



Full wwPDB EM Validation Report ⓘ

Oct 12, 2026 – 05:49 PM EDT

PDB ID : 38OL / pdb_000038ol
EMDB ID : EMD-79007
Title : LPT translocon complex from *Flavobacter johnsoniae* built in composite volume
Authors : Lea, S.M.; Berks, B.C.
Deposited on : 2026-09-09
Resolution : 3.20 Å(reported)

This is a Full wwPDB EM Validation Report for a publicly released PDB entry.

We welcome your comments at validation@mail.wwpdb.org

A user guide is available at

<https://www.wwpdb.org/validation/2017/EMValidationReportHelp>
with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

The following versions of software and data (see [references ⓘ](#)) were used in the production of this report:

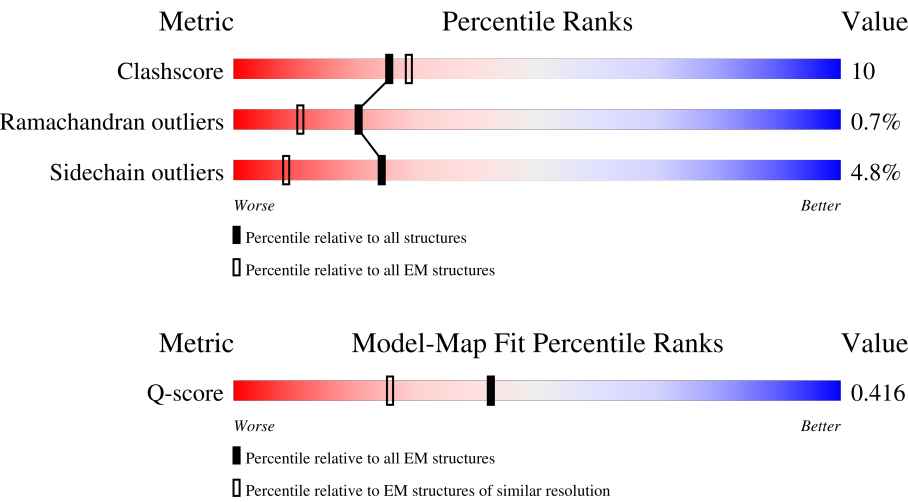
EMDB validation analysis : 0.0.1.dev133
Mogul : 2022.3.0, CSD as543be (2022)
MolProbity : 4-5-2 with Phenix2.2
Percentile statistics : 20250101.v01 (using entries in the PDB archive January 1st 2025)
EM percentile statistics : 202505.v01 (Using data in the EMDB archive up until May 2025)
MapQ : 1.9.13
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.51

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 3.20 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	15020 (2.70 - 3.70)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions $\leq 5\%$. The upper red bar (where present) indicates the fraction of residues that have poor fit to the EM map (all-atom inclusion $< 40\%$). The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	P	562	72%18%7%
2	A	549	49%16%33%
3	N	657	79%13%7%
4	S1	335	73%21%5%

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Mol	Chain	Length	Quality of chain
4	S2	335	
5	Q	274	
6	R	182	
7	T	186	
8	D	926	
9	E	172	
10	G	3	
10	I	3	
10	J	3	
10	O	3	
11	K	2	
11	U	2	

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
10	RAM	J	3	-	-	X	-

2 Entry composition

There are 12 unique types of molecules in this entry. The entry contains 57377 atoms, of which 28352 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 Hypothetical lipoprotein.

Mol	Chain	Residues	Atoms						AltConf	Trace
1	P	523	Total	C	H	N	O	S	0	0
			8596	2774	4316	683	817	6		

- Molecule 2 is a protein called OstA family protein.

Mol	Chain	Residues	Atoms						AltConf	Trace
2	A	367	Total	C	H	N	O	S	0	0
			5959	1884	2987	511	571	6		

- Molecule 3 is a protein called Porin.

Mol	Chain	Residues	Atoms						AltConf	Trace
3	N	611	Total	C	H	N	O	S	0	0
			9941	3273	4857	856	954	1		

- Molecule 4 is a protein called Hypothetical lipoprotein.

Mol	Chain	Residues	Atoms						AltConf	Trace
4	S2	319	Total	C	H	N	O	S	0	0
			4871	1555	2405	399	507	5		
4	S1	319	Total	C	H	N	O	S	0	0
			4869	1555	2403	399	507	5		

- Molecule 5 is a protein called Outer membrane protein beta-barrel domain-containing protein.

Mol	Chain	Residues	Atoms						AltConf	Trace
5	Q	195	Total	C	H	N	O	S	0	0
			3082	1024	1507	254	294	3		

- Molecule 6 is a protein called Hypothetical lipoprotein.

Mol	Chain	Residues	Atoms						AltConf	Trace
6	R	165	Total	C	H	N	O	S	0	0
			2532	804	1252	208	264	4		

- Molecule 7 is a protein called DUF5683 domain-containing protein.

Mol	Chain	Residues	Atoms						AltConf	Trace
7	T	122	Total	C	H	N	O		0	0
			2001	657	989	171	184			

- Molecule 8 is a protein called Organic solvent tolerance protein OstA-like protein.

Mol	Chain	Residues	Atoms						AltConf	Trace
8	D	805	Total	C	H	N	O	S	0	0
			12712	4091	6260	1097	1245	19		

There are 32 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
D	33	SER	-	insertion	UNP A5FB33
D	34	ALA	-	insertion	UNP A5FB33
D	35	TRP	-	insertion	UNP A5FB33
D	36	SER	-	insertion	UNP A5FB33
D	37	HIS	-	insertion	UNP A5FB33
D	38	PRO	-	insertion	UNP A5FB33
D	39	GLN	-	insertion	UNP A5FB33
D	40	PHE	-	insertion	UNP A5FB33
D	41	GLU	-	insertion	UNP A5FB33
D	42	LYS	-	insertion	UNP A5FB33
D	43	GLY	-	insertion	UNP A5FB33
D	44	GLY	-	insertion	UNP A5FB33
D	45	GLY	-	insertion	UNP A5FB33
D	46	SER	-	insertion	UNP A5FB33
D	47	GLY	-	insertion	UNP A5FB33
D	48	GLY	-	insertion	UNP A5FB33
D	49	GLY	-	insertion	UNP A5FB33
D	50	SER	-	insertion	UNP A5FB33
D	51	GLY	-	insertion	UNP A5FB33
D	52	GLY	-	insertion	UNP A5FB33
D	53	SER	-	insertion	UNP A5FB33
D	54	ALA	-	insertion	UNP A5FB33
D	55	TRP	-	insertion	UNP A5FB33
D	56	SER	-	insertion	UNP A5FB33
D	57	HIS	-	insertion	UNP A5FB33

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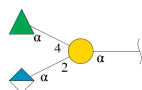
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Chain	Residue	Modelled	Actual	Comment	Reference
D	58	PRO	-	insertion	UNP A5FB33
D	59	GLN	-	insertion	UNP A5FB33
D	60	PHE	-	insertion	UNP A5FB33
D	61	GLU	-	insertion	UNP A5FB33
D	62	LYS	-	insertion	UNP A5FB33
D	63	THR	-	insertion	UNP A5FB33
D	64	SER	-	insertion	UNP A5FB33

- Molecule 9 is a protein called Hypothetical lipoprotein.

Mol	Chain	Residues	Atoms						AltConf	Trace
9	E	151	Total	C	H	N	O	S	0	0
			2354	763	1156	196	236	3		

- Molecule 10 is an oligosaccharide called alpha-D-glucopyranuronic acid-(1-2)-[alpha-L-rham nopyranose-(1-4)]alpha-D-galactopyranose.



Mol	Chain	Residues	Atoms				AltConf	Trace
10	G	3	Total	C	H	O	0	0
			61	18	28	15		
10	I	3	Total	C	H	O	0	0
			61	18	28	15		
10	J	3	Total	C	H	O	0	0
			61	18	28	15		
10	O	3	Total	C	H	O	0	0
			61	18	28	15		

- Molecule 11 is an oligosaccharide called alpha-L-rhamnopyranose-(1-4)-alpha-D-galactopyranose.



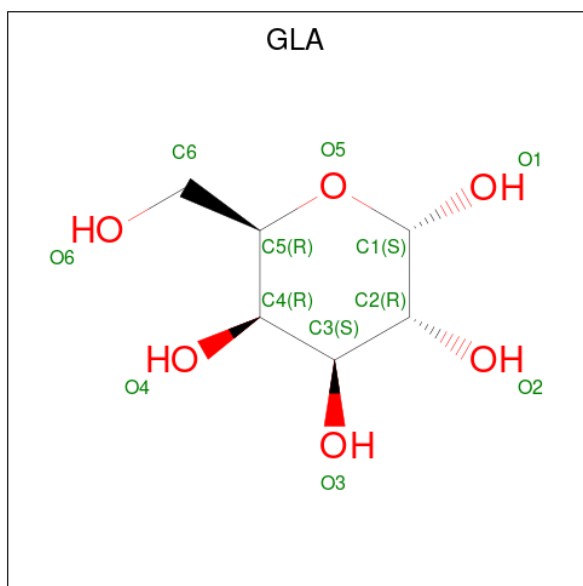
Mol	Chain	Residues	Atoms				AltConf	Trace
11	K	2	Total	C	H	O	0	0
			42	12	21	9		

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Mol	Chain	Residues	Atoms				AltConf	Trace
11	U	2	Total	C	H	O	0	0
			42	12	21	9		

- Molecule 12 is alpha-D-galactopyranose (CCD ID: GLA) (formula: $C_6H_{12}O_6$).

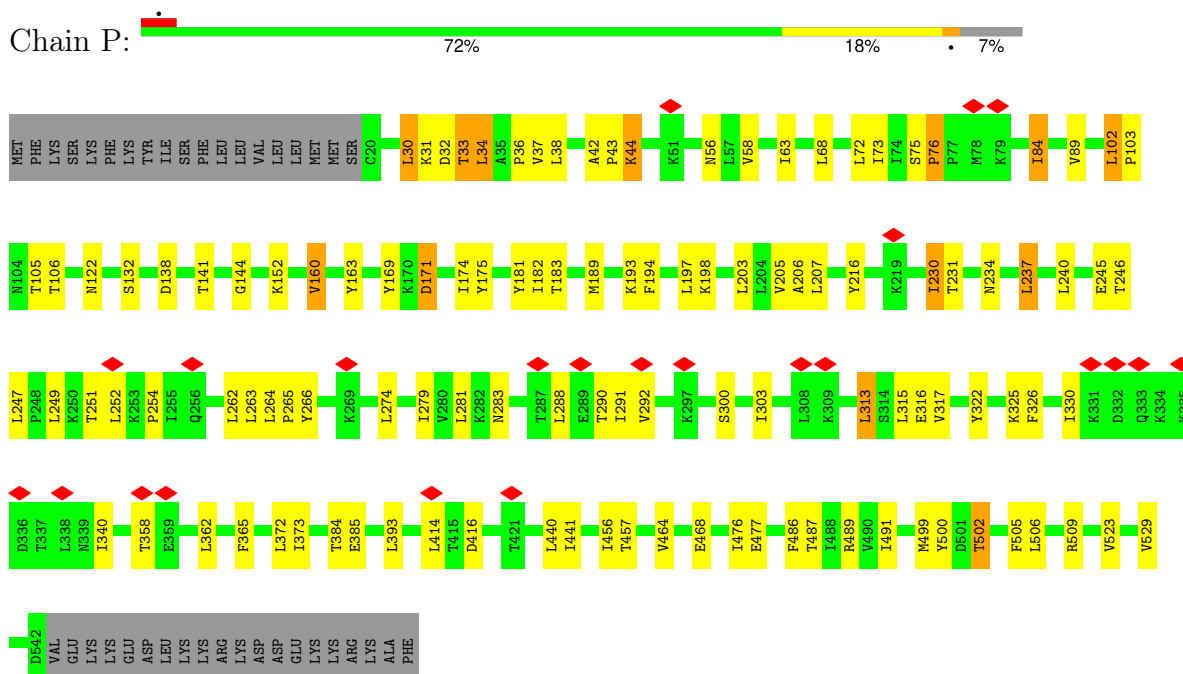


Mol	Chain	Residues	Atoms				AltConf
12	P	1	Total	C	H	O	0
			22	6	11	5	
12	P	1	Total	C	H	O	0
			22	6	11	5	
12	A	1	Total	C	H	O	0
			22	6	11	5	
12	A	1	Total	C	H	O	0
			22	6	11	5	
12	A	1	Total	C	H	O	0
			22	6	11	5	
12	A	1	Total	C	H	O	0
			22	6	11	5	

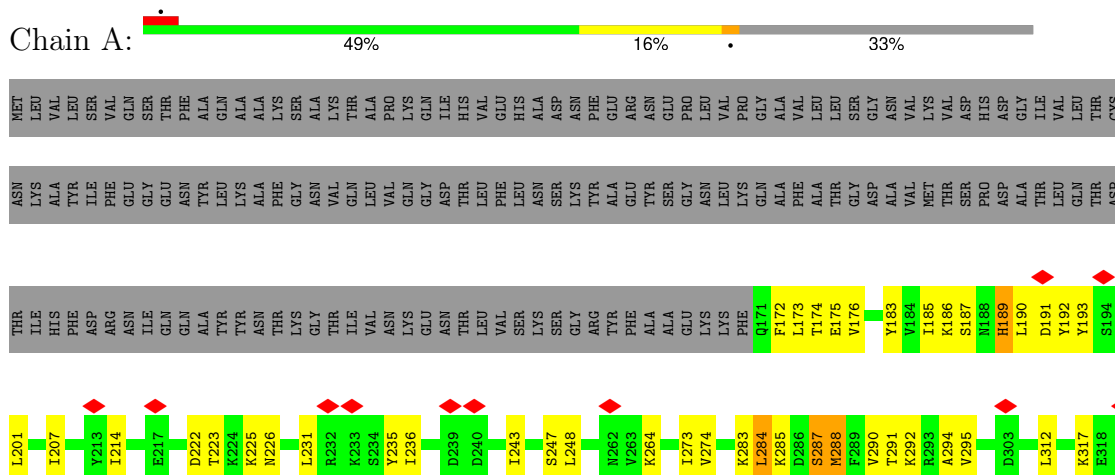
3 Residue-property plots

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.

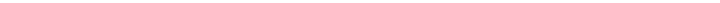
• Molecule 1: Hypothetical lipoprotein

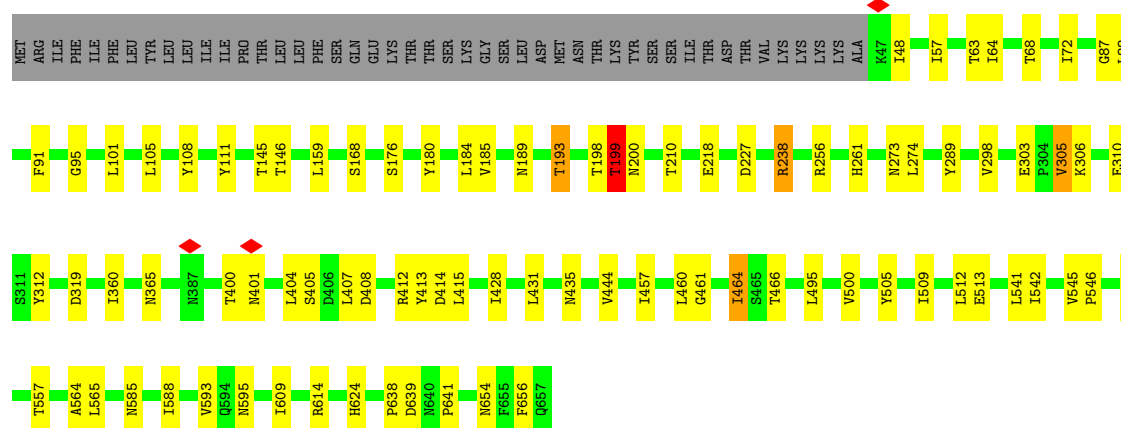


• Molecule 2: OstA family protein

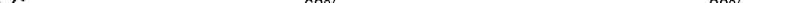


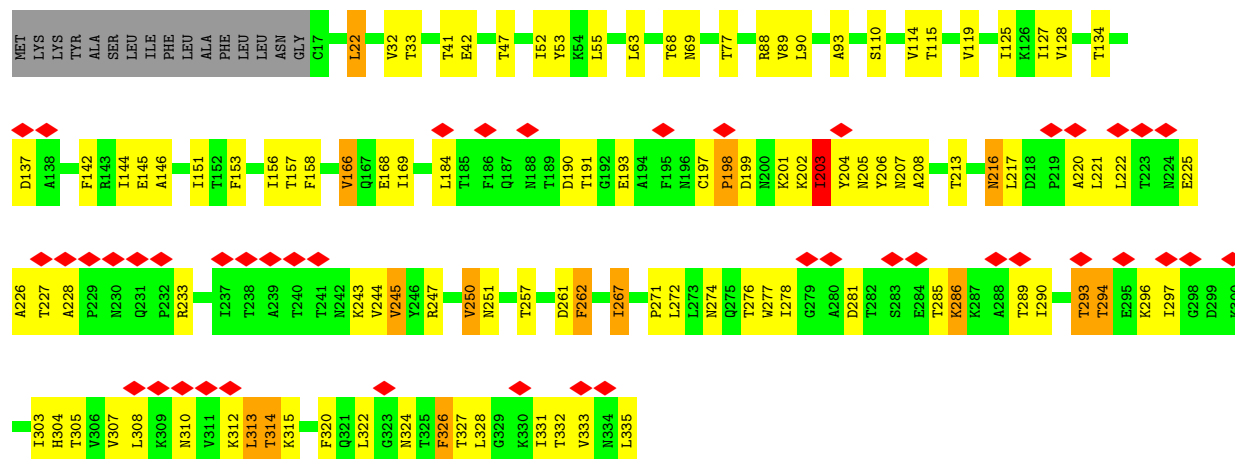
- Molecule 3: Porin

Chain N:  79% 13% 7%

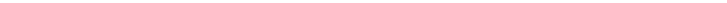


- Molecule 4: Hypothetical lipoprotein

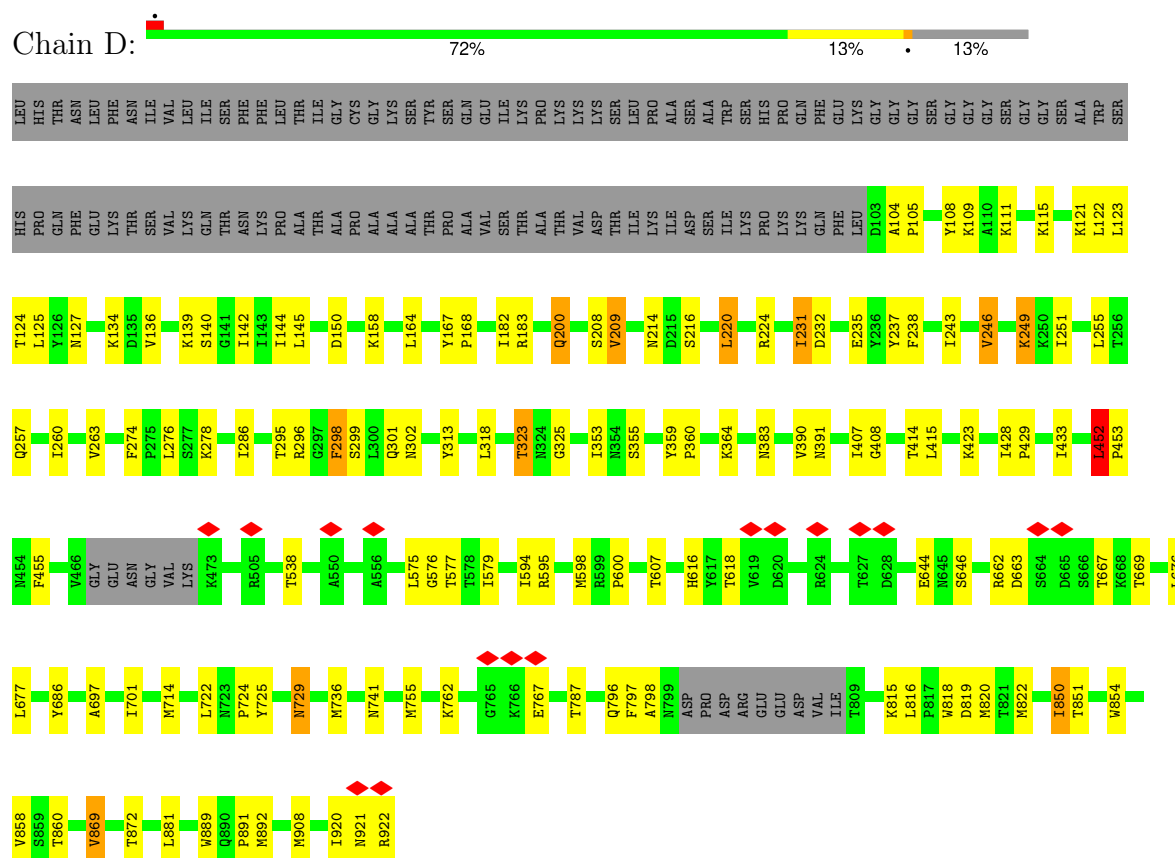
Chain S2: 



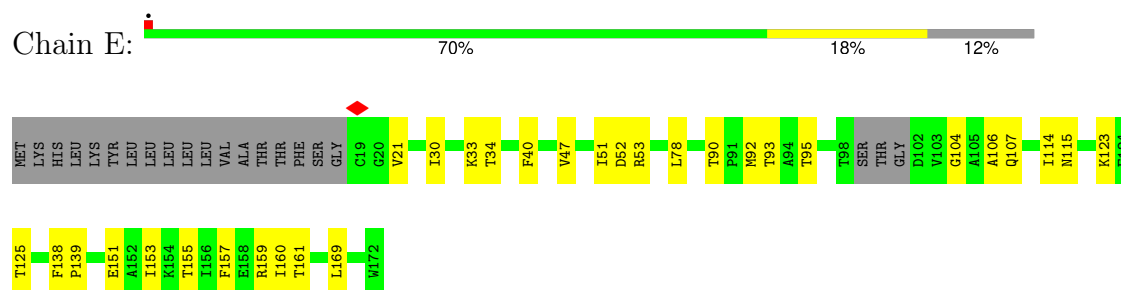
- Molecule 4: Hypothetical lipoprotein

Chain S1:  73% 21% 5%

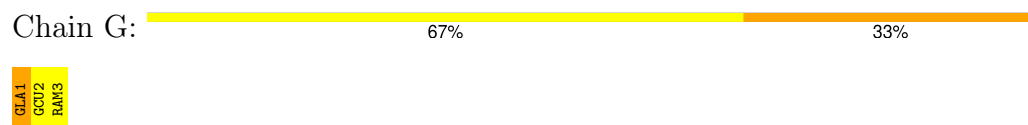
- Molecule 8: Organic solvent tolerance protein OstA-like protein



- Molecule 9: Hypothetical lipoprotein



- Molecule 10: alpha-D-glucopyranuronic acid-(1-2)-[alpha-L-rhamnopyranose-(1-4)]alpha-D-galactopyranose



- Molecule 10: alpha-D-glucopyranuronic acid-(1-2)-[alpha-L-rhamnopyranose-(1-4)]alpha-D-galactopyranose





- Molecule 10: alpha-D-glucopyranuronic acid-(1-2)-[alpha-L-rhamnopyranose-(1-4)]alpha-D-galactopyranose



- Molecule 10: alpha-D-glucopyranuronic acid-(1-2)-[alpha-L-rhamnopyranose-(1-4)]alpha-D-galactopyranose



- Molecule 11: alpha-L-rhamnopyranose-(1-4)-alpha-D-galactopyranose



- Molecule 11: alpha-L-rhamnopyranose-(1-4)-alpha-D-galactopyranose



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	218874	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	TFS KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	50	Depositor
Minimum defocus (nm)	500	Depositor
Maximum defocus (nm)	2000	Depositor
Magnification	Not provided	
Image detector	GATAN K3 BIOQUANTUM (6k x 4k)	Depositor
Maximum map value	4.215	Depositor
Minimum map value	-0.009	Depositor
Average map value	0.001	Depositor
Map value standard deviation	0.028	Depositor
Recommended contour level	0.07	Depositor
Map size (Å)	499.7, 499.7, 499.7	wwPDB
Map dimensions	380, 380, 380	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.315, 1.315, 1.315	Depositor

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: GLA, GCU, RAM

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	P	0.17	0/4373	0.34	0/5908
2	A	0.17	0/3022	0.34	0/4067
3	N	0.37	0/5219	0.36	0/7076
4	S1	0.25	0/2515	0.33	0/3439
4	S2	0.22	0/2515	0.40	0/3439
5	Q	0.26	0/1619	0.35	0/2193
6	R	0.22	0/1303	0.39	0/1781
7	T	0.38	0/1037	0.38	0/1405
8	D	0.38	0/6600	0.38	0/8913
9	E	0.41	0/1222	0.38	0/1657
All	All	0.30	0/29425	0.36	0/39878

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

Mol	Chain	#Chirality outliers	#Planarity outliers
8	D	0	1

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
8	D	452	LEU	Peptide

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	P	4280	4316	4316	108	0
2	A	2972	2987	2987	60	0
3	N	5084	4857	4857	55	0
4	S1	2466	2403	2403	54	0
4	S2	2466	2405	2405	98	0
5	Q	1575	1507	1507	46	0
6	R	1280	1252	1252	57	0
7	T	1012	989	989	18	0
8	D	6452	6260	6259	84	0
9	E	1198	1156	1156	23	0
10	G	33	28	25	1	0
10	I	33	28	25	3	0
10	J	33	28	25	7	0
10	O	33	28	25	0	0
11	K	21	21	19	1	0
11	U	21	21	19	4	0
12	A	44	44	40	0	0
12	P	22	22	20	0	0
All	All	29025	28352	28329	593	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 10.

All (593) 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)
3:N:509:ILE:HD11	3:N:542:ILE:HD11	1.49	0.94
1:P:160:VAL:HG23	1:P:183:THR:HG23	1.59	0.84
5:Q:166:ILE:HG21	6:R:91:THR:HG21	1.61	0.82
1:P:102:LEU:HD12	1:P:105:THR:HG21	1.61	0.81
10:J:1:GLA:H4	10:J:3:RAM:H5	1.63	0.80
10:J:1:GLA:H4	10:J:3:RAM:C5	2.12	0.78
3:N:428:ILE:HD11	3:N:457:ILE:HD12	1.65	0.78
6:R:114:LEU:HD21	6:R:160:MET:HE1	1.66	0.76
1:P:42:ALA:HB1	1:P:43:PRO:HD2	1.66	0.76

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
8:D:286:ILE:HD12	8:D:318:LEU:HD21	1.68	0.75
2:A:470:ASN:O	2:A:472:VAL:HG23	1.87	0.75
4:S2:114:VAL:HG11	4:S1:110:SER:HB2	1.69	0.74
2:A:185:ILE:HD11	2:A:223:THR:HG21	1.70	0.74
4:S2:245:VAL:HG22	4:S2:278:ILE:HD12	1.70	0.73
8:D:787:THR:HG21	8:D:796:GLN:HB3	1.71	0.72
3:N:656:PHE:CB	10:J:3:RAM:H62	2.20	0.72
2:A:375:ILE:HD11	2:A:387:LYS:HG2	1.72	0.71
4:S2:204:TYR:HA	4:S2:213:THR:HG23	1.72	0.71
2:A:185:ILE:HG23	2:A:207:ILE:HD12	1.73	0.70
3:N:656:PHE:HB3	10:J:3:RAM:H62	1.74	0.69
8:D:115:LYS:O	8:D:123:LEU:HD12	1.93	0.69
1:P:457:THR:HG22	1:P:464:VAL:HA	1.75	0.69
6:R:54:LYS:NZ	6:R:79:LEU:HD23	2.08	0.69
5:Q:111:LYS:HG3	5:Q:113:THR:HG23	1.75	0.69
4:S2:110:SER:HB2	4:S1:114:VAL:HG21	1.74	0.68
1:P:102:LEU:CD1	1:P:105:THR:HG21	2.23	0.68
4:S1:194:ALA:O	4:S1:331:ILE:HG22	1.93	0.68
9:E:114:ILE:HD13	9:E:160:ILE:HD13	1.76	0.68
6:R:87:ILE:HD12	6:R:88:PRO:HD2	1.75	0.68
9:E:93:THR:HG23	9:E:106:ALA:HB3	1.75	0.67
4:S2:90:LEU:HD22	4:S2:119:VAL:HG12	1.77	0.67
5:Q:67:LEU:HD12	5:Q:93:ASP:O	1.95	0.67
4:S2:216:ASN:C	4:S2:217:LEU:HD12	2.20	0.67
1:P:169:TYR:OH	1:P:203:LEU:HD22	1.96	0.66
1:P:358:THR:HG21	1:P:362:LEU:HD11	1.78	0.66
4:S2:77:THR:HG23	4:S2:128:VAL:HG22	1.78	0.66
1:P:292:VAL:HG12	1:P:303:ILE:HD13	1.78	0.65
8:D:200:GLN:HB3	8:D:276:LEU:HD21	1.78	0.65
7:T:44:THR:HG22	7:T:150:ALA:HB1	1.78	0.65
3:N:312:TYR:CE1	3:N:444:VAL:HG22	2.31	0.65
8:D:243:ILE:HD11	8:D:251:ILE:HD12	1.78	0.65
1:P:163:TYR:CE2	1:P:174:ILE:HG22	2.31	0.65
5:Q:135:LEU:HD21	5:Q:148:ILE:HG22	1.79	0.65
3:N:505:TYR:CD2	3:N:542:ILE:HD13	2.31	0.65
6:R:54:LYS:HZ2	6:R:79:LEU:HD23	1.62	0.65
4:S1:309:LYS:CD	4:S1:325:THR:HG22	2.27	0.64
4:S1:303:ILE:HD11	4:S1:330:LYS:HB2	1.79	0.64
8:D:579:ILE:CD1	8:D:598:MET:HE2	2.27	0.64
8:D:579:ILE:HD11	8:D:598:MET:HE2	1.78	0.64
3:N:512:LEU:HD23	3:N:513:GLU:N	2.12	0.64

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
6:R:89:LEU:HD11	6:R:135:PHE:CE2	2.33	0.64
4:S1:45:LEU:HD23	4:S1:45:LEU:H	1.62	0.64
4:S2:190:ASP:OD1	4:S2:191:THR:HG23	1.98	0.63
1:P:163:TYR:HE2	1:P:174:ILE:HG22	1.64	0.63
3:N:407:LEU:HD23	3:N:408:ASP:N	2.13	0.63
1:P:440:LEU:O	1:P:441:ILE:HD13	1.99	0.63
2:A:536:VAL:HG22	2:A:537:ARG:H	1.62	0.62
4:S2:244:VAL:HG21	4:S2:290:ILE:HD12	1.80	0.62
3:N:415:LEU:O	3:N:415:LEU:HD23	1.99	0.62
6:R:114:LEU:CD2	6:R:160:MET:HE1	2.28	0.62
1:P:281:LEU:HD11	1:P:313:LEU:HD13	1.80	0.62
2:A:235:TYR:O	2:A:236:ILE:HD13	1.99	0.62
6:R:91:THR:HG22	6:R:135:PHE:HZ	1.64	0.62
4:S1:200:ASN:ND2	4:S1:222:LEU:HD23	2.15	0.62
7:T:49:ALA:HB1	7:T:143:ILE:HD11	1.83	0.61
3:N:404:LEU:HD12	3:N:431:LEU:HD13	1.82	0.61
4:S2:157:THR:HG22	4:S2:166:VAL:HB	1.81	0.61
4:S2:221:LEU:HD23	4:S2:226:ALA:HB2	1.81	0.61
5:Q:142:MET:HE3	7:T:43:LEU:HD12	1.83	0.61
1:P:194:PHE:CB	1:P:197:LEU:HD11	2.31	0.60
6:R:51:THR:HG22	6:R:52:ASN:ND2	2.16	0.60
3:N:87:GLY:C	3:N:88:LEU:HD12	2.25	0.60
1:P:42:ALA:HB1	1:P:43:PRO:CD	2.31	0.60
2:A:294:ALA:HB1	2:A:312:LEU:HD12	1.84	0.60
8:D:872:THR:HG23	8:D:891:PRO:HD2	1.84	0.60
2:A:190:LEU:HD23	2:A:191:ASP:N	2.17	0.60
2:A:374:LEU:HD23	2:A:386:LEU:HD12	1.83	0.60
8:D:246:VAL:HG13	8:D:249:LYS:O	2.01	0.60
4:S2:308:LEU:H	4:S2:308:LEU:HD23	1.67	0.60
5:Q:117:ARG:C	5:Q:118:LEU:HD12	2.27	0.60
8:D:104:ALA:HB3	8:D:134:LYS:HD2	1.84	0.59
1:P:262:LEU:CD1	1:P:313:LEU:HD21	2.32	0.59
1:P:181:TYR:O	1:P:182:ILE:HD13	2.02	0.59
1:P:362:LEU:HD13	1:P:414:LEU:HB3	1.84	0.59
1:P:372:LEU:HD23	1:P:373:ILE:N	2.17	0.59
4:S2:22:LEU:HD22	8:D:729:ASN:OD1	2.02	0.59
1:P:207:LEU:HD23	1:P:216:TYR:CE1	2.38	0.59
3:N:460:LEU:HD23	3:N:461:GLY:N	2.18	0.59
6:R:89:LEU:HD11	6:R:135:PHE:CD2	2.38	0.59
5:Q:148:ILE:HD13	5:Q:197:LEU:HD13	1.85	0.58
1:P:102:LEU:HD23	1:P:102:LEU:H	1.67	0.58

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:S2:277:TRP:CB	4:S2:313:LEU:HD13	2.34	0.58
7:T:130:LEU:HD13	8:D:298:PHE:HZ	1.67	0.58
2:A:336:MET:HE1	2:A:362:ASN:ND2	2.19	0.58
4:S2:313:LEU:HD12	4:S2:320:PHE:HD2	1.67	0.58
9:E:95:THR:HG22	9:E:104:GLY:O	2.03	0.58
3:N:101:LEU:HD22	3:N:546:PRO:HG3	1.84	0.58
8:D:869:VAL:CG1	8:D:892:MET:HE1	2.34	0.58
2:A:174:THR:HG23	2:A:176:VAL:HG13	1.86	0.58
6:R:118:TYR:HB3	6:R:137:LEU:HD13	1.85	0.58
1:P:181:TYR:C	1:P:182:ILE:HD13	2.29	0.57
2:A:325:ALA:HB3	2:A:343:ILE:HD11	1.85	0.57
4:S2:226:ALA:HA	4:S2:294:THR:HG23	1.85	0.57
5:Q:209:VAL:HG13	7:T:54:ILE:HD12	1.86	0.57
4:S2:53:TYR:HD2	4:S2:55:LEU:HD13	1.68	0.57
6:R:87:ILE:HD12	6:R:88:PRO:CD	2.33	0.57
6:R:101:ILE:HG22	6:R:104:ALA:HB2	1.87	0.57
4:S2:313:LEU:HD12	4:S2:320:PHE:CD2	2.40	0.57
4:S2:322:LEU:O	4:S2:322:LEU:HD23	2.05	0.57
8:D:575:LEU:HD23	8:D:576:GLY:N	2.19	0.57
1:P:194:PHE:HB2	1:P:197:LEU:HD11	1.86	0.57
4:S2:125:ILE:HG22	4:S2:153:PHE:CD1	2.40	0.57
4:S1:114:VAL:HG23	4:S1:114:VAL:O	2.05	0.57
4:S2:250:VAL:HG12	4:S2:272:LEU:HD11	1.84	0.57
1:P:33:THR:HG23	1:P:33:THR:O	2.04	0.57
2:A:185:ILE:HG23	2:A:207:ILE:CD1	2.34	0.57
3:N:176:SER:O	3:N:184:LEU:HD12	2.05	0.57
4:S2:168:GLU:OE1	4:S2:169:ILE:HG23	2.05	0.57
4:S1:184:LEU:HD21	4:S1:246:TYR:CE1	2.40	0.57
8:D:858:VAL:HG22	8:D:860:THR:HG23	1.86	0.57
4:S2:201:LYS:HZ1	4:S2:262:PHE:HB3	1.70	0.56
4:S2:221:LEU:HD21	4:S2:225:GLU:HB3	1.87	0.56
4:S1:237:ILE:HG22	4:S1:289:THR:N	2.20	0.56
1:P:42:ALA:HB2	1:P:56:ASN:H	1.70	0.56
3:N:360:ILE:HD12	3:N:365:ASN:O	2.06	0.56
4:S2:205:ASN:ND2	4:S2:335:LEU:HD12	2.19	0.56
5:Q:148:ILE:HD11	5:Q:195:VAL:HG22	1.87	0.56
6:R:55:VAL:HG11	6:R:87:ILE:HD13	1.87	0.56
8:D:452:LEU:HB3	8:D:453:PRO:CD	2.34	0.56
2:A:264:LYS:HE3	2:A:273:ILE:HG21	1.86	0.56
2:A:367:ILE:HD13	2:A:394:ILE:HG23	1.86	0.56
4:S2:202:LYS:O	4:S2:217:LEU:HD11	2.05	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
8:D:818:TRP:HZ3	8:D:820:MET:HE2	1.69	0.56
5:Q:91:THR:HG22	5:Q:105:GLU:HB3	1.87	0.56
1:P:194:PHE:HB3	1:P:197:LEU:HD21	1.88	0.56
2:A:375:ILE:HD13	2:A:375:ILE:H	1.70	0.56
4:S2:272:LEU:HD12	4:S2:272:LEU:O	2.05	0.56
5:Q:235:PHE:CD2	5:Q:238:THR:HG22	2.40	0.56
7:T:49:ALA:O	7:T:143:ILE:HD13	2.06	0.56
8:D:158:LYS:HB3	8:D:164:LEU:HD23	1.87	0.56
1:P:32:ASP:O	1:P:33:THR:HG22	2.06	0.55
6:R:114:LEU:HD21	6:R:160:MET:CE	2.37	0.55
4:S1:302:PHE:CD1	4:S1:335:LEU:HD12	2.42	0.55
8:D:428:ILE:HD12	8:D:429:PRO:HA	1.88	0.55
1:P:457:THR:HG21	1:P:489:ARG:NH1	2.21	0.55
4:S2:276:THR:O	4:S2:278:ILE:HG22	2.07	0.55
5:Q:187:GLY:C	5:Q:188:LEU:HD12	2.32	0.55
6:R:114:LEU:CG	6:R:160:MET:HE1	2.37	0.55
8:D:667:THR:O	8:D:669:THR:HG23	2.06	0.55
4:S2:245:VAL:HG11	4:S2:247:ARG:HE	1.72	0.55
2:A:214:ILE:HG12	2:A:236:ILE:HD12	1.88	0.54
2:A:321:ARG:O	2:A:322:ILE:HD13	2.07	0.54
4:S2:277:TRP:CG	4:S2:313:LEU:HD13	2.42	0.54
1:P:489:ARG:HD3	1:P:491:ILE:HD11	1.88	0.54
6:R:37:THR:OG1	6:R:176:THR:HG21	2.07	0.54
7:T:157:VAL:HG12	7:T:157:VAL:O	2.08	0.54
1:P:489:ARG:CD	1:P:491:ILE:HD11	2.38	0.54
2:A:189:HIS:CG	2:A:534:LEU:HD21	2.43	0.54
2:A:532:VAL:HG12	2:A:533:PRO:O	2.08	0.54
9:E:78:LEU:HD12	9:E:78:LEU:N	2.23	0.54
8:D:243:ILE:HD11	8:D:251:ILE:CD1	2.37	0.54
1:P:491:ILE:HD12	1:P:491:ILE:N	2.23	0.54
2:A:172:PHE:C	2:A:173:LEU:HD12	2.33	0.54
6:R:23:ILE:HD13	7:T:98:LYS:CD	2.38	0.54
2:A:312:LEU:HD23	2:A:325:ALA:HB2	1.90	0.54
4:S2:250:VAL:CG1	4:S2:272:LEU:HD11	2.37	0.54
8:D:787:THR:HG21	8:D:796:GLN:CB	2.38	0.54
4:S1:212:LEU:HD21	4:S1:244:VAL:HG13	1.90	0.53
4:S2:119:VAL:HG23	4:S2:119:VAL:O	2.08	0.53
4:S2:307:VAL:HG21	4:S2:324:ASN:ND2	2.23	0.53
5:Q:111:LYS:CG	5:Q:113:THR:HG23	2.37	0.53
2:A:400:LEU:HD22	2:A:437:ARG:HE	1.73	0.53
4:S2:243:LYS:HE3	4:S2:278:ILE:HD11	1.89	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
8:D:452:LEU:O	8:D:453:PRO:C	2.50	0.53
1:P:63:ILE:C	1:P:63:ILE:HD12	2.34	0.53
6:R:141:ASP:OD2	6:R:165:VAL:HG11	2.09	0.53
2:A:433:VAL:HG23	2:A:489:LEU:HD11	1.90	0.53
5:Q:217:LEU:HD23	5:Q:218:LEU:N	2.24	0.53
6:R:90:LYS:HE3	6:R:96:THR:HG23	1.90	0.53
6:R:137:LEU:HD12	6:R:148:LEU:HD11	1.91	0.53
3:N:312:TYR:CD1	3:N:444:VAL:HG22	2.44	0.53
1:P:523:VAL:HG22	1:P:529:VAL:HG11	1.91	0.53
2:A:235:TYR:C	2:A:236:ILE:HD13	2.34	0.53
1:P:68:LEU:HD11	1:P:72:LEU:HD22	1.90	0.52
3:N:400:THR:HG22	3:N:401:ASN:N	2.25	0.52
4:S2:156:ILE:HD12	4:S2:158:PHE:CZ	2.44	0.52
6:R:36:ILE:HB	6:R:85:ILE:HG23	1.89	0.52
4:S1:302:PHE:CE1	4:S1:335:LEU:HD12	2.45	0.52
1:P:174:ILE:HD11	1:P:175:TYR:CZ	2.44	0.52
6:R:76:THR:HG23	6:R:79:LEU:HD12	1.90	0.52
6:R:160:MET:HG2	6:R:180:VAL:HG21	1.91	0.52
1:P:274:LEU:HD11	1:P:499:MET:HG3	1.90	0.52
1:P:313:LEU:HD12	1:P:313:LEU:C	2.35	0.52
2:A:290:VAL:HG12	2:A:294:ALA:HB2	1.91	0.52
3:N:512:LEU:HD23	3:N:513:GLU:H	1.74	0.52
8:D:407:ILE:HG23	8:D:408:GLY:N	2.25	0.52
4:S2:77:THR:CG2	4:S2:128:VAL:HG22	2.39	0.52
4:S2:88:ARG:HH21	4:S2:90:LEU:HD11	1.75	0.52
1:P:230:ILE:HD12	1:P:231:THR:N	2.25	0.52
2:A:274:VAL:HG11	2:A:290:VAL:HG21	1.92	0.52
6:R:22:ASP:O	6:R:128:ALA:HB1	2.10	0.52
8:D:577:THR:HG23	8:D:600:PRO:HD2	1.91	0.52
8:D:125:LEU:HD12	8:D:125:LEU:N	2.25	0.52
7:T:130:LEU:HD22	8:D:298:PHE:CZ	2.44	0.52
3:N:273:ASN:C	3:N:274:LEU:HD12	2.35	0.51
4:S1:152:THR:HG21	4:S1:169:ILE:HD11	1.93	0.51
1:P:456:ILE:HG23	1:P:486:PHE:HB3	1.92	0.51
4:S2:205:ASN:CG	4:S2:335:LEU:HD12	2.35	0.51
4:S2:267:ILE:N	4:S2:267:ILE:HD12	2.26	0.51
1:P:144:GLY:HA2	1:P:237:LEU:HD13	1.91	0.51
1:P:152:LYS:HE2	1:P:487:THR:HG21	1.91	0.51
1:P:160:VAL:CG2	1:P:183:THR:HG23	2.37	0.51
8:D:104:ALA:HB3	8:D:134:LYS:CD	2.40	0.51
1:P:281:LEU:HG	1:P:288:LEU:HD12	1.92	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:S1:294:THR:HG22	4:S1:304:HIS:CG	2.46	0.51
1:P:33:THR:O	1:P:34:LEU:HB3	2.10	0.51
1:P:160:VAL:HG12	1:P:206:ALA:HB2	1.92	0.51
4:S2:221:LEU:HB3	4:S2:226:ALA:HB2	1.93	0.51
4:S2:285:THR:HG22	4:S2:286:LYS:H	1.76	0.51
6:R:47:LEU:O	6:R:47:LEU:HD12	2.11	0.51
5:Q:235:PHE:CE2	5:Q:238:THR:HG22	2.45	0.51
4:S1:282:THR:HG22	4:S1:283:SER:H	1.74	0.51
3:N:210:THR:HG21	3:N:256:ARG:NH2	2.26	0.51
4:S1:217:LEU:O	4:S1:218:ASP:C	2.53	0.51
4:S2:201:LYS:HG2	4:S2:202:LYS:N	2.25	0.51
5:Q:203:VAL:HG12	5:Q:207:ILE:O	2.10	0.51
7:T:70:PRO:O	7:T:71:LEU:HB2	2.10	0.51
8:D:104:ALA:HB1	8:D:105:PRO:HD2	1.91	0.50
1:P:249:LEU:HD13	1:P:322:TYR:CD1	2.47	0.50
5:Q:173:TRP:CE2	6:R:90:LYS:HB2	2.47	0.50
6:R:171:GLU:O	6:R:172:LEU:HD23	2.12	0.50
9:E:33:LYS:O	9:E:34:THR:HG23	2.11	0.50
1:P:340:ILE:HG12	1:P:358:THR:HG22	1.94	0.50
2:A:535:LYS:O	2:A:536:VAL:HG12	2.11	0.50
6:R:68:PHE:CE2	6:R:80:THR:HG21	2.46	0.50
9:E:30:ILE:HG23	9:E:30:ILE:O	2.11	0.50
1:P:207:LEU:HD12	1:P:207:LEU:O	2.12	0.50
4:S1:270:LEU:HB3	4:S1:271:PRO:HD3	1.94	0.50
1:P:207:LEU:HD12	1:P:207:LEU:C	2.37	0.50
2:A:433:VAL:CG2	2:A:489:LEU:HD11	2.41	0.50
4:S2:202:LYS:O	4:S2:203:ILE:HG22	2.12	0.50
8:D:220:LEU:HB2	8:D:243:ILE:CG2	2.42	0.50
1:P:292:VAL:CG1	1:P:303:ILE:HD13	2.41	0.49
4:S2:303:ILE:HA	4:S2:331:ILE:HG23	1.94	0.49
8:D:220:LEU:N	8:D:220:LEU:HD12	2.27	0.49
4:S2:308:LEU:HD12	4:S2:312:LYS:CG	2.42	0.49
3:N:159:LEU:C	3:N:159:LEU:HD12	2.37	0.49
8:D:353:ILE:HG22	8:D:364:LYS:HB2	1.94	0.49
4:S2:227:THR:HG23	4:S2:228:ALA:N	2.26	0.49
5:Q:144:ASN:HB3	5:Q:201:ALA:HA	1.93	0.49
4:S1:111:SER:CB	4:S1:112:PRO:HD3	2.42	0.49
8:D:359:TYR:HB3	8:D:360:PRO:HD2	1.94	0.49
2:A:367:ILE:CD1	2:A:394:ILE:HG23	2.43	0.49
4:S1:270:LEU:HD13	4:S1:270:LEU:C	2.37	0.49
1:P:75:SER:O	1:P:76:PRO:C	2.56	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:A:489:LEU:N	2:A:489:LEU:HD12	2.27	0.49
5:Q:220:MET:HA	5:Q:220:MET:HE3	1.93	0.49
3:N:298:VAL:HG22	3:N:305:VAL:HG11	1.95	0.49
4:S2:217:LEU:HD12	4:S2:217:LEU:N	2.28	0.49
4:S2:313:LEU:O	4:S2:314:THR:HB	2.11	0.49
4:S2:293:THR:O	4:S2:304:HIS:HA	2.12	0.49
4:S1:237:ILE:HG22	4:S1:289:THR:H	1.76	0.49
2:A:225:LYS:O	2:A:226:ASN:HB2	2.12	0.48
9:E:93:THR:CG2	9:E:106:ALA:HB3	2.43	0.48
3:N:564:ALA:O	3:N:565:LEU:C	2.56	0.48
4:S2:250:VAL:HG22	4:S2:251:ASN:H	1.78	0.48
6:R:171:GLU:C	6:R:172:LEU:HD23	2.38	0.48
6:R:24:CYS:O	6:R:25:ASP:HB2	2.14	0.48
6:R:52:ASN:OD1	6:R:79:LEU:HD22	2.13	0.48
8:D:869:VAL:HG13	8:D:892:MET:HE1	1.96	0.48
1:P:106:THR:HG22	1:P:132:SER:CB	2.44	0.48
4:S2:272:LEU:HD12	4:S2:272:LEU:C	2.38	0.48
5:Q:65:TYR:C	5:Q:257:ILE:HG23	2.38	0.48
5:Q:148:ILE:HD11	5:Q:195:VAL:CG2	2.44	0.48
6:R:90:LYS:NZ	6:R:93:ALA:HB3	2.29	0.48
8:D:108:TYR:HB2	8:D:125:LEU:HD21	1.96	0.48
1:P:189:MET:HE2	1:P:189:MET:HA	1.96	0.48
4:S2:202:LYS:C	4:S2:217:LEU:HD11	2.39	0.48
4:S2:313:LEU:O	4:S2:314:THR:CB	2.61	0.48
4:S1:295:GLU:HB3	4:S1:303:ILE:HG23	1.96	0.48
8:D:414:THR:C	8:D:415:LEU:HD12	2.38	0.48
4:S1:314:THR:HG22	4:S1:319:TYR:CB	2.43	0.48
1:P:171:ASP:O	1:P:174:ILE:HG23	2.14	0.48
1:P:506:LEU:HD22	1:P:506:LEU:H	1.79	0.48
5:Q:187:GLY:O	5:Q:188:LEU:HD12	2.14	0.48
6:R:55:VAL:HG13	6:R:66:ILE:HD12	1.96	0.48
7:T:42:PRO:HG2	7:T:43:LEU:HD22	1.96	0.48
4:S1:279:GLY:HA2	4:S1:313:LEU:HA	1.96	0.48
9:E:151:GLU:O	9:E:155:THR:HG23	2.14	0.48
1:P:313:LEU:HD23	1:P:330:ILE:HD13	1.97	0.47
3:N:68:THR:HG21	10:J:1:GLA:H5	1.95	0.47
5:Q:106:LEU:HD22	5:Q:126:TYR:O	2.14	0.47
8:D:701:ILE:HG23	8:D:722:LEU:HB2	1.95	0.47
1:P:246:THR:C	1:P:247:LEU:HD12	2.39	0.47
4:S2:227:THR:HG23	4:S2:228:ALA:H	1.79	0.47
8:D:872:THR:HG21	8:D:892:MET:HE3	1.96	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:S2:197:CYS:O	4:S2:198:PRO:C	2.57	0.47
4:S1:68:THR:HG22	4:S1:69:ASN:OD1	2.15	0.47
1:P:365:PHE:HD1	1:P:414:LEU:HD23	1.80	0.47
4:S2:151:ILE:N	4:S2:151:ILE:HD12	2.30	0.47
4:S2:220:ALA:HB3	4:S2:226:ALA:HB3	1.97	0.47
6:R:96:THR:HG22	6:R:97:THR:N	2.30	0.47
8:D:860:THR:HG22	8:D:872:THR:OG1	2.14	0.47
3:N:404:LEU:HD23	3:N:405:SER:N	2.29	0.47
5:Q:106:LEU:C	5:Q:106:LEU:HD13	2.40	0.47
8:D:182:ILE:HG22	8:D:183:ARG:N	2.30	0.47
1:P:252:LEU:HD12	1:P:252:LEU:N	2.30	0.47
1:P:279:ILE:HG13	1:P:317:VAL:HG12	1.96	0.47
2:A:222:ASP:HB2	2:A:537:ARG:HE	1.80	0.47
3:N:505:TYR:CG	3:N:542:ILE:HD13	2.50	0.47
4:S2:203:ILE:HB	4:S2:217:LEU:HD21	1.96	0.47
4:S2:227:THR:HG21	4:S2:233:ARG:HB3	1.97	0.47
4:S2:312:LYS:HD2	4:S2:313:LEU:HD23	1.97	0.47
4:S2:332:THR:HG22	4:S2:333:VAL:HG22	1.97	0.47
5:Q:148:ILE:HD13	5:Q:197:LEU:CD1	2.44	0.47
5:Q:218:LEU:H	5:Q:218:LEU:HD23	1.79	0.47
8:D:136:VAL:O	8:D:136:VAL:HG12	2.13	0.47
3:N:500:VAL:CG2	3:N:588:ILE:HD12	2.44	0.47
4:S1:294:THR:HG22	4:S1:304:HIS:ND1	2.30	0.47
4:S1:307:VAL:HG23	4:S1:327:THR:H	1.79	0.47
10:J:1:GLA:C4	10:J:3:RAM:H5	2.41	0.47
1:P:263:LEU:C	1:P:263:LEU:HD23	2.40	0.47
2:A:380:THR:O	2:A:380:THR:HG22	2.14	0.47
3:N:145:THR:HG22	3:N:146:THR:N	2.29	0.47
2:A:514:LEU:O	2:A:518:LEU:HD13	2.15	0.47
7:T:126:ARG:O	7:T:130:LEU:HD23	2.15	0.47
8:D:755:MET:HE1	8:D:822:MET:HG2	1.96	0.47
1:P:385:GLU:O	1:P:393:LEU:HD12	2.15	0.46
4:S2:203:ILE:HD13	4:S2:204:TYR:H	1.79	0.46
2:A:174:THR:CG2	2:A:176:VAL:HG13	2.45	0.46
2:A:516:GLU:O	2:A:520:LYS:HG2	2.15	0.46
3:N:68:THR:HG21	3:N:656:PHE:CE1	2.50	0.46
4:S1:238:THR:HG22	4:S1:239:ALA:N	2.31	0.46
2:A:394:ILE:HD11	2:A:412:LEU:HD11	1.98	0.46
4:S2:47:THR:HG22	4:S2:47:THR:O	2.15	0.46
4:S1:305:THR:HG23	4:S1:305:THR:O	2.15	0.46
8:D:858:VAL:CG2	8:D:860:THR:HG23	2.45	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:S2:199:ASP:OD1	4:S2:201:LYS:HB2	2.16	0.46
4:S2:293:THR:C	4:S2:294:THR:HG22	2.41	0.46
4:S2:304:HIS:CG	4:S2:305:THR:N	2.84	0.46
5:Q:149:GLY:C	5:Q:150:LEU:HD22	2.39	0.46
8:D:607:THR:HG23	8:D:607:THR:O	2.15	0.46
1:P:206:ALA:CB	1:P:240:LEU:HD23	2.46	0.46
9:E:114:ILE:N	9:E:114:ILE:HD12	2.31	0.46
1:P:75:SER:CB	1:P:76:PRO:HD2	2.46	0.46
1:P:264:LEU:HD12	1:P:265:PRO:HD2	1.98	0.46
4:S2:41:THR:O	4:S2:42:GLU:C	2.59	0.46
5:Q:134:ASN:HB2	5:Q:147:THR:HG22	1.97	0.46
7:T:143:ILE:HD12	7:T:143:ILE:O	2.16	0.46
8:D:139:LYS:O	8:D:168:PRO:HA	2.15	0.46
1:P:174:ILE:HD13	1:P:505:PHE:CE2	2.51	0.46
3:N:168:SER:HB3	3:N:193:THR:HG23	1.97	0.46
3:N:289:TYR:HB3	3:N:319:ASP:OD1	2.15	0.46
1:P:73:ILE:N	1:P:73:ILE:HD12	2.30	0.46
4:S2:289:THR:HA	4:S2:310:ASN:HB3	1.96	0.46
6:R:40:ASP:HB3	6:R:182:PHE:CZ	2.51	0.46
8:D:869:VAL:HG11	8:D:892:MET:HE1	1.98	0.46
9:E:21:VAL:O	9:E:21:VAL:HG22	2.16	0.46
4:S2:305:THR:HG23	4:S2:326:PHE:CZ	2.51	0.46
5:Q:65:TYR:O	5:Q:257:ILE:HG23	2.16	0.46
7:T:157:VAL:CG1	8:D:209:VAL:HG11	2.46	0.46
4:S1:212:LEU:HD23	4:S1:213:THR:N	2.31	0.46
1:P:33:THR:HG21	11:U:2:RAM:H5	1.98	0.45
1:P:63:ILE:HD12	1:P:63:ILE:O	2.16	0.45
4:S2:127:ILE:HG22	4:S2:151:ILE:HG13	1.98	0.45
5:Q:193:LEU:N	5:Q:193:LEU:HD22	2.31	0.45
5:Q:65:TYR:HB2	5:Q:257:ILE:HD13	1.98	0.45
5:Q:166:ILE:HG23	6:R:31:THR:OG1	2.16	0.45
9:E:40:PHE:O	9:E:52:ASP:HB2	2.16	0.45
3:N:298:VAL:CG2	3:N:305:VAL:HG11	2.47	0.45
3:N:310:GLU:O	3:N:444:VAL:HG23	2.16	0.45
1:P:464:VAL:HG13	1:P:464:VAL:O	2.16	0.45
8:D:298:PHE:HB2	8:D:323:THR:OG1	2.17	0.45
9:E:157:PHE:O	9:E:161:THR:HG23	2.16	0.45
6:R:60:LYS:HD3	6:R:65:ALA:HA	1.97	0.45
6:R:89:LEU:HA	6:R:98:TYR:OH	2.16	0.45
6:R:113:VAL:HB	6:R:151:THR:HG23	1.98	0.45
4:S1:193:GLU:HA	4:S1:330:LYS:HG2	1.99	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:S2:184:LEU:HD23	4:S2:208:ALA:CB	2.47	0.45
4:S2:227:THR:HG21	4:S2:233:ARG:HE	1.82	0.45
8:D:122:LEU:HD11	8:D:144:ILE:CG2	2.46	0.45
3:N:95:GLY:HA3	3:N:185:VAL:HG11	1.99	0.45
3:N:108:TYR:CD1	3:N:457:ILE:HD13	2.52	0.45
3:N:180:TYR:OH	3:N:641:PRO:HB2	2.17	0.45
4:S1:189:THR:O	4:S1:190:ASP:CG	2.60	0.45
4:S2:90:LEU:CD2	4:S2:119:VAL:HG12	2.46	0.45
4:S2:217:LEU:HD23	4:S2:225:GLU:HB2	1.99	0.45
4:S1:190:ASP:OD1	4:S1:191:THR:HG23	2.17	0.45
1:P:106:THR:HG22	1:P:132:SER:HB3	1.99	0.44
1:P:291:ILE:O	1:P:303:ILE:HD12	2.18	0.44
4:S2:335:LEU:N	4:S2:335:LEU:HD22	2.32	0.44
8:D:145:LEU:C	8:D:145:LEU:HD23	2.43	0.44
1:P:290:THR:OG1	1:P:303:ILE:HD11	2.17	0.44
3:N:198:THR:O	3:N:200:ASN:N	2.51	0.44
3:N:541:LEU:HD12	3:N:541:LEU:N	2.32	0.44
4:S2:221:LEU:HD12	4:S2:222:LEU:N	2.33	0.44
6:R:23:ILE:HD13	7:T:98:LYS:HD3	1.99	0.44
8:D:325:GLY:N	8:D:353:ILE:HD11	2.33	0.44
1:P:251:THR:C	1:P:252:LEU:HD12	2.43	0.44
2:A:471:LYS:HB3	8:D:109:LYS:HZ1	1.82	0.44
4:S2:68:THR:HG22	4:S2:69:ASN:OD1	2.18	0.44
5:Q:146:ILE:HD13	5:Q:199:VAL:HG13	1.98	0.44
1:P:247:LEU:HD12	1:P:247:LEU:N	2.31	0.44
8:D:208:SER:C	8:D:209:VAL:HG23	2.43	0.44
8:D:214:ASN:HB2	10:I:2:GCU:H2	1.99	0.44
8:D:255:LEU:HD23	8:D:255:LEU:C	2.42	0.44
8:D:594:ILE:HG22	8:D:595:ARG:N	2.32	0.44
1:P:30:LEU:HD21	11:U:2:RAM:O4	2.17	0.44
1:P:316:GLU:HA	1:P:325:LYS:HD2	2.00	0.44
4:S1:86:ILE:HD12	4:S1:87:TYR:CE2	2.53	0.44
4:S1:94:TYR:HE1	4:S1:114:VAL:HG12	1.82	0.44
2:A:329:VAL:HG13	2:A:340:CYS:SG	2.58	0.44
2:A:344:HIS:HB2	10:G:1:GLA:O6	2.18	0.44
3:N:180:TYR:OH	3:N:238:ARG:HD3	2.18	0.44
8:D:286:ILE:CD1	8:D:318:LEU:HD21	2.42	0.44
1:P:476:ILE:HG22	1:P:477:GLU:N	2.33	0.44
7:T:73:TYR:CD2	7:T:76:ILE:HD11	2.53	0.44
1:P:36:PRO:HG3	1:P:122:ASN:OD1	2.18	0.43
2:A:295:VAL:O	2:A:295:VAL:HG13	2.17	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
8:D:815:LYS:C	8:D:816:LEU:HD12	2.43	0.43
2:A:412:LEU:C	2:A:412:LEU:HD23	2.42	0.43
3:N:72:ILE:HD11	3:N:553:THR:HG21	1.99	0.43
4:S1:184:LEU:HA	4:S1:210:PHE:CE2	2.53	0.43
9:E:78:LEU:HD22	9:E:169:LEU:HD21	2.00	0.43
1:P:372:LEU:HD23	1:P:372:LEU:C	2.42	0.43
2:A:288:MET:O	2:A:290:VAL:HG23	2.17	0.43
6:R:105:THR:HG23	6:R:106:SER:N	2.32	0.43
8:D:231:ILE:O	8:D:231:ILE:HG22	2.17	0.43
5:Q:134:ASN:HA	5:Q:147:THR:HG22	2.00	0.43
3:N:464:ILE:HD11	3:N:466:THR:CG2	2.48	0.43
4:S2:32:VAL:HG22	4:S2:33:THR:N	2.34	0.43
6:R:96:THR:HG22	6:R:97:THR:H	1.84	0.43
7:T:97:TYR:CE2	7:T:101:LEU:HD11	2.53	0.43
4:S1:62:VAL:HG22	4:S1:90:LEU:HB2	2.01	0.43
4:S1:88:ARG:HH21	4:S1:90:LEU:HD11	1.83	0.43
4:S1:111:SER:HB2	4:S1:112:PRO:HD3	2.01	0.43
1:P:33:THR:HG21	11:U:1:GLA:O5	2.17	0.43
6:R:97:THR:C	6:R:98:TYR:CD1	2.97	0.43
6:R:101:ILE:CG2	6:R:104:ALA:HB2	2.49	0.43
4:S1:306:VAL:HG12	4:S1:329:GLY:O	2.18	0.43
8:D:251:ILE:HD11	8:D:274:PHE:HD2	1.84	0.43
4:S2:93:ALA:O	4:S2:115:THR:HG22	2.19	0.43
6:R:165:VAL:HG13	6:R:165:VAL:O	2.19	0.43
8:D:433:ILE:HD12	8:D:455:PHE:CZ	2.52	0.43
9:E:93:THR:HG22	9:E:107:GLN:HB2	2.01	0.43
1:P:254:PRO:HA	1:P:265:PRO:HD3	2.01	0.43
2:A:183:TYR:OH	2:A:223:THR:HG22	2.18	0.43
2:A:421:LEU:HD13	2:A:422:HIS:N	2.34	0.43
4:S2:134:THR:HG21	4:S2:145:GLU:CG	2.49	0.43
4:S2:198:PRO:O	4:S2:199:ASP:HB3	2.19	0.43
6:R:114:LEU:N	6:R:114:LEU:HD12	2.33	0.43
4:S1:190:ASP:O	4:S1:191:THR:C	2.62	0.43
1:P:183:THR:HG22	1:P:194:PHE:CZ	2.53	0.43
2:A:264:LYS:CE	2:A:273:ILE:HG21	2.48	0.43
3:N:199:THR:HG23	3:N:200:ASN:H	1.83	0.43
5:Q:76:LEU:HG	5:Q:77:THR:H	1.83	0.43
4:S1:35:VAL:HG12	4:S1:36:SER:N	2.33	0.43
4:S1:249:PHE:CE2	4:S1:256:ILE:HG21	2.53	0.43
8:D:850:ILE:O	8:D:854:TRP:HB2	2.19	0.43
1:P:263:LEU:HD21	1:P:300:SER:HB3	2.00	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:S2:203:ILE:HG21	4:S2:335:LEU:OXT	2.19	0.43
4:S2:278:ILE:O	4:S2:314:THR:HG22	2.18	0.43
5:Q:215:LEU:HD12	5:Q:244:GLY:O	2.19	0.43
1:P:206:ALA:HB2	1:P:240:LEU:HD23	2.01	0.42
1:P:283:ASN:HA	1:P:313:LEU:HA	2.01	0.42
4:S2:226:ALA:CB	4:S2:294:THR:HG23	2.49	0.42
5:Q:71:VAL:HB	5:Q:76:LEU:HD22	2.01	0.42
9:E:51:ILE:HG23	9:E:157:PHE:HZ	1.84	0.42
1:P:362:LEU:HA	1:P:416:ASP:HA	1.99	0.42
1:P:500:TYR:HE2	1:P:502:THR:HG23	1.84	0.42
3:N:565:LEU:O	3:N:565:LEU:HG	2.19	0.42
6:R:64:ASP:HA	6:R:78:TYR:OH	2.19	0.42
4:S1:238:THR:HG22	4:S1:239:ALA:H	1.83	0.42
8:D:390:VAL:HG12	8:D:391:ASN:N	2.35	0.42
3:N:88:LEU:HD11	3:N:105:LEU:HD23	2.01	0.42
4:S2:193:GLU:HB3	4:S2:332:THR:HG23	2.02	0.42
8:D:797:PHE:O	8:D:798:ALA:C	2.62	0.42
9:E:138:PHE:HB2	9:E:139:PRO:HD2	2.00	0.42
1:P:106:THR:HG21	1:P:138:ASP:H	1.84	0.42
1:P:384:THR:CG2	1:P:393:LEU:HD11	2.49	0.42
2:A:187:SER:CB	2:A:201:LEU:HD22	2.49	0.42
2:A:372:MET:HG2	2:A:388:VAL:HG22	2.01	0.42
3:N:88:LEU:HD12	3:N:88:LEU:N	2.33	0.42
1:P:468:GLU:CD	1:P:476:ILE:HG23	2.44	0.42
6:R:74:SER:O	6:R:75:VAL:HB	2.19	0.42
4:S1:314:THR:HG22	4:S1:319:TYR:HB2	2.02	0.42
1:P:42:ALA:O	1:P:43:PRO:C	2.58	0.42
3:N:407:LEU:HD23	3:N:407:LEU:C	2.44	0.42
5:Q:150:LEU:HD22	5:Q:150:LEU:N	2.35	0.42
1:P:38:LEU:HD12	1:P:58:VAL:O	2.19	0.42
6:R:118:TYR:HB3	6:R:137:LEU:HA	2.01	0.42
9:E:78:LEU:CD2	9:E:169:LEU:HD21	2.49	0.42
9:E:92:MET:HE2	9:E:92:MET:HA	2.00	0.42
3:N:638:PRO:O	3:N:639:ASP:HB2	2.20	0.42
4:S2:261:ASP:O	4:S2:262:PHE:HB2	2.20	0.42
5:Q:140:LEU:HD21	10:I:3:RAM:H4	2.02	0.42
8:D:676:LEU:C	8:D:677:LEU:HD22	2.45	0.42
9:E:123:LYS:HB3	9:E:125:THR:HG22	2.02	0.42
1:P:43:PRO:O	1:P:44:LYS:C	2.63	0.42
1:P:283:ASN:HB3	1:P:288:LEU:HD11	2.01	0.42
4:S2:207:ASN:O	4:S2:208:ALA:HB3	2.20	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:S2:221:LEU:HD11	4:S2:225:GLU:HB3	2.01	0.42
8:D:618:THR:O	8:D:618:THR:HG23	2.19	0.42
2:A:351:LEU:HG	2:A:375:ILE:HG22	2.02	0.41
2:A:466:ILE:HG22	2:A:467:THR:N	2.35	0.41
5:Q:94:TRP:CD1	5:Q:95:ARG:O	2.73	0.41
4:S1:193:GLU:O	4:S1:331:ILE:HA	2.20	0.41
8:D:407:ILE:CG2	8:D:408:GLY:N	2.83	0.41
9:E:47:VAL:HG23	9:E:47:VAL:O	2.19	0.41
1:P:34:LEU:HA	1:P:122:ASN:CG	2.45	0.41
5:Q:148:ILE:HD12	5:Q:149:GLY:H	1.85	0.41
5:Q:172:TYR:HB2	6:R:66:ILE:HA	2.02	0.41
6:R:52:ASN:HB3	6:R:54:LYS:HZ1	1.86	0.41
8:D:301:GLN:O	8:D:302:ASN:C	2.62	0.41
2:A:367:ILE:HD12	2:A:394:ILE:HG12	2.02	0.41
6:R:159:TRP:CE2	6:R:160:MET:HG3	2.56	0.41
8:D:296:ARG:NH1	8:D:922:ARG:HD3	2.36	0.41
1:P:245:GLU:O	1:P:246:THR:HB	2.21	0.41
2:A:236:ILE:HB	2:A:243:ILE:HD11	2.03	0.41
4:S2:313:LEU:O	4:S2:314:THR:HG22	2.21	0.41
5:Q:139:TRP:CD1	5:Q:139:TRP:C	2.98	0.41
8:D:295:THR:HG21	8:D:922:ARG:HB3	2.02	0.41
8:D:686:TYR:CE1	8:D:697:ALA:HB1	2.56	0.41
9:E:51:ILE:HD12	9:E:153:ILE:HD12	2.01	0.41
3:N:404:LEU:CD1	3:N:431:LEU:HD13	2.50	0.41
4:S2:304:HIS:HB3	4:S2:332:THR:N	2.34	0.41
6:R:55:VAL:HG13	6:R:66:ILE:CD1	2.50	0.41
4:S1:47:THR:O	4:S1:47:THR:HG22	2.21	0.41
8:D:238:PHE:HA	8:D:257:GLN:O	2.20	0.41
8:D:818:TRP:CZ3	8:D:820:MET:HE2	2.54	0.41
8:D:908:MET:HE3	8:D:908:MET:HB2	1.93	0.41
3:N:609:ILE:HG23	3:N:609:ILE:O	2.20	0.41
8:D:762:LYS:HG2	8:D:819:ASP:OD1	2.21	0.41
4:S1:309:LYS:HD2	4:S1:325:THR:HG22	1.99	0.41
1:P:84:ILE:HD13	1:P:84:ILE:N	2.36	0.41
1:P:264:LEU:HD22	1:P:279:ILE:HD12	2.03	0.41
4:S2:327:THR:HG22	4:S2:328:LEU:H	1.86	0.41
4:S1:249:PHE:CD2	4:S1:256:ILE:HG21	2.55	0.41
8:D:662:ARG:O	8:D:663:ASP:C	2.64	0.41
1:P:152:LYS:CE	1:P:487:THR:HG21	2.51	0.41
1:P:152:LYS:NZ	1:P:487:THR:HG21	2.36	0.41
1:P:384:THR:HG23	1:P:393:LEU:HD11	2.03	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:A:283:LYS:O	2:A:284:LEU:C	2.63	0.41
2:A:291:THR:O	2:A:292:LYS:HB3	2.21	0.41
3:N:400:THR:HG22	3:N:401:ASN:H	1.86	0.41
4:S2:52:ILE:HD12	4:S2:52:ILE:N	2.35	0.41
4:S2:144:ILE:HD11	4:S2:146:ALA:O	2.21	0.41
4:S2:208:ALA:HA	4:S2:257:THR:HG21	2.03	0.41
4:S2:314:THR:HG23	4:S2:315:LYS:N	2.35	0.41
5:Q:87:GLY:HA2	5:Q:108:PHE:O	2.21	0.41
5:Q:127:ILE:HD13	5:Q:128:LYS:N	2.36	0.41
6:R:108:THR:N	6:R:109:PRO:CD	2.84	0.41
8:D:313:TYR:CD1	8:D:313:TYR:N	2.88	0.41
8:D:724:PRO:O	8:D:725:TYR:HB2	2.21	0.41
8:D:736:MET:HE2	8:D:741:ASN:HB2	2.01	0.41
9:E:114:ILE:HG22	9:E:115:ASN:N	2.35	0.41
1:P:262:LEU:O	1:P:303:ILE:CG2	2.69	0.41
2:A:406:GLN:CB	2:A:489:LEU:HD13	2.50	0.41
3:N:413:TYR:HD1	3:N:414:ASP:N	2.18	0.41
5:Q:96:LEU:HD22	5:Q:97:THR:HG23	2.02	0.41
4:S1:276:THR:HG23	4:S1:277:TRP:N	2.36	0.41
8:D:224:ARG:HG3	8:D:237:TYR:CD1	2.56	0.41
8:D:920:ILE:HG12	8:D:921:ASN:N	2.36	0.41
10:J:1:GLA:C4	10:J:3:RAM:C5	2.92	0.41
11:K:1:GLA:H61	11:K:2:RAM:H5	2.02	0.41
2:A:287:SER:O	2:A:288:MET:C	2.62	0.40
4:S2:134:THR:HG21	4:S2:145:GLU:HG3	2.02	0.40
6:R:85:ILE:HD11	6:R:87:ILE:HB	2.03	0.40
8:D:383:ASN:O	8:D:423:LYS:HA	2.20	0.40
1:P:103:PRO:O	1:P:105:THR:HG23	2.21	0.40
1:P:174:ILE:HD12	1:P:216:TYR:HD2	1.85	0.40
1:P:245:GLU:HG3	1:P:246:THR:H	1.86	0.40
3:N:588:ILE:O	3:N:588:ILE:HG22	2.20	0.40
4:S2:63:LEU:HD13	4:S2:89:VAL:HG22	2.02	0.40
6:R:148:LEU:N	6:R:148:LEU:HD12	2.36	0.40
7:T:55:LEU:O	7:T:56:PRO:C	2.63	0.40
1:P:141:THR:HG21	1:P:193:LYS:HE2	2.02	0.40
2:A:322:ILE:HG22	2:A:324:ARG:CD	2.50	0.40
4:S1:52:ILE:HD11	4:S1:71:LEU:HD11	2.03	0.40
8:D:235:GLU:O	8:D:260:ILE:HA	2.21	0.40
10:I:1:GLA:O3	10:I:3:RAM:C1	2.68	0.40
1:P:30:LEU:HD11	11:U:2:RAM:H2	2.04	0.40
1:P:315:LEU:HD23	1:P:326:PHE:CD2	2.57	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:A:534:LEU:HD12	2:A:534:LEU:O	2.21	0.40
3:N:48:ILE:O	3:N:48:ILE:HD12	2.22	0.40
3:N:227:ASP:O	3:N:227:ASP:OD1	2.39	0.40
4:S2:281:ASP:HB2	4:S2:313:LEU:C	2.47	0.40
4:S1:60:ALA:HB1	4:S1:103:ILE:HD11	2.03	0.40
4:S1:312:LYS:O	4:S1:314:THR:HG23	2.21	0.40
9:E:92:MET:O	9:E:93:THR:C	2.65	0.40
2:A:446:ILE:O	2:A:476:ILE:HG23	2.21	0.40
3:N:159:LEU:HD23	8:D:850:ILE:HG22	2.04	0.40
4:S1:142:PHE:C	4:S1:143:ARG:HD2	2.46	0.40

There are no symmetry-related clashes.

5.3 Torsion angles ⓘ

5.3.1 Protein backbone ⓘ

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	P	521/562 (93%)	436 (84%)	83 (16%)	2 (0%)	30	62
2	A	365/549 (66%)	288 (79%)	75 (20%)	2 (0%)	24	59
3	N	609/657 (93%)	544 (89%)	61 (10%)	4 (1%)	18	52
4	S1	317/335 (95%)	260 (82%)	56 (18%)	1 (0%)	36	68
4	S2	317/335 (95%)	217 (68%)	92 (29%)	8 (2%)	4	27
5	Q	193/274 (70%)	154 (80%)	38 (20%)	1 (0%)	24	59
6	R	163/182 (90%)	118 (72%)	44 (27%)	1 (1%)	21	56
7	T	120/186 (64%)	108 (90%)	12 (10%)	0	100	100
8	D	799/926 (86%)	676 (85%)	117 (15%)	6 (1%)	16	50
9	E	147/172 (86%)	136 (92%)	11 (8%)	0	100	100
All	All	3551/4178 (85%)	2937 (83%)	589 (17%)	25 (1%)	20	52

All (25) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	P	76	PRO
2	A	536	VAL
3	N	199	THR
3	N	303	GLU
4	S2	198	PRO
8	D	232	ASP
2	A	287	SER
4	S2	203	ILE
4	S2	297	ILE
4	S2	314	THR
4	S1	268	PRO
8	D	209	VAL
8	D	767	GLU
8	D	167	TYR
5	Q	176	GLN
1	P	89	VAL
4	S2	262	PHE
6	R	66	ILE
3	N	614	ARG
4	S2	274	ASN
8	D	355	SER
4	S2	267	ILE
3	N	111	TYR
8	D	231	ILE
4	S2	271	PRO

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	P	485/523 (93%)	466 (96%)	19 (4%)	28	62
2	A	333/486 (68%)	301 (90%)	32 (10%)	8	32
3	N	545/589 (92%)	522 (96%)	23 (4%)	26	60
4	S1	284/297 (96%)	278 (98%)	6 (2%)	47	71

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
4	S2	284/297 (96%)	269 (95%)	15 (5%)	20	53
5	Q	163/238 (68%)	154 (94%)	9 (6%)	19	52
6	R	147/163 (90%)	136 (92%)	11 (8%)	12	42
7	T	103/162 (64%)	97 (94%)	6 (6%)	18	51
8	D	708/808 (88%)	679 (96%)	29 (4%)	27	60
9	E	130/148 (88%)	127 (98%)	3 (2%)	44	70
All	All	3182/3711 (86%)	3029 (95%)	153 (5%)	24	56

All (153) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	P	30	LEU
1	P	31	LYS
1	P	33	THR
1	P	34	LEU
1	P	37	VAL
1	P	44	LYS
1	P	84	ILE
1	P	102	LEU
1	P	160	VAL
1	P	171	ASP
1	P	198	LYS
1	P	205	VAL
1	P	230	ILE
1	P	234	ASN
1	P	237	LEU
1	P	266	TYR
1	P	313	LEU
1	P	502	THR
1	P	509	ARG
2	A	175	GLU
2	A	186	LYS
2	A	189	HIS
2	A	192	TYR
2	A	193	TYR
2	A	231	LEU
2	A	247	SER
2	A	248	LEU
2	A	284	LEU
2	A	285	LYS

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Mol	Chain	Res	Type
2	A	288	MET
2	A	317	LYS
2	A	326	PHE
2	A	327	ASN
2	A	329	VAL
2	A	342	SER
2	A	343	ILE
2	A	353	LYS
2	A	354	LEU
2	A	355	ILE
2	A	368	THR
2	A	375	ILE
2	A	377	ASP
2	A	385	SER
2	A	386	LEU
2	A	397	LYS
2	A	417	LYS
2	A	421	LEU
2	A	424	VAL
2	A	436	MET
2	A	437	ARG
2	A	537	ARG
3	N	57	ILE
3	N	63	THR
3	N	64	ILE
3	N	91	PHE
3	N	189	ASN
3	N	193	THR
3	N	199	THR
3	N	218	GLU
3	N	238	ARG
3	N	261	HIS
3	N	305	VAL
3	N	306	LYS
3	N	412	ARG
3	N	435	ASN
3	N	464	ILE
3	N	495	LEU
3	N	545	VAL
3	N	557	THR
3	N	585	ASN
3	N	593	VAL

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Mol	Chain	Res	Type
3	N	595	ASN
3	N	624	HIS
3	N	654	ASN
4	S2	22	LEU
4	S2	137	ASP
4	S2	142	PHE
4	S2	166	VAL
4	S2	203	ILE
4	S2	206	TYR
4	S2	216	ASN
4	S2	245	VAL
4	S2	250	VAL
4	S2	286	LYS
4	S2	293	THR
4	S2	294	THR
4	S2	296	LYS
4	S2	313	LEU
4	S2	326	PHE
5	Q	88	ILE
5	Q	123	THR
5	Q	127	ILE
5	Q	134	ASN
5	Q	183	GLN
5	Q	207	ILE
5	Q	209	VAL
5	Q	222	ASN
5	Q	248	ASN
6	R	47	LEU
6	R	54	LYS
6	R	55	VAL
6	R	56	VAL
6	R	67	ILE
6	R	78	TYR
6	R	85	ILE
6	R	87	ILE
6	R	114	LEU
6	R	138	ASN
6	R	172	LEU
7	T	54	ILE
7	T	93	TYR
7	T	102	GLU
7	T	111	TYR

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Mol	Chain	Res	Type
7	T	142	ASN
7	T	143	ILE
4	S1	235	GLN
4	S1	282	THR
4	S1	293	THR
4	S1	304	HIS
4	S1	307	VAL
4	S1	330	LYS
8	D	111	LYS
8	D	121	LYS
8	D	124	THR
8	D	127	ASN
8	D	140	SER
8	D	142	ILE
8	D	150	ASP
8	D	200	GLN
8	D	216	SER
8	D	220	LEU
8	D	246	VAL
8	D	249	LYS
8	D	263	VAL
8	D	278	LYS
8	D	298	PHE
8	D	299	SER
8	D	323	THR
8	D	452	LEU
8	D	538	THR
8	D	616	HIS
8	D	644	GLU
8	D	646	SER
8	D	714	MET
8	D	729	ASN
8	D	850	ILE
8	D	851	THR
8	D	869	VAL
8	D	881	LEU
8	D	889	TRP
9	E	53	ARG
9	E	90	THR
9	E	159	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (23) such sidechains are listed below:

Mol	Chain	Res	Type
1	P	275	ASN
2	A	253	ASN
2	A	328	ASN
2	A	362	ASN
2	A	373	HIS
2	A	391	ASN
2	A	449	ASN
3	N	61	HIS
3	N	120	HIS
3	N	182	ASN
3	N	534	GLN
4	S2	64	GLN
4	S2	149	HIS
4	S2	188	ASN
5	Q	134	ASN
6	R	162	ASN
4	S1	187	GLN
4	S1	200	ASN
8	D	490	ASN
8	D	786	ASN
8	D	796	GLN
8	D	899	ASN
8	D	921	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 ⓘ

16 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	$\# Z > 2$
10	GLA	G	1	10,2	11,11,12	0.98	1 (9%)	15,15,17	1.33	1 (6%)
10	GCU	G	2	10	12,12,13	1.12	1 (8%)	14,17,19	1.21	1 (7%)
10	RAM	G	3	10	10,10,11	0.96	1 (10%)	14,14,16	0.83	0
10	GLA	I	1	10,8	11,11,12	0.95	0	15,15,17	1.55	2 (13%)
10	GCU	I	2	10	12,12,13	1.15	1 (8%)	14,17,19	1.24	2 (14%)
10	RAM	I	3	10	10,10,11	0.38	0	14,14,16	0.52	0
10	GLA	J	1	10	11,11,12	1.06	1 (9%)	15,15,17	1.40	3 (20%)
10	GCU	J	2	10	12,12,13	1.16	2 (16%)	14,17,19	1.12	0
10	RAM	J	3	10	10,10,11	0.38	0	14,14,16	0.52	0
11	GLA	K	1	11	11,11,12	0.85	1 (9%)	15,15,17	2.03	5 (33%)
11	RAM	K	2	11	10,10,11	0.79	0	14,14,16	1.38	2 (14%)
10	GLA	O	1	1,10	11,11,12	0.71	0	15,15,17	1.32	1 (6%)
10	GCU	O	2	10	12,12,13	1.14	2 (16%)	14,17,19	1.03	0
10	RAM	O	3	10	10,10,11	0.38	0	14,14,16	0.52	0
11	GLA	U	1	11	11,11,12	0.64	0	15,15,17	2.54	5 (33%)
11	RAM	U	2	11	10,10,11	0.85	0	14,14,16	1.04	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
10	GLA	G	1	10,2	-	0/2/19/22	0/1/1/1
10	GCU	G	2	10	-	0/4/21/24	1/1/1/1
10	RAM	G	3	10	-	-	0/1/1/1
10	GLA	I	1	10,8	-	0/2/19/22	0/1/1/1
10	GCU	I	2	10	-	1/4/21/24	0/1/1/1
10	RAM	I	3	10	-	-	0/1/1/1
10	GLA	J	1	10	-	0/2/19/22	0/1/1/1
10	GCU	J	2	10	-	0/4/21/24	0/1/1/1
10	RAM	J	3	10	-	-	0/1/1/1
11	GLA	K	1	11	-	2/2/19/22	0/1/1/1
11	RAM	K	2	11	-	-	1/1/1/1
10	GLA	O	1	1,10	-	2/2/19/22	0/1/1/1
10	GCU	O	2	10	-	0/4/21/24	0/1/1/1
10	RAM	O	3	10	-	-	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
11	GLA	U	1	11	-	2/2/19/22	0/1/1/1
11	RAM	U	2	11	-	-	1/1/1/1

All (10) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
10	J	1	GLA	O5-C1	-2.57	1.39	1.43
10	J	2	GCU	O6B-C6	-2.30	1.23	1.30
10	G	2	GCU	O6B-C6	-2.24	1.23	1.30
10	G	1	GLA	O5-C1	-2.21	1.40	1.43
10	O	2	GCU	O6B-C6	-2.21	1.23	1.30
10	I	2	GCU	O6B-C6	-2.21	1.23	1.30
10	J	2	GCU	O5-C1	-2.19	1.40	1.43
11	K	1	GLA	O5-C1	-2.14	1.40	1.43
10	G	3	RAM	O5-C1	-2.10	1.40	1.43
10	O	2	GCU	O5-C1	-2.01	1.40	1.43

All (22) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
11	U	1	GLA	C1-O5-C5	6.14	120.41	112.19
11	K	1	GLA	C1-O5-C5	5.04	118.95	112.19
11	U	1	GLA	C3-C4-C5	-4.27	102.48	110.23
11	U	1	GLA	C1-C2-C3	4.01	115.48	109.64
10	O	1	GLA	C1-O5-C5	3.65	117.08	112.19
11	K	1	GLA	C1-C2-C3	3.32	114.48	109.64
11	K	2	RAM	C1-O5-C5	3.28	120.69	112.97
10	J	1	GLA	O4-C4-C5	3.05	116.83	109.32
10	G	1	GLA	C1-O5-C5	3.00	116.21	112.19
11	U	1	GLA	O4-C4-C5	2.98	116.66	109.32
11	K	1	GLA	C2-C3-C4	2.95	116.05	110.86
10	I	1	GLA	C1-O5-C5	2.87	116.03	112.19
10	G	2	GCU	C2-C3-C4	-2.61	106.28	110.86
11	U	1	GLA	O5-C1-C2	2.55	116.87	110.79
11	K	2	RAM	O5-C5-C4	2.40	113.87	109.55
10	I	2	GCU	C1-C2-C3	2.37	113.10	109.64
11	K	1	GLA	O4-C4-C3	2.30	115.80	110.38
10	I	1	GLA	O5-C5-C4	-2.15	105.58	110.83
10	J	1	GLA	C3-C4-C5	-2.14	106.35	110.23
10	J	1	GLA	O3-C3-C2	-2.07	105.83	110.05
10	I	2	GCU	O3-C3-C2	-2.05	105.86	110.05
11	K	1	GLA	O5-C5-C4	2.00	115.69	110.83

There are no chirality outliers.

All (7) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
10	O	1	GLA	O5-C5-C6-O6
10	O	1	GLA	C4-C5-C6-O6
11	U	1	GLA	C4-C5-C6-O6
11	U	1	GLA	O5-C5-C6-O6
11	K	1	GLA	O5-C5-C6-O6
11	K	1	GLA	C4-C5-C6-O6
10	I	2	GCU	O5-C5-C6-O6B

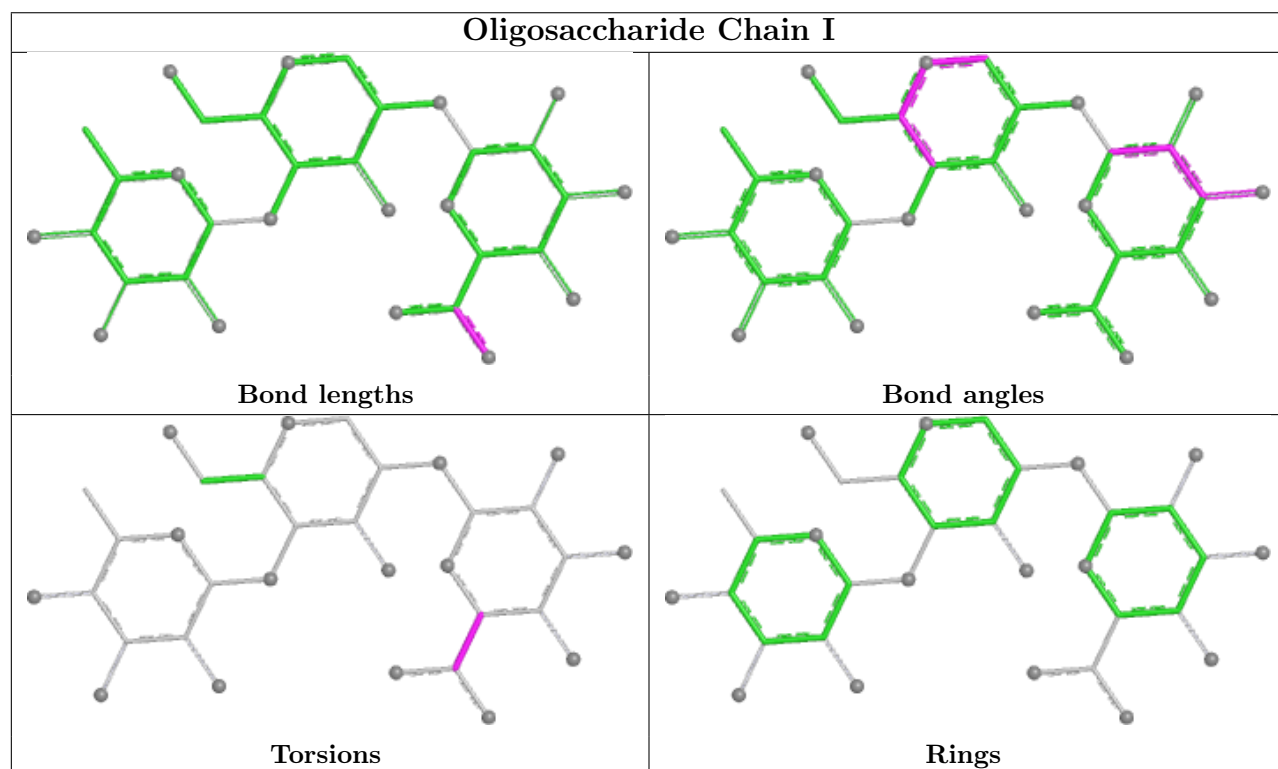
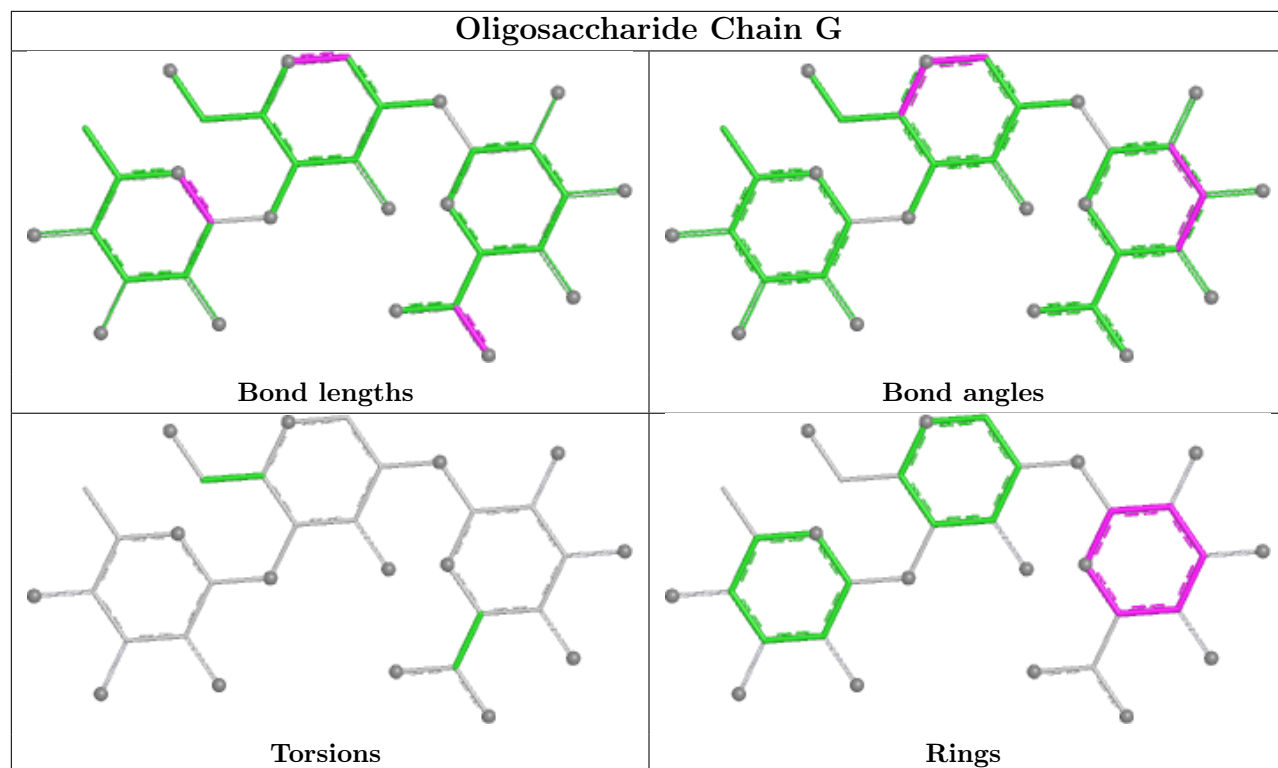
All (3) ring outliers are listed below:

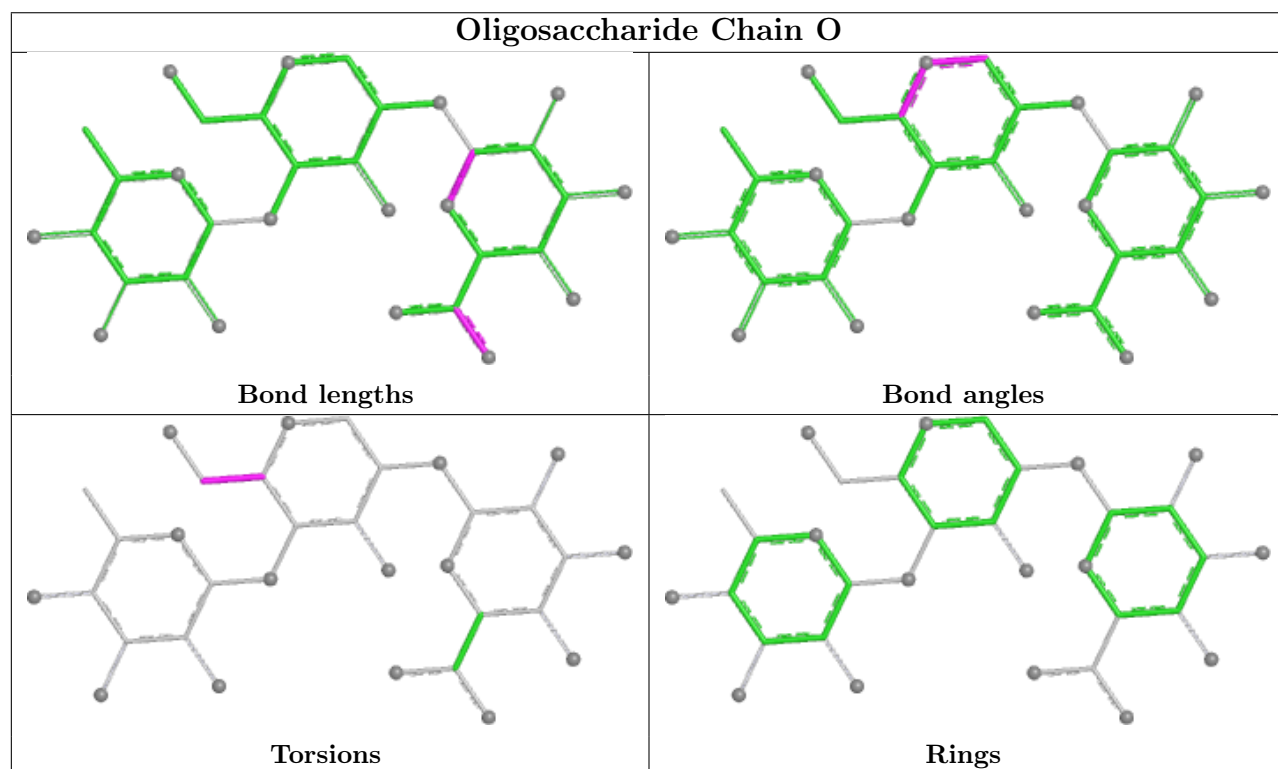
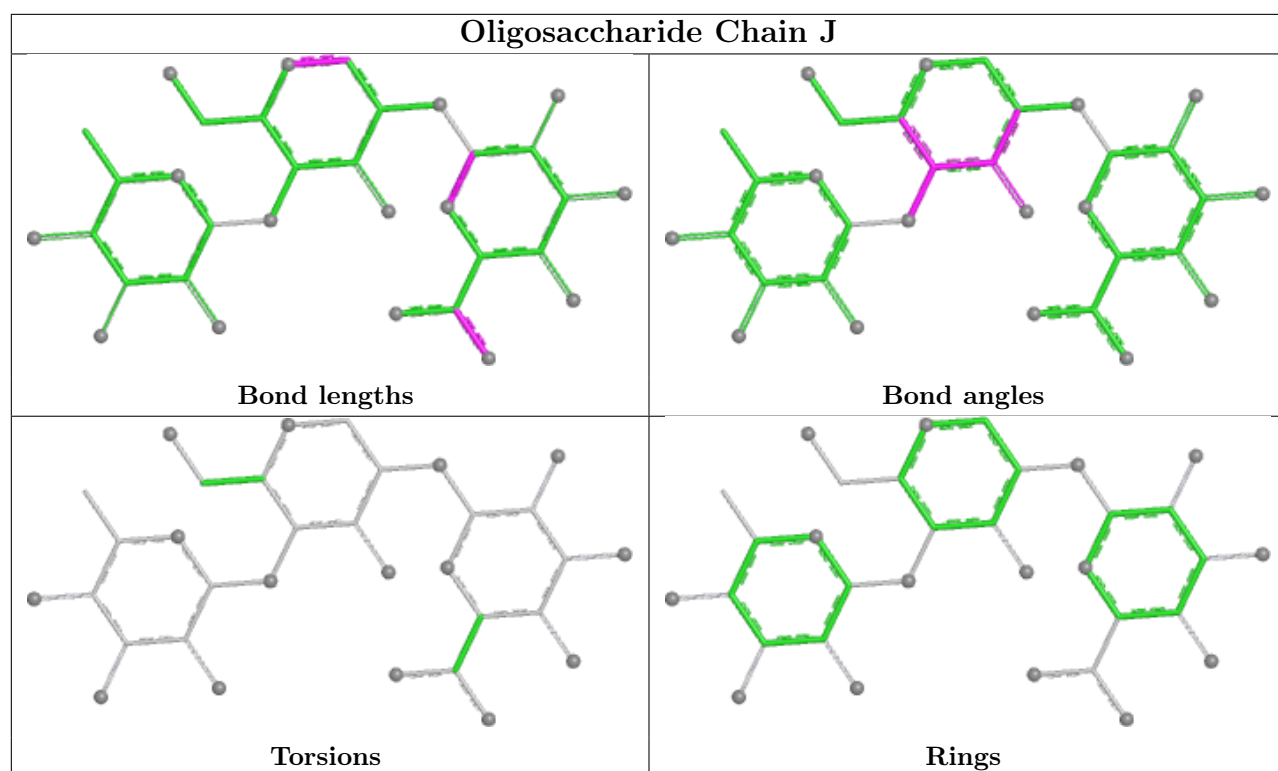
Mol	Chain	Res	Type	Atoms
11	K	2	RAM	C1-C2-C3-C4-C5-O5
11	U	2	RAM	C1-C2-C3-C4-C5-O5
10	G	2	GCU	C1-C2-C3-C4-C5-O5

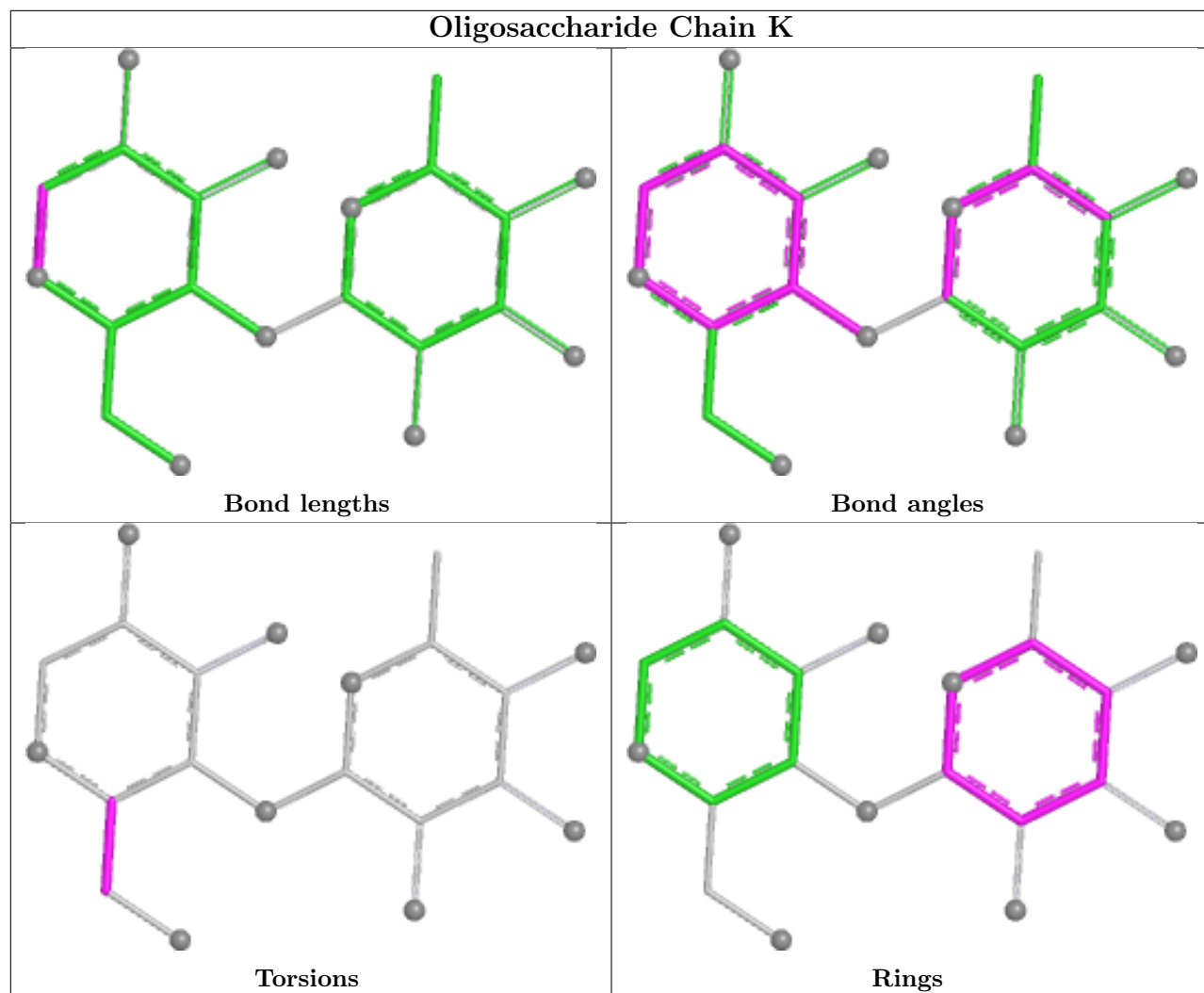
10 monomers are involved in 16 short contacts:

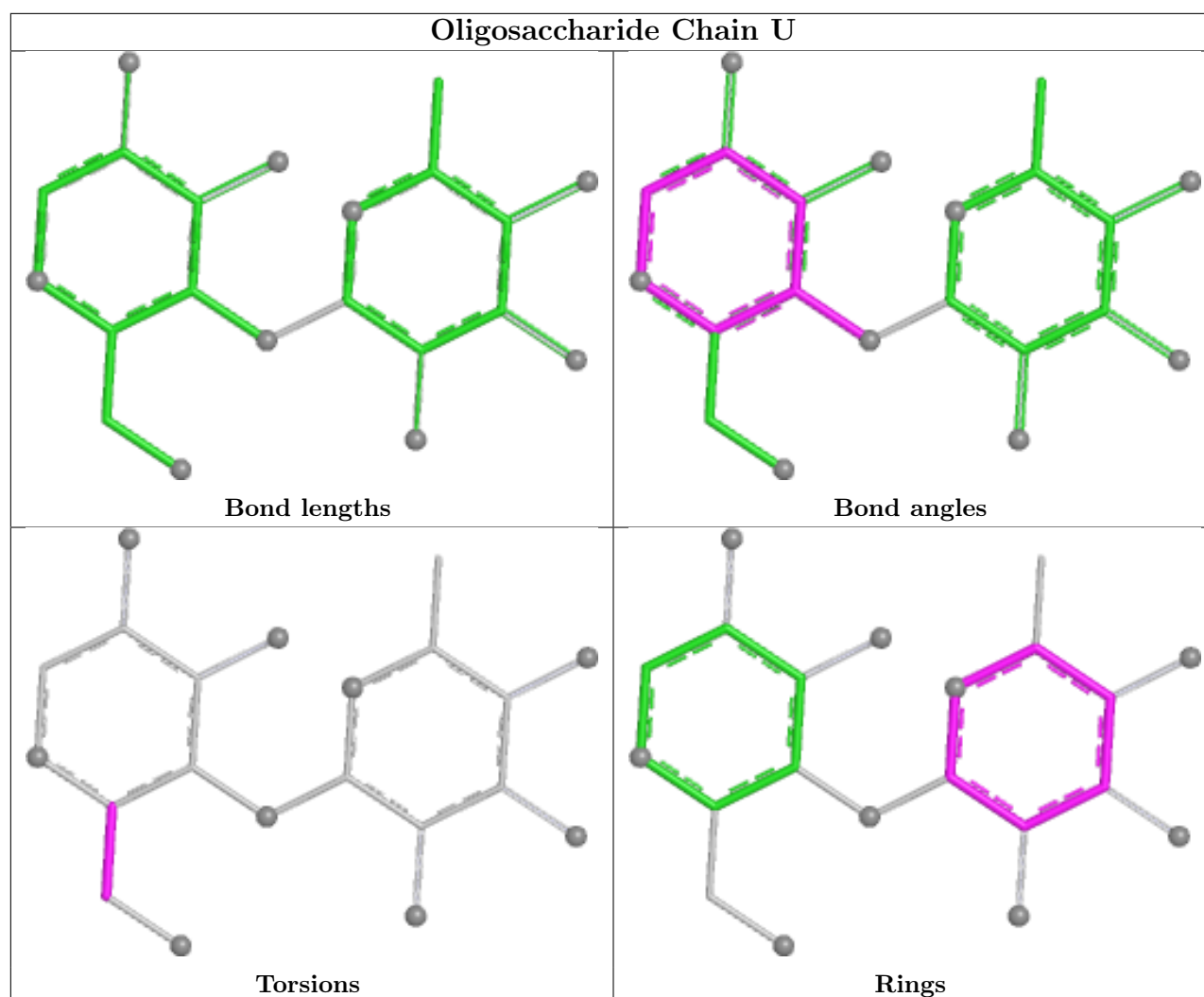
Mol	Chain	Res	Type	Clashes	Symm-Clashes
11	U	1	GLA	1	0
10	G	1	GLA	1	0
10	I	1	GLA	1	0
10	I	3	RAM	2	0
11	K	2	RAM	1	0
10	J	3	RAM	6	0
10	J	1	GLA	5	0
10	I	2	GCU	1	0
11	U	2	RAM	3	0
11	K	1	GLA	1	0

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









5.6 Ligand geometry [i](#)

6 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	$\# Z > 2$
12	GLA	P	601	1	11,11,12	0.83	0	15,15,17	0.83	0
12	GLA	P	602	-	11,11,12	0.73	0	15,15,17	1.08	1 (6%)
12	GLA	A	604	2	11,11,12	0.74	0	15,15,17	1.62	1 (6%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
12	GLA	A	601	2	11,11,12	0.76	0	15,15,17	1.21	1 (6%)
12	GLA	A	603	2	11,11,12	0.79	0	15,15,17	1.50	1 (6%)
12	GLA	A	602	2	11,11,12	0.83	0	15,15,17	0.98	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
12	GLA	P	601	1	-	1/2/19/22	0/1/1/1
12	GLA	P	602	-	-	2/2/19/22	0/1/1/1
12	GLA	A	604	2	-	0/2/19/22	0/1/1/1
12	GLA	A	601	2	-	0/2/19/22	0/1/1/1
12	GLA	A	603	2	-	0/2/19/22	0/1/1/1
12	GLA	A	602	2	-	0/2/19/22	0/1/1/1

There are no bond length outliers.

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
12	A	604	GLA	C1-O5-C5	5.04	118.94	112.19
12	A	603	GLA	C1-O5-C5	4.17	117.77	112.19
12	A	601	GLA	C1-O5-C5	3.30	116.61	112.19
12	P	602	GLA	C1-O5-C5	2.63	115.71	112.19

There are no chirality outliers.

All (3) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
12	P	602	GLA	O5-C5-C6-O6
12	P	602	GLA	C4-C5-C6-O6
12	P	601	GLA	O5-C5-C6-O6

There are no ring outliers.

No monomer is involved in short contacts.

5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

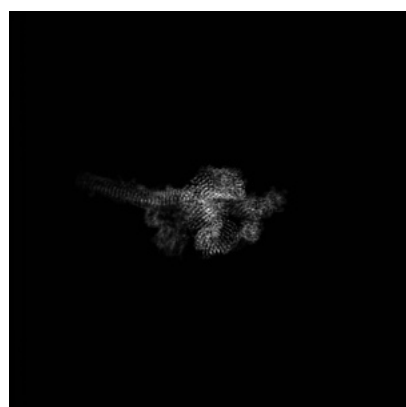
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-79007. These allow visual inspection of the internal detail of the map and identification of artifacts.

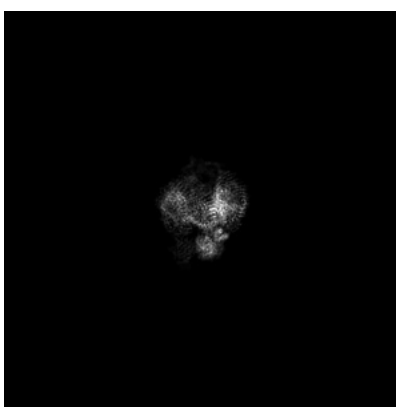
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections [i](#)

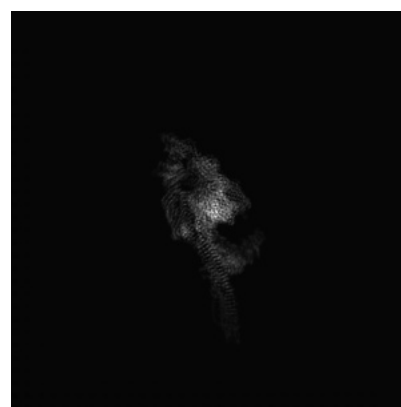
6.1.1 Primary map



X



Y



Z

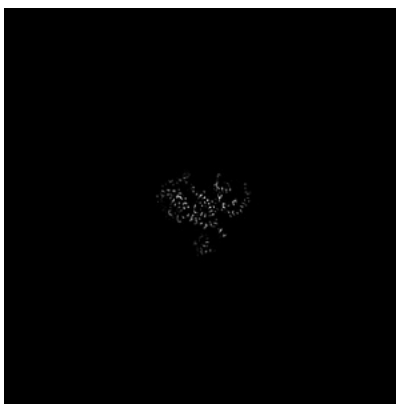
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

6.2.1 Primary map



X Index: 190



Y Index: 190



Z Index: 190

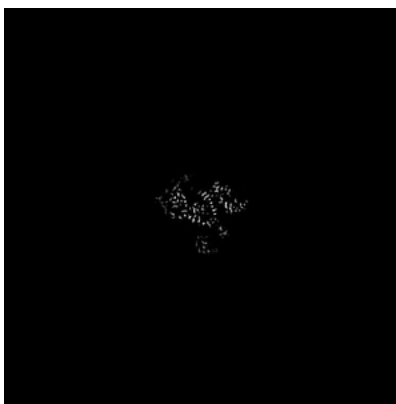
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

6.3.1 Primary map



X Index: 191



Y Index: 187

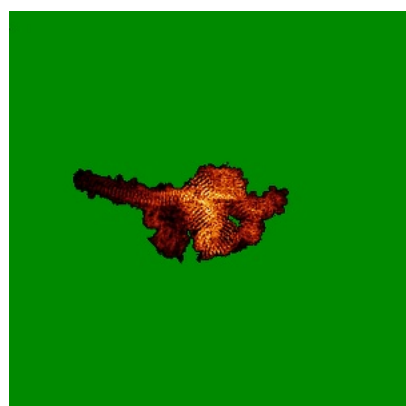


Z Index: 205

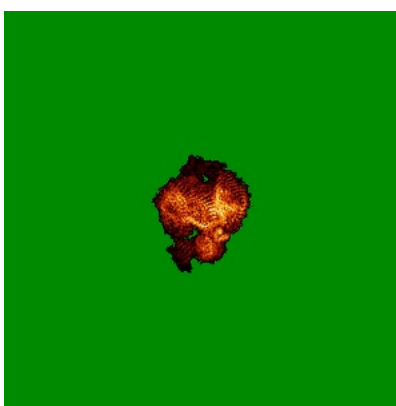
The images above show the largest variance slices of the map in three orthogonal directions.

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

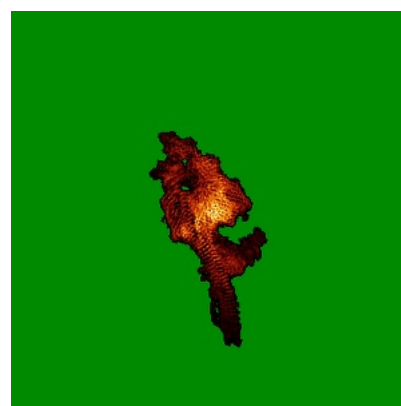
6.4.1 Primary map



X



Y

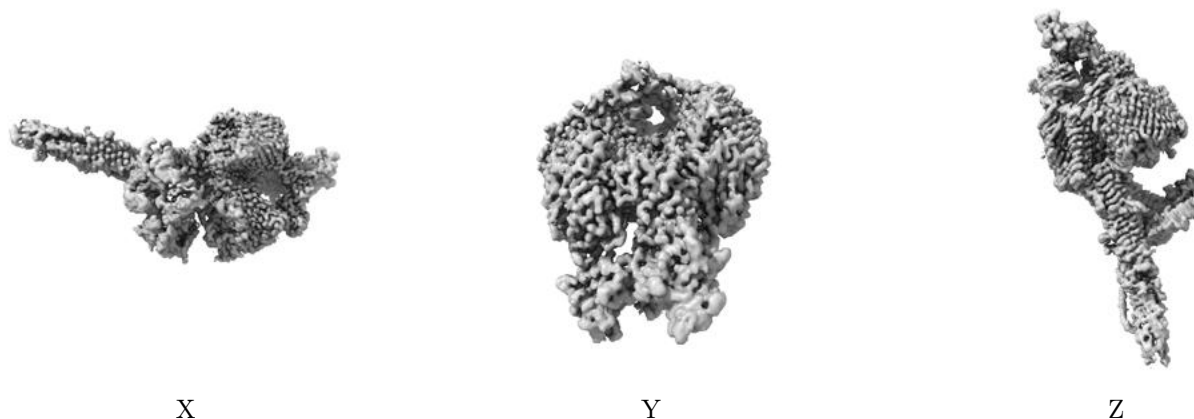


Z

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

6.5 Orthogonal surface views [i](#)

6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.07. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

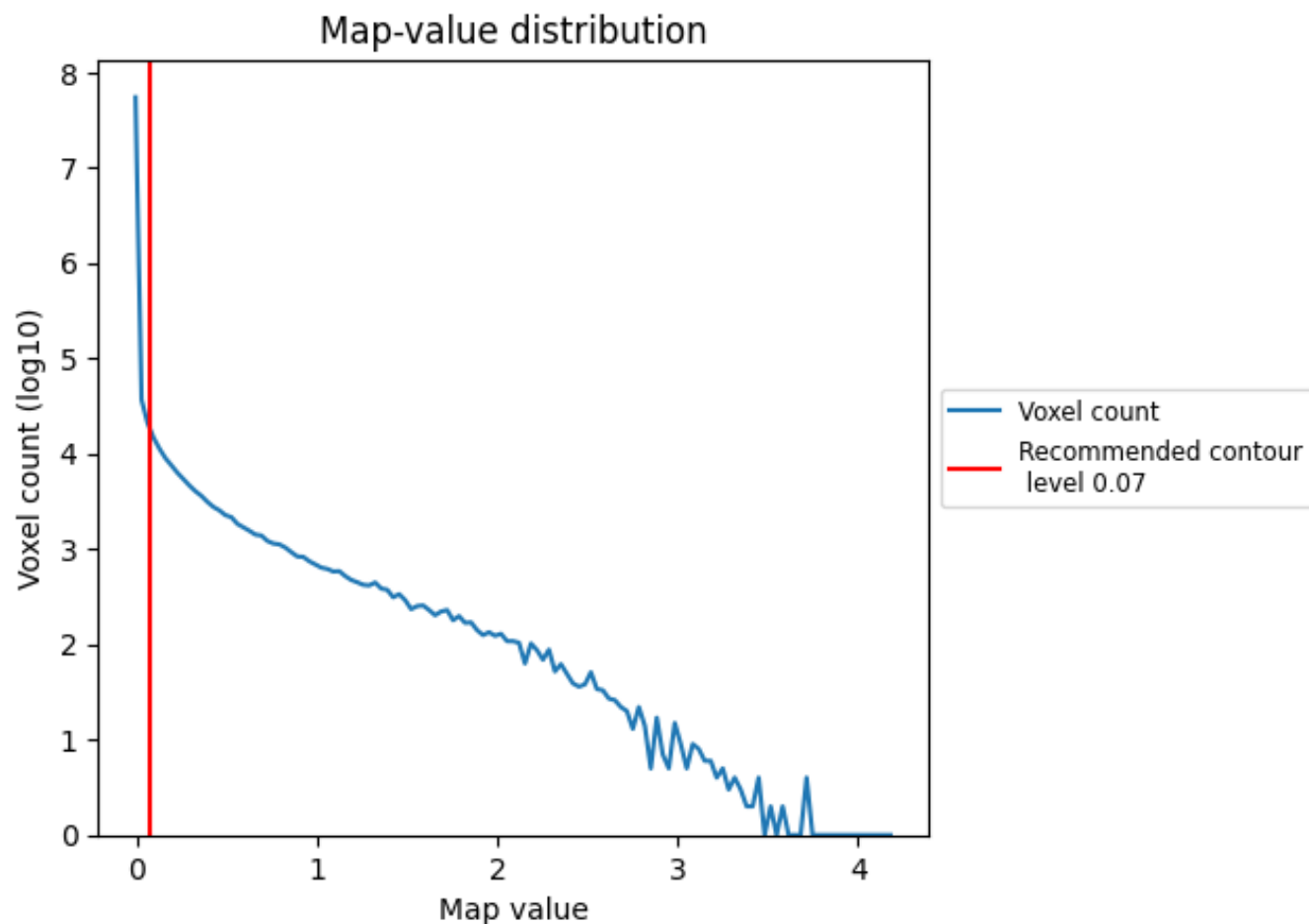
6.6 Mask visualisation [i](#)

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

7 Map analysis [i](#)

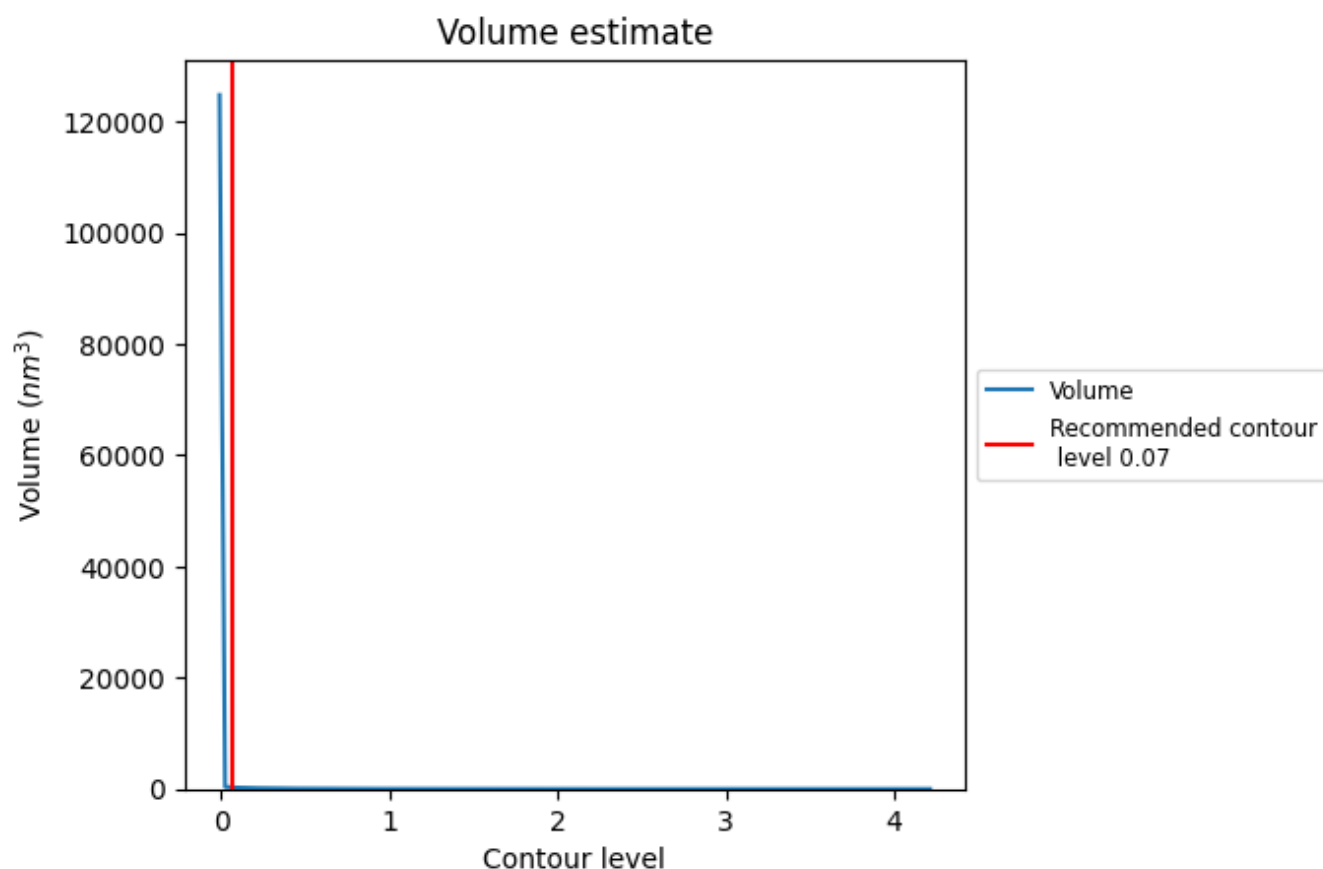
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution [i](#)



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

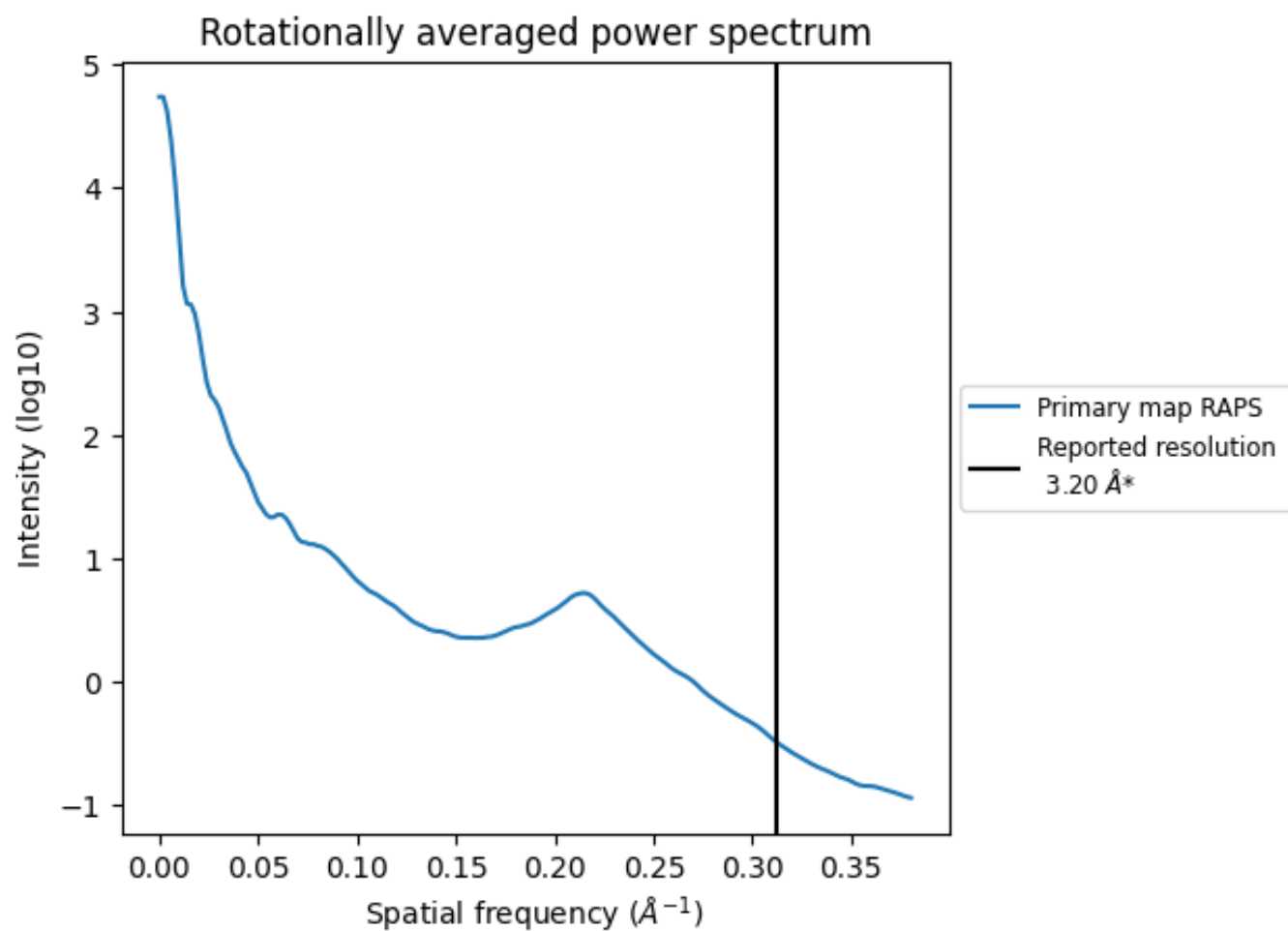
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 273 nm^3 ; this corresponds to an approximate mass of 247 kDa.

The volume estimate graph shows how the enclosed volume varies with the contour level. The recommended contour level is shown as a vertical line and the intersection between the line and the curve gives the volume of the enclosed surface at the given level.

7.3 Rotationally averaged power spectrum ⓘ



*Reported resolution corresponds to spatial frequency of 0.312 Å⁻¹

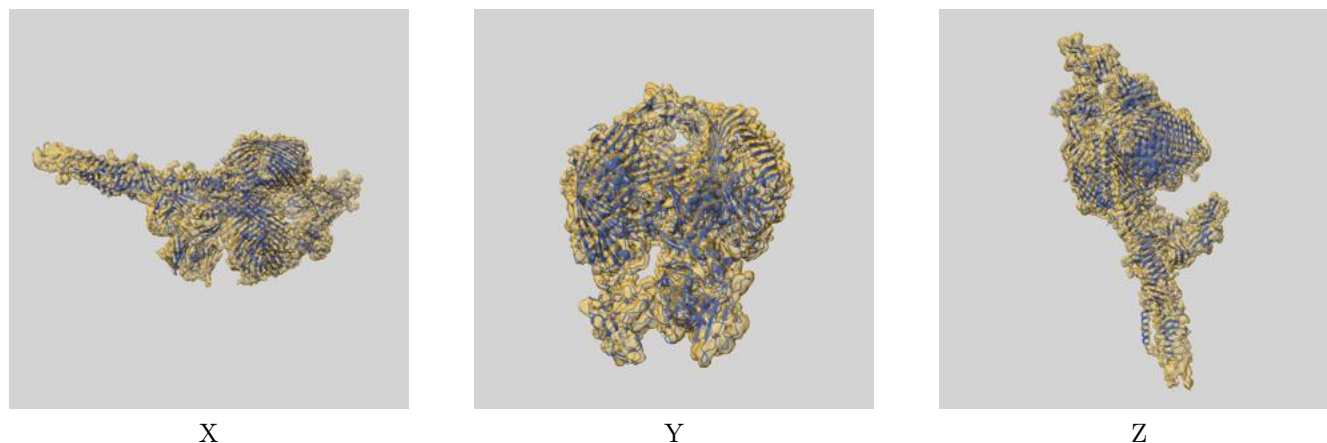
8 Fourier-Shell correlation

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

9 Map-model fit [i](#)

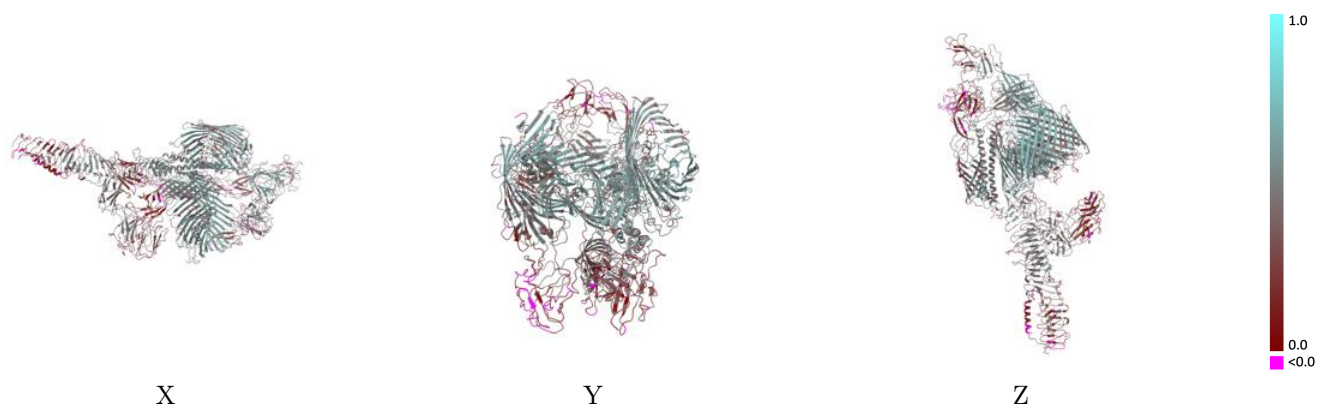
This section contains information regarding the fit between EMDB map EMD-79007 and PDB model 38OL. Per-residue inclusion information can be found in section [3](#) on page [8](#).

9.1 Map-model overlay [i](#)



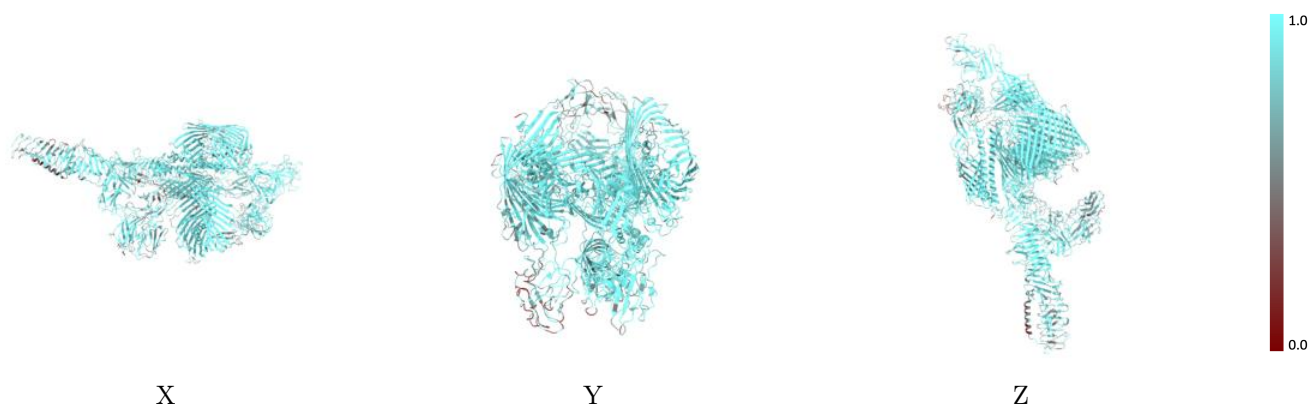
The images above show the 3D surface view of the map at the recommended contour level 0.07 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



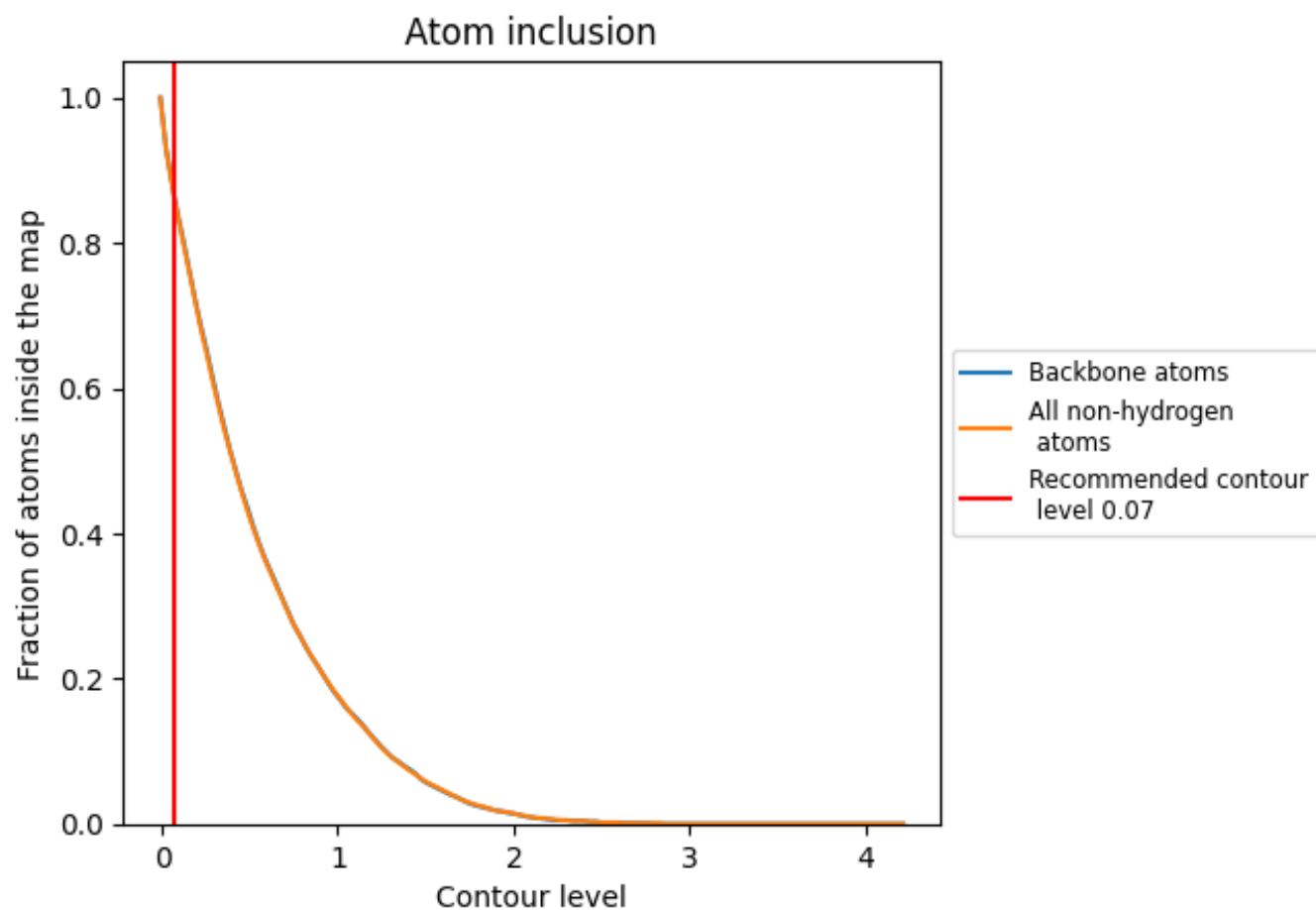
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions at which atoms can be resolved. Low Q-score values may therefore be expected for many entries.

9.3 Atom inclusion mapped to coordinate model [i](#)



The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.07).

9.4 Atom inclusion [i](#)



At the recommended contour level, 86% of all backbone atoms, 86% 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 (0.07) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.8620	 0.4160
A	 0.7790	 0.3230
D	 0.9100	 0.4910
E	 0.9440	 0.5350
G	 0.7580	 0.3190
I	 0.7880	 0.2110
J	 0.8790	 0.3730
K	 0.6190	 0.2000
N	 0.9360	 0.5320
O	 0.4850	 0.1820
P	 0.7920	 0.3110
Q	 0.8840	 0.3980
R	 0.8050	 0.2400
S1	 0.9090	 0.4310
S2	 0.7490	 0.2980
T	 0.9430	 0.4760
U	 0.7140	 0.1390

