



Full wwPDB EM Validation Report ⓘ

Jan 6, 2025 – 02:12 PM JST

PDB ID : 9J53
EMDB ID : EMD-61141
Title : CryoEM structure of human XPR1 in complex with phosphate in state C
Authors : Zhang, W.H.; Chen, Y.K.; Guan, Z.Y.; Liu, Z.
Deposited on : 2024-08-11
Resolution : 3.30 Å (reported)

This is a Full wwPDB EM Validation Report for a publicly released PDB entry.

We welcome your comments at validation@mail.wwpdb.org

A user guide is available at

<https://www.wwpdb.org/validation/2017/EMValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

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

EMDB validation analysis : 0.0.1.dev113
Mogul : 1.8.5 (274361), CSD as541be (2020)
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) : 2.40

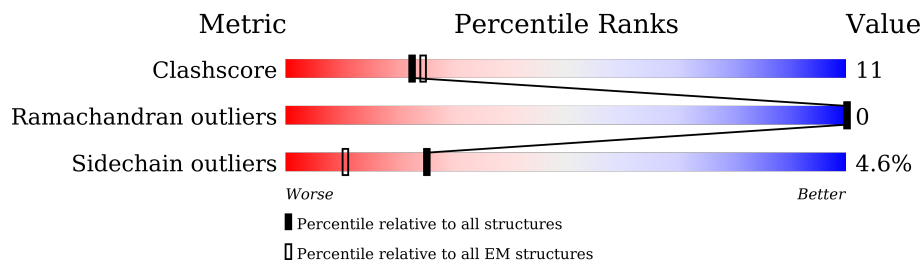
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 3.30 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 ≥ 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	720	
1	B	720	

2 Entry composition

There are 3 unique types of molecules in this entry. The entry contains 6598 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 Solute carrier family 53 member 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	B	382	3186	2143	510	518	15	0	0
1	A	382	3186	2143	510	518	15	0	0

There are 48 discrepancies between the modelled and reference sequences:

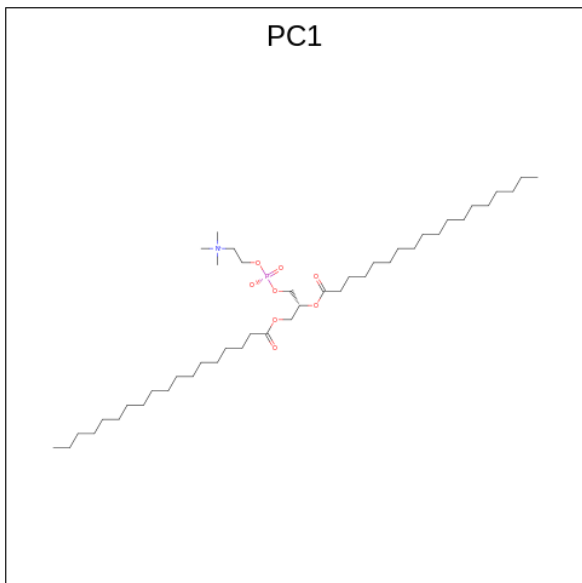
Chain	Residue	Modelled	Actual	Comment	Reference
B	697	LEU	-	expression tag	UNP Q9UBH6
B	698	GLU	-	expression tag	UNP Q9UBH6
B	699	ASP	-	expression tag	UNP Q9UBH6
B	700	TYR	-	expression tag	UNP Q9UBH6
B	701	LYS	-	expression tag	UNP Q9UBH6
B	702	ASP	-	expression tag	UNP Q9UBH6
B	703	HIS	-	expression tag	UNP Q9UBH6
B	704	ASP	-	expression tag	UNP Q9UBH6
B	705	GLY	-	expression tag	UNP Q9UBH6
B	706	ASP	-	expression tag	UNP Q9UBH6
B	707	TYR	-	expression tag	UNP Q9UBH6
B	708	LYS	-	expression tag	UNP Q9UBH6
B	709	ASP	-	expression tag	UNP Q9UBH6
B	710	HIS	-	expression tag	UNP Q9UBH6
B	711	ASP	-	expression tag	UNP Q9UBH6
B	712	ILE	-	expression tag	UNP Q9UBH6
B	713	ASP	-	expression tag	UNP Q9UBH6
B	714	TYR	-	expression tag	UNP Q9UBH6
B	715	LYS	-	expression tag	UNP Q9UBH6
B	716	ASP	-	expression tag	UNP Q9UBH6
B	717	ASP	-	expression tag	UNP Q9UBH6
B	718	ASP	-	expression tag	UNP Q9UBH6
B	719	ASP	-	expression tag	UNP Q9UBH6
B	720	LYS	-	expression tag	UNP Q9UBH6
A	697	LEU	-	expression tag	UNP Q9UBH6
A	698	GLU	-	expression tag	UNP Q9UBH6

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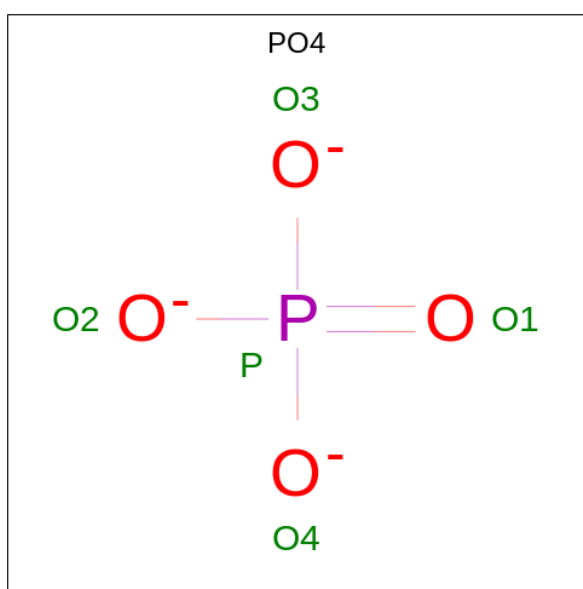
Chain	Residue	Modelled	Actual	Comment	Reference
A	699	ASP	-	expression tag	UNP Q9UBH6
A	700	TYR	-	expression tag	UNP Q9UBH6
A	701	LYS	-	expression tag	UNP Q9UBH6
A	702	ASP	-	expression tag	UNP Q9UBH6
A	703	HIS	-	expression tag	UNP Q9UBH6
A	704	ASP	-	expression tag	UNP Q9UBH6
A	705	GLY	-	expression tag	UNP Q9UBH6
A	706	ASP	-	expression tag	UNP Q9UBH6
A	707	TYR	-	expression tag	UNP Q9UBH6
A	708	LYS	-	expression tag	UNP Q9UBH6
A	709	ASP	-	expression tag	UNP Q9UBH6
A	710	HIS	-	expression tag	UNP Q9UBH6
A	711	ASP	-	expression tag	UNP Q9UBH6
A	712	ILE	-	expression tag	UNP Q9UBH6
A	713	ASP	-	expression tag	UNP Q9UBH6
A	714	TYR	-	expression tag	UNP Q9UBH6
A	715	LYS	-	expression tag	UNP Q9UBH6
A	716	ASP	-	expression tag	UNP Q9UBH6
A	717	ASP	-	expression tag	UNP Q9UBH6
A	718	ASP	-	expression tag	UNP Q9UBH6
A	719	ASP	-	expression tag	UNP Q9UBH6
A	720	LYS	-	expression tag	UNP Q9UBH6

- Molecule 2 is 1,2-DIACYL-SN-GLYCERO-3-PHOSPHOCHOLINE (three-letter code: PC1) (formula: $C_{44}H_{88}NO_8P$) (labeled as "Ligand of Interest" by depositor).



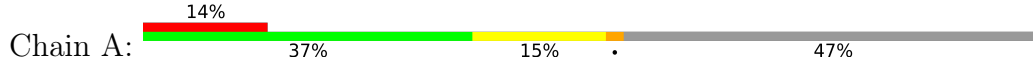
Mol	Chain	Residues	Atoms					AltConf
2	B	1	Total	C	N	O	P	0
			54	44	1	8	1	
2	B	1	Total	C	N	O	P	0
			54	44	1	8	1	
2	A	1	Total	C	N	O	P	0
			54	44	1	8	1	
2	A	1	Total	C	N	O	P	0
			54	44	1	8	1	

- Molecule 3 is PHOSPHATE ION (three-letter code: PO4) (formula: O₄P) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms		AltConf
3	B	1	Total	O P	0
			5	4 1	
3	A	1	Total	O P	0
			5	4 1	

• Molecule 1: Solute carrier family 53 member 1



MET	LYS	ALA	GLU	HIS	LEU	SER	ALA	LEU	GLY	ASP	ASP	THR	LEU	GLU	VAL	LEU	GLN	ARG	TYR	PHE	ALA	LYS	GLY	LEU	THR	PHE	GLU	LYS	PHE	GLN																							
THR	CYS	GLU	LYS	ALA	LEU	ALA	LYS	ILE	LEU	ASP	ASN	THR	THR	LEU	GLY	GLU	ALA	GLN	ARG	TYR	SER	LEU	LEU	GLN	THR	THR	HIS	LEU	HIS	GLN																							
GLU	ARG	VAL	GLN	HIS	ARG	ASN	ILE	LEU	ASP	LEU	ALA	LEU	THR	GLY	LEU	VAL	SER	GLY	THR	THR	ARG	ARG	ARG	THR	THR	THR	THR	ALA	VAL	VAL																							
GLU	VAL	ALA	PRO	PHE	S340	TYR	THR	CYS	LYS	ILE	LEU	ASN	GLN	LEU	ALA	ILE	THR	VAL	VAL	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	VAL																							
L253	A254	A255	V256	F257	K258	L259	T261	E260	D262	R263	S264	R270	I271	Y272	R273	F276	L277	L278	L284	L285	Y290	Q294	A295	G296	V297	M298	V300	L301	I302	F303	E304	L305	N306	F307	R308	S309	N310	H315	G324	C328	L329	S330	L331	L332	A333	C334							
A337	P338	I339	V341	I342	F343	A350	G353	F354	M355	V356	F357	I360	N361	T365	F366	Y367	Y368	K369	S370	R371	F372	W373	L374	L375	R376	L377	L378	F379	R380	V381	F382	T383	P385	V389	A392	D393	F394	W395	L396	Q399	S402	L403	I406	L407	M408	D409	L410	E411					
Y412	M413	I414	C415	F416	Y417	S418	L419	E420	L421	K422	W423	D424	E425	S426	K427	G428	L429	L430	P431	ASN	ASN	SER	GLU	GLY	ILE	CYS	HIS	LYS	TYR	THR	THR	G446	W447	R448	V451	Q452	C453	I454	I461	L464	R465	R466	D469	T470	K471	R472	A473	F474	P475	H476	L477	V478	M479
K482	T485	M489	Y490	T491	F492	S497	K500	E501	R502	G503	H504	S505	D506	T507	M508	V509	F510	F511	Y512	I515	V516	F517	Y518	I519	I520	Y524	Y525	W528	D529	D533	W534	G535	L536	F537	D538	K539	N540	A541	G542	E543	N544	R548	E549	E550	I551	V552	Y553	P554	Q555				
Y559	Y560	C561	E565	A572	W573	T574	I577	S578	I579	T580	S581	T582	T583	L584	L585	P586	H587	S588	G589	D590	I591	R604	N608	F609	F610	R611	L612	E613	L617	M618	G620	G621	E622	F623	R624	ALA	VAL	ARG	ASP	ALA	ILE	SER	VAL	ALA	PRO	LEU	ASN	ALA	ASP	ASP	THR		
LYS	ASP	HIS	ASP	GLY	ASP	TYR	LYS	ASP	ASP	HIS	ASP	ASP	ASP	ASP	ASP	ASP	THR	TRP	LYS	TYR	ASN	GLN	SER	ILE	SER	LEU	ARG	ARG	PRO	ARG	LEU	ALA	SER	GLN	SER	LYS	ALA	ARG	ASP	THR	LYS	VAL	LEU	ILE	GLU	ASP	THR	ASP	ASP	VAL	ASP	ASP	THR

4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	132440	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	NONE	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	50	Depositor
Minimum defocus (nm)	1200	Depositor
Maximum defocus (nm)	2200	Depositor
Magnification	Not provided	
Image detector	GATAN K3 BIOQUANTUM (6k x 4k)	Depositor
Maximum map value	2.911	Depositor
Minimum map value	-2.014	Depositor
Average map value	-0.001	Depositor
Map value standard deviation	0.061	Depositor
Recommended contour level	0.6	Depositor
Map size (\AA)	299.6, 299.6, 299.6	wwPDB
Map dimensions	280, 280, 280	wwPDB
Map angles ($^\circ$)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (\AA)	1.07, 1.07, 1.07	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: PC1, PO4

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	0.27	0/3292	0.45	0/4479
1	B	0.27	0/3292	0.46	0/4479
All	All	0.27	0/6584	0.46	0/8958

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	3186	0	3185	80	0
1	B	3186	0	3186	67	0
2	A	108	0	176	9	0
2	B	108	0	176	2	0
3	A	5	0	0	0	0
3	B	5	0	0	1	0
All	All	6598	0	6723	148	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 11.

All (148) 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:611:ARG:NH1	1:A:620:CYS:SG	2.55	0.80
1:A:395:TRP:O	1:A:399:GLN:NE2	2.17	0.76
1:A:385:PRO:HB3	1:A:465:ARG:HB2	1.69	0.73
1:A:389:VAL:HG11	1:A:466:ARG:HG2	1.72	0.71
1:B:529:ASP:HA	1:B:533:ASP:HB3	1.72	0.71
1:A:368:TYR:HA	1:A:371:ARG:HH11	1.56	0.70
1:A:529:ASP:HA	1:A:533:ASP:HB2	1.73	0.69
1:B:465:ARG:NH1	1:B:469:ASP:OD2	2.26	0.68
1:A:399:GLN:OE1	1:A:608:ASN:ND2	2.26	0.68
1:B:482:LYS:O	1:B:485:THR:OG1	2.12	0.67
1:A:482:LYS:O	1:A:485:THR:OG1	2.12	0.67
1:A:582:THR:HG23	1:A:584:LEU:H	1.60	0.67
1:B:346:VAL:O	1:B:350:ALA:N	2.26	0.65
1:A:368:TYR:HA	1:A:371:ARG:HD3	1.78	0.65
1:B:277:LEU:HD21	1:B:597:ALA:HB1	1.79	0.65
1:A:551:ILE:O	1:A:559:TYR:OH	2.13	0.65
1:A:341:VAL:HG13	1:A:342:ILE:HG12	1.79	0.65
1:A:355:MET:HB3	2:A:801:PC1:H2A2	1.77	0.65
1:A:285:LEU:HD21	2:A:801:PC1:H332	1.78	0.64
1:A:357:PHE:O	1:A:361:ASN:ND2	2.30	0.64
1:A:619:ASN:HD22	1:A:624:ARG:HB2	1.62	0.64
1:A:306:ASN:O	1:A:310:ASN:ND2	2.31	0.64
1:B:385:PRO:HD3	1:B:461:ILE:HD12	1.79	0.63
1:B:533:ASP:O	1:B:614:ASN:ND2	2.30	0.63
1:A:551:ILE:O	1:A:553:TYR:N	2.34	0.60
1:A:466:ARG:NH2	1:A:621:GLY:O	2.33	0.60
1:A:276:PHE:HE1	2:A:802:PC1:H2I1	1.67	0.59
1:B:422:LYS:HE2	1:B:424:ASP:HB2	1.84	0.59
1:B:534:TRP:O	1:B:548:ARG:NH2	2.32	0.59
1:A:361:ASN:O	1:A:371:ARG:NH2	2.32	0.59
1:A:548:ARG:NH1	1:A:613:GLU:OE2	2.36	0.59
1:A:489:MET:HE2	1:A:574:THR:HG22	1.83	0.59
1:B:230:PRO:O	1:B:233:THR:OG1	2.20	0.59
1:B:360:ILE:HA	1:B:375:LEU:HD11	1.84	0.59
1:A:534:TRP:O	1:A:548:ARG:NH2	2.35	0.58
1:B:266:TRP:HZ2	1:B:591:ILE:HG13	1.68	0.58
1:A:482:LYS:HD3	1:A:525:THR:HG22	1.84	0.58
1:A:393:ASP:N	1:A:393:ASP:OD1	2.26	0.58
1:B:466:ARG:NH2	1:B:621:GLY:O	2.37	0.58
1:A:374:LEU:HD21	2:A:801:PC1:H3A1	1.86	0.58
1:B:272:TYR:OH	1:B:334:CYS:SG	2.53	0.58

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:614:ASN:OD1	1:B:618:ASN:ND2	2.36	0.57
1:A:465:ARG:NH1	1:A:469:ASP:OD1	2.36	0.57
1:B:369:LYS:HB3	2:B:801:PC1:H132	1.87	0.57
1:B:236:ARG:NE	1:B:318:GLU:OE2	2.32	0.56
1:B:402:SER:HB2	1:B:604:ARG:HG2	1.87	0.56
1:A:517:PHE:HA	1:A:520:ILE:HG22	1.87	0.56
1:B:576:GLN:O	1:B:580:THR:OG1	2.24	0.56
1:B:341:VAL:HG23	1:B:342:ILE:HG12	1.87	0.56
1:A:461:ILE:HD12	1:A:464:LEU:HD12	1.87	0.56
1:B:527:ILE:HG13	1:B:531:LYS:HD3	1.87	0.55
1:A:473:ALA:HA	1:A:477:LEU:HD23	1.88	0.55
1:B:298:ASN:HD22	1:B:302:ILE:HG13	1.71	0.55
1:A:377:LEU:HD21	1:A:392:ALA:HB1	1.88	0.55
1:A:475:PRO:HB2	1:A:528:TRP:HH2	1.71	0.55
1:B:402:SER:OG	1:B:604:ARG:NE	2.36	0.54
1:B:576:GLN:NE2	1:B:580:THR:OG1	2.40	0.54
1:B:366:PHE:O	1:B:371:ARG:NH2	2.31	0.54
1:B:380:ARG:NH2	1:B:393:ASP:OD2	2.41	0.54
1:B:401:ASN:ND2	3:B:803:PO4:O3	2.31	0.54
1:B:382:PHE:HA	1:B:458:LEU:HD21	1.89	0.54
1:A:588:SER:OG	1:A:589:GLY:N	2.40	0.53
1:A:299:HIS:HB2	1:A:303:PHE:HD2	1.74	0.53
1:B:247:LEU:HA	1:B:250:THR:HG22	1.92	0.52
1:B:298:ASN:HB3	1:B:302:ILE:HG13	1.91	0.52
1:A:451:VAL:HG23	1:A:454:ILE:HD12	1.91	0.52
1:A:369:LYS:HG2	2:A:801:PC1:H152	1.92	0.52
1:B:484:SER:HA	1:B:487:PHE:HD2	1.75	0.51
1:B:529:ASP:OD2	1:B:570:ARG:NH2	2.31	0.51
1:A:230:PRO:HB2	1:A:233:THR:HB	1.91	0.51
1:B:577:ILE:O	1:B:581:SER:OG	2.27	0.51
1:B:272:TYR:HH	1:B:334:CYS:HG	1.38	0.51
1:B:466:ARG:O	1:B:470:THR:OG1	2.16	0.51
1:A:350:ALA:O	1:A:354:PHE:N	2.32	0.51
1:B:266:TRP:CZ2	1:B:591:ILE:HG13	2.46	0.51
1:A:279:ILE:HD13	1:A:324:GLY:HA2	1.92	0.50
1:B:393:ASP:N	1:B:393:ASP:OD1	2.45	0.50
1:A:258:LYS:HG3	1:A:259:LEU:H	1.77	0.50
1:A:406:ILE:HA	1:A:409:ASP:HB2	1.93	0.50
1:B:569:LEU:HD22	1:B:599:LEU:HB3	1.94	0.50
1:A:385:PRO:HB3	1:A:465:ARG:HD3	1.95	0.49
1:B:533:ASP:OD2	1:B:611:ARG:NH1	2.46	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:290:TYR:O	1:A:294:GLN:HG2	2.14	0.48
1:B:590:ASP:N	1:B:590:ASP:OD1	2.47	0.47
1:A:544:ASN:ND2	1:A:548:ARG:O	2.35	0.47
1:B:364:LYS:HA	1:B:368:TYR:HB3	1.96	0.47
1:B:289:THR:O	1:B:293:ARG:N	2.45	0.47
1:B:551:ILE:HD12	1:B:559:TYR:CE2	2.50	0.47
1:A:374:LEU:HD22	2:A:801:PC1:H252	1.98	0.46
1:A:381:VAL:HG21	1:A:396:LEU:HB2	1.98	0.46
1:A:353:GLY:O	1:A:357:PHE:N	2.38	0.46
1:A:379:PHE:O	1:A:383:THR:OG1	2.34	0.46
1:A:354:PHE:HA	1:A:357:PHE:HB2	1.98	0.46
1:B:377:LEU:HD11	1:B:392:ALA:HB1	1.98	0.45
1:A:366:PHE:O	1:A:371:ARG:HD2	2.15	0.45
1:B:361:ASN:HB3	1:B:371:ARG:HH11	1.81	0.45
1:B:351:LEU:O	1:B:355:MET:HG3	2.17	0.45
1:A:403:LEU:O	1:A:406:ILE:HG12	2.17	0.45
1:B:551:ILE:HG23	1:B:559:TYR:HE2	1.82	0.45
1:A:304:GLU:OE1	1:A:373:TRP:NE1	2.42	0.45
1:A:402:SER:OG	1:A:604:ARG:NE	2.35	0.45
1:A:408:MET:HE1	1:A:448:ARG:O	2.17	0.44
1:A:247:LEU:HB3	1:A:328:CYS:HB3	1.99	0.44
1:B:255:ALA:HA	1:B:259:LEU:HD13	1.98	0.44
1:B:402:SER:CB	1:B:604:ARG:HG2	2.47	0.44
1:B:501:GLU:N	1:B:501:GLU:OE1	2.50	0.44
1:A:272:TYR:OH	1:A:334:CYS:SG	2.52	0.43
1:A:315:HIS:HD2	1:A:367:TYR:CE1	2.36	0.43
1:A:482:LYS:HE2	1:A:528:TRP:CG	2.53	0.43
1:B:242:GLY:O	1:B:246:VAL:HG23	2.19	0.43
1:A:369:LYS:HD3	2:A:801:PC1:H143	2.00	0.43
1:A:585:LEU:HB3	1:A:587:HIS:CE1	2.54	0.43
1:B:474:PHE:HB2	1:B:475:PRO:HD3	2.01	0.43
1:A:273:ARG:O	1:A:277:LEU:HG	2.19	0.42
1:A:273:ARG:HA	1:A:276:PHE:HB3	2.01	0.42
1:B:247:LEU:HB3	1:B:328:CYS:HB3	2.00	0.42
1:B:387:HIS:CD2	1:B:387:HIS:H	2.35	0.42
1:B:538:ASP:HB3	1:B:540:ASN:OD1	2.19	0.42
1:B:260:GLU:CB	1:B:263:ARG:HB2	2.48	0.42
1:B:262:ASP:O	1:B:431:PRO:HB3	2.20	0.42
1:A:448:ARG:HA	1:A:451:VAL:HG12	2.00	0.42
1:B:610:PHE:O	1:B:613:GLU:HG3	2.20	0.42
1:A:242:GLY:O	1:A:246:VAL:HG23	2.20	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:375:LEU:HD23	1:A:375:LEU:HA	1.77	0.42
1:B:288:ASN:HB3	1:B:292:TRP:CZ2	2.55	0.42
1:B:565:GLU:O	1:B:569:LEU:HG	2.19	0.41
1:B:276:PHE:HA	1:B:279:ILE:HD12	2.03	0.41
1:B:460:PHE:CZ	1:B:464:LEU:HD11	2.55	0.41
1:A:475:PRO:HB2	1:A:528:TRP:CH2	2.54	0.41
1:A:369:LYS:HE3	1:A:369:LYS:HB3	1.92	0.41
1:A:461:ILE:HD12	1:A:461:ILE:HA	1.87	0.41
1:A:541:ALA:HA	1:A:549:GLU:HG2	2.02	0.41
1:A:332:LEU:HD23	1:A:332:LEU:HA	1.92	0.41
1:B:306:ASN:HB2	2:B:801:PC1:H153	2.02	0.41
1:A:253:LEU:O	1:A:257:PHE:HB2	2.21	0.41
1:A:573:TRP:CZ2	1:A:577:ILE:HD11	2.56	0.41
1:A:370:SER:HB2	2:A:801:PC1:H12	2.03	0.41
1:A:452:GLN:OE1	1:A:581:SER:OG	2.39	0.41
1:A:492:PHE:HD1	1:A:510:PHE:HD1	1.68	0.41
1:A:497:SER:HB3	1:A:584:LEU:HB2	2.03	0.41
1:A:412:TYR:O	1:A:416:PHE:N	2.47	0.41
1:B:409:ASP:HA	1:B:412:TYR:HB3	2.02	0.40
1:A:520:ILE:O	1:A:524:TYR:HB2	2.20	0.40
2:A:802:PC1:H2B2	2:A:802:PC1:H282	1.81	0.40
1:A:515:ILE:O	1:A:519:ILE:HG12	2.21	0.40
1:B:253:LEU:HD13	1:B:253:LEU:HA	1.92	0.40
1:B:459:ARG:HD2	1:B:459:ARG:HA	1.86	0.40
1:B:570:ARG:HA	1:B:570:ARG:HD3	1.85	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	378/720 (52%)	348 (92%)	30 (8%)	0	100 100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	B	378/720 (52%)	343 (91%)	35 (9%)	0	100	100
All	All	756/1440 (52%)	691 (91%)	65 (9%)	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	339/644 (53%)	322 (95%)	17 (5%)	20	48
1	B	339/644 (53%)	325 (96%)	14 (4%)	26	54
All	All	678/1288 (53%)	647 (95%)	31 (5%)	25	52

All (31) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	B	241	CYS
1	B	244	PHE
1	B	345	TYR
1	B	354	PHE
1	B	366	PHE
1	B	377	LEU
1	B	393	ASP
1	B	394	PHE
1	B	403	LEU
1	B	463	CYS
1	B	524	TYR
1	B	580	THR
1	B	602	PHE
1	B	604	ARG
1	A	257	PHE
1	A	283	PHE
1	A	303	PHE
1	A	354	PHE

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Mol	Chain	Res	Type
1	A	367	TYR
1	A	369	LYS
1	A	377	LEU
1	A	379	PHE
1	A	393	ASP
1	A	394	PHE
1	A	399	GLN
1	A	409	ASP
1	A	415	CYS
1	A	416	PHE
1	A	517	PHE
1	A	524	TYR
1	A	609	PHE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (6) such sidechains are listed below:

Mol	Chain	Res	Type
1	B	298	ASN
1	B	608	ASN
1	B	618	ASN
1	A	361	ASN
1	A	587	HIS
1	A	619	ASN

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](#)

6 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	PO4	A	803	-	4,4,4	1.38	1 (25%)	6,6,6	0.55	0
2	PC1	B	802	-	53,53,53	0.50	0	59,61,61	0.47	1 (1%)
2	PC1	A	801	-	53,53,53	0.49	0	59,61,61	0.48	1 (1%)
3	PO4	B	803	-	4,4,4	1.42	1 (25%)	6,6,6	0.47	0
2	PC1	A	802	-	53,53,53	0.51	0	59,61,61	0.49	1 (1%)
2	PC1	B	801	-	53,53,53	0.49	0	59,61,61	0.48	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	PC1	B	802	-	-	21/57/57/57	-
2	PC1	B	801	-	-	23/57/57/57	-
2	PC1	A	802	-	-	29/57/57/57	-
2	PC1	A	801	-	-	25/57/57/57	-

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	B	803	PO4	P-O1	2.48	1.56	1.50
3	A	803	PO4	P-O1	2.39	1.56	1.50

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	802	PC1	O12-P-O14	2.42	124.21	112.24
2	B	802	PC1	O12-P-O14	2.38	124.01	112.24
2	B	801	PC1	O12-P-O14	2.34	123.82	112.24
2	A	801	PC1	O12-P-O14	2.32	123.71	112.24

There are no chirality outliers.

All (98) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	B	801	PC1	C11-O13-P-O12
2	B	801	PC1	C11-O13-P-O14
2	B	802	PC1	C11-O13-P-O12
2	B	802	PC1	C12-C11-O13-P
2	B	802	PC1	O13-C11-C12-N
2	B	802	PC1	O22-C21-O21-C2
2	A	801	PC1	C11-O13-P-O12
2	A	802	PC1	C11-O13-P-O12
2	A	802	PC1	C11-O13-P-O14
2	A	802	PC1	C11-O13-P-O11
2	A	802	PC1	C1-O11-P-O12
2	A	802	PC1	C1-O11-P-O14
2	A	802	PC1	C22-C21-O21-C2
2	A	802	PC1	O22-C21-O21-C2
2	B	802	PC1	C22-C21-O21-C2
2	A	801	PC1	O32-C31-O31-C3
2	A	801	PC1	C32-C31-O31-C3
2	B	802	PC1	C2C-C2D-C2E-C2F
2	B	801	PC1	C26-C27-C28-C29
2	B	802	PC1	C2A-C2B-C2C-C2D
2	A	801	PC1	C21-C22-C23-C24
2	A	802	PC1	C21-C22-C23-C24
2	B	801	PC1	C11-O13-P-O11
2	B	802	PC1	C11-O13-P-O11
2	A	801	PC1	C11-O13-P-O11
2	A	802	PC1	C1-O11-P-O13
2	B	801	PC1	C32-C31-O31-C3
2	B	801	PC1	C32-C33-C34-C35
2	A	802	PC1	C25-C26-C27-C28
2	A	801	PC1	C36-C37-C38-C39
2	A	802	PC1	C2B-C2C-C2D-C2E
2	B	802	PC1	C3A-C3B-C3C-C3D
2	B	801	PC1	C27-C28-C29-C2A
2	B	801	PC1	C2A-C2B-C2C-C2D
2	B	801	PC1	C21-C22-C23-C24
2	A	802	PC1	C3C-C3D-C3E-C3F
2	B	801	PC1	O32-C31-O31-C3
2	A	802	PC1	C11-C12-N-C15
2	B	801	PC1	C31-C32-C33-C34
2	A	802	PC1	C3A-C3B-C3C-C3D

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Mol	Chain	Res	Type	Atoms
2	A	801	PC1	C28-C29-C2A-C2B
2	A	802	PC1	C2C-C2D-C2E-C2F
2	A	801	PC1	C34-C35-C36-C37
2	B	801	PC1	C25-C26-C27-C28
2	B	801	PC1	C2C-C2D-C2E-C2F
2	A	801	PC1	C27-C28-C29-C2A
2	B	802	PC1	C24-C25-C26-C27
2	A	801	PC1	C38-C39-C3A-C3B
2	B	801	PC1	C2E-C2F-C2G-C2H
2	B	802	PC1	C2F-C2G-C2H-C2I
2	B	801	PC1	C35-C36-C37-C38
2	A	802	PC1	C3D-C3E-C3F-C3G
2	B	801	PC1	C1-C2-C3-O31
2	A	801	PC1	O11-C1-C2-O21
2	B	802	PC1	C2B-C2C-C2D-C2E
2	A	801	PC1	O11-C1-C2-C3
2	A	801	PC1	C37-C38-C39-C3A
2	A	802	PC1	C22-C23-C24-C25
2	B	801	PC1	C33-C34-C35-C36
2	B	801	PC1	C28-C29-C2A-C2B
2	B	802	PC1	C33-C34-C35-C36
2	A	801	PC1	C11-C12-N-C14
2	A	801	PC1	C2E-C2F-C2G-C2H
2	A	802	PC1	C11-C12-N-C13
2	B	801	PC1	O13-C11-C12-N
2	A	801	PC1	O13-C11-C12-N
2	A	802	PC1	C36-C37-C38-C39
2	A	802	PC1	C34-C35-C36-C37
2	A	801	PC1	C11-C12-N-C15
2	A	802	PC1	C11-C12-N-C14
2	B	802	PC1	C35-C36-C37-C38
2	B	802	PC1	C1-C2-C3-O31
2	A	801	PC1	C11-C12-N-C13
2	B	802	PC1	C3B-C3C-C3D-C3E
2	B	802	PC1	C2D-C2E-C2F-C2G
2	B	802	PC1	C31-C32-C33-C34
2	A	802	PC1	C29-C2A-C2B-C2C
2	B	801	PC1	C37-C38-C39-C3A
2	A	802	PC1	C2-C1-O11-P
2	B	801	PC1	C34-C35-C36-C37
2	A	801	PC1	C32-C33-C34-C35
2	A	802	PC1	C28-C29-C2A-C2B

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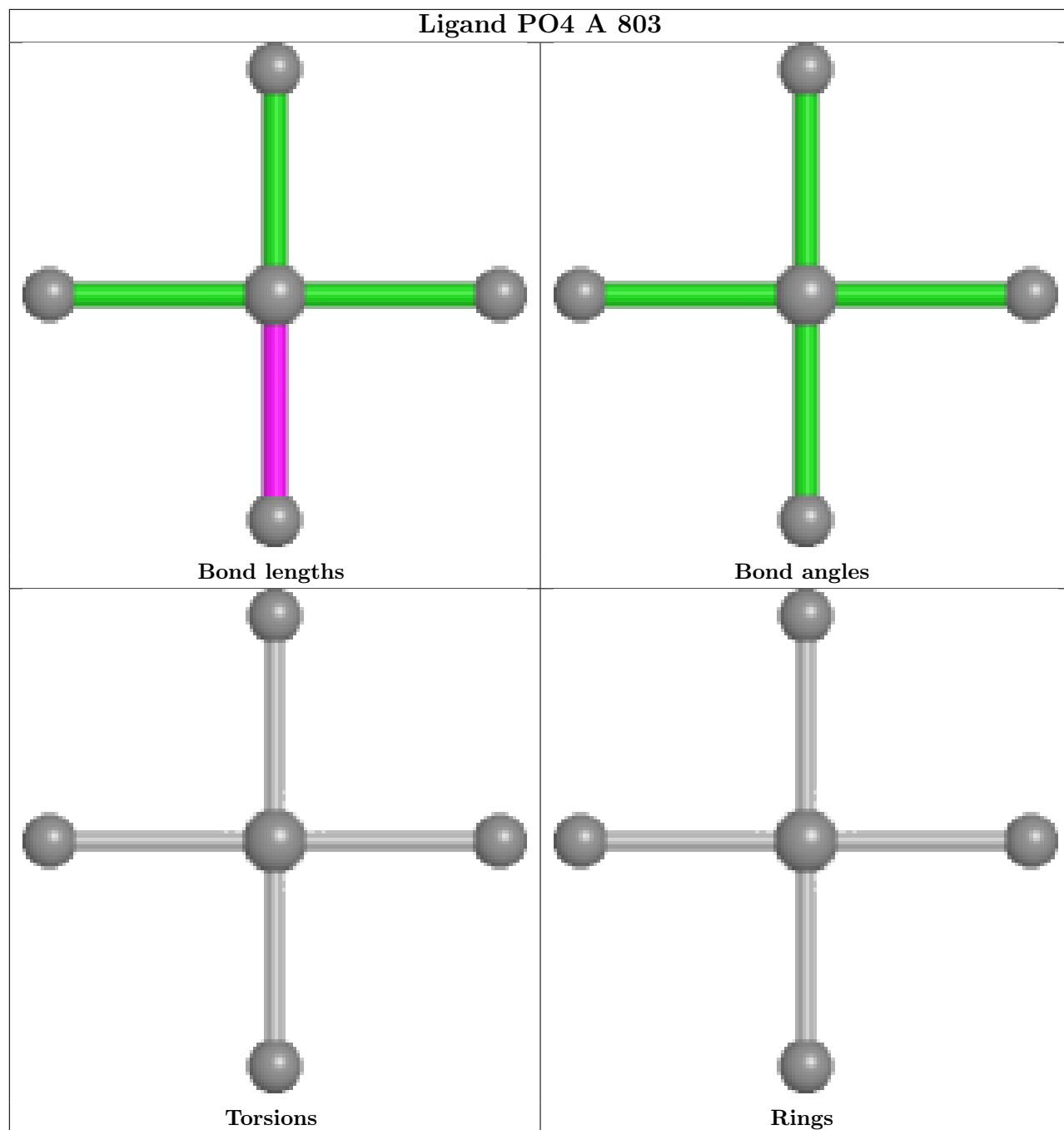
Mol	Chain	Res	Type	Atoms
2	A	801	PC1	C26-C27-C28-C29
2	A	801	PC1	O21-C21-C22-C23
2	A	801	PC1	O31-C31-C32-C33
2	A	802	PC1	C2F-C2G-C2H-C2I
2	B	802	PC1	C3C-C3D-C3E-C3F
2	B	801	PC1	C3B-C3C-C3D-C3E
2	A	802	PC1	C3B-C3C-C3D-C3E
2	A	802	PC1	C3E-C3F-C3G-C3H
2	A	801	PC1	O22-C21-C22-C23
2	A	802	PC1	C24-C25-C26-C27
2	B	802	PC1	C22-C23-C24-C25
2	B	801	PC1	C22-C23-C24-C25
2	A	801	PC1	C22-C23-C24-C25
2	A	802	PC1	C12-C11-O13-P
2	A	801	PC1	O32-C31-C32-C33
2	B	802	PC1	O21-C21-C22-C23

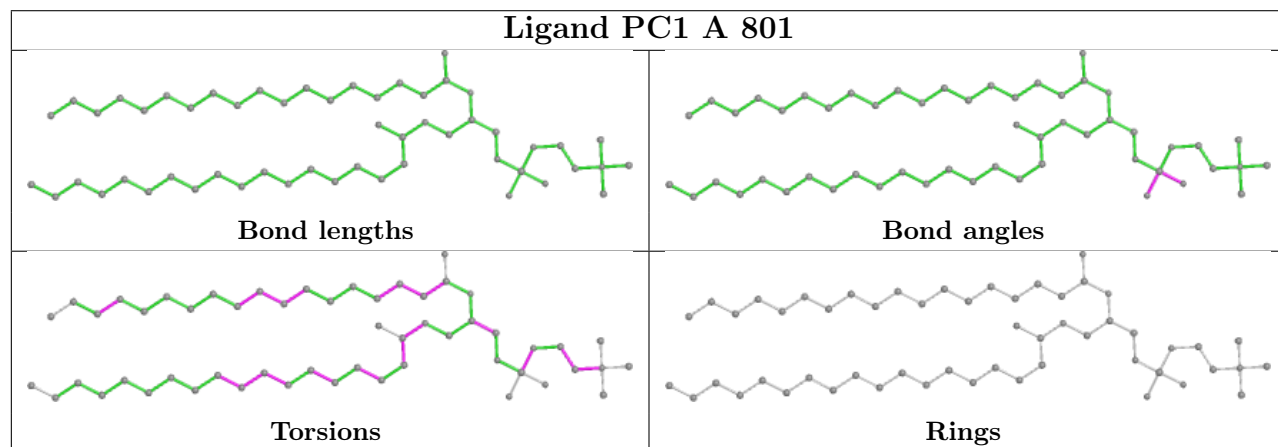
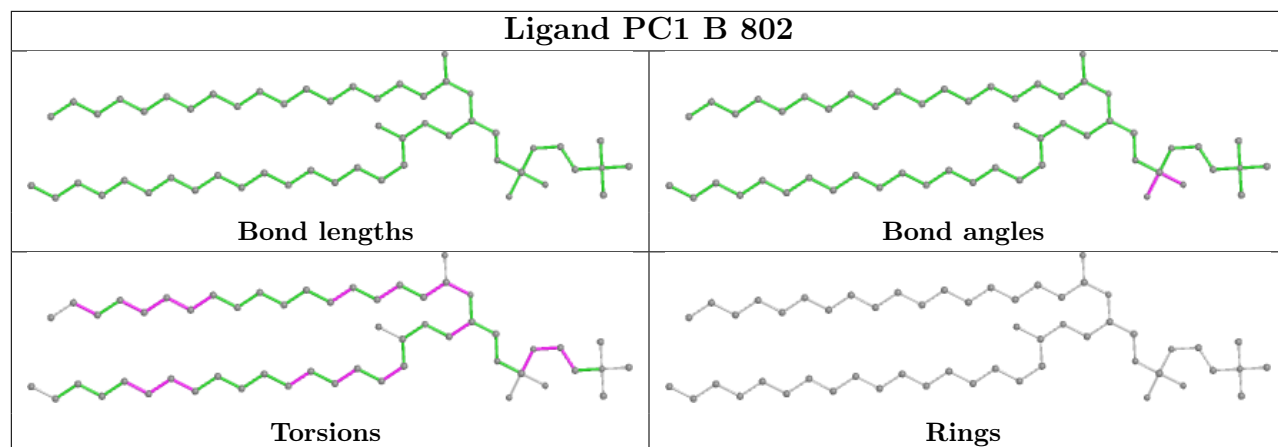
There are no ring outliers.

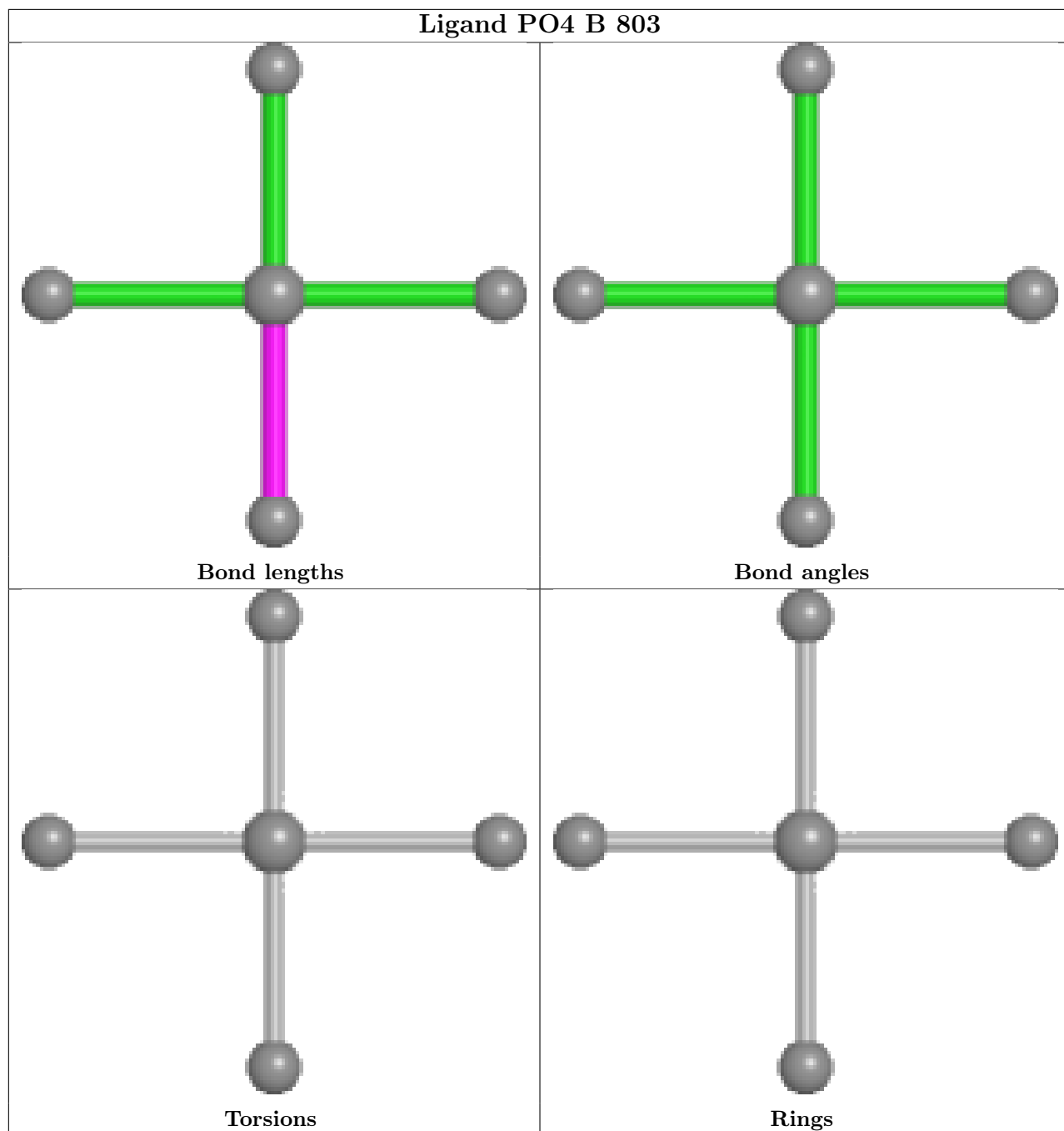
4 monomers are involved in 12 short contacts:

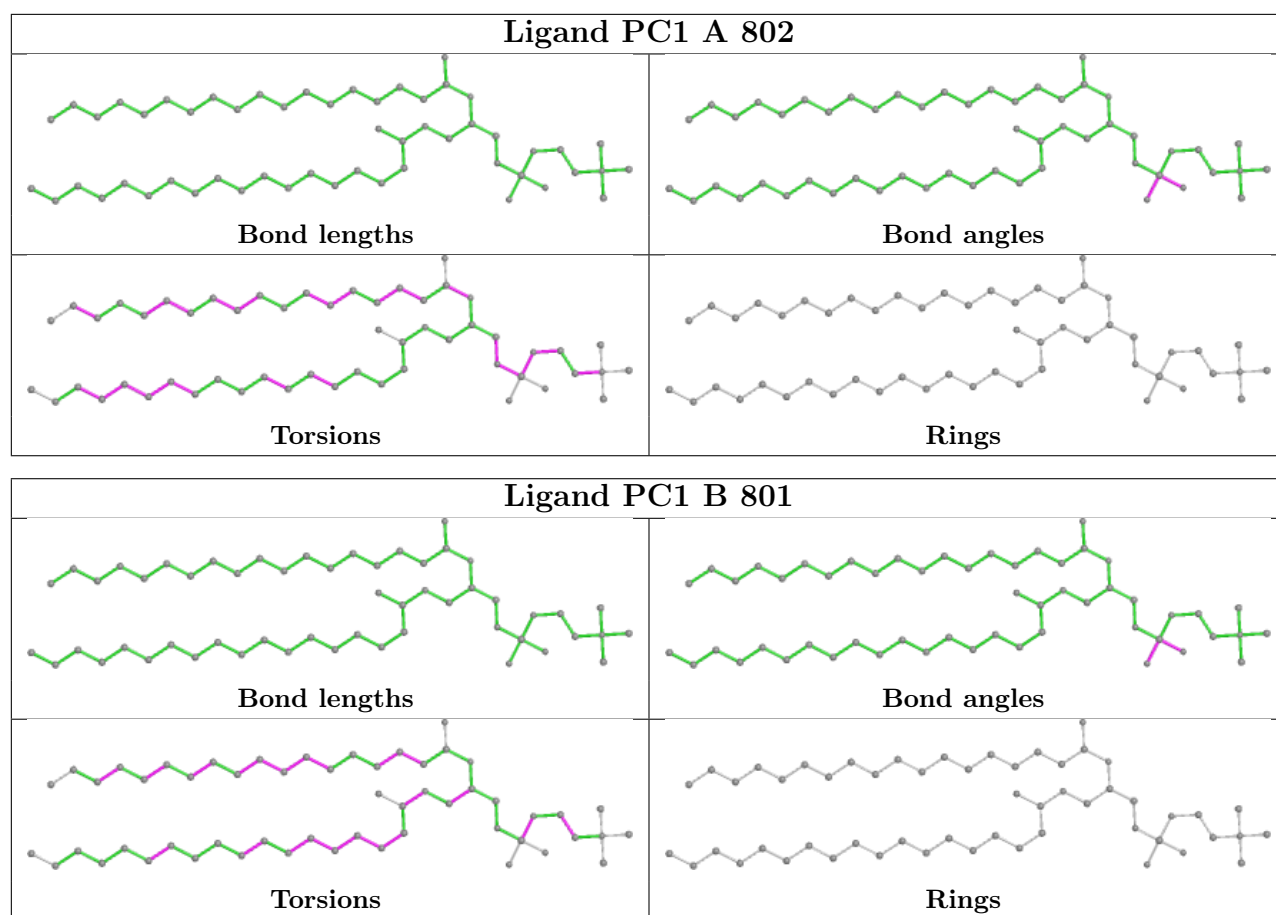
Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	801	PC1	7	0
3	B	803	PO4	1	0
2	A	802	PC1	2	0
2	B	801	PC1	2	0

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.

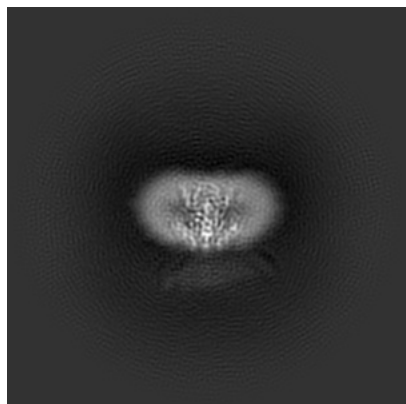
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-61141. These allow visual inspection of the internal detail of the map and identification of artifacts.

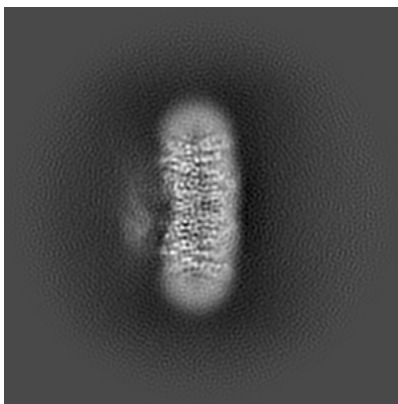
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

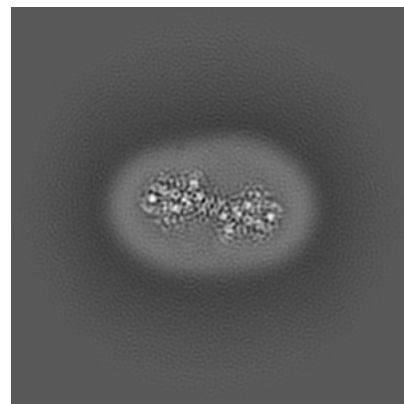
6.1.1 Primary map



X

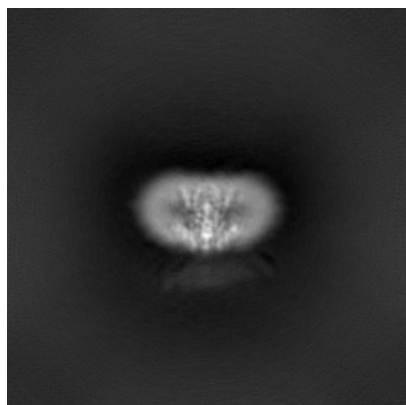


Y

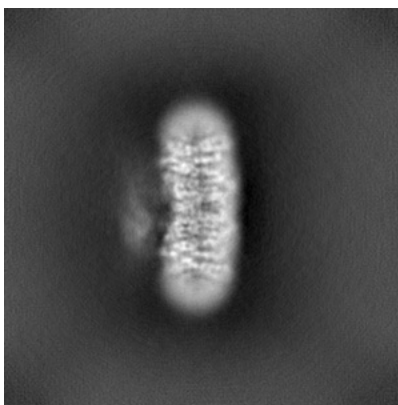


Z

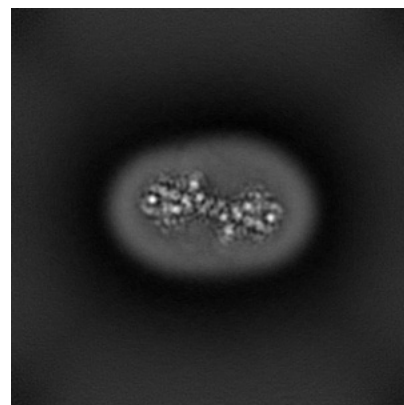
6.1.2 Raw map



X



Y

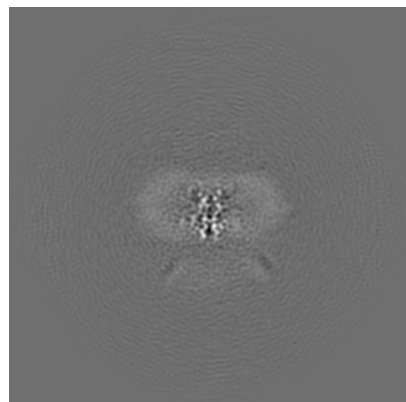


Z

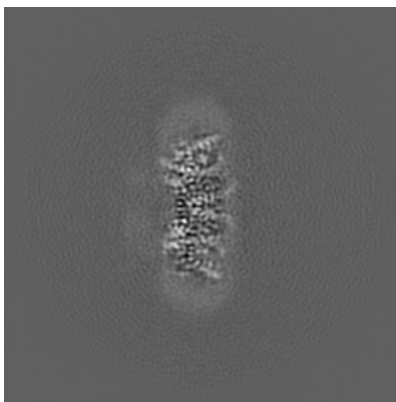
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

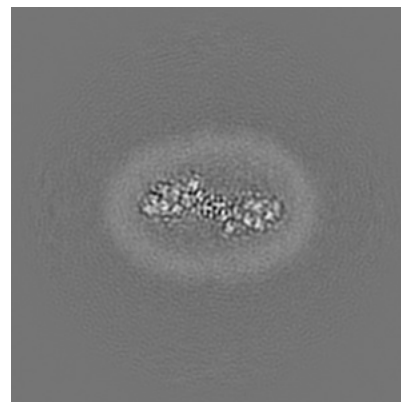
6.2.1 Primary map



X Index: 140

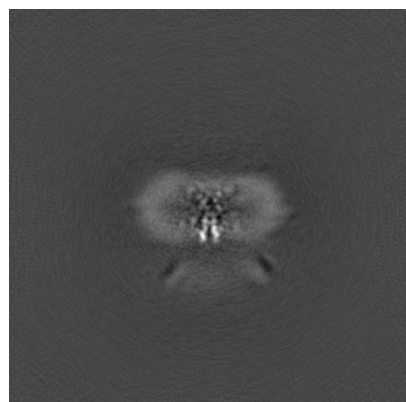


Y Index: 140

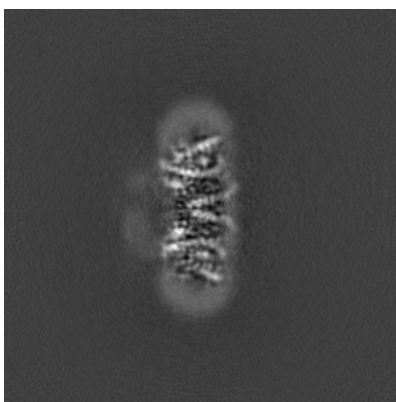


Z Index: 140

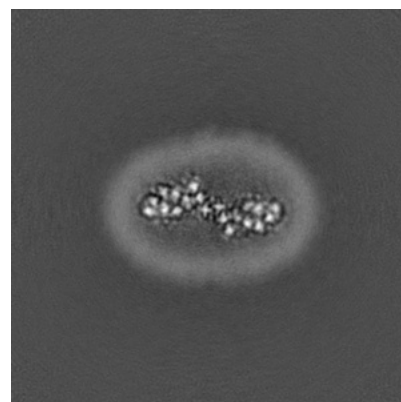
6.2.2 Raw map



X Index: 140



Y Index: 140

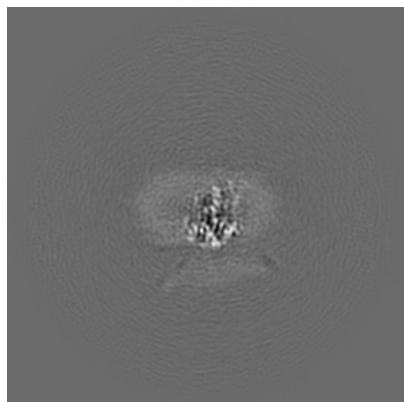


Z Index: 140

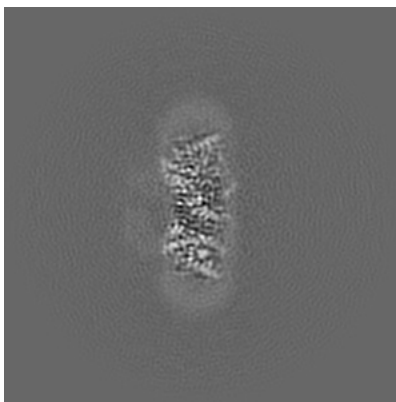
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

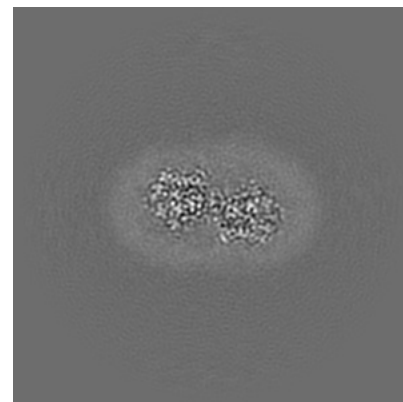
6.3.1 Primary map



X Index: 120

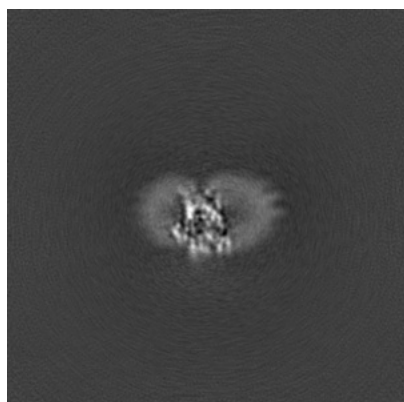


Y Index: 139

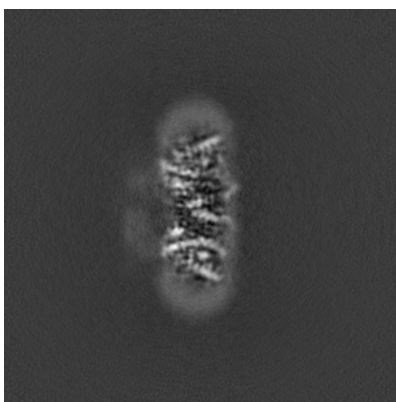


Z Index: 125

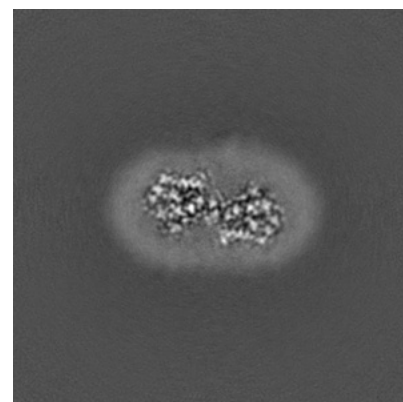
6.3.2 Raw map



X Index: 173



Y Index: 139

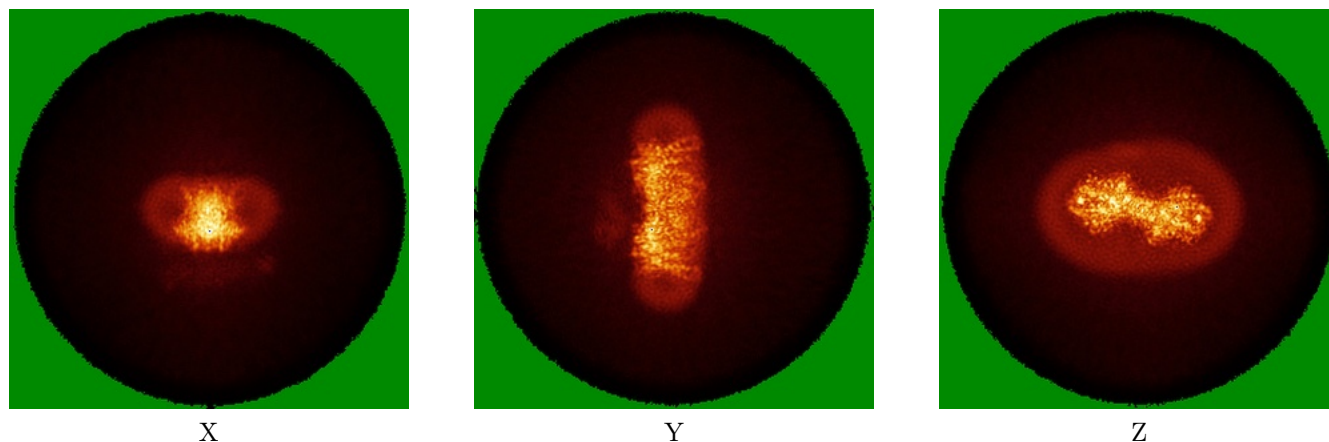


Z Index: 124

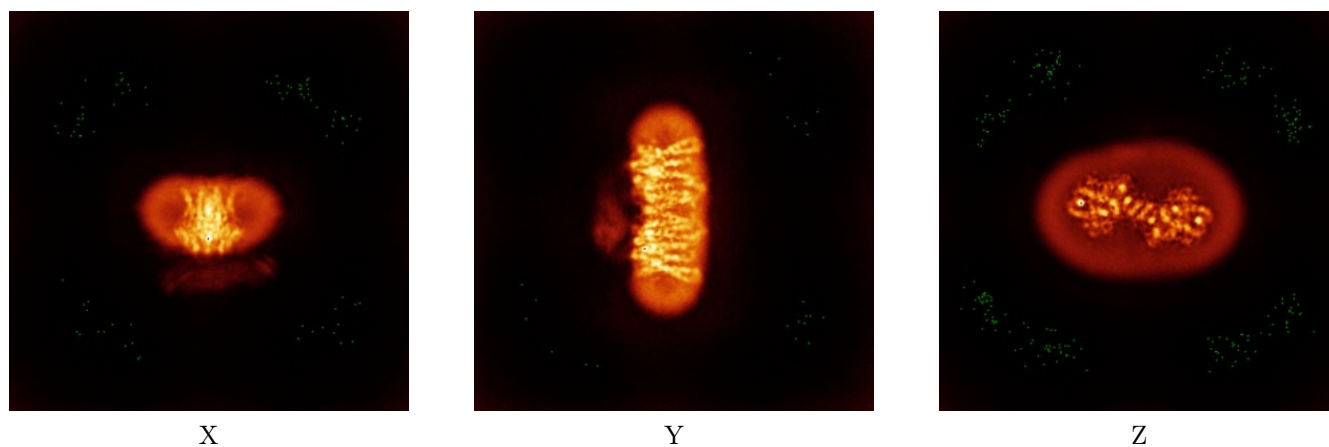
The images above show the largest variance slices of the map in three orthogonal directions.

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

6.4.1 Primary map



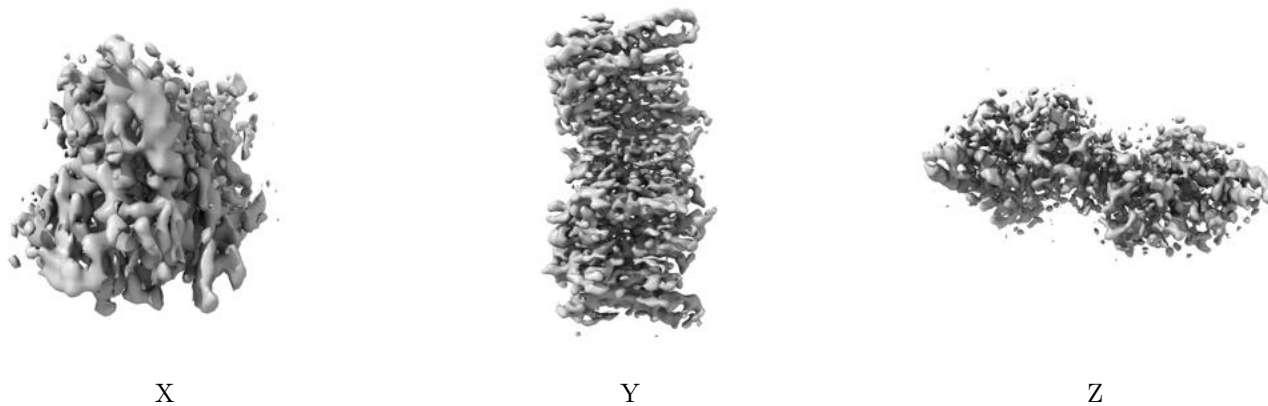
6.4.2 Raw map



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

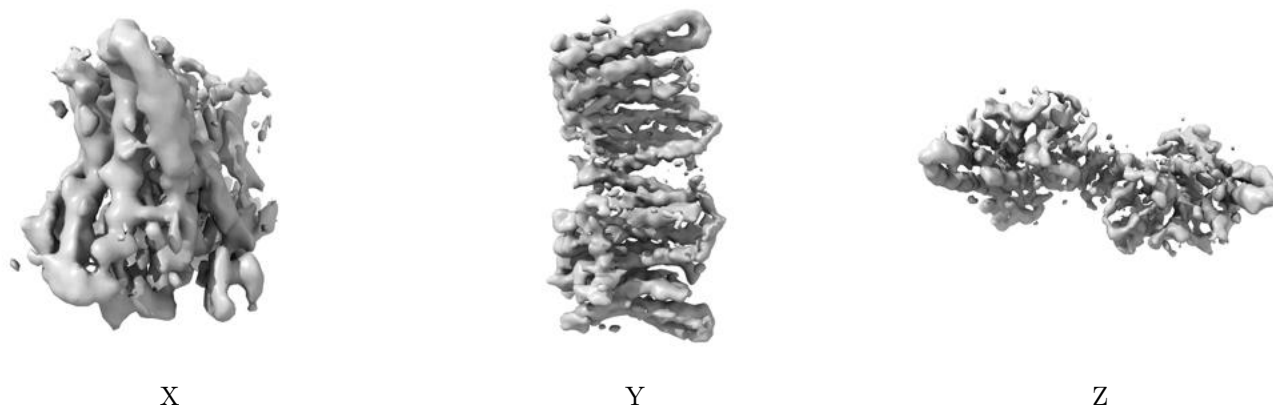
6.5 Orthogonal surface views [i](#)

6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.6. 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.

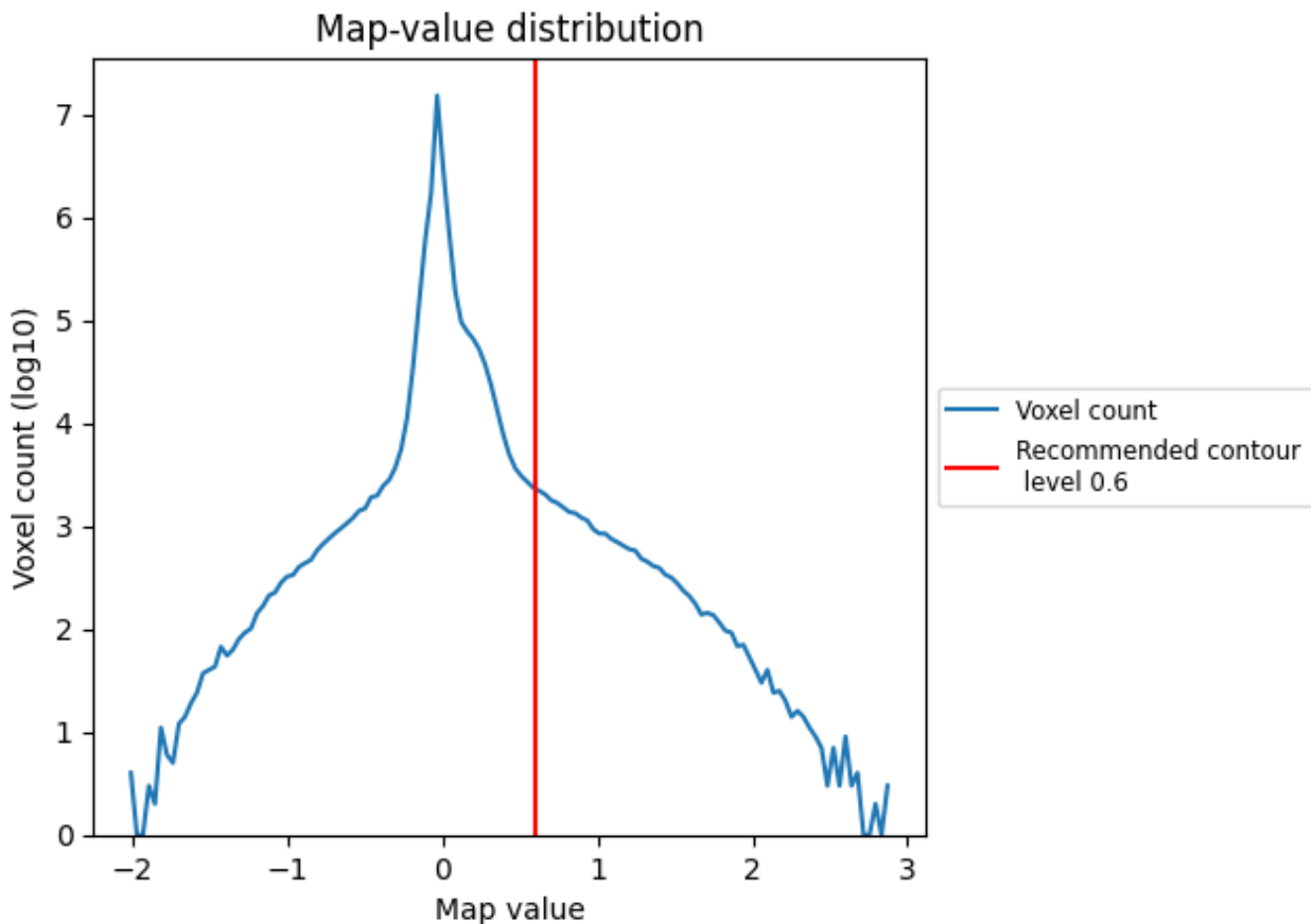
6.6 Mask visualisation [i](#)

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

7 Map analysis [i](#)

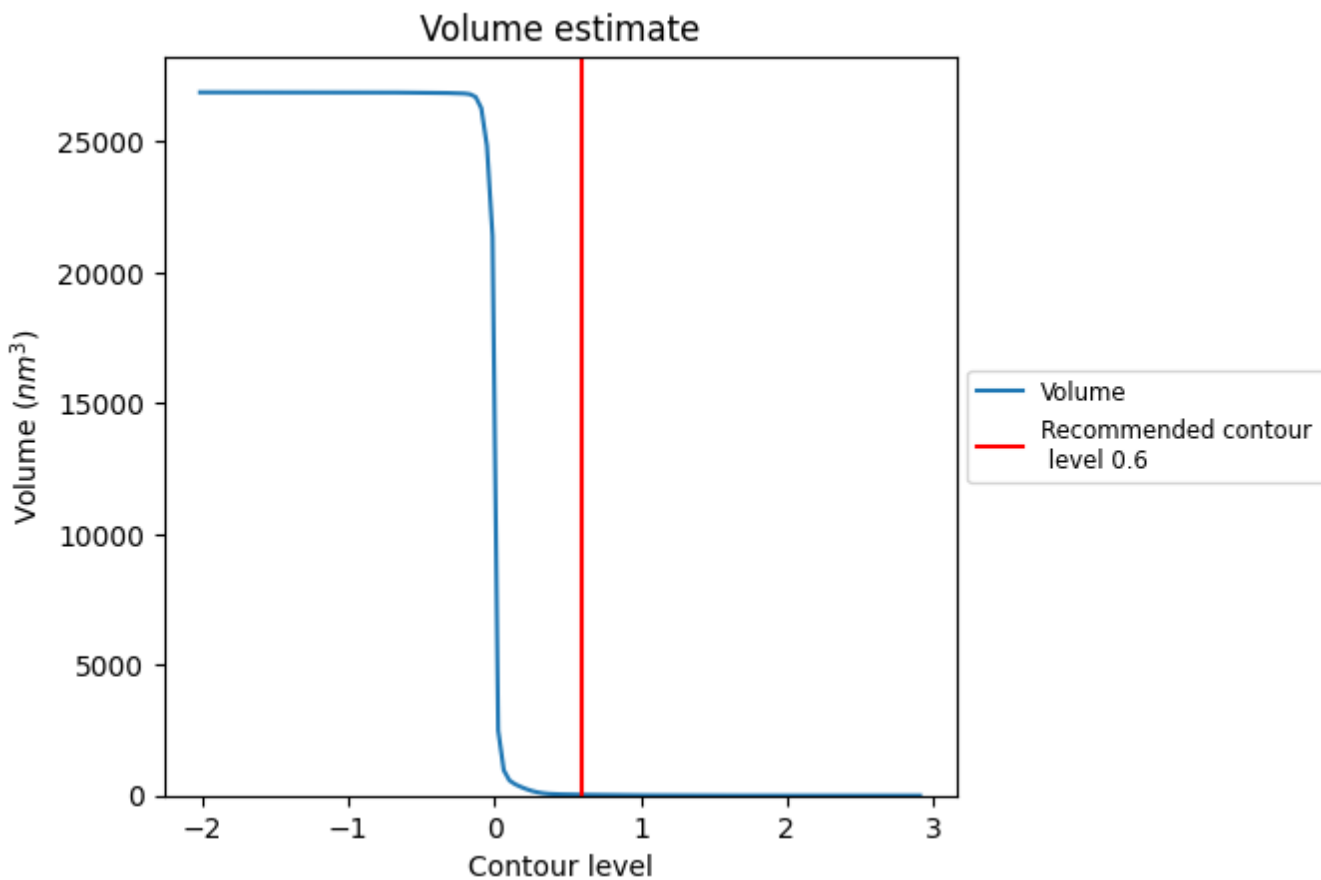
This section contains the results of statistical analysis of the map.

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.

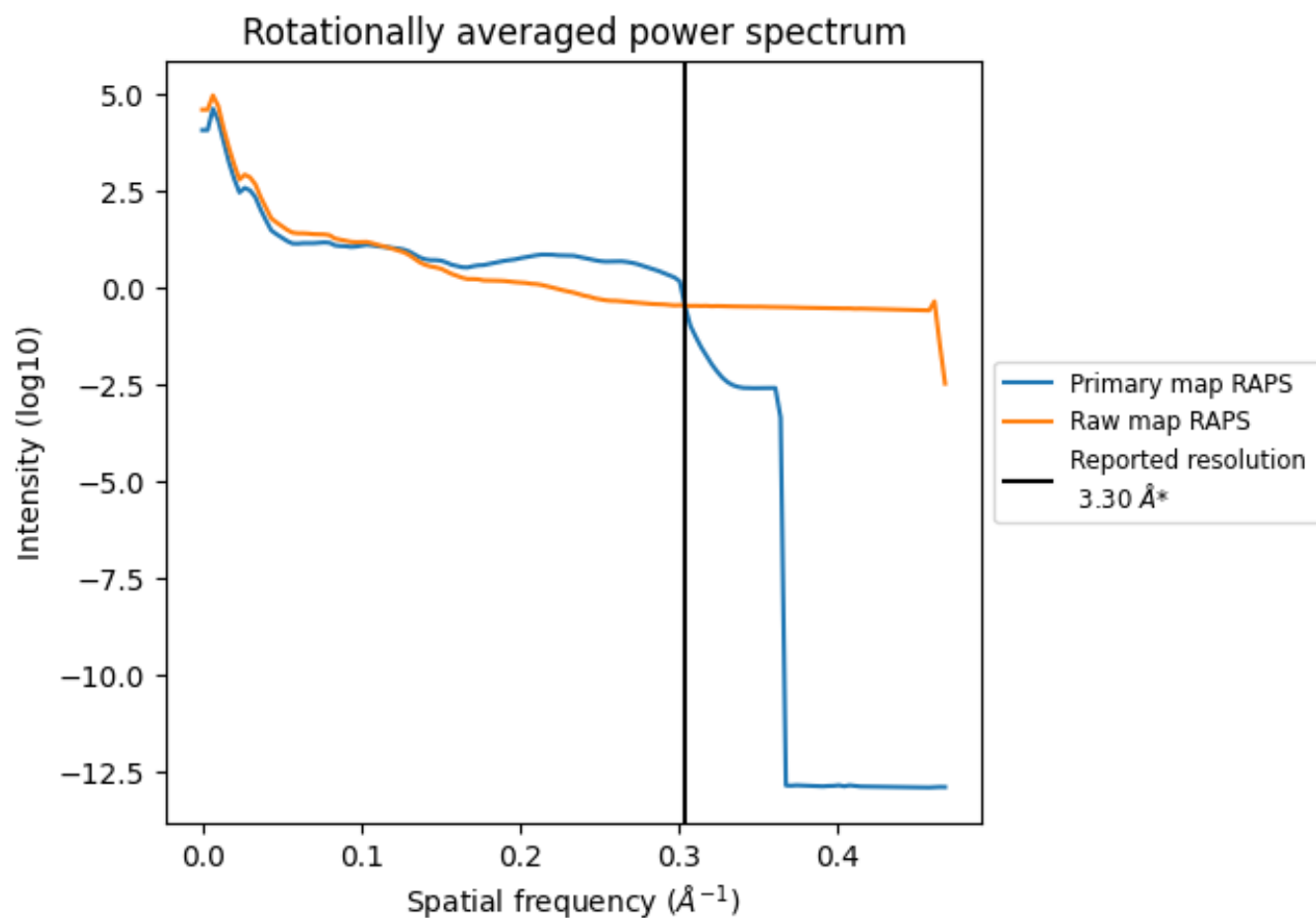
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 32 nm³; this corresponds to an approximate mass of 29 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](#)

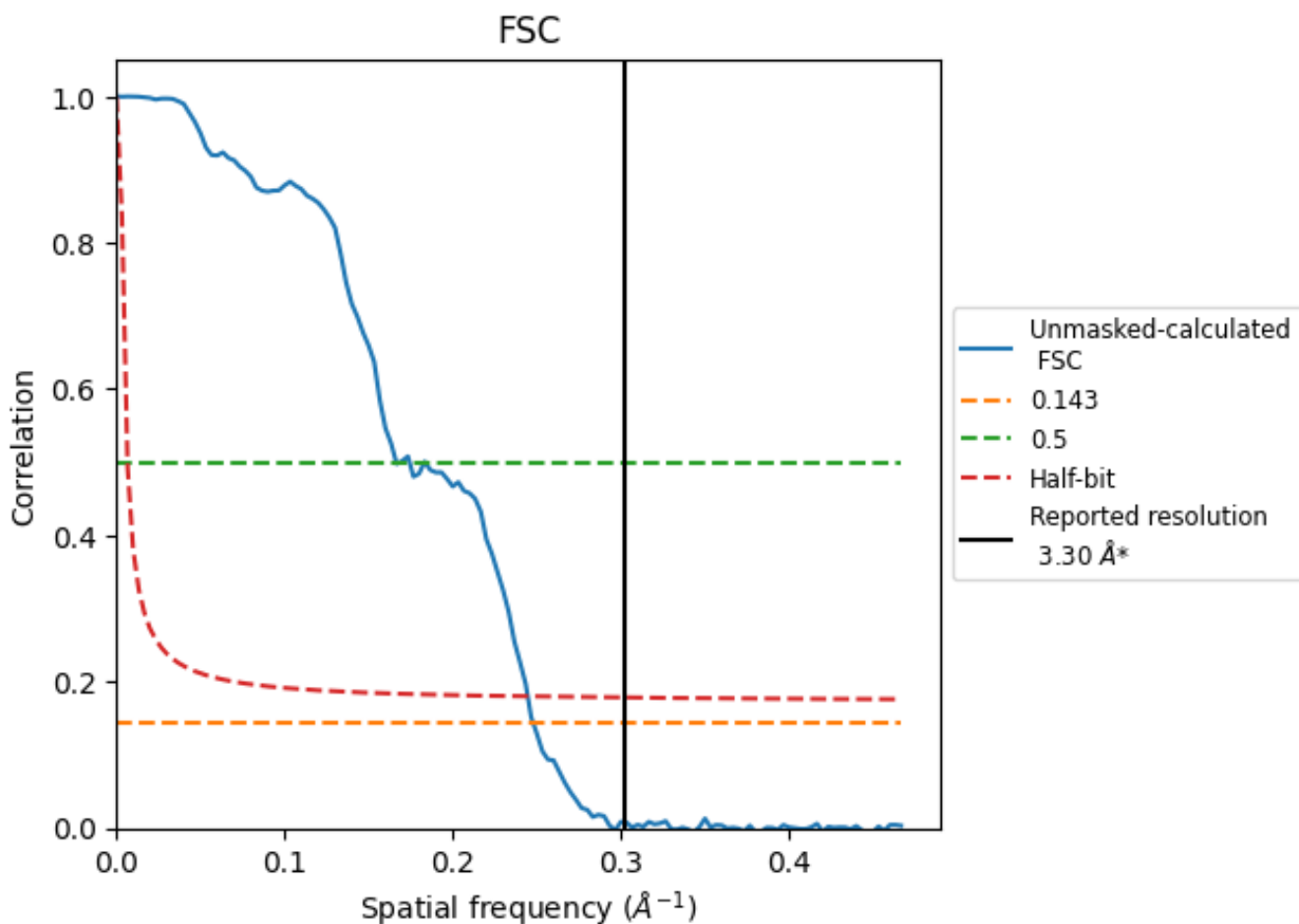


*Reported resolution corresponds to spatial frequency of 0.303 Å⁻¹

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 0.303 Å⁻¹

8.2 Resolution estimates [i](#)

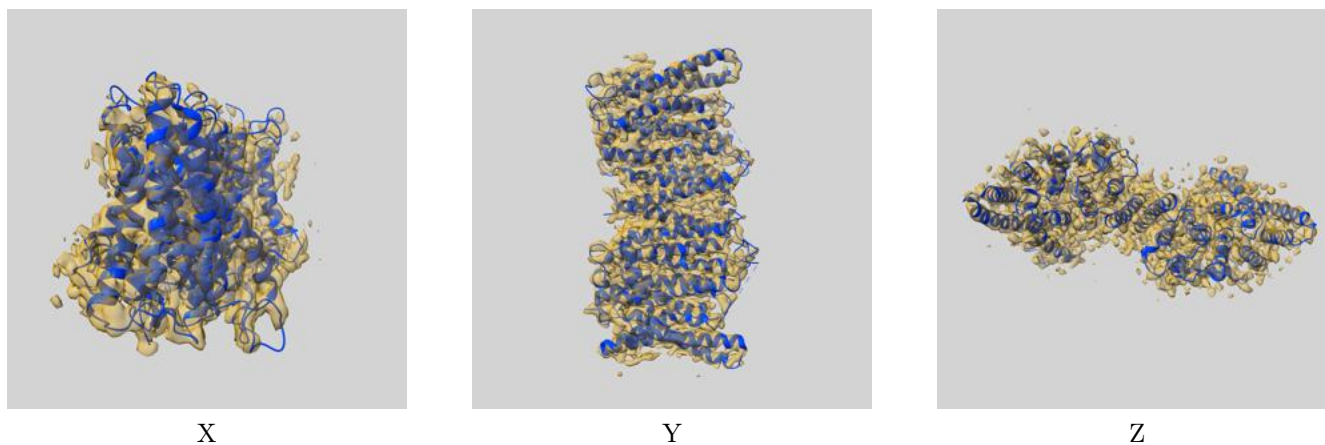
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.30	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	4.03	6.00	4.08

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 4.03 differs from the reported value 3.3 by more than 10 %

9 Map-model fit [i](#)

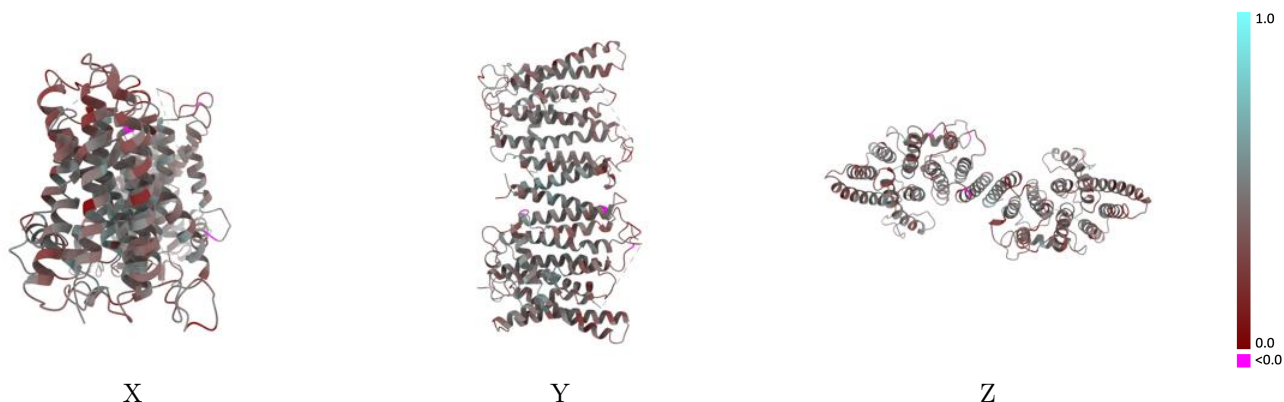
This section contains information regarding the fit between EMDB map EMD-61141 and PDB model 9J53. Per-residue inclusion information can be found in section 3 on page 6.

9.1 Map-model overlay [i](#)



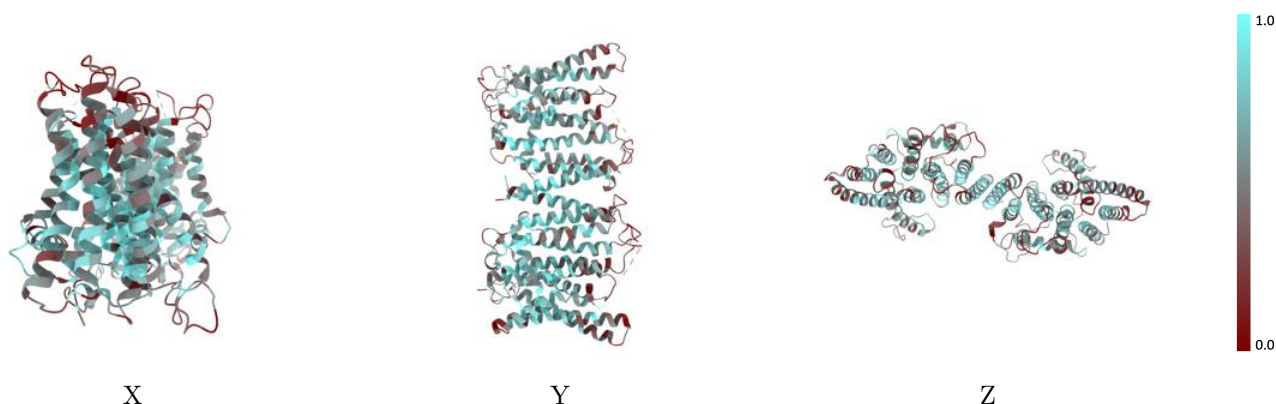
The images above show the 3D surface view of the map at the recommended contour level 0.6 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



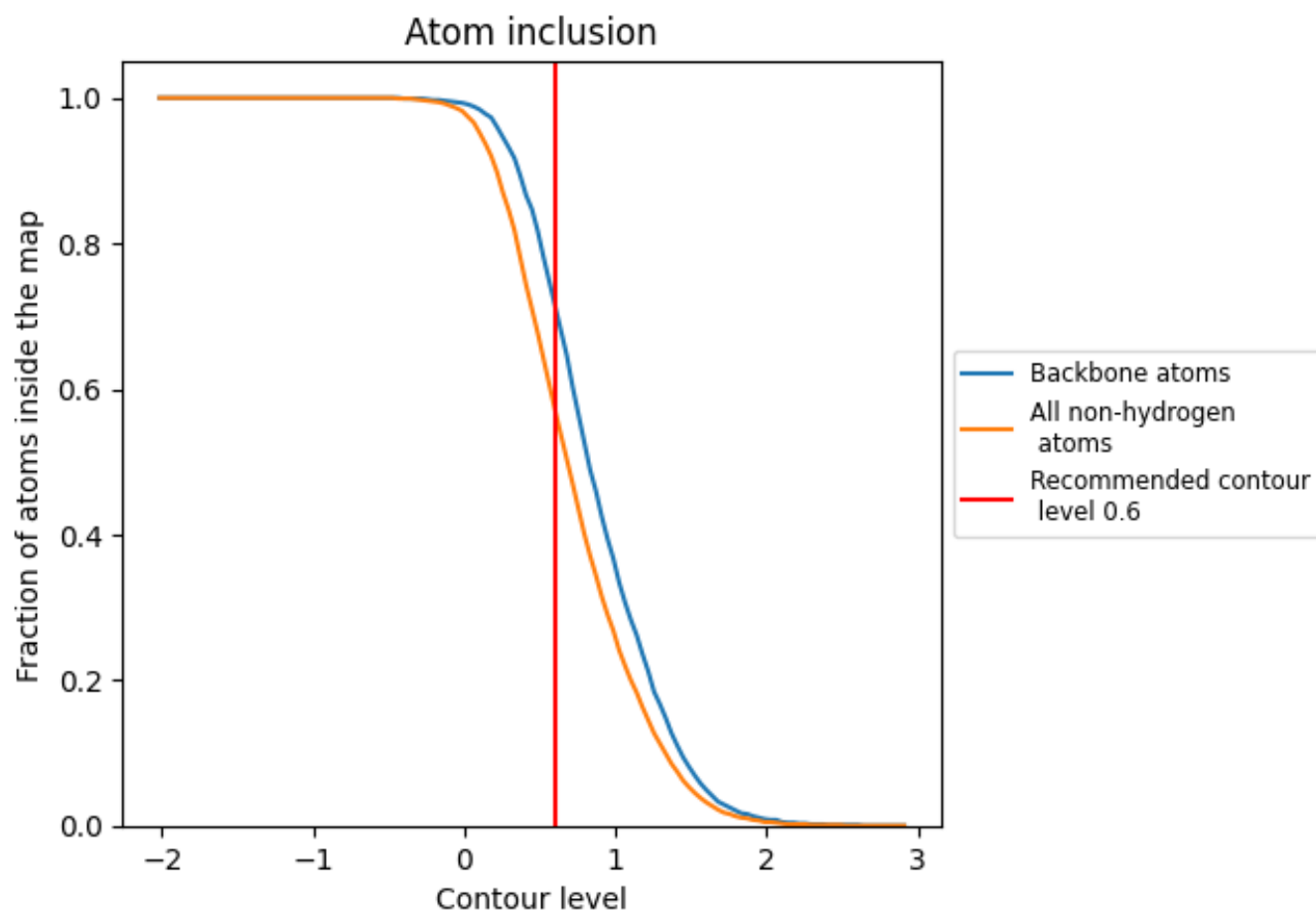
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.6).







9.4 Atom inclusion [i](#)



At the recommended contour level, 72% of all backbone atoms, 57% 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 (0.6) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.5720	 0.4130
A	 0.5770	 0.4160
B	 0.5660	 0.4090

