



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 14, 2026 – 11:10 AM UTC

PDB ID : 2J3G / pdb_00002j3g
Title : L-ficolin
Authors : Garlatti, V.; Gaboriaud, C.
Deposited on : 2006-08-21
Resolution : 2.50 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 ⓘ 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:

MolProbity : 4-5-2 with Phenix2.0
Mogul : 2022.3.0, CSD as543be (2022)
Xtriage (Phenix) : 2.0
EDS : 3.0
Buster-report : wwPDB partial adaption of 1.1.7 (2018)
Percentile statistics : 20250101.v01 (using entries in the PDB archive January 1st 2025)
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) : 2.49

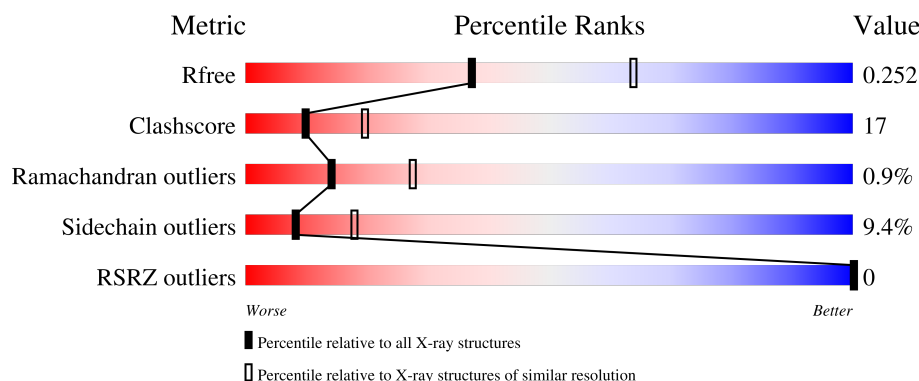
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

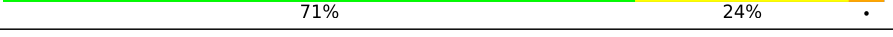
The reported resolution of this entry is 2.50 Å.

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.



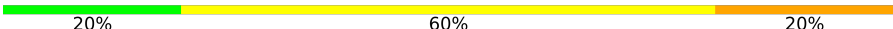
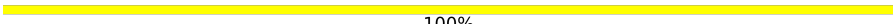
Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	180053	5829 (2.50-2.50)
Clashscore	190562	6492 (2.50-2.50)
Ramachandran outliers	187476	6378 (2.50-2.50)
Sidechain outliers	187428	6380 (2.50-2.50)
RSRZ outliers	180081	5833 (2.50-2.50)

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 $\leq 5\%$. 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	
1	B	218	
1	C	218	
1	D	218	
1	E	218	

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Mol	Chain	Length	Quality of chain
1	F	218	 70% 26% . .
2	G	5	 20% 60% 20%
3	H	3	 100%

2 Entry composition

There are 6 unique types of molecules in this entry. The entry contains 10729 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.

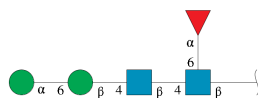
- Molecule 1 is a protein called FICOLIN-2.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	213	Total	C	N	O	S	0	0	0
			1707	1074	301	324	8			
1	B	217	Total	C	N	O	S	0	0	0
			1735	1092	305	329	9			
1	C	213	Total	C	N	O	S	8	1	0
			1719	1083	302	326	8			
1	D	217	Total	C	N	O	S	0	0	0
			1732	1089	305	329	9			
1	E	218	Total	C	N	O	S	0	0	0
			1739	1095	307	328	9			
1	F	214	Total	C	N	O	S	0	0	0
			1714	1078	302	326	8			

There are 12 discrepancies between the modelled and reference sequences:

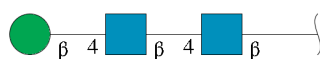
Chain	Residue	Modelled	Actual	Comment	Reference
A	168	THR	VAL	conflict	UNP Q15485
A	247	THR	VAL	conflict	UNP Q15485
B	168	THR	VAL	conflict	UNP Q15485
B	247	THR	VAL	conflict	UNP Q15485
C	168	THR	VAL	conflict	UNP Q15485
C	247	THR	VAL	conflict	UNP Q15485
D	168	THR	VAL	conflict	UNP Q15485
D	247	THR	VAL	conflict	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)-beta-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	C	N	O	0	0	0
			60	34	2	24			

- Molecule 3 is an oligosaccharide called beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose.

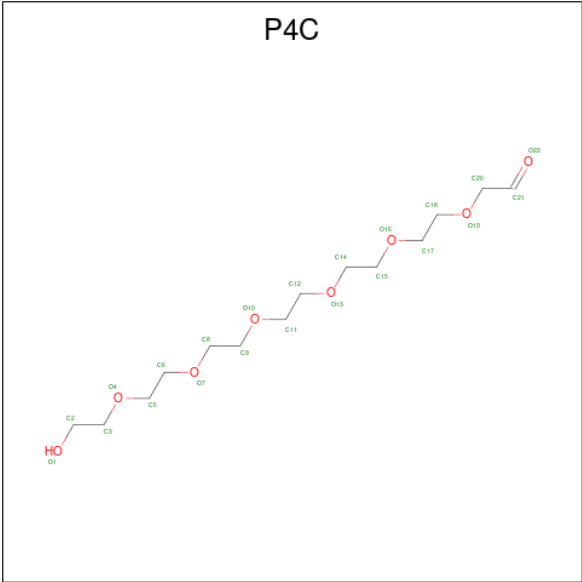


Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
3	H	3	Total	C	N	O	0	0	0
			39	22	2	15			

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

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

- Molecule 5 is O-ACETALDEHYDYL-HEXAETHYLENE GLYCOL (CCD ID: P4C) (formula: C₁₄H₂₈O₈).



Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	E	1	Total	C O	6	0
			22	14 8		

- Molecule 6 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	A	23	Total	O	0	0
			23	23		
6	B	60	Total	O	0	0
			60	60		
6	C	52	Total	O	0	0
			52	52		
6	D	29	Total	O	0	0
			29	29		
6	E	55	Total	O	0	0
			55	55		
6	F	37	Total	O	0	0
			37	37		

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.

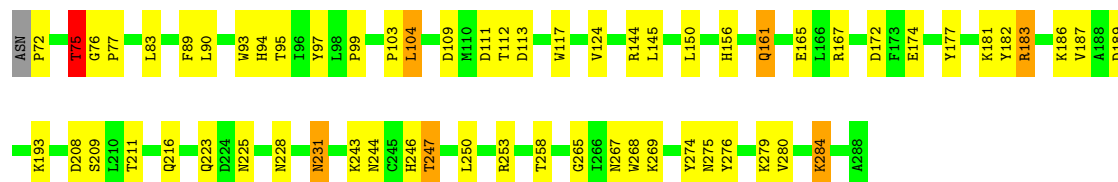
• Molecule 1: FICOLIN-2

Chain A: 



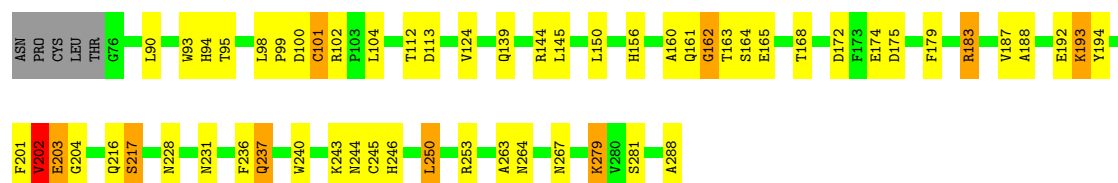
• Molecule 1: FICOLIN-2

Chain B: 



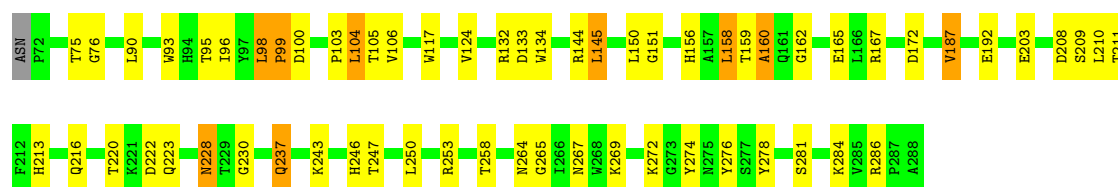
• Molecule 1: FICOLIN-2

Chain C: 

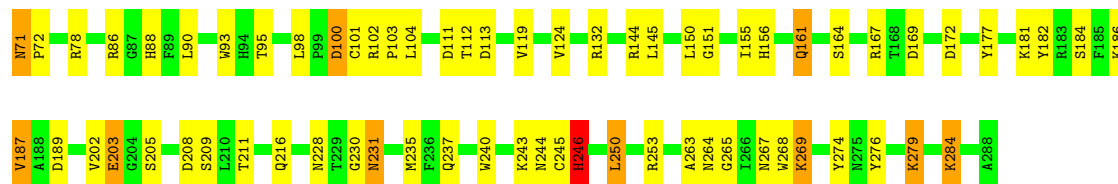


• Molecule 1: FICOLIN-2

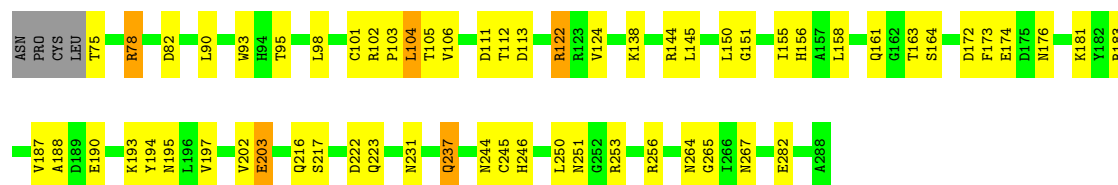
Chain D: 



• Molecule 1: FICOLIN-2



• Molecule 1: FICOLIN-2



• Molecule 2: alpha-D-mannopyranose-(1-6)-beta-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



• Molecule 3: beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose



4 Data and refinement statistics

Property	Value	Source
Space group	P 32	Depositor
Cell constants a, b, c, α , β , γ	98.89Å 98.89Å 141.97Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	15.00 – 2.50 15.00 – 2.50	Depositor EDS
% Data completeness (in resolution range)	100.0 (15.00-2.50) 97.9 (15.00-2.50)	Depositor EDS
R_{merge}	0.09	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.60 (at 2.50Å)	Xtriage
Refinement program	REFMAC 5.2.0019	Depositor
R, R_{free}	0.202 , 0.259 0.199 , 0.252	Depositor DCC
R_{free} test set	2608 reflections (5.00%)	wwPDB-VP
Wilson B-factor (Å ²)	38.2	Xtriage
Anisotropy	0.257	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.31 , 19.9	EDS
L-test for twinning ²	$\langle L \rangle = 0.45$, $\langle L^2 \rangle = 0.28$	Xtriage
Estimated twinning fraction	0.033 for -h,-k,l 0.095 for h,-h-k,-l 0.042 for -k,-h,-l	Xtriage
F_o, F_c correlation	0.97	EDS
Total number of atoms	10729	wwPDB-VP
Average B, all atoms (Å ²)	35.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.02% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

²Theoretical values of $\langle |L| \rangle$, $\langle L^2 \rangle$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality [i](#)

5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: MAN, NAG, P4C, FUC, CA, BMA

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	0.64	0/1754	0.92	0/2373
1	B	0.73	1/1783 (0.1%)	0.91	1/2413 (0.0%)
1	C	0.69	0/1767	0.89	1/2391 (0.0%)
1	D	0.63	0/1780	0.86	1/2409 (0.0%)
1	E	0.72	0/1787	0.89	1/2419 (0.0%)
1	F	0.67	0/1761	0.83	0/2383
All	All	0.68	1/10632 (0.0%)	0.88	4/14388 (0.0%)

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
1	C	0	2

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	223	GLN	CA-C	-5.56	1.47	1.53

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C	203	GLU	N-CA-C	8.41	120.53	111.36
1	B	246	HIS	N-CA-C	6.74	119.11	108.79
1	D	162	GLY	N-CA-C	6.47	117.94	111.21
1	E	246	HIS	N-CA-C	6.37	118.82	108.76

There are no chirality outliers.

All (2) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	C	202	VAL	Peptide
1	C	203	GLU	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	A	1707	0	1578	104	0
1	B	1735	0	1606	53	0
1	C	1719	0	1586	42	0
1	D	1732	0	1598	56	0
1	E	1739	0	1609	54	0
1	F	1714	0	1585	50	0
2	G	60	0	52	1	0
3	H	39	0	34	0	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	E	22	0	27	4	0
6	A	23	0	0	10	0
6	B	60	0	0	4	0
6	C	52	0	0	6	0
6	D	29	0	0	1	0
6	E	55	0	0	5	0
6	F	37	0	0	2	0
All	All	10729	0	9675	352	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 (352) 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:F:104:LEU:CD2	1:F:106:VAL:HG13	1.74	1.15
1:C:245:CYS:SG	6:C:2043:HOH:O	2.06	1.14
1:F:104:LEU:HD22	1:F:106:VAL:HG13	1.16	1.11
1:A:266:ILE:HA	6:A:2020:HOH:O	1.49	1.10
1:F:104:LEU:CD2	1:F:106:VAL:CG1	2.29	1.10
1:B:183:ARG:HG3	1:B:183:ARG:HH11	0.98	1.09
1:F:104:LEU:HD22	1:F:106:VAL:CG1	1.84	1.07
1:A:198:LEU:HD22	1:A:210:LEU:CD2	1.89	1.02
1:A:112:THR:CG2	1:A:167:ARG:HH21	1.74	1.01
1:A:164:SER:HB3	1:A:287:PRO:HA	1.46	0.97
1:D:98:LEU:HB3	1:D:99:PRO:HD3	1.44	0.96
1:D:98:LEU:CB	1:D:99:PRO:CD	2.44	0.96
1:A:198:LEU:CD2	1:A:210:LEU:CD2	2.44	0.95
1:A:198:LEU:HD22	1:A:210:LEU:HD23	1.46	0.95
1:C:245:CYS:HB2	6:C:2042:HOH:O	1.66	0.94
1:C:193:LYS:HB3	1:C:217:SER:HB3	1.50	0.93
1:F:104:LEU:HD21	1:F:106:VAL:HG12	1.48	0.93
1:B:183:ARG:HH11	1:B:183:ARG:CG	1.82	0.92
1:A:198:LEU:CD2	1:A:210:LEU:HD23	1.99	0.92
1:A:202:VAL:O	1:A:203:GLU:HG3	1.72	0.90
1:E:237:GLN:HE21	1:E:264:ASN:HD22	1.18	0.88
1:E:237:GLN:NE2	1:E:264:ASN:HD22	1.70	0.88
1:F:104:LEU:HD21	1:F:106:VAL:CG1	2.02	0.85
1:D:98:LEU:HB3	1:D:99:PRO:CD	2.06	0.85
1:D:98:LEU:HB2	1:D:99:PRO:HD2	1.59	0.84
1:D:209:SER:HB3	1:D:247:THR:HG22	1.60	0.84
1:B:183:ARG:HG3	1:B:183:ARG:NH1	1.77	0.84
1:D:98:LEU:CD2	1:D:158:LEU:HD23	2.07	0.84
1:F:237:GLN:HE21	1:F:253:ARG:HE	1.24	0.83
1:F:104:LEU:C	1:F:104:LEU:HD23	2.03	0.83
1:D:237:GLN:NE2	1:D:264:ASN:HD22	1.77	0.82
1:E:167:ARG:NH2	1:E:177:TYR:OH	2.11	0.81
1:C:98:LEU:HD12	1:C:102:ARG:HB3	1.64	0.80
1:E:216:GLN:HE21	1:E:243:LYS:NZ	1.80	0.80
1:B:228:ASN:HD22	1:B:244:ASN:ND2	1.81	0.79
1:A:174:GLU:N	1:A:174:GLU:OE1	2.16	0.78
1:C:228:ASN:HD22	1:C:244:ASN:ND2	1.81	0.78
1:D:247:THR:HG23	1:D:269:LYS:HB3	1.66	0.78
1:A:198:LEU:HD22	1:A:210:LEU:HD21	1.65	0.78
1:D:98:LEU:HB2	1:D:99:PRO:CD	2.12	0.78
1:F:237:GLN:HE22	1:F:264:ASN:HD22	1.30	0.78
1:D:98:LEU:CB	1:D:99:PRO:HD3	2.13	0.77

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:272:LYS:HG2	1:A:278:TYR:OH	1.85	0.77
1:D:151:GLY:HA3	6:D:2010:HOH:O	1.83	0.77
1:C:237:GLN:HE22	1:C:264:ASN:HD22	1.33	0.77
1:A:112:THR:HG22	1:A:167:ARG:HH21	1.48	0.75
1:C:237:GLN:HE21	1:C:253:ARG:HE	1.35	0.75
1:A:169:ASP:O	1:A:170:LEU:HD23	1.87	0.74
1:D:237:GLN:HE22	1:D:264:ASN:HD22	1.36	0.73
1:A:202:VAL:O	1:A:203:GLU:CG	2.36	0.73
1:F:113:ASP:OD2	1:F:181:LYS:CE	2.37	0.72
1:A:250:LEU:HA	6:A:2020:HOH:O	1.87	0.71
1:A:172:ASP:OD1	1:A:176:ASN:HB2	1.90	0.71
1:C:228:ASN:HD22	1:C:244:ASN:HD21	1.39	0.71
1:F:113:ASP:OD2	1:F:181:LYS:NZ	2.25	0.70
1:A:166:LEU:HD13	1:A:167:ARG:N	2.06	0.70
1:C:100:ASP:O	1:C:101:CYS:HB2	1.91	0.70
1:A:198:LEU:HD21	1:A:210:LEU:CD2	2.21	0.69
1:A:202:VAL:C	1:A:203:GLU:HG3	2.18	0.69
1:C:183:ARG:HH11	1:C:183:ARG:HB3	1.57	0.68
1:E:71:ASN:N	1:E:72:PRO:CD	2.56	0.68
1:B:167:ARG:NH2	1:B:177:TYR:OH	2.27	0.68
1:F:237:GLN:NE2	1:F:264:ASN:HD22	1.92	0.68
1:A:209:SER:O	1:A:248:SER:HB3	1.94	0.68
1:A:227:LEU:HB2	1:A:243:LYS:HA	1.76	0.67
1:E:228:ASN:HD22	1:E:244:ASN:ND2	1.92	0.67
1:E:113:ASP:OD2	1:E:181:LYS:NZ	2.25	0.67
1:E:279:LYS:NZ	5:E:1293:P4C:H52	2.11	0.66
1:F:78:ARG:NE	1:F:82:ASP:OD2	2.28	0.66
1:B:72:PRO:O	1:B:75:THR:HG23	1.96	0.66
1:E:71:ASN:N	1:E:72:PRO:HD2	2.11	0.66
1:E:265:GLY:H	1:E:267:ASN:HD21	1.42	0.66
1:A:78:ARG:HG3	1:A:79:THR:HG23	1.75	0.66
1:B:117:TRP:HB3	1:B:284:LYS:HG3	1.79	0.65
1:A:164:SER:HB3	1:A:287:PRO:CA	2.25	0.65
1:E:216:GLN:HE21	1:E:243:LYS:HZ1	1.43	0.65
1:A:213:HIS:HE1	1:A:246:HIS:HA	1.63	0.63
1:B:167:ARG:HH21	1:B:177:TYR:HH	1.45	0.63
1:B:216:GLN:HE21	1:B:243:LYS:HE2	1.64	0.62
1:D:216:GLN:HB2	1:D:243:LYS:NZ	2.14	0.62
1:D:228:ASN:HD22	1:D:230:GLY:H	1.46	0.62
1:D:98:LEU:HD21	1:D:158:LEU:CD2	2.28	0.62
1:D:98:LEU:HD22	1:D:158:LEU:HD23	1.80	0.62

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:156:HIS:HD2	1:C:187:VAL:O	1.82	0.62
1:D:98:LEU:CD2	1:D:158:LEU:CD2	2.77	0.61
1:B:72:PRO:O	1:B:75:THR:CG2	2.49	0.61
1:D:265:GLY:H	1:D:267:ASN:HD21	1.47	0.61
1:F:156:HIS:HD2	1:F:187:VAL:O	1.82	0.61
1:E:101:CYS:O	1:E:103:PRO:HD3	2.01	0.61
1:A:213:HIS:CE1	1:A:246:HIS:HA	2.35	0.61
1:A:198:LEU:CD2	1:A:210:LEU:HD21	2.26	0.60
1:A:213:HIS:HE1	1:A:246:HIS:CB	2.14	0.60
1:A:213:HIS:HE1	1:A:246:HIS:CA	2.14	0.60
1:D:216:GLN:HB2	1:D:243:LYS:HZ2	1.67	0.60
1:A:213:HIS:HE1	1:A:246:HIS:HB2	1.66	0.60
1:C:162:GLY:O	1:C:163:THR:HG23	2.01	0.60
1:F:244:ASN:ND2	1:F:244:ASN:O	2.34	0.60
1:B:253:ARG:HD3	6:B:2010:HOH:O	2.02	0.60
1:B:265:GLY:H	1:B:267:ASN:HD21	1.50	0.60
1:A:151:GLY:O	1:A:155:ILE:HG13	2.02	0.60
1:F:104:LEU:CD2	1:F:104:LEU:C	2.74	0.60
1:A:258:THR:HA	1:A:275:ASN:O	2.02	0.59
1:B:174:GLU:O	1:B:174:GLU:HG3	2.02	0.59
1:A:156:HIS:HD2	1:A:187:VAL:O	1.85	0.59
1:D:237:GLN:HE21	1:D:253:ARG:HE	1.51	0.59
1:A:214:ASN:OD1	1:A:215:ASN:N	2.36	0.59
1:A:210:LEU:HD23	1:A:210:LEU:C	2.27	0.58
1:D:216:GLN:HE21	1:D:243:LYS:NZ	2.01	0.58
1:F:265:GLY:H	1:F:267:ASN:HD21	1.51	0.58
1:A:193:LYS:HB2	1:A:217:SER:OG	2.03	0.58
1:B:231:ASN:C	1:B:231:ASN:HD22	2.11	0.58
1:E:244:ASN:N	1:E:245:CYS:HA	2.16	0.57
1:B:89:PHE:HB2	6:B:2003:HOH:O	2.04	0.57
1:F:173:PHE:CZ	1:F:256:ARG:HA	2.39	0.57
1:A:86:ARG:O	1:A:86:ARG:HG3	2.05	0.57
1:B:113:ASP:OD2	1:B:181:LYS:NZ	2.37	0.57
1:A:112:THR:HG22	1:A:167:ARG:NH2	2.18	0.57
1:B:209:SER:HB3	1:B:247:THR:HG23	1.86	0.57
1:A:98:LEU:HD13	1:A:102:ARG:NH2	2.20	0.57
1:E:279:LYS:HZ1	5:E:1293:P4C:H52	1.70	0.56
1:B:72:PRO:HA	1:B:75:THR:CG2	2.35	0.56
1:E:156:HIS:HD2	1:E:187:VAL:O	1.88	0.56
1:F:102:ARG:HG2	1:F:103:PRO:HD2	1.86	0.56
1:A:179:PHE:O	1:A:206:ALA:HB3	2.05	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:231:ASN:C	1:E:231:ASN:HD22	2.13	0.56
1:F:75:THR:HG21	6:F:2001:HOH:O	2.06	0.56
1:D:237:GLN:NE2	1:D:253:ARG:HE	2.03	0.56
1:A:250:LEU:C	6:A:2020:HOH:O	2.50	0.55
1:A:266:ILE:HG23	6:A:2020:HOH:O	2.05	0.55
1:D:156:HIS:HD2	1:D:187:VAL:O	1.89	0.55
1:D:216:GLN:HE21	1:D:243:LYS:HZ2	1.54	0.55
1:E:88:HIS:HD2	6:E:2003:HOH:O	1.88	0.55
1:E:237:GLN:HE22	1:E:253:ARG:HH21	1.54	0.55
1:A:213:HIS:CE1	1:A:246:HIS:HB2	2.42	0.55
1:B:208:ASP:OD1	1:B:211:THR:HB	2.07	0.55
1:A:98:LEU:O	1:A:101:CYS:N	2.30	0.54
1:C:279:LYS:HE3	6:C:2051:HOH:O	2.06	0.54
1:E:132:ARG:HH22	1:F:111:ASP:CG	2.14	0.54
1:D:265:GLY:H	1:D:267:ASN:ND2	2.05	0.54
1:A:117:TRP:CZ3	1:A:167:ARG:HB2	2.43	0.54
1:F:98:LEU:HD12	1:F:102:ARG:HB3	1.89	0.54
1:A:236:PHE:HE2	1:A:245:CYS:SG	2.30	0.54
1:B:93:TRP:CE3	1:B:144:ARG:HD3	2.42	0.54
1:F:78:ARG:HD3	1:F:78:ARG:N	2.23	0.54
1:C:113:ASP:HA	6:C:2009:HOH:O	2.08	0.54
1:C:216:GLN:HE21	1:C:243:LYS:NZ	2.06	0.54
1:F:104:LEU:HD23	1:F:105:THR:N	2.23	0.54
1:A:76:GLY:N	6:A:2001:HOH:O	2.41	0.53
1:F:172:ASP:OD1	1:F:174:GLU:HG2	2.07	0.53
1:F:188:ALA:O	1:F:194:TYR:HA	2.08	0.53
1:F:195:ASN:ND2	1:F:216:GLN:C	2.66	0.53
1:B:93:TRP:CD2	1:B:144:ARG:HD3	2.44	0.53
1:C:237:GLN:NE2	1:C:264:ASN:HD22	2.04	0.53
1:B:228:ASN:HD22	1:B:244:ASN:HD21	1.56	0.53
1:C:201:PHE:CD1	1:C:202:VAL:O	2.61	0.53
1:A:166:LEU:CD1	1:A:167:ARG:N	2.71	0.53
1:B:156:HIS:HD2	1:B:187:VAL:O	1.91	0.53
1:A:231:ASN:HD21	1:A:233:ALA:HB3	1.73	0.53
1:A:93:TRP:HE3	1:A:105:THR:HG22	1.74	0.52
1:A:272:LYS:HG2	1:A:278:TYR:CZ	2.44	0.52
1:E:144:ARG:NH1	6:E:2015:HOH:O	2.41	0.52
1:D:272:LYS:HG3	1:D:278:TYR:OH	2.09	0.52
1:E:88:HIS:CD2	6:E:2003:HOH:O	2.61	0.52
1:E:203:GLU:C	1:E:203:GLU:OE2	2.53	0.52
1:E:265:GLY:H	1:E:267:ASN:ND2	2.08	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:95:THR:HA	1:A:104:LEU:O	2.09	0.52
1:A:244:ASN:N	1:A:245:CYS:HA	2.24	0.52
1:B:258:THR:HG22	1:B:276:TYR:HD2	1.72	0.52
1:C:193:LYS:CB	1:C:217:SER:HB3	2.30	0.52
1:A:227:LEU:HB2	1:A:243:LYS:CA	2.39	0.52
1:D:132:ARG:HH22	1:E:111:ASP:CG	2.17	0.52
1:E:216:GLN:HE21	1:E:243:LYS:HZ2	1.53	0.52
1:F:193:LYS:CB	1:F:217:SER:HB3	2.40	0.52
1:A:201:PHE:HB2	1:A:208:ASP:OD2	2.10	0.52
1:E:228:ASN:HD22	1:E:244:ASN:HD22	1.55	0.52
1:A:113:ASP:HB2	1:A:167:ARG:NH2	2.25	0.52
1:E:100:ASP:O	1:E:101:CYS:HB2	2.10	0.52
1:A:193:LYS:CB	1:A:217:SER:OG	2.58	0.51
1:A:190:GLU:O	1:A:193:LYS:HD3	2.10	0.51
1:E:269:LYS:HD3	1:E:274:TYR:CZ	2.46	0.51
1:F:122:ARG:HD2	1:F:282:GLU:OE2	2.11	0.51
1:F:183:ARG:HG3	1:F:202:VAL:CG2	2.41	0.51
1:F:202:VAL:HG12	1:F:203:GLU:HG2	1.93	0.51
1:A:198:LEU:HD23	1:A:211:THR:HA	1.93	0.51
1:E:172:ASP:HB2	1:E:276:TYR:OH	2.10	0.51
1:D:75:THR:HG22	1:D:76:GLY:N	2.26	0.50
1:D:213:HIS:HE1	1:D:246:HIS:HA	1.76	0.50
1:E:151:GLY:O	1:E:155:ILE:HG13	2.11	0.50
1:F:173:PHE:CE1	1:F:256:ARG:HA	2.47	0.50
1:E:209:SER:HB2	1:E:268:TRP:CE2	2.46	0.50
1:E:240:TRP:CH2	1:E:250:LEU:HB2	2.47	0.50
1:E:279:LYS:HE3	5:E:1293:P4C:O10	2.12	0.50
1:C:201:PHE:CE1	1:C:202:VAL:O	2.65	0.49
1:B:72:PRO:HA	1:B:75:THR:HG21	1.93	0.49
1:C:188:ALA:O	1:C:194:TYR:HA	2.11	0.49
1:C:231:ASN:HD22	1:C:231:ASN:C	2.19	0.49
1:F:195:ASN:HD22	1:F:216:GLN:C	2.20	0.49
1:A:172:ASP:CG	1:A:174:GLU:OE1	2.55	0.49
1:A:198:LEU:HD21	1:A:210:LEU:HD23	1.87	0.49
1:F:244:ASN:N	1:F:245:CYS:HA	2.26	0.49
1:A:165:GLU:O	1:A:285:VAL:HA	2.12	0.49
1:D:208:ASP:OD2	1:D:211:THR:OG1	2.30	0.49
1:D:96:ILE:O	1:D:103:PRO:HA	2.13	0.49
1:B:75:THR:HG23	1:B:76:GLY:N	2.28	0.49
1:F:93:TRP:CD2	1:F:144:ARG:HD3	2.47	0.49
1:C:93:TRP:CD2	1:C:144:ARG:HD3	2.47	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:216:GLN:NE2	1:E:243:LYS:NZ	2.58	0.48
1:A:98:LEU:HD13	1:A:102:ARG:CZ	2.43	0.48
1:C:113:ASP:CA	6:C:2009:HOH:O	2.61	0.48
1:A:240:TRP:CH2	1:A:250:LEU:HB2	2.48	0.48
1:E:119:VAL:O	6:E:2008:HOH:O	2.20	0.48
1:C:236:PHE:HE2	1:C:245:CYS:SG	2.37	0.48
1:A:132:ARG:HH22	1:B:111:ASP:CG	2.21	0.48
1:B:156:HIS:CE1	1:B:189:ASP:HB3	2.49	0.48
1:D:132:ARG:NH2	1:E:111:ASP:OD1	2.40	0.48
1:F:237:GLN:HE22	1:F:264:ASN:ND2	2.06	0.48
1:D:272:LYS:HG3	1:D:278:TYR:CZ	2.48	0.48
1:F:104:LEU:HD23	1:F:105:THR:C	2.39	0.48
1:F:183:ARG:HG3	1:F:202:VAL:HG22	1.95	0.48
1:E:208:ASP:OD1	1:E:211:THR:HB	2.13	0.47
1:A:156:HIS:O	1:A:160:ALA:HB2	2.13	0.47
1:A:89:PHE:CE1	1:C:139:GLN:HB2	2.50	0.47
1:B:208:ASP:OD1	1:B:211:THR:CB	2.62	0.47
1:D:98:LEU:HD21	1:D:158:LEU:HD21	1.96	0.47
1:D:208:ASP:OD1	1:D:208:ASP:C	2.58	0.47
1:A:250:LEU:CA	6:A:2020:HOH:O	2.54	0.47
1:A:180:ALA:HB1	1:A:201:PHE:HE1	1.80	0.47
1:B:183:ARG:CG	1:B:183:ARG:NH1	2.52	0.47
1:D:213:HIS:CE1	1:D:246:HIS:HA	2.49	0.47
1:D:228:ASN:ND2	1:D:230:GLY:H	2.12	0.47
1:E:100:ASP:O	1:E:100:ASP:OD2	2.33	0.47
1:B:182:TYR:CE2	1:B:208:ASP:OD2	2.68	0.47
1:B:209:SER:HB2	1:B:268:TRP:CE2	2.50	0.47
1:E:98:LEU:HD12	1:E:102:ARG:HB3	1.96	0.47
1:D:98:LEU:HD21	1:D:158:LEU:HD23	1.85	0.47
1:B:117:TRP:CB	1:B:284:LYS:HG3	2.44	0.47
1:C:246:HIS:CD2	1:C:246:HIS:C	2.93	0.47
1:A:173:PHE:CZ	1:A:256:ARG:HA	2.49	0.46
6:B:2056:HOH:O	2:G:5:FUC:H3	2.15	0.46
1:D:145:LEU:HD21	1:E:93:TRP:HE1	1.80	0.46
1:C:240:TRP:CH2	1:C:250:LEU:HB2	2.51	0.46
1:A:144:ARG:NH2	1:B:94:HIS:NE2	2.64	0.46
1:C:174:GLU:O	1:C:175:ASP:HB2	2.16	0.46
1:A:98:LEU:O	1:A:99:PRO:C	2.59	0.46
1:F:222:ASP:OD1	1:F:222:ASP:N	2.40	0.46
1:F:265:GLY:H	1:F:267:ASN:ND2	2.14	0.46
1:A:166:LEU:HD23	1:A:185:PHE:CG	2.50	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:166:LEU:CD1	1:A:166:LEU:C	2.89	0.45
1:E:156:HIS:CE1	1:E:189:ASP:HB3	2.52	0.45
1:A:86:ARG:O	1:A:86:ARG:CG	2.64	0.45
1:C:165:GLU:HG3	1:C:288:ALA:HA	1.99	0.45
1:D:159:THR:O	1:D:160:ALA:C	2.59	0.45
1:F:231:ASN:C	1:F:231:ASN:HD22	2.24	0.45
1:B:144:ARG:NH2	1:C:94:HIS:NE2	2.65	0.45
1:D:133:ASP:HB2	1:D:222:ASP:OD2	2.16	0.45
1:D:172:ASP:HB2	1:D:276:TYR:OH	2.16	0.45
1:E:208:ASP:OD1	1:E:211:THR:CB	2.65	0.45
1:D:117:TRP:HB3	1:D:284:LYS:HB2	1.98	0.45
1:B:193:LYS:HE3	1:B:225:ASN:OD1	2.16	0.45
1:D:237:GLN:HE22	1:D:264:ASN:ND2	2.08	0.45
1:F:151:GLY:O	1:F:155:ILE:HG13	2.16	0.45
1:D:93:TRP:CZ2	1:D:144:ARG:HA	2.52	0.45
1:D:209:SER:CB	1:D:247:THR:HG22	2.41	0.45
1:F:193:LYS:HB2	1:F:217:SER:HB3	1.99	0.45
1:A:172:ASP:HB2	1:A:276:TYR:OH	2.18	0.44
1:A:180:ALA:HA	1:A:204:GLY:HA3	1.97	0.44
1:A:236:PHE:HE2	1:A:245:CYS:CB	2.30	0.44
1:B:77:PRO:HG3	1:B:83:LEU:HD21	1.98	0.44
1:D:167:ARG:O	1:D:284:LYS:HG2	2.16	0.44
1:A:266:ILE:CB	6:A:2020:HOH:O	2.61	0.44
1:A:179:PHE:O	1:A:180:ALA:HB2	2.17	0.44
1:B:228:ASN:ND2	1:B:244:ASN:ND2	2.57	0.44
1:E:182:TYR:CE2	1:E:208:ASP:OD2	2.71	0.44
1:B:269:LYS:NZ	6:B:2044:HOH:O	2.45	0.44
1:B:228:ASN:HB2	1:B:244:ASN:HD22	1.81	0.44
1:D:222:ASP:O	1:D:223:GLN:HG2	2.18	0.44
1:B:97:TYR:CE2	1:B:103:PRO:HB3	2.52	0.44
1:F:138:LYS:HE2	1:F:190:GLU:OE1	2.17	0.44
1:A:91:SER:O	1:C:144:ARG:HG3	2.17	0.44
1:A:243:LYS:C	1:A:245:CYS:HA	2.43	0.44
1:C:161:GLN:O	1:C:162:GLY:C	2.61	0.44
1:C:172:ASP:C	1:C:172:ASP:OD1	2.61	0.44
1:B:161:GLN:HE21	1:B:161:GLN:HB3	1.64	0.43
1:D:269:LYS:HD2	1:D:274:TYR:CE2	2.52	0.43
1:C:162:GLY:O	1:C:163:THR:CG2	2.65	0.43
1:E:78:ARG:HA	1:E:78:ARG:HD3	1.52	0.43
1:F:193:LYS:HB3	1:F:217:SER:HB3	2.00	0.43
1:A:219:SER:HB2	6:A:2016:HOH:O	2.17	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:168:THR:O	1:C:179:PHE:HA	2.19	0.43
1:F:93:TRP:CE3	1:F:144:ARG:HD3	2.53	0.43
1:C:100:ASP:O	1:C:101:CYS:CB	2.62	0.43
1:A:137:TYR:CZ	1:A:239:ALA:HB3	2.53	0.43
1:C:192:GLU:O	1:C:193:LYS:HB2	2.19	0.43
1:D:134:TRP:HA	1:D:220:THR:HG21	2.01	0.43
1:E:164:SER:O	1:E:184:SER:HA	2.19	0.43
1:E:169:ASP:OD1	1:E:284:LYS:NZ	2.43	0.43
1:A:182:TYR:HA	1:A:200:ALA:O	2.19	0.43
1:E:230:GLY:HA3	1:E:235:MET:CE	2.48	0.43
1:A:150:LEU:HD23	1:A:150:LEU:HA	1.85	0.43
1:A:174:GLU:N	1:A:174:GLU:CD	2.74	0.43
1:A:247:THR:HB	1:A:269:LYS:HB3	2.01	0.42
1:D:158:LEU:HD23	1:D:158:LEU:HA	1.82	0.42
1:A:120:PHE:CD1	1:A:155:ILE:HD13	2.54	0.42
1:B:269:LYS:HD2	1:B:274:TYR:CZ	2.54	0.42
1:C:98:LEU:HB3	1:C:99:PRO:HD2	2.00	0.42
5:E:1293:P4C:H62	5:E:1293:P4C:H32	1.70	0.42
1:A:215:ASN:HA	6:A:2012:HOH:O	2.18	0.42
1:D:99:PRO:HG2	1:D:100:ASP:H	1.84	0.42
1:B:182:TYR:HE2	1:B:208:ASP:OD2	2.01	0.42
1:A:112:THR:HG23	1:A:167:ARG:HH21	1.72	0.42
1:B:172:ASP:HB2	1:B:276:TYR:OH	2.20	0.42
1:B:279:LYS:HG2	1:B:280:VAL:HG23	2.00	0.42
1:E:169:ASP:OD2	1:E:177:TYR:OH	2.28	0.42
1:A:172:ASP:CG	1:A:176:ASN:HB2	2.45	0.42
1:E:202:VAL:HG12	1:E:203:GLU:HG3	2.02	0.42
1:C:279:LYS:CE	6:C:2051:HOH:O	2.64	0.42
1:A:167:ARG:HG2	1:A:181:LYS:HB3	2.02	0.41
1:D:104:LEU:HD13	1:D:106:VAL:CG1	2.50	0.41
1:D:165:GLU:HG2	1:D:286:ARG:O	2.20	0.41
1:B:109:ASP:OD1	1:B:109:ASP:C	2.63	0.41
1:A:212:PHE:O	1:A:243:LYS:NZ	2.36	0.41
1:A:231:ASN:ND2	1:A:233:ALA:HB3	2.33	0.41
1:D:228:ASN:HD22	1:D:230:GLY:N	2.14	0.41
1:A:164:SER:CB	1:A:287:PRO:HA	2.34	0.41
1:A:265:GLY:H	1:A:267:ASN:ND2	2.18	0.41
1:E:216:GLN:NE2	1:E:243:LYS:HZ1	2.13	0.41
1:A:236:PHE:CE2	1:A:245:CYS:SG	3.11	0.41
1:E:161:GLN:NE2	6:E:2022:HOH:O	2.53	0.41
1:F:112:THR:O	1:F:113:ASP:C	2.64	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:167:ARG:NH1	1:A:179:PHE:CD1	2.89	0.41
1:B:104:LEU:HD23	1:B:104:LEU:HA	1.93	0.41
1:C:93:TRP:CE3	1:C:144:ARG:HD3	2.55	0.41
1:C:112:THR:O	1:C:113:ASP:C	2.64	0.41
1:E:246:HIS:HE1	1:E:263:ALA:O	2.03	0.41
1:D:210:LEU:HD12	1:D:210:LEU:HA	1.82	0.41
1:A:197:VAL:HA	6:A:2012:HOH:O	2.20	0.40
1:A:231:ASN:C	1:A:231:ASN:HD22	2.29	0.40
1:E:112:THR:O	1:E:113:ASP:C	2.64	0.40
1:A:82:ASP:O	1:A:85:ASP:HB2	2.20	0.40
1:B:112:THR:O	1:B:113:ASP:C	2.64	0.40
1:B:258:THR:HA	1:B:275:ASN:O	2.21	0.40
1:A:93:TRP:HA	1:A:106:VAL:O	2.21	0.40
1:C:263:ALA:HA	1:C:267:ASN:ND2	2.36	0.40
1:E:182:TYR:HE2	1:E:208:ASP:OD2	2.04	0.40
1:F:172:ASP:OD2	1:F:176:ASN:HB2	2.22	0.40
1:B:165:GLU:H	1:B:165:GLU:HG2	1.68	0.40
1:B:172:ASP:OD1	1:B:172:ASP:C	2.65	0.40
1:F:246:HIS:CD2	1:F:246:HIS:C	2.99	0.40
1:F:251:ASN:HB2	6:F:2032:HOH:O	2.21	0.40
1:A:93:TRP:CD2	1:A:144:ARG:HD3	2.57	0.40
1:A:169:ASP:C	1:A:170:LEU:HD23	2.47	0.40
1:B:75:THR:HG23	1:B:76:GLY:H	1.85	0.40

There are no symmetry-related clashes.

5.3 Torsion angles [i](#)

5.3.1 Protein backbone [i](#)

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all 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	211/218 (97%)	185 (88%)	23 (11%)	3 (1%)	9	17
1	B	215/218 (99%)	197 (92%)	17 (8%)	1 (0%)	24	43

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	C	212/218 (97%)	193 (91%)	16 (8%)	3 (1%)	9	17
1	D	215/218 (99%)	193 (90%)	19 (9%)	3 (1%)	9	17
1	E	216/218 (99%)	200 (93%)	16 (7%)	0	100	100
1	F	212/218 (97%)	198 (93%)	13 (6%)	1 (0%)	24	43
All	All	1281/1308 (98%)	1166 (91%)	104 (8%)	11 (1%)	14	27

All (11) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	D	98	LEU
1	B	75	THR
1	C	162	GLY
1	C	204	GLY
1	A	180	ALA
1	D	99	PRO
1	A	160	ALA
1	C	160	ALA
1	D	160	ALA
1	F	161	GLN
1	A	99	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	178/183 (97%)	161 (90%)	17 (10%)	8	17
1	B	182/183 (100%)	167 (92%)	15 (8%)	10	23
1	C	179/183 (98%)	163 (91%)	16 (9%)	9	20
1	D	181/183 (99%)	165 (91%)	16 (9%)	9	20
1	E	182/183 (100%)	162 (89%)	20 (11%)	6	13
1	F	179/183 (98%)	162 (90%)	17 (10%)	8	17
All	All	1081/1098 (98%)	980 (91%)	101 (9%)	8	18

All (101) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	90	LEU
1	A	95	THR
1	A	104	LEU
1	A	124	VAL
1	A	145	LEU
1	A	150	LEU
1	A	164	SER
1	A	166	LEU
1	A	167	ARG
1	A	174	GLU
1	A	186	LYS
1	A	187	VAL
1	A	205	SER
1	A	223	GLN
1	A	227	LEU
1	A	231	ASN
1	A	281	SER
1	B	75	THR
1	B	90	LEU
1	B	95	THR
1	B	99	PRO
1	B	104	LEU
1	B	124	VAL
1	B	145	LEU
1	B	150	LEU
1	B	161	GLN
1	B	183	ARG
1	B	186	LYS
1	B	231	ASN
1	B	247	THR
1	B	250	LEU
1	B	284	LYS
1	C	90	LEU
1	C	95	THR
1	C	101	CYS
1	C	104	LEU
1	C	124	VAL
1	C	145	LEU
1	C	150	LEU
1	C	164	SER
1	C	183	ARG
1	C	193	LYS

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Mol	Chain	Res	Type
1	C	202	VAL
1	C	217	SER
1	C	237	GLN
1	C	250	LEU
1	C	279	LYS
1	C	281	SER
1	D	90	LEU
1	D	95	THR
1	D	104	LEU
1	D	105	THR
1	D	124	VAL
1	D	145	LEU
1	D	150	LEU
1	D	158	LEU
1	D	187	VAL
1	D	192	GLU
1	D	203	GLU
1	D	228	ASN
1	D	237	GLN
1	D	250	LEU
1	D	258	THR
1	D	281	SER
1	E	71	ASN
1	E	86	ARG
1	E	90	LEU
1	E	95	THR
1	E	100	ASP
1	E	104	LEU
1	E	124	VAL
1	E	145	LEU
1	E	150	LEU
1	E	161	GLN
1	E	186	LYS
1	E	187	VAL
1	E	203	GLU
1	E	205	SER
1	E	231	ASN
1	E	246	HIS
1	E	250	LEU
1	E	269	LYS
1	E	279	LYS
1	E	284	LYS

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Mol	Chain	Res	Type
1	F	78	ARG
1	F	90	LEU
1	F	95	THR
1	F	101	CYS
1	F	104	LEU
1	F	122	ARG
1	F	124	VAL
1	F	145	LEU
1	F	150	LEU
1	F	158	LEU
1	F	163	THR
1	F	164	SER
1	F	197	VAL
1	F	203	GLU
1	F	223	GLN
1	F	237	GLN
1	F	250	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (55) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	88	HIS
1	A	94	HIS
1	A	139	GLN
1	A	156	HIS
1	A	176	ASN
1	A	213	HIS
1	A	225	ASN
1	A	228	ASN
1	A	231	ASN
1	A	244	ASN
1	A	246	HIS
1	A	267	ASN
1	A	275	ASN
1	B	139	GLN
1	B	156	HIS
1	B	176	ASN
1	B	216	GLN
1	B	231	ASN
1	B	244	ASN
1	B	267	ASN
1	C	88	HIS

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Mol	Chain	Res	Type
1	C	139	GLN
1	C	156	HIS
1	C	178	GLN
1	C	195	ASN
1	C	216	GLN
1	C	231	ASN
1	C	237	GLN
1	C	244	ASN
1	C	246	HIS
1	C	267	ASN
1	C	275	ASN
1	D	139	GLN
1	D	156	HIS
1	D	216	GLN
1	D	228	ASN
1	D	237	GLN
1	D	244	ASN
1	D	267	ASN
1	D	275	ASN
1	E	139	GLN
1	E	156	HIS
1	E	161	GLN
1	E	216	GLN
1	E	231	ASN
1	E	237	GLN
1	E	244	ASN
1	E	246	HIS
1	E	267	ASN
1	F	139	GLN
1	F	156	HIS
1	F	195	ASN
1	F	231	ASN
1	F	237	GLN
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

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	NAG	G	1	2,1	14,14,15	0.68	0	17,19,21	1.33	1 (5%)
2	NAG	G	2	2	14,14,15	0.78	1 (7%)	17,19,21	1.42	2 (11%)
2	BMA	G	3	2	11,11,12	0.60	0	15,15,17	1.04	0
2	MAN	G	4	2	11,11,12	0.74	0	15,15,17	1.24	2 (13%)
2	FUC	G	5	2	10,10,11	0.74	0	14,14,16	1.17	1 (7%)
3	NAG	H	1	3,1	14,14,15	0.53	0	17,19,21	1.41	2 (11%)
3	NAG	H	2	3	14,14,15	0.37	0	17,19,21	1.25	1 (5%)
3	BMA	H	3	3	11,11,12	0.64	0	15,15,17	1.81	3 (20%)

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

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	G	2	NAG	O5-C1	-2.05	1.40	1.43

All (12) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	H	3	BMA	C2-C3-C4	3.79	117.53	110.86
3	H	1	NAG	C1-O5-C5	3.63	117.05	112.19
3	H	3	BMA	C3-C4-C5	3.57	116.71	110.23
3	H	2	NAG	C1-O5-C5	3.33	116.64	112.19
2	G	1	NAG	C3-C4-C5	-3.29	104.27	110.23
2	G	2	NAG	C2-N2-C7	-3.10	118.75	122.90
2	G	4	MAN	O2-C2-C3	-3.00	103.95	110.15
3	H	3	BMA	C1-C2-C3	2.92	113.89	109.64
3	H	1	NAG	C3-C4-C5	-2.46	105.78	110.23
2	G	2	NAG	C6-C5-C4	-2.30	107.37	113.02
2	G	5	FUC	C1-O5-C5	2.12	117.97	112.97
2	G	4	MAN	C2-C3-C4	-2.09	107.19	110.86

There are no chirality outliers.

All (5) torsion outliers are listed below:

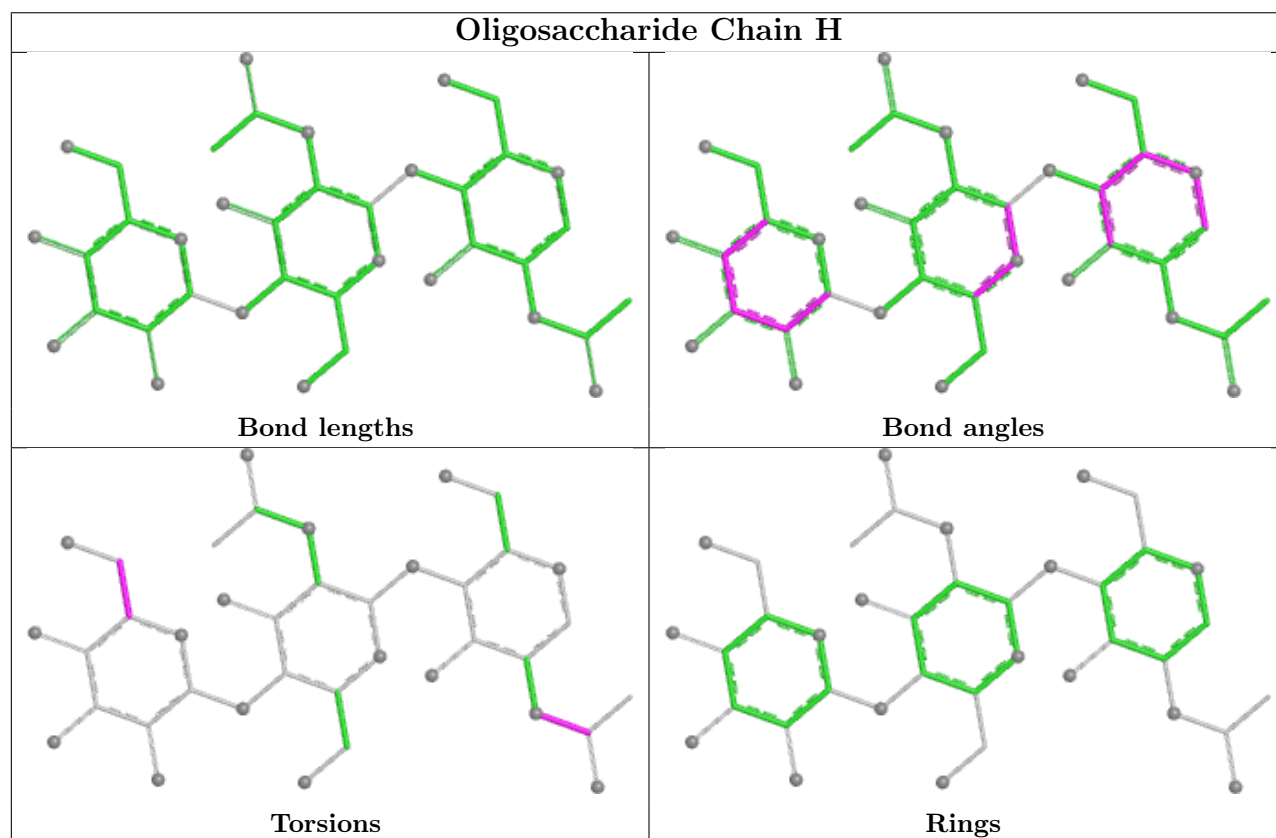
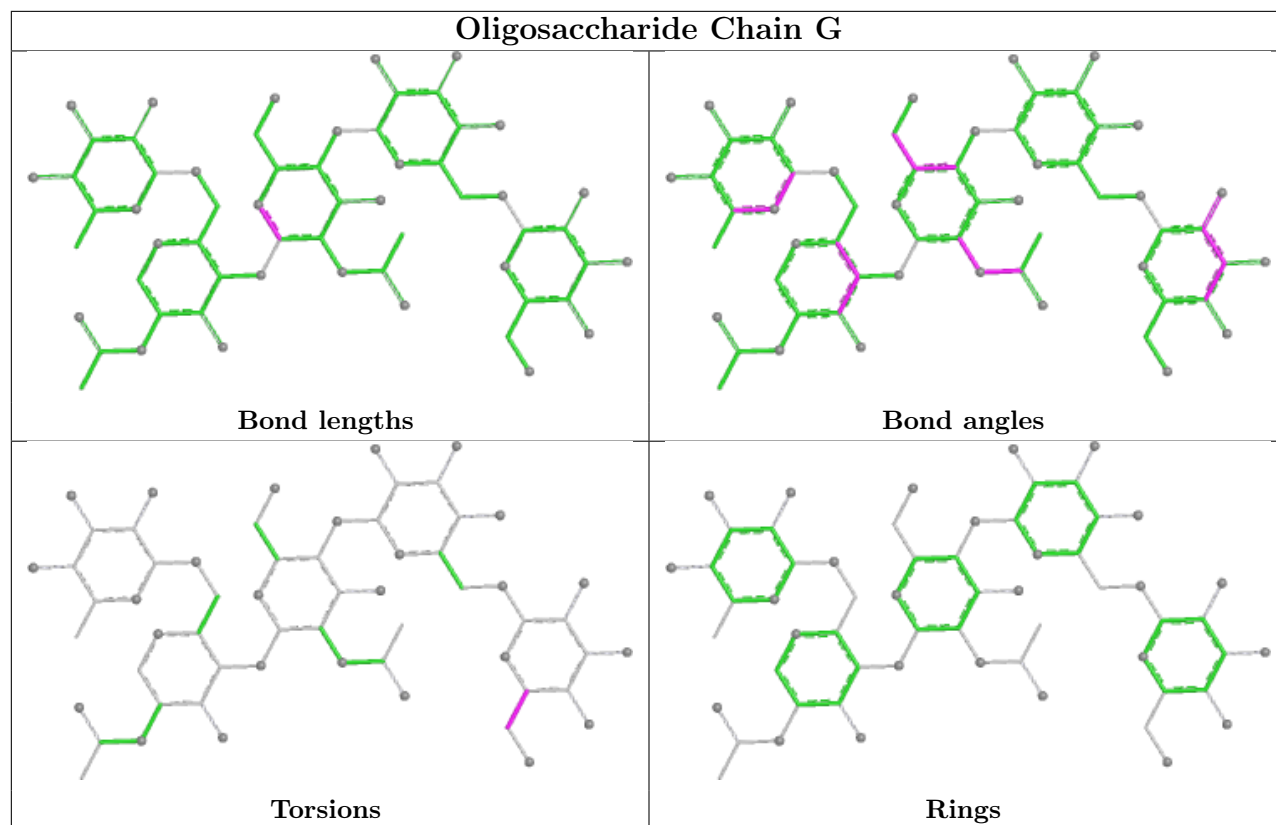
Mol	Chain	Res	Type	Atoms
3	H	3	BMA	C4-C5-C6-O6
3	H	3	BMA	O5-C5-C6-O6
3	H	1	NAG	C8-C7-N2-C2
3	H	1	NAG	O7-C7-N2-C2
2	G	4	MAN	C4-C5-C6-O6

There are no ring outliers.

1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	G	5	FUC	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

Of 7 ligands modelled in this entry, 6 are monoatomic - leaving 1 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	P4C	E	1293	-	21,21,21	2.39	4 (19%)	20,20,20	2.61	2 (10%)

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	P4C	E	1293	-	-	11/18/19/19	-

All (4) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	E	1293	P4C	O16-C17	8.51	1.78	1.42
5	E	1293	P4C	O22-C21	4.07	1.43	1.20
5	E	1293	P4C	O19-C20	3.51	1.56	1.42
5	E	1293	P4C	O1-C2	-3.46	1.24	1.42

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	E	1293	P4C	C17-O16-C15	10.45	158.99	113.26
5	E	1293	P4C	O16-C17-C18	-4.39	90.34	110.35

There are no chirality outliers.

All (11) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
5	E	1293	P4C	O10-C11-C12-O13
5	E	1293	P4C	C6-C5-O4-C3

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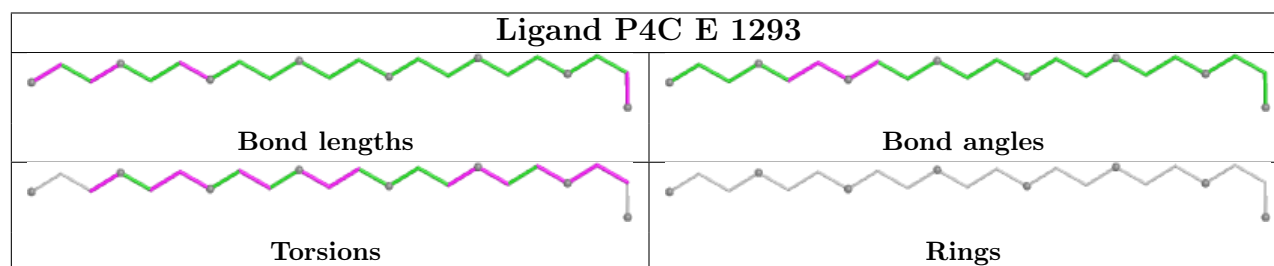
Mol	Chain	Res	Type	Atoms
5	E	1293	P4C	O16-C17-C18-O19
5	E	1293	P4C	O1-C2-C3-O4
5	E	1293	P4C	C21-C20-O19-C18
5	E	1293	P4C	C2-C3-O4-C5
5	E	1293	P4C	C9-C8-O7-C6
5	E	1293	P4C	O13-C14-C15-O16
5	E	1293	P4C	C5-C6-O7-C8
5	E	1293	P4C	C18-C17-O16-C15
5	E	1293	P4C	C11-C12-O13-C14

There are no ring outliers.

1 monomer is involved in 4 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	E	1293	P4C	4	0

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.



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 [i](#)

6.1 Protein, DNA and RNA chains [i](#)

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	213/218 (97%)	-1.59	0 100 100	20, 42, 71, 74	0
1	B	217/218 (99%)	-1.77	0 100 100	14, 30, 45, 52	0
1	C	213/218 (97%)	-1.75	0 100 100	11, 33, 49, 56	1 (0%)
1	D	217/218 (99%)	-1.71	0 100 100	20, 38, 59, 71	0
1	E	218/218 (100%)	-1.78	0 100 100	18, 31, 46, 59	1 (0%)
1	F	214/218 (98%)	-1.73	0 100 100	20, 34, 54, 66	0
All	All	1292/1308 (98%)	-1.72	0 100 100	11, 34, 60, 74	2 (0%)

There are no RSRZ outliers to report.

6.2 Non-standard residues in protein, DNA, RNA chains [i](#)

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

6.3 Carbohydrates [i](#)

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.

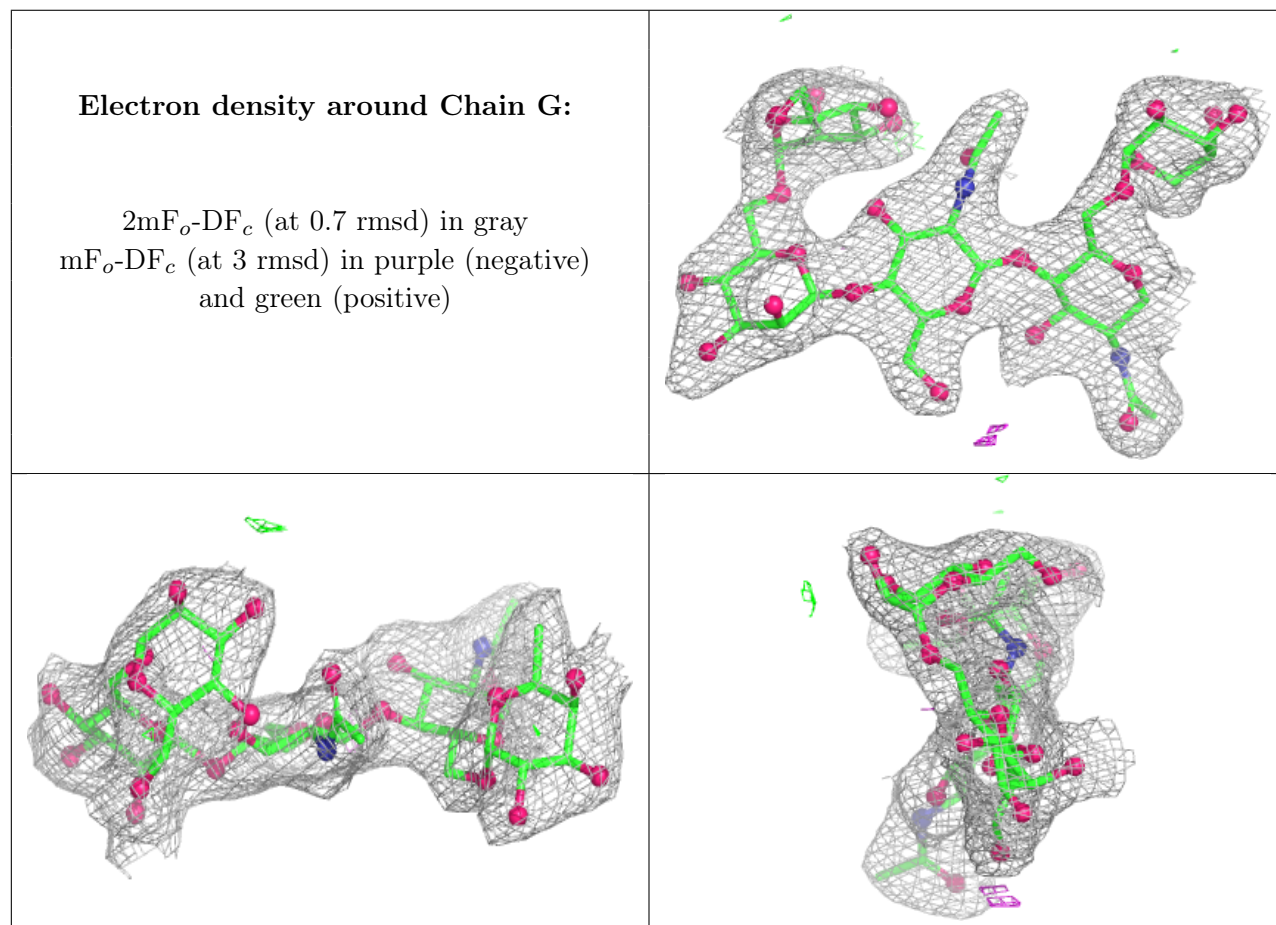
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
3	BMA	H	3	11/12	0.98	0.03	63,65,66,66	0
2	NAG	G	2	14/15	0.99	0.02	34,37,42,44	0
2	BMA	G	3	11/12	0.99	0.02	47,49,50,51	0
2	MAN	G	4	11/12	0.99	0.03	50,50,51,52	0
3	NAG	H	1	14/15	0.99	0.03	45,48,50,52	0
3	NAG	H	2	14/15	0.99	0.03	55,57,59,61	0

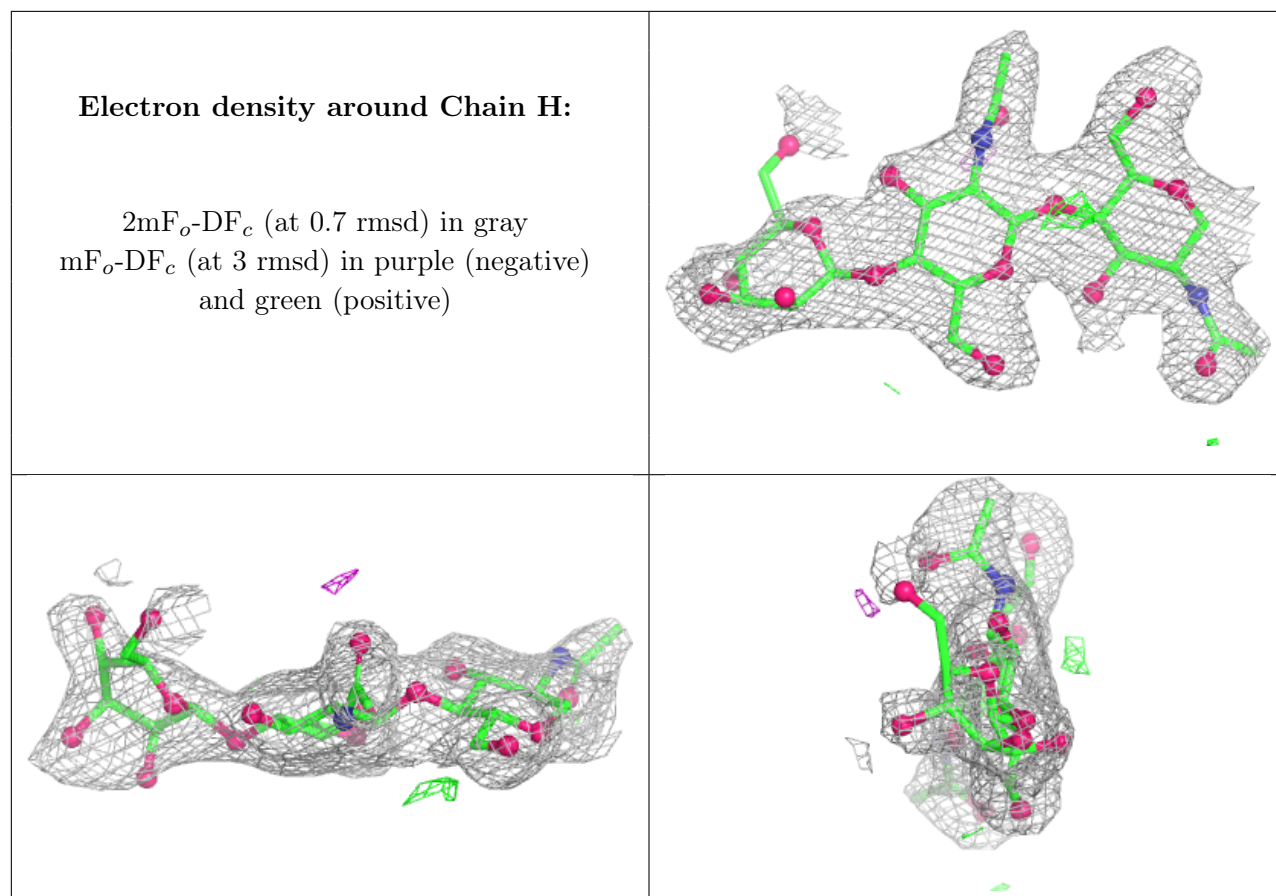
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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($\text{\AA}^2$)	Q<0.9
2	NAG	G	1	14/15	0.99	0.02	26,29,35,37	0
2	FUC	G	5	10/11	1.00	0.02	37,40,41,42	0

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.



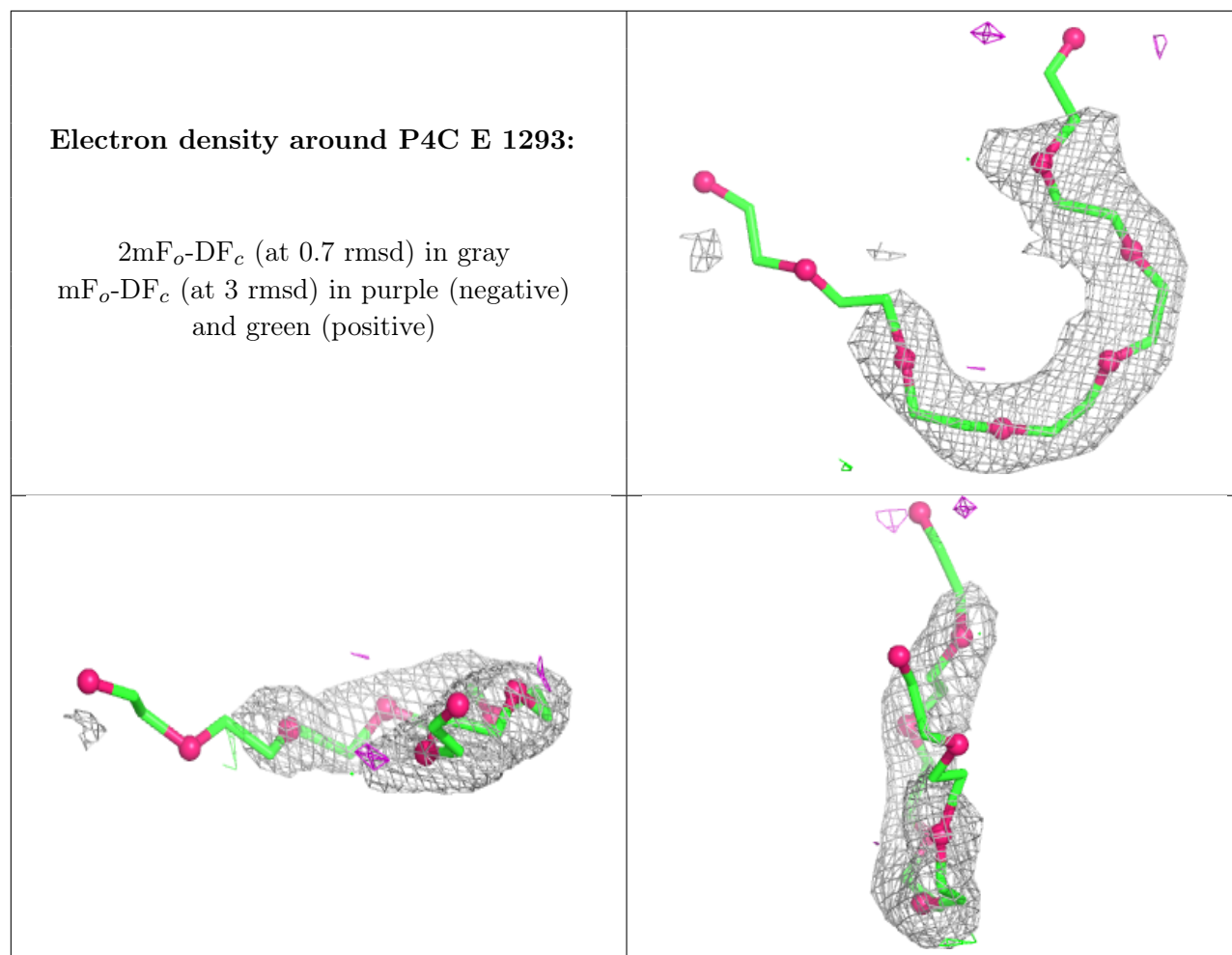


6.4 Ligands [i](#)

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	A	1289	1/1	0.99	0.02	76,76,76,76	0
4	CA	B	1289	1/1	0.99	0.03	36,36,36,36	0
5	P4C	E	1293	22/22	0.99	0.03	20,51,69,71	6
4	CA	D	1289	1/1	1.00	0.01	60,60,60,60	0
4	CA	E	1289	1/1	1.00	0.01	28,28,28,28	0
4	CA	F	1289	1/1	1.00	0.01	44,44,44,44	0
4	CA	C	1289	1/1	1.00	0.01	37,37,37,37	0

The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation to approximate a three-dimensional view.



6.5 Other polymers [i](#)

There are no such residues in this entry.