



Full wwPDB EM Validation Report ⓘ

Jan 2, 2025 – 01:26 AM EST

PDB ID : 9GVQ
EMDB ID : EMD-51639
Title : MUC5AC mucin amino acids 28 to 1483
Authors : Haberman, M.; Kamyshinsky, R.; Fass, D.
Deposited on : 2024-09-25
Resolution : 3.90 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:

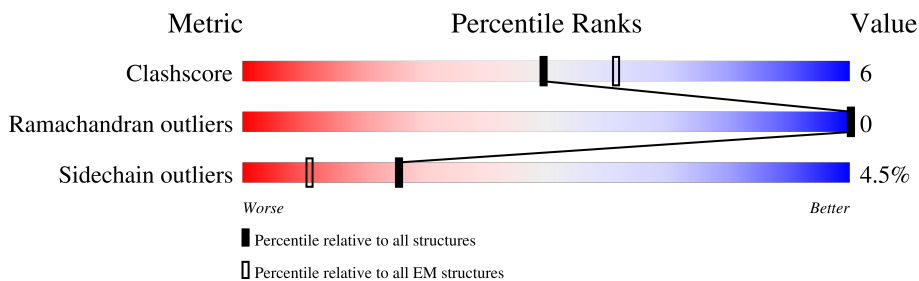
EMDB validation analysis : 0.0.1.dev113
MolProbity : 4.02b-467
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ : 1.9.13
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 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 3.90 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	1456	
1	B	1456	
1	C	1456	
1	D	1456	

2 Entry composition [i](#)

There are 3 unique types of molecules in this entry. The entry contains 34750 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 Mucin-5AC.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	1153	8695	5394	1505	1671	125	8	0
1	B	1151	8672	5380	1499	1668	125	7	0
1	C	1153	8695	5394	1505	1671	125	8	0
1	D	1151	8672	5380	1499	1668	125	7	0

- Molecule 2 is CALCIUM ION (three-letter code: CA) (formula: Ca).

Mol	Chain	Residues	Atoms		AltConf
2	A	3	Total 3	Ca 3	0
2	B	3	Total 3	Ca 3	0
2	C	3	Total 3	Ca 3	0
2	D	3	Total 3	Ca 3	0

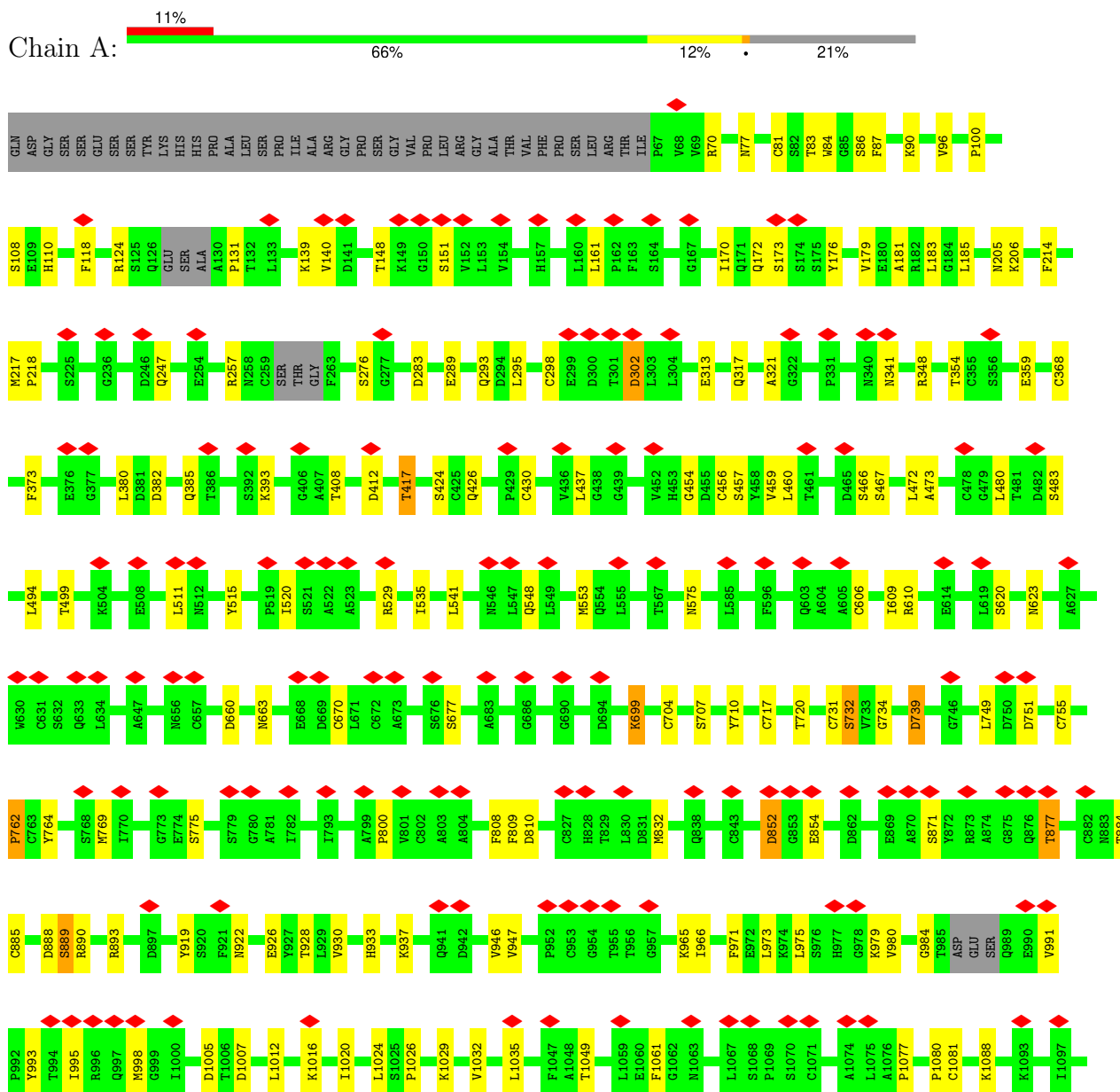
- Molecule 3 is COPPER (II) ION (three-letter code: CU) (formula: Cu) (labeled as "Ligand of Interest" by depositor).

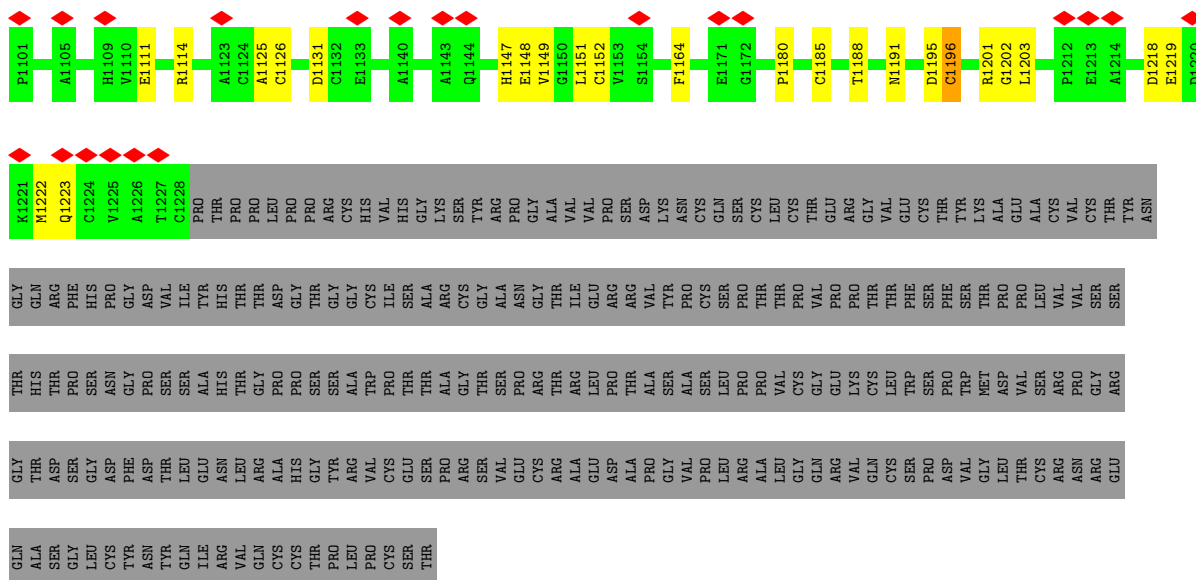
Mol	Chain	Residues	Atoms		AltConf
3	A	1	Total 1	Cu 1	0
3	B	1	Total 1	Cu 1	0
3	C	1	Total 1	Cu 1	0
3	D	1	Total 1	Cu 1	0

3 Residue-property plots

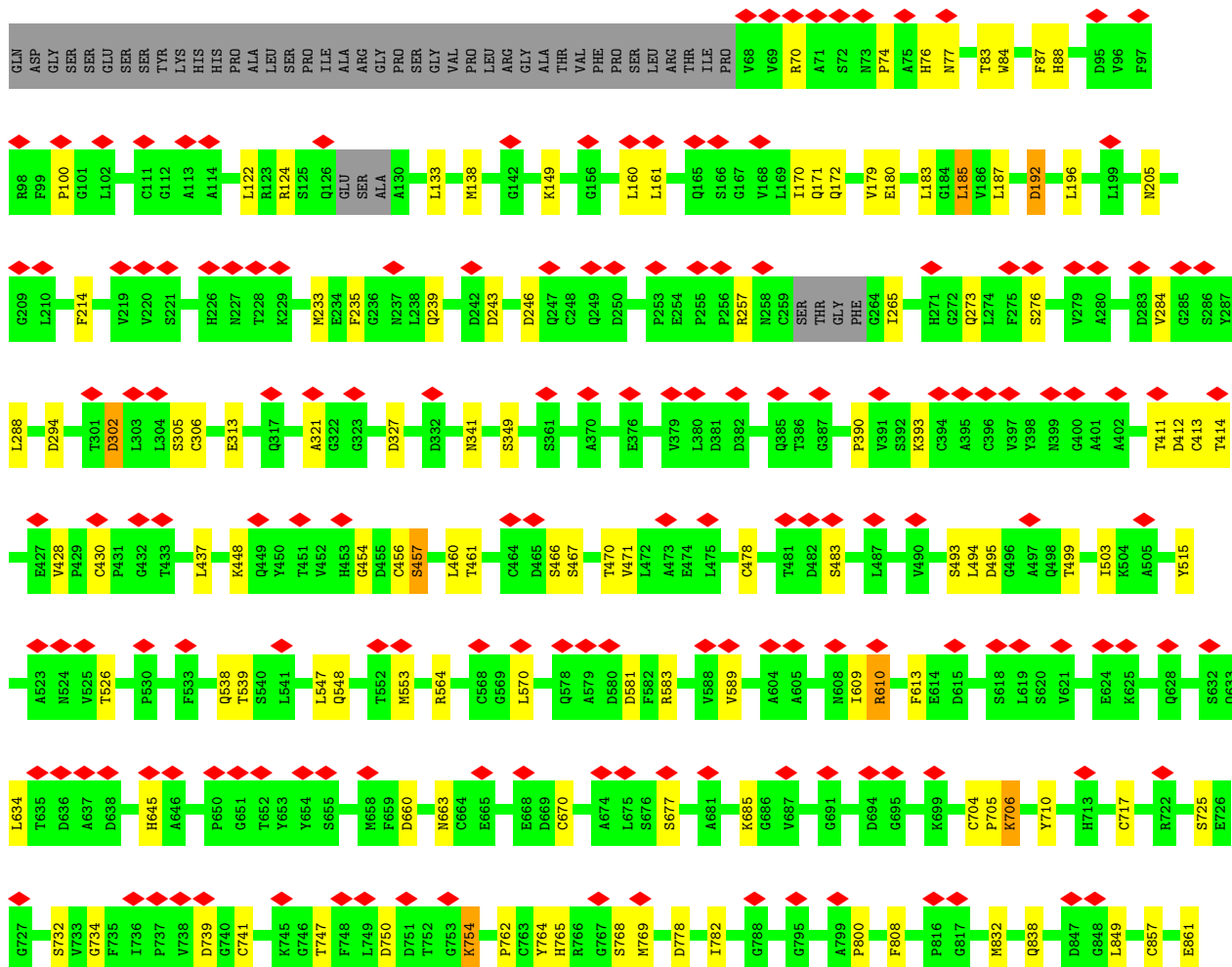
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion 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.

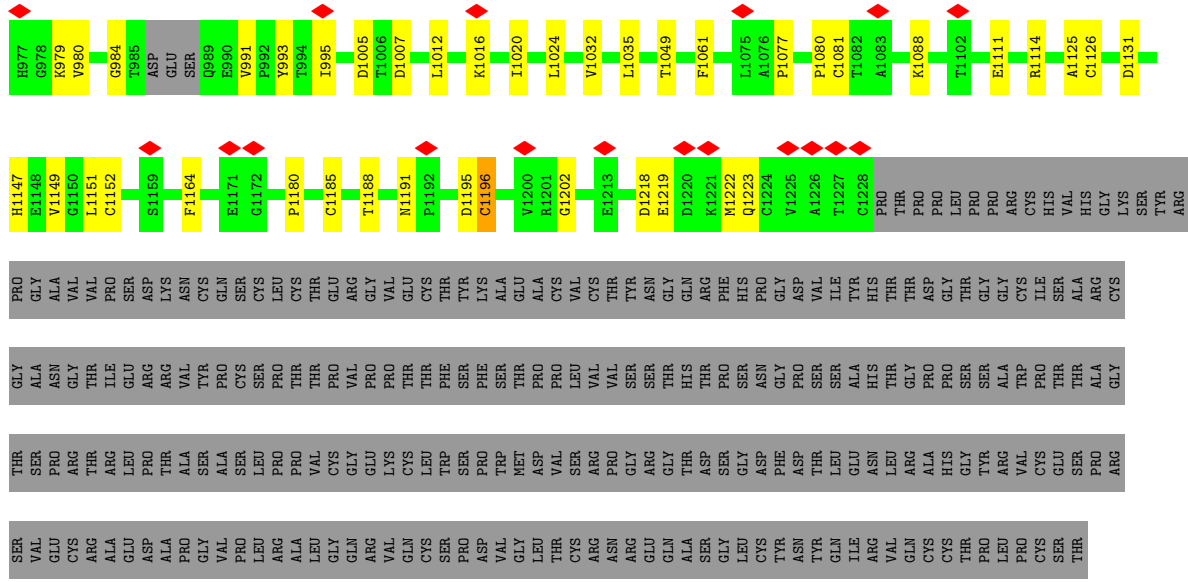
- Molecule 1: Mucin-5AC



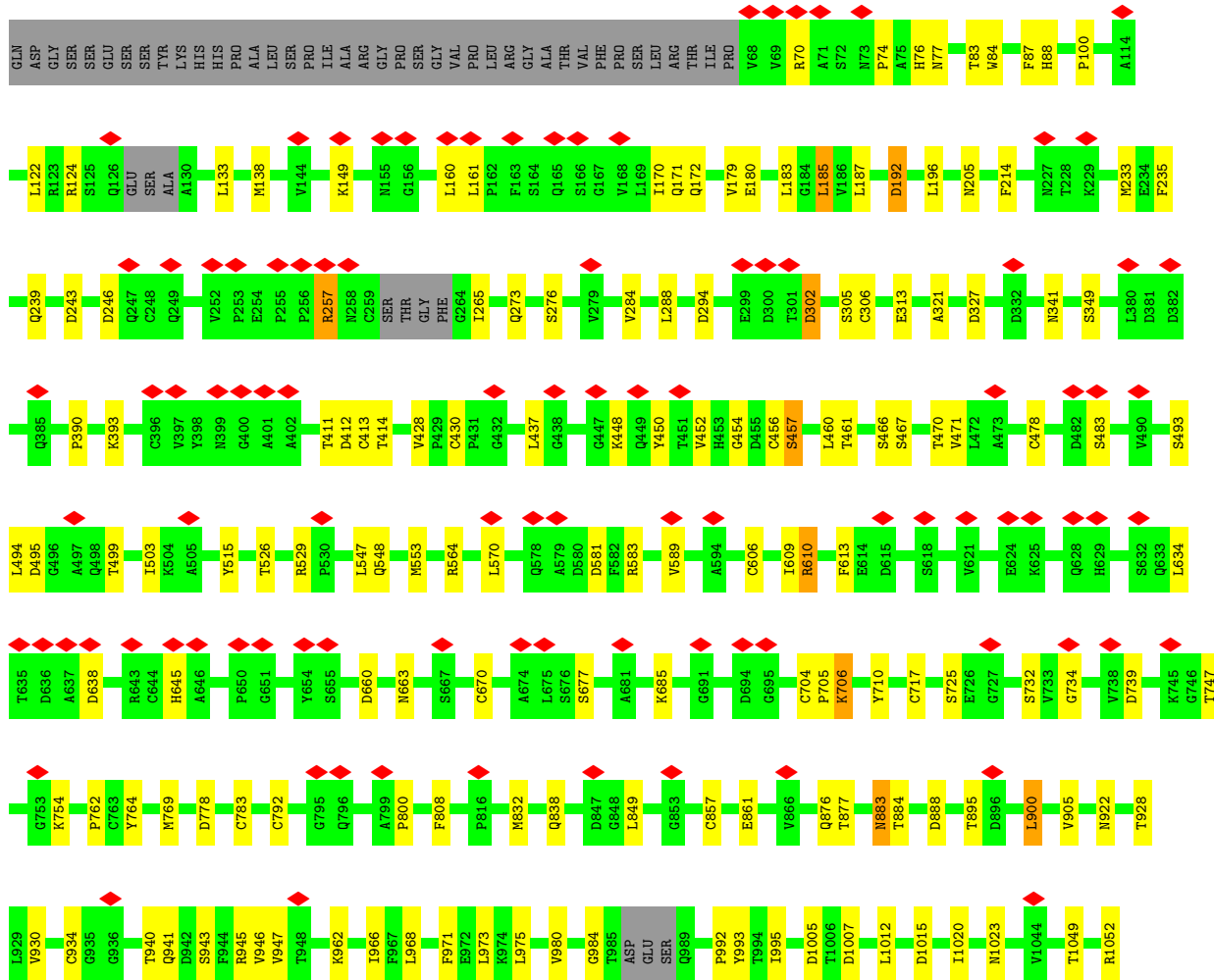


● Molecule 1: Mucin-5AC





• Molecule 1: Mucin-5AC



SI053	T1227	GLY	PHE	TYR
V1054	C1228	ASP	ASP	ASN
F1061		THR	THR	TYR
P1069		ILE	LEU	GLN
A1076		ALA	GLU	ILE
P1077		ASN	ASN	ARG
D1079		THR	LEU	VAL
P1080		GLY	ARG	GLN
C1081		VAL	VAL	LEU
T1082		CYS	TRP	PRO
A1083		ILE	CYS	PRO
N1084		THR	GLU	SER
R1087		ALA	PRO	THR
M1090		GLY	ALA	ARG
M1090		THR	THR	SER
Q1094		ALA	VAL	VAL
A1113		ARG	CYS	ALA
R1114		THR	GLU	GLU
A1125		PRO	ASP	ASP
C1126		ARG	THR	ALA
D1131		ALA	ALA	PRO
A1145		VAL	VAL	LEU
C1146		LEU	LEU	LEU
H1147		THR	THR	ALA
T1157		PRO	VAL	GLY
F1164		VAL	GLU	ARG
C1181		GLY	LYS	VAL
C1185		THR	CYS	GLN
M1191		THR	THR	VAL
D1195		PHE	TRP	GLN
C1196		SER	PRO	CYS
D1199		PHE	ASP	ARG
G1202		THR	VAL	ASN
P1215		THR	GLY	ARG
D1218		GLN	THR	GLU
E1219		THR	ALA	ALA
M1222		ASP	SER	SER
A1226		GLY	LEU	LEU
		PRO	ASP	CYS

4 Experimental information

Property	Value	Source
EM reconstruction method	HELICAL	Depositor
Imposed symmetry	HELICAL, twist=74°, rise=94 Å, axial sym=C1	Depositor
Number of segments used	165735	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{Å}^2$)	45	Depositor
Minimum defocus (nm)	600	Depositor
Maximum defocus (nm)	1500	Depositor
Magnification	Not provided	
Image detector	GATAN K3 BIOQUANTUM (6k x 4k)	Depositor
Maximum map value	1.474	Depositor
Minimum map value	-0.461	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.044	Depositor
Recommended contour level	0.22	Depositor
Map size (Å)	738.48315, 738.48315, 738.48315	wwPDB
Map dimensions	448, 448, 448	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.6484, 1.6484, 1.6484	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: CU, CA

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	0.28	1/8920 (0.0%)	0.50	1/12133 (0.0%)
1	B	0.30	1/8893 (0.0%)	0.50	1/12098 (0.0%)
1	C	0.28	1/8920 (0.0%)	0.50	1/12133 (0.0%)
1	D	0.30	1/8893 (0.0%)	0.50	2/12098 (0.0%)
All	All	0.29	4/35626 (0.0%)	0.50	5/48462 (0.0%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand. A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	A	0	1
1	C	0	1
All	All	0	2

All (4) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	762	PRO	C-N	14.22	1.66	1.34
1	D	762	PRO	C-N	14.22	1.66	1.34
1	A	762	PRO	C-N	11.38	1.60	1.34
1	C	762	PRO	C-N	11.37	1.60	1.34

All (5) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	762	PRO	O-C-N	-7.22	111.15	122.70
1	C	762	PRO	O-C-N	-7.20	111.17	122.70
1	B	1195	ASP	CB-CG-OD1	5.71	123.44	118.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	D	1195	ASP	CB-CG-OD1	5.71	123.44	118.30
1	D	638	ASP	CB-CG-OD1	5.02	122.82	118.30

There are no chirality outliers.

All (2) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	762	PRO	Mainchain
1	C	762	PRO	Mainchain

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	8695	0	8156	97	0
1	B	8672	0	8131	95	0
1	C	8695	0	8156	91	0
1	D	8672	0	8131	91	0
2	A	3	0	0	1	0
2	B	3	0	0	0	0
2	C	3	0	0	1	0
2	D	3	0	0	0	0
3	A	1	0	0	0	0
3	B	1	0	0	0	0
3	C	1	0	0	0	0
3	D	1	0	0	0	0
All	All	34750	0	32574	371	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 6.

All (371) 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:1147:HIS:HB3	1:B:1202:GLY:HA3	1.69	0.74

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:1147:HIS:HB3	1:D:1202:GLY:HA3	1.69	0.73
1:B:548:GLN:O	1:B:553:MET:HA	1.89	0.72
1:D:548:GLN:O	1:D:553:MET:HA	1.89	0.71
1:A:660:ASP:HB3	1:A:670:CYS:HB3	1.72	0.71
1:C:660:ASP:HB3	1:C:670:CYS:HB3	1.73	0.70
1:B:1087:ARG:NH2	1:B:1131:ASP:OD2	2.20	0.70
1:B:1191:ASN:ND2	1:B:1195:ASP:O	2.25	0.70
1:C:1147:HIS:HB3	1:C:1202:GLY:HA3	1.74	0.70
1:A:1147:HIS:HB3	1:A:1202:GLY:HA3	1.74	0.70
1:D:1191:ASN:ND2	1:D:1195:ASP:O	2.25	0.69
1:D:183:LEU:HD11	1:D:185:LEU:HD23	1.74	0.69
1:B:430:CYS:HB3	1:B:564:ARG:HH21	1.59	0.68
1:D:430:CYS:HB3	1:D:564:ARG:HH21	1.59	0.68
1:B:183:LEU:HD11	1:B:185:LEU:HD23	1.74	0.68
1:A:483:SER:O	1:A:663:ASN:ND2	2.29	0.66
1:D:88:HIS:NE2	1:D:294:ASP:OD1	2.29	0.66
1:D:1087:ARG:NH2	1:D:1131:ASP:OD2	2.20	0.66
1:C:483:SER:O	1:C:663:ASN:ND2	2.29	0.65
1:A:83:THR:OG1	1:A:124:ARG:NH2	2.29	0.65
1:C:83:THR:OG1	1:C:124:ARG:NH2	2.29	0.65
1:C:926:GLU:OE2	1:C:965:LYS:NZ	2.28	0.65
1:C:1223:GLN:N	1:C:1223:GLN:OE1	2.30	0.65
1:C:548:GLN:O	1:C:553:MET:HA	1.98	0.64
1:A:548:GLN:O	1:A:553:MET:HA	1.98	0.64
1:A:1223:GLN:OE1	1:A:1223:GLN:N	2.30	0.64
1:C:575:ASN:OD1	2:C:1502:CA:CA	1.75	0.64
1:A:575:ASN:OD1	2:A:1502:CA:CA	1.75	0.63
1:A:354:THR:HG22	1:A:380:LEU:HB3	1.81	0.63
1:B:88:HIS:NE2	1:B:294:ASP:OD1	2.29	0.63
1:D:461:THR:HG22	1:D:471:VAL:HB	1.79	0.63
1:B:461:THR:HG22	1:B:471:VAL:HB	1.79	0.62
1:B:968:LEU:HD23	1:B:992:PRO:HG2	1.82	0.62
1:C:354:THR:HG22	1:C:380:LEU:HB3	1.80	0.61
1:C:620:SER:HB3	1:C:623:ASN:HB2	1.83	0.61
1:A:313:GLU:OE2	1:A:317:GLN:NE2	2.34	0.61
1:B:454:GLY:HA2	1:B:609:ILE:HG13	1.82	0.61
1:D:968:LEU:HD23	1:D:992:PRO:HG2	1.81	0.61
1:A:620:SER:HB3	1:A:623:ASN:HB2	1.83	0.61
1:B:161:LEU:HD12	1:B:172:GLN:HB2	1.83	0.61
1:B:971:PHE:HD1	1:B:984:GLY:HA2	1.66	0.61
1:D:971:PHE:HD1	1:D:984:GLY:HA2	1.66	0.61

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:161:LEU:HD12	1:D:172:GLN:HB2	1.83	0.61
1:C:313:GLU:OE2	1:C:317:GLN:NE2	2.34	0.60
1:D:725:SER:OG	1:D:764:TYR:HB2	2.00	0.60
1:B:610:ARG:NH1	1:B:610:ARG:HB3	2.17	0.60
1:B:725:SER:OG	1:B:764:TYR:HB2	2.00	0.60
1:D:454:GLY:HA2	1:D:609:ILE:HG13	1.82	0.60
1:D:171:GLN:NE2	1:D:180:GLU:OE2	2.35	0.59
1:B:83:THR:OG1	1:B:124:ARG:NH2	2.35	0.59
1:C:382:ASP:O	1:C:385:GLN:NE2	2.35	0.59
1:D:610:ARG:HB3	1:D:610:ARG:NH1	2.17	0.59
1:B:660:ASP:HB3	1:B:670:CYS:HB3	1.84	0.59
1:A:181:ALA:HB3	1:A:185:LEU:HG	1.84	0.59
1:B:171:GLN:NE2	1:B:180:GLU:OE2	2.35	0.59
1:D:83:THR:OG1	1:D:124:ARG:NH2	2.35	0.59
1:A:382:ASP:O	1:A:385:GLN:NE2	2.35	0.59
1:C:181:ALA:HB3	1:C:185:LEU:HG	1.83	0.59
1:A:930:VAL:HG12	1:A:946:VAL:HB	1.85	0.59
1:A:70:ARG:HB3	1:A:70:ARG:NH1	2.18	0.59
1:A:1049:THR:HG22	1:A:1061:PHE:HA	1.85	0.59
1:C:183:LEU:HD11	1:C:185:LEU:HD23	1.85	0.59
1:C:70:ARG:HB3	1:C:70:ARG:NH1	2.18	0.58
1:D:412:ASP:OD2	1:D:685:LYS:NZ	2.36	0.58
1:B:412:ASP:OD2	1:B:685:LYS:NZ	2.36	0.58
1:C:1080:PRO:HB3	1:C:1125:ALA:HB2	1.84	0.58
1:D:170:ILE:HG23	1:D:179:VAL:HG22	1.84	0.58
1:B:883:ASN:ND2	1:B:895:THR:O	2.28	0.58
1:B:1218:ASP:O	1:B:1222:MET:N	2.36	0.58
1:C:1081:CYS:HB3	1:C:1088:LYS:HG3	1.85	0.58
1:D:660:ASP:HB3	1:D:670:CYS:HB3	1.84	0.58
1:C:930:VAL:HG12	1:C:946:VAL:HB	1.85	0.58
1:A:926:GLU:OE2	1:A:965:LYS:NZ	2.28	0.58
1:A:1080:PRO:HB3	1:A:1125:ALA:HB2	1.84	0.58
1:D:413:CYS:HA	1:D:428:VAL:HG23	1.85	0.58
1:D:1218:ASP:O	1:D:1222:MET:N	2.36	0.58
1:B:170:ILE:HG23	1:B:179:VAL:HG22	1.84	0.58
1:A:183:LEU:HD11	1:A:185:LEU:HD23	1.85	0.57
1:A:1081:CYS:HB3	1:A:1088:LYS:HG3	1.85	0.57
1:C:1049:THR:HG22	1:C:1061:PHE:HA	1.85	0.57
1:A:751:ASP:OD2	1:A:764:TYR:OH	2.22	0.57
1:D:900:LEU:HD22	1:D:1023:ASN:HB3	1.87	0.57
1:B:900:LEU:HD22	1:B:1023:ASN:HB3	1.87	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:302:ASP:OD1	1:A:302:ASP:N	2.37	0.57
1:C:751:ASP:OD2	1:C:764:TYR:OH	2.22	0.57
1:B:413:CYS:HA	1:B:428:VAL:HG23	1.85	0.57
1:D:883:ASN:ND2	1:D:895:THR:O	2.28	0.56
1:A:720:THR:HG22	1:A:749:LEU:HB3	1.87	0.56
1:B:1049:THR:HG22	1:B:1061:PHE:HA	1.87	0.56
1:A:973:LEU:HD21	1:A:995:ILE:HD11	1.87	0.55
1:C:720:THR:HG22	1:C:749:LEU:HB3	1.87	0.55
1:C:973:LEU:HD21	1:C:995:ILE:HD11	1.87	0.55
1:D:1049:THR:HG22	1:D:1061:PHE:HA	1.87	0.55
1:B:778:ASP:N	1:B:778:ASP:OD1	2.38	0.54
1:C:889:SER:O	1:C:889:SER:OG	2.24	0.54
1:D:778:ASP:N	1:D:778:ASP:OD1	2.38	0.54
1:A:889:SER:OG	1:A:889:SER:O	2.24	0.54
1:A:946:VAL:HG22	1:A:966:ILE:HG23	1.89	0.54
1:B:1080:PRO:HB3	1:B:1125:ALA:HB2	1.90	0.54
1:D:483:SER:O	1:D:663:ASN:ND2	2.38	0.54
1:D:946:VAL:HG22	1:D:966:ILE:HG23	1.90	0.53
1:B:77:ASN:HD21	1:B:321:ALA:HB2	1.73	0.53
1:C:946:VAL:HG22	1:C:966:ILE:HG23	1.89	0.53
1:B:946:VAL:HG22	1:B:966:ILE:HG23	1.90	0.53
1:B:930:VAL:HG12	1:B:946:VAL:HB	1.89	0.53
1:D:930:VAL:HG12	1:D:946:VAL:HB	1.89	0.53
1:D:940:THR:HG23	1:D:941:GLN:HG2	1.90	0.53
1:C:922[A]:ASN:HD22	1:C:1077:PRO:HG3	1.73	0.53
1:D:77:ASN:HD21	1:D:321:ALA:HB2	1.73	0.53
1:B:390:PRO:HD2	1:B:393:LYS:HD3	1.90	0.53
1:C:1147:HIS:CD2	1:C:1152:CYS:HA	2.44	0.53
1:A:1147:HIS:CD2	1:A:1152:CYS:HA	2.43	0.52
1:B:243:ASP:HB2	1:B:246:ASP:HB2	1.92	0.52
1:B:494:LEU:HB2	1:B:499:THR:HB	1.91	0.52
1:D:1080:PRO:HB3	1:D:1125:ALA:HB2	1.90	0.52
1:B:483:SER:O	1:B:663:ASN:ND2	2.38	0.52
1:D:243:ASP:HB2	1:D:246:ASP:HB2	1.92	0.52
1:D:390:PRO:HD2	1:D:393:LYS:HD3	1.90	0.52
1:B:940:THR:HG23	1:B:941:GLN:HG2	1.90	0.52
1:D:706:LYS:CD	1:D:706:LYS:H	2.23	0.52
1:C:302:ASP:OD1	1:C:302:ASP:N	2.37	0.52
1:D:732:SER:O	1:D:734:GLY:N	2.41	0.52
1:A:971:PHE:HD1	1:A:984:GLY:HA3	1.74	0.52
1:B:706:LYS:H	1:B:706:LYS:CD	2.23	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:170:ILE:HG23	1:C:179:VAL:HG22	1.92	0.52
1:C:971:PHE:HD1	1:C:984:GLY:HA3	1.74	0.52
1:A:922[A]:ASN:HD22	1:A:1077:PRO:HG3	1.73	0.52
1:A:170:ILE:HG23	1:A:179:VAL:HG22	1.92	0.51
1:B:732:SER:O	1:B:734:GLY:N	2.41	0.51
1:C:1152:CYS:HB3	1:C:1180:PRO:HB2	1.93	0.51
1:D:494:LEU:HB2	1:D:499:THR:HB	1.92	0.51
1:A:1152:CYS:HB3	1:A:1180:PRO:HB2	1.93	0.51
1:B:1012:LEU:HD23	1:B:1020:ILE:HD11	1.93	0.50
1:D:1012:LEU:HD23	1:D:1020:ILE:HD11	1.93	0.50
1:A:454:GLY:HA2	1:A:609:ILE:HG13	1.94	0.50
1:B:122:LEU:HD12	1:B:133:LEU:HD21	1.94	0.49
1:D:122:LEU:HD12	1:D:133:LEU:HD21	1.94	0.49
1:C:289:GLU:O	1:C:293:GLN:HG3	2.11	0.49
1:A:289:GLU:O	1:A:293:GLN:HG3	2.11	0.49
1:B:192:ASP:OD1	1:B:192:ASP:N	2.46	0.49
1:D:849:LEU:HB3	1:D:857:CYS:HB3	1.94	0.49
1:B:905:VAL:HB	1:B:1020:ILE:HG22	1.95	0.49
1:D:192:ASP:OD1	1:D:192:ASP:N	2.46	0.49
1:D:905:VAL:HB	1:D:1020:ILE:HG22	1.95	0.49
1:A:1147:HIS:HD2	1:A:1152:CYS:HA	1.77	0.49
1:B:265:ILE:HD12	1:B:265:ILE:H	1.78	0.49
1:C:454:GLY:HA2	1:C:609:ILE:HG13	1.94	0.49
1:C:973:LEU:HD13	1:C:993:TYR:CZ	2.48	0.49
1:A:610:ARG:NH1	1:A:610:ARG:HB2	2.28	0.49
1:B:849:LEU:HB3	1:B:857:CYS:HB3	1.94	0.49
1:D:411:THR:OG1	1:D:414:THR:HG22	2.13	0.49
1:A:973:LEU:HD13	1:A:993:TYR:CZ	2.48	0.48
1:B:610:ARG:HB3	1:B:610:ARG:HH11	1.78	0.48
1:C:610:ARG:NH1	1:C:610:ARG:HB2	2.28	0.48
1:D:265:ILE:HD12	1:D:265:ILE:H	1.78	0.48
1:A:928:THR:HA	1:A:947:VAL:HG22	1.94	0.48
1:C:707:SER:HB2	1:C:755:CYS:HB2	1.94	0.48
1:A:460:LEU:HD11	1:A:473:ALA:HB2	1.95	0.48
1:A:707:SER:HB2	1:A:755:CYS:HB2	1.94	0.48
1:B:87:PHE:CG	1:B:100:PRO:HA	2.48	0.48
1:D:934:CYS:O	1:D:1052:ARG:NH2	2.46	0.48
1:B:934:CYS:O	1:B:1052:ARG:NH2	2.46	0.48
1:C:460:LEU:HD11	1:C:473:ALA:HB2	1.95	0.48
1:D:74:PRO:O	1:D:76:HIS:ND1	2.46	0.48
1:D:273:GLN:HA	1:D:276:SER:HB3	1.96	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:466:SER:OG	1:A:467:SER:N	2.47	0.48
1:A:832:MET:SD	1:A:890:ARG:NH1	2.87	0.48
1:B:74:PRO:O	1:B:76:HIS:ND1	2.46	0.48
1:C:810:ASP:OD1	1:C:810:ASP:N	2.47	0.48
1:C:1147:HIS:HD2	1:C:1152:CYS:HA	1.77	0.48
1:A:90:LYS:HG3	1:A:96:VAL:HG22	1.96	0.48
1:B:273:GLN:HA	1:B:276:SER:HB3	1.96	0.48
1:D:87:PHE:CG	1:D:100:PRO:HA	2.48	0.48
1:C:1191:ASN:ND2	1:C:1195:ASP:O	2.46	0.48
1:D:973:LEU:HD11	1:D:995:ILE:HD11	1.96	0.48
1:A:382:ASP:OD1	1:A:382:ASP:N	2.47	0.47
1:A:1191:ASN:ND2	1:A:1195:ASP:O	2.46	0.47
1:C:382:ASP:OD1	1:C:382:ASP:N	2.47	0.47
1:C:928:THR:HA	1:C:947:VAL:HG22	1.95	0.47
1:B:973:LEU:HD11	1:B:995:ILE:HD11	1.96	0.47
1:B:411:THR:OG1	1:B:414:THR:HG22	2.13	0.47
1:B:634:LEU:O	1:B:645:HIS:NE2	2.48	0.47
1:C:732:SER:O	1:C:734:GLY:N	2.45	0.47
1:B:1079:ASP:HB3	1:B:1082:THR:HB	1.96	0.47
1:C:466:SER:OG	1:C:467:SER:N	2.47	0.47
1:C:90:LYS:HG3	1:C:96:VAL:HG22	1.96	0.47
1:D:466:SER:OG	1:D:467:SER:N	2.47	0.47
1:D:610:ARG:HB3	1:D:610:ARG:HH11	1.78	0.47
1:D:634:LEU:O	1:D:645:HIS:NE2	2.48	0.47
1:B:466:SER:OG	1:B:467:SER:N	2.47	0.47
1:C:529:ARG:HG3	1:C:535:ILE:HG12	1.97	0.47
1:A:732:SER:O	1:A:734:GLY:N	2.45	0.47
1:A:87:PHE:CZ	1:A:131:PRO:HB3	2.50	0.47
1:A:529:ARG:HG3	1:A:535:ILE:HG12	1.97	0.47
1:C:832:MET:SD	1:C:890:ARG:NH1	2.87	0.47
1:C:87:PHE:CZ	1:C:131:PRO:HB3	2.50	0.46
1:C:800:PRO:HB2	1:C:808:PHE:HE2	1.81	0.46
1:C:408:THR:HG22	1:C:417:THR:HB	1.98	0.46
1:D:1079:ASP:HB3	1:D:1082:THR:HB	1.96	0.46
1:A:408:THR:HG22	1:A:417:THR:HB	1.98	0.46
1:B:84:TRP:CD2	1:B:313:GLU:HG2	2.51	0.46
1:D:460:LEU:HD23	1:D:570:LEU:HD12	1.98	0.46
1:A:800:PRO:HB2	1:A:808:PHE:HE2	1.80	0.46
1:D:529[B]:ARG:HE	1:D:529[B]:ARG:HB3	1.58	0.46
1:B:302:ASP:N	1:B:302:ASP:OD1	2.49	0.46
1:D:257:ARG:H	1:D:257:ARG:HG2	1.57	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:1084:ASN:HB3	1:D:1087:ARG:HD3	1.98	0.46
1:D:583[A]:ARG:HB2	1:D:589:VAL:HG22	1.97	0.46
1:A:1012:LEU:HD23	1:A:1020:ILE:HD11	1.98	0.45
1:B:460:LEU:HD23	1:B:570:LEU:HD12	1.98	0.45
1:A:313:GLU:O	1:A:317:GLN:HG2	2.16	0.45
1:A:810:ASP:OD1	1:A:810:ASP:N	2.47	0.45
1:A:511:LEU:HD22	1:A:520:ILE:HG21	1.98	0.45
1:A:494:LEU:HB2	1:A:499:THR:HB	1.99	0.45
1:C:1012:LEU:HD23	1:C:1020:ILE:HD11	1.98	0.45
1:D:84:TRP:CD2	1:D:313:GLU:HG2	2.51	0.45
1:D:302:ASP:OD1	1:D:302:ASP:N	2.49	0.45
1:C:511:LEU:HD22	1:C:520:ILE:HG21	1.99	0.45
1:B:1084:ASN:HB3	1:B:1087:ARG:HD3	1.98	0.45
1:C:1131:ASP:N	1:C:1131:ASP:OD1	2.49	0.45
1:A:1149:VAL:HG23	1:A:1151:LEU:HD12	1.98	0.45
1:C:1188:THR:HG23	1:C:1191:ASN:H	1.81	0.45
1:D:456:CYS:HB2	1:D:606:CYS:HB3	1.81	0.45
1:B:583[A]:ARG:HB2	1:B:589:VAL:HG22	1.97	0.45
1:A:1131:ASP:N	1:A:1131:ASP:OD1	2.49	0.44
1:A:1188:THR:HG23	1:A:1191:ASN:H	1.81	0.44
1:B:1066:LYS:NZ	1:B:1073:ASP:OD1	2.37	0.44
1:C:313:GLU:O	1:C:317:GLN:HG2	2.16	0.44
1:A:161:LEU:HD12	1:A:172:GLN:HB2	1.98	0.44
1:C:359:GLU:OE2	1:C:359:GLU:HA	2.17	0.44
1:C:975:LEU:HD23	1:C:980:VAL:HG13	1.99	0.44
1:A:922[A]:ASN:ND2	1:A:1077:PRO:HG3	2.32	0.44
1:B:877:THR:HG23	1:B:884:THR:HG23	2.00	0.44
1:D:922[A]:ASN:HD22	1:D:1077:PRO:HG3	1.81	0.44
1:A:456:CYS:HB2	1:A:606:CYS:HB3	1.80	0.44
1:C:922[A]:ASN:ND2	1:C:1077:PRO:HG3	2.32	0.44
1:B:922[A]:ASN:HD22	1:B:1077:PRO:HG3	1.81	0.44
1:C:1149:VAL:HG23	1:C:1151:LEU:HD12	1.99	0.44
1:A:348:ARG:HB2	1:A:373:PHE:CE2	2.53	0.44
1:A:359:GLU:OE2	1:A:359:GLU:HA	2.17	0.44
1:A:1024:LEU:HD11	1:A:1032:VAL:HG11	2.00	0.44
1:B:456:CYS:SG	1:B:457:SER:N	2.91	0.44
1:C:494:LEU:HB2	1:C:499:THR:HB	1.99	0.44
1:A:87:PHE:CG	1:A:100:PRO:HA	2.53	0.44
1:C:348:ARG:HB2	1:C:373:PHE:CE2	2.53	0.44
1:A:975:LEU:HD23	1:A:980:VAL:HG13	1.99	0.43
1:B:448:LYS:HD2	1:B:581:ASP:HB2	2.00	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:161:LEU:HD12	1:C:172:GLN:HB2	1.98	0.43
1:D:235:PHE:O	1:D:239:GLN:HG2	2.18	0.43
1:D:877:THR:HG23	1:D:884:THR:HG23	2.00	0.43
1:B:138:MET:SD	1:B:187:LEU:HD22	2.59	0.43
1:B:235:PHE:O	1:B:239:GLN:HG2	2.18	0.43
1:B:945:ARG:HG2	1:B:947:VAL:HG23	2.00	0.43
1:D:138:MET:SD	1:D:187:LEU:HD22	2.59	0.43
1:D:1185:CYS:CA	1:D:1196:CYS:HB3	2.43	0.43
1:D:448:LYS:HD2	1:D:581:ASP:HB2	2.00	0.43
1:D:704:CYS:HB2	1:D:705:PRO:HD2	2.00	0.43
1:A:437:LEU:HD13	1:A:677:SER:HB2	2.01	0.43
1:A:456:CYS:SG	1:A:457:SER:N	2.92	0.43
1:C:205:ASN:N	1:C:214:PHE:O	2.39	0.43
1:C:456:CYS:HB2	1:C:606:CYS:HB3	1.80	0.43
1:C:1024:LEU:HD11	1:C:1032:VAL:HG11	2.00	0.43
1:D:945:ARG:HG2	1:D:947:VAL:HG23	2.00	0.43
1:A:775:SER:O	1:B:478:CYS:HA	2.18	0.43
1:A:1218:ASP:O	1:A:1222:MET:N	2.52	0.43
1:B:704:CYS:HB2	1:B:705:PRO:HD2	2.00	0.43
1:C:456:CYS:SG	1:C:457:SER:N	2.92	0.43
1:C:775:SER:O	1:D:478:CYS:HA	2.18	0.43
1:C:991:VAL:HG13	1:C:993:TYR:HD2	1.83	0.43
1:D:456:CYS:SG	1:D:457:SER:N	2.91	0.43
1:A:933:HIS:HB3	1:A:937:LYS:HA	2.01	0.43
1:B:706:LYS:H	1:B:706:LYS:HD3	1.84	0.43
1:B:929:LEU:HD23	1:B:929:LEU:HA	1.91	0.43
1:C:710:TYR:OH	1:C:739:ASP:OD2	2.20	0.43
1:A:84:TRP:CD2	1:A:313:GLU:HG2	2.54	0.43
1:A:971:PHE:HB3	1:A:993:TYR:HE2	1.84	0.43
1:C:87:PHE:CG	1:C:100:PRO:HA	2.53	0.43
1:C:437:LEU:HD13	1:C:677:SER:HB2	2.01	0.43
1:D:1090:TRP:CE2	1:D:1094:GLN:HG3	2.54	0.43
1:A:1148:GLU:OE2	1:A:1201[A]:ARG:NH2	2.48	0.43
1:B:160:LEU:HD23	1:B:160:LEU:HA	1.84	0.43
1:C:699:LYS:HB3	1:C:699:LYS:HE3	1.76	0.43
1:A:1185:CYS:HB3	1:A:1196:CYS:N	2.34	0.42
1:A:1185:CYS:HB3	1:A:1196:CYS:CA	2.40	0.42
1:B:341:ASN:OD1	1:B:341:ASN:N	2.52	0.42
1:B:1090:TRP:CE2	1:B:1094:GLN:HG3	2.54	0.42
1:C:1185:CYS:HB3	1:C:1196:CYS:CA	2.40	0.42
1:C:84:TRP:CD2	1:C:313:GLU:HG2	2.54	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:933:HIS:HB3	1:C:937:LYS:HA	2.01	0.42
1:A:110:HIS:HB2	1:A:118:PHE:CE1	2.55	0.42
1:D:706:LYS:H	1:D:706:LYS:HD3	1.84	0.42
1:A:77:ASN:ND2	1:A:321:ALA:HB2	2.34	0.42
1:A:710:TYR:OH	1:A:739:ASP:OD2	2.20	0.42
1:A:991:VAL:HG13	1:A:993:TYR:HD2	1.83	0.42
1:B:1185:CYS:CA	1:B:1196:CYS:HB3	2.43	0.42
1:C:77:ASN:ND2	1:C:321:ALA:HB2	2.34	0.42
1:C:110:HIS:HB2	1:C:118:PHE:CE1	2.55	0.42
1:B:1215:PRO:HD2	1:B:1226:ALA:HA	2.01	0.42
1:A:699:LYS:HE3	1:A:699:LYS:HB3	1.76	0.42
1:D:341:ASN:OD1	1:D:341:ASN:N	2.52	0.42
1:D:1215:PRO:HD2	1:D:1226:ALA:HA	2.01	0.42
1:D:975:LEU:HD23	1:D:980:VAL:HG13	2.02	0.42
1:B:470:THR:HB	1:B:493:SER:HB3	2.02	0.42
1:C:1185:CYS:HB3	1:C:1196:CYS:N	2.34	0.42
1:A:998:MET:HE3	1:A:1203:LEU:HD12	2.01	0.41
1:C:971:PHE:HB3	1:C:993:TYR:HE2	1.84	0.41
1:D:928:THR:HA	1:D:947:VAL:HG22	2.02	0.41
1:B:205:ASN:N	1:B:214:PHE:O	2.44	0.41
1:B:710:TYR:HA	1:B:741:CYS:HA	2.02	0.41
1:C:1218:ASP:O	1:C:1222:MET:N	2.52	0.41
1:A:148:THR:OG1	1:A:151:SER:HB3	2.20	0.41
1:A:295:LEU:HD12	1:A:295:LEU:HA	1.84	0.41
1:B:503:ILE:HG21	1:B:547:LEU:HD13	2.03	0.41
1:B:710:TYR:OH	1:B:739:ASP:OD2	2.32	0.41
1:B:922[A]:ASN:ND2	1:B:1077:PRO:HG3	2.35	0.41
1:A:852:ASP:HB3	1:A:854:GLU:HG3	2.03	0.41
1:C:1126:CYS:SG	1:C:1131:ASP:HA	2.61	0.41
1:A:459:VAL:HA	1:A:472:LEU:HD23	2.03	0.41
1:C:148:THR:OG1	1:C:151:SER:HB3	2.20	0.41
1:D:973:LEU:HG	1:D:993:TYR:CE2	2.56	0.41
1:B:800:PRO:HG2	1:B:808:PHE:CE2	2.56	0.41
1:C:852:ASP:HB3	1:C:854:GLU:HG3	2.03	0.41
1:C:1024:LEU:HD23	1:C:1024:LEU:HA	1.83	0.41
1:D:470:THR:HB	1:D:493:SER:HB3	2.02	0.41
1:D:922[A]:ASN:ND2	1:D:1077:PRO:HG3	2.35	0.41
1:A:919:TYR:OH	1:A:1035:LEU:O	2.33	0.41
1:C:289:GLU:OE1	1:C:293:GLN:NE2	2.54	0.41
1:D:430:CYS:HB3	1:D:564:ARG:NH2	2.30	0.41
1:A:205:ASN:N	1:A:214:PHE:O	2.39	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:480:LEU:HD13	1:B:782:ILE:HG21	2.03	0.41
1:A:877:THR:HG23	1:A:884:THR:HG23	2.02	0.41
1:A:893[A]:ARG:HA	1:A:893[A]:ARG:HD3	1.86	0.41
1:A:1126:CYS:SG	1:A:1131:ASP:HA	2.61	0.41
1:B:430:CYS:HB3	1:B:564:ARG:NH2	2.30	0.41
1:B:928:THR:HA	1:B:947:VAL:HG22	2.02	0.41
1:B:975:LEU:HD23	1:B:980:VAL:HG13	2.02	0.41
1:B:1181:CYS:HA	1:B:1202:GLY:HA2	2.03	0.41
1:C:459:VAL:HA	1:C:472:LEU:HD23	2.03	0.41
1:C:809:PHE:O	1:C:841:PRO:HA	2.21	0.41
1:D:160:LEU:HD23	1:D:160:LEU:HA	1.84	0.41
1:D:547:LEU:HD22	1:D:553:MET:HE2	2.02	0.41
1:D:1181:CYS:HA	1:D:1202:GLY:HA2	2.03	0.41
1:B:973:LEU:HD23	1:B:973:LEU:HA	1.91	0.41
1:B:973:LEU:HG	1:B:993:TYR:CE2	2.56	0.41
1:C:238:LEU:HD23	1:C:238:LEU:HA	1.89	0.41
1:D:783:CYS:HA	1:D:792:CYS:HA	2.03	0.41
1:A:118:PHE:HA	1:A:139:LYS:O	2.21	0.40
1:A:217:MET:HA	1:A:218:PRO:HD3	1.93	0.40
1:A:289:GLU:OE1	1:A:293:GLN:NE2	2.54	0.40
1:B:84:TRP:CE2	1:B:313:GLU:HG2	2.57	0.40
1:B:971:PHE:CD1	1:B:984:GLY:HA2	2.51	0.40
1:C:427:GLU:H	1:C:427:GLU:HG2	1.75	0.40
1:D:437:LEU:HD13	1:D:677:SER:HB2	2.02	0.40
1:A:1026:PRO:O	1:A:1029:LYS:HG3	2.21	0.40
1:B:765:HIS:O	1:B:768:SER:OG	2.32	0.40
1:D:503:ILE:HG21	1:D:547:LEU:HD13	2.03	0.40
1:D:1191:ASN:ND2	1:D:1195:ASP:OD1	2.54	0.40
1:B:437:LEU:HD13	1:B:677:SER:HB2	2.02	0.40
1:B:538:GLN:NE2	1:B:539:THR:O	2.53	0.40
1:D:710:TYR:OH	1:D:739:ASP:OD2	2.32	0.40
1:D:800:PRO:HG2	1:D:808:PHE:CE2	2.56	0.40
1:A:341:ASN:OD1	1:A:341:ASN:N	2.54	0.40
1:B:583[B]:ARG:HB2	1:B:589:VAL:HG22	2.02	0.40
1:B:750:ASP:OD2	1:B:754:LYS:NZ	2.37	0.40
1:C:919:TYR:OH	1:C:1035:LEU:O	2.33	0.40
1:D:205:ASN:N	1:D:214:PHE:O	2.44	0.40
1:A:140:VAL:HG12	1:A:183:LEU:HD21	2.04	0.40
1:C:877:THR:HG23	1:C:884:THR:HG23	2.02	0.40
1:D:450:TYR:HD2	1:D:452:VAL:HG23	1.86	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	1153/1456 (79%)	1114 (97%)	39 (3%)	0	100	100
1	B	1150/1456 (79%)	1113 (97%)	37 (3%)	0	100	100
1	C	1153/1456 (79%)	1114 (97%)	39 (3%)	0	100	100
1	D	1150/1456 (79%)	1112 (97%)	38 (3%)	0	100	100
All	All	4606/5824 (79%)	4453 (97%)	153 (3%)	0	100	100

There are no Ramachandran outliers to report.

5.3.2 Protein sidechains [i](#)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	971/1233 (79%)	927 (96%)	44 (4%)	23	48
1	B	968/1233 (78%)	924 (96%)	44 (4%)	23	48
1	C	971/1233 (79%)	927 (96%)	44 (4%)	23	48
1	D	968/1233 (78%)	924 (96%)	44 (4%)	23	48
All	All	3878/4932 (79%)	3702 (96%)	176 (4%)	26	48

All (176) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	81	CYS
1	A	86	SER

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Mol	Chain	Res	Type
1	A	108	SER
1	A	173	SER
1	A	176	TYR
1	A	206	LYS
1	A	247	GLN
1	A	257	ARG
1	A	276	SER
1	A	283	ASP
1	A	298	CYS
1	A	302	ASP
1	A	368	CYS
1	A	393	LYS
1	A	412	ASP
1	A	417	THR
1	A	424	SER
1	A	426	GLN
1	A	430	CYS
1	A	515	TYR
1	A	541	LEU
1	A	699	LYS
1	A	704	CYS
1	A	717	CYS
1	A	731	CYS
1	A	732	SER
1	A	739	ASP
1	A	769	MET
1	A	809	PHE
1	A	852	ASP
1	A	871	SER
1	A	877	THR
1	A	888	ASP
1	A	889	SER
1	A	979	LYS
1	A	1005	ASP
1	A	1007	ASP
1	A	1016	LYS
1	A	1111	GLU
1	A	1114[A]	ARG
1	A	1114[B]	ARG
1	A	1164	PHE
1	A	1196	CYS
1	A	1219	GLU

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Mol	Chain	Res	Type
1	B	70	ARG
1	B	149	LYS
1	B	185	LEU
1	B	192	ASP
1	B	196	LEU
1	B	233	MET
1	B	257	ARG
1	B	284	VAL
1	B	288	LEU
1	B	302	ASP
1	B	305	SER
1	B	306	CYS
1	B	327	ASP
1	B	349	SER
1	B	457	SER
1	B	495	ASP
1	B	515	TYR
1	B	526	THR
1	B	610	ARG
1	B	613	PHE
1	B	706	LYS
1	B	717	CYS
1	B	747	THR
1	B	754	LYS
1	B	769	MET
1	B	832	MET
1	B	838	GLN
1	B	861	GLU
1	B	876	GLN
1	B	883	ASN
1	B	888	ASP
1	B	900	LEU
1	B	943	SER
1	B	962	LYS
1	B	1005	ASP
1	B	1007	ASP
1	B	1015	ASP
1	B	1114[A]	ARG
1	B	1114[B]	ARG
1	B	1126	CYS
1	B	1157	THR
1	B	1164	PHE

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Mol	Chain	Res	Type
1	B	1185	CYS
1	B	1222	MET
1	C	81	CYS
1	C	86	SER
1	C	108	SER
1	C	173	SER
1	C	176	TYR
1	C	206	LYS
1	C	247	GLN
1	C	257	ARG
1	C	276	SER
1	C	283	ASP
1	C	298	CYS
1	C	302	ASP
1	C	368	CYS
1	C	393	LYS
1	C	412	ASP
1	C	417	THR
1	C	424	SER
1	C	426	GLN
1	C	430	CYS
1	C	515	TYR
1	C	541	LEU
1	C	699	LYS
1	C	704	CYS
1	C	717	CYS
1	C	731	CYS
1	C	732	SER
1	C	739	ASP
1	C	769	MET
1	C	809	PHE
1	C	852	ASP
1	C	871	SER
1	C	877	THR
1	C	888	ASP
1	C	889	SER
1	C	979	LYS
1	C	1005	ASP
1	C	1007	ASP
1	C	1016	LYS
1	C	1111	GLU
1	C	1114[A]	ARG

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Mol	Chain	Res	Type
1	C	1114[B]	ARG
1	C	1164	PHE
1	C	1196	CYS
1	C	1219	GLU
1	D	70	ARG
1	D	149	LYS
1	D	185	LEU
1	D	192	ASP
1	D	196	LEU
1	D	233	MET
1	D	257	ARG
1	D	284	VAL
1	D	288	LEU
1	D	302	ASP
1	D	305	SER
1	D	306	CYS
1	D	327	ASP
1	D	349	SER
1	D	457	SER
1	D	495	ASP
1	D	515	TYR
1	D	526	THR
1	D	610	ARG
1	D	613	PHE
1	D	706	LYS
1	D	717	CYS
1	D	747	THR
1	D	754	LYS
1	D	769	MET
1	D	832	MET
1	D	838	GLN
1	D	861	GLU
1	D	876	GLN
1	D	883	ASN
1	D	888	ASP
1	D	900	LEU
1	D	943	SER
1	D	962	LYS
1	D	1005	ASP
1	D	1007	ASP
1	D	1015	ASP
1	D	1114[A]	ARG

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Mol	Chain	Res	Type
1	D	1114[B]	ARG
1	D	1126	CYS
1	D	1157	THR
1	D	1164	PHE
1	D	1185	CYS
1	D	1222	MET

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (22) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	126	GLN
1	A	385	GLN
1	A	546	ASN
1	A	838	GLN
1	A	1147	HIS
1	B	77	ASN
1	B	426	GLN
1	B	498	GLN
1	B	824	GLN
1	B	917	GLN
1	B	997	GLN
1	C	126	GLN
1	C	385	GLN
1	C	546	ASN
1	C	838	GLN
1	C	1147	HIS
1	D	77	ASN
1	D	171	GLN
1	D	426	GLN
1	D	498	GLN
1	D	917	GLN
1	D	997	GLN

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 16 ligands modelled in this entry, 16 are monoatomic - leaving 0 for Mogul analysis.

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

The following chains have linkage breaks:

Mol	Chain	Number of breaks
1	B	1
1	D	1

All chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	B	762:PRO	C	763:CYS	N	1.66
1	D	762:PRO	C	763:CYS	N	1.66

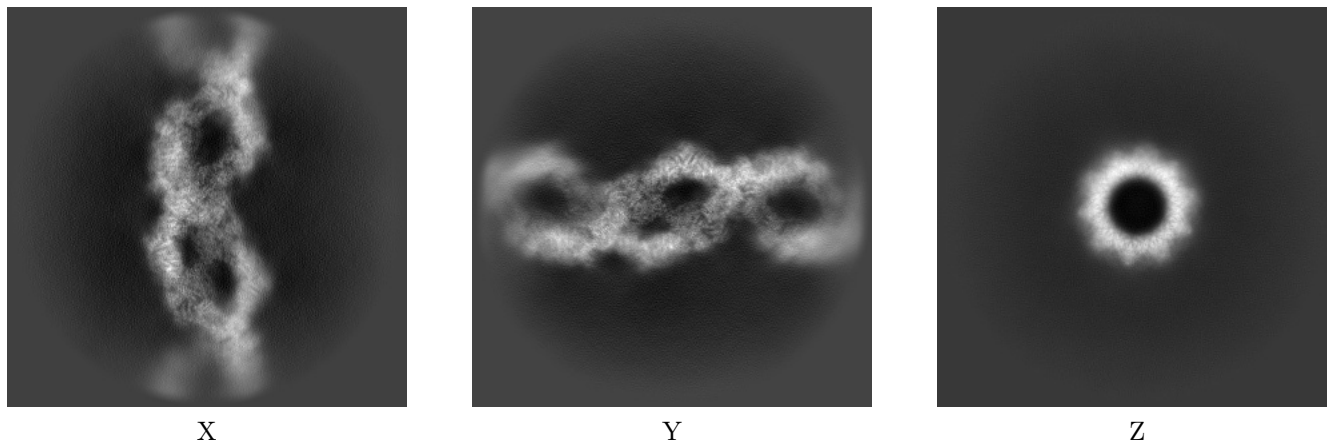
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-51639. These allow visual inspection of the internal detail of the map and identification of artifacts.

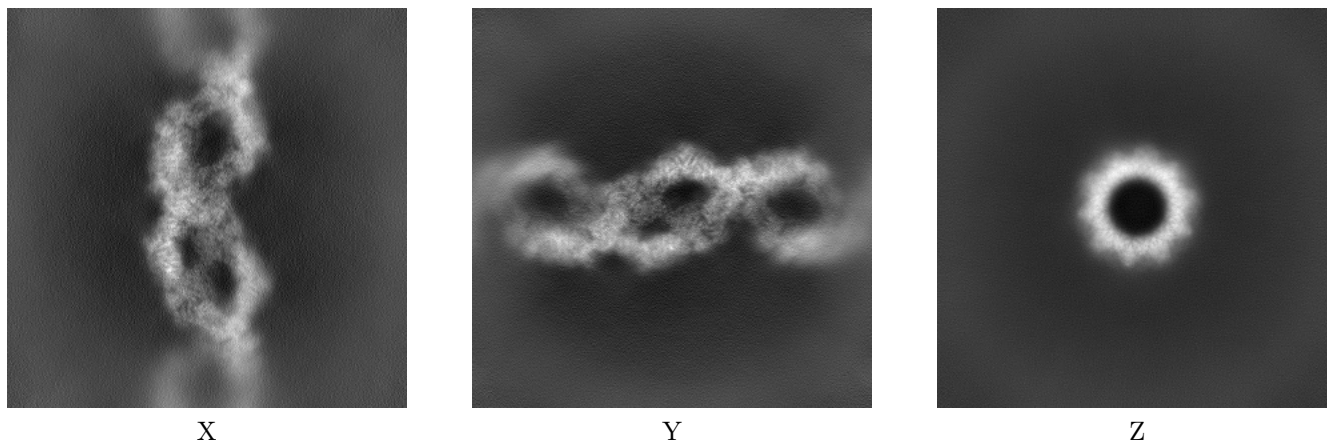
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

6.1.1 Primary map



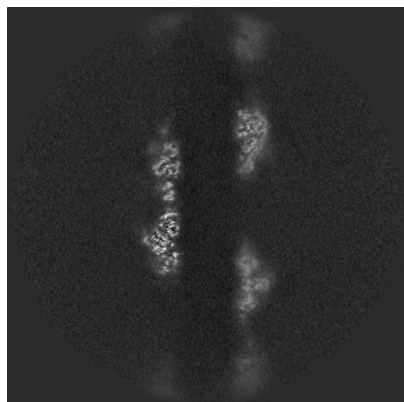
6.1.2 Raw map



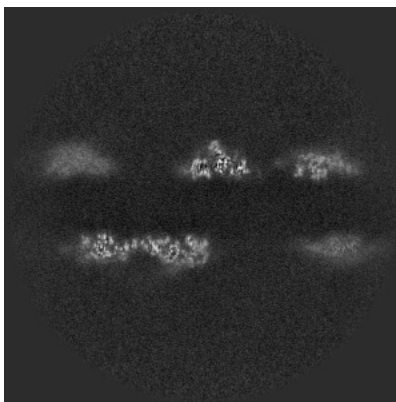
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

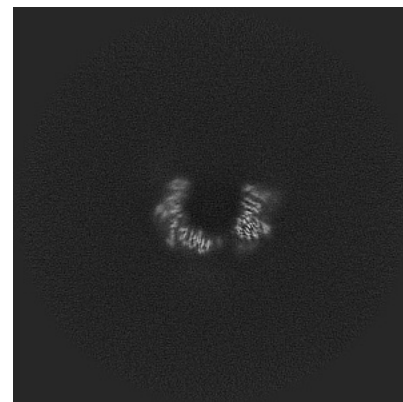
6.2.1 Primary map



X Index: 224

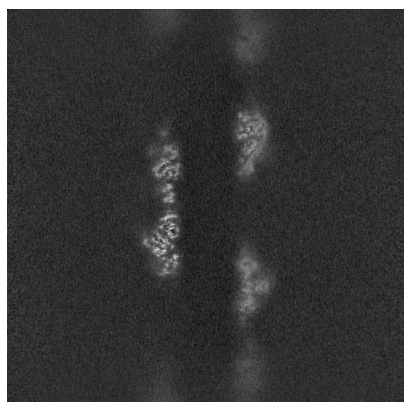


Y Index: 224

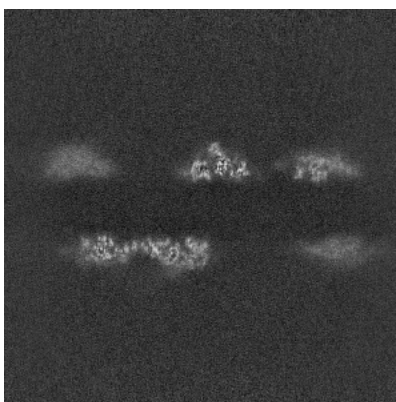


Z Index: 224

6.2.2 Raw map



X Index: 224



Y Index: 224

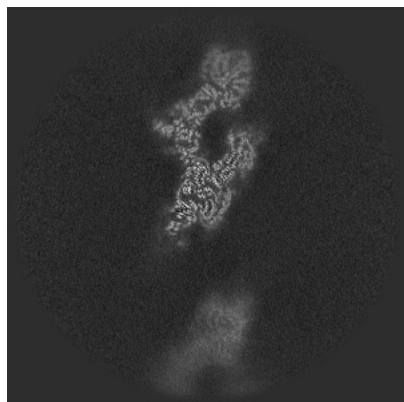


Z Index: 224

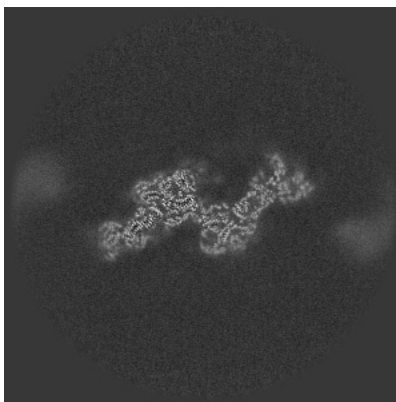
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

6.3.1 Primary map



X Index: 264

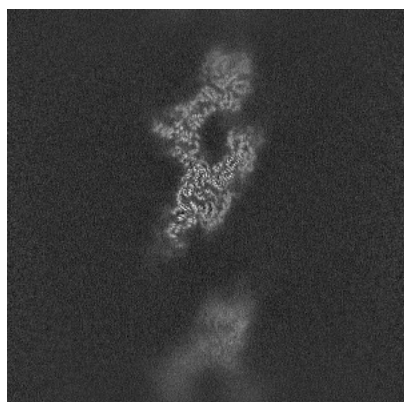


Y Index: 183

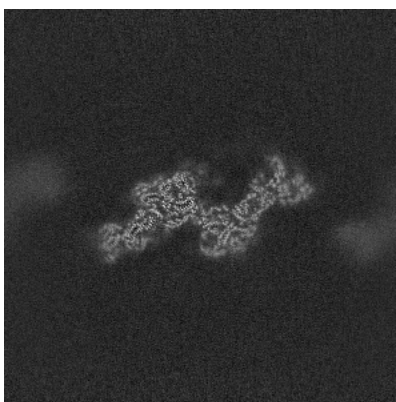


Z Index: 210

6.3.2 Raw map



X Index: 263



Y Index: 183

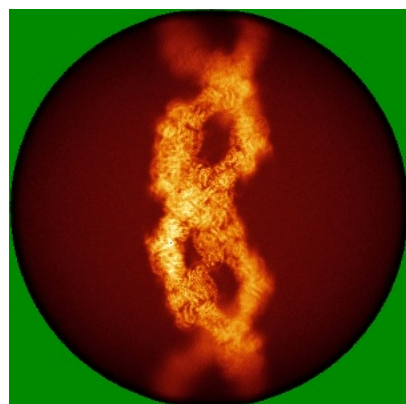


Z Index: 210

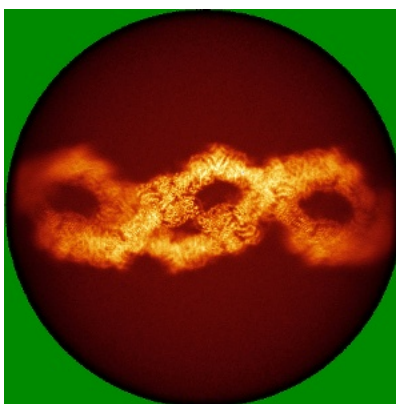
The images above show the largest variance slices of the map in three orthogonal directions.

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

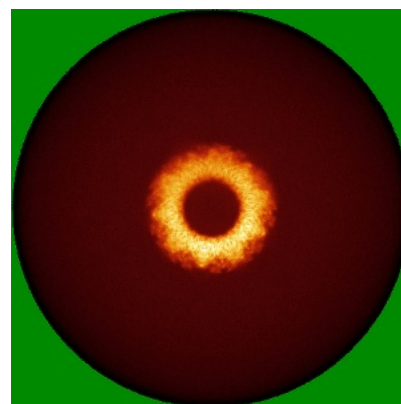
6.4.1 Primary map



X

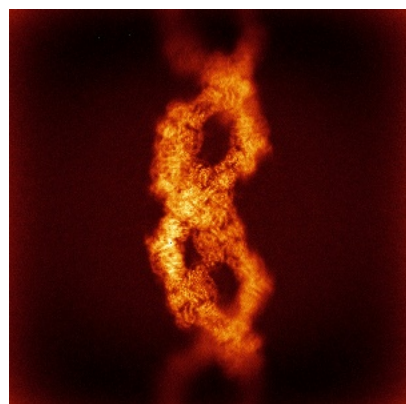


Y

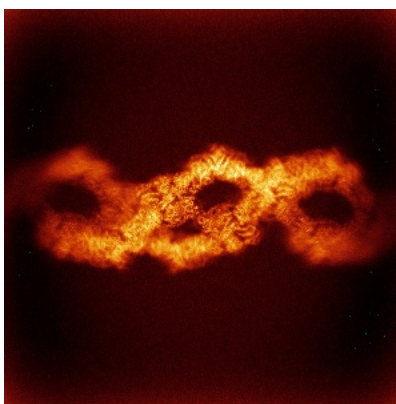


Z

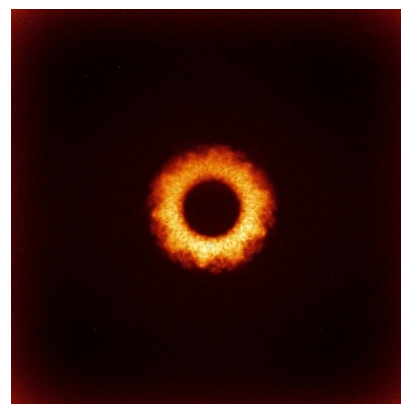
6.4.2 Raw map



X



Y



Z

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

6.5 Orthogonal surface views [i](#)

6.5.1 Primary map



X



Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.22. 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



X



Y



Z

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.

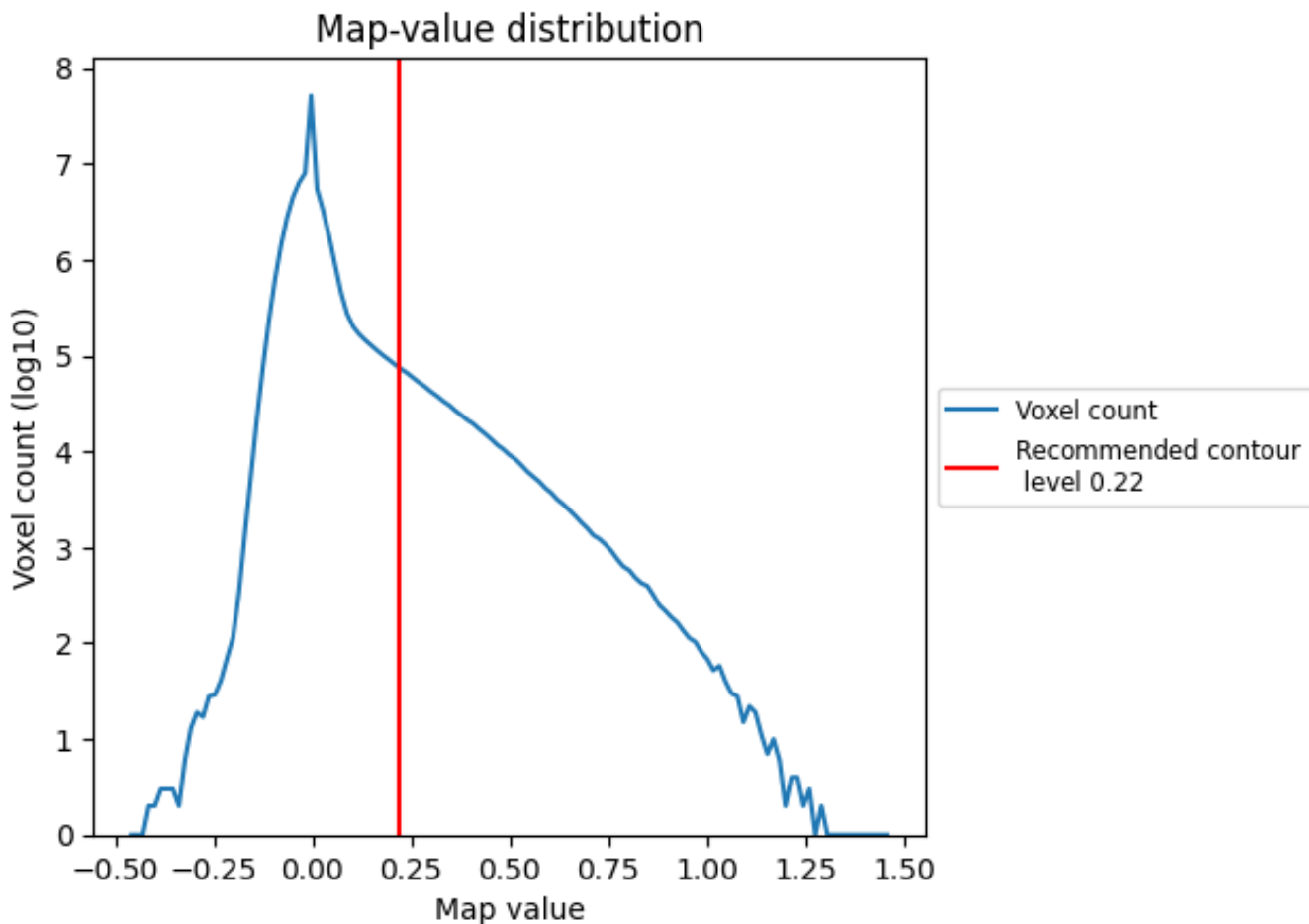
6.6 Mask visualisation [i](#)

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

7 Map analysis [i](#)

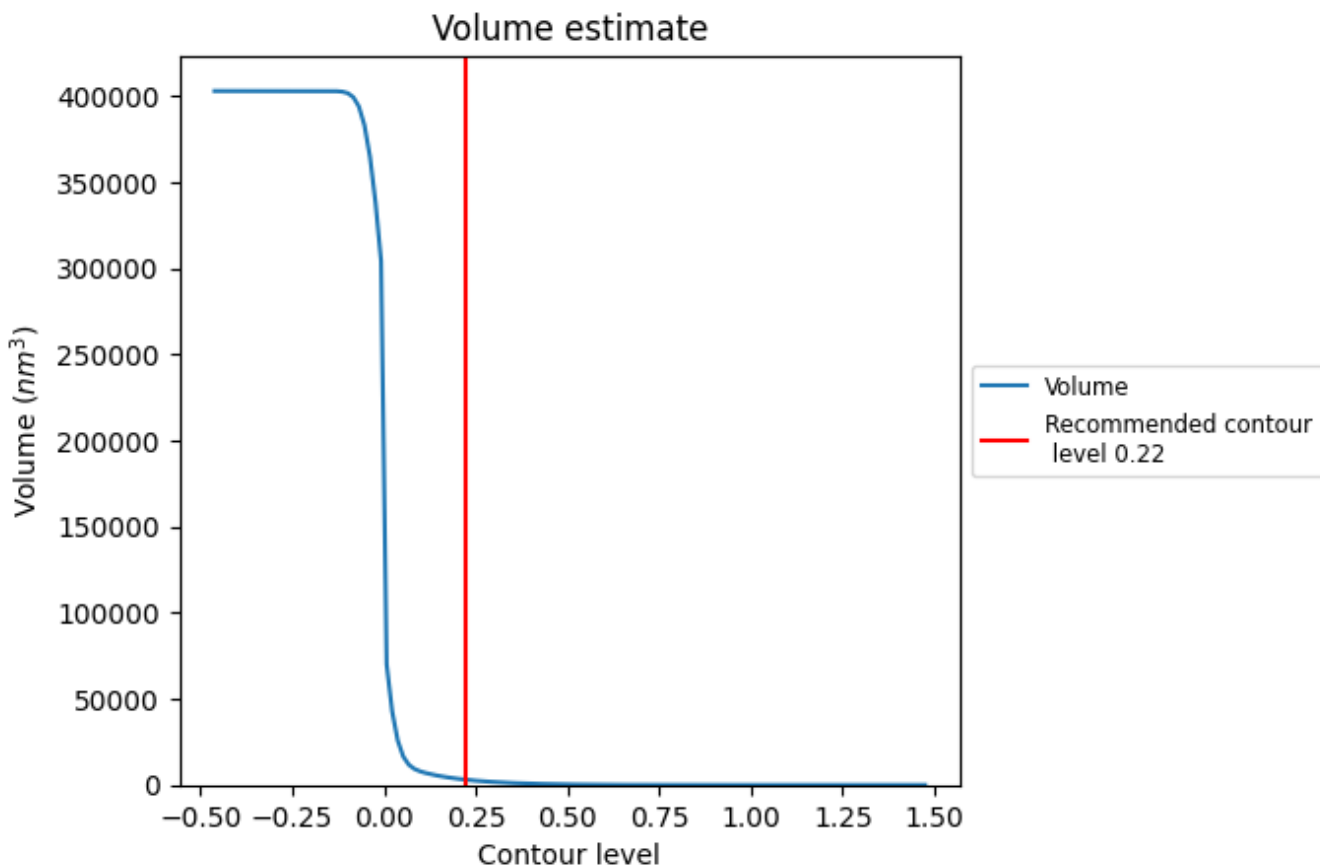
This section contains the results of statistical analysis of the map.

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.

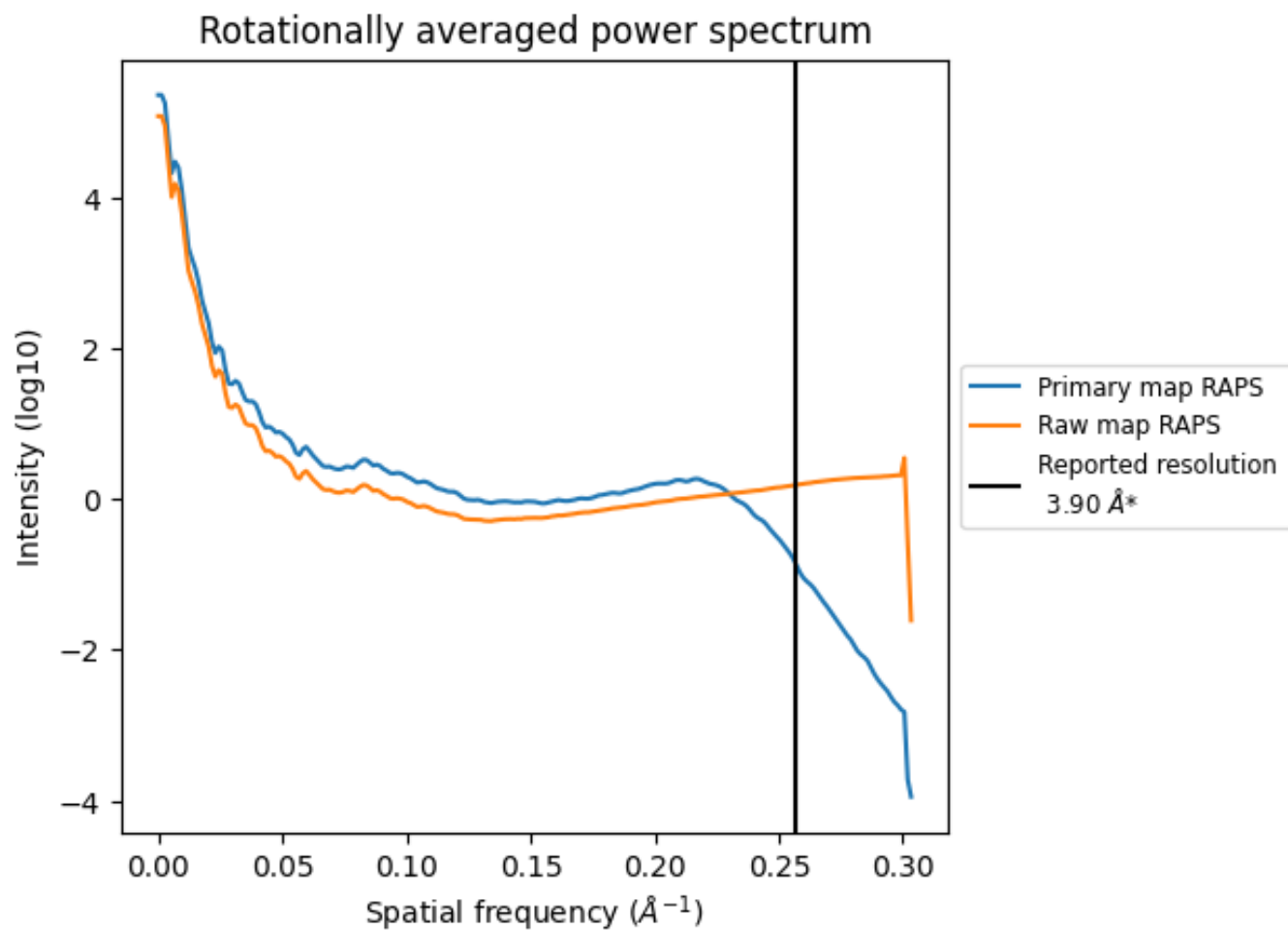
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 3123 nm^3 ; this corresponds to an approximate mass of 2821 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

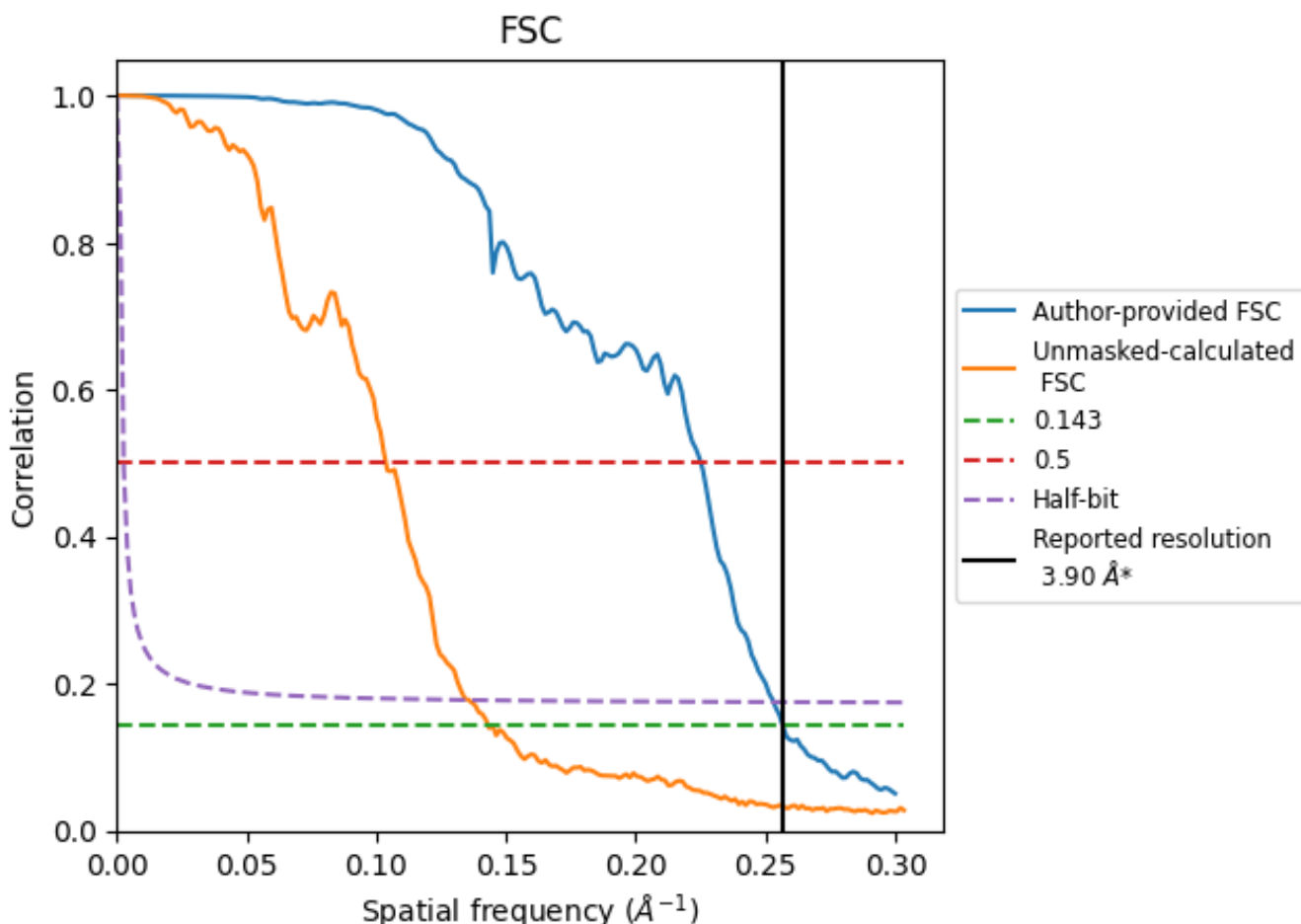


*Reported resolution corresponds to spatial frequency of 0.256 Å⁻¹

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 0.256 Å⁻¹

8.2 Resolution estimates [i](#)

Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.90	-	-
Author-provided FSC curve	3.90	4.44	3.95
Unmasked-calculated*	6.99	9.64	7.37

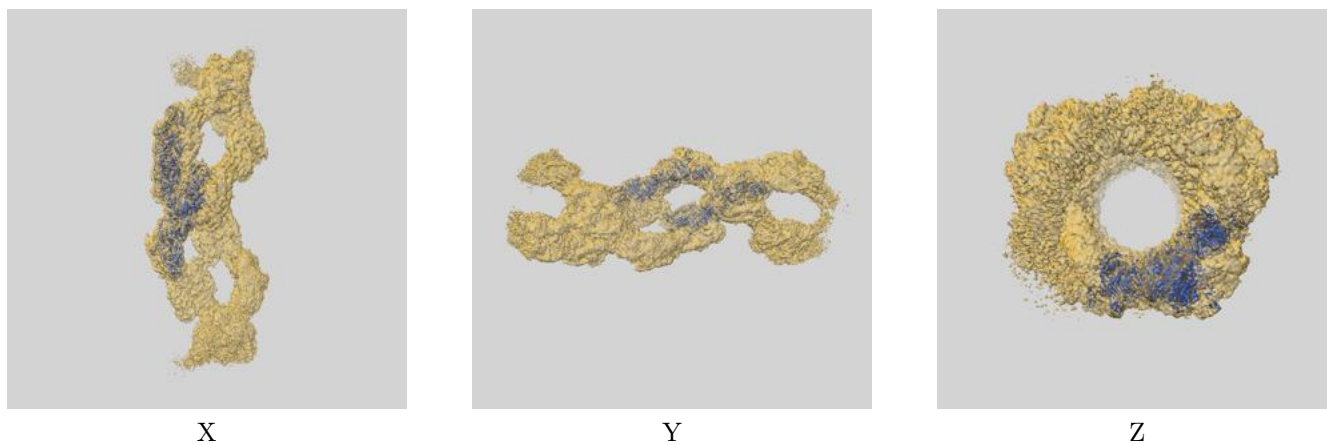
*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 6.99 differs from the reported value 3.9 by more than 10 %

9 Map-model fit [i](#)

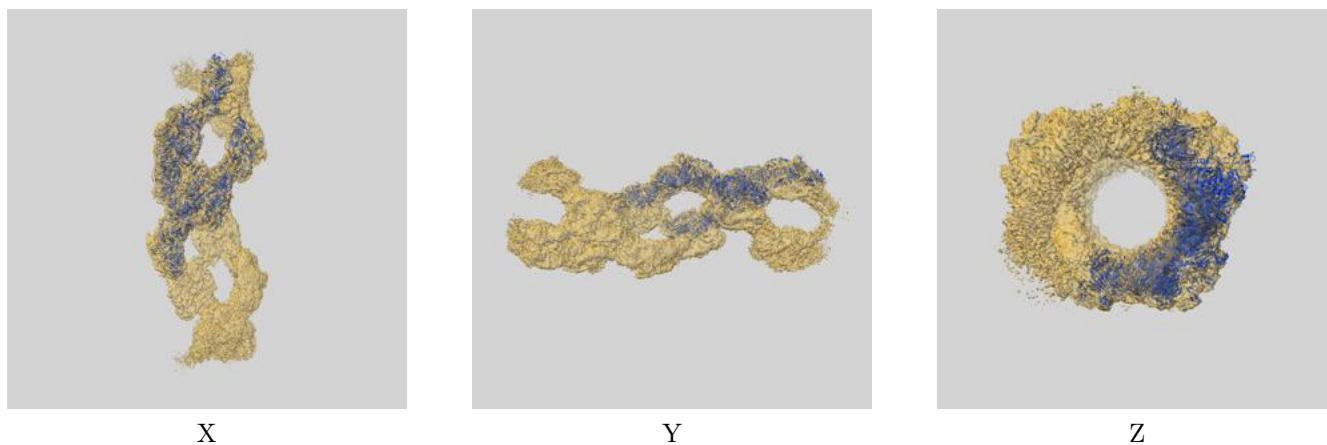
This section contains information regarding the fit between EMDB map EMD-51639 and PDB model 9GVQ. Per-residue inclusion information can be found in section 3 on page 4.

9.1 Map-model overlays

9.1.1 Map-model overlay [i](#)

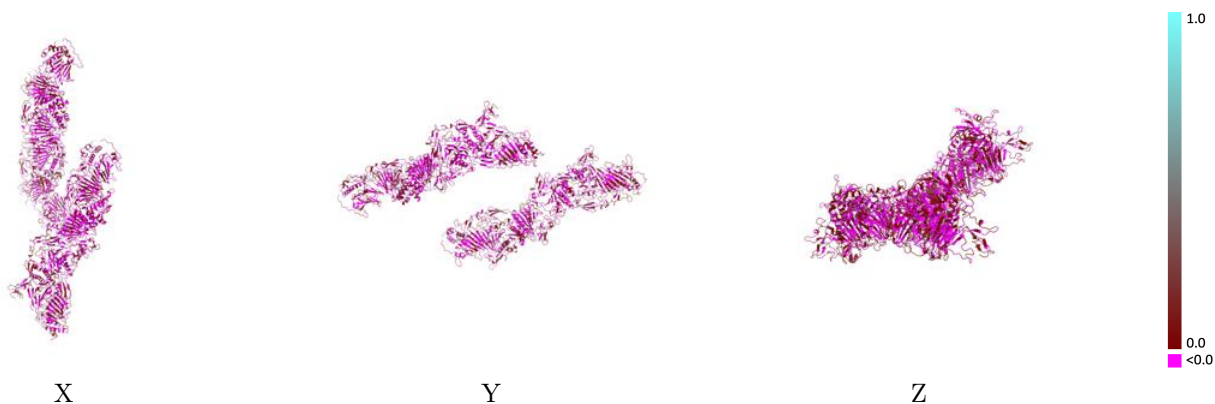


9.1.2 Map-model assembly overlay [i](#)



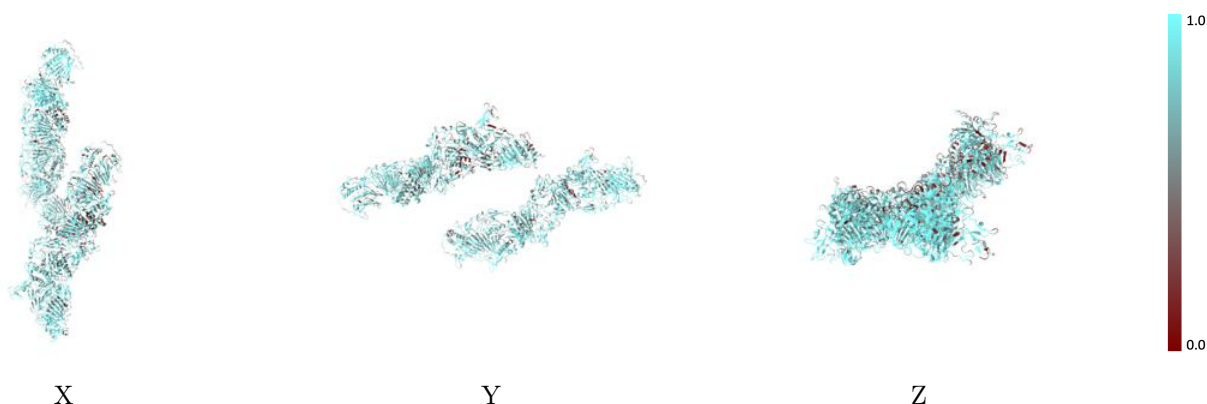
The images above show the 3D surface view of the map at the recommended contour level 0.22 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



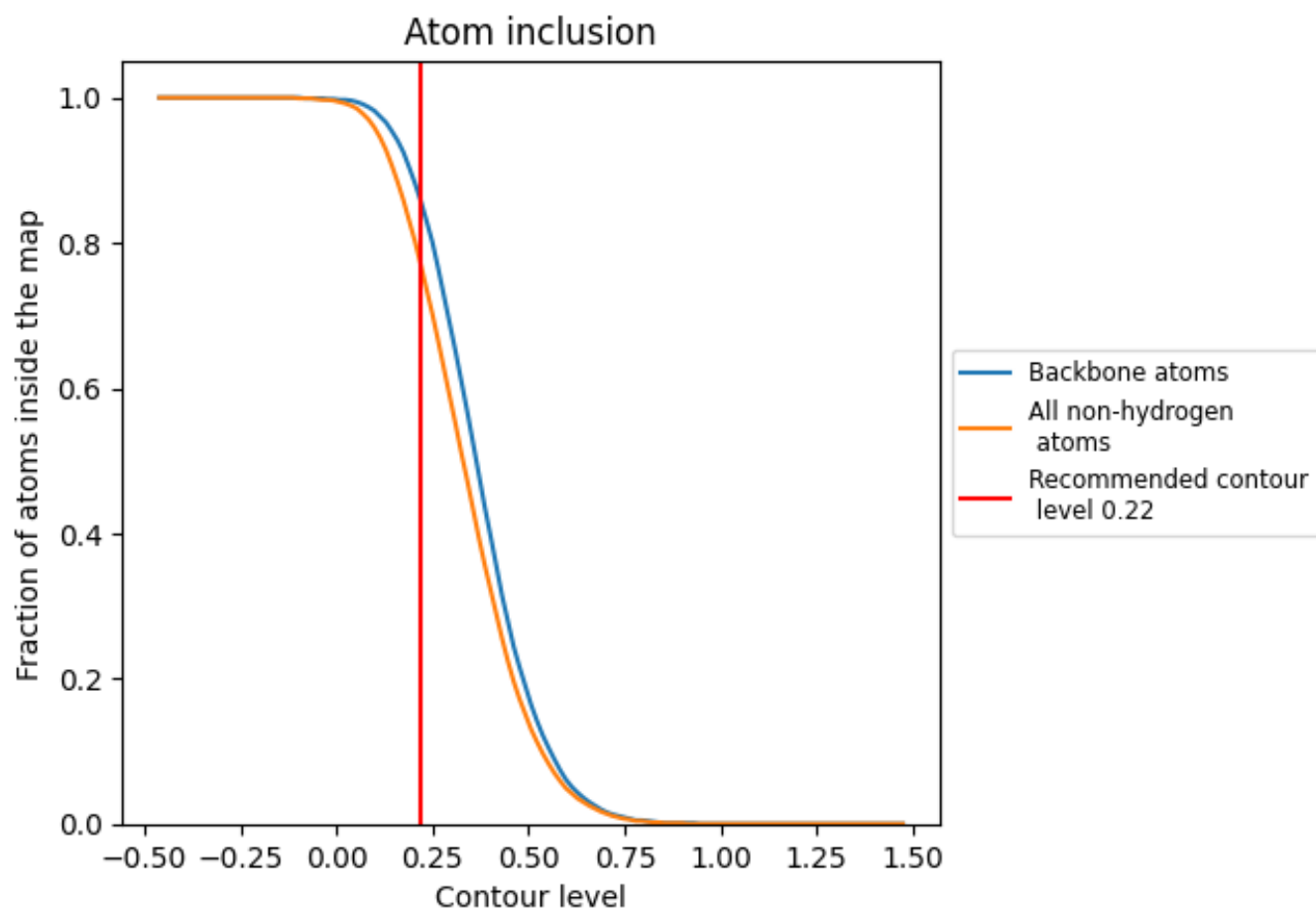
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.22).











9.4 Atom inclusion [i](#)



At the recommended contour level, 86% of all backbone atoms, 77% 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 (0.22) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.7680	 0.0190
A	 0.7440	 0.0130
B	 0.7290	 0.0090
C	 0.7950	 0.0270
D	 0.8030	 0.0270

