



Full wwPDB EM Validation Report ⓘ

Mar 9, 2026 – 10:38 AM UTC

PDB ID : 7WF3 / pdb_00007wf3
EMDB ID : EMD-32459
Title : Composite map of human Kv1.3 channel in apo state with beta subunits
Authors : Tyagi, A.; Ahmed, T.; Jian, S.; Bajaj, S.; Ong, S.T.; Goay, S.S.M.; Zhao, Y.; Vorobyov, I.; Tian, C.; Chandy, K.G.; Bhushan, S.
Deposited on : 2021-12-25
Resolution : 3.40 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:

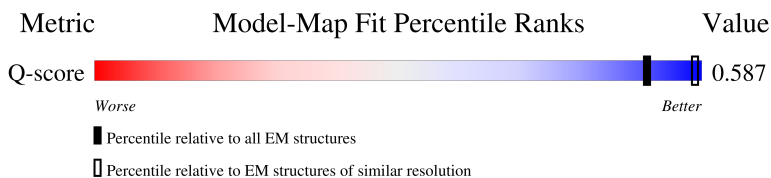
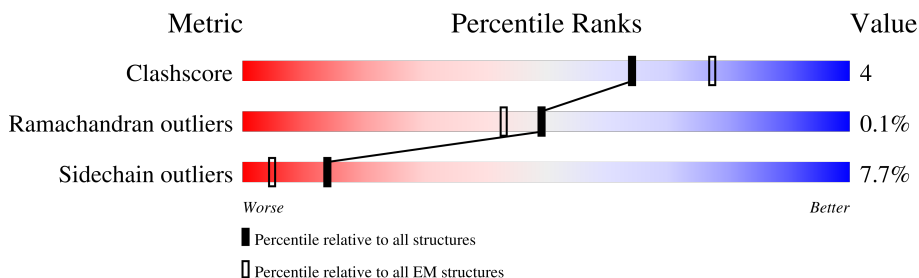
EMDB validation analysis : 0.0.1.dev132
Mogul : 2022.3.0, CSD as543be (2022)
MolProbity : 4-5-2 with Phenix2.0
Buster-report : wwPDB partial adaption of 1.1.7 (2018)
Percentile statistics : 20250101.v01 (using entries in the PDB archive January 1st 2025)
EM percentile statistics : 202505.v01 (Using data in the EMDB archive up until May 2025)
MapQ : 1.9.13
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.49

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 3.40 Å.

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



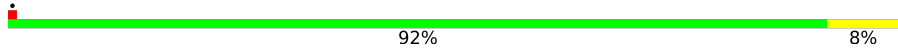
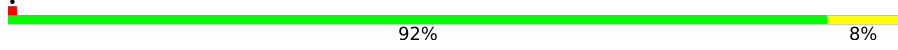
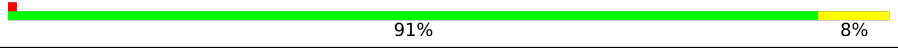
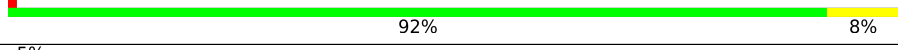
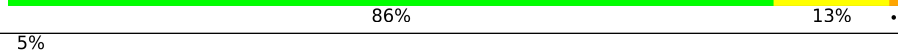
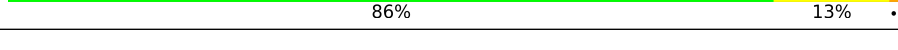
Metric	Whole archive (#Entries)	EM structures (#Entries)	Similar EM resolution (#Entries, resolution range(Å))
Clashscore	229148	23984	-
Ramachandran outliers	224038	23583	-
Sidechain outliers	223484	23102	-
Q-score	-	25397	14717 (2.90 - 3.90)

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	B	286	 7% 64% 19% 5% 12%
1	D	286	 7% 62% 21% 5% 12%
1	F	286	 8% 64% 19% 6% 12%
1	H	286	 7% 63% 20% 5% 12%

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Mol	Chain	Length	Quality of chain
2	C	328	
2	G	328	
2	I	328	
2	M	328	
3	J	106	
3	N	106	
3	O	106	
3	P	106	

2 Entry composition

There are 6 unique types of molecules in this entry. The entry contains 22100 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 Potassium voltage-gated channel subfamily A member 3.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	B	252	Total	C	N	O	S	0	0
			2002	1329	324	341	8		
1	D	252	Total	C	N	O	S	0	0
			2002	1329	324	341	8		
1	F	252	Total	C	N	O	S	0	0
			2002	1329	324	341	8		
1	H	252	Total	C	N	O	S	0	0
			2002	1329	324	341	8		

- Molecule 2 is a protein called Voltage-gated potassium channel subunit beta-2.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	C	328	Total	C	N	O	S	0	0
			2557	1625	443	473	16		
2	G	328	Total	C	N	O	S	0	0
			2557	1625	443	473	16		
2	I	328	Total	C	N	O	S	0	0
			2557	1625	443	473	16		
2	M	328	Total	C	N	O	S	0	0
			2557	1625	443	473	16		

- Molecule 3 is a protein called Potassium voltage-gated channel subfamily A member 3.

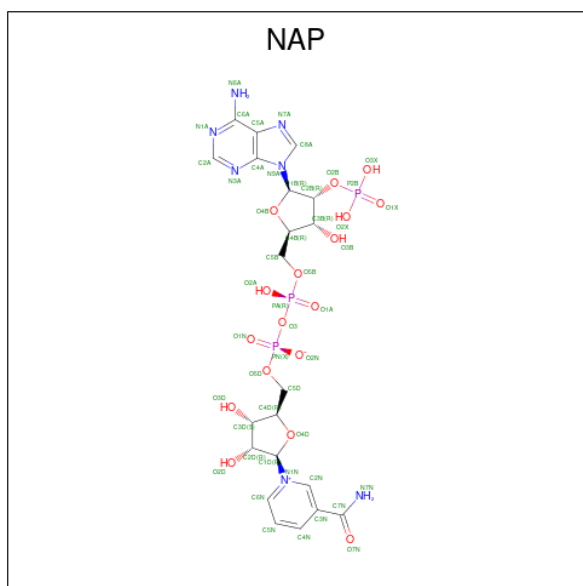
Mol	Chain	Residues	Atoms					AltConf	Trace
3	J	106	Total	C	N	O	S	0	0
			888	566	156	161	5		
3	N	106	Total	C	N	O	S	0	0
			888	566	156	161	5		
3	O	106	Total	C	N	O	S	0	0
			888	566	156	161	5		
3	P	106	Total	C	N	O	S	0	0
			888	566	156	161	5		

- Molecule 4 is POTASSIUM ION (CCD ID: K) (formula: K) (labeled as "Ligand of Interest")

by depositor).

Mol	Chain	Residues	Atoms	AltConf
4	B	4	Total K 4 4	0

- Molecule 5 is NADP NICOTINAMIDE-ADENINE-DINUCLEOTIDE PHOSPHATE (CCD ID: NAP) (formula: $C_{21}H_{28}N_7O_{17}P_3$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms					AltConf
5	C	1	Total 48	C 21	N 7	O 17	P 3	0
5	G	1	Total 48	C 21	N 7	O 17	P 3	0
5	I	1	Total 48	C 21	N 7	O 17	P 3	0
5	M	1	Total 48	C 21	N 7	O 17	P 3	0

- Molecule 6 is water.

Mol	Chain	Residues	Atoms		AltConf
6	B	6	Total 6	O 6	0
6	C	23	Total 23	O 23	0
6	D	6	Total 6	O 6	0

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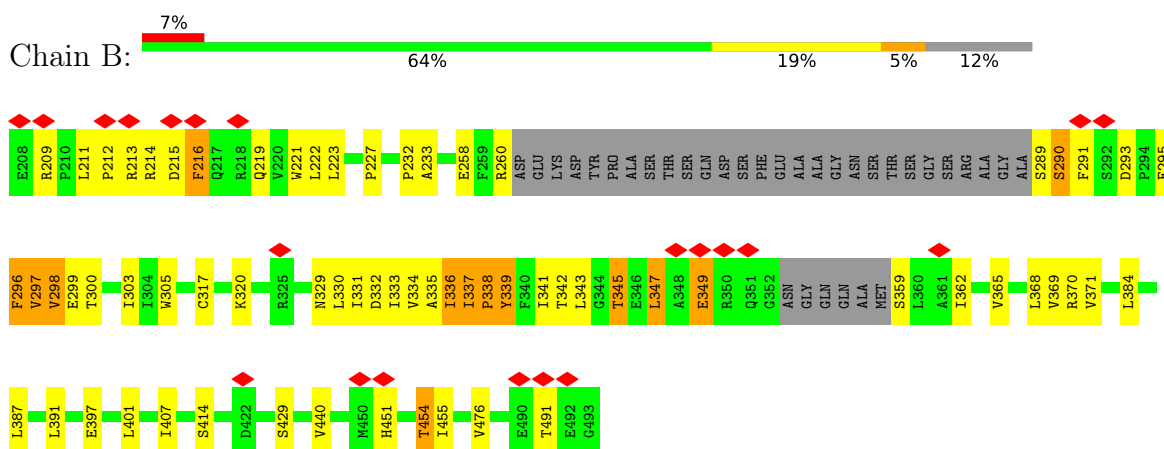
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Mol	Chain	Residues	Atoms		AltConf
6	F	6	Total 6	O 6	0
6	G	23	Total 23	O 23	0
6	H	6	Total 6	O 6	0
6	I	23	Total 23	O 23	0
6	M	23	Total 23	O 23	0

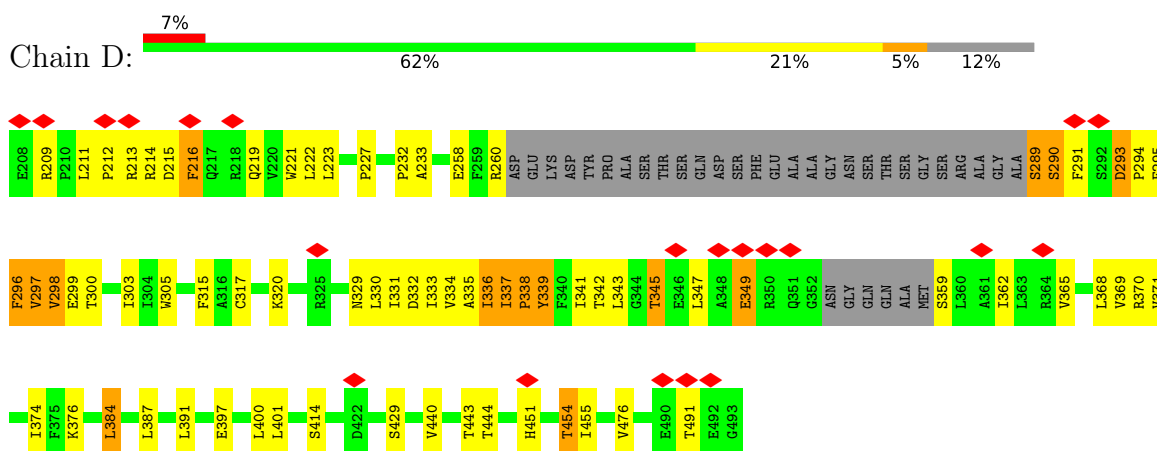
3 Residue-property plots

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.

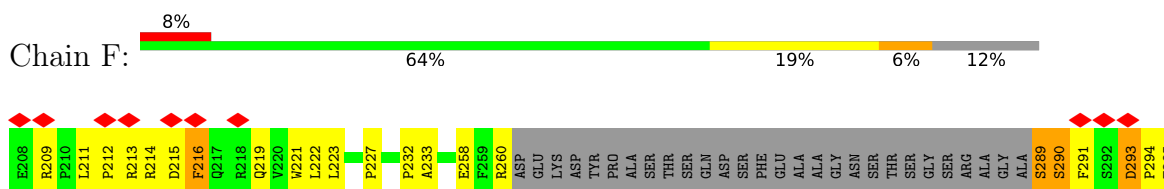
- Molecule 1: Potassium voltage-gated channel subfamily A member 3

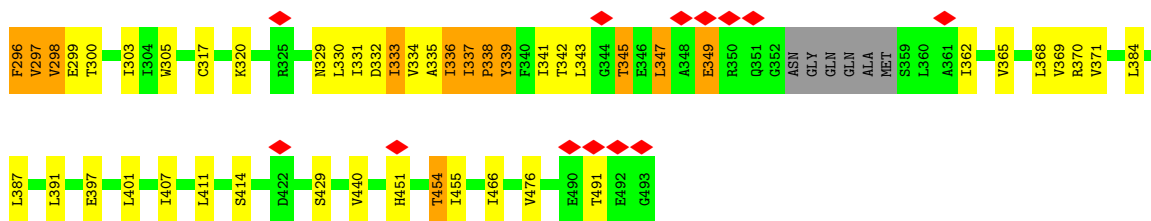


- Molecule 1: Potassium voltage-gated channel subfamily A member 3

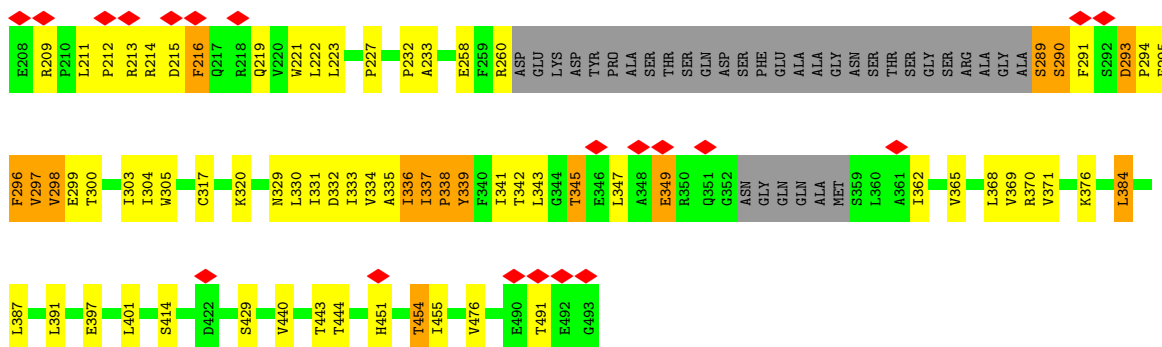


- Molecule 1: Potassium voltage-gated channel subfamily A member 3





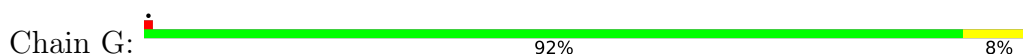
- Molecule 1: Potassium voltage-gated channel subfamily A member 3



- Molecule 2: Voltage-gated potassium channel subunit beta-2



- Molecule 2: Voltage-gated potassium channel subunit beta-2

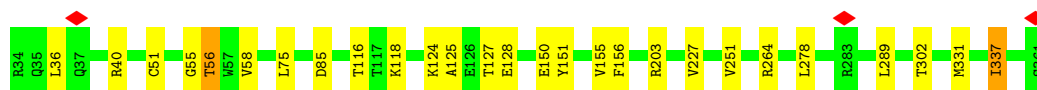


- Molecule 2: Voltage-gated potassium channel subunit beta-2

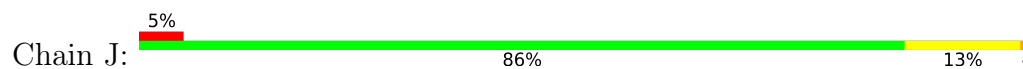


- Molecule 2: Voltage-gated potassium channel subunit beta-2

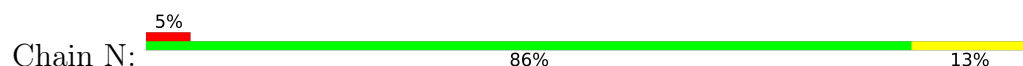




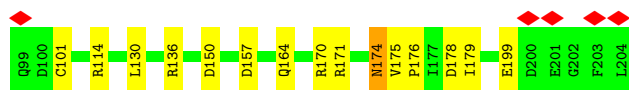
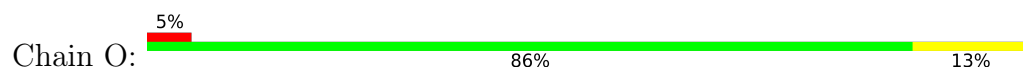
- Molecule 3: Potassium voltage-gated channel subfamily A member 3



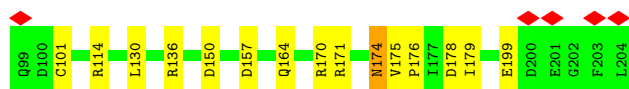
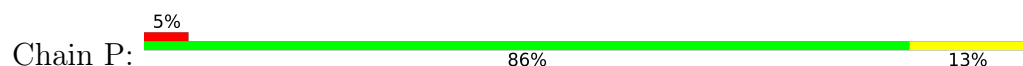
- Molecule 3: Potassium voltage-gated channel subfamily A member 3



- Molecule 3: Potassium voltage-gated channel subfamily A member 3



- Molecule 3: Potassium voltage-gated channel subfamily A member 3



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	177130	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	TFS KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	65	Depositor
Minimum defocus (nm)	1000	Depositor
Maximum defocus (nm)	2500	Depositor
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	65.094	Depositor
Minimum map value	-39.824	Depositor
Average map value	-0.041	Depositor
Map value standard deviation	1.215	Depositor
Recommended contour level	6	Depositor
Map size (Å)	360.36, 360.36, 360.36	wwPDB
Map dimensions	420, 420, 420	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.858, 0.858, 0.858	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: NAP, K

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	B	1.01	18/2053 (0.9%)	0.97	14/2789 (0.5%)
1	D	1.01	18/2053 (0.9%)	0.97	14/2789 (0.5%)
1	F	1.01	17/2053 (0.8%)	0.97	14/2789 (0.5%)
1	H	1.01	17/2053 (0.8%)	0.97	14/2789 (0.5%)
2	C	0.26	0/2608	0.55	0/3525
2	G	0.26	0/2608	0.55	0/3525
2	I	0.26	0/2608	0.55	0/3525
2	M	0.26	0/2608	0.55	0/3525
3	J	0.24	0/909	0.57	0/1221
3	N	0.24	0/909	0.57	0/1221
3	O	0.24	0/909	0.56	0/1221
3	P	0.24	0/909	0.57	0/1221
All	All	0.65	70/22280 (0.3%)	0.74	56/30140 (0.2%)

All (70) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	337	ILE	CA-CB	-14.89	1.43	1.53
1	D	337	ILE	CA-CB	-14.82	1.43	1.53
1	H	337	ILE	CA-CB	-14.74	1.43	1.53
1	F	337	ILE	CA-CB	-14.72	1.43	1.53
1	F	335	ALA	C-O	13.94	1.40	1.24
1	D	335	ALA	C-O	13.92	1.40	1.24
1	H	335	ALA	C-O	13.90	1.40	1.24
1	B	335	ALA	C-O	13.90	1.40	1.24
1	D	337	ILE	N-CA	-7.41	1.37	1.46
1	H	334	VAL	CA-CB	-7.38	1.45	1.54
1	F	334	VAL	CA-CB	-7.38	1.45	1.54
1	B	337	ILE	N-CA	-7.37	1.37	1.46
1	B	334	VAL	CA-CB	-7.35	1.45	1.54
1	H	337	ILE	N-CA	-7.34	1.37	1.46

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	F	337	ILE	N-CA	-7.34	1.37	1.46
1	D	334	VAL	CA-CB	-7.31	1.45	1.54
1	D	298	VAL	C-O	-7.27	1.15	1.24
1	H	298	VAL	C-O	-7.23	1.15	1.24
1	B	298	VAL	C-O	-7.23	1.15	1.24
1	F	298	VAL	C-O	-7.19	1.15	1.24
1	F	333	ILE	CA-CB	-6.98	1.45	1.54
1	D	333	ILE	CA-CB	-6.94	1.45	1.54
1	H	333	ILE	CA-CB	-6.94	1.45	1.54
1	B	333	ILE	CA-CB	-6.90	1.45	1.54
1	H	295	PHE	C-O	-6.44	1.16	1.24
1	D	339	TYR	CA-CB	-6.42	1.43	1.53
1	H	339	TYR	CA-CB	-6.41	1.43	1.53
1	B	295	PHE	C-O	-6.34	1.16	1.24
1	B	339	TYR	CA-CB	-6.33	1.43	1.53
1	D	295	PHE	C-O	-6.32	1.16	1.24
1	F	295	PHE	C-O	-6.31	1.16	1.24
1	F	339	TYR	CA-CB	-6.28	1.43	1.53
1	B	332	ASP	CA-CB	-6.14	1.43	1.53
1	F	332	ASP	CA-CB	-6.14	1.43	1.53
1	H	332	ASP	CA-CB	-6.12	1.43	1.53
1	D	332	ASP	CA-CB	-6.11	1.43	1.53
1	D	293	ASP	CA-C	-5.90	1.45	1.52
1	B	293	ASP	CA-C	-5.90	1.45	1.52
1	F	295	PHE	CA-C	-5.86	1.45	1.52
1	F	293	ASP	CA-C	-5.85	1.45	1.52
1	H	293	ASP	CA-C	-5.84	1.45	1.52
1	H	295	PHE	CA-C	-5.81	1.45	1.52
1	H	337	ILE	C-O	-5.80	1.17	1.24
1	F	337	ILE	C-O	-5.79	1.17	1.24
1	D	295	PHE	CA-C	-5.78	1.45	1.52
1	F	297	VAL	C-O	-5.71	1.17	1.24
1	B	295	PHE	CA-C	-5.67	1.45	1.52
1	D	297	VAL	C-O	-5.66	1.17	1.24
1	B	337	ILE	C-O	-5.64	1.17	1.24
1	D	337	ILE	C-O	-5.62	1.17	1.24
1	H	297	VAL	C-O	-5.58	1.17	1.24
1	B	297	VAL	C-O	-5.56	1.17	1.24
1	D	329	ASN	CA-CB	-5.44	1.44	1.53
1	B	329	ASN	CA-CB	-5.41	1.44	1.53
1	H	329	ASN	CA-CB	-5.40	1.44	1.53
1	F	329	ASN	CA-CB	-5.37	1.44	1.53

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	F	336	ILE	CA-CB	-5.25	1.47	1.54
1	H	335	ALA	CA-CB	-5.25	1.45	1.53
1	H	330	LEU	C-O	-5.23	1.17	1.24
1	B	336	ILE	CA-CB	-5.23	1.47	1.54
1	H	336	ILE	CA-CB	-5.21	1.47	1.54
1	D	336	ILE	CA-CB	-5.21	1.47	1.54
1	D	330	LEU	C-O	-5.21	1.18	1.24
1	D	335	ALA	CA-CB	-5.19	1.45	1.53
1	F	330	LEU	C-O	-5.18	1.18	1.24
1	B	330	LEU	C-O	-5.18	1.18	1.24
1	B	335	ALA	CA-CB	-5.16	1.45	1.53
1	F	335	ALA	CA-CB	-5.15	1.45	1.53
1	D	339	TYR	CA-C	-5.02	1.46	1.52
1	B	339	TYR	CA-C	-5.01	1.46	1.52

All (56) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	D	293	ASP	CA-C-N	15.14	135.94	119.28
1	D	293	ASP	C-N-CA	15.14	135.94	119.28
1	B	293	ASP	CA-C-N	15.13	135.93	119.28
1	B	293	ASP	C-N-CA	15.13	135.93	119.28
1	H	293	ASP	CA-C-N	15.10	135.89	119.28
1	H	293	ASP	C-N-CA	15.10	135.89	119.28
1	F	293	ASP	CA-C-N	15.07	135.86	119.28
1	F	293	ASP	C-N-CA	15.07	135.86	119.28
1	B	347	LEU	CA-CB-CG	-9.51	83.03	116.30
1	F	347	LEU	CA-CB-CG	-9.49	83.07	116.30
1	H	347	LEU	CA-CB-CG	-9.49	83.09	116.30
1	D	347	LEU	CA-CB-CG	-9.48	83.12	116.30
1	D	298	VAL	N-CA-C	8.16	118.96	110.72
1	H	298	VAL	N-CA-C	8.15	118.96	110.72
1	B	298	VAL	N-CA-C	8.14	118.94	110.72
1	F	298	VAL	N-CA-C	8.09	118.89	110.72
1	B	335	ALA	O-C-N	-7.90	113.93	122.07
1	F	335	ALA	O-C-N	-7.89	113.95	122.07
1	D	335	ALA	O-C-N	-7.85	113.99	122.07
1	H	335	ALA	O-C-N	-7.84	114.00	122.07
1	H	336	ILE	N-CA-C	7.05	119.86	111.05
1	D	336	ILE	N-CA-C	7.04	119.85	111.05
1	B	336	ILE	N-CA-C	7.03	119.84	111.05
1	F	336	ILE	N-CA-C	7.03	119.83	111.05

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	H	345	THR	N-CA-CB	6.74	120.73	110.28
1	B	345	THR	N-CA-CB	6.72	120.69	110.28
1	F	345	THR	N-CA-CB	6.71	120.69	110.28
1	D	345	THR	N-CA-CB	6.71	120.68	110.28
1	B	295	PHE	CA-C-O	-6.32	114.18	120.82
1	D	295	PHE	CA-C-O	-6.30	114.21	120.82
1	F	295	PHE	CA-C-O	-6.25	114.26	120.82
1	H	295	PHE	CA-C-O	-6.24	114.27	120.82
1	B	337	ILE	N-CA-C	6.17	121.56	112.61
1	F	337	ILE	N-CA-C	6.16	121.54	112.61
1	D	337	ILE	N-CA-C	6.15	121.52	112.61
1	H	337	ILE	N-CA-C	6.11	121.47	112.61
1	F	290	SER	N-CA-C	6.08	119.27	109.79
1	B	290	SER	N-CA-C	6.08	119.27	109.79
1	D	290	SER	N-CA-C	6.07	119.26	109.79
1	H	290	SER	N-CA-C	6.06	119.25	109.79
1	F	334	VAL	N-CA-C	5.71	116.45	110.62
1	D	334	VAL	N-CA-C	5.66	116.39	110.62
1	B	334	VAL	N-CA-C	5.64	116.37	110.62
1	H	334	VAL	N-CA-C	5.62	116.35	110.62
1	H	337	ILE	N-CA-CB	-5.53	107.02	110.50
1	F	337	ILE	N-CA-CB	-5.47	107.05	110.50
1	D	337	ILE	N-CA-CB	-5.43	107.08	110.50
1	D	293	ASP	N-CA-CB	5.41	120.00	110.37
1	F	293	ASP	N-CA-CB	5.40	119.99	110.37
1	H	293	ASP	N-CA-CB	5.40	119.99	110.37
1	B	293	ASP	N-CA-CB	5.40	119.97	110.37
1	B	337	ILE	N-CA-CB	-5.36	107.13	110.50
1	H	332	ASP	N-CA-C	5.30	117.06	111.28
1	D	332	ASP	N-CA-C	5.25	117.00	111.28
1	F	332	ASP	N-CA-C	5.24	116.99	111.28
1	B	332	ASP	N-CA-C	5.19	116.94	111.28

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	B	2002	0	2054	28	0
1	D	2002	0	2054	33	0
1	F	2002	0	2054	31	0
1	H	2002	0	2054	32	0
2	C	2557	0	2568	9	0
2	G	2557	0	2568	10	0
2	I	2557	0	2568	11	0
2	M	2557	0	2568	11	0
3	J	888	0	848	7	0
3	N	888	0	848	7	0
3	O	888	0	848	7	0
3	P	888	0	848	7	0
4	B	4	0	0	0	0
5	C	48	0	23	1	0
5	G	48	0	23	1	0
5	I	48	0	23	2	0
5	M	48	0	23	2	0
6	B	6	0	0	0	0
6	C	23	0	0	1	0
6	D	6	0	0	0	0
6	F	6	0	0	0	0
6	G	23	0	0	1	0
6	H	6	0	0	0	0
6	I	23	0	0	1	0
6	M	23	0	0	1	0
All	All	22100	0	21972	179	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 4.

All (179) 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:300:THR:HG1	1:B:339:TYR:HH	1.28	0.76
2:G:55:GLY:HA3	5:G:401:NAP:O3D	1.86	0.75
2:M:55:GLY:HA3	5:M:401:NAP:O3D	1.87	0.75
1:F:300:THR:HG1	1:F:339:TYR:HH	1.28	0.74
2:C:55:GLY:HA3	5:C:401:NAP:O3D	1.88	0.73
2:I:55:GLY:HA3	5:I:401:NAP:O3D	1.90	0.72
1:B:336:ILE:HD12	1:B:336:ILE:N	2.12	0.65
1:D:336:ILE:HD12	1:D:336:ILE:N	2.12	0.65
1:H:336:ILE:HD12	1:H:336:ILE:N	2.12	0.64

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:223:LEU:HD21	1:B:232:PRO:HB2	1.81	0.63
1:H:223:LEU:HD21	1:H:232:PRO:HB2	1.81	0.62
1:F:336:ILE:HD12	1:F:336:ILE:N	2.12	0.62
1:D:223:LEU:HD21	1:D:232:PRO:HB2	1.81	0.62
1:F:223:LEU:HD21	1:F:232:PRO:HB2	1.81	0.61
1:H:211:LEU:HB2	1:H:213:ARG:HH12	1.68	0.58
2:M:36:LEU:H	2:M:337:ILE:HD11	1.69	0.58
1:B:211:LEU:HB2	1:B:213:ARG:HH12	1.68	0.57
1:B:227:PRO:HA	1:B:233:ALA:HB1	1.87	0.57
2:G:36:LEU:H	2:G:337:ILE:HD11	1.69	0.57
1:B:296:PHE:C	1:B:296:PHE:CD1	2.82	0.57
1:D:211:LEU:HB2	1:D:213:ARG:HH12	1.68	0.57
1:D:299:GLU:OE2	1:D:370:ARG:NH1	2.32	0.57
1:F:227:PRO:HA	1:F:233:ALA:HB1	1.87	0.57
1:B:299:GLU:OE2	1:B:370:ARG:NH1	2.32	0.57
1:D:227:PRO:HA	1:D:233:ALA:HB1	1.87	0.57
1:D:296:PHE:C	1:D:296:PHE:CD1	2.82	0.56
1:D:384:LEU:HD11	1:F:407:ILE:HD12	1.86	0.56
1:B:260:ARG:NH2	1:D:429:SER:O	2.38	0.56
1:F:211:LEU:HB2	1:F:213:ARG:HH12	1.68	0.56
1:F:299:GLU:OE2	1:F:370:ARG:NH1	2.32	0.56
1:H:227:PRO:HA	1:H:233:ALA:HB1	1.87	0.56
1:H:296:PHE:CD1	1:H:296:PHE:C	2.83	0.56
2:C:36:LEU:H	2:C:337:ILE:HD11	1.69	0.56
2:I:36:LEU:H	2:I:337:ILE:HD11	1.69	0.56
1:F:296:PHE:C	1:F:296:PHE:CD1	2.83	0.56
1:D:337:ILE:HB	1:D:338:PRO:HD3	1.88	0.56
1:F:337:ILE:HB	1:F:338:PRO:HD3	1.88	0.56
1:B:429:SER:O	1:H:260:ARG:NH2	2.39	0.55
2:C:118:LYS:HG2	2:C:156:PHE:HB2	1.89	0.54
1:B:337:ILE:HB	1:B:338:PRO:HD3	1.88	0.54
1:H:337:ILE:HB	1:H:338:PRO:HD3	1.88	0.54
1:F:317:CYS:O	1:F:320:LYS:NZ	2.41	0.54
1:D:317:CYS:O	1:D:320:LYS:NZ	2.41	0.53
2:I:118:LYS:HG2	2:I:156:PHE:HB2	1.89	0.53
1:H:336:ILE:N	1:H:336:ILE:CD1	2.71	0.53
2:G:118:LYS:HG2	2:G:156:PHE:HB2	1.89	0.53
2:M:118:LYS:HG2	2:M:156:PHE:HB2	1.89	0.53
1:F:336:ILE:N	1:F:336:ILE:CD1	2.71	0.53
1:H:317:CYS:O	1:H:320:LYS:NZ	2.41	0.53
1:B:336:ILE:N	1:B:336:ILE:CD1	2.71	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:I:75:LEU:HD21	2:I:331:MET:HG2	1.91	0.52
1:B:300:THR:OG1	1:B:339:TYR:OH	2.07	0.52
2:C:75:LEU:HD21	2:C:331:MET:HG2	1.91	0.52
2:G:75:LEU:HD21	2:G:331:MET:HG2	1.91	0.51
1:D:336:ILE:N	1:D:336:ILE:CD1	2.71	0.51
2:M:75:LEU:HD21	2:M:331:MET:HG2	1.91	0.51
1:H:299:GLU:OE2	1:H:370:ARG:NH1	2.32	0.51
3:P:171:ARG:NH1	3:P:175:VAL:O	2.45	0.50
3:O:171:ARG:NH1	3:O:175:VAL:O	2.45	0.50
1:B:317:CYS:O	1:B:320:LYS:NZ	2.41	0.50
3:N:178:ASP:N	3:N:178:ASP:OD1	2.46	0.49
3:P:176:PRO:HD2	3:P:179:ILE:HD12	1.94	0.49
2:G:40:ARG:NE	2:G:51:CYS:SG	2.85	0.49
3:J:176:PRO:HD2	3:J:179:ILE:HD12	1.94	0.49
3:O:176:PRO:HD2	3:O:179:ILE:HD12	1.94	0.49
3:N:176:PRO:HD2	3:N:179:ILE:HD12	1.94	0.49
2:M:40:ARG:NE	2:M:51:CYS:SG	2.86	0.49
2:C:40:ARG:NE	2:C:51:CYS:SG	2.86	0.49
2:I:40:ARG:NE	2:I:51:CYS:SG	2.85	0.49
3:J:171:ARG:NH1	3:J:175:VAL:O	2.45	0.49
3:N:171:ARG:NH1	3:N:175:VAL:O	2.45	0.49
1:F:260:ARG:NH2	1:H:429:SER:O	2.46	0.49
1:D:260:ARG:NH2	1:F:429:SER:O	2.46	0.48
3:N:174:ASN:OD1	3:N:174:ASN:N	2.47	0.48
1:D:349:GLU:HA	1:D:349:GLU:OE2	2.14	0.48
3:J:174:ASN:N	3:J:174:ASN:OD1	2.47	0.48
3:O:150:ASP:OD2	3:P:164:GLN:NE2	2.45	0.48
2:I:203:ARG:NH1	6:I:505:HOH:O	2.45	0.48
3:P:178:ASP:N	3:P:178:ASP:OD1	2.46	0.48
3:J:178:ASP:N	3:J:178:ASP:OD1	2.46	0.47
3:P:174:ASN:OD1	3:P:174:ASN:N	2.47	0.47
1:F:349:GLU:HA	1:F:349:GLU:OE2	2.13	0.47
3:O:174:ASN:OD1	3:O:174:ASN:N	2.47	0.47
3:O:178:ASP:OD1	3:O:178:ASP:N	2.46	0.47
1:H:293:ASP:HA	1:H:294:PRO:HD2	1.56	0.47
1:H:349:GLU:OE2	1:H:349:GLU:HA	2.14	0.47
1:B:349:GLU:OE2	1:B:349:GLU:HA	2.13	0.47
2:C:199:TYR:OH	3:N:142:PRO:O	2.33	0.47
1:B:212:PRO:O	1:B:214:ARG:NH2	2.48	0.47
2:G:203:ARG:NH1	6:G:506:HOH:O	2.45	0.47
1:H:212:PRO:O	1:H:214:ARG:NH2	2.48	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:J:164:GLN:NE2	3:P:150:ASP:OD2	2.47	0.47
1:D:209:ARG:HD3	1:D:221:TRP:HH2	1.79	0.47
1:H:209:ARG:HD3	1:H:221:TRP:HH2	1.79	0.47
1:D:293:ASP:HA	1:D:294:PRO:HD2	1.56	0.47
1:D:296:PHE:CD1	1:D:296:PHE:O	2.68	0.46
1:B:296:PHE:CD1	1:B:296:PHE:O	2.68	0.46
1:F:341:ILE:HD13	1:F:341:ILE:HG21	1.60	0.46
1:D:341:ILE:HD13	1:D:341:ILE:HG21	1.60	0.46
1:F:296:PHE:CD1	1:F:296:PHE:O	2.68	0.46
1:F:212:PRO:O	1:F:214:ARG:NH2	2.48	0.46
1:B:365:VAL:O	1:B:369:VAL:HG23	2.16	0.46
1:H:296:PHE:CD1	1:H:296:PHE:O	2.68	0.46
1:F:209:ARG:HD3	1:F:221:TRP:HH2	1.79	0.46
1:B:209:ARG:HD3	1:B:221:TRP:HH2	1.79	0.46
1:D:365:VAL:O	1:D:369:VAL:HG23	2.16	0.45
2:G:151:TYR:OH	2:I:138:GLU:OE2	2.31	0.45
1:H:365:VAL:O	1:H:369:VAL:HG23	2.16	0.45
2:C:125:ALA:HB3	2:C:128:GLU:HG3	1.99	0.45
1:D:212:PRO:O	1:D:214:ARG:NH2	2.48	0.45
2:M:203:ARG:NH1	6:M:506:HOH:O	2.46	0.45
2:I:264:ARG:NH2	5:I:401:NAP:O3B	2.49	0.45
1:B:347:LEU:HD23	1:B:347:LEU:HA	1.59	0.45
2:M:125:ALA:HB3	2:M:128:GLU:HG3	1.99	0.45
1:D:454:THR:HG22	1:D:455:ILE:H	1.82	0.45
1:F:454:THR:HG22	1:F:455:ILE:H	1.82	0.44
2:M:264:ARG:NH2	5:M:401:NAP:O3B	2.50	0.44
1:F:365:VAL:O	1:F:369:VAL:HG23	2.16	0.44
2:I:125:ALA:HB3	2:I:128:GLU:HG3	1.99	0.44
1:D:289:SER:O	1:D:289:SER:OG	2.35	0.44
1:F:296:PHE:O	1:F:296:PHE:CG	2.70	0.44
1:D:296:PHE:O	1:D:296:PHE:CG	2.70	0.44
1:B:454:THR:HG22	1:B:455:ILE:H	1.82	0.44
1:H:296:PHE:O	1:H:296:PHE:CG	2.70	0.44
1:B:296:PHE:O	1:B:296:PHE:CG	2.70	0.44
1:F:216:PHE:HD2	1:F:216:PHE:HA	1.69	0.44
1:H:368:LEU:O	1:H:371:VAL:HG23	2.18	0.44
3:P:130:LEU:O	3:P:136:ARG:NH1	2.51	0.44
1:B:341:ILE:HD13	1:B:341:ILE:HG21	1.60	0.43
2:G:125:ALA:HB3	2:G:128:GLU:HG3	1.99	0.43
1:H:454:THR:HG22	1:H:455:ILE:H	1.82	0.43
1:B:216:PHE:HD2	1:B:216:PHE:HA	1.69	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:M:56:THR:OG1	2:M:85:ASP:O	2.33	0.43
1:B:368:LEU:O	1:B:371:VAL:HG23	2.18	0.43
1:F:368:LEU:O	1:F:371:VAL:HG23	2.18	0.43
2:C:203:ARG:NH1	6:C:506:HOH:O	2.49	0.43
1:D:300:THR:OG1	1:D:339:TYR:OH	2.07	0.43
1:D:368:LEU:O	1:D:371:VAL:HG23	2.18	0.43
3:J:130:LEU:O	3:J:136:ARG:NH1	2.51	0.43
3:N:150:ASP:OD2	3:O:164:GLN:NE2	2.52	0.43
1:F:293:ASP:HA	1:F:294:PRO:HD2	1.56	0.42
1:D:216:PHE:HD2	1:D:216:PHE:HA	1.69	0.42
2:G:138:GLU:OE2	2:M:151:TYR:OH	2.31	0.42
3:O:130:LEU:O	3:O:136:ARG:NH1	2.51	0.42
2:G:85:ASP:OD2	2:G:116:THR:OG1	2.38	0.42
1:H:215:ASP:O	1:H:219:GLN:NE2	2.52	0.42
3:N:130:LEU:O	3:N:136:ARG:NH1	2.51	0.42
1:D:215:ASP:O	1:D:219:GLN:NE2	2.53	0.42
1:F:289:SER:O	1:F:289:SER:OG	2.35	0.42
2:I:85:ASP:OD2	2:I:116:THR:OG1	2.38	0.42
1:B:215:ASP:O	1:B:219:GLN:NE2	2.52	0.42
1:B:223:LEU:HD23	1:B:223:LEU:HA	1.93	0.42
1:F:362:ILE:H	1:F:362:ILE:HG13	1.63	0.41
1:H:300:THR:OG1	1:H:339:TYR:OH	2.08	0.41
2:M:85:ASP:OD2	2:M:116:THR:OG1	2.38	0.41
2:C:85:ASP:OD2	2:C:116:THR:OG1	2.38	0.41
1:F:215:ASP:O	1:F:219:GLN:NE2	2.52	0.41
1:D:374:ILE:HD11	1:F:411:LEU:HD13	2.02	0.41
1:D:376:LYS:HE3	1:D:376:LYS:HB2	1.81	0.41
1:F:466:ILE:HD13	1:F:466:ILE:HA	1.91	0.41
1:H:289:SER:O	1:H:289:SER:OG	2.35	0.41
1:H:223:LEU:HD23	1:H:223:LEU:HA	1.93	0.41
1:B:407:ILE:HD12	1:H:384:LEU:HD11	2.03	0.41
1:D:315:PHE:HD1	1:D:315:PHE:HA	1.78	0.41
1:D:443:THR:O	1:D:444:THR:OG1	2.34	0.41
1:F:347:LEU:HA	1:F:347:LEU:HD23	1.59	0.41
1:H:216:PHE:HD2	1:H:216:PHE:HA	1.69	0.41
1:H:304:ILE:HD13	1:H:304:ILE:HA	1.91	0.41
1:H:362:ILE:H	1:H:362:ILE:HG13	1.63	0.41
2:I:199:TYR:OH	3:J:142:PRO:O	2.38	0.41
1:H:443:THR:O	1:H:444:THR:OG1	2.34	0.41
1:D:362:ILE:H	1:D:362:ILE:HG13	1.63	0.40
1:H:376:LYS:HB2	1:H:376:LYS:HE3	1.81	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:359:SER:HB2	1:D:362:ILE:HG13	2.03	0.40
1:D:400:LEU:HD23	1:D:400:LEU:HA	1.96	0.40
1:F:333:ILE:O	1:F:337:ILE:HG13	2.22	0.40
1:H:337:ILE:HG21	1:H:337:ILE:HD13	1.80	0.40
1:B:359:SER:HB2	1:B:362:ILE:HG13	2.04	0.40
1:H:341:ILE:HD13	1:H:341:ILE:HG21	1.60	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	B	246/286 (86%)	236 (96%)	10 (4%)	0	100	100
1	D	246/286 (86%)	236 (96%)	10 (4%)	0	100	100
1	F	246/286 (86%)	236 (96%)	10 (4%)	0	100	100
1	H	246/286 (86%)	236 (96%)	10 (4%)	0	100	100
2	C	326/328 (99%)	314 (96%)	11 (3%)	1 (0%)	36	65
2	G	326/328 (99%)	313 (96%)	12 (4%)	1 (0%)	36	65
2	I	326/328 (99%)	314 (96%)	11 (3%)	1 (0%)	36	65
2	M	326/328 (99%)	314 (96%)	11 (3%)	1 (0%)	36	65
3	J	104/106 (98%)	100 (96%)	4 (4%)	0	100	100
3	N	104/106 (98%)	100 (96%)	4 (4%)	0	100	100
3	O	104/106 (98%)	100 (96%)	4 (4%)	0	100	100
3	P	104/106 (98%)	100 (96%)	4 (4%)	0	100	100
All	All	2704/2880 (94%)	2599 (96%)	101 (4%)	4 (0%)	49	78

All (4) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	C	58	VAL
2	G	58	VAL
2	I	58	VAL
2	M	58	VAL

5.3.2 Protein sidechains ⓘ

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	B	220/244 (90%)	192 (87%)	28 (13%)	4	17
1	D	220/244 (90%)	192 (87%)	28 (13%)	4	17
1	F	220/244 (90%)	192 (87%)	28 (13%)	4	17
1	H	220/244 (90%)	192 (87%)	28 (13%)	4	17
2	C	271/275 (98%)	260 (96%)	11 (4%)	27	52
2	G	271/275 (98%)	260 (96%)	11 (4%)	27	52
2	I	271/275 (98%)	260 (96%)	11 (4%)	27	52
2	M	271/275 (98%)	260 (96%)	11 (4%)	27	52
3	J	94/97 (97%)	88 (94%)	6 (6%)	16	42
3	N	94/97 (97%)	88 (94%)	6 (6%)	16	42
3	O	94/97 (97%)	88 (94%)	6 (6%)	16	42
3	P	94/97 (97%)	88 (94%)	6 (6%)	16	42
All	All	2340/2464 (95%)	2160 (92%)	180 (8%)	14	37

All (180) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	B	216	PHE
1	B	222	LEU
1	B	258	GLU
1	B	289	SER
1	B	290	SER
1	B	291	PHE
1	B	296	PHE

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Mol	Chain	Res	Type
1	B	297	VAL
1	B	298	VAL
1	B	303	ILE
1	B	305	TRP
1	B	331	ILE
1	B	338	PRO
1	B	342	THR
1	B	343	LEU
1	B	345	THR
1	B	349	GLU
1	B	384	LEU
1	B	387	LEU
1	B	391	LEU
1	B	397	GLU
1	B	401	LEU
1	B	414	SER
1	B	440	VAL
1	B	451	HIS
1	B	454	THR
1	B	476	VAL
1	B	491	THR
2	C	56	THR
2	C	124	LYS
2	C	127	THR
2	C	150	GLU
2	C	155	VAL
2	C	227	VAL
2	C	251	VAL
2	C	278	LEU
2	C	289	LEU
2	C	302	THR
2	C	337	ILE
1	D	216	PHE
1	D	222	LEU
1	D	258	GLU
1	D	289	SER
1	D	290	SER
1	D	291	PHE
1	D	296	PHE
1	D	297	VAL
1	D	298	VAL
1	D	303	ILE

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Mol	Chain	Res	Type
1	D	305	TRP
1	D	331	ILE
1	D	338	PRO
1	D	342	THR
1	D	343	LEU
1	D	345	THR
1	D	349	GLU
1	D	384	LEU
1	D	387	LEU
1	D	391	LEU
1	D	397	GLU
1	D	401	LEU
1	D	414	SER
1	D	440	VAL
1	D	451	HIS
1	D	454	THR
1	D	476	VAL
1	D	491	THR
1	F	216	PHE
1	F	222	LEU
1	F	258	GLU
1	F	289	SER
1	F	290	SER
1	F	291	PHE
1	F	296	PHE
1	F	297	VAL
1	F	298	VAL
1	F	303	ILE
1	F	305	TRP
1	F	331	ILE
1	F	338	PRO
1	F	342	THR
1	F	343	LEU
1	F	345	THR
1	F	349	GLU
1	F	384	LEU
1	F	387	LEU
1	F	391	LEU
1	F	397	GLU
1	F	401	LEU
1	F	414	SER
1	F	440	VAL

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Mol	Chain	Res	Type
1	F	451	HIS
1	F	454	THR
1	F	476	VAL
1	F	491	THR
2	G	56	THR
2	G	124	LYS
2	G	127	THR
2	G	150	GLU
2	G	155	VAL
2	G	227	VAL
2	G	251	VAL
2	G	278	LEU
2	G	289	LEU
2	G	302	THR
2	G	337	ILE
1	H	216	PHE
1	H	222	LEU
1	H	258	GLU
1	H	289	SER
1	H	290	SER
1	H	291	PHE
1	H	296	PHE
1	H	297	VAL
1	H	298	VAL
1	H	303	ILE
1	H	305	TRP
1	H	331	ILE
1	H	338	PRO
1	H	342	THR
1	H	343	LEU
1	H	345	THR
1	H	349	GLU
1	H	384	LEU
1	H	387	LEU
1	H	391	LEU
1	H	397	GLU
1	H	401	LEU
1	H	414	SER
1	H	440	VAL
1	H	451	HIS
1	H	454	THR
1	H	476	VAL

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Mol	Chain	Res	Type
1	H	491	THR
2	I	56	THR
2	I	124	LYS
2	I	127	THR
2	I	150	GLU
2	I	155	VAL
2	I	227	VAL
2	I	251	VAL
2	I	278	LEU
2	I	289	LEU
2	I	302	THR
2	I	337	ILE
3	J	101	CYS
3	J	114	ARG
3	J	157	ASP
3	J	170	ARG
3	J	174	ASN
3	J	199	GLU
2	M	56	THR
2	M	124	LYS
2	M	127	THR
2	M	150	GLU
2	M	155	VAL
2	M	227	VAL
2	M	251	VAL
2	M	278	LEU
2	M	289	LEU
2	M	302	THR
2	M	337	ILE
3	N	101	CYS
3	N	114	ARG
3	N	157	ASP
3	N	170	ARG
3	N	174	ASN
3	N	199	GLU
3	O	101	CYS
3	O	114	ARG
3	O	157	ASP
3	O	170	ARG
3	O	174	ASN
3	O	199	GLU
3	P	101	CYS

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Mol	Chain	Res	Type
3	P	114	ARG
3	P	157	ASP
3	P	170	ARG
3	P	174	ASN
3	P	199	GLU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (15) such sidechains are listed below:

Mol	Chain	Res	Type
1	B	219	GLN
2	C	286	GLN
2	C	326	ASN
1	D	219	GLN
1	D	380	HIS
1	F	219	GLN
1	F	380	HIS
2	G	286	GLN
2	G	326	ASN
1	H	219	GLN
1	H	380	HIS
2	I	286	GLN
2	I	326	ASN
2	M	286	GLN
2	M	326	ASN

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 oligosaccharides in this entry.

5.6 Ligand geometry

Of 8 ligands modelled in this entry, 4 are monoatomic - leaving 4 for Mogul analysis.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
5	NAP	M	401	-	50,52,52	2.78	16 (32%)	71,80,80	1.77	12 (16%)
5	NAP	I	401	-	50,52,52	2.78	16 (32%)	71,80,80	1.76	12 (16%)
5	NAP	C	401	-	50,52,52	2.79	16 (32%)	71,80,80	1.76	12 (16%)
5	NAP	G	401	-	50,52,52	2.78	16 (32%)	71,80,80	1.76	11 (15%)

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
5	NAP	M	401	-	-	11/35/67/67	0/5/5/5
5	NAP	I	401	-	-	11/35/67/67	0/5/5/5
5	NAP	C	401	-	-	11/35/67/67	0/5/5/5
5	NAP	G	401	-	-	11/35/67/67	0/5/5/5

All (64) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	G	401	NAP	C2B-C1B	-8.84	1.31	1.53
5	C	401	NAP	C2B-C1B	-8.83	1.31	1.53
5	I	401	NAP	C2B-C1B	-8.77	1.31	1.53
5	M	401	NAP	C2B-C1B	-8.71	1.31	1.53
5	C	401	NAP	C7N-N7N	6.91	1.45	1.33
5	M	401	NAP	C7N-N7N	6.90	1.45	1.33
5	I	401	NAP	C7N-N7N	6.86	1.45	1.33
5	G	401	NAP	C7N-N7N	6.81	1.45	1.33
5	I	401	NAP	O4D-C4D	-6.36	1.30	1.45
5	M	401	NAP	O4D-C4D	-6.35	1.30	1.45

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	G	401	NAP	O4D-C4D	-6.29	1.31	1.45
5	C	401	NAP	O4D-C4D	-6.24	1.31	1.45
5	C	401	NAP	O4B-C4B	-6.13	1.31	1.45
5	I	401	NAP	O4B-C4B	-6.13	1.31	1.45
5	G	401	NAP	O4B-C4B	-6.12	1.31	1.45
5	M	401	NAP	O4B-C4B	-6.08	1.31	1.45
5	M	401	NAP	PA-O3	5.87	1.65	1.59
5	C	401	NAP	PA-O3	5.70	1.65	1.59
5	I	401	NAP	PA-O3	5.69	1.65	1.59
5	G	401	NAP	PA-O3	5.61	1.65	1.59
5	I	401	NAP	PN-O3	5.60	1.65	1.59
5	C	401	NAP	PN-O3	5.57	1.65	1.59
5	G	401	NAP	PN-O3	5.57	1.65	1.59
5	M	401	NAP	PN-O3	5.46	1.65	1.59
5	I	401	NAP	C6A-N6A	4.29	1.45	1.34
5	C	401	NAP	C6A-N6A	4.29	1.45	1.34
5	M	401	NAP	C6A-N6A	4.21	1.45	1.34
5	G	401	NAP	C6A-N6A	4.21	1.45	1.34
5	G	401	NAP	P2B-O2B	3.52	1.65	1.59
5	M	401	NAP	P2B-O2B	3.48	1.65	1.59
5	I	401	NAP	P2B-O2B	3.47	1.65	1.59
5	C	401	NAP	P2B-O2B	3.46	1.65	1.59
5	I	401	NAP	O3D-C3D	-3.05	1.35	1.43
5	G	401	NAP	O3D-C3D	-3.04	1.35	1.43
5	C	401	NAP	O3D-C3D	-3.00	1.35	1.43
5	M	401	NAP	O3D-C3D	-3.00	1.35	1.43
5	C	401	NAP	O7N-C7N	-2.96	1.18	1.24
5	I	401	NAP	O7N-C7N	-2.95	1.18	1.24
5	G	401	NAP	O7N-C7N	-2.92	1.18	1.24
5	M	401	NAP	O7N-C7N	-2.91	1.18	1.24
5	G	401	NAP	O3B-C3B	-2.89	1.35	1.43
5	C	401	NAP	C5A-C4A	-2.88	1.33	1.39
5	G	401	NAP	C5A-C4A	-2.85	1.34	1.39
5	I	401	NAP	O3B-C3B	-2.84	1.35	1.43
5	M	401	NAP	C5A-C4A	-2.83	1.34	1.39
5	I	401	NAP	C5A-C4A	-2.83	1.34	1.39
5	G	401	NAP	C5A-N7A	-2.82	1.33	1.39
5	C	401	NAP	O3B-C3B	-2.82	1.36	1.43
5	M	401	NAP	O3B-C3B	-2.81	1.36	1.43
5	C	401	NAP	O2D-C2D	2.76	1.49	1.43
5	I	401	NAP	O2D-C2D	2.72	1.49	1.43
5	M	401	NAP	O2D-C2D	2.70	1.49	1.43

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	G	401	NAP	O2D-C2D	2.69	1.49	1.43
5	C	401	NAP	C5A-N7A	-2.66	1.34	1.39
5	M	401	NAP	C5A-N7A	-2.65	1.34	1.39
5	I	401	NAP	C5A-N7A	-2.64	1.34	1.39
5	C	401	NAP	C4N-C3N	-2.29	1.35	1.39
5	G	401	NAP	C4N-C3N	-2.29	1.35	1.39
5	M	401	NAP	C4N-C3N	-2.28	1.36	1.39
5	I	401	NAP	C4N-C3N	-2.21	1.36	1.39
5	I	401	NAP	C8A-N9A	-2.21	1.33	1.37
5	G	401	NAP	C8A-N9A	-2.11	1.34	1.37
5	C	401	NAP	C8A-N9A	-2.10	1.34	1.37
5	M	401	NAP	C8A-N9A	-2.09	1.34	1.37

All (47) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	G	401	NAP	N3A-C2A-N1A	-5.81	119.79	128.58
5	M	401	NAP	N3A-C2A-N1A	-5.80	119.80	128.58
5	I	401	NAP	N3A-C2A-N1A	-5.77	119.85	128.58
5	C	401	NAP	N3A-C2A-N1A	-5.74	119.89	128.58
5	C	401	NAP	N6A-C6A-N1A	-5.69	105.70	118.38
5	G	401	NAP	N6A-C6A-N1A	-5.67	105.76	118.38
5	M	401	NAP	N6A-C6A-N1A	-5.66	105.77	118.38
5	I	401	NAP	N6A-C6A-N1A	-5.65	105.78	118.38
5	I	401	NAP	C5A-C4A-N3A	-4.98	119.86	126.72
5	M	401	NAP	C5A-C4A-N3A	-4.95	119.89	126.72
5	C	401	NAP	C5A-C4A-N3A	-4.95	119.90	126.72
5	G	401	NAP	C5A-C4A-N3A	-4.87	120.01	126.72
5	M	401	NAP	C5A-C6A-N6A	4.42	134.23	123.29
5	C	401	NAP	C5A-C6A-N6A	4.39	134.16	123.29
5	G	401	NAP	C5A-C6A-N6A	4.39	134.14	123.29
5	I	401	NAP	C5A-C6A-N6A	4.38	134.13	123.29
5	G	401	NAP	N9A-C8A-N7A	-3.93	108.37	113.94
5	M	401	NAP	N9A-C8A-N7A	-3.88	108.44	113.94
5	C	401	NAP	N9A-C8A-N7A	-3.85	108.47	113.94
5	I	401	NAP	N9A-C8A-N7A	-3.83	108.51	113.94
5	M	401	NAP	C2A-N3A-C4A	3.44	120.23	111.83
5	G	401	NAP	C2A-N3A-C4A	3.44	120.22	111.83
5	C	401	NAP	C2A-N3A-C4A	3.42	120.19	111.83
5	I	401	NAP	C2A-N3A-C4A	3.40	120.14	111.83
5	I	401	NAP	N3A-C4A-N9A	2.98	132.24	127.17
5	G	401	NAP	N3A-C4A-N9A	2.97	132.22	127.17

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	M	401	NAP	N3A-C4A-N9A	2.96	132.21	127.17
5	C	401	NAP	N3A-C4A-N9A	2.94	132.16	127.17
5	M	401	NAP	C5A-N7A-C8A	2.72	107.72	103.45
5	G	401	NAP	C5A-N7A-C8A	2.70	107.70	103.45
5	I	401	NAP	C5A-N7A-C8A	2.68	107.66	103.45
5	C	401	NAP	C5A-N7A-C8A	2.67	107.64	103.45
5	M	401	NAP	C2B-C1B-N9A	-2.58	109.51	113.75
5	G	401	NAP	C2B-C1B-N9A	-2.53	109.59	113.75
5	I	401	NAP	C2B-C1B-N9A	-2.50	109.64	113.75
5	C	401	NAP	C4D-O4D-C1D	-2.49	107.64	109.92
5	C	401	NAP	C2B-C1B-N9A	-2.44	109.74	113.75
5	M	401	NAP	C4D-O4D-C1D	-2.40	107.73	109.92
5	G	401	NAP	O4B-C1B-C2B	2.36	110.65	106.59
5	M	401	NAP	O4B-C1B-C2B	2.34	110.61	106.59
5	G	401	NAP	C4D-O4D-C1D	-2.32	107.80	109.92
5	I	401	NAP	C4D-O4D-C1D	-2.32	107.80	109.92
5	I	401	NAP	O4B-C1B-C2B	2.32	110.58	106.59
5	C	401	NAP	O4B-C1B-C2B	2.30	110.55	106.59
5	I	401	NAP	C4A-C5A-N7A	-2.11	108.17	110.58
5	M	401	NAP	C4A-C5A-N7A	-2.08	108.20	110.58
5	C	401	NAP	C4A-C5A-N7A	-2.06	108.23	110.58

There are no chirality outliers.

All (44) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
5	C	401	NAP	C5B-O5B-PA-O3
5	C	401	NAP	C1B-C2B-O2B-P2B
5	C	401	NAP	C5D-O5D-PN-O1N
5	C	401	NAP	C5D-O5D-PN-O2N
5	G	401	NAP	C5B-O5B-PA-O3
5	G	401	NAP	C1B-C2B-O2B-P2B
5	G	401	NAP	C5D-O5D-PN-O1N
5	G	401	NAP	C5D-O5D-PN-O2N
5	I	401	NAP	C5B-O5B-PA-O3
5	I	401	NAP	C1B-C2B-O2B-P2B
5	I	401	NAP	C5D-O5D-PN-O1N
5	I	401	NAP	C5D-O5D-PN-O2N
5	M	401	NAP	C5B-O5B-PA-O3
5	M	401	NAP	C1B-C2B-O2B-P2B
5	M	401	NAP	C5D-O5D-PN-O1N
5	M	401	NAP	C5D-O5D-PN-O2N

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Mol	Chain	Res	Type	Atoms
5	C	401	NAP	O4B-C4B-C5B-O5B
5	C	401	NAP	C3B-C4B-C5B-O5B
5	G	401	NAP	O4B-C4B-C5B-O5B
5	G	401	NAP	C3B-C4B-C5B-O5B
5	I	401	NAP	O4B-C4B-C5B-O5B
5	I	401	NAP	C3B-C4B-C5B-O5B
5	M	401	NAP	O4B-C4B-C5B-O5B
5	M	401	NAP	C3B-C4B-C5B-O5B
5	C	401	NAP	PN-O3-PA-O5B
5	G	401	NAP	PN-O3-PA-O5B
5	I	401	NAP	PN-O3-PA-O5B
5	M	401	NAP	PN-O3-PA-O5B
5	C	401	NAP	C5B-O5B-PA-O1A
5	C	401	NAP	C5D-O5D-PN-O3
5	G	401	NAP	C5B-O5B-PA-O1A
5	G	401	NAP	C5D-O5D-PN-O3
5	I	401	NAP	C5B-O5B-PA-O1A
5	I	401	NAP	C5D-O5D-PN-O3
5	M	401	NAP	C5B-O5B-PA-O1A
5	M	401	NAP	C5D-O5D-PN-O3
5	C	401	NAP	C3D-C4D-C5D-O5D
5	G	401	NAP	C3D-C4D-C5D-O5D
5	I	401	NAP	C3D-C4D-C5D-O5D
5	M	401	NAP	C3D-C4D-C5D-O5D
5	C	401	NAP	PN-O3-PA-O2A
5	G	401	NAP	PN-O3-PA-O2A
5	I	401	NAP	PN-O3-PA-O2A
5	M	401	NAP	PN-O3-PA-O2A

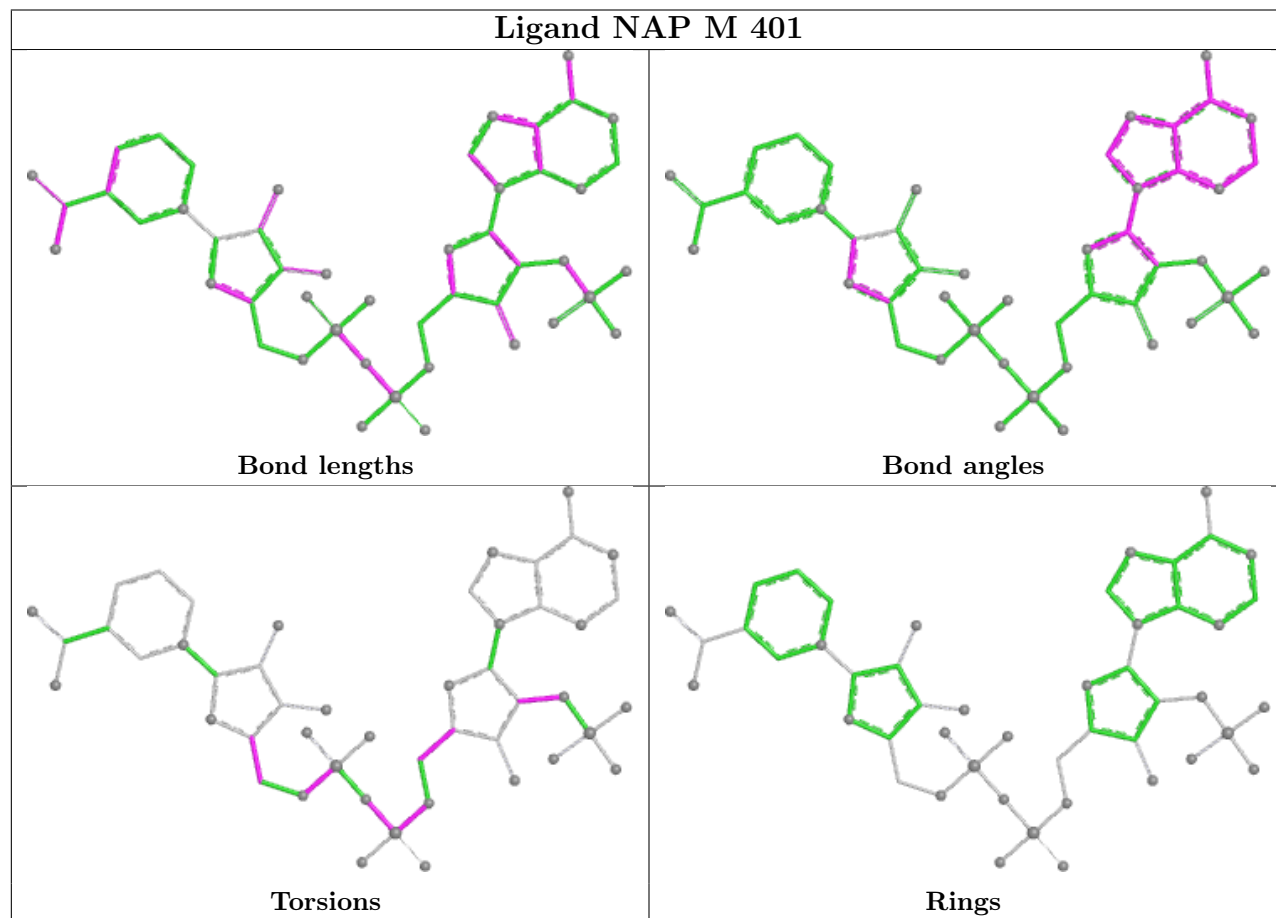
There are no ring outliers.

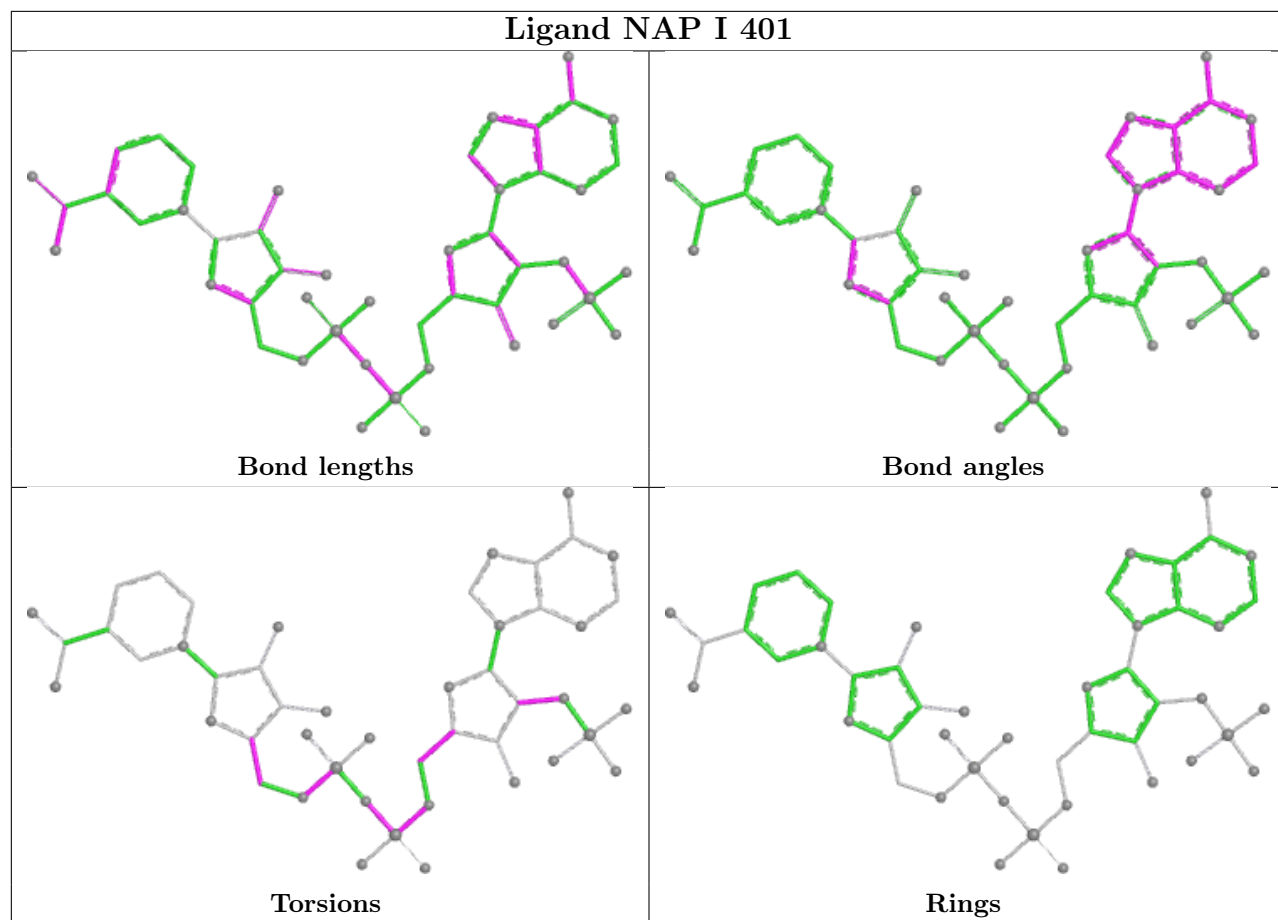
4 monomers are involved in 6 short contacts:

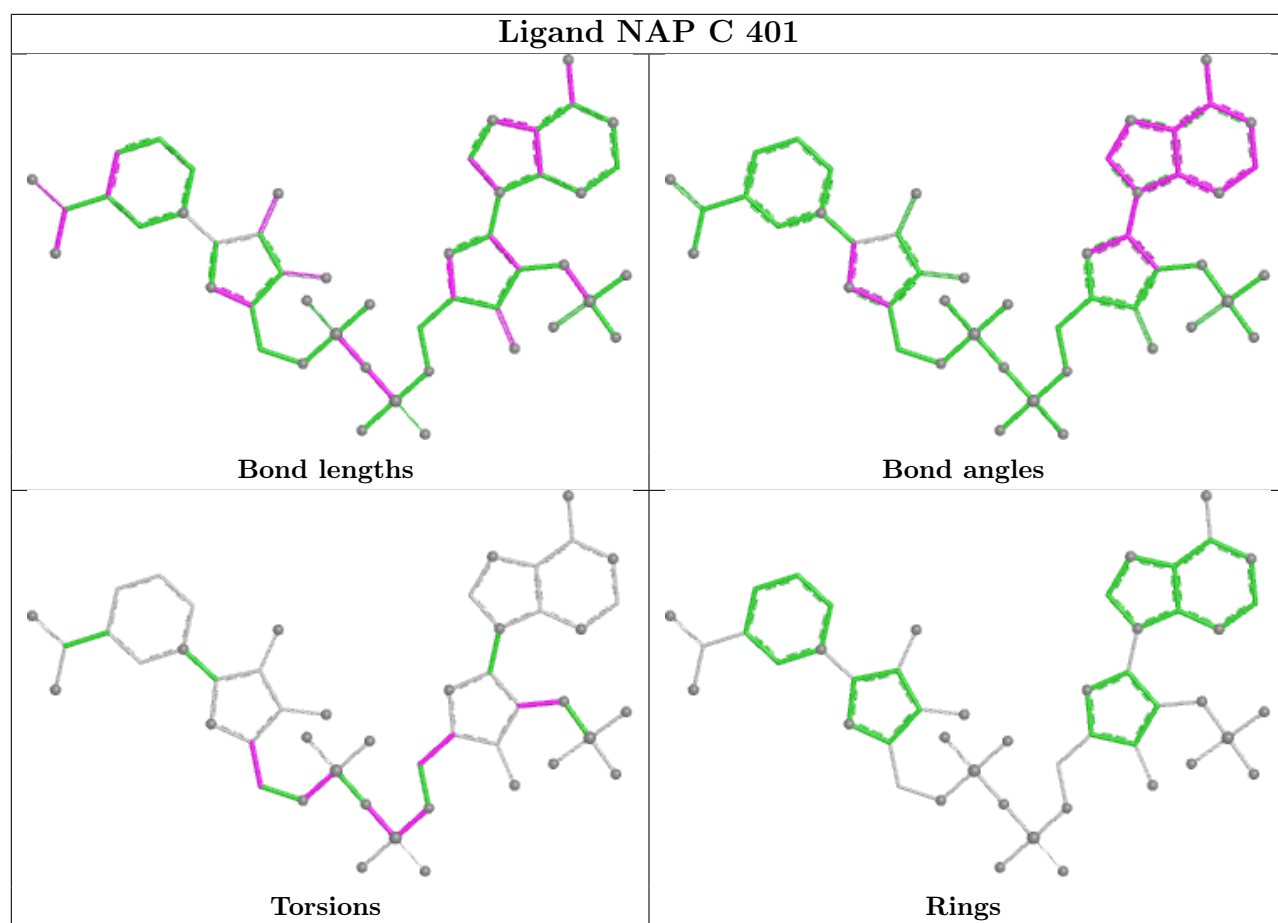
Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	M	401	NAP	2	0
5	I	401	NAP	2	0
5	C	401	NAP	1	0
5	G	401	NAP	1	0

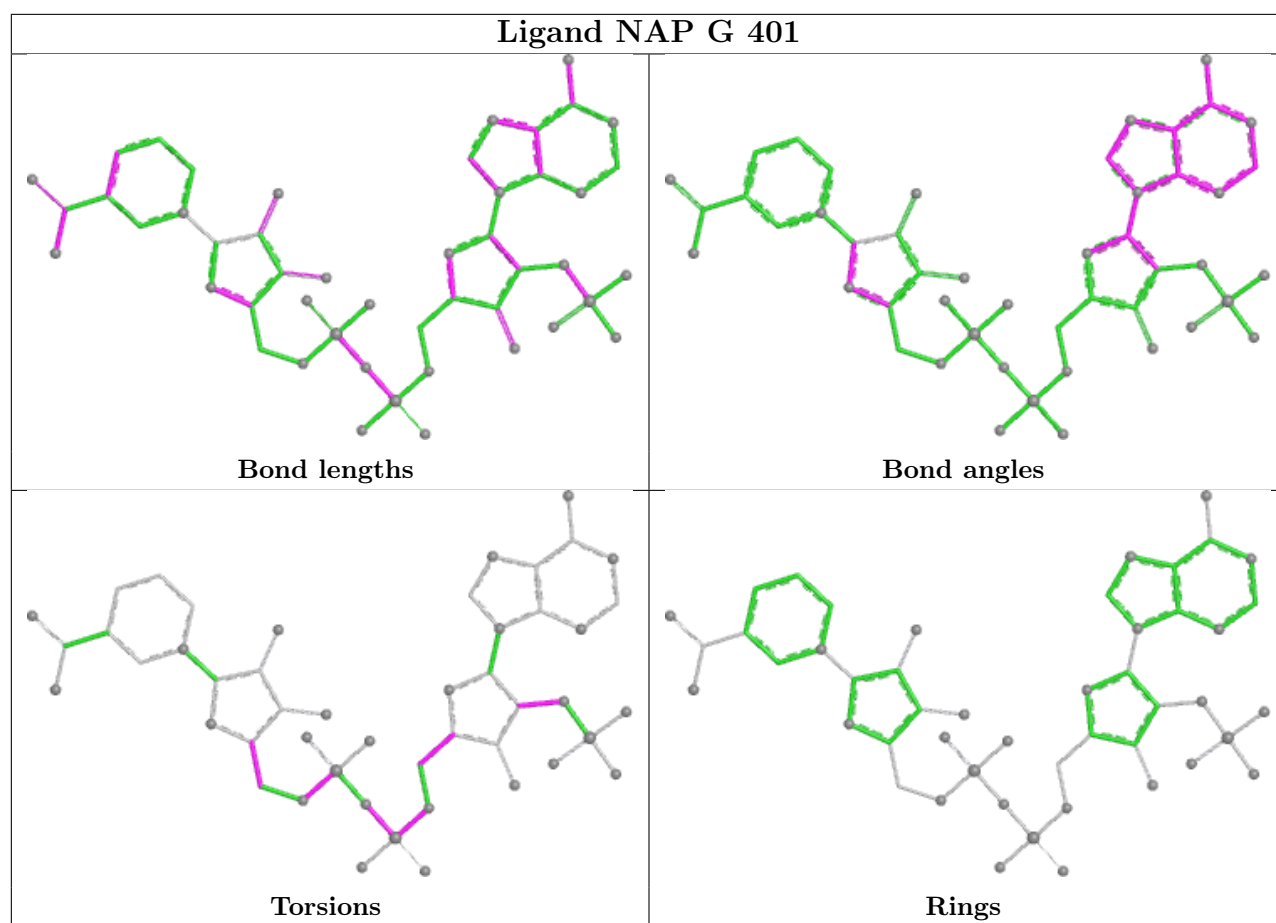
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included.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

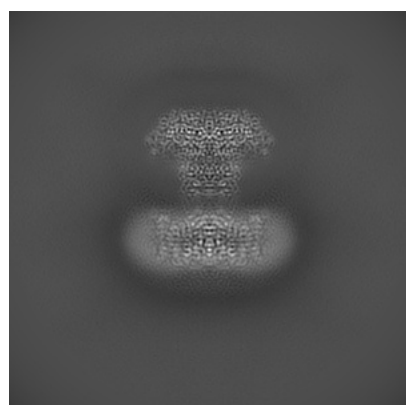
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-32459. These allow visual inspection of the internal detail of the map and identification of artifacts.

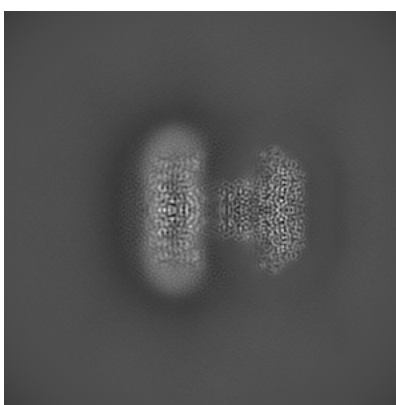
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections [i](#)

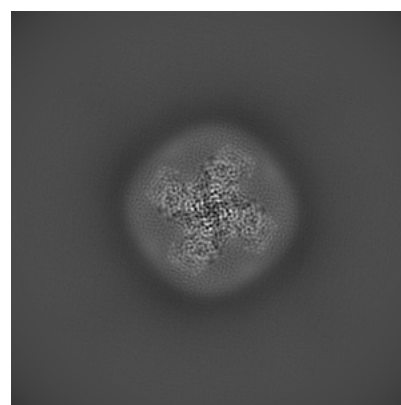
6.1.1 Primary map



X



Y

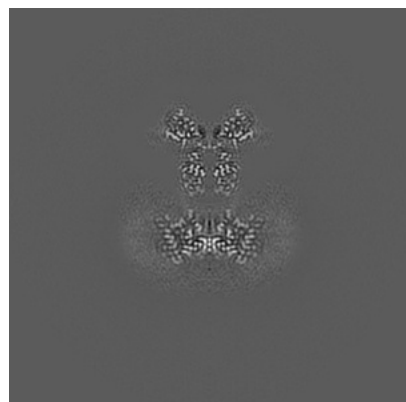


Z

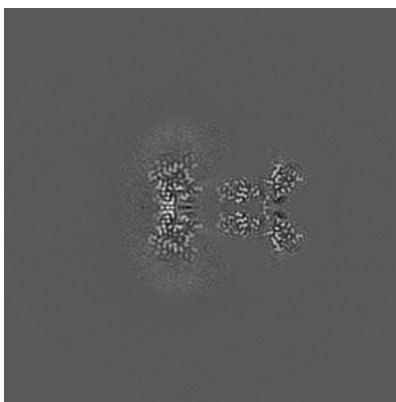
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

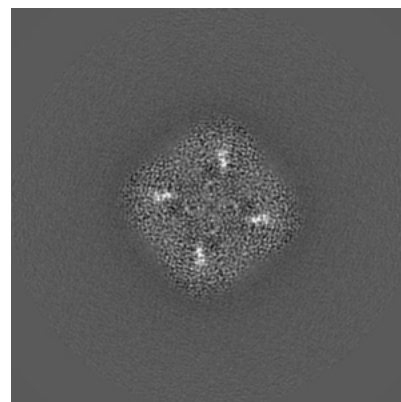
6.2.1 Primary map



X Index: 210



Y Index: 210

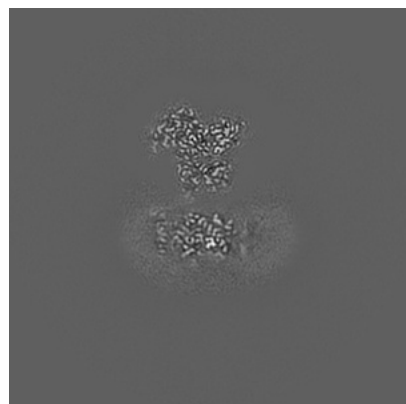


Z Index: 210

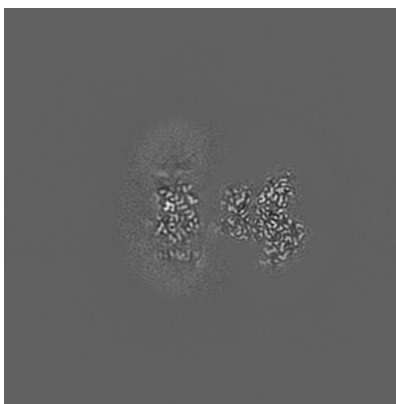
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

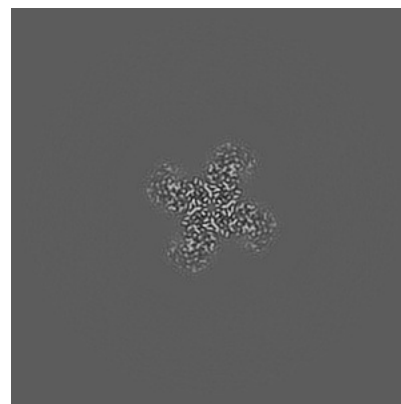
6.3.1 Primary map



X Index: 200



Y Index: 220

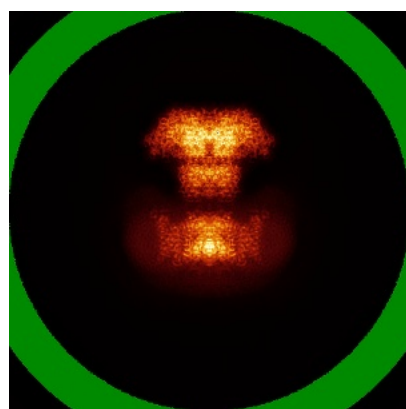


Z Index: 287

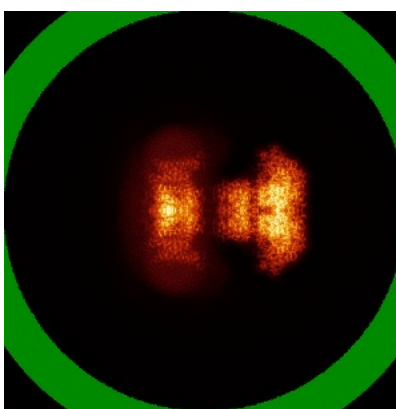
The images above show the largest variance slices of the map in three orthogonal directions.

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

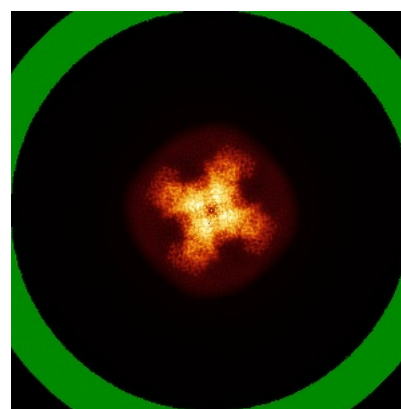
6.4.1 Primary map



X



Y

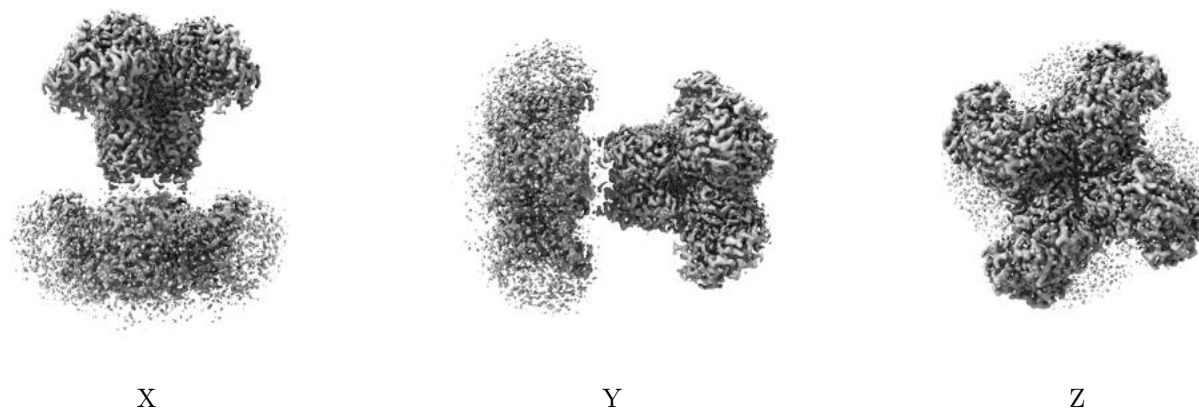


Z

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

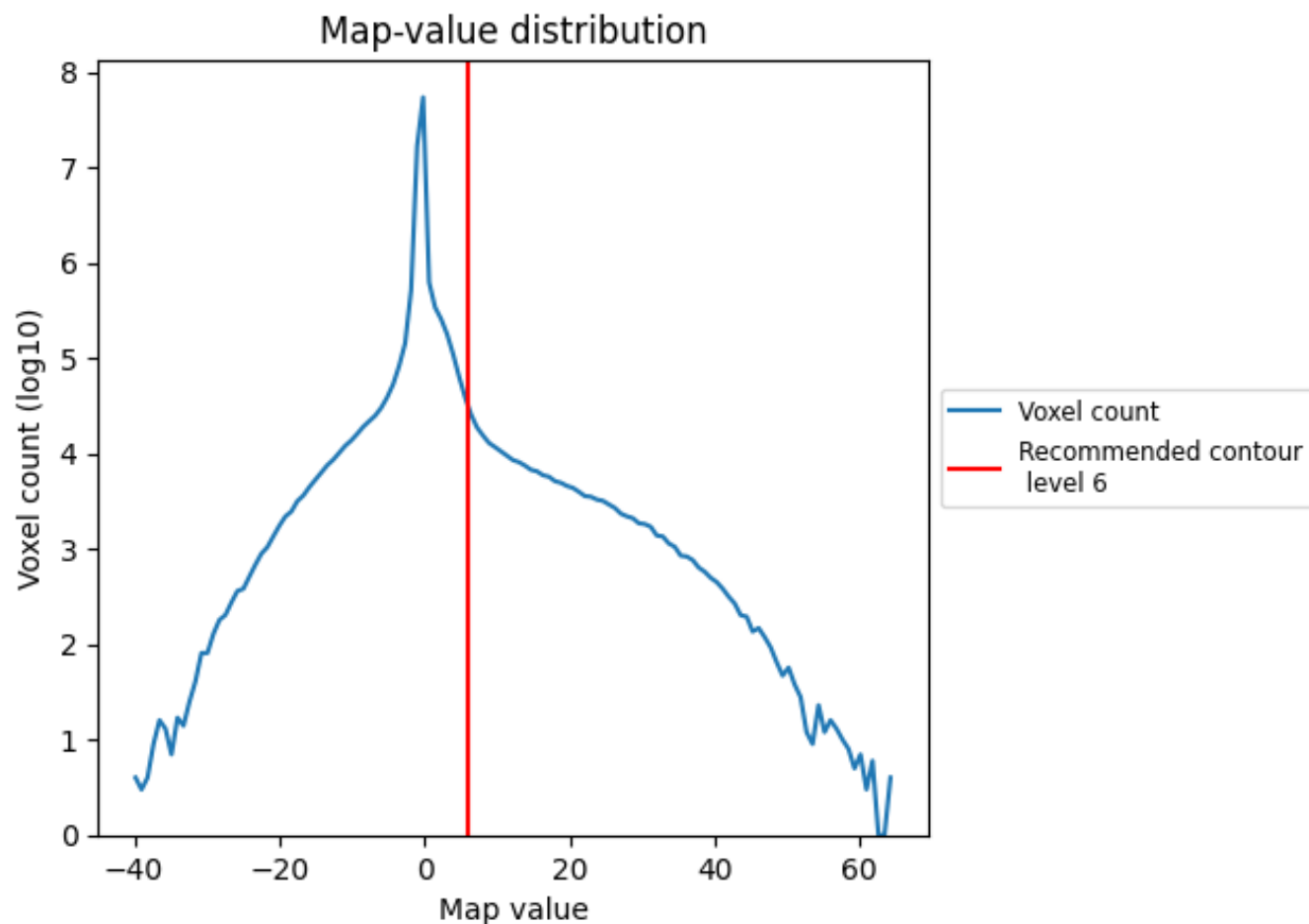
6.6 Mask visualisation [i](#)

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

7 Map analysis [i](#)

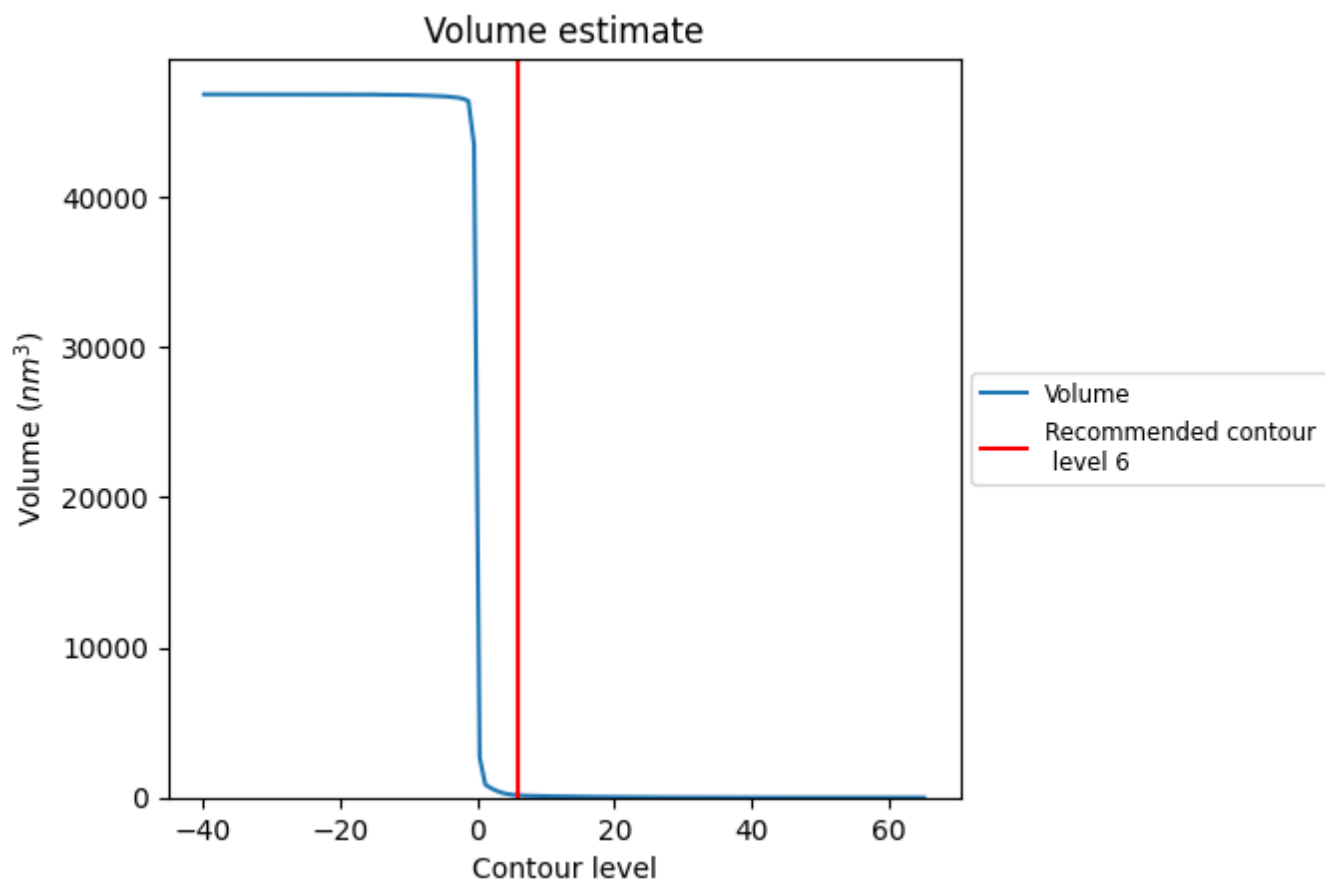
This section contains the results of statistical analysis of the map.

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.

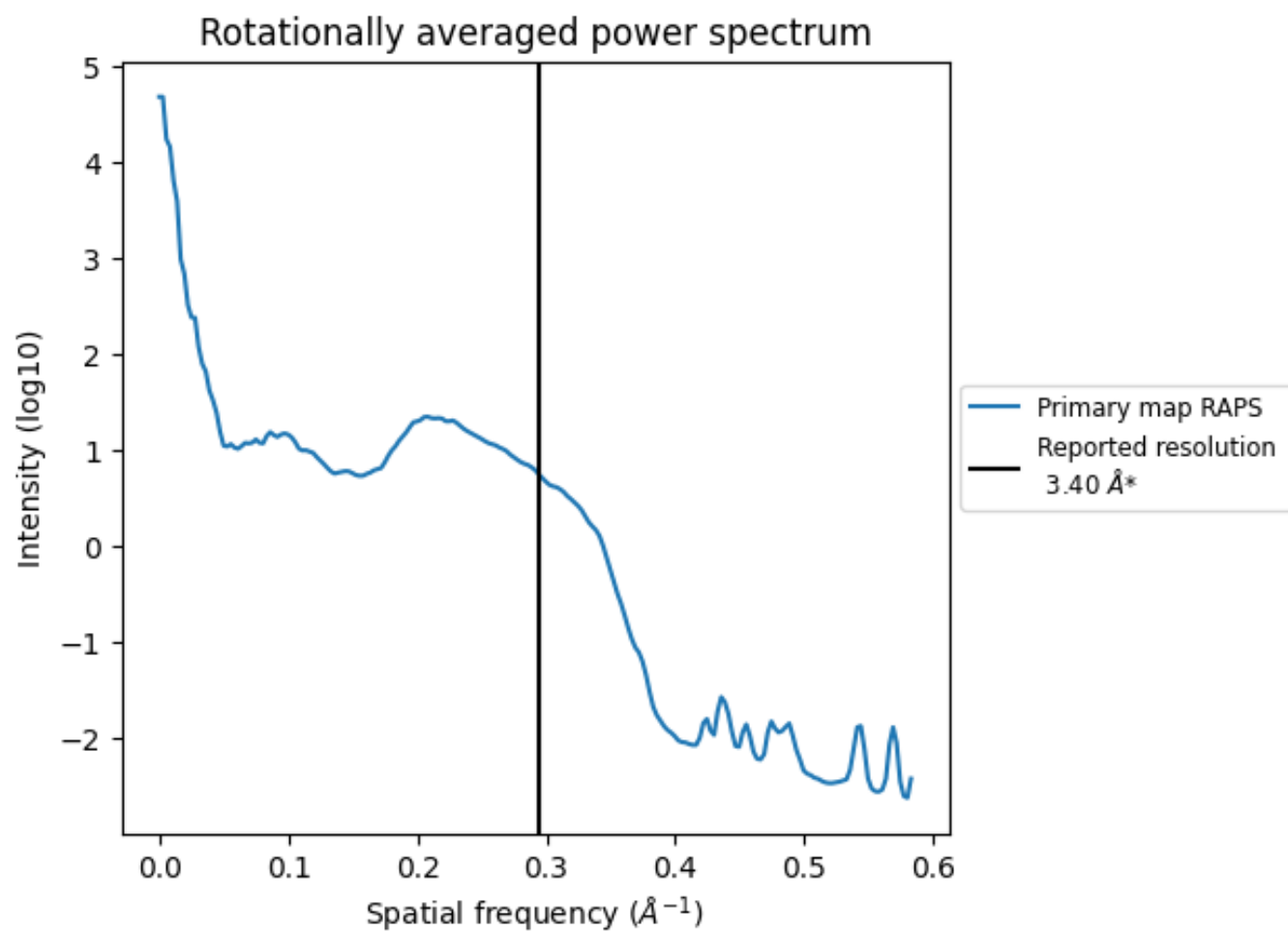
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 151 nm^3 ; 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 ⓘ



*Reported resolution corresponds to spatial frequency of 0.294 Å⁻¹

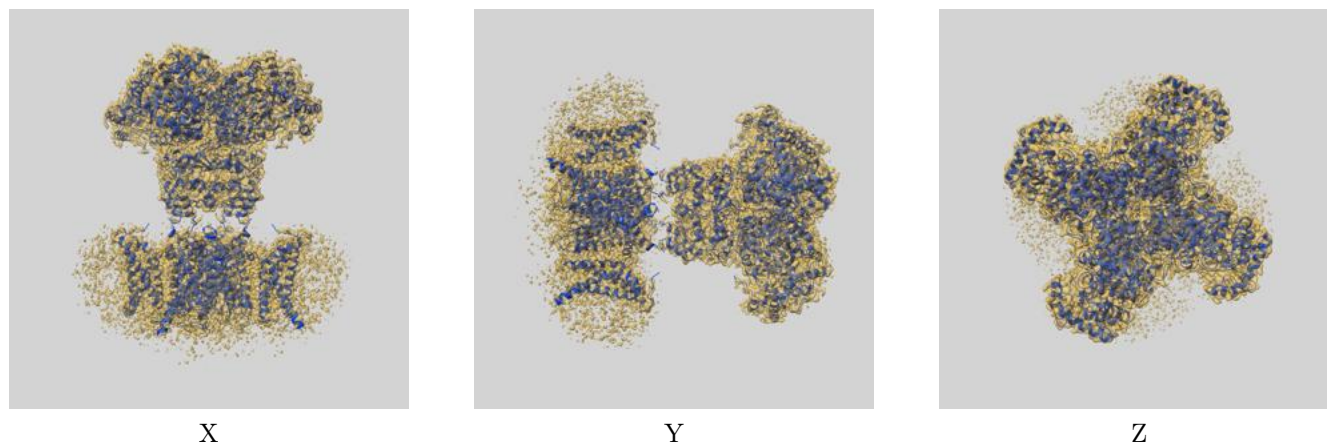
8 Fourier-Shell correlation

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

9 Map-model fit [i](#)

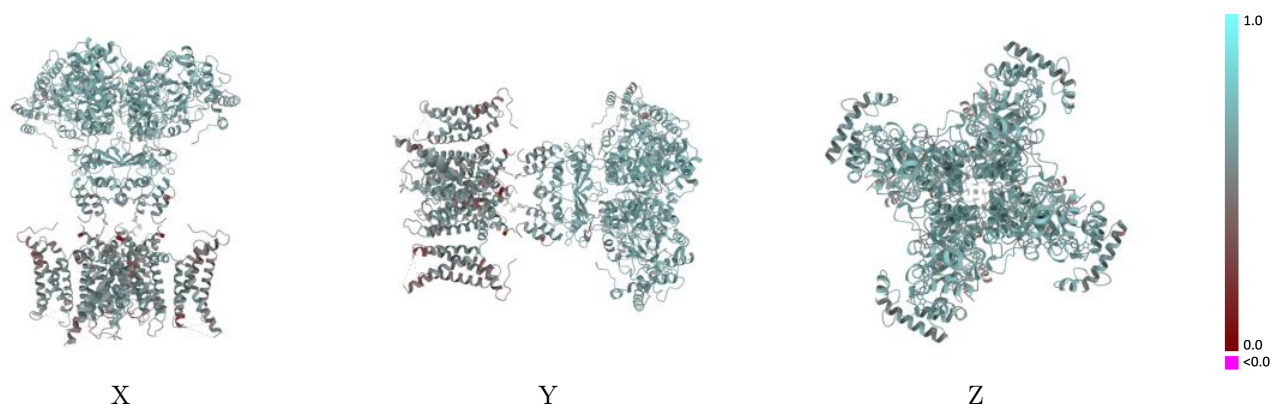
This section contains information regarding the fit between EMDB map EMD-32459 and PDB model 7WF3. Per-residue inclusion information can be found in section [3](#) on page [7](#).

9.1 Map-model overlay [i](#)



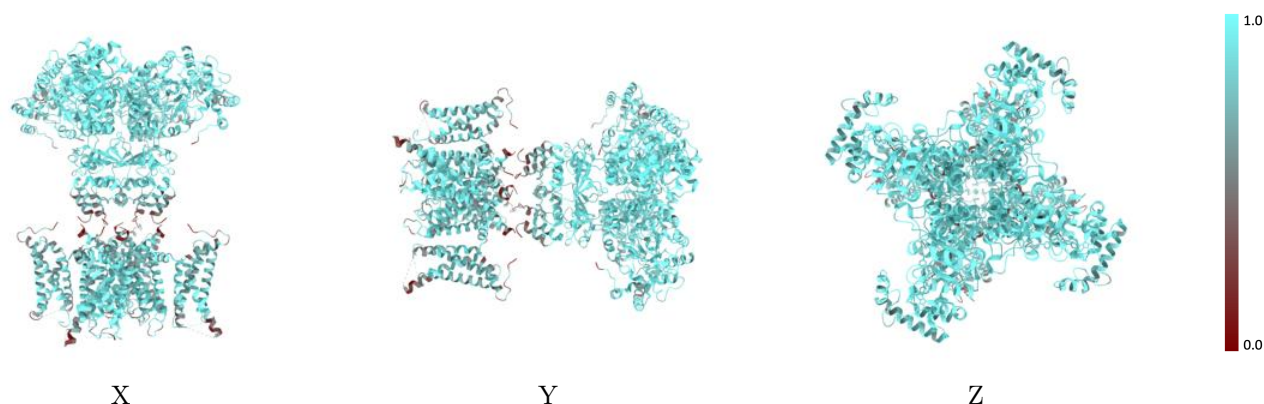
The images above show the 3D surface view of the map at the recommended contour level 6.0 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



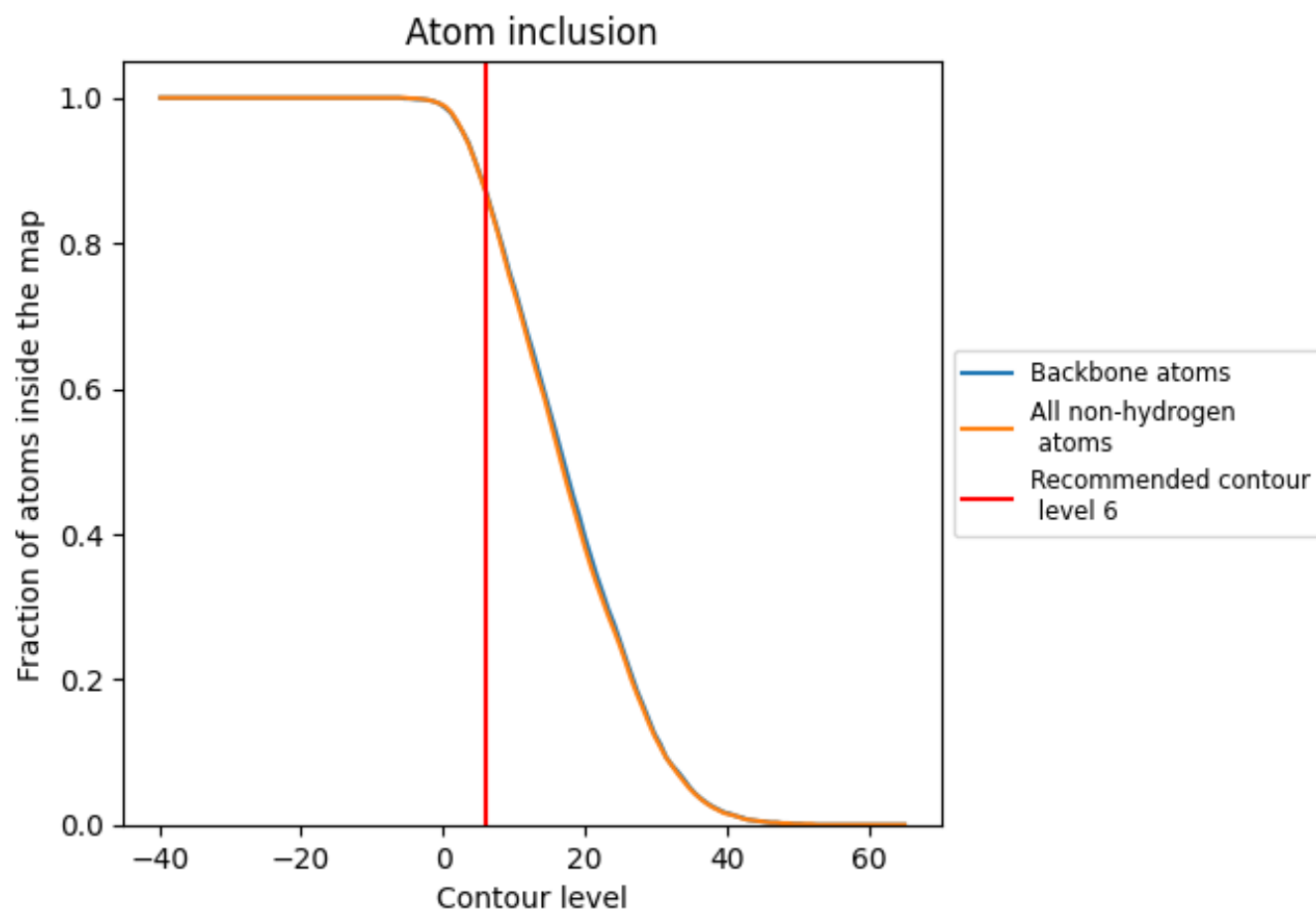
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (6).

9.4 Atom inclusion [i](#)



At the recommended contour level, 87% of all backbone atoms, 87% 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 (6) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.8710	0.5870
B	0.8000	0.5210
C	0.9390	0.6330
D	0.7970	0.5180
F	0.7850	0.5070
G	0.9340	0.6320
H	0.7960	0.5160
I	0.9370	0.6340
J	0.8800	0.6140
M	0.9360	0.6340
N	0.8740	0.6130
O	0.8770	0.6140
P	0.8720	0.6120

1.0

0.0

<0.0