



## Full wwPDB EM Validation Report ⓘ

Nov 19, 2022 – 10:36 AM EST

PDB ID : 7T6F  
EMDB ID : EMD-25715  
Title : Structure of active Janus Kinase (JAK) dimer complexed with cytokine receptor intracellular domain  
Authors : Glassman, C.R.; Tsutsumi, N.; Jude, K.M.; Garcia, K.C.  
Deposited on : 2021-12-13  
Resolution : 3.60 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](mailto: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>.

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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.dev43  
Mogul : 1.8.5 (274361), CSD as541be (2020)  
MolProbity : 4.02b-467  
buster-report : 1.1.7 (2018)  
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)  
MapQ : 1.9.9  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.31.3

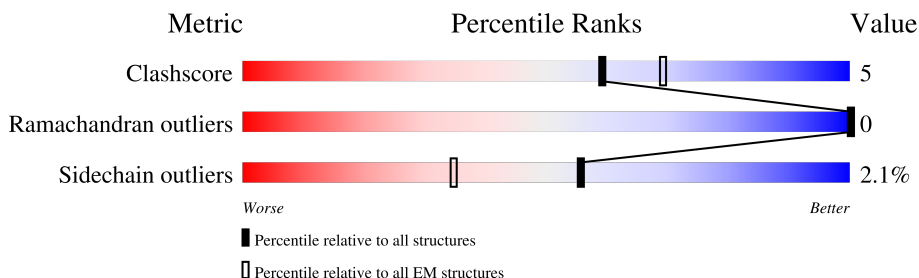
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*ELECTRON MICROSCOPY*

The reported resolution of this entry is 3.60 Å.

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



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

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the bar indicate the fraction of residues that contain outliers for  $\geq 3$ , 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	1173	
1	B	1173	
2	C	85	
2	D	85	

## 2 Entry composition

There are 4 unique types of molecules in this entry. The entry contains 17062 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 Tyrosine-protein kinase.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	1045	Total	C	N	O	S	0	0
			8205	5225	1418	1508	54		
1	B	1045	Total	C	N	O	S	0	0
			8205	5225	1418	1508	54		

There are 42 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	657	PHE	VAL	variant	UNP B1ASP2
A	1154	GLY	-	expression tag	UNP B1ASP2
A	1155	SER	-	expression tag	UNP B1ASP2
A	1156	ASP	-	expression tag	UNP B1ASP2
A	1157	ARG	-	expression tag	UNP B1ASP2
A	1158	LYS	-	expression tag	UNP B1ASP2
A	1159	ALA	-	expression tag	UNP B1ASP2
A	1160	ALA	-	expression tag	UNP B1ASP2
A	1161	VAL	-	expression tag	UNP B1ASP2
A	1162	SER	-	expression tag	UNP B1ASP2
A	1163	HIS	-	expression tag	UNP B1ASP2
A	1164	TRP	-	expression tag	UNP B1ASP2
A	1165	GLN	-	expression tag	UNP B1ASP2
A	1166	HIS	-	expression tag	UNP B1ASP2
A	1167	HIS	-	expression tag	UNP B1ASP2
A	1168	HIS	-	expression tag	UNP B1ASP2
A	1169	HIS	-	expression tag	UNP B1ASP2
A	1170	HIS	-	expression tag	UNP B1ASP2
A	1171	HIS	-	expression tag	UNP B1ASP2
A	1172	HIS	-	expression tag	UNP B1ASP2
A	1173	HIS	-	expression tag	UNP B1ASP2
B	657	PHE	VAL	variant	UNP B1ASP2
B	1154	GLY	-	expression tag	UNP B1ASP2
B	1155	SER	-	expression tag	UNP B1ASP2
B	1156	ASP	-	expression tag	UNP B1ASP2
B	1157	ARG	-	expression tag	UNP B1ASP2

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Chain	Residue	Modelled	Actual	Comment	Reference
B	1158	LYS	-	expression tag	UNP B1ASP2
B	1159	ALA	-	expression tag	UNP B1ASP2
B	1160	ALA	-	expression tag	UNP B1ASP2
B	1161	VAL	-	expression tag	UNP B1ASP2
B	1162	SER	-	expression tag	UNP B1ASP2
B	1163	HIS	-	expression tag	UNP B1ASP2
B	1164	TRP	-	expression tag	UNP B1ASP2
B	1165	GLN	-	expression tag	UNP B1ASP2
B	1166	HIS	-	expression tag	UNP B1ASP2
B	1167	HIS	-	expression tag	UNP B1ASP2
B	1168	HIS	-	expression tag	UNP B1ASP2
B	1169	HIS	-	expression tag	UNP B1ASP2
B	1170	HIS	-	expression tag	UNP B1ASP2
B	1171	HIS	-	expression tag	UNP B1ASP2
B	1172	HIS	-	expression tag	UNP B1ASP2
B	1173	HIS	-	expression tag	UNP B1ASP2

- Molecule 2 is a protein called Interferon lambda receptor 1.

Mol	Chain	Residues	Atoms				AltConf	Trace
2	C	37	Total	C	N	O	0	0
			280	188	39	53		
2	D	37	Total	C	N	O	0	0
			280	188	39	53		

There are 70 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
C	214	GLY	-	expression tag	UNP Q8CGK5
C	215	PRO	-	expression tag	UNP Q8CGK5
C	216	ARG	-	expression tag	UNP Q8CGK5
C	217	MET	-	expression tag	UNP Q8CGK5
C	218	LYS	-	expression tag	UNP Q8CGK5
C	219	GLN	-	expression tag	UNP Q8CGK5
C	220	LEU	-	expression tag	UNP Q8CGK5
C	221	GLU	-	expression tag	UNP Q8CGK5
C	222	ASP	-	expression tag	UNP Q8CGK5
C	223	LYS	-	expression tag	UNP Q8CGK5
C	224	VAL	-	expression tag	UNP Q8CGK5
C	225	GLU	-	expression tag	UNP Q8CGK5
C	226	GLU	-	expression tag	UNP Q8CGK5
C	227	LEU	-	expression tag	UNP Q8CGK5

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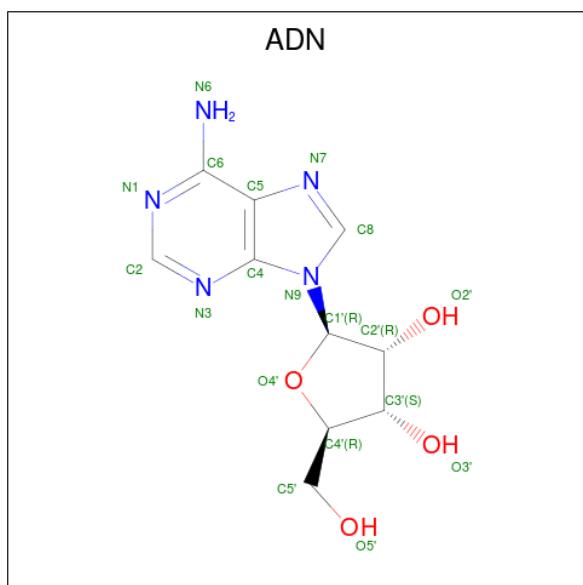
Chain	Residue	Modelled	Actual	Comment	Reference
C	228	LEU	-	expression tag	UNP Q8CGK5
C	229	SER	-	expression tag	UNP Q8CGK5
C	230	LYS	-	expression tag	UNP Q8CGK5
C	231	ASN	-	expression tag	UNP Q8CGK5
C	232	TYR	-	expression tag	UNP Q8CGK5
C	233	HIS	-	expression tag	UNP Q8CGK5
C	234	LEU	-	expression tag	UNP Q8CGK5
C	235	GLU	-	expression tag	UNP Q8CGK5
C	236	ASN	-	expression tag	UNP Q8CGK5
C	237	GLU	-	expression tag	UNP Q8CGK5
C	238	VAL	-	expression tag	UNP Q8CGK5
C	239	ALA	-	expression tag	UNP Q8CGK5
C	240	ARG	-	expression tag	UNP Q8CGK5
C	241	LEU	-	expression tag	UNP Q8CGK5
C	242	LYS	-	expression tag	UNP Q8CGK5
C	243	LYS	-	expression tag	UNP Q8CGK5
C	244	LEU	-	expression tag	UNP Q8CGK5
C	245	VAL	-	expression tag	UNP Q8CGK5
C	246	GLY	-	expression tag	UNP Q8CGK5
C	247	GLU	-	expression tag	UNP Q8CGK5
C	248	ARG	-	expression tag	UNP Q8CGK5
D	214	GLY	-	expression tag	UNP Q8CGK5
D	215	PRO	-	expression tag	UNP Q8CGK5
D	216	ARG	-	expression tag	UNP Q8CGK5
D	217	MET	-	expression tag	UNP Q8CGK5
D	218	LYS	-	expression tag	UNP Q8CGK5
D	219	GLN	-	expression tag	UNP Q8CGK5
D	220	LEU	-	expression tag	UNP Q8CGK5
D	221	GLU	-	expression tag	UNP Q8CGK5
D	222	ASP	-	expression tag	UNP Q8CGK5
D	223	LYS	-	expression tag	UNP Q8CGK5
D	224	VAL	-	expression tag	UNP Q8CGK5
D	225	GLU	-	expression tag	UNP Q8CGK5
D	226	GLU	-	expression tag	UNP Q8CGK5
D	227	LEU	-	expression tag	UNP Q8CGK5
D	228	LEU	-	expression tag	UNP Q8CGK5
D	229	SER	-	expression tag	UNP Q8CGK5
D	230	LYS	-	expression tag	UNP Q8CGK5
D	231	ASN	-	expression tag	UNP Q8CGK5
D	232	TYR	-	expression tag	UNP Q8CGK5
D	233	HIS	-	expression tag	UNP Q8CGK5
D	234	LEU	-	expression tag	UNP Q8CGK5

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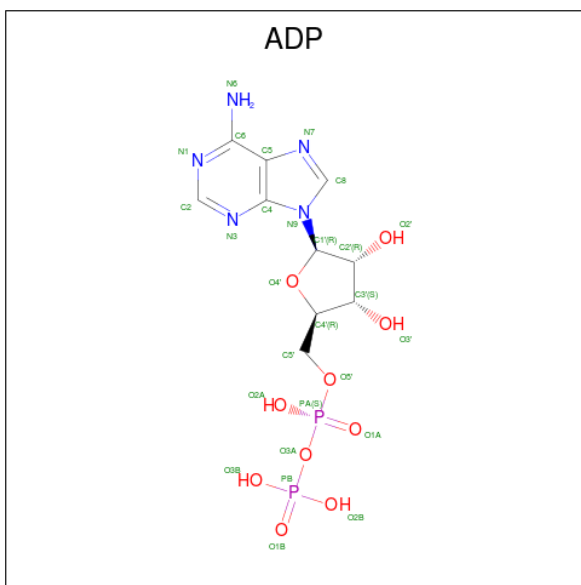
Chain	Residue	Modelled	Actual	Comment	Reference
D	235	GLU	-	expression tag	UNP Q8CGK5
D	236	ASN	-	expression tag	UNP Q8CGK5
D	237	GLU	-	expression tag	UNP Q8CGK5
D	238	VAL	-	expression tag	UNP Q8CGK5
D	239	ALA	-	expression tag	UNP Q8CGK5
D	240	ARG	-	expression tag	UNP Q8CGK5
D	241	LEU	-	expression tag	UNP Q8CGK5
D	242	LYS	-	expression tag	UNP Q8CGK5
D	243	LYS	-	expression tag	UNP Q8CGK5
D	244	LEU	-	expression tag	UNP Q8CGK5
D	245	VAL	-	expression tag	UNP Q8CGK5
D	246	GLY	-	expression tag	UNP Q8CGK5
D	247	GLU	-	expression tag	UNP Q8CGK5
D	248	ARG	-	expression tag	UNP Q8CGK5

- Molecule 3 is ADENOSINE (three-letter code: ADN) (formula:  $C_{10}H_{13}N_5O_4$ ).



Mol	Chain	Residues	Atoms				AltConf
3	A	1	Total	C	N	O	0
			19	10	5	4	
3	B	1	Total	C	N	O	0
			19	10	5	4	

- Molecule 4 is ADENOSINE-5'-DIPHOSPHATE (three-letter code: ADP) (formula:  $C_{10}H_{15}N_5O_{10}P_2$ ).



Mol	Chain	Residues	Atoms					AltConf
4	A	1	Total 27	C 10	N 5	O 10	P 2	0
4	B	1	Total 27	C 10	N 5	O 10	P 2	0





## 4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C2	Depositor
Number of particles used	224615	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION; Final per-particle CTF values were determined by cryoSPARC Local CTF Refinement.	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ( $e^-/\text{\AA}^2$ )	55	Depositor
Minimum defocus (nm)	1000	Depositor
Maximum defocus (nm)	2000	Depositor
Magnification	58680	Depositor
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	0.652	Depositor
Minimum map value	-0.342	Depositor
Average map value	0.008	Depositor
Map value standard deviation	0.048	Depositor
Recommended contour level	0.08	Depositor
Map size ( $\text{\AA}$ )	104.808304, 139.7444, 159.3427	wwPDB
Map dimensions	187, 164, 123	wwPDB
Map angles ( $^\circ$ )	90.0, 90.0, 90.0	wwPDB
Pixel spacing ( $\text{\AA}$ )	0.8521, 0.8521, 0.85209996	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: ADN, ADP

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	0/8389	0.46	0/11367
1	B	0.25	0/8389	0.46	0/11367
2	C	0.25	0/292	0.40	0/403
2	D	0.26	0/292	0.41	0/403
All	All	0.25	0/17362	0.45	0/23540

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	8205	0	7917	77	0
1	B	8205	0	7917	76	0
2	C	280	0	242	8	0
2	D	280	0	242	7	0
3	A	19	0	13	1	0
3	B	19	0	13	1	0
4	A	27	0	12	1	0
4	B	27	0	12	1	0
All	All	17062	0	16368	159	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 5.

All (159) 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:B:669:VAL:H	3:B:1201:ADN:H2	1.38	0.88
1:A:669:VAL:H	3:A:1201:ADN:H2	1.38	0.87
1:A:956:GLU:O	4:A:1202:ADP:N6	2.24	0.70
1:B:956:GLU:O	4:B:1202:ADP:N6	2.24	0.69
1:B:524:HIS:O	1:B:528:GLN:NE2	2.22	0.67
1:A:524:HIS:O	1:A:528:GLN:NE2	2.22	0.67
1:A:1047:TYR:HE2	1:A:1052:LEU:HB2	1.61	0.66
1:B:34:PRO:HA	1:B:102:SER:HB3	1.79	0.65
1:A:34:PRO:HA	1:A:102:SER:HB3	1.79	0.65
1:B:1047:TYR:HE2	1:B:1052:LEU:HB2	1.60	0.65
1:B:1071:HIS:O	1:B:1075:THR:OG1	2.15	0.62
2:D:284:GLU:OE1	1:B:509:HIS:ND1	2.33	0.62
1:A:958:LEU:HD22	1:A:1009:LEU:HB3	1.82	0.62
1:A:1112:ARG:NH1	1:A:1131:TRP:O	2.31	0.61
1:A:509:HIS:ND1	2:C:284:GLU:OE1	2.34	0.60
1:B:958:LEU:HD22	1:B:1009:LEU:HB3	1.82	0.60
1:B:151:ASP:OD1	1:B:152:ALA:N	2.34	0.60
1:B:1112:ARG:NH1	1:B:1131:TRP:O	2.31	0.60
1:A:151:ASP:OD1	1:A:152:ALA:N	2.34	0.59
1:A:960:SER:OG	1:A:1010:VAL:O	2.20	0.59
1:A:1071:HIS:O	1:A:1075:THR:OG1	2.15	0.59
1:B:960:SER:OG	1:B:1010:VAL:O	2.20	0.59
1:A:264:HIS:CE1	2:C:274:PRO:HD3	2.38	0.58
1:B:45:ARG:NH2	1:B:67:GLU:O	2.37	0.57
1:B:1054:GLN:HB3	1:B:1056:LYS:HD3	1.87	0.57
1:A:45:ARG:NH2	1:A:67:GLU:O	2.37	0.57
1:A:1054:GLN:HB3	1:A:1056:LYS:HD3	1.87	0.56
1:A:434:HIS:O	1:A:438:ASN:ND2	2.35	0.56
1:A:743:VAL:HG23	1:A:746:LEU:HD12	1.89	0.55
1:B:925:ILE:HD11	1:B:953:LEU:HB2	1.89	0.54
1:A:502:GLN:HG2	1:A:503:LYS:HG2	1.90	0.54
1:A:569:MET:SD	1:A:569:MET:N	2.81	0.54
1:A:925:ILE:HD11	1:A:953:LEU:HB2	1.89	0.53
1:B:569:MET:SD	1:B:569:MET:N	2.81	0.53
1:A:115:ASN:O	1:A:115:ASN:ND2	2.39	0.53
1:A:301:ARG:HH11	1:A:730:ILE:HA	1.74	0.53
1:B:743:VAL:HG23	1:B:746:LEU:HD12	1.89	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:115:ASN:O	1:B:115:ASN:ND2	2.39	0.52
1:B:502:GLN:HG2	1:B:503:LYS:HG2	1.90	0.52
1:A:287:GLU:OE2	1:A:327:LYS:NZ	2.36	0.52
2:D:263:PRO:HB2	2:D:266:LEU:HD13	1.91	0.52
1:B:129:HIS:CG	1:B:550:ILE:HD11	2.44	0.52
1:A:129:HIS:CG	1:A:550:ILE:HD11	2.44	0.52
1:B:301:ARG:HH11	1:B:730:ILE:HA	1.74	0.51
1:B:434:HIS:O	1:B:438:ASN:ND2	2.35	0.51
1:B:1082:SER:O	1:B:1086:LEU:N	2.41	0.51
2:C:263:PRO:HB2	2:C:266:LEU:HD13	1.91	0.51
2:D:274:PRO:HD3	1:B:264:HIS:CE1	2.46	0.51
1:B:921:LEU:O	1:B:925:ILE:HG12	2.11	0.50
1:A:880:LEU:HD21	1:A:890:LEU:HB2	1.94	0.50
1:A:1106:THR:HA	1:A:1109:GLU:HG2	1.94	0.50
1:B:880:LEU:HD21	1:B:890:LEU:HB2	1.94	0.50
1:A:710:VAL:HG21	1:A:769:LEU:HD21	1.93	0.49
1:B:710:VAL:HG21	1:B:769:LEU:HD21	1.93	0.49
1:B:1070:LEU:HD11	1:B:1148:PHE:HZ	1.78	0.49
1:B:1106:THR:HA	1:B:1109:GLU:HG2	1.94	0.49
1:A:921:LEU:O	1:A:925:ILE:HG12	2.11	0.49
1:B:622:VAL:HG22	1:B:663:ILE:HG12	1.95	0.49
1:B:522:MET:O	1:B:526:LYS:HG3	2.13	0.49
1:B:958:LEU:HD13	1:B:1009:LEU:HD13	1.95	0.49
1:B:466:ARG:NH2	1:B:478:THR:OG1	2.46	0.49
1:A:522:MET:O	1:A:526:LYS:HG3	2.13	0.48
1:B:287:GLU:OE2	1:B:327:LYS:NZ	2.36	0.48
1:A:622:VAL:HG22	1:A:663:ILE:HG12	1.95	0.48
1:A:958:LEU:HD13	1:A:1009:LEU:HD13	1.95	0.48
1:A:1070:LEU:HD11	1:A:1148:PHE:HZ	1.78	0.48
1:B:828:ASN:OD1	1:B:829:TYR:N	2.46	0.48
1:B:629:ASP:OD1	1:B:629:ASP:N	2.47	0.48
1:A:828:ASN:OD1	1:A:829:TYR:N	2.47	0.48
1:A:466:ARG:NH2	1:A:478:THR:OG1	2.46	0.47
1:A:1112:ARG:HH22	1:A:1131:TRP:HB3	1.79	0.47
1:A:992:TYR:O	1:A:995:SER:OG	2.24	0.47
1:B:737:SER:OG	1:B:738:ASP:N	2.48	0.46
1:B:463:TYR:CZ	1:B:542:CYS:HB2	2.51	0.46
1:A:463:TYR:CZ	1:A:542:CYS:HB2	2.51	0.46
1:A:925:ILE:HG21	1:A:942:ILE:HD12	1.97	0.46
1:A:391:ASN:OD1	1:A:392:MET:N	2.48	0.46
1:A:532:THR:HG23	2:C:285:PHE:HB2	1.97	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:391:ASN:OD1	1:B:392:MET:N	2.48	0.46
1:B:925:ILE:HG21	1:B:942:ILE:HD12	1.97	0.46
1:A:737:SER:OG	1:A:738:ASP:N	2.48	0.46
1:B:1112:ARG:HH22	1:B:1131:TRP:HB3	1.79	0.46
1:B:974:ILE:HD12	1:B:974:ILE:HA	1.86	0.46
1:B:1047:TYR:CE2	1:B:1052:LEU:HB2	2.48	0.45
1:A:982:TYR:OH	1:A:1013:GLU:OE1	2.31	0.45
1:B:982:TYR:OH	1:B:1013:GLU:OE1	2.31	0.45
1:A:116:TRP:HA	1:A:126:VAL:HG22	1.99	0.45
1:B:964:LYS:HA	1:B:1077:CYS:SG	2.57	0.45
1:B:116:TRP:HA	1:B:126:VAL:HG22	1.99	0.45
1:B:251:PHE:O	1:B:255:THR:OG1	2.33	0.45
1:A:461:GLY:HA3	1:A:540:LYS:HG2	1.98	0.45
1:B:414:ARG:HA	1:B:418:ASP:O	2.17	0.44
1:A:414:ARG:HA	1:A:418:ASP:O	2.17	0.44
1:A:629:ASP:N	1:A:629:ASP:OD1	2.47	0.44
1:B:704:LEU:HD23	1:B:704:LEU:HA	1.84	0.44
1:B:992:TYR:O	1:B:995:SER:OG	2.24	0.44
1:A:529:ILE:HG23	2:C:289:LEU:HB3	1.99	0.44
1:A:1112:ARG:HH12	1:A:1131:TRP:C	2.19	0.44
1:A:1121:ASP:OD1	1:A:1122:GLU:N	2.51	0.44
1:A:964:LYS:HA	1:A:1077:CYS:SG	2.57	0.44
1:B:461:GLY:HA3	1:B:540:LYS:HG2	1.98	0.44
1:A:398:SER:OG	1:A:399:ARG:N	2.51	0.43
1:A:178:THR:OG1	1:A:179:GLU:N	2.51	0.43
1:A:1033:TYR:HB2	1:A:1056:LYS:HB3	2.00	0.43
2:D:285:PHE:HB2	1:B:532:THR:HG23	2.00	0.43
1:B:1033:TYR:CD1	1:B:1056:LYS:HE3	2.54	0.43
1:A:974:ILE:HD12	1:A:974:ILE:HA	1.86	0.43
1:B:1121:ASP:OD1	1:B:1122:GLU:N	2.51	0.43
1:A:721:LEU:HD23	1:A:734:ILE:HG22	2.00	0.43
1:A:1033:TYR:CD1	1:A:1056:LYS:HE3	2.54	0.43
1:B:894:ASP:N	1:B:894:ASP:OD1	2.51	0.43
2:D:257:PHE:CE1	1:B:239:ARG:HG3	2.54	0.43
1:A:502:GLN:OE1	1:A:503:LYS:NZ	2.52	0.43
1:A:1049:PRO:HD3	1:A:1064:TRP:HZ3	1.84	0.43
1:B:398:SER:OG	1:B:399:ARG:N	2.51	0.43
1:A:247:PHE:CZ	2:C:263:PRO:HD3	2.55	0.42
1:B:502:GLN:OE1	1:B:503:LYS:NZ	2.52	0.42
1:B:1033:TYR:HB2	1:B:1056:LYS:HB3	2.00	0.42
1:A:704:LEU:HD23	1:A:704:LEU:HA	1.84	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:1112:ARG:NH2	1:B:1131:TRP:HB3	2.34	0.42
1:A:1082:SER:O	1:A:1086:LEU:N	2.40	0.42
1:B:721:LEU:HD23	1:B:734:ILE:HG22	2.00	0.42
1:A:907:LYS:HB3	1:A:953:LEU:HB3	2.00	0.42
1:B:178:THR:OG1	1:B:179:GLU:N	2.51	0.42
1:B:1049:PRO:HD3	1:B:1064:TRP:HZ3	1.84	0.42
2:D:282:GLY:HA2	2:D:283:PRO:HD3	1.88	0.42
1:A:894:ASP:OD1	1:A:894:ASP:N	2.51	0.42
1:A:986:ILE:HD11	1:A:1066:PHE:CD1	2.55	0.42
1:B:129:HIS:CE1	1:B:556:ALA:HB2	2.55	0.42
1:B:1071:HIS:ND1	1:B:1116:PRO:HG3	2.35	0.42
1:A:782:LEU:HD23	1:A:782:LEU:HA	1.85	0.42
1:B:168:LYS:HD2	1:B:168:LYS:HA	1.92	0.42
2:D:258:GLN:OE1	2:D:258:GLN:N	2.53	0.42
1:B:800:GLU:OE2	1:B:929:ARG:NH2	2.53	0.42
1:A:529:ILE:HD11	1:A:536:SER:HB3	2.02	0.41
1:B:907:LYS:HB3	1:B:953:LEU:HB3	2.01	0.41
1:B:1112:ARG:HH12	1:B:1131:TRP:C	2.19	0.41
1:B:205:LYS:HA	1:B:205:LYS:HD2	1.85	0.41
2:C:258:GLN:OE1	2:C:258:GLN:N	2.53	0.41
1:A:513:ASP:N	1:A:513:ASP:OD1	2.53	0.41
1:A:1071:HIS:ND1	1:A:1116:PRO:HG3	2.35	0.41
1:A:1112:ARG:NH2	1:A:1131:TRP:HB3	2.34	0.41
1:A:233:ASN:ND2	1:A:236:THR:OG1	2.52	0.41
1:A:527:LYS:HB3	1:A:527:LYS:HE2	1.86	0.41
1:B:1021:PHE:HB3	1:B:1024:THR:OG1	2.21	0.41
1:A:129:HIS:CE1	1:A:556:ALA:HB2	2.55	0.41
1:B:266:LEU:HD12	1:B:267:LYS:HG3	2.03	0.41
1:B:529:ILE:HD11	1:B:536:SER:HB3	2.02	0.41
1:B:986:ILE:HD11	1:B:1066:PHE:CD1	2.55	0.41
1:B:266:LEU:HD12	1:B:267:LYS:N	2.36	0.41
1:B:993:LEU:HD21	1:B:1021:PHE:HE1	1.86	0.40
1:A:251:PHE:O	1:A:255:THR:OG1	2.33	0.40
1:A:1027:ILE:H	1:A:1027:ILE:HG13	1.74	0.40
1:B:810:ARG:NH1	1:B:827:MET:O	2.53	0.40
1:A:266:LEU:HD12	1:A:267:LYS:N	2.36	0.40
1:A:971:LYS:H	1:A:971:LYS:HG2	1.71	0.40
1:A:1021:PHE:HB3	1:A:1024:THR:OG1	2.21	0.40
1:A:266:LEU:HD12	1:A:267:LYS:HG3	2.03	0.40
2:C:282:GLY:HA2	2:C:283:PRO:HD3	1.88	0.40

There are no symmetry-related clashes.

## 5.3 Torsion angles

### 5.3.1 Protein backbone

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	1031/1173 (88%)	1002 (97%)	29 (3%)	0	100	100
1	B	1031/1173 (88%)	1002 (97%)	29 (3%)	0	100	100
2	C	35/85 (41%)	27 (77%)	8 (23%)	0	100	100
2	D	35/85 (41%)	27 (77%)	8 (23%)	0	100	100
All	All	2132/2516 (85%)	2058 (96%)	74 (4%)	0	100	100

There are no Ramachandran outliers to report.

### 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	872/1066 (82%)	854 (98%)	18 (2%)	53	78
1	B	872/1066 (82%)	854 (98%)	18 (2%)	53	78
2	C	28/77 (36%)	27 (96%)	1 (4%)	35	67
2	D	28/77 (36%)	27 (96%)	1 (4%)	35	67
All	All	1800/2286 (79%)	1762 (98%)	38 (2%)	56	78

All (38) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	75	HIS
1	A	85	THR

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Mol	Chain	Res	Type
1	A	96	THR
1	A	115	ASN
1	A	270	TYR
1	A	574	PHE
1	A	656	CYS
1	A	804	PHE
1	A	880	LEU
1	A	909	LEU
1	A	921	LEU
1	A	954	ILE
1	A	965	GLU
1	A	986	ILE
1	A	1033	TYR
1	A	1075	THR
1	A	1105	ASN
1	A	1124	TYR
2	C	285	PHE
2	D	285	PHE
1	B	75	HIS
1	B	85	THR
1	B	96	THR
1	B	115	ASN
1	B	270	TYR
1	B	574	PHE
1	B	656	CYS
1	B	804	PHE
1	B	880	LEU
1	B	909	LEU
1	B	921	LEU
1	B	954	ILE
1	B	965	GLU
1	B	986	ILE
1	B	1033	TYR
1	B	1075	THR
1	B	1105	ASN
1	B	1124	TYR

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (2) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	129	HIS
1	B	129	HIS

### 5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

## 5.4 Non-standard residues in protein, DNA, RNA chains ⓘ

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

## 5.5 Carbohydrates ⓘ

There are no monosaccharides in this entry.

## 5.6 Ligand geometry ⓘ

4 ligands are modelled in this entry.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# $ Z  > 2$	Counts	RMSZ	# $ Z  > 2$
4	ADP	B	1202	-	24,29,29	0.93	1 (4%)	29,45,45	1.47	4 (13%)
4	ADP	A	1202	-	24,29,29	0.93	1 (4%)	29,45,45	1.47	4 (13%)
3	ADN	B	1201	-	18,21,21	0.69	0	18,31,31	0.78	1 (5%)
3	ADN	A	1201	-	18,21,21	0.67	0	18,31,31	0.79	1 (5%)

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
4	ADP	B	1202	-	-	2/12/32/32	0/3/3/3
4	ADP	A	1202	-	-	2/12/32/32	0/3/3/3
3	ADN	B	1201	-	-	2/2/22/22	0/3/3/3
3	ADN	A	1201	-	-	2/2/22/22	0/3/3/3

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	A	1202	ADP	C5-C4	2.36	1.47	1.40
4	B	1202	ADP	C5-C4	2.36	1.47	1.40

All (10) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	A	1202	ADP	PA-O3A-PB	-3.73	120.03	132.83
4	B	1202	ADP	PA-O3A-PB	-3.72	120.05	132.83
4	B	1202	ADP	N3-C2-N1	-3.15	123.75	128.68
4	B	1202	ADP	C3'-C2'-C1'	3.15	105.73	100.98
4	A	1202	ADP	N3-C2-N1	-3.15	123.75	128.68
4	A	1202	ADP	C3'-C2'-C1'	3.12	105.67	100.98
4	B	1202	ADP	C4-C5-N7	-2.75	106.53	109.40
4	A	1202	ADP	C4-C5-N7	-2.71	106.57	109.40
3	A	1201	ADN	C5-C6-N6	2.30	123.85	120.35
3	B	1201	ADN	C5-C6-N6	2.29	123.84	120.35

There are no chirality outliers.

All (8) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	A	1202	ADP	C5'-O5'-PA-O2A
4	A	1202	ADP	C5'-O5'-PA-O3A
4	B	1202	ADP	C5'-O5'-PA-O2A
4	B	1202	ADP	C5'-O5'-PA-O3A
3	A	1201	ADN	O4'-C4'-C5'-O5'
3	B	1201	ADN	O4'-C4'-C5'-O5'
3	B	1201	ADN	C3'-C4'-C5'-O5'
3	A	1201	ADN	C3'-C4'-C5'-O5'

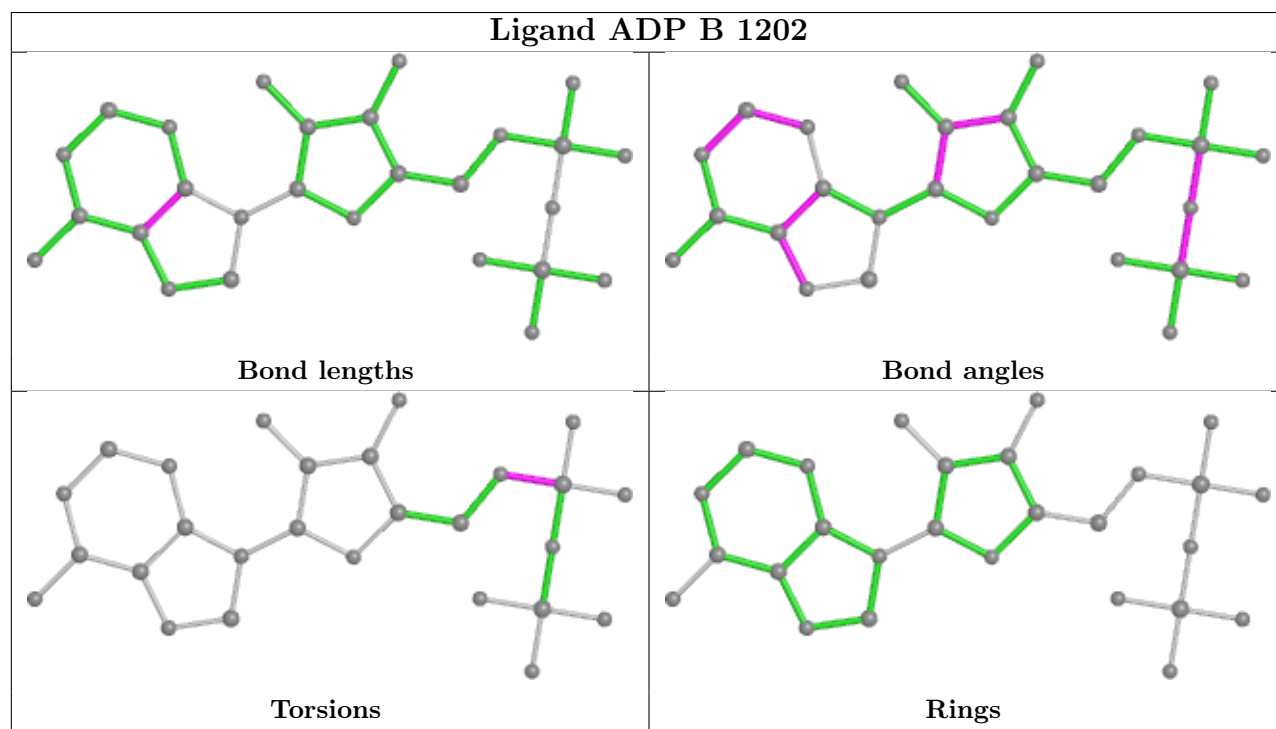
There are no ring outliers.

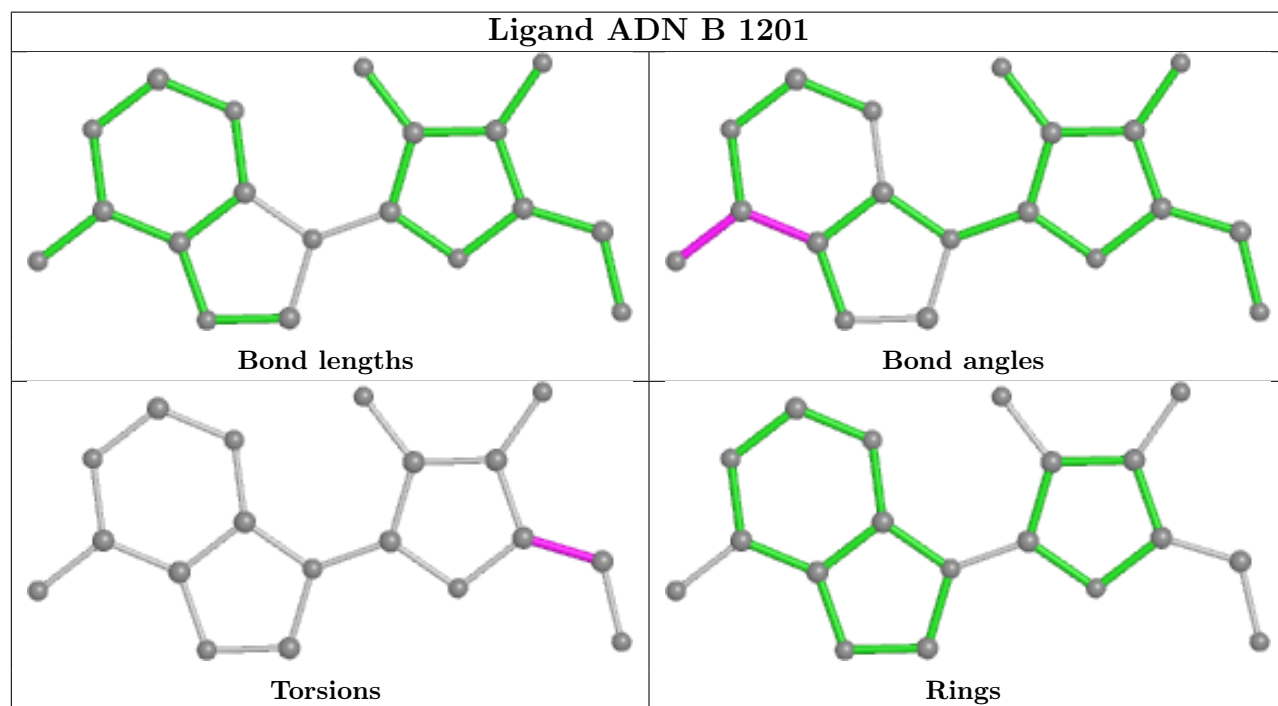
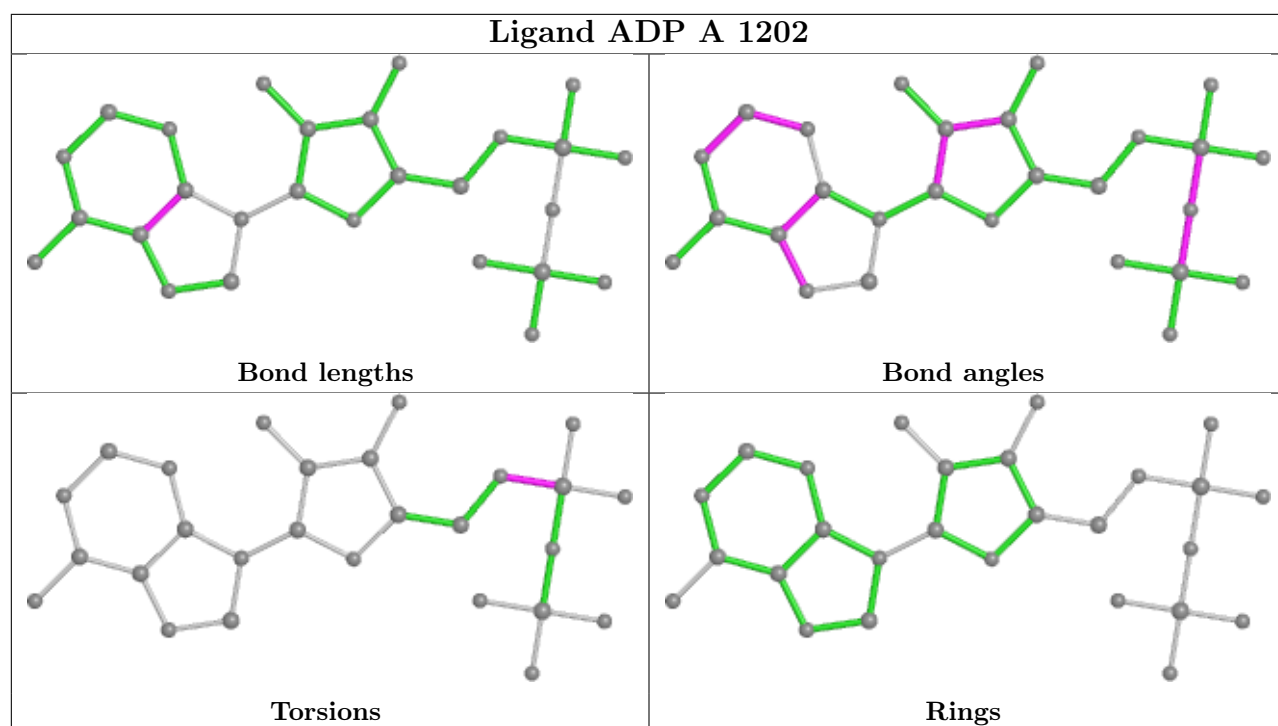
4 monomers are involved in 4 short contacts:

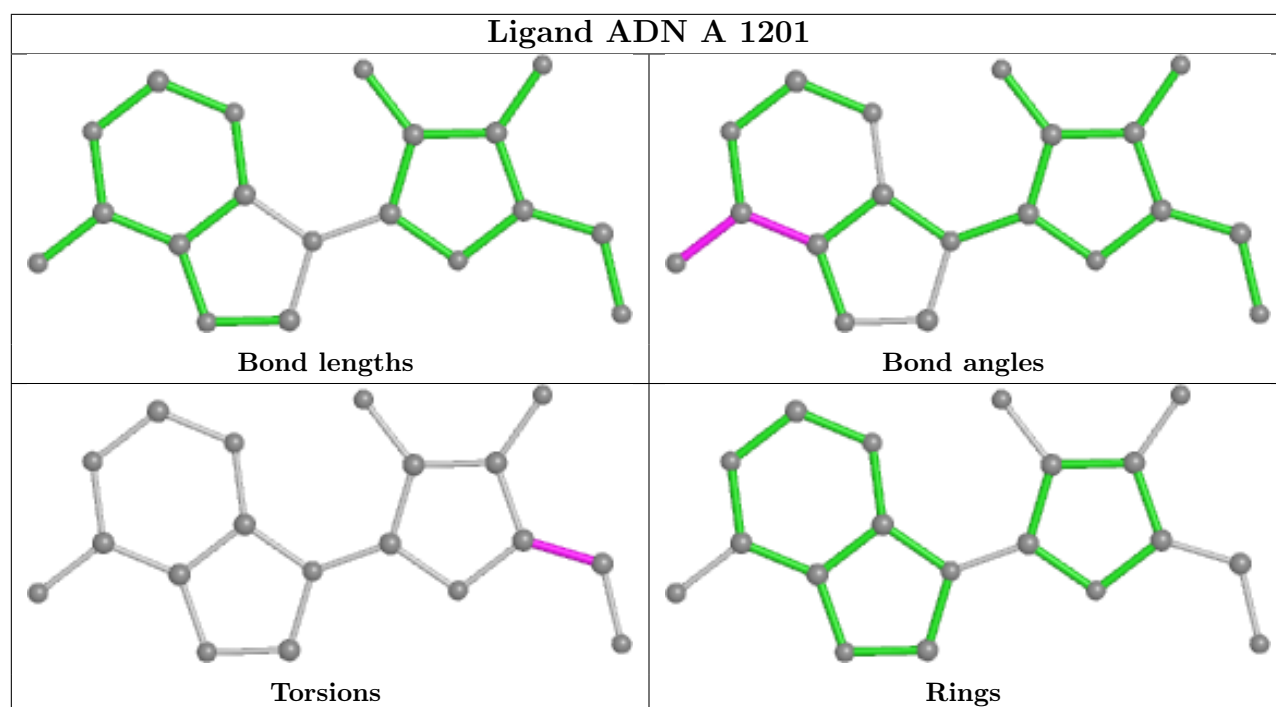
Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	B	1202	ADP	1	0
4	A	1202	ADP	1	0
3	B	1201	ADN	1	0
3	A	1201	ADN	1	0

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths,

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







## 5.7 Other polymers [i](#)

There are no such residues in this entry.

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

There are no chain breaks in this entry.

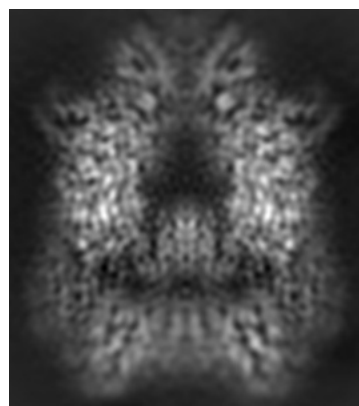
## 6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-25715. These allow visual inspection of the internal detail of the map and identification of artifacts.

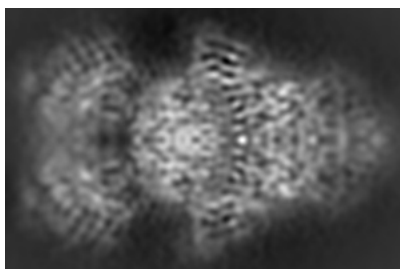
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

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

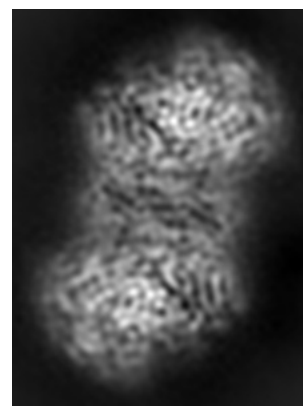
#### 6.1.1 Primary map



X

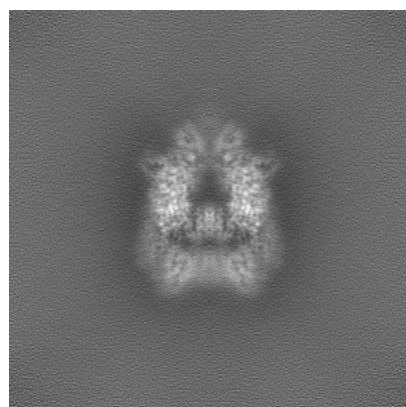


Y

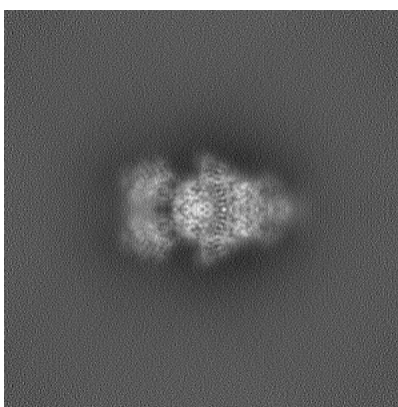


Z

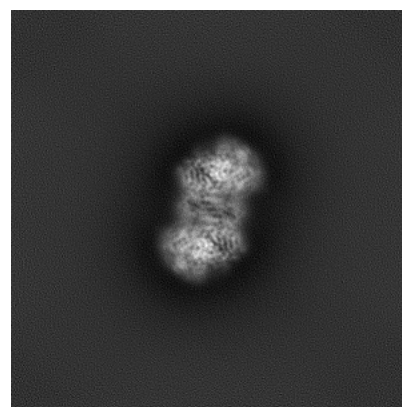
#### 6.1.2 Raw map



X



Y

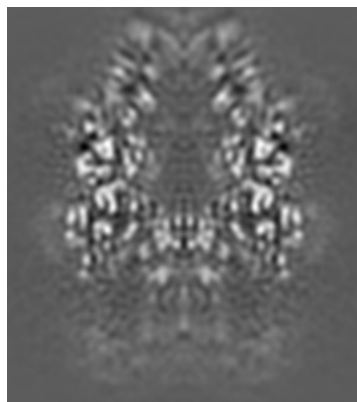


Z

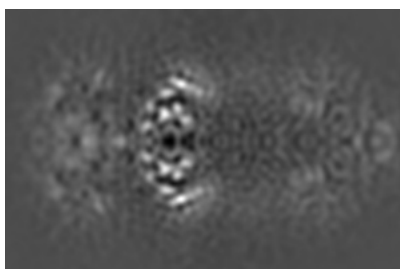
The images above show the map projected in three orthogonal directions.

## 6.2 Central slices [i](#)

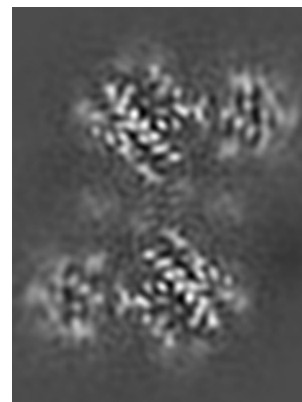
### 6.2.1 Primary map



X Index: 61

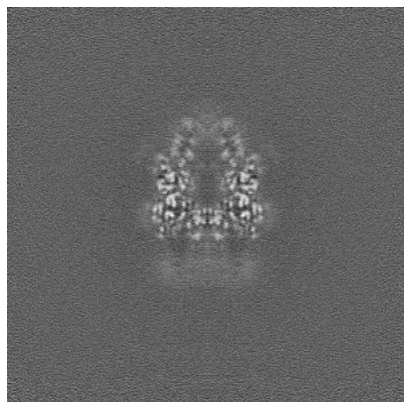


Y Index: 82

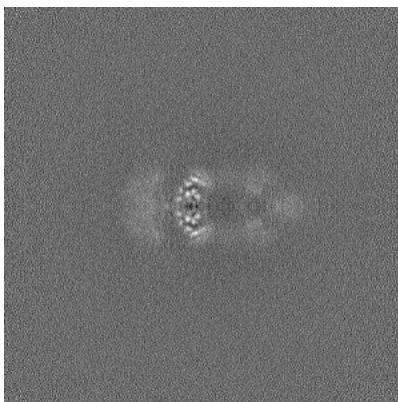


Z Index: 93

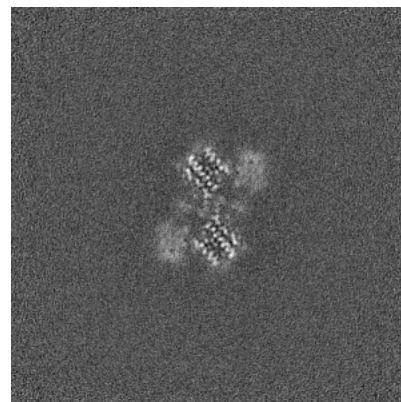
### 6.2.2 Raw map



X Index: 200



Y Index: 200

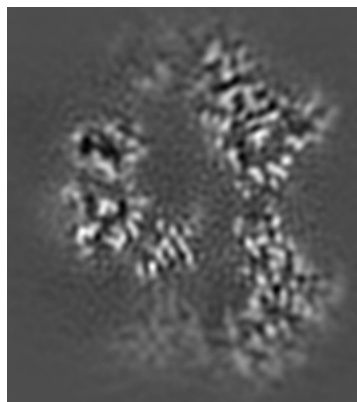


Z Index: 200

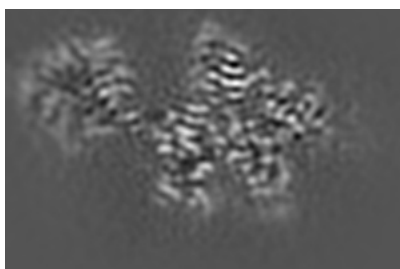
The images above show central slices of the map in three orthogonal directions.

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

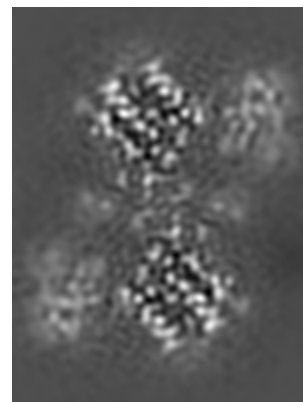
### 6.3.1 Primary map



X Index: 73

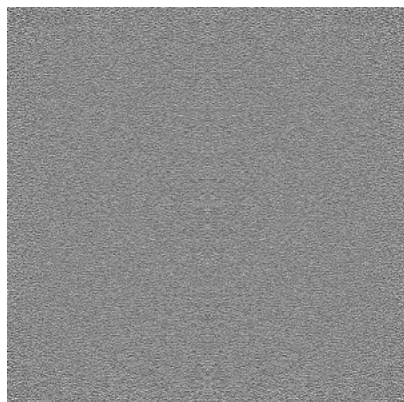


Y Index: 119

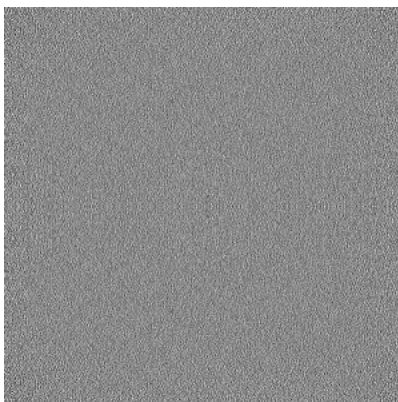


Z Index: 90

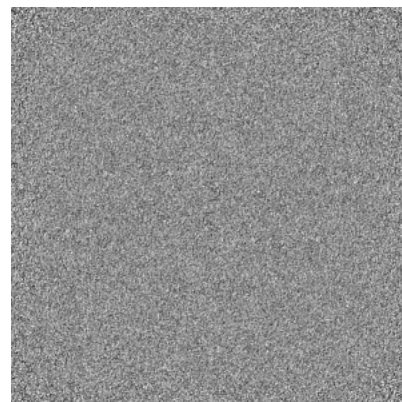
### 6.3.2 Raw map



X Index: 0



Y Index: 0

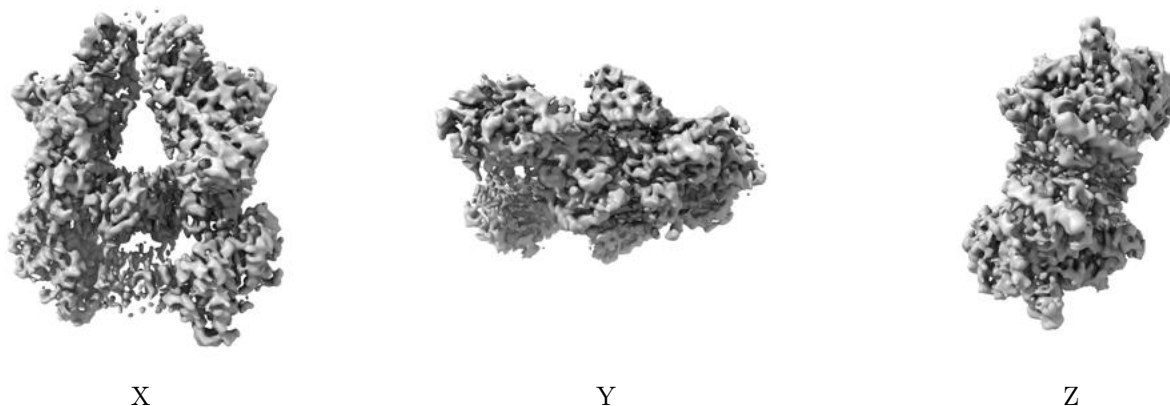


Z Index: 0

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

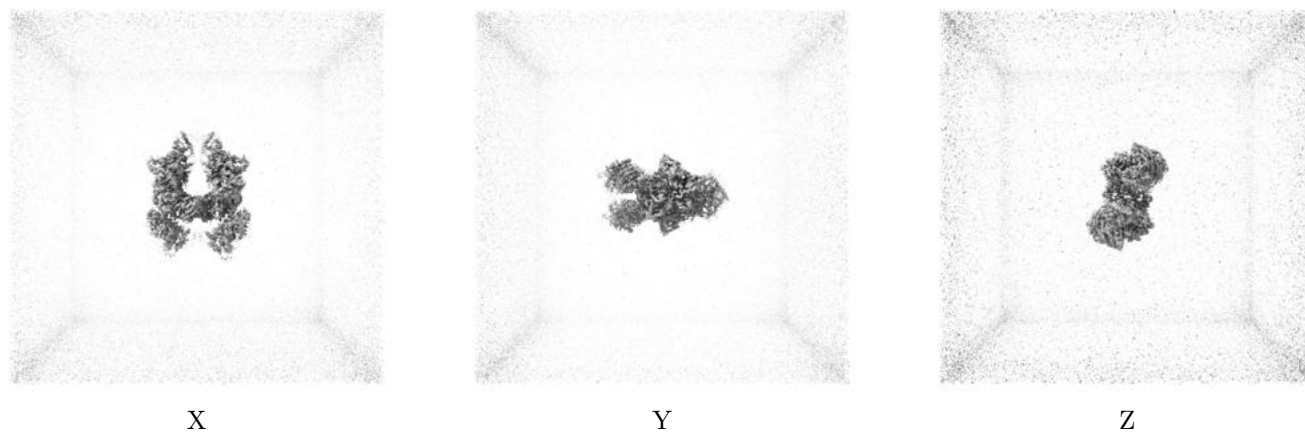
## 6.4 Orthogonal surface views [i](#)

### 6.4.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.08. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

### 6.4.2 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.

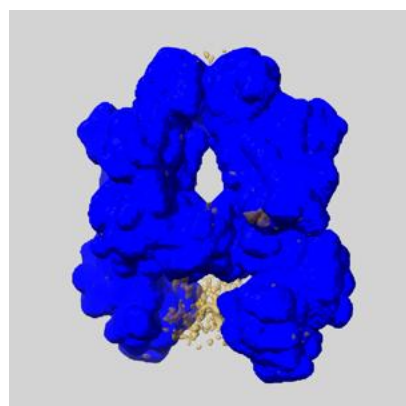
## 6.5 Mask visualisation [i](#)

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

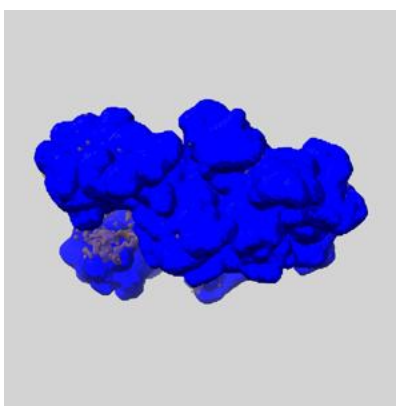
A mask typically either:

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

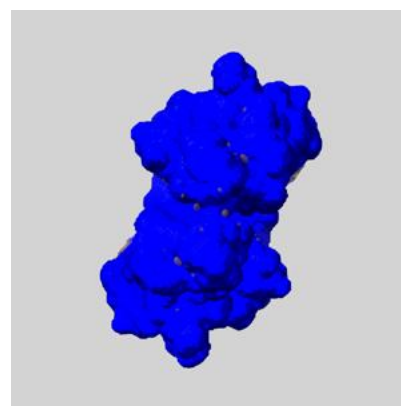
### 6.5.1 emd\_25715\_msk\_1.map [i](#)



X

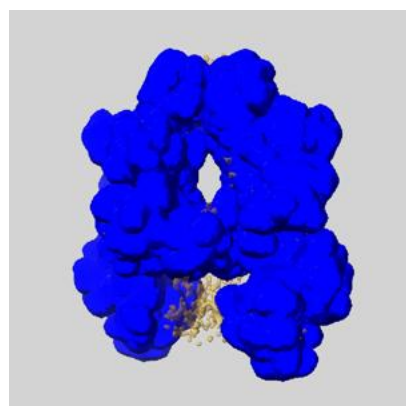


Y

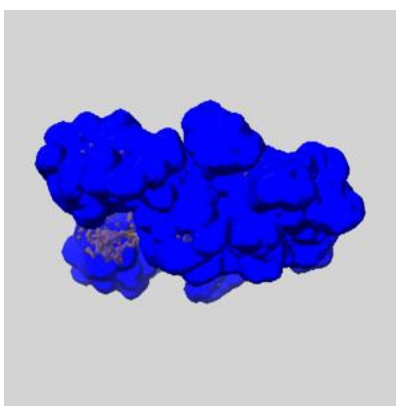


Z

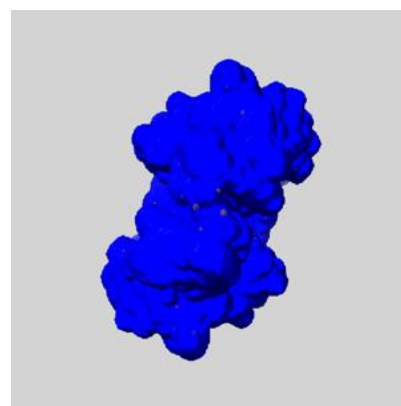
### 6.5.2 emd\_25715\_msk\_2.map [i](#)



X



Y

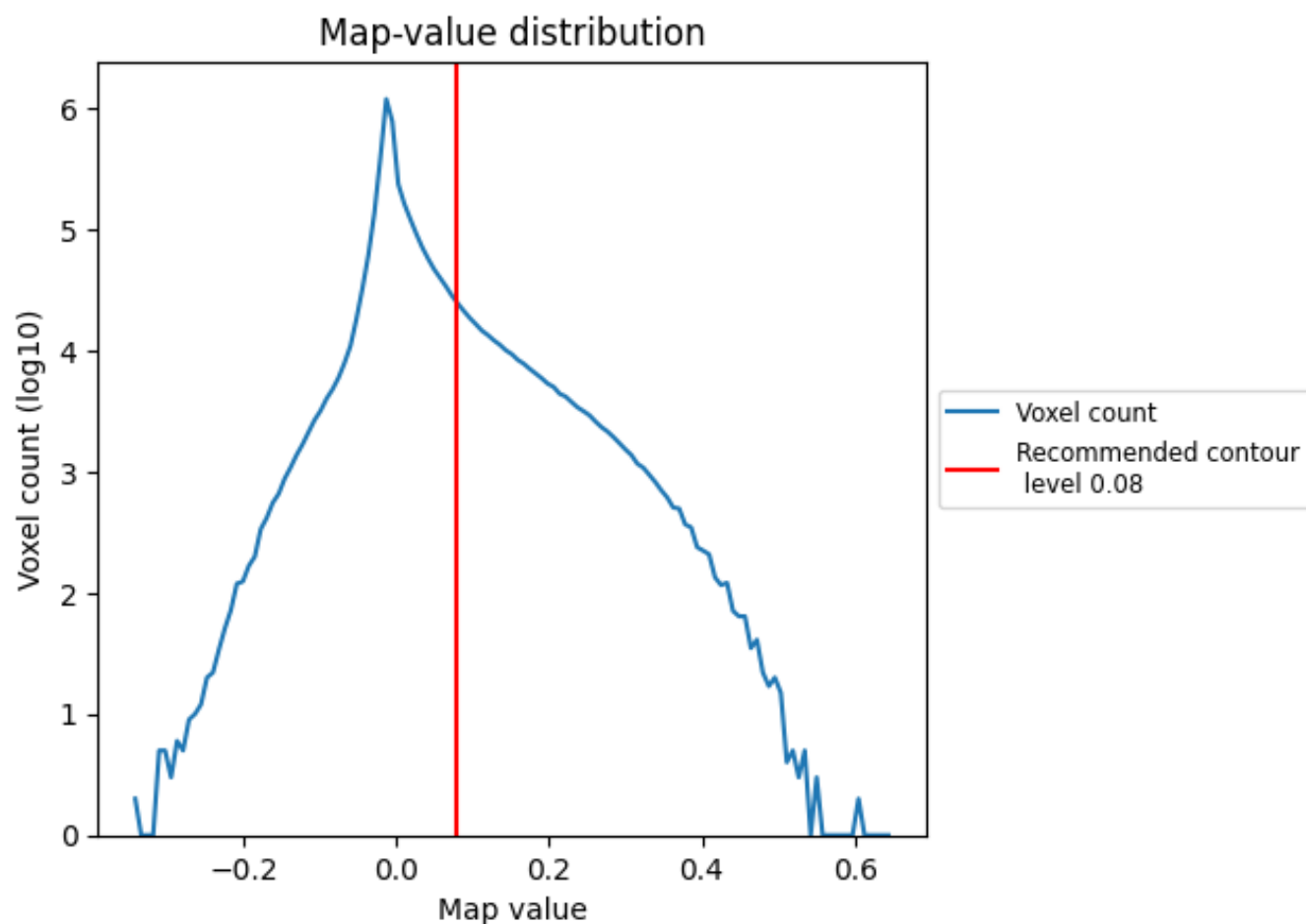


Z

## 7 Map analysis [i](#)

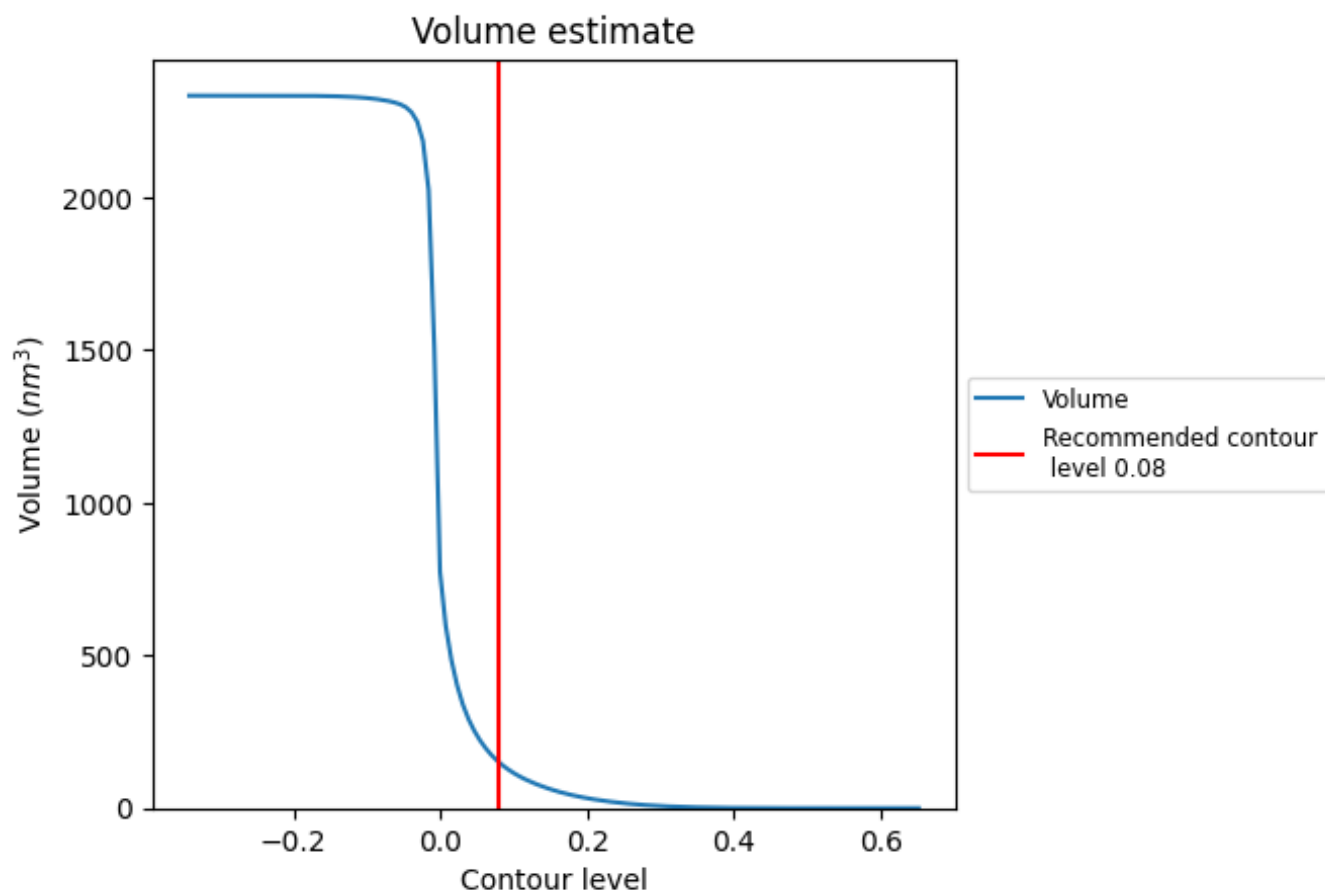
This section contains the results of statistical analysis of the map.

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



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

## 7.2 Volume estimate [i](#)



The volume at the recommended contour level is 151 nm<sup>3</sup>; this corresponds to an approximate mass of 136 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.

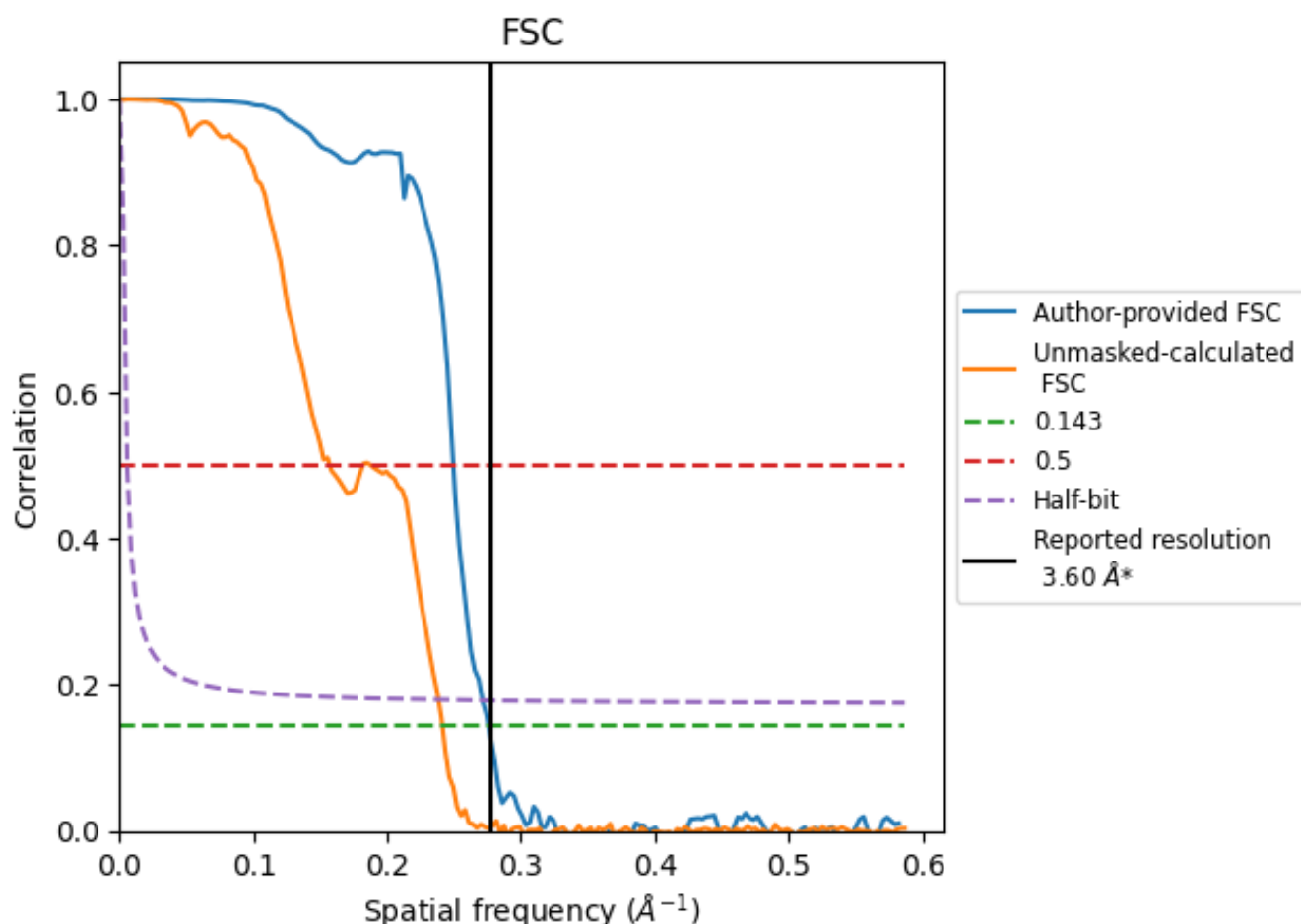
## 7.3 Rotationally averaged power spectrum [i](#)

This section was not generated. The rotationally averaged power spectrum is only generated for cubic maps.

## 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 0.278 Å<sup>-1</sup>

## 8.2 Resolution estimates [i](#)

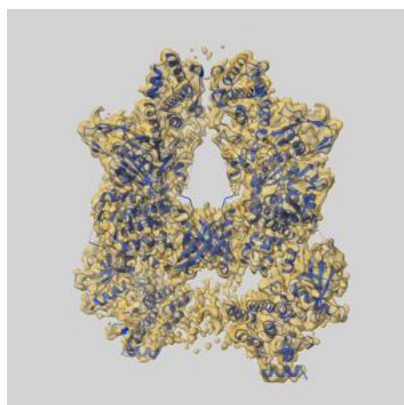
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.60	-	-
Author-provided FSC curve	3.63	4.01	3.69
Unmasked-calculated*	4.14	6.37	4.19

\*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 4.14 differs from the reported value 3.6 by more than 10 %

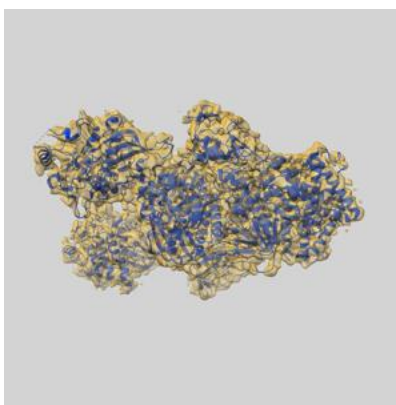
## 9 Map-model fit [i](#)

This section contains information regarding the fit between EMDB map EMD-25715 and PDB model 7T6F. Per-residue inclusion information can be found in section [3](#) on page [8](#).

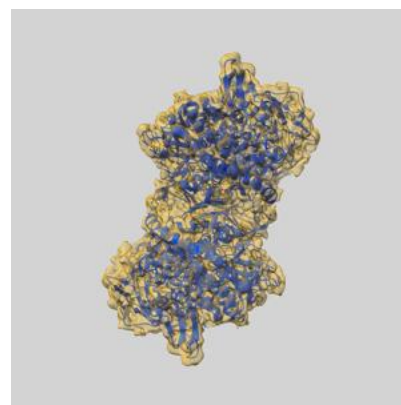
### 9.1 Map-model overlay [i](#)



X



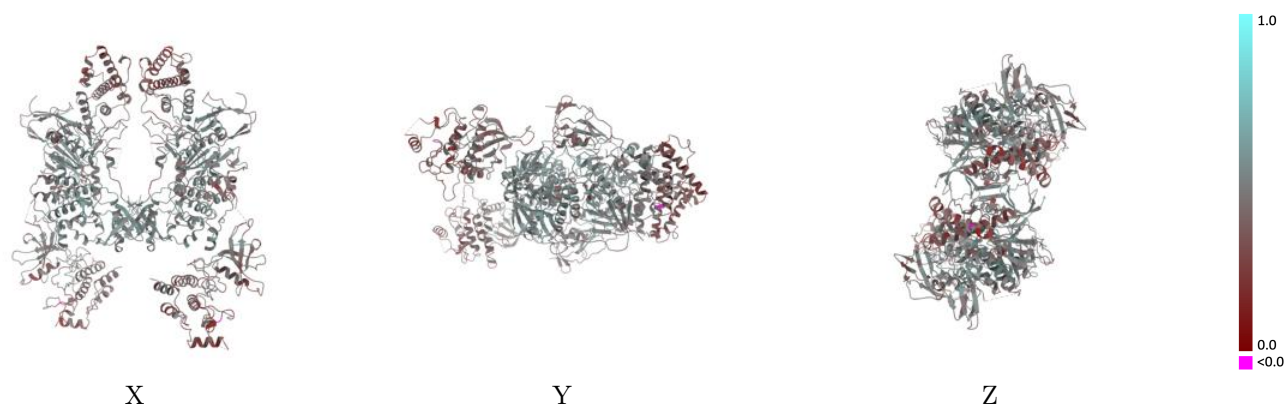
Y



Z

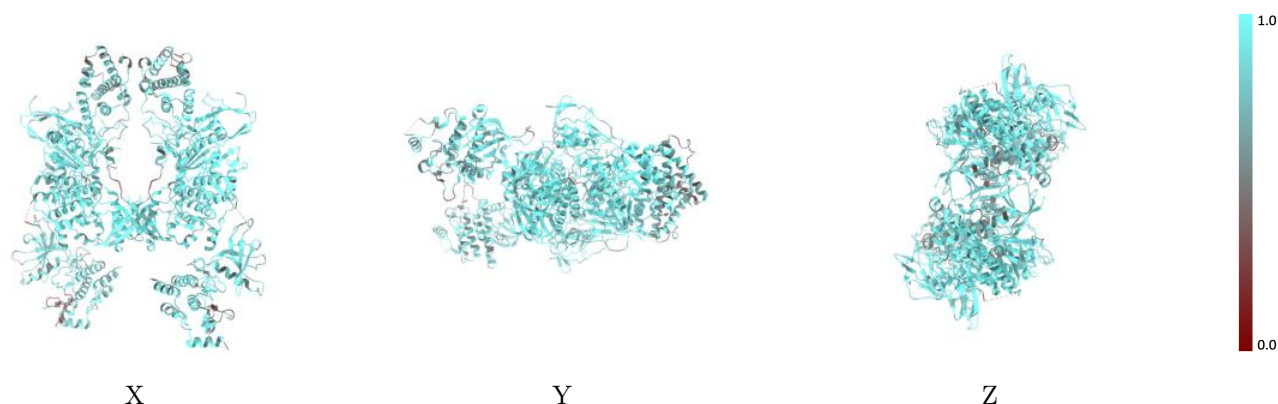
The images above show the 3D surface view of the map at the recommended contour level 0.08 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



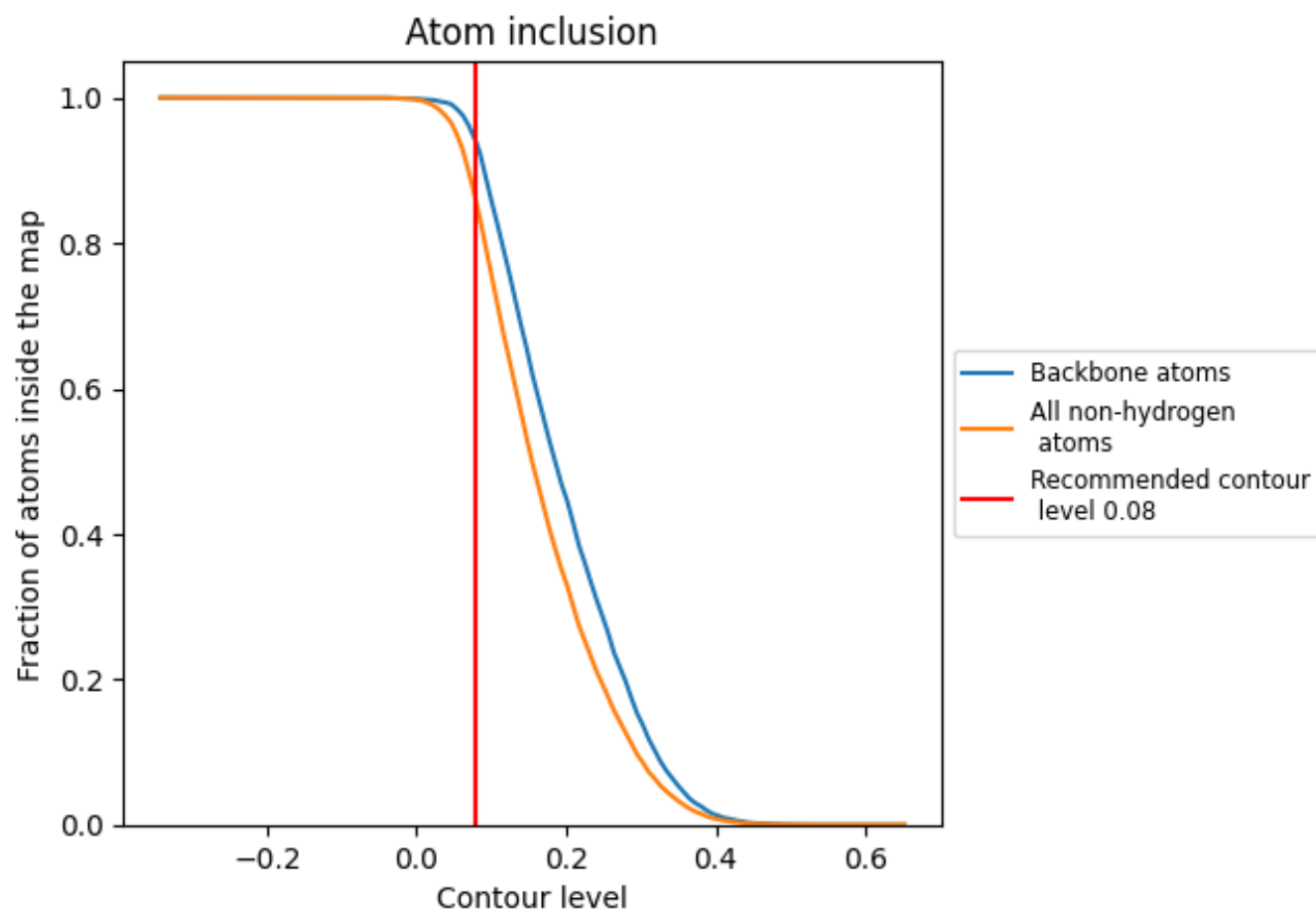
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.08).

## 9.4 Atom inclusion [i](#)



At the recommended contour level, 94% of all backbone atoms, 86% 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 (0.08) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	<div></div> 0.8567	<div></div> 0.4570
A	<div></div> 0.8615	<div></div> 0.4600
B	<div></div> 0.8607	<div></div> 0.4610
C	<div></div> 0.7329	<div></div> 0.3870
D	<div></div> 0.7256	<div></div> 0.3680

