Full wwPDB X-ray Structure Validation Report ⓘ

Oct 6, 2025 – 01:37 pm BST

PDB ID	:	9QJ3 / pdb_00009qj3
Title	:	Structure of native leukocyte myeloperoxidase in complex with a truncated version of the Staphylococcal Peroxidase Inhibitor SPIN and iodide at pH 5.5
Authors	:	Leitgeb, U.; Pfanzagl, V.
Deposited on	:	2025-03-18
Resolution	:	2.63 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:

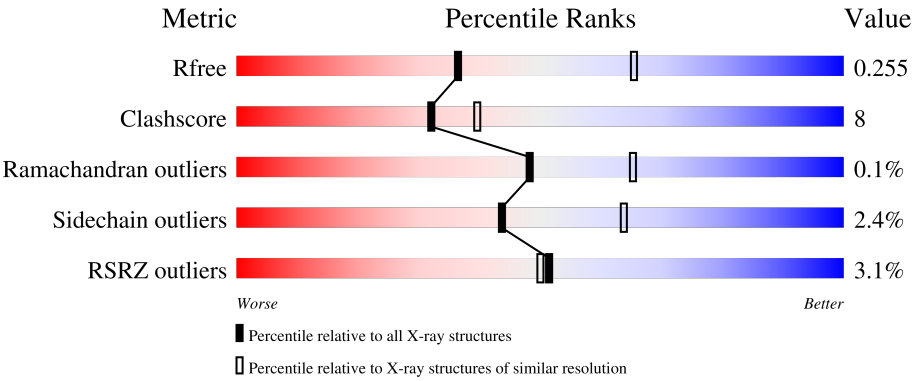
MolProbity	:	4-5-2 with Phenix2.0
Mogul	:	1.8.4, CSD as541be (2020)
Xtriage (Phenix)	:	2.0
EDS	:	3.0
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4	:	9.0.010 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.46

1 Overall quality at a glance (i)

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

The reported resolution of this entry is 2.63 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	1851 (2.66-2.62)
Clashscore	180529	1953 (2.66-2.62)
Ramachandran outliers	177936	1929 (2.66-2.62)
Sidechain outliers	177891	1929 (2.66-2.62)
RSRZ outliers	164620	1850 (2.66-2.62)

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	B	467	81% 18%
1	D	467	80% 18%
2	A	114	74% 17% 8%
2	C	114	68% 22% 8%
3	E	60	3% 82% 12% 5%

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Mol	Chain	Length	Quality of chain
3	F	60	43% 83% 13%
4	G	2	50% 50%
4	H	2	50% 50%
4	J	2	100%
4	K	2	50% 50%
5	I	6	83% 17%
6	L	6	67% 33%

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
7	IOD	A	305	-	-	X	-
7	IOD	B	814[A]	-	-	X	-
7	IOD	B	814[B]	-	-	X	-
7	IOD	B	824[B]	-	-	X	-
7	IOD	C	303	-	-	X	-
7	IOD	D	826	-	-	X	-
7	IOD	D	833	-	-	X	-
7	IOD	D	834	-	-	X	-

2 Entry composition (i)

There are 10 unique types of molecules in this entry. The entry contains 10800 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 heavy chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	B	466	Total	C	N	O	S	0	1	0
			3740	2356	690	667	27			
1	D	465	Total	C	N	O	S	0	0	0
			3727	2348	686	666	27			

- Molecule 2 is a protein called Myeloperoxidase light chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	A	105	Total	C	N	O	S	0	0	0
			842	532	149	156	5			
2	C	105	Total	C	N	O	S	0	0	0
			842	532	149	156	5			

- Molecule 3 is a protein called Myeloperoxidase inhibitor SPIN.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
3	E	57	Total	C	N	O	0	0	0
			462	292	77	93			
3	F	58	Total	C	N	O	0	0	0
			472	298	80	94			

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

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
4	G	2	Total	C	N	O	0	0	0
			28	16	2	10			

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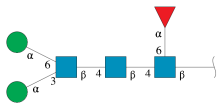
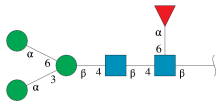
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf	Trace
4	H	2	Total C N O 28 16 2 10	0	0	0
4	J	2	Total C N O 28 16 2 10	0	0	0
4	K	2	Total C N O 28 16 2 10	0	0	0

- Molecule 5 is an oligosaccharide called alpha-D-mannopyranose-(1-3)-[alpha-D-mannopyranose-(1-6)]2-acetamido-2-deoxy-beta-D-glucopyranose-(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
5	I	6	Total C N O 74 42 3 29	0	0	0

- Molecule 6 is an oligosaccharide called alpha-D-mannopyranose-(1-3)-[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
6	L	6	Total C N O 71 40 2 29	0	0	0

- Molecule 7 is IODIDE ION (CCD ID: IOD) (formula: I).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
7	B	41	Total I 47 47	0	6
7	D	33	Total I 35 35	0	2
7	A	9	Total I 9 9	0	0

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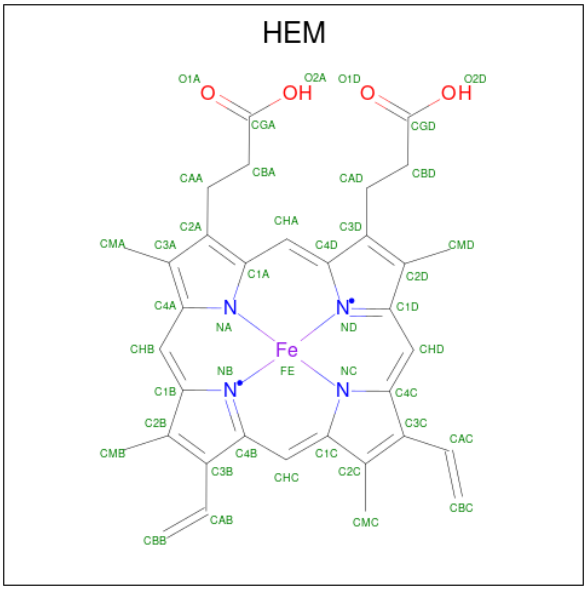
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
7	C	4	Total I 4 4	0	0
7	E	1	Total I 1 1	0	0
7	F	1	Total I 1 1	0	0

- Molecule 8 is CALCIUM ION (CCD ID: CA) (formula: Ca).

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

- Molecule 9 is PROTOPORPHYRIN IX CONTAINING FE (CCD ID: HEM) (formula: $C_{34}H_{32}FeN_4O_4$) (labeled as "Ligand of Interest" by depositor).



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

- Molecule 10 is water.

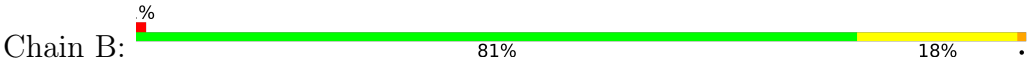
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
10	B	119	Total O 119 119	0	0
10	D	85	Total O 85 85	0	0
10	A	22	Total O 22 22	0	0
10	C	27	Total O 27 27	0	0
10	E	16	Total O 16 16	0	0
10	F	4	Total O 4 4	0	0

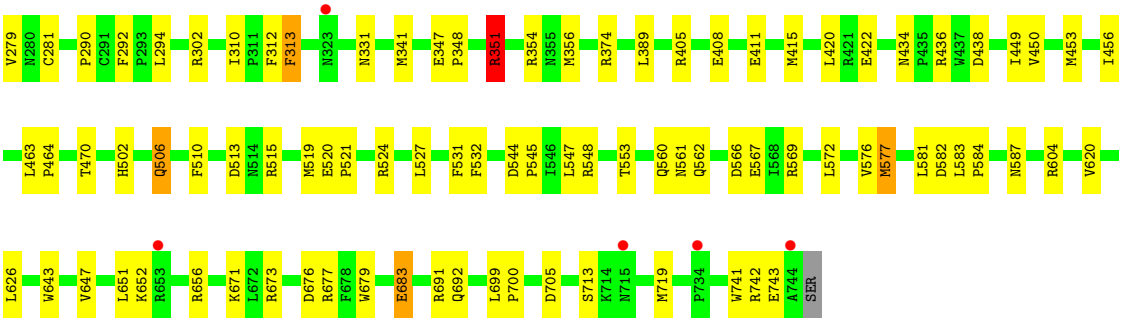
3 Residue-property plots (i)

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 heavy chain

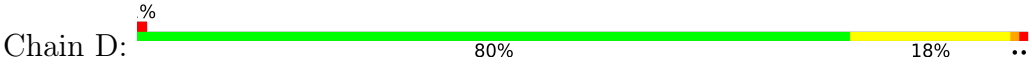
Chain B:

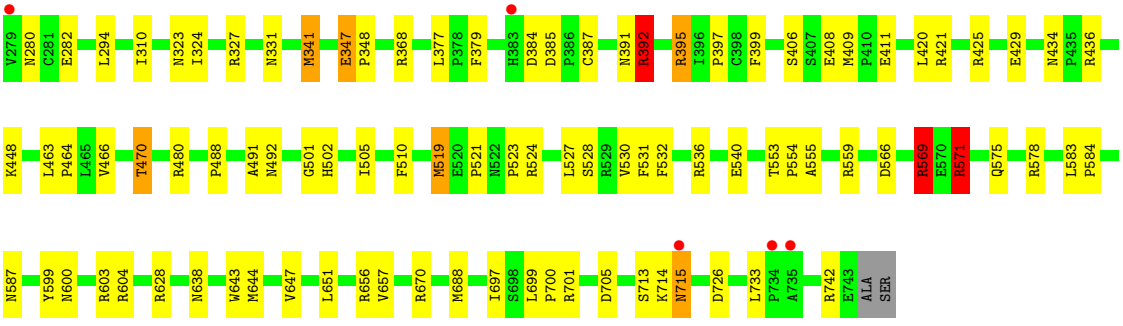




• Molecule 1: Myeloperoxidase heavy chain

Chain D:



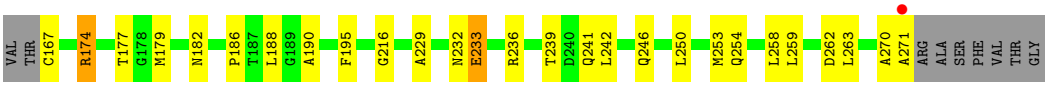


• Molecule 2: Myeloperoxidase light chain

Chain A:

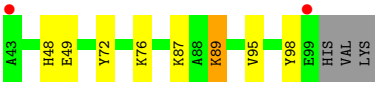
• Molecule 2: Myeloperoxidase light chain

Chain C:



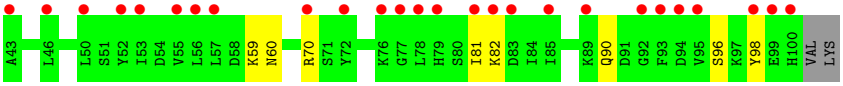
• Molecule 3: Myeloperoxidase inhibitor SPIN

Chain E:



• Molecule 3: Myeloperoxidase inhibitor SPIN

Chain F:



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

Chain G:

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

Chain H:

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

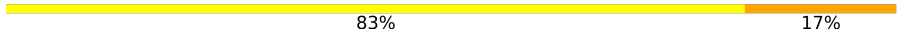
Chain J:

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

Chain K:

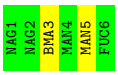
• Molecule 5: alpha-D-mannopyranose-(1-3)-[alpha-D-mannopyranose-(1-6)]2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-[alpha-L-fucopyranose-(1-6)]2-acetamido-2-deoxy-beta-D-glucopyranose

Chain I:



• Molecule 6: alpha-D-mannopyranose-(1-3)-[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

Chain L:



4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 43 21 2	Depositor
Cell constants a, b, c, α, β, γ	111.36Å 111.36Å 242.07Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	101.17 – 2.63 101.17 – 2.63	Depositor EDS
% Data completeness (in resolution range)	84.7 (101.17-2.63) 84.7 (101.17-2.63)	Depositor EDS
R_{merge}	0.34	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.52 (at 2.65Å)	Xtriage
Refinement program	REFMAC 5.8.0430	Depositor
R, R_{free}	0.192 , 0.249 0.199 , 0.255	Depositor DCC
R_{free} test set	1925 reflections (4.20%)	wwPDB-VP
Wilson B-factor (Å^2)	44.6	Xtriage
Anisotropy	0.048	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.35 , 44.0	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	10800	wwPDB-VP
Average B, all atoms (Å^2)	49.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.86% 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 (i)

5.1 Standard geometry (i)

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

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	B	0.77	0/3821	1.25	15/5182 (0.3%)
1	D	0.69	0/3805	1.15	4/5161 (0.1%)
2	A	0.82	0/867	1.33	5/1181 (0.4%)
2	C	0.74	0/867	1.28	5/1181 (0.4%)
3	E	0.64	0/469	1.23	2/629 (0.3%)
3	F	0.60	0/480	1.16	0/644
All	All	0.73	0/10309	1.22	31/13978 (0.2%)

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	B	0	6
1	D	0	11
2	A	0	1
2	C	0	1
3	F	0	1
All	All	0	20

There are no bond length outliers.

All (31) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	B	351	ARG	NE-CZ-NH2	8.73	127.06	119.20
1	B	506	GLN	CB-CA-C	8.05	120.45	108.86
2	A	260	ASP	CA-CB-CG	7.49	120.09	112.60
1	D	715	ASN	CB-CA-C	-7.30	108.14	116.54
1	B	506	GLN	N-CA-CB	-6.82	101.77	110.03

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	B	532	PHE	CA-CB-CG	-6.58	107.22	113.80
1	B	544	ASP	CA-CB-CG	6.21	118.81	112.60
2	C	233	GLU	N-CA-CB	6.05	119.22	110.20
2	A	264	ASP	CA-CB-CG	6.00	118.60	112.60
3	E	89	LYS	CB-CA-C	-5.98	101.45	110.90
2	C	233	GLU	CB-CG-CD	5.92	122.66	112.60
2	A	220	ASN	CA-CB-CG	5.90	118.50	112.60
2	A	262	ASP	CA-CB-CG	5.82	118.42	112.60
2	A	236	ARG	CB-CA-C	-5.67	100.58	109.70
3	E	98	TYR	CB-CA-C	5.52	118.85	109.75
1	B	438	ASP	CA-CB-CG	5.49	118.09	112.60
1	D	569	ARG	CG-CD-NE	-5.47	99.96	112.00
1	B	566	ASP	CB-CA-C	5.44	121.36	109.99
2	C	241	GLN	CB-CA-C	-5.39	100.31	110.01
1	B	683	GLU	N-CA-CB	5.37	117.81	109.48
1	D	644	MET	CG-SD-CE	-5.37	89.08	100.90
1	B	351	ARG	CD-NE-CZ	5.34	131.88	124.40
1	D	571	ARG	CG-CD-NE	-5.27	100.40	112.00
1	B	313	PHE	CA-CB-CG	5.26	119.06	113.80
1	B	705	ASP	CA-CB-CG	5.25	117.85	112.60
2	C	233	GLU	CB-CA-C	-5.25	101.10	110.70
2	C	262	ASP	CA-CB-CG	5.23	117.83	112.60
1	B	567	GLU	CB-CA-C	5.16	120.18	110.63
1	B	683	GLU	CB-CG-CD	5.11	121.28	112.60
1	B	567	GLU	N-CA-CB	-5.03	102.48	110.22
1	B	719	MET	N-CA-C	-5.00	106.28	112.93

There are no chirality outliers.

All (20) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
2	A	174	ARG	Sidechain
1	B	302	ARG	Sidechain
1	B	351	ARG	Sidechain
1	B	374	ARG	Sidechain
1	B	436	ARG	Sidechain
1	B	515	ARG	Sidechain
1	B	691	ARG	Sidechain
2	C	174	ARG	Sidechain
1	D	368	ARG	Sidechain
1	D	392	ARG	Sidechain
1	D	395	ARG	Sidechain

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Mol	Chain	Res	Type	Group
1	D	421	ARG	Sidechain
1	D	480	ARG	Sidechain
1	D	559	ARG	Sidechain
1	D	569	ARG	Sidechain
1	D	571	ARG	Sidechain
1	D	578	ARG	Sidechain
1	D	628	ARG	Sidechain
1	D	670	ARG	Sidechain
3	F	70	ARG	Sidechain

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	B	3740	0	3738	56	0
1	D	3727	0	3721	64	0
2	A	842	0	800	14	0
2	C	842	0	800	18	0
3	E	462	0	447	9	0
3	F	472	0	454	9	0
4	G	28	0	25	0	0
4	H	28	0	25	0	0
4	J	28	0	25	0	0
4	K	28	0	25	1	0
5	I	74	0	64	2	0
6	L	71	0	61	0	0
7	A	9	0	0	2	0
7	B	47	0	0	16	0
7	C	4	0	0	4	0
7	D	35	0	0	13	0
7	E	1	0	0	0	0
7	F	1	0	0	1	0
8	B	1	0	0	0	0
8	D	1	0	0	0	0
9	A	43	0	30	0	0
9	D	43	0	30	2	0
10	A	22	0	0	1	0
10	B	119	0	0	5	1

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
10	C	27	0	0	2	0
10	D	85	0	0	16	3
10	E	16	0	0	2	2
10	F	4	0	0	5	0
All	All	10800	0	10245	163	3

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 8.

All (163) 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:D:519:MET:HE2	7:D:834:IOD:I	2.17	1.13
7:D:805:IOD:I	10:D:957:HOH:O	2.40	1.09
1:D:519:MET:CE	7:D:834:IOD:I	2.71	1.09
1:B:519:MET:HE1	7:B:814[B]:IOD:I	2.23	1.07
7:D:820:IOD:I	10:D:923:HOH:O	2.50	1.00
1:D:470:THR:HG22	7:D:833:IOD:I	2.41	0.91
1:D:502:HIS:HD1	1:D:587:ASN:HD21	1.24	0.84
1:B:502:HIS:HD1	1:B:587:ASN:HD21	1.25	0.82
1:B:456:ILE:HA	10:B:990:HOH:O	1.79	0.82
1:B:620:VAL:HG22	7:B:826[B]:IOD:I	2.55	0.77
1:B:524:ARG:HD3	7:B:824[B]:IOD:I	2.55	0.77
10:B:915:HOH:O	7:A:305:IOD:I	2.73	0.77
1:D:434:ASN:HD21	1:D:742:ARG:HA	1.52	0.74
3:F:90:GLN:HG3	10:F:302:HOH:O	1.88	0.72
1:B:545:PRO:HG3	7:B:814[B]:IOD:I	2.63	0.68
1:D:409:MET:HE2	1:D:411:GLU:CD	2.19	0.68
1:D:470:THR:CG2	7:D:833:IOD:I	3.13	0.67
1:B:548:ARG:NH2	7:B:814[B]:IOD:I	3.00	0.64
3:F:90:GLN:CG	10:F:302:HOH:O	2.43	0.64
3:E:89:LYS:HG2	3:E:95:VAL:HG21	1.80	0.64
1:B:519:MET:CE	7:B:814[A]:IOD:I	3.16	0.63
1:D:569:ARG:NH2	2:C:232:ASN:OD1	2.33	0.62
7:D:827:IOD:I	4:K:1:NAG:O6	2.87	0.62
1:B:331:ASN:HB2	2:A:195:PHE:CE1	2.35	0.61
1:D:566:ASP:OD1	1:D:569:ARG:HD3	2.01	0.61
1:B:652:LYS:HE2	7:B:806:IOD:I	2.70	0.61
1:B:577:MET:HE1	1:B:581:LEU:HD21	1.82	0.60
1:B:524:ARG:CD	7:B:824[B]:IOD:I	3.19	0.60
1:D:600:ASN:HB2	1:D:638:ASN:HD22	1.67	0.60

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:411:GLU:HB2	2:C:254:GLN:OE1	2.02	0.59
10:D:960:HOH:O	2:C:174:ARG:HD2	2.02	0.59
7:B:827[B]:IOD:I	2:A:247:GLU:HG3	2.73	0.59
7:B:817:IOD:I	10:B:985:HOH:O	2.87	0.58
1:B:415:MET:CE	1:B:547:LEU:CD2	2.81	0.58
2:A:172:LYS:HD3	2:A:173:TYR:CZ	2.38	0.58
1:D:575:GLN:HB2	10:D:916:HOH:O	2.04	0.57
10:D:914:HOH:O	2:C:182:ASN:HB2	2.03	0.57
2:C:174:ARG:HG3	10:C:421:HOH:O	2.05	0.57
1:B:519:MET:HE2	7:B:814[A]:IOD:I	2.75	0.57
1:B:294:LEU:HB2	1:B:310:ILE:HB	1.87	0.56
1:B:354:ARG:HB3	1:B:356:MET:HE3	1.87	0.56
1:B:519:MET:HE1	7:B:814[A]:IOD:I	2.76	0.56
1:D:341:MET:HE2	2:C:258:LEU:HG	1.88	0.54
1:D:519:MET:HE3	7:D:834:IOD:I	2.76	0.54
2:C:236:ARG:NH2	10:C:401:HOH:O	2.39	0.54
1:D:408:GLU:HG3	7:D:808:IOD:I	2.78	0.54
1:D:715:ASN:O	10:D:901:HOH:O	2.18	0.54
3:E:48:HIS:HE1	10:E:301:HOH:O	1.91	0.54
1:D:323:ASN:OD1	1:D:324:ILE:HG13	2.08	0.54
3:F:96:SER:C	3:F:98:TYR:H	2.15	0.54
1:D:521:PRO:HD2	10:D:953:HOH:O	2.09	0.53
1:D:331:ASN:HB2	2:C:195:PHE:CE1	2.44	0.52
1:D:280:ASN:OD1	1:D:282:GLU:HB2	2.09	0.52
2:C:259:LEU:O	2:C:263:LEU:HD13	2.10	0.51
1:B:643:TRP:O	1:B:647:VAL:HG22	2.11	0.51
1:D:643:TRP:O	1:D:647:VAL:HG22	2.11	0.51
1:B:422:GLU:HG2	1:B:453:MET:HE1	1.91	0.51
1:D:604:ARG:NH2	7:A:305:IOD:I	3.14	0.51
1:B:677:ARG:NH1	2:A:180:CYS:O	2.44	0.51
1:D:651:LEU:HD13	1:D:656:ARG:HA	1.91	0.51
3:F:81:ILE:CG1	10:F:301:HOH:O	2.59	0.51
10:B:925:HOH:O	3:E:48:HIS:HD2	1.93	0.50
1:B:408:GLU:O	1:B:531:PHE:HA	2.12	0.50
3:F:82:LYS:HE2	7:F:201:IOD:I	2.81	0.50
10:D:984:HOH:O	5:I:4:MAN:H3	2.11	0.49
3:E:49:GLU:OE1	3:E:76:LYS:NZ	2.44	0.49
1:D:347:GLU:N	1:D:348:PRO:CD	2.76	0.49
1:B:415:MET:CE	1:B:547:LEU:HD21	2.42	0.49
1:D:524:ARG:HG3	7:D:825:IOD:I	2.83	0.49
1:D:554:PRO:HG2	7:C:303:IOD:I	2.83	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:379:PHE:CG	1:D:397:PRO:HG2	2.48	0.49
2:C:270:ALA:O	2:C:271:ALA:C	2.56	0.49
1:D:519:MET:HE1	7:D:834:IOD:I	2.77	0.49
1:D:701:ARG:HG2	7:D:826:IOD:I	2.83	0.49
1:B:562:GLN:HG2	2:A:237:PHE:CD2	2.48	0.48
1:D:429:GLU:HG2	10:D:921:HOH:O	2.12	0.48
1:B:506:GLN:HG2	1:B:510:PHE:HE2	1.79	0.48
1:D:523:PRO:HD2	10:D:946:HOH:O	2.12	0.48
1:B:677:ARG:HD3	2:A:181:ASN:O	2.14	0.48
1:B:281:CYS:HB2	1:B:313:PHE:CE2	2.49	0.48
1:B:651:LEU:HD13	1:B:656:ARG:HA	1.96	0.47
1:B:604:ARG:NH2	7:B:810:IOD:I	3.10	0.47
1:B:463:LEU:N	1:B:464:PRO:CD	2.77	0.47
1:D:425:ARG:HH11	1:D:705:ASP:HB3	1.80	0.47
1:B:513:ASP:HA	1:B:519:MET:HE3	1.95	0.47
1:D:463:LEU:N	1:D:464:PRO:CD	2.78	0.47
1:D:436:ARG:CG	10:D:942:HOH:O	2.62	0.46
2:A:172:LYS:HD3	2:A:173:TYR:CE2	2.49	0.46
1:B:351:ARG:HH11	3:E:72:TYR:HA	1.80	0.46
1:D:391:ASN:O	1:D:392:ARG:HB2	2.15	0.46
1:D:331:ASN:ND2	10:D:905:HOH:O	2.49	0.46
1:B:415:MET:HE3	1:B:547:LEU:CD2	2.46	0.46
1:D:510:PHE:CD1	1:D:553:THR:HG21	2.50	0.46
1:D:395:ARG:NH2	10:D:902:HOH:O	2.40	0.45
2:C:229:ALA:O	2:C:233:GLU:HG2	2.16	0.45
1:B:411:GLU:HB2	2:A:254:GLN:OE1	2.16	0.45
2:C:216:GLY:HA2	7:C:302:IOD:I	2.87	0.45
3:E:87:LYS:HE3	10:E:306:HOH:O	2.17	0.45
1:B:699:LEU:N	1:B:700:PRO:CD	2.79	0.45
1:B:347:GLU:N	1:B:348:PRO:CD	2.79	0.45
5:I:1:NAG:H61	5:I:2:NAG:H82	1.99	0.45
1:B:389:LEU:HB2	1:B:576:VAL:HG12	1.98	0.45
1:D:408:GLU:O	1:D:531:PHE:HA	2.16	0.45
1:D:505:ILE:HD11	9:D:801:HEM:CHC	2.47	0.45
1:D:436:ARG:HG2	10:D:942:HOH:O	2.17	0.45
2:C:182:ASN:O	2:C:186:PRO:HA	2.17	0.45
1:B:692:GLN:NE2	7:B:828:IOD:I	3.21	0.44
1:D:377:LEU:HB2	1:D:399:PHE:CD1	2.52	0.44
3:F:59:LYS:HG3	3:F:60:ASN:N	2.33	0.44
3:F:90:GLN:HG2	10:F:302:HOH:O	2.15	0.44
1:B:673:ARG:HG3	1:B:679:TRP:CE2	2.53	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:C:242:LEU:C	2:C:242:LEU:HD23	2.43	0.44
3:E:89:LYS:HG2	3:E:95:VAL:CG2	2.47	0.44
1:D:501:GLY:HA3	9:D:801:HEM:HBC2	2.00	0.43
1:B:405:ARG:HD2	7:B:808:IOD:I	2.89	0.43
1:D:536:ARG:O	1:D:540:GLU:HB2	2.18	0.43
1:B:434:ASN:HD21	1:B:743:GLU:H	1.64	0.43
3:E:89:LYS:CG	3:E:95:VAL:HG21	2.47	0.43
1:B:434:ASN:HD21	1:B:742:ARG:HA	1.83	0.43
1:D:395:ARG:HG3	10:D:902:HOH:O	2.18	0.43
1:B:583:LEU:HB3	1:B:584:PRO:HD3	2.01	0.43
3:F:96:SER:C	3:F:98:TYR:N	2.76	0.43
1:B:560:GLN:HB3	1:B:626:LEU:HD22	2.01	0.43
1:B:292:PHE:HB3	1:B:312:PHE:CD1	2.54	0.43
1:B:450:VAL:HA	1:B:453:MET:HE2	2.00	0.43
2:C:246:GLN:OE1	7:C:303:IOD:I	3.07	0.42
1:D:600:ASN:HD22	1:D:638:ASN:ND2	2.18	0.42
1:D:699:LEU:N	1:D:700:PRO:CD	2.81	0.42
1:B:510:PHE:CD2	1:B:553:THR:HG21	2.54	0.42
1:B:577:MET:HE3	1:B:577:MET:HB3	1.93	0.42
1:D:466:VAL:O	1:D:657:VAL:HG22	2.20	0.42
3:F:81:ILE:HG12	10:F:301:HOH:O	2.19	0.42
1:D:327:ARG:HH11	1:D:327:ARG:HD2	1.61	0.42
1:D:583:LEU:HB3	1:D:584:PRO:HD3	2.01	0.42
2:A:170:GLN:HA	2:A:170:GLN:OE1	2.19	0.42
1:B:569:ARG:NH1	2:A:236:ARG:HD2	2.35	0.42
1:D:387:CYS:HA	1:D:532:PHE:O	2.19	0.42
2:A:179:MET:O	2:A:180:CYS:HB2	2.20	0.42
1:D:554:PRO:CG	7:C:303:IOD:I	3.38	0.42
1:B:520:GLU:HB3	1:B:521:PRO:HA	2.02	0.41
1:D:528:SER:OG	1:D:571:ARG:HB2	2.20	0.41
1:D:697:ILE:HA	7:D:826:IOD:I	2.90	0.41
1:D:384:ASP:O	1:D:385:ASP:C	2.63	0.41
1:D:701:ARG:NH1	1:D:733:LEU:O	2.54	0.41
1:B:449:ILE:HD11	1:B:741:TRP:NE1	2.35	0.41
1:D:599:TYR:CZ	1:D:603:ARG:HD3	2.55	0.41
1:D:714:LYS:HE2	1:D:726:ASP:HA	2.02	0.41
1:B:281:CYS:HB2	1:B:313:PHE:CZ	2.56	0.41
1:B:676:ASP:OD1	2:A:174:ARG:NH2	2.52	0.41
1:D:294:LEU:HB2	1:D:310:ILE:HB	2.02	0.41
1:B:561:ASN:OD1	1:B:561:ASN:O	2.38	0.41
1:B:671:LYS:NZ	7:B:822:IOD:I	3.22	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:409:MET:HE2	1:D:411:GLU:OE2	2.19	0.41
1:B:582:ASP:OD1	1:B:584:PRO:HD2	2.21	0.41
1:D:555:ALA:HA	2:C:250:LEU:HD13	2.02	0.41
10:B:925:HOH:O	3:E:48:HIS:CD2	2.72	0.40
1:D:436:ARG:HB2	10:D:942:HOH:O	2.19	0.40
1:D:488:PRO:HD2	2:C:188:LEU:HB3	2.03	0.40
2:A:204:GLU:HG2	10:A:412:HOH:O	2.20	0.40
2:C:177:THR:O	2:C:190:ALA:HA	2.20	0.40
1:B:572:LEU:HB3	1:B:581:LEU:HB2	2.04	0.40
1:D:491:ALA:O	1:D:492:ASN:C	2.65	0.40
2:A:177:THR:O	2:A:190:ALA:HA	2.22	0.40

All (3) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
10:D:974:HOH:O	10:E:314:HOH:O[7_555]	1.22	0.98
10:D:975:HOH:O	10:E:305:HOH:O[7_555]	1.55	0.65
10:B:955:HOH:O	10:D:939:HOH:O[6_555]	1.97	0.23

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	B	464/467 (99%)	453 (98%)	11 (2%)	0	100	100
1	D	462/467 (99%)	444 (96%)	17 (4%)	1 (0%)	44	59
2	A	103/114 (90%)	101 (98%)	2 (2%)	0	100	100
2	C	103/114 (90%)	101 (98%)	2 (2%)	0	100	100
3	E	55/60 (92%)	55 (100%)	0	0	100	100
3	F	56/60 (93%)	55 (98%)	1 (2%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
All	All	1243/1282 (97%)	1209 (97%)	33 (3%)	1 (0%)	48 65

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	D	392	ARG

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	B	411/411 (100%)	402 (98%)	9 (2%)	47 67
1	D	410/411 (100%)	399 (97%)	11 (3%)	40 60
2	A	90/97 (93%)	88 (98%)	2 (2%)	47 67
2	C	90/97 (93%)	86 (96%)	4 (4%)	24 39
3	E	50/53 (94%)	50 (100%)	0	100 100
3	F	51/53 (96%)	51 (100%)	0	100 100
All	All	1102/1122 (98%)	1076 (98%)	26 (2%)	44 64

All (26) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	B	279	VAL
1	B	290	PRO
1	B	341	MET
1	B	420	LEU
1	B	470	THR
1	B	527	LEU
1	B	577	MET
1	B	683	GLU
1	B	713	SER
1	D	341	MET
1	D	347	GLU

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Mol	Chain	Res	Type
1	D	406	SER
1	D	420	LEU
1	D	448	LYS
1	D	470	THR
1	D	519	MET
1	D	527	LEU
1	D	530	VAL
1	D	688	MET
1	D	713	SER
2	A	242	LEU
2	A	253	MET
2	C	167	CYS
2	C	179	MET
2	C	239	THR
2	C	253	MET

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (19) such sidechains are listed below:

Mol	Chain	Res	Type
1	B	367	GLN
1	B	423	HIS
1	B	434	ASN
1	B	496	ASN
1	B	522	ASN
1	B	561	ASN
1	B	737	ASN
1	D	306	GLN
1	D	367	GLN
1	D	434	ASN
1	D	492	ASN
1	D	496	ASN
1	D	633	GLN
1	D	638	ASN
2	C	241	GLN
3	E	48	HIS
3	E	68	ASN
3	F	68	ASN
3	F	86	ASN

5.3.3 RNA (i)

There are no RNA molecules in this entry.

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

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	$\#\|Z\| > 2$
1	CSO	D	316	1	3,6,7	0.89	0	0,6,8	-	-
1	CSO	B	316	1	3,6,7	0.74	0	0,6,8	-	-

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
1	CSO	D	316	1	-	0/1/5/7	-
1	CSO	B	316	1	-	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)

20 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	$\#\|Z\| > 2$
4	NAG	G	1	4,1	14,14,15	0.36	0	17,19,21	0.64	0
4	NAG	G	2	4	14,14,15	0.41	0	17,19,21	0.96	1 (5%)
4	NAG	H	1	4,1	14,14,15	0.39	0	17,19,21	1.98	3 (17%)
4	NAG	H	2	4	14,14,15	0.35	0	17,19,21	0.80	0
5	NAG	I	1	5,1	14,14,15	0.60	0	17,19,21	1.01	0
5	NAG	I	2	5	14,14,15	0.54	0	17,19,21	1.30	2 (11%)
5	NAG	I	3	5	14,14,15	0.37	0	17,19,21	1.18	1 (5%)
5	MAN	I	4	5	11,11,12	0.49	0	15,15,17	0.82	0
5	MAN	I	5	5	11,11,12	0.53	0	15,15,17	1.75	2 (13%)
5	FUC	I	6	5	10,10,11	0.62	0	14,14,16	1.13	1 (7%)
4	NAG	J	1	4,1	14,14,15	0.40	0	17,19,21	0.47	0
4	NAG	J	2	4	14,14,15	0.32	0	17,19,21	0.90	0
4	NAG	K	1	4,1	14,14,15	0.44	0	17,19,21	0.84	1 (5%)
4	NAG	K	2	4	14,14,15	0.39	0	17,19,21	0.74	0
6	NAG	L	1	1,6	14,14,15	0.56	0	17,19,21	0.77	0
6	NAG	L	2	6	14,14,15	0.48	0	17,19,21	0.67	0
6	BMA	L	3	6	11,11,12	1.10	1 (9%)	15,15,17	1.16	1 (6%)
6	MAN	L	4	6	11,11,12	0.44	0	15,15,17	0.83	0
6	MAN	L	5	6	11,11,12	0.68	0	15,15,17	0.94	1 (6%)
6	FUC	L	6	6	10,10,11	0.72	0	14,14,16	0.83	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
4	NAG	G	1	4,1	-	0/6/23/26	0/1/1/1
4	NAG	G	2	4	-	0/6/23/26	0/1/1/1
4	NAG	H	1	4,1	-	4/6/23/26	0/1/1/1
4	NAG	H	2	4	-	1/6/23/26	0/1/1/1
5	NAG	I	1	5,1	-	2/6/23/26	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
5	NAG	I	2	5	-	3/6/23/26	0/1/1/1
5	NAG	I	3	5	-	0/6/23/26	0/1/1/1
5	MAN	I	4	5	-	2/2/19/22	0/1/1/1
5	MAN	I	5	5	-	1/2/19/22	0/1/1/1
5	FUC	I	6	5	-	-	0/1/1/1
4	NAG	J	1	4,1	-	0/6/23/26	0/1/1/1
4	NAG	J	2	4	-	0/6/23/26	0/1/1/1
4	NAG	K	1	4,1	-	2/6/23/26	0/1/1/1
4	NAG	K	2	4	-	2/6/23/26	0/1/1/1
6	NAG	L	1	1,6	-	2/6/23/26	0/1/1/1
6	NAG	L	2	6	-	1/6/23/26	0/1/1/1
6	BMA	L	3	6	-	0/2/19/22	0/1/1/1
6	MAN	L	4	6	-	0/2/19/22	0/1/1/1
6	MAN	L	5	6	-	0/2/19/22	0/1/1/1
6	FUC	L	6	6	-	-	0/1/1/1

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
6	L	3	BMA	C2-C3	-3.24	1.47	1.52

All (13) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	H	1	NAG	C2-N2-C7	5.48	130.70	122.90
5	I	5	MAN	C1-O5-C5	5.32	119.40	112.19
5	I	2	NAG	C2-N2-C7	3.54	127.94	122.90
6	L	3	BMA	O3-C3-C2	-3.32	103.63	109.99
5	I	2	NAG	C1-C2-N2	3.09	115.77	110.49
4	H	1	NAG	C4-C3-C2	-3.07	106.52	111.02
5	I	3	NAG	C2-N2-C7	2.83	126.93	122.90
4	H	1	NAG	C1-C2-N2	2.79	115.25	110.49
5	I	5	MAN	O5-C5-C6	-2.69	102.99	107.20
5	I	6	FUC	C6-C5-C4	2.47	117.64	113.07
6	L	5	MAN	C1-O5-C5	2.41	115.46	112.19
4	K	1	NAG	O5-C1-C2	-2.27	107.70	111.29
4	G	2	NAG	O4-C4-C5	2.11	114.53	109.30

There are no chirality outliers.

All (20) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	K	1	NAG	C4-C5-C6-O6
4	H	1	NAG	C8-C7-N2-C2
5	I	1	NAG	C4-C5-C6-O6
4	H	1	NAG	O7-C7-N2-C2
5	I	4	MAN	O5-C5-C6-O6
6	L	1	NAG	C8-C7-N2-C2
4	K	1	NAG	O5-C5-C6-O6
5	I	1	NAG	O5-C5-C6-O6
4	K	2	NAG	C8-C7-N2-C2
4	K	2	NAG	O7-C7-N2-C2
5	I	5	MAN	O5-C5-C6-O6
6	L	1	NAG	O7-C7-N2-C2
4	H	1	NAG	C3-C2-N2-C7
4	H	2	NAG	C8-C7-N2-C2
5	I	2	NAG	O7-C7-N2-C2
5	I	4	MAN	C4-C5-C6-O6
4	H	1	NAG	C4-C5-C6-O6
5	I	2	NAG	C8-C7-N2-C2
5	I	2	NAG	C3-C2-N2-C7
6	L	2	NAG	O7-C7-N2-C2

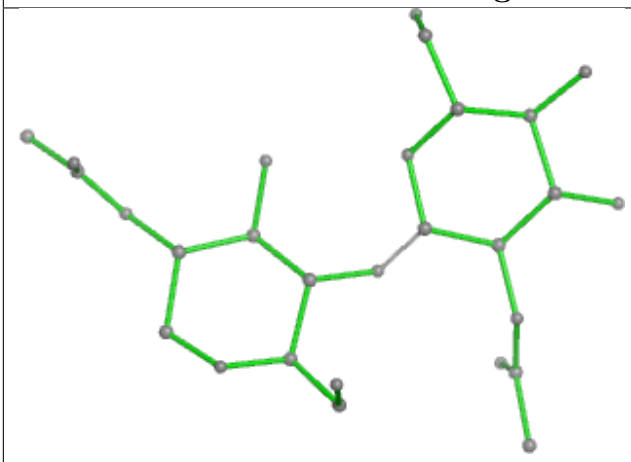
There are no ring outliers.

4 monomers are involved in 3 short contacts:

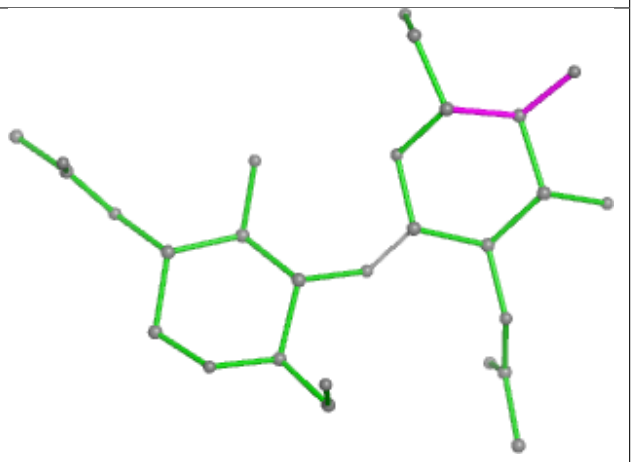
Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	I	4	MAN	1	0
4	K	1	NAG	1	0
5	I	1	NAG	1	0
5	I	2	NAG	1	0

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

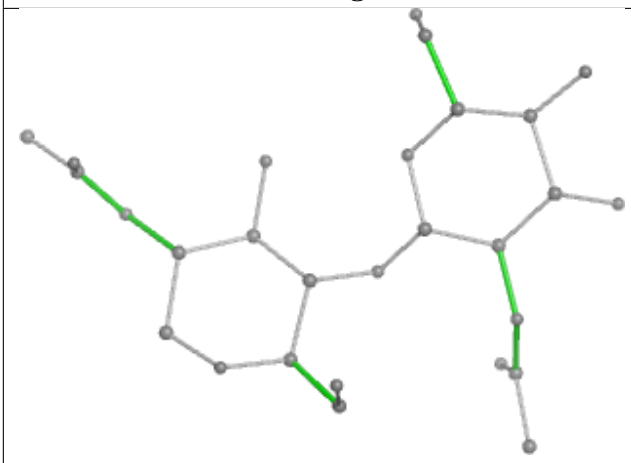
Oligosaccharide Chain G



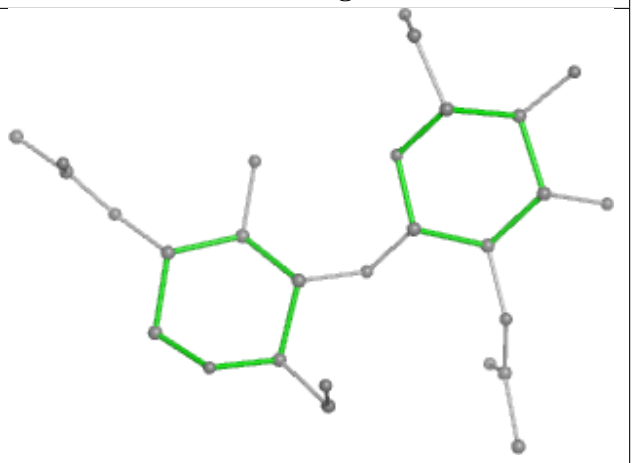
Bond lengths



Bond angles

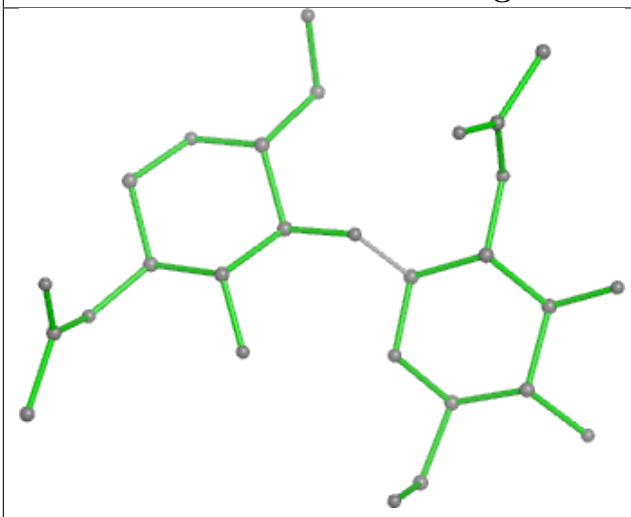


Torsions

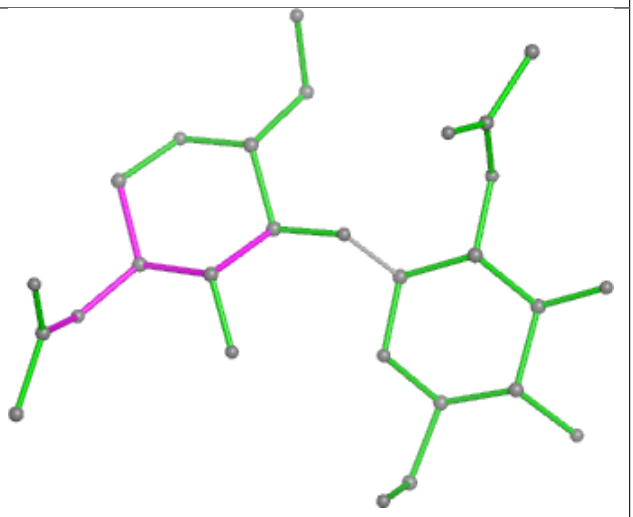


Rings

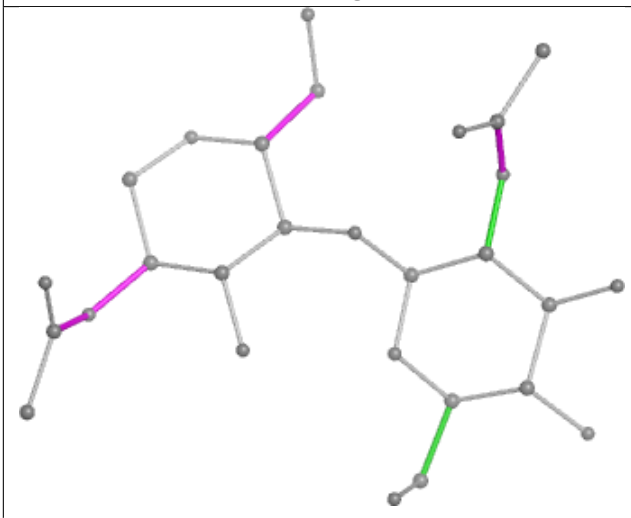
Oligosaccharide Chain H



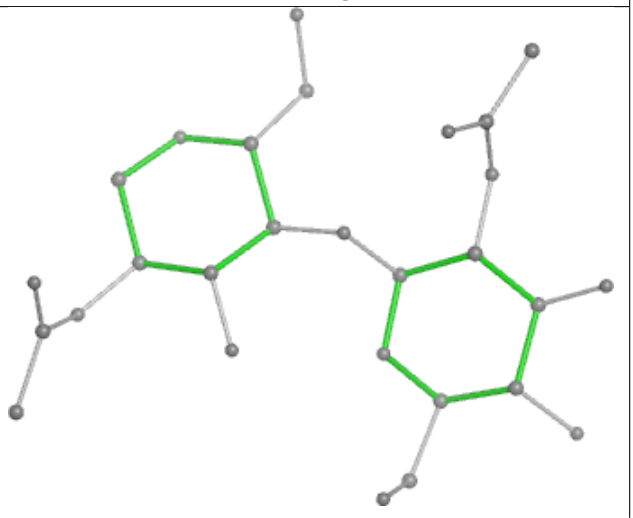
Bond lengths



Bond angles

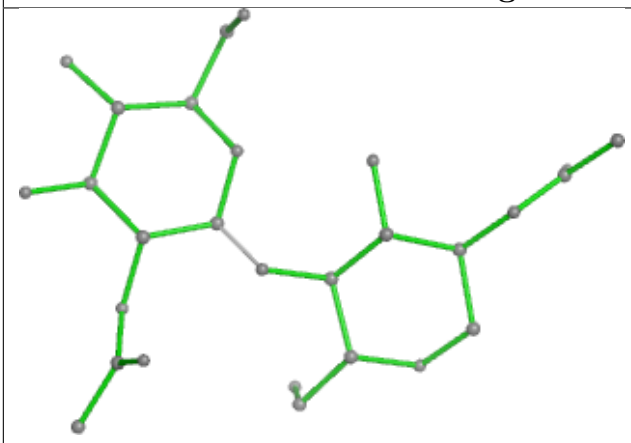


Torsions

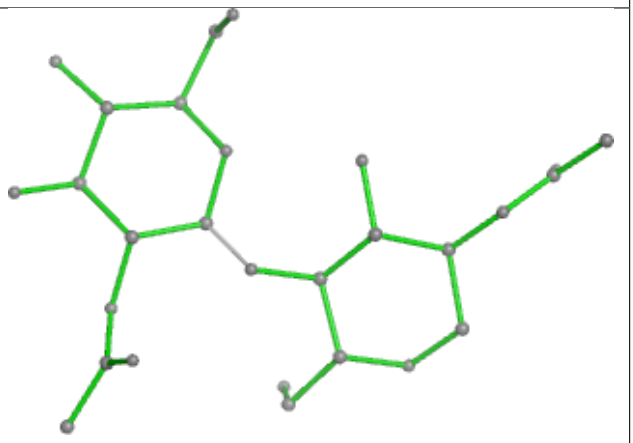


Rings

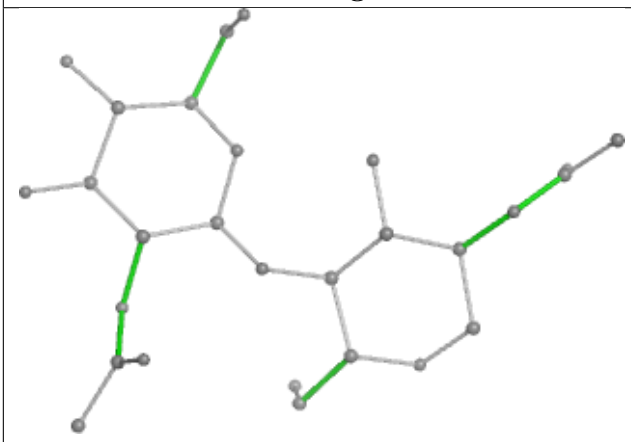
Oligosaccharide Chain J



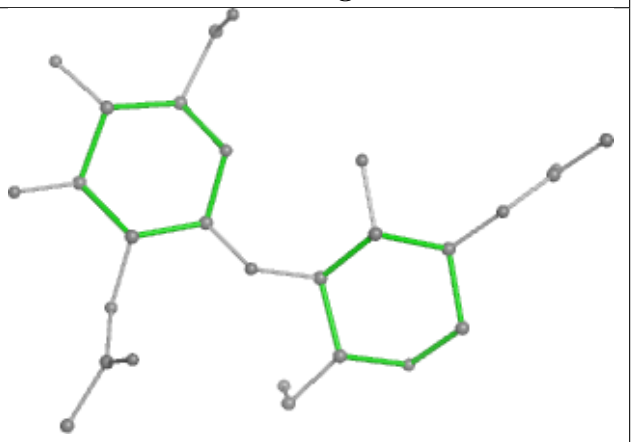
Bond lengths



Bond angles

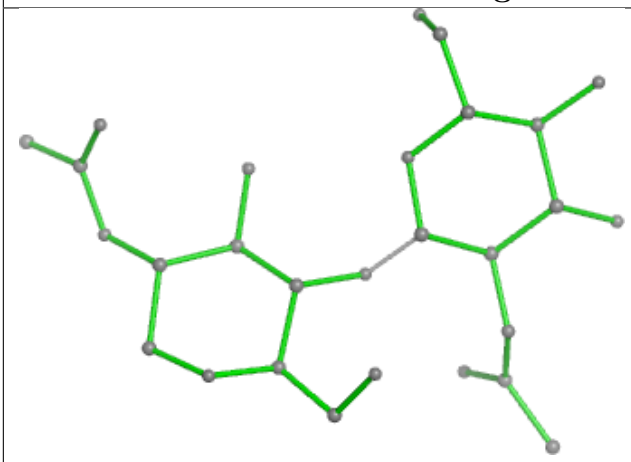


Torsions

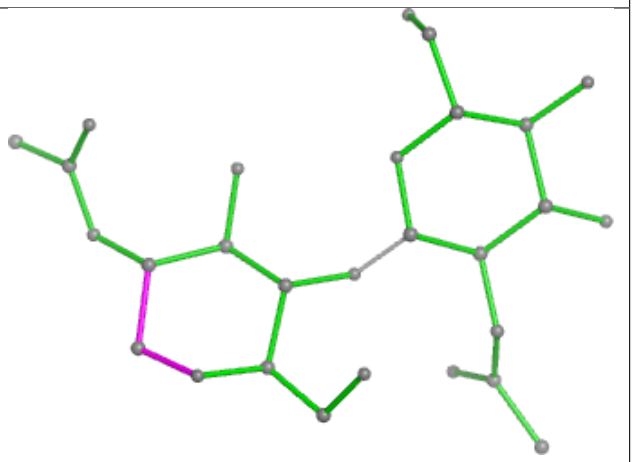


Rings

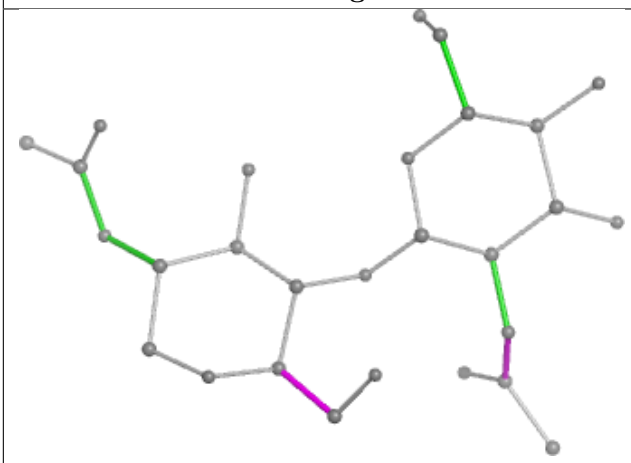
Oligosaccharide Chain K



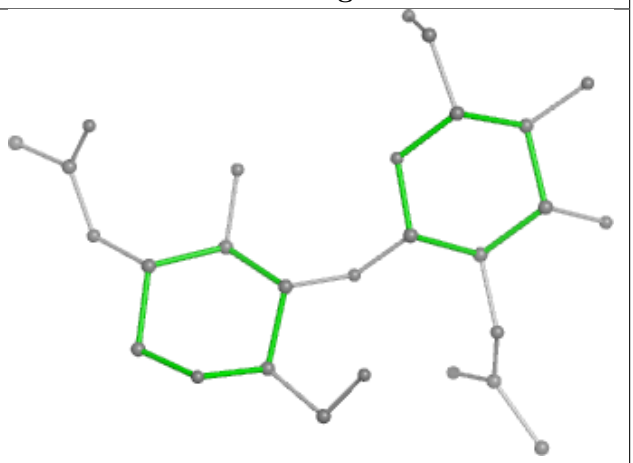
Bond lengths



Bond angles

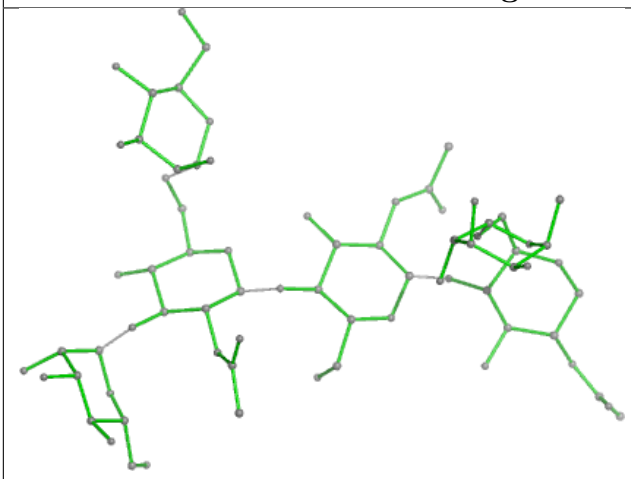


Torsions

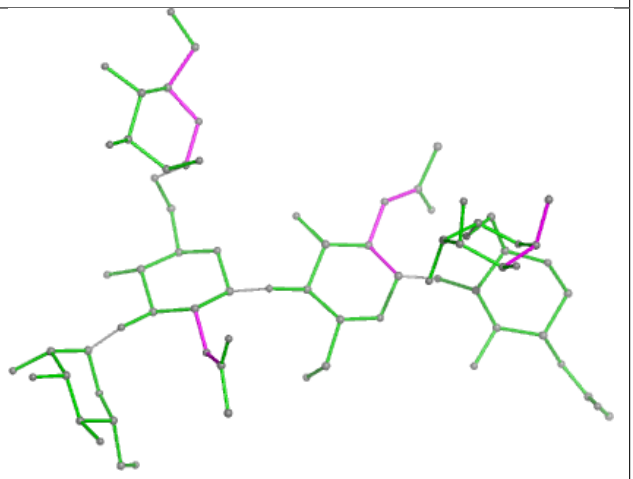


Rings

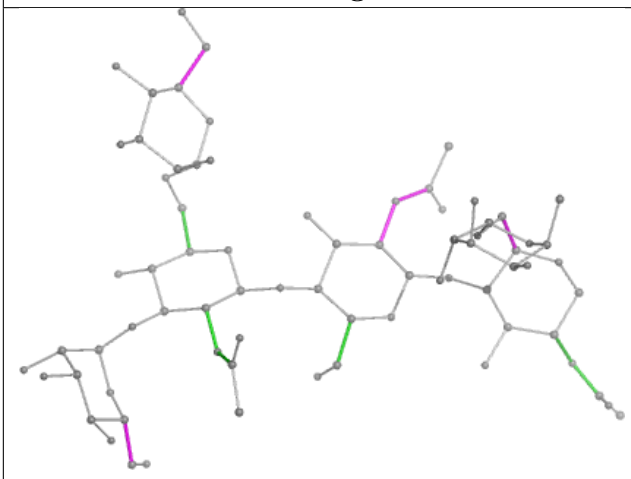
Oligosaccharide Chain I



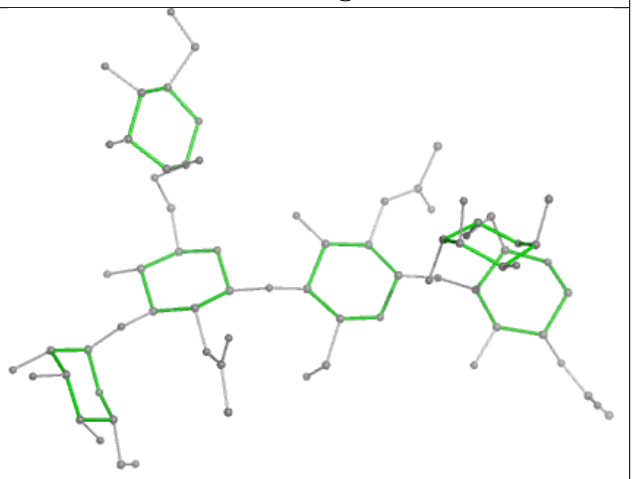
Bond lengths



Bond angles

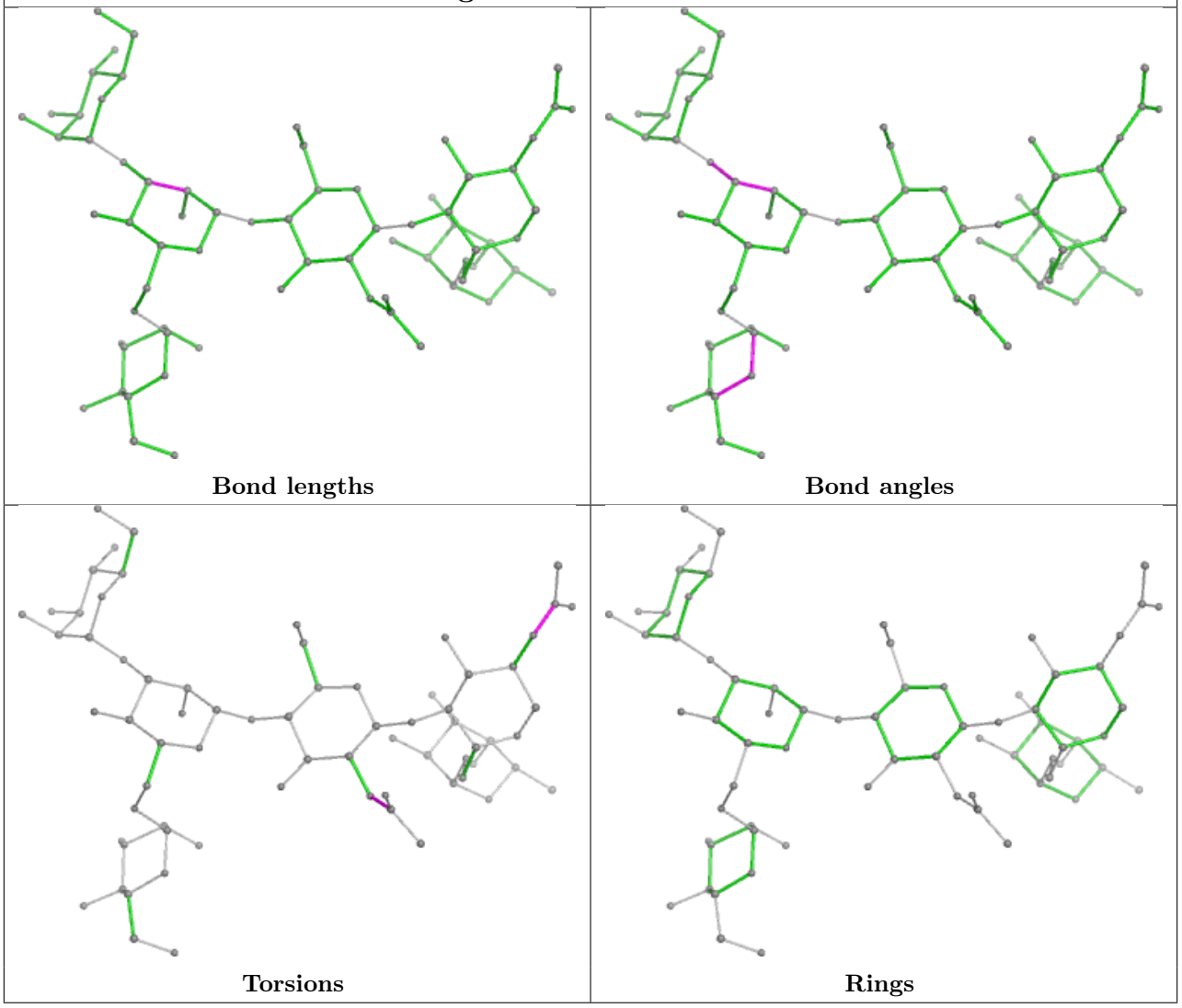


Torsions



Rings

Oligosaccharide Chain L



5.6 Ligand geometry (i)

Of 101 ligands modelled in this entry, 99 are monoatomic - leaving 2 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	$\#\|Z\| > 2$
9	HEM	D	801	2,1	41,50,50	1.72	8 (19%)	45,82,82	1.24	5 (11%)
9	HEM	A	301	2,1	41,50,50	1.58	6 (14%)	45,82,82	1.18	3 (6%)

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
9	HEM	D	801	2,1	-	4/12/54/54	-
9	HEM	A	301	2,1	-	4/12/54/54	-

All (14) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
9	D	801	HEM	C1D-C2D	-4.07	1.36	1.44
9	D	801	HEM	C1B-C2B	-3.99	1.36	1.44
9	A	301	HEM	C3B-C4B	-3.93	1.37	1.44
9	D	801	HEM	C4D-C3D	-3.83	1.38	1.45
9	A	301	HEM	C4D-C3D	-3.82	1.38	1.45
9	D	801	HEM	FE-NB	3.82	2.15	1.96
9	A	301	HEM	C1B-C2B	-3.63	1.37	1.44
9	D	801	HEM	C3B-C4B	-3.44	1.38	1.44
9	A	301	HEM	C4D-ND	-3.24	1.34	1.40
9	A	301	HEM	C1D-C2D	-3.18	1.38	1.44
9	D	801	HEM	C4D-ND	-2.98	1.35	1.40
9	D	801	HEM	C1B-NB	-2.68	1.35	1.40
9	D	801	HEM	O2D-CGD	-2.68	1.21	1.30
9	A	301	HEM	C1B-NB	-2.19	1.36	1.40

All (8) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
9	D	801	HEM	C4B-CHC-C1C	3.61	127.32	122.56
9	D	801	HEM	CAD-CBD-CGD	3.12	120.32	113.60
9	D	801	HEM	C4C-CHD-C1D	2.61	126.01	122.56
9	A	301	HEM	C4C-CHD-C1D	2.55	125.92	122.56
9	A	301	HEM	CHC-C4B-NB	2.45	127.10	124.43
9	D	801	HEM	C4A-C3A-C2A	2.34	108.62	107.00
9	A	301	HEM	CHD-C1D-ND	2.28	126.91	124.43
9	D	801	HEM	CHA-C4D-ND	-2.22	121.64	124.38

There are no chirality outliers.

All (8) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
9	D	801	HEM	CAD-CBD-CGD-O2D
9	D	801	HEM	CAD-CBD-CGD-O1D
9	D	801	HEM	CAA-CBA-CGA-O2A
9	A	301	HEM	CAA-CBA-CGA-O2A
9	A	301	HEM	CAD-CBD-CGD-O2D
9	A	301	HEM	CAA-CBA-CGA-O1A
9	A	301	HEM	CAD-CBD-CGD-O1D
9	D	801	HEM	CAA-CBA-CGA-O1A

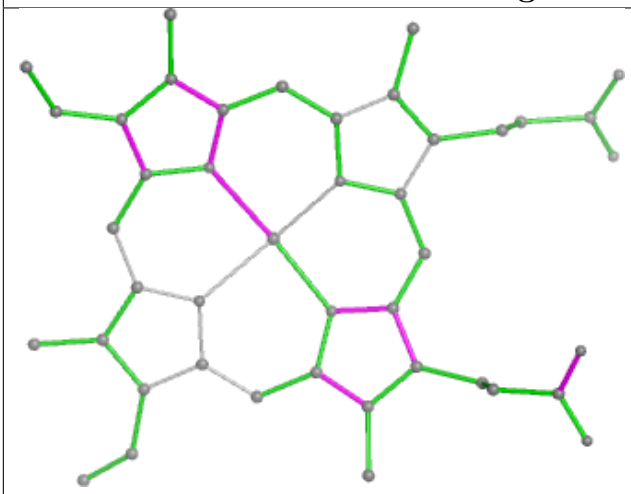
There are no ring outliers.

1 monomer is involved in 2 short contacts:

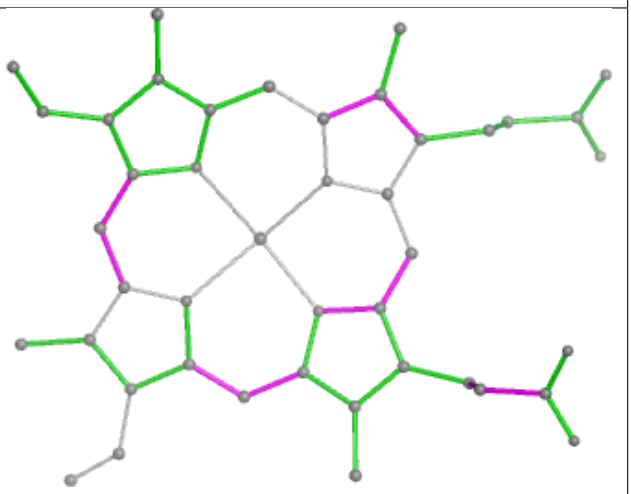
Mol	Chain	Res	Type	Clashes	Symm-Clashes
9	D	801	HEM	2	0

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.

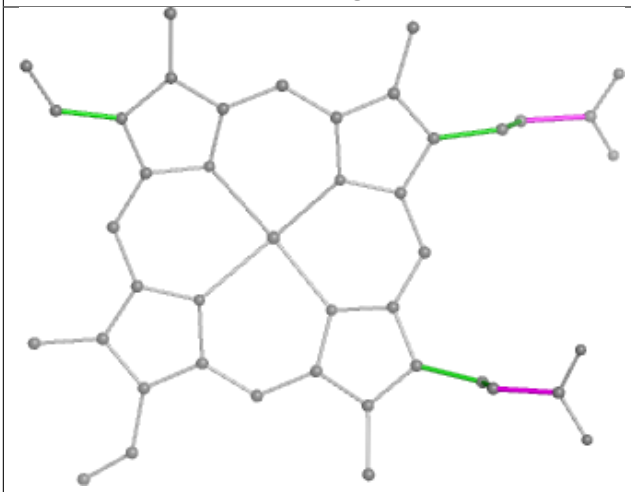
Ligand HEM D 801



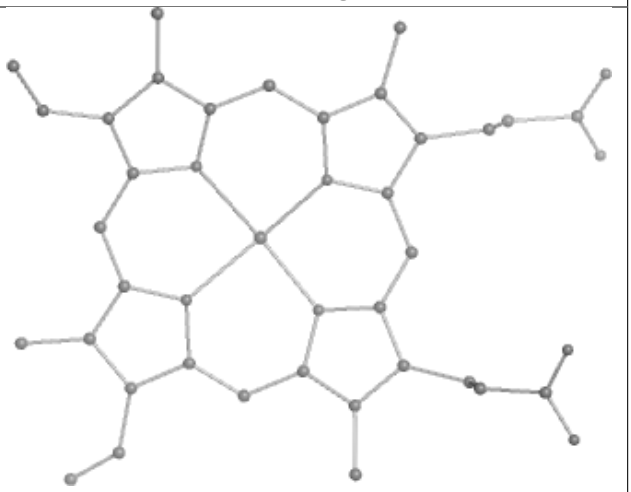
Bond lengths



Bond angles

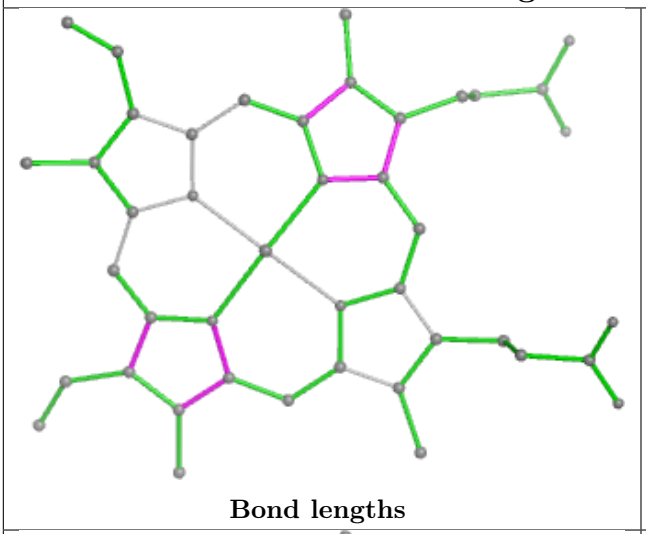


Torsions

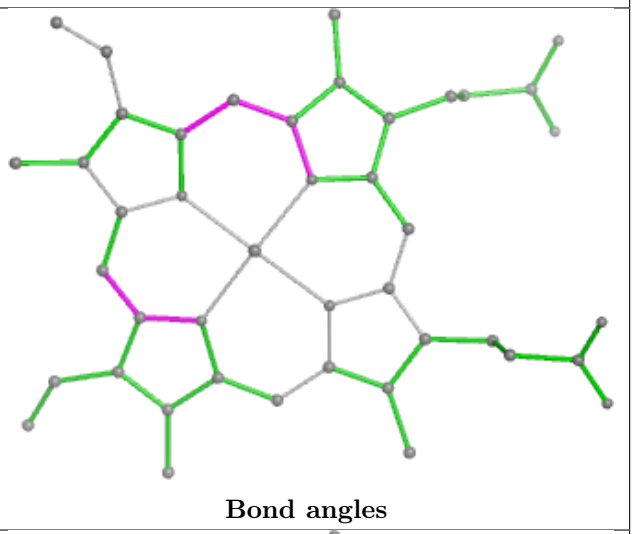


Rings

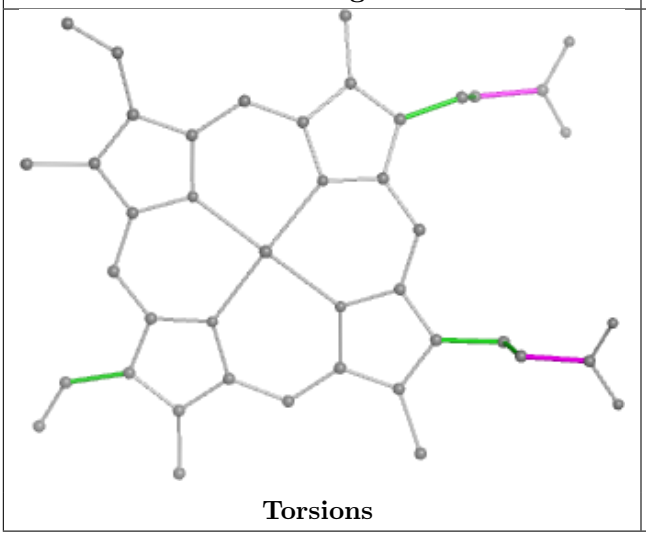
Ligand HEM A 301



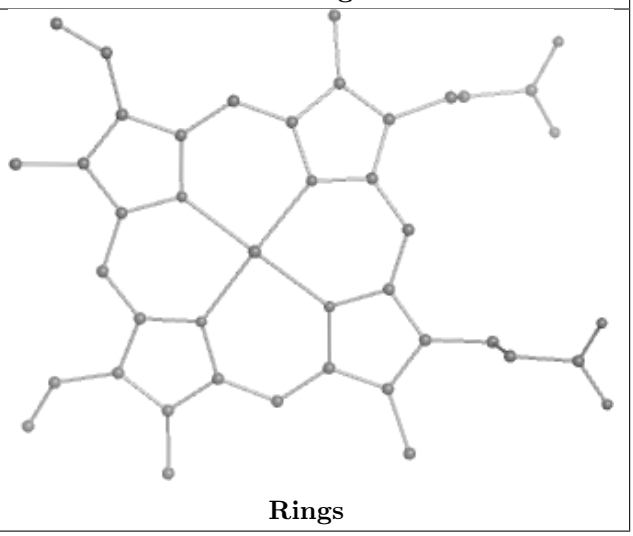
Bond lengths



Bond angles



Torsions



Rings

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	B	465/467 (99%)	-0.52	5 (1%) 77 76	22, 36, 59, 94	1 (0%)
1	D	464/467 (99%)	-0.09	5 (1%) 77 76	27, 49, 80, 101	0
2	A	105/114 (92%)	-0.54	0 100 100	25, 32, 69, 85	0
2	C	105/114 (92%)	-0.32	1 (0%) 79 78	26, 41, 72, 89	0
3	E	57/60 (95%)	0.33	2 (3%) 47 45	39, 61, 90, 106	0
3	F	58/60 (96%)	2.01	26 (44%) 1 0	101, 131, 148, 153	0
All	All	1254/1282 (97%)	-0.19	39 (3%) 51 50	22, 41, 94, 153	1 (0%)

All (39) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
3	F	100	HIS	5.5
1	D	279	VAL	4.0
3	F	43	ALA	3.5
3	F	81	ILE	3.3
1	B	715	ASN	3.2
3	F	52	TYR	3.0
3	F	55	VAL	3.0
3	F	92	GLY	3.0
3	F	85	ILE	2.9
1	B	744	ALA	2.9
3	F	57	LEU	2.9
1	D	715	ASN	2.9
3	F	83	ASP	2.8
2	C	271	ALA	2.8
3	F	56	LEU	2.7
3	F	79	HIS	2.7
3	F	53	ILE	2.6
3	F	72	TYR	2.6
3	F	95	VAL	2.6

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Mol	Chain	Res	Type	RSRZ
3	F	93	PHE	2.6
3	F	89	LYS	2.5
3	E	99	GLU	2.5
3	F	98	TYR	2.5
3	F	70	ARG	2.4
3	E	43	ALA	2.4
1	B	653[A]	ARG	2.4
3	F	82	LYS	2.4
3	F	78	LEU	2.4
3	F	46	LEU	2.3
3	F	99	GLU	2.3
1	D	735	ALA	2.3
3	F	94	ASP	2.2
1	B	323	ASN	2.2
3	F	76	LYS	2.2
1	B	734	PRO	2.1
1	D	734	PRO	2.1
1	D	383	HIS	2.1
3	F	77	GLY	2.1
3	F	50	LEU	2.1

6.2 Non-standard residues in protein, DNA, RNA chains (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
1	CSO	D	316	7/8	0.94	0.09	34,35,40,44	0
1	CSO	B	316	7/8	0.98	0.05	27,30,32,32	0

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, 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
5	MAN	I	4	11/12	0.61	0.14	78,80,85,87	0

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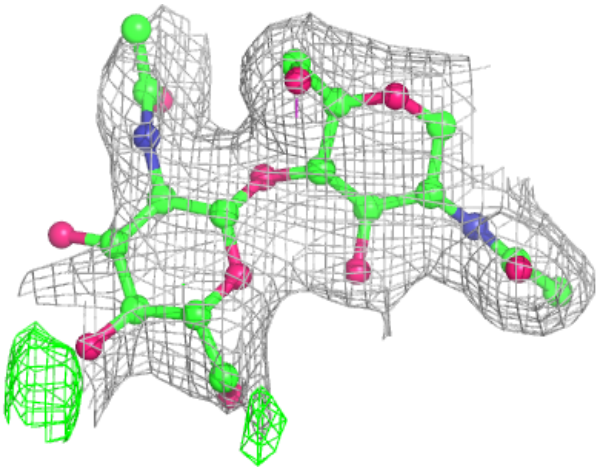
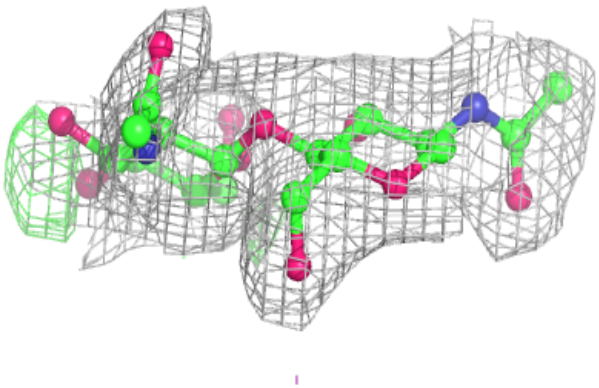
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
4	NAG	J	2	14/15	0.68	0.16	93,101,105,106	0
6	MAN	L	4	11/12	0.69	0.14	65,76,83,86	0
4	NAG	G	2	14/15	0.71	0.17	65,78,89,90	0
4	NAG	K	2	14/15	0.74	0.14	96,102,108,108	0
4	NAG	H	2	14/15	0.77	0.17	71,91,119,125	0
5	FUC	I	6	10/11	0.78	0.18	48,60,90,106	0
5	NAG	I	3	14/15	0.81	0.17	51,59,82,87	0
4	NAG	H	1	14/15	0.81	0.15	47,59,67,79	0
4	NAG	K	1	14/15	0.87	0.12	68,82,88,91	0
4	NAG	J	1	14/15	0.87	0.11	60,75,80,93	0
5	NAG	I	1	14/15	0.89	0.12	35,38,50,60	0
5	MAN	I	5	11/12	0.90	0.10	51,57,60,68	0
6	MAN	L	5	11/12	0.91	0.09	41,45,50,55	0
5	NAG	I	2	14/15	0.93	0.09	32,37,40,48	0
4	NAG	G	1	14/15	0.94	0.07	35,45,53,60	0
6	BMA	L	3	11/12	0.94	0.07	38,46,49,59	0
6	NAG	L	1	14/15	0.95	0.08	31,33,39,39	0
6	FUC	L	6	10/11	0.95	0.07	38,42,42,43	0
6	NAG	L	2	14/15	0.97	0.05	27,33,35,38	0

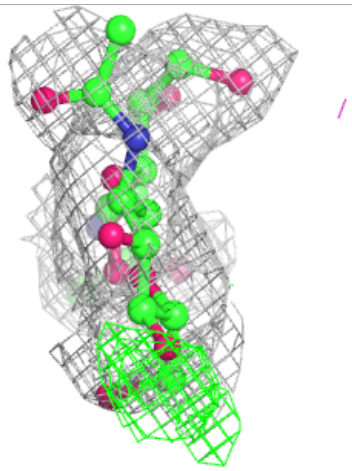
The following is a graphical depiction of the model fit to experimental electron density for oligosaccharide. Each fit is shown from different orientation to approximate a three-dimensional view.

Electron density around Chain G:

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

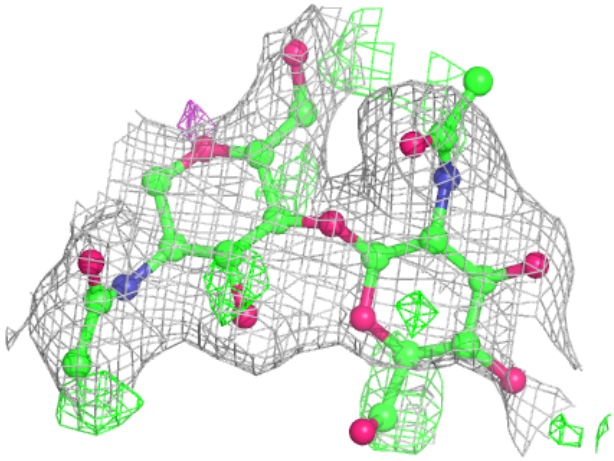


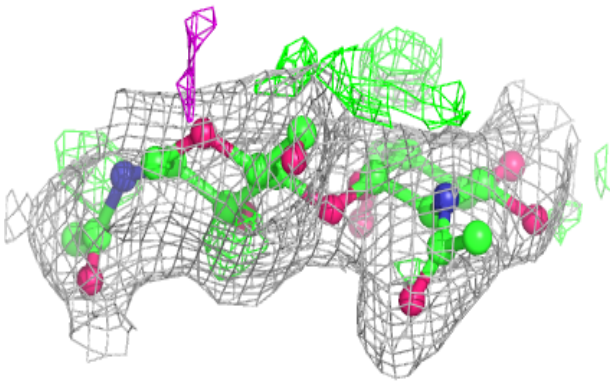


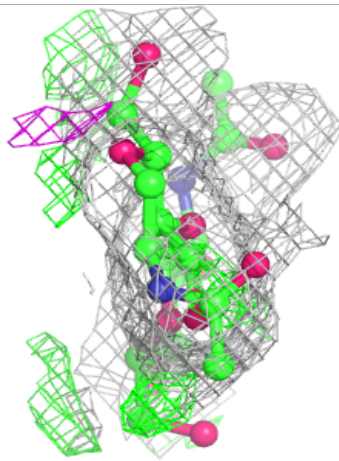


Electron density around Chain H:

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

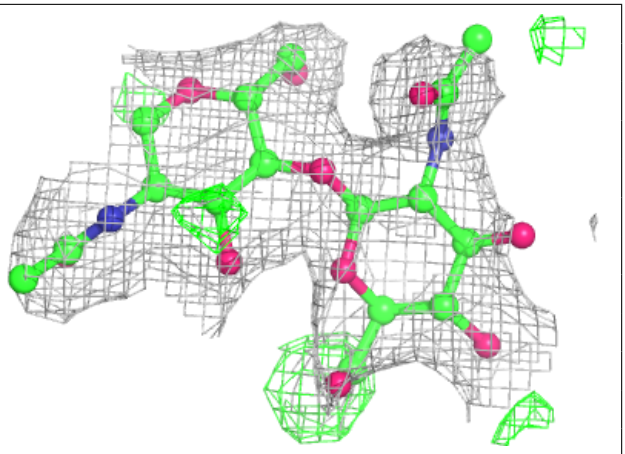


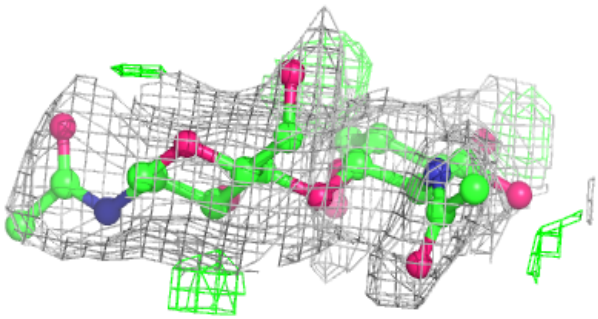


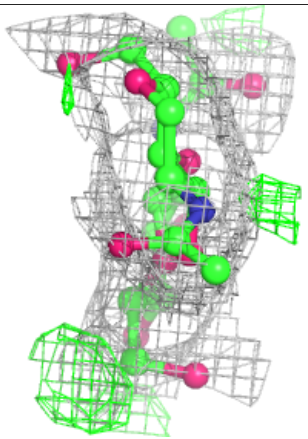


Electron density around Chain J:

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

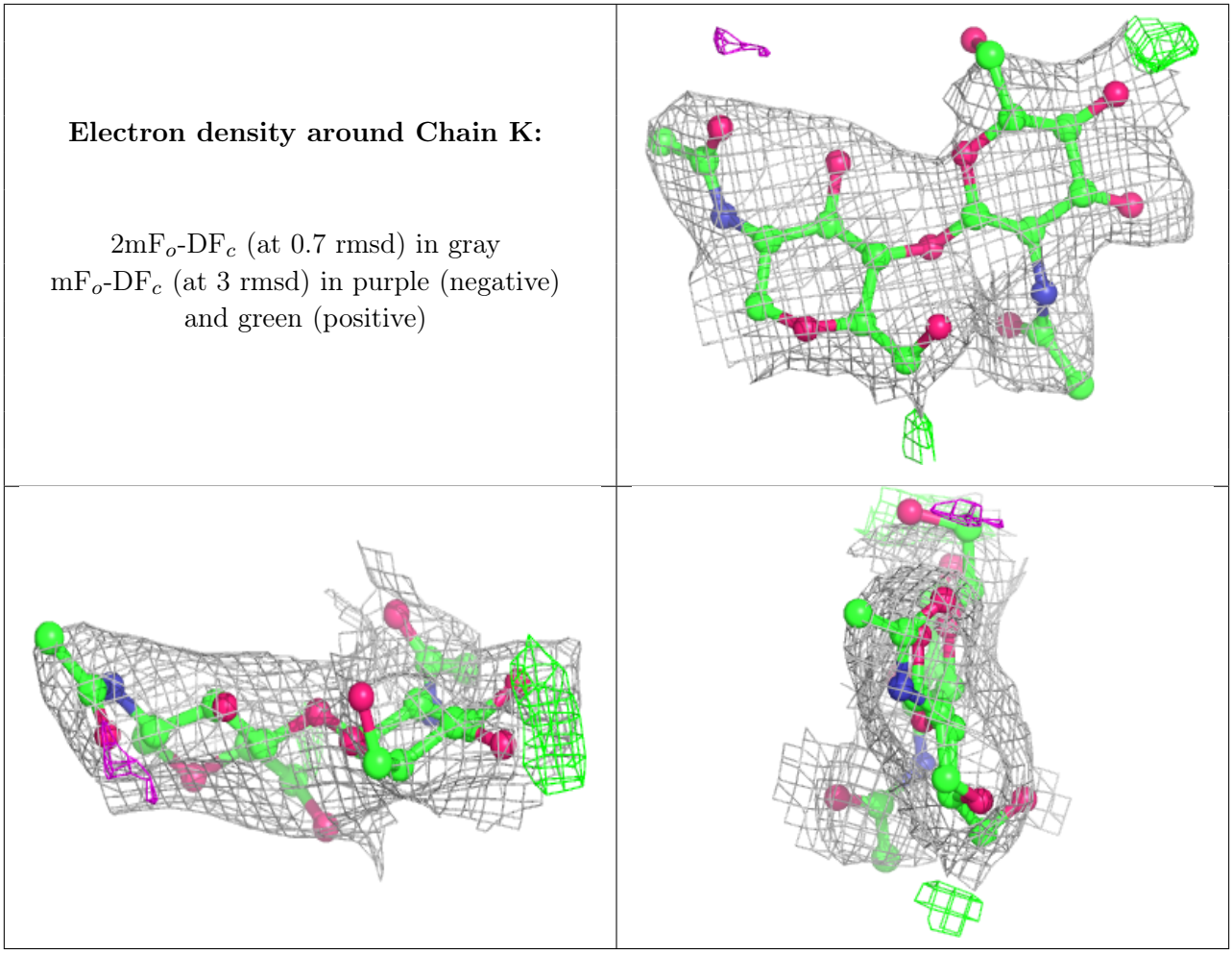






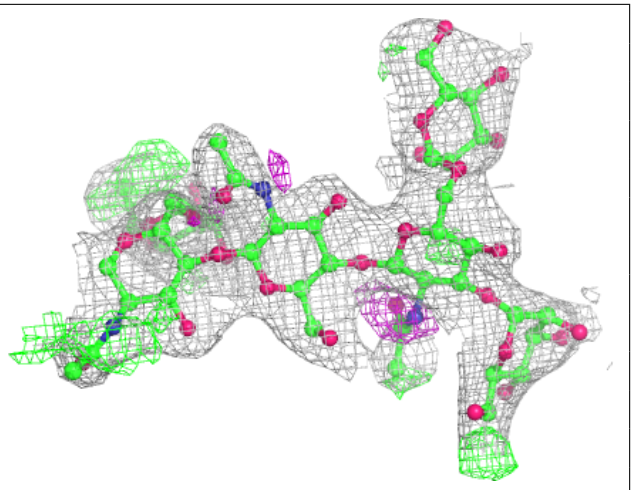
Electron density around Chain K:

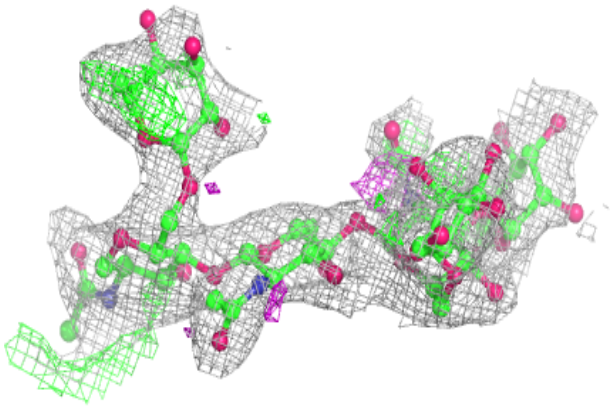
$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)

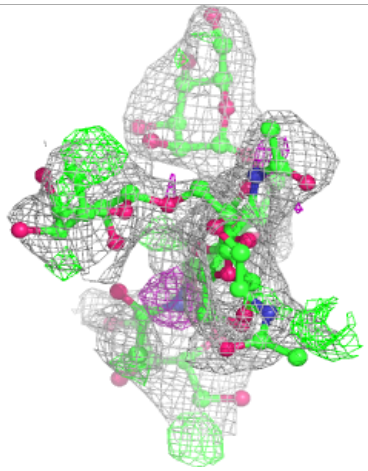


Electron density around Chain I:

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

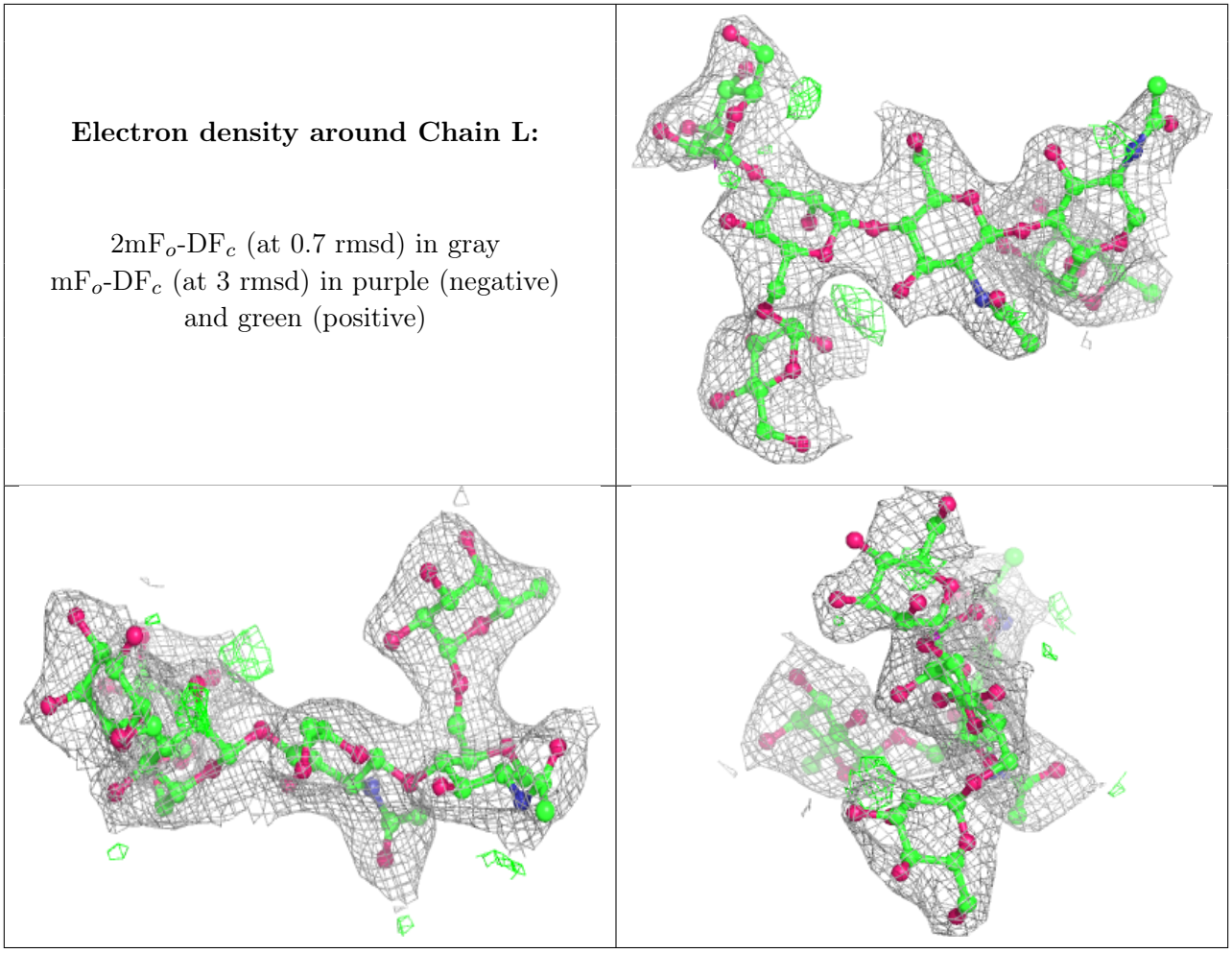






Electron density around Chain L:

$2mF_o$-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, 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
7	IOD	B	831	1/1	0.82	0.12	70,70,70,70	1
7	IOD	D	823	1/1	0.84	0.11	79,79,79,79	1
7	IOD	D	834	1/1	0.84	0.11	98,98,98,98	1
7	IOD	D	825	1/1	0.85	0.12	95,95,95,95	1
7	IOD	B	832	1/1	0.85	0.11	73,73,73,73	1
7	IOD	B	828	1/1	0.88	0.09	83,83,83,83	1
7	IOD	B	837	1/1	0.88	0.08	88,88,88,88	1
7	IOD	D	821	1/1	0.88	0.10	71,71,71,71	1
7	IOD	B	836	1/1	0.89	0.10	56,56,56,56	1
7	IOD	D	816[A]	1/1	0.90	0.08	60,60,60,60	1

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
7	IOD	D	816[B]	1/1	0.90	0.08	65,65,65,65	1
7	IOD	A	310	1/1	0.90	0.09	73,73,73,73	1
7	IOD	E	201	1/1	0.90	0.10	53,53,53,53	1
7	IOD	C	304	1/1	0.91	0.08	64,64,64,64	1
7	IOD	B	835	1/1	0.91	0.08	73,73,73,73	1
7	IOD	B	829	1/1	0.92	0.07	78,78,78,78	1
7	IOD	D	827	1/1	0.92	0.06	72,72,72,72	1
7	IOD	D	822[A]	1/1	0.92	0.07	55,55,55,55	1
7	IOD	D	822[B]	1/1	0.92	0.07	59,59,59,59	1
7	IOD	B	825	1/1	0.92	0.09	58,58,58,58	1
7	IOD	D	824	1/1	0.92	0.07	90,90,90,90	1
7	IOD	B	814[B]	1/1	0.93	0.07	68,68,68,68	1
7	IOD	A	307	1/1	0.93	0.07	52,52,52,52	1
7	IOD	B	814[A]	1/1	0.93	0.07	72,72,72,72	1
7	IOD	C	302	1/1	0.93	0.06	68,68,68,68	1
7	IOD	C	303	1/1	0.93	0.08	74,74,74,74	1
7	IOD	B	834[A]	1/1	0.93	0.06	63,63,63,63	1
7	IOD	B	834[B]	1/1	0.93	0.06	61,61,61,61	1
7	IOD	B	826[A]	1/1	0.94	0.06	53,53,53,53	1
7	IOD	A	308	1/1	0.94	0.09	69,69,69,69	1
7	IOD	B	826[B]	1/1	0.94	0.06	59,59,59,59	1
7	IOD	B	830	1/1	0.94	0.07	67,67,67,67	1
7	IOD	B	827[A]	1/1	0.94	0.08	56,56,56,56	1
7	IOD	D	832	1/1	0.94	0.08	80,80,80,80	1
7	IOD	B	827[B]	1/1	0.94	0.08	62,62,62,62	1
7	IOD	D	831	1/1	0.95	0.07	59,59,59,59	1
7	IOD	B	824[A]	1/1	0.95	0.08	55,55,55,55	1
7	IOD	D	833	1/1	0.95	0.07	68,68,68,68	1
7	IOD	B	824[B]	1/1	0.95	0.08	64,64,64,64	1
7	IOD	B	821[A]	1/1	0.95	0.08	63,63,63,63	1
7	IOD	B	821[B]	1/1	0.95	0.08	62,62,62,62	1
7	IOD	B	833	1/1	0.95	0.08	71,71,71,71	1
7	IOD	B	838	1/1	0.95	0.06	73,73,73,73	1
7	IOD	D	811	1/1	0.95	0.08	65,65,65,65	0
7	IOD	D	814	1/1	0.95	0.10	64,64,64,64	1
7	IOD	D	815	1/1	0.95	0.11	66,66,66,66	1
7	IOD	D	830	1/1	0.96	0.08	62,62,62,62	1
7	IOD	D	819	1/1	0.96	0.05	62,62,62,62	1
7	IOD	B	808	1/1	0.96	0.07	60,60,60,60	1
7	IOD	D	828	1/1	0.96	0.09	74,74,74,74	1
9	HEM	D	801	43/43	0.96	0.07	28,39,44,49	0
9	HEM	A	301	43/43	0.96	0.08	24,28,32,34	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
7	IOD	B	841	1/1	0.97	0.05	53,53,53,53	1
7	IOD	D	803	1/1	0.97	0.06	60,60,60,60	0
7	IOD	B	823	1/1	0.97	0.07	63,63,63,63	1
7	IOD	B	818	1/1	0.97	0.05	64,64,64,64	1
7	IOD	B	820	1/1	0.97	0.05	63,63,63,63	1
7	IOD	B	806	1/1	0.97	0.06	58,58,58,58	0
7	IOD	B	816	1/1	0.97	0.06	62,62,62,62	1
7	IOD	D	826	1/1	0.97	0.04	59,59,59,59	1
7	IOD	A	306	1/1	0.98	0.06	59,59,59,59	1
7	IOD	D	806	1/1	0.98	0.04	63,63,63,63	0
7	IOD	D	818	1/1	0.98	0.05	59,59,59,59	1
7	IOD	A	309	1/1	0.98	0.04	56,56,56,56	1
7	IOD	D	808	1/1	0.98	0.05	68,68,68,68	1
7	IOD	D	820	1/1	0.98	0.03	63,63,63,63	1
7	IOD	B	817	1/1	0.98	0.05	61,61,61,61	1
7	IOD	D	812	1/1	0.98	0.06	57,57,57,57	1
7	IOD	B	840	1/1	0.98	0.04	56,56,56,56	1
7	IOD	B	815	1/1	0.98	0.04	54,54,54,54	1
7	IOD	B	813	1/1	0.98	0.05	51,51,51,51	1
7	IOD	D	817	1/1	0.99	0.04	64,64,64,64	1
7	IOD	D	805	1/1	0.99	0.03	51,51,51,51	0
7	IOD	B	822	1/1	0.99	0.06	43,43,43,43	1
7	IOD	D	807	1/1	0.99	0.04	53,53,53,53	0
7	IOD	A	303	1/1	0.99	0.04	47,47,47,47	1
7	IOD	A	304	1/1	0.99	0.07	40,40,40,40	0
7	IOD	A	305	1/1	0.99	0.03	47,47,47,47	1
7	IOD	B	811	1/1	0.99	0.04	56,56,56,56	1
7	IOD	D	809	1/1	0.99	0.06	54,54,54,54	0
7	IOD	D	810	1/1	0.99	0.04	51,51,51,51	0
7	IOD	B	812	1/1	0.99	0.04	44,44,44,44	0
7	IOD	B	805	1/1	0.99	0.06	51,51,51,51	0
7	IOD	C	301	1/1	0.99	0.03	37,37,37,37	0
7	IOD	D	813	1/1	0.99	0.05	52,52,52,52	1
7	IOD	B	819	1/1	0.99	0.03	50,50,50,50	1
7	IOD	B	801	1/1	0.99	0.05	41,41,41,41	0
7	IOD	B	803	1/1	0.99	0.04	50,50,50,50	1
7	IOD	F	201	1/1	0.99	0.05	52,52,52,52	1
8	CA	B	842	1/1	0.99	0.02	32,32,32,32	0
7	IOD	D	829	1/1	0.99	0.04	49,49,49,49	1
7	IOD	B	809	1/1	0.99	0.04	52,52,52,52	1
7	IOD	B	807	1/1	1.00	0.05	45,45,45,45	0
7	IOD	D	804	1/1	1.00	0.04	40,40,40,40	0

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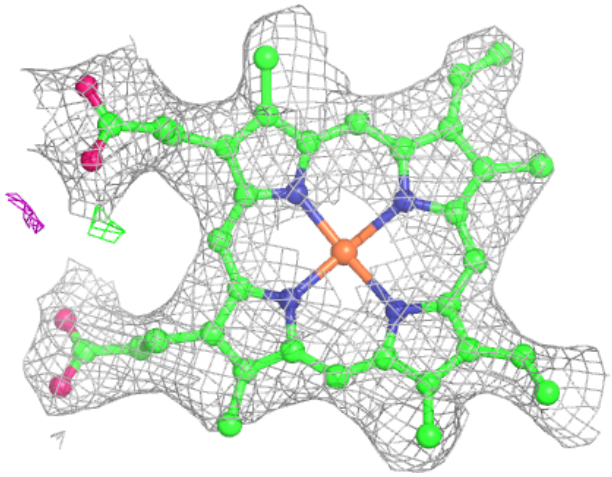
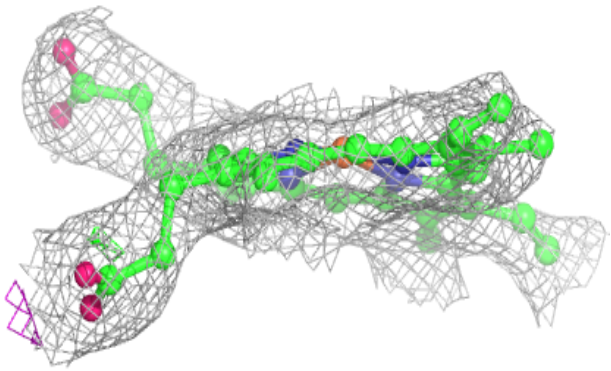
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
7	IOD	B	802	1/1	1.00	0.05	36,36,36,36	0
7	IOD	B	839	1/1	1.00	0.05	52,52,52,52	1
7	IOD	B	804	1/1	1.00	0.03	40,40,40,40	0
7	IOD	B	810	1/1	1.00	0.05	45,45,45,45	0
8	CA	D	835	1/1	1.00	0.03	33,33,33,33	0
7	IOD	A	302	1/1	1.00	0.03	27,27,27,27	0
7	IOD	D	802	1/1	1.00	0.03	26,26,26,26	0

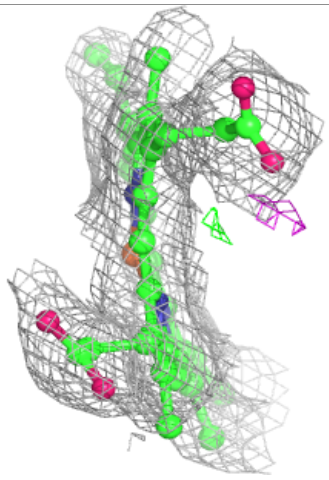
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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

Electron density around HEM D 801:

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

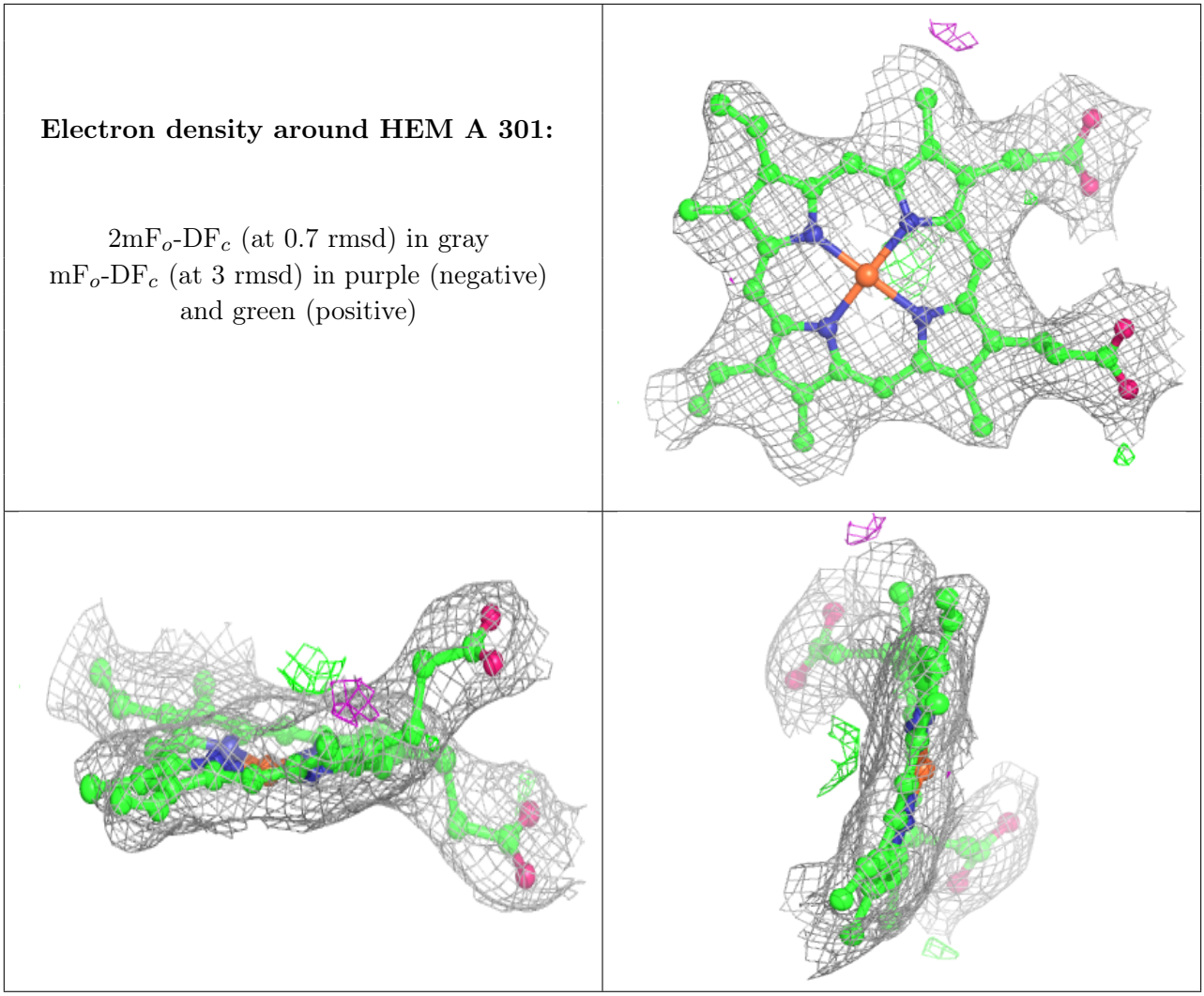






Electron density around HEM A 301:

$2mF_o$-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.