression tag	UNP G0GA88
C	424	SER	-	expression tag	UNP G0GA88
C	425	GLY	-	expression tag	UNP G0GA88
C	426	LEU	-	expression tag	UNP G0GA88
C	427	VAL	-	expression tag	UNP G0GA88
C	428	PRO	-	expression tag	UNP G0GA88
C	429	ARG	-	expression tag	UNP G0GA88
C	430	GLY	-	expression tag	UNP G0GA88
C	431	SER	-	expression tag	UNP G0GA88
C	432	VAL	-	expression tag	UNP G0GA88
C	433	LYS	-	expression tag	UNP G0GA88
C	434	HIS	-	expression tag	UNP G0GA88
C	435	HIS	-	expression tag	UNP G0GA88

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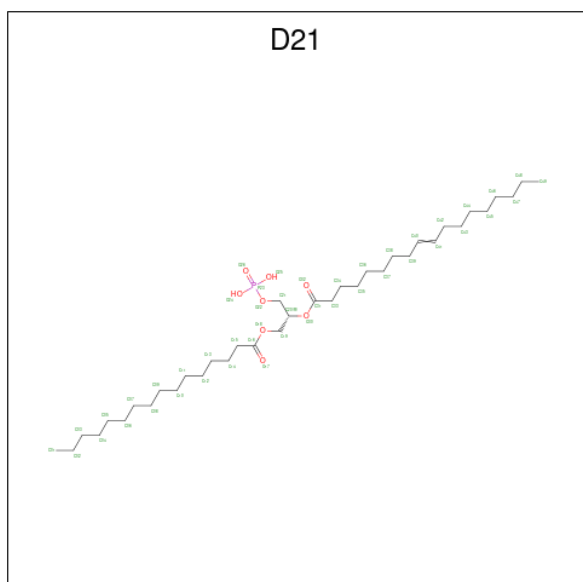
Chain	Residue	Modelled	Actual	Comment	Reference
C	436	HIS	-	expression tag	UNP G0GA88
C	437	HIS	-	expression tag	UNP G0GA88
D	-18	MET	-	initiating methionine	UNP G0GA88
D	-17	ALA	-	expression tag	UNP G0GA88
D	-16	LYS	-	expression tag	UNP G0GA88
D	-15	ASP	-	expression tag	UNP G0GA88
D	-14	ILE	-	expression tag	UNP G0GA88
D	-13	GLY	-	expression tag	UNP G0GA88
D	-12	ILE	-	expression tag	UNP G0GA88
D	-11	ASN	-	expression tag	UNP G0GA88
D	-10	SER	-	expression tag	UNP G0GA88
D	-9	ASP	-	expression tag	UNP G0GA88
D	-8	PRO	-	expression tag	UNP G0GA88
D	-7	ASN	-	expression tag	UNP G0GA88
D	-6	SER	-	expression tag	UNP G0GA88
D	-5	SER	-	expression tag	UNP G0GA88
D	-4	SER	-	expression tag	UNP G0GA88
D	-3	VAL	-	expression tag	UNP G0GA88
D	-2	ASP	-	expression tag	UNP G0GA88
D	-1	LYS	-	expression tag	UNP G0GA88
D	0	LEU	-	expression tag	UNP G0GA88
D	421	LEU	-	expression tag	UNP G0GA88
D	422	GLU	-	expression tag	UNP G0GA88
D	423	SER	-	expression tag	UNP G0GA88
D	424	SER	-	expression tag	UNP G0GA88
D	425	GLY	-	expression tag	UNP G0GA88
D	426	LEU	-	expression tag	UNP G0GA88
D	427	VAL	-	expression tag	UNP G0GA88
D	428	PRO	-	expression tag	UNP G0GA88
D	429	ARG	-	expression tag	UNP G0GA88
D	430	GLY	-	expression tag	UNP G0GA88
D	431	SER	-	expression tag	UNP G0GA88
D	432	VAL	-	expression tag	UNP G0GA88
D	433	LYS	-	expression tag	UNP G0GA88
D	434	HIS	-	expression tag	UNP G0GA88
D	435	HIS	-	expression tag	UNP G0GA88
D	436	HIS	-	expression tag	UNP G0GA88
D	437	HIS	-	expression tag	UNP G0GA88

- Molecule 2 is ADENOSINE-3',5'-CYCLIC-MONOPHOSPHATE (three-letter code: CMP) (formula: C₁₀H₁₂N₅O₆P).



Mol	Chain	Residues	Atoms					AltConf
			Total	C	N	O	P	
2	A	1	Total	C	N	O	P	0
			22	10	5	6	1	
2	B	1	Total	C	N	O	P	0
			22	10	5	6	1	
2	C	1	Total	C	N	O	P	0
			22	10	5	6	1	
2	D	1	Total	C	N	O	P	0
			22	10	5	6	1	

- Molecule 3 is (2R)-1-(hexadecanoyloxy)-3-(phosphonoxy)propan-2-yl (9Z)-octadec-9-enoate (three-letter code: D21) (formula: C₃₇H₇₁O₈P) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms	AltConf
3	A	1	Total C 16 16	0
3	A	1	Total C 15 15	0
3	A	1	Total C 13 13	0
3	A	1	Total C O 30 25 5	0
3	A	1	Total C 15 15	0
3	A	1	Total C O P 32 23 8 1	0
3	A	1	Total C O 24 19 5	0
3	B	1	Total C O P 32 23 8 1	0
3	B	1	Total C O 24 19 5	0
3	B	1	Total C 16 16	0
3	B	1	Total C 15 15	0
3	B	1	Total C 13 13	0
3	B	1	Total C O 30 25 5	0
3	B	1	Total C 15 15	0
3	C	1	Total C O P 32 23 8 1	0
3	C	1	Total C O 24 19 5	0
3	C	1	Total C 16 16	0
3	C	1	Total C 15 15	0
3	C	1	Total C 13 13	0
3	C	1	Total C O 30 25 5	0
3	C	1	Total C 15 15	0
3	D	1	Total C O P 32 23 8 1	0

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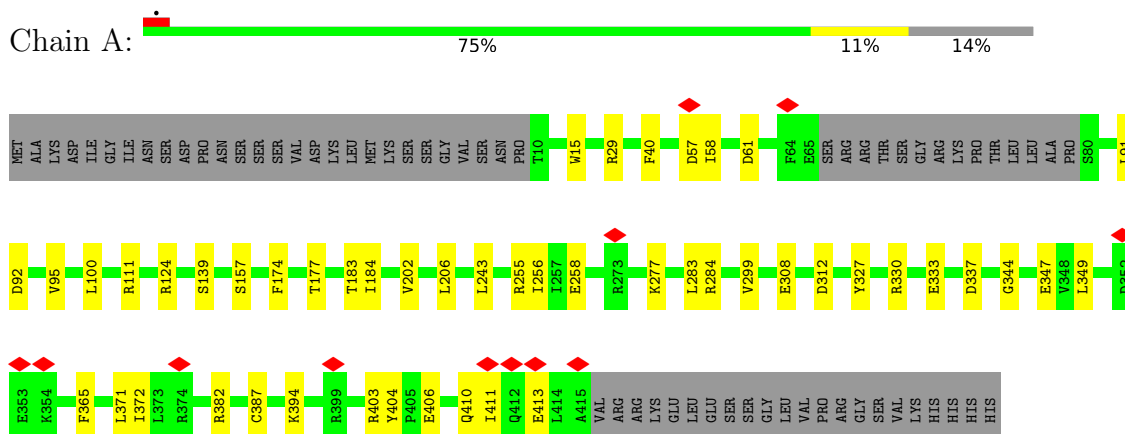
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Mol	Chain	Residues	Atoms			AltConf
			Total	C	O	
3	D	1	24	19	5	0
3	D	1	16	16		0
3	D	1	15	15		0
3	D	1	13	13		0
3	D	1	30	25	5	0
3	D	1	15	15		0

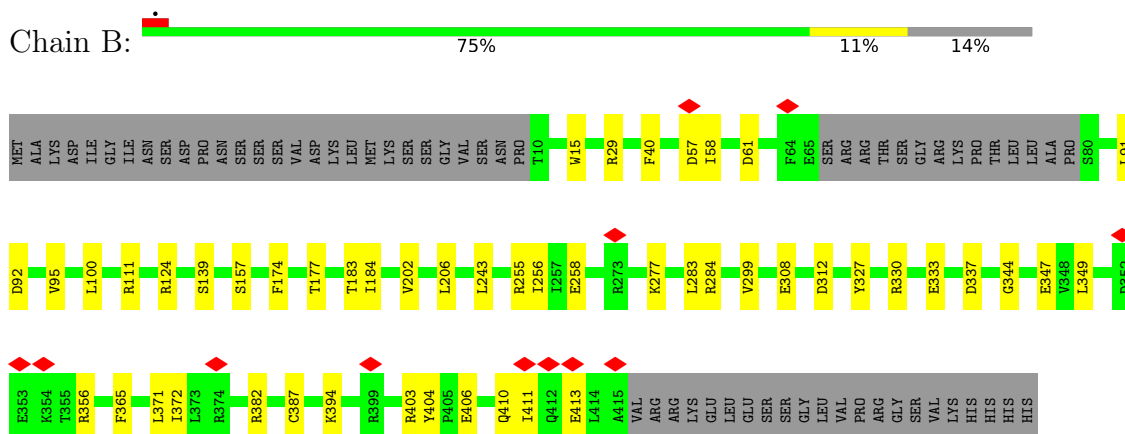
3 Residue-property plots [i](#)

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

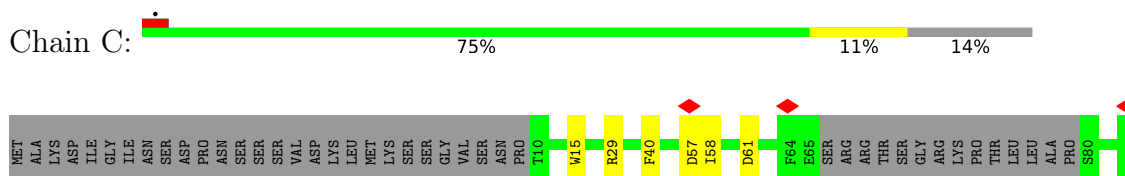
- Molecule 1: Putative transcriptional regulator, Crp/Fnr family

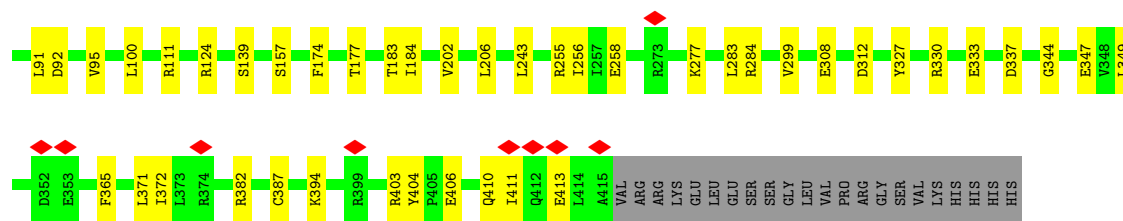


- Molecule 1: Putative transcriptional regulator, Crp/Fnr family



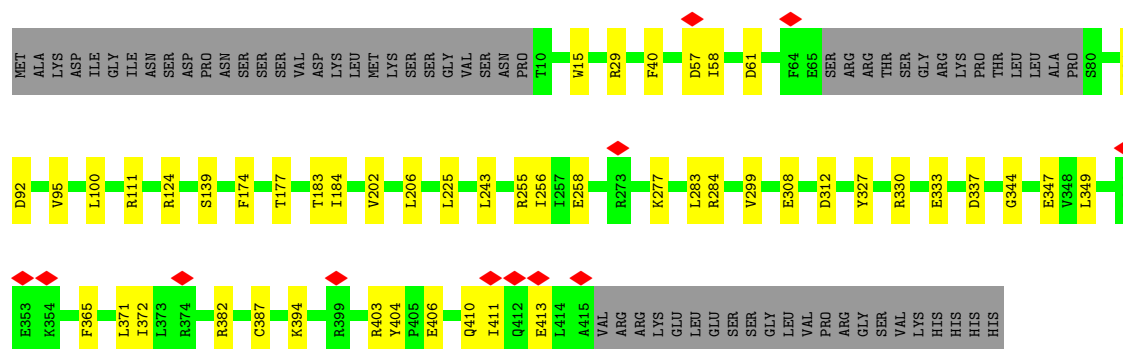
- Molecule 1: Putative transcriptional regulator, Crp/Fnr family





- Molecule 1: Putative transcriptional regulator, Crp/Fnr family

Chain D: 75% 11% 14%



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C4	Depositor
Number of particles used	294383	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	50.812	Depositor
Minimum defocus (nm)	1000	Depositor
Maximum defocus (nm)	2000	Depositor
Magnification	105000	Depositor
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	0.047	Depositor
Minimum map value	-0.016	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.001	Depositor
Recommended contour level	0.00603	Depositor
Map size (\AA)	255.59999, 255.59999, 255.59999	wwPDB
Map dimensions	284, 284, 284	wwPDB
Map angles ($^\circ$)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (\AA)	0.9, 0.9, 0.9	Depositor

5 Model quality [i](#)

5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: CMP, D21

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 5$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
1	A	0.29	0/3192	0.55	0/4349
1	B	0.30	0/3192	0.55	0/4349
1	C	0.29	0/3192	0.55	0/4349
1	D	0.30	0/3192	0.55	0/4349
All	All	0.29	0/12768	0.55	0/17396

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts [i](#)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	3121	0	3247	33	0
1	B	3121	0	3247	34	0
1	C	3121	0	3247	33	0
1	D	3121	0	3247	34	0
2	A	22	0	11	1	0
2	B	22	0	11	1	0
2	C	22	0	11	1	0
2	D	22	0	11	1	0
3	A	145	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	B	145	0	0	0	0
3	C	145	0	0	0	0
3	D	145	0	0	0	0
All	All	13152	0	13032	130	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 5.

All (130) 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:D:603:CMP:H2	2:D:603:CMP:C2	0.97	1.49
2:B:603:CMP:H2	2:B:603:CMP:C2	0.97	1.47
2:C:603:CMP:H2	2:C:603:CMP:C2	0.97	1.47
2:A:501:CMP:C2	2:A:501:CMP:H2	0.97	1.46
1:B:327:TYR:HD2	1:B:330:ARG:NE	1.40	1.20
1:A:327:TYR:HD2	1:A:330:ARG:NE	1.40	1.20
1:C:327:TYR:HD2	1:C:330:ARG:NE	1.40	1.19
1:D:327:TYR:HD2	1:D:330:ARG:NE	1.40	1.19
1:A:327:TYR:CD2	1:A:330:ARG:NE	2.29	1.00
1:C:327:TYR:CD2	1:C:330:ARG:NE	2.29	1.00
1:B:327:TYR:CD2	1:B:330:ARG:NE	2.29	0.99
1:D:327:TYR:CD2	1:D:330:ARG:NE	2.29	0.99
1:A:327:TYR:HD2	1:A:330:ARG:HE	0.92	0.90
1:D:327:TYR:HD2	1:D:330:ARG:HE	0.92	0.88
1:C:327:TYR:HD2	1:C:330:ARG:HE	0.92	0.87
1:B:327:TYR:HD2	1:B:330:ARG:HE	0.92	0.85
1:A:372:ILE:HG22	1:A:411:ILE:HG23	1.66	0.78
1:D:372:ILE:HG22	1:D:411:ILE:HG23	1.66	0.77
1:B:372:ILE:HG22	1:B:411:ILE:HG23	1.66	0.77
1:C:372:ILE:HG22	1:C:411:ILE:HG23	1.66	0.75
1:B:184:ILE:HG12	1:C:183:THR:HA	1.76	0.67
1:A:183:THR:HA	1:D:184:ILE:HG12	1.76	0.66
1:C:92:ASP:OD1	1:C:111:ARG:NH1	2.33	0.61
1:A:92:ASP:OD1	1:A:111:ARG:NH1	2.33	0.61
1:D:92:ASP:OD1	1:D:111:ARG:NH1	2.33	0.61
1:B:92:ASP:OD1	1:B:111:ARG:NH1	2.33	0.60
1:C:327:TYR:HD2	1:C:330:ARG:CD	2.15	0.57
1:D:344:GLY:HA3	1:D:387:CYS:HA	1.87	0.57
1:C:344:GLY:HA3	1:C:387:CYS:HA	1.87	0.57
1:A:349:LEU:HD12	1:A:382:ARG:HG3	1.87	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:184:ILE:HG12	1:D:183:THR:HA	1.87	0.56
1:B:349:LEU:HD12	1:B:382:ARG:HG3	1.87	0.56
1:A:344:GLY:HA3	1:A:387:CYS:HA	1.87	0.56
1:B:344:GLY:HA3	1:B:387:CYS:HA	1.87	0.56
1:D:349:LEU:HD12	1:D:382:ARG:HG3	1.87	0.55
1:D:327:TYR:HD2	1:D:330:ARG:CD	2.15	0.55
1:C:349:LEU:HD12	1:C:382:ARG:HG3	1.87	0.55
1:A:327:TYR:HD2	1:A:330:ARG:CD	2.15	0.55
1:D:15:TRP:NE1	1:D:57:ASP:OD1	2.40	0.54
1:C:15:TRP:NE1	1:C:57:ASP:OD1	2.40	0.54
1:B:327:TYR:HD2	1:B:330:ARG:CD	2.15	0.54
1:B:327:TYR:HE1	1:B:382:ARG:HH11	1.56	0.54
1:A:327:TYR:HE1	1:A:382:ARG:HH11	1.56	0.53
1:A:283:LEU:HD13	1:D:256:ILE:HG12	1.90	0.53
1:A:184:ILE:HG12	1:B:183:THR:HA	1.88	0.53
1:A:15:TRP:NE1	1:A:57:ASP:OD1	2.40	0.53
1:B:15:TRP:NE1	1:B:57:ASP:OD1	2.40	0.53
1:D:327:TYR:HE1	1:D:382:ARG:HH11	1.56	0.53
1:D:243:LEU:HD11	1:D:256:ILE:HD12	1.92	0.52
1:A:256:ILE:HG12	1:B:283:LEU:HD13	1.90	0.52
1:C:243:LEU:HD11	1:C:256:ILE:HD12	1.92	0.52
1:A:243:LEU:HD11	1:A:256:ILE:HD12	1.92	0.52
1:B:243:LEU:HD11	1:B:256:ILE:HD12	1.92	0.52
1:C:327:TYR:HE1	1:C:382:ARG:HH11	1.57	0.52
1:B:347:GLU:HG3	1:B:382:ARG:HB2	1.93	0.51
1:A:347:GLU:HG3	1:A:382:ARG:HB2	1.93	0.50
1:C:256:ILE:HG12	1:D:283:LEU:HD13	1.92	0.50
1:D:202:VAL:O	1:D:206:LEU:HG	2.12	0.50
1:C:347:GLU:HG3	1:C:382:ARG:HB2	1.93	0.50
1:B:256:ILE:HG12	1:C:283:LEU:HD13	1.94	0.49
1:C:202:VAL:O	1:C:206:LEU:HG	2.12	0.49
1:A:202:VAL:O	1:A:206:LEU:HG	2.12	0.49
1:D:347:GLU:HG3	1:D:382:ARG:HB2	1.93	0.49
1:B:202:VAL:O	1:B:206:LEU:HG	2.12	0.48
1:B:174:PHE:HA	1:B:177:THR:HG22	1.95	0.48
1:D:174:PHE:HA	1:D:177:THR:HG22	1.95	0.48
1:A:174:PHE:HA	1:A:177:THR:HG22	1.95	0.48
1:A:58:ILE:HD12	1:A:61:ASP:HB3	1.96	0.47
1:C:174:PHE:HA	1:C:177:THR:HG22	1.95	0.47
1:D:58:ILE:HD12	1:D:61:ASP:HB3	1.96	0.47
1:B:58:ILE:HD12	1:B:61:ASP:HB3	1.96	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:308:GLU:HG3	1:C:404:TYR:HE1	1.80	0.47
1:B:327:TYR:CD2	1:B:330:ARG:HG2	2.50	0.47
1:C:327:TYR:CD2	1:C:330:ARG:HG2	2.50	0.47
1:A:327:TYR:CD2	1:A:330:ARG:HG2	2.50	0.47
1:D:308:GLU:HG3	1:D:404:TYR:HE1	1.80	0.46
1:B:308:GLU:HG3	1:B:404:TYR:HE1	1.80	0.46
1:C:58:ILE:HD12	1:C:61:ASP:HB3	1.96	0.46
1:A:255:ARG:O	1:A:258:GLU:HG2	2.15	0.46
1:C:255:ARG:O	1:C:258:GLU:HG2	2.15	0.46
1:D:327:TYR:CD2	1:D:330:ARG:HG2	2.50	0.46
1:B:255:ARG:O	1:B:258:GLU:HG2	2.15	0.46
1:A:308:GLU:HG3	1:A:404:TYR:HE1	1.80	0.46
1:C:406:GLU:O	1:C:410:GLN:HG3	2.16	0.46
1:D:255:ARG:O	1:D:258:GLU:HG2	2.15	0.46
1:C:410:GLN:O	1:C:413:GLU:HG3	2.17	0.45
1:A:91:LEU:HD12	1:A:91:LEU:HA	1.81	0.45
1:D:277:LYS:HA	1:D:284:ARG:HH21	1.82	0.45
1:A:371:LEU:HA	1:A:394:LYS:HD2	1.99	0.45
1:A:406:GLU:O	1:A:410:GLN:HG3	2.16	0.45
1:B:277:LYS:HA	1:B:284:ARG:HH21	1.82	0.45
1:B:406:GLU:O	1:B:410:GLN:HG3	2.16	0.45
1:D:406:GLU:O	1:D:410:GLN:HG3	2.16	0.45
1:C:371:LEU:HA	1:C:394:LYS:HD2	1.99	0.45
1:B:371:LEU:HA	1:B:394:LYS:HD2	1.99	0.45
1:C:95:VAL:HG12	1:C:100:LEU:HD12	1.99	0.45
1:D:410:GLN:O	1:D:413:GLU:HG3	2.17	0.45
1:A:277:LYS:HA	1:A:284:ARG:HH21	1.82	0.45
1:D:371:LEU:HA	1:D:394:LYS:HD2	1.99	0.45
1:A:330:ARG:O	1:A:333:GLU:HG2	2.18	0.44
1:B:308:GLU:HG3	1:B:404:TYR:CE1	2.53	0.44
1:B:410:GLN:O	1:B:413:GLU:HG3	2.17	0.44
1:D:91:LEU:HD12	1:D:91:LEU:HA	1.81	0.44
1:B:330:ARG:O	1:B:333:GLU:HG2	2.18	0.44
1:A:95:VAL:HG12	1:A:100:LEU:HD12	1.99	0.44
1:A:308:GLU:HG3	1:A:404:TYR:CE1	2.53	0.44
1:A:410:GLN:O	1:A:413:GLU:HG3	2.17	0.43
1:B:91:LEU:HD12	1:B:91:LEU:HA	1.81	0.43
1:D:330:ARG:O	1:D:333:GLU:HG2	2.18	0.43
1:C:277:LYS:HA	1:C:284:ARG:HH21	1.82	0.43
1:C:330:ARG:O	1:C:333:GLU:HG2	2.18	0.43
1:D:95:VAL:HG12	1:D:100:LEU:HD12	1.99	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:308:GLU:HG3	1:C:404:TYR:CE1	2.53	0.43
1:B:95:VAL:HG12	1:B:100:LEU:HD12	1.99	0.43
1:D:308:GLU:HG3	1:D:404:TYR:CE1	2.53	0.43
1:C:91:LEU:HD12	1:C:91:LEU:HA	1.81	0.42
1:C:299:VAL:HG22	1:C:365:PHE:CE2	2.55	0.42
1:D:225:LEU:HD23	1:D:225:LEU:HA	1.82	0.42
1:A:299:VAL:HG22	1:A:365:PHE:CE2	2.55	0.41
1:B:299:VAL:HG22	1:B:365:PHE:CE2	2.55	0.41
1:D:29:ARG:NH2	1:D:40:PHE:HA	2.36	0.41
1:B:403:ARG:HG3	1:B:404:TYR:CD2	2.56	0.41
1:A:403:ARG:HG3	1:A:404:TYR:CD2	2.56	0.41
1:D:299:VAL:HG22	1:D:365:PHE:CE2	2.55	0.41
1:A:29:ARG:NH2	1:A:40:PHE:HA	2.36	0.41
1:B:29:ARG:NH2	1:B:40:PHE:HA	2.36	0.40
1:C:29:ARG:NH2	1:C:40:PHE:HA	2.36	0.40
1:C:403:ARG:HG3	1:C:404:TYR:CD2	2.56	0.40
1:B:349:LEU:HD23	1:B:356:ARG:HA	2.04	0.40
1:D:403:ARG:HG3	1:D:404:TYR:CD2	2.56	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	388/456 (85%)	367 (95%)	21 (5%)	0	100	100
1	B	388/456 (85%)	367 (95%)	21 (5%)	0	100	100
1	C	388/456 (85%)	367 (95%)	21 (5%)	0	100	100
1	D	388/456 (85%)	367 (95%)	21 (5%)	0	100	100
All	All	1552/1824 (85%)	1468 (95%)	84 (5%)	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	336/393 (86%)	331 (98%)	5 (2%)	65	79
1	B	336/393 (86%)	331 (98%)	5 (2%)	65	79
1	C	336/393 (86%)	331 (98%)	5 (2%)	65	79
1	D	336/393 (86%)	332 (99%)	4 (1%)	71	84
All	All	1344/1572 (86%)	1325 (99%)	19 (1%)	68	81

All (19) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	124	ARG
1	A	139	SER
1	A	157	SER
1	A	312	ASP
1	A	337	ASP
1	B	124	ARG
1	B	139	SER
1	B	157	SER
1	B	312	ASP
1	B	337	ASP
1	C	124	ARG
1	C	139	SER
1	C	157	SER
1	C	312	ASP
1	C	337	ASP
1	D	124	ARG
1	D	139	SER
1	D	312	ASP
1	D	337	ASP

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](#)

32 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
2	CMP	A	501	-	22,25,25	1.39	4 (18%)	24,39,39	1.46	4 (16%)
3	D21	A	502	-	15,15,45	0.56	0	14,14,50	0.37	0
3	D21	D	606	-	12,12,45	0.61	0	11,11,50	1.70	2 (18%)
3	D21	D	601	-	31,31,45	1.25	4 (12%)	35,36,50	1.38	3 (8%)
3	D21	C	605	-	14,14,45	0.68	0	13,13,50	1.51	2 (15%)
3	D21	B	601	-	31,31,45	1.26	4 (12%)	35,36,50	1.38	3 (8%)
3	D21	A	506	-	14,14,45	0.71	0	13,13,50	1.55	2 (15%)
3	D21	B	608	-	14,14,45	0.71	0	13,13,50	1.55	2 (15%)
3	D21	A	507	-	31,31,45	1.25	4 (12%)	35,36,50	1.38	3 (8%)
3	D21	A	504	-	12,12,45	0.61	0	11,11,50	1.70	2 (18%)
3	D21	A	503	-	14,14,45	0.68	0	13,13,50	1.51	2 (15%)
3	D21	B	606	-	12,12,45	0.61	0	11,11,50	1.70	2 (18%)
3	D21	C	601	-	31,31,45	1.26	4 (12%)	35,36,50	1.37	3 (8%)
3	D21	B	605	-	14,14,45	0.68	0	13,13,50	1.51	2 (15%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
3	D21	D	605	-	14,14,45	0.67	0	13,13,50	1.51	2 (15%)
3	D21	D	607	-	29,29,45	1.29	4 (13%)	31,31,50	1.31	3 (9%)
3	D21	A	505	-	29,29,45	1.30	4 (13%)	31,31,50	1.31	3 (9%)
3	D21	A	508	-	23,23,45	1.41	4 (17%)	25,25,50	1.68	4 (16%)
3	D21	B	602	-	23,23,45	1.41	4 (17%)	25,25,50	1.68	4 (16%)
3	D21	B	607	-	29,29,45	1.30	4 (13%)	31,31,50	1.30	3 (9%)
3	D21	C	602	-	23,23,45	1.41	4 (17%)	25,25,50	1.68	4 (16%)
2	CMP	D	603	-	22,25,25	1.40	4 (18%)	24,39,39	1.46	4 (16%)
3	D21	C	608	-	14,14,45	0.71	0	13,13,50	1.55	2 (15%)
3	D21	C	606	-	12,12,45	0.61	0	11,11,50	1.70	2 (18%)
3	D21	D	608	-	14,14,45	0.71	0	13,13,50	1.55	2 (15%)
2	CMP	C	603	-	22,25,25	1.39	4 (18%)	24,39,39	1.45	4 (16%)
3	D21	C	607	-	29,29,45	1.29	4 (13%)	31,31,50	1.31	3 (9%)
3	D21	C	604	-	15,15,45	0.56	0	14,14,50	0.37	0
3	D21	D	604	-	15,15,45	0.56	0	14,14,50	0.37	0
2	CMP	B	603	-	22,25,25	1.38	4 (18%)	24,39,39	1.46	4 (16%)
3	D21	D	602	-	23,23,45	1.41	4 (17%)	25,25,50	1.69	4 (16%)
3	D21	B	604	-	15,15,45	0.56	0	14,14,50	0.37	0

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
2	CMP	A	501	-	-	0/0/31/31	0/4/4/4
3	D21	A	502	-	-	6/13/13/47	-
3	D21	D	606	-	-	3/10/10/47	-
3	D21	D	601	-	-	11/32/32/47	-
3	D21	C	605	-	-	7/12/12/47	-
3	D21	B	601	-	-	11/32/32/47	-
3	D21	A	506	-	-	5/12/12/47	-
3	D21	B	608	-	-	5/12/12/47	-
3	D21	A	507	-	-	11/32/32/47	-
3	D21	A	504	-	-	3/10/10/47	-
3	D21	A	503	-	-	7/12/12/47	-
3	D21	B	606	-	-	3/10/10/47	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	D21	C	601	-	-	11/32/32/47	-
3	D21	B	605	-	-	7/12/12/47	-
3	D21	D	605	-	-	7/12/12/47	-
3	D21	D	607	-	-	18/31/31/47	-
3	D21	A	505	-	-	18/31/31/47	-
3	D21	A	508	-	-	11/25/25/47	-
3	D21	B	602	-	-	11/25/25/47	-
3	D21	B	607	-	-	18/31/31/47	-
3	D21	C	602	-	-	11/25/25/47	-
2	CMP	D	603	-	-	0/0/31/31	0/4/4/4
3	D21	C	608	-	-	5/12/12/47	-
3	D21	C	606	-	-	3/10/10/47	-
3	D21	D	608	-	-	5/12/12/47	-
2	CMP	C	603	-	-	0/0/31/31	0/4/4/4
3	D21	C	607	-	-	18/31/31/47	-
3	D21	C	604	-	-	6/13/13/47	-
3	D21	D	604	-	-	6/13/13/47	-
2	CMP	B	603	-	-	0/0/31/31	0/4/4/4
3	D21	D	602	-	-	11/25/25/47	-
3	D21	B	604	-	-	6/13/13/47	-

All (64) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	C	603	CMP	P-O3'	3.20	1.63	1.57
2	A	501	CMP	P-O3'	3.19	1.63	1.57
2	B	603	CMP	P-O3'	3.16	1.63	1.57
2	D	603	CMP	P-O3'	3.16	1.63	1.57
3	D	602	D21	O30-C31	3.15	1.43	1.34
3	C	602	D21	O30-C31	3.13	1.43	1.34
3	B	602	D21	O30-C31	3.13	1.43	1.34
3	B	607	D21	O30-C31	3.11	1.43	1.34
3	C	601	D21	O30-C31	3.11	1.43	1.34
3	A	508	D21	O30-C31	3.10	1.43	1.34
3	D	607	D21	O30-C31	3.09	1.43	1.34
3	A	505	D21	O30-C31	3.08	1.43	1.34
3	B	601	D21	O30-C31	3.08	1.43	1.34
3	D	601	D21	O30-C31	3.08	1.43	1.34

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	507	D21	O30-C31	3.07	1.43	1.34
3	C	607	D21	O30-C31	3.07	1.43	1.34
2	D	603	CMP	P-O5'	2.74	1.60	1.57
2	A	501	CMP	P-O5'	2.67	1.60	1.57
2	C	603	CMP	P-O5'	2.66	1.60	1.57
2	B	603	CMP	P-O5'	2.63	1.60	1.57
3	D	607	D21	O30-C20	-2.61	1.40	1.46
3	B	601	D21	O30-C20	-2.61	1.40	1.46
3	A	507	D21	O30-C20	-2.60	1.40	1.46
3	A	505	D21	O30-C20	-2.60	1.40	1.46
3	C	607	D21	O30-C20	-2.60	1.40	1.46
3	C	601	D21	O30-C20	-2.60	1.40	1.46
3	A	508	D21	O30-C20	-2.59	1.40	1.46
3	B	602	D21	O30-C20	-2.59	1.40	1.46
3	C	602	D21	O30-C20	-2.59	1.40	1.46
3	B	607	D21	O30-C20	-2.59	1.40	1.46
3	D	601	D21	O30-C20	-2.57	1.40	1.46
3	D	602	D21	O30-C20	-2.56	1.40	1.46
3	A	508	D21	O18-C16	2.54	1.40	1.33
3	C	602	D21	O18-C16	2.54	1.40	1.33
2	D	603	CMP	C5-C4	2.53	1.47	1.40
3	B	602	D21	O18-C16	2.52	1.40	1.33
3	D	602	D21	O18-C16	2.51	1.40	1.33
2	C	603	CMP	C5-C4	2.51	1.47	1.40
2	A	501	CMP	C5-C4	2.51	1.47	1.40
3	D	607	D21	O18-C16	2.48	1.40	1.33
3	A	505	D21	O18-C16	2.48	1.40	1.33
2	B	603	CMP	C5-C4	2.48	1.47	1.40
3	C	607	D21	O18-C16	2.48	1.40	1.33
3	B	607	D21	O18-C16	2.45	1.40	1.33
3	C	601	D21	C33-C31	2.33	1.57	1.50
3	D	601	D21	C33-C31	2.32	1.57	1.50
3	B	602	D21	C33-C31	2.32	1.57	1.50
3	A	505	D21	C33-C31	2.32	1.57	1.50
3	B	607	D21	C33-C31	2.32	1.57	1.50
3	C	607	D21	C33-C31	2.32	1.57	1.50
3	B	601	D21	C33-C31	2.32	1.57	1.50
2	C	603	CMP	O5'-C5'	-2.31	1.42	1.46
3	C	601	D21	P23-O22	2.31	1.67	1.60
3	D	607	D21	C33-C31	2.31	1.57	1.50
3	A	507	D21	C33-C31	2.31	1.57	1.50
3	C	602	D21	C33-C31	2.31	1.57	1.50

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	D	602	D21	C33-C31	2.31	1.57	1.50
3	A	508	D21	C33-C31	2.30	1.57	1.50
2	A	501	CMP	O5'-C5'	-2.30	1.42	1.46
3	B	601	D21	P23-O22	2.30	1.67	1.60
3	A	507	D21	P23-O22	2.29	1.67	1.60
2	B	603	CMP	O5'-C5'	-2.28	1.42	1.46
2	D	603	CMP	O5'-C5'	-2.28	1.42	1.46
3	D	601	D21	P23-O22	2.27	1.67	1.60

All (80) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	A	508	D21	O30-C31-C33	4.14	120.41	111.50
3	C	602	D21	O30-C31-C33	4.13	120.41	111.50
3	D	602	D21	O30-C31-C33	4.13	120.40	111.50
3	B	602	D21	O30-C31-C33	4.13	120.40	111.50
3	D	607	D21	O30-C31-C33	4.03	120.20	111.50
3	B	601	D21	O30-C31-C33	4.03	120.18	111.50
3	A	507	D21	O30-C31-C33	4.03	120.18	111.50
3	C	601	D21	O30-C31-C33	4.02	120.17	111.50
3	D	607	D21	C39-C40-C41	4.02	154.19	126.84
3	C	607	D21	C39-C40-C41	4.02	154.19	126.84
3	C	607	D21	O30-C31-C33	4.02	120.16	111.50
3	A	505	D21	C39-C40-C41	4.02	154.16	126.84
3	A	505	D21	O30-C31-C33	4.01	120.15	111.50
3	D	601	D21	O30-C31-C33	4.01	120.15	111.50
3	B	607	D21	C39-C40-C41	4.01	154.12	126.84
3	B	607	D21	O30-C31-C33	4.00	120.12	111.50
3	A	508	D21	C42-C41-C40	3.93	154.86	124.73
3	C	602	D21	C42-C41-C40	3.92	154.83	124.73
3	B	602	D21	C42-C41-C40	3.92	154.83	124.73
3	D	602	D21	C42-C41-C40	3.92	154.80	124.73
3	C	606	D21	C39-C40-C41	3.90	154.66	124.73
3	D	606	D21	C39-C40-C41	3.90	154.66	124.73
3	D	608	D21	C39-C40-C41	3.90	154.66	124.73
3	B	606	D21	C39-C40-C41	3.90	154.66	124.73
3	A	504	D21	C39-C40-C41	3.90	154.66	124.73
3	C	608	D21	C39-C40-C41	3.90	154.63	124.73
3	A	506	D21	C39-C40-C41	3.90	154.62	124.73
3	B	608	D21	C39-C40-C41	3.89	154.60	124.73
3	D	606	D21	C42-C41-C40	3.88	154.54	124.73
3	B	606	D21	C42-C41-C40	3.88	154.53	124.73

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	A	504	D21	C42-C41-C40	3.88	154.53	124.73
3	C	606	D21	C42-C41-C40	3.88	154.50	124.73
3	C	601	D21	C39-C40-C41	3.88	154.49	124.73
3	A	507	D21	C39-C40-C41	3.88	154.47	124.73
3	B	601	D21	C39-C40-C41	3.87	154.45	124.73
3	D	601	D21	C39-C40-C41	3.87	154.43	124.73
3	A	507	D21	C42-C41-C40	3.87	154.41	124.73
3	D	601	D21	C42-C41-C40	3.87	154.41	124.73
3	B	601	D21	C42-C41-C40	3.87	154.40	124.73
3	C	601	D21	C42-C41-C40	3.86	154.35	124.73
3	D	608	D21	C42-C41-C40	3.82	154.03	124.73
3	A	506	D21	C42-C41-C40	3.82	154.02	124.73
3	A	508	D21	C39-C40-C41	3.82	154.02	124.73
3	B	608	D21	C42-C41-C40	3.82	154.00	124.73
3	C	608	D21	C42-C41-C40	3.82	154.00	124.73
3	D	602	D21	C39-C40-C41	3.81	153.98	124.73
3	C	602	D21	C39-C40-C41	3.81	153.97	124.73
3	B	602	D21	C39-C40-C41	3.81	153.97	124.73
3	C	605	D21	C42-C41-C40	3.76	153.58	124.73
3	B	605	D21	C42-C41-C40	3.76	153.56	124.73
3	A	503	D21	C42-C41-C40	3.76	153.54	124.73
3	D	605	D21	C42-C41-C40	3.75	153.53	124.73
3	D	605	D21	C39-C40-C41	3.74	153.41	124.73
3	C	605	D21	C39-C40-C41	3.74	153.39	124.73
3	A	503	D21	C39-C40-C41	3.74	153.39	124.73
3	B	605	D21	C39-C40-C41	3.73	153.38	124.73
2	D	603	CMP	O2P-P-O1P	3.51	119.73	108.73
2	A	501	CMP	O2P-P-O1P	3.51	119.72	108.73
2	C	603	CMP	O2P-P-O1P	3.50	119.69	108.73
2	B	603	CMP	O2P-P-O1P	3.50	119.68	108.73
3	D	602	D21	O18-C16-C15	3.31	120.05	111.38
3	C	602	D21	O18-C16-C15	3.30	120.02	111.38
3	B	602	D21	O18-C16-C15	3.29	120.02	111.38
3	A	508	D21	O18-C16-C15	3.28	119.99	111.38
2	B	603	CMP	N3-C2-N1	-3.19	123.69	128.68
2	D	603	CMP	N3-C2-N1	-3.19	123.69	128.68
2	A	501	CMP	N3-C2-N1	-3.17	123.72	128.68
2	C	603	CMP	N3-C2-N1	-3.16	123.75	128.68
2	A	501	CMP	C4-C5-N7	-2.61	106.68	109.40
2	D	603	CMP	C4-C5-N7	-2.61	106.68	109.40
2	C	603	CMP	C4-C5-N7	-2.57	106.72	109.40
2	B	603	CMP	C4-C5-N7	-2.56	106.73	109.40

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	B	607	D21	O18-C16-C15	2.54	119.89	111.91
3	D	607	D21	O18-C16-C15	2.54	119.89	111.91
3	A	505	D21	O18-C16-C15	2.54	119.88	111.91
3	C	607	D21	O18-C16-C15	2.54	119.87	111.91
2	D	603	CMP	O5'-P-O3'	-2.11	102.77	105.68
2	A	501	CMP	O5'-P-O3'	-2.09	102.80	105.68
2	C	603	CMP	O5'-P-O3'	-2.07	102.83	105.68
2	B	603	CMP	O5'-P-O3'	-2.06	102.84	105.68

There are no chirality outliers.

All (244) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	A	505	D21	C19-C20-C21-O22
3	A	505	D21	O30-C20-C21-O22
3	A	507	D21	C21-O22-P23-O24
3	A	507	D21	C21-O22-P23-O26
3	A	508	D21	O32-C31-O30-C20
3	B	601	D21	C21-O22-P23-O24
3	B	601	D21	C21-O22-P23-O26
3	B	602	D21	O32-C31-O30-C20
3	B	607	D21	C19-C20-C21-O22
3	B	607	D21	O30-C20-C21-O22
3	C	601	D21	C21-O22-P23-O24
3	C	601	D21	C21-O22-P23-O26
3	C	602	D21	O32-C31-O30-C20
3	C	607	D21	C19-C20-C21-O22
3	C	607	D21	O30-C20-C21-O22
3	D	601	D21	C21-O22-P23-O24
3	D	601	D21	C21-O22-P23-O26
3	D	602	D21	O32-C31-O30-C20
3	D	607	D21	C19-C20-C21-O22
3	D	607	D21	O30-C20-C21-O22
3	A	507	D21	C15-C16-O18-C19
3	B	601	D21	C15-C16-O18-C19
3	C	601	D21	C15-C16-O18-C19
3	D	601	D21	C15-C16-O18-C19
3	A	507	D21	O17-C16-O18-C19
3	B	601	D21	O17-C16-O18-C19
3	C	601	D21	O17-C16-O18-C19
3	D	601	D21	O17-C16-O18-C19
3	A	505	D21	O17-C16-O18-C19

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Mol	Chain	Res	Type	Atoms
3	B	607	D21	O17-C16-O18-C19
3	C	607	D21	O17-C16-O18-C19
3	D	607	D21	O17-C16-O18-C19
3	A	508	D21	C15-C16-O18-C19
3	B	602	D21	C15-C16-O18-C19
3	C	602	D21	C15-C16-O18-C19
3	D	602	D21	C15-C16-O18-C19
3	A	508	D21	C33-C31-O30-C20
3	B	602	D21	C33-C31-O30-C20
3	C	602	D21	C33-C31-O30-C20
3	D	602	D21	C33-C31-O30-C20
3	A	505	D21	C15-C16-O18-C19
3	B	607	D21	C15-C16-O18-C19
3	C	607	D21	C15-C16-O18-C19
3	D	607	D21	C15-C16-O18-C19
3	A	508	D21	O17-C16-O18-C19
3	B	602	D21	O17-C16-O18-C19
3	C	602	D21	O17-C16-O18-C19
3	D	602	D21	O17-C16-O18-C19
3	A	505	D21	C34-C35-C36-C37
3	B	607	D21	C34-C35-C36-C37
3	C	607	D21	C34-C35-C36-C37
3	D	607	D21	C34-C35-C36-C37
3	A	506	D21	C42-C43-C44-C45
3	B	608	D21	C42-C43-C44-C45
3	C	608	D21	C42-C43-C44-C45
3	D	608	D21	C42-C43-C44-C45
3	A	508	D21	C31-C33-C34-C35
3	B	602	D21	C31-C33-C34-C35
3	C	602	D21	C31-C33-C34-C35
3	D	602	D21	C31-C33-C34-C35
3	A	505	D21	C31-C33-C34-C35
3	B	607	D21	C31-C33-C34-C35
3	C	607	D21	C31-C33-C34-C35
3	D	607	D21	C31-C33-C34-C35
3	A	502	D21	C06-C07-C08-C09
3	C	604	D21	C06-C07-C08-C09
3	A	508	D21	C35-C36-C37-C38
3	B	602	D21	C35-C36-C37-C38
3	B	604	D21	C06-C07-C08-C09
3	C	602	D21	C35-C36-C37-C38
3	D	602	D21	C35-C36-C37-C38

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Mol	Chain	Res	Type	Atoms
3	D	604	D21	C06-C07-C08-C09
3	A	506	D21	C35-C36-C37-C38
3	B	608	D21	C35-C36-C37-C38
3	C	602	D21	C33-C34-C35-C36
3	C	608	D21	C35-C36-C37-C38
3	D	608	D21	C35-C36-C37-C38
3	A	508	D21	C33-C34-C35-C36
3	B	602	D21	C33-C34-C35-C36
3	D	602	D21	C33-C34-C35-C36
3	A	505	D21	C36-C37-C38-C39
3	A	506	D21	C36-C37-C38-C39
3	B	607	D21	C36-C37-C38-C39
3	B	608	D21	C36-C37-C38-C39
3	C	607	D21	C36-C37-C38-C39
3	C	608	D21	C36-C37-C38-C39
3	D	607	D21	C36-C37-C38-C39
3	D	608	D21	C36-C37-C38-C39
3	A	502	D21	C05-C06-C07-C08
3	B	604	D21	C05-C06-C07-C08
3	C	604	D21	C05-C06-C07-C08
3	D	604	D21	C05-C06-C07-C08
3	A	502	D21	C07-C08-C09-C10
3	A	503	D21	C42-C43-C44-C45
3	B	604	D21	C07-C08-C09-C10
3	B	605	D21	C42-C43-C44-C45
3	C	604	D21	C07-C08-C09-C10
3	C	605	D21	C42-C43-C44-C45
3	D	604	D21	C07-C08-C09-C10
3	D	605	D21	C42-C43-C44-C45
3	A	502	D21	C08-C09-C10-C11
3	B	604	D21	C08-C09-C10-C11
3	C	604	D21	C08-C09-C10-C11
3	D	604	D21	C08-C09-C10-C11
3	A	505	D21	C09-C10-C11-C12
3	B	607	D21	C09-C10-C11-C12
3	C	607	D21	C09-C10-C11-C12
3	D	607	D21	C09-C10-C11-C12
3	A	502	D21	C09-C10-C11-C12
3	B	604	D21	C09-C10-C11-C12
3	C	604	D21	C09-C10-C11-C12
3	D	604	D21	C09-C10-C11-C12
3	A	508	D21	C36-C37-C38-C39

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Mol	Chain	Res	Type	Atoms
3	B	602	D21	C36-C37-C38-C39
3	C	602	D21	C36-C37-C38-C39
3	D	602	D21	C36-C37-C38-C39
3	A	505	D21	C08-C09-C10-C11
3	B	607	D21	C08-C09-C10-C11
3	C	607	D21	C08-C09-C10-C11
3	D	607	D21	C08-C09-C10-C11
3	A	505	D21	C33-C31-O30-C20
3	B	607	D21	C33-C31-O30-C20
3	C	607	D21	C33-C31-O30-C20
3	D	607	D21	C33-C31-O30-C20
3	A	507	D21	C46-C47-C48-C49
3	B	601	D21	C46-C47-C48-C49
3	C	601	D21	C46-C47-C48-C49
3	D	601	D21	C46-C47-C48-C49
3	A	507	D21	O18-C19-C20-C21
3	B	601	D21	O18-C19-C20-C21
3	C	601	D21	O18-C19-C20-C21
3	C	602	D21	O18-C19-C20-C21
3	D	601	D21	O18-C19-C20-C21
3	A	503	D21	C31-C33-C34-C35
3	B	605	D21	C31-C33-C34-C35
3	C	605	D21	C31-C33-C34-C35
3	D	605	D21	C31-C33-C34-C35
3	A	508	D21	O18-C19-C20-O30
3	B	602	D21	O18-C19-C20-O30
3	C	602	D21	O18-C19-C20-O30
3	D	602	D21	O18-C19-C20-O30
3	A	505	D21	C35-C36-C37-C38
3	C	605	D21	C43-C44-C45-C46
3	D	605	D21	C43-C44-C45-C46
3	D	607	D21	C35-C36-C37-C38
3	A	503	D21	C43-C44-C45-C46
3	B	605	D21	C43-C44-C45-C46
3	B	607	D21	C35-C36-C37-C38
3	C	607	D21	C35-C36-C37-C38
3	A	504	D21	C37-C38-C39-C40
3	B	606	D21	C37-C38-C39-C40
3	C	606	D21	C37-C38-C39-C40
3	D	606	D21	C37-C38-C39-C40
3	A	505	D21	O32-C31-O30-C20
3	B	607	D21	O32-C31-O30-C20

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Mol	Chain	Res	Type	Atoms
3	C	607	D21	O32-C31-O30-C20
3	D	607	D21	O32-C31-O30-C20
3	A	508	D21	O18-C19-C20-C21
3	B	602	D21	O18-C19-C20-C21
3	D	602	D21	O18-C19-C20-C21
3	A	507	D21	C43-C44-C45-C46
3	B	601	D21	C43-C44-C45-C46
3	C	601	D21	C43-C44-C45-C46
3	D	601	D21	C43-C44-C45-C46
3	B	607	D21	C05-C06-C07-C08
3	D	607	D21	C05-C06-C07-C08
3	A	505	D21	C05-C06-C07-C08
3	C	607	D21	C05-C06-C07-C08
3	A	503	D21	C37-C38-C39-C40
3	B	605	D21	C37-C38-C39-C40
3	C	605	D21	C37-C38-C39-C40
3	D	605	D21	C37-C38-C39-C40
3	A	507	D21	O18-C19-C20-O30
3	B	601	D21	O18-C19-C20-O30
3	C	601	D21	O18-C19-C20-O30
3	D	601	D21	O18-C19-C20-O30
3	A	505	D21	C10-C11-C12-C13
3	B	607	D21	C10-C11-C12-C13
3	C	607	D21	C10-C11-C12-C13
3	D	607	D21	C10-C11-C12-C13
3	A	505	D21	C07-C08-C09-C10
3	D	607	D21	C07-C08-C09-C10
3	B	607	D21	C07-C08-C09-C10
3	C	607	D21	C07-C08-C09-C10
3	A	506	D21	C37-C38-C39-C40
3	D	608	D21	C37-C38-C39-C40
3	B	608	D21	C37-C38-C39-C40
3	C	608	D21	C37-C38-C39-C40
3	A	503	D21	C36-C37-C38-C39
3	C	605	D21	C36-C37-C38-C39
3	D	605	D21	C36-C37-C38-C39
3	B	605	D21	C36-C37-C38-C39
3	D	601	D21	C36-C37-C38-C39
3	A	507	D21	C36-C37-C38-C39
3	B	601	D21	C36-C37-C38-C39
3	C	601	D21	C36-C37-C38-C39
3	A	504	D21	C31-C33-C34-C35

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Mol	Chain	Res	Type	Atoms
3	B	606	D21	C31-C33-C34-C35
3	C	606	D21	C31-C33-C34-C35
3	D	606	D21	C31-C33-C34-C35
3	B	607	D21	C33-C34-C35-C36
3	C	607	D21	C33-C34-C35-C36
3	A	505	D21	C33-C34-C35-C36
3	D	607	D21	C33-C34-C35-C36
3	C	604	D21	C11-C12-C13-C14
3	D	604	D21	C11-C12-C13-C14
3	D	606	D21	C35-C36-C37-C38
3	A	502	D21	C11-C12-C13-C14
3	A	504	D21	C35-C36-C37-C38
3	B	604	D21	C11-C12-C13-C14
3	B	606	D21	C35-C36-C37-C38
3	C	606	D21	C35-C36-C37-C38
3	A	507	D21	C38-C39-C40-C41
3	B	601	D21	C38-C39-C40-C41
3	C	601	D21	C38-C39-C40-C41
3	D	601	D21	C38-C39-C40-C41
3	A	507	D21	C21-O22-P23-O25
3	B	601	D21	C21-O22-P23-O25
3	C	601	D21	C21-O22-P23-O25
3	D	601	D21	C21-O22-P23-O25
3	A	505	D21	O30-C31-C33-C34
3	B	607	D21	O30-C31-C33-C34
3	C	607	D21	O30-C31-C33-C34
3	D	607	D21	O30-C31-C33-C34
3	B	608	D21	C38-C39-C40-C41
3	C	608	D21	C38-C39-C40-C41
3	A	506	D21	C38-C39-C40-C41
3	D	608	D21	C38-C39-C40-C41
3	C	602	D21	C40-C41-C42-C43
3	B	605	D21	C34-C35-C36-C37
3	C	605	D21	C34-C35-C36-C37
3	A	508	D21	C40-C41-C42-C43
3	B	602	D21	C40-C41-C42-C43
3	D	602	D21	C40-C41-C42-C43
3	A	503	D21	C34-C35-C36-C37
3	D	605	D21	C34-C35-C36-C37
3	A	505	D21	O32-C31-C33-C34
3	B	607	D21	O32-C31-C33-C34
3	C	607	D21	O32-C31-C33-C34

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Continued from previous page...

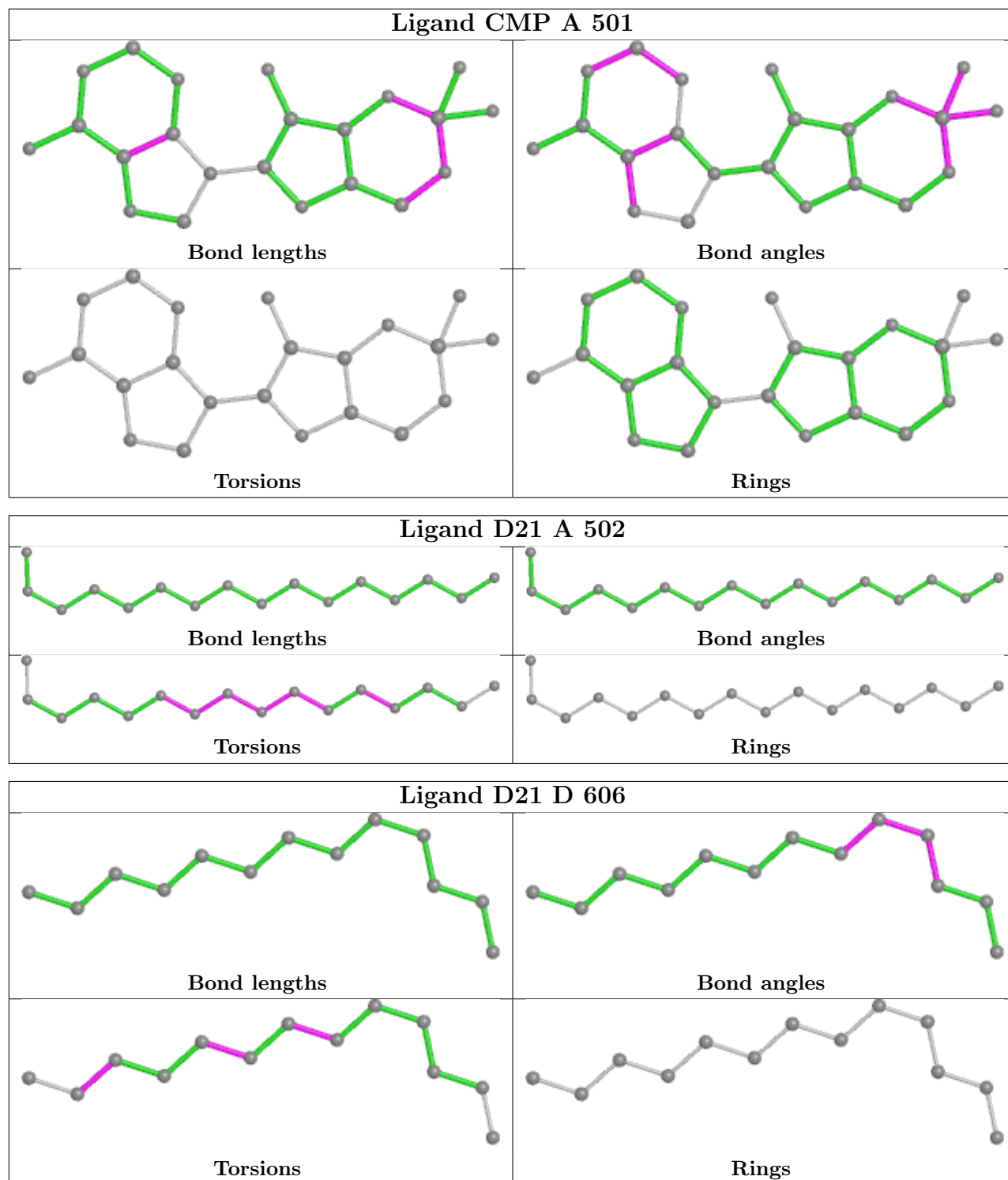
Mol	Chain	Res	Type	Atoms
3	D	607	D21	O32-C31-C33-C34
3	A	503	D21	C33-C34-C35-C36
3	C	605	D21	C33-C34-C35-C36
3	D	605	D21	C33-C34-C35-C36
3	B	605	D21	C33-C34-C35-C36

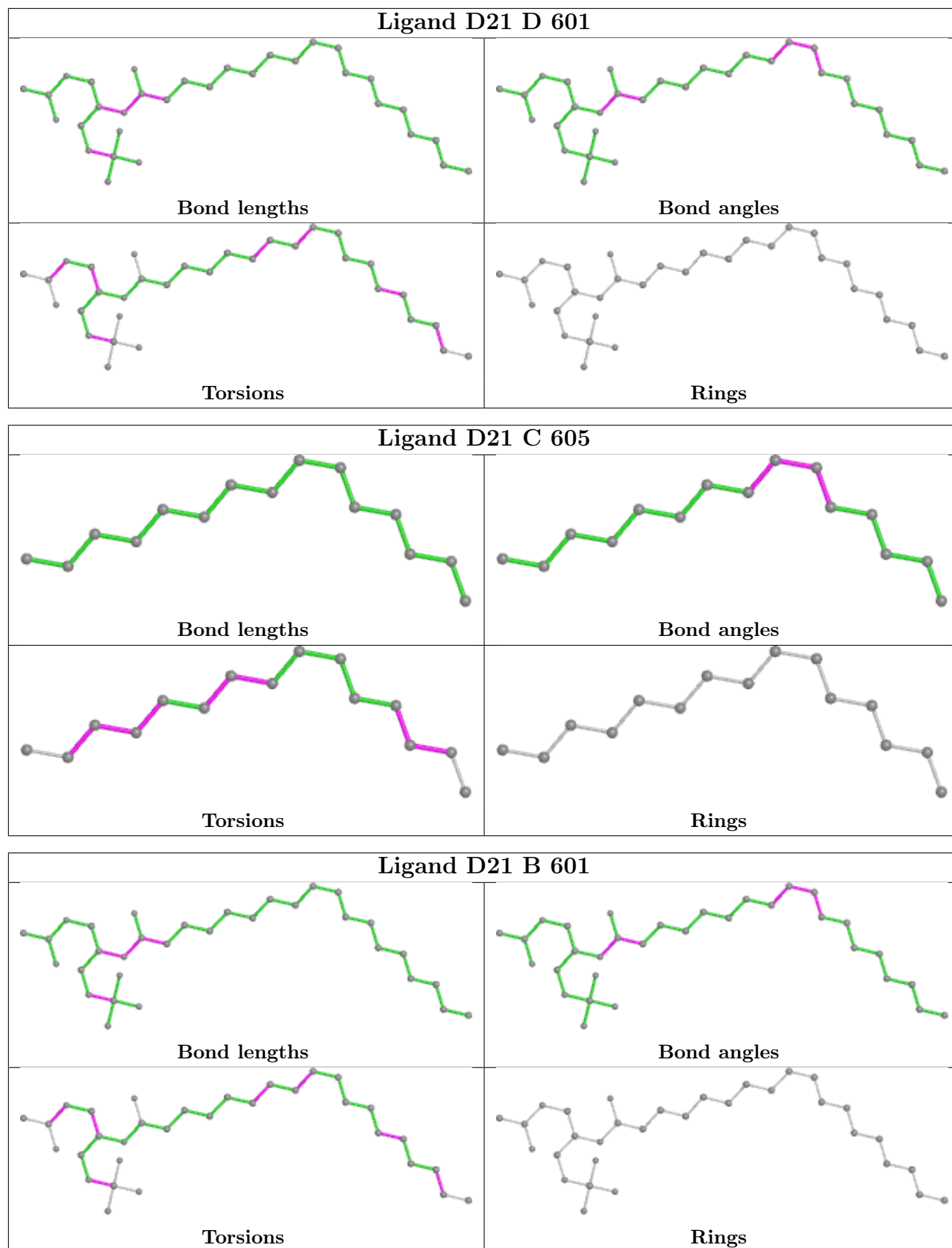
There are no ring outliers.

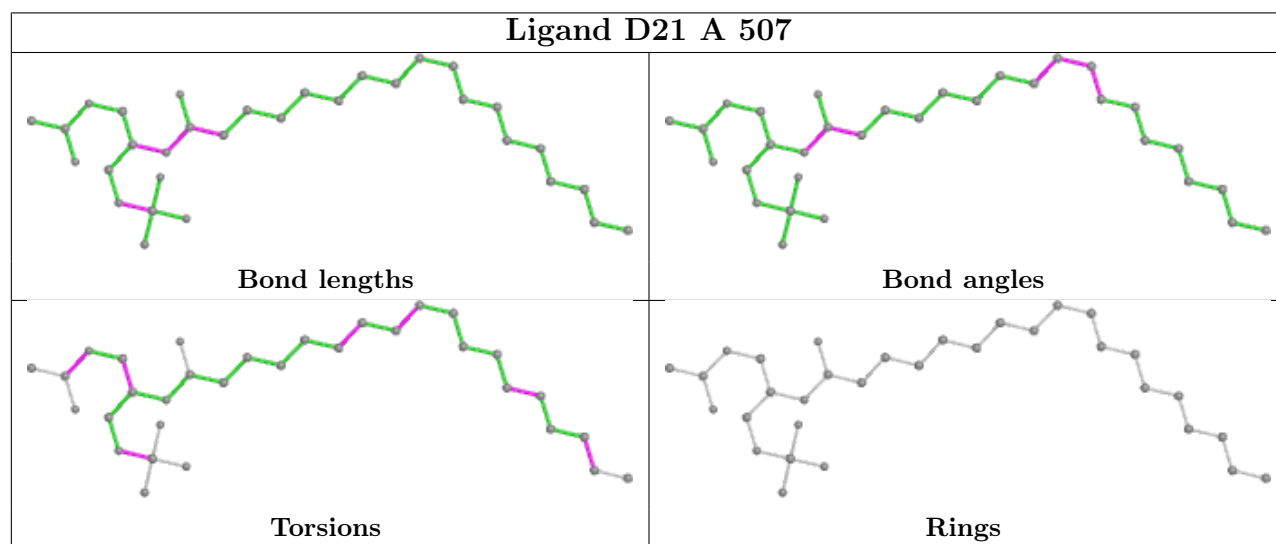
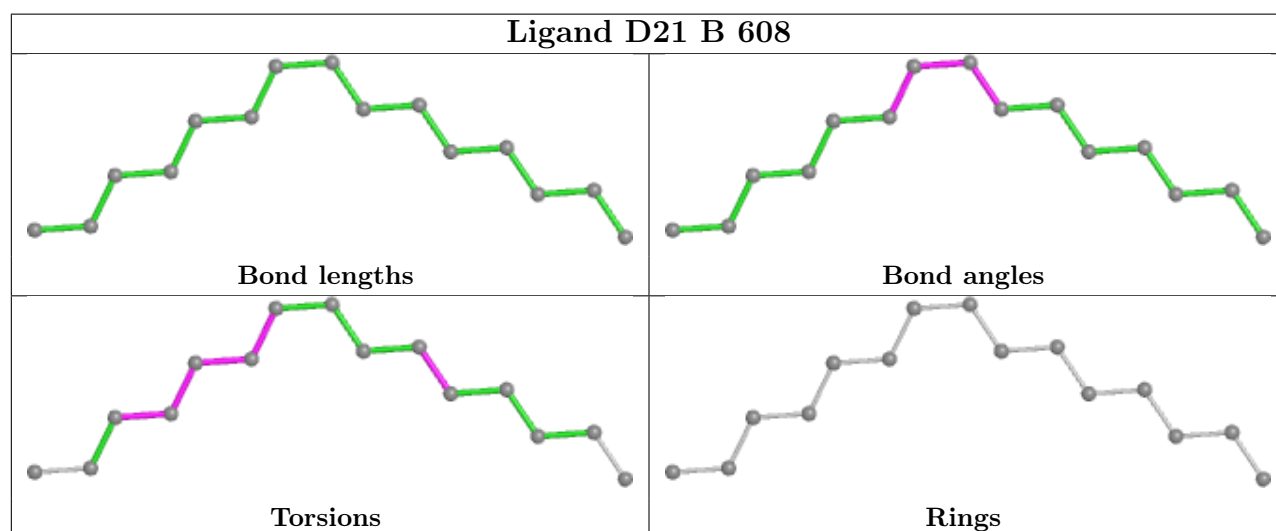
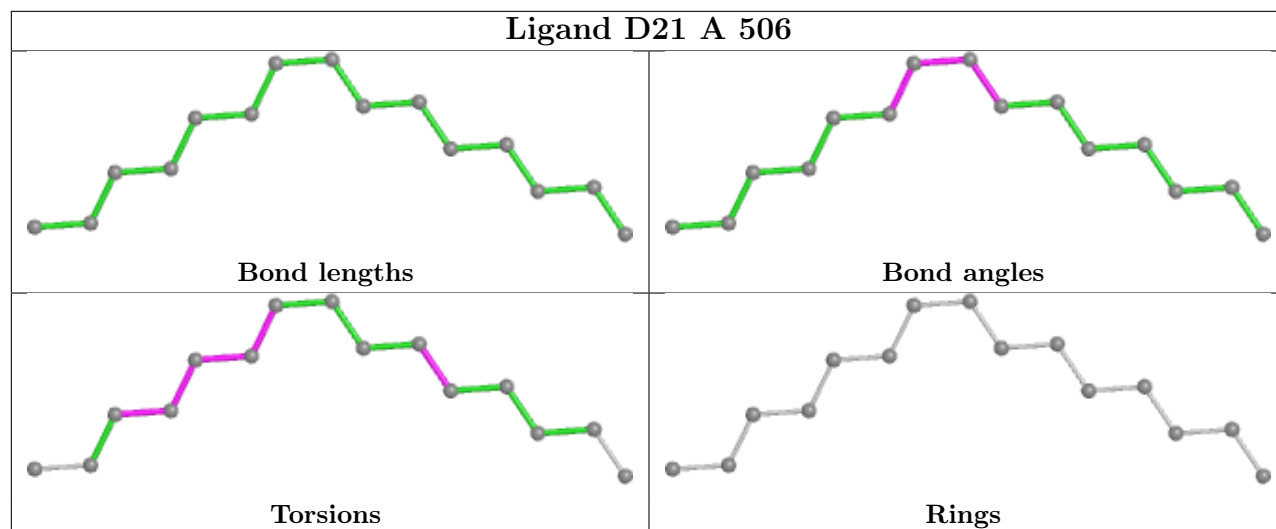
4 monomers are involved in 4 short contacts:

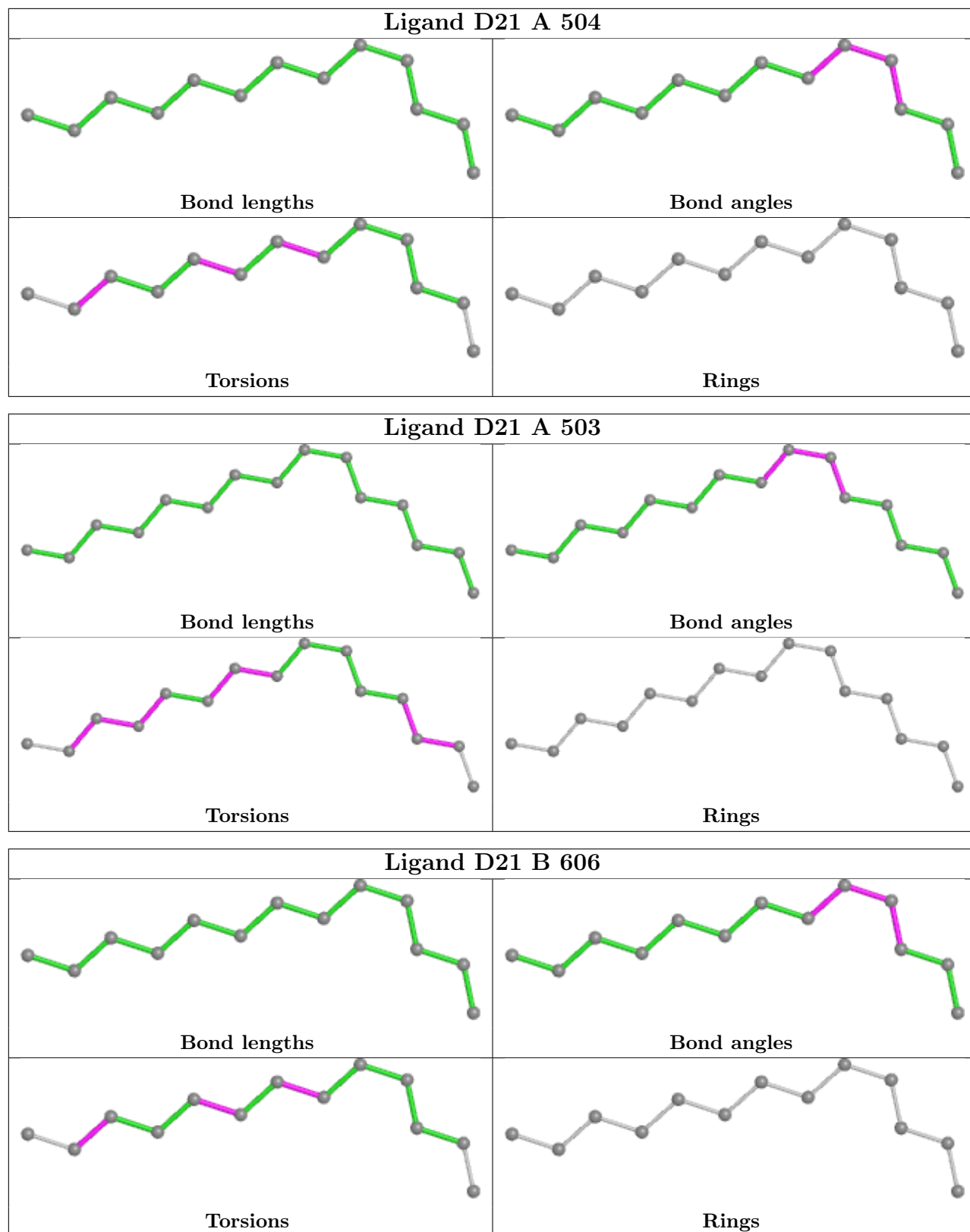
Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	501	CMP	1	0
2	D	603	CMP	1	0
2	C	603	CMP	1	0
2	B	603	CMP	1	0

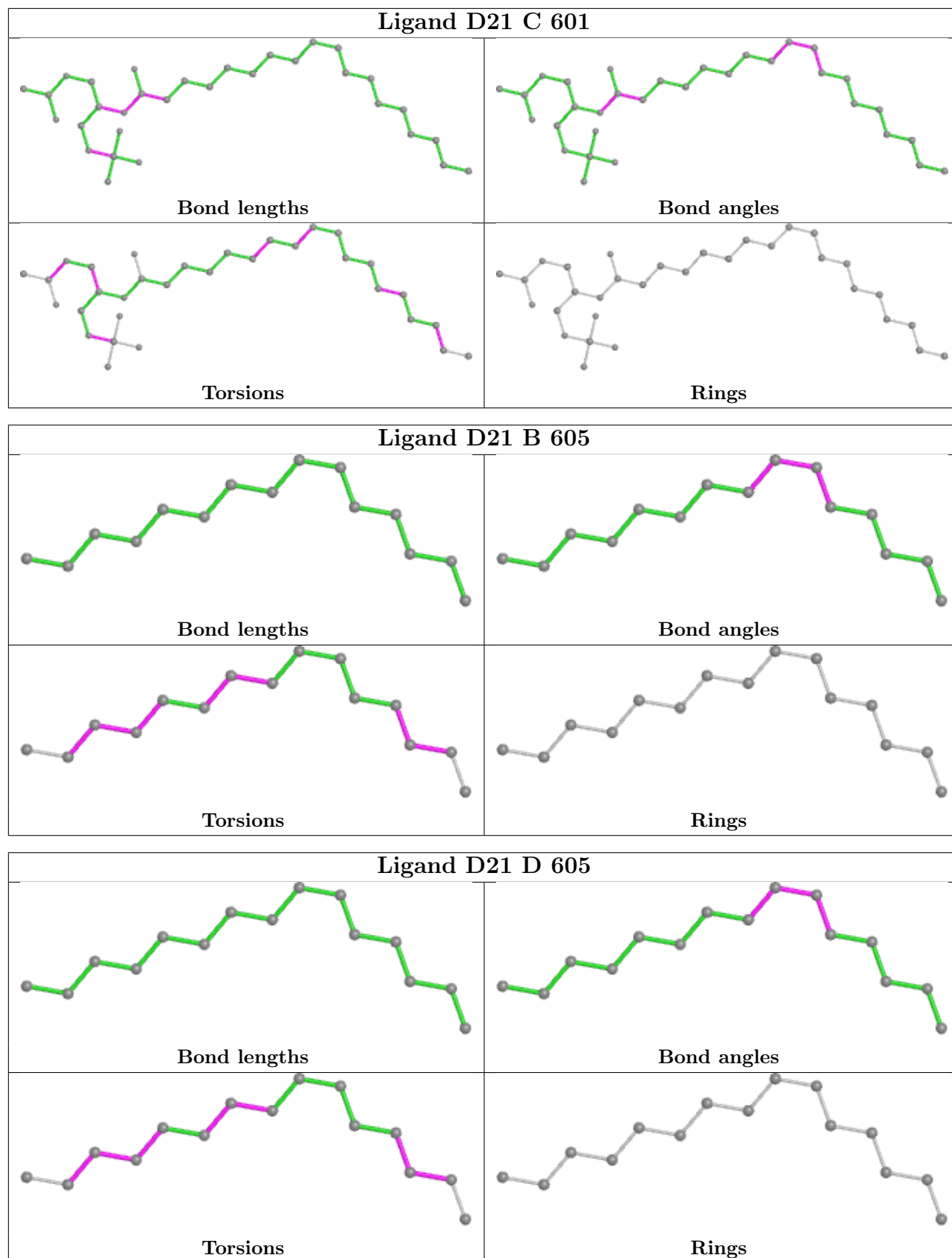
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.

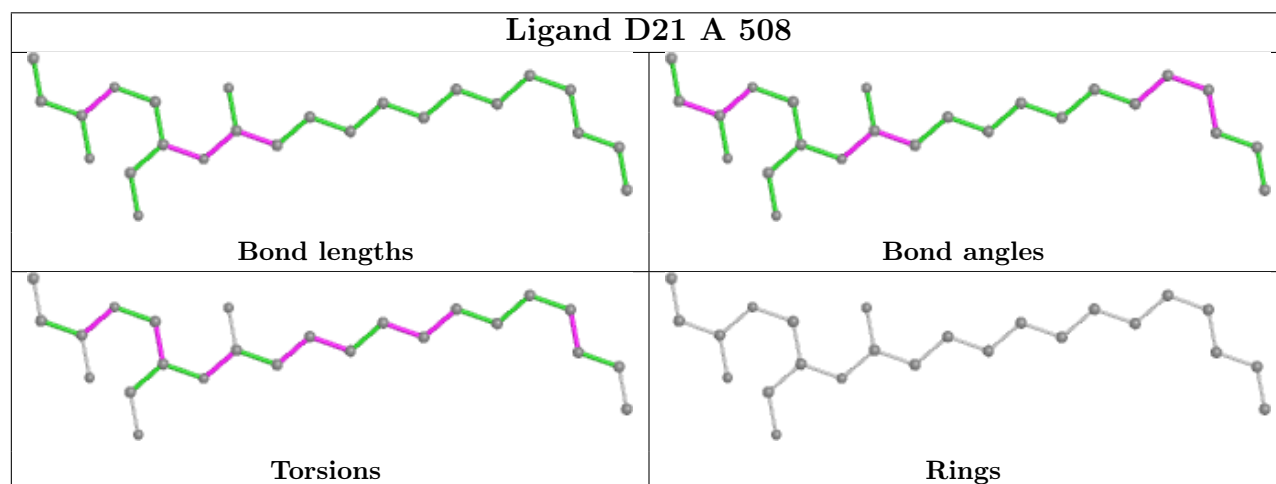
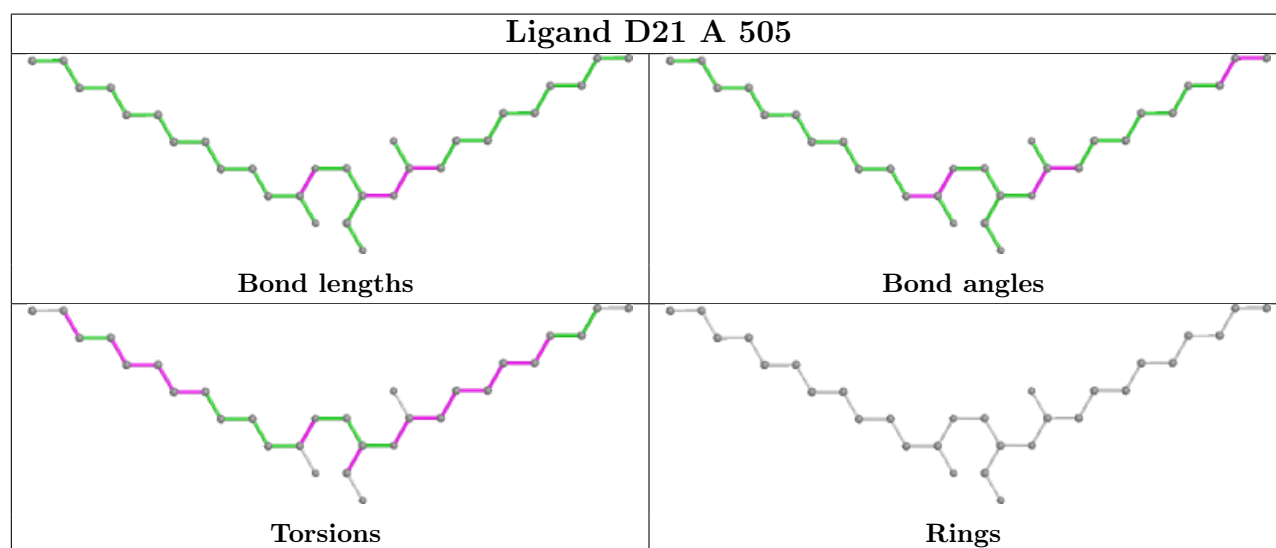
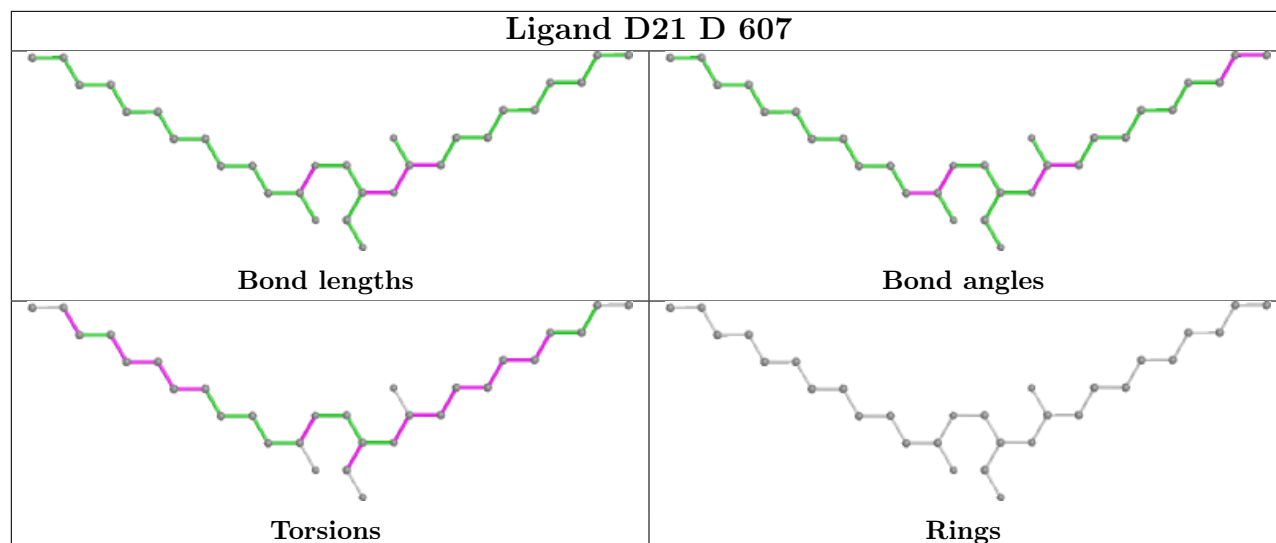


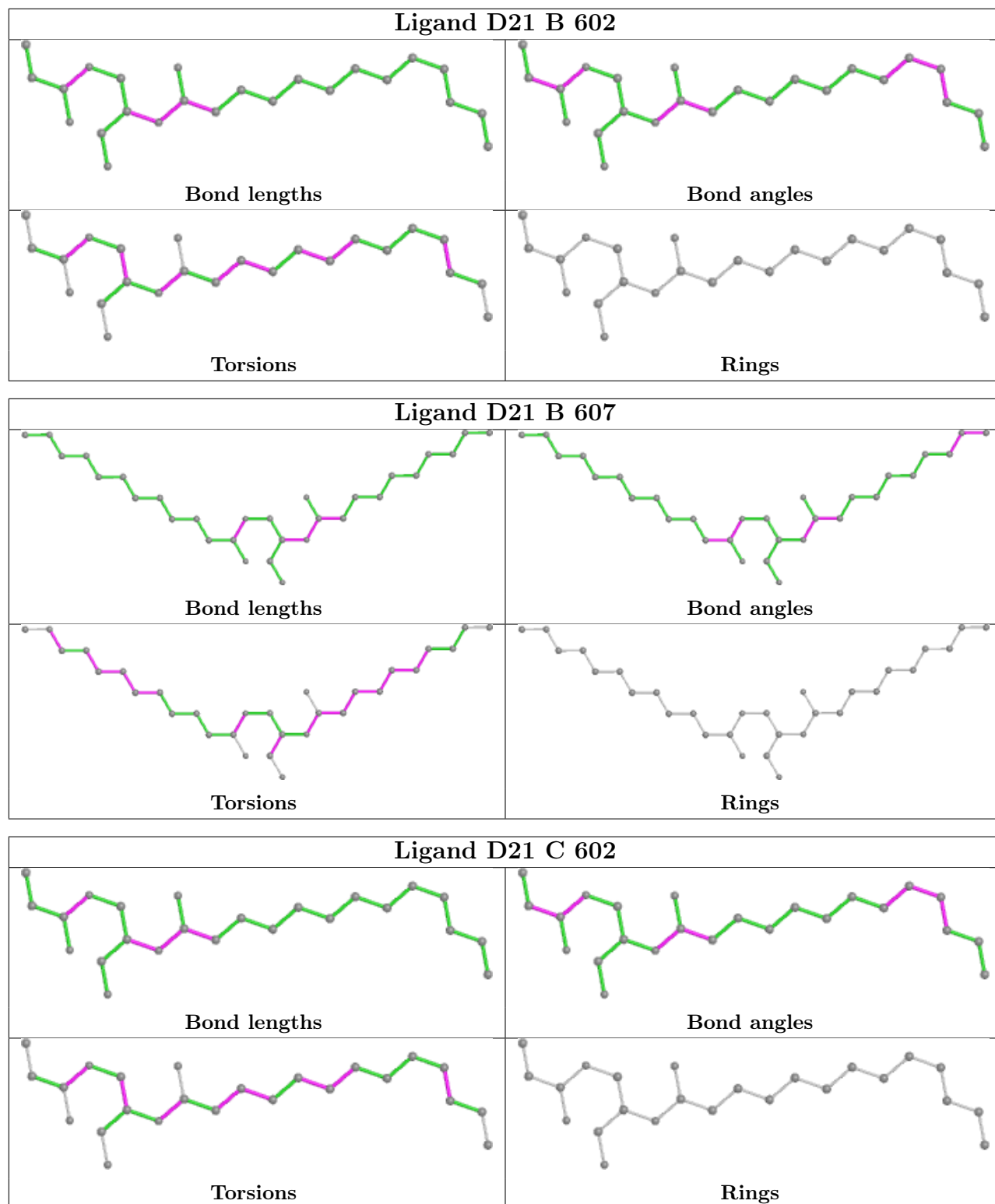


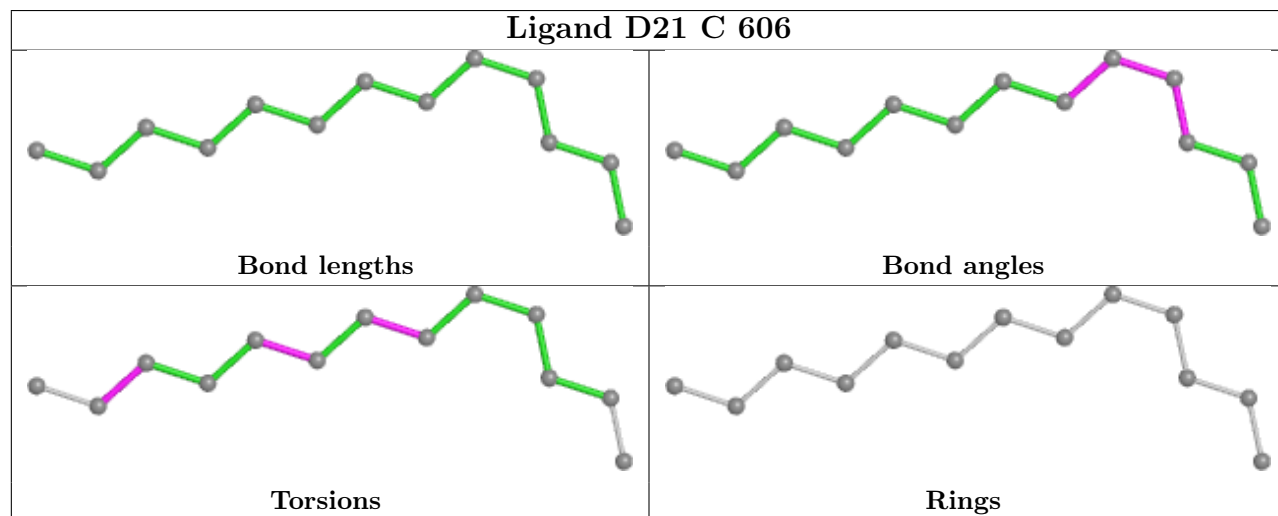
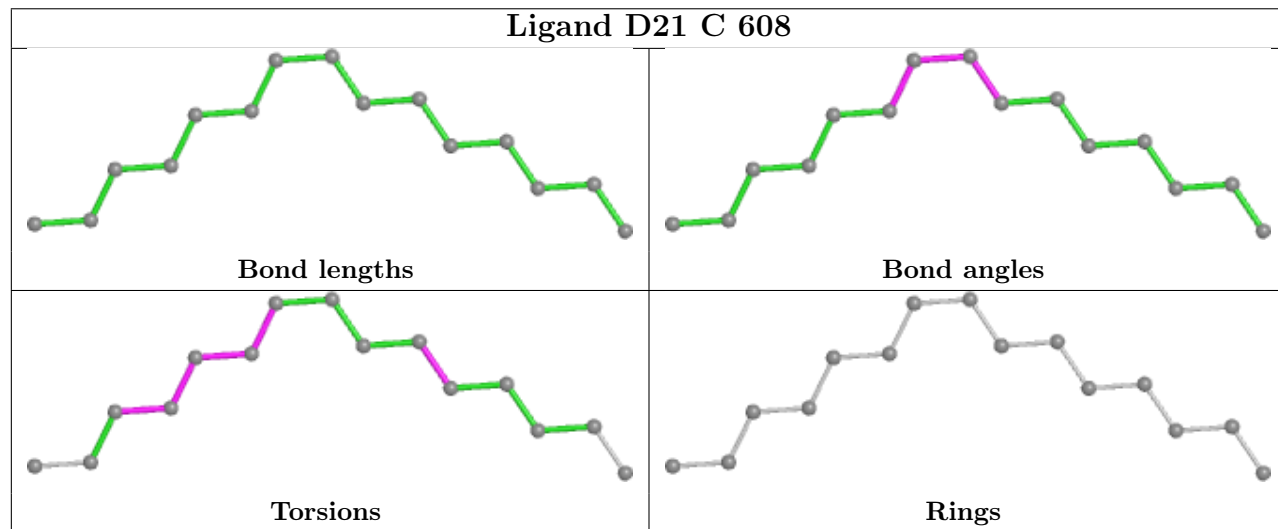
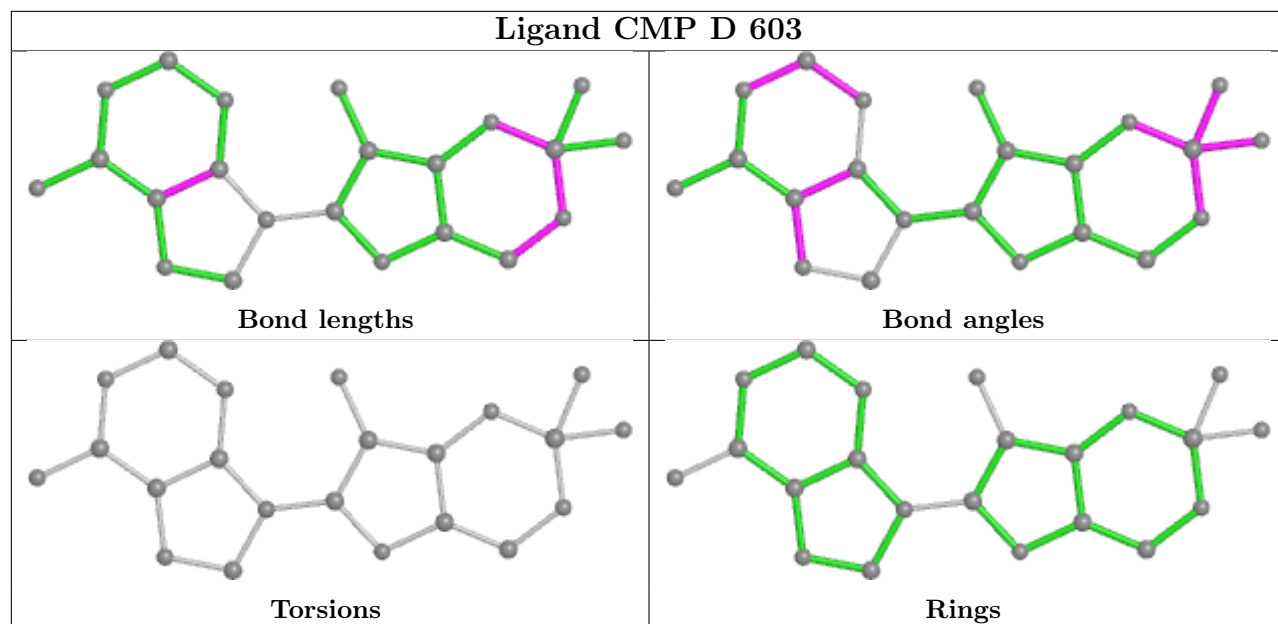


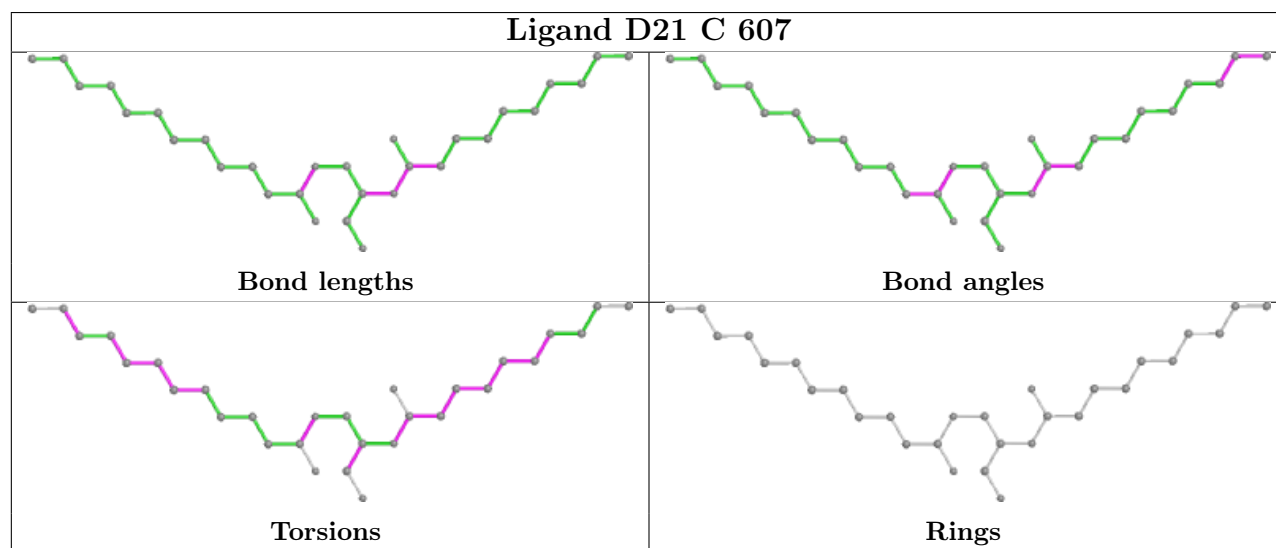
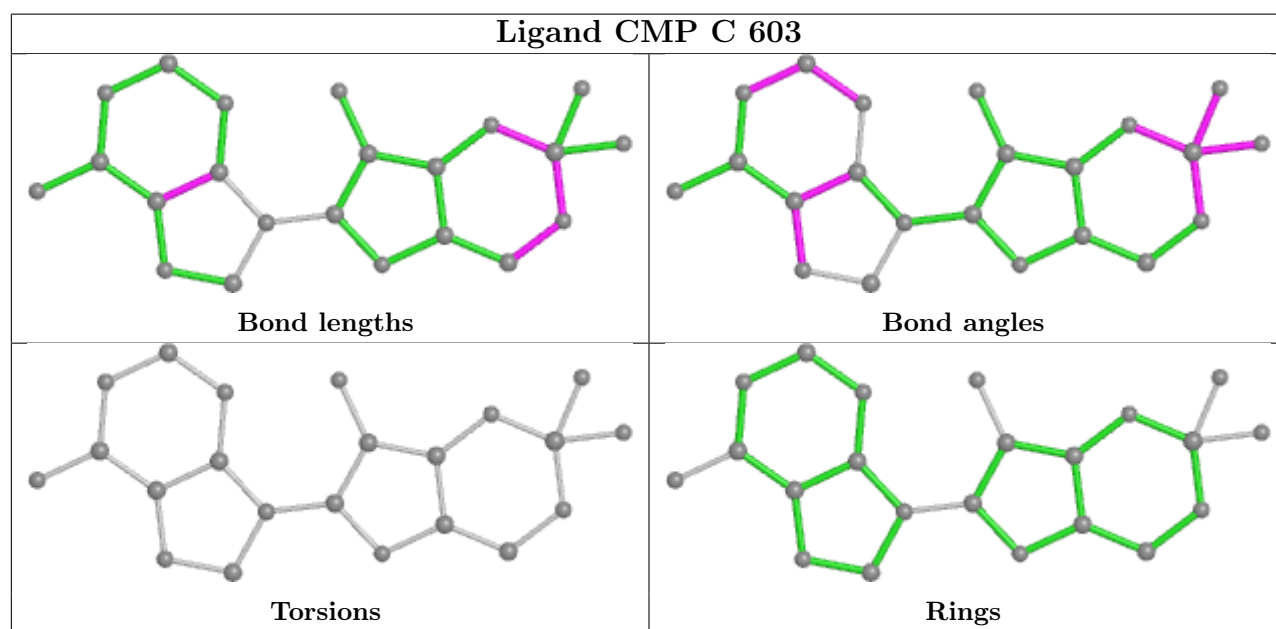
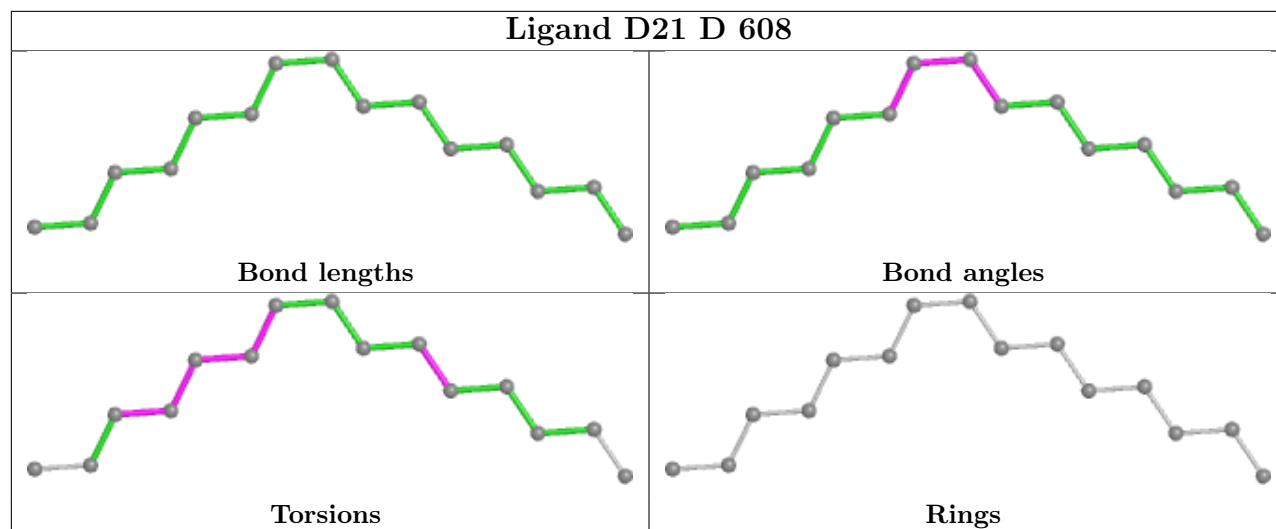


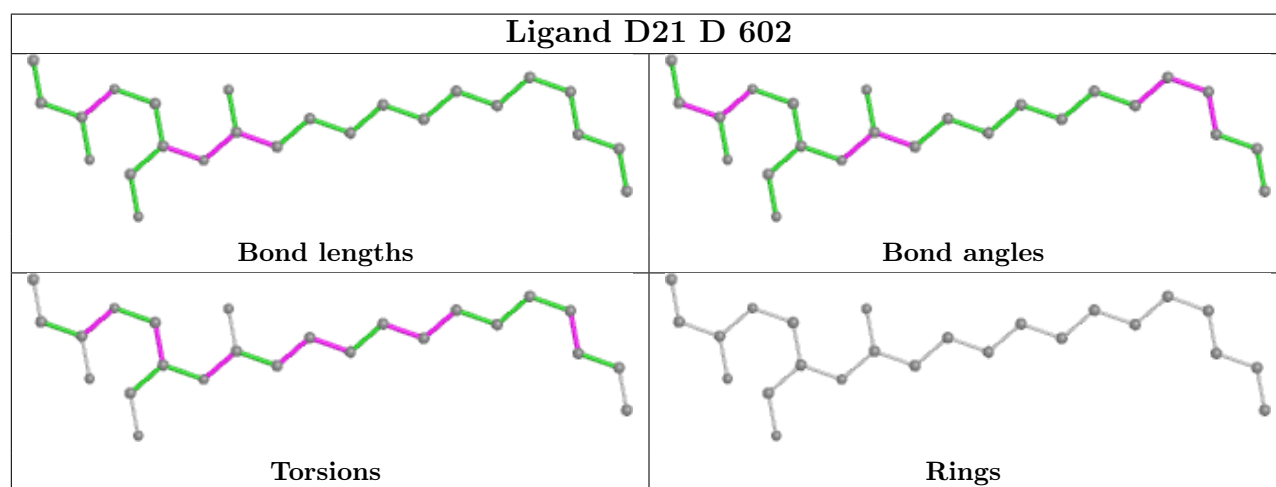
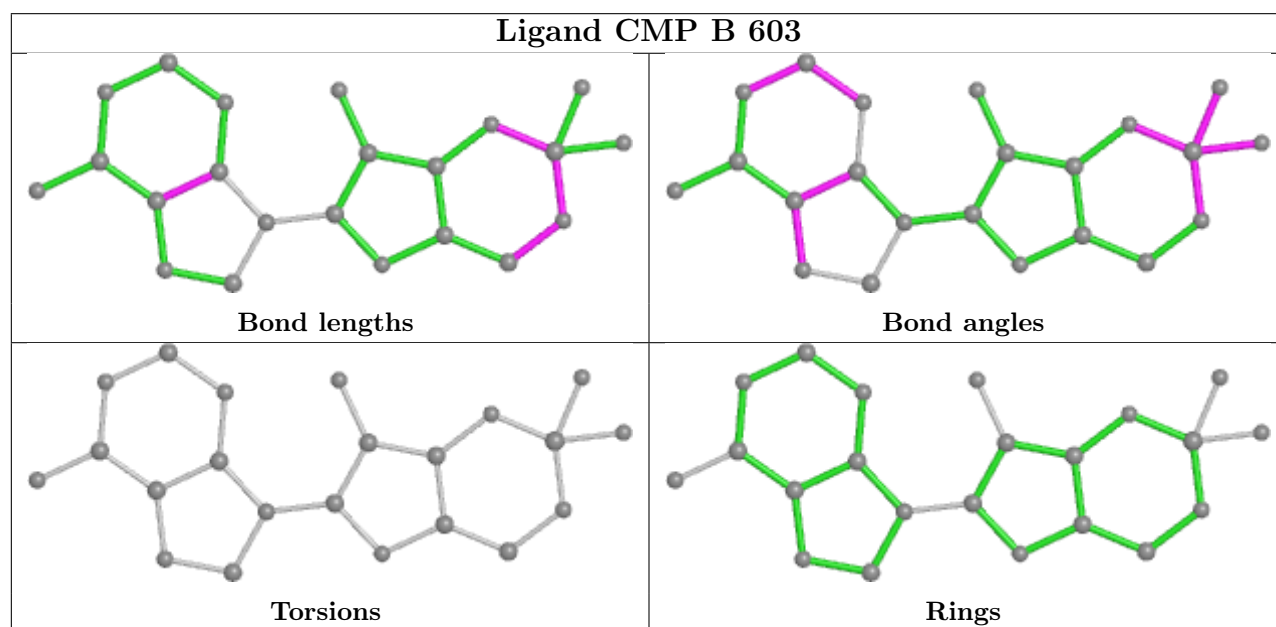
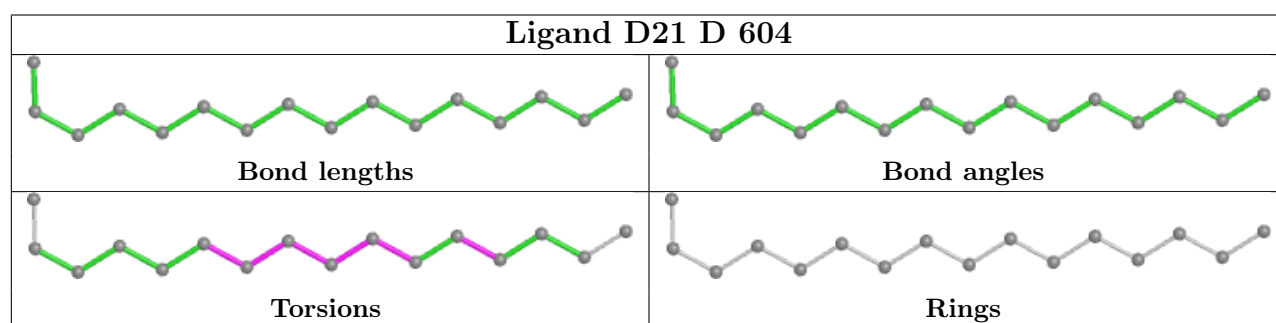
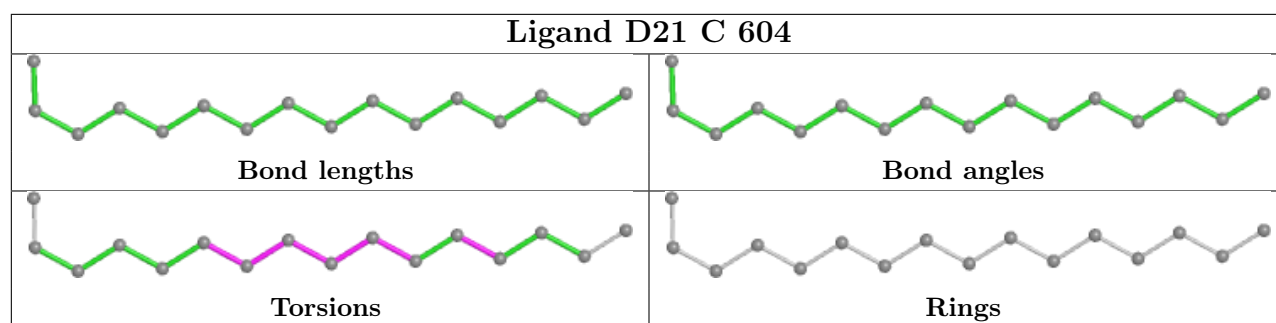


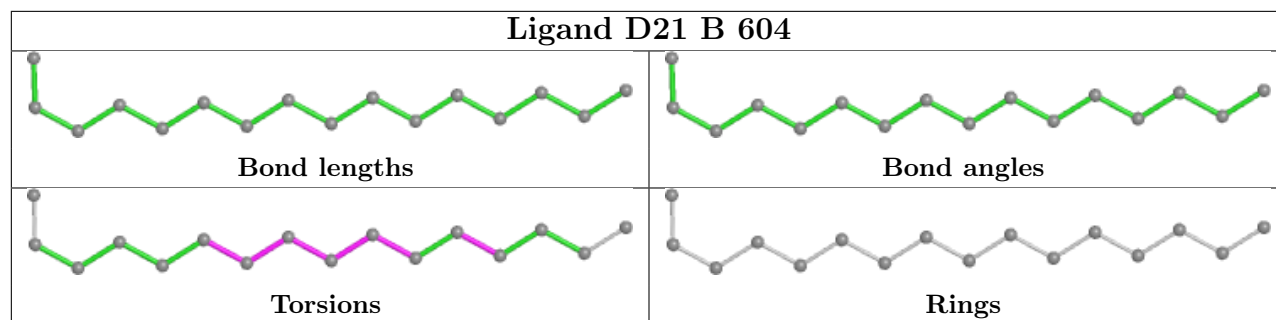












5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

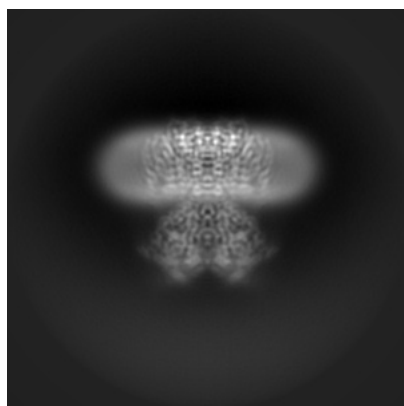
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-25916. These allow visual inspection of the internal detail of the map and identification of artifacts.

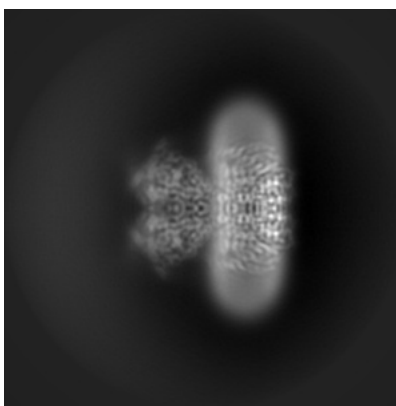
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

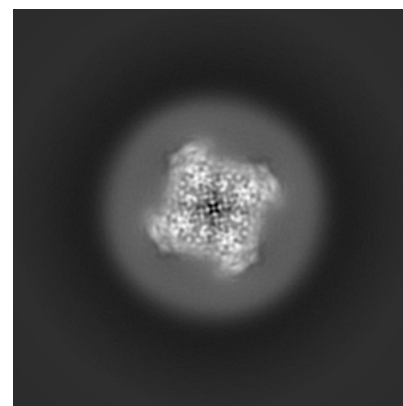
6.1.1 Primary map



X

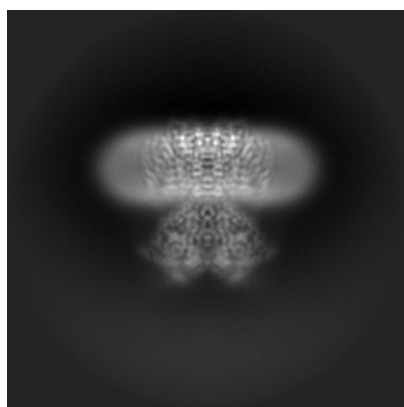


Y

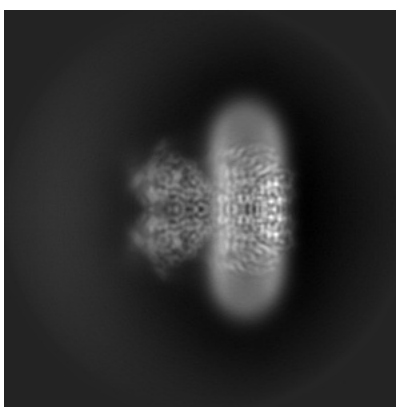


Z

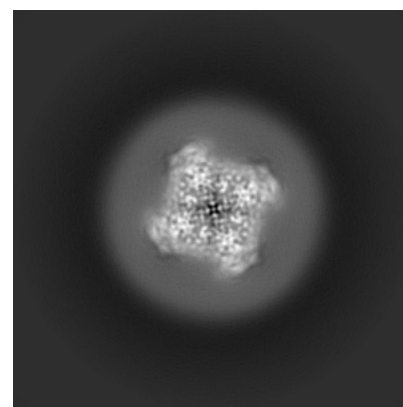
6.1.2 Raw map



X



Y

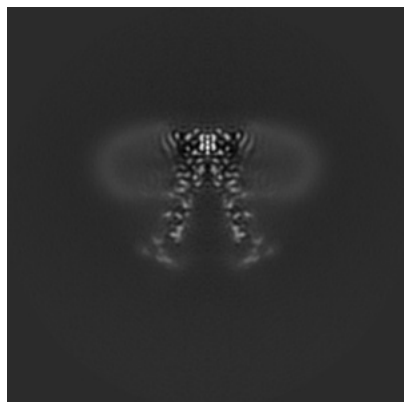


Z

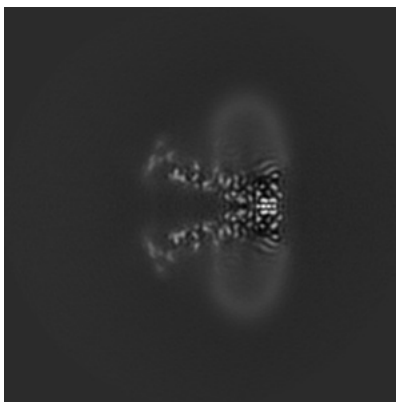
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

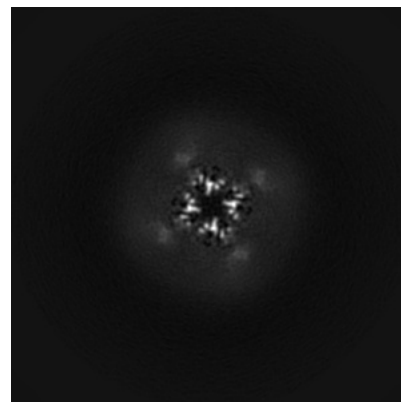
6.2.1 Primary map



X Index: 142

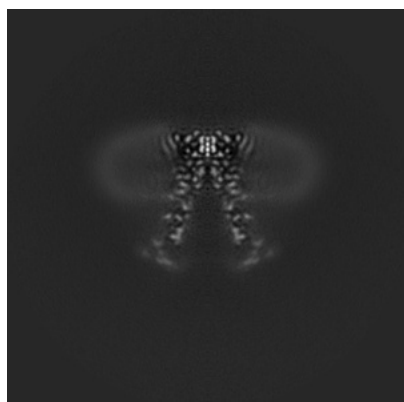


Y Index: 142

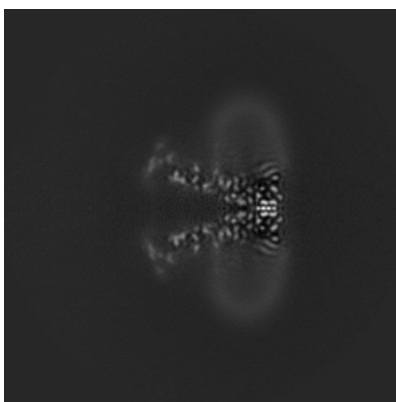


Z Index: 142

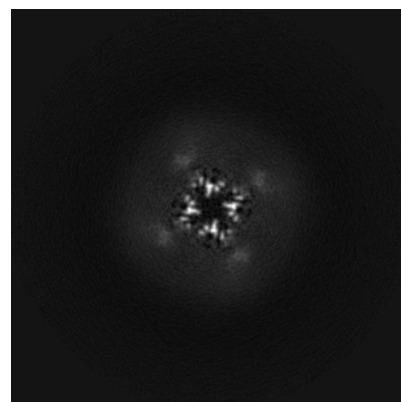
6.2.2 Raw map



X Index: 142



Y Index: 142

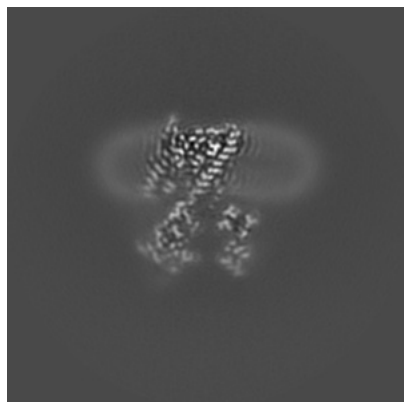


Z Index: 142

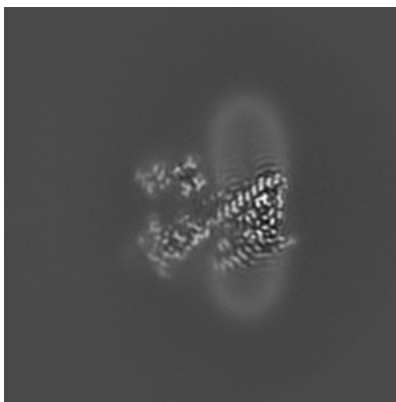
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

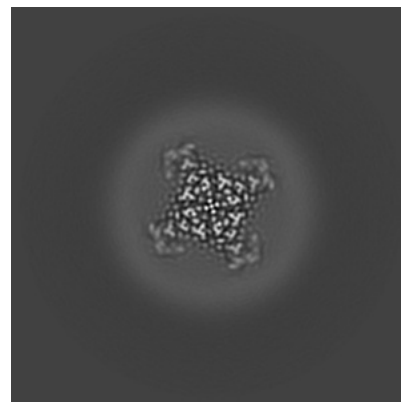
6.3.1 Primary map



X Index: 150

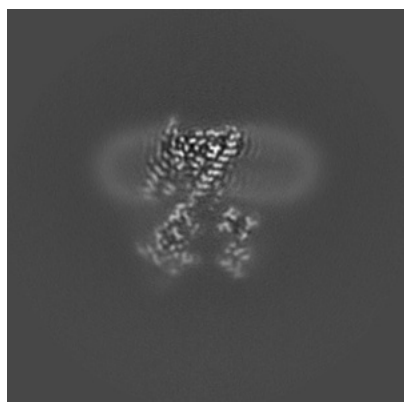


Y Index: 134

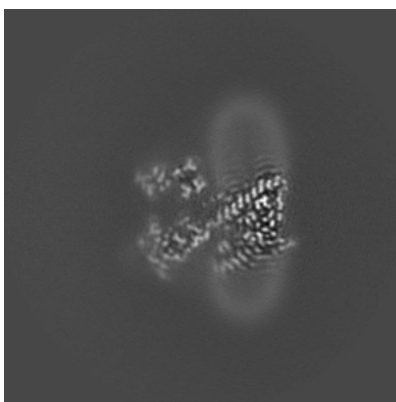


Z Index: 188

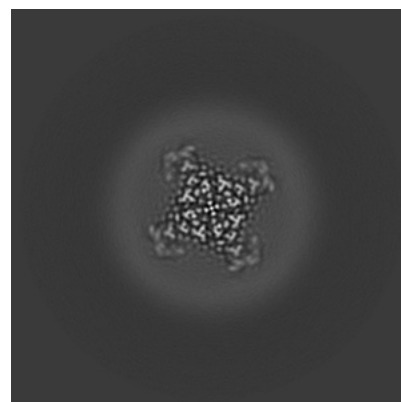
6.3.2 Raw map



X Index: 150



Y Index: 134

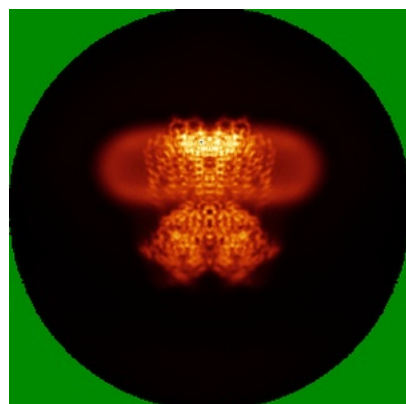


Z Index: 188

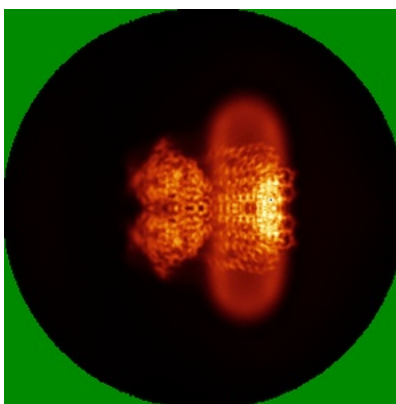
The images above show the largest variance slices of the map in three orthogonal directions.

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

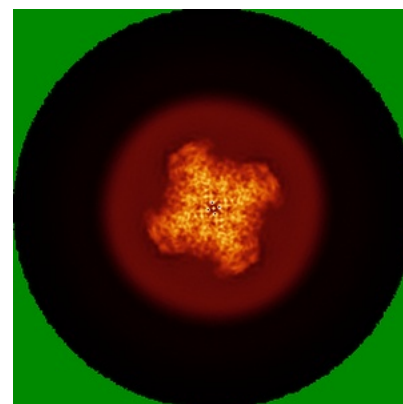
6.4.1 Primary map



X

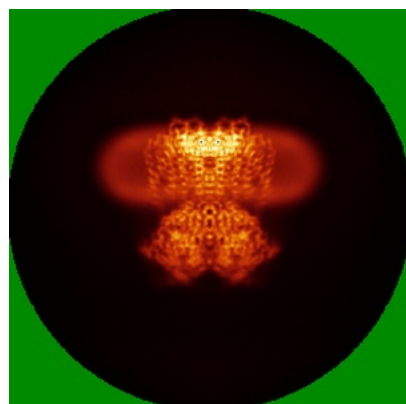


Y

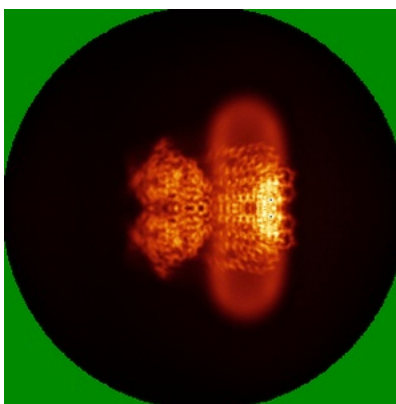


Z

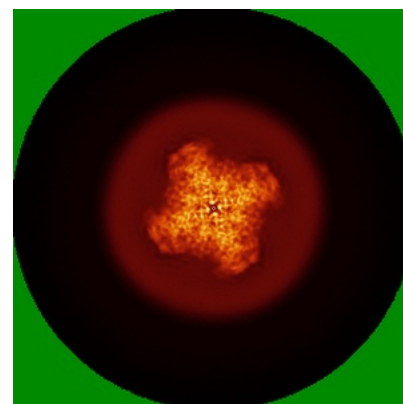
6.4.2 Raw map



X



Y

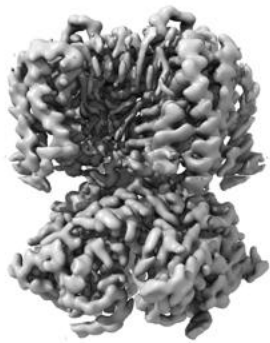


Z

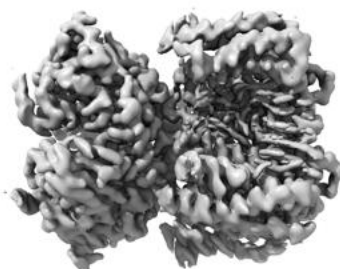
The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

6.5 Orthogonal surface views [i](#)

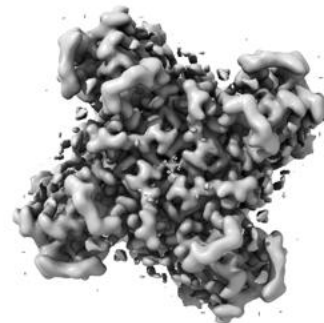
6.5.1 Primary map



X



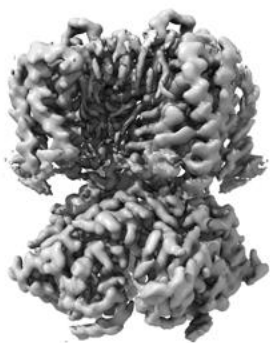
Y



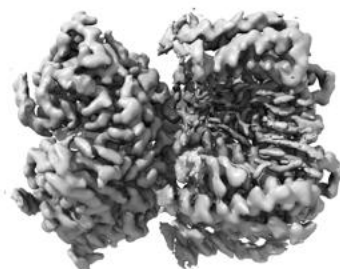
Z

The images above show the 3D surface view of the map at the recommended contour level 0.00603. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

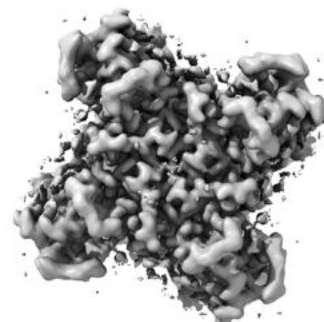
6.5.2 Raw map



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.

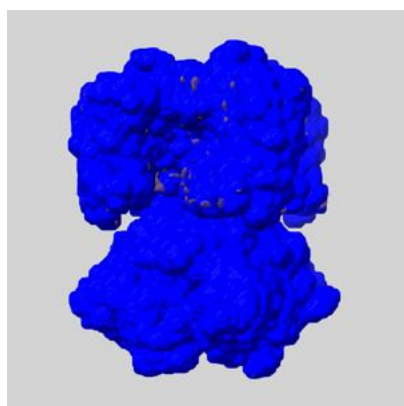
6.6 Mask visualisation [i](#)

This section shows the 3D surface view of the primary map at 50% transparency overlaid with the specified mask at 0% transparency

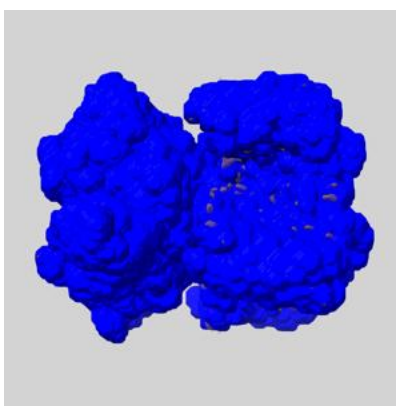
A mask typically either:

- Encompasses the whole structure
- Separates out a domain, a functional unit, a monomer or an area of interest from a larger structure

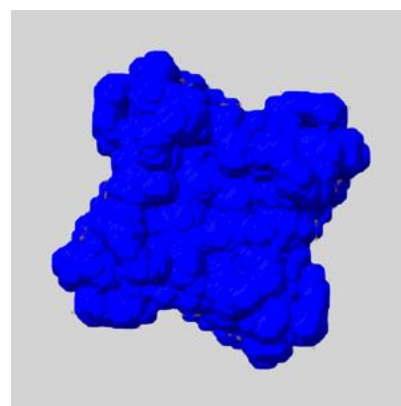
6.6.1 emd_25916_msk_1.map [i](#)



X



Y

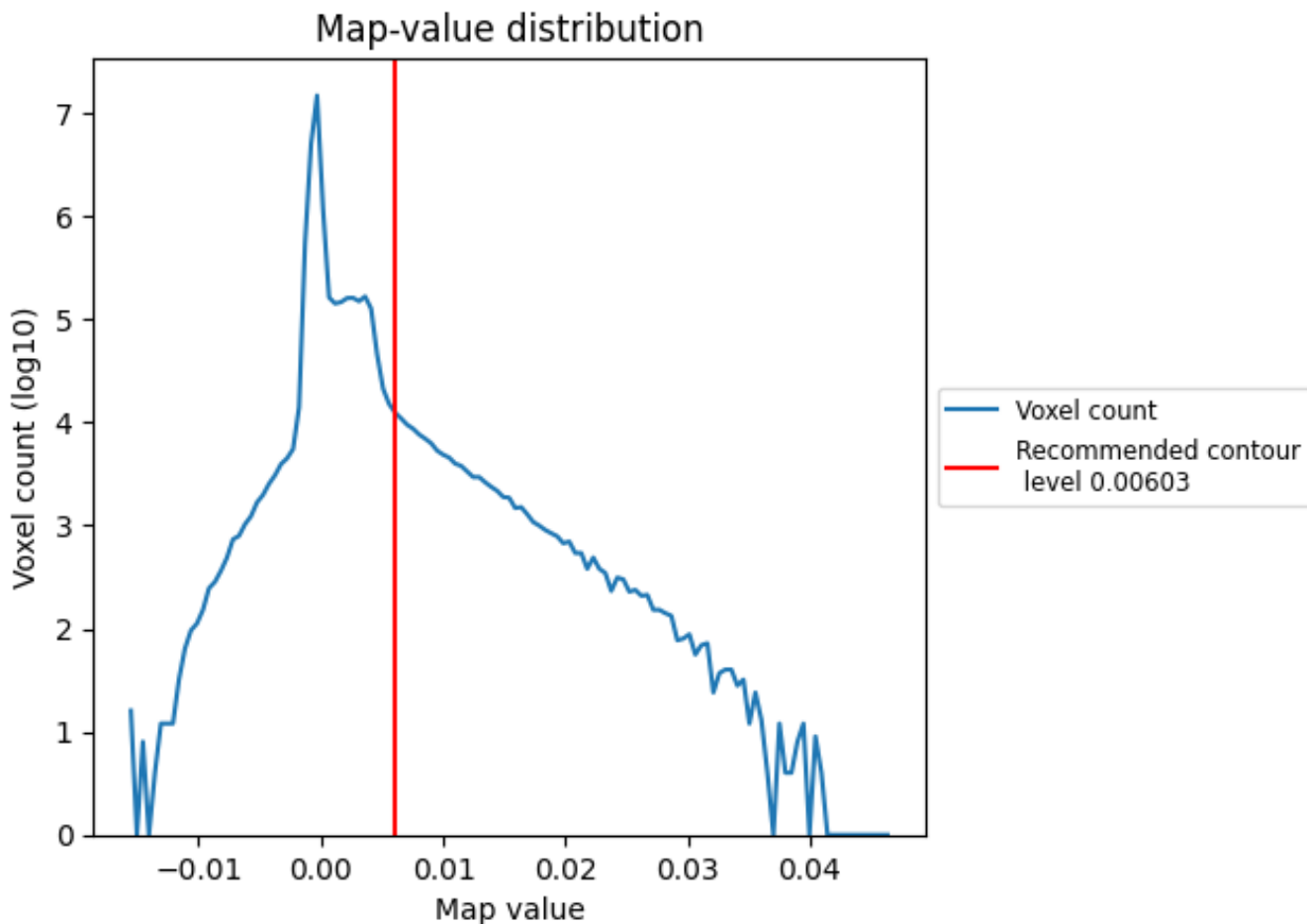


Z

7 Map analysis [i](#)

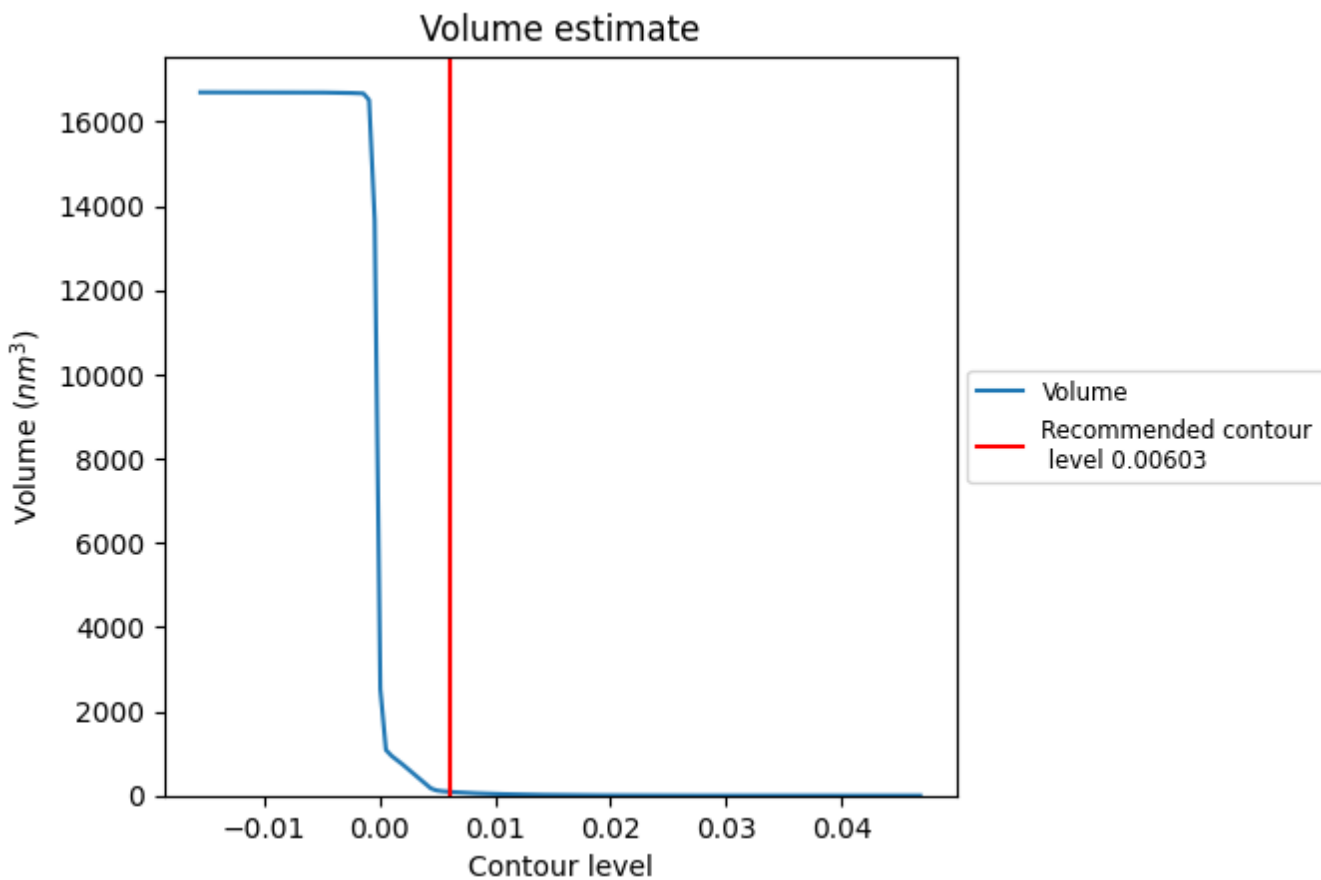
This section contains the results of statistical analysis of the map.

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.

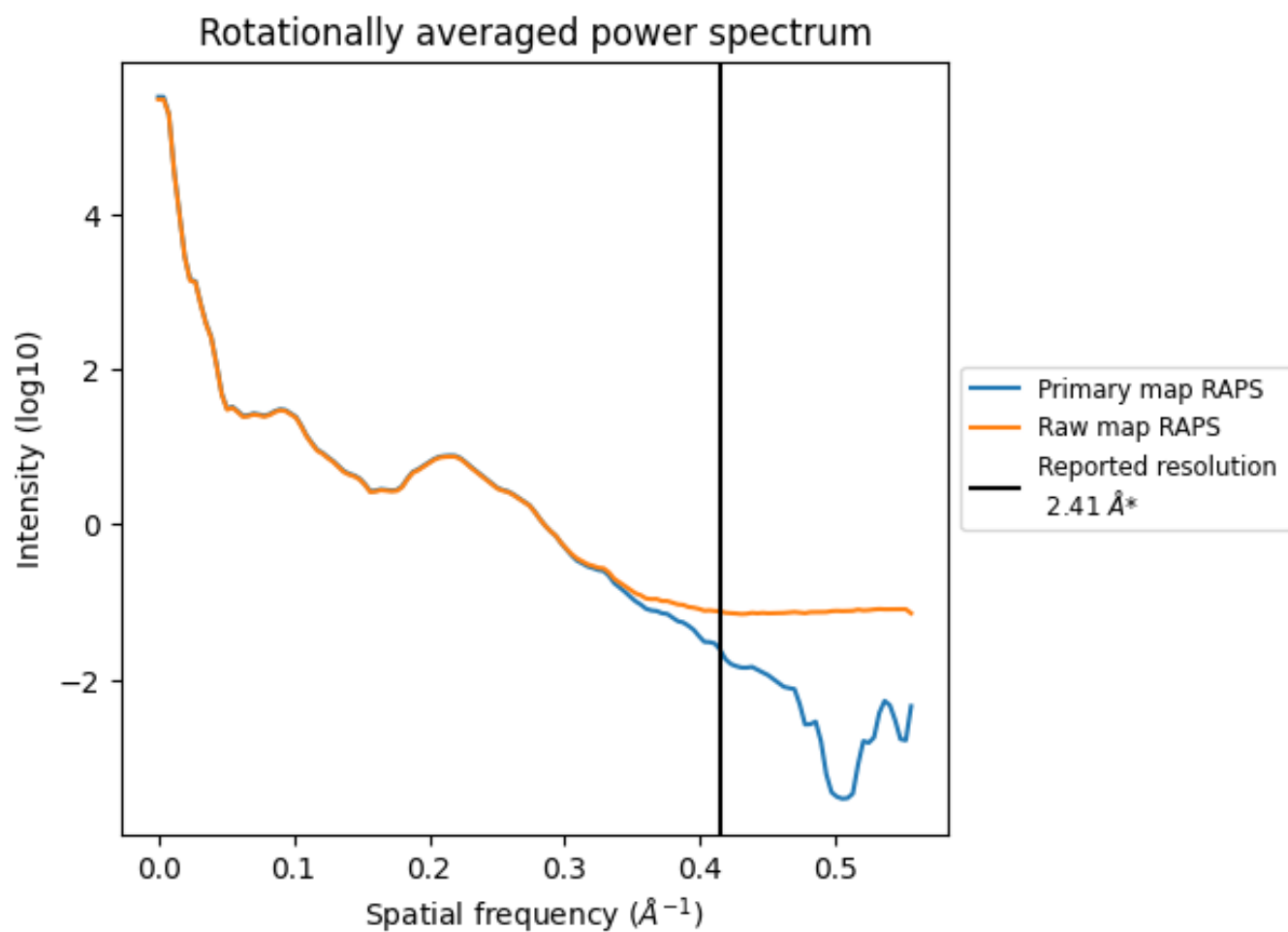
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 89 nm^3 ; this corresponds to an approximate mass of 80 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

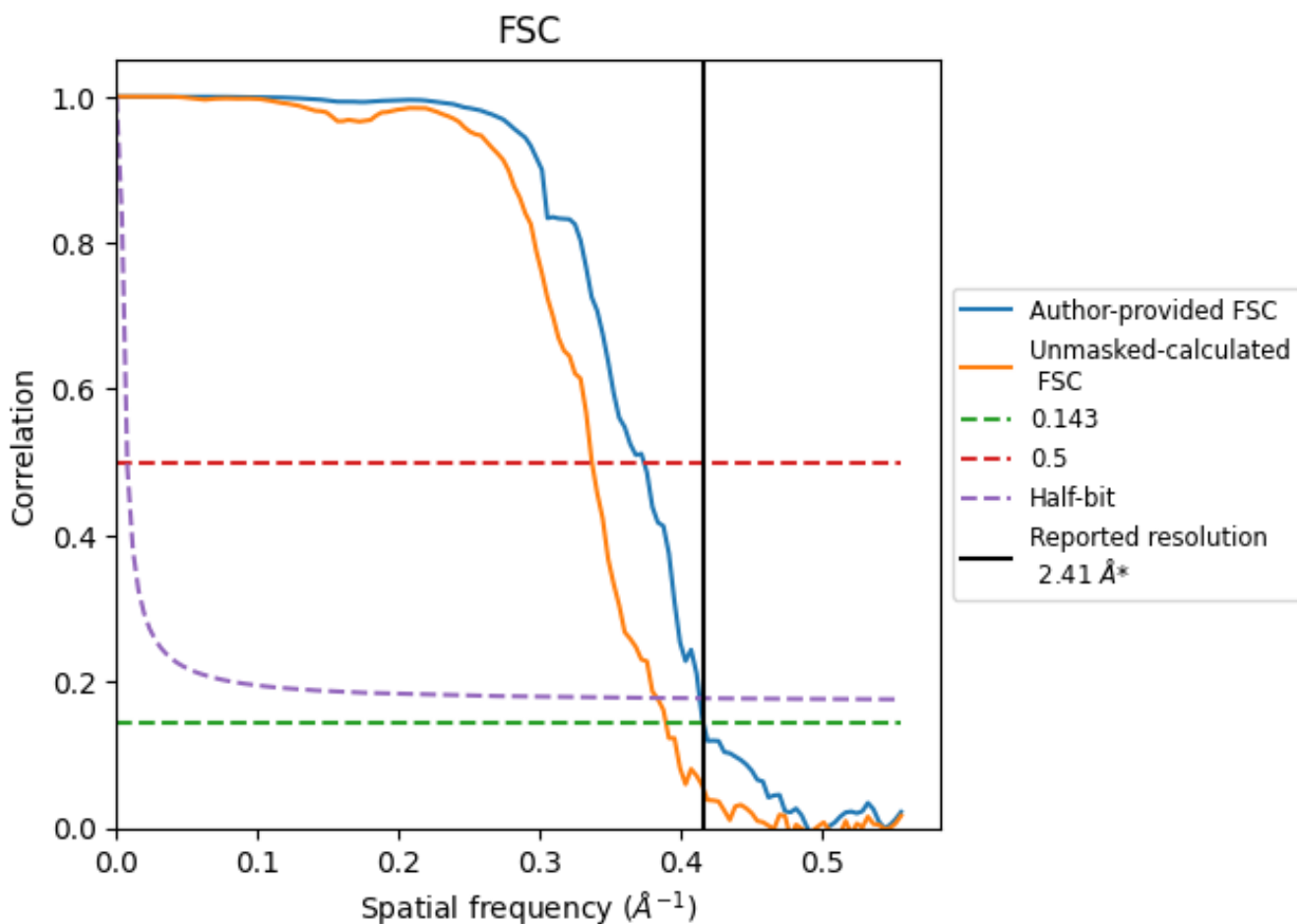


*Reported resolution corresponds to spatial frequency of 0.415 Å⁻¹

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 0.415\AA^{-1}

8.2 Resolution estimates [i](#)

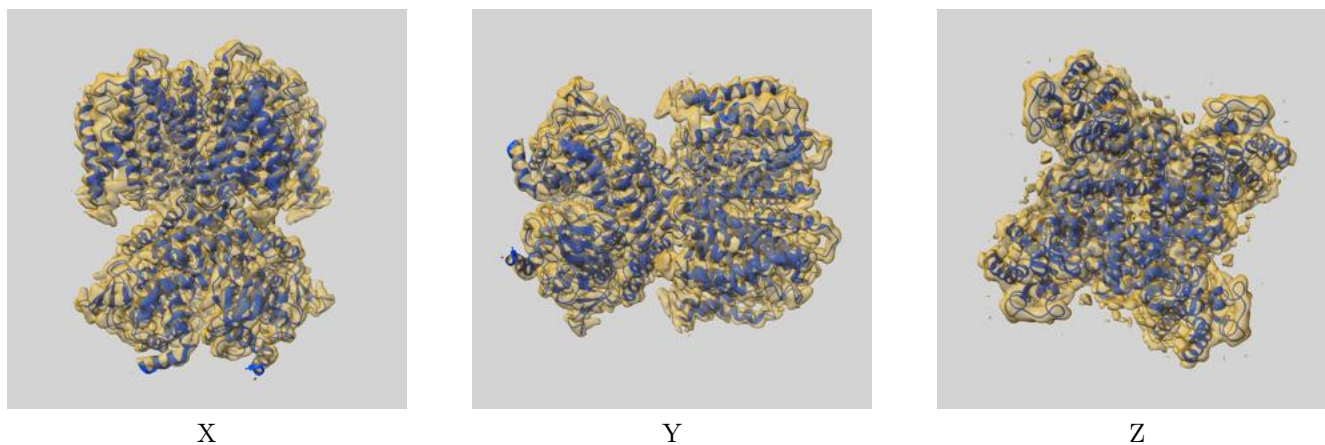
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	2.41	-	-
Author-provided FSC curve	2.41	2.68	2.42
Unmasked-calculated*	2.57	2.97	2.61

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

9 Map-model fit [i](#)

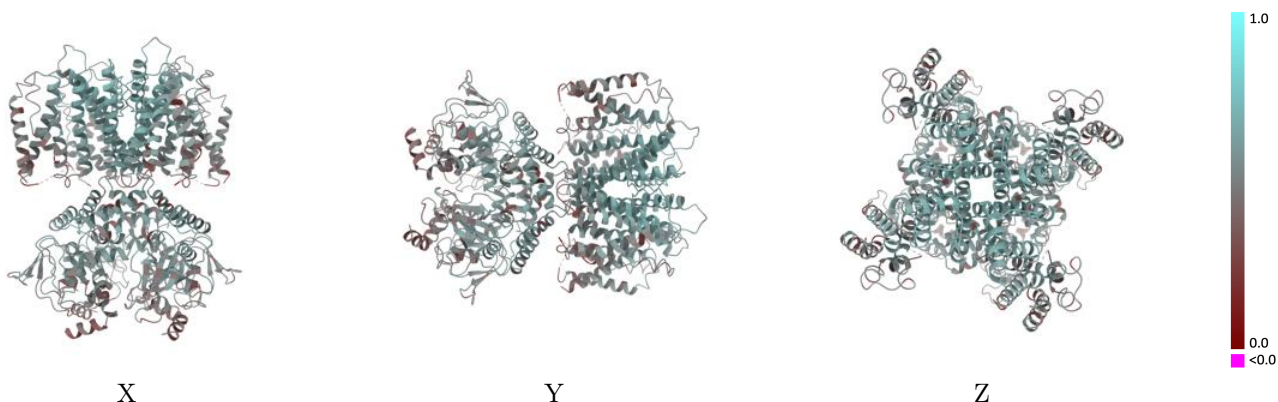
This section contains information regarding the fit between EMDB map EMD-25916 and PDB model 7TJ5. Per-residue inclusion information can be found in section 3 on page 10.

9.1 Map-model overlay [i](#)



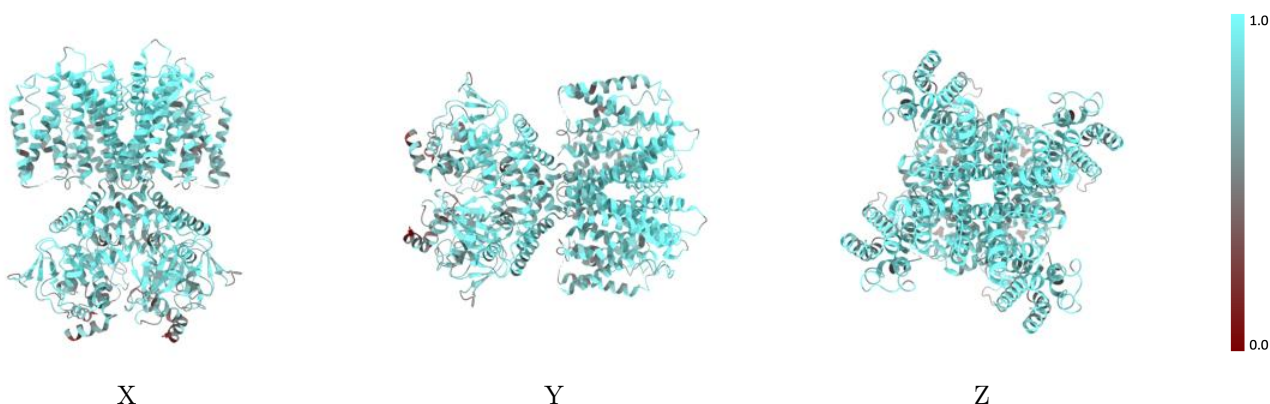
The images above show the 3D surface view of the map at the recommended contour level 0.00603 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



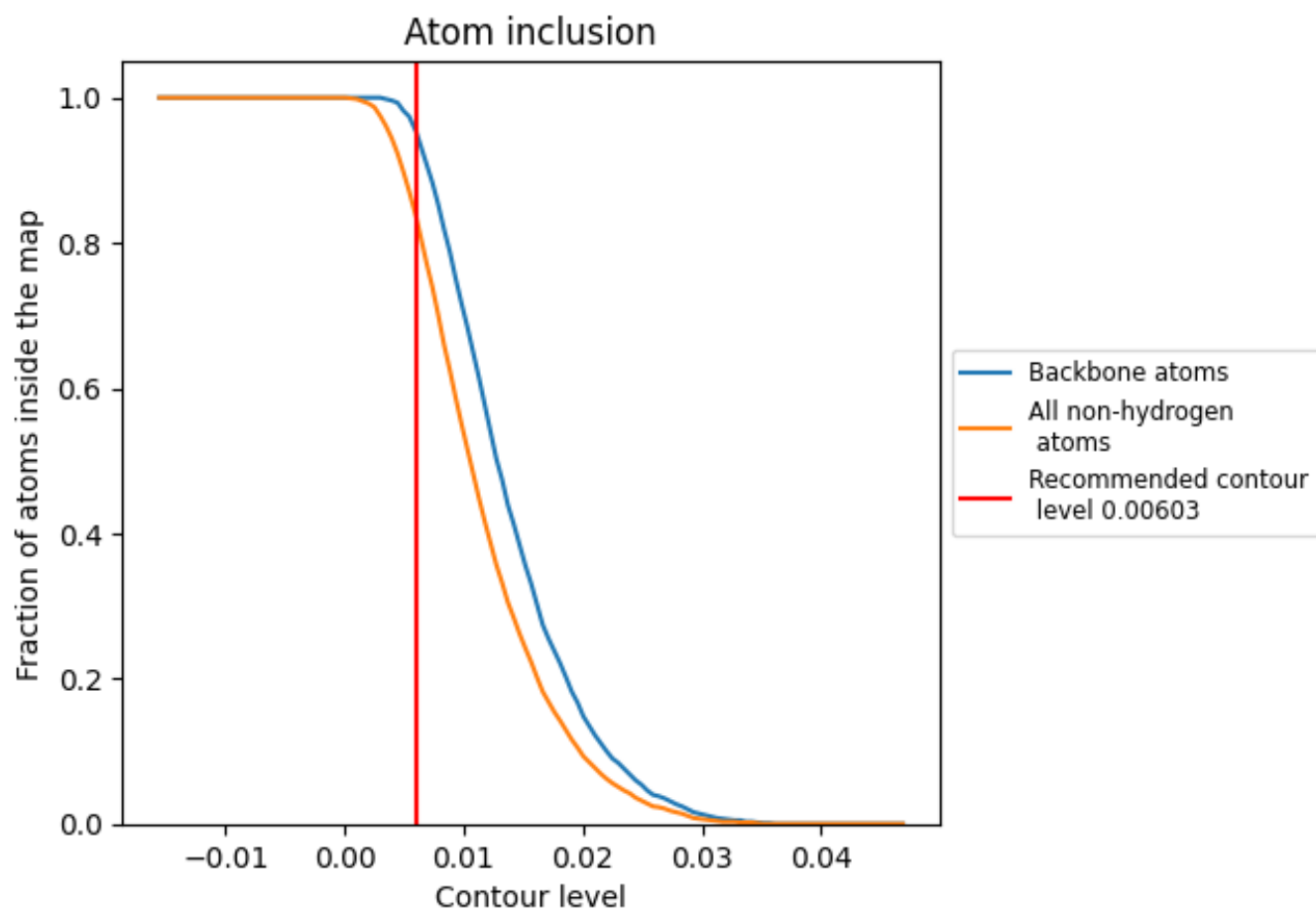
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions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

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



The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.00603).











9.4 Atom inclusion [i](#)



At the recommended contour level, 95% of all backbone atoms, 83% of all non-hydrogen atoms, are inside the map.

9.5 Map-model fit summary [i](#)

The table lists the average atom inclusion at the recommended contour level (0.00603) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.8340	 0.5260
A	 0.8340	 0.5270
B	 0.8330	 0.5250
C	 0.8350	 0.5240
D	 0.8320	 0.5260

