Full wwPDB EM Validation Report ⓘ

Mar 9, 2026 – 03:23 AM UTC

PDB ID	:	9D3A / pdb_00009d3a
EMDB ID	:	EMD-46529
Title	:	Nonactive state of Gly-,Glu- bound GluN1a-2B-2D NMDAR (Low-res)
Authors	:	Hyunook, K.; Hiro, F.
Deposited on	:	2024-08-09
Resolution	:	3.78 Å(reported)
Based on initial models	:	8e96, 7saa

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:

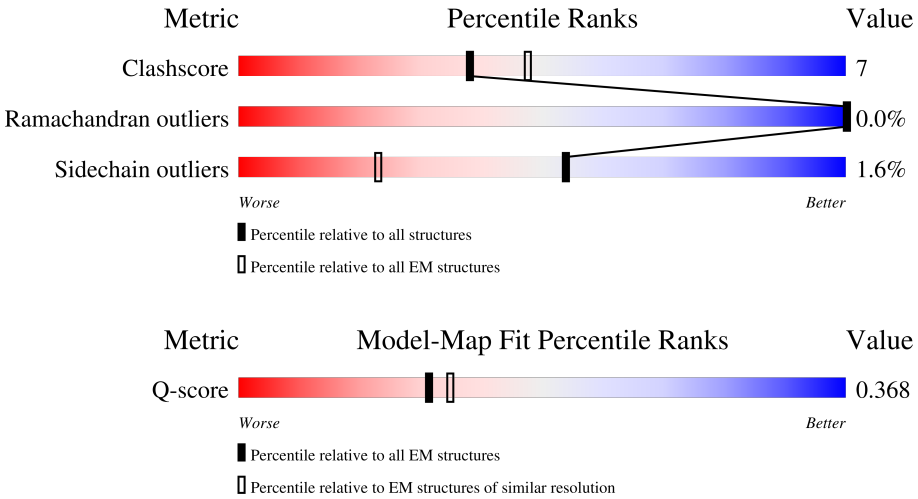
EMDB validation analysis	:	0.0.1.dev132
Mogul	:	2022.3.0, CSD as543be (2022)
MolProbity	:	4-5-2 with Phenix2.0
Buster-report	:	wwPDB partial adaption of 1.1.7 (2018)
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
EM percentile statistics	:	202505.v01 (Using data 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 (i)

The following experimental techniques were used to determine the structure:
ELECTRON MICROSCOPY

The reported resolution of this entry is 3.78 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	10074 (3.28 - 4.27)

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	825	27% 77% 19% .
1	C	825	13% 77% 20% .
2	B	884	25% 73% 14% 12%
3	D	861	29% 71% 17% 11%

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Mol	Chain	Length	Quality of chain
4	E	2	100%

2 Entry composition

There are 7 unique types of molecules in this entry. The entry contains 24270 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 Glutamate receptor ionotropic, NMDA 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	789	Total	C	N	O	S	0	0
			6161	3932	1057	1137	35		
1	C	801	Total	C	N	O	S	0	0
			6246	3985	1066	1160	35		

There are 6 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	844	ASN	ARG	engineered mutation	UNP Q05586
A	845	GLY	ARG	engineered mutation	UNP Q05586
A	846	ALA	LYS	engineered mutation	UNP Q05586
C	844	ASN	ARG	engineered mutation	UNP Q05586
C	845	GLY	ARG	engineered mutation	UNP Q05586
C	846	ALA	LYS	engineered mutation	UNP Q05586

- Molecule 2 is a protein called Glutamate receptor ionotropic, NMDA 2B.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	B	776	Total	C	N	O	S	0	0
			5879	3795	948	1099	37		

There are 61 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	-8	TRP	-	expression tag	UNP Q13224
B	-7	SER	-	expression tag	UNP Q13224
B	-6	HIS	-	expression tag	UNP Q13224
B	-5	PRO	-	expression tag	UNP Q13224
B	-4	GLN	-	expression tag	UNP Q13224
B	-3	PHE	-	expression tag	UNP Q13224
B	-2	GLU	-	expression tag	UNP Q13224
B	-1	LYS	-	expression tag	UNP Q13224
B	0	GLY	-	expression tag	UNP Q13224

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Chain	Residue	Modelled	Actual	Comment	Reference
B	1	GLY	-	expression tag	UNP Q13224
B	2	GLY	-	expression tag	UNP Q13224
B	3	SER	-	expression tag	UNP Q13224
B	4	GLY	-	expression tag	UNP Q13224
B	5	GLY	-	expression tag	UNP Q13224
B	6	GLY	-	expression tag	UNP Q13224
B	7	SER	-	expression tag	UNP Q13224
B	8	GLY	-	expression tag	UNP Q13224
B	9	GLY	-	expression tag	UNP Q13224
B	10	SER	-	expression tag	UNP Q13224
B	11	ALA	-	expression tag	UNP Q13224
B	12	TRP	-	expression tag	UNP Q13224
B	13	SER	-	expression tag	UNP Q13224
B	14	HIS	-	expression tag	UNP Q13224
B	15	PRO	-	expression tag	UNP Q13224
B	16	GLN	-	expression tag	UNP Q13224
B	17	PHE	-	expression tag	UNP Q13224
B	18	GLU	-	expression tag	UNP Q13224
B	19	LYS	-	expression tag	UNP Q13224
B	20	GLY	-	expression tag	UNP Q13224
B	21	ALA	-	expression tag	UNP Q13224
B	22	LEU	-	expression tag	UNP Q13224
B	23	VAL	-	expression tag	UNP Q13224
B	24	PRO	-	expression tag	UNP Q13224
B	25	ARG	-	expression tag	UNP Q13224
B	26	GLY	-	expression tag	UNP Q13224
B	588	SER	CYS	conflict	UNP Q13224
B	838	SER	CYS	engineered mutation	UNP Q13224
B	849	SER	CYS	engineered mutation	UNP Q13224
B	853	GLY	-	expression tag	UNP Q13224
B	854	PRO	-	expression tag	UNP Q13224
B	855	GLY	-	expression tag	UNP Q13224
B	856	SER	-	expression tag	UNP Q13224
B	857	GLY	-	expression tag	UNP Q13224
B	858	ALA	-	expression tag	UNP Q13224
B	859	THR	-	expression tag	UNP Q13224
B	860	ASN	-	expression tag	UNP Q13224
B	861	PHE	-	expression tag	UNP Q13224
B	862	SER	-	expression tag	UNP Q13224
B	863	LEU	-	expression tag	UNP Q13224
B	864	LEU	-	expression tag	UNP Q13224
B	865	LYS	-	expression tag	UNP Q13224

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Chain	Residue	Modelled	Actual	Comment	Reference
B	866	GLN	-	expression tag	UNP Q13224
B	867	ALA	-	expression tag	UNP Q13224
B	868	GLY	-	expression tag	UNP Q13224
B	869	ASP	-	expression tag	UNP Q13224
B	870	VAL	-	expression tag	UNP Q13224
B	871	GLU	-	expression tag	UNP Q13224
B	872	GLU	-	expression tag	UNP Q13224
B	873	ASN	-	expression tag	UNP Q13224
B	874	PRO	-	expression tag	UNP Q13224
B	875	GLY	-	expression tag	UNP Q13224

- Molecule 3 is a protein called Glutamate receptor ionotropic, NMDA 2D.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	D	763	Total	C	N	O	S	0	0
			5870	3774	996	1071	29		

There are 8 discrepancies between the modelled and reference sequences:

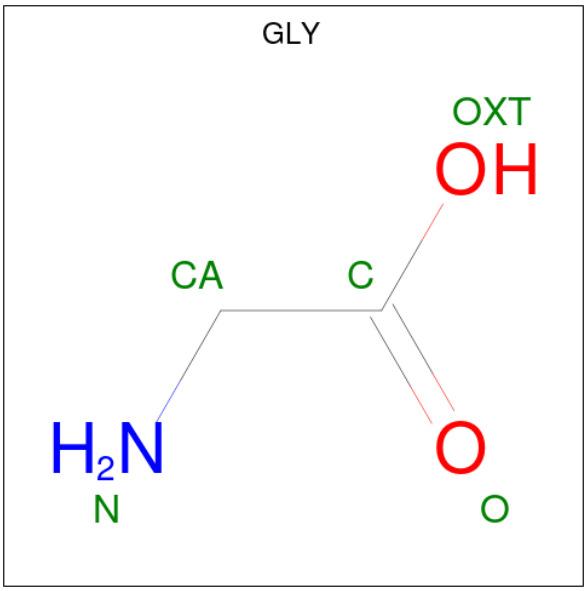
Chain	Residue	Modelled	Actual	Comment	Reference
D	881	GLU	-	expression tag	UNP O15399
D	882	THR	-	expression tag	UNP O15399
D	883	SER	-	expression tag	UNP O15399
D	884	GLN	-	expression tag	UNP O15399
D	885	VAL	-	expression tag	UNP O15399
D	886	ALA	-	expression tag	UNP O15399
D	887	PRO	-	expression tag	UNP O15399
D	888	ALA	-	expression tag	UNP O15399

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



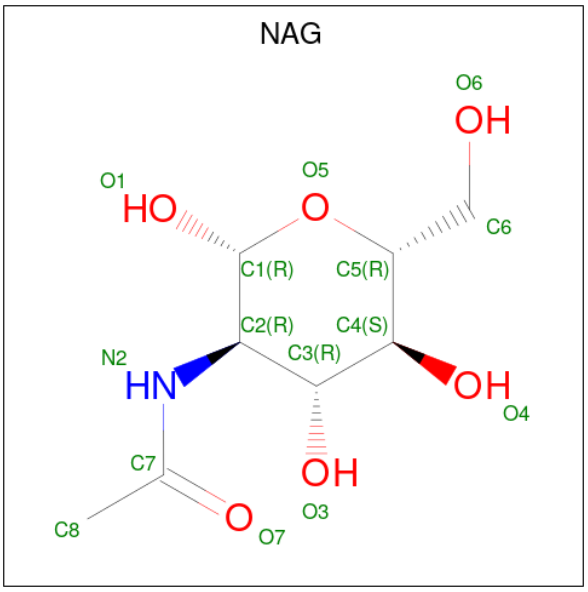
Mol	Chain	Residues	Atoms				AltConf	Trace
4	E	2	Total	C	N	O	0	0
			28	16	2	10		

- Molecule 5 is GLYCINE (CCD ID: GLY) (formula: $C_2H_5NO_2$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms				AltConf
5	A	1	Total	C	N	O	0
			5	2	1	2	
5	C	1	Total	C	N	O	0
			5	2	1	2	

- Molecule 6 is 2-acetamido-2-deoxy-beta-D-glucopyranose (CCD ID: NAG) (formula: $C_8H_{15}NO_6$).



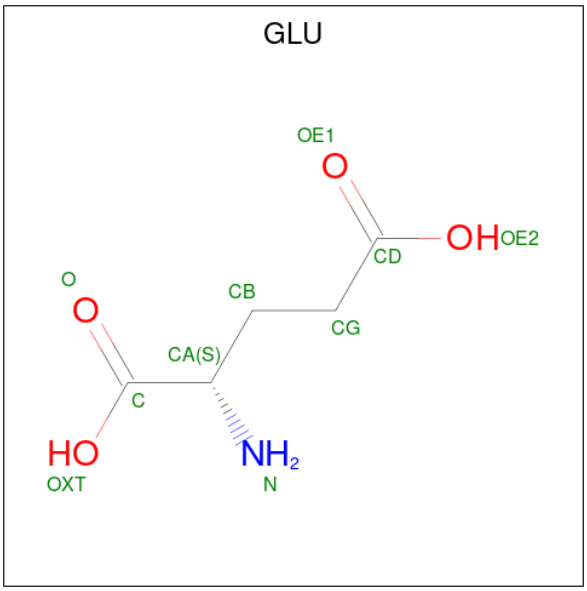
Mol	Chain	Residues	Atoms				AltConf
6	A	1	Total	C	N	O	0
			14	8	1	5	

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Mol	Chain	Residues	Atoms				AltConf
6	B	1	Total	C	N	O	0
			14	8	1	5	
6	C	1	Total	C	N	O	0
			14	8	1	5	
6	D	1	Total	C	N	O	0
			14	8	1	5	

- Molecule 7 is GLUTAMIC ACID (CCD ID: GLU) (formula: $C_5H_9NO_4$) (labeled as "Ligand of Interest" by depositor).



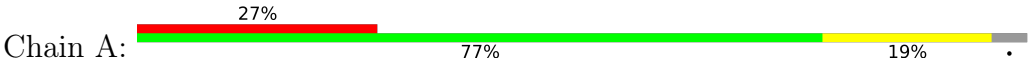
Mol	Chain	Residues	Atoms				AltConf
7	B	1	Total	C	N	O	0
			10	5	1	4	
7	D	1	Total	C	N	O	0
			10	5	1	4	

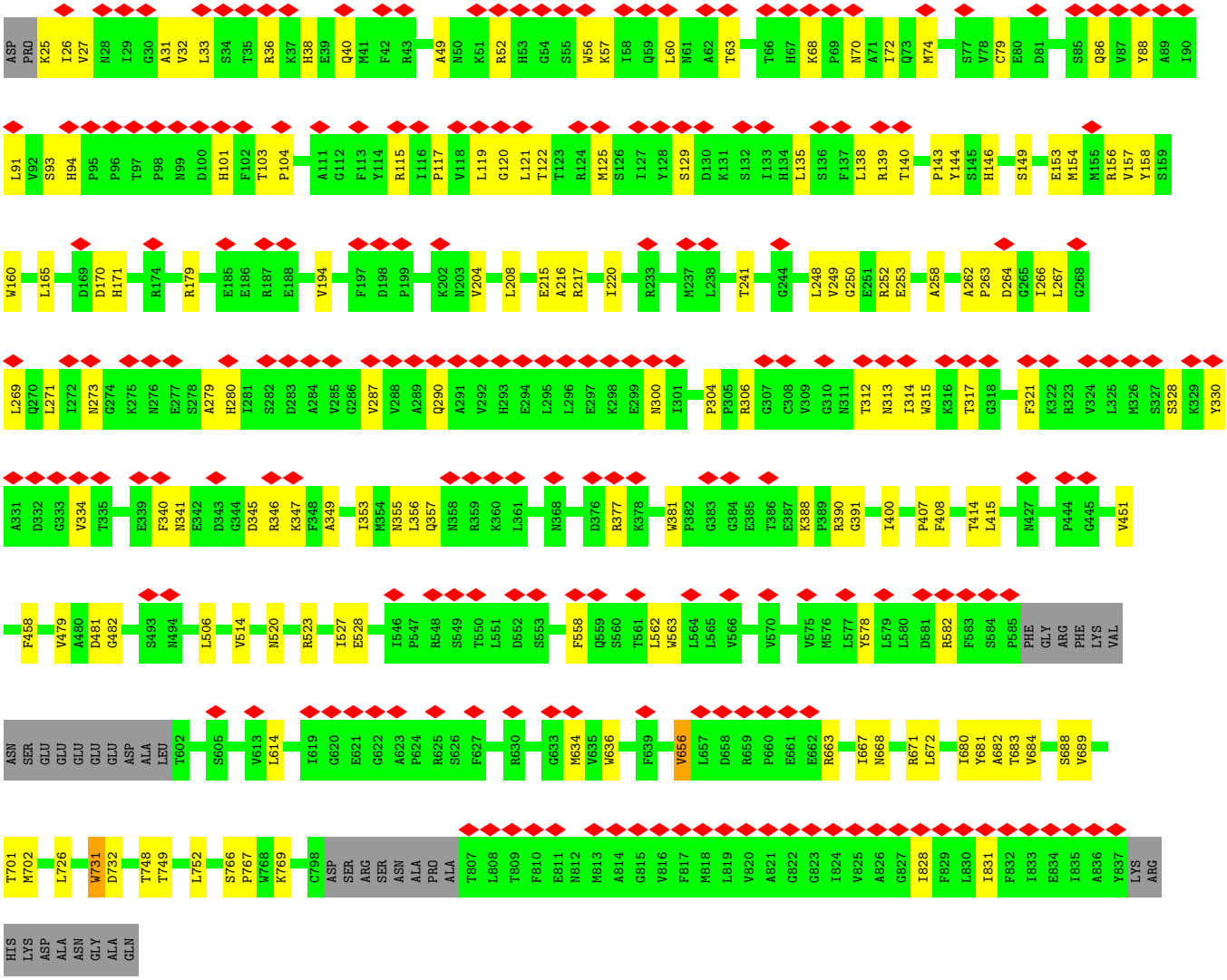
3 Residue-property plots (i)

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: Glutamate receptor ionotropic, NMDA 1

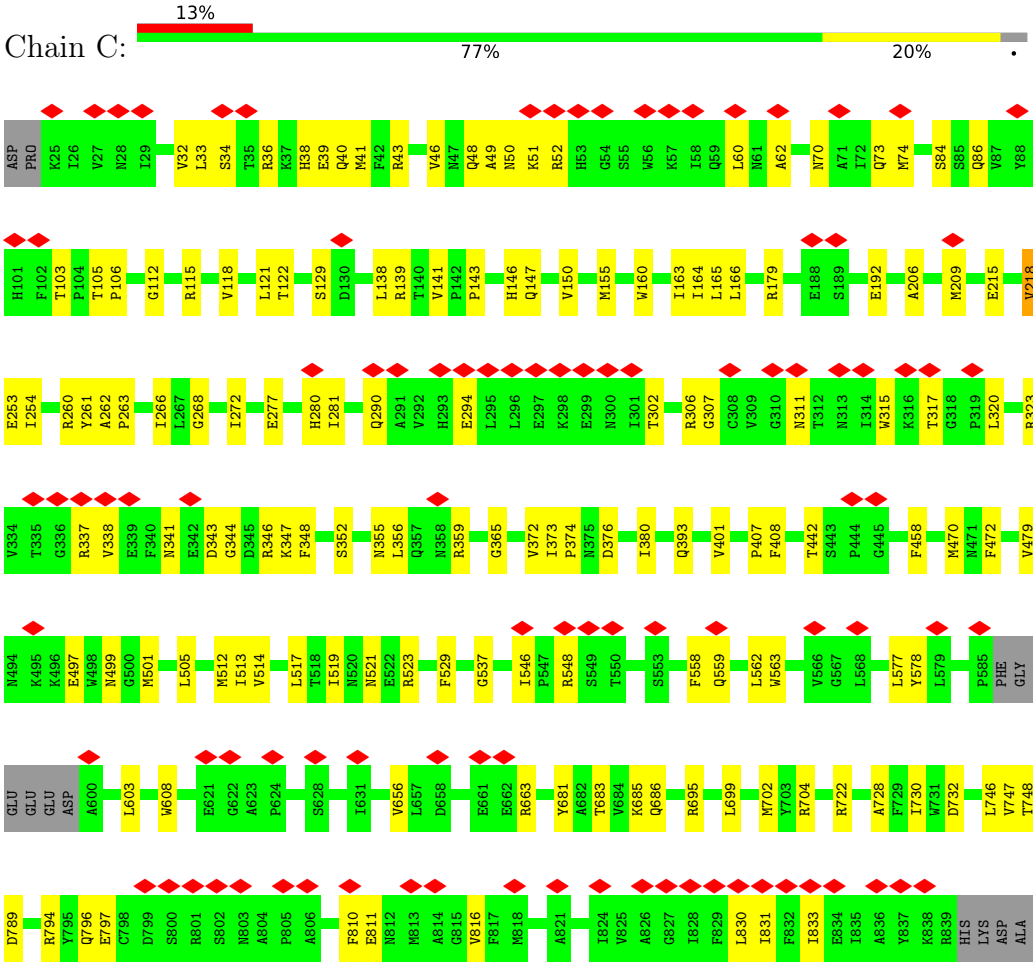
Chain A:





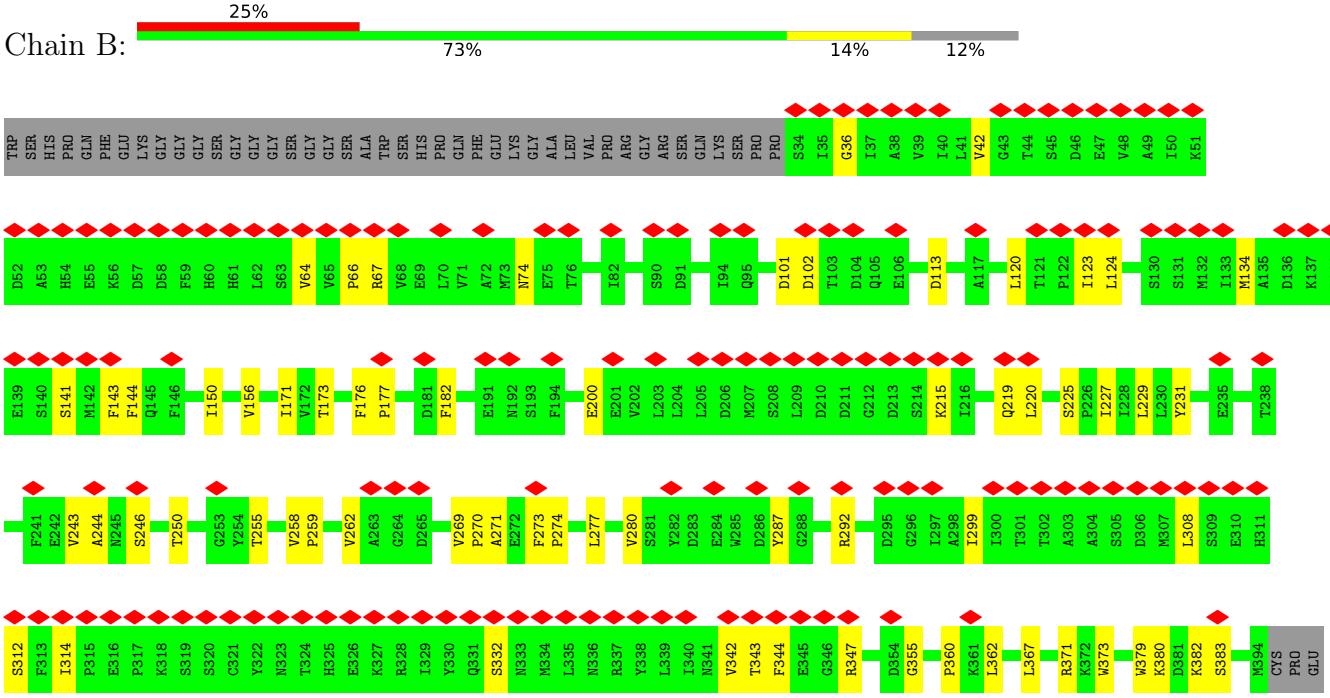
• Molecule 1: Glutamate receptor ionotropic, NMDA 1

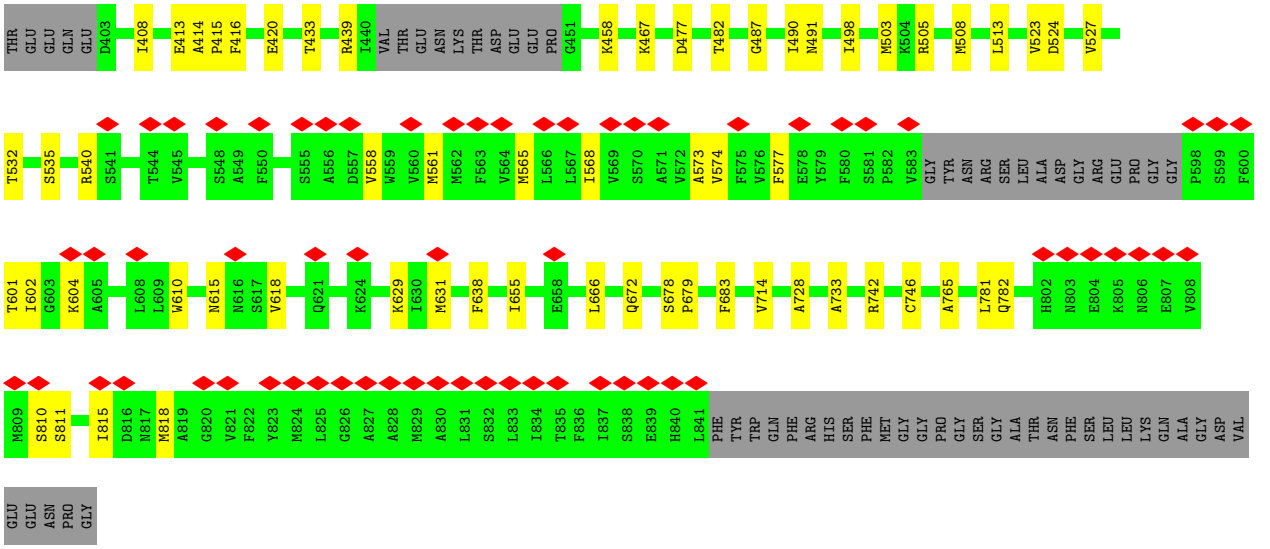
Chain C:



• Molecule 2: Glutamate receptor ionotropic, NMDA 2B

Chain B:

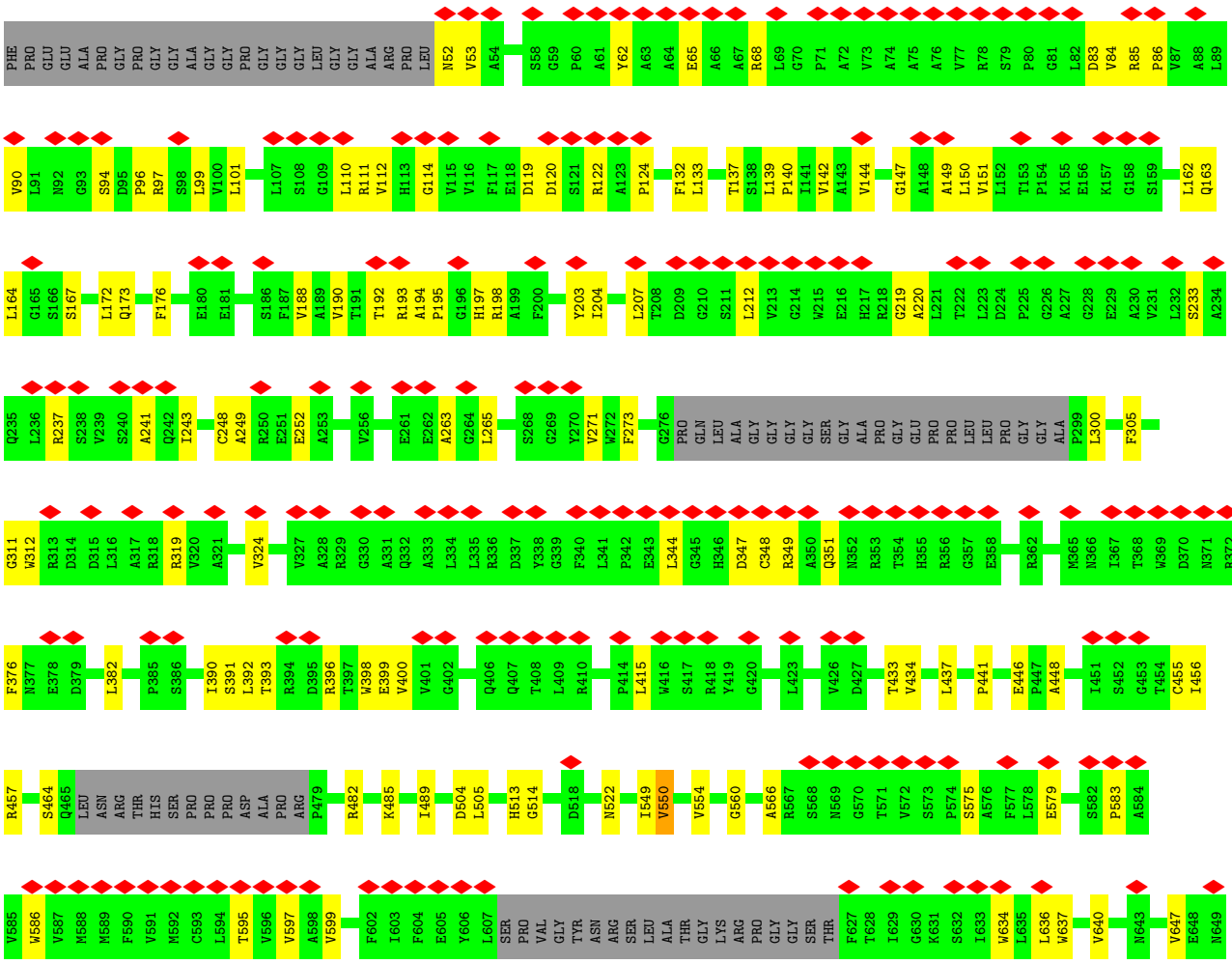


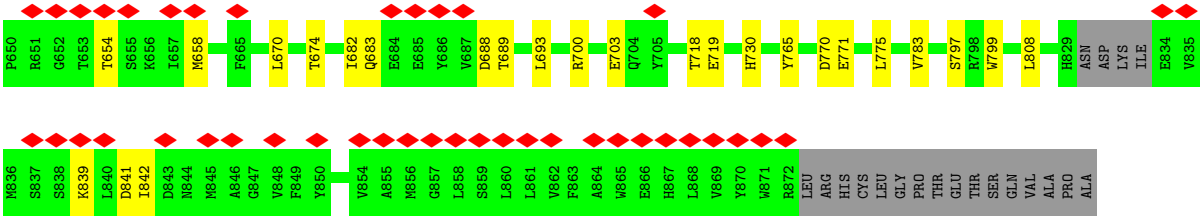


• Molecule 3: Glutamate receptor ionotropic, NMDA 2D

Chain D:

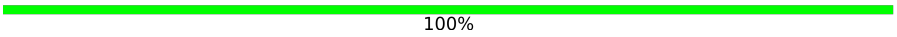






• Molecule 4: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain E:





4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	133433	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	NONE	Depositor
Microscope	TFS KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/Å^2$)	75.3	Depositor
Minimum defocus (nm)	1000	Depositor
Maximum defocus (nm)	2400	Depositor
Magnification	Not provided	
Image detector	GATAN K3 BIOQUANTUM (6k x 4k)	Depositor
Maximum map value	3.066	Depositor
Minimum map value	-1.971	Depositor
Average map value	0.001	Depositor
Map value standard deviation	0.046	Depositor
Recommended contour level	0.25	Depositor
Map size (Å)	342.4, 342.4, 342.4	wwPDB
Map dimensions	400, 400, 400	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.856, 0.856, 0.856	Depositor

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: NAG

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	0.13	0/6299	0.27	0/8544
1	C	0.15	0/6388	0.28	0/8672
2	B	0.13	0/6006	0.26	0/8167
3	D	0.11	0/6008	0.26	0/8179
All	All	0.13	0/24701	0.27	0/33562

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts

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	6161	0	6095	96	0
1	C	6246	0	6162	106	0
2	B	5879	0	5682	80	0
3	D	5870	0	5771	96	0
4	E	28	0	25	0	0
5	A	5	0	2	1	0
5	C	5	0	2	2	0
6	A	14	0	13	0	0
6	B	14	0	13	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
6	C	14	0	13	0	0
6	D	14	0	13	0	0
7	B	10	0	5	0	0
7	D	10	0	5	2	0
All	All	24270	0	23801	357	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 7.

All (357) 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:C:129:SER:HB2	1:C:139:ARG:HH22	1.47	0.76
3:D:119:ASP:HB3	3:D:147:GLY:H	1.55	0.72
1:A:217:ARG:HB2	1:A:391:GLY:HA2	1.71	0.71
1:C:499:ASN:ND2	1:C:686:GLN:OE1	2.25	0.69
3:D:52:ASN:N	3:D:83:ASP:O	2.26	0.68
3:D:549:ILE:HG13	3:D:550:VAL:HG12	1.74	0.68
1:C:33:LEU:HD12	1:C:39:GLU:HG2	1.75	0.67
1:C:48:GLN:O	1:C:52:ARG:NH1	2.28	0.67
3:D:194:ALA:HB3	3:D:197:HIS:HB3	1.75	0.67
1:A:663:ARG:O	1:A:671:ARG:NH2	2.29	0.66
3:D:455:CYS:SG	3:D:456:ILE:N	2.67	0.66
1:A:523:ARG:HH21	1:A:688:SER:HB2	1.60	0.66
2:B:227:ILE:HG22	2:B:255:THR:HB	1.79	0.65
1:C:523:ARG:NH2	5:C:901:GLY:OXT	2.28	0.64
3:D:513:HIS:ND1	7:D:901:GLU:OXT	2.27	0.64
1:C:34:SER:HB2	1:C:96:PRO:HD3	1.78	0.64
1:A:290:GLN:HE22	1:A:330:TYR:HB2	1.61	0.64
2:B:573:ALA:HA	2:B:577:PHE:HD2	1.63	0.63
1:C:290:GLN:NE2	1:C:294:GLU:OE2	2.32	0.63
1:A:388:LYS:HG3	1:A:390:ARG:HH22	1.63	0.63
1:A:290:GLN:NE2	1:A:328:SER:OG	2.32	0.63
2:B:782:GLN:OE1	1:C:521:ASN:ND2	2.32	0.62
1:C:263:PRO:HG2	1:C:266:ILE:HG12	1.81	0.62
1:A:273:ASN:O	1:A:280:HIS:NE2	2.33	0.62
1:A:656:VAL:HG12	3:D:683:GLN:HE22	1.64	0.62
2:B:36:GLY:HA2	2:B:67:ARG:HB2	1.82	0.62
2:B:408:ILE:HG12	2:B:508:MET:HB3	1.82	0.62
1:A:279:ALA:HB1	1:A:334:VAL:HG21	1.81	0.62
1:C:317:THR:HA	1:C:320:LEU:HD13	1.82	0.61

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:578:TYR:OH	1:A:582:ARG:NH1	2.33	0.61
3:D:111:ARG:NH1	3:D:347:ASP:OD1	2.33	0.61
3:D:248:CYS:SG	3:D:249:ALA:N	2.73	0.61
1:A:562:LEU:HD13	2:B:815:ILE:HD13	1.82	0.61
1:A:125:MET:O	1:A:139:ARG:NH1	2.31	0.61
1:C:355:ASN:OD1	1:C:356:LEU:N	2.32	0.60
1:C:789:ASP:OD1	1:C:794:ARG:NH1	2.34	0.60
1:C:122:THR:H	1:C:141:VAL:HG21	1.66	0.60
1:A:86:GLN:HG2	1:A:306:ARG:HH22	1.66	0.60
1:A:165:LEU:HB3	1:A:194:VAL:HG12	1.83	0.59
1:C:254:ILE:HD11	1:C:268:GLY:HA3	1.84	0.59
3:D:172:LEU:HD22	3:D:203:TYR:HD2	1.66	0.59
2:B:666:LEU:O	2:B:672:GLN:NE2	2.36	0.59
1:C:830:LEU:HD13	1:C:833:ILE:HD11	1.84	0.59
3:D:300:LEU:H	3:D:396:ARG:HH12	1.51	0.59
3:D:142:VAL:HG22	3:D:162:LEU:HB2	1.84	0.59
2:B:420:GLU:OE1	2:B:458:LYS:NZ	2.32	0.58
2:B:273:PHE:O	2:B:371:ARG:NH1	2.36	0.58
1:A:732:ASP:OD2	5:A:901:GLY:N	2.36	0.58
2:B:523:VAL:HG21	2:B:765:ALA:HB1	1.86	0.58
1:C:762:MET:HE1	1:C:769:LYS:HA	1.84	0.58
1:C:341:ASN:HB3	1:C:347:LYS:HE2	1.86	0.58
3:D:65:GLU:O	3:D:68:ARG:NH1	2.32	0.58
2:B:173:THR:HG23	2:B:231:TYR:HB3	1.84	0.58
3:D:634:TRP:HD1	3:D:647:VAL:HG12	1.67	0.58
2:B:540:ARG:NH1	2:B:746:CYS:O	2.37	0.58
1:C:732:ASP:OD2	5:C:901:GLY:N	2.37	0.57
1:C:811:GLU:N	1:C:811:GLU:OE1	2.33	0.57
1:A:341:ASN:ND2	1:A:345:ASP:O	2.37	0.57
3:D:311:GLY:O	3:D:319:ARG:NH2	2.37	0.57
1:A:752:LEU:HD12	1:A:752:LEU:H	1.69	0.57
1:C:86:GLN:HB2	1:C:306:ARG:HD3	1.86	0.57
2:B:64:VAL:HG23	2:B:66:PRO:HD3	1.87	0.57
2:B:683:PHE:HB3	2:B:728:ALA:HB3	1.86	0.57
1:C:356:LEU:HD11	1:C:359:ARG:HH21	1.70	0.57
1:A:115:ARG:HH12	1:A:135:LEU:HD23	1.70	0.56
3:D:700:ARG:NH1	3:D:703:GLU:OE1	2.37	0.56
1:C:704:ARG:HH12	3:D:212:LEU:HD22	1.70	0.56
3:D:841:ASP:OD1	3:D:842:ILE:N	2.37	0.56
1:C:332:ASP:OD1	1:C:333:GLY:N	2.38	0.56
1:A:264:ASP:HA	1:A:356:LEU:HD22	1.87	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:164:ILE:HG22	1:C:192:GLU:HB3	1.87	0.56
1:C:681:TYR:HB3	1:C:728:ALA:HB3	1.88	0.56
1:A:120:GLY:N	1:A:138:LEU:O	2.39	0.56
1:A:153:GLU:HG3	1:A:156:ARG:HH21	1.70	0.56
3:D:188:VAL:HG23	3:D:241:ALA:HB3	1.87	0.55
2:B:655:ILE:HD12	1:C:656:VAL:HG11	1.87	0.55
1:A:49:ALA:HA	1:A:52:ARG:HD3	1.89	0.55
1:A:149:SER:OG	1:A:179:ARG:NH2	2.39	0.55
2:B:308:LEU:HD12	2:B:312:SER:HA	1.89	0.55
1:C:512:MET:HG2	1:C:514:VAL:HG23	1.87	0.55
2:B:433:THR:HG22	2:B:458:LYS:HB3	1.88	0.55
2:B:379:TRP:HZ2	2:B:382:LYS:HD2	1.72	0.55
1:C:262:ALA:HB1	1:C:266:ILE:HD11	1.88	0.55
3:D:504:ASP:N	3:D:504:ASP:OD1	2.39	0.54
1:C:84:SER:O	1:C:306:ARG:NE	2.38	0.54
3:D:347:ASP:HB2	3:D:351:GLN:HE22	1.72	0.54
1:C:147:GLN:HE22	1:C:251:GLU:HB2	1.72	0.54
1:C:663:ARG:HH21	1:C:747:VAL:HG11	1.71	0.54
3:D:173:GLN:HB3	3:D:203:TYR:HE2	1.73	0.54
3:D:194:ALA:O	3:D:197:HIS:ND1	2.39	0.54
3:D:597:VAL:HG12	3:D:636:LEU:HD12	1.89	0.54
1:C:112:GLY:O	1:C:115:ARG:NH1	2.39	0.54
1:A:355:ASN:OD1	1:A:356:LEU:N	2.40	0.54
2:B:574:VAL:HG11	2:B:602:ILE:HG22	1.89	0.54
1:A:481:ASP:OD1	1:A:482:GLY:N	2.41	0.54
2:B:360:PRO:HG2	2:B:362:LEU:HD11	1.90	0.54
3:D:176:PHE:HD2	3:D:207:LEU:HD12	1.73	0.54
2:B:678:SER:HB2	2:B:679:PRO:HD2	1.91	0.53
3:D:554:VAL:HG11	3:D:808:LEU:HD21	1.89	0.53
3:D:114:GLY:H	3:D:139:LEU:HD11	1.72	0.53
1:A:250:GLY:N	1:A:253:GLU:OE2	2.41	0.53
2:B:269:VAL:HG12	2:B:271:ALA:H	1.73	0.53
2:B:535:SER:HB2	2:B:733:ALA:HB2	1.91	0.53
1:C:704:ARG:HH22	3:D:212:LEU:HD13	1.73	0.53
3:D:83:ASP:OD2	3:D:85:ARG:NH1	2.41	0.53
2:B:558:VAL:HA	2:B:561:MET:HE2	1.91	0.53
1:C:38:HIS:HD2	1:C:277:GLU:HG3	1.74	0.53
3:D:144:VAL:HA	3:D:164:LEU:HD12	1.90	0.53
1:C:330:TYR:HB3	1:C:338:VAL:HB	1.91	0.53
1:A:506:LEU:HD21	1:A:527:ILE:HG22	1.89	0.52
1:C:546:ILE:HG22	1:C:548:ARG:H	1.74	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:565:MET:HA	2:B:568:ILE:HG12	1.92	0.52
2:B:258:VAL:HB	2:B:262:VAL:HG21	1.91	0.52
1:C:311:ASN:O	3:D:94:SER:OG	2.28	0.52
3:D:243:ILE:HG23	3:D:271:VAL:HG23	1.91	0.52
2:B:277:LEU:HD23	2:B:373:TRP:HH2	1.75	0.52
3:D:188:VAL:HG13	3:D:219:GLY:HA2	1.90	0.52
1:C:73:GLN:HE21	3:D:349:ARG:HD2	1.73	0.51
1:A:68:LYS:HB2	1:A:74:MET:HE3	1.92	0.51
3:D:797:SER:C	3:D:799:TRP:H	2.19	0.51
1:C:558:PHE:HD2	1:C:563:TRP:HE1	1.57	0.51
2:B:601:THR:HG22	2:B:604:LYS:HE2	1.92	0.51
1:A:119:LEU:HD23	1:A:138:LEU:HB2	1.93	0.51
2:B:380:LYS:O	2:B:383:SER:OG	2.27	0.50
1:C:121:LEU:HD13	1:C:280:HIS:HB2	1.93	0.50
1:C:497:GLU:N	1:C:497:GLU:OE1	2.44	0.50
1:A:253:GLU:N	1:A:253:GLU:OE1	2.44	0.50
2:B:101:ASP:OD1	2:B:102:ASP:N	2.43	0.50
2:B:540:ARG:HH12	2:B:746:CYS:HB3	1.77	0.50
1:C:49:ALA:HA	1:C:52:ARG:HD3	1.93	0.50
3:D:149:ALA:O	3:D:163:GLN:NE2	2.44	0.50
3:D:583:PRO:HA	3:D:586:TRP:CE2	2.47	0.50
1:A:33:LEU:HD13	1:A:38:HIS:HB3	1.94	0.50
1:A:400:ILE:HG21	1:A:514:VAL:HG22	1.92	0.50
1:C:341:ASN:ND2	1:C:343:ASP:H	2.08	0.50
1:C:407:PRO:HG2	1:C:408:PHE:HD1	1.77	0.50
3:D:688:ASP:OD1	3:D:689:THR:N	2.44	0.50
2:B:42:VAL:HG13	2:B:74:ASN:HA	1.93	0.50
1:A:681:TYR:OH	1:A:702:MET:HB2	2.11	0.50
1:A:828:ILE:HA	1:A:831:ILE:HD12	1.94	0.50
1:C:685:LYS:HG2	1:C:686:GLN:HG3	1.92	0.50
2:B:344:PHE:HB3	2:B:347:ARG:HD2	1.92	0.50
2:B:220:LEU:HD21	2:B:244:ALA:HA	1.94	0.49
1:C:374:PRO:O	1:C:376:ASP:N	2.44	0.49
1:A:157:VAL:HG23	1:A:158:TYR:HD1	1.75	0.49
1:A:663:ARG:HD2	1:A:749:THR:HG21	1.94	0.49
2:B:524:ASP:N	2:B:524:ASP:OD1	2.44	0.49
2:B:113:ASP:OD1	2:B:141:SER:OG	2.29	0.49
2:B:477:ASP:OD1	2:B:477:ASP:N	2.45	0.49
1:C:330:TYR:CZ	1:C:332:ASP:HB3	2.47	0.49
1:C:470:MET:HE2	1:C:472:PHE:HE2	1.77	0.49
1:A:346:ARG:HH12	1:A:349:ALA:HA	1.77	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:D:96:PRO:HA	3:D:99:LEU:HB2	1.93	0.49
3:D:172:LEU:HD21	3:D:204:ILE:HD13	1.94	0.49
1:C:215:GLU:HB2	1:C:393:GLN:H	1.77	0.49
2:B:171:ILE:HA	2:B:229:LEU:HB2	1.95	0.48
1:A:287:VAL:HG12	1:A:330:TYR:HB3	1.96	0.48
2:B:124:LEU:HD22	2:B:144:PHE:HB2	1.96	0.48
2:B:243:VAL:O	2:B:246:SER:OG	2.24	0.48
1:C:341:ASN:OD1	1:C:347:LYS:NZ	2.38	0.48
3:D:348:CYS:SG	3:D:349:ARG:HG2	2.53	0.48
1:A:634:MET:HG3	2:B:610:TRP:CE2	2.49	0.48
3:D:273:PHE:HD1	3:D:305:PHE:HB2	1.78	0.48
1:C:166:LEU:HD13	1:C:219:ILE:HG23	1.96	0.48
1:A:731:TRP:HA	1:A:731:TRP:CE3	2.49	0.47
3:D:124:PRO:HB3	3:D:150:LEU:HD13	1.95	0.47
1:A:140:THR:HG22	1:A:340:PHE:HZ	1.78	0.47
3:D:273:PHE:CD1	3:D:305:PHE:HB2	2.50	0.47
2:B:144:PHE:HD2	2:B:355:GLY:HA2	1.78	0.47
2:B:367:LEU:HD11	2:B:371:ARG:HA	1.96	0.47
3:D:719:GLU:OE2	3:D:730:HIS:NE2	2.36	0.47
1:C:681:TYR:OH	1:C:702:MET:HB2	2.14	0.47
2:B:231:TYR:CD1	2:B:259:PRO:HG3	2.50	0.47
1:C:41:MET:SD	1:C:41:MET:N	2.79	0.47
2:B:573:ALA:HA	2:B:577:PHE:CD2	2.46	0.47
3:D:84:VAL:HG22	3:D:86:PRO:HD3	1.96	0.47
3:D:233:SER:OG	3:D:237:ARG:NH1	2.43	0.47
3:D:575:SER:OG	3:D:579:GLU:OE1	2.31	0.47
1:A:129:SER:HB2	1:A:139:ARG:HH21	1.80	0.47
2:B:270:PRO:HD2	2:B:273:PHE:HE2	1.78	0.47
1:C:97:THR:OG1	1:C:99:ASN:OD1	2.28	0.47
3:D:514:GLY:HA2	3:D:522:ASN:O	2.15	0.47
3:D:566:ALA:HA	3:D:775:LEU:HD23	1.97	0.47
1:A:56:TRP:CD1	1:A:57:LYS:HG2	2.50	0.47
3:D:151:VAL:HG21	3:D:167:SER:HA	1.97	0.47
1:A:520:ASN:HB3	1:A:523:ARG:HG3	1.96	0.47
2:B:250:THR:HB	2:B:274:PRO:HB3	1.97	0.47
1:C:347:LYS:HA	1:C:347:LYS:HD3	1.66	0.47
1:A:341:ASN:HD22	1:A:347:LYS:HB2	1.80	0.46
1:C:315:TRP:H	1:C:315:TRP:CD1	2.32	0.46
2:B:343:THR:HG23	2:B:347:ARG:H	1.80	0.46
2:B:299:ILE:HG23	2:B:342:VAL:HG11	1.96	0.46
1:A:313:ASN:OD1	1:A:314:ILE:N	2.39	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:138:LEU:HG	1:C:344:GLY:HA3	1.97	0.46
3:D:110:LEU:HB3	3:D:112:VAL:HG13	1.97	0.46
3:D:192:THR:OG1	3:D:193:ARG:N	2.48	0.46
3:D:437:LEU:HD23	3:D:513:HIS:HD2	1.81	0.46
2:B:439:ARG:HB3	2:B:482:THR:HG21	1.97	0.46
1:C:562:LEU:HD13	3:D:842:ILE:HG12	1.97	0.46
1:C:656:VAL:HG21	3:D:682:ILE:HD13	1.98	0.46
2:B:742:ARG:HA	2:B:742:ARG:HD3	1.79	0.46
1:A:117:PRO:HG2	1:A:321:PHE:CD2	2.51	0.46
2:B:577:PHE:HD1	1:C:831:ILE:HD11	1.80	0.46
3:D:97:ARG:HH22	3:D:101:LEU:HD11	1.80	0.46
1:C:36:ARG:O	1:C:40:GLN:NE2	2.45	0.46
3:D:52:ASN:HD21	3:D:110:LEU:HG	1.80	0.46
1:A:271:LEU:HD23	1:A:271:LEU:H	1.81	0.46
3:D:122:ARG:HH22	3:D:312:TRP:HH2	1.63	0.46
3:D:237:ARG:HH22	3:D:263:ALA:HB1	1.81	0.46
3:D:446:GLU:OE1	3:D:485:LYS:NZ	2.49	0.45
1:C:320:LEU:HA	1:C:323:ARG:HE	1.81	0.45
3:D:83:ASP:N	3:D:83:ASP:OD1	2.49	0.45
2:B:273:PHE:HB3	2:B:277:LEU:HD22	1.98	0.45
1:C:408:PHE:O	1:C:458:PHE:N	2.49	0.45
1:C:722:ARG:HG2	1:C:746:LEU:HD11	1.97	0.45
2:B:156:VAL:HG22	2:B:379:TRP:CZ3	2.51	0.45
3:D:390:ILE:HG13	3:D:400:VAL:HG22	1.99	0.45
1:C:43:ARG:HG2	1:C:62:ALA:HB2	1.98	0.45
3:D:718:THR:OG1	7:D:901:GLU:OE1	2.22	0.45
1:A:91:LEU:HD13	1:A:121:LEU:HD11	1.99	0.45
3:D:237:ARG:HH21	3:D:265:LEU:HD11	1.82	0.45
1:C:50:ASN:OD1	1:C:51:LYS:N	2.50	0.45
2:B:200:GLU:OE2	2:B:225:SER:OG	2.32	0.45
2:B:467:LYS:HE3	2:B:467:LYS:HB2	1.85	0.45
2:B:678:SER:O	2:B:679:PRO:C	2.58	0.45
3:D:119:ASP:OD1	3:D:120:ASP:N	2.50	0.45
1:A:414:THR:OG1	1:A:415:LEU:N	2.50	0.44
2:B:413:GLU:HG2	2:B:416:PHE:HD2	1.81	0.44
1:A:103:THR:HB	1:A:104:PRO:HD3	1.99	0.44
1:A:407:PRO:HG2	1:A:408:PHE:HD1	1.82	0.44
1:C:219:ILE:HD12	1:C:219:ILE:H	1.82	0.44
3:D:173:GLN:OE1	3:D:203:TYR:OH	2.31	0.44
2:B:527:VAL:HG11	2:B:781:LEU:HD21	2.00	0.44
1:C:501:MET:HE3	1:C:517:LEU:HD13	1.98	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:796:GLN:OE1	1:C:797:GLU:N	2.48	0.44
1:C:147:GLN:O	1:C:150:VAL:HG12	2.18	0.44
3:D:62:TYR:HE2	3:D:120:ASP:HB2	1.83	0.44
1:A:634:MET:HE3	1:A:634:MET:HB2	1.88	0.44
1:A:315:TRP:H	1:A:315:TRP:CD1	2.36	0.44
2:B:287:TYR:CE2	2:B:292:ARG:HG2	2.53	0.44
1:A:93:SER:O	1:A:122:THR:OG1	2.36	0.44
2:B:308:LEU:HB2	2:B:314:ILE:HD11	2.00	0.43
1:C:277:GLU:H	1:C:277:GLU:CD	2.26	0.43
1:A:304:PRO:HG2	1:A:306:ARG:NH2	2.33	0.43
2:B:498:ILE:HD12	2:B:498:ILE:HA	1.90	0.43
3:D:489:ILE:HD12	3:D:505:LEU:HD21	2.01	0.43
2:B:176:PHE:CG	2:B:177:PRO:HD2	2.52	0.43
2:B:810:SER:OG	2:B:811:SER:N	2.52	0.43
3:D:634:TRP:CD1	3:D:647:VAL:HG12	2.52	0.43
1:A:101:HIS:ND1	1:A:125:MET:HG3	2.33	0.43
2:B:577:PHE:HA	1:C:831:ILE:HD11	2.01	0.43
3:D:195:PRO:O	3:D:198:ARG:NH2	2.45	0.43
3:D:344:LEU:H	3:D:344:LEU:HD12	1.82	0.43
1:A:70:ASN:HD21	1:A:72:ILE:HD12	1.84	0.43
2:B:513:LEU:HD23	2:B:513:LEU:HA	1.78	0.43
1:A:263:PRO:HD2	1:A:266:ILE:HD11	1.99	0.43
1:A:667:ILE:HG13	1:A:668:ASN:H	1.84	0.43
1:C:272:ILE:HD11	1:C:352:SER:HB3	2.00	0.43
2:B:561:MET:HE1	1:C:810:PHE:CD1	2.54	0.43
1:C:74:MET:HE2	1:C:74:MET:HB2	1.90	0.43
1:A:170:ASP:OD1	1:A:171:HIS:N	2.48	0.43
1:C:365:GLY:HA2	1:C:374:PRO:HD2	2.00	0.43
1:A:25:LYS:HB3	1:A:26:ILE:H	1.62	0.42
1:A:154:MET:HE1	1:A:267:LEU:HD21	2.01	0.42
1:C:139:ARG:HH21	1:C:143:PRO:HG3	1.84	0.42
3:D:139:LEU:HD12	3:D:140:PRO:HD2	1.99	0.42
1:C:106:PRO:HG3	3:D:132:PHE:HE1	1.84	0.42
1:C:155:MET:HB2	1:C:160:TRP:HB2	2.01	0.42
1:C:277:GLU:O	1:C:281:ILE:HG13	2.19	0.42
1:A:94:HIS:HB2	1:A:122:THR:HG21	2.02	0.42
1:A:160:TRP:HZ3	1:A:248:LEU:HD21	1.84	0.42
1:A:667:ILE:HD12	1:A:672:LEU:HD23	2.02	0.42
1:C:338:VAL:HG22	1:C:346:ARG:HH12	1.84	0.42
1:C:704:ARG:CD	3:D:456:ILE:HD11	2.48	0.42
3:D:448:ALA:HB2	3:D:482:ARG:HA	2.01	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:828:ILE:HD13	1:A:831:ILE:HD12	2.01	0.42
2:B:487:GLY:HA3	2:B:498:ILE:HG22	2.01	0.42
1:C:521:ASN:HB3	1:C:695:ARG:HH12	1.84	0.42
3:D:53:VAL:HG11	3:D:324:VAL:HG12	2.01	0.42
3:D:376:PHE:HD1	3:D:382:LEU:HA	1.84	0.42
1:A:614:LEU:HD11	1:A:636:TRP:CZ2	2.54	0.42
3:D:248:CYS:SG	3:D:252:GLU:HB3	2.60	0.42
1:A:558:PHE:HB2	1:A:563:TRP:CZ2	2.55	0.42
1:C:46:VAL:HB	1:C:60:LEU:HB3	2.02	0.42
1:C:103:THR:O	1:C:106:PRO:HD2	2.19	0.42
1:C:519:ILE:HG22	1:C:529:PHE:CG	2.55	0.42
3:D:654:THR:O	3:D:658:MET:HG3	2.19	0.42
1:A:31:ALA:HB2	1:A:91:LEU:H	1.85	0.42
1:A:683:THR:OG1	1:A:689:VAL:HG21	2.20	0.42
1:C:683:THR:HG22	1:C:730:ILE:HB	2.02	0.42
3:D:560:GLY:HA3	3:D:783:VAL:HG12	2.01	0.42
1:A:143:PRO:HD2	1:A:146:HIS:CD2	2.55	0.42
1:A:216:ALA:O	1:A:217:ARG:NH1	2.40	0.42
2:B:414:ALA:HB3	2:B:415:PRO:HD3	2.00	0.42
1:C:146:HIS:CE1	1:C:179:ARG:HH22	2.38	0.42
1:A:27:VAL:HG22	1:A:88:TYR:HE2	1.85	0.42
1:A:144:TYR:CE2	1:A:252:ARG:HD3	2.55	0.42
1:A:220:ILE:HG12	1:A:248:LEU:HB2	2.00	0.42
1:A:315:TRP:CZ3	1:A:317:THR:HB	2.54	0.42
2:B:123:ILE:HG23	2:B:143:PHE:HD1	1.84	0.42
2:B:491:ASN:O	2:B:491:ASN:ND2	2.52	0.42
2:B:631:MET:HE3	2:B:631:MET:HB3	1.92	0.42
1:C:505:LEU:HB2	1:C:513:ILE:HD11	2.02	0.42
1:A:27:VAL:HG13	1:A:88:TYR:CD2	2.55	0.42
1:C:206:ALA:O	1:C:209:MET:HG2	2.20	0.42
1:C:372:VAL:O	1:C:374:PRO:HD3	2.20	0.42
1:A:408:PHE:O	1:A:458:PHE:N	2.52	0.41
1:C:578:TYR:CG	1:C:603:LEU:HB2	2.55	0.41
1:A:357:GLN:OE1	1:A:377:ARG:NH2	2.53	0.41
2:B:150:ILE:HD11	2:B:182:PHE:HB2	2.02	0.41
3:D:393:THR:HG23	3:D:399:GLU:CD	2.46	0.41
1:C:163:ILE:HG22	1:C:218:VAL:HG11	2.03	0.41
3:D:670:LEU:O	3:D:674:THR:HG22	2.20	0.41
1:A:36:ARG:O	1:A:40:GLN:HG2	2.21	0.41
1:A:258:ALA:O	1:A:262:ALA:N	2.54	0.41
2:B:215:LYS:O	2:B:219:GLN:HG2	2.21	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:503:MET:HG2	2:B:505:ARG:NH1	2.35	0.41
1:C:70:ASN:HB2	1:C:73:GLN:OE1	2.21	0.41
3:D:637:TRP:O	3:D:640:VAL:HG12	2.20	0.41
2:B:134:MET:HE2	2:B:134:MET:HB2	1.89	0.41
1:C:559:GLN:HG3	3:D:839:LYS:NZ	2.36	0.41
1:A:558:PHE:CD1	2:B:818:MET:HE1	2.55	0.41
2:B:120:LEU:HD12	2:B:332:SER:HB3	2.03	0.41
1:C:481:ASP:OD1	1:C:481:ASP:N	2.32	0.41
3:D:190:VAL:HG12	3:D:220:ALA:HB3	2.02	0.41
3:D:391:SER:OG	3:D:392:LEU:N	2.54	0.41
1:A:208:LEU:HD23	1:A:208:LEU:HA	1.92	0.41
1:C:253:GLU:OE1	1:C:253:GLU:N	2.54	0.41
1:C:577:LEU:HD13	1:C:577:LEU:HA	1.96	0.41
3:D:595:THR:O	3:D:599:VAL:HG23	2.20	0.41
3:D:693:LEU:HD12	3:D:693:LEU:H	1.84	0.41
1:A:27:VAL:O	1:A:60:LEU:HA	2.21	0.41
1:A:300:ASN:O	1:A:300:ASN:ND2	2.54	0.41
1:A:682:ALA:HB3	1:A:726:LEU:HD21	2.02	0.41
3:D:456:ILE:HG12	3:D:457:ARG:H	1.86	0.40
3:D:464:SER:HB2	3:D:482:ARG:HH21	1.87	0.40
1:A:269:LEU:HG	1:A:353:ILE:HG13	2.02	0.40
1:C:249:VAL:CG1	1:C:253:GLU:HB2	2.51	0.40
1:C:260:ARG:HG2	1:C:261:TYR:CD2	2.55	0.40
1:C:537:GLY:HA3	1:C:752:LEU:HD23	2.04	0.40
3:D:133:LEU:O	3:D:137:THR:HG22	2.21	0.40
3:D:390:ILE:HG22	3:D:398:TRP:HE3	1.86	0.40
1:A:528:GLU:CD	1:A:769:LYS:HG3	2.45	0.40
2:B:629:LYS:HB3	1:C:608:TRP:HE1	1.87	0.40
3:D:441:PRO:HB3	3:D:765:TYR:CE2	2.57	0.40
3:D:770:ASP:OD1	3:D:771:GLU:N	2.55	0.40
1:A:140:THR:HG22	1:A:340:PHE:CZ	2.56	0.40
1:A:215:GLU:OE1	1:A:215:GLU:N	2.55	0.40
1:A:683:THR:OG1	1:A:684:VAL:N	2.55	0.40
1:A:766:SER:HA	1:A:767:PRO:HD3	1.92	0.40
1:C:337:ARG:HD2	1:C:348:PHE:HB2	2.03	0.40
1:A:25:LYS:HG2	1:A:57:LYS:HB2	2.04	0.40
1:A:32:VAL:HB	1:A:93:SER:HB2	2.03	0.40
1:A:381:TRP:CH2	1:A:388:LYS:HB3	2.57	0.40
2:B:638:PHE:HD1	1:C:816:VAL:HG12	1.86	0.40
1:C:106:PRO:HG3	3:D:132:PHE:CE1	2.56	0.40
1:C:307:GLY:O	1:C:311:ASN:ND2	2.54	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	783/825 (95%)	729 (93%)	54 (7%)	0	100 100
1	C	797/825 (97%)	739 (93%)	58 (7%)	0	100 100
2	B	768/884 (87%)	719 (94%)	48 (6%)	1 (0%)	48 79
3	D	753/861 (88%)	712 (95%)	41 (5%)	0	100 100
All	All	3101/3395 (91%)	2899 (94%)	201 (6%)	1 (0%)	100 100

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	B	615	ASN

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	665/710 (94%)	652 (98%)	13 (2%)	48 64
1	C	675/710 (95%)	658 (98%)	17 (2%)	42 61
2	B	617/760 (81%)	612 (99%)	5 (1%)	73 76
3	D	615/701 (88%)	610 (99%)	5 (1%)	73 76
All	All	2572/2881 (89%)	2532 (98%)	40 (2%)	54 68

All (40) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	63	THR
1	A	79	CYS
1	A	204	VAL
1	A	241	THR
1	A	249	VAL
1	A	312	THR
1	A	451	VAL
1	A	479	VAL
1	A	656	VAL
1	A	680	ILE
1	A	701	THR
1	A	731	TRP
1	A	748	THR
2	B	280	VAL
2	B	490	ILE
2	B	532	THR
2	B	618	VAL
2	B	714	VAL
1	C	32	VAL
1	C	92	VAL
1	C	105	THR
1	C	118	VAL
1	C	165	LEU
1	C	218	VAL
1	C	302	THR
1	C	373	ILE
1	C	380	ILE
1	C	401	VAL
1	C	442	THR
1	C	479	VAL
1	C	481	ASP
1	C	486	THR
1	C	492	ASN
1	C	699	LEU
1	C	748	THR
3	D	90	VAL
3	D	415	LEU
3	D	433	THR
3	D	434	VAL
3	D	550	VAL

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (21)

such sidechains are listed below:

Mol	Chain	Res	Type
1	A	47	ASN
1	A	50	ASN
1	A	70	ASN
1	A	290	GLN
1	A	293	HIS
1	A	341	ASN
1	A	536	GLN
1	A	770	GLN
2	B	348	ASN
2	B	385	GLN
2	B	486	HIS
2	B	491	ASN
2	B	775	GLN
1	C	38	HIS
1	C	70	ASN
1	C	280	HIS
1	C	453	GLN
1	C	556	GLN
1	C	803	ASN
3	D	352	ASN
3	D	366	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

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	$\#\|Z\|>2$
4	NAG	E	1	4,1	14,14,15	0.32	0	17,19,21	0.46	0
4	NAG	E	2	4	14,14,15	0.31	0	17,19,21	0.54	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
4	NAG	E	1	4,1	-	1/6/23/26	0/1/1/1
4	NAG	E	2	4	-	4/6/23/26	0/1/1/1

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

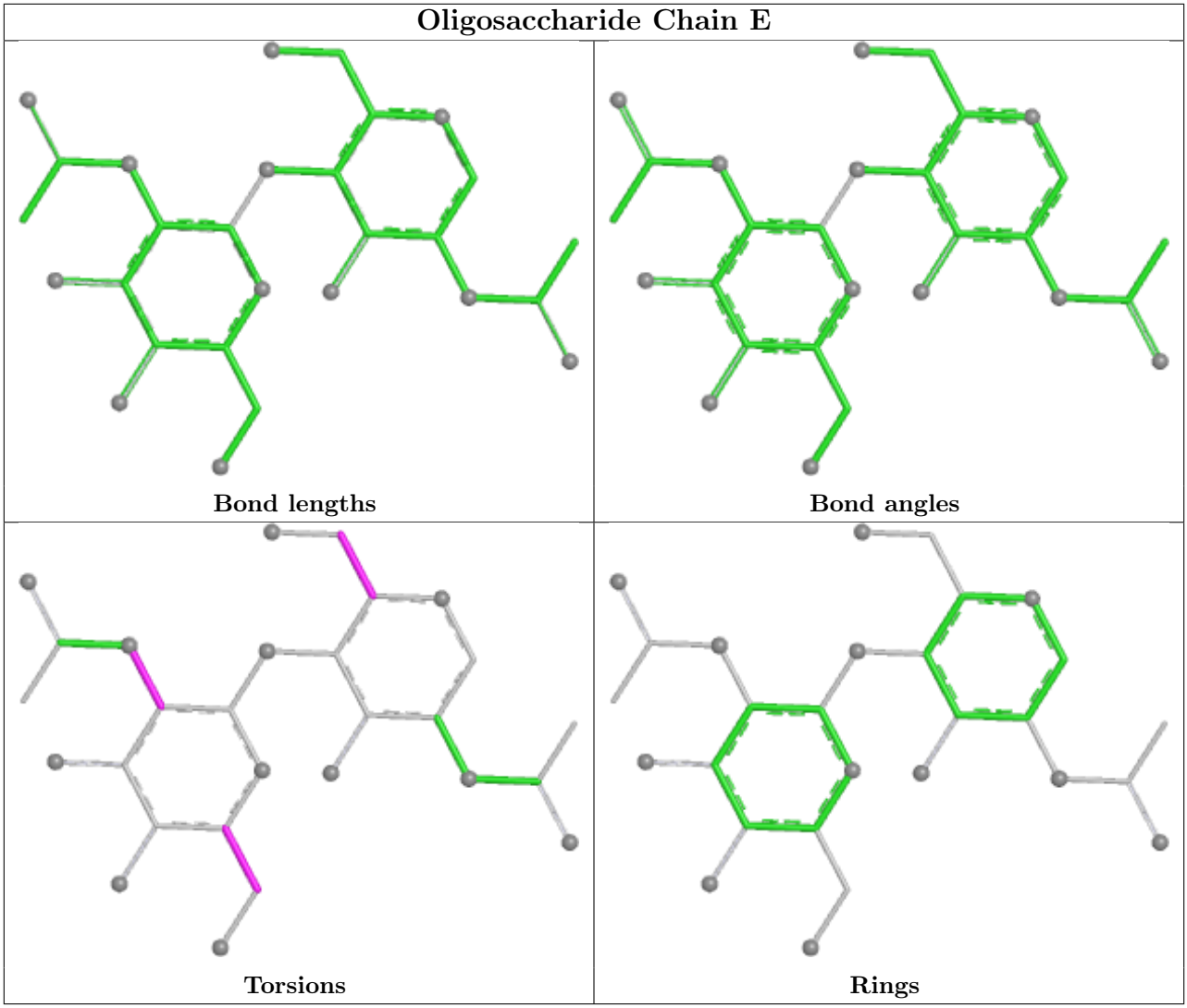
All (5) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	E	2	NAG	C4-C5-C6-O6
4	E	2	NAG	O5-C5-C6-O6
4	E	1	NAG	O5-C5-C6-O6
4	E	2	NAG	C1-C2-N2-C7
4	E	2	NAG	C3-C2-N2-C7

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.



5.6 Ligand geometry (i)

8 ligands are modelled in this entry.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\| > 2$	Counts	RMSZ	$\#\|Z\| > 2$
6	NAG	C	902	1	14,14,15	0.18	0	17,19,21	0.47	0
7	GLU	B	901	-	8,9,9	1.11	1 (12%)	8,11,11	1.21	1 (12%)
7	GLU	D	901	-	8,9,9	1.13	1 (12%)	8,11,11	1.17	1 (12%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\|>2$	Counts	RMSZ	$\#\|Z\|>2$
6	NAG	A	902	1	14,14,15	0.35	0	17,19,21	0.42	0
6	NAG	B	902	2	14,14,15	0.21	0	17,19,21	0.58	0
5	GLY	A	901	-	4,4,4	1.20	1 (25%)	3,4,4	1.76	2 (66%)
6	NAG	D	902	3	14,14,15	0.25	0	17,19,21	0.47	0
5	GLY	C	901	-	4,4,4	1.18	1 (25%)	3,4,4	1.67	1 (33%)

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
6	NAG	C	902	1	-	2/6/23/26	0/1/1/1
7	GLU	B	901	-	-	1/9/9/9	-
7	GLU	D	901	-	-	0/9/9/9	-
6	NAG	A	902	1	-	4/6/23/26	0/1/1/1
6	NAG	B	902	2	-	2/6/23/26	0/1/1/1
5	GLY	A	901	-	-	0/2/2/2	-
6	NAG	D	902	3	-	4/6/23/26	0/1/1/1
5	GLY	C	901	-	-	0/2/2/2	-

All (4) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
7	D	901	GLU	OXT-C	-2.38	1.23	1.30
7	B	901	GLU	OXT-C	-2.33	1.23	1.30
5	A	901	GLY	OXT-C	-2.28	1.23	1.30
5	C	901	GLY	OXT-C	-2.25	1.23	1.30

All (5) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
7	B	901	GLU	OXT-C-O	-2.71	117.94	124.08
7	D	901	GLU	OXT-C-O	-2.56	118.28	124.08
5	A	901	GLY	OXT-C-CA	2.14	121.89	113.38
5	A	901	GLY	OXT-C-O	-2.12	117.89	123.33
5	C	901	GLY	OXT-C-CA	2.05	121.55	113.38

There are no chirality outliers.

All (13) torsion outliers are listed below:

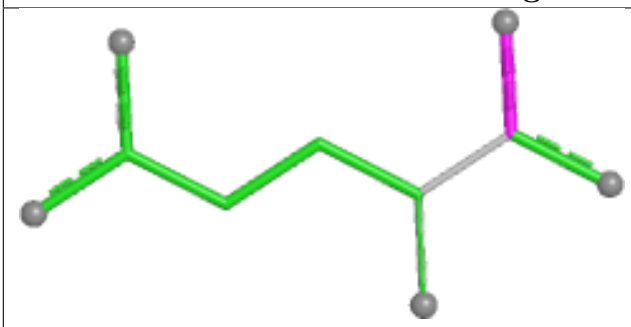
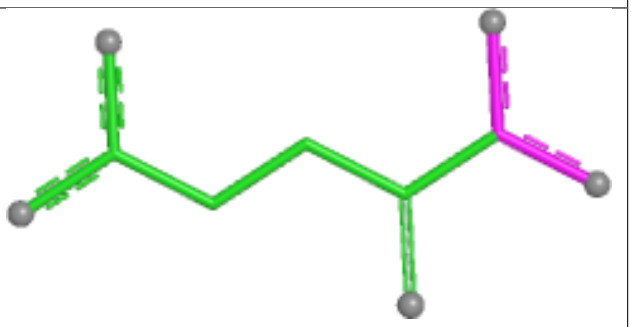
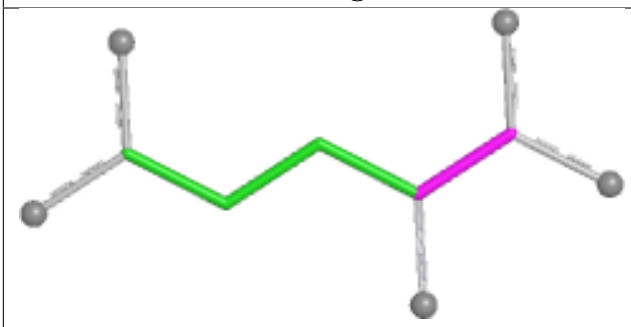
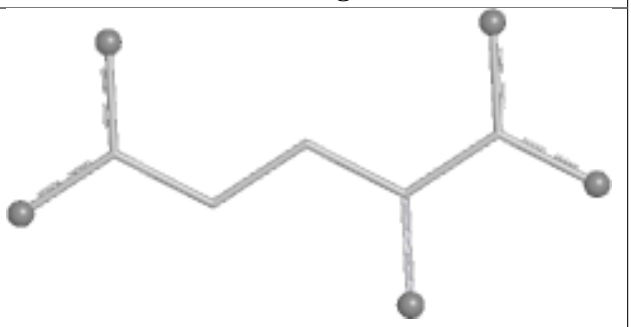
Mol	Chain	Res	Type	Atoms
6	C	902	NAG	C4-C5-C6-O6
6	C	902	NAG	O5-C5-C6-O6
6	A	902	NAG	O5-C5-C6-O6
6	D	902	NAG	O5-C5-C6-O6
6	A	902	NAG	C8-C7-N2-C2
6	A	902	NAG	O7-C7-N2-C2
6	D	902	NAG	C8-C7-N2-C2
6	D	902	NAG	O7-C7-N2-C2
6	A	902	NAG	C4-C5-C6-O6
6	D	902	NAG	C4-C5-C6-O6
7	B	901	GLU	OXT-C-CA-N
6	B	902	NAG	C3-C2-N2-C7
6	B	902	NAG	C1-C2-N2-C7

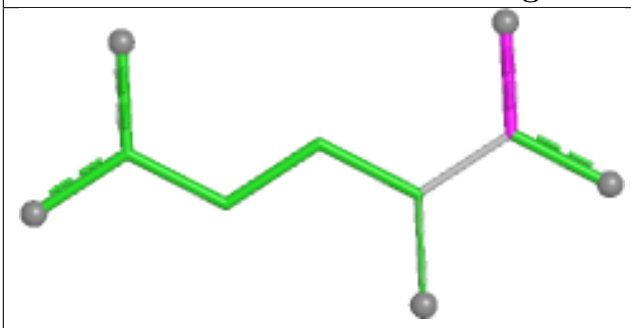
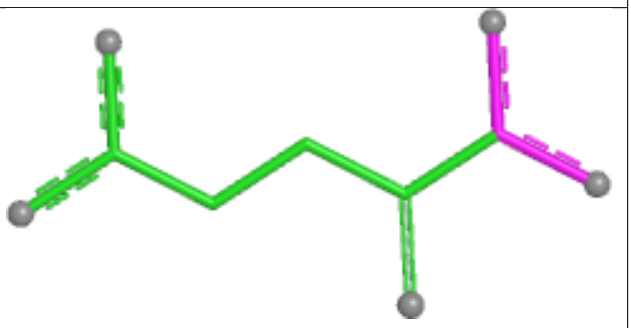
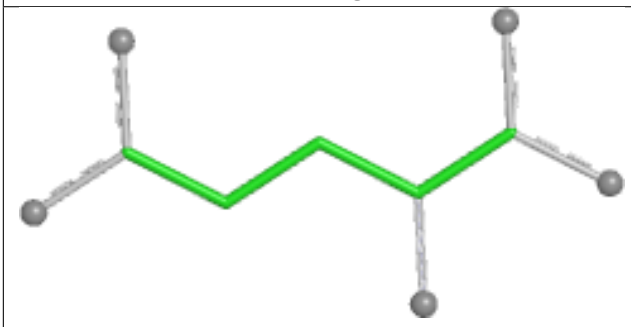
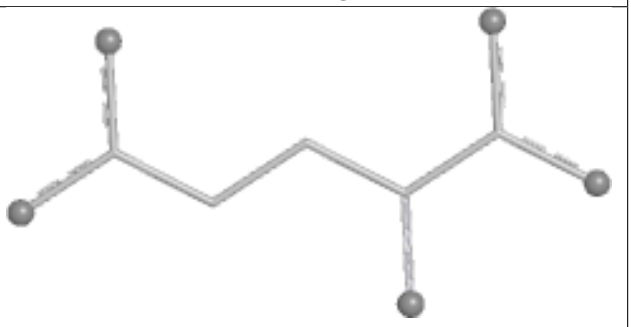
There are no ring outliers.

3 monomers are involved in 5 short contacts:

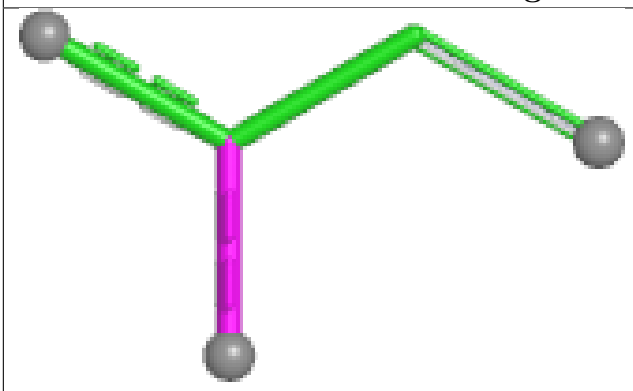
Mol	Chain	Res	Type	Clashes	Symm-Clashes
7	D	901	GLU	2	0
5	A	901	GLY	1	0
5	C	901	GLY	2	0

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

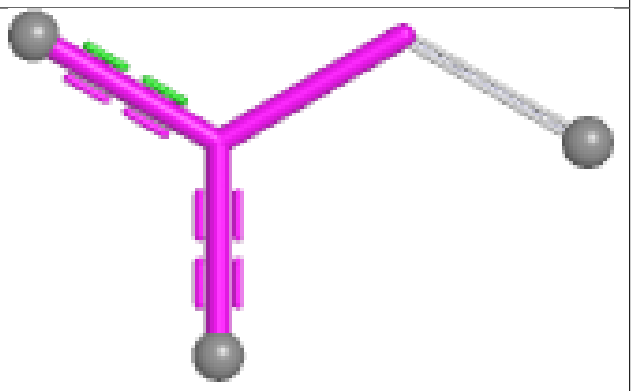
Ligand GLU B 901	
 Bond lengths	 Bond angles
 Torsions	 Rings

Ligand GLU D 901	
 Bond lengths	 Bond angles
 Torsions	 Rings

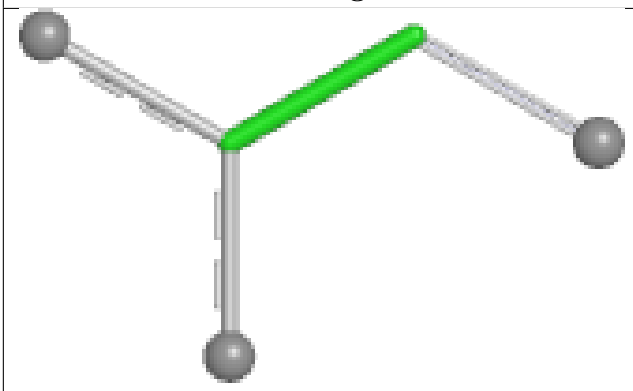
Ligand GLY A 901



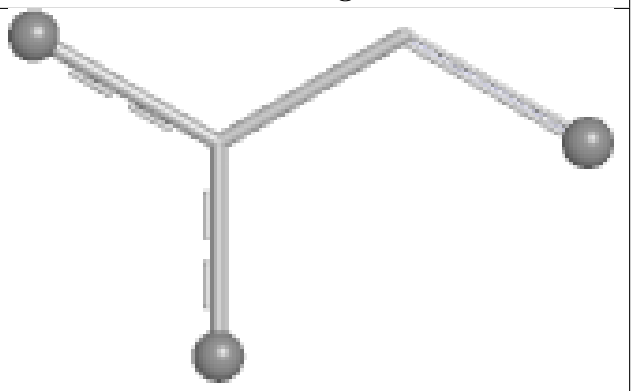
Bond lengths



Bond angles

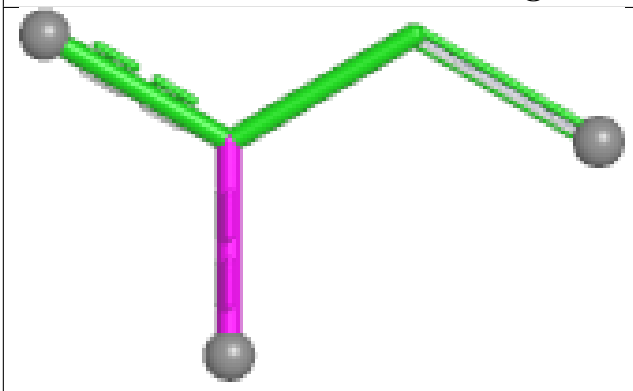


Torsions

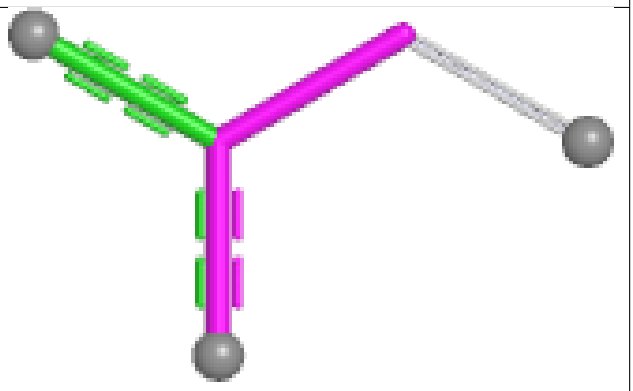


Rings

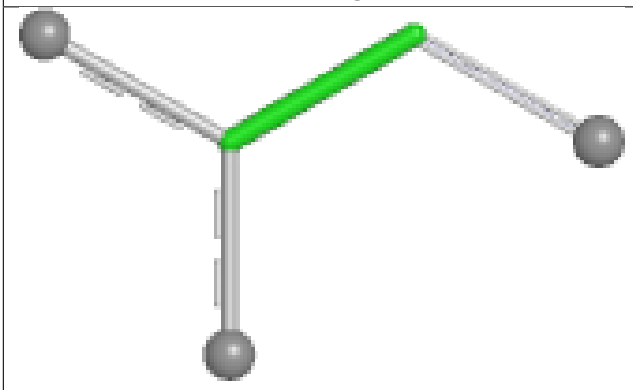
Ligand GLY C 901



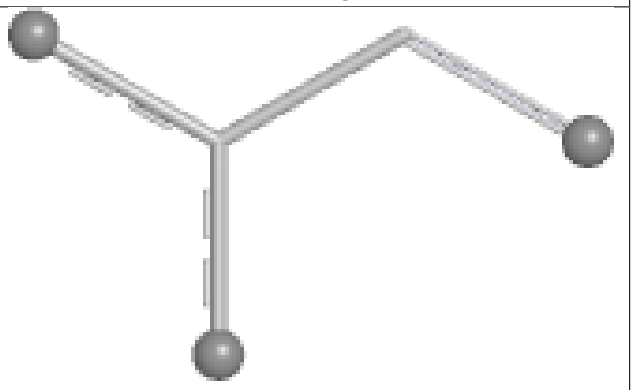
Bond lengths



Bond angles



Torsions



Rings

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.

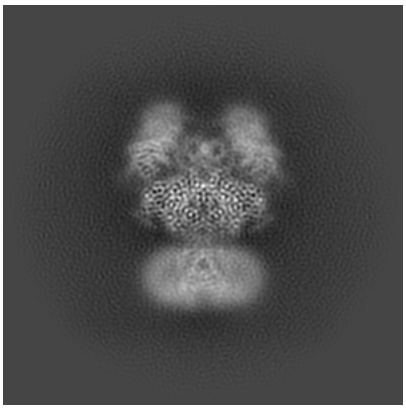
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-46529. These allow visual inspection of the internal detail of the map and identification of artifacts.

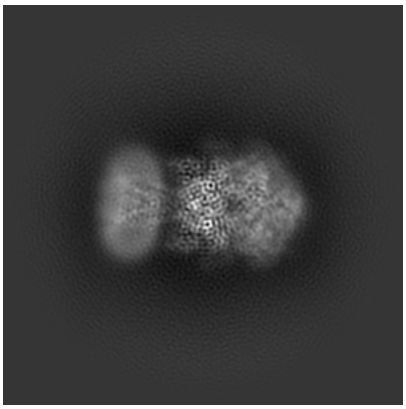
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections

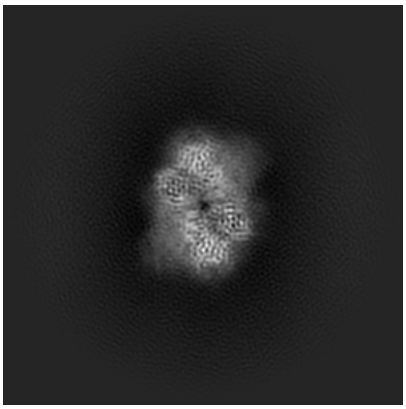
6.1.1 Primary map



X

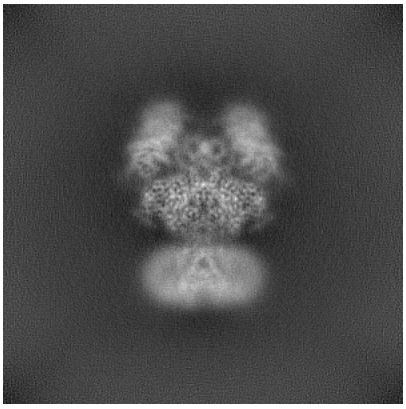


Y

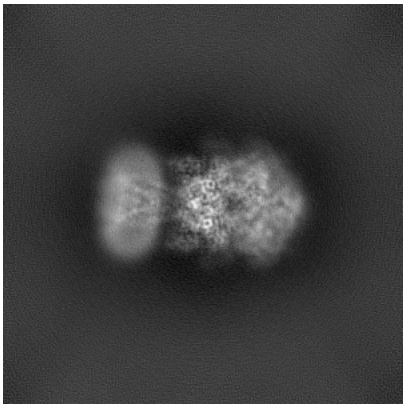


Z

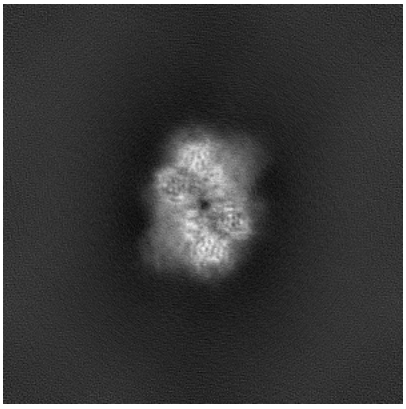
6.1.2 Raw map



X



Y

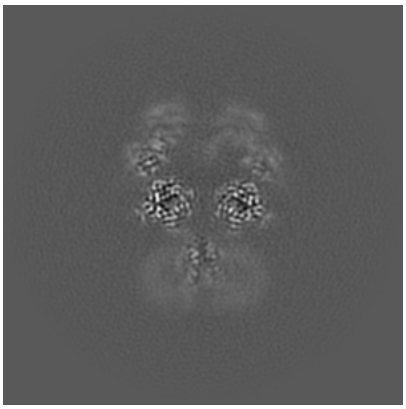


Z

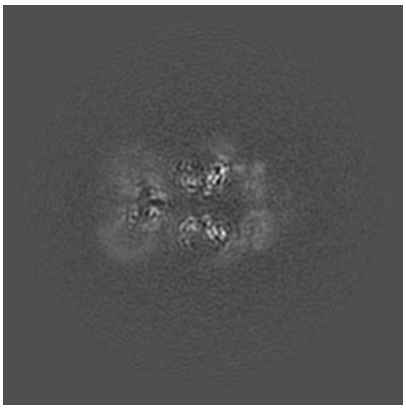
The images above show the map projected in three orthogonal directions.

6.2 Central slices (i)

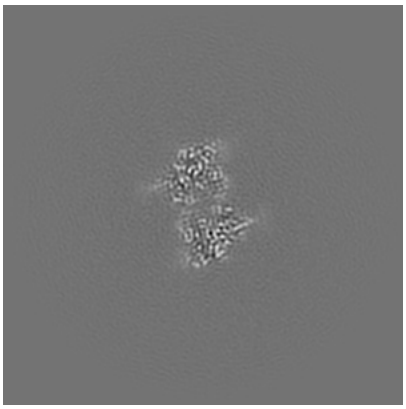
6.2.1 Primary map



X Index: 200

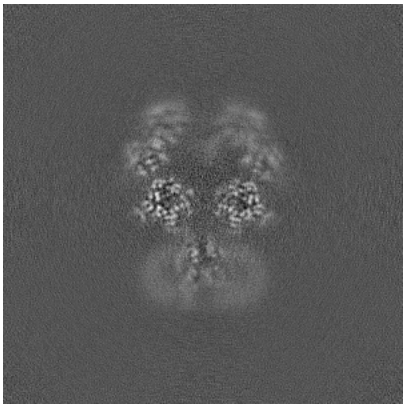


Y Index: 200

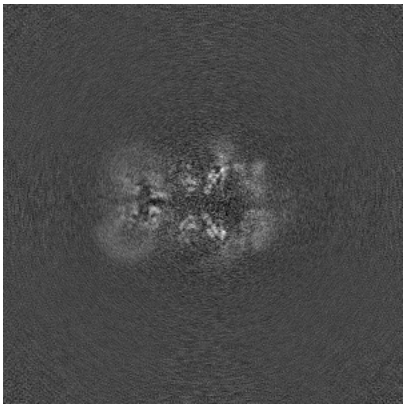


Z Index: 200

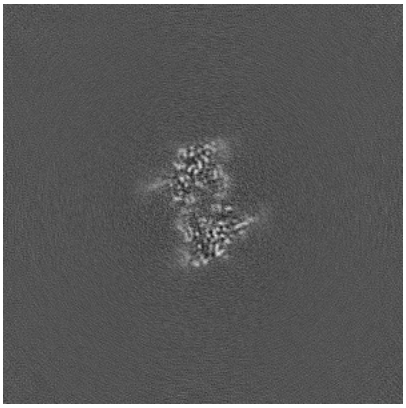
6.2.2 Raw map



X Index: 200



Y Index: 200

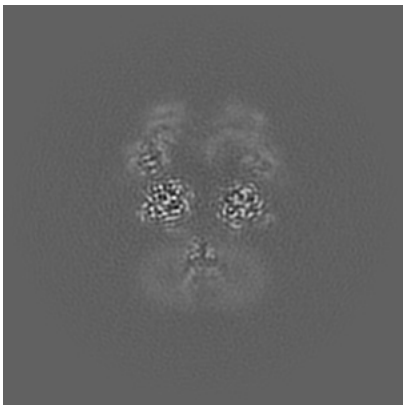


Z Index: 200

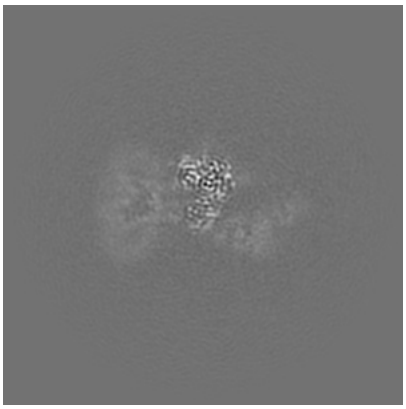
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

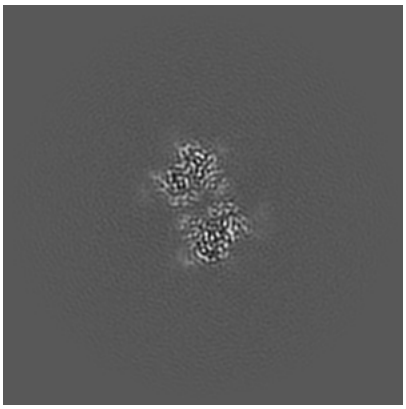
6.3.1 Primary map



X Index: 202

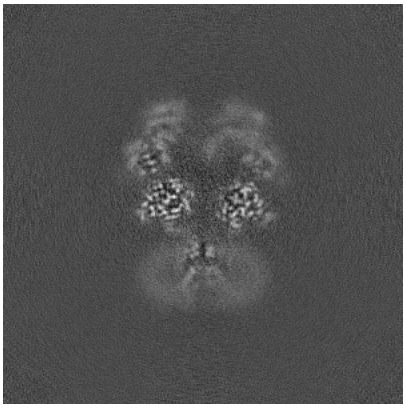


Y Index: 182

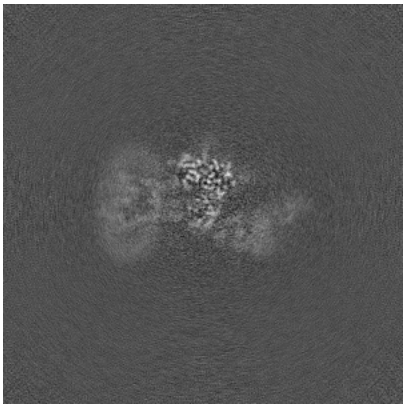


Z Index: 206

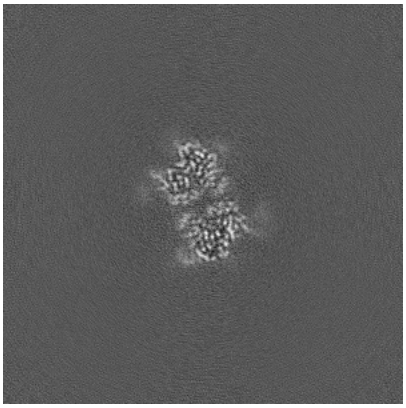
6.3.2 Raw map



X Index: 202



Y Index: 182

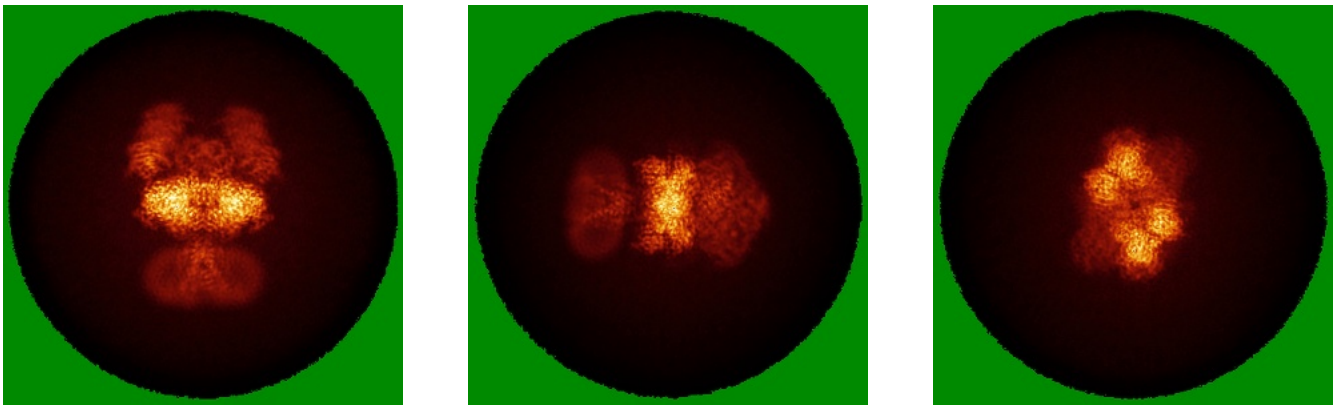


Z Index: 206

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

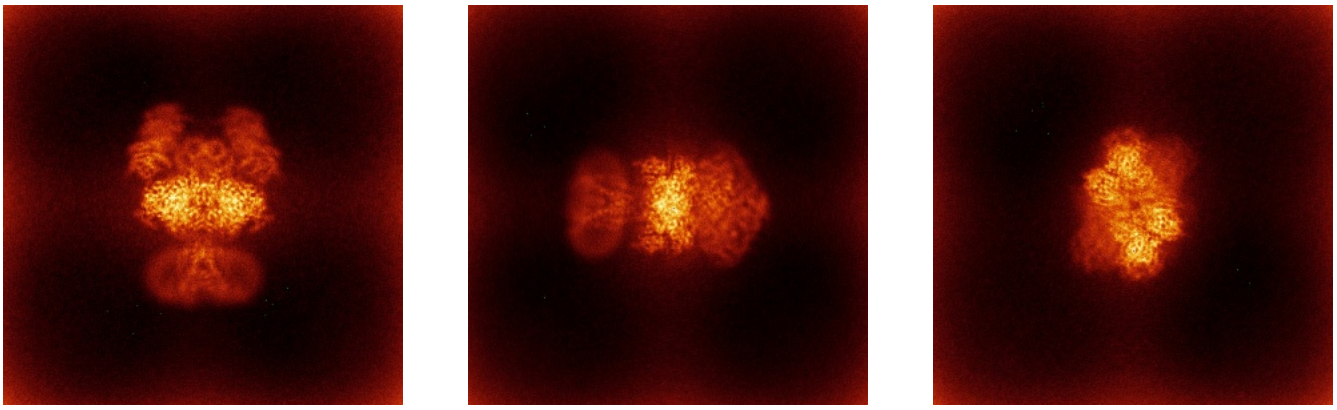
6.4 Orthogonal standard-deviation projections (False-color) (i)

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)

This section was not generated.

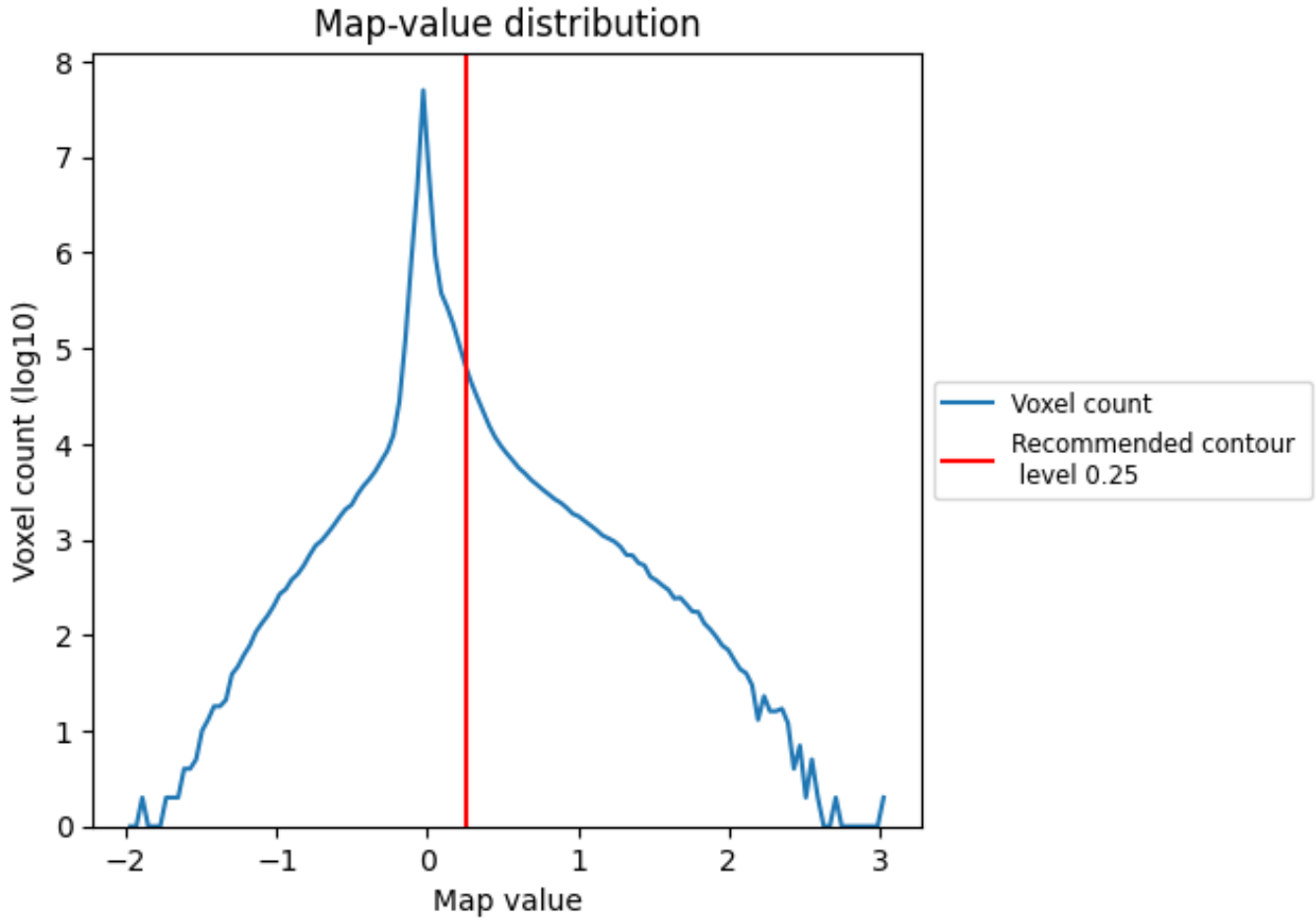
6.6 Mask visualisation (i)

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

7 Map analysis

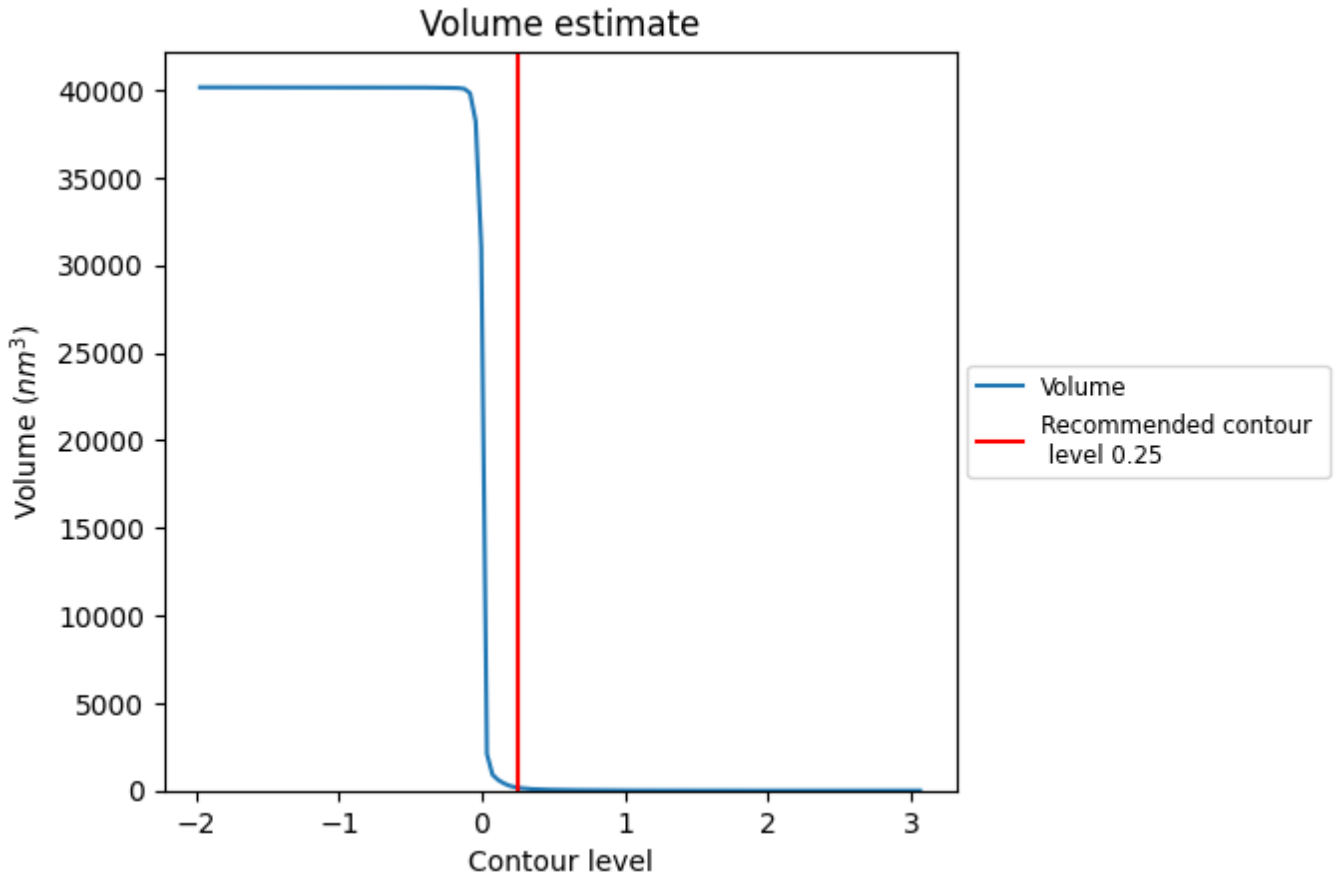
This section contains the results of statistical analysis of the map.

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.

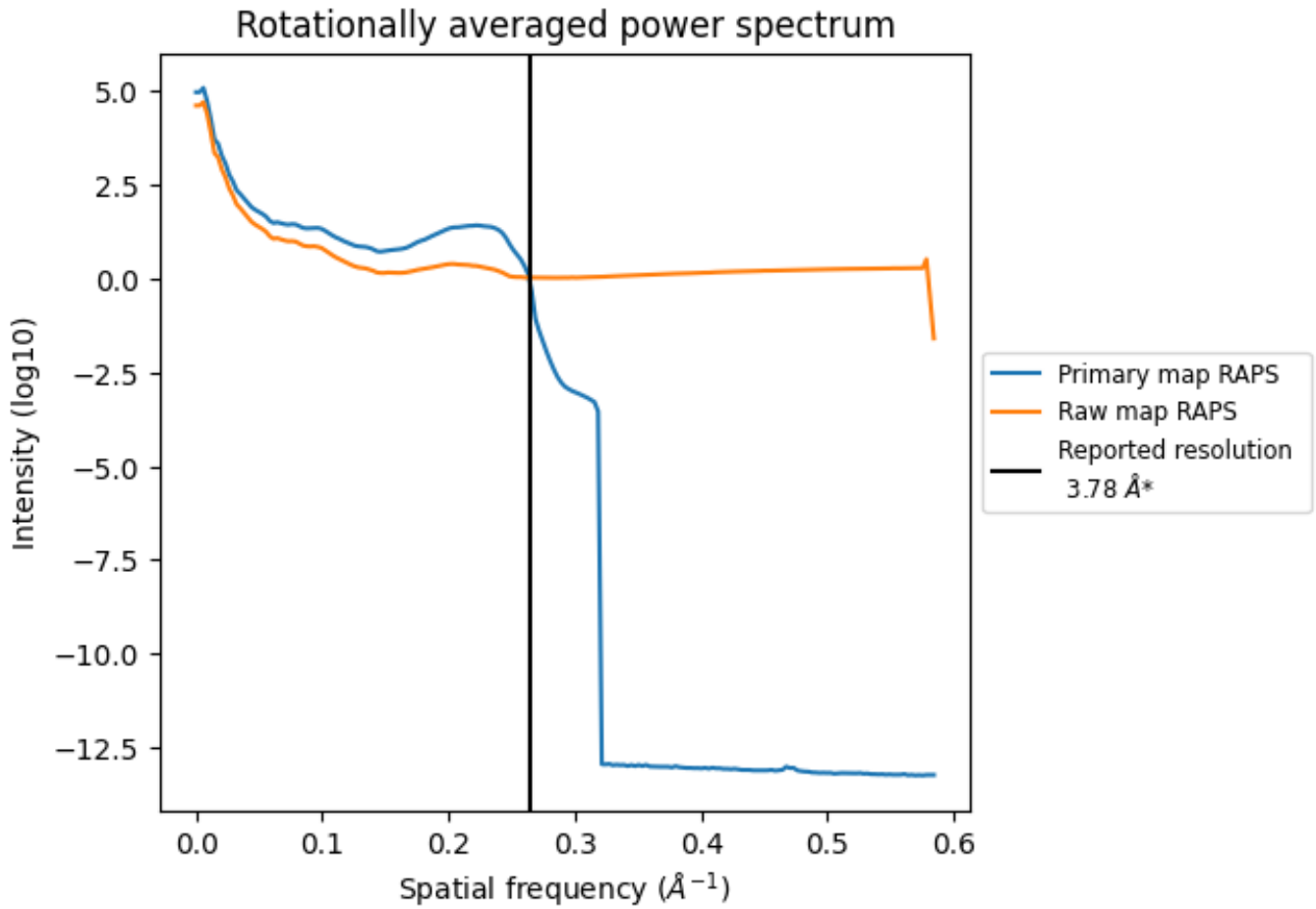
7.2 Volume estimate



The volume at the recommended contour level is 169 nm^3; this corresponds to an approximate mass of 153 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)

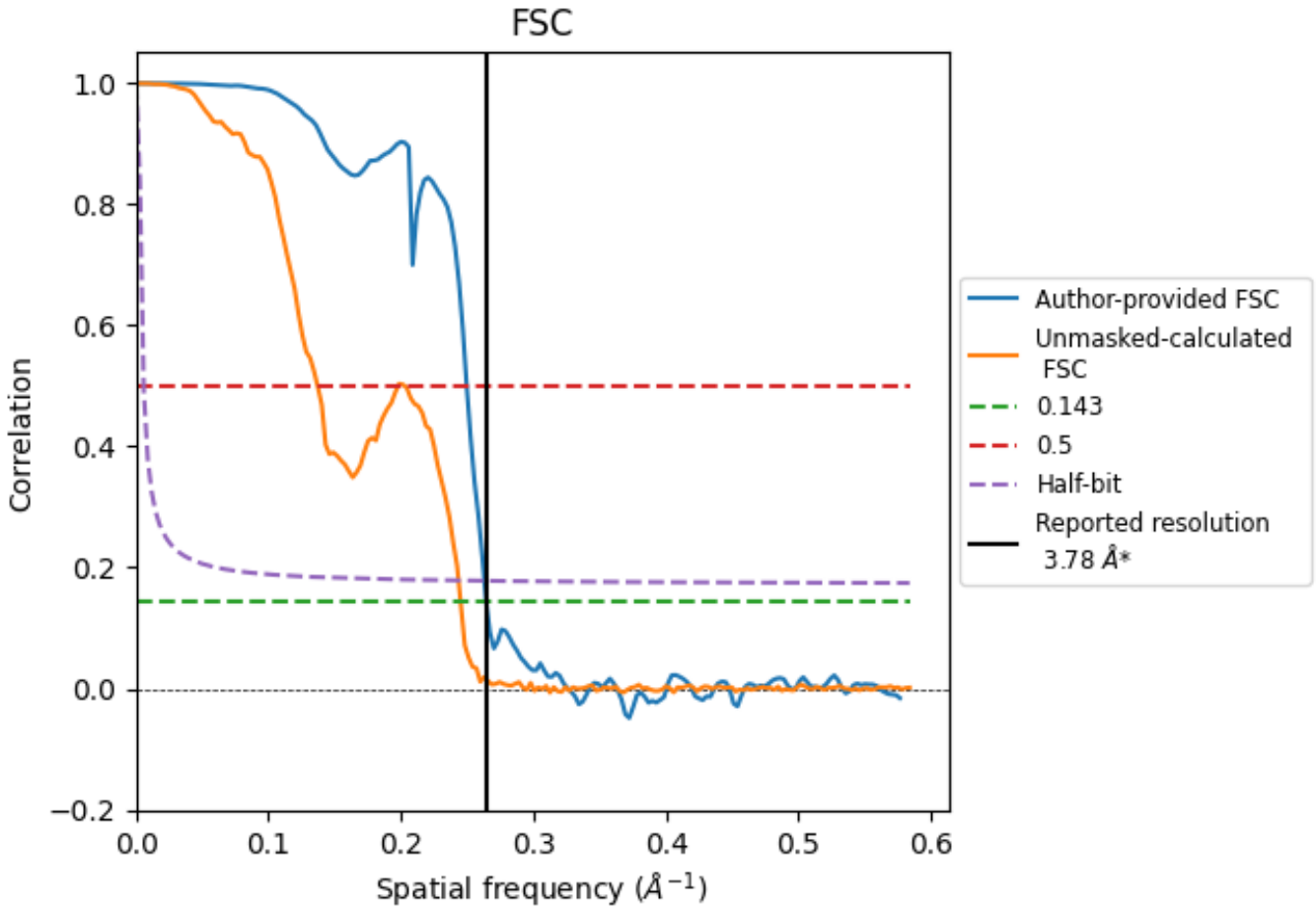


*Reported resolution corresponds to spatial frequency of 0.265 $Å^{-1}$

8 Fourier-Shell correlation

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



*Reported resolution corresponds to spatial frequency of 0.265 Å^{-1}

8.2 Resolution estimates (i)

Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.78	-	-
Author-provided FSC curve	3.78	4.01	3.80
Unmasked-calculated*	4.08	7.30	4.11

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps.

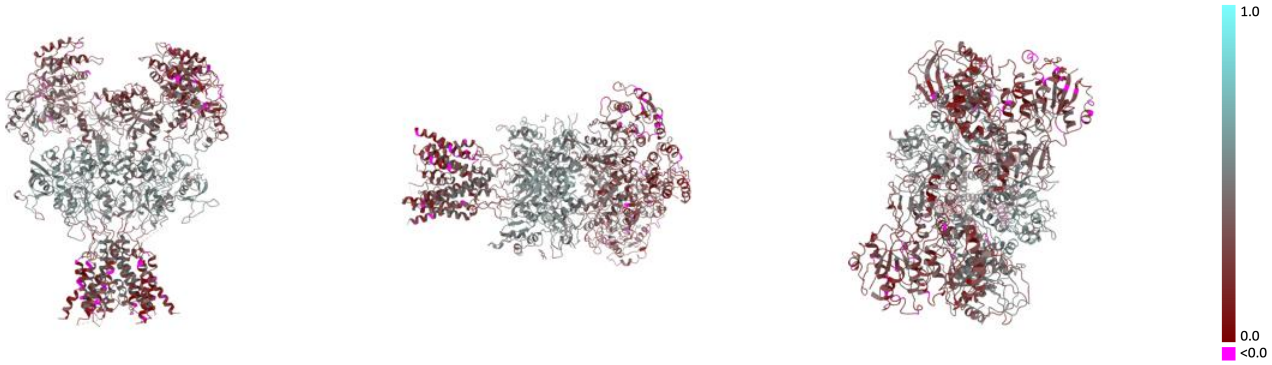
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-46529 and PDB model 9D3A. Per-residue inclusion information can be found in section 3 on page 9.

9.1 Map-model overlay

This section was not generated.

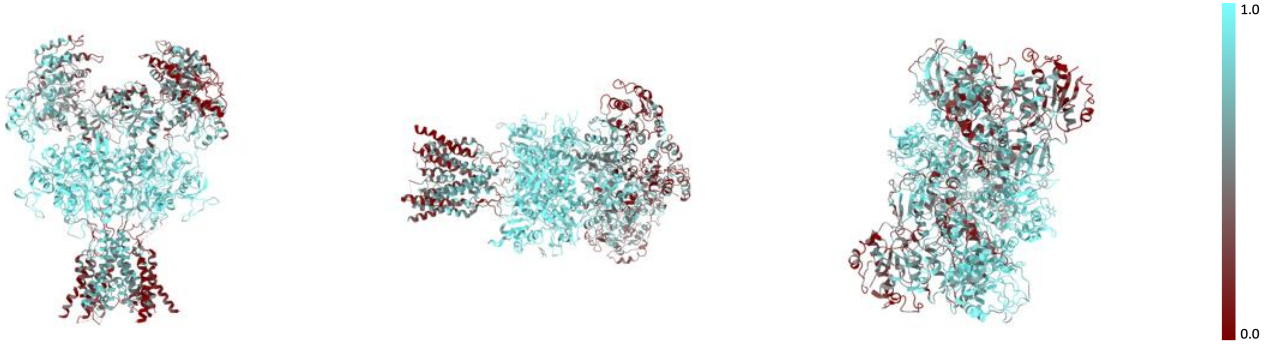
9.2 Q-score mapped to coordinate model



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.

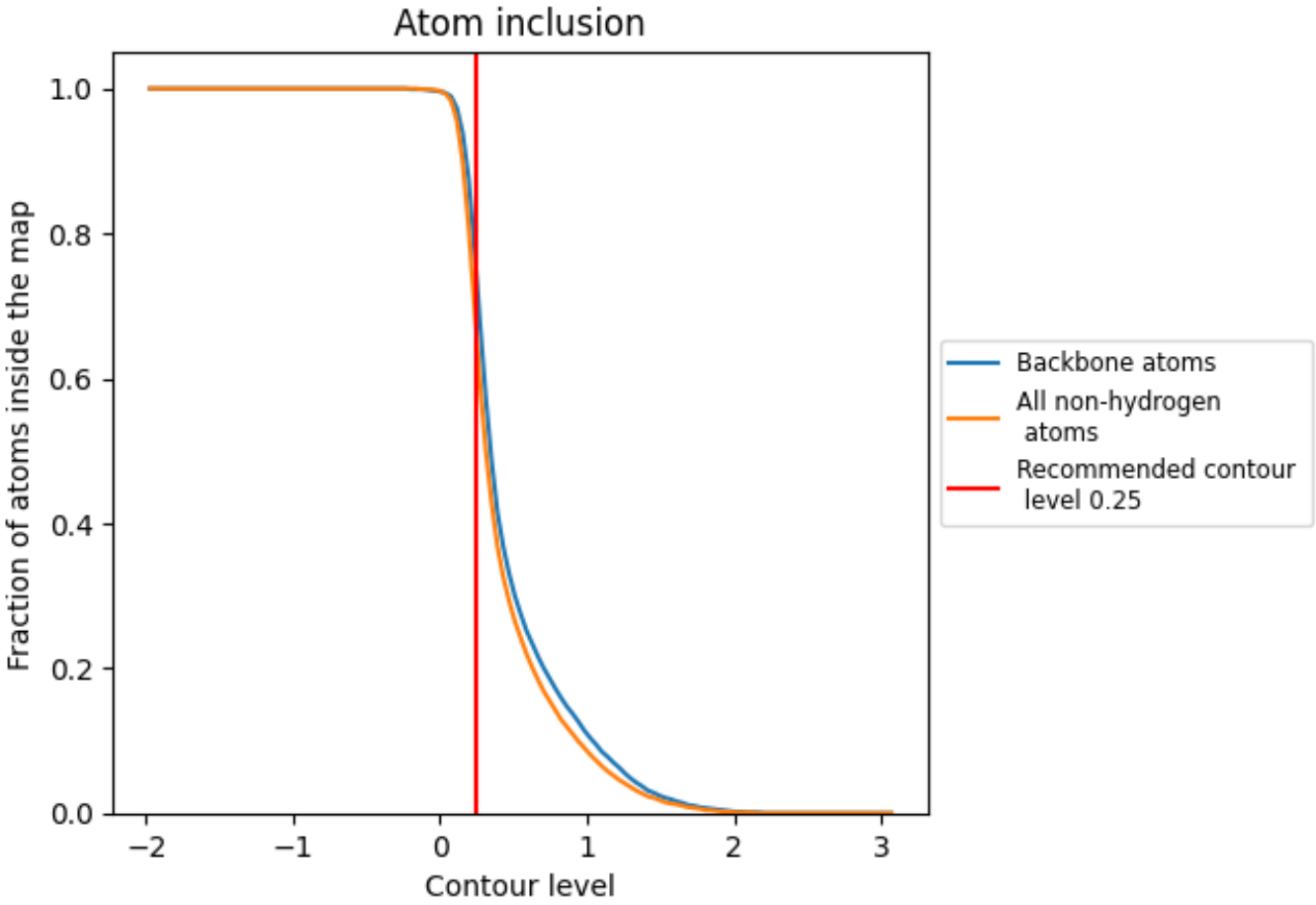
9.3 Atom inclusion mapped to coordinate model



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 (0.25).

9.4 Atom inclusion (i)



At the recommended contour level, 74% of all backbone atoms, 65% 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 (0.25) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.6490	0.3680
A	0.6300	0.3550
B	0.6250	0.3700
C	0.7370	0.3950
D	0.5990	0.3510
E	0.6790	0.4230

