Full wwPDB X-ray Structure Validation Report ⓘ

Oct 12, 2024 – 09:39 AM EDT

PDB ID	:	5WDJ
Title	:	CRYSTAL STRUCTURE OF MYELOPEROXIDASE SUBFORM C (MPO) COMPLEX WITH COMPOUND-6 AKA 7-(BENZYLOXY)-1H-[1,2, 3]TRIAZOLO[4,5-D]PYRIMIDIN-5-AMINE
Authors	:	Khan, J.A.
Deposited on	:	2017-07-05
Resolution	:	2.40 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:

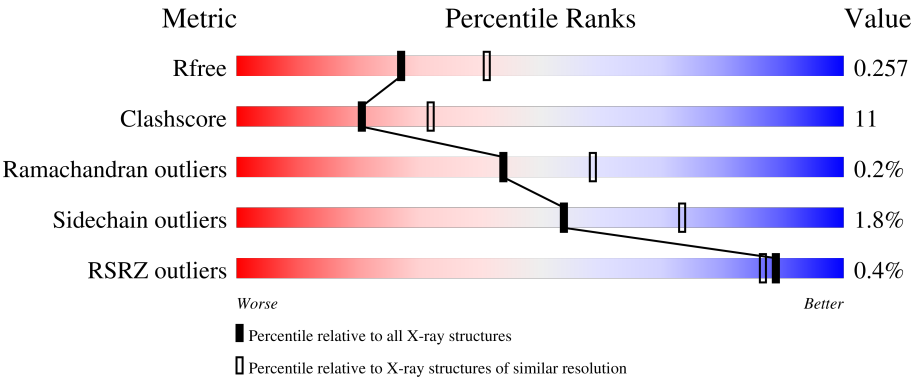
MolProbity	:	4.02b-467
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	1.20.1
EDS	:	3.0
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4	:	9.0.003 (Gargrove)
Density-Fitness	:	1.0.11
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.39

1 Overall quality at a glance (i)

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

The reported resolution of this entry is 2.40 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}	164625	4642 (2.40-2.40)
Clashscore	180529	5218 (2.40-2.40)
Ramachandran outliers	177936	5158 (2.40-2.40)
Sidechain outliers	177891	5159 (2.40-2.40)
RSRZ outliers	164620	4642 (2.40-2.40)

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	105	80% 18%
1	D	105	% 76% 22%
2	B	467	81% 17%
2	E	467	% 83% 16%

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Mol	Chain	Length	Quality of chain
3	C	3	100%
4	F	3	33% 67%

2 Entry composition

There are 12 unique types of molecules in this entry. The entry contains 9895 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 Myeloperoxidase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	104	Total	C	N	O	S	0	0	0
			825	522	146	152	5			
1	D	103	Total	C	N	O	S	0	0	0
			824	521	146	152	5			

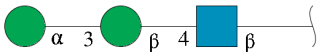
- Molecule 2 is a protein called Myeloperoxidase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	B	466	Total	C	N	O	S	0	0	0
			3696	2338	669	662	27			
2	E	465	Total	C	N	O	S	0	0	0
			3702	2338	675	662	27			

There are 2 discrepancies between the modelled and reference sequences:

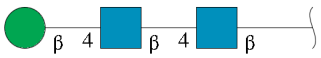
Chain	Residue	Modelled	Actual	Comment	Reference
B	112	ALA	-	expression tag	UNP P05164
E	112	ALA	-	expression tag	UNP P05164

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



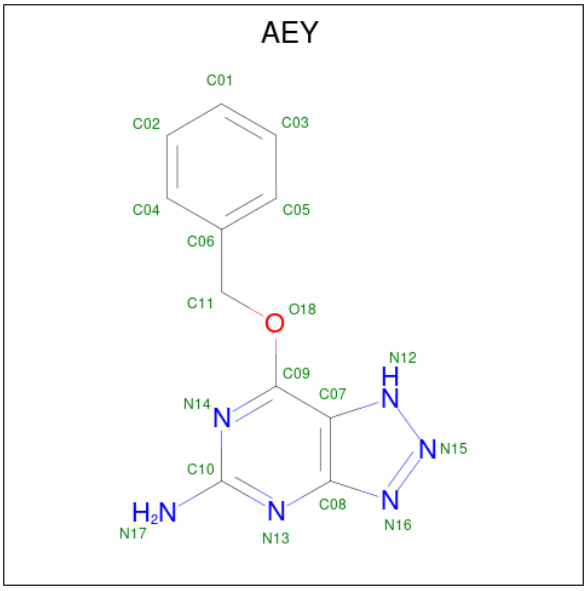
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
3	C	3	Total	C	N	O	0	0	0
			36	20	1	15			

- Molecule 4 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
4	F	3	Total C N O 39 22 2 15	0	0	0

- Molecule 5 is 7-(benzyloxy)-1H-[1,2,3]triazolo[4,5-d]pyrimidin-5-amine (three-letter code: AEY) (formula: $C_{11}H_{10}N_6O$).

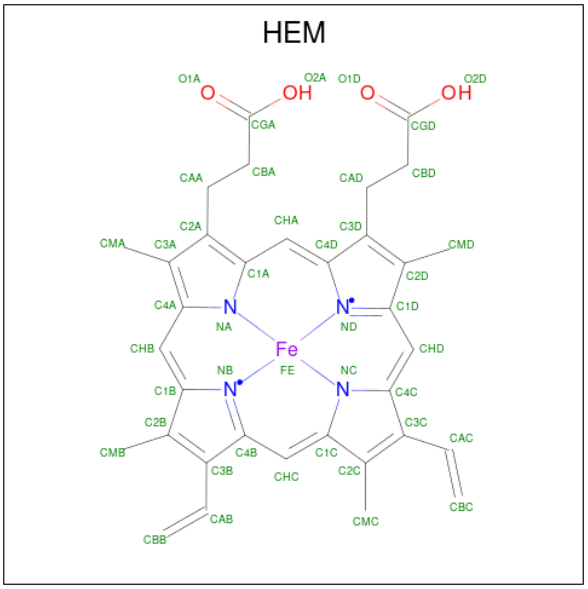


Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	A	1	Total C N O 18 11 6 1	0	0
5	E	1	Total C N O 18 11 6 1	0	0

- Molecule 6 is CHLORIDE ION (three-letter code: CL) (formula: Cl).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
6	A	1	Total Cl 1 1	0	0
6	B	1	Total Cl 1 1	0	0
6	D	1	Total Cl 1 1	0	0
6	E	1	Total Cl 1 1	0	0

- Molecule 7 is PROTOPORPHYRIN IX CONTAINING FE (three-letter code: HEM) (formula: $C_{34}H_{32}FeN_4O_4$).

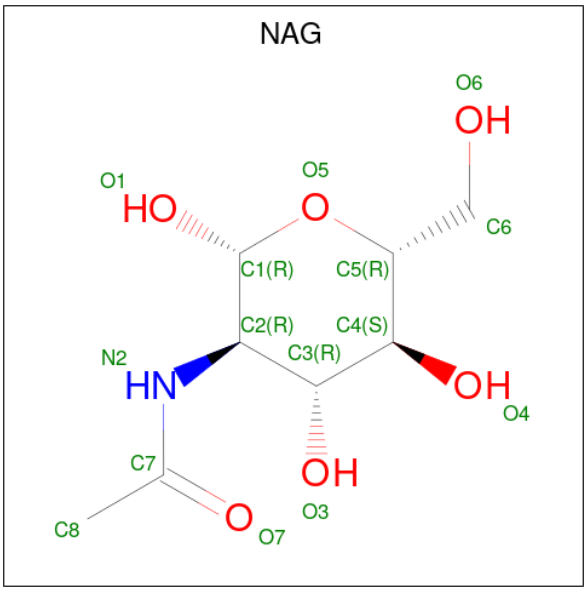


Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
7	A	1	Total	C	Fe	N	O	0	0
			43	34	1	4	4		
7	D	1	Total	C	Fe	N	O	0	0
			43	34	1	4	4		

- Molecule 8 is CALCIUM ION (three-letter code: CA) (formula: Ca).

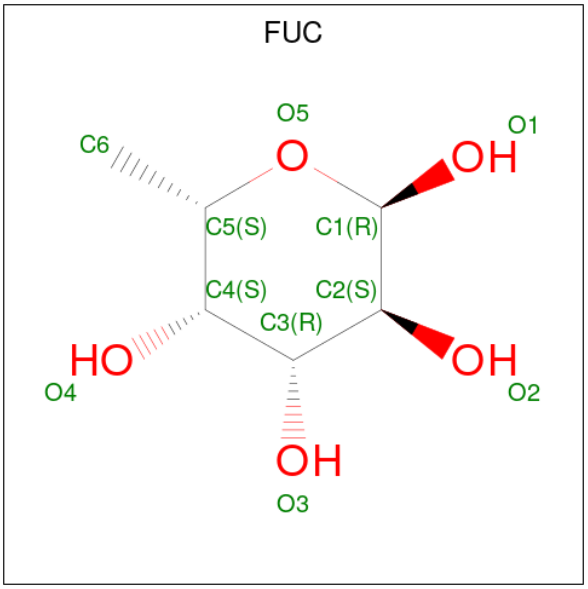
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
8	A	1	Total	Ca	0	0
			1	1		
8	D	1	Total	Ca	0	0
			1	1		

- Molecule 9 is 2-acetamido-2-deoxy-beta-D-glucopyranose (three-letter code: NAG) (formula: $C_8H_{15}NO_6$).



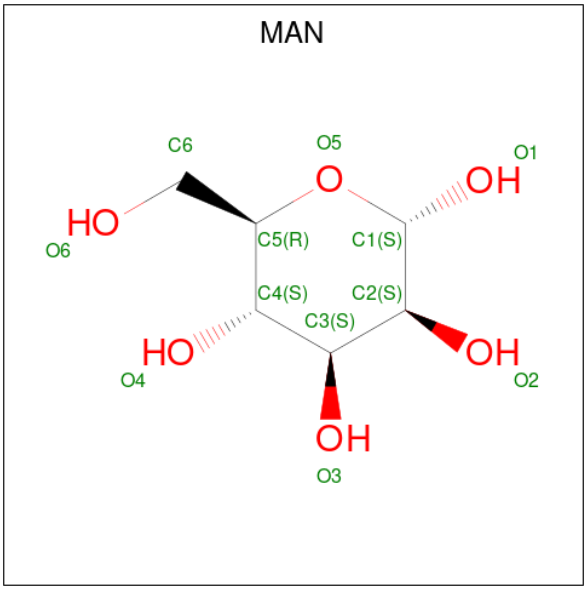
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
9	B	1	Total C N O 14 8 1 5	0	0
9	B	1	Total C N O 14 8 1 5	0	0
9	B	1	Total C N O 14 8 1 5	0	0
9	E	1	Total C N O 14 8 1 5	0	0
9	E	1	Total C N O 14 8 1 5	0	0

- Molecule 10 is alpha-L-fucopyranose (three-letter code: FUC) (formula: $C_6H_{12}O_5$).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
10	B	1	Total C O 10 6 4	0	0
10	E	1	Total C O 10 6 4	0	0

- Molecule 11 is alpha-D-mannopyranose (three-letter code: MAN) (formula: $C_6H_{12}O_6$).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
11	B	1	Total C O 11 6 5	0	0
11	B	1	Total C O 11 6 5	0	0
11	E	1	Total C O 11 6 5	0	0

- Molecule 12 is water.

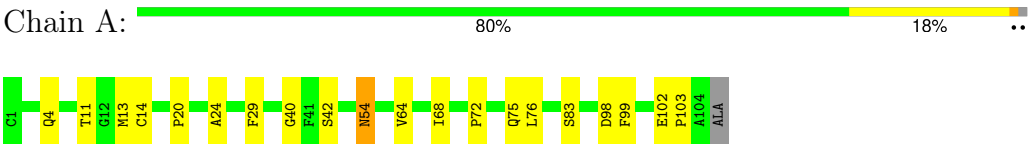
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
12	A	55	Total O 55 55	0	0
12	B	203	Total O 203 203	0	0
12	D	55	Total O 55 55	0	0
12	E	209	Total O 209 209	0	0

3 Residue-property plots (i)

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.

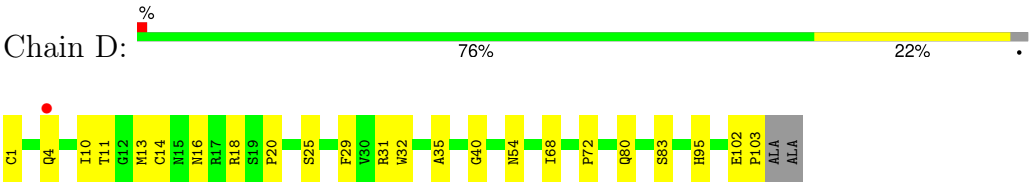
• Molecule 1: Myeloperoxidase

Chain A:



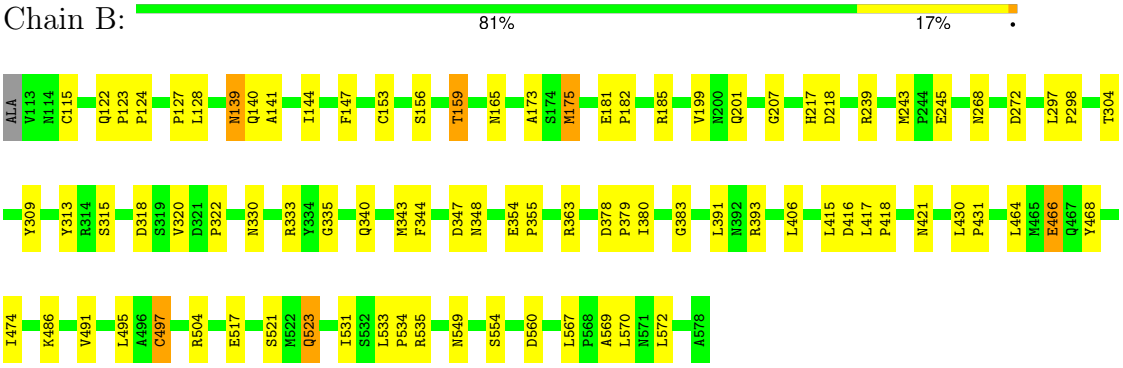
• Molecule 1: Myeloperoxidase

Chain D:



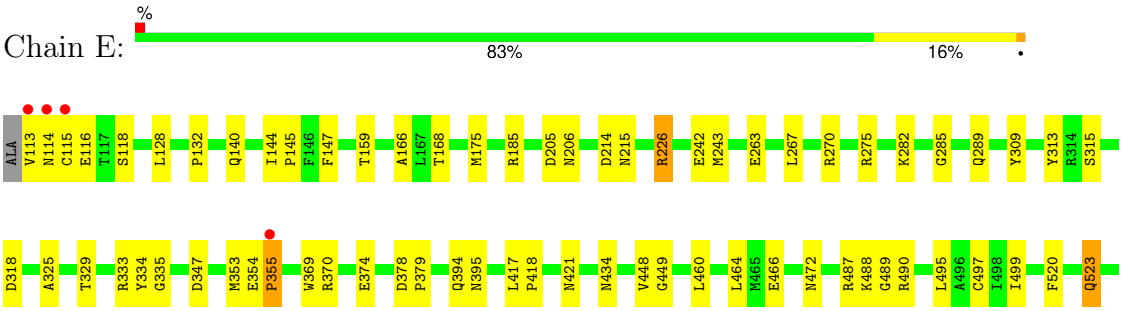
• Molecule 2: Myeloperoxidase

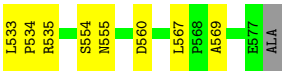
Chain B:



• Molecule 2: Myeloperoxidase

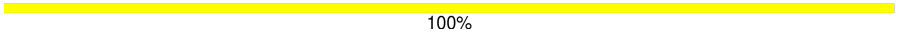
Chain E:





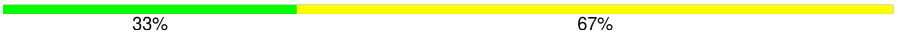
• Molecule 3: alpha-D-mannopyranose-(1-3)-beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain C:



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

Chain F:



4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 43 21 2	Depositor
Cell constants a, b, c, α, β, γ	103.92Å 103.92Å 242.28Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	95.51 – 2.40 95.51 – 2.40	Depositor EDS
% Data completeness (in resolution range)	99.5 (95.51-2.40) 99.6 (95.51-2.40)	Depositor EDS
R_{merge}	0.11	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	3.23 (at 2.39Å)	Xtriage
Refinement program	BUSTER	Depositor
R, R_{free}	0.194 , 0.248 0.212 , 0.257	Depositor DCC
R_{free} test set	2681 reflections (5.08%)	wwPDB-VP
Wilson B-factor (Å^2)	34.8	Xtriage
Anisotropy	0.004	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.30 , 23.1	EDS
L-test for twinning[2]	$< \|L\| > = 0.50$, $< L^2 > = 0.33$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.93	EDS
Total number of atoms	9895	wwPDB-VP
Average B, all atoms (Å^2)	24.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.74% of the height of the origin peak. No significant pseudotranslation is detected.*

[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: CA, BMA, MAN, HEM, CL, NAG, FUC, CSO, AEY

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	0.33	0/850	0.52	0/1160
1	D	0.33	0/849	0.52	0/1158
2	B	0.34	0/3774	0.49	0/5120
2	E	0.34	0/3780	0.49	0/5129
All	All	0.34	0/9253	0.50	0/12567

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	825	0	777	18	0
1	D	824	0	778	20	0
2	B	3696	0	3666	82	0
2	E	3702	0	3678	76	0
3	C	36	0	29	4	0
4	F	39	0	32	3	0
5	A	18	0	0	0	0
5	E	18	0	0	1	0
6	A	1	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
6	B	1	0	0	0	0
6	D	1	0	0	0	0
6	E	1	0	0	0	0
7	A	43	0	30	13	0
7	D	43	0	30	16	0
8	A	1	0	0	0	0
8	D	1	0	0	0	0
9	B	42	0	39	7	0
9	E	28	0	26	0	0
10	B	10	0	9	1	0
10	E	10	0	9	0	0
11	B	22	0	18	3	0
11	E	11	0	10	1	0
12	A	55	0	0	4	0
12	B	203	0	0	25	0
12	D	55	0	0	5	0
12	E	209	0	0	16	0
All	All	9895	0	9131	204	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 11.

All (204) 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)
7:A:203:HEM:HBB1	2:B:243:MET:SD	1.39	1.59
7:D:201:HEM:HBB1	2:E:243:MET:SD	1.44	1.55
2:E:113:VAL:CB	2:E:114:ASN:HA	1.20	1.50
7:D:201:HEM:CMB	2:E:242:GLU:OE2	1.63	1.42
9:B:601:NAG:O6	10:B:602:FUC:C1	1.69	1.38
7:A:203:HEM:CBB	2:B:243:MET:SD	2.12	1.37
7:D:201:HEM:CBB	2:E:243:MET:SD	2.20	1.29
9:B:601:NAG:O4	3:C:1:NAG:C1	1.79	1.29
2:E:113:VAL:CB	2:E:114:ASN:CA	2.11	1.26
7:A:203:HEM:HBB1	2:B:243:MET:CE	1.71	1.20
7:D:201:HEM:HMB1	2:E:242:GLU:OE2	1.00	1.17
11:B:605:MAN:C1	4:F:3:BMA:O3	1.91	1.16
2:E:118:SER:N	12:E:701:HOH:O	1.80	1.12
1:D:72:PRO:HD3	12:D:351:HOH:O	1.47	1.12
1:A:4:GLN:CB	12:A:354:HOH:O	1.95	1.11
2:B:363:ARG:HG2	12:B:882:HOH:O	0.91	1.08

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
7:D:201:HEM:HBB2	7:D:201:HEM:HMB2	1.45	0.99
2:B:304:THR:CB	12:B:707:HOH:O	2.12	0.96
9:B:601:NAG:C4	3:C:1:NAG:C1	2.46	0.94
2:B:304:THR:HB	12:B:707:HOH:O	1.68	0.93
7:D:201:HEM:HMB2	2:E:242:GLU:OE2	1.67	0.93
2:E:115:CYS:HB2	2:E:147:PHE:CZ	2.07	0.90
2:B:549:ASN:HB3	12:B:889:HOH:O	1.74	0.87
2:B:217:HIS:HB2	12:B:890:HOH:O	1.76	0.85
2:B:333:ARG:HH11	2:B:421:ASN:ND2	1.75	0.85
2:B:535:ARG:HD3	2:B:569:ALA:HA	1.60	0.84
2:B:159:THR:CG2	12:B:813:HOH:O	2.25	0.84
2:E:114:ASN:O	12:E:701:HOH:O	1.95	0.84
9:B:601:NAG:HO4	3:C:1:NAG:C1	1.91	0.83
7:D:201:HEM:HBB1	2:E:243:MET:CE	2.09	0.82
7:D:201:HEM:HBC2	7:D:201:HEM:HMC1	1.62	0.81
2:E:270:ARG:HH11	2:E:270:ARG:CB	1.93	0.80
7:A:203:HEM:HMB1	7:A:203:HEM:HBB2	1.65	0.79
2:B:391:LEU:HD23	2:B:393:ARG:HD2	1.64	0.79
2:B:466:GLU:HG2	12:B:835:HOH:O	1.81	0.78
2:E:118:SER:HA	12:E:710:HOH:O	1.84	0.77
2:E:226:ARG:NH2	12:E:703:HOH:O	2.06	0.77
2:B:185:ARG:HD2	12:B:896:HOH:O	1.85	0.76
2:E:354:GLU:OE1	2:E:355:PRO:O	2.03	0.76
2:E:226:ARG:NE	12:E:703:HOH:O	2.16	0.75
7:D:201:HEM:CMB	2:E:242:GLU:CD	2.56	0.74
7:A:203:HEM:HBB2	7:A:203:HEM:CMB	2.19	0.73
2:B:139:ASN:ND2	2:B:141:ALA:H	1.87	0.71
2:B:333:ARG:HH11	2:B:421:ASN:HD22	1.36	0.71
2:E:270:ARG:HB2	2:E:270:ARG:NH1	2.08	0.69
2:E:118:SER:CB	12:E:701:HOH:O	2.41	0.68
2:E:275:ARG:HD3	12:E:895:HOH:O	1.93	0.68
7:A:203:HEM:HMC2	7:A:203:HEM:HBC2	1.74	0.68
1:A:68:ILE:HD13	2:B:464:LEU:HD23	1.76	0.68
2:E:554:SER:HB3	2:E:560:ASP:HB3	1.76	0.68
2:E:270:ARG:HH11	2:E:270:ARG:HB2	1.59	0.66
2:E:214:ASP:OD1	2:E:215:ASN:N	2.27	0.65
2:B:531:ILE:HD12	2:B:531:ILE:C	2.17	0.65
7:D:201:HEM:HBC2	7:D:201:HEM:CMC	2.26	0.64
2:E:263:GLU:O	2:E:267:LEU:HD23	1.99	0.62
7:A:203:HEM:CAB	2:B:243:MET:SD	2.85	0.62
2:E:333:ARG:HH11	2:E:421:ASN:ND2	1.98	0.62

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:521:SER:OG	2:B:523:GLN:HG2	1.99	0.61
11:B:605:MAN:C1	4:F:3:BMA:C3	2.78	0.61
2:B:363:ARG:CG	12:B:882:HOH:O	1.75	0.61
2:E:555:ASN:O	12:E:705:HOH:O	2.16	0.61
1:A:29:PHE:CE1	2:B:165:ASN:HB2	2.36	0.61
9:B:601:NAG:H4	3:C:1:NAG:C1	2.29	0.61
2:E:333:ARG:HH11	2:E:421:ASN:HD22	1.49	0.61
2:B:340:GLN:N	12:B:710:HOH:O	2.34	0.60
11:E:604:MAN:O2	12:E:702:HOH:O	1.95	0.60
2:B:140:GLN:HG3	12:B:886:HOH:O	2.00	0.60
2:B:416:ASP:OD1	2:B:418:PRO:HD2	2.01	0.60
2:E:115:CYS:HB2	2:E:147:PHE:CE2	2.36	0.60
7:A:203:HEM:CBB	2:B:243:MET:CE	2.63	0.60
7:A:203:HEM:HBB1	2:B:243:MET:HE3	1.78	0.60
2:E:226:ARG:CZ	12:E:703:HOH:O	2.41	0.60
2:B:406:LEU:HB3	2:B:415:LEU:HB2	1.83	0.59
7:D:201:HEM:HMB2	2:E:242:GLU:CD	2.20	0.59
2:B:378:ASP:HB2	2:B:379:PRO:HD3	1.85	0.58
2:E:140:GLN:O	12:E:706:HOH:O	2.17	0.58
11:B:605:MAN:C2	4:F:3:BMA:O3	2.52	0.58
1:A:13:MET:O	1:A:14:CYS:HB2	2.04	0.58
2:B:348:ASN:CG	12:B:701:HOH:O	2.41	0.58
2:E:495:LEU:O	2:E:499:ILE:HG13	2.03	0.58
2:E:347:ASP:HB3	2:E:353:MET:HG3	1.86	0.57
7:A:203:HEM:HBC2	7:A:203:HEM:CMC	2.35	0.56
2:B:354:GLU:OE1	2:B:355:PRO:HA	2.06	0.56
2:E:270:ARG:CB	2:E:270:ARG:NH1	2.64	0.56
1:A:98:ASP:OD2	7:A:203:HEM:HBD1	2.05	0.56
2:B:181:GLU:HB2	2:B:182:PRO:HD3	1.87	0.56
2:B:304:THR:HG21	12:B:707:HOH:O	2.06	0.55
2:E:116:GLU:OE2	2:E:147:PHE:HZ	1.89	0.55
2:E:115:CYS:HB2	2:E:147:PHE:CE1	2.41	0.55
2:E:270:ARG:HH11	2:E:270:ARG:HB3	1.69	0.55
7:D:201:HEM:CMB	7:D:201:HEM:HBB2	2.27	0.54
1:A:64:VAL:HG13	1:A:68:ILE:HD12	1.87	0.54
2:B:468:TYR:CD2	2:B:474:ILE:HG12	2.43	0.54
2:B:330:ASN:O	2:B:333:ARG:HB2	2.08	0.54
2:B:173:ALA:HA	2:B:175:MET:SD	2.48	0.53
1:D:68:ILE:CD1	2:E:464:LEU:HD23	2.38	0.53
2:B:417:LEU:HB3	2:B:418:PRO:HD3	1.90	0.53
2:E:118:SER:HB2	12:E:701:HOH:O	2.03	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:159:THR:HG21	12:B:813:HOH:O	1.98	0.53
2:B:207:GLY:N	12:B:705:HOH:O	2.28	0.53
2:B:304:THR:CG2	12:B:707:HOH:O	2.48	0.53
1:A:83:SER:HB3	2:B:554:SER:O	2.09	0.52
2:B:533:LEU:N	2:B:534:PRO:CD	2.73	0.52
2:B:115:CYS:HB2	2:B:147:PHE:CZ	2.45	0.52
2:B:491:VAL:HB	2:B:495:LEU:HB2	1.92	0.52
2:E:448:VAL:HG13	2:E:449:GLY:N	2.25	0.51
2:B:517:GLU:HB2	12:B:827:HOH:O	2.10	0.51
2:E:395:ASN:HB3	12:E:899:HOH:O	2.11	0.51
1:D:102:GLU:HB2	1:D:103:PRO:HD2	1.92	0.51
2:E:533:LEU:HB3	2:E:534:PRO:HD3	1.93	0.50
2:B:333:ARG:NH1	2:B:421:ASN:HD22	2.04	0.50
1:D:95:HIS:NE2	5:E:611:AEY:N16	2.59	0.50
2:E:417:LEU:HB3	2:E:418:PRO:HD3	1.93	0.50
7:A:203:HEM:CBB	7:A:203:HEM:HMB1	2.38	0.50
1:D:83:SER:HB3	2:E:554:SER:O	2.12	0.50
2:E:313:TYR:CZ	2:E:315:SER:HA	2.47	0.50
2:B:313:TYR:CZ	2:B:315:SER:HA	2.47	0.49
1:A:72:PRO:HB2	1:A:75:GLN:HG2	1.95	0.49
2:B:570:LEU:HD21	2:B:572:LEU:HD21	1.95	0.49
2:E:114:ASN:OD1	2:E:116:GLU:OE1	2.29	0.49
1:A:40:GLY:HA2	12:A:323:HOH:O	2.11	0.49
1:D:72:PRO:CG	12:D:351:HOH:O	2.59	0.49
1:A:68:ILE:HD13	2:B:464:LEU:CD2	2.42	0.48
2:B:466:GLU:CG	12:B:835:HOH:O	2.48	0.48
2:B:554:SER:HB3	2:B:560:ASP:HB3	1.96	0.48
2:E:118:SER:CA	12:E:710:HOH:O	2.51	0.48
2:B:199:VAL:O	2:B:201:GLN:NE2	2.47	0.47
2:B:272:ASP:OD1	2:B:272:ASP:C	2.53	0.47
1:D:40:GLY:HA2	12:D:325:HOH:O	2.13	0.47
2:E:205:ASP:O	2:E:206:ASN:C	2.53	0.47
2:B:127:PRO:HG2	12:B:849:HOH:O	2.13	0.47
1:D:11:THR:O	2:E:168:THR:HG22	2.15	0.47
1:D:13:MET:O	1:D:14:CYS:HB2	2.14	0.47
1:A:68:ILE:CD1	2:B:464:LEU:HD23	2.44	0.47
1:D:72:PRO:CD	12:D:351:HOH:O	2.26	0.47
1:D:1:CYS:SG	1:D:20:PRO:HB3	2.55	0.46
2:E:378:ASP:HB2	2:E:379:PRO:HD3	1.98	0.46
2:E:487:ARG:HG2	2:E:488:LYS:HG3	1.98	0.46
7:D:201:HEM:CAB	2:E:243:MET:SD	2.94	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
7:A:203:HEM:CBC	2:B:335:GLY:HA3	2.45	0.46
2:E:370:ARG:O	2:E:374:GLU:HB2	2.16	0.46
2:B:139:ASN:C	2:B:139:ASN:HD22	2.18	0.46
7:D:201:HEM:CBB	7:D:201:HEM:HMB2	2.31	0.45
1:D:25:SER:HB2	2:E:166:ALA:O	2.16	0.45
2:B:139:ASN:HD22	2:B:140:GLN:N	2.15	0.45
2:B:297:LEU:N	2:B:298:PRO:CD	2.80	0.45
2:B:380:ILE:HG23	12:B:760:HOH:O	2.17	0.44
1:D:18:ARG:HB2	12:D:316:HOH:O	2.17	0.44
2:E:115:CYS:SG	2:E:147:PHE:CD2	3.11	0.44
2:E:535:ARG:HD3	2:E:569:ALA:HA	1.99	0.44
2:B:128:LEU:HB2	2:B:144:ILE:HB	1.99	0.44
2:B:320:VAL:O	2:B:322:PRO:HD3	2.17	0.44
1:D:32:TRP:CE2	2:E:325:ALA:HB2	2.52	0.44
2:B:123:PRO:HA	2:B:124:PRO:HA	1.78	0.44
7:D:201:HEM:HMC1	7:D:201:HEM:CBC	2.39	0.44
2:E:533:LEU:N	2:E:534:PRO:CD	2.81	0.44
2:B:122:GLN:O	2:B:123:PRO:C	2.56	0.43
2:B:268:ASN:C	12:B:715:HOH:O	2.55	0.43
1:A:76:LEU:C	1:A:76:LEU:HD23	2.39	0.43
2:B:309:TYR:O	2:B:504:ARG:HD2	2.19	0.43
2:E:333:ARG:HD3	2:E:421:ASN:ND2	2.34	0.43
1:A:11:THR:HG23	12:A:321:HOH:O	2.19	0.42
9:B:601:NAG:N2	12:B:703:HOH:O	2.24	0.42
2:E:128:LEU:HD12	2:E:128:LEU:N	2.35	0.42
2:E:132:PRO:HA	2:E:140:GLN:OE1	2.19	0.42
2:B:313:TYR:CE2	2:B:315:SER:HA	2.55	0.42
2:E:394:GLN:HB3	2:E:460:LEU:HD22	2.01	0.42
1:D:10:ILE:HD13	1:D:10:ILE:HA	1.89	0.42
2:E:282:LYS:HG2	2:E:520:PHE:CZ	2.54	0.42
2:B:486:LYS:HG3	2:B:491:VAL:O	2.20	0.42
1:A:102:GLU:HB2	1:A:103:PRO:CD	2.50	0.42
2:E:185:ARG:HD2	12:E:858:HOH:O	2.18	0.42
1:A:54:ASN:HA	12:A:351:HOH:O	2.19	0.42
7:D:201:HEM:HBB1	2:E:243:MET:HE3	1.94	0.42
1:A:11:THR:O	1:A:24:ALA:HA	2.20	0.42
2:B:201:GLN:NE2	9:B:603:NAG:C7	2.83	0.42
2:B:347:ASP:HB2	12:B:701:HOH:O	2.19	0.42
2:B:333:ARG:NH1	2:B:421:ASN:ND2	2.55	0.42
1:D:102:GLU:HB2	1:D:103:PRO:CD	2.50	0.42
2:B:245:GLU:OE2	2:B:343:MET:HG3	2.19	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:E:144:ILE:HA	2:E:145:PRO:HD3	1.92	0.41
2:E:523:GLN:CD	2:E:523:GLN:H	2.22	0.41
2:B:333:ARG:HD3	2:B:421:ASN:ND2	2.36	0.41
1:D:16:ASN:O	1:D:20:PRO:HA	2.19	0.41
2:E:285:GLY:O	2:E:289:GLN:HG3	2.21	0.41
2:E:334:TYR:CG	2:E:335:GLY:N	2.88	0.41
2:E:369:TRP:N	12:E:747:HOH:O	2.53	0.41
1:D:29:PHE:CZ	2:E:329:THR:HG21	2.55	0.41
1:A:99:PHE:HB2	2:B:239:ARG:NH2	2.35	0.41
2:B:153:CYS:SG	2:B:156:SER:HB2	2.61	0.41
2:B:344:PHE:O	2:B:383:GLY:HA3	2.21	0.41
1:D:31:ARG:CZ	1:D:35:ALA:HB2	2.51	0.41
2:E:434:ASN:HB2	2:E:472:ASN:HA	2.03	0.41
2:E:489:GLY:O	2:E:490:ARG:HD3	2.21	0.41
2:B:486:LYS:HB3	2:B:486:LYS:HE2	1.85	0.41
2:E:309:TYR:CZ	2:E:497:CYS:HA	2.56	0.41
2:B:430:LEU:HA	2:B:431:PRO:HD3	1.96	0.40
2:E:535:ARG:NH1	2:E:567:LEU:O	2.54	0.40
1:A:20:PRO:HD2	1:D:40:GLY:HA2	2.02	0.40
2:B:348:ASN:CB	12:B:701:HOH:O	2.69	0.40
2:B:309:TYR:CZ	2:B:497:CYS:HA	2.57	0.40
2:B:378:ASP:HB2	12:B:782:HOH:O	2.20	0.40
2:B:535:ARG:NH1	2:B:567:LEU:O	2.54	0.40
2:E:115:CYS:SG	2:E:147:PHE:CE2	3.14	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	102/105 (97%)	95 (93%)	6 (6%)	1 (1%)	13 20

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
1	D	101/105 (96%)	97 (96%)	4 (4%)	0	100 100
2	B	463/467 (99%)	444 (96%)	19 (4%)	0	100 100
2	E	462/467 (99%)	444 (96%)	17 (4%)	1 (0%)	44 59
All	All	1128/1144 (99%)	1080 (96%)	46 (4%)	2 (0%)	44 59

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	42	SER
2	E	355	PRO

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	87/90 (97%)	86 (99%)	1 (1%)	70 84
1	D	88/90 (98%)	85 (97%)	3 (3%)	32 52
2	B	399/410 (97%)	391 (98%)	8 (2%)	50 70
2	E	403/410 (98%)	397 (98%)	6 (2%)	60 77
All	All	977/1000 (98%)	959 (98%)	18 (2%)	54 73

All (18) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	54	ASN
2	B	139	ASN
2	B	159	THR
2	B	175	MET
2	B	218	ASP
2	B	318	ASP
2	B	466	GLU
2	B	497	CYS
2	B	523	GLN

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Mol	Chain	Res	Type
1	D	4	GLN
1	D	54	ASN
1	D	80	GLN
2	E	159	THR
2	E	175	MET
2	E	226	ARG
2	E	318	ASP
2	E	466	GLU
2	E	523	GLN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (9) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	54	ASN
2	B	139	ASN
2	B	421	ASN
2	B	549	ASN
1	D	54	ASN
1	D	88	GLN
1	D	91	GLN
2	E	421	ASN
2	E	549	ASN

5.3.3 RNA

There are no RNA molecules in this entry.

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

2 non-standard protein/DNA/RNA residues 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	CSO	B	150	2	3,6,7	0.58	0	1,6,8	0.72	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\|>2$	Counts	RMSZ	$\#\|Z\|>2$
2	CSO	E	150	2	3,6,7	0.91	0	1,6,8	1.42	0

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	CSO	B	150	2	-	0/1/5/7	-
2	CSO	E	150	2	-	0/1/5/7	-

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

5.5 Carbohydrates (i)

6 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	$\#\|Z\|>2$
3	NAG	C	1	3	14,14,15	0.55	0	17,19,21	0.82	0
3	BMA	C	2	3	11,11,12	1.20	0	15,15,17	3.19	5 (33%)
3	MAN	C	3	3	11,11,12	4.05	4 (36%)	15,15,17	2.66	5 (33%)
4	NAG	F	1	2,4	14,14,15	1.27	1 (7%)	17,19,21	1.99	4 (23%)
4	NAG	F	2	4	14,14,15	0.65	0	17,19,21	0.90	0
4	BMA	F	3	4	11,11,12	0.28	0	15,15,17	0.91	0

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	NAG	C	1	3	-	0/6/23/26	0/1/1/1
3	BMA	C	2	3	-	2/2/19/22	0/1/1/1
3	MAN	C	3	3	-	0/2/19/22	0/1/1/1
4	NAG	F	1	2,4	-	2/6/23/26	0/1/1/1
4	NAG	F	2	4	-	0/6/23/26	0/1/1/1
4	BMA	F	3	4	-	0/2/19/22	0/1/1/1

All (5) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	C	3	MAN	O6-C6	-8.35	1.07	1.42
3	C	3	MAN	C4-C5	6.91	1.67	1.53
3	C	3	MAN	C4-C3	-6.19	1.36	1.52
3	C	3	MAN	C2-C3	4.15	1.58	1.52
4	F	1	NAG	O7-C7	-2.32	1.18	1.23

All (14) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	C	2	BMA	C1-O5-C5	7.03	121.61	112.19
3	C	2	BMA	C1-C2-C3	6.67	119.36	109.64
3	C	2	BMA	C3-C4-C5	5.39	120.00	110.23
3	C	3	MAN	C1-O5-C5	5.10	119.02	112.19
3	C	3	MAN	O5-C5-C4	-5.08	98.46	110.83
4	F	1	NAG	O5-C1-C2	-4.64	104.12	111.29
3	C	3	MAN	O6-C6-C5	-4.48	96.09	111.33
4	F	1	NAG	C1-O5-C5	3.96	117.50	112.19
4	F	1	NAG	O6-C6-C5	3.54	123.39	111.33
3	C	2	BMA	O6-C6-C5	3.49	123.22	111.33
3	C	3	MAN	O4-C4-C3	-2.98	103.35	110.38
3	C	3	MAN	O5-C5-C6	-2.23	103.33	107.66
4	F	1	NAG	O7-C7-C8	-2.14	118.25	122.05
3	C	2	BMA	O5-C5-C6	2.02	111.60	107.66

There are no chirality outliers.

All (4) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	C	2	BMA	O5-C5-C6-O6
3	C	2	BMA	C4-C5-C6-O6
4	F	1	NAG	C4-C5-C6-O6
4	F	1	NAG	O5-C5-C6-O6

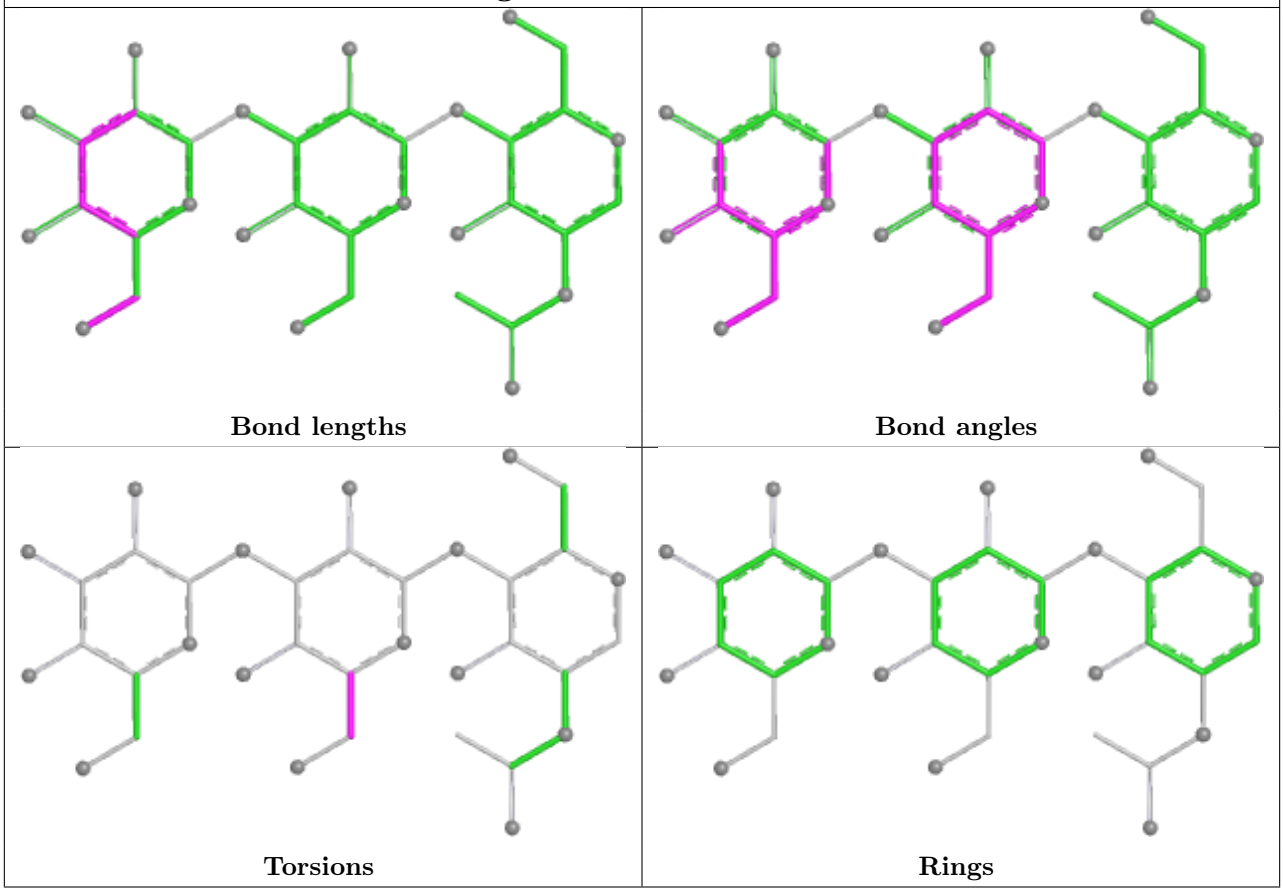
There are no ring outliers.

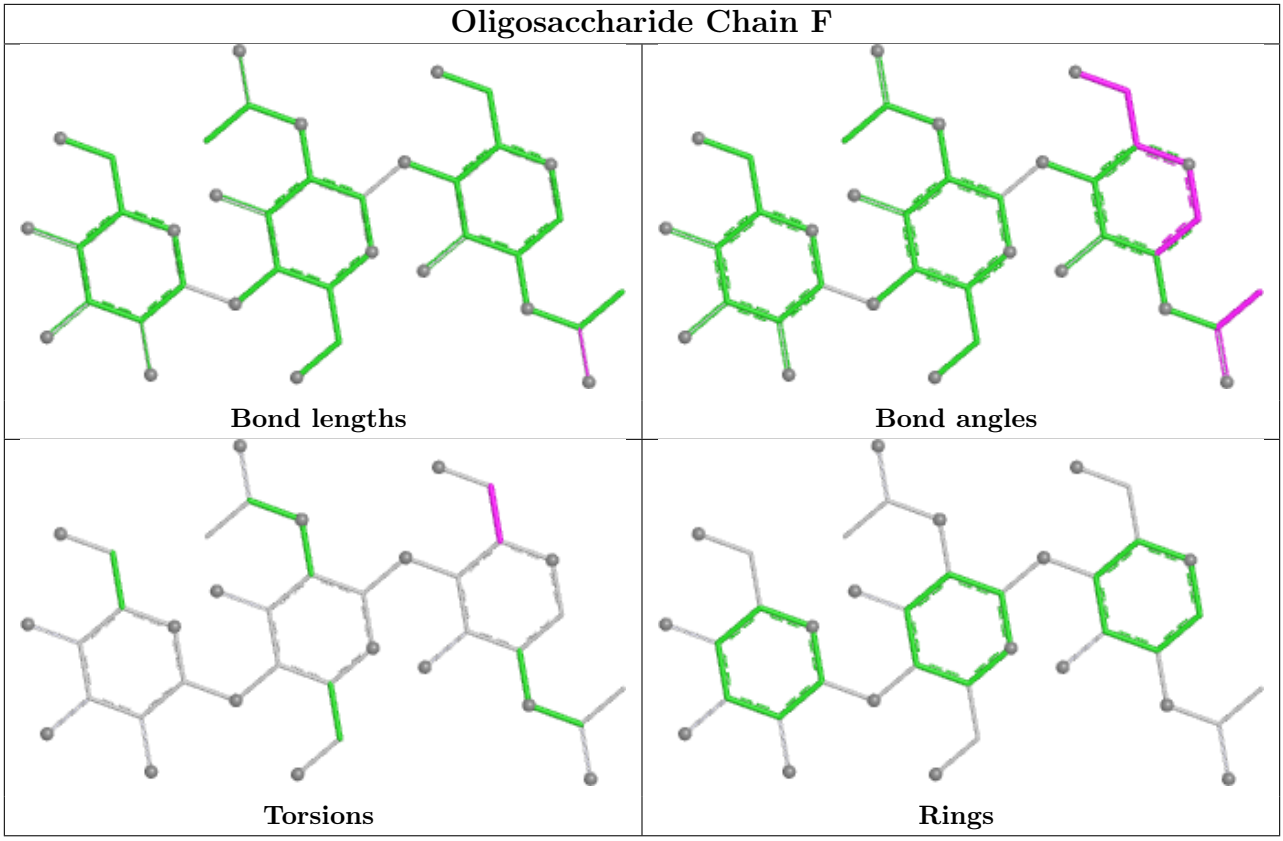
2 monomers are involved in 7 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	C	1	NAG	4	0
4	F	3	BMA	3	0

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

Oligosaccharide Chain C





5.6 Ligand geometry (i)

Of 20 ligands modelled in this entry, 6 are monoatomic - leaving 14 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	$\#\|Z\| > 2$
7	HEM	A	203	2,1	42,50,50	1.91	6 (14%)	46,82,82	1.58	7 (15%)
9	NAG	B	601	2	14,14,15	1.35	2 (14%)	17,19,21	2.14	4 (23%)
11	MAN	E	604	-	11,11,12	3.56	6 (54%)	15,15,17	2.47	8 (53%)
5	AEY	E	611	-	16,20,20	0.98	1 (6%)	16,27,27	1.61	2 (12%)
9	NAG	E	610	2	14,14,15	0.57	0	17,19,21	0.74	0
5	AEY	A	201	-	16,20,20	0.97	2 (12%)	16,27,27	1.59	3 (18%)
10	FUC	E	608	-	10,10,11	2.57	7 (70%)	14,14,16	1.78	4 (28%)
7	HEM	D	201	2,1	42,50,50	1.96	6 (14%)	46,82,82	1.56	8 (17%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\|>2$	Counts	RMSZ	$\#\|Z\|>2$
11	MAN	B	605	-	11,11,12	4.03	6 (54%)	15,15,17	2.52	6 (40%)
11	MAN	B	606	-	11,11,12	1.28	1 (9%)	15,15,17	1.55	3 (20%)
9	NAG	B	603	2	14,14,15	0.50	0	17,19,21	0.81	0
9	NAG	B	604	2	14,14,15	1.23	2 (14%)	17,19,21	1.69	3 (17%)
10	FUC	B	602	-	10,10,11	3.51	7 (70%)	14,14,16	2.30	8 (57%)
9	NAG	E	609	2	14,14,15	0.45	0	17,19,21	0.92	0

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
7	HEM	A	203	2,1	-	4/12/54/54	-
9	NAG	B	601	2	-	0/6/23/26	0/1/1/1
11	MAN	E	604	-	-	1/2/19/22	0/1/1/1
5	AEY	E	611	-	-	2/5/5/5	0/3/3/3
9	NAG	E	610	2	-	1/6/23/26	0/1/1/1
5	AEY	A	201	-	-	0/5/5/5	0/3/3/3
10	FUC	E	608	-	-	-	0/1/1/1
7	HEM	D	201	2,1	-	4/12/54/54	-
11	MAN	B	605	-	-	0/2/19/22	0/1/1/1
11	MAN	B	606	-	-	2/2/19/22	0/1/1/1
9	NAG	B	603	2	-	0/6/23/26	0/1/1/1
9	NAG	B	604	2	-	0/6/23/26	0/1/1/1
10	FUC	B	602	-	-	-	0/1/1/1
9	NAG	E	609	2	-	0/6/23/26	0/1/1/1

All (46) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
11	B	605	MAN	C2-C3	9.03	1.66	1.52
7	D	201	HEM	C3D-C2D	7.74	1.53	1.36
7	A	203	HEM	C3D-C2D	7.58	1.53	1.36
10	B	602	FUC	O5-C5	-7.19	1.29	1.43
11	E	604	MAN	C1-C2	-6.88	1.35	1.52
11	E	604	MAN	O5-C5	6.83	1.56	1.43
11	B	605	MAN	O6-C6	-6.54	1.15	1.42
11	B	605	MAN	O5-C5	4.96	1.53	1.43
7	D	201	HEM	C3C-C2C	-4.89	1.33	1.40

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
7	A	203	HEM	C3C-C2C	-4.10	1.34	1.40
11	E	604	MAN	O3-C3	4.08	1.53	1.43
10	B	602	FUC	O5-C1	4.06	1.50	1.43
10	B	602	FUC	C6-C5	3.82	1.60	1.51
10	E	608	FUC	O5-C5	-3.70	1.36	1.43
10	B	602	FUC	C1-C2	-3.69	1.43	1.52
7	A	203	HEM	C3C-CAC	3.49	1.55	1.47
10	E	608	FUC	O2-C2	3.44	1.50	1.43
11	B	605	MAN	O2-C2	-3.39	1.36	1.43
10	E	608	FUC	C2-C3	-3.37	1.47	1.52
7	D	201	HEM	C3C-CAC	3.18	1.54	1.47
10	E	608	FUC	O5-C1	-3.08	1.38	1.43
11	E	604	MAN	C4-C5	3.07	1.59	1.53
7	D	201	HEM	C3C-C4C	2.96	1.45	1.41
10	B	602	FUC	O4-C4	-2.95	1.35	1.43
10	B	602	FUC	C4-C5	-2.92	1.46	1.52
7	A	203	HEM	FE-ND	2.84	2.13	1.98
7	A	203	HEM	CAB-C3B	2.83	1.54	1.47
10	E	608	FUC	O4-C4	-2.81	1.36	1.43
11	E	604	MAN	C4-C3	-2.81	1.45	1.52
7	D	201	HEM	FE-ND	2.80	2.13	1.98
11	B	605	MAN	O4-C4	2.78	1.49	1.43
7	A	203	HEM	C3C-C4C	2.70	1.45	1.41
7	D	201	HEM	CAB-C3B	2.69	1.54	1.47
9	B	604	NAG	C2-N2	-2.67	1.41	1.46
9	B	601	NAG	O5-C1	-2.56	1.39	1.43
11	B	606	MAN	O5-C1	-2.40	1.39	1.43
11	E	604	MAN	O5-C1	2.36	1.47	1.43
10	E	608	FUC	C1-C2	2.30	1.57	1.52
11	B	605	MAN	C4-C3	-2.29	1.46	1.52
9	B	601	NAG	C2-N2	-2.27	1.42	1.46
10	B	602	FUC	C2-C3	-2.23	1.49	1.52
5	E	611	AEY	O18-C09	2.18	1.37	1.34
5	A	201	AEY	O18-C09	2.13	1.37	1.34
5	A	201	AEY	C09-N14	2.08	1.35	1.31
9	B	604	NAG	O7-C7	-2.08	1.18	1.23
10	E	608	FUC	C4-C5	2.00	1.57	1.52

All (56) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
11	B	605	MAN	C1-O5-C5	6.49	120.89	112.19

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
9	B	601	NAG	O5-C1-C2	-5.43	102.90	111.29
9	B	601	NAG	C1-O5-C5	5.18	119.13	112.19
7	A	203	HEM	C4D-ND-C1D	4.94	111.06	105.21
7	D	201	HEM	C4D-ND-C1D	4.84	110.94	105.21
5	E	611	AEY	N13-C10-N14	-4.30	121.74	127.21
11	E	604	MAN	O5-C5-C4	-4.11	100.83	110.83
10	B	602	FUC	O4-C4-C3	-3.97	101.01	110.38
5	A	201	AEY	N13-C10-N14	-3.82	122.35	127.21
11	E	604	MAN	O4-C4-C3	3.76	119.23	110.38
11	B	605	MAN	O4-C4-C3	-3.75	101.54	110.38
5	A	201	AEY	C10-N13-C08	3.72	119.49	115.48
11	E	604	MAN	O6-C6-C5	3.71	123.98	111.33
9	B	604	NAG	O5-C1-C2	-3.62	105.70	111.29
9	B	604	NAG	C1-O5-C5	3.51	116.89	112.19
5	E	611	AEY	C10-N13-C08	3.42	119.17	115.48
10	B	602	FUC	C1-O5-C5	3.36	120.89	112.97
10	E	608	FUC	O5-C5-C6	3.34	114.65	107.40
10	B	602	FUC	O5-C5-C4	3.30	115.50	109.55
7	A	203	HEM	C4C-CHD-C1D	3.30	126.91	122.56
11	B	605	MAN	C1-C2-C3	3.27	114.40	109.64
11	B	606	MAN	O4-C4-C3	-3.23	102.76	110.38
9	B	604	NAG	C1-C2-N2	-3.10	105.54	110.43
7	D	201	HEM	CBA-CAA-C2A	-3.07	107.38	112.54
10	E	608	FUC	O4-C4-C3	3.00	117.45	110.38
10	E	608	FUC	C1-O5-C5	2.90	119.80	112.97
11	B	605	MAN	O6-C6-C5	-2.87	101.56	111.33
10	B	602	FUC	O5-C5-C6	-2.86	101.20	107.40
11	E	604	MAN	O4-C4-C5	-2.85	102.31	109.32
11	E	604	MAN	C6-C5-C4	-2.85	106.02	113.02
11	E	604	MAN	C1-O5-C5	2.83	115.98	112.19
7	D	201	HEM	C3B-C2B-C1B	2.72	108.45	106.41
11	B	606	MAN	O5-C1-C2	-2.70	104.36	110.79
11	B	605	MAN	O5-C5-C6	2.64	112.81	107.66
7	D	201	HEM	CBD-CAD-C3D	-2.62	105.29	112.53
7	A	203	HEM	C3B-C4B-NB	-2.57	107.62	109.47
9	B	601	NAG	O4-C4-C3	-2.49	104.50	110.38
11	E	604	MAN	O5-C5-C6	-2.49	102.83	107.66
11	B	605	MAN	O5-C1-C2	2.45	116.64	110.79
7	D	201	HEM	C4C-CHD-C1D	2.43	125.77	122.56
10	B	602	FUC	C2-C3-C4	-2.41	106.62	110.86
7	A	203	HEM	C1B-NB-C4B	2.31	107.95	105.21
10	B	602	FUC	C1-C2-C3	2.31	113.00	109.64

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
5	A	201	AEY	N16-N15-N12	-2.28	108.29	111.25
10	B	602	FUC	O4-C4-C5	2.28	114.76	109.74
7	D	201	HEM	C1B-NB-C4B	2.23	107.85	105.21
7	A	203	HEM	C3B-C2B-C1B	2.19	108.06	106.41
10	B	602	FUC	O2-C2-C3	-2.19	105.61	110.15
7	D	201	HEM	CHB-C1B-NB	2.18	127.08	124.37
10	E	608	FUC	C6-C5-C4	-2.17	109.11	113.08
7	A	203	HEM	CAD-C3D-C4D	2.16	128.46	124.70
11	B	606	MAN	C1-C2-C3	-2.15	106.51	109.64
11	E	604	MAN	C1-C2-C3	2.12	112.73	109.64
7	D	201	HEM	C3B-C4B-NB	-2.08	107.97	109.47
7	A	203	HEM	CHB-C1B-NB	2.03	126.89	124.37
9	B	601	NAG	C2-N2-C7	-2.02	120.19	122.90

There are no chirality outliers.

All (14) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
11	B	606	MAN	C4-C5-C6-O6
5	E	611	AEY	N14-C09-O18-C11
5	E	611	AEY	C07-C09-O18-C11
11	B	606	MAN	O5-C5-C6-O6
7	D	201	HEM	CAA-CBA-CGA-O1A
9	E	610	NAG	C4-C5-C6-O6
7	D	201	HEM	CAA-CBA-CGA-O2A
7	D	201	HEM	CAD-CBD-CGD-O2D
7	A	203	HEM	CAD-CBD-CGD-O2D
7	A	203	HEM	CAD-CBD-CGD-O1D
7	D	201	HEM	CAD-CBD-CGD-O1D
11	E	604	MAN	O5-C5-C6-O6
7	A	203	HEM	CAA-CBA-CGA-O1A
7	A	203	HEM	CAA-CBA-CGA-O2A

There are no ring outliers.

8 monomers are involved in 41 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
7	A	203	HEM	13	0
9	B	601	NAG	6	0
11	E	604	MAN	1	0
5	E	611	AEY	1	0

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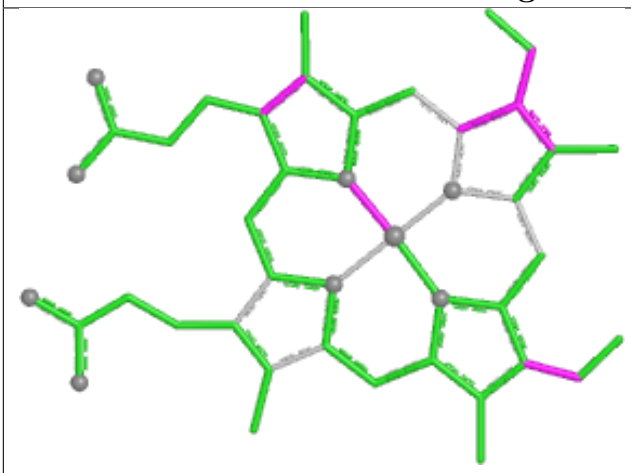
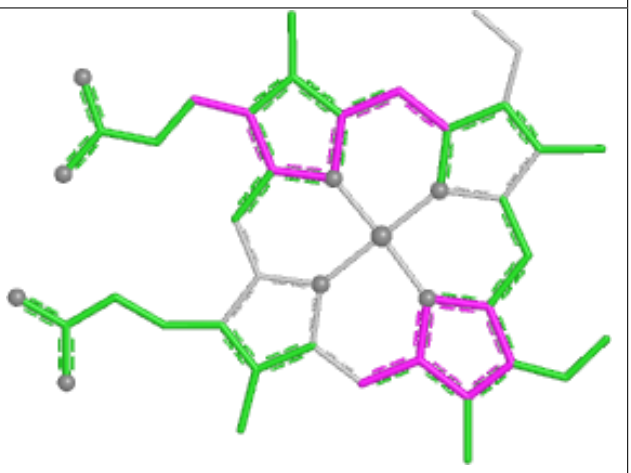
Mol	Chain	Res	Type	Clashes	Symm-Clashes
7	D	201	HEM	16	0
11	B	605	MAN	3	0
9	B	603	NAG	1	0
10	B	602	FUC	1	0

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

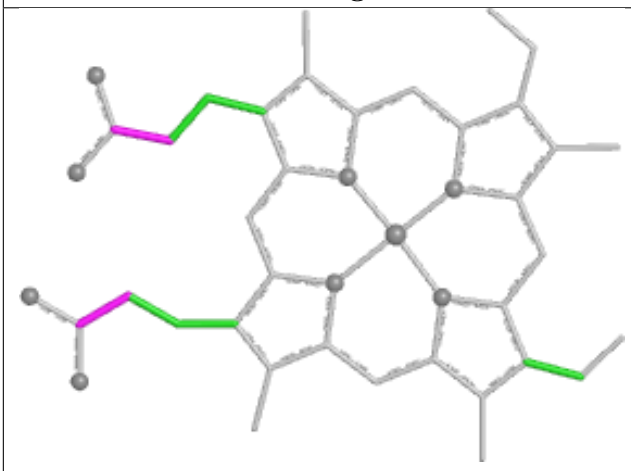
Ligand HEM A 203



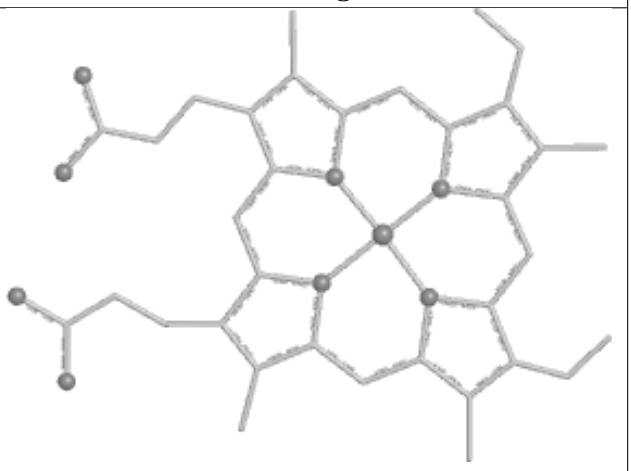
Bond lengths



Bond angles

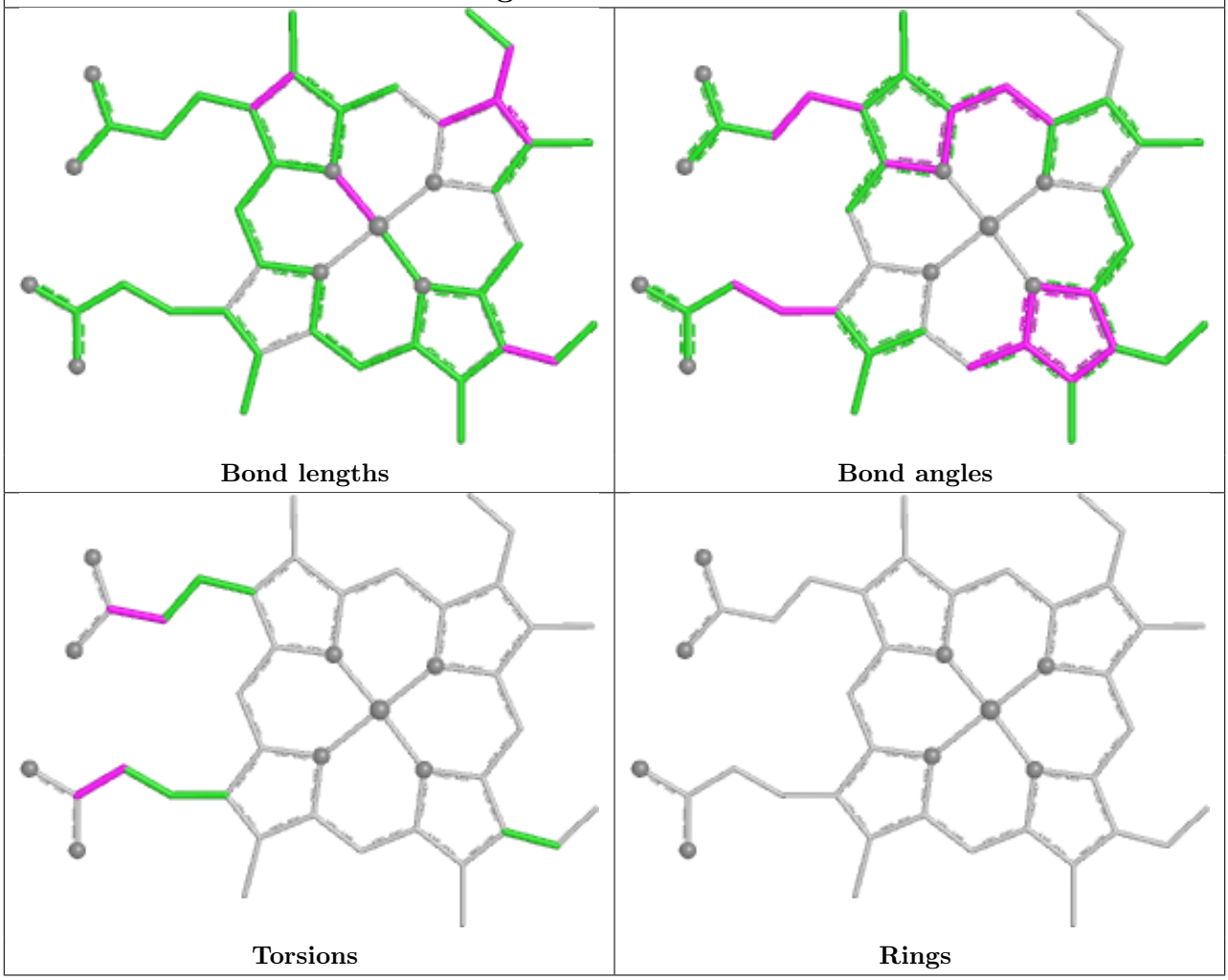


Torsions



Rings

Ligand HEM D 201



5.7 Other polymers

There are no such residues in this entry.

5.8 Polymer linkage issues

There are no chain breaks in this entry.

6 Fit of model and data

6.1 Protein, DNA and RNA chains

In the following table, the column labelled '#RSRZ> 2' contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95^{th} 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	104/105 (99%)	-0.41	0 100 100	19, 22, 30, 39	0
1	D	103/105 (98%)	-0.40	1 (0%) 79 76	18, 22, 30, 39	0
2	B	465/467 (99%)	-0.38	0 100 100	17, 24, 33, 42	0
2	E	464/467 (99%)	-0.28	4 (0%) 81 78	17, 24, 33, 42	0
All	All	1136/1144 (99%)	-0.34	5 (0%) 89 87	17, 23, 34, 42	0

All (5) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	E	115	CYS	4.0
2	E	355	PRO	3.6
1	D	4	GLN	3.1
2	E	113	VAL	2.9
2	E	114	ASN	2.1

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

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, 95^{th} percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
2	CSO	B	150	7/8	0.94	0.08	22,23,24,25	0
2	CSO	E	150	7/8	0.95	0.07	22,23,24,25	0

6.3 Carbohydrates

SUGAR-RSR INFOmissingINFO

6.4 Ligands (i)

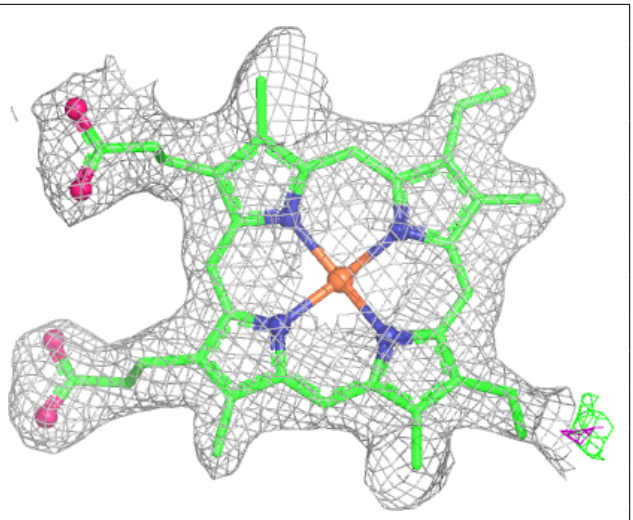
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95^{th} percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9'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

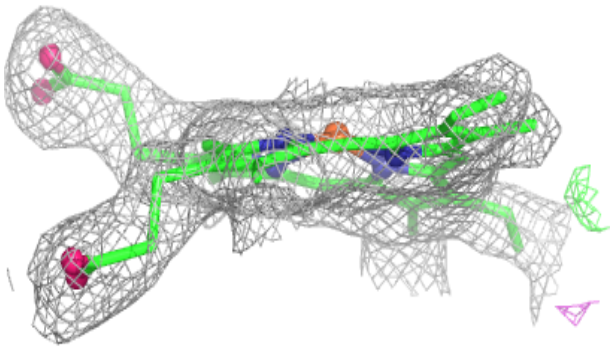
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
11	MAN	B	605	11/12	0.67	0.15	42,42,43,44	0
9	NAG	B	604	14/15	0.78	0.12	34,36,38,39	0
10	FUC	B	602	10/11	0.80	0.12	24,27,27,28	0
5	AEY	A	201	18/18	0.80	0.17	44,46,47,47	0
9	NAG	E	610	14/15	0.81	0.10	33,35,37,37	0
11	MAN	E	604	11/12	0.81	0.11	28,29,29,30	0
9	NAG	B	601	14/15	0.82	0.12	18,21,23,23	0
5	AEY	E	611	18/18	0.86	0.14	41,43,47,47	0
9	NAG	E	609	14/15	0.87	0.10	28,31,32,32	0
9	NAG	B	603	14/15	0.88	0.08	28,30,31,31	0
10	FUC	E	608	10/11	0.92	0.08	24,25,26,27	0
11	MAN	B	606	11/12	0.95	0.06	25,26,27,28	0
6	CL	E	612	1/1	0.96	0.33	45,45,45,45	0
6	CL	B	607	1/1	0.97	0.35	47,47,47,47	0
7	HEM	A	203	43/43	0.97	0.08	17,21,22,22	0
7	HEM	D	201	43/43	0.98	0.07	13,18,20,21	0
8	CA	D	203	1/1	0.98	0.09	28,28,28,28	0
6	CL	A	202	1/1	0.98	0.09	29,29,29,29	0
8	CA	A	204	1/1	0.99	0.13	31,31,31,31	0
6	CL	D	202	1/1	0.99	0.10	26,26,26,26	0

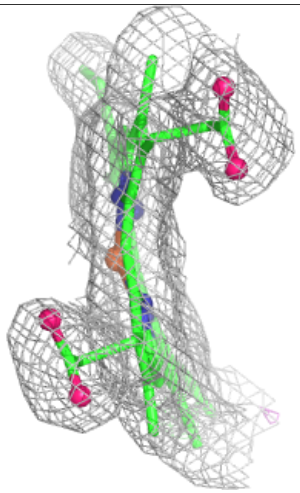
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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

Electron density around HEM A 203:

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

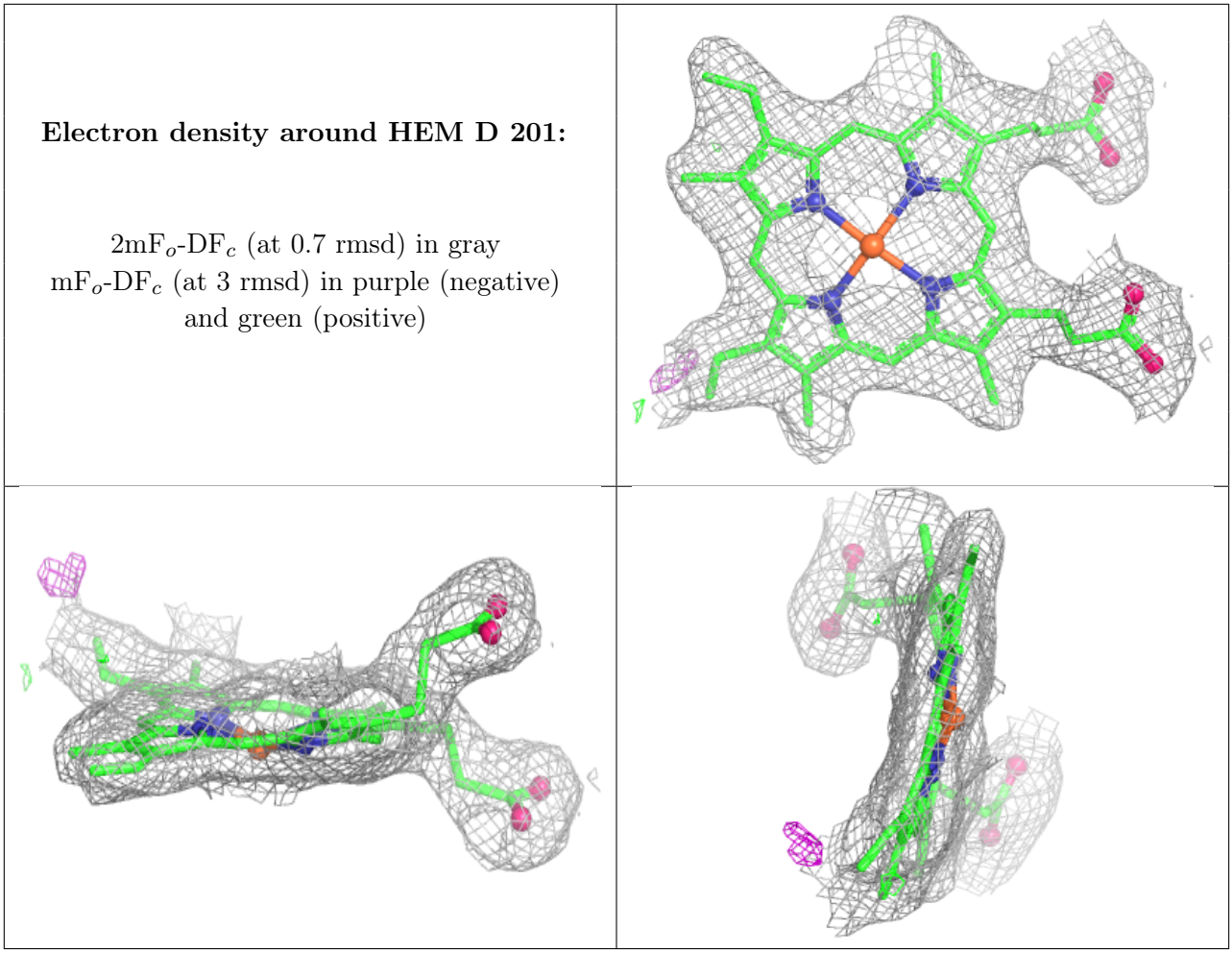






Electron density around HEM D 201:

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



6.5 Other polymers

There are no such residues in this entry.