WORLDWIDE PDB

PROTEIN DATA BANK

Full wwPDB X-ray Structure Validation Report ⓘ

Oct 10, 2023 – 11:05 PM EDT

PDB ID	:	7K7M
Title	:	Crystal Structure of a membrane protein
Authors	:	Su, C.-C.
Deposited on	:	2020-09-23
Resolution	:	3.33 Å(reported)

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

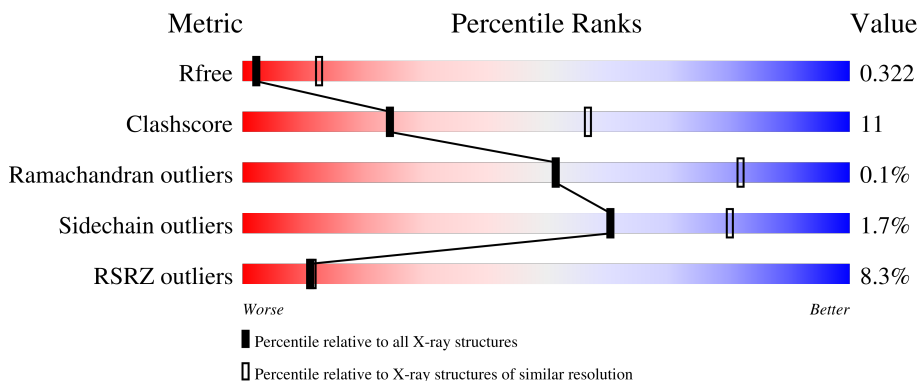|		
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.35.1
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.35.1

1 Overall quality at a glance ⓘ

The following experimental techniques were used to determine the structure:
X-RAY DIFFRACTION

The reported resolution of this entry is 3.33 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
Rfree		0.322
Clashscore		11
Ramachandran outliers		0.1%
Sidechain outliers		1.7%
RSRZ outliers		8.3%

Worse   *Better*

▌ Percentile relative to all X-ray structures

▯ Percentile relative to X-ray structures of similar resolution

Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	1060 (3.38-3.30)
Clashscore	141614	1111 (3.38-3.30)
Ramachandran outliers	138981	1090 (3.38-3.30)
Sidechain outliers	138945	1089 (3.38-3.30)
RSRZ outliers	127900	1028 (3.38-3.30)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower 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 electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	786	8% — 69% / 27% / •
1	B	786	8% — 75% / 21% / •
2	C	2	50% / 50%
2	D	2	100%
2	E	2	50% / 50%

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Mol	Chain	Length	Quality of chain
2	F	2	50% 50%

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
2	U2D	D	1	-	-	-	X
2	U2D	E	1	-	-	-	X

2 Entry composition (i)

There are 2 unique types of molecules in this entry. The entry contains 11641 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, the ZeroOcc column contains the number of atoms modelled with zero occupancy, 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 Drug exporters of the RND superfamily-like protein.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	756	Total 5751	C 3721	N 956	O 1046	S 28	0	0	0
1	B	757	Total 5754	C 3724	N 956	O 1046	S 28	0	0	0

There are 12 discrepancies between the modelled and reference sequences:

| Chain	Residue	Modelled	Actual	Comment	Reference
A	781	HIS	-	expression tag	UNP I7G2R2
A	782	HIS	-	expression tag	UNP I7G2R2
A	783	HIS	-	expression tag	UNP I7G2R2
A	784	HIS	-	expression tag	UNP I7G2R2
A	785	HIS	-	expression tag	UNP I7G2R2
A	786	HIS	-	expression tag	UNP I7G2R2
B	781	HIS	-	expression tag	UNP I7G2R2
B	782	HIS	-	expression tag	UNP I7G2R2
B	783	HIS	-	expression tag	UNP I7G2R2
B	784	HIS	-	expression tag	UNP I7G2R2
B	785	HIS	-	expression tag	UNP I7G2R2
B	786	HIS	-	expression tag	UNP I7G2R2

- Molecule 2 is an oligosaccharide called alpha-D-glucopyranose-(1-1)-6-O-decanoyl-alpha-D-glucopyranose.

| Mol	Chain	Residues	Atoms			ZeroOcc	AltConf	Trace
2	C	2	Total 34	C 22	O 12	0	0	0
2	D	2	Total 34	C 22	O 12	0	0	0
2	E	2	Total 34	C 22	O 12	0	0	0
2	F	2	Total 34	C 22	O 12	0	0	0

3 Residue-property plots ⓘ

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron 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 dot above a residue indicates a poor fit to the electron density (RSRZ > 2). 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: Drug exporters of the RND superfamily-like protein
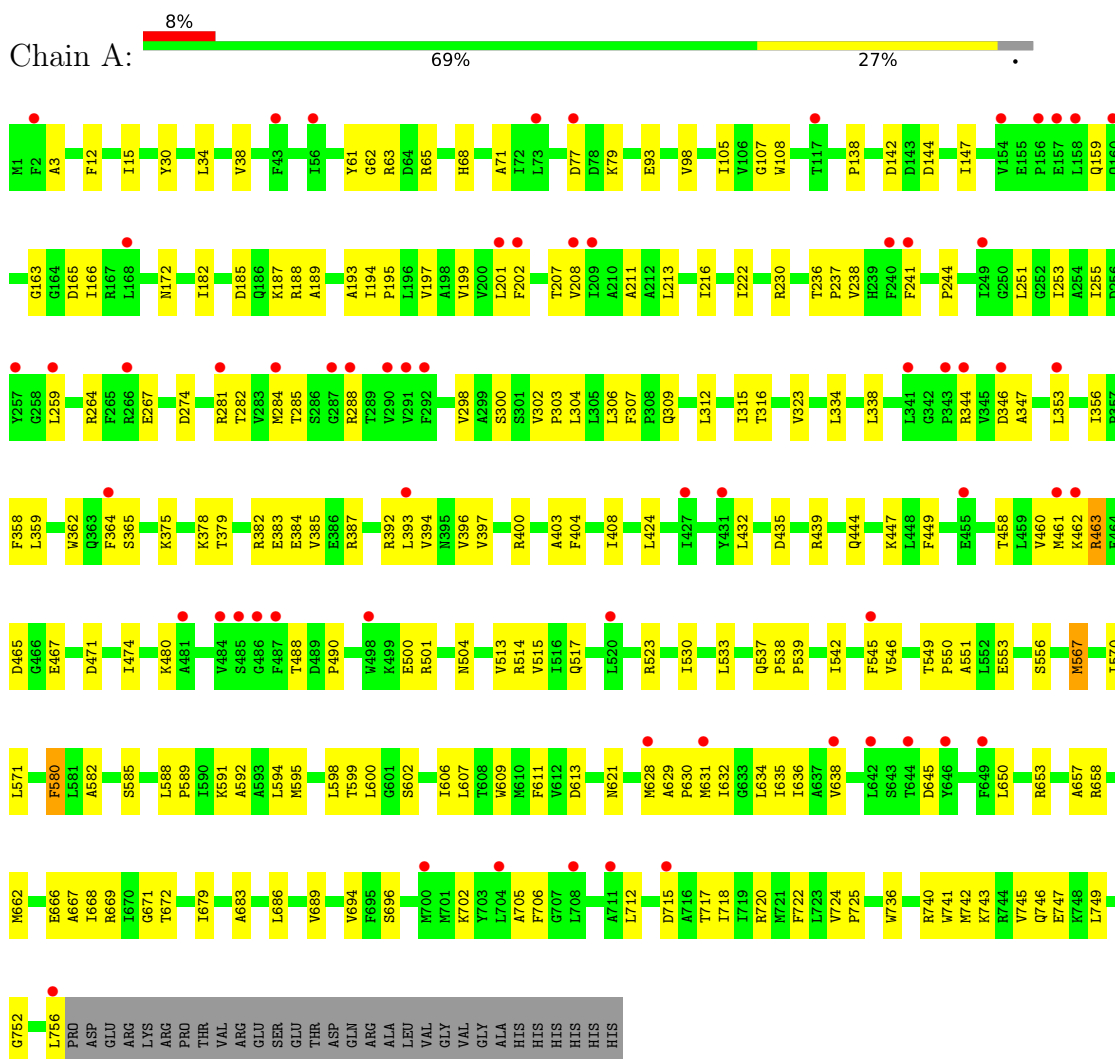
- Molecule 1: Drug exporters of the RND superfamily-like protein
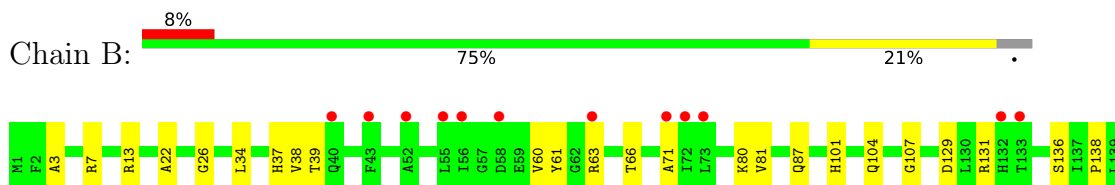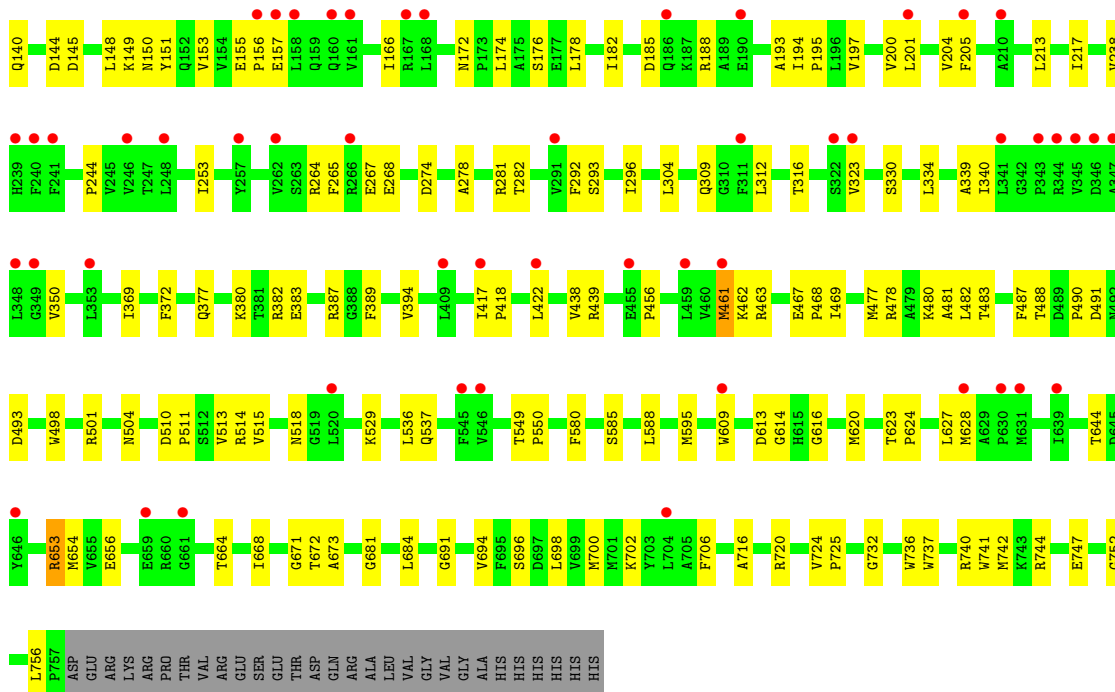
• Molecule 2: alpha-D-glucopyranose-(1-1)-6-O-decanoyl-alpha-D-glucopyranose

Chain C:

• Molecule 2: alpha-D-glucopyranose-(1-1)-6-O-decanoyl-alpha-D-glucopyranose

Chain D:

• Molecule 2: alpha-D-glucopyranose-(1-1)-6-O-decanoyl-alpha-D-glucopyranose

Chain E:

• Molecule 2: alpha-D-glucopyranose-(1-1)-6-O-decanoyl-alpha-D-glucopyranose

Chain F:

4 Data and refinement statistics ⓘ

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α, β, γ	180.38Å　147.71Å　138.19Å 90.00°　120.89°　90.00°	Depositor
Resolution (Å)	98.66　–　3.33 98.66　–　3.33	Depositor EDS
% Data completeness (in resolution range)	97.6 (98.66-3.33) 98.6 (98.66-3.33)	Depositor EDS
R_{merge}	0.09	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.18 (at 3.33Å)	Xtriage
Refinement program	PHENIX 1.8	Depositor
R, R_{free}	0.267　,　0.321 0.269　,　0.322	Depositor DCC
R_{free} test set	2138 reflections (4.77%)	wwPDB-VP
Wilson B-factor (Å^2)	125.9	Xtriage
Anisotropy	0.402	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.24 , 72.5	EDS
L-test for twinning[2]	$< |L| > = 0.46$, $< L^2 > = 0.28$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.83	EDS
Total number of atoms	11641	wwPDB-VP
Average B, all atoms (Å^2)	139.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.24% of the height of the origin peak. No significant pseudotranslation is detected.*

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[1]Intensities estimated from amplitudes.
[2]Theoretical values of $< |L| >$, $< L^2 >$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality ⓘ

5.1 Standard geometry ⓘ

Bond lengths and bond angles in the following residue types are not validated in this section: GLC, U2D

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	0.24	0/5867	0.42	0/7987
1	B	0.25	0/5871	0.44	0/7993
All	All	0.25	0/11738	0.43	0/15980

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts ⓘ

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	5751	0	5886	139	0
1	B	5754	0	5890	123	0
2	C	34	0	11	1	0
2	D	34	0	11	0	0
2	E	34	0	11	1	0
2	F	34	0	11	0	0
All	All	11641	0	11820	258	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 11.

All (258) 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:A:462:LYS:C	1:A:542:ILE:HG22	1.93	0.89
1:A:394:VAL:HG21	1:A:672:THR:HG21	1.58	0.84
1:B:71:ALA:HB1	1:B:166:ILE:HD11	1.61	0.82
1:A:463:ARG:N	1:A:542:ILE:HG22	1.96	0.81
1:B:477:MET:HA	1:B:480:LYS:HB2	1.60	0.81
1:A:747:GLU:HA	1:A:752:GLY:HA3	1.66	0.76
1:B:264:ARG:NH1	1:B:268:GLU:OE2	2.22	0.73
1:B:380:LYS:HA	1:B:383:GLU:HG2	1.71	0.73
1:A:523:ARG:NH2	1:A:553:GLU:OE1	2.22	0.72
1:B:664:THR:HG21	1:B:732:GLY:HA2	1.72	0.70
1:B:80:LYS:NZ	1:B:129:ASP:O	2.25	0.70
1:A:34:LEU:HB2	1:A:230:ARG:HB2	1.74	0.70
1:A:460:VAL:HB	1:A:545:PHE:HB2	1.74	0.69
1:A:62:GLY:HA3	1:A:504:ASN:HB2	1.73	0.69
1:A:264:ARG:HG3	1:A:282:THR:HG22	1.73	0.68
1:A:432:LEU:O	1:A:439:ARG:NH2	2.28	0.67
1:B:185:ASP:OD1	1:B:188:ARG:NH2	2.28	0.67
1:A:264:ARG:NH1	1:A:267:GLU:OE1	2.29	0.66
1:A:264:ARG:HH21	1:A:285:THR:HG21	1.61	0.66
1:B:585:SER:HB2	1:B:736:TRP:HD1	1.60	0.66
1:B:194:ILE:HA	1:B:197:VAL:HG22	1.79	0.64
1:B:60:VAL:HG21	1:B:513:VAL:HG21	1.80	0.64
1:B:620:MET:CE	1:B:706:PHE:CE1	2.80	0.64
1:A:208:VAL:HG11	1:A:353:LEU:HB2	1.79	0.64
1:A:460:VAL:HA	1:A:515:VAL:HG12	1.80	0.63
1:B:264:ARG:NH2	1:B:656:GLU:OE2	2.31	0.63
1:B:620:MET:HE2	1:B:706:PHE:CE1	2.33	0.63
1:B:204:VAL:HG11	1:B:681:GLY:HA3	1.79	0.63
1:B:387:ARG:HG3	1:B:673:ALA:HB1	1.80	0.63
1:A:344:ARG:HG2	1:A:347:ALA:HB2	1.80	0.62
1:B:595:MET:HE1	1:B:724:VAL:HG22	1.81	0.62
1:A:666:GLU:OE1	1:A:669:ARG:NH2	2.33	0.62
1:B:481:ALA:HB1	1:B:498:TRP:CE2	2.34	0.62
1:B:101:HIS:NE2	1:B:157:GLU:OE1	2.34	0.61
1:A:288:ARG:NH2	1:A:582:ALA:O	2.33	0.60
1:A:302:VAL:HG23	1:A:303:PRO:HD3	1.84	0.60
1:A:480:LYS:NZ	1:A:537:GLN:O	2.34	0.59
1:B:477:MET:O	1:B:481:ALA:N	2.32	0.59
1:A:163:GLY:O	1:B:744:ARG:NH1	2.35	0.59
1:A:592:ALA:HA	1:A:595:MET:HE2	1.83	0.59
1:A:696:SER:O	1:A:702:LYS:NZ	2.30	0.59

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:93:GLU:OE2	1:B:740:ARG:NH1	2.35	0.59
1:A:12:PHE:HD2	1:A:15:ILE:HD11	1.67	0.58
1:B:580:PHE:CZ	1:B:742:MET:HB3	2.38	0.58
1:A:274:ASP:OD1	1:A:274:ASP:N	2.36	0.58
1:B:265:PHE:HA	1:B:282:THR:HG21	1.86	0.58
1:A:653:ARG:HB3	1:A:671:GLY:HA2	1.86	0.58
1:A:253:ILE:HD11	1:A:323:VAL:HG12	1.86	0.58
1:A:306:LEU:HD11	1:A:570:ILE:HD12	1.84	0.58
1:A:694:VAL:HG13	1:A:706:PHE:CE1	2.39	0.58
1:A:694:VAL:HG23	1:A:705:ALA:HB1	1.85	0.58
1:B:620:MET:CE	1:B:706:PHE:HE1	2.15	0.57
1:A:63:ARG:NH2	1:A:142:ASP:O	2.38	0.57
1:A:444:GLN:HA	1:A:447:LYS:HG2	1.87	0.57
1:A:359:LEU:HA	1:A:365:SER:HB2	1.87	0.56
1:B:267:GLU:OE1	1:B:653:ARG:NH2	2.37	0.56
1:B:140:GLN:O	1:B:150:ASN:ND2	2.39	0.56
1:A:393:LEU:HD11	1:A:722:PHE:HE1	1.70	0.56
1:A:304:LEU:HB2	1:A:316:THR:HG21	1.87	0.55
1:A:185:ASP:HA	1:A:188:ARG:HB3	1.89	0.54
1:B:462:LYS:HA	1:B:513:VAL:HG12	1.89	0.54
1:B:696:SER:O	1:B:702:LYS:NZ	2.26	0.54
1:A:68:HIS:CE1	1:A:147:ILE:HG21	2.42	0.54
1:A:668:ILE:O	1:A:672:THR:HG22	2.08	0.54
1:A:461:MET:HE1	1:A:474:ILE:HA	1.89	0.54
1:B:668:ILE:O	1:B:672:THR:HG22	2.08	0.53
1:A:463:ARG:HD3	1:A:465:ASP:HB2	1.90	0.53
1:A:98:VAL:HG22	1:A:105:ILE:HG21	1.91	0.53
1:A:580:PHE:CZ	1:A:742:MET:HB3	2.43	0.53
1:A:501:ARG:HB3	1:A:515:VAL:HG23	1.90	0.53
1:A:34:LEU:HA	1:A:230:ARG:HD3	1.91	0.53
1:B:620:MET:HE1	1:B:706:PHE:CE1	2.44	0.53
1:B:463:ARG:HD3	1:B:467:GLU:O	2.09	0.53
1:A:213:LEU:HD23	1:A:216:ILE:HD12	1.90	0.52
1:A:694:VAL:HG13	1:A:706:PHE:HE1	1.72	0.52
1:B:197:VAL:O	1:B:201:LEU:HB2	2.09	0.52
1:B:588:LEU:HD11	1:B:736:TRP:HE1	1.74	0.52
1:B:60:VAL:HG11	1:B:513:VAL:HG23	1.91	0.52
1:B:744:ARG:HA	1:B:747:GLU:HB2	1.91	0.52
1:A:71:ALA:HB1	1:A:166:ILE:HD11	1.92	0.51
1:B:63:ARG:O	1:B:504:ASN:ND2	2.43	0.51
1:A:657:ALA:HB3	1:A:667:ALA:HA	1.92	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:628:MET:HE2	1:B:700:MET:HG3	1.91	0.51
1:A:300:SER:HA	1:A:571:LEU:HD12	1.92	0.51
1:A:194:ILE:HA	1:A:197:VAL:HG22	1.93	0.51
1:A:93:GLU:HG2	1:B:740:ARG:HH12	1.76	0.51
1:A:694:VAL:O	1:A:702:LYS:HG2	2.11	0.51
1:B:200:VAL:HG11	1:B:684:LEU:HB2	1.93	0.51
1:A:65:ARG:HB3	1:A:138:PRO:HB3	1.93	0.50
1:B:309:GLN:OE1	1:B:309:GLN:N	2.44	0.50
1:B:439:ARG:HH12	1:B:623:THR:HG21	1.77	0.50
1:B:491:ASP:OD2	1:B:493:ASP:HB3	2.11	0.50
1:B:66:THR:O	1:B:136:SER:OG	2.22	0.50
1:A:530:ILE:HD13	1:A:551:ALA:HA	1.94	0.50
1:B:487:PHE:HB3	1:B:518:ASN:ND2	2.27	0.50
1:A:382:ARG:HA	1:A:385:VAL:HG22	1.93	0.50
1:A:199:VAL:HA	1:A:202:PHE:CE2	2.47	0.50
1:A:201:LEU:HB3	1:A:211:ALA:HB1	1.93	0.49
1:A:588:LEU:HA	1:A:591:LYS:HE3	1.94	0.49
1:A:182:ILE:HD12	1:A:244:PRO:HG2	1.94	0.49
1:B:61:TYR:CE1	1:B:515:VAL:HG12	2.48	0.49
1:B:480:LYS:O	1:B:483:THR:OG1	2.22	0.49
1:B:39:THR:OG1	1:B:145:ASP:OD2	2.28	0.49
1:B:81:VAL:O	1:B:87:GLN:NE2	2.43	0.49
1:A:98:VAL:HG21	1:A:108:TRP:HD1	1.76	0.48
1:A:207:THR:HG21	1:A:346:ASP:HA	1.95	0.48
1:B:461:MET:HE3	1:B:477:MET:HB3	1.95	0.48
1:B:151:TYR:CD2	1:B:172:ASN:HB3	2.49	0.48
1:B:204:VAL:HG23	1:B:205:PHE:CD1	2.48	0.48
1:B:107:GLY:O	1:B:138:PRO:HD2	2.13	0.48
1:A:222:ILE:HG21	1:A:251:LEU:HB2	1.95	0.48
1:A:356:ILE:O	1:A:358:PHE:N	2.45	0.48
1:A:255:ILE:O	1:A:259:LEU:N	2.46	0.48
1:B:480:LYS:HZ1	1:B:537:GLN:HB2	1.79	0.47
1:B:620:MET:CE	1:B:706:PHE:CZ	2.97	0.47
1:A:679:ILE:HB	1:A:720:ARG:HH21	1.80	0.47
1:B:3:ALA:O	1:B:7:ARG:HG3	2.14	0.47
1:B:480:LYS:HD2	1:B:536:LEU:HD22	1.96	0.47
1:A:334:LEU:O	1:A:338:LEU:HG	2.14	0.47
1:A:397:VAL:HA	1:A:404:PHE:CD2	2.49	0.47
1:A:686:LEU:HA	1:A:689:VAL:HG22	1.97	0.47
1:B:744:ARG:HD2	1:B:747:GLU:HB2	1.95	0.47
1:B:101:HIS:HB3	1:B:104:GLN:HB2	1.97	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:478:ARG:HG3	1:B:498:TRP:HB2	1.97	0.47
1:B:478:ARG:O	1:B:482:LEU:HG	2.14	0.47
1:B:653:ARG:HA	1:B:653:ARG:HD2	1.63	0.47
1:A:662:MET:HB3	1:A:666:GLU:HB2	1.97	0.47
1:A:600:LEU:HD11	1:A:636:ILE:HG23	1.97	0.46
1:B:461:MET:HG3	1:B:514:ARG:O	2.15	0.46
1:B:38:VAL:HG13	1:B:238:VAL:HG23	1.97	0.46
1:A:461:MET:HB3	1:A:542:ILE:HD12	1.98	0.46
1:B:580:PHE:HZ	1:B:742:MET:HB3	1.80	0.46
1:A:435:ASP:OD2	1:A:621:ASN:ND2	2.38	0.46
1:A:165:ASP:OD2	1:B:744:ARG:NH2	2.48	0.46
1:A:189:ALA:O	1:A:193:ALA:HB3	2.16	0.46
1:B:350:VAL:HG22	1:B:372:PHE:CZ	2.51	0.46
1:B:654:MET:HG2	1:B:671:GLY:HA3	1.98	0.46
1:B:480:LYS:NZ	1:B:537:GLN:HB2	2.31	0.46
1:A:743:LYS:O	1:A:747:GLU:HG3	2.16	0.46
1:A:400:ARG:HG2	1:A:403:ALA:HB2	1.98	0.45
1:A:717:THR:OG1	1:A:718:ILE:N	2.50	0.45
1:B:61:TYR:CZ	1:B:515:VAL:HG12	2.52	0.45
1:B:296:ILE:HG21	1:B:644:THR:HG21	1.98	0.45
1:A:463:ARG:HB3	1:A:542:ILE:HG23	1.98	0.45
1:A:159:GLN:NE2	1:A:166:ILE:O	2.43	0.45
1:A:538:PRO:HA	1:A:539:PRO:HD3	1.60	0.45
1:A:658:ARG:HG2	1:A:736:TRP:CG	2.51	0.45
1:B:281:ARG:NH2	1:B:756:LEU:HB3	2.32	0.45
1:B:491:ASP:OD1	1:B:491:ASP:N	2.49	0.45
1:A:588:LEU:HB2	1:A:589:PRO:HD3	1.99	0.45
1:A:629:ALA:HB3	1:A:630:PRO:HD3	1.98	0.45
1:A:105:ILE:HG22	1:A:107:GLY:H	1.80	0.45
1:A:298:VAL:O	1:A:302:VAL:HG22	2.17	0.45
1:A:683:ALA:O	1:A:712:LEU:HD21	2.17	0.45
1:A:444:GLN:HG3	1:A:447:LYS:HZ3	1.82	0.45
1:B:144:ASP:OD2	2:E:1:U2D:O11	2.36	0.44
1:A:462:LYS:HB2	1:A:513:VAL:HG22	1.99	0.44
1:A:530:ILE:HG23	1:A:546:VAL:HG11	1.98	0.44
1:B:609:TRP:O	1:B:613:ASP:HB2	2.17	0.44
1:A:3:ALA:HB2	1:A:284:MET:SD	2.57	0.44
1:A:61:TYR:OH	1:A:514:ARG:NH1	2.50	0.44
1:A:312:LEU:O	1:A:316:THR:HG23	2.17	0.44
1:A:424:LEU:H	2:C:2:GLC:H62	1.82	0.44
1:A:634:LEU:O	1:A:638:VAL:HG23	2.17	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:756:LEU:HD12	1:A:756:LEU:H	1.82	0.44
1:A:38:VAL:HG22	1:A:238:VAL:HG23	1.98	0.44
1:A:77:ASP:HB2	1:A:79:LYS:HE2	1.98	0.44
1:A:408:ILE:HD11	1:A:722:PHE:HD2	1.83	0.44
1:B:292:PHE:O	1:B:296:ILE:HG13	2.17	0.44
1:B:501:ARG:HB3	1:B:515:VAL:HG13	2.00	0.44
1:A:195:PRO:O	1:A:199:VAL:HG13	2.17	0.44
1:A:632:ILE:HA	1:A:635:ILE:HG22	2.00	0.44
1:B:394:VAL:HG13	1:B:725:PRO:HB3	1.99	0.44
1:B:510:ASP:HB3	1:B:513:VAL:HG22	1.99	0.44
1:A:12:PHE:CD2	1:A:15:ILE:HD11	2.49	0.44
1:A:609:TRP:O	1:A:613:ASP:HB2	2.18	0.44
1:A:650:LEU:HD22	1:A:720:ARG:HA	1.99	0.44
1:A:724:VAL:HB	1:A:725:PRO:HD3	2.00	0.43
1:B:13:ARG:HD2	1:B:340:ILE:HD12	1.99	0.43
1:B:488:THR:HG22	1:B:490:PRO:HD3	1.99	0.43
1:B:194:ILE:HG13	1:B:195:PRO:HD3	2.00	0.43
1:B:274:ASP:OD1	1:B:274:ASP:N	2.42	0.43
1:A:488:THR:HG22	1:A:490:PRO:HD3	2.00	0.43
1:B:691:GLY:O	1:B:694:VAL:HG22	2.18	0.43
1:B:744:ARG:HA	1:B:744:ARG:HD2	1.72	0.43
1:A:303:PRO:HB2	1:A:567:MET:HG3	2.00	0.43
1:A:444:GLN:HE21	1:A:447:LYS:NZ	2.17	0.43
1:B:178:LEU:HD22	1:B:698:LEU:HD13	2.00	0.43
1:B:372:PHE:HA	1:B:377:GLN:CB	2.49	0.43
1:A:236:THR:OG1	1:A:237:PRO:HD2	2.19	0.43
1:A:379:THR:O	1:A:383:GLU:HG3	2.18	0.43
1:A:463:ARG:HD2	1:A:467:GLU:N	2.33	0.43
1:B:22:ALA:O	1:B:26:GLY:N	2.48	0.43
1:A:599:THR:HG21	1:A:715:ASP:OD1	2.19	0.43
1:A:658:ARG:HG2	1:A:736:TRP:CD2	2.53	0.43
1:A:194:ILE:N	1:A:195:PRO:HD2	2.34	0.43
1:B:155:GLU:N	1:B:156:PRO:HD2	2.33	0.43
1:A:304:LEU:HA	1:A:307:PHE:HD2	1.83	0.43
1:A:585:SER:HB2	1:A:736:TRP:HA	1.99	0.43
1:B:213:LEU:HB3	1:B:334:LEU:HD11	2.01	0.42
1:B:34:LEU:O	1:B:37:HIS:N	2.48	0.42
1:B:182:ILE:HG23	1:B:244:PRO:HG3	2.00	0.42
1:A:694:VAL:CG1	1:A:706:PHE:CE1	3.02	0.42
1:B:148:LEU:HD11	1:B:176:SER:HB2	2.02	0.42
1:B:468:PRO:HA	1:B:511:PRO:HB2	2.01	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:716:ALA:O	1:B:720:ARG:NH1	2.47	0.42
1:A:542:ILE:H	1:A:542:ILE:HG12	1.57	0.42
1:A:746:GLN:HE21	1:A:752:GLY:HA2	1.84	0.42
1:B:13:ARG:HD3	1:B:339:ALA:HB1	2.00	0.42
1:B:461:MET:HB2	1:B:469:ILE:HD13	2.00	0.42
1:A:105:ILE:HG22	1:A:107:GLY:N	2.34	0.42
1:B:417:ILE:N	1:B:418:PRO:HD2	2.35	0.42
1:A:194:ILE:HG23	1:A:195:PRO:HD3	2.02	0.42
1:B:278:ALA:O	1:B:282:THR:HG23	2.19	0.42
1:B:616:GLY:O	1:B:620:MET:HB2	2.20	0.42
1:A:253:ILE:HG22	1:A:686:LEU:HD21	2.02	0.42
1:A:458:THR:HG22	1:A:517:GLN:HB3	2.00	0.42
1:A:500:GLU:OE2	1:A:514:ARG:NH2	2.52	0.42
1:B:174:LEU:HD23	1:B:438:VAL:HG12	2.02	0.42
1:B:463:ARG:HG3	1:B:469:ILE:HG12	2.02	0.42
1:A:375:LYS:HA	1:A:379:THR:HG22	2.02	0.42
1:A:378:LYS:O	1:A:382:ARG:HD3	2.20	0.42
1:B:131:ARG:HD2	1:B:131:ARG:HA	1.70	0.42
1:B:304:LEU:HB2	1:B:316:THR:HG21	2.02	0.42
1:B:330:SER:O	1:B:334:LEU:HB3	2.19	0.42
1:B:149:LYS:O	1:B:153:VAL:HG23	2.20	0.42
1:B:620:MET:HE1	1:B:706:PHE:CZ	2.55	0.42
1:A:549:THR:OG1	1:A:550:PRO:HD3	2.20	0.41
1:B:312:LEU:O	1:B:316:THR:HG23	2.20	0.41
1:A:241:PHE:HD2	1:A:315:ILE:HD11	1.85	0.41
1:A:392:ARG:O	1:A:396:VAL:HG23	2.20	0.41
1:A:594:LEU:O	1:A:598:LEU:N	2.51	0.41
1:B:422:LEU:HD11	1:B:627:LEU:HD12	2.01	0.41
1:A:281:ARG:HE	1:A:281:ARG:HB3	1.68	0.41
1:B:194:ILE:HG13	1:B:195:PRO:CD	2.50	0.41
1:B:293:SER:HA	1:B:296:ILE:HD12	2.02	0.41
1:B:549:THR:OG1	1:B:550:PRO:HD3	2.21	0.41
1:A:304:LEU:HD12	1:A:316:THR:HG22	2.02	0.41
1:B:253:ILE:HD11	1:B:323:VAL:HG12	2.02	0.41
1:A:628:MET:HB3	1:A:631:MET:HB2	2.02	0.41
1:B:194:ILE:N	1:B:195:PRO:HD2	2.35	0.41
1:B:217:ILE:HD13	1:B:217:ILE:HA	1.91	0.41
1:B:747:GLU:HA	1:B:752:GLY:HA3	2.03	0.41
1:A:309:GLN:NE2	1:A:556:SER:OG	2.49	0.41
1:B:369:ILE:HG12	1:B:372:PHE:HE2	1.86	0.41
1:A:607:LEU:O	1:A:611:PHE:HB2	2.21	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:745:VAL:O	1:A:749:LEU:HB2	2.20	0.41
1:B:529:LYS:HD3	1:B:529:LYS:HA	1.75	0.41
1:B:193:ALA:O	1:B:197:VAL:HG13	2.21	0.41
1:B:724:VAL:HB	1:B:725:PRO:HD3	2.02	0.41
1:B:614:GLY:HA2	1:B:624:PRO:HB3	2.02	0.40
1:B:480:LYS:NZ	1:B:537:GLN:O	2.50	0.40
1:A:187:LYS:HB3	1:A:187:LYS:HE3	1.89	0.40
1:A:533:LEU:HD23	1:A:533:LEU:HA	1.90	0.40
1:B:39:THR:HG22	1:B:238:VAL:O	2.22	0.40
1:A:474:ILE:HD11	1:A:514:ARG:HG3	2.04	0.40
1:A:602:SER:O	1:A:606:ILE:HG13	2.21	0.40
1:B:304:LEU:HD12	1:B:316:THR:HG22	2.03	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 X-ray entries followed by that with respect to entries of similar resolution.

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	754/786 (96%)	719 (95%)	35 (5%)	0	100	100
1	B	755/786 (96%)	720 (95%)	34 (4%)	1 (0%)	51	82
All	All	1509/1572 (96%)	1439 (95%)	69 (5%)	1 (0%)	51	82

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	456	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 X-ray entries followed by that with respect to entries of similar resolution.

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	608/646 (94%)	593 (98%)	15 (2%)	47	74
1	B	608/646 (94%)	602 (99%)	6 (1%)	76	87
All	All	1216/1292 (94%)	1195 (98%)	21 (2%)	60	80

All (21) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	30	TYR
1	A	144	ASP
1	A	172	ASN
1	A	362	TRP
1	A	364	PHE
1	A	384	GLU
1	A	387	ARG
1	A	449	PHE
1	A	463	ARG
1	A	471	ASP
1	A	567	MET
1	A	580	PHE
1	A	645	ASP
1	A	740	ARG
1	A	741	TRP
1	B	382	ARG
1	B	389	PHE
1	B	461	MET
1	B	653	ARG
1	B	737	TRP
1	B	741	TRP

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	68	HIS

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Mol	Chain	Res	Type
1	A	444	GLN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains ⓘ

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

5.5 Carbohydrates ⓘ

8 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	$\#|Z| > 2$
2	U2D	C	1	2	22,22,23	1.79	2 (9%)	27,27,29	1.54	2 (7%)
2	GLC	C	2	2	12,12,12	1.03	0	17,17,17	1.67	2 (11%)
2	U2D	D	1	2	22,22,23	1.89	2 (9%)	27,27,29	1.50	3 (11%)
2	GLC	D	2	2	12,12,12	1.26	2 (16%)	17,17,17	1.53	3 (17%)
2	U2D	E	1	2	22,22,23	1.79	2 (9%)	27,27,29	1.54	2 (7%)
2	GLC	E	2	2	12,12,12	0.74	0	17,17,17	0.75	0
2	U2D	F	1	2	22,22,23	1.77	2 (9%)	27,27,29	1.61	3 (11%)
2	GLC	F	2	2	12,12,12	0.70	0	17,17,17	0.79	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
2	U2D	C	1	2	-	2/14/31/34	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	GLC	C	2	2	-	2/2/22/22	0/1/1/1
2	U2D	D	1	2	-	8/14/31/34	0/1/1/1
2	GLC	D	2	2	-	0/2/22/22	0/1/1/1
2	U2D	E	1	2	-	7/14/31/34	0/1/1/1
2	GLC	E	2	2	-	2/2/22/22	0/1/1/1
2	U2D	F	1	2	-	2/14/31/34	0/1/1/1
2	GLC	F	2	2	-	0/2/22/22	0/1/1/1

All (10) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	D	1	U2D	O11-CAX	7.26	1.44	1.22
2	C	1	U2D	O11-CAX	7.08	1.43	1.22
2	F	1	U2D	O11-CAX	7.06	1.43	1.22
2	E	1	U2D	O11-CAX	7.04	1.43	1.22
2	D	1	U2D	O6-CAX	4.14	1.45	1.33
2	C	1	U2D	O6-CAX	3.61	1.43	1.33
2	E	1	U2D	O6-CAX	3.59	1.43	1.33
2	F	1	U2D	O6-CAX	3.58	1.43	1.33
2	D	2	GLC	C1-C2	2.70	1.58	1.52
2	D	2	GLC	O1-C1	2.57	1.47	1.39

All (15) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	F	1	U2D	O6-CAX-O11	-5.88	108.76	123.59
2	E	1	U2D	O6-CAX-O11	-5.67	109.28	123.59
2	C	1	U2D	O6-CAX-O11	-5.65	109.33	123.59
2	C	2	GLC	O5-C5-C6	5.58	120.31	106.44
2	D	1	U2D	O6-CAX-O11	-5.21	110.45	123.59
2	E	1	U2D	O11-CAX-CAY	-3.73	109.19	123.73
2	D	1	U2D	O11-CAX-CAY	-3.65	109.51	123.73
2	C	1	U2D	O11-CAX-CAY	-3.60	109.67	123.73
2	F	1	U2D	O11-CAX-CAY	-3.56	109.83	123.73
2	D	2	GLC	O2-C2-C1	2.98	116.08	109.16
2	D	2	GLC	O5-C5-C6	2.97	113.82	106.44
2	F	1	U2D	C6-O6-CAX	-2.62	107.44	117.12
2	C	2	GLC	C1-O5-C5	2.51	118.40	113.66
2	D	1	U2D	O6-C6-C5	2.14	112.97	108.43
2	D	2	GLC	C6-C5-C4	-2.14	108.00	113.00

There are no chirality outliers.

All (23) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	D	1	U2D	CAY-CAX-O6-C6
2	D	1	U2D	O11-CAX-O6-C6
2	E	1	U2D	O11-CAX-O6-C6
2	E	1	U2D	CAY-CAX-O6-C6
2	C	1	U2D	O11-CAX-O6-C6
2	F	1	U2D	CAY-CAX-O6-C6
2	E	2	GLC	O5-C5-C6-O6
2	E	2	GLC	C4-C5-C6-O6
2	F	1	U2D	O11-CAX-O6-C6
2	C	1	U2D	CAY-CAX-O6-C6
2	C	2	GLC	C4-C5-C6-O6
2	C	2	GLC	O5-C5-C6-O6
2	E	1	U2D	CBA-CBB-CBC-CBD
2	D	1	U2D	CAZ-CBA-CBB-CBC
2	E	1	U2D	CAX-CAY-CAZ-CBA
2	D	1	U2D	CAY-CAZ-CBA-CBB
2	E	1	U2D	CBC-CBD-CBE-CBF
2	E	1	U2D	CAY-CAZ-CBA-CBB
2	E	1	U2D	CBB-CBC-CBD-CBE
2	D	1	U2D	C4-C5-C6-O6
2	D	1	U2D	CBA-CBB-CBC-CBD
2	D	1	U2D	CBB-CBC-CBD-CBE
2	D	1	U2D	O6-CAX-CAY-CAZ

There are no ring outliers.

2 monomers are involved in 2 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	C	2	GLC	1	0
2	E	1	U2D	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.

Oligosaccharide Chain C

Bond lengths

Bond angles

Torsions

Rings

Oligosaccharide Chain D

Bond lengths

Bond angles

Torsions

Rings

Oligosaccharide Chain E

Bond lengths

Bond angles

Torsions

Rings

Oligosaccharide Chain F	
Bond lengths	Bond angles
Torsions	Rings
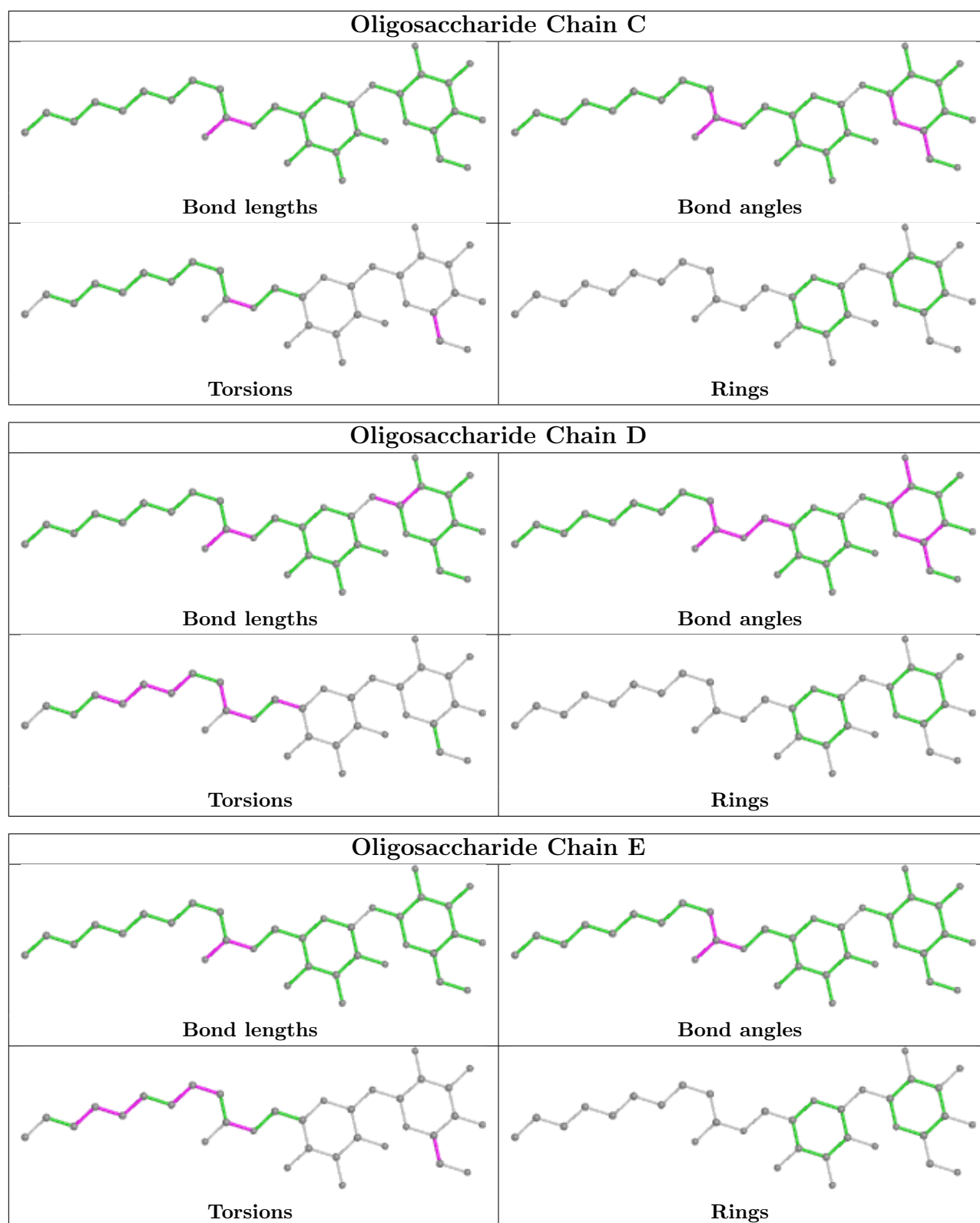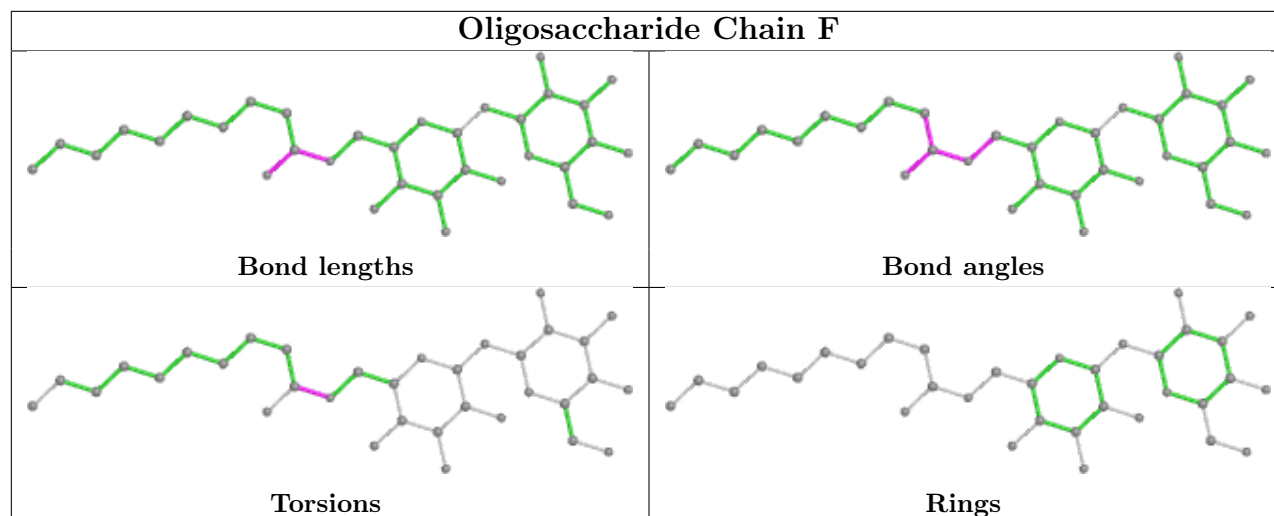
5.6 Ligand geometry ⓘ

There are no ligands in this entry.

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 Fit of model and data ⓘ

6.1 Protein, DNA and RNA chains ⓘ

In the following table, the column labelled '#RSRZ> 2' contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95th percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled 'Q< 0.9' lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2			OWAB(Å²)	Q<0.9
1	A	756/786 (96%)	0.28	62 (8%)	11	12	91, 137, 194, 213	0
1	B	757/786 (96%)	0.41	63 (8%)	11	11	92, 130, 188, 215	0
All	All	1513/1572 (96%)	0.34	125 (8%)	11	11	91, 134, 192, 215	0

All (125) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	347	ALA	8.1
1	B	240	PHE	7.2
1	A	756	LEU	7.0
1	B	348	LEU	6.4
1	B	56	ILE	6.1
1	B	73	LEU	5.5
1	A	2	PHE	5.4
1	A	646	TYR	5.1
1	B	659	GLU	4.6
1	A	290	VAL	4.6
1	B	168	LEU	4.5
1	B	157	GLU	4.5
1	B	133	THR	4.3
1	A	455	GLU	4.2
1	B	345	VAL	4.1
1	A	708	LEU	4.1
1	B	71	ALA	3.9
1	B	72	ILE	3.9
1	B	455	GLU	3.9
1	A	344	ARG	3.9
1	B	158	LEU	3.9
1	A	704	LEU	3.8
1	B	241	PHE	3.8
1	B	43	PHE	3.7

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Mol	Chain	Res	Type	RSRZ
1	A	208	VAL	3.7
1	B	55	LEU	3.6
1	B	346	ASP	3.5
1	A	341	LEU	3.5
1	B	545	PHE	3.5
1	A	649	PHE	3.5
1	B	63	ARG	3.5
1	B	160	GLN	3.4
1	A	202	PHE	3.3
1	A	364	PHE	3.3
1	A	158	LEU	3.3
1	A	241	PHE	3.3
1	A	160	GLN	3.2
1	B	257	TYR	3.2
1	B	167	ARG	3.2
1	A	642	LEU	3.2
1	B	266	ARG	3.2
1	B	248	LEU	3.2
1	A	485	SER	3.1
1	A	484	VAL	3.1
1	B	40	GLN	3.1
1	A	353	LEU	3.1
1	A	288	ARG	3.1
1	B	704	LEU	3.0
1	A	520	LEU	3.0
1	A	156	PRO	3.0
1	A	168	LEU	2.9
1	B	344	ARG	2.9
1	B	353	LEU	2.9
1	A	715	ASP	2.9
1	A	209	ILE	2.9
1	B	205	PHE	2.9
1	B	262	VAL	2.9
1	B	161	VAL	2.8
1	A	346	ASP	2.8
1	B	239	HIS	2.8
1	B	646	TYR	2.7
1	A	343	PRO	2.7
1	B	311	PHE	2.7
1	B	409	LEU	2.6
1	A	240	PHE	2.6
1	B	341	LEU	2.6

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Mol	Chain	Res	Type	RSRZ
1	B	520	LEU	2.6
1	A	461	MET	2.6
1	B	461	MET	2.6
1	B	417	ILE	2.6
1	B	322	SER	2.5
1	B	459	LEU	2.5
1	A	498	TRP	2.5
1	A	462	LYS	2.5
1	A	431	TYR	2.5
1	B	210	ALA	2.5
1	A	628	MET	2.5
1	B	628	MET	2.5
1	B	190	GLU	2.5
1	B	639	ILE	2.5
1	B	349	GLY	2.4
1	B	343	PRO	2.4
1	B	422	LEU	2.4
1	A	292	PHE	2.4
1	B	546	VAL	2.4
1	A	249	ILE	2.4
1	A	481	ALA	2.4
1	A	700	MET	2.4
1	A	487	PHE	2.4
1	B	132	HIS	2.4
1	A	427	ILE	2.3
1	A	257	TYR	2.3
1	B	630	PRO	2.3
1	A	287	GLY	2.3
1	B	609	TRP	2.3
1	A	486	GLY	2.3
1	B	661	GLY	2.3
1	A	77	ASP	2.3
1	A	157	GLU	2.3
1	A	73	LEU	2.3
1	A	117	THR	2.2
1	A	291	VAL	2.2
1	A	711	ALA	2.2
1	A	56	ILE	2.2
1	B	291	VAL	2.2
1	B	323	VAL	2.2
1	B	52	ALA	2.2
1	B	201	LEU	2.2

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Mol	Chain	Res	Type	RSRZ
1	B	156	PRO	2.2
1	A	393	LEU	2.2
1	B	631	MET	2.2
1	B	186	GLN	2.1
1	A	266	ARG	2.1
1	A	545	PHE	2.1
1	A	154	VAL	2.1
1	A	644	THR	2.1
1	A	638	VAL	2.1
1	A	631	MET	2.1
1	A	201	LEU	2.1
1	A	281	ARG	2.0
1	A	284	MET	2.0
1	B	246	VAL	2.0
1	A	259	LEU	2.0
1	A	43	PHE	2.0
1	B	58	ASP	2.0

6.2 Non-standard residues in protein, DNA, RNA chains ⓘ

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

6.3 Carbohydrates ⓘ

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

| Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
2	U2D	D	1	22/23	0.75	0.69	121,140,151,154	0
2	U2D	E	1	22/23	0.79	0.99	168,186,194,197	0
2	U2D	F	1	22/23	0.82	0.31	89,158,167,174	0
2	GLC	F	2	12/12	0.83	0.16	138,161,167,169	0
2	U2D	C	1	22/23	0.86	0.22	82,146,158,160	0
2	GLC	D	2	12/12	0.87	0.76	112,135,141,143	0
2	GLC	C	2	12/12	0.89	0.16	142,150,161,162	0
2	GLC	E	2	12/12	0.89	1.28	166,177,187,188	0

The following is a graphical depiction of the model fit to experimental electron density for oligosaccharide. Each fit is shown from different orientation to approximate a three-dimensional view.

Electron density around Chain C:

2mF$_o$-DF$_c$ (at 0.7 rmsd) in gray
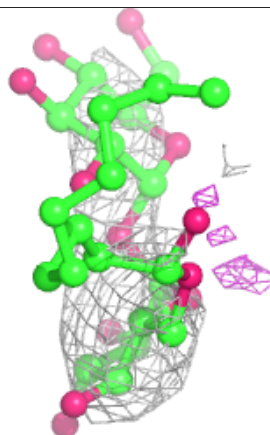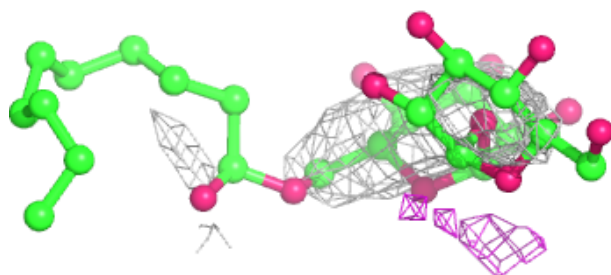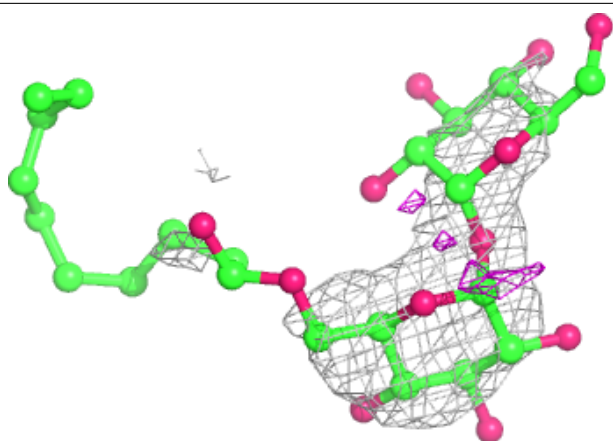mF$_o$-DF$_c$ (at 3 rmsd) in purple (negative)
and green (positive)
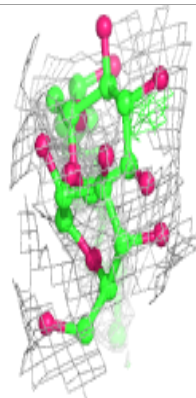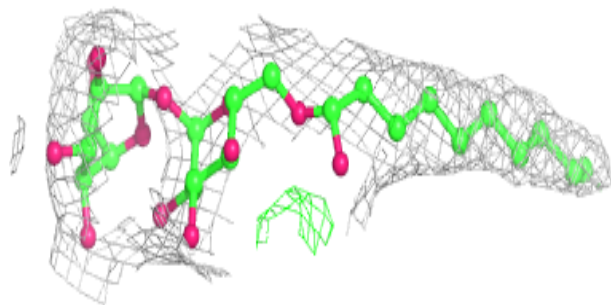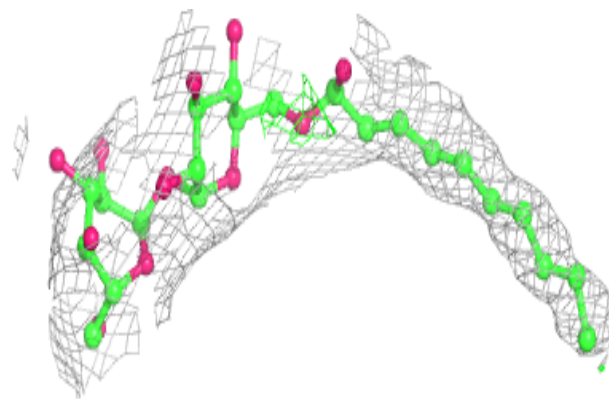
Electron density around Chain D:

2mF$_o$-DF$_c$ (at 0.7 rmsd) in gray
mF$_o$-DF$_c$ (at 3 rmsd) in purple (negative)
and green (positive)
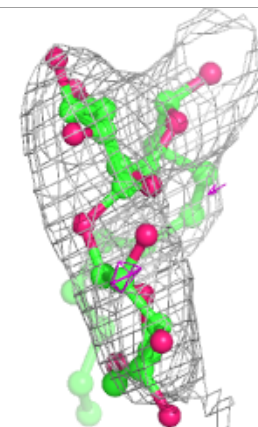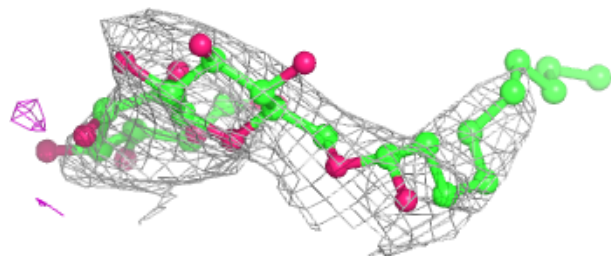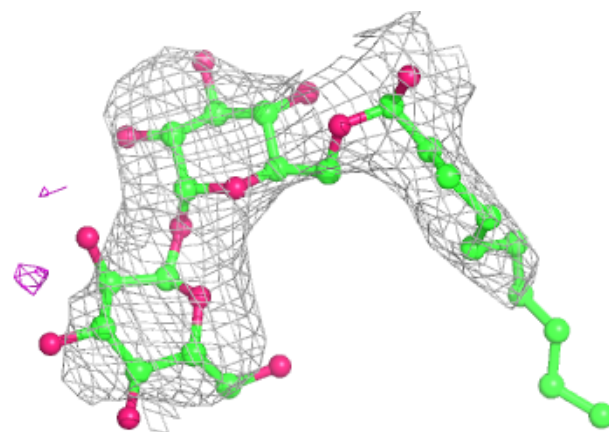
Electron density around Chain E:

$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
and green (positive)

Electron density around Chain F:

$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
and green (positive)
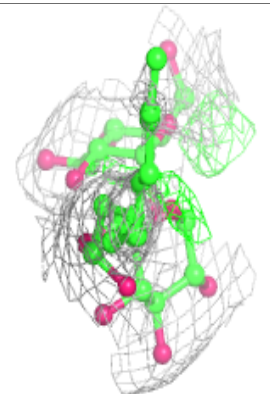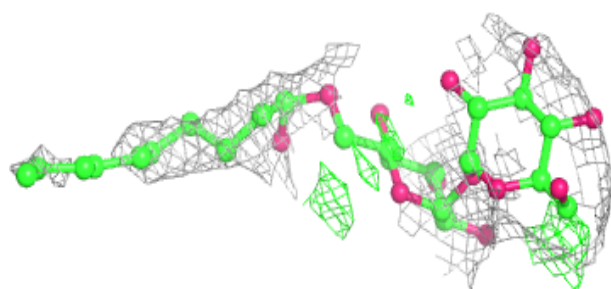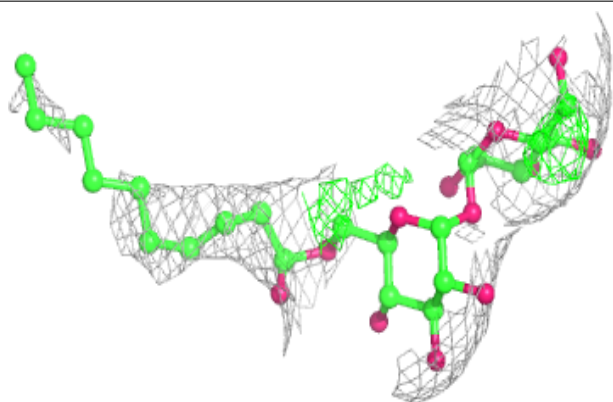
6.4 Ligands ⓘ

There are no ligands in this entry.

6.5 Other polymers ⓘ

There are no such residues in this entry.