



wwPDB EM Validation Summary Report ⓘ

Aug 6, 2026 – 03:50 PM EDT

PDB ID : 13LN / pdb_000013ln
EMDB ID : EMD-77138
Title : Structure of human TRPV3-Q580P Olmsted syndrome mutant in the inactivated state
Authors : Purohit, R.; Khau, J.; Nadezhdin, K.D.; Sobolevsky, A.I.
Deposited on : 2026-05-13
Resolution : 3.02 Å(reported)

This is a wwPDB EM Validation Summary 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:

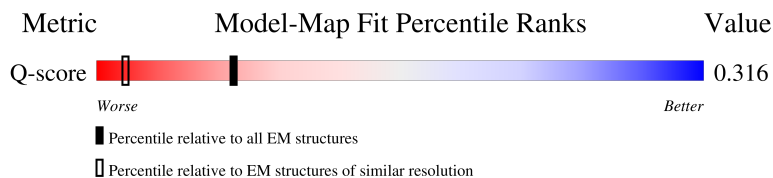
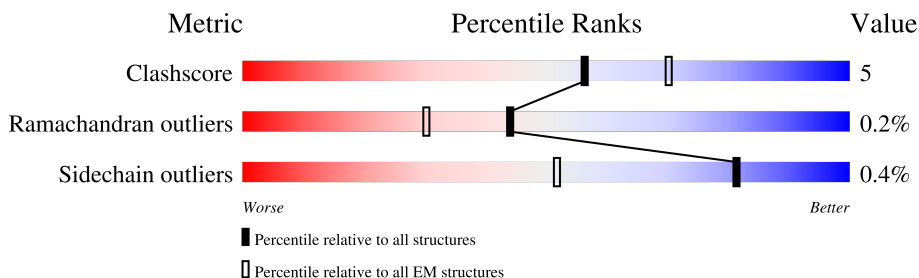
EMDB validation analysis : 0.0.1.dev133
Mogul : 2022.3.0, CSD as543be (2022)
MolProbity : 4-5-2 with Phenix2.0
Buster-report : wwPDB partial adaption of 1.1.7 (2018)
Percentile statistics : 20250101.v01 (using entries in the PDB archive January 1st 2025)
EM percentile statistics : 202505.v01 (Using data in the EMDB archive up until May 2025)
MapQ : 1.9.13
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.50

1 Overall quality at a glance

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

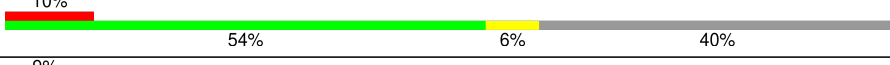
The reported resolution of this entry is 3.02 Å.

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



Metric	Whole archive (#Entries)	EM structures (#Entries)	Similar EM resolution (#Entries, resolution range(Å))
Clashscore	229148	23984	-
Ramachandran outliers	224038	23583	-
Sidechain outliers	223484	23102	-
Q-score	-	25397	13913 (2.52 - 3.52)

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	1052	
1	B	1052	
1	C	1052	
1	D	1052	

2 Entry composition

There are 4 unique types of molecules in this entry. The entry contains 22147 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 Isoform 2 of Transient receptor potential cation channel sub-family V member 3, Green fluorescent protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	626	Total	C	N	O	S	0	0
			5094	3314	841	907	32		
1	B	626	Total	C	N	O	S	0	0
			5094	3314	841	907	32		
1	C	626	Total	C	N	O	S	0	0
			5094	3314	841	907	32		
1	D	626	Total	C	N	O	S	0	0
			5094	3314	841	907	32		

There are 116 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	580	PRO	GLN	engineered mutation	UNP Q8NET8
A	792	LEU	-	linker	UNP Q8NET8
A	793	VAL	-	linker	UNP Q8NET8
A	794	PRO	-	linker	UNP Q8NET8
A	795	ARG	-	linker	UNP Q8NET8
A	796	GLY	-	linker	UNP Q8NET8
A	797	SER	-	linker	UNP Q8NET8
A	798	ALA	-	linker	UNP Q8NET8
A	799	ALA	-	linker	UNP Q8NET8
A	800	ALA	-	linker	UNP Q8NET8
A	801	ALA	-	linker	UNP Q8NET8
A	802	VAL	-	linker	UNP Q8NET8
A	865	LEU	PHE	conflict	UNP P42212
A	866	THR	SER	conflict	UNP P42212
A	1007	LYS	ALA	conflict	UNP P42212
A	1032	LEU	HIS	conflict	UNP P42212
A	1040	SER	-	expression tag	UNP P42212
A	1041	GLY	-	expression tag	UNP P42212
A	1042	LEU	-	expression tag	UNP P42212
A	1043	ARG	-	expression tag	UNP P42212
A	1044	SER	-	expression tag	UNP P42212

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Chain	Residue	Modelled	Actual	Comment	Reference
A	1045	TRP	-	expression tag	UNP P42212
A	1046	SER	-	expression tag	UNP P42212
A	1047	HIS	-	expression tag	UNP P42212
A	1048	PRO	-	expression tag	UNP P42212
A	1049	GLN	-	expression tag	UNP P42212
A	1050	PHE	-	expression tag	UNP P42212
A	1051	GLU	-	expression tag	UNP P42212
A	1052	LYS	-	expression tag	UNP P42212
B	580	PRO	GLN	engineered mutation	UNP Q8NET8
B	792	LEU	-	linker	UNP Q8NET8
B	793	VAL	-	linker	UNP Q8NET8
B	794	PRO	-	linker	UNP Q8NET8
B	795	ARG	-	linker	UNP Q8NET8
B	796	GLY	-	linker	UNP Q8NET8
B	797	SER	-	linker	UNP Q8NET8
B	798	ALA	-	linker	UNP Q8NET8
B	799	ALA	-	linker	UNP Q8NET8
B	800	ALA	-	linker	UNP Q8NET8
B	801	ALA	-	linker	UNP Q8NET8
B	802	VAL	-	linker	UNP Q8NET8
B	865	LEU	PHE	conflict	UNP P42212
B	866	THR	SER	conflict	UNP P42212
B	1007	LYS	ALA	conflict	UNP P42212
B	1032	LEU	HIS	conflict	UNP P42212
B	1040	SER	-	expression tag	UNP P42212
B	1041	GLY	-	expression tag	UNP P42212
B	1042	LEU	-	expression tag	UNP P42212
B	1043	ARG	-	expression tag	UNP P42212
B	1044	SER	-	expression tag	UNP P42212
B	1045	TRP	-	expression tag	UNP P42212
B	1046	SER	-	expression tag	UNP P42212
B	1047	HIS	-	expression tag	UNP P42212
B	1048	PRO	-	expression tag	UNP P42212
B	1049	GLN	-	expression tag	UNP P42212
B	1050	PHE	-	expression tag	UNP P42212
B	1051	GLU	-	expression tag	UNP P42212
B	1052	LYS	-	expression tag	UNP P42212
C	580	PRO	GLN	engineered mutation	UNP Q8NET8
C	792	LEU	-	linker	UNP Q8NET8
C	793	VAL	-	linker	UNP Q8NET8
C	794	PRO	-	linker	UNP Q8NET8
C	795	ARG	-	linker	UNP Q8NET8

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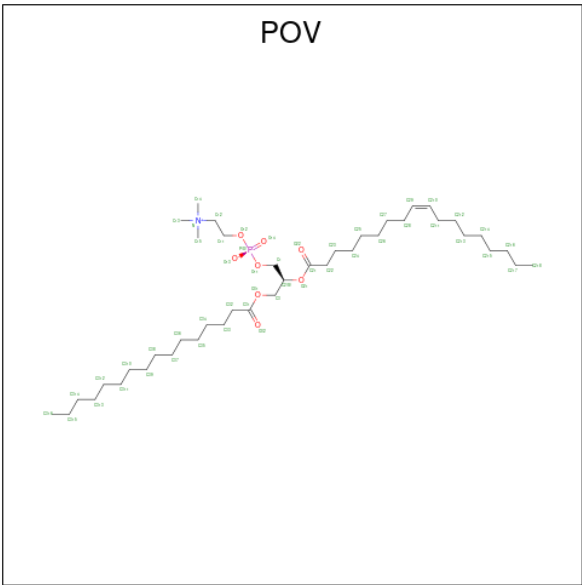
Chain	Residue	Modelled	Actual	Comment	Reference
C	796	GLY	-	linker	UNP Q8NET8
C	797	SER	-	linker	UNP Q8NET8
C	798	ALA	-	linker	UNP Q8NET8
C	799	ALA	-	linker	UNP Q8NET8
C	800	ALA	-	linker	UNP Q8NET8
C	801	ALA	-	linker	UNP Q8NET8
C	802	VAL	-	linker	UNP Q8NET8
C	865	LEU	PHE	conflict	UNP P42212
C	866	THR	SER	conflict	UNP P42212
C	1007	LYS	ALA	conflict	UNP P42212
C	1032	LEU	HIS	conflict	UNP P42212
C	1040	SER	-	expression tag	UNP P42212
C	1041	GLY	-	expression tag	UNP P42212
C	1042	LEU	-	expression tag	UNP P42212
C	1043	ARG	-	expression tag	UNP P42212
C	1044	SER	-	expression tag	UNP P42212
C	1045	TRP	-	expression tag	UNP P42212
C	1046	SER	-	expression tag	UNP P42212
C	1047	HIS	-	expression tag	UNP P42212
C	1048	PRO	-	expression tag	UNP P42212
C	1049	GLN	-	expression tag	UNP P42212
C	1050	PHE	-	expression tag	UNP P42212
C	1051	GLU	-	expression tag	UNP P42212
C	1052	LYS	-	expression tag	UNP P42212
D	580	PRO	GLN	engineered mutation	UNP Q8NET8
D	792	LEU	-	linker	UNP Q8NET8
D	793	VAL	-	linker	UNP Q8NET8
D	794	PRO	-	linker	UNP Q8NET8
D	795	ARG	-	linker	UNP Q8NET8
D	796	GLY	-	linker	UNP Q8NET8
D	797	SER	-	linker	UNP Q8NET8
D	798	ALA	-	linker	UNP Q8NET8
D	799	ALA	-	linker	UNP Q8NET8
D	800	ALA	-	linker	UNP Q8NET8
D	801	ALA	-	linker	UNP Q8NET8
D	802	VAL	-	linker	UNP Q8NET8
D	865	LEU	PHE	conflict	UNP P42212
D	866	THR	SER	conflict	UNP P42212
D	1007	LYS	ALA	conflict	UNP P42212
D	1032	LEU	HIS	conflict	UNP P42212
D	1040	SER	-	expression tag	UNP P42212
D	1041	GLY	-	expression tag	UNP P42212

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Chain	Residue	Modelled	Actual	Comment	Reference
D	1042	LEU	-	expression tag	UNP P42212
D	1043	ARG	-	expression tag	UNP P42212
D	1044	SER	-	expression tag	UNP P42212
D	1045	TRP	-	expression tag	UNP P42212
D	1046	SER	-	expression tag	UNP P42212
D	1047	HIS	-	expression tag	UNP P42212
D	1048	PRO	-	expression tag	UNP P42212
D	1049	GLN	-	expression tag	UNP P42212
D	1050	PHE	-	expression tag	UNP P42212
D	1051	GLU	-	expression tag	UNP P42212
D	1052	LYS	-	expression tag	UNP P42212

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



Mol	Chain	Residues	Atoms					AltConf
2	A	1	Total	C	N	O	P	0
			52	42	1	8	1	
2	A	1	Total	C	N	O	P	0
			52	42	1	8	1	
2	A	1	Total	C	N	O	P	0
			52	42	1	8	1	
2	A	1	Total	C	N	O	P	0
			52	42	1	8	1	
2	A	1	Total	C	N	O	P	0
			52	42	1	8	1	

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Mol	Chain	Residues	Atoms					AltConf
2	A	1	Total	C	N	O	P	0
			52	42	1	8	1	
2	A	1	Total	C	N	O	P	0
			52	42	1	8	1	
2	A	1	Total	C	N	O	P	0
			52	42	1	8	1	
2	A	1	Total	C	N	O	P	0
			52	42	1	8	1	
2	B	1	Total	C	N	O	P	0
			52	42	1	8	1	
2	B	1	Total	C	N	O	P	0
			52	42	1	8	1	
2	B	1	Total	C	N	O	P	0
			52	42	1	8	1	
2	B	1	Total	C	N	O	P	0
			52	42	1	8	1	
2	B	1	Total	C	N	O	P	0
			52	42	1	8	1	
2	B	1	Total	C	N	O	P	0
			52	42	1	8	1	
2	C	1	Total	C	N	O	P	0
			52	42	1	8	1	
2	C	1	Total	C	N	O	P	0
			52	42	1	8	1	
2	C	1	Total	C	N	O	P	0
			52	42	1	8	1	
2	C	1	Total	C	N	O	P	0
			52	42	1	8	1	
2	C	1	Total	C	N	O	P	0
			52	42	1	8	1	
2	C	1	Total	C	N	O	P	0
			52	42	1	8	1	
2	C	1	Total	C	N	O	P	0
			52	42	1	8	1	
2	D	1	Total	C	N	O	P	0
			52	42	1	8	1	

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Mol	Chain	Residues	Atoms					AltConf
2	D	1	Total	C	N	O	P	0
			52	42	1	8	1	
2	D	1	Total	C	N	O	P	0
			52	42	1	8	1	
2	D	1	Total	C	N	O	P	0
			52	42	1	8	1	
2	D	1	Total	C	N	O	P	0
			52	42	1	8	1	
2	D	1	Total	C	N	O	P	0
			52	42	1	8	1	

- Molecule 3 is SODIUM ION (CCD ID: NA) (formula: Na).

Mol	Chain	Residues	Atoms		AltConf
3	A	3	Total	Na	0
			3	3	

- Molecule 4 is water.

Mol	Chain	Residues	Atoms		AltConf
4	A	25	Total	O	0
			25	25	
4	B	29	Total	O	0
			29	29	
4	C	25	Total	O	0
			25	25	
4	D	25	Total	O	0
			25	25	

LEU	GLU	PHE	VAL	THR	ALA	ALA	GLY	ILE	THR	LEU	GLY	MET	ASP	GLU	LEU	TYR	LYS	SER	GLY	LEU	ARG	SER	TRP	SER	HIS	PRO	GLN	PHE	GLU	LYS														
ILE	VAL	ASN	PHE	LYS	ILE	ARG	HIS	ASN	ILE	GLU	ASP	GLY	SER	GLN	VAL	LEU	ALA	ASP	THR	PRO	ILE	GLY	ASP	GLY	PRO	LEU	LEU	PRO	ASP	ASN	HIS	TYR	LEU	SER	THR	GLN	LYS	SER	ASP	ARG	LYS	VAL	THR	ILE

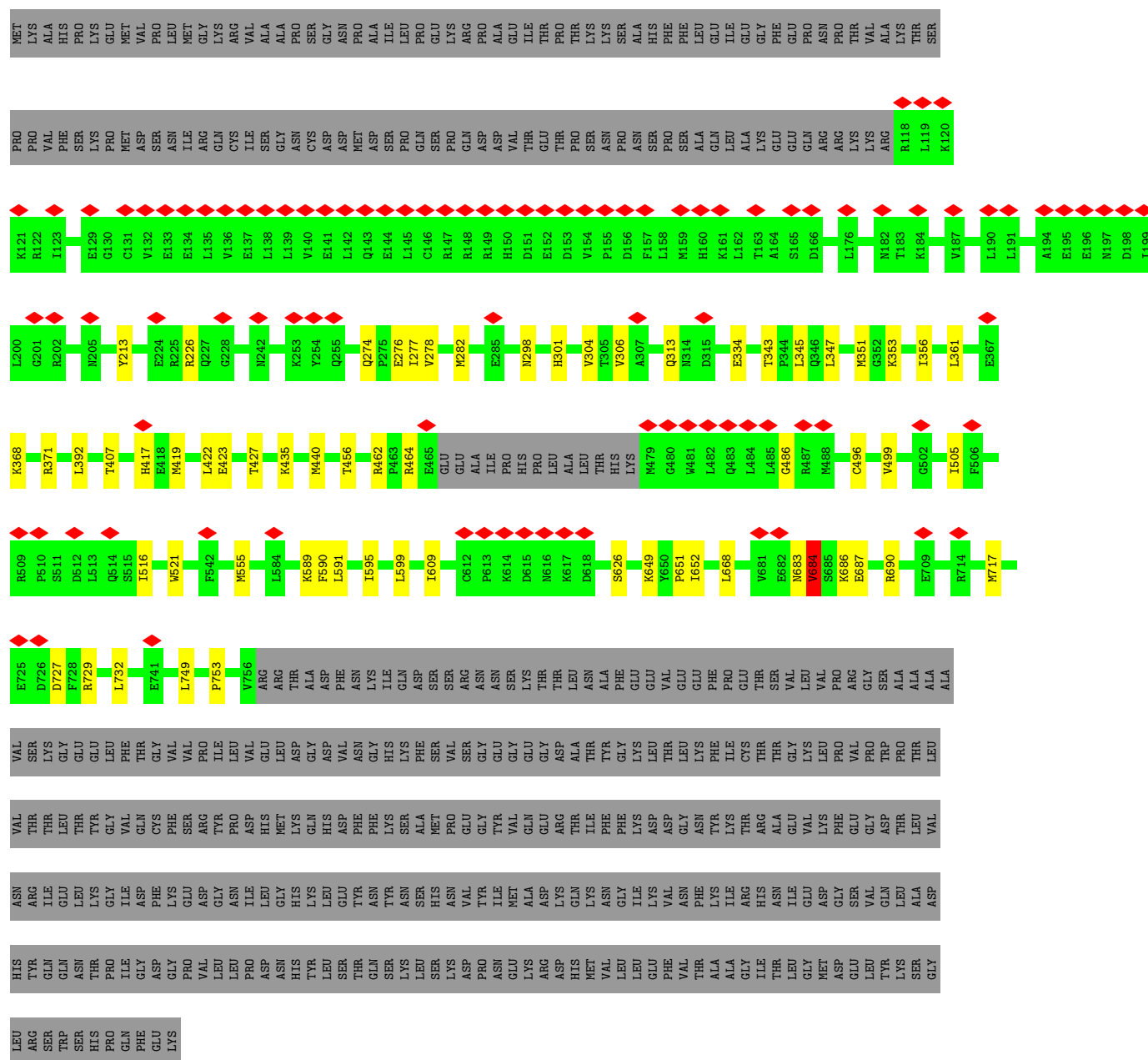
● Molecule 1: Isoform 2 of Transient receptor potential cation channel subfamily V member 3, Green fluorescent protein



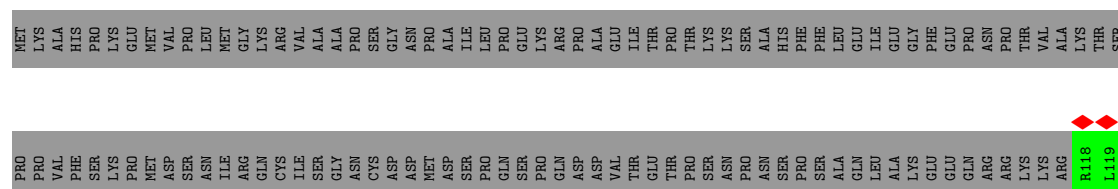
MET	LYS	ALA	HIS	PRO	LYS	GLU	MET	VAL	LEU	GLY	LYS	ARG	VAL	ALA	ALA	PRO	SER	GLY	ASN	PRO	ALA	ILE	LEU	GLU	LYS	ARG	PRO	GLU	ILE	THR	THR	LYS	LYS	SER	ALA	HIS	PHE	PHE	LEU	LEU	ILE	GLY	GLY	PHE	GLU	PRO	PRO	ASN	PRO	THR	VAL	ALA	LYS	THR	SER
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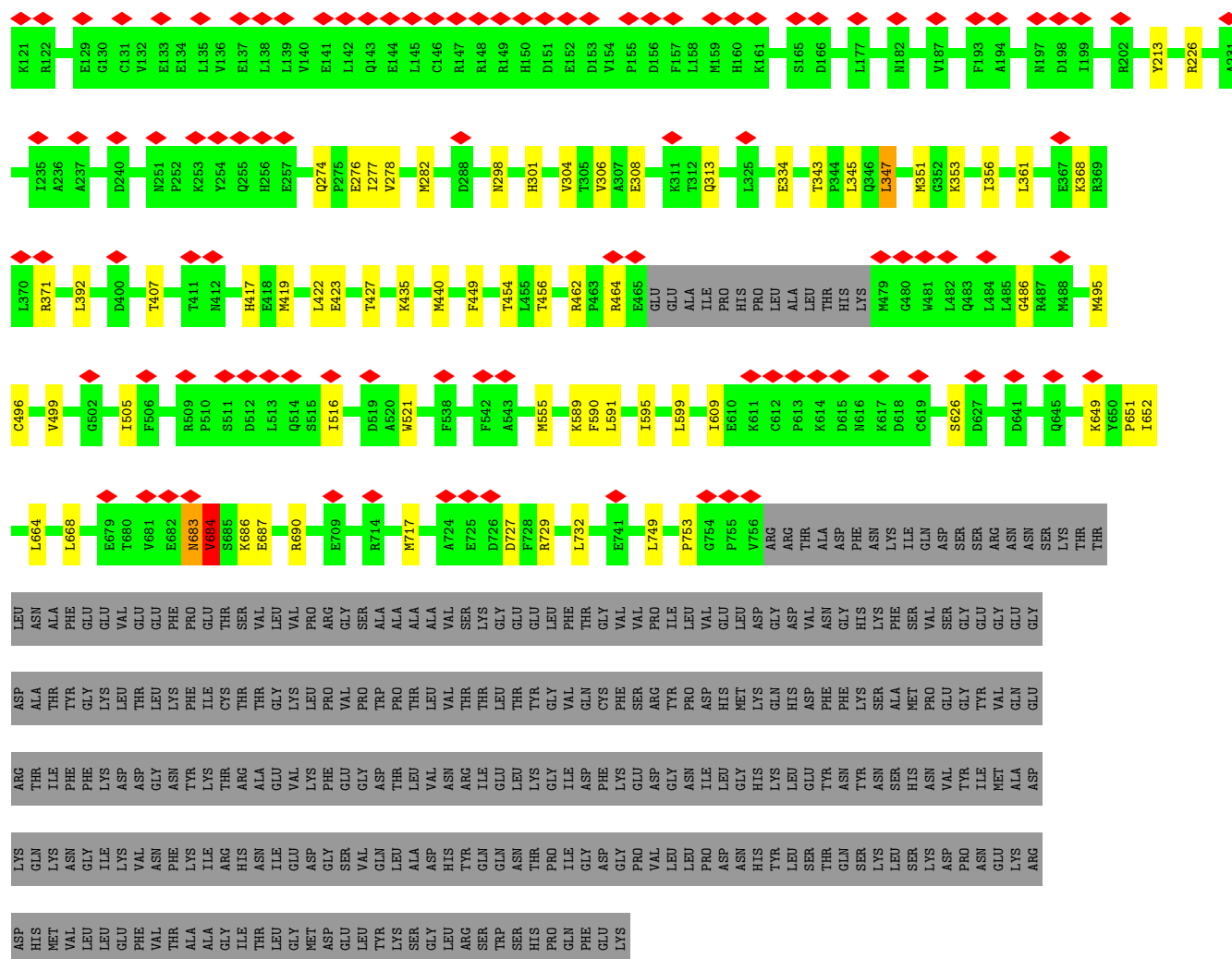
THR	ASN	ALA	THR	VAL	V681	L485	T343	N197	K121	PRO
LEU	ILE	GLU	GLY	LEU	V681	L485	P344	D198	R121	VAL
GLY	ILE	VAL	LYS	VAL	E682	I492	L345	D198	R122	PHE
MET	ASP	LYS	PRO	PRO	M683	I492	L346	G201	F124	SER
ASP	GLY	PHE	PRO	ARG	V684	C496	L347	R202	A125	LYS
GLU	SER	GLY	VAL	GLY	S685	V499	M351	F203	A126	PRO
LEU	VAL	GLY	PRO	SER	K686	V499	G362	I204	V127	MET
TRP	ASP	ASP	TRP	ALA	E687	I505	K353	N205	S128	ASP
LEU	THR	THR	PRO	ALA	E687	I505	I356	A206	E129	SER
SER	ALA	LEU	PRO	ALA	R690	F506	I356	E207	G130	ASN
GLY	ALA	VAL	LEU	ALA	R690	F506	L361	E207	C131	ILE
LEU	ASP	VAL	VAL	VAL	M717	L507	L361	E210	V132	ARG
ARG	THR	ARG	THR	SER	M717	L507	K368	E210	E133	GLN
SER	THR	ILE	THR	GLN	K722	S511	R371	Y213	E134	ILE
TRP	GLN	GLU	LEU	GLY	S511	S511	R371	E214	L135	GLY
SER	ASN	LEU	THR	GLU	D727	D512	L392	G215	V136	ASN
HIS	THR	LYS	TYR	GLY	F728	L513	L392	E215	E137	CYS
PRO	PRO	GLY	GLY	LEU	R729	Q514	L392	Q226	L138	ASP
ILE	ILE	ILE	VAL	PHE	L732	S515	T407	Q227	L139	ASP
GLN	ASP	ASP	GLY	GLY	L732	I516	T407	Q227	V140	MET
ASP	GLY	PHE	CYS	VAL	L749	L517	D414	G228	E141	SER
PRO	PRO	GLU	PHE	VAL	P753	S518	H417	A239	E142	PRO
LEU	LEU	GLY	ARG	PRO	P753	S518	H417	A239	Q143	GLN
LEU	ASN	ASN	PRO	LEU	V756	M521	E418	T264	E144	SER
PRO	PRO	ILE	ASP	VAL	V756	M521	E418	T264	L142	GLN
ASP	ASP	GLY	HIS	GLU	ARG	F542	M419	Q274	Q145	ASP
GLY	GLY	LEU	LEU	GLY	THR	F542	E419	P275	C146	ASP
LEU	GLY	ASP	ASP	GLY	ASP	M555	L422	E276	V154	ASP
LEU	LEU	GLY	ASP	GLY	ASP	M555	E423	I277	P155	ASP
LEU	LEU	GLY	ASP	GLY	ASP	D586	L422	V278	D156	ALA
LEU	LEU	GLY	ASP	GLY	ASP	D586	E423	V278	F157	GLN
LEU	LEU	GLY	ASP	GLY	ASP	D586	E423	V278	L158	LEU
LEU	LEU	GLY	ASP	GLY	ASP	D586	E423	V278	M159	LYS
LEU	LEU	GLY	ASP	GLY	ASP	D586	E423	V278	H160	GLY
LEU	LEU	GLY	ASP	GLY	ASP	D586	E423	V278	K161	GLN
LEU	LEU	GLY	ASP	GLY	ASP	D586	E423	V278	L162	ARG
LEU	LEU	GLY	ASP	GLY	ASP	D586	E423	V278	T163	ARG
LEU	LEU	GLY	ASP	GLY	ASP	D586	E423	V278	A164	LYS
LEU	LEU	GLY	ASP	GLY	ASP	D586	E423	V278	S165	LYS
LEU	LEU	GLY	ASP	GLY	ASP	D586	E423	V278	D166	ARG
LEU	LEU	GLY	ASP	GLY	ASP	D586	E423	V278	T167	LYS
LEU	LEU	GLY	ASP	GLY	ASP	D586	E423	V278	G168	LYS
LEU	LEU	GLY	ASP	GLY	ASP	D586	E423	V278	K169	LYS
LEU	LEU	GLY	ASP	GLY	ASP	D586	E423	V278	T170	ARG
LEU	LEU	GLY	ASP	GLY	ASP	D586	E423	V278	I179	ARG
LEU	LEU	GLY	ASP	GLY	ASP	D586	E423	V278	K184	ARG
LEU	LEU	GLY	ASP	GLY	ASP	D586	E423	V278	E185	ARG
LEU	LEU	GLY	ASP	GLY	ASP	D586	E423	V278	I186	ARG
LEU	LEU	GLY	ASP	GLY	ASP	D586	E423	V278	A194	ARG
LEU	LEU	GLY	ASP	GLY	ASP	D586	E423	V278	E195	ARG
LEU	LEU	GLY	ASP	GLY	ASP	D586	E423	V278	E196	ARG

- Molecule 1: Isoform 2 of Transient receptor potential cation channel subfamily V member 3, Green fluorescent protein



- Molecule 1: Isoform 2 of Transient receptor potential cation channel subfamily V member 3, Green fluorescent protein





4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	318748	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	TFS KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	60.8	Depositor
Minimum defocus (nm)	500	Depositor
Maximum defocus (nm)	1500	Depositor
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	0.792	Depositor
Minimum map value	-0.508	Depositor
Average map value	0.002	Depositor
Map value standard deviation	0.025	Depositor
Recommended contour level	0.0557	Depositor
Map size (Å)	213.6832, 213.6832, 213.6832	wwPDB
Map dimensions	256, 256, 256	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.8347, 0.8347, 0.8347	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: POV, NA

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	0.25	0/5206	0.54	3/7043 (0.0%)
1	B	0.25	0/5206	0.54	3/7043 (0.0%)
1	C	0.25	0/5206	0.54	3/7043 (0.0%)
1	D	0.25	0/5206	0.54	3/7043 (0.0%)
All	All	0.25	0/20824	0.54	12/28172 (0.0%)

There are no bond length outliers.

The worst 5 of 12 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	D	505	ILE	N-CA-C	-6.08	106.88	112.96
1	B	505	ILE	N-CA-C	-6.07	106.89	112.96
1	A	505	ILE	N-CA-C	-6.05	106.91	112.96
1	C	505	ILE	N-CA-C	-6.05	106.91	112.96
1	B	368	LYS	CA-C-N	5.78	132.58	121.54

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	5094	0	5156	50	0
1	B	5094	0	5156	44	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	C	5094	0	5156	45	0
1	D	5094	0	5156	53	0
2	A	468	0	738	35	0
2	B	364	0	574	16	0
2	C	468	0	738	32	0
2	D	364	0	574	27	0
3	A	3	0	0	0	0
4	A	25	0	0	0	0
4	B	29	0	0	0	0
4	C	25	0	0	0	0
4	D	25	0	0	0	0
All	All	22147	0	23248	222	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.

The worst 5 of 222 close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:753:PRO:O	1:B:213:TYR:OH	2.18	0.62
1:A:454:THR:HG23	2:A:1108:POV:H34	1.82	0.62
1:A:609:ILE:O	1:D:464:ARG:NH1	2.34	0.61
1:B:464:ARG:NH1	1:C:609:ILE:O	2.34	0.61
1:C:464:ARG:NH1	1:D:609:ILE:O	2.34	0.59

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	622/1052 (59%)	580 (93%)	41 (7%)	1 (0%)	43 75

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	B	622/1052 (59%)	580 (93%)	41 (7%)	1 (0%)	43	75
1	C	622/1052 (59%)	580 (93%)	41 (7%)	1 (0%)	43	75
1	D	622/1052 (59%)	580 (93%)	41 (7%)	1 (0%)	43	75
All	All	2488/4208 (59%)	2320 (93%)	164 (7%)	4 (0%)	44	75

All (4) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	C	684	VAL
1	D	684	VAL
1	A	684	VAL
1	B	684	VAL

5.3.2 Protein sidechains ⓘ

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	555/929 (60%)	554 (100%)	1 (0%)	87	91
1	B	555/929 (60%)	554 (100%)	1 (0%)	87	91
1	C	555/929 (60%)	552 (100%)	3 (0%)	81	88
1	D	555/929 (60%)	552 (100%)	3 (0%)	81	88
All	All	2220/3716 (60%)	2212 (100%)	8 (0%)	81	89

5 of 8 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	D	684	VAL
1	D	683	ASN
1	C	684	VAL
1	C	683	ASN
1	D	347	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 15

such sidechains are listed below:

Mol	Chain	Res	Type
1	C	150	HIS
1	D	483	GLN
1	C	178	ASN
1	D	745	HIS
1	C	745	HIS

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 35 ligands modelled in this entry, 3 are monoatomic - leaving 32 for Mogul analysis.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\# Z > 2$	Counts	RMSZ	$\# Z > 2$
2	POV	C	1106	-	51,51,51	0.32	0	57,59,59	0.40	0
2	POV	C	1103	-	51,51,51	0.33	0	57,59,59	0.45	0
2	POV	B	1104	-	51,51,51	0.31	0	57,59,59	0.43	0
2	POV	C	1104	-	51,51,51	0.32	0	57,59,59	0.45	0
2	POV	C	1109	-	51,51,51	0.31	0	57,59,59	0.37	0
2	POV	A	1105	-	51,51,51	0.33	0	57,59,59	0.39	0
2	POV	A	1103	-	51,51,51	0.32	0	57,59,59	0.47	0
2	POV	B	1107	-	51,51,51	0.31	0	57,59,59	0.38	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
2	POV	D	1101	-	51,51,51	0.31	0	57,59,59	0.37	0
2	POV	D	1104	-	51,51,51	0.34	0	57,59,59	0.45	0
2	POV	A	1104	-	51,51,51	0.31	0	57,59,59	0.41	0
2	POV	B	1101	-	51,51,51	0.30	0	57,59,59	0.41	0
2	POV	D	1102	-	51,51,51	0.29	0	57,59,59	0.40	0
2	POV	A	1102	-	51,51,51	0.34	0	57,59,59	0.46	0
2	POV	A	1109	-	51,51,51	0.30	0	57,59,59	0.40	0
2	POV	C	1105	-	51,51,51	0.32	0	57,59,59	0.42	0
2	POV	D	1107	-	51,51,51	0.34	0	57,59,59	0.56	1 (1%)
2	POV	B	1105	-	51,51,51	0.32	0	57,59,59	0.39	0
2	POV	A	1107	-	51,51,51	0.32	0	57,59,59	0.44	0
2	POV	A	1106	-	51,51,51	0.33	0	57,59,59	0.56	1 (1%)
2	POV	B	1103	-	51,51,51	0.33	0	57,59,59	0.44	0
2	POV	D	1105	-	51,51,51	0.32	0	57,59,59	0.41	0
2	POV	C	1107	-	51,51,51	0.34	0	57,59,59	0.56	1 (1%)
2	POV	C	1108	-	51,51,51	0.32	0	57,59,59	0.45	0
2	POV	D	1106	-	51,51,51	0.33	0	57,59,59	0.40	0
2	POV	B	1102	-	51,51,51	0.28	0	57,59,59	0.27	0
2	POV	C	1101	-	51,51,51	0.29	0	57,59,59	0.40	0
2	POV	D	1103	-	51,51,51	0.28	0	57,59,59	0.28	0
2	POV	A	1108	-	51,51,51	0.31	0	57,59,59	0.37	0
2	POV	A	1101	-	51,51,51	0.28	0	57,59,59	0.28	0
2	POV	C	1102	-	51,51,51	0.28	0	57,59,59	0.27	0
2	POV	B	1106	-	51,51,51	0.33	0	57,59,59	0.56	1 (1%)

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	POV	C	1106	-	-	11/55/55/55	-
2	POV	C	1103	-	-	21/55/55/55	-
2	POV	B	1104	-	-	20/55/55/55	-
2	POV	C	1104	-	-	14/55/55/55	-
2	POV	C	1109	-	-	19/55/55/55	-
2	POV	A	1105	-	-	12/55/55/55	-
2	POV	A	1103	-	-	17/55/55/55	-
2	POV	B	1107	-	-	21/55/55/55	-
2	POV	D	1101	-	-	19/55/55/55	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	POV	D	1104	-	-	23/55/55/55	-
2	POV	A	1104	-	-	20/55/55/55	-
2	POV	B	1101	-	-	15/55/55/55	-
2	POV	D	1102	-	-	14/55/55/55	-
2	POV	A	1102	-	-	23/55/55/55	-
2	POV	A	1109	-	-	14/55/55/55	-
2	POV	C	1105	-	-	20/55/55/55	-
2	POV	D	1107	-	-	21/55/55/55	-
2	POV	B	1105	-	-	11/55/55/55	-
2	POV	A	1107	-	-	14/55/55/55	-
2	POV	A	1106	-	-	22/55/55/55	-
2	POV	B	1103	-	-	25/55/55/55	-
2	POV	D	1105	-	-	20/55/55/55	-
2	POV	C	1107	-	-	22/55/55/55	-
2	POV	C	1108	-	-	14/55/55/55	-
2	POV	D	1106	-	-	10/55/55/55	-
2	POV	B	1102	-	-	15/55/55/55	-
2	POV	C	1101	-	-	14/55/55/55	-
2	POV	D	1103	-	-	16/55/55/55	-
2	POV	A	1108	-	-	15/55/55/55	-
2	POV	A	1101	-	-	16/55/55/55	-
2	POV	C	1102	-	-	16/55/55/55	-
2	POV	B	1106	-	-	23/55/55/55	-

There are no bond length outliers.

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	1106	POV	C2-O21-C21	2.65	124.14	117.80
2	D	1107	POV	C2-O21-C21	2.65	124.14	117.80
2	C	1107	POV	C2-O21-C21	2.63	124.08	117.80
2	B	1106	POV	C2-O21-C21	2.63	124.08	117.80

There are no chirality outliers.

5 of 557 torsion outliers are listed below:

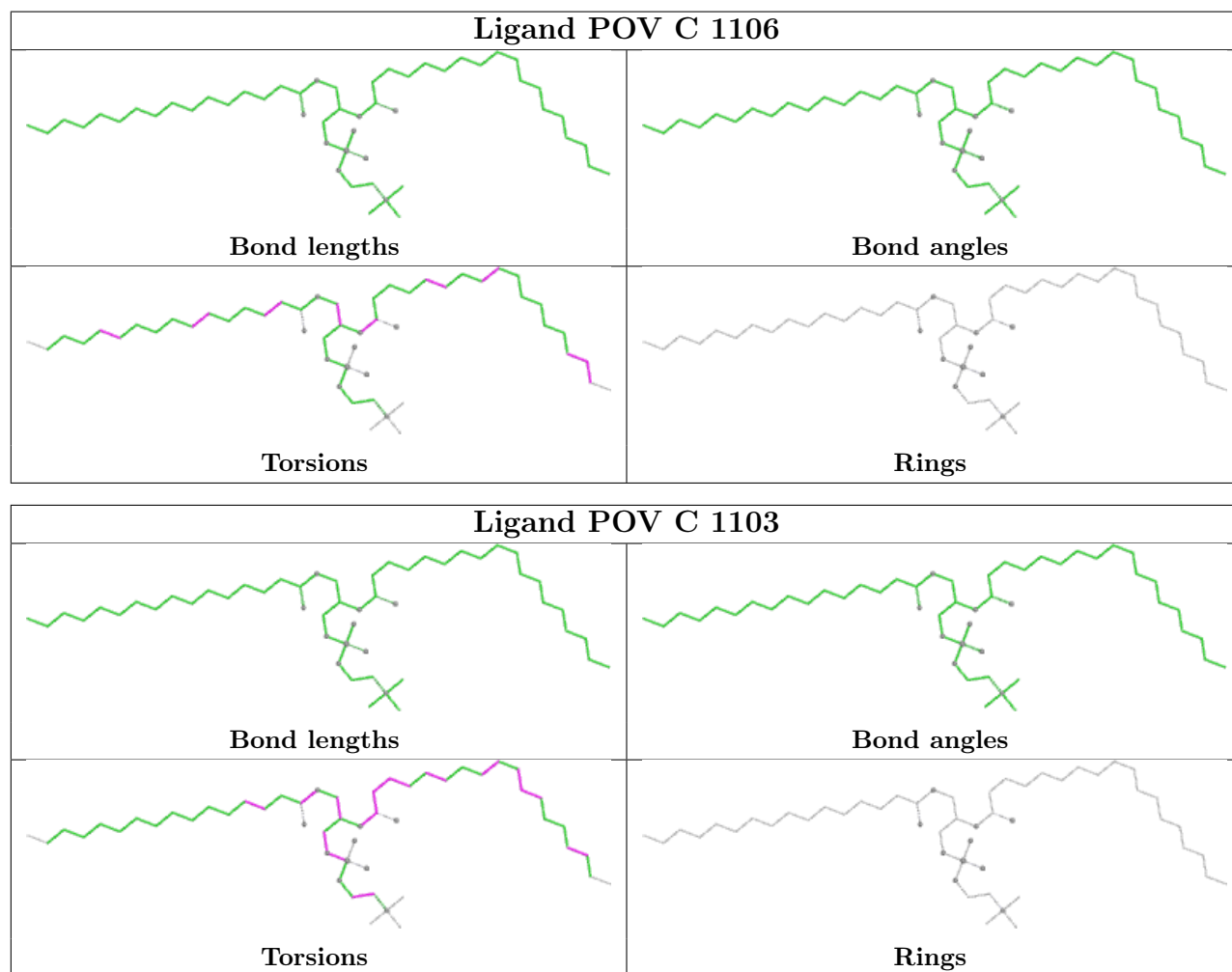
Mol	Chain	Res	Type	Atoms
2	A	1101	POV	C1-O11-P-O12
2	A	1101	POV	C1-O11-P-O13
2	A	1101	POV	C11-O12-P-O11
2	A	1102	POV	C1-O11-P-O12
2	A	1102	POV	C1-O11-P-O13

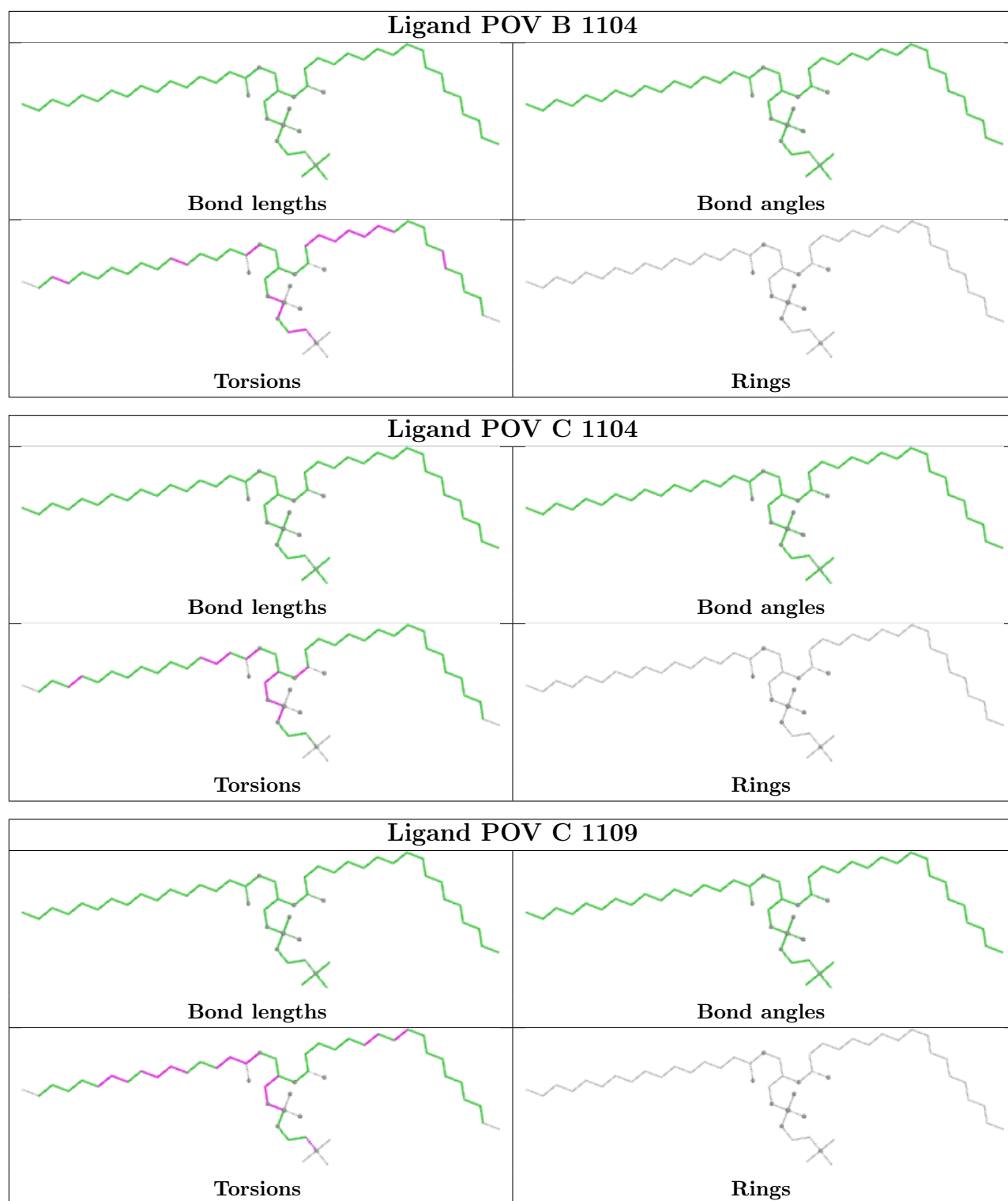
There are no ring outliers.

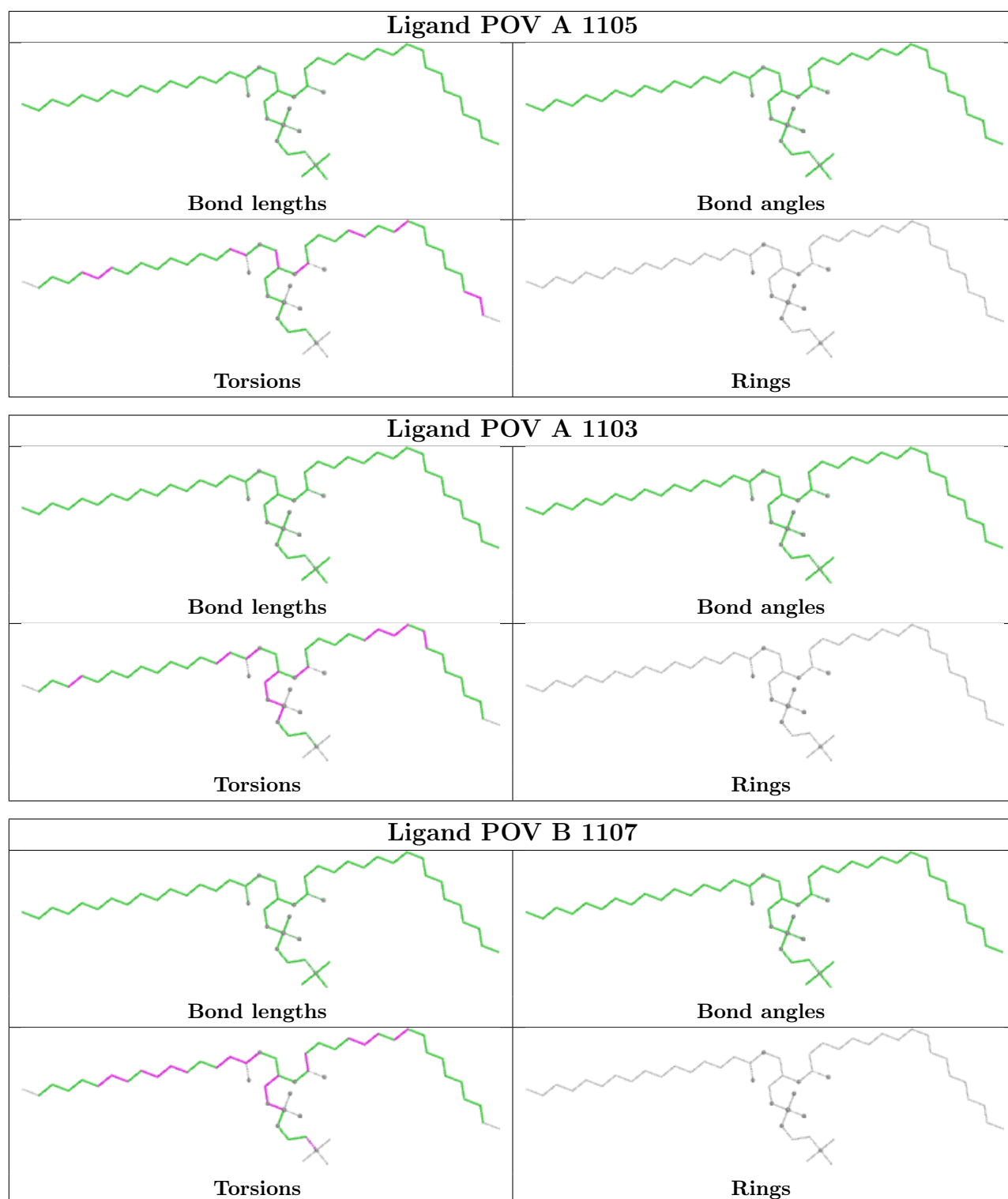
32 monomers are involved in 104 short contacts:

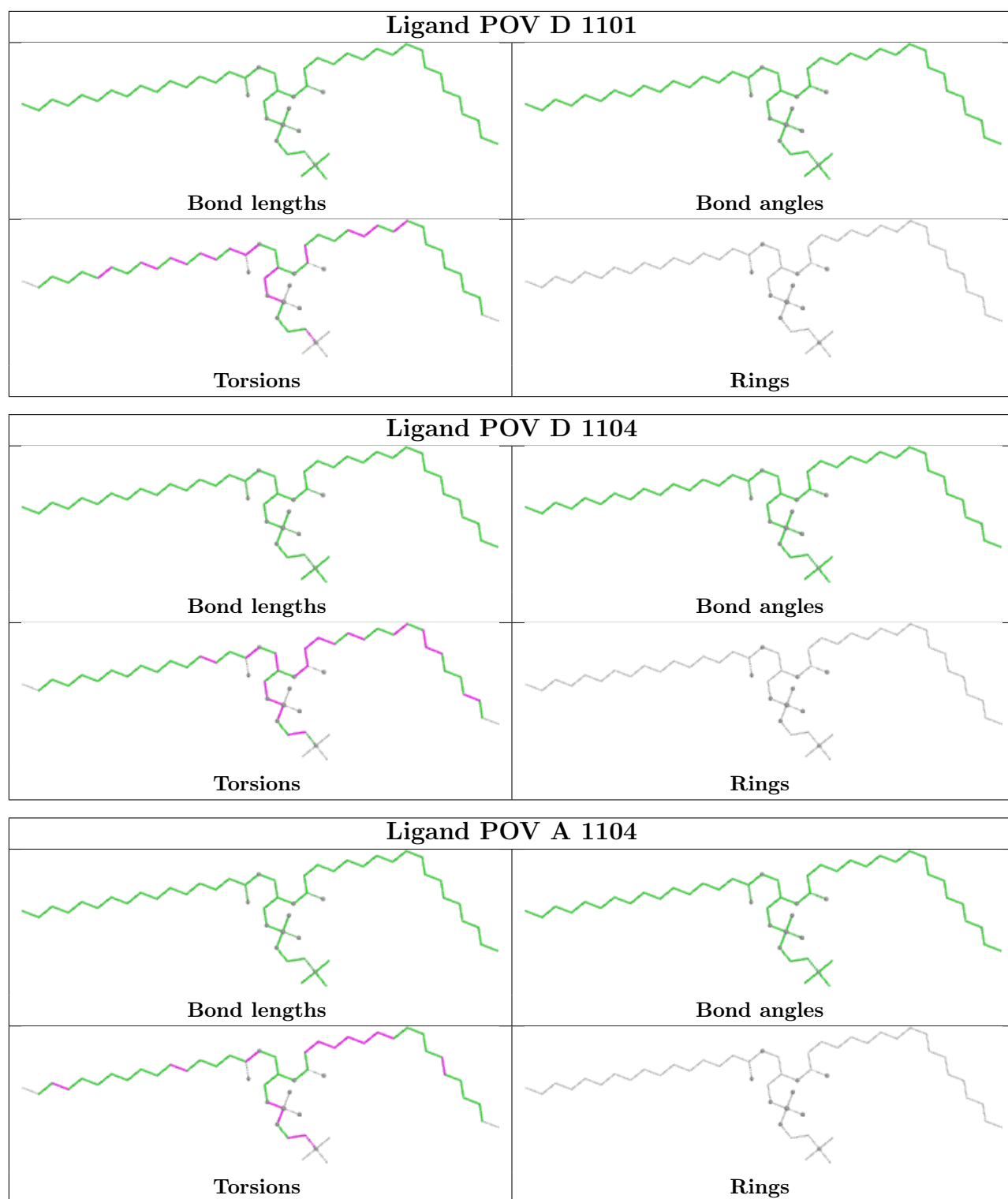
Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	C	1106	POV	3	0
2	C	1103	POV	1	0
2	B	1104	POV	3	0
2	C	1104	POV	4	0
2	C	1109	POV	4	0
2	A	1105	POV	6	0
2	A	1103	POV	6	0
2	B	1107	POV	1	0
2	D	1101	POV	6	0
2	D	1104	POV	1	0
2	A	1104	POV	6	0
2	B	1101	POV	4	0
2	D	1102	POV	3	0
2	A	1102	POV	2	0
2	A	1109	POV	3	0
2	C	1105	POV	5	0
2	D	1107	POV	4	0
2	B	1105	POV	2	0
2	A	1107	POV	3	0
2	A	1106	POV	3	0
2	B	1103	POV	1	0
2	D	1105	POV	6	0
2	C	1107	POV	4	0
2	C	1108	POV	5	0
2	D	1106	POV	4	0
2	B	1102	POV	4	0
2	C	1101	POV	3	0
2	D	1103	POV	4	0
2	A	1108	POV	4	0
2	A	1101	POV	5	0
2	C	1102	POV	5	0
2	B	1106	POV	1	0

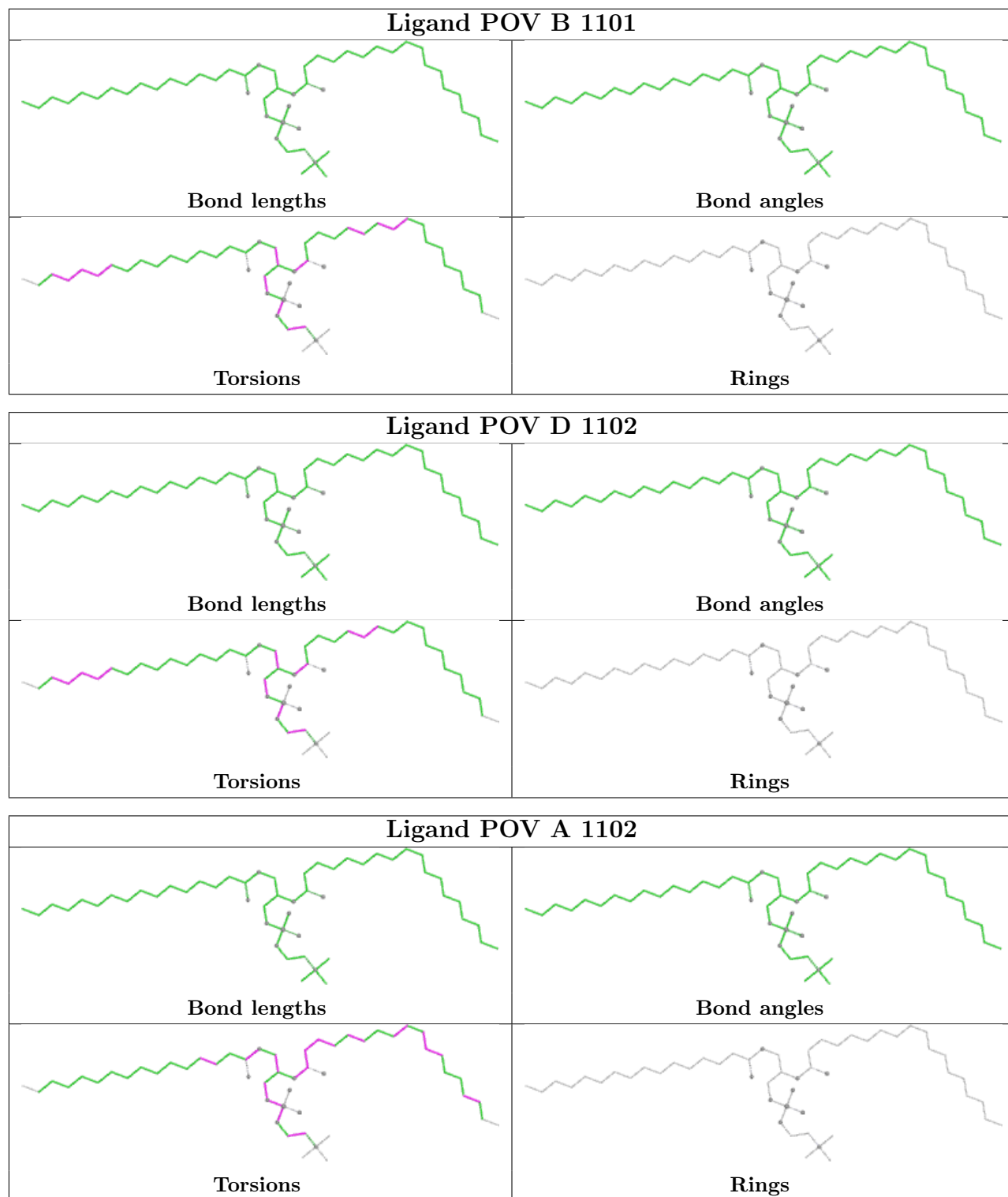
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included.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

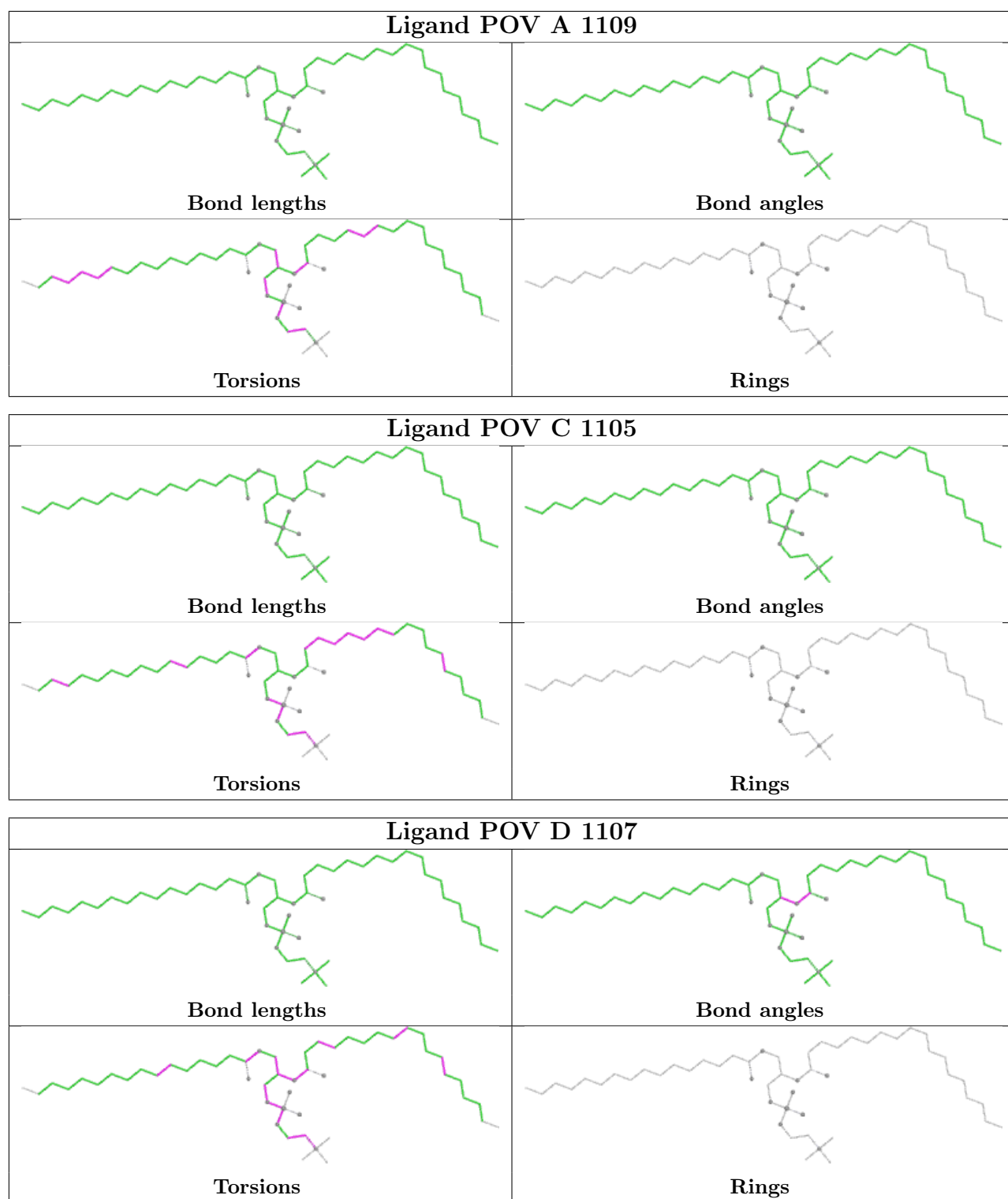


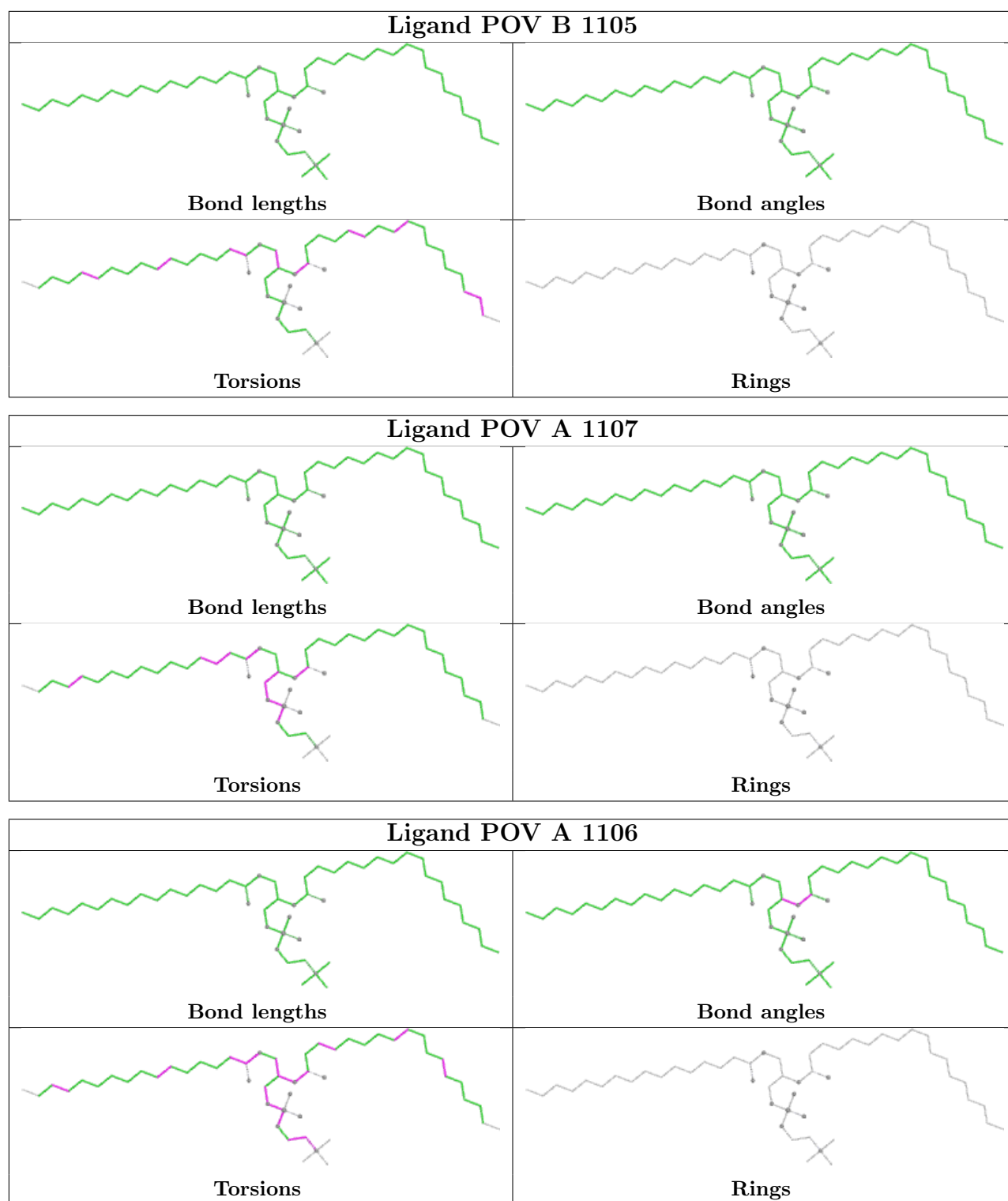


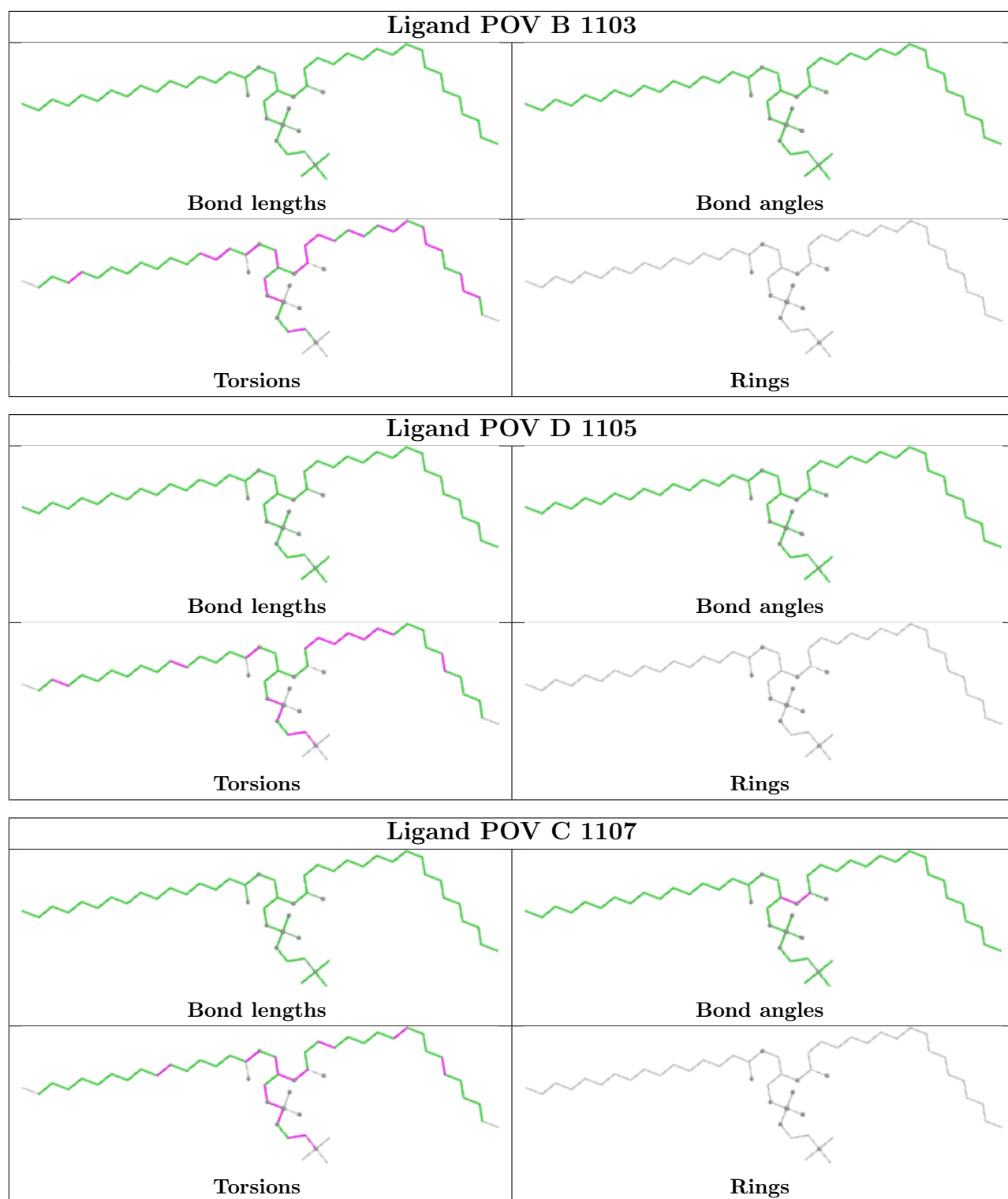


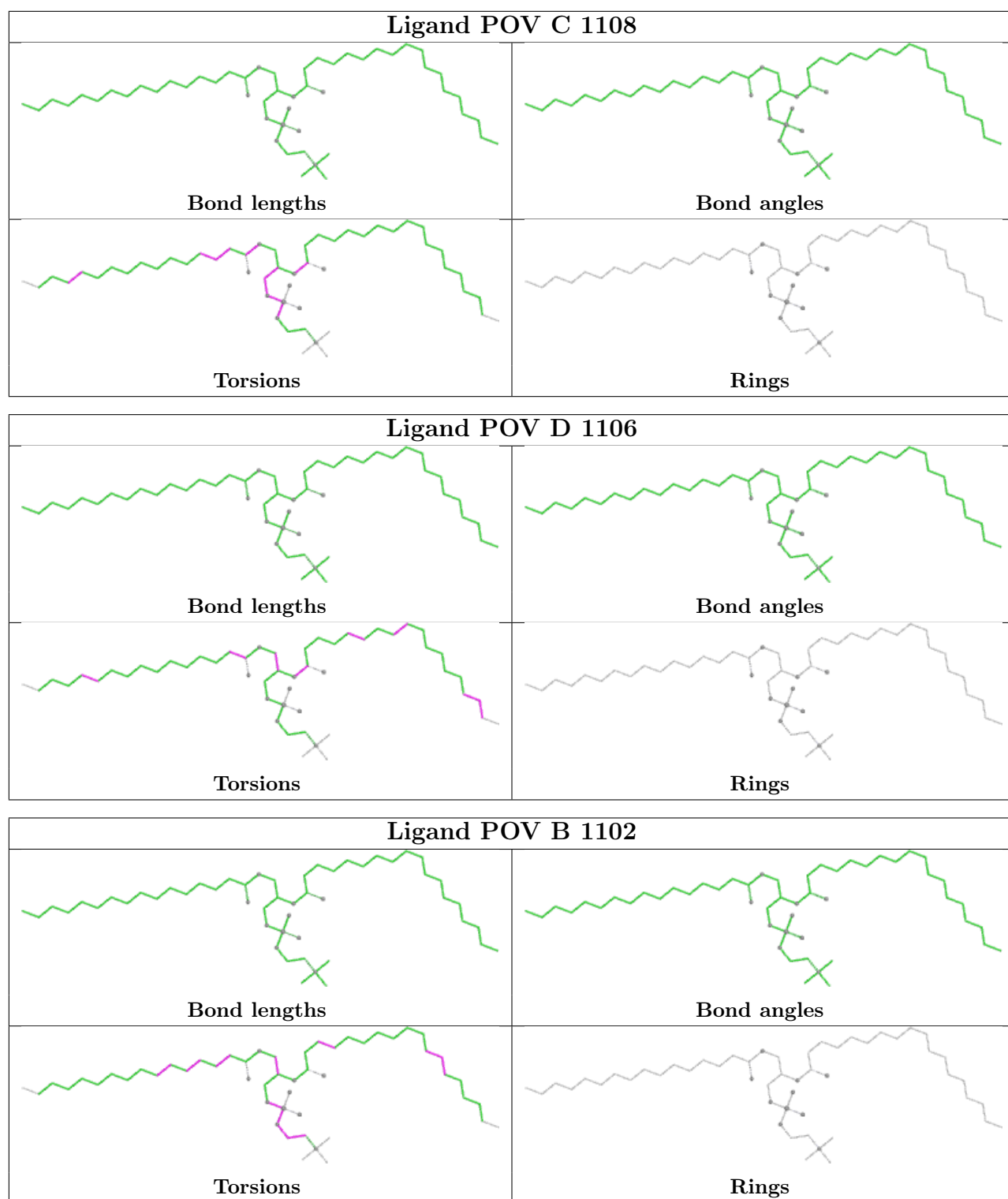


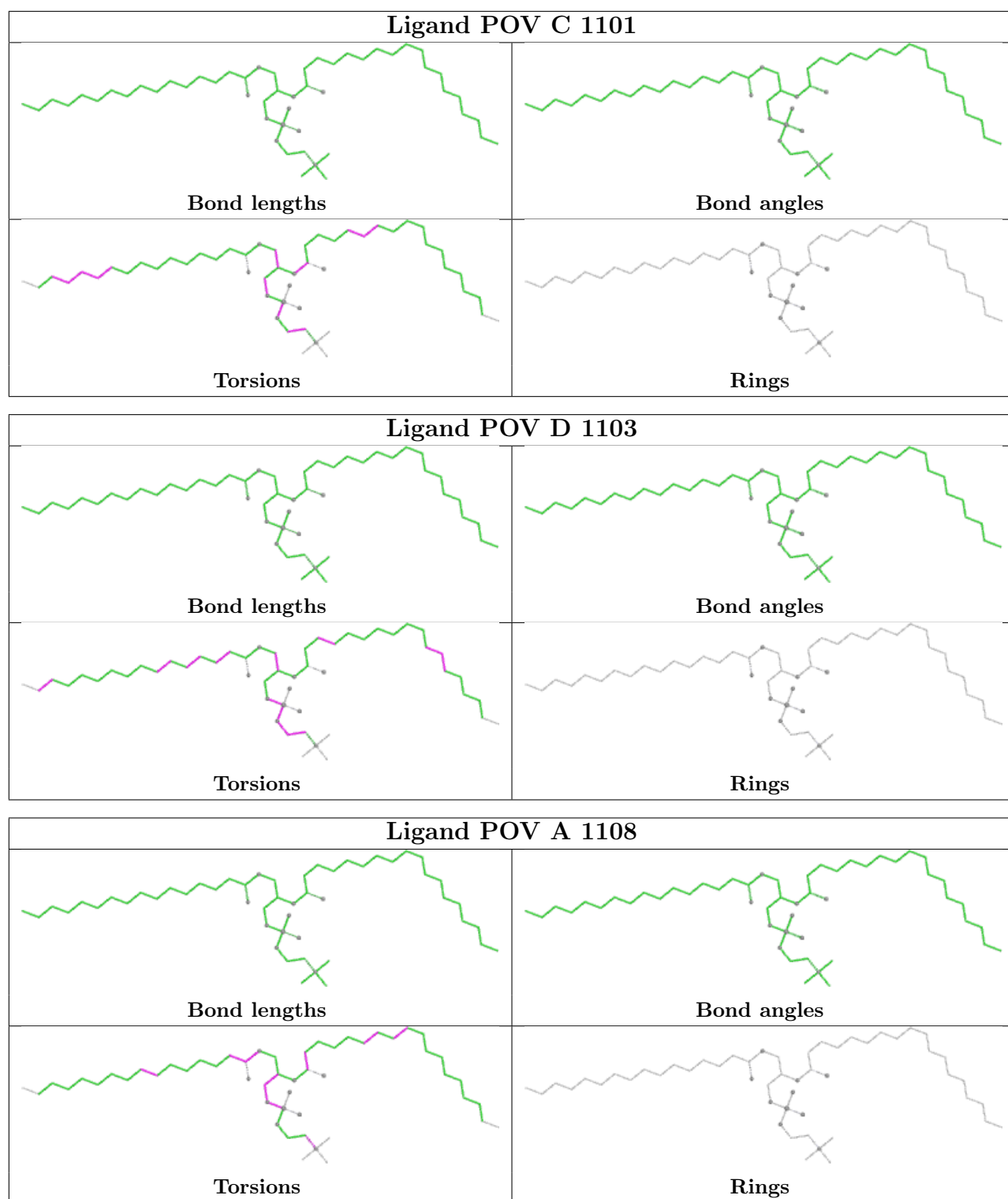


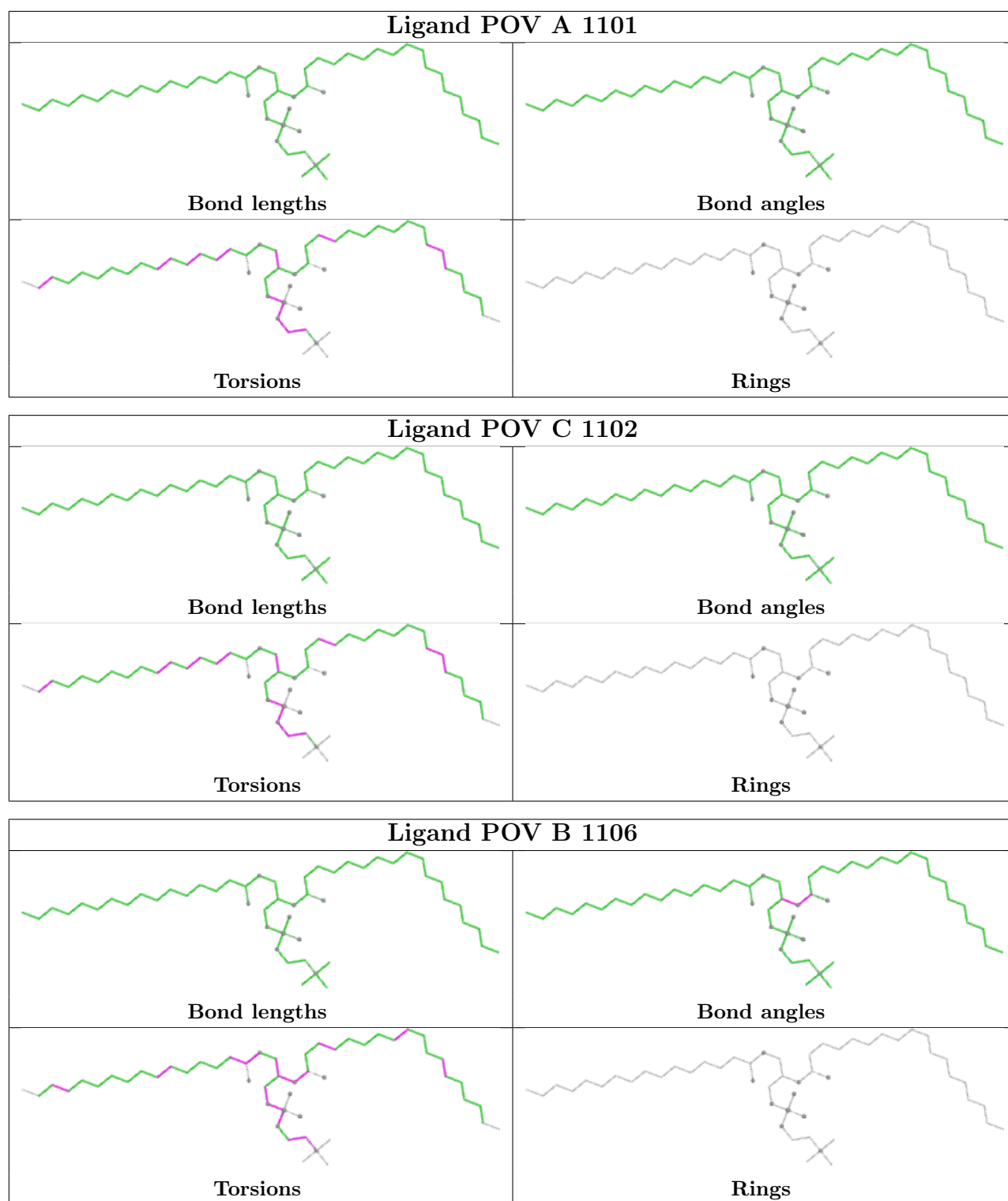












5.7 Other polymers [\(i\)](#)

There are no such residues in this entry.

5.8 Polymer linkage issues ⓘ

There are no chain breaks in this entry.

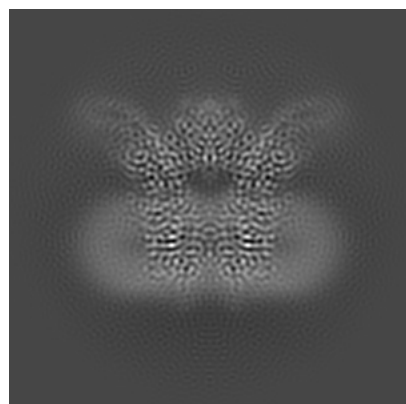
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-77138. These allow visual inspection of the internal detail of the map and identification of artifacts.

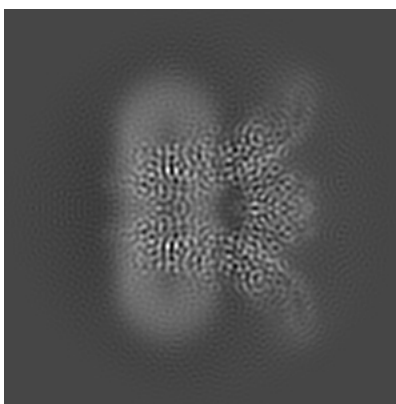
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

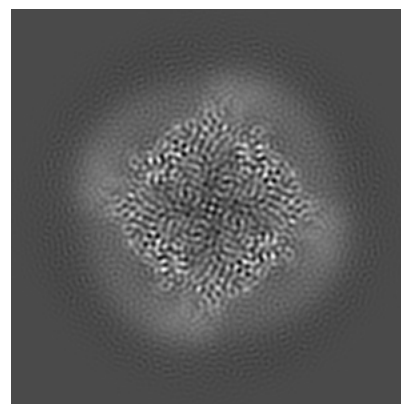
6.1.1 Primary map



X

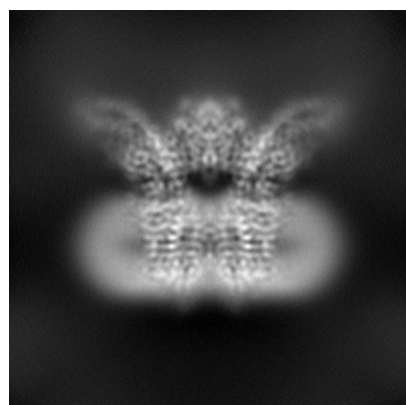


Y

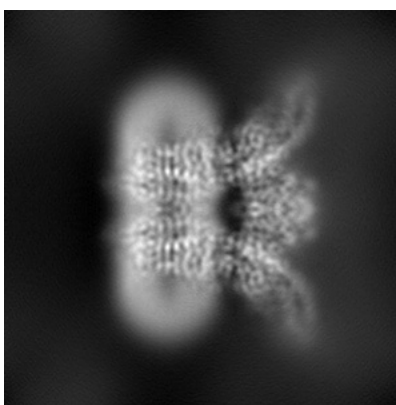


Z

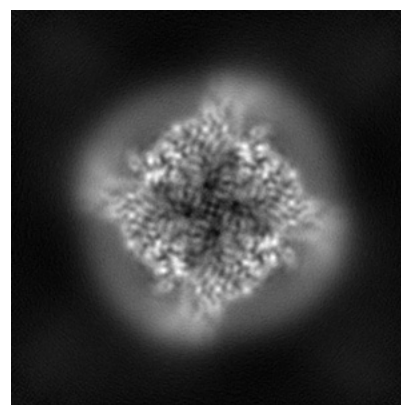
6.1.2 Raw map



X



Y

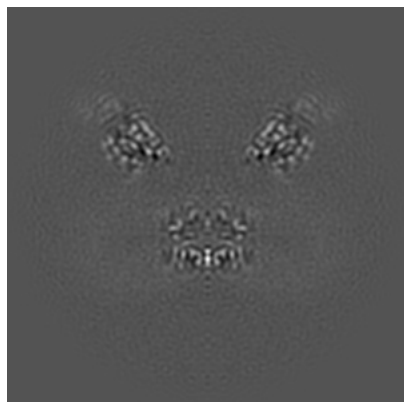


Z

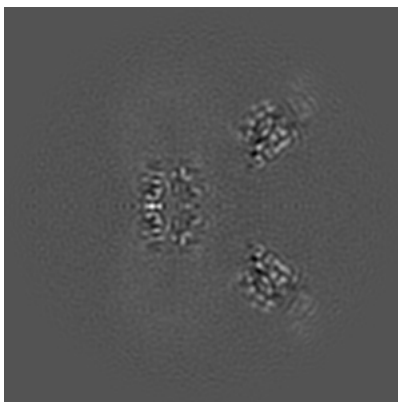
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

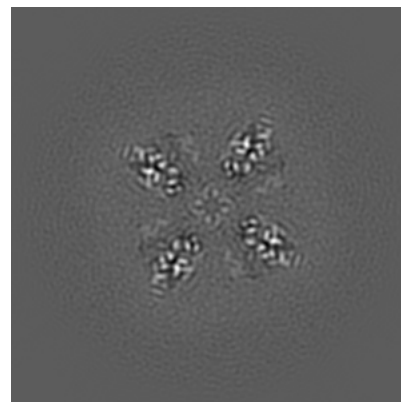
6.2.1 Primary map



X Index: 128

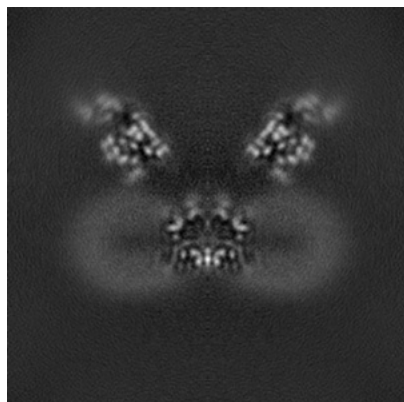


Y Index: 128

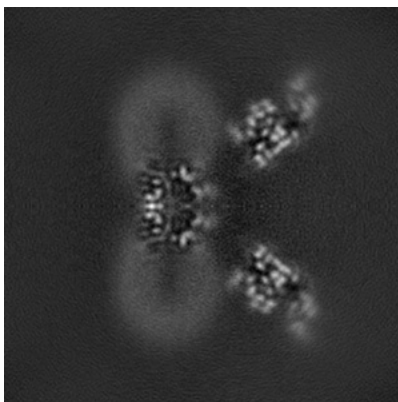


Z Index: 128

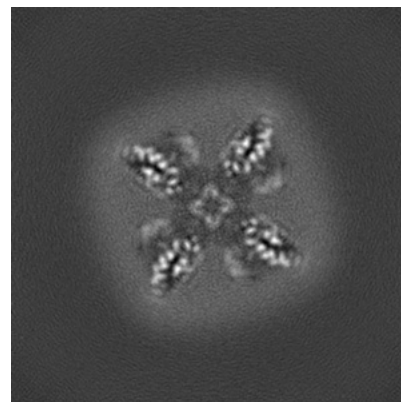
6.2.2 Raw map



X Index: 128



Y Index: 128

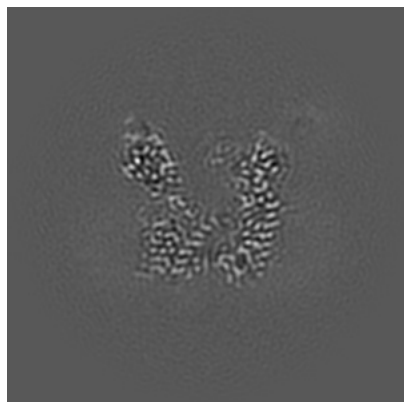


Z Index: 128

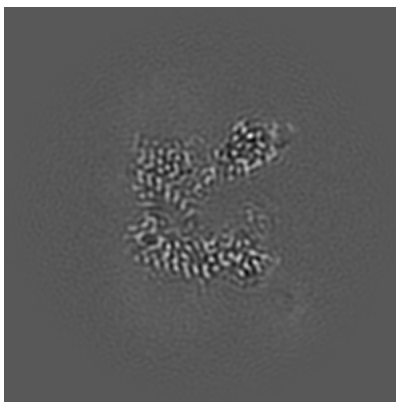
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

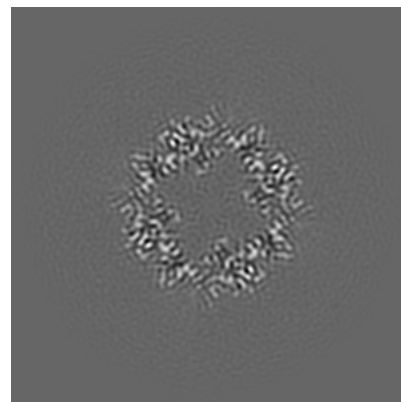
6.3.1 Primary map



X Index: 151

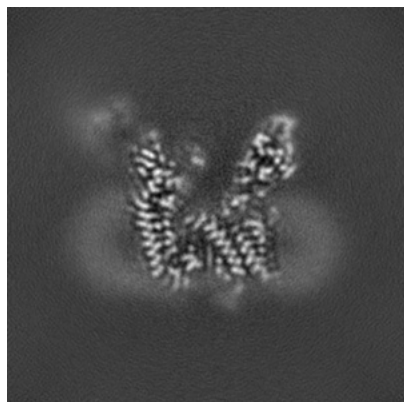


Y Index: 151

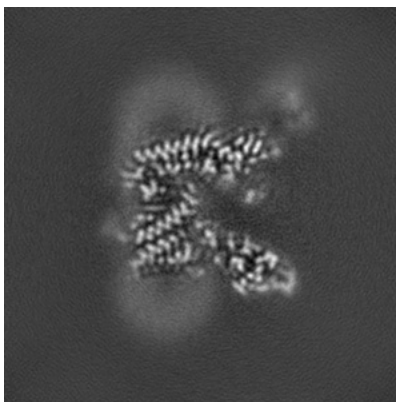


Z Index: 158

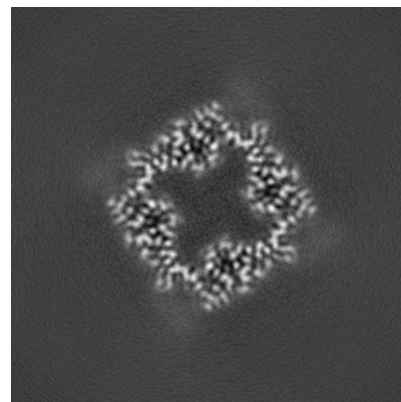
6.3.2 Raw map



X Index: 106



Y Index: 106

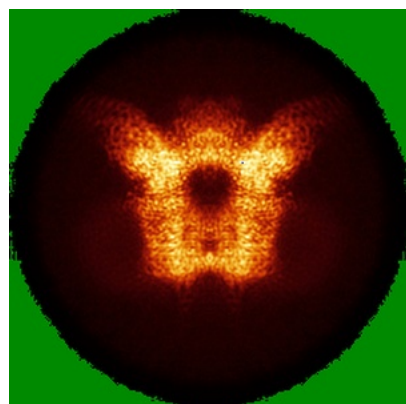


Z Index: 163

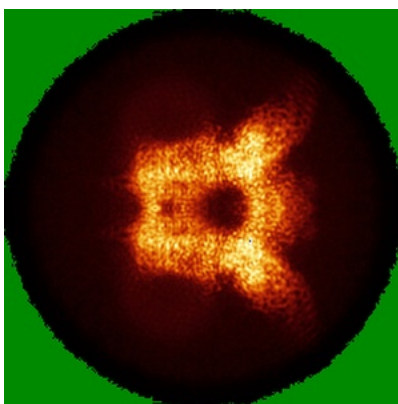
The images above show the largest variance slices of the map in three orthogonal directions.

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

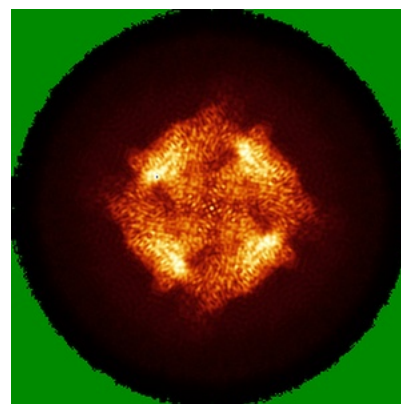
6.4.1 Primary map



X

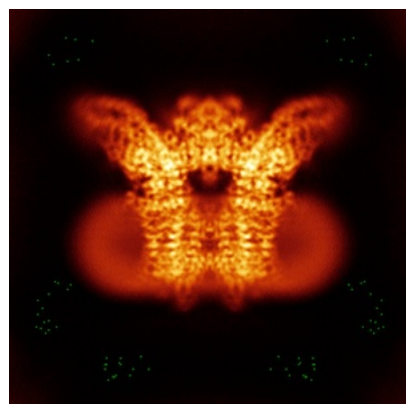


Y

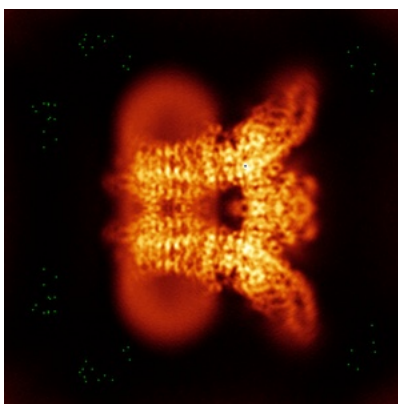


Z

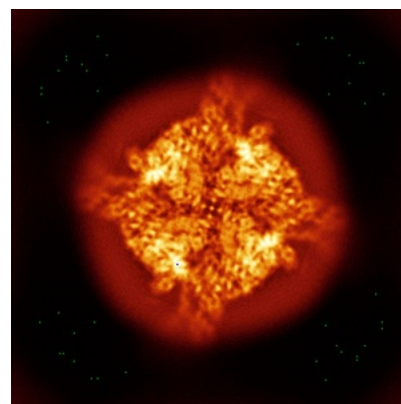
6.4.2 Raw map



X



Y

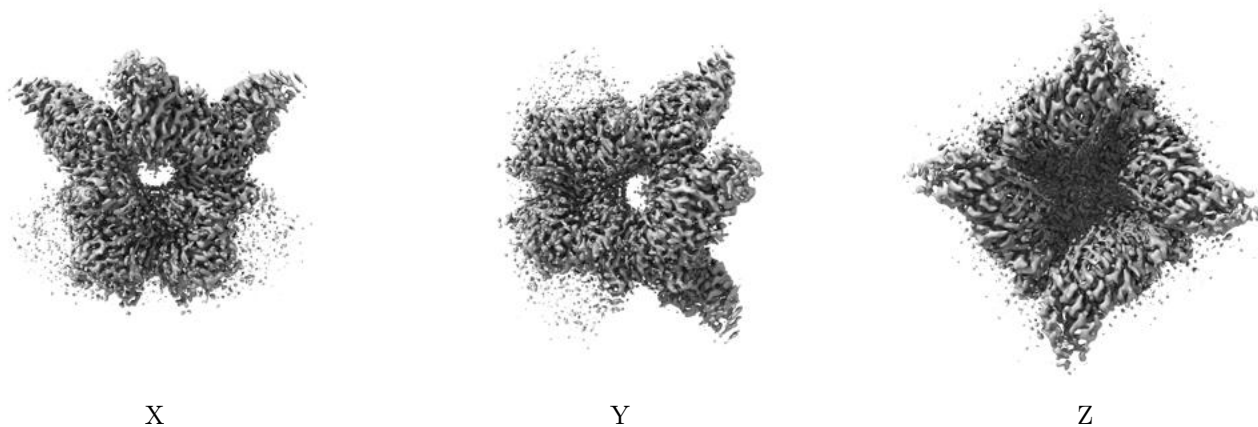


Z

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

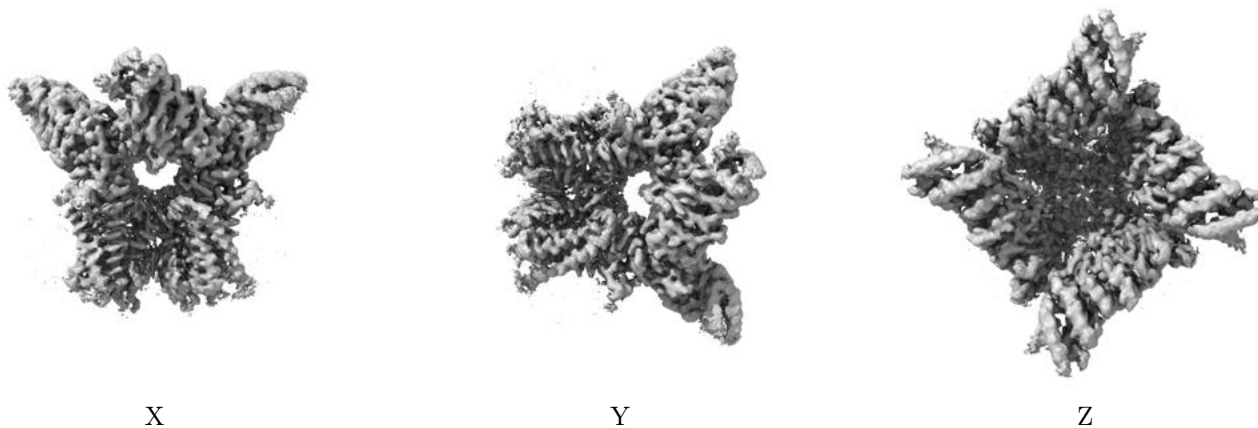
6.5 Orthogonal surface views [i](#)

6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.0557. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.5.2 Raw map



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

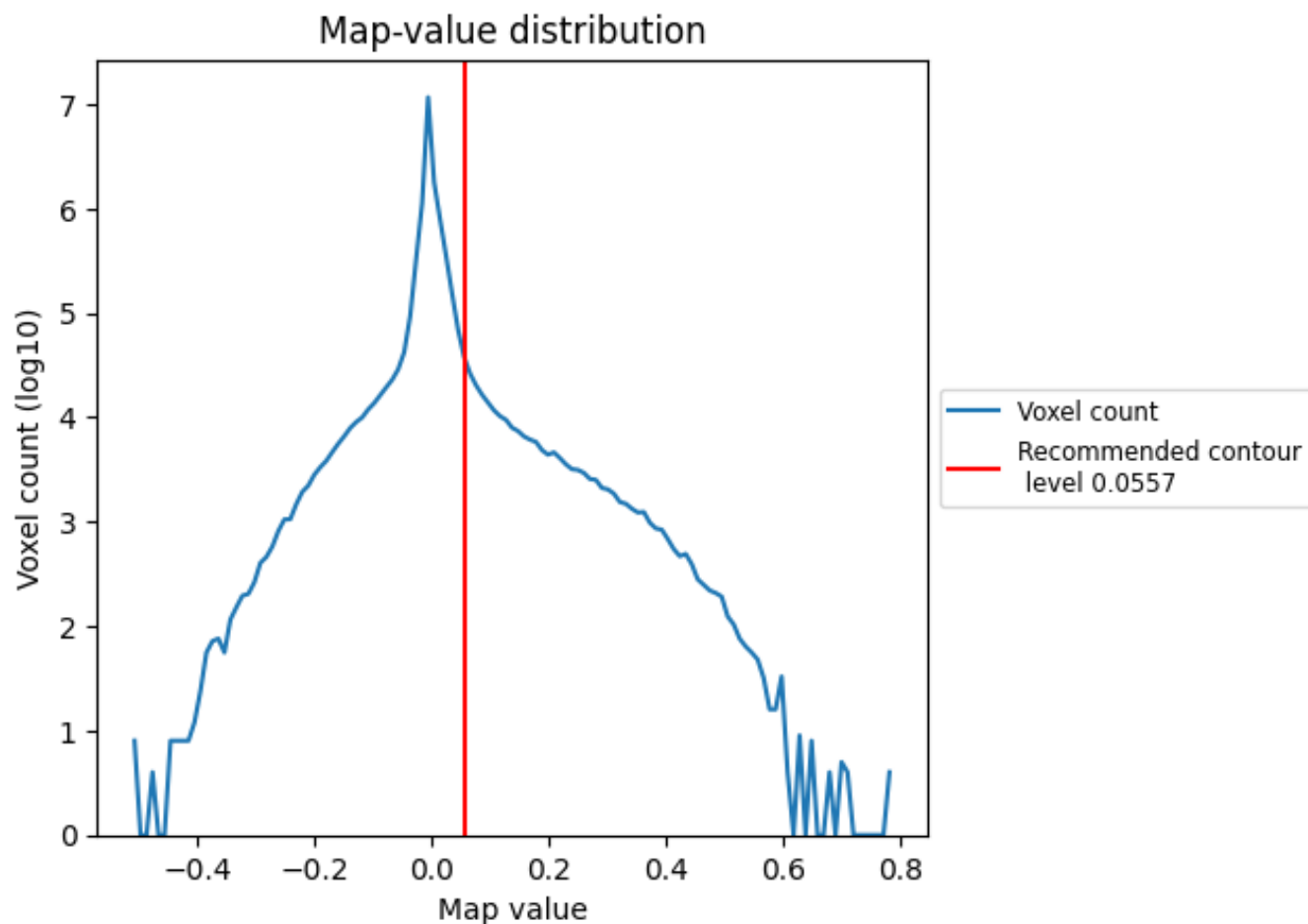
6.6 Mask visualisation [i](#)

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

7 Map analysis [i](#)

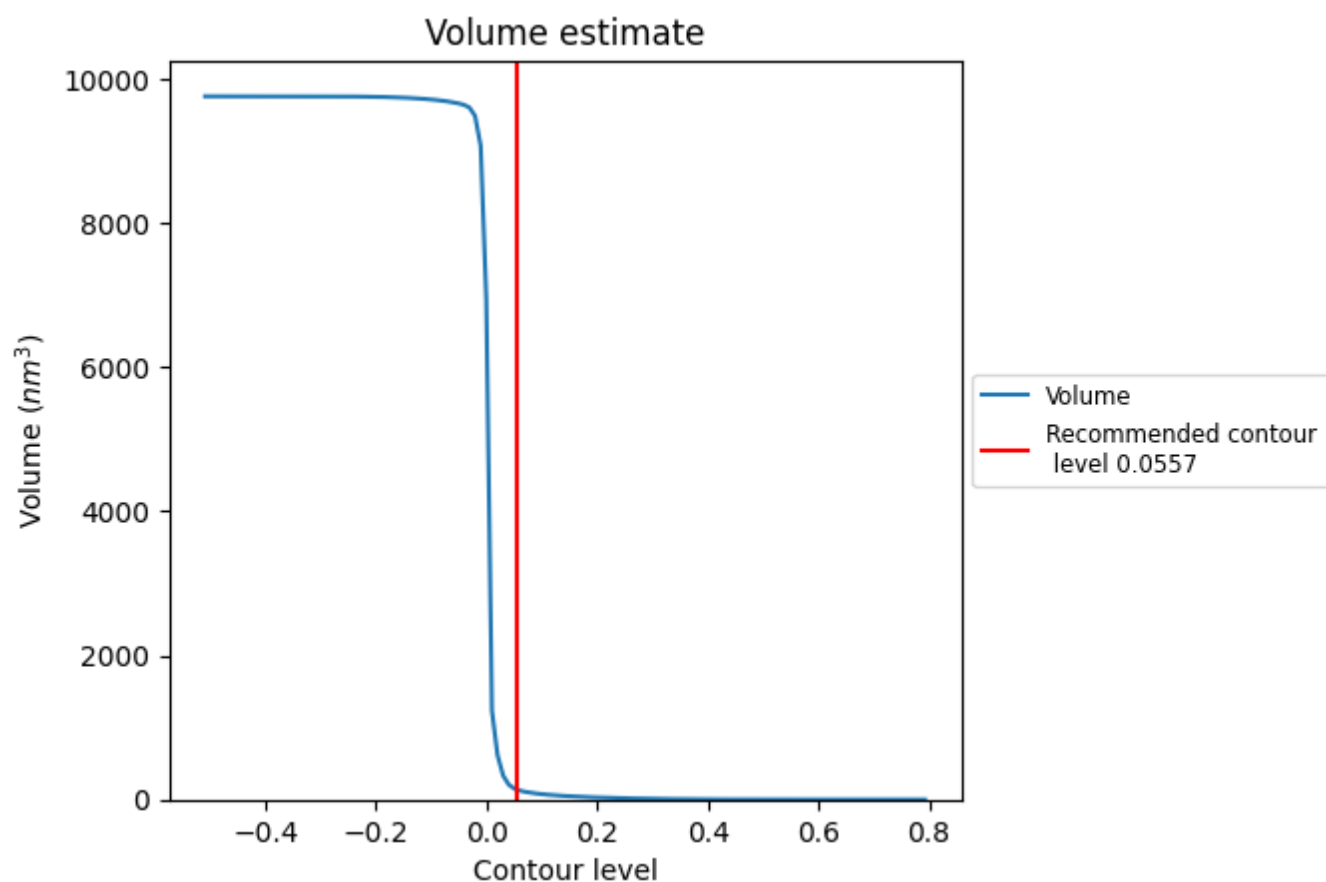
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution [i](#)



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

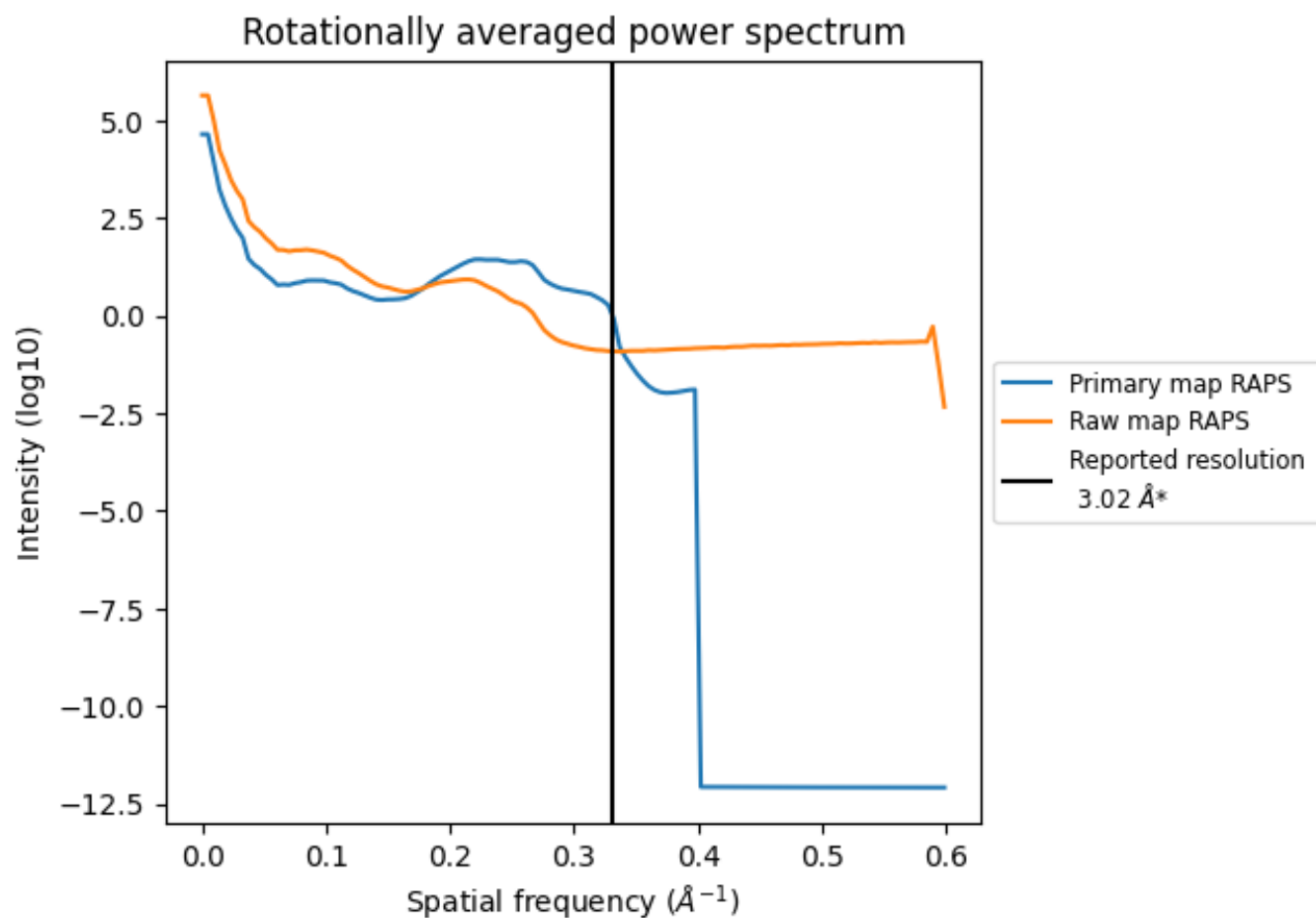
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 137 nm³; this corresponds to an approximate mass of 124 kDa.

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

7.3 Rotationally averaged power spectrum ⓘ

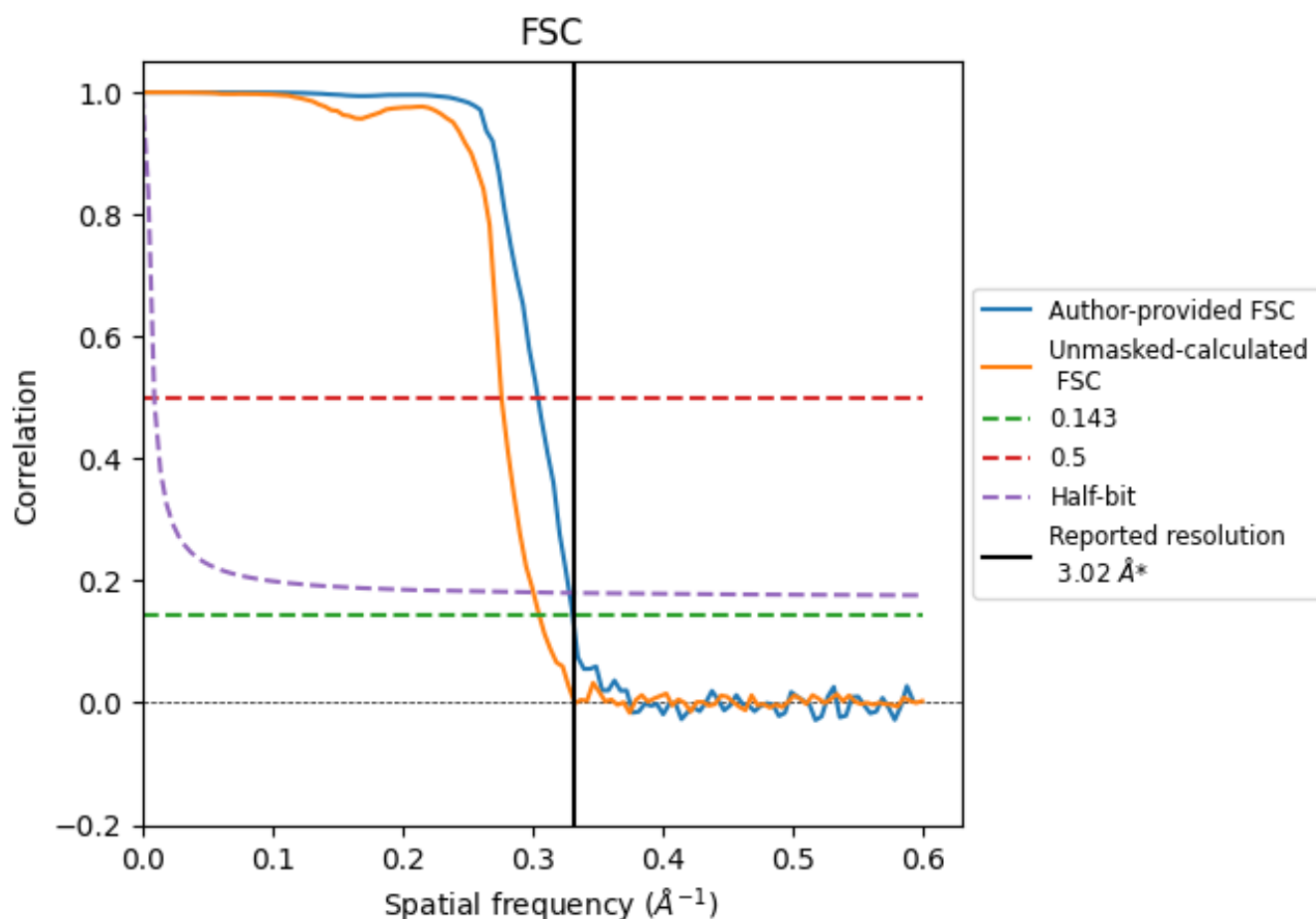


*Reported resolution corresponds to spatial frequency of $0.331 \text{ \AA}^{-1}$

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 0.331 Å⁻¹

8.2 Resolution estimates [i](#)

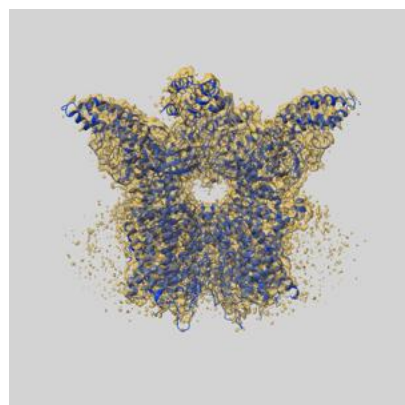
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.02	-	-
Author-provided FSC curve	3.02	3.29	3.05
Unmasked-calculated*	3.28	3.62	3.33

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

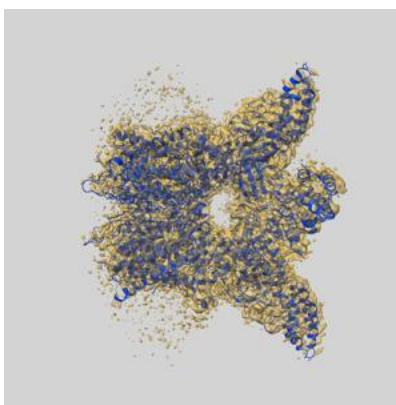
9 Map-model fit [i](#)

This section contains information regarding the fit between EMDB map EMD-77138 and PDB model 13LN. Per-residue inclusion information can be found in section [3](#) on page [9](#).

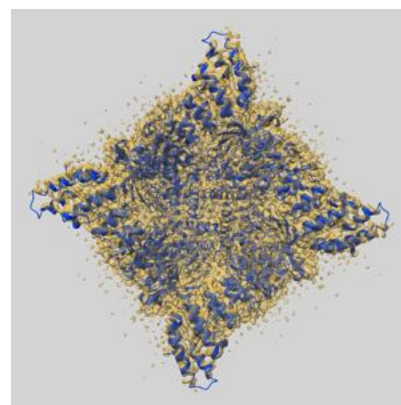
9.1 Map-model overlay [i](#)



X



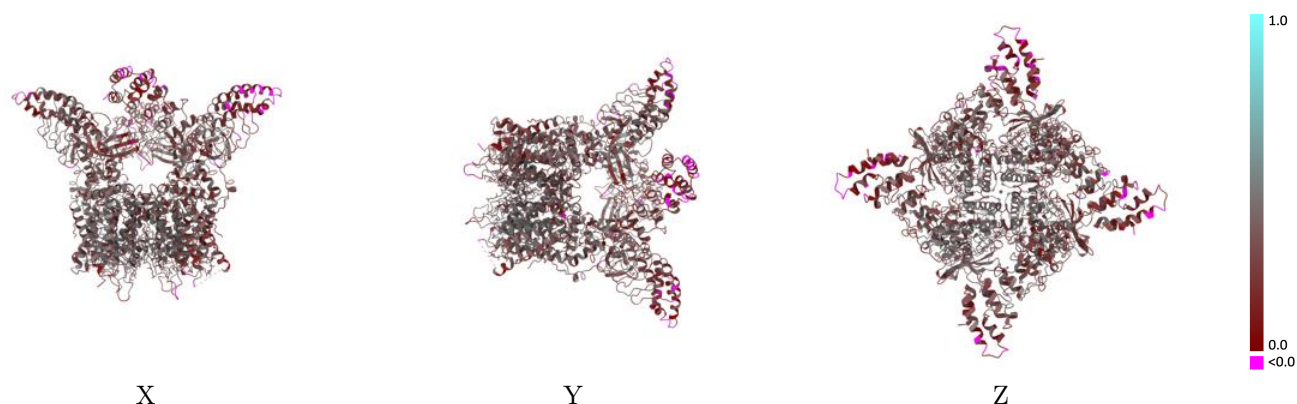
Y



Z

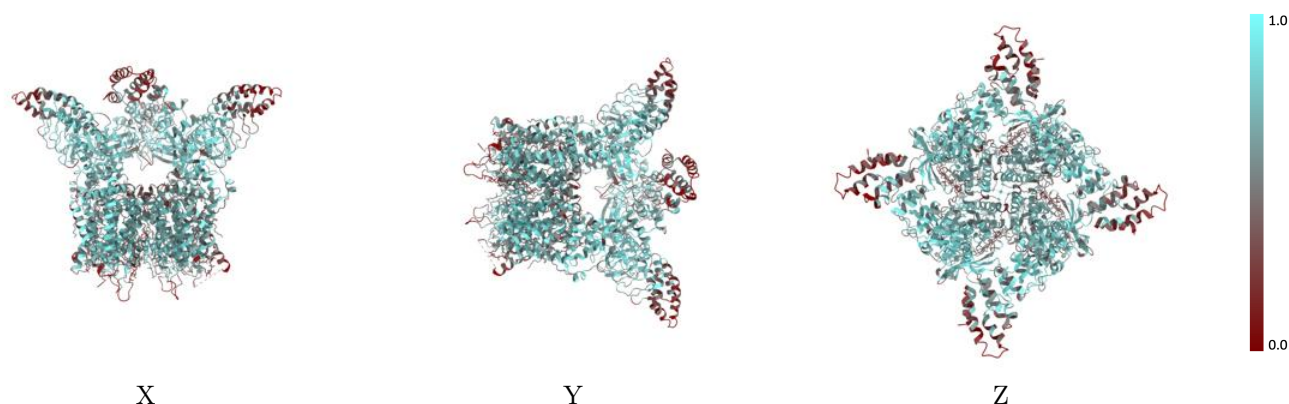
The images above show the 3D surface view of the map at the recommended contour level 0.0557 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



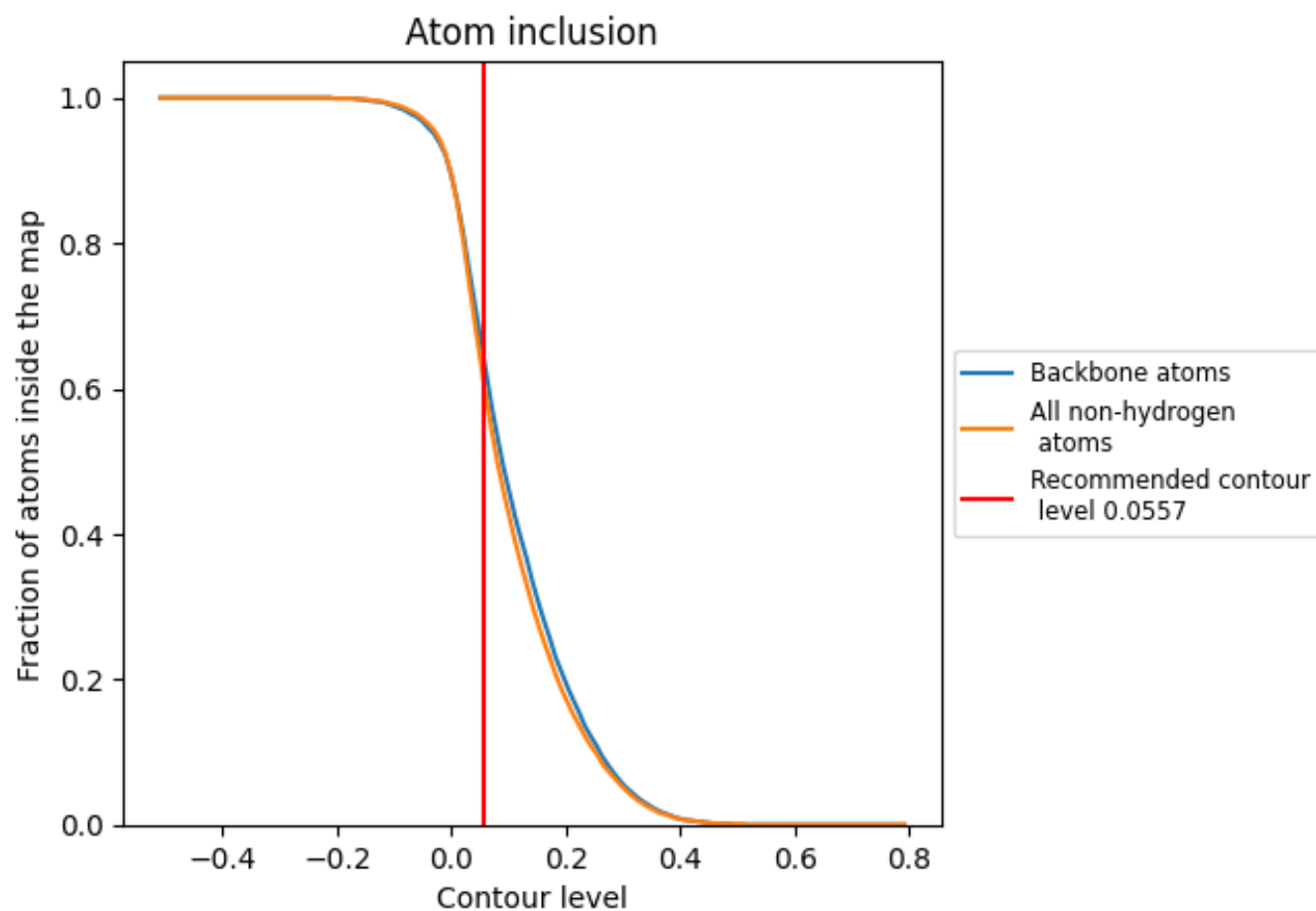
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.0557).

9.4 Atom inclusion [i](#)



At the recommended contour level, 65% of all backbone atoms, 61% 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 (0.0557) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.6140	0.3160
A	0.6030	0.3060
B	0.6070	0.2970
C	0.6340	0.3340
D	0.6260	0.3270

