W O R L D W I D E
wwPDB
P R O T E I N   D A T A   B A N K

Full wwPDB X-ray Structure Validation Report (i)

Sep 24, 2025 – 07:31 am BST

PDB ID	:	2J0G / pdb_00002j0g
Title	:	L-ficolin complexed to N-acetyl-mannosamine
Authors	:	Garlatti, V.; Gaboriaud, C.
Deposited on	:	2006-08-03
Resolution	:	2.85 Å(reported)

This is a Full wwPDB X-ray Structure 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/XrayValidationReportHelp
with specific help available everywhere you see the (i) 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 (i)) were used in the production of this report:

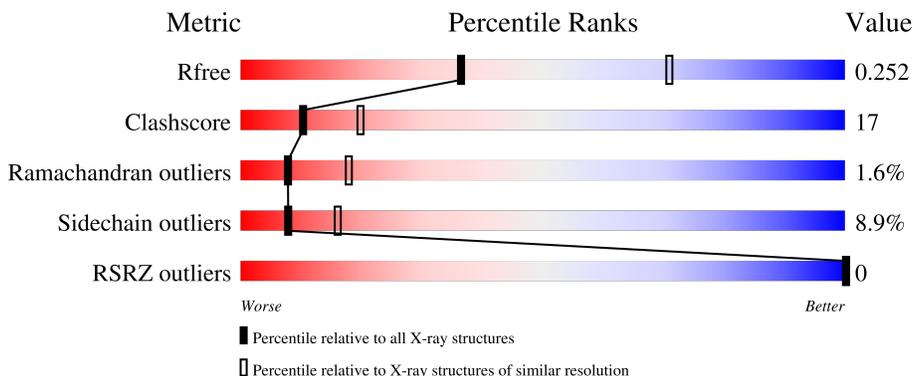|		
MolProbity	:	4-5-2 with Phenix2.0
Mogul	:	1.8.4, CSD as541be (2020)
Xtriage (Phenix)	:	2.0
EDS	:	3.0
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4	:	9.0.010 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.46

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 2.85 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		0.252
Clashscore		17
Ramachandran outliers		1.6%
Sidechain outliers		8.9%
RSRZ outliers		0

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}	164625	1268 (2.88-2.84)
Clashscore	180529	1351 (2.88-2.84)
Ramachandran outliers	177936	1318 (2.88-2.84)
Sidechain outliers	177891	1319 (2.88-2.84)
RSRZ outliers	164620	1269 (2.88-2.84)

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	218	58% 34% • • •
1	B	218	70% 26% •
1	C	218	65% 28% 6% •
1	D	218	64% 29% • •
1	E	218	72% 24% •

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Mol	Chain	Length	Quality of chain
1	F	218	67% 23% 6%
2	G	5	60% 40%
3	H	4	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	MAN	G	3	X	-	-	-
3	MAN	H	3	X	-	-	-
5	BM3	B	301	-	-	X	-

2　Entry composition ⓘ

There are 7 unique types of molecules in this entry. The entry contains 10580 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 FICOLIN-2.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	212	Total	C	N	O	S	0	0	0
			1702	1071	300	323	8			
1	B	217	Total	C	N	O	S	0	1	0
			1744	1097	307	331	9			
1	C	216	Total	C	N	O	S	0	0	0
			1728	1087	304	328	9			
1	D	214	Total	C	N	O	S	0	0	0
			1715	1078	302	327	8			
1	E	218	Total	C	N	O	S	0	0	0
			1744	1096	307	332	9			
1	F	212	Total	C	N	O	S	0	1	0
			1715	1078	304	325	8			

There are 12 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	168	THR	VAL	conflict	UNP Q15485
A	247	THR	VAL	conflict	UNP Q15485
B	168	THR	VAL	conflict	UNP Q15485
B	247	THR	VAL	conflict	UNP Q15485
C	168	THR	VAL	conflict	UNP Q15485
C	247	THR	VAL	conflict	UNP Q15485
D	168	THR	VAL	conflict	UNP Q15485
D	247	THR	VAL	conflict	UNP Q15485
E	168	THR	VAL	conflict	UNP Q15485
E	247	THR	VAL	conflict	UNP Q15485
F	168	THR	VAL	conflict	UNP Q15485
F	247	THR	VAL	conflict	UNP Q15485

- Molecule 2 is an oligosaccharide called alpha-D-mannopyranose-(1-6)-alpha-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-[alpha-L-fucopyranose-(1-6)]2-acetamido-2-deoxy-beta-D-glucopyranose.
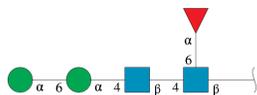
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
2	G	5	Total 60	C 34	N 2	O 24	0	0	0

- Molecule 3 is an oligosaccharide called alpha-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-[alpha-L-fucopyranose-(1-6)]2-acetamido-2-deoxy-beta-D-glucopyranose.
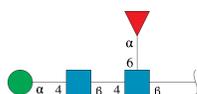
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
3	H	4	Total 49	C 28	N 2	O 19	0	0	0

- Molecule 4 is CALCIUM ION (CCD ID: CA) (formula: Ca).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	1	Total 1	Ca 1	0	0
4	B	1	Total 1	Ca 1	0	0
4	C	1	Total 1	Ca 1	0	0
4	D	1	Total 1	Ca 1	0	0
4	E	1	Total 1	Ca 1	0	0
4	F	1	Total 1	Ca 1	0	0

- Molecule 5 is 2-acetamido-2-deoxy-alpha-D-mannopyranose (CCD ID: BM3) (formula: $C_8H_{15}NO_6$).
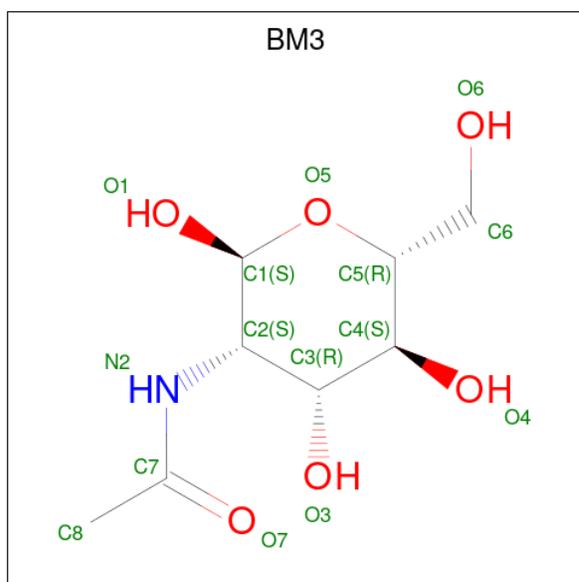
BM3

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
5	B	1	Total	C	N	O	2	0
			15	8	1	6		
5	C	1	Total	C	N	O	0	0
			15	8	1	6		
5	E	1	Total	C	N	O	2	0
			15	8	1	6		
5	F	1	Total	C	N	O	11	0
			15	8	1	6		

- Molecule 6 is alpha-D-mannopyranose (CCD ID: MAN) (formula: $C_6H_{12}O_6$).

MAN
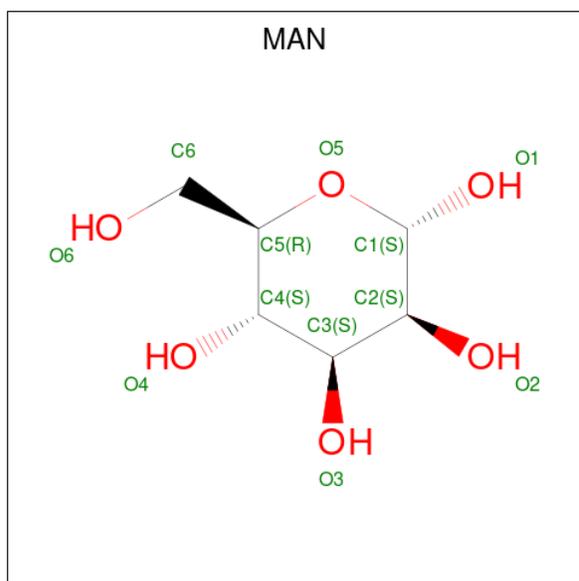
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
6	F	1	Total 11	C 6	O 5	0	0

- Molecule 7 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
7	A	5	Total 5	O 5	0	0
7	B	10	Total 10	O 10	0	0
7	C	8	Total 8	O 8	0	0
7	D	4	Total 4	O 4	0	0
7	E	9	Total 9	O 9	0	0
7	F	10	Total 10	O 10	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: FICOLIN-2

Chain A:

● Molecule 1: FICOLIN-2

Chain B:

● Molecule 1: FICOLIN-2

Chain C:

● Molecule 1: FICOLIN-2

Chain D:

ASN PRO CYS LEU T75 G76 P77 R86 L90 T95 L98 P99 D100 C101 R102 P103 L104 T105 V124 Y131 R132 D133 W134 T136 A135 S143 R144 L145 L150 G151 N152 D153 N154 I155 H156 A157 L158 E165 L166 R167 L170 V171 D172 F173 N176 Y177 Q178 F179
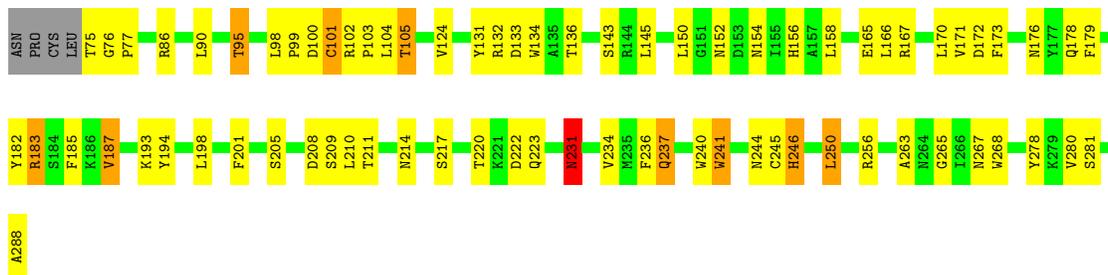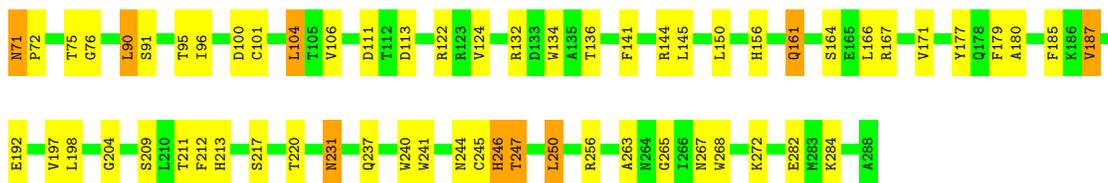
Y182 R183 S184 F185 K186 V187 K193 Y194 L198 F201 S205 D208 S209 L210 T211 N214 S217 T220 K221 D222 Q223 N231 V234 M235 F236 Q237 W240 W241 N244 C245 H246 L250 R256 A263 N264 G265 I266 N267 W268 Y278 K279 V280 S281

A288

• Molecule 1: FICOLIN-2

Chain E:

72%	24%	•

N71 P72 T75 G76 L90 S91 T95 I96 D100 C101 L104 T105 V106 D111 T112 D113 R122 R123 V124 R132 D133 W134 A135 T136 F141 R144 L145 L150 H156 Q161 S164 E165 L166 R167 V171 Y177 Q178 F179 A180 F185 K186 V187

E192 V197 L198 G204 S209 L210 T211 F212 H213 S217 T220 N231 Q237 W240 W241 N244 C245 H246 T247 L250 R256 A263 N264 G265 I266 N267 W268 K272 E282 M283 K284 A288

• Molecule 1: FICOLIN-2

Chain F:

67%	23%	6%	•

ASN PRO CYS LEU THR GLY P77 R78 L90 H94 T95 I96 Y97 L98 P99 D100 C101 L104 T105 D111 R122 R123 V124 R132 T136 L145 L150 G151 I155 H156 Q161 G162 T163 T168 V171 D172 F173 F179 A180 K181 V187 L196 V202

E203 S209 L210 T211 F212 F218 L227 N228 T229 G230 N231 V234 M235 F236 Q237 W240 W241 Y242 K243 N244 C245 H246 T247 S248 N249 L250 R256 S261 F262 G265 I266 N267 W268 V280 S281 E282 A288

• Molecule 2: alpha-D-mannopyranose-(1-6)-alpha-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-[alpha-L-fucopyranose-(1-6)]2-acetamido-2-deoxy-beta-D-glucopyranose

Chain G:

60%	40%

NAG1 NAG2 MAN3 MAN4 FUC5

• Molecule 3: alpha-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-[alpha-L-fucopyranose-(1-6)]2-acetamido-2-deoxy-beta-D-glucopyranose

Chain H:

50%	50%

NAG1 NAG2 MAN3 FUC4

4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 32	Depositor
Cell constants a, b, c, α, β, γ	96.94Å 96.94Å 139.47Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	15.00 – 2.85 15.00 – 2.85	Depositor EDS
% Data completeness (in resolution range)	100.0 (15.00-2.85) 99.0 (15.00-2.85)	Depositor EDS
R_{merge}	0.08	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	3.72 (at 2.86Å)	Xtriage
Refinement program	REFMAC 5.2.0019	Depositor
R, R_{free}	0.193 , 0.248 0.202 , 0.252	Depositor DCC
R_{free} test set	1691 reflections (5.00%)	wwPDB-VP
Wilson B-factor (Å^2)	50.4	Xtriage
Anisotropy	0.073	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.35 , 49.2	EDS
L-test for twinning[2]	$< |L| > = 0.47, < L^2 > = 0.29$	Xtriage
Estimated twinning fraction	0.037 for -h,-k,l 0.447 for h,-h-k,-l 0.038 for -k,-h,-l	Xtriage
F_o,F_c correlation	0.94	EDS
Total number of atoms	10580	wwPDB-VP
Average B, all atoms (Å^2)	40.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.88% 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: FUC, BM3, CA, MAN, NAG

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 5$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	#$|Z|$ >5	RMSZ	#$|Z|$ >5
1	A	0.71	2/1749 (0.1%)	0.92	3/2366 (0.1%)
1	B	0.69	0/1792	1.01	6/2423 (0.2%)
1	C	0.79	2/1775 (0.1%)	0.96	2/2400 (0.1%)
1	D	0.59	0/1762	0.90	2/2383 (0.1%)
1	E	0.66	0/1792	1.01	8/2425 (0.3%)
1	F	0.64	0/1762	0.93	3/2381 (0.1%)
All	All	0.68	4/10632 (0.0%)	0.96	24/14378 (0.2%)

All (4) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	C	223	GLN	C-N	-18.36	1.07	1.33
1	A	224	ASP	C-N	-14.31	1.14	1.33
1	C	224	ASP	C-N	-8.13	1.20	1.34
1	A	223	GLN	C-N	-6.75	1.23	1.33

All (24) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	F	228	ASN	CB-CA-C	-10.57	92.62	110.16
1	B	76	GLY	CA-C-N	10.52	131.28	120.14
1	B	76	GLY	C-N-CA	10.52	131.28	120.14
1	C	228	ASN	CB-CA-C	-9.33	94.67	110.16
1	F	228	ASN	N-CA-C	8.94	122.98	108.41
1	C	228	ASN	N-CA-C	8.88	122.88	108.41
1	E	76	GLY	CA-C-N	7.60	127.53	119.85
1	E	76	GLY	C-N-CA	7.60	127.53	119.85
1	B	228	ASN	N-CA-C	7.37	120.42	108.41
1	E	247	THR	N-CA-C	-6.46	105.14	114.12
1	E	71	ASN	CA-C-N	6.22	125.91	119.82

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	E	71	ASN	C-N-CA	6.22	125.91	119.82
1	B	228	ASN	CB-CA-C	-5.85	100.44	110.16
1	E	96	ILE	CA-C-N	-5.55	115.17	123.00
1	E	96	ILE	C-N-CA	-5.55	115.17	123.00
1	F	246	HIS	N-CA-C	5.43	117.10	108.79
1	D	246	HIS	N-CA-C	5.42	117.42	109.24
1	A	76	GLY	CA-C-N	5.20	127.06	120.51
1	A	76	GLY	C-N-CA	5.20	127.06	120.51
1	E	246	HIS	N-CA-C	5.18	116.72	108.79
1	A	175	ASP	N-CA-C	5.14	118.53	111.54
1	D	231	ASN	N-CA-C	5.12	117.12	109.59
1	B	247	THR	N-CA-C	-5.08	106.00	113.61
1	B	217	SER	N-CA-C	-5.04	104.03	110.53

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts (i)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	1702	0	1573	64	0
1	B	1744	0	1613	55	0
1	C	1728	0	1600	60	0
1	D	1715	0	1585	61	0
1	E	1744	0	1611	47	0
1	F	1715	0	1588	56	0
2	G	60	0	52	1	0
3	H	49	0	43	1	0
4	A	1	0	0	0	0
4	B	1	0	0	0	0
4	C	1	0	0	0	0
4	D	1	0	0	0	0
4	E	1	0	0	0	0
4	F	1	0	0	0	0
5	B	15	0	14	17	0
5	C	15	0	14	1	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
5	E	15	0	14	3	0
5	F	15	0	14	4	0
6	F	11	0	10	1	0
7	A	5	0	0	0	0
7	B	10	0	0	1	0
7	C	8	0	0	2	0
7	D	4	0	0	1	0
7	E	9	0	0	0	0
7	F	10	0	0	0	0
All	All	10580	0	9731	339	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 17.

All (339) 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:B:132:ARG:HD2	5:B:301:BM3:C8	1.32	1.53
5:B:301:BM3:C6	5:B:301:BM3:O6	1.75	1.33
5:C:301:BM3:O6	5:C:301:BM3:C6	1.77	1.31
1:B:132:ARG:HD2	5:B:301:BM3:H8C3	1.25	1.14
1:F:132:ARG:HD2	5:F:301:BM3:H8C1	1.22	1.10
1:B:132:ARG:CD	5:B:301:BM3:C8	2.29	1.09
1:D:183:ARG:HG3	1:D:183:ARG:HH11	0.98	1.08
1:A:133:ASP:HB2	1:A:222:ASP:OD2	1.53	1.07
1:B:132:ARG:HD2	5:B:301:BM3:H8C2	1.16	1.07
1:C:186:LYS:HB3	1:C:197:VAL:HG23	1.37	1.05
1:D:95:THR:HG22	7:D:603:HOH:O	1.62	0.99
1:F:132:ARG:CD	5:F:301:BM3:H8C1	1.94	0.98
1:D:231:ASN:HD21	1:D:234:VAL:H	1.13	0.95
1:D:244:ASN:N	1:D:245:CYS:HA	1.78	0.94
1:B:132:ARG:CD	5:B:301:BM3:H8C2	1.95	0.92
1:D:183:ARG:HG3	1:D:183:ARG:NH1	1.79	0.90
1:B:132:ARG:HH11	5:B:301:BM3:C8	1.83	0.90
1:A:133:ASP:CB	1:A:222:ASP:OD2	2.19	0.89
1:D:183:ARG:HH11	1:D:183:ARG:CG	1.83	0.89
1:C:231:ASN:HD22	1:C:231:ASN:C	1.82	0.88
1:F:132:ARG:HD2	5:F:301:BM3:C8	2.05	0.87
1:A:244:ASN:N	1:A:245:CYS:HA	1.90	0.85
1:B:132:ARG:HH11	5:B:301:BM3:H8C1	1.41	0.85
1:F:231:ASN:C	1:F:231:ASN:HD22	1.87	0.83

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:71:ASN:N	1:E:72:PRO:HD2	1.95	0.82
1:B:183:ARG:HD2	1:D:288:ALA:O	1.80	0.81
1:D:231:ASN:C	1:D:231:ASN:HD22	1.88	0.81
1:A:183:ARG:HH11	1:A:183:ARG:HB3	1.45	0.80
1:E:161:GLN:HA	1:E:161:GLN:NE2	1.94	0.80
1:D:231:ASN:ND2	1:D:234:VAL:H	1.79	0.80
2:G:3:MAN:H5	2:G:4:MAN:H2	1.63	0.80
1:B:132:ARG:CD	5:B:301:BM3:H8C3	2.05	0.80
1:C:228:ASN:O	1:C:230:GLY:N	2.15	0.79
1:F:228:ASN:O	1:F:230:GLY:N	2.15	0.79
1:C:216:GLN:HE21	1:C:243:LYS:NZ	1.80	0.79
1:B:100:ASP:O	1:B:101:CYS:HB2	1.83	0.78
1:A:100:ASP:O	1:A:101:CYS:HB2	1.81	0.77
1:D:198:LEU:H	1:D:214:ASN:ND2	1.83	0.77
1:B:244:ASN:HB3	7:B:406:HOH:O	1.85	0.76
1:E:156:HIS:HD2	1:E:187:VAL:O	1.67	0.75
1:F:122:ARG:HD2	1:F:282:GLU:OE2	1.85	0.75
1:D:217:SER:O	1:D:241:TRP:HA	1.86	0.75
1:B:244:ASN:N	1:B:245:CYS:HA	2.01	0.74
1:C:186:LYS:HE2	1:C:197:VAL:HG21	1.70	0.74
1:D:209:SER:HB2	1:D:268:TRP:CE2	2.23	0.73
1:E:132:ARG:CD	5:E:301:BM3:H8C1	2.18	0.73
1:D:98:LEU:O	1:D:100:ASP:N	2.22	0.73
1:E:132:ARG:HD2	5:E:301:BM3:H8C1	1.71	0.72
1:C:214:ASN:HD22	1:C:215:ASN:N	1.86	0.72
1:A:156:HIS:HD2	1:A:187:VAL:O	1.73	0.72
1:B:231:ASN:C	1:B:231:ASN:HD22	1.95	0.72
1:E:231:ASN:C	1:E:231:ASN:HD22	1.98	0.72
1:D:75:THR:HG23	1:D:76:GLY:H	1.54	0.71
1:A:228:ASN:HB2	1:A:244:ASN:OD1	1.90	0.70
1:B:156:HIS:HD2	1:B:187:VAL:O	1.74	0.70
1:A:173:PHE:CZ	1:A:256:ARG:HA	2.26	0.70
1:B:180:ALA:HA	1:B:204:GLY:HA3	1.72	0.70
1:E:71:ASN:N	1:E:72:PRO:CD	2.55	0.69
1:C:186:LYS:HB3	1:C:197:VAL:CG2	2.20	0.69
1:C:171:VAL:HB	1:C:280:VAL:HB	1.74	0.69
1:F:228:ASN:O	1:F:230:GLY:O	2.10	0.69
1:E:180:ALA:HA	1:E:204:GLY:HA3	1.74	0.68
1:A:132:ARG:NH2	1:B:111:ASP:OD2	2.26	0.68
1:D:156:HIS:HD2	1:D:187:VAL:O	1.75	0.68
1:B:228:ASN:O	1:B:230:GLY:N	2.26	0.68

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:213:HIS:CD2	1:E:247:THR:HG22	2.29	0.68
1:F:98:LEU:HB3	1:F:99:PRO:HD2	1.76	0.68
1:E:244:ASN:N	1:E:245:CYS:HA	2.09	0.68
1:B:132:ARG:HA	5:B:301:BM3:H8C2	1.76	0.67
1:E:212:PHE:HB3	1:E:247:THR:HG21	1.76	0.67
1:C:73:CYS:O	1:C:76:GLY:N	2.28	0.67
1:D:231:ASN:C	1:D:231:ASN:ND2	2.51	0.66
1:D:132:ARG:NH2	1:E:111:ASP:OD2	2.29	0.66
1:F:100:ASP:O	1:F:101:CYS:HB2	1.95	0.66
1:F:209:SER:HB3	1:F:247:THR:HG22	1.77	0.66
1:D:231:ASN:HD21	1:D:234:VAL:N	1.90	0.66
1:E:209:SER:HB2	1:E:268:TRP:CE2	2.30	0.66
1:E:122:ARG:HD2	1:E:282:GLU:OE2	1.96	0.65
1:B:132:ARG:HH11	5:B:301:BM3:H8C3	1.59	0.65
1:F:97:TYR:N	1:F:97:TYR:CD2	2.64	0.65
1:C:216:GLN:HE21	1:C:243:LYS:HZ3	1.44	0.65
1:A:134:TRP:HA	1:A:220:THR:HG21	1.77	0.64
1:A:246:HIS:CE1	1:A:263:ALA:HB1	2.31	0.64
1:D:77:PRO:HD3	1:D:86:ARG:HH12	1.63	0.64
1:B:132:ARG:HD2	5:B:301:BM3:H8C1	1.66	0.64
1:A:166:LEU:HD13	1:A:185:PHE:CG	2.32	0.64
1:F:97:TYR:N	1:F:97:TYR:HD2	1.96	0.64
1:B:265:GLY:H	1:B:267:ASN:HD21	1.46	0.63
1:D:236:PHE:O	1:D:237:GLN:C	2.42	0.63
1:A:231:ASN:C	1:A:231:ASN:HD22	2.06	0.63
1:C:97:TYR:N	1:C:97:TYR:CD2	2.66	0.63
1:C:156:HIS:HD2	1:C:187:VAL:O	1.81	0.63
1:F:161:GLN:O	1:F:162:GLY:O	2.16	0.63
1:C:122:ARG:NH1	1:C:124:VAL:HG21	2.14	0.62
1:D:152:ASN:HB3	1:D:194:TYR:CD1	2.33	0.62
1:B:132:ARG:NH1	5:B:301:BM3:H8C3	2.15	0.62
1:B:228:ASN:O	1:B:230:GLY:O	2.17	0.62
1:B:74:LEU:HD12	1:B:74:LEU:H	1.65	0.62
1:E:100:ASP:OD1	1:E:100:ASP:C	2.41	0.62
1:F:156:HIS:HD2	1:F:187:VAL:O	1.81	0.62
1:E:161:GLN:HA	1:E:161:GLN:HE21	1.64	0.61
1:D:240:TRP:CH2	1:D:250:LEU:HB2	2.37	0.60
1:E:240:TRP:CH2	1:E:250:LEU:HB2	2.36	0.60
1:A:183:ARG:HB3	1:A:183:ARG:NH1	2.16	0.60
1:B:166:LEU:HD22	1:B:185:PHE:CD1	2.37	0.60
1:D:246:HIS:CE1	1:D:263:ALA:HB1	2.36	0.60

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:240:TRP:CH2	1:A:250:LEU:HB2	2.37	0.60
1:C:122:ARG:HD2	1:C:282:GLU:OE2	2.02	0.60
1:C:228:ASN:C	1:C:230:GLY:N	2.59	0.59
1:E:132:ARG:NH2	1:F:111:ASP:OD2	2.33	0.59
1:E:132:ARG:NH1	1:E:136:THR:HG21	2.17	0.59
1:A:151:GLY:O	1:A:155:ILE:HG13	2.03	0.59
1:C:216:GLN:NE2	1:C:243:LYS:HZ2	2.01	0.59
1:F:228:ASN:C	1:F:230:GLY:N	2.59	0.58
1:B:132:ARG:NH1	5:B:301:BM3:C8	2.62	0.58
1:C:186:LYS:CB	1:C:197:VAL:HG23	2.24	0.58
1:C:97:TYR:N	1:C:97:TYR:HD2	2.01	0.58
1:C:216:GLN:NE2	1:C:243:LYS:NZ	2.53	0.57
1:F:209:SER:HB2	1:F:268:TRP:CE2	2.39	0.57
1:A:133:ASP:CA	1:A:222:ASP:OD2	2.52	0.57
1:A:143:SER:HA	1:B:91:SER:HB2	1.85	0.57
1:A:166:LEU:HD13	1:A:185:PHE:CD1	2.40	0.57
1:A:166:LEU:HB2	1:A:185:PHE:HB2	1.87	0.57
1:A:213:HIS:CE1	1:A:246:HIS:HA	2.40	0.57
1:B:228:ASN:C	1:B:230:GLY:N	2.62	0.57
1:C:228:ASN:C	1:C:230:GLY:H	2.11	0.57
1:F:228:ASN:C	1:F:230:GLY:H	2.12	0.56
1:D:173:PHE:CZ	1:D:256:ARG:HA	2.41	0.56
1:F:96:ILE:C	1:F:97:TYR:CD2	2.84	0.56
1:D:166:LEU:HD13	1:D:185:PHE:CG	2.41	0.56
1:C:214:ASN:HD22	1:C:215:ASN:H	1.53	0.56
1:F:96:ILE:C	1:F:97:TYR:HD2	2.14	0.56
1:A:223:GLN:OE1	1:A:225:ASN:ND2	2.38	0.55
1:D:133:ASP:HB2	1:D:222:ASP:OD2	2.06	0.55
1:E:132:ARG:HD3	5:E:301:BM3:H8C1	1.87	0.55
1:F:122:ARG:NH1	1:F:124:VAL:HG21	2.21	0.55
1:A:227:LEU:N	1:A:227:LEU:HD23	2.21	0.55
1:E:100:ASP:O	1:E:101:CYS:HB2	2.05	0.55
1:A:180:ALA:HB1	1:A:201:PHE:HE1	1.72	0.55
1:C:253:ARG:HD2	7:C:401:HOH:O	2.07	0.55
1:F:246:HIS:CE1	1:F:249:ASN:HB2	2.41	0.55
1:C:216:GLN:HE21	1:C:243:LYS:HZ2	1.52	0.54
1:A:231:ASN:HD21	1:A:233:ALA:HB3	1.72	0.54
1:B:228:ASN:C	1:B:230:GLY:H	2.16	0.54
1:D:231:ASN:ND2	1:D:234:VAL:N	2.52	0.54
1:E:265:GLY:H	1:E:267:ASN:HD21	1.56	0.54
1:F:228:ASN:OD1	1:F:230:GLY:N	2.38	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:143:SER:HA	1:E:91:SER:HB2	1.89	0.54
1:D:198:LEU:H	1:D:214:ASN:HD21	1.53	0.54
1:B:202:VAL:O	1:B:203:GLU:HB3	2.07	0.53
1:B:216:GLN:OE1	1:B:216:GLN:HA	2.08	0.53
1:C:265:GLY:H	1:C:267:ASN:HD21	1.56	0.53
1:A:231:ASN:HD22	1:A:234:VAL:H	1.56	0.53
1:F:132:ARG:NH1	5:F:301:BM3:H8C3	2.23	0.53
1:A:246:HIS:HE1	1:A:263:ALA:O	1.90	0.53
1:F:265:GLY:H	1:F:267:ASN:HD21	1.55	0.53
1:C:231:ASN:C	1:C:231:ASN:ND2	2.55	0.53
1:C:228:ASN:ND2	1:C:244:ASN:OD1	2.35	0.53
1:C:132:ARG:NH1	1:C:136:THR:HG21	2.24	0.52
1:E:213:HIS:NE2	1:E:247:THR:HG22	2.24	0.52
1:B:183:ARG:CD	1:D:288:ALA:O	2.55	0.52
1:A:263:ALA:HA	1:A:267:ASN:ND2	2.25	0.52
1:F:95:THR:HA	1:F:105:THR:HA	1.91	0.51
1:F:181:LYS:O	1:F:202:VAL:HG13	2.10	0.51
1:A:231:ASN:C	1:A:231:ASN:ND2	2.67	0.51
1:A:99:PRO:HB2	1:A:161:GLN:HE22	1.75	0.51
1:A:99:PRO:HB2	1:A:161:GLN:NE2	2.25	0.51
1:A:171:VAL:HB	1:A:280:VAL:HB	1.93	0.51
1:D:75:THR:HG23	1:D:76:GLY:N	2.22	0.51
1:B:265:GLY:H	1:B:267:ASN:ND2	2.08	0.51
1:A:154:ASN:O	1:A:158:LEU:HB2	2.11	0.51
1:E:104:LEU:HD13	1:E:106:VAL:CG1	2.41	0.50
1:C:73:CYS:O	1:C:74:LEU:C	2.54	0.50
1:D:132:ARG:NH1	1:D:136:THR:HG21	2.27	0.50
1:F:171:VAL:HB	1:F:280:VAL:HB	1.94	0.50
1:E:231:ASN:C	1:E:231:ASN:ND2	2.69	0.50
1:F:228:ASN:ND2	1:F:244:ASN:OD1	2.39	0.50
1:B:132:ARG:NH2	1:C:111:ASP:OD2	2.38	0.50
1:D:265:GLY:H	1:D:267:ASN:ND2	2.10	0.50
1:B:223:GLN:HE21	1:B:225:ASN:HD21	1.60	0.50
1:B:231:ASN:C	1:B:235:MET:HE3	2.37	0.50
1:D:201:PHE:HB2	1:D:208:ASP:OD2	2.11	0.50
1:A:255:LEU:O	1:A:256:ARG:HB2	2.13	0.49
1:B:213:HIS:CE1	1:B:246:HIS:HA	2.47	0.49
1:C:265:GLY:H	1:C:267:ASN:ND2	2.09	0.49
1:C:202:VAL:O	1:C:203:GLU:HB3	2.11	0.49
1:D:95:THR:HA	1:D:105:THR:HA	1.94	0.49
1:E:217:SER:O	1:E:241:TRP:HA	2.13	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:132:ARG:NH1	1:A:136:THR:HG21	2.27	0.49
1:B:132:ARG:CA	5:B:301:BM3:H8C2	2.42	0.49
1:D:244:ASN:H	1:D:245:CYS:HA	1.70	0.49
1:F:244:ASN:N	1:F:245:CYS:HA	2.27	0.49
1:A:246:HIS:CE1	1:A:263:ALA:O	2.66	0.49
1:F:265:GLY:H	1:F:267:ASN:ND2	2.09	0.49
1:D:167:ARG:NH1	1:D:179:PHE:CD1	2.81	0.49
1:D:265:GLY:H	1:D:267:ASN:HD21	1.60	0.48
1:A:133:ASP:HA	1:A:222:ASP:OD2	2.14	0.48
1:E:156:HIS:CD2	1:E:187:VAL:O	2.57	0.48
1:A:156:HIS:CD2	1:A:187:VAL:O	2.60	0.48
1:A:95:THR:HA	1:A:105:THR:HA	1.95	0.48
1:A:178:GLN:HG2	1:A:205:SER:OG	2.13	0.48
1:B:231:ASN:C	1:B:231:ASN:ND2	2.67	0.48
1:D:156:HIS:CD2	1:D:187:VAL:O	2.63	0.48
1:F:173:PHE:CE1	1:F:256[B]:ARG:HA	2.48	0.48
1:D:198:LEU:HD13	1:D:210:LEU:HD23	1.96	0.48
1:D:244:ASN:N	1:D:245:CYS:CA	2.62	0.48
1:F:173:PHE:CZ	1:F:256[B]:ARG:HA	2.49	0.48
1:D:77:PRO:HD3	1:D:86:ARG:NH1	2.27	0.47
1:D:131:TYR:CE1	1:D:237:GLN:HA	2.50	0.47
1:A:217:SER:O	1:A:241:TRP:HA	2.13	0.47
1:F:231:ASN:C	1:F:231:ASN:ND2	2.60	0.47
1:C:165:GLU:HB2	1:C:182:TYR:O	2.14	0.47
1:A:169:ASP:OD1	1:A:284:LYS:HE3	2.15	0.47
1:E:171:VAL:HG22	1:E:177:TYR:CD1	2.50	0.47
1:A:244:ASN:N	1:A:245:CYS:CA	2.73	0.47
1:E:246:HIS:HE1	1:E:263:ALA:O	1.97	0.47
1:F:173:PHE:CZ	1:F:256[A]:ARG:HA	2.50	0.47
1:A:209:SER:HB2	1:A:268:TRP:CE2	2.49	0.46
1:C:231:ASN:ND2	1:C:234:VAL:H	2.12	0.46
1:A:221:LYS:HG2	1:A:222:ASP:N	2.30	0.46
1:D:172:ASP:OD2	1:D:176:ASN:HB2	2.15	0.46
1:C:173:PHE:CZ	1:C:256:ARG:HA	2.50	0.46
1:F:202:VAL:O	1:F:203:GLU:HB3	2.15	0.46
1:B:156:HIS:CD2	1:B:187:VAL:O	2.63	0.46
1:C:98:LEU:HB3	1:C:99:PRO:HD2	1.97	0.46
1:B:104:LEU:HD13	1:B:106:VAL:CG1	2.45	0.46
1:B:239:ALA:O	1:B:240:TRP:HB2	2.14	0.46
1:A:231:ASN:ND2	1:A:234:VAL:H	2.13	0.46
1:C:95:THR:HA	1:C:105:THR:HA	1.96	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:183:ARG:NH1	1:D:183:ARG:CG	2.54	0.46
1:B:122:ARG:NH1	1:B:282:GLU:OE2	2.47	0.46
1:E:198:LEU:HD23	1:E:211:THR:HA	1.97	0.46
1:E:265:GLY:H	1:E:267:ASN:ND2	2.14	0.45
1:A:172:ASP:HB2	1:A:276:TYR:CE1	2.52	0.45
1:C:182:TYR:OH	1:C:208:ASP:OD1	2.30	0.45
1:B:246:HIS:HE1	1:B:263:ALA:O	1.99	0.45
1:C:213:HIS:CE1	1:C:246:HIS:HA	2.51	0.45
1:C:172:ASP:C	1:C:172:ASP:OD1	2.58	0.45
1:A:131:TYR:CE1	1:A:237:GLN:HA	2.51	0.45
1:B:240:TRP:CH2	1:B:250:LEU:HB2	2.52	0.45
1:C:246:HIS:CE1	1:C:249:ASN:HB2	2.52	0.45
1:D:100:ASP:O	1:D:101:CYS:HB2	2.16	0.45
1:F:231:ASN:ND2	1:F:234:VAL:HG23	2.31	0.45
1:F:262:PHE:CZ	6:F:302:MAN:O4	2.69	0.45
1:E:246:HIS:CE1	1:E:263:ALA:HB1	2.52	0.45
1:C:73:CYS:O	1:C:75:THR:N	2.50	0.45
1:A:226:ASP:C	1:A:227:LEU:HD23	2.42	0.44
1:C:173:PHE:CE1	1:C:256:ARG:HA	2.53	0.44
1:D:98:LEU:C	1:D:100:ASP:H	2.23	0.44
1:C:240:TRP:CH2	1:C:250:LEU:HB2	2.52	0.44
1:F:173:PHE:CE1	1:F:256[A]:ARG:HA	2.51	0.44
1:A:244:ASN:H	1:A:245:CYS:HA	1.79	0.44
1:D:131:TYR:CD1	1:D:237:GLN:HB3	2.53	0.44
1:D:171:VAL:HB	1:D:280:VAL:HB	1.99	0.44
1:F:240:TRP:CH2	1:F:250:LEU:HB2	2.53	0.44
1:B:246:HIS:CD2	1:B:246:HIS:C	2.95	0.44
1:F:227:LEU:HD12	1:F:243:LYS:HG3	2.00	0.44
1:B:244:ASN:N	1:B:245:CYS:CA	2.77	0.44
1:A:193:LYS:HB3	1:A:217:SER:HB3	1.99	0.44
1:A:272:LYS:HE2	1:A:272:LYS:HA	2.00	0.44
1:B:144:ARG:NH2	1:C:94:HIS:NE2	2.66	0.44
1:B:284:LYS:HE2	1:B:284:LYS:HB3	1.82	0.44
1:A:122:ARG:HD3	1:A:282:GLU:OE2	2.17	0.44
1:B:124:VAL:O	1:B:124:VAL:CG1	2.64	0.44
1:B:170:LEU:HD13	1:B:278:TYR:CE1	2.53	0.44
1:F:218:PHE:HA	1:F:241:TRP:HA	1.99	0.44
1:C:124:VAL:O	1:C:124:VAL:CG1	2.63	0.44
5:B:301:BM3:O6	5:B:301:BM3:C5	2.61	0.43
1:B:216:GLN:HG3	1:B:243:LYS:HB2	2.00	0.43
1:F:124:VAL:O	1:F:124:VAL:CG1	2.65	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:231:ASN:O	1:A:232:CYS:C	2.60	0.43
5:B:301:BM3:C6	5:B:301:BM3:H6	2.18	0.43
1:C:124:VAL:O	1:C:124:VAL:HG12	2.18	0.43
1:F:231:ASN:CG	1:F:234:VAL:HG23	2.43	0.43
1:C:78:ARG:HG2	1:C:97:TYR:O	2.18	0.43
1:E:179:PHE:CE2	1:E:204:GLY:HA2	2.54	0.43
1:A:164:SER:O	1:A:184:SER:HA	2.18	0.43
1:D:263:ALA:HA	1:D:267:ASN:ND2	2.34	0.43
1:C:98:LEU:O	1:C:99:PRO:C	2.61	0.43
1:C:184:SER:OG	1:C:199:GLY:HA3	2.19	0.43
1:C:192:GLU:O	1:C:193:LYS:C	2.62	0.43
1:D:98:LEU:C	1:D:100:ASP:N	2.76	0.43
1:E:90:LEU:HD12	1:E:90:LEU:HA	1.88	0.43
1:A:152:ASN:HB3	1:A:194:TYR:CD1	2.53	0.43
1:D:165:GLU:HB2	1:D:182:TYR:O	2.19	0.43
1:F:236:PHE:O	1:F:237:GLN:C	2.62	0.43
1:E:263:ALA:HA	1:E:267:ASN:ND2	2.34	0.42
1:E:284:LYS:HE2	1:E:284:LYS:HB3	1.85	0.42
1:C:146:GLY:HA3	7:C:404:HOH:O	2.18	0.42
1:D:250:LEU:HD12	1:D:250:LEU:HA	1.88	0.42
1:E:246:HIS:CD2	1:E:246:HIS:C	2.98	0.42
1:E:136:THR:HG22	1:E:141:PHE:CD1	2.54	0.42
1:E:144:ARG:NH2	1:F:94:HIS:NE2	2.68	0.42
1:F:168:THR:O	1:F:179:PHE:HA	2.20	0.42
1:D:167:ARG:NH1	1:D:179:PHE:CE1	2.88	0.42
1:B:78:ARG:HH21	1:B:99:PRO:HA	1.85	0.42
1:E:212:PHE:HB3	1:E:247:THR:CG2	2.47	0.42
1:C:93:TRP:CZ2	1:C:144:ARG:HA	2.55	0.41
1:C:195:ASN:HD21	1:C:216:GLN:N	2.18	0.41
1:F:98:LEU:O	1:F:99:PRO:C	2.60	0.41
1:A:76:GLY:HA2	1:A:77:PRO:HD3	1.87	0.41
1:A:231:ASN:ND2	1:A:234:VAL:HG23	2.34	0.41
1:B:194:TYR:O	1:B:195:ASN:C	2.63	0.41
1:F:172:ASP:OD1	1:F:172:ASP:C	2.63	0.41
1:A:93:TRP:CE2	1:A:144:ARG:HG2	2.55	0.41
1:C:244:ASN:N	1:C:245:CYS:HA	2.34	0.41
1:E:113:ASP:OD2	1:E:167:ARG:NH1	2.54	0.41
1:E:240:TRP:CZ3	1:E:250:LEU:HB2	2.55	0.41
1:C:78:ARG:HG2	1:C:97:TYR:HB2	2.02	0.41
1:C:96:ILE:C	1:C:97:TYR:CD2	2.98	0.41
1:D:166:LEU:HB2	1:D:185:PHE:HB2	2.02	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:256:ARG:NH1	1:E:256:ARG:HG3	2.35	0.41
1:F:151:GLY:O	1:F:155:ILE:HG13	2.20	0.41
1:C:161:GLN:O	1:C:163:THR:N	2.54	0.41
1:C:228:ASN:O	1:C:229:THR:C	2.63	0.41
1:D:178:GLN:HG2	1:D:205:SER:OG	2.21	0.41
1:B:171:VAL:HB	1:B:280:VAL:HB	2.02	0.41
1:D:154:ASN:O	1:D:158:LEU:HB2	2.21	0.41
1:D:170:LEU:HD13	1:D:278:TYR:CE1	2.55	0.41
1:F:210:LEU:C	1:F:212:PHE:N	2.77	0.41
1:A:166:LEU:HG	1:A:167:ARG:N	2.36	0.41
1:A:240:TRP:C	1:A:242:TYR:H	2.27	0.41
1:D:102:ARG:HA	1:D:103:PRO:HD3	1.89	0.41
1:D:210:LEU:O	1:D:211:THR:C	2.64	0.41
1:E:166:LEU:HD22	1:E:185:PHE:CD1	2.55	0.41
1:F:132:ARG:NH1	1:F:136:THR:HG21	2.35	0.41
1:F:236:PHE:HE2	1:F:245:CYS:SG	2.44	0.41
1:D:134:TRP:HA	1:D:220:THR:HG21	2.02	0.40
1:F:209:SER:HB3	1:F:247:THR:CG2	2.47	0.40
1:A:109:ASP:OD1	1:A:109:ASP:C	2.65	0.40
1:E:244:ASN:N	1:E:245:CYS:CA	2.82	0.40
1:F:196:LEU:HB2	1:F:241:TRP:CD1	2.56	0.40
1:F:231:ASN:ND2	1:F:234:VAL:H	2.18	0.40
1:C:170:LEU:HB3	1:C:278:TYR:CD2	2.57	0.40
1:E:134:TRP:HA	1:E:220:THR:HG21	2.04	0.40
1:A:216:GLN:HE22	1:A:227:LEU:HD11	1.86	0.40
1:A:246:HIS:HE1	1:A:263:ALA:HB1	1.83	0.40
1:C:201:PHE:CD2	1:C:208:ASP:HB2	2.57	0.40
3:H:2:NAG:O3	3:H:3:MAN:H2	2.22	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	210/218 (96%)	189 (90%)	18 (9%)	3 (1%)	9	20
1	B	216/218 (99%)	193 (89%)	19 (9%)	4 (2%)	6	15
1	C	214/218 (98%)	190 (89%)	19 (9%)	5 (2%)	5	11
1	D	212/218 (97%)	189 (89%)	19 (9%)	4 (2%)	6	15
1	E	216/218 (99%)	196 (91%)	19 (9%)	1 (0%)	25	43
1	F	211/218 (97%)	185 (88%)	22 (10%)	4 (2%)	6	15
All	All	1279/1308 (98%)	1142 (89%)	116 (9%)	21 (2%)	8	18

All (21) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	101	CYS
1	C	162	GLY
1	F	162	GLY
1	B	162	GLY
1	B	229	THR
1	C	74	LEU
1	C	229	THR
1	D	237	GLN
1	F	161	GLN
1	F	229	THR
1	D	99	PRO
1	B	203	GLU
1	C	160	ALA
1	D	241	TRP
1	A	241	TRP
1	F	124	VAL
1	A	124	VAL
1	B	124	VAL
1	C	124	VAL
1	D	124	VAL
1	E	124	VAL

5.3.2 Protein sidechains (i)

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all 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	178/183 (97%)	162 (91%)	16 (9%)		8	15
1	B	183/183 (100%)	166 (91%)	17 (9%)		7	14
1	C	181/183 (99%)	164 (91%)	17 (9%)		7	14
1	D	179/183 (98%)	165 (92%)	14 (8%)		10	22
1	E	183/183 (100%)	168 (92%)	15 (8%)		9	20
1	F	179/183 (98%)	162 (90%)	17 (10%)		7	14
All	All	1083/1098 (99%)	987 (91%)	96 (9%)		8	16

All (96) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	90	LEU
1	A	95	THR
1	A	100	ASP
1	A	101	CYS
1	A	104	LEU
1	A	145	LEU
1	A	150	LEU
1	A	178	GLN
1	A	187	VAL
1	A	223	GLN
1	A	228	ASN
1	A	231	ASN
1	A	235	MET
1	A	250	LEU
1	A	279	LYS
1	A	281	SER
1	B	74	LEU
1	B	75	THR
1	B	90	LEU
1	B	95	THR
1	B	104	LEU
1	B	139	GLN
1	B	145	LEU
1	B	150	LEU
1	B	164	SER
1	B	174	GLU
1	B	175	ASP
1	B	187	VAL
1	B	192	GLU
1	B	231	ASN

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Mol	Chain	Res	Type
1	B	237	GLN
1	B	250	LEU
1	B	272	LYS
1	C	90	LEU
1	C	95	THR
1	C	97	TYR
1	C	104	LEU
1	C	122	ARG
1	C	145	LEU
1	C	150	LEU
1	C	163	THR
1	C	187	VAL
1	C	196	LEU
1	C	197	VAL
1	C	202	VAL
1	C	211	THR
1	C	223	GLN
1	C	231	ASN
1	C	250	LEU
1	C	281	SER
1	D	90	LEU
1	D	95	THR
1	D	101	CYS
1	D	104	LEU
1	D	105	THR
1	D	145	LEU
1	D	150	LEU
1	D	183	ARG
1	D	187	VAL
1	D	193	LYS
1	D	223	GLN
1	D	231	ASN
1	D	250	LEU
1	D	281	SER
1	E	75	THR
1	E	90	LEU
1	E	95	THR
1	E	104	LEU
1	E	145	LEU
1	E	150	LEU
1	E	161	GLN
1	E	164	SER

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Mol	Chain	Res	Type
1	E	187	VAL
1	E	192	GLU
1	E	197	VAL
1	E	231	ASN
1	E	237	GLN
1	E	250	LEU
1	E	272	LYS
1	F	78	ARG
1	F	90	LEU
1	F	95	THR
1	F	97	TYR
1	F	104	LEU
1	F	122	ARG
1	F	145	LEU
1	F	150	LEU
1	F	163	THR
1	F	187	VAL
1	F	196	LEU
1	F	202	VAL
1	F	231	ASN
1	F	247	THR
1	F	250	LEU
1	F	261	SER
1	F	281	SER

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (48) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	139	GLN
1	A	156	HIS
1	A	161	GLN
1	A	178	GLN
1	A	195	ASN
1	A	216	GLN
1	A	228	ASN
1	A	231	ASN
1	A	246	HIS
1	A	267	ASN
1	B	88	HIS
1	B	139	GLN
1	B	156	HIS
1	B	223	GLN

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Mol	Chain	Res	Type
1	B	231	ASN
1	B	244	ASN
1	B	246	HIS
1	B	267	ASN
1	B	275	ASN
1	C	156	HIS
1	C	195	ASN
1	C	214	ASN
1	C	216	GLN
1	C	223	GLN
1	C	231	ASN
1	C	267	ASN
1	C	275	ASN
1	D	139	GLN
1	D	156	HIS
1	D	214	ASN
1	D	228	ASN
1	D	231	ASN
1	D	246	HIS
1	D	267	ASN
1	D	275	ASN
1	E	88	HIS
1	E	139	GLN
1	E	156	HIS
1	E	161	GLN
1	E	231	ASN
1	E	246	HIS
1	E	267	ASN
1	E	275	ASN
1	F	156	HIS
1	F	178	GLN
1	F	223	GLN
1	F	231	ASN
1	F	267	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 (i)

9 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	NAG	G	1	2,1	14,14,15	0.83	0	17,19,21	1.85	5 (29%)
2	NAG	G	2	2	14,14,15	0.55	0	17,19,21	1.34	2 (11%)
2	MAN	G	3	2	11,11,12	0.87	1 (9%)	15,15,17	1.66	3 (20%)
2	MAN	G	4	2	11,11,12	0.62	0	15,15,17	1.08	1 (6%)
2	FUC	G	5	2	10,10,11	0.81	0	14,14,16	1.43	2 (14%)
3	NAG	H	1	3,1	14,14,15	0.85	1 (7%)	17,19,21	1.38	2 (11%)
3	NAG	H	2	3	14,14,15	0.71	0	17,19,21	1.27	1 (5%)
3	MAN	H	3	3,6	11,11,12	0.66	0	15,15,17	1.24	2 (13%)
3	FUC	H	4	3	10,10,11	0.90	0	14,14,16	2.98	6 (42%)

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	NAG	G	1	2,1	-	0/6/23/26	0/1/1/1
2	NAG	G	2	2	-	0/6/23/26	0/1/1/1
2	MAN	G	3	2	1/1/4/5	2/2/19/22	0/1/1/1
2	MAN	G	4	2	-	0/2/19/22	1/1/1/1
2	FUC	G	5	2	-	-	0/1/1/1
3	NAG	H	1	3,1	-	1/6/23/26	0/1/1/1
3	NAG	H	2	3	-	2/6/23/26	0/1/1/1
3	MAN	H	3	3,6	1/1/4/5	2/2/19/22	0/1/1/1
3	FUC	H	4	3	-	-	0/1/1/1

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	H	1	NAG	O5-C1	-2.19	1.40	1.43
2	G	3	MAN	O5-C1	-2.06	1.40	1.43

All (24) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	H	4	FUC	C2-C3-C4	-7.51	97.91	110.89
3	H	4	FUC	C1-C2-C3	-4.52	104.12	109.67
2	G	1	NAG	O5-C1-C2	-4.40	104.35	111.29
2	G	1	NAG	C3-C4-C5	-3.85	103.37	110.24
3	H	4	FUC	O5-C5-C4	3.81	116.35	109.52
2	G	3	MAN	O5-C1-C2	-3.60	105.21	110.77
3	H	2	NAG	C4-C3-C2	3.60	116.29	111.02
3	H	1	NAG	O5-C1-C2	-3.34	106.02	111.29
2	G	3	MAN	C3-C4-C5	3.29	116.11	110.24
2	G	5	FUC	C1-C2-C3	3.24	113.65	109.67
2	G	2	NAG	C2-N2-C7	3.04	127.23	122.90
2	G	2	NAG	C1-O5-C5	2.96	116.20	112.19
2	G	1	NAG	O5-C5-C6	2.78	111.56	107.20
3	H	4	FUC	O2-C2-C3	2.41	114.97	110.14
3	H	1	NAG	C4-C3-C2	2.33	114.43	111.02
2	G	3	MAN	C2-C3-C4	2.26	114.81	110.89
3	H	4	FUC	C1-O5-C5	2.25	117.88	112.78
2	G	1	NAG	C8-C7-N2	2.21	119.85	116.10
3	H	3	MAN	C1-O5-C5	-2.17	109.25	112.19
3	H	3	MAN	C2-C3-C4	-2.16	107.15	110.89
2	G	4	MAN	C1-O5-C5	2.15	115.11	112.19
2	G	5	FUC	O5-C5-C6	2.10	111.85	107.33
2	G	1	NAG	C4-C3-C2	2.09	114.08	111.02
3	H	4	FUC	O4-C4-C3	-2.00	105.72	110.35

All (2) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
2	G	3	MAN	C1
3	H	3	MAN	C1

All (7) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	G	3	MAN	O5-C5-C6-O6
3	H	3	MAN	O5-C5-C6-O6
3	H	3	MAN	C4-C5-C6-O6

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Mol	Chain	Res	Type	Atoms
2	G	3	MAN	C4-C5-C6-O6
3	H	2	NAG	C4-C5-C6-O6
3	H	2	NAG	O5-C5-C6-O6
3	H	1	NAG	O5-C5-C6-O6

All (1) ring outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	G	4	MAN	C1-C2-C3-C4-C5-O5

4 monomers are involved in 2 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	H	3	MAN	1	0
2	G	4	MAN	1	0
2	G	3	MAN	1	0
3	H	2	NAG	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 G

Bond lengths

Bond angles

Torsions

Rings

Oligosaccharide Chain H

Bond lengths	Bond angles

Torsions	Rings
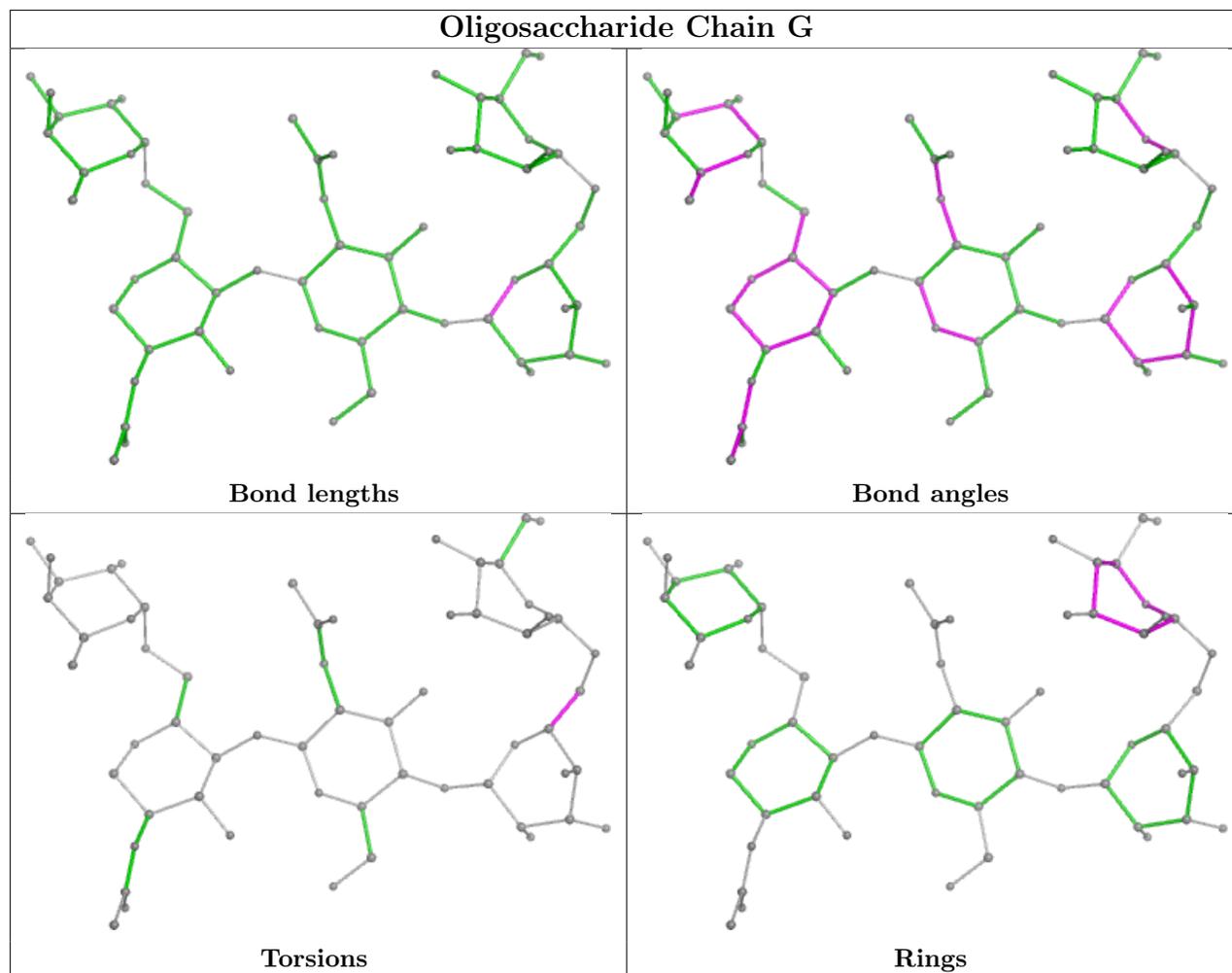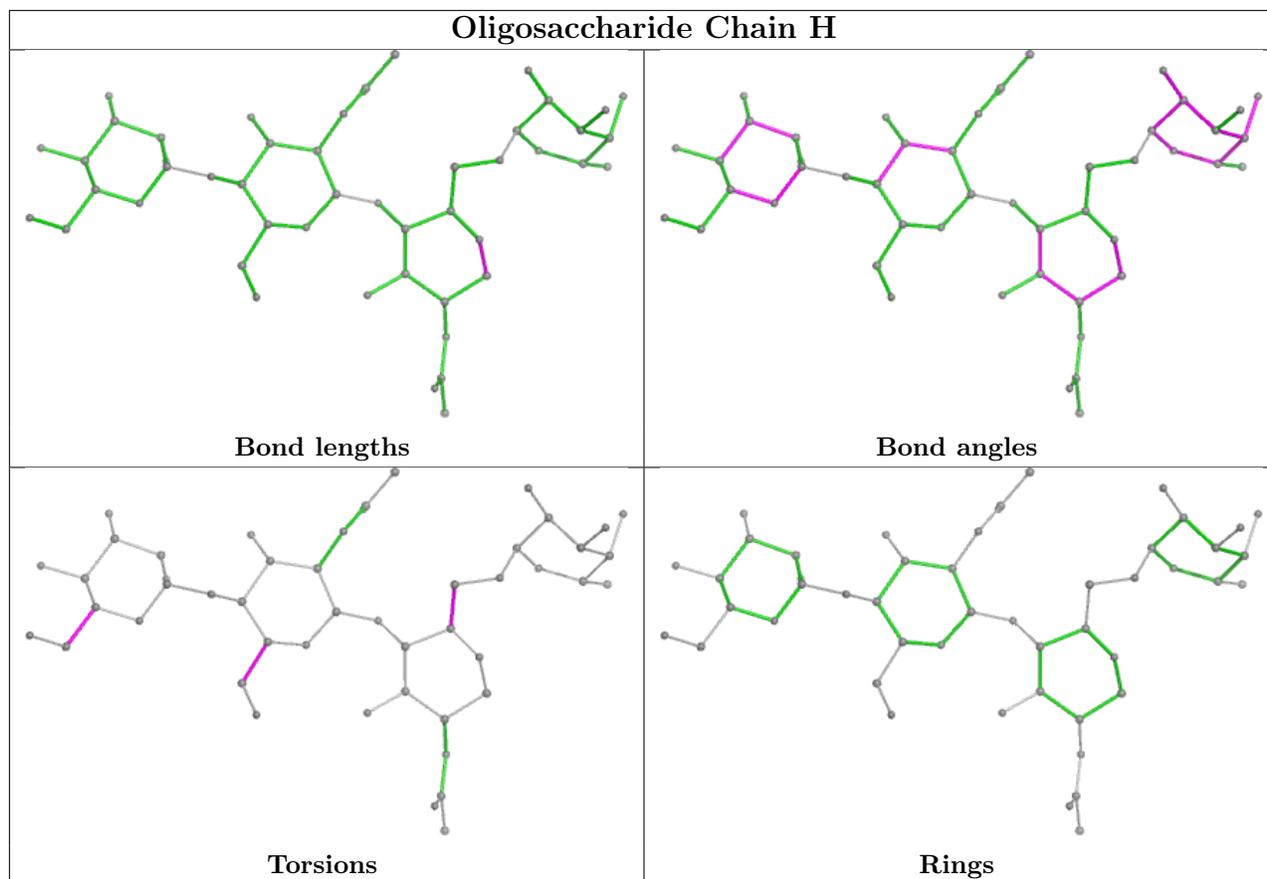
5.6   Ligand geometry ⓘ

Of 11 ligands modelled in this entry, 6 are monoatomic - leaving 5 for Mogul analysis.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	#$|Z| > 2$	Counts	RMSZ	#$|Z| > 2$
5	BM3	E	301	-	15,15,15	2.63	3 (20%)	21,21,21	3.93	13 (61%)
5	BM3	C	301	-	15,15,15	2.64	4 (26%)	21,21,21	4.52	9 (42%)
6	MAN	F	302	3	11,11,12	1.39	1 (9%)	15,15,17	1.07	1 (6%)
5	BM3	B	301	-	15,15,15	3.15	6 (40%)	21,21,21	4.49	11 (52%)
5	BM3	F	301	-	15,15,15	3.09	6 (40%)	21,21,21	3.77	8 (38%)

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
5	BM3	E	301	-	-	4/6/26/26	0/1/1/1
5	BM3	C	301	-	-	4/6/26/26	0/1/1/1
6	MAN	F	302	3	-	0/2/19/22	0/1/1/1
5	BM3	B	301	-	-	4/6/26/26	0/1/1/1
5	BM3	F	301	-	-	4/6/26/26	0/1/1/1

All (20) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	F	301	BM3	O6-C6	9.35	1.81	1.42
5	E	301	BM3	C1-C2	-8.68	1.42	1.52
5	C	301	BM3	O6-C6	8.27	1.77	1.42
5	B	301	BM3	O6-C6	7.85	1.75	1.42
5	B	301	BM3	C1-C2	-6.37	1.45	1.52
5	F	301	BM3	O1-C1	4.53	1.54	1.39
5	C	301	BM3	C1-C2	-4.15	1.48	1.52
5	B	301	BM3	C4-C3	3.67	1.61	1.52
6	F	302	MAN	C2-C3	3.45	1.57	1.52
5	B	301	BM3	C2-N2	-3.39	1.40	1.45
5	F	301	BM3	C2-N2	2.93	1.50	1.45
5	E	301	BM3	O1-C1	2.72	1.48	1.39
5	B	301	BM3	C4-C5	2.61	1.58	1.53
5	F	301	BM3	C7-N2	2.59	1.43	1.34
5	B	301	BM3	O5-C5	2.59	1.50	1.44
5	C	301	BM3	C2-N2	2.27	1.49	1.45
5	F	301	BM3	C3-C2	-2.21	1.49	1.53
5	C	301	BM3	C4-C5	2.19	1.57	1.53
5	F	301	BM3	C1-C2	-2.08	1.50	1.52
5	E	301	BM3	C4-C5	2.01	1.57	1.53

All (42) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	B	301	BM3	C1-C2-N2	12.74	125.49	110.73
5	F	301	BM3	C1-C2-N2	11.37	123.90	110.73
5	C	301	BM3	C3-C2-N2	10.61	130.66	110.62
5	E	301	BM3	C1-C2-N2	10.19	122.54	110.73
5	C	301	BM3	O1-C1-C2	9.68	129.33	109.22
5	C	301	BM3	C1-C2-N2	8.21	120.24	110.73

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
5	E	301	BM3	O1-C1-C2	7.40	124.59	109.22
5	F	301	BM3	O1-C1-C2	7.37	124.53	109.22
5	B	301	BM3	C1-C2-C3	-7.34	100.53	110.54
5	B	301	BM3	O1-C1-C2	7.25	124.28	109.22
5	E	301	BM3	C4-C3-C2	-6.98	100.12	110.34
5	B	301	BM3	C1-O5-C5	-6.89	100.66	113.66
5	C	301	BM3	C4-C3-C2	-6.86	100.29	110.34
5	E	301	BM3	C3-C2-N2	6.28	122.48	110.62
5	C	301	BM3	C1-O5-C5	-5.73	102.86	113.66
5	B	301	BM3	C4-C3-C2	-5.28	102.61	110.34
5	F	301	BM3	C3-C2-N2	5.10	120.26	110.62
5	E	301	BM3	C1-O5-C5	-4.75	104.70	113.66
5	F	301	BM3	O5-C1-C2	4.71	114.25	109.52
5	B	301	BM3	C3-C2-N2	4.54	119.18	110.62
5	F	301	BM3	C2-N2-C7	4.52	134.18	123.18
5	C	301	BM3	C1-C2-C3	-4.43	104.50	110.54
5	C	301	BM3	O5-C1-C2	-4.35	105.15	109.52
5	F	301	BM3	C4-C3-C2	-3.68	104.96	110.34
5	B	301	BM3	C3-C4-C5	3.56	116.59	110.24
5	F	301	BM3	C1-O5-C5	-3.54	106.98	113.66
5	C	301	BM3	C2-N2-C7	3.35	131.32	123.18
5	B	301	BM3	O3-C3-C2	2.88	115.47	109.66
5	E	301	BM3	O3-C3-C2	2.82	115.35	109.66
5	F	301	BM3	C1-C2-C3	-2.81	106.71	110.54
5	B	301	BM3	C6-C5-C4	-2.67	106.76	113.00
5	B	301	BM3	O7-C7-C8	-2.64	117.15	122.06
5	E	301	BM3	O1-C1-O5	2.63	118.27	110.38
6	F	302	MAN	O5-C5-C6	-2.47	103.33	107.20
5	E	301	BM3	O6-C6-C5	-2.46	102.85	111.29
5	E	301	BM3	C8-C7-N2	-2.28	112.23	116.10
5	C	301	BM3	O3-C3-C4	2.25	115.56	110.35
5	E	301	BM3	C2-N2-C7	2.22	128.57	123.18
5	E	301	BM3	C6-C5-C4	-2.12	108.04	113.00
5	B	301	BM3	O6-C6-C5	-2.12	104.03	111.29
5	E	301	BM3	O4-C4-C3	2.04	115.06	110.35
5	E	301	BM3	O7-C7-N2	2.01	125.65	121.95

There are no chirality outliers.

All (16) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
5	B	301	BM3	O7-C7-N2-C2

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Mol	Chain	Res	Type	Atoms
5	B	301	BM3	C8-C7-N2-C2
5	C	301	BM3	O7-C7-N2-C2
5	C	301	BM3	C8-C7-N2-C2
5	E	301	BM3	O7-C7-N2-C2
5	E	301	BM3	C8-C7-N2-C2
5	F	301	BM3	O7-C7-N2-C2
5	F	301	BM3	C8-C7-N2-C2
5	E	301	BM3	C4-C5-C6-O6
5	E	301	BM3	O5-C5-C6-O6
5	C	301	BM3	O5-C5-C6-O6
5	B	301	BM3	O5-C5-C6-O6
5	F	301	BM3	O5-C5-C6-O6
5	F	301	BM3	C4-C5-C6-O6
5	B	301	BM3	C4-C5-C6-O6
5	C	301	BM3	C4-C5-C6-O6

There are no ring outliers.

5 monomers are involved in 26 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	E	301	BM3	3	0
5	C	301	BM3	1	0
6	F	302	MAN	1	0
5	B	301	BM3	17	0
5	F	301	BM3	4	0

5.7 Other polymers ⓘ

There are no such residues in this entry.

5.8 Polymer linkage issues ⓘ

The following chains have linkage breaks:

Mol	Chain	Number of breaks
1	C	2
1	A	1

All chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	C	224:ASP	C	225:ASN	N	1.20
1	A	224:ASP	C	225:ASN	N	1.14
1	C	223:GLN	C	224:ASP	N	1.07

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(Å^2)	Q<0.9
1	A	212/218 (97%)	-1.43	0	100	100	33, 39, 50, 55	0
1	B	217/218 (99%)	-1.53	0	100	100	23, 39, 46, 54	1 (0%)
1	C	216/218 (99%)	-1.50	0	100	100	34, 39, 50, 74	0
1	D	214/218 (98%)	-1.22	0	100	100	34, 39, 49, 59	0
1	E	218/218 (100%)	-1.21	0	100	100	32, 39, 47, 60	0
1	F	212/218 (97%)	-1.14	0	100	100	20, 39, 47, 54	1 (0%)
All	All	1289/1308 (98%)	-1.34	0	100	100	20, 39, 48, 74	2 (0%)

There are no RSRZ outliers to report.

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.
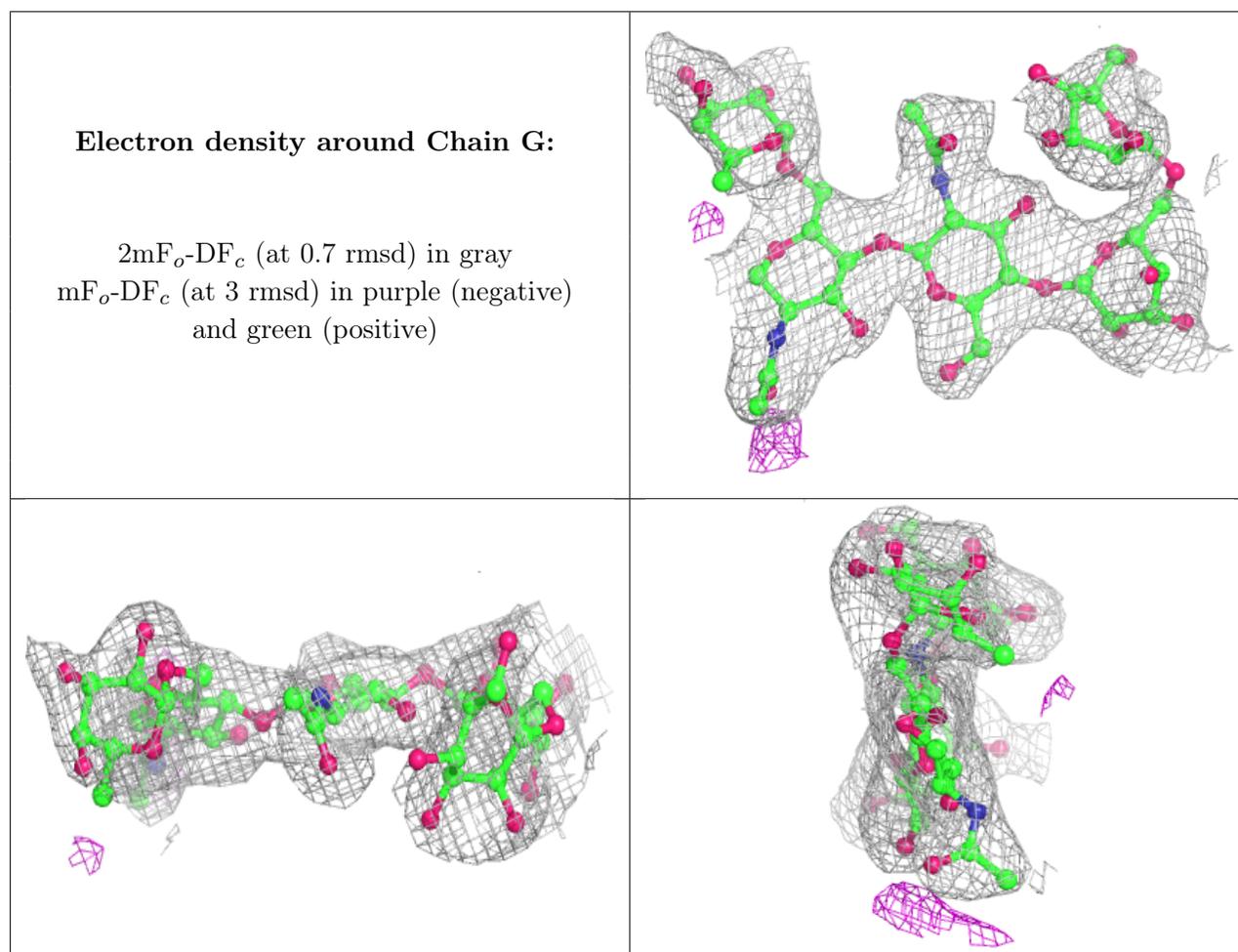
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
3	NAG	H	2	14/15	0.95	0.08	59,63,67,70	0
3	MAN	H	3	11/12	0.95	0.08	72,73,74,74	0
3	NAG	H	1	14/15	0.97	0.07	49,53,59,59	0
3	FUC	H	4	10/11	0.97	0.12	61,63,65,65	0
2	MAN	G	4	11/12	0.98	0.06	88,90,91,91	0
2	FUC	G	5	10/11	0.98	0.08	52,53,53,54	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
2	NAG	G	1	14/15	0.99	0.04	37,40,49,51	0
2	NAG	G	2	14/15	0.99	0.04	48,53,57,63	0
2	MAN	G	3	11/12	0.99	0.04	68,71,80,85	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.
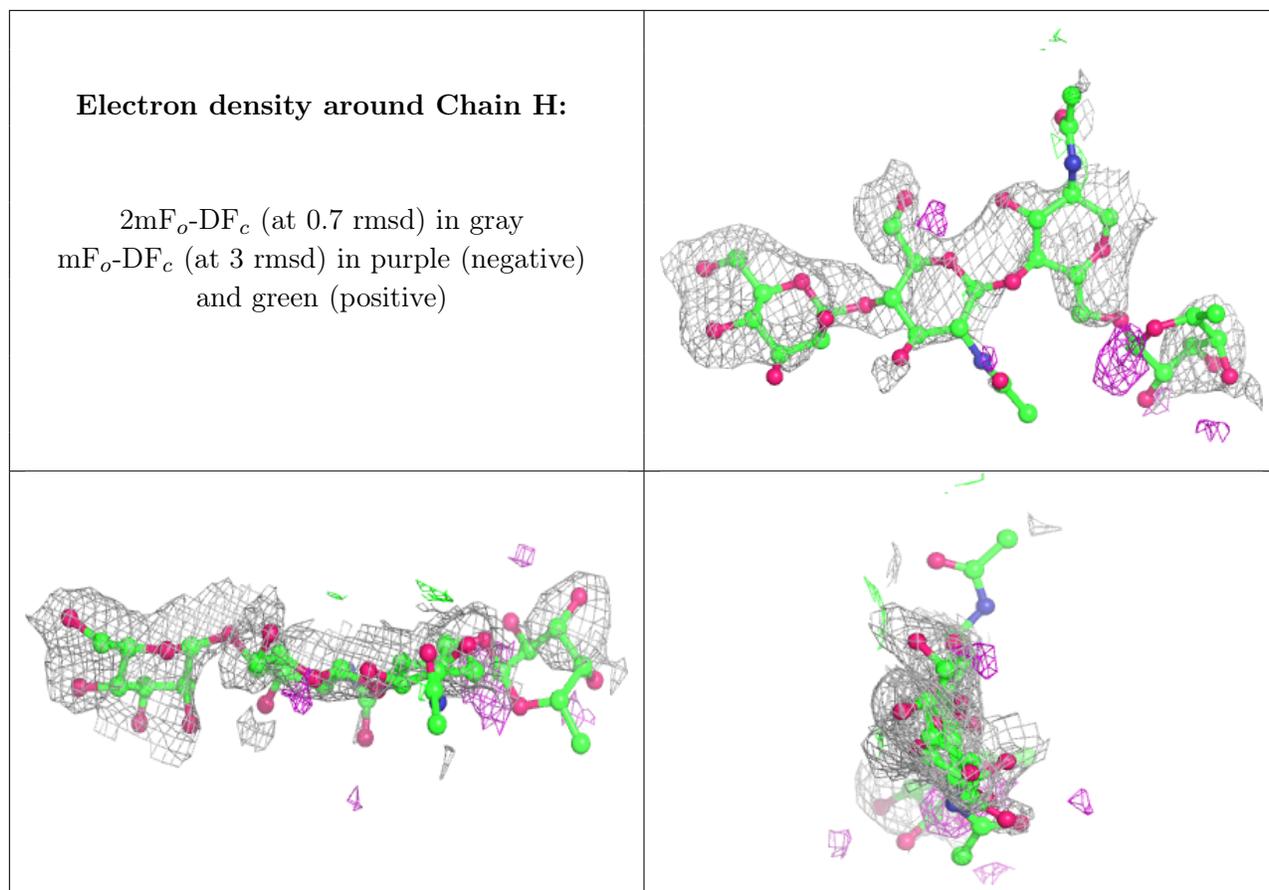
Electron density around Chain G:

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

Electron density around Chain H:

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

6.4 Ligands ⓘ

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
4	CA	F	303	1/1	0.96	0.05	46,46,46,46	0
5	BM3	B	301	15/15	0.97	0.08	32,36,44,48	8
5	BM3	C	301	15/15	0.97	0.07	28,33,41,42	0
5	BM3	E	301	15/15	0.97	0.07	27,34,43,45	11
6	MAN	F	302	11/12	0.97	0.07	20,20,20,20	0
5	BM3	F	301	15/15	0.98	0.05	29,33,41,42	11
4	CA	D	500	1/1	0.99	0.03	70,70,70,70	0
4	CA	E	302	1/1	0.99	0.04	34,34,34,34	0
4	CA	A	500	1/1	0.99	0.03	75,75,75,75	0
4	CA	B	302	1/1	0.99	0.03	27,27,27,27	0
4	CA	C	302	1/1	1.00	0.03	38,38,38,38	0

6.5 Other polymers ⓘ

There are no such residues in this entry.