



# wwPDB EM Validation Summary Report

Oct 12, 2024 – 08:35 PM EDT

PDB ID : 6UZY  
EMDB ID : EMD-20964  
Title : Cryo-EM structure of *Xenopus tropicalis* pannexin 1  
Authors : Deng, Z.; He, Z.; Yuan, P.  
Deposited on : 2019-11-15  
Resolution : 3.38 Å (reported)

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<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>.

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The following versions of software and data (see [references](#) ) were used in the production of this report:

EMDB validation analysis : 0.0.1.dev113  
Mogul : 2022.3.0, CSD as543be (2022)  
MolProbity : 4.02b-467  
buster-report : 1.1.7 (2018)  
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)  
MapQ : 1.9.13  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.39

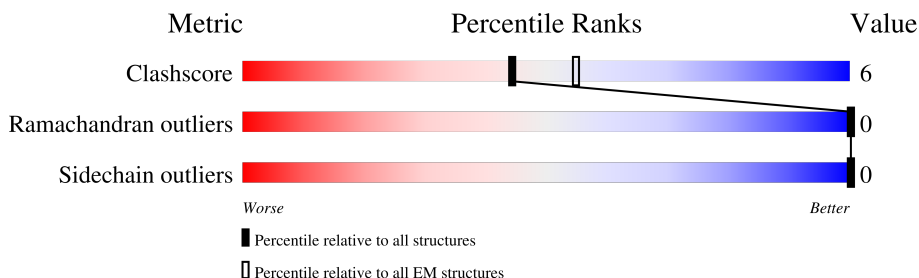
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*ELECTRON MICROSCOPY*

The reported resolution of this entry is 3.38 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	210492	15764
Ramachandran outliers	207382	16835
Sidechain outliers	206894	16415

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  $\geq 3$ , 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	437	52% 11% 36%
1	B	437	52% 11% 36%
1	C	437	52% 11% 36%
1	D	437	52% 12% 36%
1	E	437	53% 11% 36%
1	F	437	52% 11% 36%
1	G	437	52% 12% 36%

## 2 Entry composition i

There are 3 unique types of molecules in this entry. The entry contains 16212 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 Pannexin.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	278	2260	1517	349	383	11	0	0
1	B	278	2260	1517	349	383	11	0	0
1	C	278	2260	1517	349	383	11	0	0
1	D	278	2260	1517	349	383	11	0	0
1	E	278	2260	1517	349	383	11	0	0
1	F	278	2260	1517	349	383	11	0	0
1	G	278	2260	1517	349	383	11	0	0

There are 63 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	429	SER	-	expression tag	UNP B3DLA5
A	430	ASN	-	expression tag	UNP B3DLA5
A	431	SER	-	expression tag	UNP B3DLA5
A	432	LEU	-	expression tag	UNP B3DLA5
A	433	GLU	-	expression tag	UNP B3DLA5
A	434	VAL	-	expression tag	UNP B3DLA5
A	435	LEU	-	expression tag	UNP B3DLA5
A	436	PHE	-	expression tag	UNP B3DLA5
A	437	GLN	-	expression tag	UNP B3DLA5
B	429	SER	-	expression tag	UNP B3DLA5
B	430	ASN	-	expression tag	UNP B3DLA5
B	431	SER	-	expression tag	UNP B3DLA5
B	432	LEU	-	expression tag	UNP B3DLA5
B	433	GLU	-	expression tag	UNP B3DLA5
B	434	VAL	-	expression tag	UNP B3DLA5
B	435	LEU	-	expression tag	UNP B3DLA5

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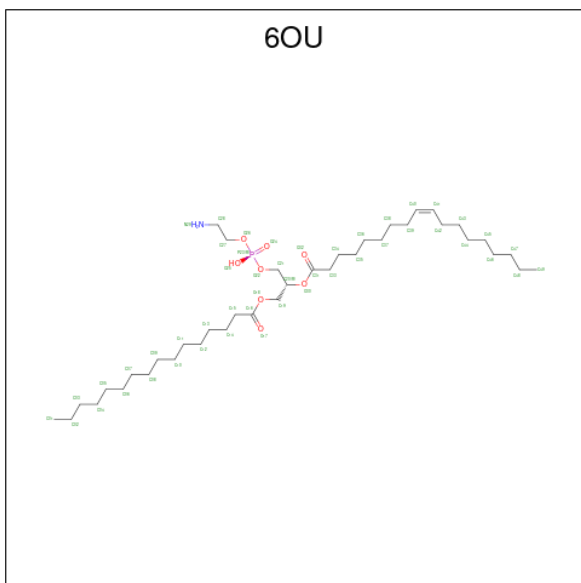
Chain	Residue	Modelled	Actual	Comment	Reference
B	436	PHE	-	expression tag	UNP B3DLA5
B	437	GLN	-	expression tag	UNP B3DLA5
C	429	SER	-	expression tag	UNP B3DLA5
C	430	ASN	-	expression tag	UNP B3DLA5
C	431	SER	-	expression tag	UNP B3DLA5
C	432	LEU	-	expression tag	UNP B3DLA5
C	433	GLU	-	expression tag	UNP B3DLA5
C	434	VAL	-	expression tag	UNP B3DLA5
C	435	LEU	-	expression tag	UNP B3DLA5
C	436	PHE	-	expression tag	UNP B3DLA5
C	437	GLN	-	expression tag	UNP B3DLA5
D	429	SER	-	expression tag	UNP B3DLA5
D	430	ASN	-	expression tag	UNP B3DLA5
D	431	SER	-	expression tag	UNP B3DLA5
D	432	LEU	-	expression tag	UNP B3DLA5
D	433	GLU	-	expression tag	UNP B3DLA5
D	434	VAL	-	expression tag	UNP B3DLA5
D	435	LEU	-	expression tag	UNP B3DLA5
D	436	PHE	-	expression tag	UNP B3DLA5
D	437	GLN	-	expression tag	UNP B3DLA5
E	429	SER	-	expression tag	UNP B3DLA5
E	430	ASN	-	expression tag	UNP B3DLA5
E	431	SER	-	expression tag	UNP B3DLA5
E	432	LEU	-	expression tag	UNP B3DLA5
E	433	GLU	-	expression tag	UNP B3DLA5
E	434	VAL	-	expression tag	UNP B3DLA5
E	435	LEU	-	expression tag	UNP B3DLA5
E	436	PHE	-	expression tag	UNP B3DLA5
E	437	GLN	-	expression tag	UNP B3DLA5
F	429	SER	-	expression tag	UNP B3DLA5
F	430	ASN	-	expression tag	UNP B3DLA5
F	431	SER	-	expression tag	UNP B3DLA5
F	432	LEU	-	expression tag	UNP B3DLA5
F	433	GLU	-	expression tag	UNP B3DLA5
F	434	VAL	-	expression tag	UNP B3DLA5
F	435	LEU	-	expression tag	UNP B3DLA5
F	436	PHE	-	expression tag	UNP B3DLA5
F	437	GLN	-	expression tag	UNP B3DLA5
G	429	SER	-	expression tag	UNP B3DLA5
G	430	ASN	-	expression tag	UNP B3DLA5
G	431	SER	-	expression tag	UNP B3DLA5
G	432	LEU	-	expression tag	UNP B3DLA5

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Chain	Residue	Modelled	Actual	Comment	Reference
G	433	GLU	-	expression tag	UNP B3DLA5
G	434	VAL	-	expression tag	UNP B3DLA5
G	435	LEU	-	expression tag	UNP B3DLA5
G	436	PHE	-	expression tag	UNP B3DLA5
G	437	GLN	-	expression tag	UNP B3DLA5

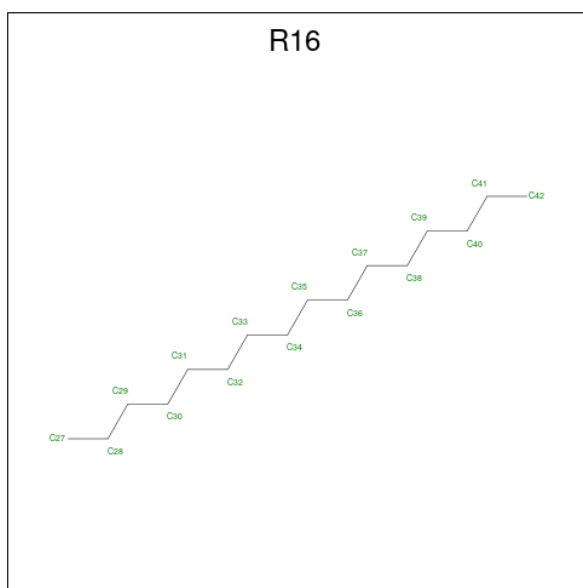
- Molecule 2 is [(2 {R})-1-[2-azanylethoxy(oxidanyl)phosphoryl]oxy-3-hexadecanoyloxy-prop an-2-yl] ( {Z})-octadec-9-enoate (three-letter code: 6OU) (formula: C<sub>39</sub>H<sub>76</sub>NO<sub>8</sub>P) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms				AltConf
			Total	C	O	P	
2	A	1	30	21	8	1	0
2	B	1	30	21	8	1	0
2	C	1	30	21	8	1	0
2	D	1	30	21	8	1	0
2	E	1	30	21	8	1	0
2	F	1	30	21	8	1	0
2	G	1	30	21	8	1	0

- Molecule 3 is HEXADECANE (three-letter code: R16) (formula: C<sub>16</sub>H<sub>34</sub>) (labeled as "Ligand

of Interest" by depositor).



Mol	Chain	Residues	Atoms	AltConf
3	A	1	Total C 10 10	0
3	A	1	Total C 16 16	0
3	B	1	Total C 10 10	0
3	B	1	Total C 16 16	0
3	C	1	Total C 10 10	0
3	C	1	Total C 16 16	0
3	D	1	Total C 10 10	0
3	D	1	Total C 16 16	0
3	E	1	Total C 10 10	0
3	E	1	Total C 16 16	0
3	F	1	Total C 10 10	0
3	F	1	Total C 16 16	0
3	G	1	Total C 16 16	0

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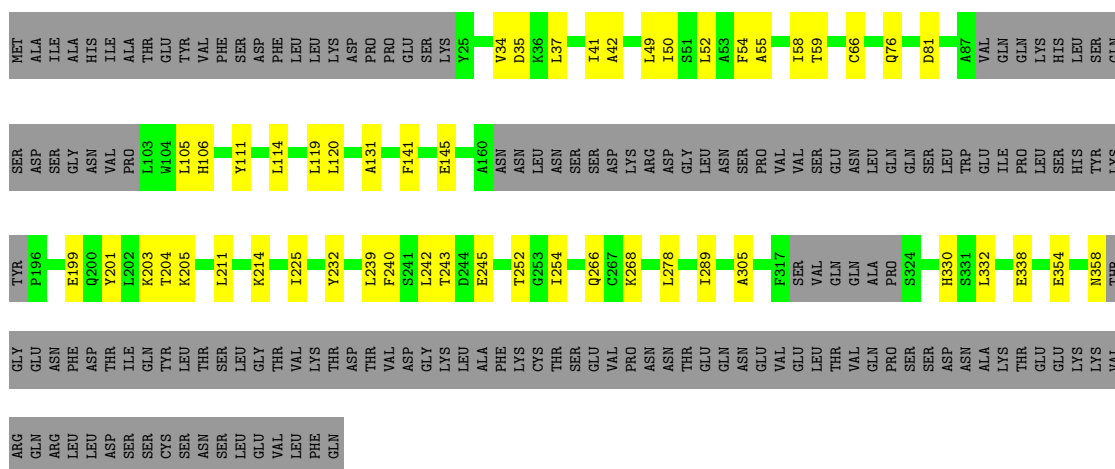
Mol	Chain	Residues	Atoms		AltConf
3	G	1	Total	C	0
			10	10	

### 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.

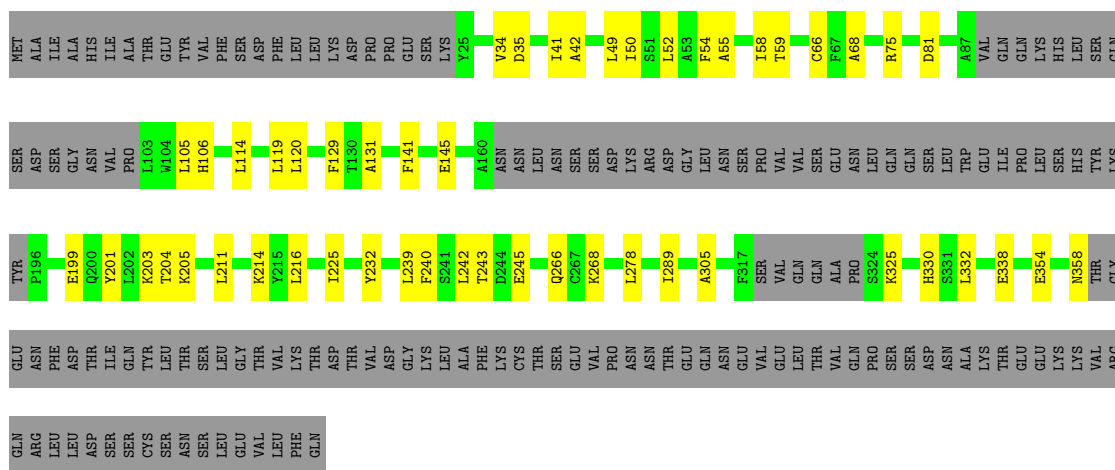
- Molecule 1: Pannexin

Chain A: 



- Molecule 1: Pannexin

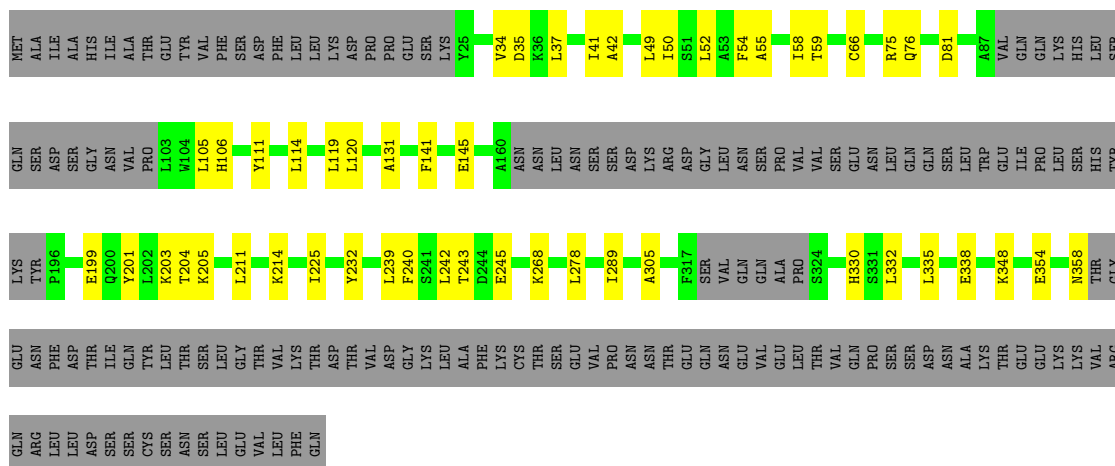
Chain B: 



- Molecule 1: Pannexin

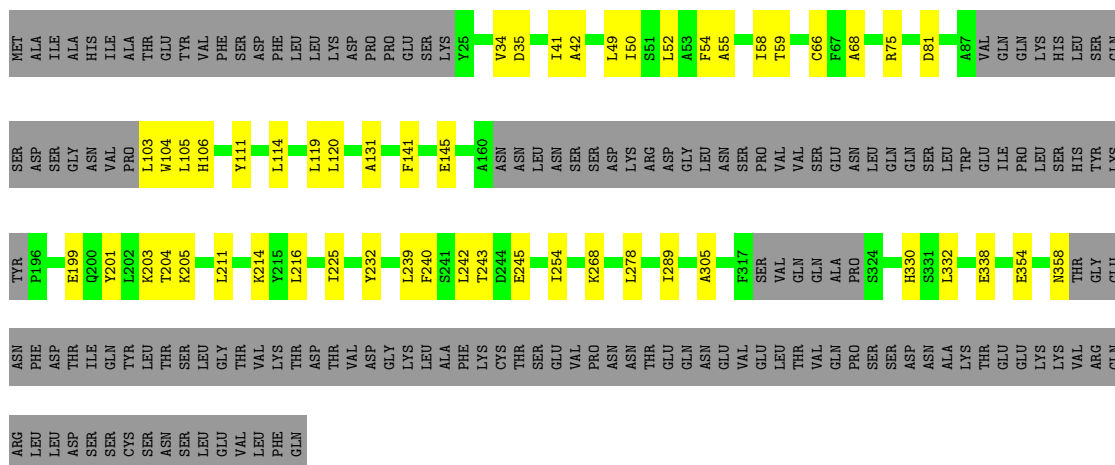


Chain C:



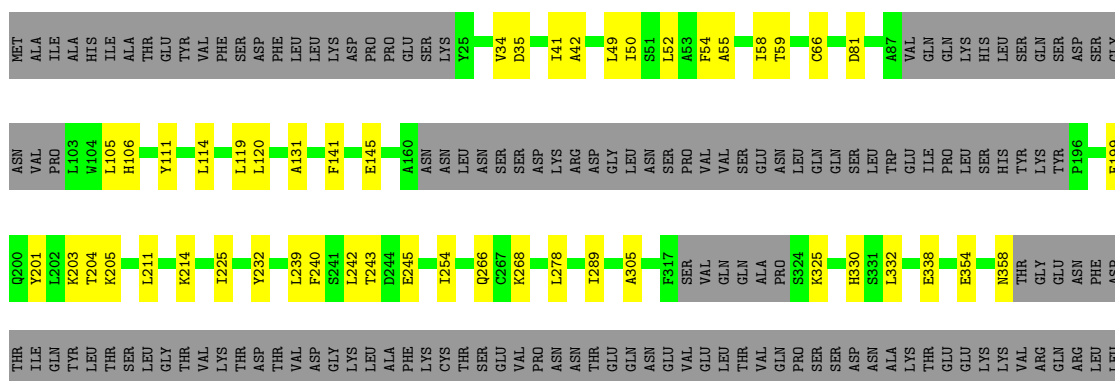
• Molecule 1: Pannexin

Chain D:



• Molecule 1: Pannexin

Chain E:



ASP  
SER  
SER  
CYS  
SER  
ASN  
SER  
LEU  
LEU  
VAL  
PHE  
GLN

● Molecule 1: Pannexin

Chain F:  52% 11% 36%

MET  
ALA  
ILE  
ALA  
HIS  
PRO  
HIS  
ALA  
THR  
GLU  
TYR  
VAL  
PHE  
SER  
ASP  
PHE  
LEU  
LEU  
LYS  
LYS  
ASP  
PRO  
PRO  
GLU  
SER  
LYS  
Y25  
V34  
D35  
I41  
A42  
L49  
I50  
S51  
L52  
A53  
F54  
A55  
I58  
T59  
C66  
R75  
D81  
A87  
VAL  
GLN  
GLN  
LYS  
HIS  
LEU  
SER  
GLN  
SER  
ASP

SER  
GLY  
VAL  
VAL  
PRO  
L103  
W104  
L105  
H106  
Y111  
Y114  
L114  
L119  
L120  
A131  
F141  
E145  
A160  
ASN  
ASN  
LEU  
ASN  
ASN  
SER  
SER  
SER  
ASP  
LYS  
ARG  
ASP  
GLY  
LEU  
LEU  
SER  
PRO  
VAL  
VAL  
GLU  
ASN  
SER  
GLN  
TRP  
GLU  
ILE  
PRO  
LEU  
SER  
HIS  
LEU  
TYR  
LYS  
TYR  
P196

E199  
Q200  
Y201  
L202  
K203  
T204  
K205  
L211  
L214  
K214  
Y215  
L216  
T225  
Y232  
L239  
F240  
S241  
L242  
T243  
D244  
E245  
T252  
C253  
I254  
Q266  
C267  
K268  
L278  
I289  
A305  
F317  
SER  
VAL  
GLN  
GLN  
ALA  
ALA  
PRO  
S324  
H330  
S331  
L332  
E338  
E354  
N358  
THR

GLY  
GLU  
ASN  
PHE  
THR  
THR  
ILE  
GLN  
TYR  
LEU  
THR  
SER  
SER  
LEU  
GLY  
THR  
VAL  
LYS  
THR  
THR  
THR  
THR  
VAL  
ASP  
GLY  
LYS  
LEU  
ALA  
PHE  
LYS

ARG  
GLN  
ARG  
LEU  
LEU  
ASP  
SER  
SER  
CYS  
ASN  
ASN  
SER  
LEU  
LEU  
VAL  
PHE  
GLN

● Molecule 1: Pannexin

Chain G:  52% 12% 36%

MET  
ALA  
ILE  
ALA  
HIS  
PRO  
ILE  
ALA  
THR  
GLU  
TYR  
VAL  
PHE  
SER  
ASP  
PHE  
LEU  
LEU  
LYS  
LYS  
ASP  
PRO  
PRO  
GLU  
SER  
LYS  
Y25  
V34  
D35  
I41  
A42  
L49  
I50  
S51  
L52  
A53  
F54  
A55  
I58  
T59  
C66  
R75  
D81  
A87  
VAL  
GLN  
GLN  
LYS  
HIS  
LEU  
SER  
GLN  
SER  
ASP

SER  
GLY  
ASN  
VAL  
PRO  
L103  
W104  
L105  
H106  
Y111  
Y114  
L114  
L119  
L120  
F129  
T130  
A131  
F141  
E145  
A160  
ASN  
ASN  
LEU  
ASN  
ASN  
SER  
SER  
SER  
ASP  
LYS  
ARG  
ASP  
GLY  
LEU  
LEU  
ASN  
SER  
PRO  
VAL  
VAL  
SER  
GLU  
GLU  
ASN  
LEU  
GLN  
GLN  
SER  
LEU  
TRP  
GLU  
ILE  
PRO  
LEU  
LYS  
HIS  
LEU  
TYR  
LYS  
TYR  
P196

E199  
Q200  
Y201  
L202  
K203  
T204  
K205  
L211  
L214  
K214  
Y225  
Y232  
L239  
F240  
S241  
L242  
T243  
D244  
E245  
I254  
Q266  
C267  
K268  
L278  
I289  
A305  
F317  
SER  
VAL  
GLN  
GLN  
ALA  
PRO  
S324  
K325  
H330  
S331  
L332  
F335  
L334  
E338  
E354  
N358  
THR  
GLY

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

GLN  
ARG  
LEU  
LEU  
ASP  
SER  
SER  
CYS  
SER  
ASN  
SER  
LEU  
GLU  
VAL  
LEU  
PHE  
GLN

## 4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C7	Depositor
Number of particles used	176371	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 ( $e^-/\text{\AA}^2$ )	62	Depositor
Minimum defocus (nm)	Not provided	
Maximum defocus (nm)	Not provided	
Magnification	Not provided	
Image detector	GATAN K2 SUMMIT (4k x 4k)	Depositor
Maximum map value	0.219	Depositor
Minimum map value	-0.133	Depositor
Average map value	-0.000	Depositor
Map value standard deviation	0.007	Depositor
Recommended contour level	0.012	Depositor
Map size ( $\text{\AA}$ )	264.0, 264.0, 264.0	wwPDB
Map dimensions	240, 240, 240	wwPDB
Map angles ( $^\circ$ )	90.0, 90.0, 90.0	wwPDB
Pixel spacing ( $\text{\AA}$ )	1.1, 1.1, 1.1	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: 6OU, R16

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	0.41	0/2314	0.52	0/3143
1	B	0.41	0/2314	0.52	0/3143
1	C	0.41	0/2314	0.52	0/3143
1	D	0.41	0/2314	0.52	0/3143
1	E	0.41	0/2314	0.52	0/3143
1	F	0.41	0/2314	0.52	0/3143
1	G	0.41	0/2314	0.52	0/3143
All	All	0.41	0/16198	0.52	0/22001

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	2260	0	2358	32	0
1	B	2260	0	2358	35	0
1	C	2260	0	2358	34	0
1	D	2260	0	2358	32	0
1	E	2260	0	2358	30	0
1	F	2260	0	2358	31	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	G	2260	0	2358	34	0
2	A	30	0	0	0	0
2	B	30	0	0	0	0
2	C	30	0	0	0	0
2	D	30	0	0	0	0
2	E	30	0	0	0	0
2	F	30	0	0	0	0
2	G	30	0	0	0	0
3	A	26	0	50	0	0
3	B	26	0	50	0	0
3	C	26	0	50	0	0
3	D	26	0	50	0	0
3	E	26	0	50	0	0
3	F	26	0	50	0	0
3	G	26	0	50	0	0
All	All	16212	0	16856	205	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 6.

The worst 5 of 205 close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:105:LEU:HD12	1:C:239:LEU:HD22	1.59	0.85
1:A:105:LEU:HD12	1:A:239:LEU:HD22	1.59	0.84
1:G:105:LEU:HD12	1:G:239:LEU:HD22	1.59	0.84
1:B:105:LEU:HD12	1:B:239:LEU:HD22	1.59	0.84
1:D:105:LEU:HD12	1:D:239:LEU:HD22	1.60	0.84

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	270/437 (62%)	263 (97%)	7 (3%)	0	100	100
1	B	270/437 (62%)	263 (97%)	7 (3%)	0	100	100
1	C	270/437 (62%)	263 (97%)	7 (3%)	0	100	100
1	D	270/437 (62%)	263 (97%)	7 (3%)	0	100	100
1	E	270/437 (62%)	263 (97%)	7 (3%)	0	100	100
1	F	270/437 (62%)	263 (97%)	7 (3%)	0	100	100
1	G	270/437 (62%)	263 (97%)	7 (3%)	0	100	100
All	All	1890/3059 (62%)	1841 (97%)	49 (3%)	0	100	100

There are no Ramachandran outliers to report.

### 5.3.2 Protein sidechains [i](#)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	252/400 (63%)	252 (100%)	0	100	100
1	B	252/400 (63%)	252 (100%)	0	100	100
1	C	252/400 (63%)	252 (100%)	0	100	100
1	D	252/400 (63%)	252 (100%)	0	100	100
1	E	252/400 (63%)	252 (100%)	0	100	100
1	F	252/400 (63%)	252 (100%)	0	100	100
1	G	252/400 (63%)	252 (100%)	0	100	100
All	All	1764/2800 (63%)	1764 (100%)	0	100	100

There are no protein residues with a non-rotameric sidechain to report.

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 oligosaccharides in this entry.

## 5.6 Ligand geometry [i](#)

21 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
3	R16	D	503	-	15,15,15	0.31	0	14,14,14	0.38	0
3	R16	B	503	-	15,15,15	0.31	0	14,14,14	0.38	0
2	6OU	D	501	-	29,29,48	2.47	11 (37%)	32,34,53	1.33	2 (6%)
3	R16	F	502	-	9,9,15	0.29	0	8,8,14	0.39	0
3	R16	G	1003	-	9,9,15	0.29	0	8,8,14	0.39	0
3	R16	F	503	-	15,15,15	0.31	0	14,14,14	0.38	0
3	R16	G	1001	-	15,15,15	0.31	0	14,14,14	0.38	0
2	6OU	A	501	-	29,29,48	2.47	11 (37%)	32,34,53	1.33	2 (6%)
2	6OU	G	1002	-	29,29,48	2.46	11 (37%)	32,34,53	1.33	2 (6%)
2	6OU	E	501	-	29,29,48	2.46	11 (37%)	32,34,53	1.33	2 (6%)
2	6OU	B	501	-	29,29,48	2.47	11 (37%)	32,34,53	1.33	2 (6%)
2	6OU	C	501	-	29,29,48	2.46	11 (37%)	32,34,53	1.33	3 (9%)
3	R16	D	502	-	9,9,15	0.29	0	8,8,14	0.39	0
3	R16	E	503	-	15,15,15	0.31	0	14,14,14	0.38	0
3	R16	C	503	-	15,15,15	0.31	0	14,14,14	0.38	0
3	R16	E	502	-	9,9,15	0.28	0	8,8,14	0.39	0
2	6OU	F	501	-	29,29,48	2.46	11 (37%)	32,34,53	1.33	2 (6%)
3	R16	B	502	-	9,9,15	0.29	0	8,8,14	0.39	0
3	R16	C	502	-	9,9,15	0.28	0	8,8,14	0.39	0
3	R16	A	502	-	9,9,15	0.29	0	8,8,14	0.39	0
3	R16	A	503	-	15,15,15	0.31	0	14,14,14	0.38	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
3	R16	D	503	-	-	6/13/13/13	-
3	R16	B	503	-	-	6/13/13/13	-
2	6OU	D	501	-	-	10/31/31/52	-
3	R16	F	502	-	-	4/7/7/13	-
3	R16	G	1003	-	-	4/7/7/13	-
3	R16	F	503	-	-	6/13/13/13	-
3	R16	G	1001	-	-	6/13/13/13	-
2	6OU	A	501	-	-	10/31/31/52	-
2	6OU	G	1002	-	-	10/31/31/52	-
2	6OU	E	501	-	-	10/31/31/52	-
2	6OU	B	501	-	-	10/31/31/52	-
2	6OU	C	501	-	-	10/31/31/52	-
3	R16	D	502	-	-	4/7/7/13	-
3	R16	E	503	-	-	6/13/13/13	-
3	R16	C	503	-	-	6/13/13/13	-
3	R16	E	502	-	-	4/7/7/13	-
2	6OU	F	501	-	-	10/31/31/52	-
3	R16	B	502	-	-	4/7/7/13	-
3	R16	C	502	-	-	4/7/7/13	-
3	R16	A	502	-	-	4/7/7/13	-
3	R16	A	503	-	-	6/13/13/13	-

The worst 5 of 77 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	D	501	6OU	P23-O26	4.97	1.73	1.54
2	G	1002	6OU	P23-O26	4.96	1.73	1.54
2	C	501	6OU	P23-O26	4.96	1.73	1.54
2	A	501	6OU	P23-O26	4.96	1.73	1.54
2	E	501	6OU	P23-O26	4.95	1.73	1.54

The worst 5 of 15 bond angle outliers are listed below:



Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	501	6OU	O30-C31-C33	4.09	120.33	111.48
2	F	501	6OU	O30-C31-C33	4.08	120.31	111.48
2	B	501	6OU	O30-C31-C33	4.08	120.31	111.48
2	D	501	6OU	O30-C31-C33	4.08	120.31	111.48
2	E	501	6OU	O30-C31-C33	4.08	120.31	111.48

There are no chirality outliers.

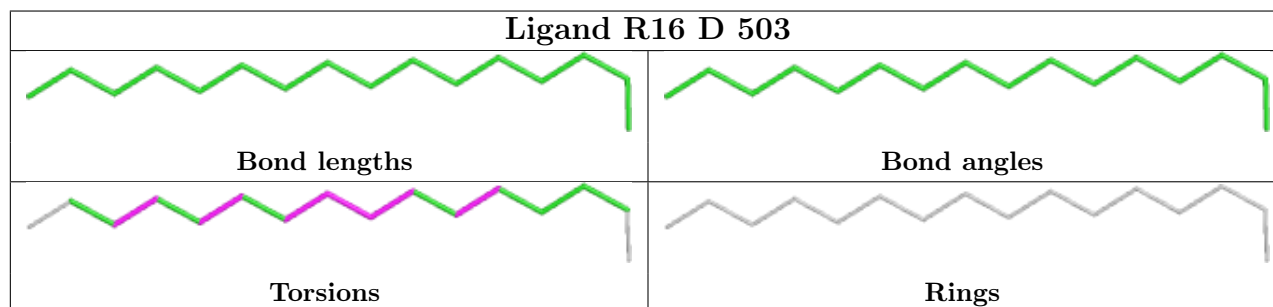
5 of 140 torsion outliers are listed below:

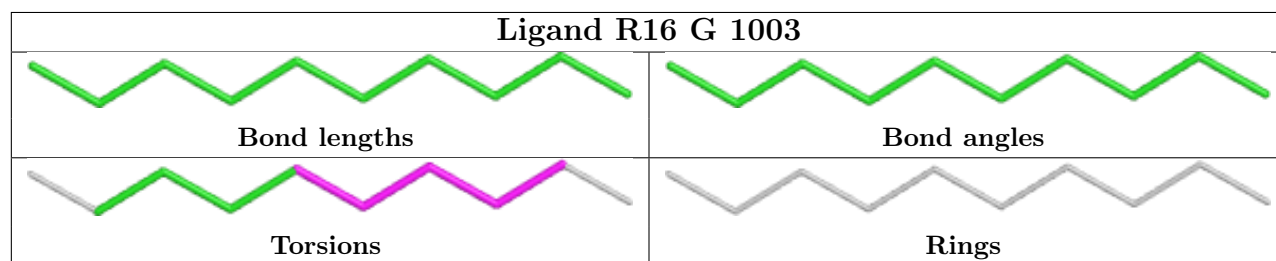
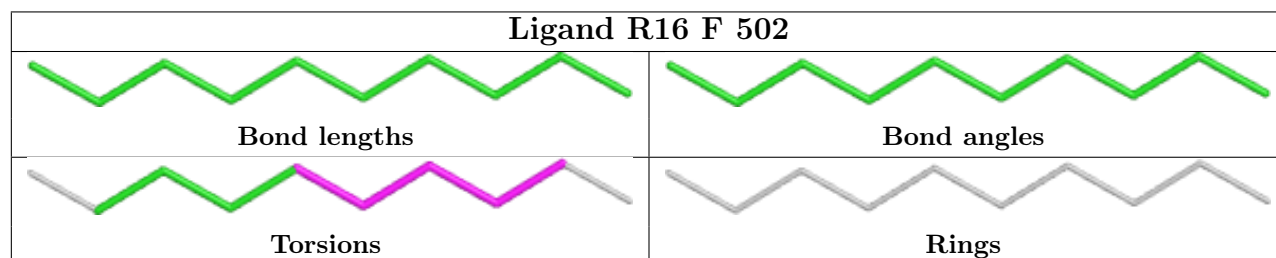
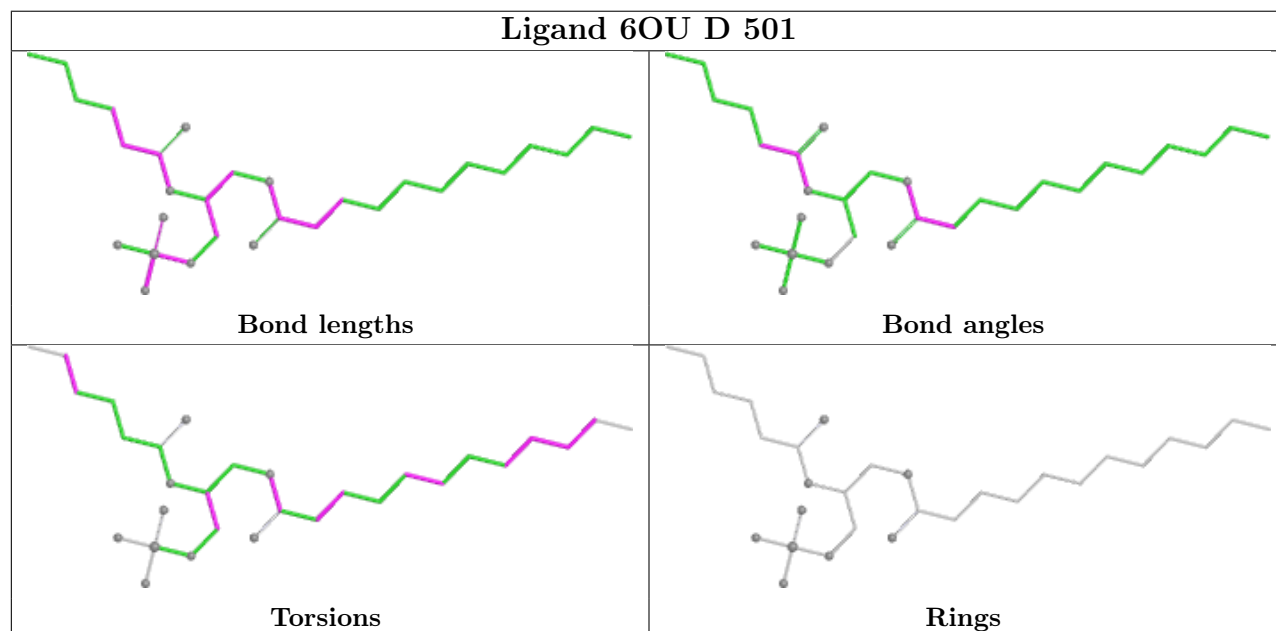
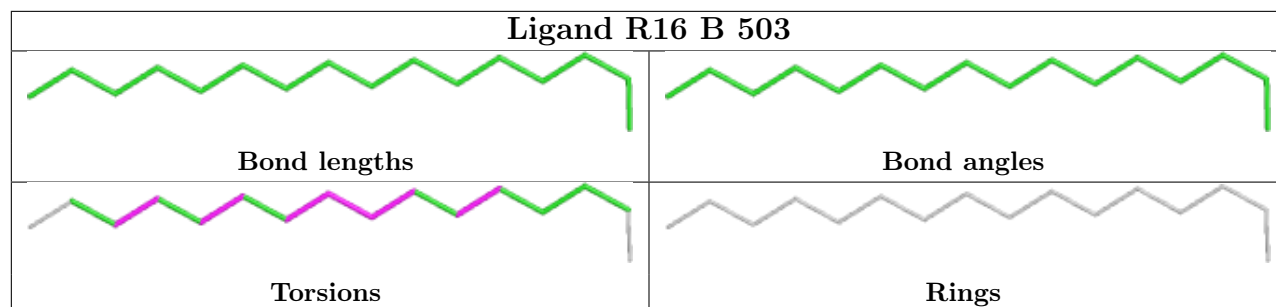
Mol	Chain	Res	Type	Atoms
2	A	501	6OU	O17-C16-O18-C19
2	B	501	6OU	O17-C16-O18-C19
2	C	501	6OU	O17-C16-O18-C19
2	D	501	6OU	O17-C16-O18-C19
2	E	501	6OU	O17-C16-O18-C19

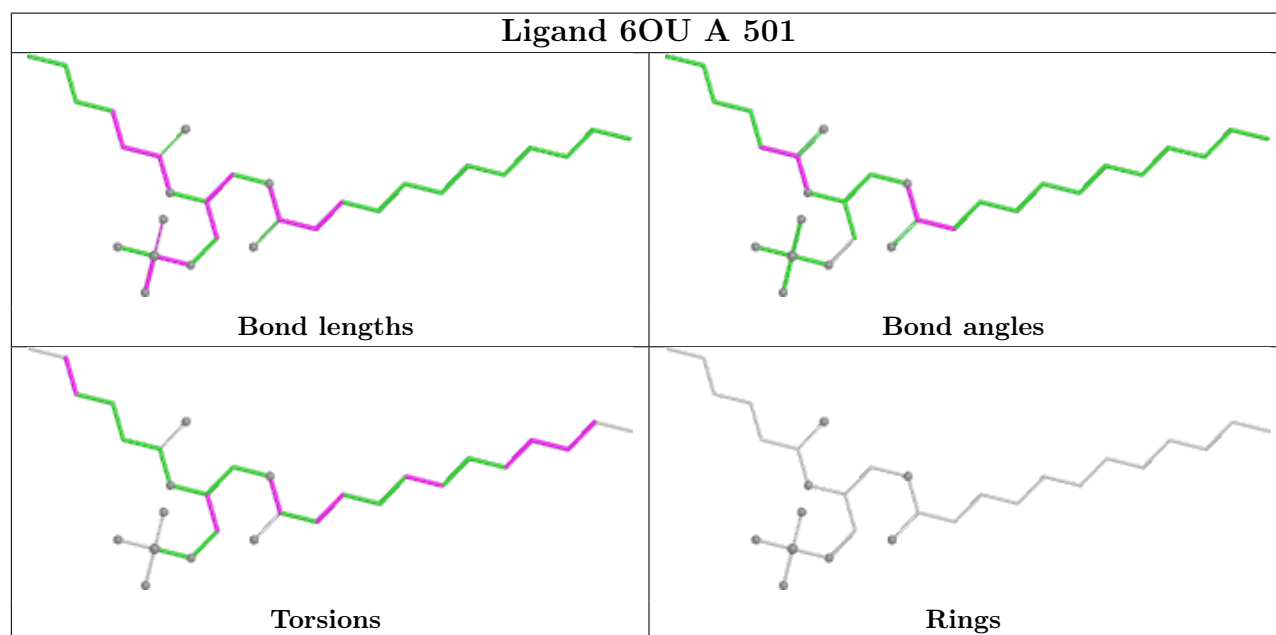
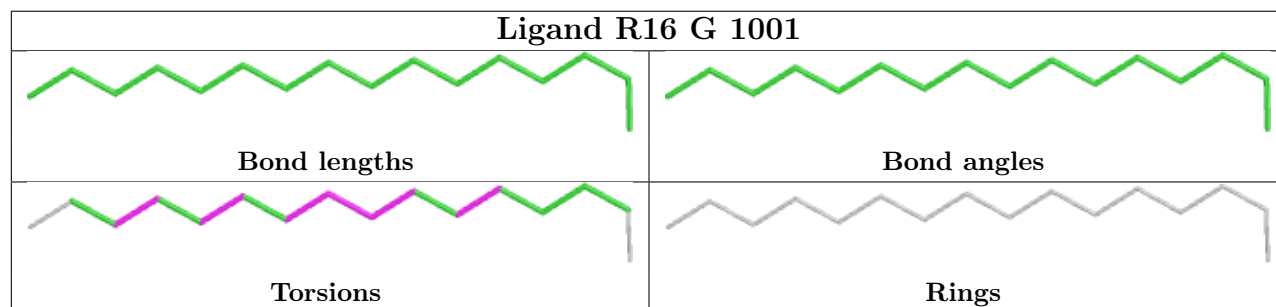
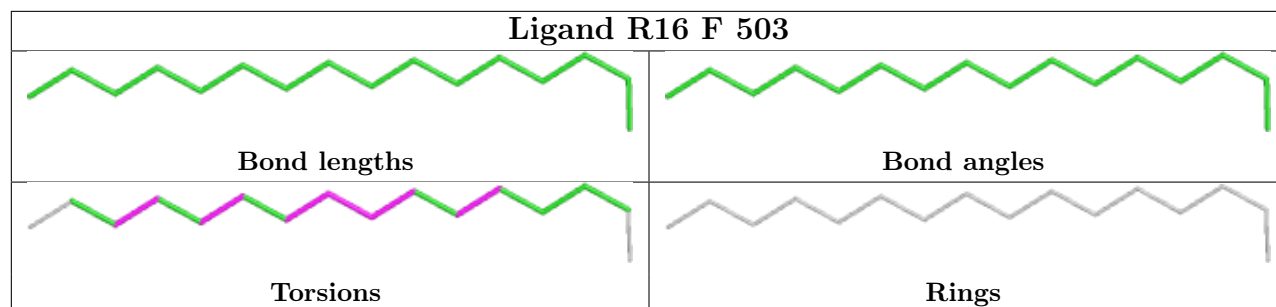
There are no ring outliers.

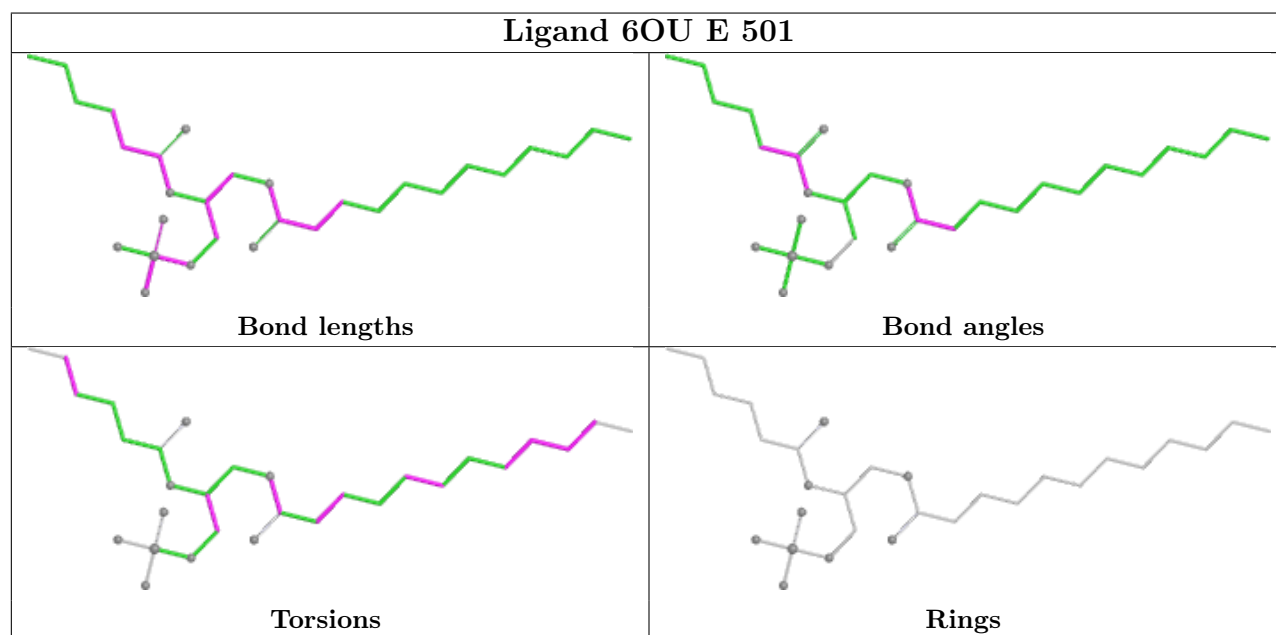
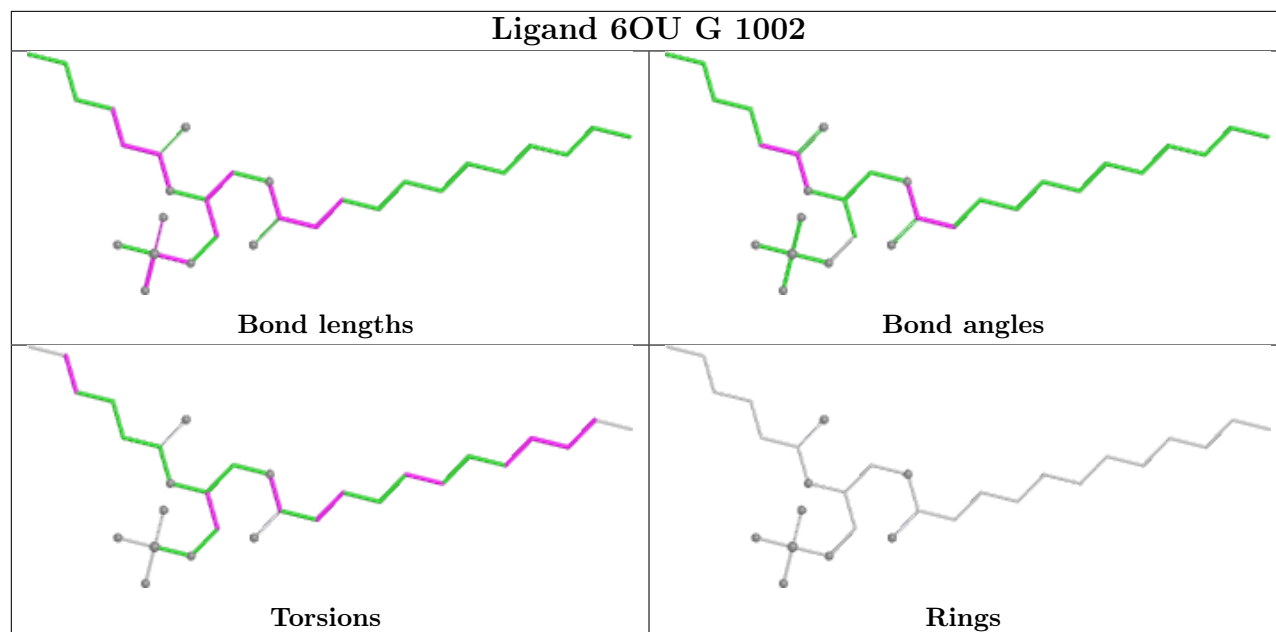
No monomer is involved in short contacts.

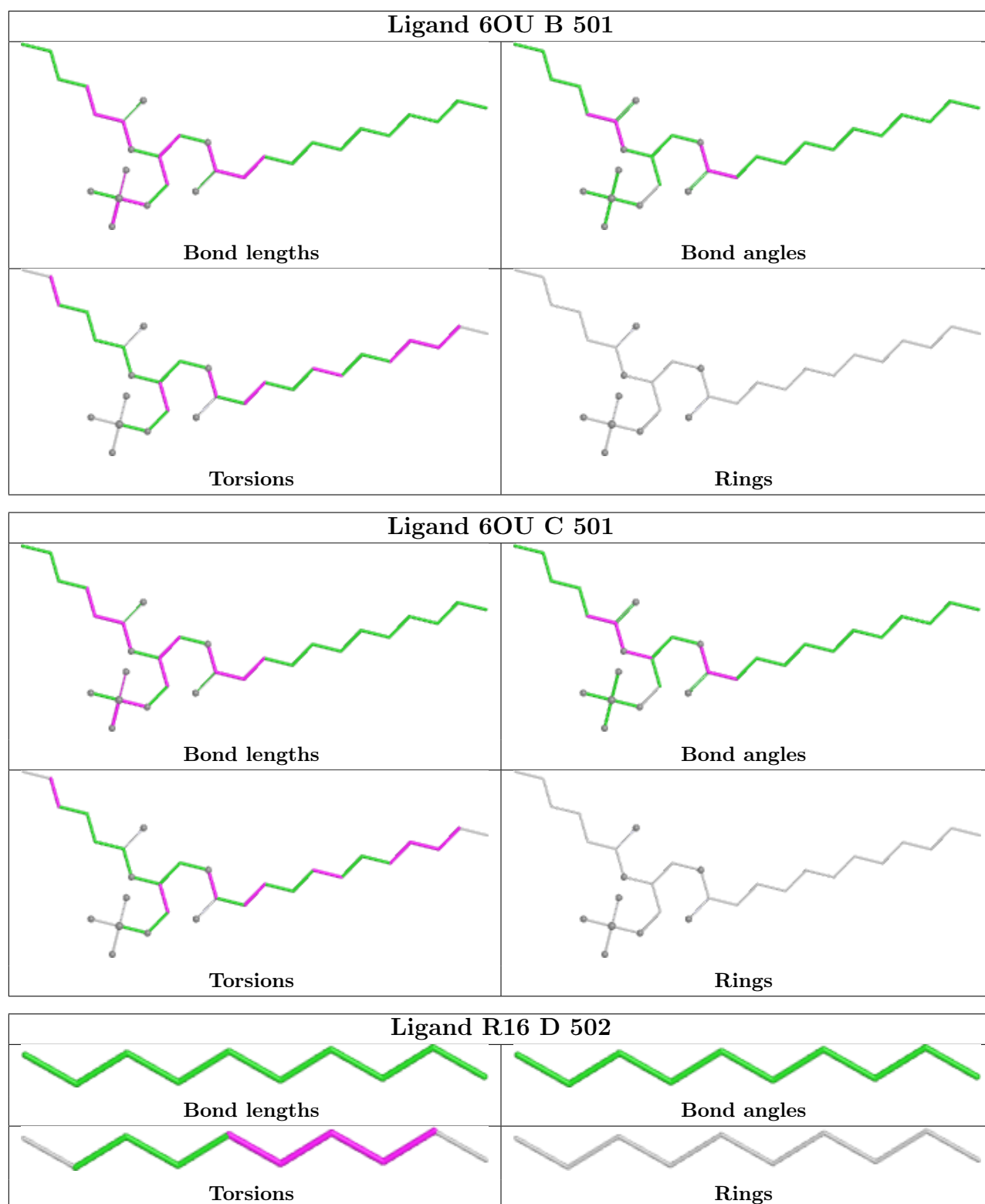
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included.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

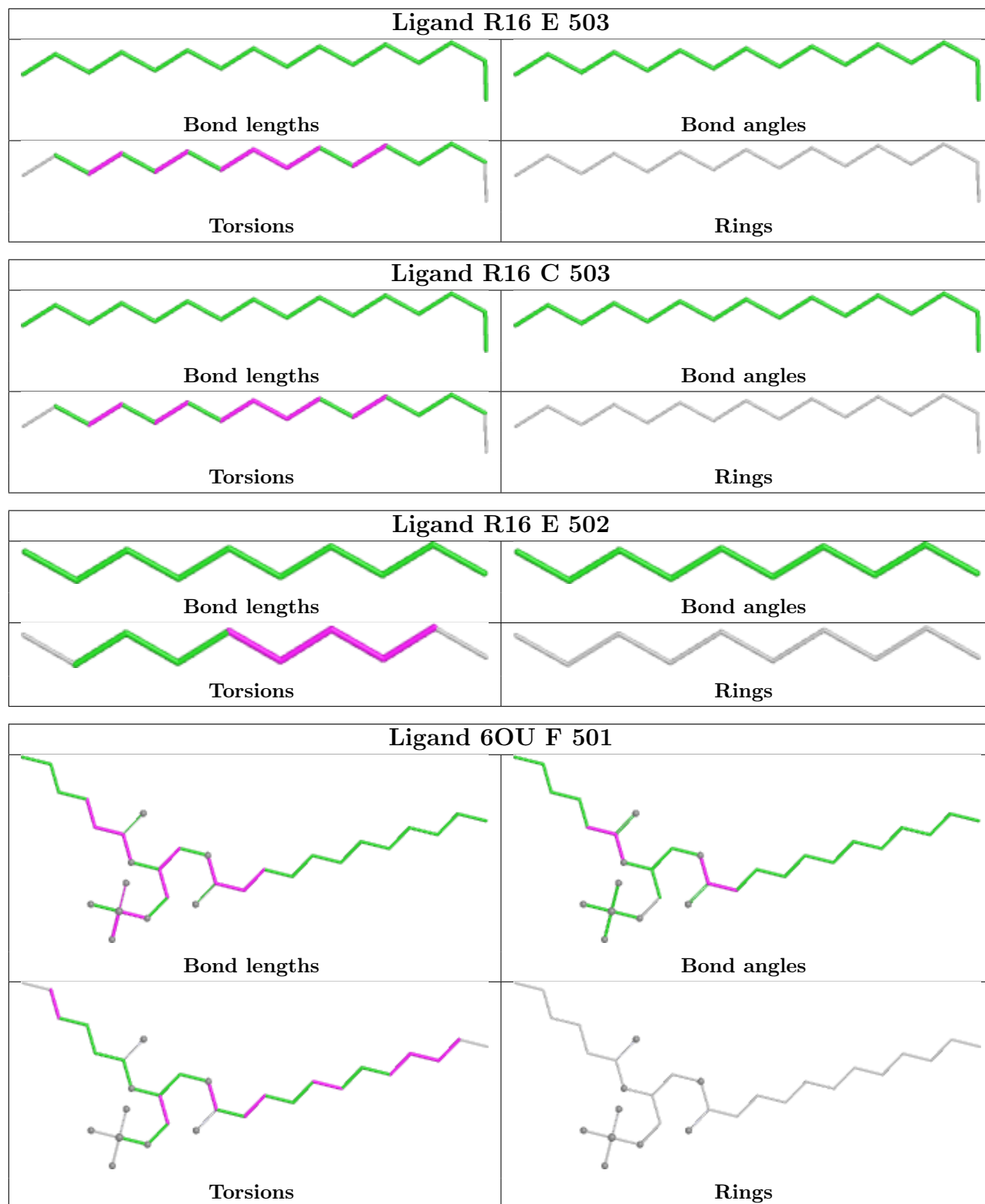


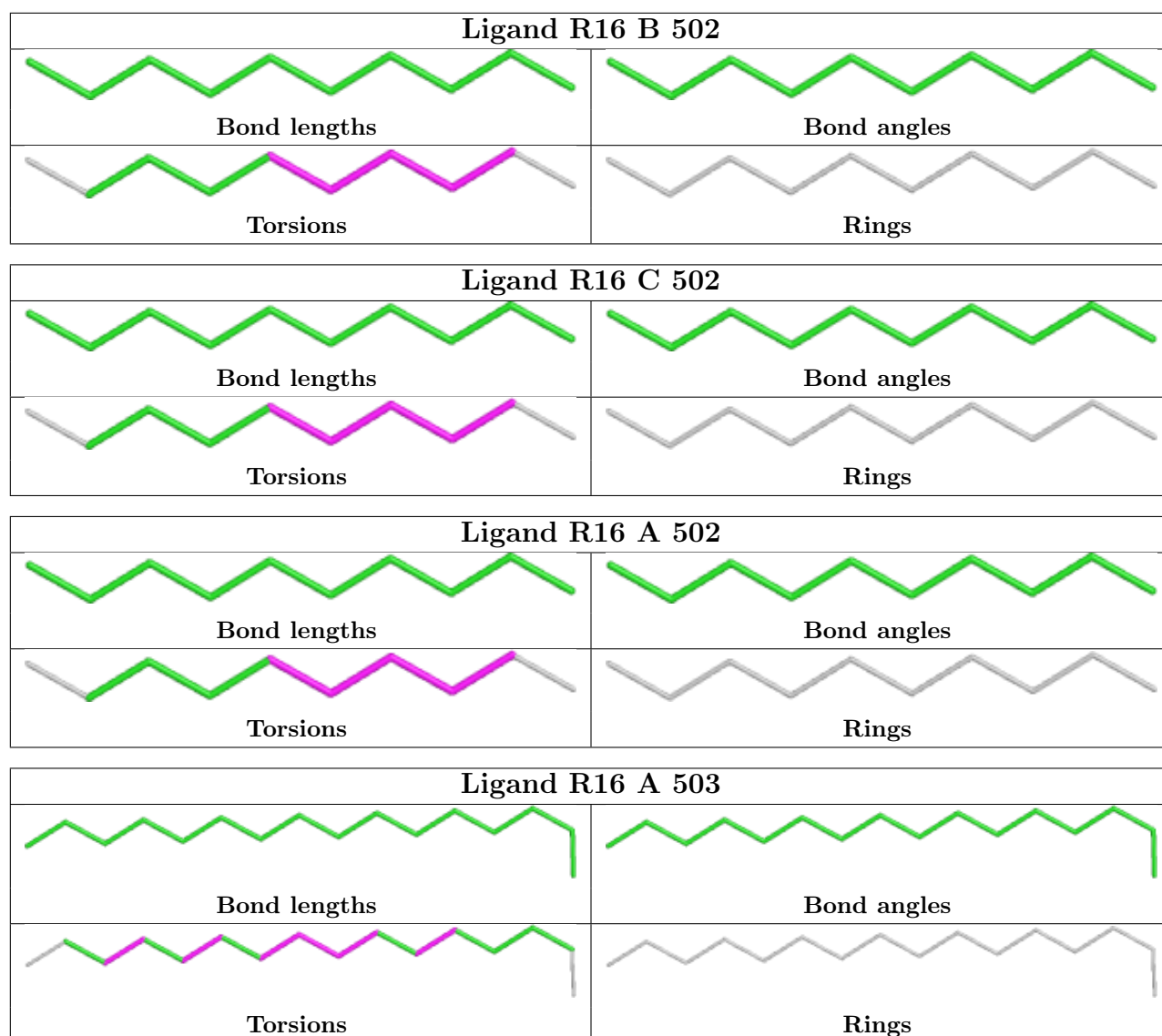












## 5.7 Other polymers [i](#)

There are no such residues in this entry.

## 5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

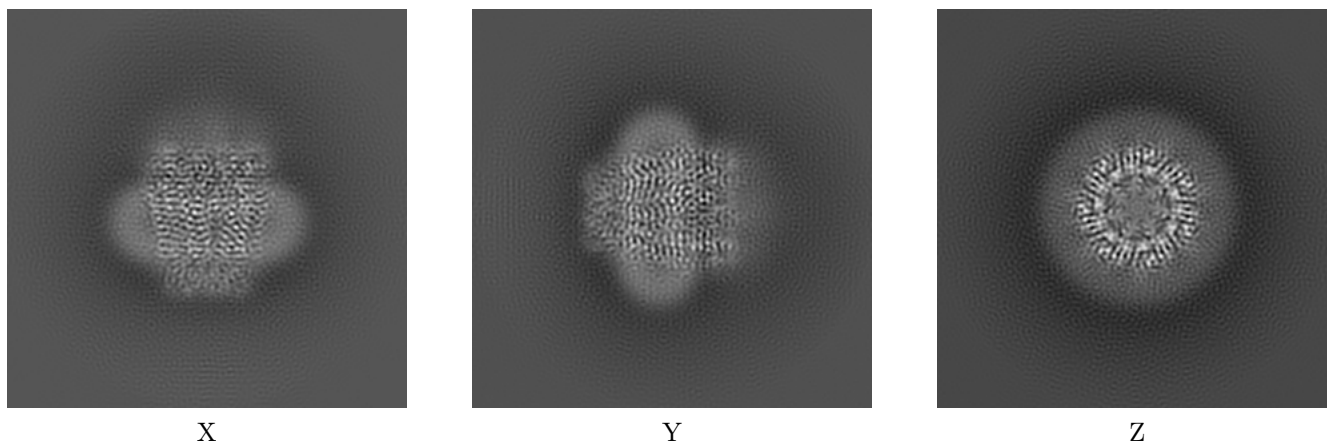
## 6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-20964. These allow visual inspection of the internal detail of the map and identification of artifacts.

No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

### 6.1 Orthogonal projections [i](#)

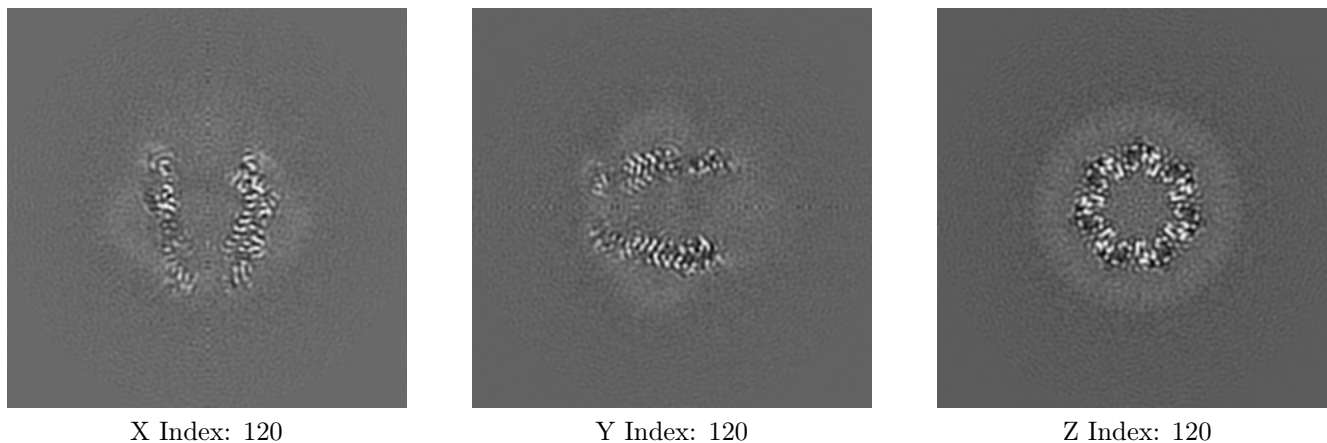
#### 6.1.1 Primary map



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

### 6.2 Central slices [i](#)

#### 6.2.1 Primary map

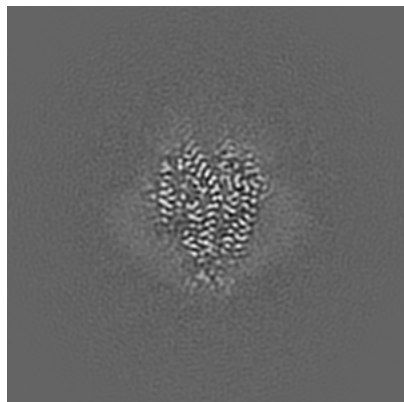




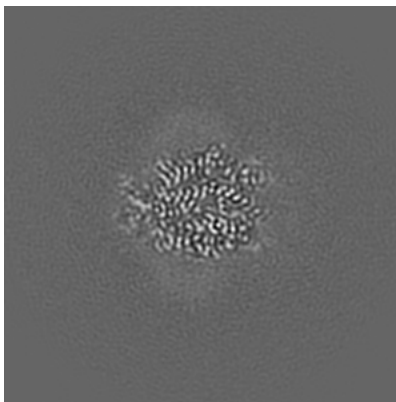
The images above show central slices of the map in three orthogonal directions.

## 6.3 Largest variance slices [i](#)

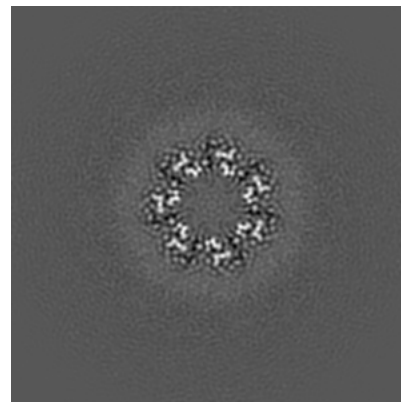
### 6.3.1 Primary map



X Index: 98



Y Index: 141

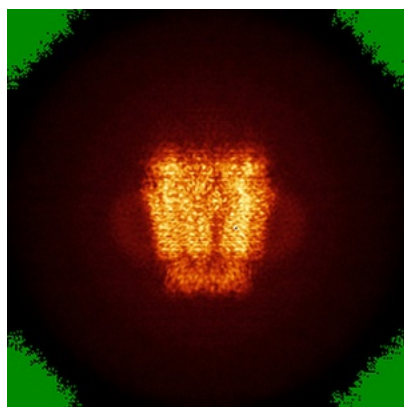


Z Index: 124

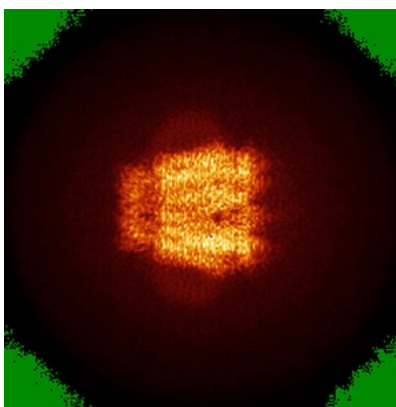
The images above show the largest variance slices of the map in three orthogonal directions.

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

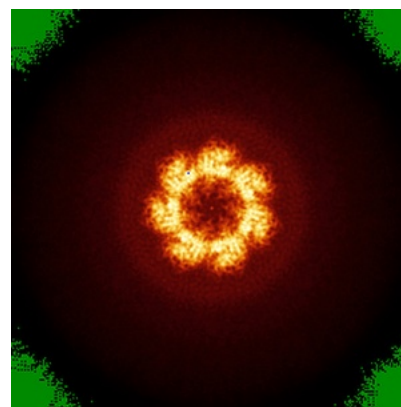
### 6.4.1 Primary map



X



Y

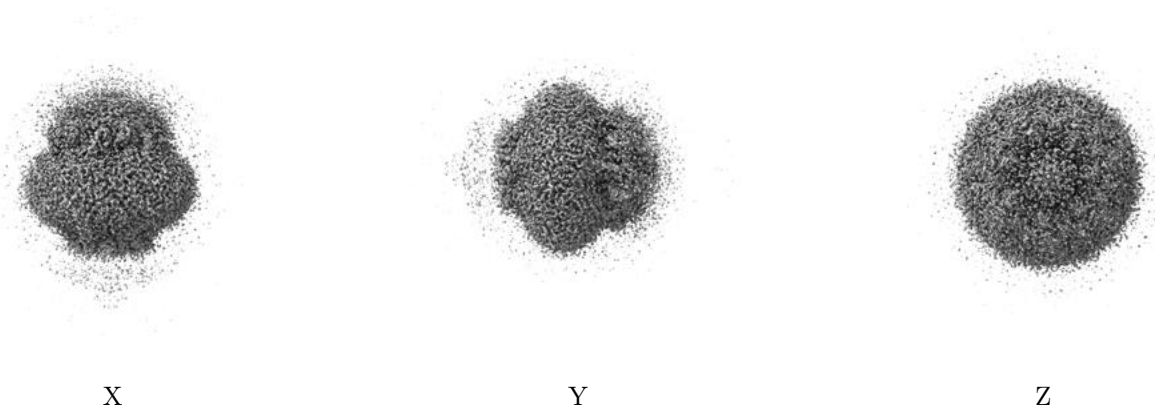


Z

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

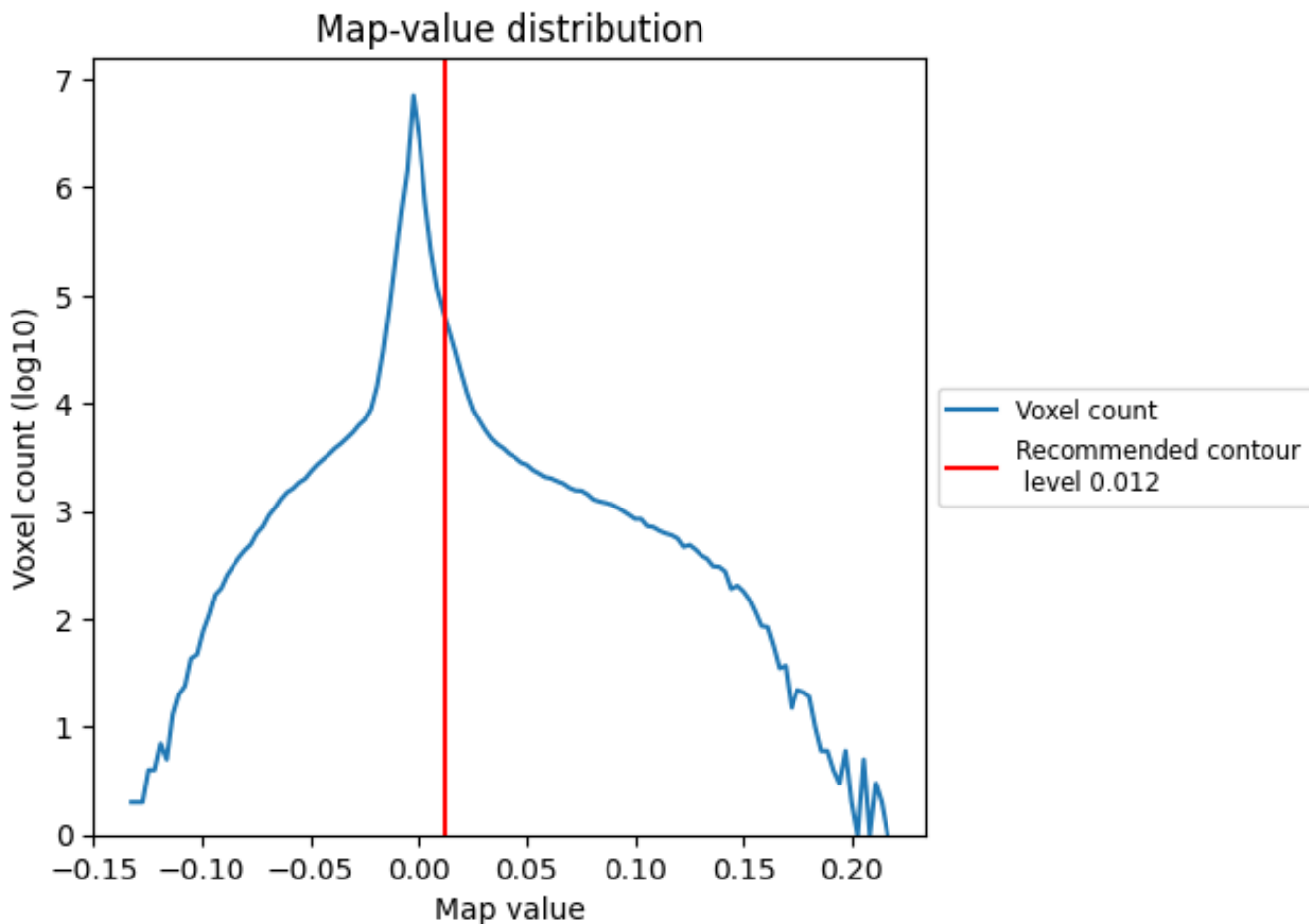
## 6.6 Mask visualisation [i](#)

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

## 7 Map analysis [i](#)

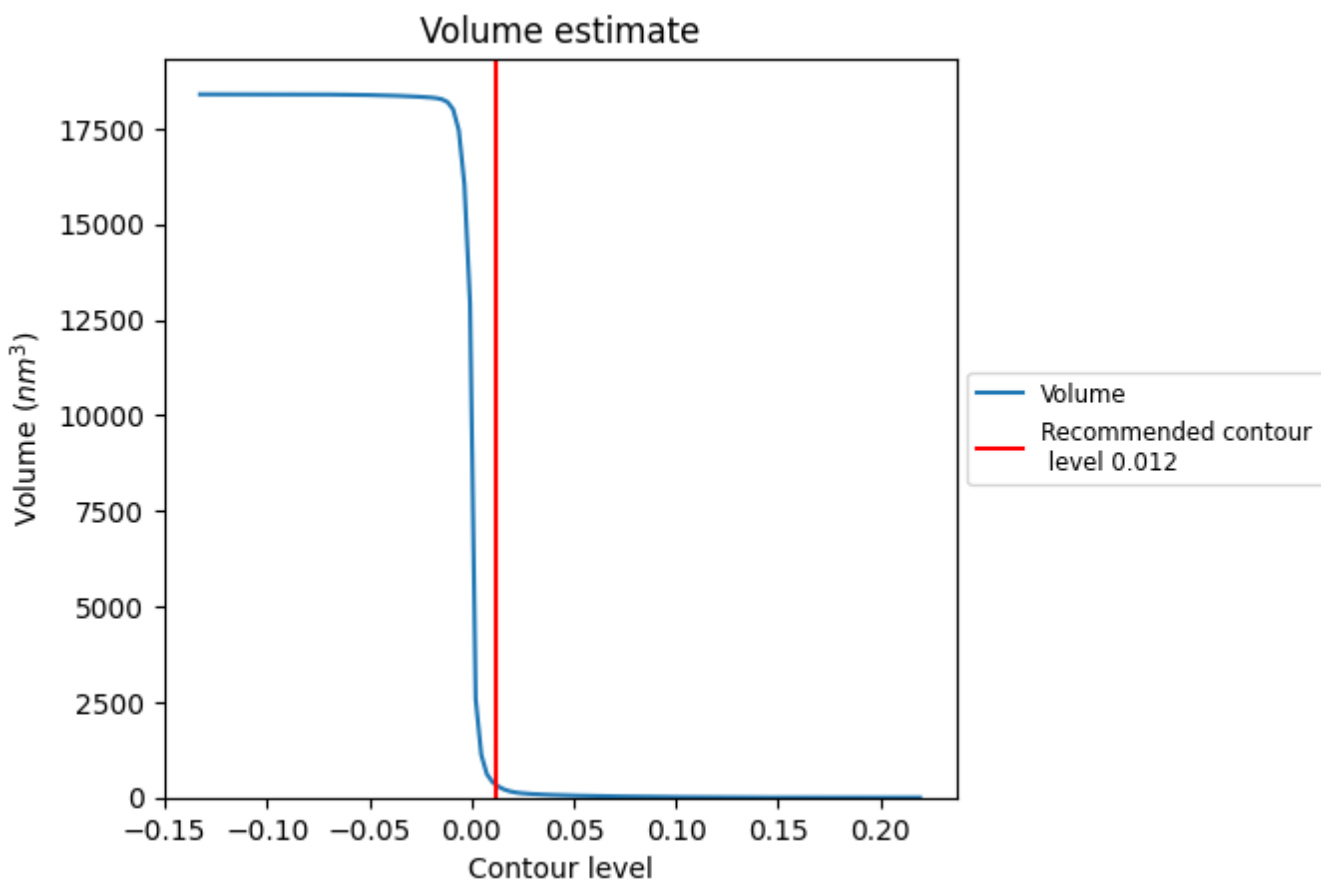
This section contains the results of statistical analysis of the map.

### 7.1 Map-value distribution [i](#)



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

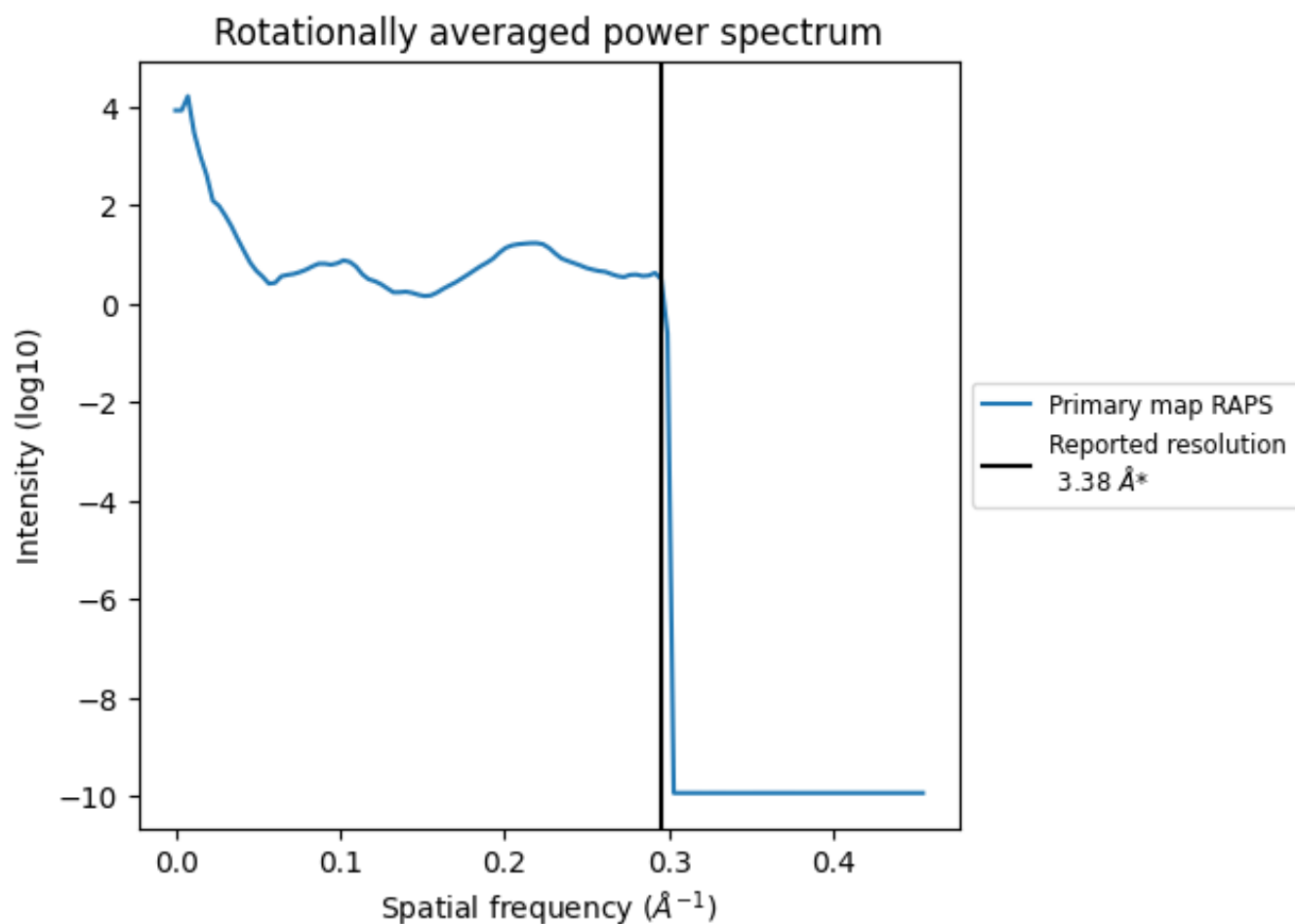
## 7.2 Volume estimate [i](#)



The volume at the recommended contour level is 335  $\text{nm}^3$ ; this corresponds to an approximate mass of 302 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 0.296 Å<sup>-1</sup>

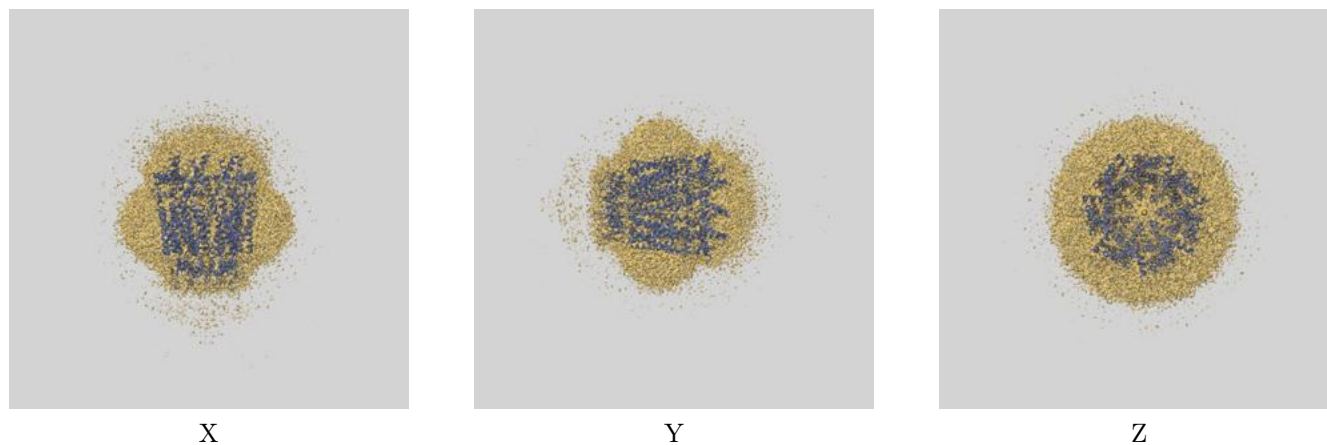
## 8 Fourier-Shell correlation

This section was not generated. No FSC curve or half-maps provided.

## 9 Map-model fit [i](#)

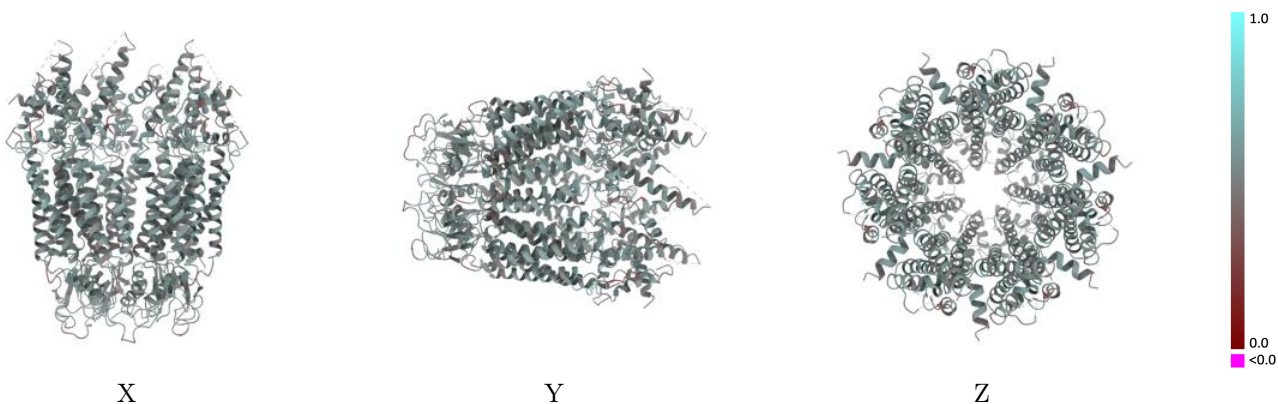
This section contains information regarding the fit between EMDB map EMD-20964 and PDB model 6UZY. Per-residue inclusion information can be found in section 3 on page 8.

### 9.1 Map-model overlay [i](#)



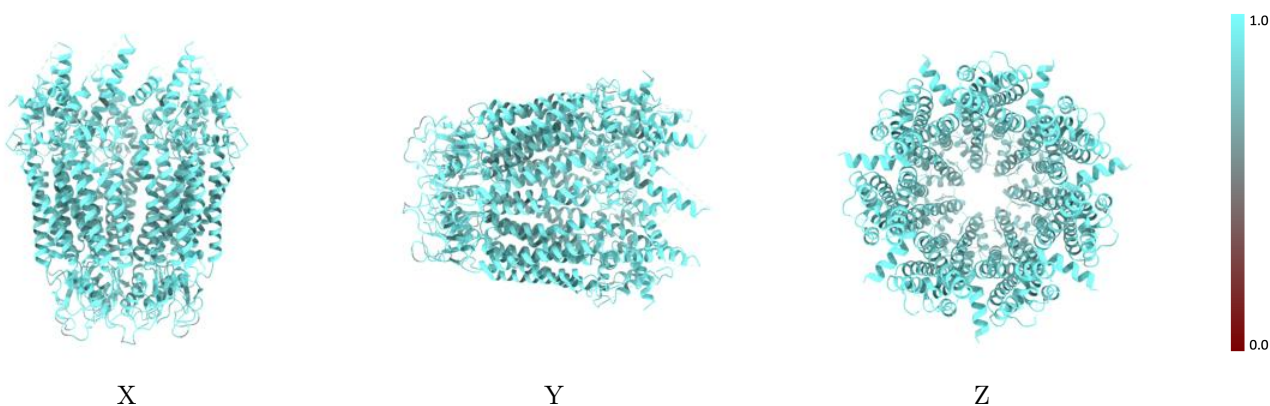
The images above show the 3D surface view of the map at the recommended contour level 0.012 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

## 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.

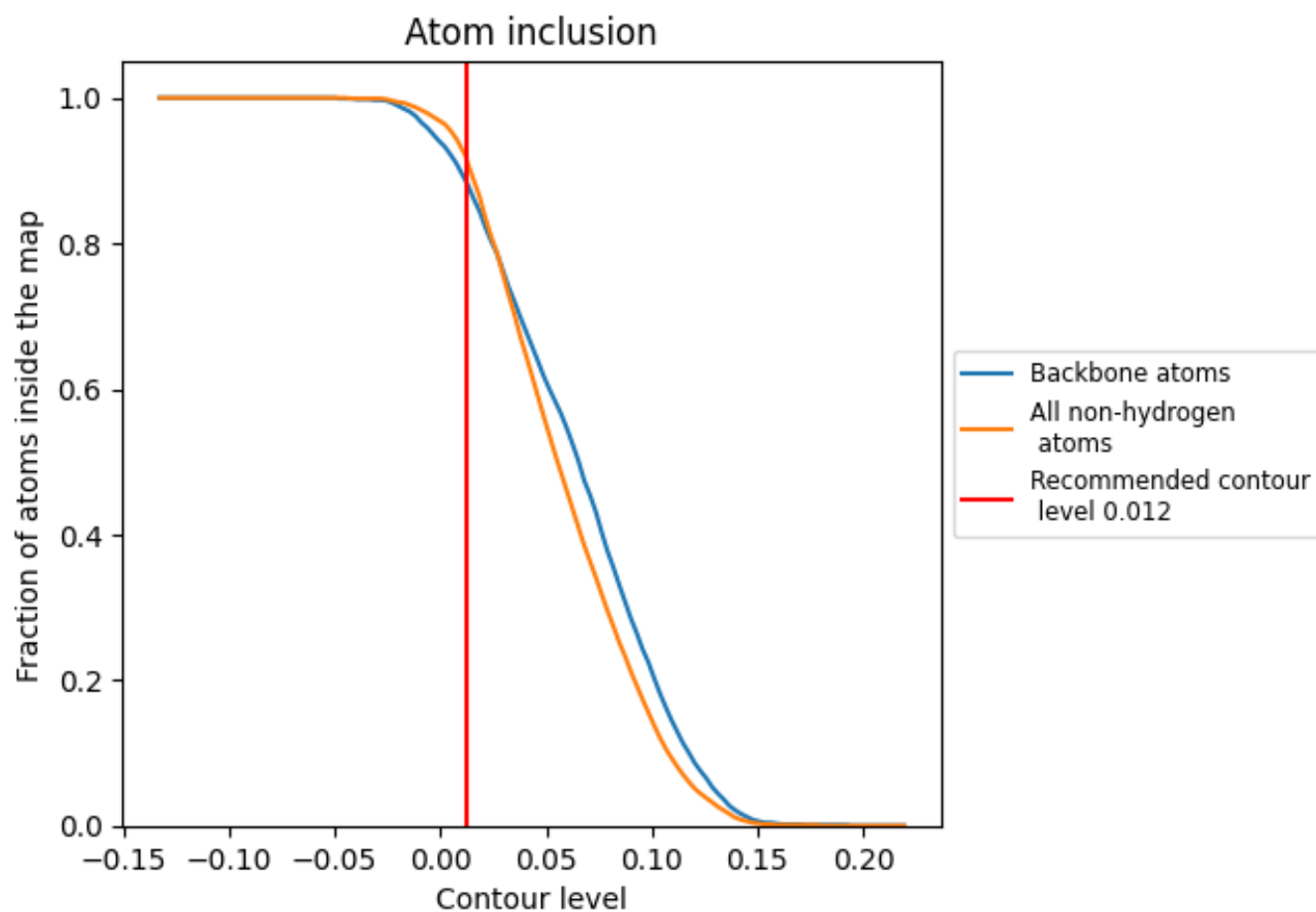
## 9.3 Atom inclusion mapped to coordinate model [i](#)



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 (0.012).



















## 9.4 Atom inclusion [i](#)



At the recommended contour level, 89% of all backbone atoms, 92% 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 (0.012) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.9200	 0.5280
A	 0.9220	 0.5280
B	 0.9190	 0.5270
C	 0.9230	 0.5280
D	 0.9210	 0.5290
E	 0.9180	 0.5290
F	 0.9180	 0.5280
G	 0.9180	 0.5270

