WORLDWIDE wwPDB PROTEIN DATA BANK

Full wwPDB EM Validation Report (i)

Apr 5, 2025 – 01:13 PM EDT

|		
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

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 3.78 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	Percentile Ranks	Value
Clashscore		7
Ramachandran outliers		0.0%
Sidechain outliers		1.2%

Worse — *Better*

▮ Percentile relative to all structures

▯ Percentile relative to all EM structures
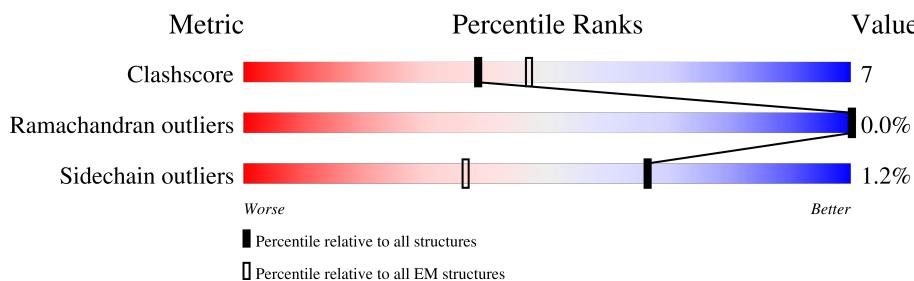
Metric	Whole archive (#Entries)	EM structures (#Entries)
Clashscore	210492	15764
Ramachandran outliers	207382	16835
Sidechain outliers	206894	16415

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	825	27% / 78% 18% •
1	C	825	13% / 78% 19% •
2	B	884	25% / 75% 13% 12%
3	D	861	29% / 72% 16% 11%
4	E	2	100%
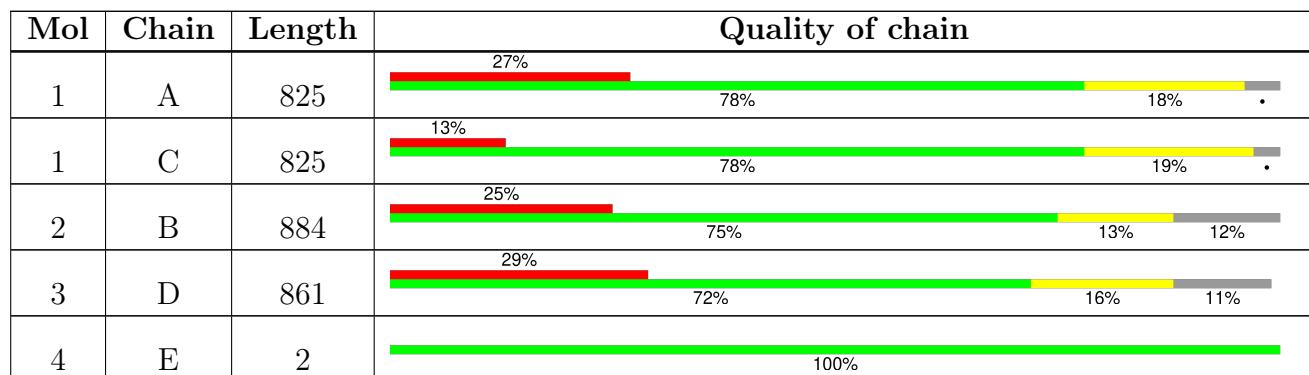
2 Entry composition ⓘ

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 6161	C 3932	N 1057	O 1137	S 35	0	0
1	C	801	Total 6246	C 3985	N 1066	O 1160	S 35	0	0

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 5879	C 3795	N 948	O 1099	S 37	0	0

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
			Total	C	N	O	S		
3	D	763	5870	3774	996	1071	29	0	0

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-a cetamido-2-deoxy-beta-D-glucopyranose.


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

- Molecule 5 is GLYCINE (CCD ID: GLY) (formula: $C_2H_5NO_2$) (labeled as "Ligand of Interest" by depositor).
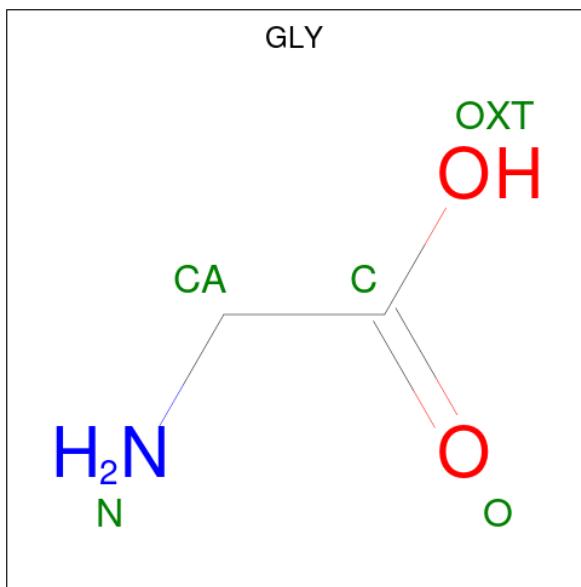
Mol	Chain	Residues	Atoms				AltConf
5	A	1	Total	C	N	O	0
			5	2	1	2	
5	C	1	Total	C	N	O	0
			5	2	1	2	

- Molecule 6 is 2-acetamido-2-deoxy-beta-D-glucopyranose (CCD ID: NAG) (formula: $C_8H_{15}NO_6$).
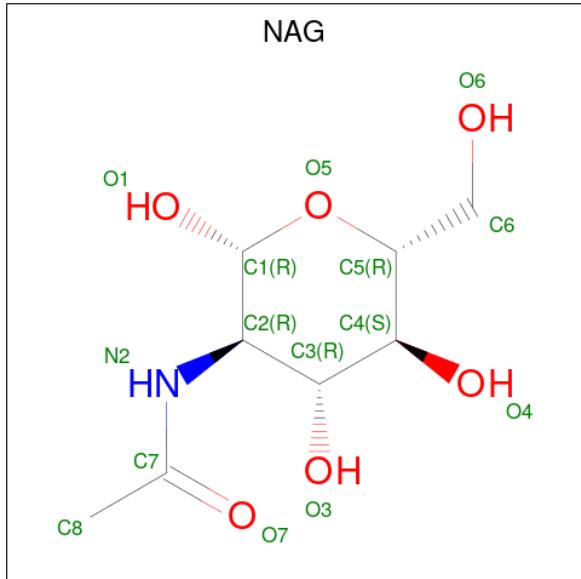
Mol	Chain	Residues	Atoms				AltConf
6	A	1	Total	C	N	O	0
			14	8	1	5	

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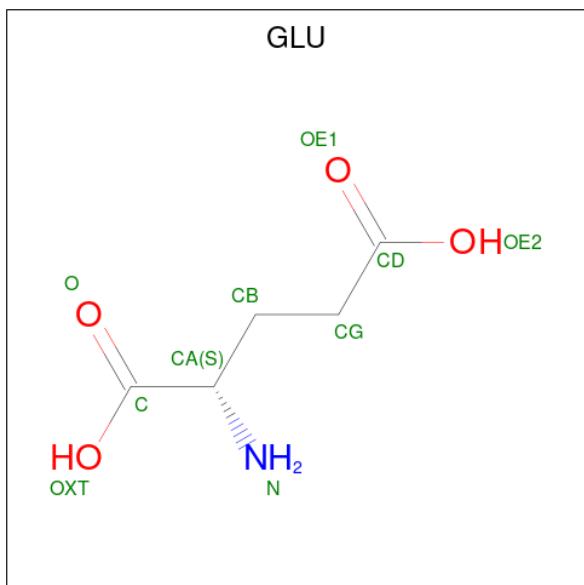
| Mol	Chain	Residues	Atoms				AltConf
7	B	1	Total	C	N	O	0
			10	5	1	4	
7	D	1	Total	C	N	O	0
			10	5	1	4	

3   Residue-property plots ⓘ

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:

ASP PRO K25 I26 V27 N28 I29 L33 S34 T35 R36 K37 H38 E39 Q40 M41 F42 R43 V46 N47 Q48 A49 N50 K51 R52 H53 G54 S55 W56 K57 I58 Q59 L60 N61 A62 N70 A71 I72 Q73 M74 S84 S85 Q86 V87 Y88 A89 I90 P96 T97 P98 N99 D100 H101 F102 T103

P104 T105 P106 G112 R115 V118 L121 T122 S129 D130 L138 R139 T140 V141 F142 P143 H146 Q147 V150 M155 W160 I163 I164 L165 L166 R179 E188 S189 E192 A206 M209 E215 V218 I219 V249 G250 E251 R252 E253 I254

R260 Y261 A262 P263 I266 L267 G268 I272 E277 H280 I281 Q290 A291 V292 H293 E294 L296 L296 E297 K298 E299 N300 I301 T302 R306 G307 C308 V309 G310 N311 T312 N313 I314 W315 K316 T317 G318 P319 L320 R323 V324 L325 M326 S327 S328 K329 Y330 A331 D332 G333 V334 T335 G336

R337 V338 E339 F340 N341 E342 D343 G344 D345 R346 K347 F348 S352 N355 L356 Q357 N358 R359 G365 V372 I373 P374 N375 D376 Q393 V401 P407 F408 T442 S443 P444 G445 F458 M470 N471 F472 V479 A480 D481 T486 S493 N494 K495 K496 E497 W498 N499

L505 M512 I513 V514 I519 N520 N521 E522 R523 F529 G537 I546 P547 R548 S549 T550 S553 F558 Q559 L562 W563 V566 G567 L568 L577 Y578 L579 P585 PHE GLY ARG PHE LYS VAL ASN SER GLU GLU GLU GLU ASP A600 L603 W608

E621 G622 A623 P624 S628 I631 V656 L657 D658 E661 E662 R663 Y681 A682 T683 V684 K685 Q686 R695 L699 M702 Y703 R704 R722 A728 F729 I730 W731 D732 L746 V747 T748 L752 D789 R794 Y795 Q796 E797 C798 D799 S800 R801 S802 N803 A804 P805

A806 F810 E811 N812 M813 A814 G815 V816 F817 M818 A821 I824 V825 A826 G827 I828 F829 L830 I831 F832 I833 E834 I835 A836 Y837 K838 R839 HIS LYS ASP ALA ASN GLY ALA GLN

● Molecule 2: Glutamate receptor ionotropic, NMDA 2B

Chain B:

25%
75%
13%
12%

TRP SER HIS PRO GLN PHE GLU LYS GLY GLY GLY SER GLY GLY GLY SER GLY GLY GLY SER ALA TRP SER HIS PRO GLN PHE GLU LYS GLY ALA LEU VAL PRO ARG GLY SER GLN LYS LYS SER PRO PRO S34 I35 G36 I37 A38 V39 I40 L41 V42 G43 T44 S45 D46 E47 V48 A49 I50 K51

D52 A53 H54 E55 K56 D57 D58 F59 H60 H61 L62 S63 V64 V65 P66 R67 V68 E69 L70 V71 A72 M73 N74 E75 T76 I82 S90 D91 I94 Q95 D101 D102 T103 D104 Q105 E106 D113 A117 L120 T121 P122 I123 L124 S130 S131 M132 I133 D136 K137 D138 E139

S140 S141 M142 F143 F144 Q145 F146 I150 V156 I171 V172 T173 F176 P177 D181 F182 E191 N192 S193 F194 E201 V202 L203 L204 L205 D206 M207 S208 L209 D210 D211 G212 D213 S214 K215 I216 Q219 L220 I227 L228 L230 Y231 E235 T238 F242 E242 V243

A244 N245 S246 T250 G253 Y254 T255 V258 P259 V262 A263 G264 D265 V269 P270 A271 E272 F273 P274 L277 Y282 D283 E284 W285 D286 Y287 G288 R292 D295 G296 I297 A298 I299 I300 T301 T302 A303 A304 S305 D306 M307 L308 S309 E310 H311 S312 F313 I314 P315 E316 P317

K318 S319 S320 C321 Y322 N323 T324 H325 E326 K327 R328 I329 Y330 Q331 S332 N333 M334 L335 N336 R337 Y338 L339 I340 N341 V342 T343 F344 E345 G346 R347 D354 G355 P360 K361 L362 L367 R371 K372 W373 W379 K382 S383 M394 CYS PRO GLU THR GLU GLU GLN GLU D403

I408 E413 A414 P415 F416 E420 T433 R439 I440 VAL THR GLU ASN LYS THR ASP GLU GLU PRO G451 K458 K467 D477 T482 G487 M491 V498 M503 K504 R505 M508 L513 V523 D524 V527 T532 S535 R540 S541 T544

• 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-gluc opyranose

Chain E:

<!-- bar graph showing 100% -->

100%

NAG1
NAG2

4 Experimental information ⓘ

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 $(e^-/\text{Å}^2)$	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 (i)

5.1 Standard geometry (i)

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	0.26	0/6299	0.47	0/8544
1	C	0.27	0/6388	0.48	0/8672
2	B	0.26	0/6006	0.45	0/8167
3	D	0.25	0/6008	0.48	0/8179
All	All	0.26	0/24701	0.47	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 (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	6161	0	6095	91	0
1	C	6246	0	6162	101	0
2	B	5879	0	5682	73	0
3	D	5870	0	5771	94	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	1	0
All	All	24270	0	23801	340	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 (340) 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: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: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
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

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
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
3:D:504:ASP:N	3:D:504:ASP:OD1	2.39	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
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
2:B:420:GLU:OE1	2:B:458:LYS:NZ	2.32	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
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
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

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
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:97:THR:OG1	1:C:99:ASN:OD1	2.28	0.52
1:C:73:GLN:HE21	3:D:349:ARG:HD2	1.73	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
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:A:346:ARG:HH12	1:A:349:ALA:HA	1.77	0.49
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

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
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
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
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
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
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

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
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
3:D:797:SER:C	3:D:799:TRP:H	2.19	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
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
1:A:602:THR:N	1:A:605:SER:HG	2.14	0.45
2:B:467:LYS:HE3	2:B:467:LYS:HB2	1.85	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: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
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
1:C:470:MET:HE2	1:C:472:PHE:HE2	1.82	0.44
2:B:308:LEU:HB2	2:B:314:ILE:HD11	2.00	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

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
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
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: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
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

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
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
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
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
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
1:C:559:GLN:HG3	3:D:839:LYS:NZ	2.36	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
2:B:678:SER:O	2:B:679:PRO:C	2.58	0.41
1:C:253:GLU:OE1	1:C:253:GLU:N	2.54	0.41
1:C:335:THR:HG1	1:C:337:ARG:HG2	1.85	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

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
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
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:C:341:ASN:OD1	1:C:347:LYS:NZ	2.38	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

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
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 ⓘ

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%)	655 (98%)	10 (2%)	60	75
1	C	675/710 (95%)	664 (98%)	11 (2%)	58	74
2	B	617/760 (81%)	615 (100%)	2 (0%)	91	94
3	D	615/701 (88%)	608 (99%)	7 (1%)	70	80
All	All	2572/2881 (89%)	2542 (99%)	30 (1%)	66	79

All (30) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	36	ARG
1	A	79	CYS
1	A	241	THR
1	A	312	THR
1	A	359	ARG
1	A	656	VAL
1	A	680	ILE
1	A	701	THR
1	A	731	TRP
1	A	748	THR

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Mol	Chain	Res	Type
2	B	532	THR
2	B	682	ARG
1	C	105	THR
1	C	118	VAL
1	C	165	LEU
1	C	302	THR
1	C	308	CYS
1	C	401	VAL
1	C	442	THR
1	C	479	VAL
1	C	486	THR
1	C	699	LEU
1	C	748	THR
3	D	68	ARG
3	D	90	VAL
3	D	198	ARG
3	D	329	ARG
3	D	415	LEU
3	D	433	THR
3	D	550	VAL

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

Mol	Chain	Res	Type
1	A	290	GLN
1	A	341	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	1,4	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	1,4	-	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.

Oligosaccharide Chain E

Bond lengths · Bond angles · Torsions · Rings
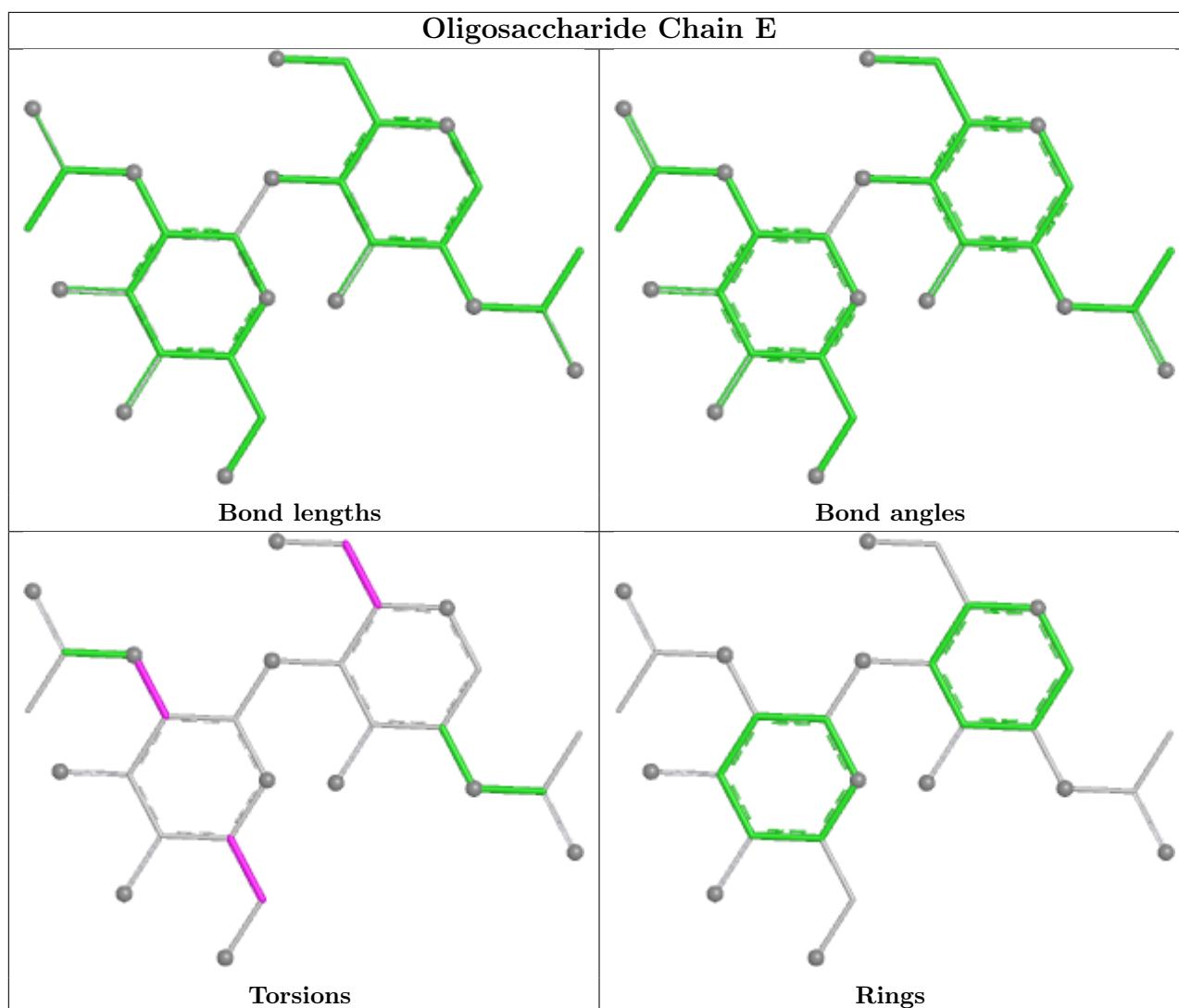
5.6 Ligand geometry ⓘ

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	D	902	3	14,14,15	0.25	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%)
6	NAG	C	902	1	14,14,15	0.18	0	17,19,21	0.47	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	#|Z| > 2	Counts	RMSZ	#|Z| > 2
5	GLY	C	901	-	4,4,4	1.18	1 (25%)	3,4,4	1.67	1 (33%)
5	GLY	A	901	-	4,4,4	1.20	1 (25%)	3,4,4	1.76	2 (66%)
7	GLU	D	901	-	8,9,9	1.13	1 (12%)	8,11,11	1.17	1 (12%)
6	NAG	B	902	2	14,14,15	0.21	0	17,19,21	0.58	0
6	NAG	A	902	1	14,14,15	0.35	0	17,19,21	0.42	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
6	NAG	D	902	3	-	4/6/23/26	0/1/1/1
7	GLU	B	901	-	-	1/9/9/9	-
6	NAG	C	902	1	-	2/6/23/26	0/1/1/1
5	GLY	C	901	-	-	0/2/2/2	-
5	GLY	A	901	-	-	0/2/2/2	-
7	GLU	D	901	-	-	0/9/9/9	-
6	NAG	B	902	2	-	2/6/23/26	0/1/1/1
6	NAG	A	902	1	-	4/6/23/26	0/1/1/1

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 4 short contacts:

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

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less 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 GLY C 901

Bond lengths

Bond angles

Torsions

Rings

Ligand GLY A 901

Bond lengths

Bond angles

Torsions

Rings

Ligand GLU D 901

Bond lengths

Bond angles

Torsions

Rings
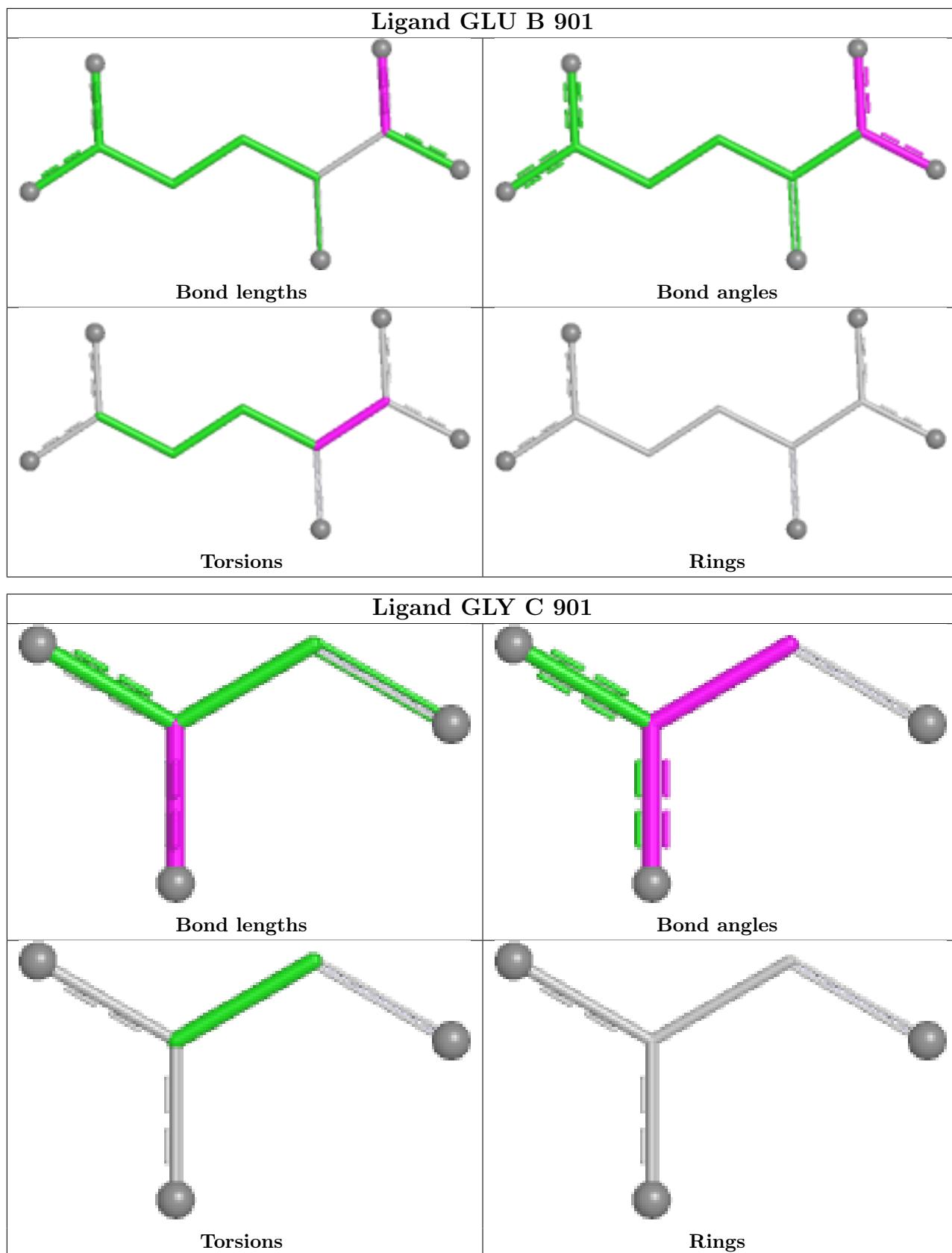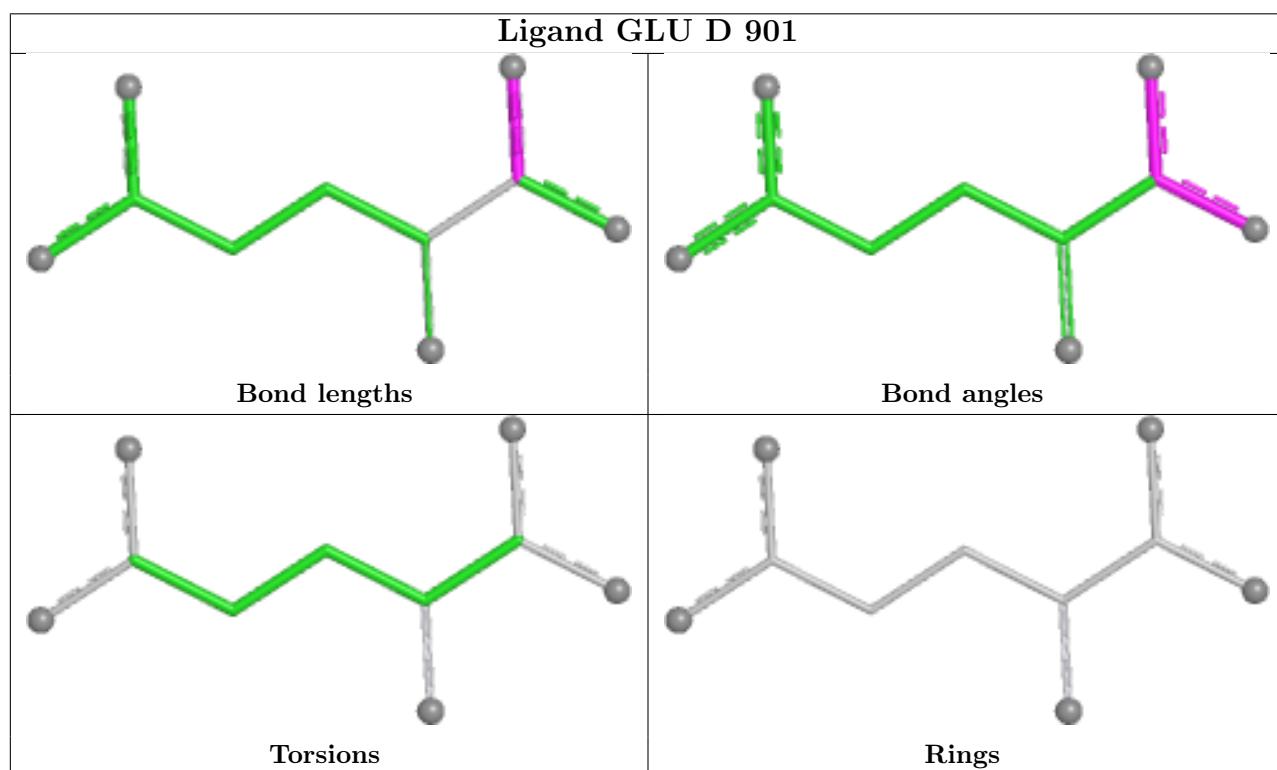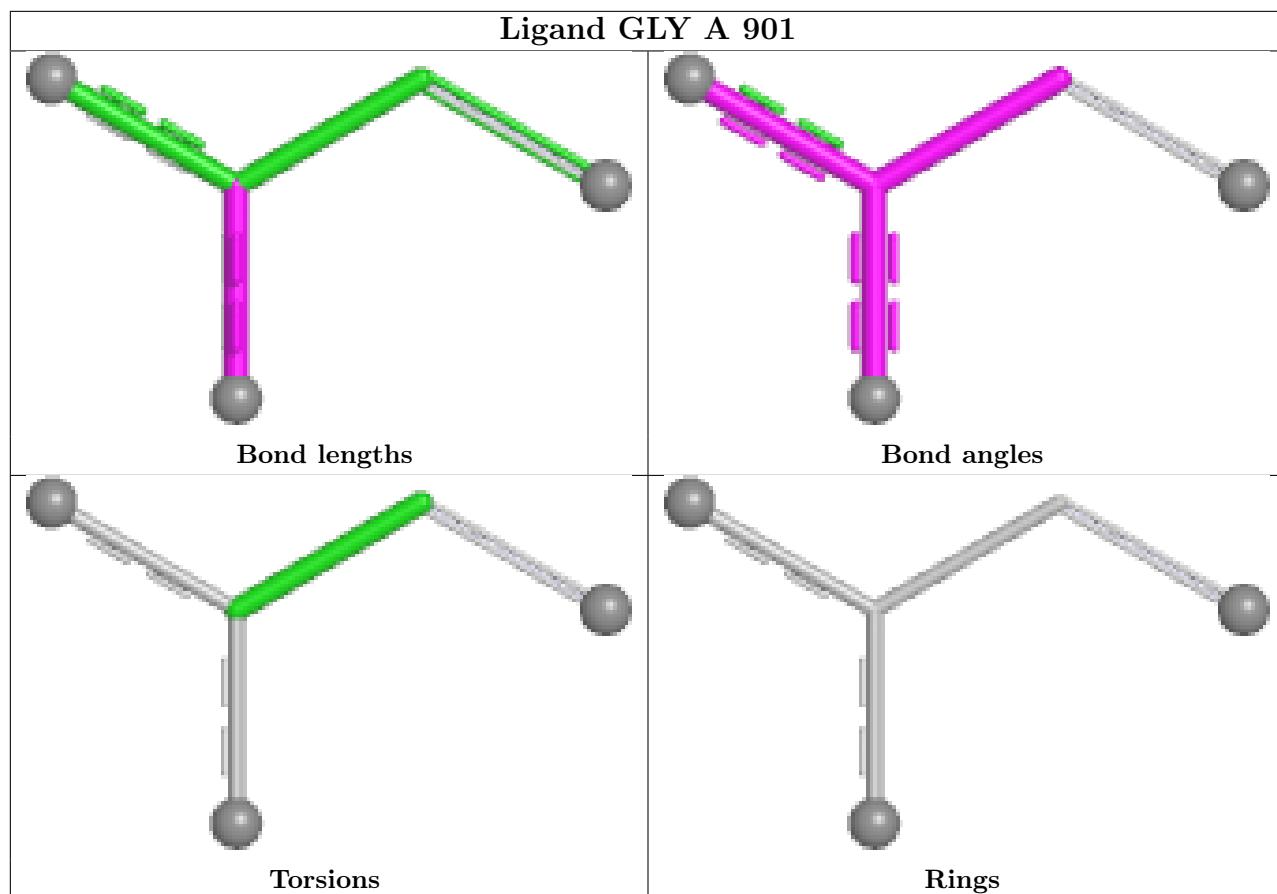
5.7 Other polymers ⓘ

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-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　ⓘ
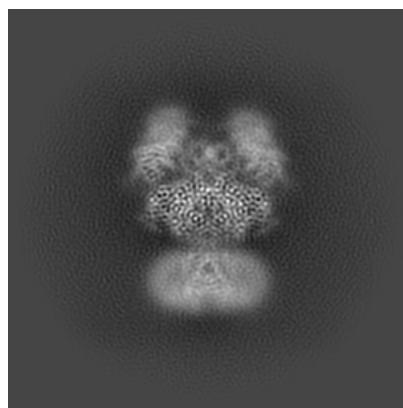
6.1.1　Primary map

X
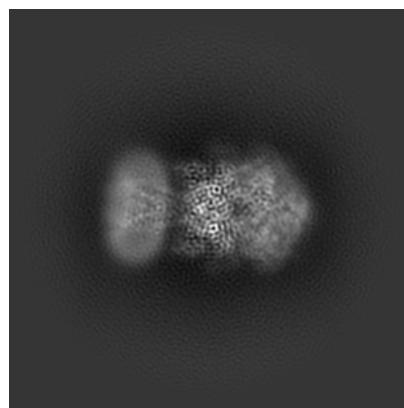
Y
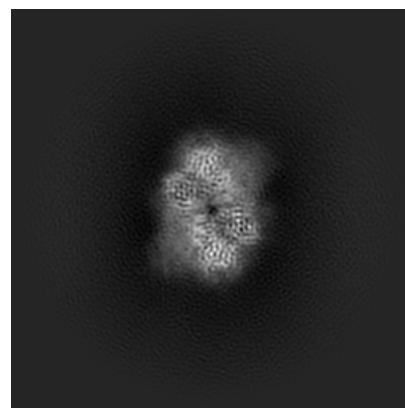
Z

6.1.2　Raw map

X

Y

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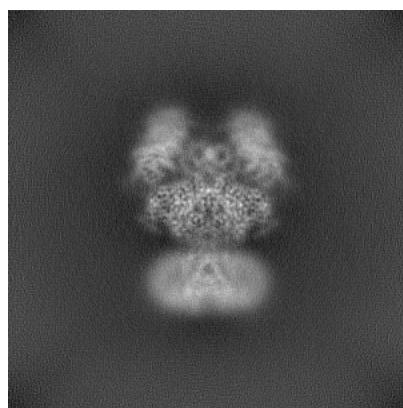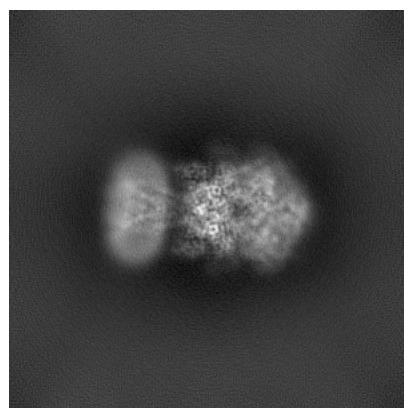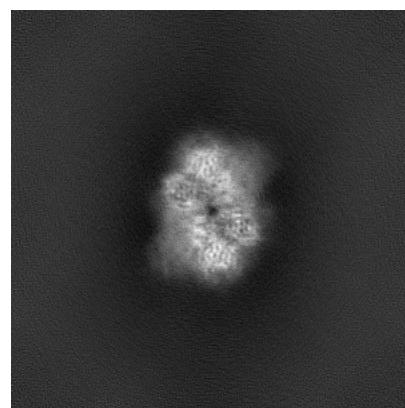
The images above show the map projected in three orthogonal directions.

6.2 Central slices (i)
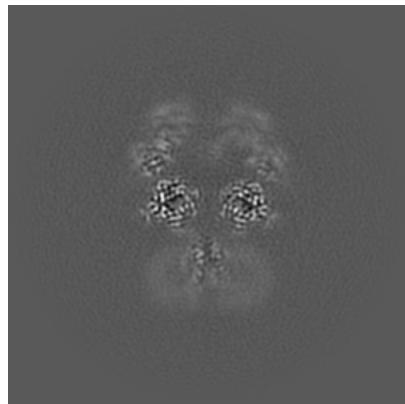
6.2.1 Primary map
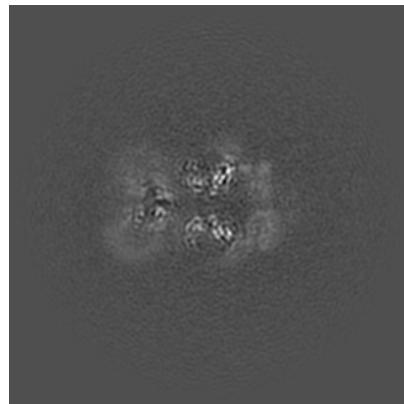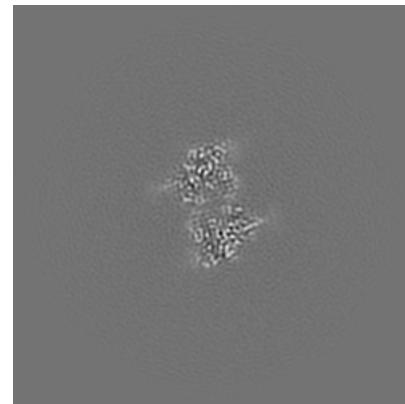
| X Index: 200 | Y Index: 200 | Z Index: 200 |

6.2.2 Raw map
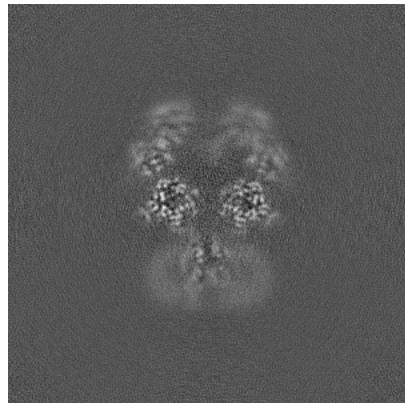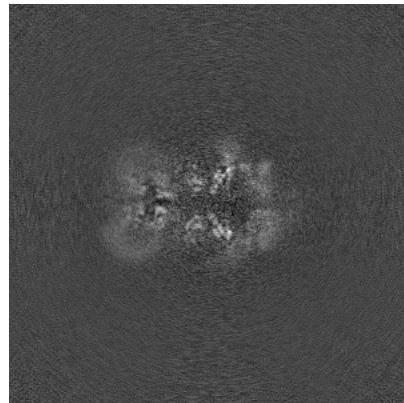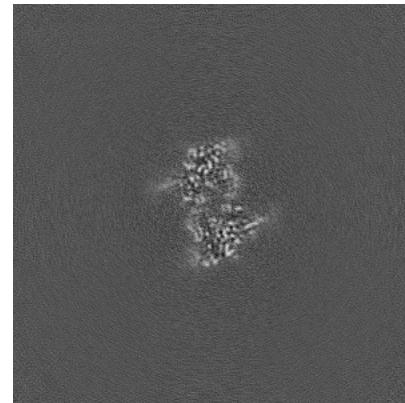
| X Index: 200 | Y Index: 200 | Z Index: 200 |

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

6.3 Largest variance slices ⓘ

6.3.1 Primary map
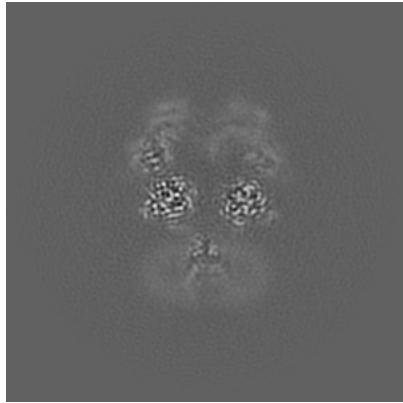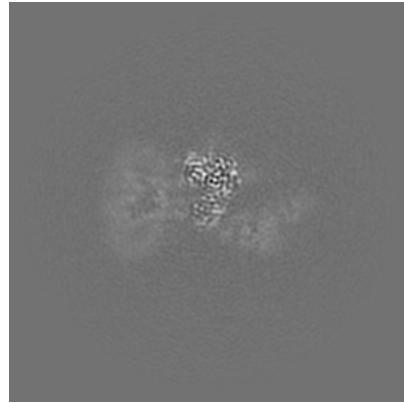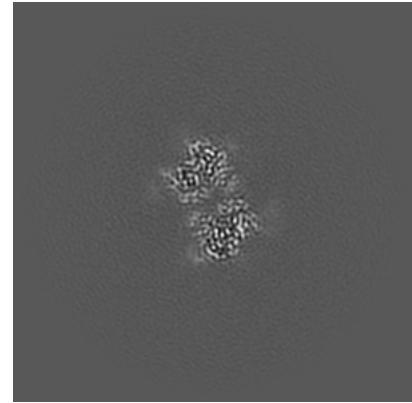
X Index: 202	Y Index: 182	Z Index: 206

6.3.2 Raw map
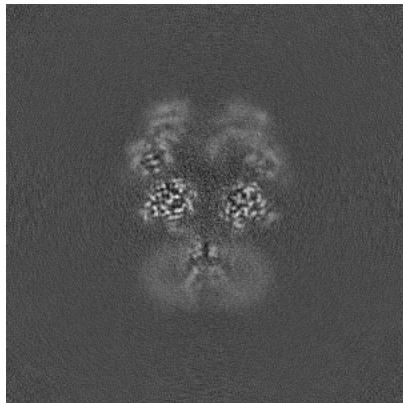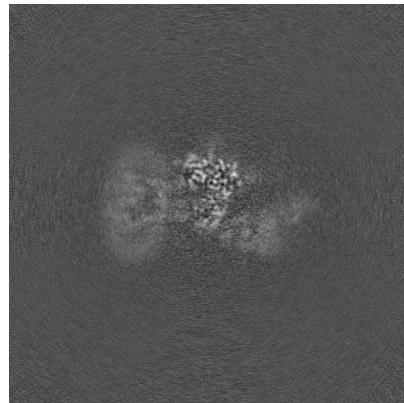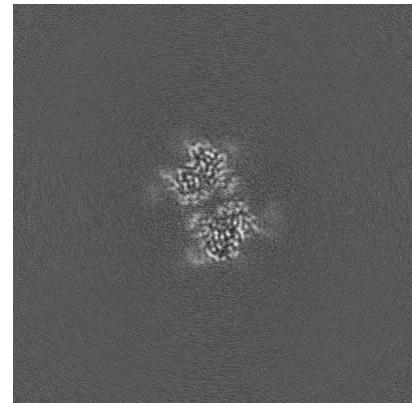
X Index: 202	Y Index: 182	Z Index: 206

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

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

6.4.1 Primary map
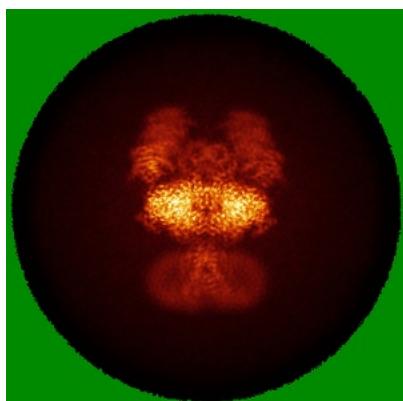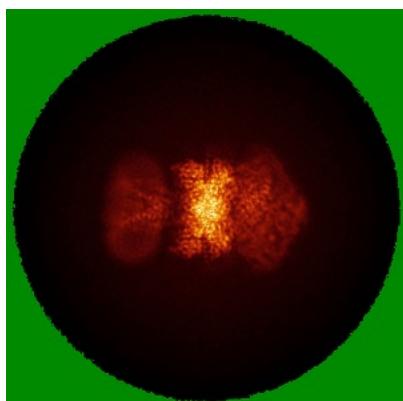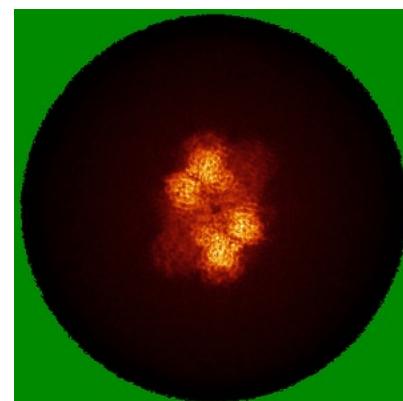
| X | Y | Z |

6.4.2 Raw map

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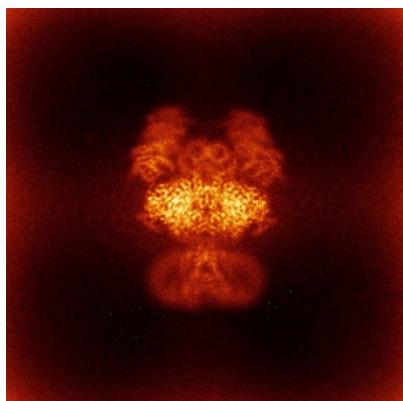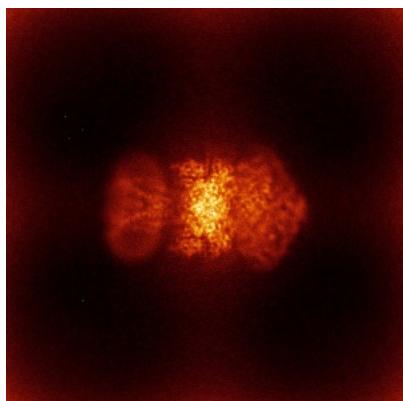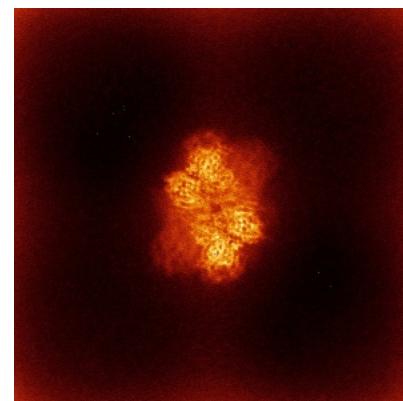
The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

6.5 Orthogonal surface views ⓘ

6.5.1 Primary map

X	Y	Z
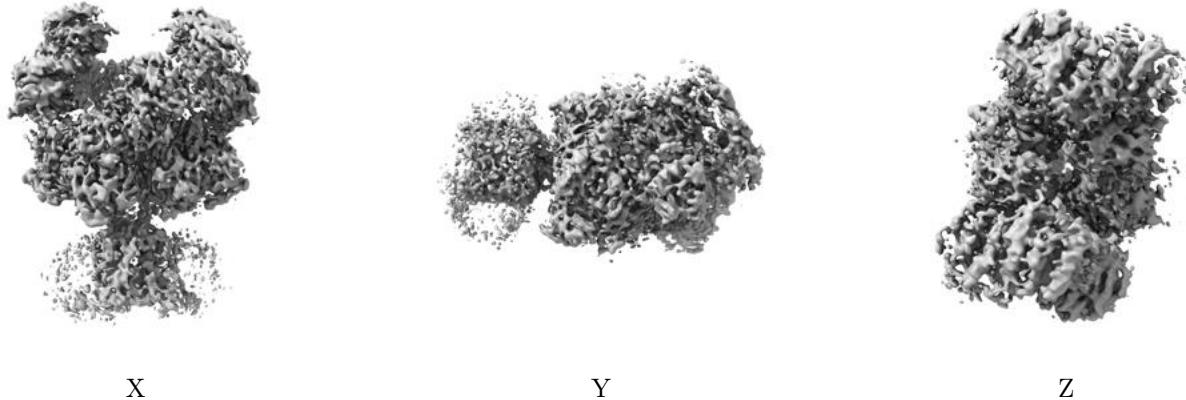
The images above show the 3D surface view of the map at the recommended contour level 0.25. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.5.2 Raw map

X	Y	Z
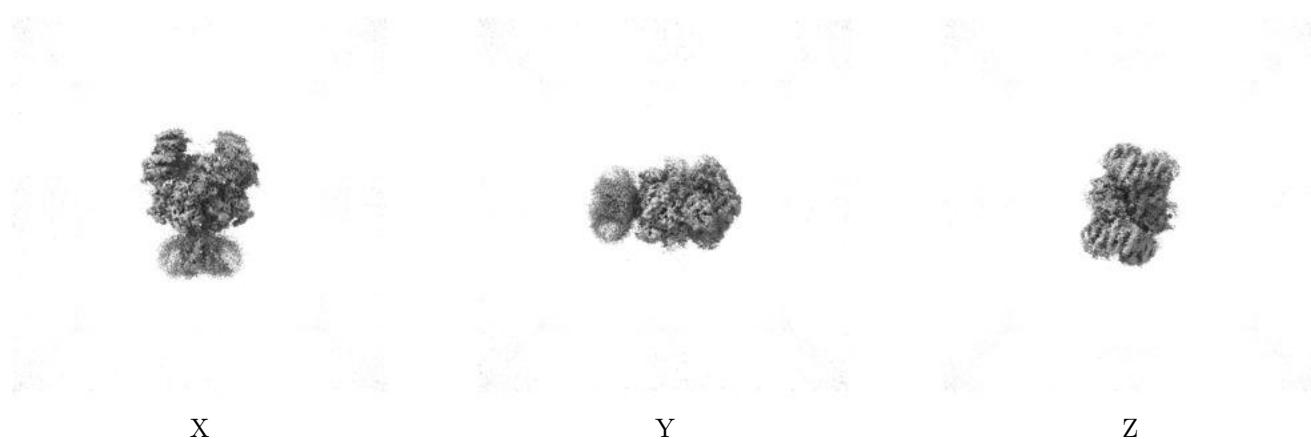
These images show the 3D surface of the raw map. The raw map's contour level was selected so that its surface encloses the same volume as the primary map does at its recommended contour level.

6.6 Mask visualisation ⓘ

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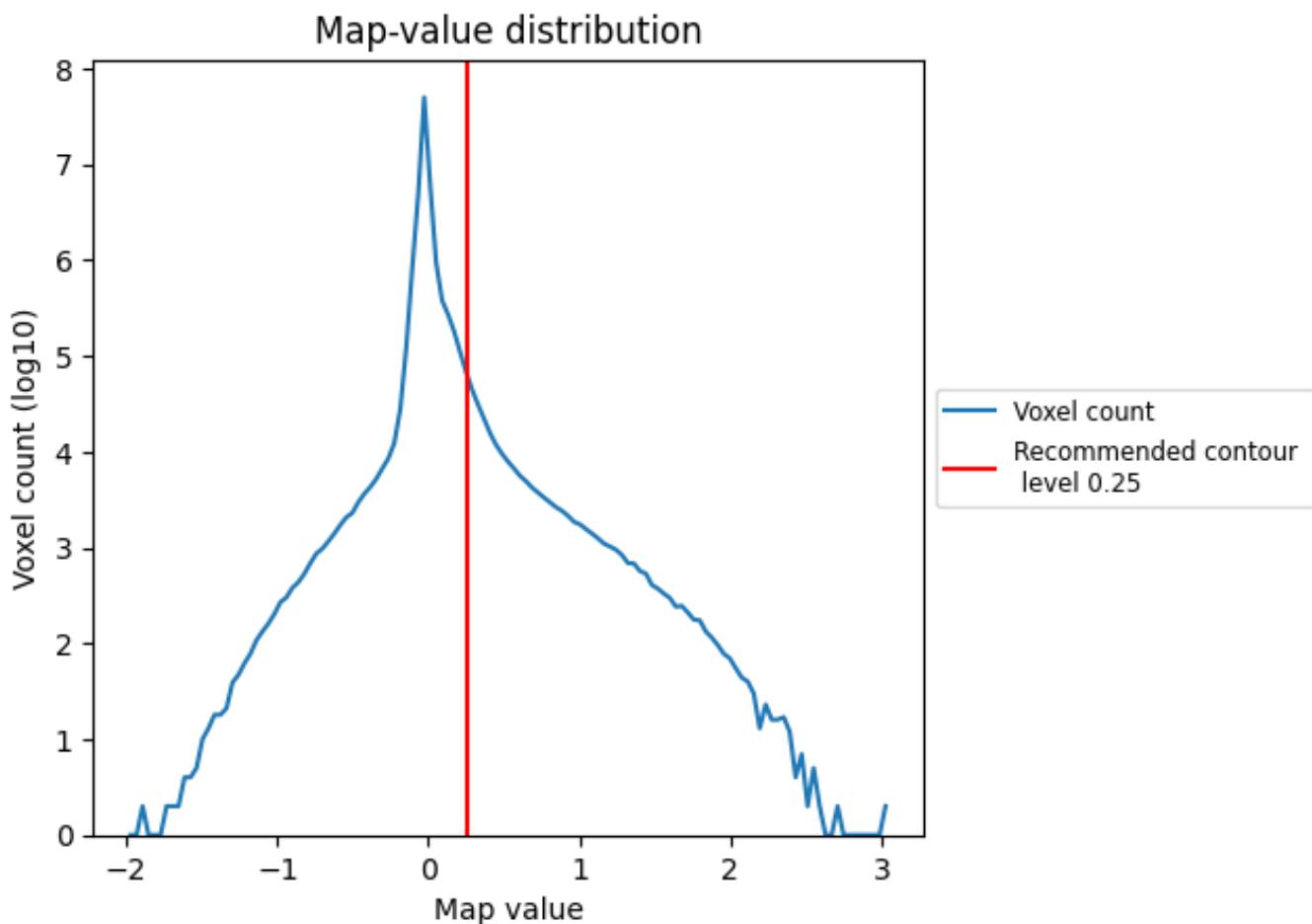
The map-value distribution is plotted in 128 intervals along the x-axis. The y-axis is logarithmic. A spike in this graph at zero usually indicates that the volume has been masked.

7.2   Volume estimate ⓘ
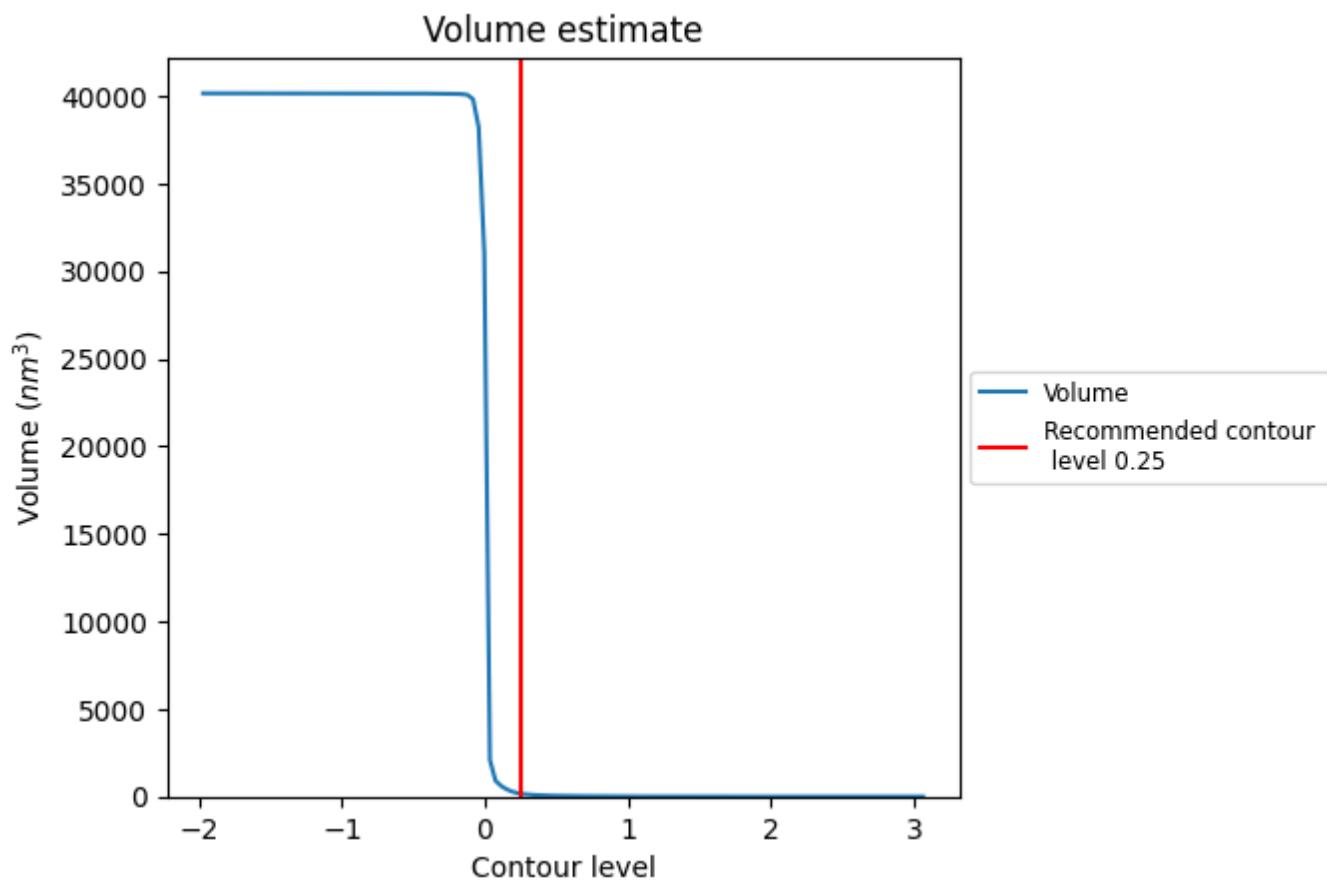
The volume at the recommended contour level is 169 nm^3; this corresponds to an approximate mass of 153 kDa.

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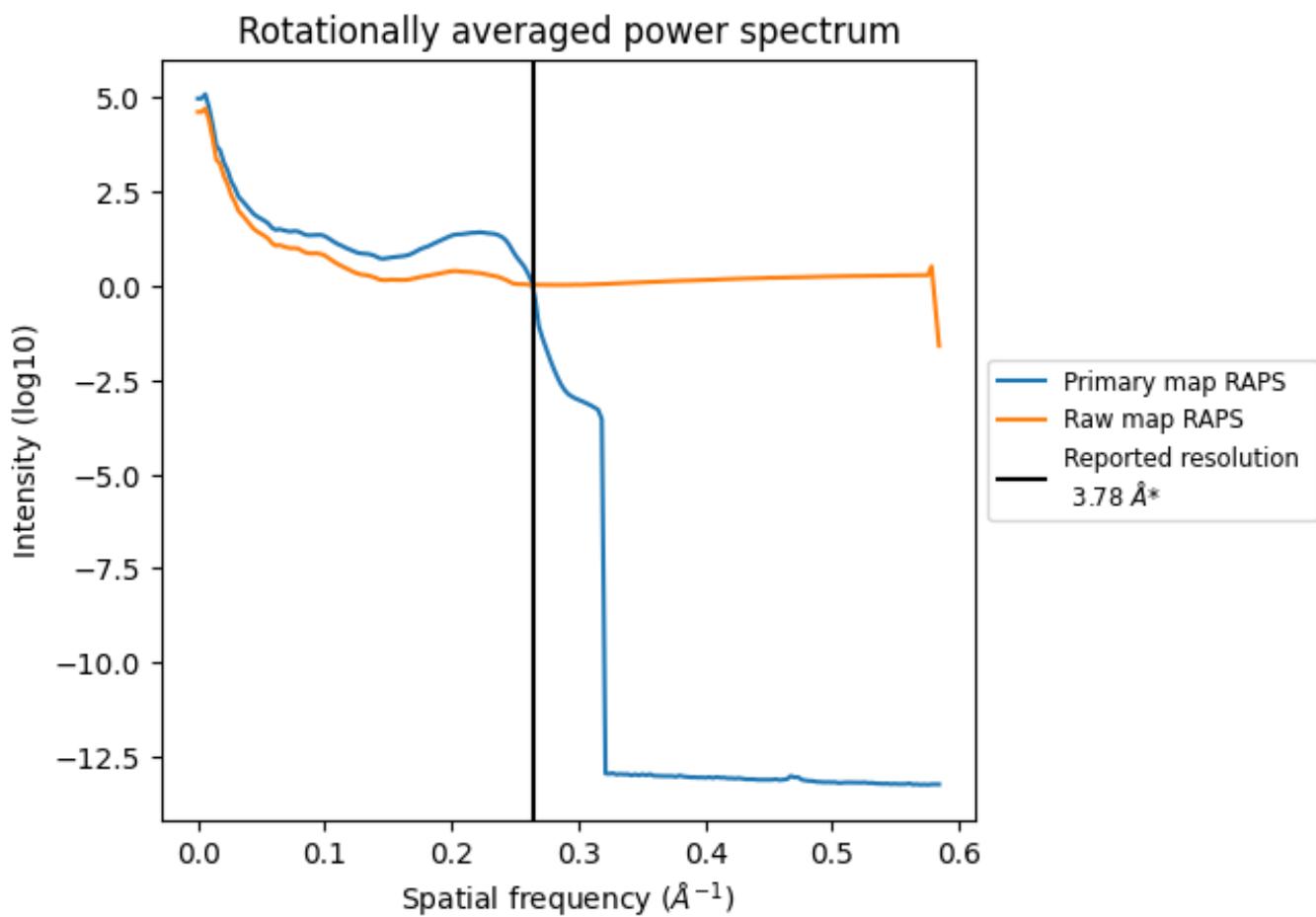
*Reported resolution corresponds to spatial frequency of 0.265 Å^{-1}

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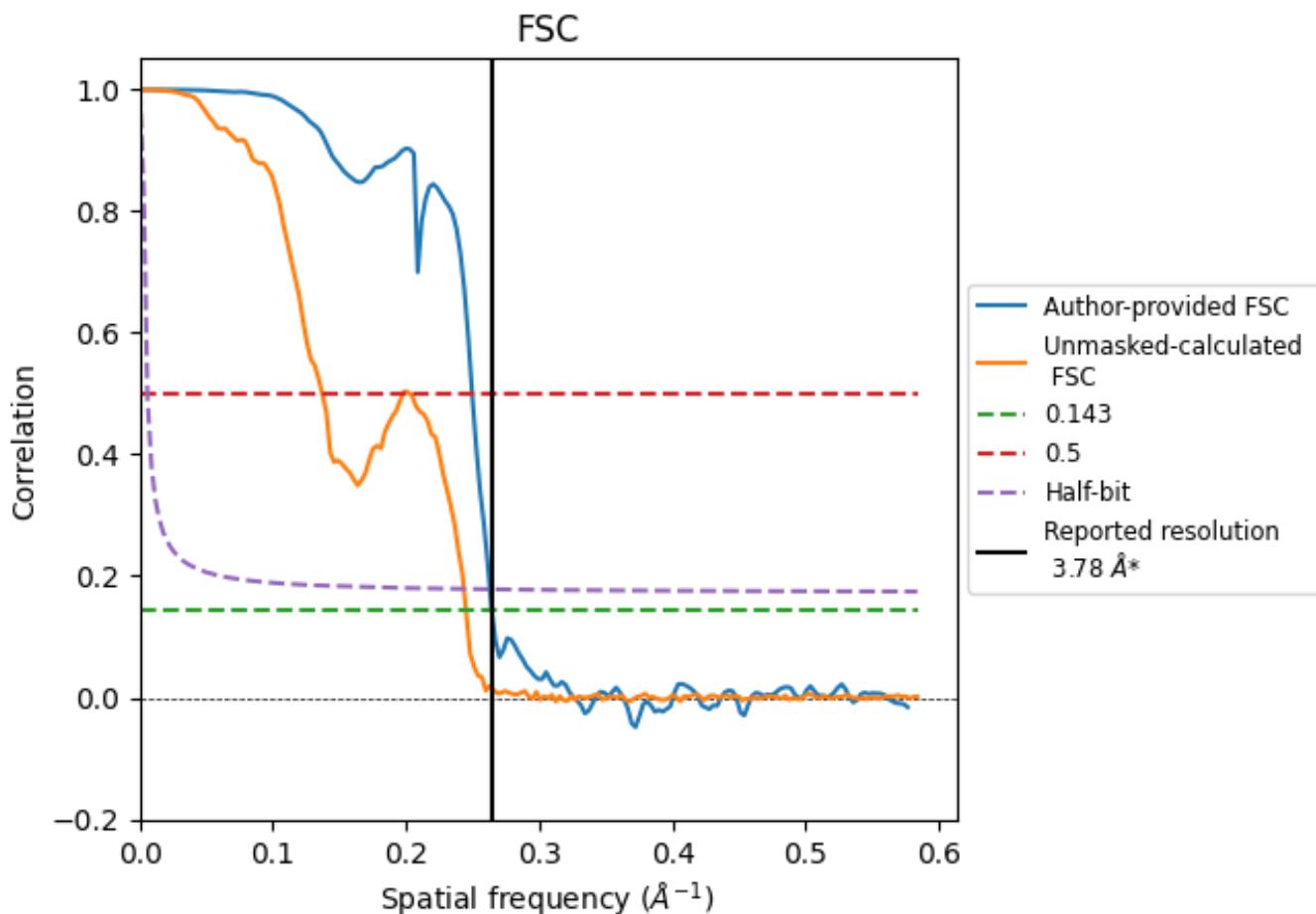
*Reported resolution corresponds to spatial frequency of 0.265 Å^{-1}

8.2   Resolution estimates ⓘ

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 8.

9.1   Map-model overlay ⓘ


X　　　　　　　　　　Y　　　　　　　　　　Z
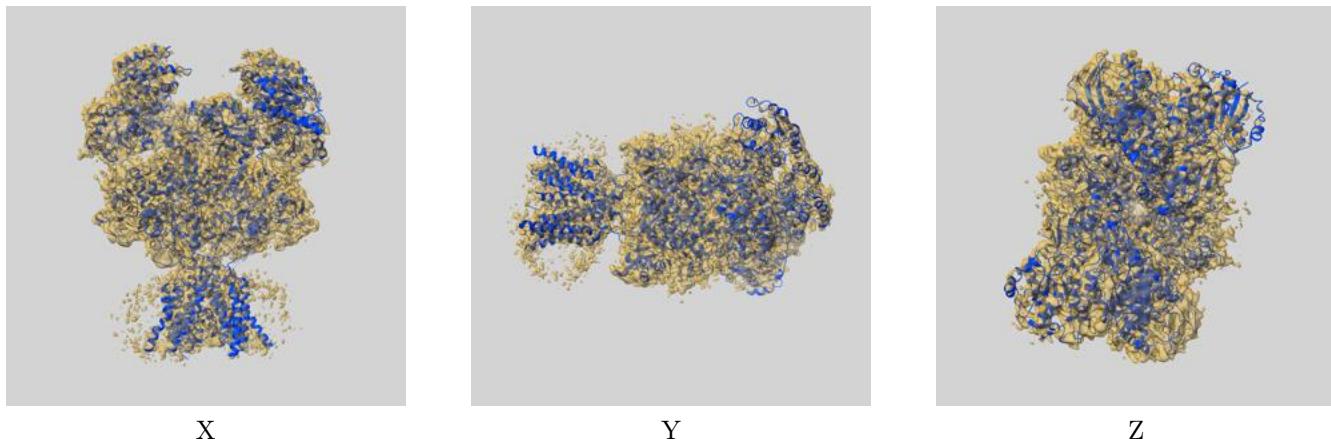
The images above show the 3D surface view of the map at the recommended contour level 0.25 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

9.2 Q-score mapped to coordinate model ⓘ

X   Y   Z
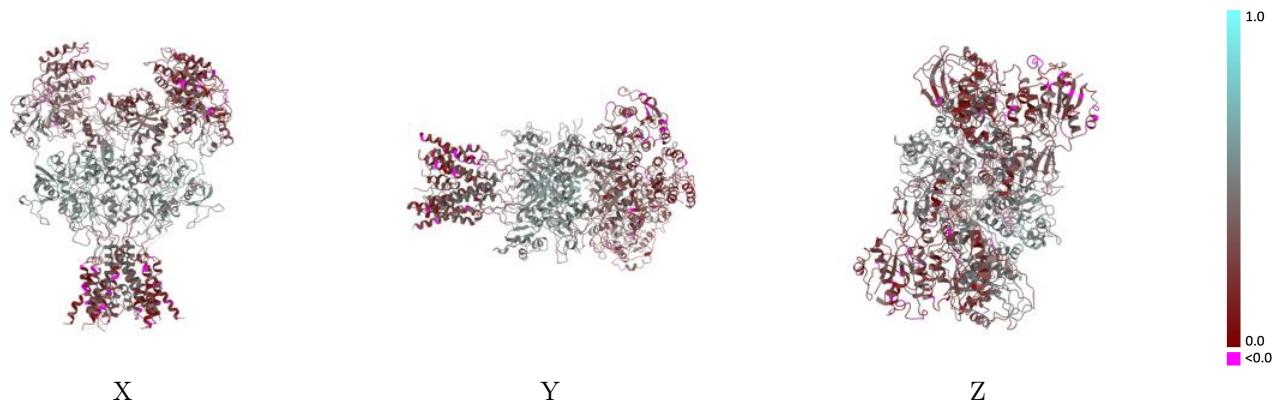
The images above show the model with each residue coloured according its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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
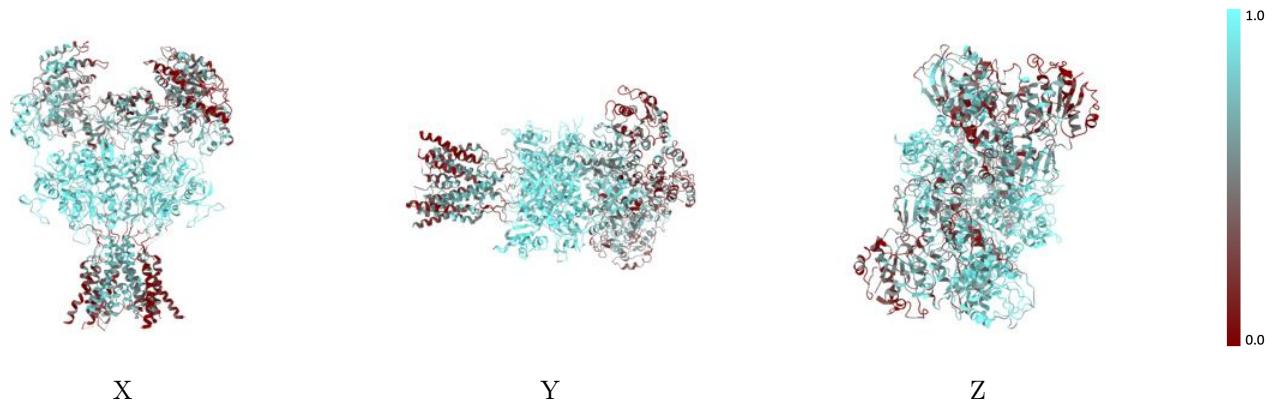
The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.25).

9.4　Atom inclusion ⓘ
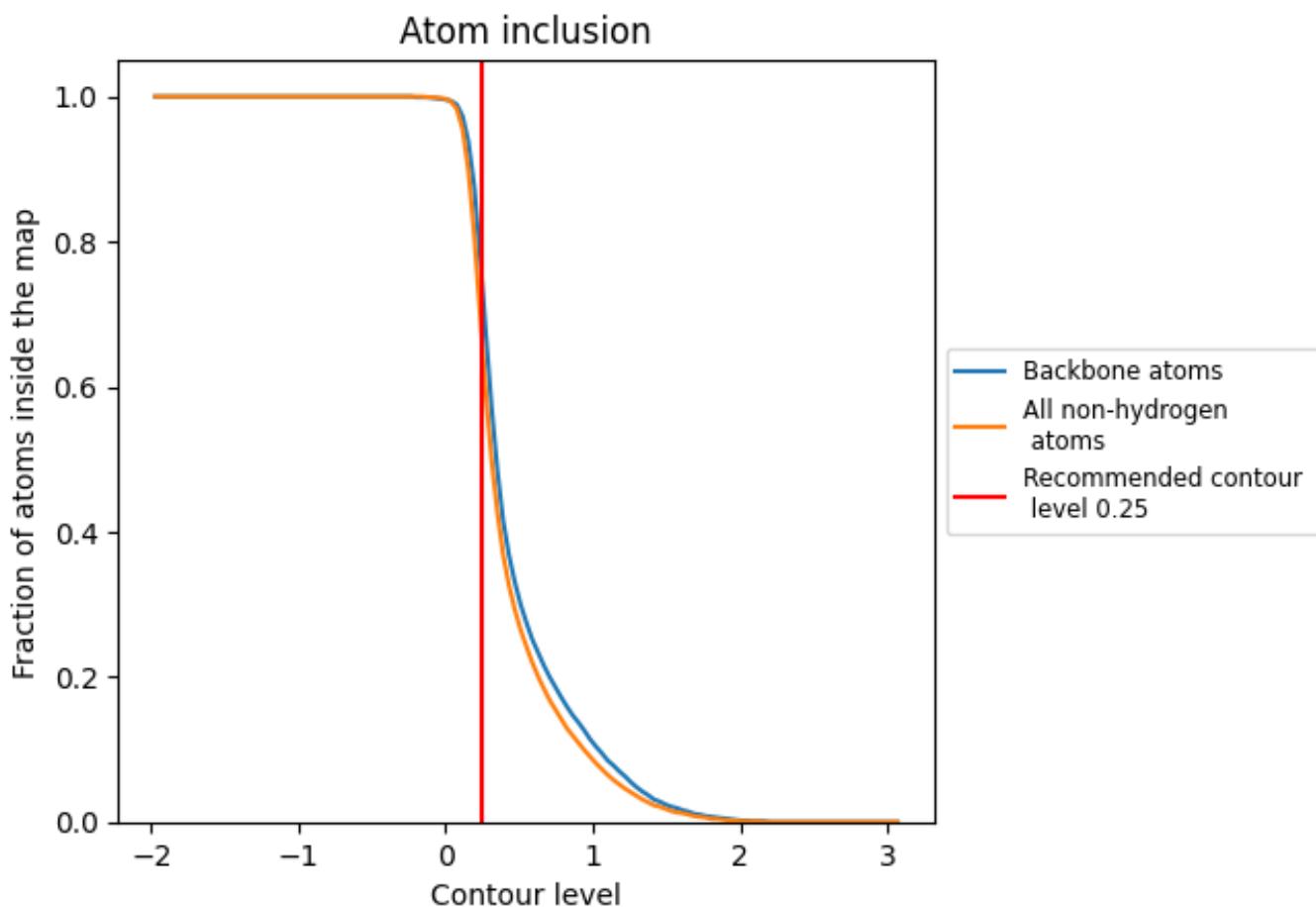
At the recommended contour level, 74% of all backbone atoms, 65% of all non-hydrogen atoms, are inside the map.

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

1.0

0.0

<0.0