WORLDWIDE wwPDB PROTEIN DATA BANK

Full wwPDB EM Validation Report (i)

Oct 20, 2024 – 05:01 PM EDT

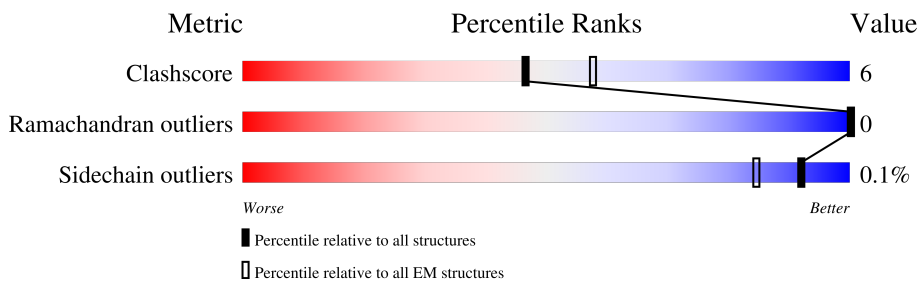|		
PDB ID	:	7USM
EMDB ID	:	EMD-26739
Title	:	Integrin alphaM/beta2 ectodomain
Authors	:	Goldsmith, J.A.; McLellan, J.S.
Deposited on	:	2022-04-25
Resolution	:	2.70 Å(reported)

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 2.70 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	Percentile Ranks	Value
Clashscore		6
Ramachandran outliers		0
Sidechain outliers		0.1%

Worse   *Better*

▮ Percentile relative to all structures

▯ Percentile relative to all EM structures

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 <=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	1162	5% — 62% / 11% / 27%
2	B	730	17% — 79% / 13% / 8%
3	C	2	100%

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2   Entry composition ⓘ

There are 5 unique types of molecules in this entry. The entry contains 11893 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 Integrin alpha-M.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	848	6559	4116	1152	1257	34	0	0

There are 74 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	1089	GLY	-	expression tag	UNP P11215
A	1090	CYS	-	expression tag	UNP P11215
A	1091	GLY	-	expression tag	UNP P11215
A	1092	GLY	-	expression tag	UNP P11215
A	1093	LEU	-	expression tag	UNP P11215
A	1094	GLU	-	expression tag	UNP P11215
A	1095	VAL	-	expression tag	UNP P11215
A	1096	LEU	-	expression tag	UNP P11215
A	1097	PHE	-	expression tag	UNP P11215
A	1098	GLN	-	expression tag	UNP P11215
A	1099	GLY	-	expression tag	UNP P11215
A	1100	PRO	-	expression tag	UNP P11215
A	1101	GLY	-	expression tag	UNP P11215
A	1102	GLU	-	expression tag	UNP P11215
A	1103	ASN	-	expression tag	UNP P11215
A	1104	ALA	-	expression tag	UNP P11215
A	1105	GLN	-	expression tag	UNP P11215
A	1106	CYS	-	expression tag	UNP P11215
A	1107	GLU	-	expression tag	UNP P11215
A	1108	LYS	-	expression tag	UNP P11215
A	1109	GLU	-	expression tag	UNP P11215
A	1110	LEU	-	expression tag	UNP P11215
A	1111	GLN	-	expression tag	UNP P11215
A	1112	ALA	-	expression tag	UNP P11215
A	1113	LEU	-	expression tag	UNP P11215
A	1114	GLU	-	expression tag	UNP P11215
A	1115	LYS	-	expression tag	UNP P11215
A	1116	GLU	-	expression tag	UNP P11215

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Chain	Residue	Modelled	Actual	Comment	Reference
A	1117	ASN	-	expression tag	UNP P11215
A	1118	ALA	-	expression tag	UNP P11215
A	1119	GLN	-	expression tag	UNP P11215
A	1120	LEU	-	expression tag	UNP P11215
A	1121	GLU	-	expression tag	UNP P11215
A	1122	TRP	-	expression tag	UNP P11215
A	1123	GLU	-	expression tag	UNP P11215
A	1124	LEU	-	expression tag	UNP P11215
A	1125	GLN	-	expression tag	UNP P11215
A	1126	ALA	-	expression tag	UNP P11215
A	1127	LEU	-	expression tag	UNP P11215
A	1128	GLU	-	expression tag	UNP P11215
A	1129	LYS	-	expression tag	UNP P11215
A	1130	GLU	-	expression tag	UNP P11215
A	1131	LEU	-	expression tag	UNP P11215
A	1132	ALA	-	expression tag	UNP P11215
A	1133	GLN	-	expression tag	UNP P11215
A	1134	TRP	-	expression tag	UNP P11215
A	1135	SER	-	expression tag	UNP P11215
A	1136	HIS	-	expression tag	UNP P11215
A	1137	PRO	-	expression tag	UNP P11215
A	1138	GLN	-	expression tag	UNP P11215
A	1139	PHE	-	expression tag	UNP P11215
A	1140	GLU	-	expression tag	UNP P11215
A	1141	LYS	-	expression tag	UNP P11215
A	1142	GLY	-	expression tag	UNP P11215
A	1143	GLY	-	expression tag	UNP P11215
A	1144	GLY	-	expression tag	UNP P11215
A	1145	SER	-	expression tag	UNP P11215
A	1146	GLY	-	expression tag	UNP P11215
A	1147	GLY	-	expression tag	UNP P11215
A	1148	GLY	-	expression tag	UNP P11215
A	1149	GLY	-	expression tag	UNP P11215
A	1150	SER	-	expression tag	UNP P11215
A	1151	GLY	-	expression tag	UNP P11215
A	1152	GLY	-	expression tag	UNP P11215
A	1153	SER	-	expression tag	UNP P11215
A	1154	ALA	-	expression tag	UNP P11215
A	1155	TRP	-	expression tag	UNP P11215
A	1156	SER	-	expression tag	UNP P11215
A	1157	HIS	-	expression tag	UNP P11215
A	1158	PRO	-	expression tag	UNP P11215

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Chain	Residue	Modelled	Actual	Comment	Reference
A	1159	GLN	-	expression tag	UNP P11215
A	1160	PHE	-	expression tag	UNP P11215
A	1161	GLU	-	expression tag	UNP P11215
A	1162	LYS	-	expression tag	UNP P11215

- Molecule 2 is a protein called Integrin beta.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	B	673	5176	3182	929	1001	64	0	0

There are 53 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	678	ASP	-	expression tag	UNP A0A494C0X7
B	679	GLY	-	expression tag	UNP A0A494C0X7
B	680	CYS	-	expression tag	UNP A0A494C0X7
B	681	GLY	-	expression tag	UNP A0A494C0X7
B	682	LEU	-	expression tag	UNP A0A494C0X7
B	683	GLU	-	expression tag	UNP A0A494C0X7
B	684	VAL	-	expression tag	UNP A0A494C0X7
B	685	LEU	-	expression tag	UNP A0A494C0X7
B	686	PHE	-	expression tag	UNP A0A494C0X7
B	687	GLN	-	expression tag	UNP A0A494C0X7
B	688	GLY	-	expression tag	UNP A0A494C0X7
B	689	PRO	-	expression tag	UNP A0A494C0X7
B	690	GLY	-	expression tag	UNP A0A494C0X7
B	691	LYS	-	expression tag	UNP A0A494C0X7
B	692	ASN	-	expression tag	UNP A0A494C0X7
B	693	ALA	-	expression tag	UNP A0A494C0X7
B	694	GLN	-	expression tag	UNP A0A494C0X7
B	695	CYS	-	expression tag	UNP A0A494C0X7
B	696	LYS	-	expression tag	UNP A0A494C0X7
B	697	LYS	-	expression tag	UNP A0A494C0X7
B	698	LYS	-	expression tag	UNP A0A494C0X7
B	699	LEU	-	expression tag	UNP A0A494C0X7
B	700	GLN	-	expression tag	UNP A0A494C0X7
B	701	ALA	-	expression tag	UNP A0A494C0X7
B	702	LEU	-	expression tag	UNP A0A494C0X7
B	703	LYS	-	expression tag	UNP A0A494C0X7
B	704	LYS	-	expression tag	UNP A0A494C0X7
B	705	LYS	-	expression tag	UNP A0A494C0X7

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Chain	Residue	Modelled	Actual	Comment	Reference
B	706	ASN	-	expression tag	UNP A0A494C0X7
B	707	ALA	-	expression tag	UNP A0A494C0X7
B	708	GLN	-	expression tag	UNP A0A494C0X7
B	709	LEU	-	expression tag	UNP A0A494C0X7
B	710	LYS	-	expression tag	UNP A0A494C0X7
B	711	TRP	-	expression tag	UNP A0A494C0X7
B	712	LYS	-	expression tag	UNP A0A494C0X7
B	713	LEU	-	expression tag	UNP A0A494C0X7
B	714	GLN	-	expression tag	UNP A0A494C0X7
B	715	ALA	-	expression tag	UNP A0A494C0X7
B	716	LEU	-	expression tag	UNP A0A494C0X7
B	717	LYS	-	expression tag	UNP A0A494C0X7
B	718	LYS	-	expression tag	UNP A0A494C0X7
B	719	LYS	-	expression tag	UNP A0A494C0X7
B	720	LEU	-	expression tag	UNP A0A494C0X7
B	721	ALA	-	expression tag	UNP A0A494C0X7
B	722	GLN	-	expression tag	UNP A0A494C0X7
B	723	GLY	-	expression tag	UNP A0A494C0X7
B	724	GLY	-	expression tag	UNP A0A494C0X7
B	725	HIS	-	expression tag	UNP A0A494C0X7
B	726	HIS	-	expression tag	UNP A0A494C0X7
B	727	HIS	-	expression tag	UNP A0A494C0X7
B	728	HIS	-	expression tag	UNP A0A494C0X7
B	729	HIS	-	expression tag	UNP A0A494C0X7
B	730	HIS	-	expression tag	UNP A0A494C0X7

- Molecule 3 is an oligosaccharide called 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-a cetamido-2-deoxy-beta-D-glucopyranose.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
3	C	2	28	16	2	10	0	0

- Molecule 4 is CALCIUM ION (three-letter code: CA) (formula: Ca).

Mol	Chain	Residues	Atoms		AltConf
			Total	Ca	
4	A	3	3	3	0

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Mol	Chain	Residues	Atoms		AltConf
4	B	1	Total 1	Ca 1	0

- Molecule 5 is 2-acetamido-2-deoxy-beta-D-glucopyranose (three-letter code: NAG) (formula: $C_8H_{15}NO_6$).

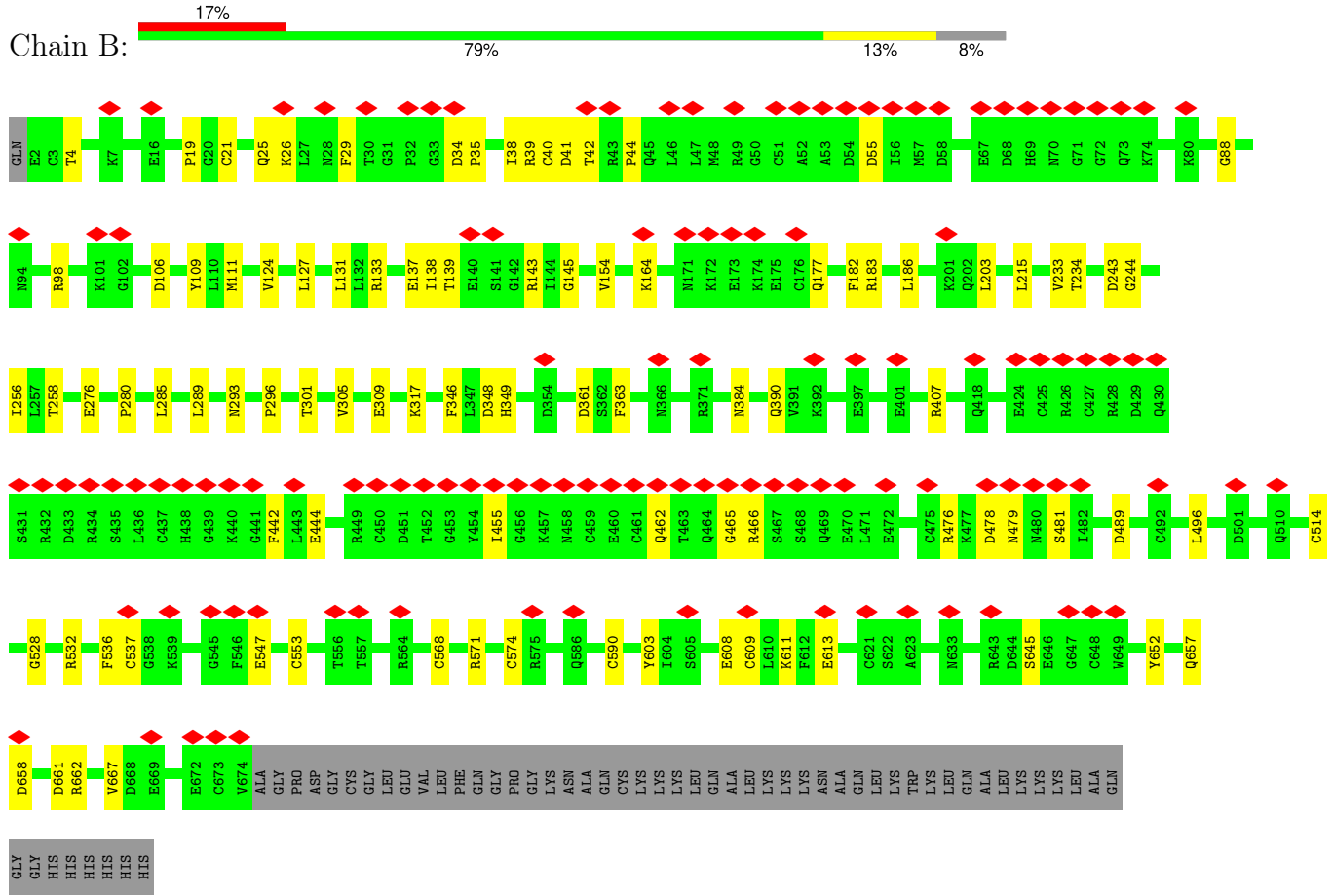| Mol	Chain	Residues	Atoms				AltConf
5	A	1	Total 14	C 8	N 1	O 5	0
5	A	1	Total 14	C 8	N 1	O 5	0
5	A	1	Total 14	C 8	N 1	O 5	0
5	A	1	Total 14	C 8	N 1	O 5	0
5	A	1	Total 14	C 8	N 1	O 5	0
5	A	1	Total 14	C 8	N 1	O 5	0
5	A	1	Total 14	C 8	N 1	O 5	0
5	A	1	Total 14	C 8	N 1	O 5	0
5	B	1	Total 14	C 8	N 1	O 5	0

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: Integrin alpha-M

LEU GLU TRP GLU LEU GLN ALA LEU GLU LYS GLU LEU ALA GLN TRP SER HIS PRO GLN PHE GLU LYS GLY GLY GLY SER GLY GLY GLY SER GLY GLY SER ALA TRP SER HIS PRO GLN PHE GLU LYS

• Molecule 2: Integrin beta

Chain B:

17%

79% 13% 8%

GLN E2 C3 T4 K7 E16 P19 G20 C21 Q25 K26 L27 N28 F29 T30 G31 P32 G33 D34 P35 I38 R39 C40 D41 T42 R43 P44 Q45 L46 L47 M48 R49 G50 C51 A52 A53 D54 D55 I56 M57 D58 E67 D68 H69 N70 G71 G72 Q73 K74 K80 G88

N94 R98 K101 G102 D106 Y109 L110 M111 V124 L127 L131 L132 R133 E137 I138 T139 E140 S141 G142 R143 I144 G145 V154 K164 N171 K172 E173 K174 E175 C176 Q177 F182 R183 L186 K201 Q202 L203 L215 V233 T234 D243 G244

I256 L257 T258 E276 P280 L285 L289 N293 P296 T301 V305 E309 K317 F346 L347 D348 H349 D354 D361 S362 F363 N366 R371 N384 Q390 V391 K392 E397 E401 R407 Q418 E424 C425 R426 C427 R428 D429 Q430

S431 R432 D433 R434 S435 L436 C437 H438 G439 K440 G441 F442 L443 E444 R449 C450 D451 T452 G453 Y454 I455 G456 K457 N458 C459 E460 C461 Q462 T463 Q464 G465 R466 S467 S468 Q469 E470 L471 E472 C475 R476 K477 D478 N479 N480 S481 I482 D489 C492 L496 D501 Q510 C514

G528 R532 F536 C537 G538 K539 G545 F546 E547 C553 T556 T557 R564 C568 R571 C574 R575 Q586 C590 Y603 I604 S605 E608 C609 L610 K611 F612 E613 C621 S622 A623 N633 R643 D644 S645 E646 G647 C648 W649 Y652 Q657

D658 D661 R662 V667 D668 E669 E672 C673 V674 ALA GLY PRO ASP GLY CYS GLY LEU GLU VAL LEU PHE GLN GLY PRO GLY LYS ASN ALA GLN CYS LYS LYS LYS LEU GLN ALA LEU LYS LYS LYS ASN ALA GLN LEU LEU LYS TRP LYS LEU GLN ALA LEU LYS LYS LYS LEU ALA GLN

GLY GLY HIS HIS HIS HIS HIS HIS

• Molecule 3: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-gluc opyranose

Chain C:

100%

NAG1 NAG2
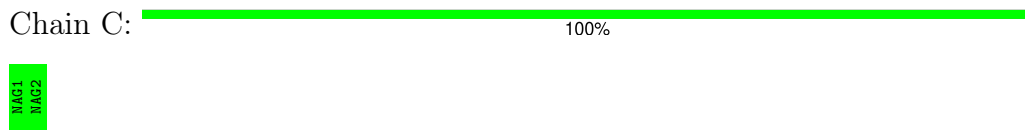
4 Experimental information ⓘ

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	1114678	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	NONE	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose $(e^-/\text{Å}^2)$	80	Depositor
Minimum defocus (nm)	800	Depositor
Maximum defocus (nm)	2200	Depositor
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	194.034	Depositor
Minimum map value	-7.691	Depositor
Average map value	0.012	Depositor
Map value standard deviation	1.262	Depositor
Recommended contour level	8	Depositor
Map size (Å)	362.67398, 362.67398, 362.67398	wwPDB
Map dimensions	338, 338, 338	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.073, 1.073, 1.073	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: NAG, 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	0.26	0/6687	0.53	1/9076 (0.0%)
2	B	0.26	0/5273	0.54	0/7120
All	All	0.26	0/11960	0.53	1/16196 (0.0%)

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	757	ASP	CB-CG-OD1	5.02	122.82	118.30

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts (i)

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	6559	0	6450	85	0
2	B	5176	0	4969	55	0
3	C	28	0	25	0	0
4	A	3	0	0	0	0
4	B	1	0	0	0	0
5	A	112	0	104	3	0
5	B	14	0	13	0	0
All	All	11893	0	11561	139	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 (139) 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)
2:B:42:THR:HG22	2:B:44:PRO:HD2	1.57	0.85
2:B:243:ASP:OD2	2:B:244:GLY:N	2.12	0.83
2:B:215:LEU:HG	2:B:280:PRO:HG2	1.66	0.75
1:A:75:LEU:HD23	1:A:91:PRO:HG2	1.69	0.75
2:B:19:PRO:HG3	2:B:88:GLY:HA3	1.73	0.71
1:A:619:VAL:HG13	1:A:631:GLU:HB3	1.75	0.69
2:B:258:THR:OG1	2:B:276:GLU:O	2.11	0.69
1:A:395:ILE:HG22	1:A:456:THR:HG21	1.75	0.69
1:A:893:ARG:HE	5:A:1209:NAG:HN2	1.41	0.69
1:A:961:LEU:HD12	1:A:1009:ALA:HB2	1.78	0.66
1:A:337:GLU:HA	1:A:352:THR:HG22	1.79	0.65
1:A:21:SER:OG	1:A:74:GLY:O	2.14	0.64
2:B:462:GLN:HG3	2:B:465:GLY:H	1.63	0.63
2:B:25:GLN:NE2	2:B:55:ASP:O	2.32	0.63
2:B:4:THR:HB	2:B:536:PHE:CZ	2.34	0.62
2:B:657:GLN:NE2	2:B:658:ASP:O	2.32	0.62
2:B:361:ASP:HB2	2:B:390:GLN:HB3	1.82	0.61
2:B:603:TYR:OH	2:B:661:ASP:OD1	2.19	0.61
1:A:949:LEU:HB2	1:A:1063:PHE:CE2	2.36	0.61
1:A:360:GLY:HA3	1:A:388:LEU:HB3	1.83	0.60
2:B:233:VAL:HG22	2:B:234:THR:H	1.65	0.60
1:A:870:ASP:HB3	1:A:873:ALA:HB2	1.82	0.59
1:A:69:VAL:HB	1:A:71:MET:HG3	1.84	0.59
2:B:41:ASP:OD1	2:B:42:THR:N	2.34	0.58
1:A:802:VAL:HG22	1:A:885:VAL:HG12	1.86	0.58
2:B:476:ARG:HH12	2:B:479:ASN:HA	1.69	0.57
1:A:511:LEU:HD21	1:A:585:LEU:HD13	1.87	0.57
1:A:906:LYS:HD3	1:A:1064:THR:HB	1.86	0.57
1:A:893:ARG:NH2	5:A:1209:NAG:O3	2.39	0.56
1:A:657:VAL:HG22	1:A:688:VAL:HG22	1.87	0.56
1:A:475:VAL:HG12	1:A:493:LEU:HB2	1.88	0.55
1:A:108:PHE:HB3	1:A:117:GLN:HG3	1.89	0.54
1:A:960:ARG:O	1:A:1010:VAL:N	2.37	0.54
1:A:799:ARG:HH21	1:A:888:GLU:CD	2.10	0.54
2:B:26:LYS:O	2:B:39:ARG:NH1	2.36	0.54
1:A:87:LEU:HD23	1:A:341:ALA:HB1	1.89	0.53
1:A:950:PRO:HD2	1:A:1063:PHE:HE2	1.74	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:362:VAL:HG21	1:A:403:LEU:HD21	1.91	0.53
1:A:719:PHE:O	1:A:742:ARG:NH2	2.42	0.53
1:A:799:ARG:HA	1:A:852:HIS:CD2	2.44	0.53
2:B:215:LEU:HD12	2:B:285:LEU:HD22	1.92	0.52
2:B:571:ARG:NH1	2:B:590:CYS:O	2.39	0.52
1:A:24:GLN:NE2	1:A:584:ASP:O	2.38	0.52
1:A:799:ARG:HA	1:A:852:HIS:HD2	1.74	0.52
2:B:476:ARG:NH1	2:B:478:ASP:O	2.42	0.52
1:A:51:ASP:OD1	1:A:53:SER:N	2.39	0.52
1:A:530:GLU:HB2	1:A:533:ARG:HG2	1.92	0.51
2:B:442:PHE:HD2	2:B:444:GLU:OE1	1.94	0.51
1:A:989:PRO:HD3	1:A:1010:VAL:HG22	1.93	0.51
1:A:909:VAL:HG11	1:A:949:LEU:HD13	1.92	0.51
2:B:145:GLY:HA2	2:B:186:LEU:HD23	1.92	0.51
1:A:344:THR:OG1	1:A:346:ASN:OD1	2.26	0.51
2:B:305:VAL:O	2:B:309:GLU:HG2	2.11	0.50
2:B:35:PRO:O	2:B:38:ILE:HG12	2.11	0.50
1:A:26:GLN:NE2	1:A:81:THR:OG1	2.36	0.50
1:A:946:GLN:HG2	1:A:947:ARG:HH11	1.77	0.50
1:A:99:GLU:OE1	2:B:164:LYS:NZ	2.39	0.50
1:A:792:ASN:OD1	1:A:793:ASP:N	2.45	0.50
2:B:317:LYS:HE3	2:B:346:PHE:HD1	1.77	0.49
2:B:608:GLU:OE2	2:B:645:SER:N	2.45	0.49
2:B:289:LEU:HD13	2:B:296:PRO:HG3	1.95	0.49
1:A:806:PHE:CD2	1:A:810:LEU:HB2	2.48	0.49
1:A:396:LEU:HD12	1:A:399:ARG:HA	1.95	0.48
1:A:561:SER:HB3	1:A:564:LEU:HD13	1.95	0.48
1:A:737:ALA:HB3	1:A:740:ALA:HB2	1.96	0.48
1:A:342:ALA:O	1:A:349:LEU:N	2.42	0.48
1:A:960:ARG:HA	1:A:965:VAL:HA	1.95	0.48
2:B:4:THR:HB	2:B:536:PHE:CE1	2.48	0.48
2:B:568:CYS:SG	2:B:574:CYS:HB3	2.53	0.47
1:A:789:THR:OG1	1:A:860:GLU:OE2	2.30	0.47
1:A:1:PHE:CG	1:A:2:ASN:N	2.82	0.47
1:A:922:TYR:HE1	1:A:1082:GLU:HG2	1.80	0.47
1:A:960:ARG:NH2	1:A:986:GLU:OE2	2.42	0.47
1:A:335:SER:HB2	1:A:352:THR:HB	1.97	0.47
2:B:34:ASP:HB3	2:B:38:ILE:HD13	1.96	0.47
2:B:609:CYS:O	2:B:613:GLU:N	2.47	0.46
1:A:813:ARG:HD2	1:A:868:ASP:HB2	1.97	0.46
1:A:87:LEU:HB2	1:A:343:ILE:HD11	1.98	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:408:PRO:HA	1:A:441:PHE:O	2.15	0.46
2:B:348:ASP:OD1	2:B:349:HIS:N	2.49	0.46
2:B:611:LYS:HG2	2:B:667:VAL:HB	1.97	0.46
1:A:351:SER:HA	1:A:362:VAL:HG12	1.97	0.46
2:B:528:GLY:HA3	2:B:532:ARG:HD2	1.98	0.46
1:A:966:ILE:HD11	1:A:1050:ILE:HG12	1.98	0.45
2:B:363:PHE:HE2	2:B:390:GLN:HB2	1.81	0.45
2:B:109:TYR:CE2	2:B:111:MET:HB2	2.52	0.45
1:A:34:ALA:O	1:A:45:GLY:HA2	2.16	0.45
1:A:500:PRO:HB2	1:A:501:TRP:CE3	2.52	0.45
1:A:878:LYS:HD3	1:A:902:GLU:HG3	1.99	0.45
2:B:514:CYS:HA	2:B:537:CYS:HB3	1.98	0.45
1:A:742:ARG:HE	1:A:742:ARG:HB3	1.54	0.45
1:A:946:GLN:OE1	1:A:946:GLN:N	2.50	0.44
1:A:87:LEU:HD13	1:A:109:LEU:HD13	1.99	0.44
2:B:293:ASN:OD1	2:B:407:ARG:NH1	2.50	0.44
2:B:476:ARG:NH2	2:B:481:SER:O	2.51	0.44
1:A:354:GLY:HA2	1:A:358:TRP:HA	1.99	0.44
2:B:109:TYR:CE2	2:B:124:VAL:HG11	2.53	0.44
2:B:138:ILE:HG22	2:B:139:THR:HG23	1.99	0.44
2:B:127:LEU:HG	2:B:131:LEU:HG	2.00	0.43
2:B:29:PHE:CE2	2:B:39:ARG:HA	2.52	0.43
1:A:806:PHE:HD2	1:A:810:LEU:HB2	1.83	0.43
2:B:133:ARG:O	2:B:137:GLU:HG3	2.18	0.43
2:B:182:PHE:CD1	2:B:183:ARG:N	2.86	0.43
1:A:470:THR:OG1	1:A:497:GLN:OE1	2.22	0.43
2:B:657:GLN:NE2	2:B:662:ARG:HH11	2.17	0.43
1:A:47:LEU:HG	1:A:73:LEU:HD21	2.01	0.43
1:A:719:PHE:HE2	1:A:744:PHE:HE2	1.67	0.43
2:B:652:TYR:HB3	2:B:667:VAL:HG22	2.00	0.43
1:A:362:VAL:HG23	1:A:374:ILE:HB	2.00	0.43
1:A:658:VAL:HG21	1:A:689:LEU:HD12	2.01	0.43
2:B:301:THR:O	2:B:305:VAL:HG23	2.19	0.43
1:A:346:ASN:HD21	1:A:364:LEU:HD21	1.84	0.42
1:A:386:ALA:HB1	1:A:407:ALA:HB1	2.00	0.42
1:A:617:ARG:HA	1:A:620:PHE:CE2	2.54	0.42
1:A:475:VAL:CG1	1:A:493:LEU:HB2	2.50	0.42
1:A:1080:LYS:HE3	1:A:1082:GLU:CD	2.39	0.42
2:B:177:GLN:NE2	2:B:203:LEU:O	2.53	0.42
1:A:410:TYR:CD2	1:A:415:LEU:HB2	2.55	0.42
1:A:410:TYR:HE2	1:A:433:LYS:HD3	1.83	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:413:ILE:O	1:A:441:PHE:HB3	2.19	0.42
1:A:677:GLU:HG3	1:A:678:THR:HG23	2.01	0.42
1:A:661:ASP:OD2	5:A:1206:NAG:N2	2.53	0.42
2:B:154:VAL:HG11	2:B:256:ILE:HD11	2.02	0.42
1:A:69:VAL:HG23	1:A:70:ASN:N	2.35	0.41
1:A:617:ARG:NH1	1:A:751:GLU:O	2.53	0.41
1:A:418:MET:HE3	1:A:487:TRP:CZ2	2.55	0.41
2:B:21:CYS:HB3	2:B:40:CYS:SG	2.59	0.41
2:B:489:ASP:O	2:B:496:LEU:N	2.53	0.41
1:A:78:ALA:HB3	1:A:87:LEU:HB3	2.03	0.41
1:A:910:TYR:CD1	1:A:944:LEU:HB2	2.56	0.41
2:B:98:ARG:HE	2:B:384:ASN:HA	1.85	0.41
2:B:106:ASP:OD1	2:B:143:ARG:HB2	2.21	0.41
1:A:808:LEU:HA	1:A:844:LYS:HE3	2.03	0.41
1:A:949:LEU:HB2	1:A:1063:PHE:HE2	1.84	0.41
2:B:547:GLU:N	2:B:553:CYS:O	2.44	0.41
1:A:960:ARG:HB3	1:A:1010:VAL:HB	2.03	0.40
1:A:25:LEU:HD13	1:A:86:LEU:HD12	2.04	0.40
1:A:87:LEU:HD11	1:A:107:CYS:SG	2.61	0.40
2:B:455:ILE:HD12	2:B:455:ILE:HA	1.95	0.40

There are no symmetry-related clashes.

5.3 Torsion angles ⓘ

5.3.1 Protein backbone ⓘ

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	838/1162 (72%)	800 (96%)	38 (4%)	0	100	100
2	B	671/730 (92%)	650 (97%)	21 (3%)	0	100	100
All	All	1509/1892 (80%)	1450 (96%)	59 (4%)	0	100	100

There are no Ramachandran outliers to report.

5.3.2   Protein sidechains ⓘ

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	733/1000 (73%)	733 (100%)	0	100	100
2	B	582/626 (93%)	581 (100%)	1 (0%)	92	98
All	All	1315/1626 (81%)	1314 (100%)	1 (0%)	92	98

All (1) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
2	B	466	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (3) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	852	HIS
2	B	177	GLN
2	B	657	GLN

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 ⓘ

2 monosaccharides are modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond

length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#|Z| > 2$	Counts	RMSZ	$\#|Z| > 2$
3	NAG	C	1	3,1	14,14,15	0.22	0	17,19,21	0.40	0
3	NAG	C	2	3	14,14,15	0.23	0	17,19,21	0.46	0

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	NAG	C	1	3,1	-	2/6/23/26	0/1/1/1
3	NAG	C	2	3	-	2/6/23/26	0/1/1/1

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (4) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	C	2	NAG	O5-C5-C6-O6
3	C	2	NAG	C4-C5-C6-O6
3	C	1	NAG	C1-C2-N2-C7
3	C	1	NAG	O5-C5-C6-O6

There are no ring outliers.

No monomer is involved in short contacts.

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for oligosaccharide.

Oligosaccharide Chain C

Bond lengths

Bond angles

Torsions

Rings
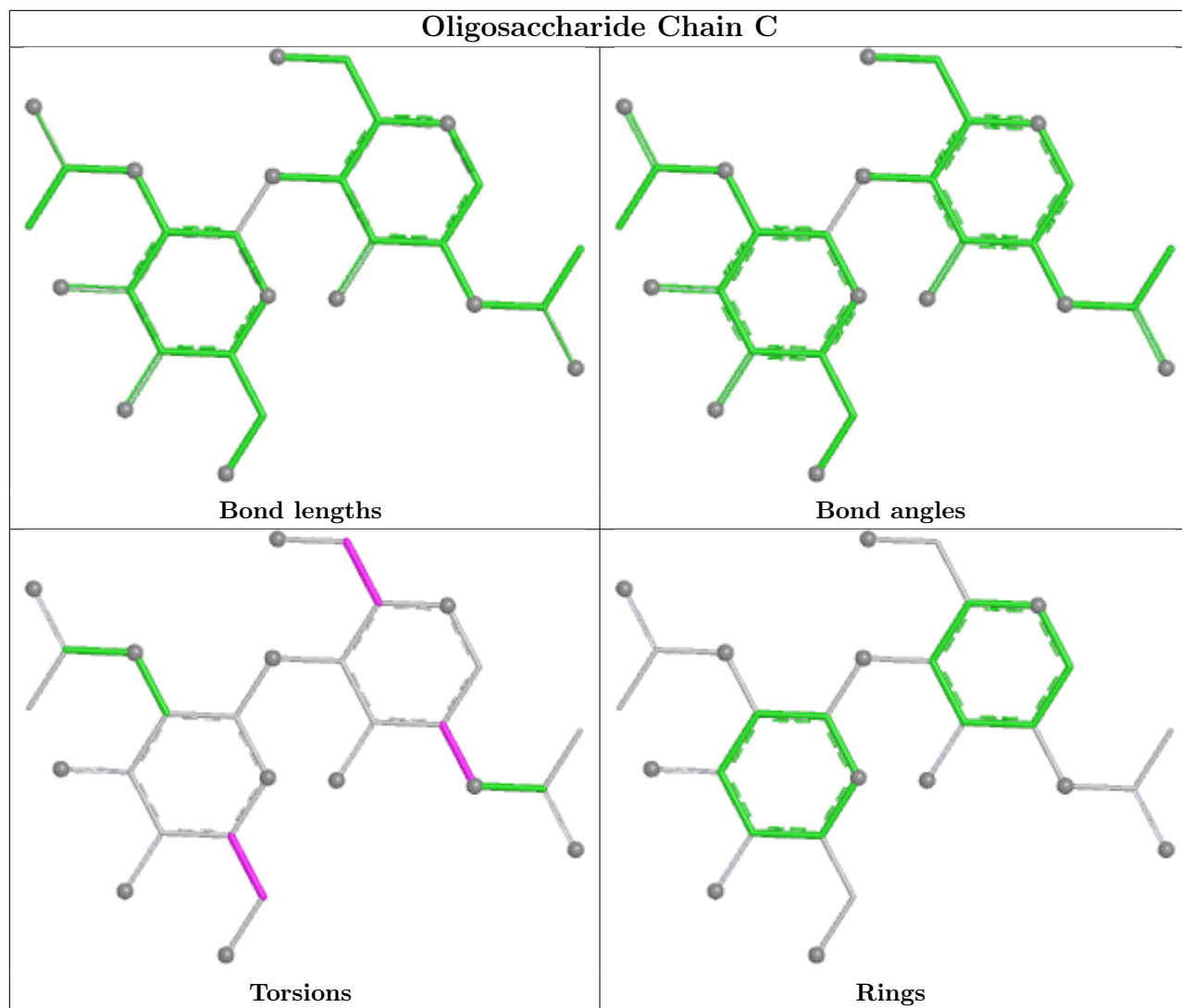
5.6 Ligand geometry ⓘ

Of 13 ligands modelled in this entry, 4 are monoatomic - leaving 9 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	$\#\lvert Z\rvert > 2$	Counts	RMSZ	$\#\lvert Z\rvert > 2$
5	NAG	A	1206	1	14,14,15	0.29	0	17,19,21	0.53	0
5	NAG	B	802	2	14,14,15	0.23	0	17,19,21	0.43	0
5	NAG	A	1211	1	14,14,15	0.24	0	17,19,21	0.53	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	#|Z| > 2	Counts	RMSZ	#|Z| > 2
5	NAG	A	1210	1	14,14,15	0.25	0	17,19,21	0.59	0
5	NAG	A	1205	1	14,14,15	0.23	0	17,19,21	0.51	0
5	NAG	A	1208	1	14,14,15	0.27	0	17,19,21	0.46	0
5	NAG	A	1207	1	14,14,15	0.37	0	17,19,21	0.76	1 (5%)
5	NAG	A	1209	1	14,14,15	0.16	0	17,19,21	0.68	0
5	NAG	A	1204	1	14,14,15	0.28	0	17,19,21	0.56	0

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
5	NAG	A	1206	1	-	0/6/23/26	0/1/1/1
5	NAG	B	802	2	-	0/6/23/26	0/1/1/1
5	NAG	A	1211	1	-	2/6/23/26	0/1/1/1
5	NAG	A	1210	1	-	2/6/23/26	0/1/1/1
5	NAG	A	1205	1	-	0/6/23/26	0/1/1/1
5	NAG	A	1208	1	-	2/6/23/26	0/1/1/1
5	NAG	A	1207	1	-	2/6/23/26	0/1/1/1
5	NAG	A	1209	1	-	4/6/23/26	0/1/1/1
5	NAG	A	1204	1	-	4/6/23/26	0/1/1/1

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
5	A	1207	NAG	C1-O5-C5	2.47	115.50	112.19

There are no chirality outliers.

All (16) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
5	A	1204	NAG	O5-C5-C6-O6
5	A	1204	NAG	C4-C5-C6-O6
5	A	1209	NAG	O5-C5-C6-O6
5	A	1208	NAG	O5-C5-C6-O6
5	A	1211	NAG	O5-C5-C6-O6
5	A	1211	NAG	C4-C5-C6-O6

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Mol	Chain	Res	Type	Atoms
5	A	1208	NAG	C4-C5-C6-O6
5	A	1204	NAG	C1-C2-N2-C7
5	A	1204	NAG	C3-C2-N2-C7
5	A	1207	NAG	C3-C2-N2-C7
5	A	1209	NAG	C3-C2-N2-C7
5	A	1210	NAG	C3-C2-N2-C7
5	A	1209	NAG	C4-C5-C6-O6
5	A	1207	NAG	C1-C2-N2-C7
5	A	1209	NAG	C1-C2-N2-C7
5	A	1210	NAG	C1-C2-N2-C7

There are no ring outliers.

2 monomers are involved in 3 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	A	1206	NAG	1	0
5	A	1209	NAG	2	0

5.7 Other polymers ⓘ

There are no such residues in this entry.

5.8 Polymer linkage issues ⓘ

There are no chain breaks in this entry.

6 Map visualisation ⓘ

This section contains visualisations of the EMDB entry EMD-26739. 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 ⓘ

6.1.1 Primary map

| X | Y | Z |
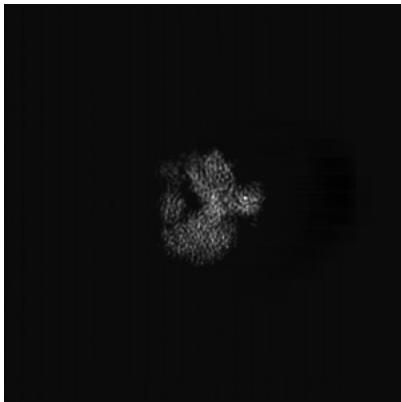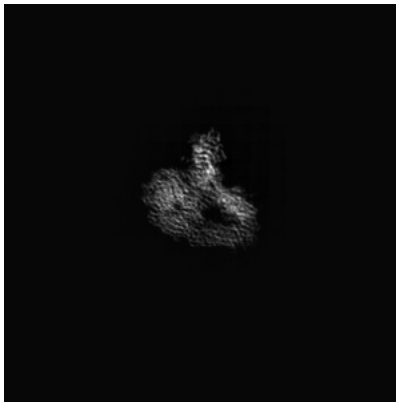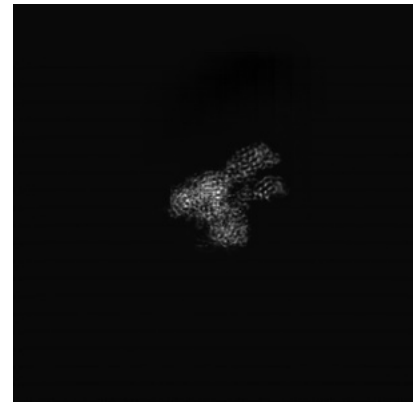
The images above show the map projected in three orthogonal directions.

6.2 Central slices ⓘ

6.2.1 Primary map

| X Index: 169 | Y Index: 169 | Z Index: 169 |

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

6.3 Largest variance slices ⓘ

6.3.1 Primary map

| X Index: 173 | Y Index: 176 | Z Index: 173 |

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

6.4 Orthogonal standard-deviation projections (False-color) ⓘ

6.4.1 Primary map

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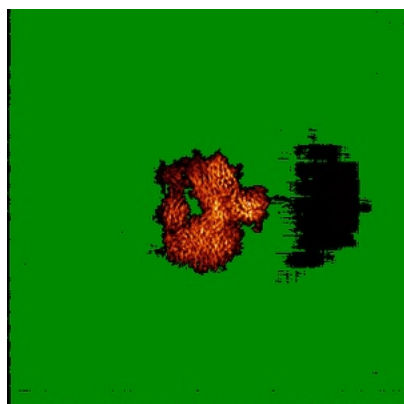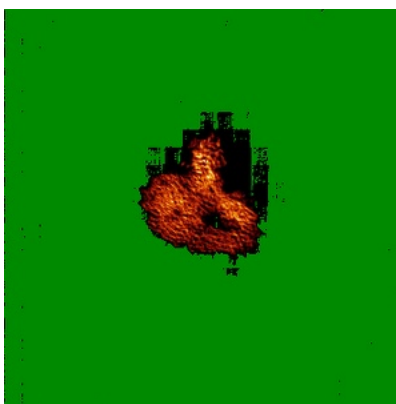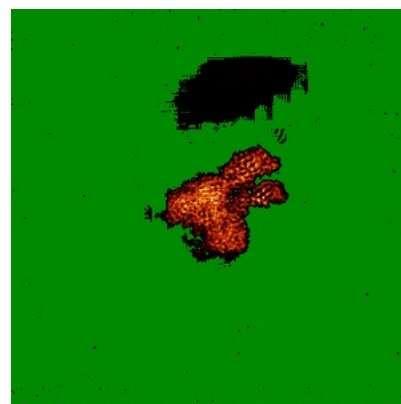
The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

6.5 Orthogonal surface views ⓘ

6.5.1 Primary map

| X | Y | Z |
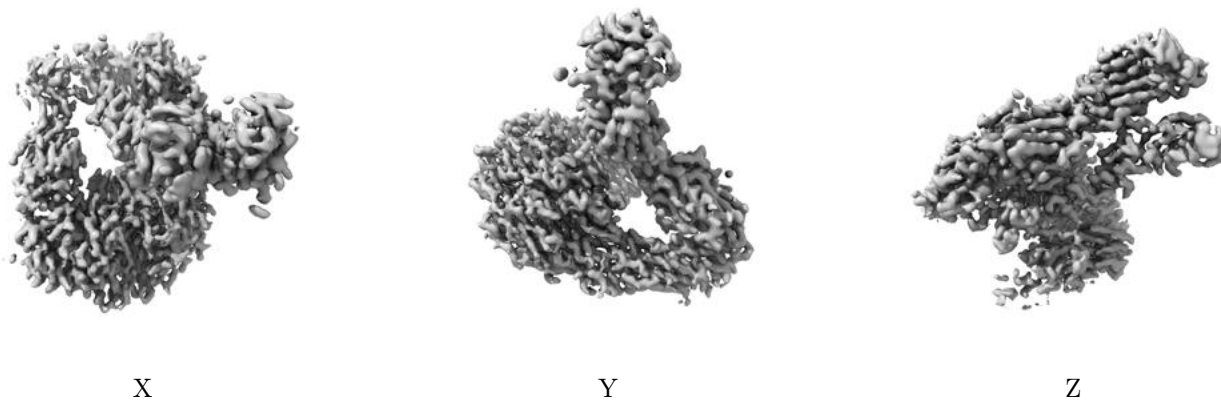
The images above show the 3D surface view of the map at the recommended contour level 8.0. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.6 Mask visualisation ⓘ

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

7 Map analysis ⓘ

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

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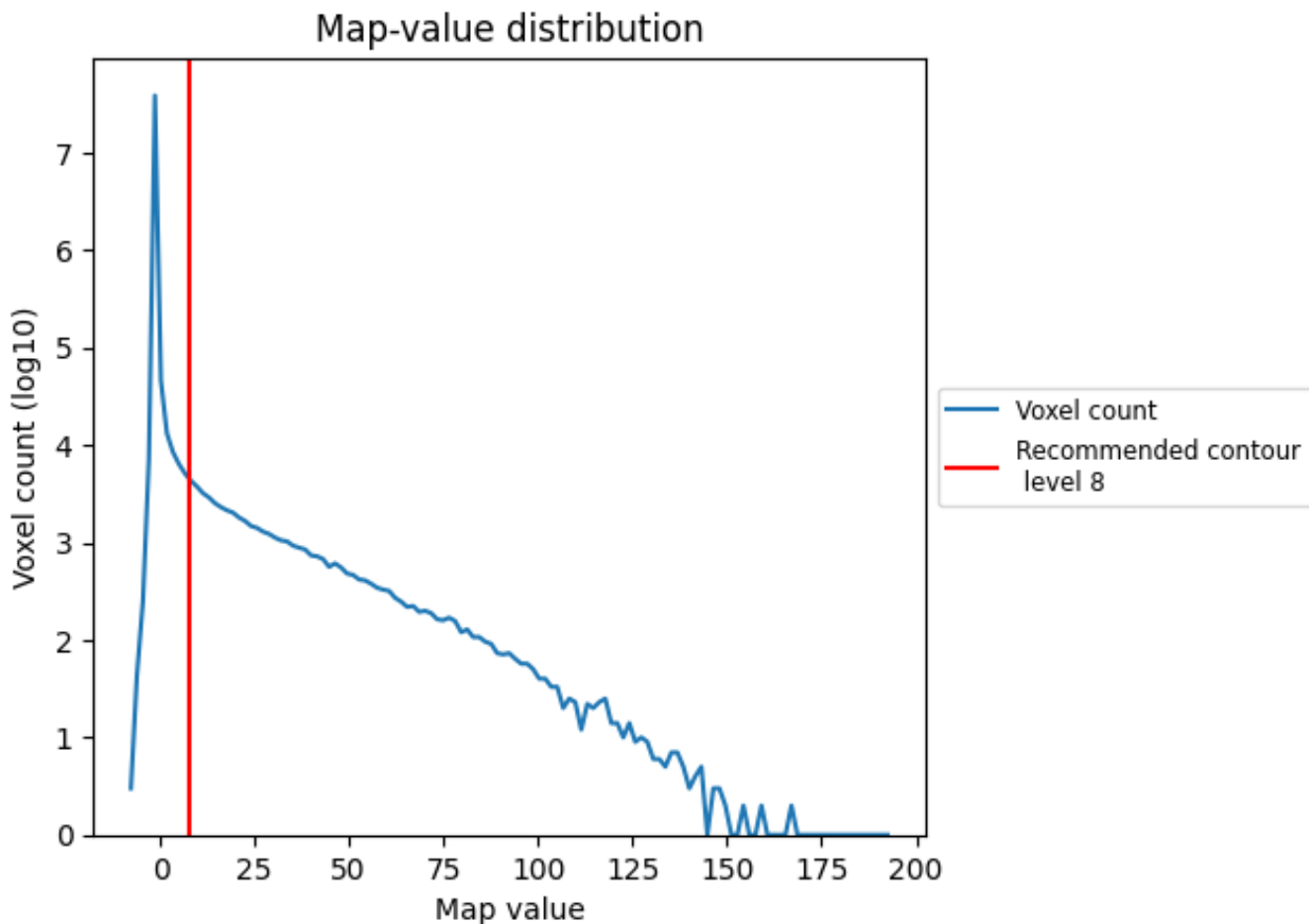
The map-value distribution is plotted in 128 intervals along the x-axis. The y-axis is logarithmic. A spike in this graph at zero usually indicates that the volume has been masked.

7.2 Volume estimate ⓘ
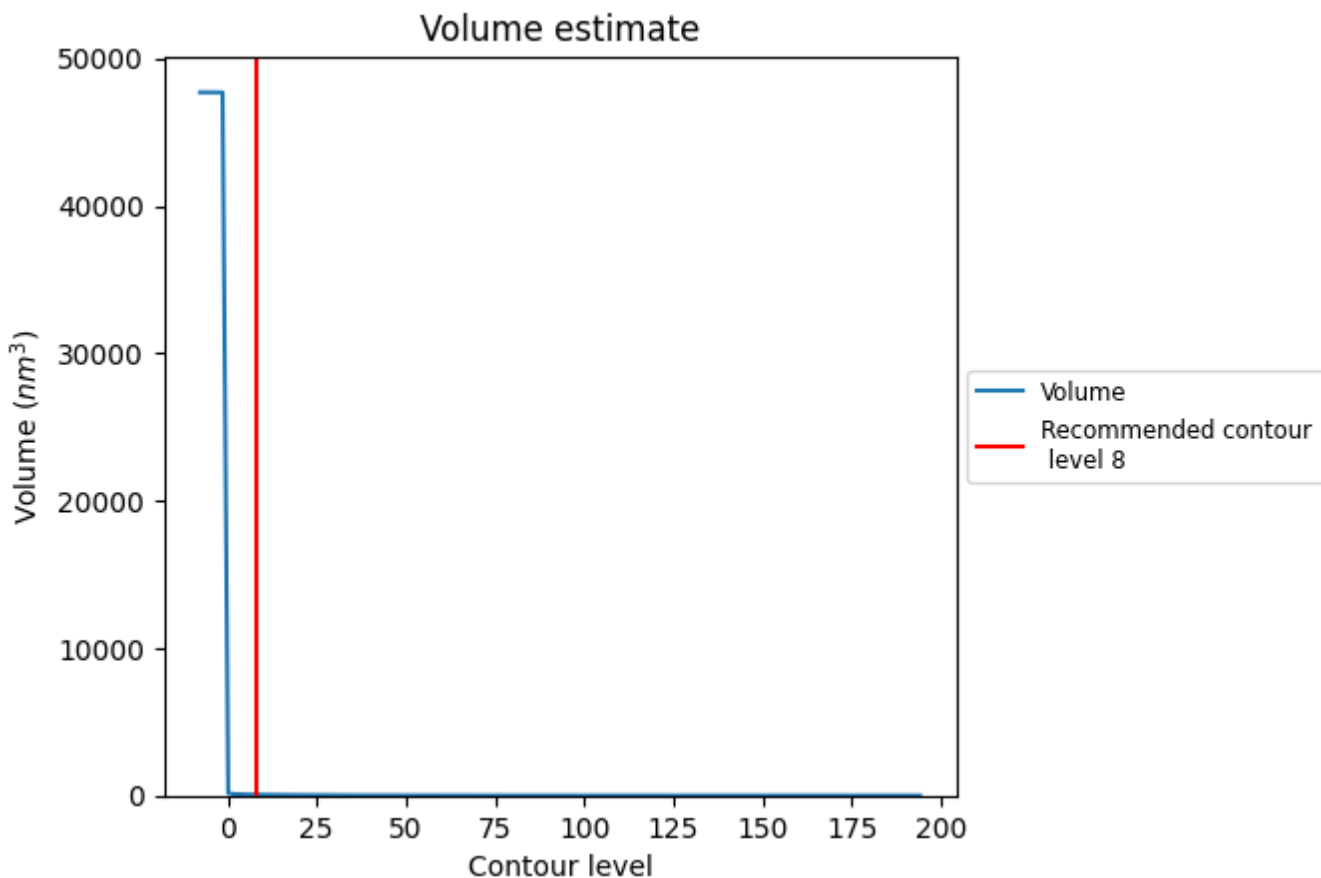
The volume at the recommended contour level is 61 nm^3; this corresponds to an approximate mass of 55 kDa.

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)
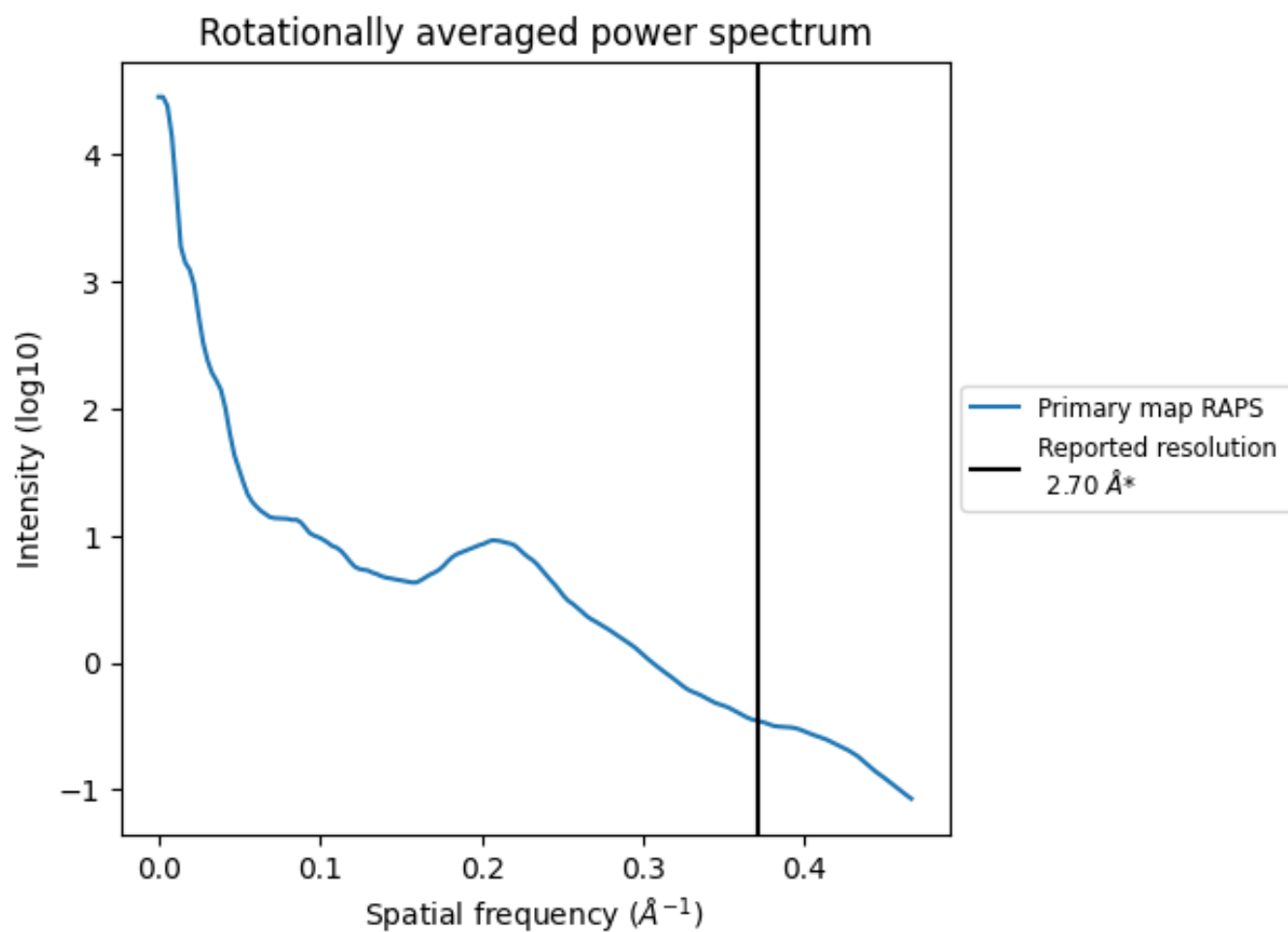
*Reported resolution corresponds to spatial frequency of 0.370 Å^{-1}

8 Fourier-Shell correlation ⓘ

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

9 Map-model fit ⓘ

This section contains information regarding the fit between EMDB map EMD-26739 and PDB model 7USM. Per-residue inclusion information can be found in section 3 on page 8.

9.1 Map-model overlay ⓘ

| X | Y | Z |
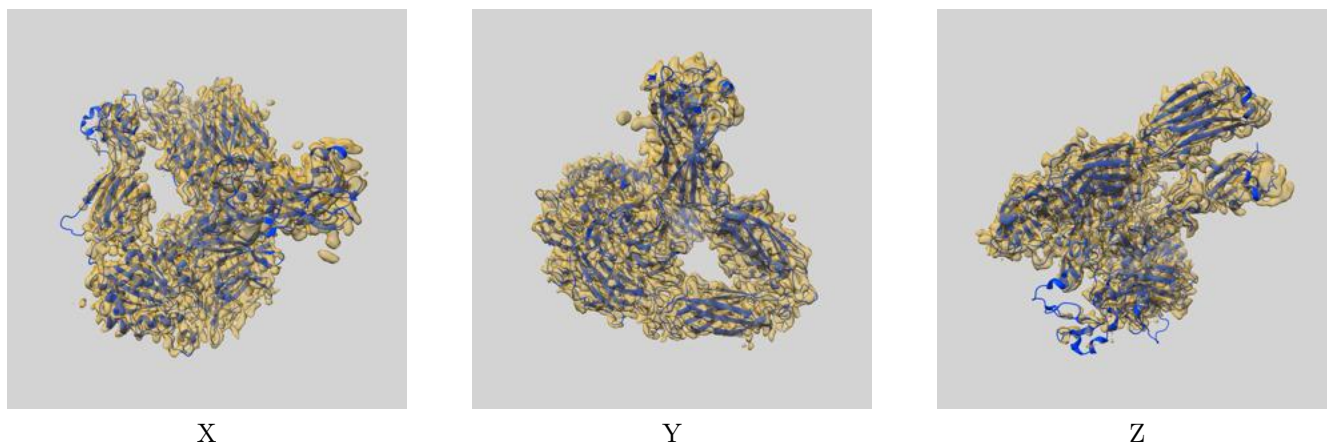
The images above show the 3D surface view of the map at the recommended contour level 8.0 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

9.2 Q-score mapped to coordinate model ⓘ

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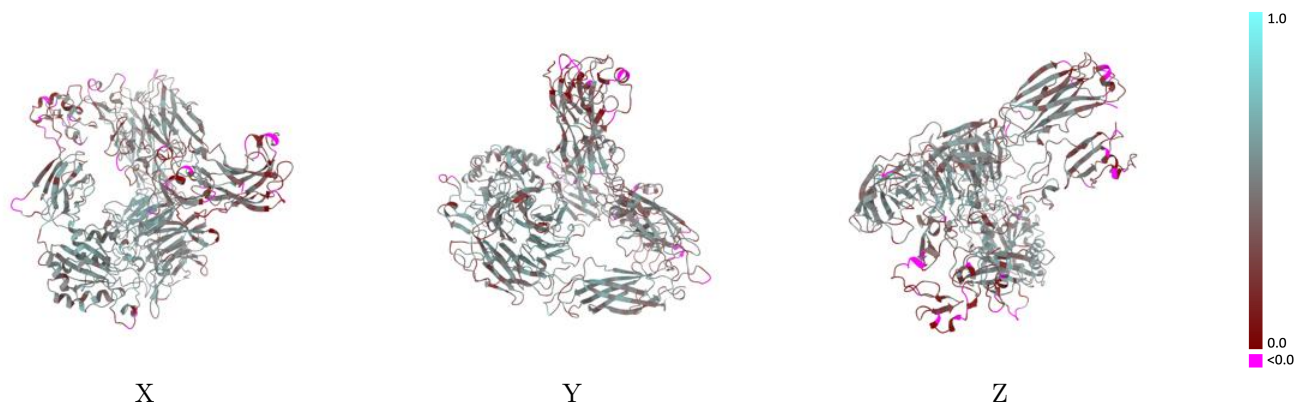
The images above show the model with each residue coloured according its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions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

X   Y   Z
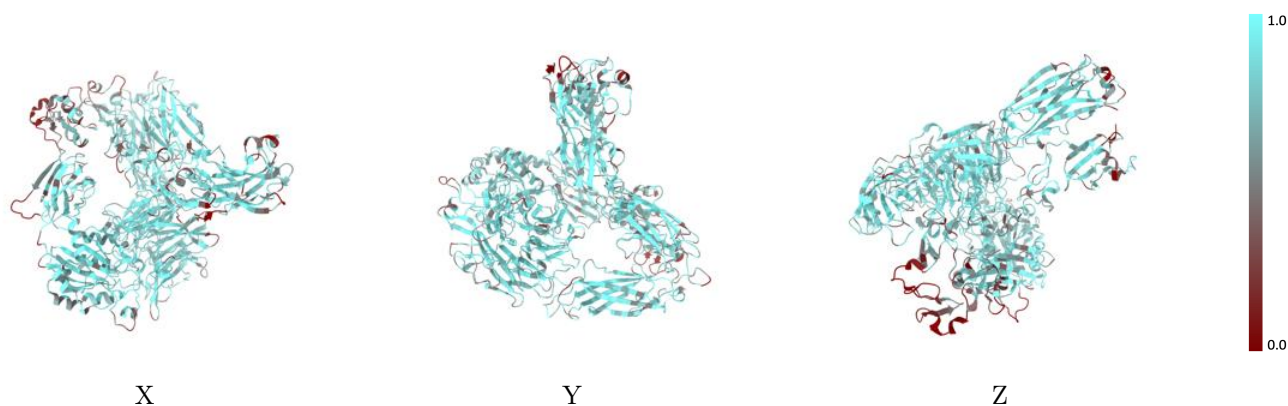
The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (8).

9.4　Atom inclusion ⓘ
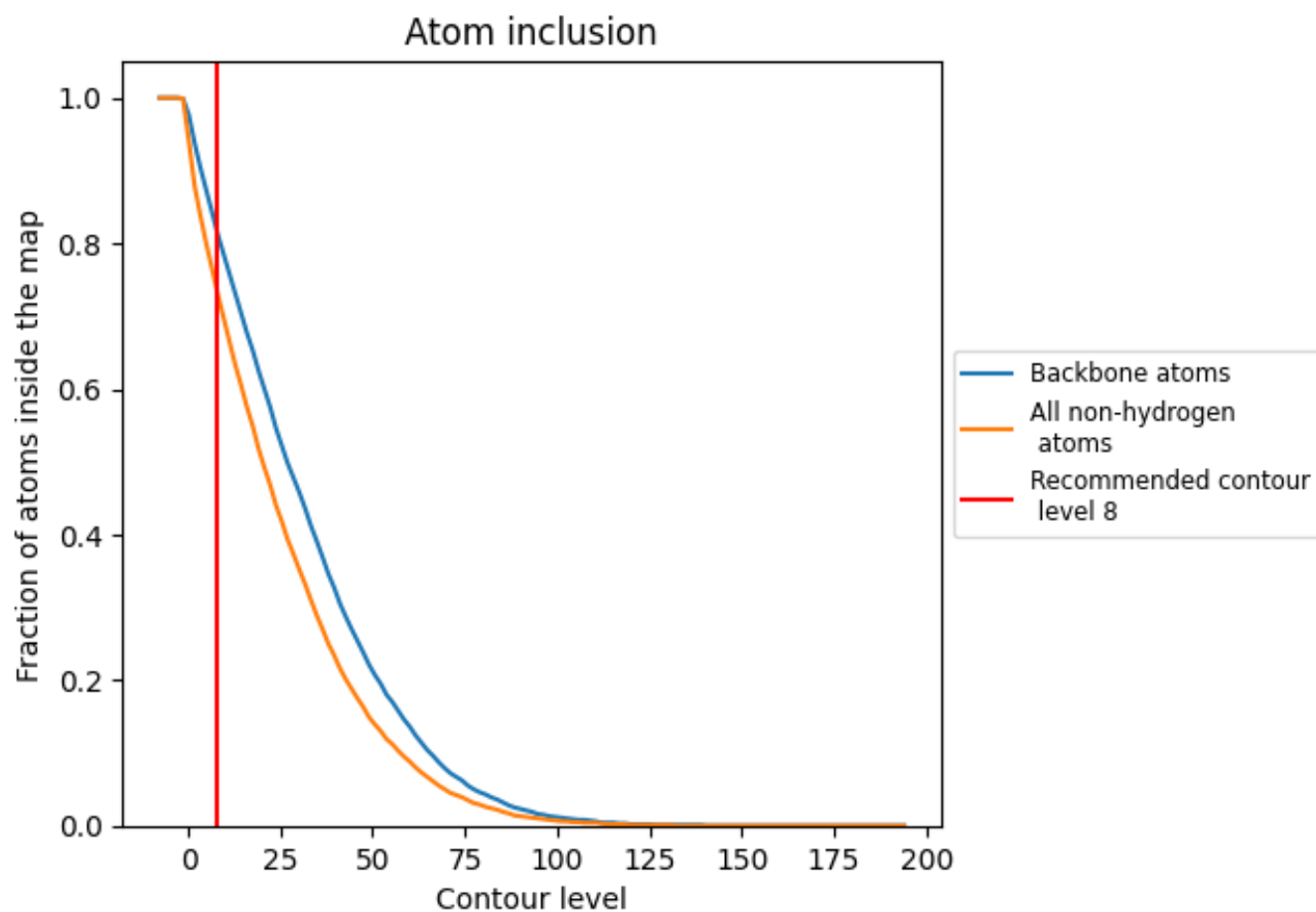
At the recommended contour level, 81% of all backbone atoms, 73% of all non-hydrogen atoms, are inside the map.

9.5　Map-model fit summary　ⓘ

The table lists the average atom inclusion at the recommended contour level (8) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.7310	0.4300
A	0.7770	0.4510
B	0.6700	0.4030
C	0.8570	0.5660

1.0

0.0
<0.0