Full wwPDB X-ray Structure Validation Report (i)

Dec 18, 2023 – 06:11 am GMT

PDB ID	:	2Y74
Title	:	THE CRYSTAL STRUCTURE OF HUMAN SOLUBLE PRIMARY AMINE OXIDASE AOC3 IN THE OFF-COPPER CONFORMATION
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Deposited on	:	2011-01-28
Resolution	:	2.95 Å(reported)

This is a Full wwPDB X-ray Structure Validation Report for a publicly released PDB entry.

We welcome your comments at *validation@mail.wwpdb.org*
A user guide is available at
https://www.wwpdb.org/validation/2017/XrayValidationReportHelp
with specific help available everywhere you see the (i) symbol.

The types of validation reports are described at
http://www.wwpdb.org/validation/2017/FAQs#types.

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

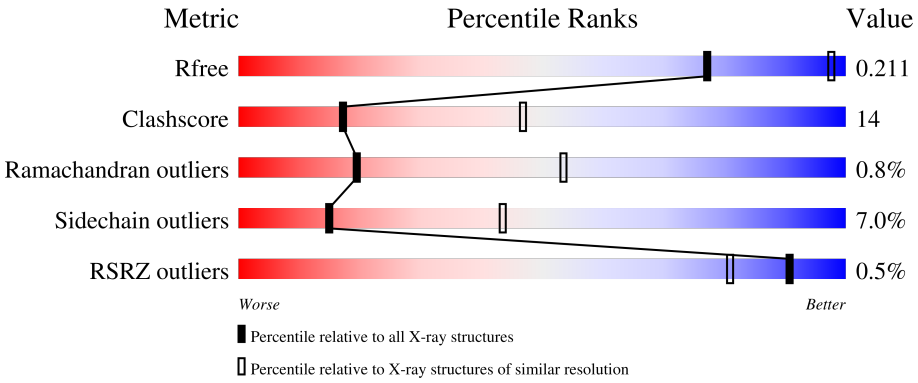
MolProbity	:	4.02b-467
Mogul	:	1.8.4, CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.36
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.36

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 2.95 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}	130704	3104 (3.00-2.92)
Clashscore	141614	3462 (3.00-2.92)
Ramachandran outliers	138981	3340 (3.00-2.92)
Sidechain outliers	138945	3343 (3.00-2.92)
RSRZ outliers	127900	2986 (3.00-2.92)

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	763	67% 21% · 9%
1	B	763	% 66% 22% · 8%
2	C	3	67% 33%
3	D	2	100%
3	E	2	100%

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Mol	Chain	Length	Quality of chain
3	F	2	100%

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
3	NAG	D	2	-	-	-	X
7	NAG	A	812	-	-	-	X
7	NAG	A	813	-	-	-	X
8	MAN	B	809	-	-	-	X

2 Entry composition

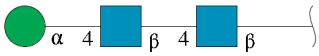
There are 9 unique types of molecules in this entry. The entry contains 11371 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 MEMBRANE PRIMARY AMINE OXIDASE.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	695	Total	C	N	O	S	0	0	0
			5490	3532	942	997	19			
1	B	699	Total	C	N	O	S	0	0	0
			5526	3551	950	1005	20			

- Molecule 2 is an oligosaccharide called alpha-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
2	C	3	Total	C	N	O	0	0	0
			39	22	2	15			

- Molecule 3 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
3	D	2	Total	C	N	O	0	0	0
			28	16	2	10			
3	E	2	Total	C	N	O	0	0	0
			28	16	2	10			
3	F	2	Total	C	N	O	0	0	0
			28	16	2	10			

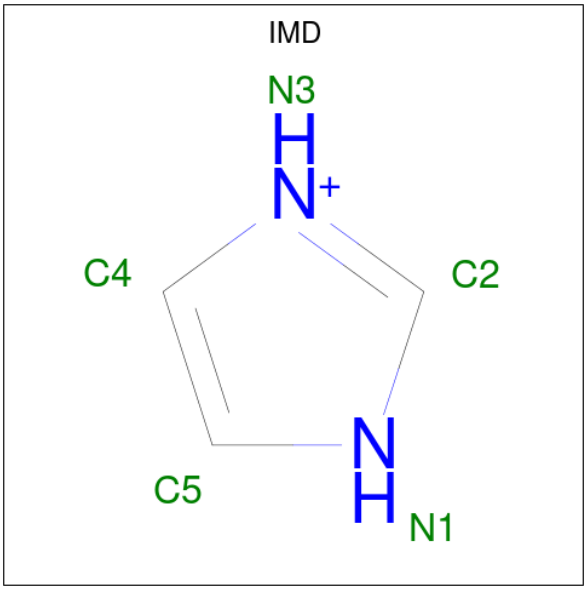
- Molecule 4 is COPPER (II) ION (three-letter code: CU) (formula: Cu).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	1	Total Cu 1 1	0	0
4	B	1	Total Cu 1 1	0	0

- Molecule 5 is CALCIUM ION (three-letter code: CA) (formula: Ca).

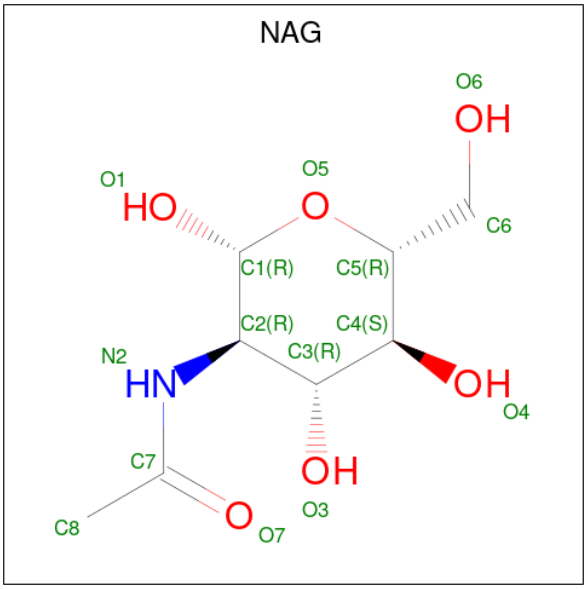
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	A	2	Total Ca 2 2	0	0
5	B	2	Total Ca 2 2	0	0

- Molecule 6 is IMIDAZOLE (three-letter code: IMD) (formula: $C_3H_5N_2$).



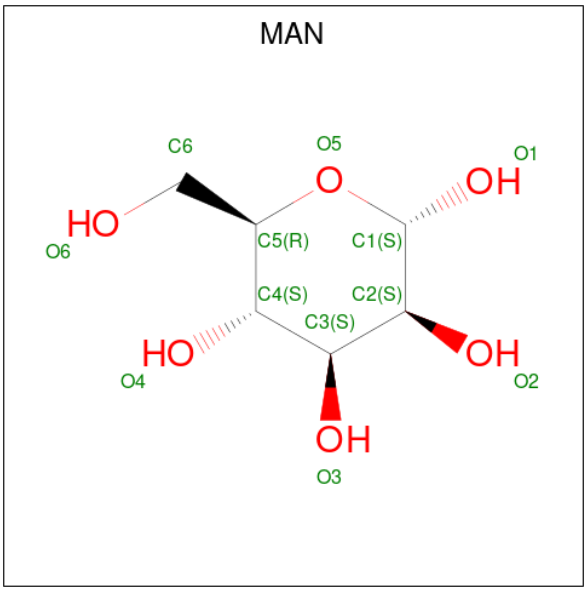
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
6	A	1	Total C N 5 3 2	0	0
6	A	1	Total C N 5 3 2	0	0
6	A	1	Total C N 5 3 2	0	0
6	B	1	Total C N 5 3 2	0	0
6	B	1	Total C N 5 3 2	0	0
6	B	1	Total C N 5 3 2	0	0

- Molecule 7 is 2-acetamido-2-deoxy-beta-D-glucopyranose (three-letter code: NAG) (formula: $C_8H_{15}NO_6$).



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

- Molecule 8 is alpha-D-mannopyranose (three-letter code: MAN) (formula: $C_6H_{12}O_6$).



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

- Molecule 9 is water.

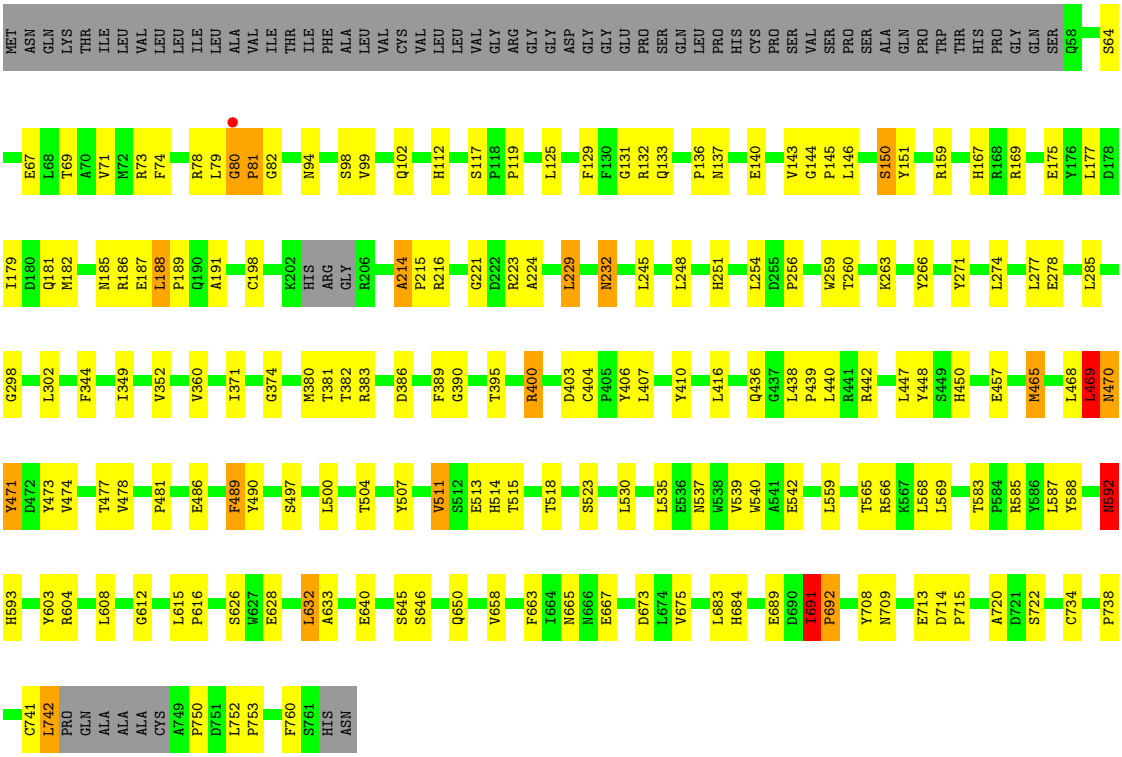
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
9	A	60	Total O 60 60	0	0
9	B	69	Total O 69 69	0	0

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.

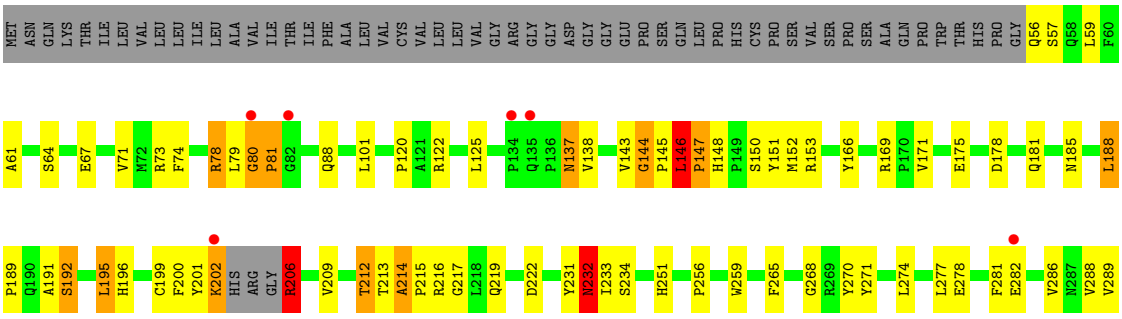
• Molecule 1: MEMBRANE PRIMARY AMINE OXIDASE

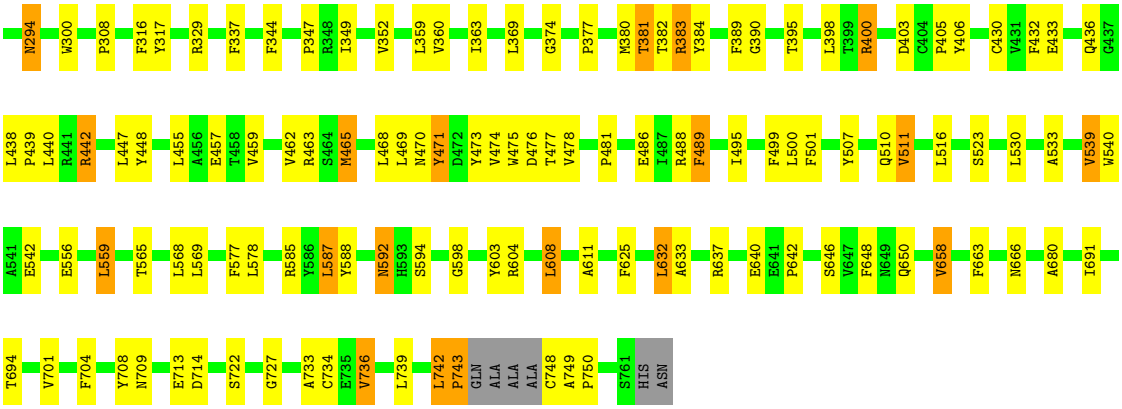
Chain A:



• Molecule 1: MEMBRANE PRIMARY AMINE OXIDASE

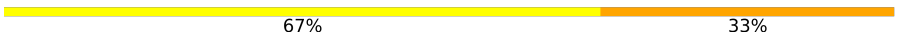
Chain B:





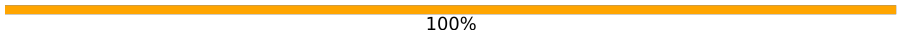
• Molecule 2: alpha-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain C:



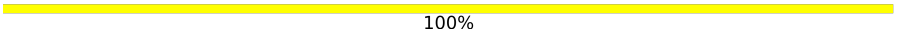
• Molecule 3: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain D:



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

Chain E:



• Molecule 3: 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 65 2 2	Depositor
Cell constants a, b, c, α, β, γ	225.80Å 225.80Å 218.70Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	38.21 – 2.95 38.50 – 2.95	Depositor EDS
% Data completeness (in resolution range)	99.8 (38.21-2.95) 99.9 (38.50-2.95)	Depositor EDS
R_{merge}	0.14	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	4.09 (at 2.95Å)	Xtriage
Refinement program	PHENIX (PHENIX.REFINE)	Depositor
R, R_{free}	0.179 , 0.214 0.178 , 0.211	Depositor DCC
R_{free} test set	3503 reflections (5.06%)	wwPDB-VP
Wilson B-factor (Å^2)	35.6	Xtriage
Anisotropy	0.767	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.33 , 40.7	EDS
L-test for twinning[2]	$< \|L\| > = 0.47$, $< L^2 > = 0.30$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.93	EDS
Total number of atoms	11371	wwPDB-VP
Average B, all atoms (Å^2)	33.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.68% 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: MAN, IMD, T0I, CA, CU, NAG

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

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	#$\|Z\|$ >5	RMSZ	#$\|Z\|$ >5
1	A	0.60	5/5644 (0.1%)	0.55	3/7694 (0.0%)
1	B	0.59	3/5681 (0.1%)	0.55	4/7744 (0.1%)
All	All	0.59	8/11325 (0.1%)	0.55	7/15438 (0.0%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand.A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	A	0	3
1	B	0	3
All	All	0	6

All (8) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	469	LEU	C-N	11.74	1.61	1.34
1	B	137	ASN	CG-ND2	6.99	1.50	1.32
1	B	232	ASN	CG-ND2	5.89	1.47	1.32
1	A	266	TYR	CD2-CE2	-5.41	1.31	1.39
1	A	232	ASN	CG-ND2	5.40	1.46	1.32
1	A	266	TYR	CD1-CE1	-5.21	1.31	1.39
1	A	266	TYR	CE2-CZ	-5.19	1.31	1.38
1	B	592	ASN	CG-ND2	5.16	1.45	1.32

All (7) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	469	LEU	C-N-CA	-9.68	97.50	121.70

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	691	ILE	C-N-CD	-7.93	103.16	120.60
1	B	743	PRO	CB-CA-C	-6.88	94.80	112.00
1	A	592	ASN	N-CA-CB	6.36	122.04	110.60
1	B	592	ASN	CA-CB-CG	6.23	127.10	113.40
1	B	743	PRO	N-CA-C	5.11	125.38	112.10
1	B	206	ARG	NE-CZ-NH1	-5.07	117.76	120.30

There are no chirality outliers.

All (6) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	146	LEU	Peptide
1	A	592	ASN	Sidechain
1	A	691	ILE	Peptide
1	B	137	ASN	Sidechain
1	B	146	LEU	Peptide
1	B	666	ASN	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	A	5490	0	5243	143	0
1	B	5526	0	5280	167	0
2	C	39	0	34	5	0
3	D	28	0	25	3	0
3	E	28	0	22	0	0
3	F	28	0	25	4	0
4	A	1	0	0	0	0
4	B	1	0	0	0	0
5	A	2	0	0	0	0
5	B	2	0	0	0	0
6	A	15	0	15	0	0
6	B	15	0	15	0	0
7	A	28	0	26	2	0
7	B	28	0	26	2	0
8	B	11	0	10	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
9	A	60	0	0	1	0
9	B	69	0	0	3	0
All	All	11371	0	10721	305	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 14.

All (305) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:137:ASN:HD21	2:C:1:NAG:C1	1.25	1.45
1:B:214:ALA:HB1	1:B:215:PRO:CD	1.61	1.30
1:A:137:ASN:ND2	2:C:1:NAG:C1	2.01	1.24
1:B:206:ARG:HG2	1:B:206:ARG:HH11	0.95	1.09
1:B:214:ALA:HB1	1:B:215:PRO:HD2	1.31	1.07
1:B:214:ALA:CB	1:B:215:PRO:CD	2.29	1.03
1:B:214:ALA:CB	1:B:215:PRO:HD2	1.88	1.00
1:B:206:ARG:HH11	1:B:206:ARG:CG	1.69	0.99
1:A:214:ALA:HB1	1:A:215:PRO:HD2	1.44	0.98
1:B:78:ARG:HG3	1:B:78:ARG:HH11	1.30	0.96
1:B:383:ARG:HD3	1:B:383:ARG:N	1.81	0.95
1:B:214:ALA:HB1	1:B:215:PRO:HD3	1.48	0.94
1:A:214:ALA:CB	1:A:383:ARG:H	1.81	0.94
1:A:125:LEU:HD11	1:A:159:ARG:HH12	1.34	0.93
1:A:214:ALA:HB1	1:A:215:PRO:CD	2.01	0.90
1:B:206:ARG:HG2	1:B:206:ARG:NH1	1.76	0.90
1:A:214:ALA:CB	1:A:215:PRO:HD2	2.06	0.85
1:B:511:VAL:CG1	1:B:691:ILE:HD11	2.07	0.84
1:A:214:ALA:HB1	1:A:383:ARG:H	1.40	0.84
1:A:741:CYS:O	1:A:742:LEU:HB2	1.75	0.84
1:B:214:ALA:HB2	1:B:382:THR:HA	1.61	0.82
1:B:469:LEU:HD12	1:B:471:T0I:H15	1.63	0.81
1:A:145:PRO:HD3	1:A:151:TYR:CE2	2.16	0.81
1:B:214:ALA:CB	1:B:382:THR:HA	2.13	0.78
1:B:511:VAL:HG11	1:B:691:ILE:HD11	1.65	0.78
1:A:436:GLN:HG3	1:A:457:GLU:HG2	1.66	0.78
1:B:59:LEU:HD11	1:B:120:PRO:HD2	1.66	0.78
1:B:403:ASP:HB3	1:B:465:MET:CE	2.14	0.77
1:B:145:PRO:HD3	1:B:151:TYR:CD2	2.20	0.76
1:B:465:MET:SD	1:B:474:VAL:HG22	2.26	0.75
3:D:1:NAG:O3	3:D:2:NAG:O5	2.03	0.75

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:383:ARG:N	1:B:383:ARG:CD	2.49	0.75
1:B:145:PRO:HD3	1:B:151:TYR:CE2	2.21	0.75
1:B:78:ARG:HH11	1:B:78:ARG:CG	2.00	0.73
1:A:298:GLY:CA	1:A:692:PRO:HD3	2.19	0.73
1:B:206:ARG:CG	1:B:206:ARG:NH1	2.32	0.73
1:A:145:PRO:HD3	1:A:151:TYR:CD2	2.24	0.72
1:A:539:VAL:HG22	1:A:569:LEU:HB2	1.70	0.72
1:B:214:ALA:CB	1:B:383:ARG:H	2.02	0.72
1:B:214:ALA:HB1	1:B:383:ARG:H	1.54	0.72
1:A:144:GLY:HA2	1:A:151:TYR:CE1	2.25	0.71
1:B:403:ASP:HB3	1:B:465:MET:HE3	1.72	0.71
1:B:500:LEU:HD12	1:B:516:LEU:HB2	1.73	0.71
1:B:265:PHE:HD2	1:B:270:TYR:CE1	2.08	0.70
1:A:214:ALA:CB	1:A:215:PRO:CD	2.66	0.70
1:B:192:SER:O	1:B:196:HIS:HB2	1.92	0.70
1:B:344:PHE:HA	1:B:390:GLY:HA2	1.74	0.70
1:A:691:ILE:HG22	1:A:692:PRO:CD	2.22	0.69
1:A:738:PRO:HA	1:A:741:CYS:SG	2.33	0.69
1:B:214:ALA:HB2	1:B:382:THR:CA	2.22	0.69
1:A:214:ALA:CB	1:A:383:ARG:N	2.56	0.69
1:A:214:ALA:CB	1:A:382:THR:HA	2.25	0.67
1:A:298:GLY:HA3	1:A:692:PRO:HD3	1.77	0.67
1:B:233:ILE:HG22	1:B:234:SER:N	2.09	0.67
1:A:214:ALA:HB2	1:A:382:THR:HG23	1.77	0.66
1:B:511:VAL:HG13	1:B:691:ILE:HD11	1.76	0.66
1:A:438:LEU:HD12	1:A:439:PRO:HD2	1.78	0.65
1:B:214:ALA:HB2	1:B:382:THR:HG23	1.78	0.65
1:B:232:ASN:ND2	3:F:1:NAG:O7	2.30	0.65
1:B:144:GLY:HA2	1:B:151:TYR:CZ	2.30	0.65
1:A:145:PRO:HD2	1:A:150:SER:H	1.60	0.65
1:B:122:ARG:O	1:B:146:LEU:HB2	1.95	0.65
1:B:438:LEU:HD12	1:B:439:PRO:HD2	1.78	0.65
1:B:212:THR:OG1	1:B:213:THR:N	2.30	0.64
1:A:223:ARG:HG3	1:A:223:ARG:HH11	1.62	0.64
1:B:559:LEU:HD23	1:B:559:LEU:O	1.98	0.64
1:A:450:HIS:H	3:F:2:NAG:H81	1.64	0.63
1:A:102:GLN:OE1	1:A:125:LEU:HD12	1.97	0.63
1:B:608:LEU:HD21	1:B:704:PHE:CE2	2.32	0.63
1:A:675:VAL:HG13	1:A:675:VAL:O	1.98	0.63
1:A:440:LEU:HD22	1:A:481:PRO:HG2	1.79	0.63
1:B:147:PRO:HD2	1:B:148:HIS:H	1.63	0.63

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:145:PRO:HD2	1:B:150:SER:H	1.63	0.63
1:B:294:ASN:HA	1:B:300:TRP:CZ3	2.33	0.62
1:B:539:VAL:HG22	1:B:569:LEU:HB2	1.81	0.62
1:B:144:GLY:HA2	1:B:151:TYR:CE1	2.34	0.62
1:A:615:LEU:HD12	1:A:616:PRO:HD2	1.81	0.61
1:B:511:VAL:HG13	1:B:691:ILE:CD1	2.30	0.61
1:B:214:ALA:CB	1:B:383:ARG:N	2.63	0.61
1:A:403:ASP:HB3	1:A:465:MET:HE3	1.83	0.60
1:B:374:GLY:HA2	1:B:507:TYR:HB3	1.82	0.60
1:A:741:CYS:O	1:A:742:LEU:CB	2.49	0.60
1:A:73:ARG:HG2	1:A:73:ARG:HH11	1.67	0.60
1:B:214:ALA:HB3	1:B:215:PRO:HD2	1.77	0.60
1:A:131:GLY:HA2	1:A:136:PRO:HB3	1.83	0.59
1:A:344:PHE:HA	1:A:390:GLY:HA2	1.84	0.59
1:A:298:GLY:HA3	1:A:692:PRO:CD	2.32	0.59
1:B:476:ASP:HB2	1:B:488:ARG:HB2	1.85	0.58
1:A:298:GLY:C	1:A:692:PRO:HD3	2.22	0.58
1:A:760:PHE:CE2	1:B:727:GLY:HA2	2.38	0.58
1:B:317:TYR:HE2	1:B:433:GLU:HB2	1.68	0.57
1:A:214:ALA:HB2	1:A:382:THR:HA	1.85	0.57
1:A:263:LYS:HD3	1:A:271:TYR:O	2.05	0.57
1:A:271:TYR:CE1	1:A:277:LEU:HD13	2.38	0.57
1:B:214:ALA:HB2	1:B:383:ARG:N	2.19	0.56
1:B:436:GLN:HG3	1:B:457:GLU:HG2	1.88	0.56
1:B:286:VAL:HG23	1:B:288:VAL:HG23	1.87	0.56
1:A:125:LEU:HD11	1:A:159:ARG:NH1	2.13	0.56
1:A:80:GLY:O	1:A:81:PRO:O	2.24	0.56
1:A:468:LEU:O	1:A:470:ASN:N	2.39	0.55
1:A:82:GLY:HA3	1:A:132:ARG:NH1	2.21	0.55
1:B:539:VAL:CG2	1:B:569:LEU:HB2	2.36	0.55
1:B:739:LEU:O	1:B:742:LEU:HB2	2.06	0.55
1:A:99:VAL:HB	1:A:416:LEU:HD23	1.89	0.55
1:A:112:HIS:C	1:A:112:HIS:CD2	2.81	0.55
1:A:232:ASN:CG	1:A:232:ASN:O	2.43	0.55
1:B:742:LEU:CB	1:B:743:PRO:HD3	2.37	0.55
1:B:231:TYR:O	1:B:233:ILE:N	2.40	0.54
1:A:214:ALA:HB2	1:A:383:ARG:N	2.22	0.54
1:A:665:ASN:OD1	1:A:667:GLU:HG3	2.08	0.54
1:B:64:SER:OG	1:B:67:GLU:HG3	2.08	0.53
1:B:232:ASN:ND2	3:F:1:NAG:C7	2.70	0.53
1:B:80:GLY:O	1:B:81:PRO:O	2.26	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:147:PRO:CD	1:B:148:HIS:H	2.20	0.53
1:B:360:VAL:HG12	1:B:530:LEU:HD23	1.90	0.53
1:B:251:HIS:HA	1:B:259:TRP:CD1	2.44	0.53
1:A:82:GLY:HA3	1:A:132:ARG:HH12	1.73	0.53
1:B:233:ILE:HG22	1:B:234:SER:H	1.72	0.53
1:A:144:GLY:HA2	1:A:151:TYR:CD1	2.42	0.53
1:A:750:PRO:HD2	1:B:749:ALA:HB2	1.91	0.53
1:B:680:ALA:HB1	1:B:701:VAL:HB	1.91	0.53
1:B:214:ALA:HB2	1:B:382:THR:CG2	2.39	0.53
1:B:592:ASN:ND2	7:B:810:NAG:H83	2.24	0.53
1:A:760:PHE:HE2	1:B:727:GLY:HA2	1.74	0.52
1:A:407:LEU:HD21	1:A:752:LEU:HD23	1.91	0.52
1:B:377:PRO:O	1:B:381:THR:OG1	2.27	0.52
1:A:349:ILE:HG13	1:A:477:THR:HG21	1.92	0.52
1:B:382:THR:C	1:B:383:ARG:HD3	2.27	0.52
1:B:369:LEU:HD12	1:B:384:TYR:O	2.10	0.52
1:B:742:LEU:HB2	1:B:743:PRO:HD3	1.91	0.52
1:A:675:VAL:O	1:A:675:VAL:CG1	2.57	0.52
1:B:61:ALA:O	1:B:101:LEU:HD22	2.10	0.52
1:A:214:ALA:HB3	1:A:382:THR:HA	1.92	0.52
1:A:223:ARG:HG3	1:A:223:ARG:NH1	2.26	0.51
1:A:381:THR:HG22	1:B:559:LEU:HD12	1.92	0.51
1:A:447:LEU:HG	1:A:448:TYR:CD2	2.45	0.51
1:A:632:LEU:HG	1:A:633:ALA:N	2.25	0.51
1:A:133:GLN:HE22	2:C:1:NAG:H61	1.75	0.51
1:B:542:GLU:HA	1:B:565:THR:O	2.11	0.51
1:A:403:ASP:HB3	1:A:465:MET:CE	2.40	0.51
1:A:593:HIS:NE2	7:A:812:NAG:O3	2.43	0.51
1:B:281:PHE:HA	1:B:286:VAL:HG22	1.92	0.51
1:B:594:SER:HB3	1:B:598:GLY:HA2	1.92	0.51
1:A:468:LEU:HD12	1:A:473:TYR:CE2	2.46	0.51
1:B:380:MET:O	1:B:380:MET:HG2	2.10	0.51
1:B:213:THR:O	1:B:214:ALA:O	2.29	0.50
1:B:440:LEU:HD23	1:B:455:LEU:HD23	1.92	0.50
1:B:478:VAL:HB	1:B:486:GLU:HB3	1.93	0.50
1:B:430:CYS:SG	1:B:463:ARG:HB3	2.51	0.50
1:B:389:PHE:HE1	1:B:650:GLN:HE21	1.59	0.50
3:D:1:NAG:HO3	3:D:2:NAG:C1	2.24	0.50
1:A:374:GLY:HA2	1:A:507:TYR:HB3	1.94	0.50
1:B:209:VAL:HG13	1:B:232:ASN:HB2	1.93	0.49
1:A:720:ALA:O	1:B:308:PRO:HA	2.12	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:389:PHE:HE1	1:B:650:GLN:NE2	2.09	0.49
1:B:382:THR:C	1:B:383:ARG:CD	2.80	0.49
1:B:468:LEU:HD12	1:B:473:TYR:CE2	2.47	0.49
1:B:349:ILE:HG13	1:B:477:THR:HG21	1.93	0.49
1:B:400:ARG:HD3	1:B:406:TYR:O	2.13	0.49
1:B:511:VAL:CG1	1:B:691:ILE:CD1	2.83	0.49
1:B:265:PHE:CD2	1:B:270:TYR:CE1	2.96	0.49
1:A:125:LEU:HD21	1:A:140:GLU:HB3	1.95	0.49
1:A:473:TYR:CD1	1:A:489:PHE:HE1	2.31	0.49
1:A:298:GLY:O	1:A:692:PRO:HD3	2.13	0.49
1:B:642:PRO:HD2	9:B:936:HOH:O	2.11	0.49
1:A:588:TYR:HB3	1:A:604:ARG:HA	1.95	0.49
1:B:398:LEU:HD22	1:B:465:MET:HE3	1.94	0.49
1:A:251:HIS:HA	1:A:259:TRP:CD1	2.48	0.48
3:D:1:NAG:O4	3:D:1:NAG:O6	2.30	0.48
1:A:64:SER:OG	1:A:67:GLU:HG3	2.13	0.48
1:A:214:ALA:HB2	1:A:382:THR:CA	2.44	0.48
1:B:78:ARG:CG	1:B:78:ARG:NH1	2.63	0.48
1:A:79:LEU:O	1:A:80:GLY:C	2.51	0.48
1:B:489:PHE:CD1	1:B:489:PHE:C	2.87	0.48
1:B:663:PHE:CD1	1:B:663:PHE:N	2.81	0.48
1:B:201:TYR:CD1	1:B:202:LYS:N	2.82	0.48
1:B:352:VAL:HB	1:B:360:VAL:HG22	1.94	0.48
1:B:577:PHE:CD2	1:B:632:LEU:HD23	2.49	0.48
1:A:474:VAL:HB	1:A:490:TYR:HB2	1.94	0.48
1:A:129:PHE:CZ	1:A:169:ARG:HB2	2.49	0.48
1:A:478:VAL:HB	1:A:486:GLU:HB3	1.94	0.48
1:A:137:ASN:ND2	2:C:1:NAG:O5	2.30	0.48
1:B:278:GLU:HA	1:B:278:GLU:OE1	2.14	0.48
1:A:500:LEU:HD12	1:A:504:THR:HG21	1.96	0.47
1:B:468:LEU:HD12	1:B:473:TYR:HE2	1.78	0.47
1:A:407:LEU:HD21	1:A:752:LEU:CD2	2.44	0.47
1:A:125:LEU:CD1	1:A:159:ARG:HH12	2.14	0.47
1:A:440:LEU:HB2	1:A:457:GLU:HB2	1.96	0.47
1:A:389:PHE:HE1	1:A:650:GLN:HE21	1.62	0.47
1:A:511:VAL:HG13	1:A:691:ILE:HD11	1.97	0.47
1:B:233:ILE:CG2	1:B:234:SER:N	2.78	0.47
1:A:112:HIS:ND1	1:A:119:PRO:HA	2.30	0.46
1:A:224:ALA:HB1	1:A:248:LEU:HD11	1.97	0.46
1:A:592:ASN:OD1	1:A:592:ASN:N	2.34	0.46
1:B:217:GLY:HA3	1:B:222:ASP:CB	2.45	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:500:LEU:HD22	1:B:510:GLN:HG3	1.97	0.46
1:B:271:TYR:CE1	1:B:277:LEU:HD13	2.50	0.46
1:A:360:VAL:HG12	1:A:530:LEU:HD23	1.96	0.46
1:B:499:PHE:CE2	1:B:501:PHE:HB2	2.51	0.46
1:A:513:GLU:O	1:A:514:HIS:HB2	2.14	0.46
1:B:495:ILE:HG23	9:B:924:HOH:O	2.15	0.46
1:A:593:HIS:CD2	7:A:812:NAG:O3	2.69	0.46
1:B:742:LEU:CB	1:B:743:PRO:CD	2.93	0.46
1:A:136:PRO:HG2	1:A:254:LEU:HD21	1.98	0.45
1:A:214:ALA:HB1	1:A:383:ARG:N	2.21	0.45
1:B:359:LEU:HD22	1:B:603:TYR:CE1	2.51	0.45
1:A:382:THR:C	1:A:383:ARG:HD2	2.37	0.45
1:A:144:GLY:HA2	1:A:151:TYR:CZ	2.50	0.45
1:A:386:ASP:OD1	1:A:471:T0I:N11	2.50	0.45
1:B:533:ALA:HA	9:B:904:HOH:O	2.17	0.45
1:A:400:ARG:HD3	1:A:406:TYR:O	2.17	0.45
1:B:403:ASP:CB	1:B:465:MET:CE	2.90	0.45
1:B:403:ASP:CB	1:B:465:MET:HE3	2.45	0.45
1:B:640:GLU:C	1:B:642:PRO:HD3	2.37	0.45
1:A:389:PHE:HE1	1:A:650:GLN:NE2	2.15	0.45
1:B:166:TYR:O	1:B:169:ARG:HD3	2.17	0.45
1:B:214:ALA:HB3	1:B:382:THR:HA	1.97	0.45
1:B:540:TRP:CZ2	1:B:568:LEU:HD13	2.51	0.45
3:F:1:NAG:O3	3:F:2:NAG:O5	2.30	0.45
1:A:73:ARG:HG2	1:A:73:ARG:NH1	2.31	0.45
1:B:587:LEU:CD2	1:B:632:LEU:HD21	2.47	0.45
1:A:380:MET:HG3	1:A:381:THR:HG23	1.99	0.44
1:B:80:GLY:HA2	1:B:81:PRO:HD2	1.82	0.44
1:B:440:LEU:HB2	1:B:457:GLU:HB2	1.98	0.44
1:A:497:SER:HB2	1:A:515:THR:HG23	1.99	0.44
1:B:251:HIS:H	1:B:251:HIS:CD2	2.36	0.44
1:B:274:LEU:H	1:B:274:LEU:HD12	1.82	0.44
1:B:74:PHE:HE1	1:B:152:MET:HB2	1.81	0.44
1:B:360:VAL:HG21	1:B:363:ILE:HG13	1.99	0.44
1:B:188:LEU:HD12	1:B:188:LEU:HA	1.79	0.44
1:B:202:LYS:HE3	1:B:202:LYS:HB3	1.20	0.44
1:B:708:TYR:O	1:B:709:ASN:HB2	2.16	0.44
1:A:112:HIS:HA	1:A:117:SER:O	2.18	0.44
1:A:468:LEU:CD1	1:A:473:TYR:CE2	3.00	0.44
1:B:577:PHE:HD2	1:B:632:LEU:HD23	1.83	0.44
1:A:187:GLU:O	1:A:274:LEU:HD13	2.18	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:734:CYS:O	1:A:734:CYS:SG	2.75	0.44
1:A:133:GLN:HE22	2:C:1:NAG:C6	2.31	0.43
1:A:229:LEU:HD13	1:A:245:LEU:HD23	2.00	0.43
1:A:683:LEU:HG	1:A:684:HIS:N	2.33	0.43
1:B:588:TYR:HB3	1:B:604:ARG:HB3	1.98	0.43
1:A:74:PHE:CE1	1:A:78:ARG:HG3	2.52	0.43
1:B:200:PHE:N	1:B:200:PHE:CD1	2.86	0.43
1:B:440:LEU:HD22	1:B:481:PRO:HG2	1.99	0.43
1:A:71:VAL:HG13	1:A:143:VAL:HG11	2.00	0.43
1:A:540:TRP:CE2	1:A:568:LEU:HD13	2.53	0.43
1:B:405:PRO:HG2	1:B:432:PHE:CD2	2.53	0.43
1:A:188:LEU:N	1:A:189:PRO:CD	2.81	0.43
1:A:628:GLU:O	1:A:628:GLU:HG2	2.19	0.43
1:A:714:ASP:HA	1:A:715:PRO:HD2	1.88	0.43
1:B:79:LEU:O	1:B:80:GLY:C	2.56	0.43
1:A:94:ASN:HA	1:A:129:PHE:O	2.17	0.43
1:A:404:CYS:HB2	1:A:410:TYR:OH	2.19	0.43
1:B:181:GLN:O	1:B:185:ASN:HB2	2.19	0.43
1:B:470:ASN:OD1	1:B:471:T0I:H14	2.18	0.43
1:A:175:GLU:O	1:A:179:ILE:HG13	2.18	0.43
1:B:189:PRO:C	1:B:191:ALA:H	2.21	0.43
1:A:167:HIS:CD2	1:A:221:GLY:HA2	2.54	0.43
1:B:265:PHE:CD2	1:B:377:PRO:HD3	2.54	0.43
1:A:371:ILE:HD13	1:A:615:LEU:HB2	2.01	0.42
1:A:403:ASP:CB	1:A:465:MET:HE3	2.49	0.42
1:B:337:PHE:CE2	1:B:462:VAL:HG21	2.54	0.42
1:B:646:SER:HB2	1:B:658:VAL:CG1	2.49	0.42
1:A:689:GLU:O	1:B:714:ASP:HB2	2.19	0.42
1:B:195:LEU:HB3	1:B:201:TYR:CG	2.55	0.42
1:B:316:PHE:CD2	1:B:750:PRO:HD3	2.54	0.42
1:A:181:GLN:O	1:A:185:ASN:HB2	2.20	0.42
1:A:542:GLU:HA	1:A:565:THR:O	2.19	0.42
1:B:347:PRO:HG2	1:B:475:TRP:CG	2.55	0.42
1:B:138:VAL:HG11	1:B:648:PHE:CZ	2.55	0.42
1:B:71:VAL:HG13	1:B:143:VAL:HG11	2.01	0.42
1:B:251:HIS:CD2	1:B:251:HIS:N	2.87	0.42
1:A:186:ARG:HG3	1:A:186:ARG:HH11	1.85	0.42
1:A:256:PRO:HA	1:A:259:TRP:CE2	2.54	0.42
1:A:468:LEU:O	1:A:469:LEU:HB2	2.19	0.42
1:B:271:TYR:CZ	1:B:277:LEU:HD13	2.55	0.42
1:A:182:MET:HA	1:A:186:ARG:NH2	2.35	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:752:LEU:HA	1:A:753:PRO:HD2	1.86	0.41
1:A:535:LEU:O	1:A:673:ASP:HA	2.20	0.41
1:A:663:PHE:N	1:A:663:PHE:CD1	2.85	0.41
1:B:171:VAL:HG13	1:B:175:GLU:HB3	2.01	0.41
1:A:537:ASN:ND2	9:A:901:HOH:O	2.53	0.41
1:B:178:ASP:O	1:B:181:GLN:HB2	2.20	0.41
1:B:632:LEU:HG	1:B:633:ALA:N	2.33	0.41
1:A:585:ARG:NH1	1:B:611:ALA:O	2.53	0.41
1:A:360:VAL:HG12	1:A:530:LEU:CD2	2.50	0.41
1:B:268:GLY:HA3	1:B:501:PHE:CE1	2.54	0.41
1:B:733:ALA:HB3	1:B:736:VAL:CG1	2.50	0.41
1:A:352:VAL:HB	1:A:360:VAL:HG22	2.02	0.41
1:A:708:TYR:O	1:A:709:ASN:HB2	2.20	0.41
1:A:302:LEU:HD12	1:A:302:LEU:HA	1.88	0.41
1:B:217:GLY:HA3	1:B:222:ASP:HB3	2.03	0.41
1:B:578:LEU:HA	1:B:578:LEU:HD23	1.79	0.41
1:B:256:PRO:HA	1:B:259:TRP:CD2	2.56	0.41
1:B:488:ARG:HA	1:B:488:ARG:HD3	1.74	0.41
1:A:191:ALA:HA	1:A:278:GLU:HB2	2.04	0.41
1:B:447:LEU:HG	1:B:448:TYR:CD2	2.56	0.41
1:A:403:ASP:OD1	1:B:442:ARG:HD3	2.21	0.40
1:B:231:TYR:O	1:B:233:ILE:HG12	2.22	0.40
1:B:592:ASN:HD22	7:B:810:NAG:H83	1.86	0.40
1:B:587:LEU:HD22	1:B:632:LEU:CD2	2.52	0.40
1:A:187:GLU:HB3	1:A:274:LEU:HD12	2.04	0.40
1:A:214:ALA:HB2	1:A:382:THR:CG2	2.48	0.40
1:A:468:LEU:HD12	1:A:473:TYR:CD2	2.56	0.40
1:A:612:GLY:HA2	1:B:585:ARG:NH1	2.37	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	688/763 (90%)	645 (94%)	38 (6%)	5 (1%)	22 56
1	B	692/763 (91%)	650 (94%)	36 (5%)	6 (1%)	17 51
All	All	1380/1526 (90%)	1295 (94%)	74 (5%)	11 (1%)	19 53

All (11) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	81	PRO
1	A	214	ALA
1	A	692	PRO
1	B	81	PRO
1	B	147	PRO
1	B	214	ALA
1	A	80	GLY
1	B	144	GLY
1	A	469	LEU
1	B	80	GLY
1	B	232	ASN

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	577/634 (91%)	543 (94%)	34 (6%)	19 50
1	B	583/634 (92%)	536 (92%)	47 (8%)	11 36
All	All	1160/1268 (92%)	1079 (93%)	81 (7%)	15 43

All (81) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	69	THR
1	A	98	SER
1	A	150	SER
1	A	177	LEU
1	A	188	LEU

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Mol	Chain	Res	Type
1	A	198	CYS
1	A	216	ARG
1	A	229	LEU
1	A	260	THR
1	A	285	LEU
1	A	395	THR
1	A	400	ARG
1	A	442	ARG
1	A	465	MET
1	A	470	ASN
1	A	489	PHE
1	A	511	VAL
1	A	518	THR
1	A	523	SER
1	A	559	LEU
1	A	566	ARG
1	A	583	THR
1	A	587	LEU
1	A	603	TYR
1	A	608	LEU
1	A	626	SER
1	A	632	LEU
1	A	640	GLU
1	A	645	SER
1	A	646	SER
1	A	658	VAL
1	A	713	GLU
1	A	722	SER
1	A	742	LEU
1	B	56	GLN
1	B	57	SER
1	B	73	ARG
1	B	78	ARG
1	B	88	GLN
1	B	125	LEU
1	B	146	LEU
1	B	153	ARG
1	B	188	LEU
1	B	192	SER
1	B	195	LEU
1	B	199	CYS
1	B	202	LYS

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Mol	Chain	Res	Type
1	B	206	ARG
1	B	212	THR
1	B	216	ARG
1	B	219	GLN
1	B	282	GLU
1	B	289	VAL
1	B	294	ASN
1	B	329	ARG
1	B	381	THR
1	B	383	ARG
1	B	395	THR
1	B	400	ARG
1	B	442	ARG
1	B	459	VAL
1	B	465	MET
1	B	489	PHE
1	B	511	VAL
1	B	523	SER
1	B	539	VAL
1	B	556	GLU
1	B	559	LEU
1	B	587	LEU
1	B	608	LEU
1	B	625	PHE
1	B	632	LEU
1	B	637	ARG
1	B	658	VAL
1	B	694	THR
1	B	713	GLU
1	B	722	SER
1	B	734	CYS
1	B	736	VAL
1	B	742	LEU
1	B	748	CYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (6) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	137	ASN
1	A	267	GLN
1	A	470	ASN
1	A	537	ASN

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Mol	Chain	Res	Type
1	A	650	GLN
1	A	699	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	$\#\|Z\| > 2$
1	T0I	B	471	1	14,19,20	1.01	1 (7%)	15,26,28	1.32	2 (13%)
1	T0I	A	471	1	14,19,20	1.00	0	15,26,28	1.32	1 (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
1	T0I	B	471	1	-	2/5/10/12	0/2/2/2
1	T0I	A	471	1	-	2/5/10/12	0/2/2/2

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	471	T0I	CB-C1	-2.08	1.48	1.51

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	471	T0I	C1-CB-CA	3.86	120.49	114.53
1	B	471	T0I	C1-CB-CA	3.38	119.76	114.53
1	B	471	T0I	CB-CA-C	-2.55	106.69	111.47

There are no chirality outliers.

All (4) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
1	A	471	T0I	C-CA-CB-C1
1	A	471	T0I	N-CA-CB-C1
1	B	471	T0I	C-CA-CB-C1
1	B	471	T0I	N-CA-CB-C1

There are no ring outliers.

2 monomers are involved in 3 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
1	B	471	T0I	2	0
1	A	471	T0I	1	0

5.5 Carbohydrates (i)

9 monosaccharides are modelled in this entry.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\| > 2$	Counts	RMSZ	$\#\|Z\| > 2$
2	NAG	C	1	2	14,14,15	2.62	6 (42%)	17,19,21	1.38	3 (17%)
2	NAG	C	2	2	14,14,15	2.17	6 (42%)	17,19,21	1.39	2 (11%)
2	MAN	C	3	2	11,11,12	2.09	4 (36%)	15,15,17	1.26	1 (6%)
3	NAG	D	1	1,3	14,14,15	2.30	6 (42%)	17,19,21	1.25	2 (11%)
3	NAG	D	2	3	14,14,15	2.30	6 (42%)	17,19,21	1.25	2 (11%)
3	NAG	E	1	1,3	14,14,15	2.66	6 (42%)	17,19,21	1.94	6 (35%)
3	NAG	E	2	3	14,14,15	2.66	9 (64%)	17,19,21	2.17	7 (41%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\|>2$	Counts	RMSZ	$\#\|Z\|>2$
3	NAG	F	1	1,3	14,14,15	2.53	6 (42%)	17,19,21	1.83	5 (29%)
3	NAG	F	2	3	14,14,15	2.23	8 (57%)	17,19,21	1.44	2 (11%)

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

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

All (57) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	F	1	NAG	C3-C2	-5.73	1.40	1.52
2	C	1	NAG	C3-C2	-5.68	1.40	1.52
3	E	1	NAG	C3-C2	-5.55	1.40	1.52
2	C	2	NAG	O5-C5	5.01	1.53	1.43
2	C	1	NAG	C1-C2	-4.51	1.45	1.52
3	D	1	NAG	C4-C5	-4.34	1.43	1.53
3	D	2	NAG	C4-C5	-4.33	1.43	1.53
3	E	1	NAG	C4-C3	-4.29	1.41	1.52
2	C	1	NAG	C2-N2	4.20	1.53	1.46
2	C	3	MAN	C4-C3	-4.15	1.41	1.52
3	D	2	NAG	O5-C5	4.08	1.51	1.43
3	D	1	NAG	O5-C5	4.06	1.51	1.43
3	F	1	NAG	C1-C2	-3.98	1.46	1.52
3	E	2	NAG	C4-C5	-3.97	1.44	1.53
3	F	2	NAG	O5-C5	3.84	1.51	1.43
3	F	2	NAG	C4-C5	-3.82	1.45	1.53
3	E	2	NAG	O5-C5	3.80	1.51	1.43
3	E	2	NAG	C1-C2	-3.65	1.46	1.52

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	F	1	NAG	C4-C3	-3.63	1.43	1.52
3	E	1	NAG	C4-C5	-3.60	1.45	1.53
3	E	1	NAG	C1-C2	-3.42	1.47	1.52
2	C	3	MAN	O5-C5	3.36	1.50	1.43
3	E	2	NAG	C4-C3	-3.30	1.43	1.52
3	D	1	NAG	C4-C3	-3.29	1.43	1.52
3	D	2	NAG	C4-C3	-3.28	1.44	1.52
3	E	2	NAG	O5-C1	-3.17	1.38	1.43
3	E	2	NAG	C3-C2	-3.14	1.45	1.52
2	C	2	NAG	C7-N2	3.11	1.45	1.34
3	F	1	NAG	C7-N2	3.05	1.44	1.34
3	F	2	NAG	C7-N2	3.00	1.44	1.34
3	E	2	NAG	C6-C5	-2.93	1.42	1.51
3	F	2	NAG	C4-C3	-2.87	1.45	1.52
2	C	1	NAG	C7-N2	2.80	1.44	1.34
2	C	2	NAG	C4-C5	-2.73	1.47	1.53
3	E	1	NAG	C7-N2	2.62	1.43	1.34
3	E	2	NAG	C7-N2	2.51	1.43	1.34
3	D	2	NAG	C6-C5	-2.43	1.43	1.51
3	D	1	NAG	C6-C5	-2.43	1.43	1.51
2	C	1	NAG	O5-C1	-2.42	1.39	1.43
3	D	2	NAG	C7-N2	2.40	1.42	1.34
3	D	1	NAG	C7-N2	2.38	1.42	1.34
3	D	2	NAG	C3-C2	-2.37	1.47	1.52
3	F	1	NAG	O5-C5	-2.35	1.38	1.43
3	D	1	NAG	C3-C2	-2.34	1.47	1.52
2	C	3	MAN	C2-C3	-2.32	1.49	1.52
3	F	2	NAG	C3-C2	-2.26	1.47	1.52
2	C	3	MAN	C4-C5	-2.26	1.48	1.53
3	F	2	NAG	C6-C5	-2.22	1.44	1.51
3	E	1	NAG	O5-C5	-2.20	1.39	1.43
2	C	2	NAG	C1-C2	-2.20	1.49	1.52
2	C	2	NAG	C3-C2	-2.18	1.47	1.52
2	C	1	NAG	O4-C4	2.17	1.48	1.43
3	F	1	NAG	C4-C5	-2.14	1.48	1.53
3	F	2	NAG	O5-C1	-2.12	1.40	1.43
3	E	2	NAG	C2-N2	-2.06	1.42	1.46
3	F	2	NAG	C1-C2	-2.05	1.49	1.52
2	C	2	NAG	C4-C3	-2.03	1.47	1.52

All (30) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	E	2	NAG	C2-N2-C7	-4.15	117.00	122.90
3	E	2	NAG	O5-C5-C6	-3.82	101.21	107.20
3	E	1	NAG	O5-C1-C2	-3.58	105.64	111.29
3	F	1	NAG	O4-C4-C3	-3.51	102.23	110.35
3	F	1	NAG	C1-C2-N2	-3.21	105.01	110.49
2	C	3	MAN	O5-C5-C6	3.06	112.00	107.20
3	E	2	NAG	C8-C7-N2	2.93	121.06	116.10
3	E	1	NAG	O4-C4-C3	-2.91	103.63	110.35
3	E	2	NAG	C6-C5-C4	-2.88	106.26	113.00
3	F	2	NAG	C1-O5-C5	-2.85	108.33	112.19
2	C	1	NAG	C3-C4-C5	2.81	115.25	110.24
2	C	2	NAG	C2-N2-C7	-2.73	119.02	122.90
3	E	2	NAG	O3-C3-C4	-2.71	104.08	110.35
3	E	1	NAG	O7-C7-N2	-2.67	117.04	121.95
3	E	1	NAG	C6-C5-C4	-2.65	106.79	113.00
3	E	2	NAG	O5-C1-C2	-2.65	107.11	111.29
3	D	2	NAG	C3-C4-C5	-2.50	105.78	110.24
3	D	1	NAG	C3-C4-C5	-2.49	105.79	110.24
3	F	2	NAG	O5-C5-C6	2.41	110.98	107.20
2	C	2	NAG	O5-C1-C2	-2.38	107.53	111.29
2	C	1	NAG	C2-N2-C7	-2.36	119.54	122.90
3	E	1	NAG	C3-C4-C5	-2.35	106.04	110.24
3	F	1	NAG	O5-C5-C6	-2.34	103.53	107.20
3	F	1	NAG	C6-C5-C4	-2.33	107.55	113.00
3	E	1	NAG	C4-C3-C2	2.26	114.33	111.02
3	F	1	NAG	C4-C3-C2	2.25	114.31	111.02
3	D	1	NAG	C6-C5-C4	-2.20	107.86	113.00
3	D	2	NAG	C6-C5-C4	-2.20	107.86	113.00
3	E	2	NAG	O4-C4-C3	-2.12	105.46	110.35
2	C	1	NAG	C8-C7-N2	2.09	119.63	116.10

There are no chirality outliers.

All (17) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	D	1	NAG	C4-C5-C6-O6
3	D	2	NAG	C4-C5-C6-O6
2	C	2	NAG	O5-C5-C6-O6
3	D	1	NAG	O7-C7-N2-C2
3	D	2	NAG	O7-C7-N2-C2
3	D	1	NAG	O5-C5-C6-O6
3	D	2	NAG	O5-C5-C6-O6
2	C	2	NAG	C4-C5-C6-O6

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Mol	Chain	Res	Type	Atoms
3	F	1	NAG	O5-C5-C6-O6
3	F	1	NAG	C4-C5-C6-O6
3	E	2	NAG	O5-C5-C6-O6
3	F	1	NAG	O7-C7-N2-C2
3	E	2	NAG	C4-C5-C6-O6
3	F	1	NAG	C1-C2-N2-C7
2	C	1	NAG	O5-C5-C6-O6
2	C	3	MAN	C4-C5-C6-O6
2	C	3	MAN	O5-C5-C6-O6

All (1) ring outliers are listed below:

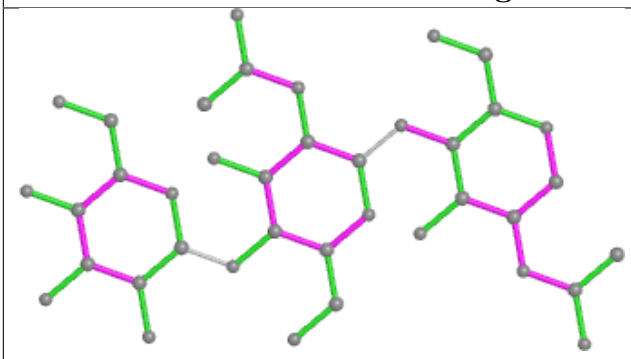
Mol	Chain	Res	Type	Atoms
2	C	3	MAN	C1-C2-C3-C4-C5-O5

5 monomers are involved in 12 short contacts:

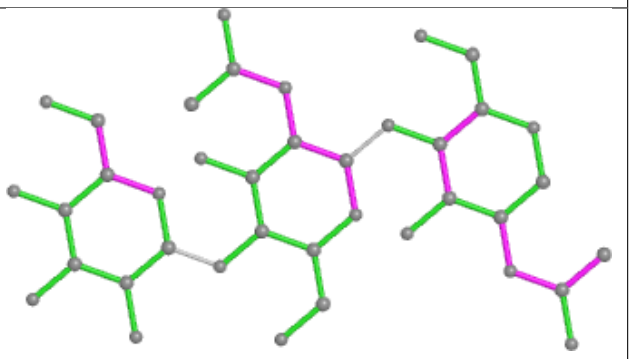
Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	D	2	NAG	2	0
3	F	1	NAG	3	0
3	F	2	NAG	2	0
3	D	1	NAG	3	0
2	C	1	NAG	5	0

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

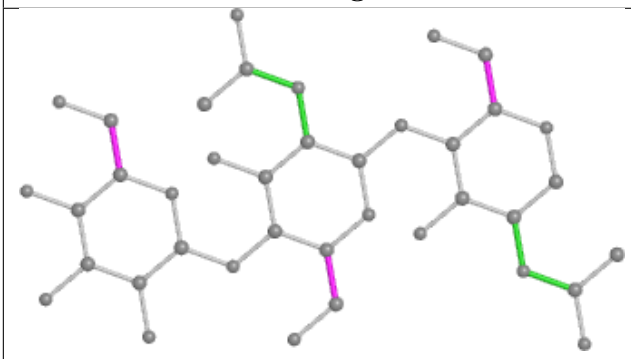
Oligosaccharide Chain C



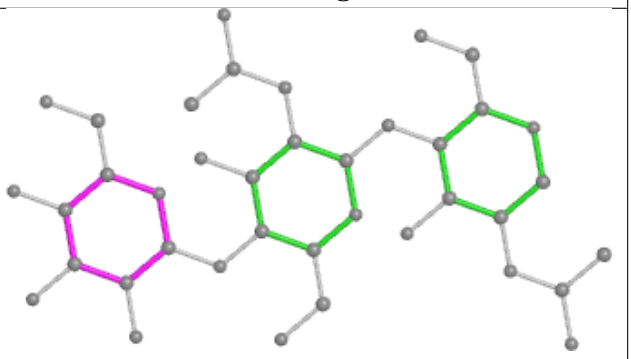
Bond lengths



Bond angles

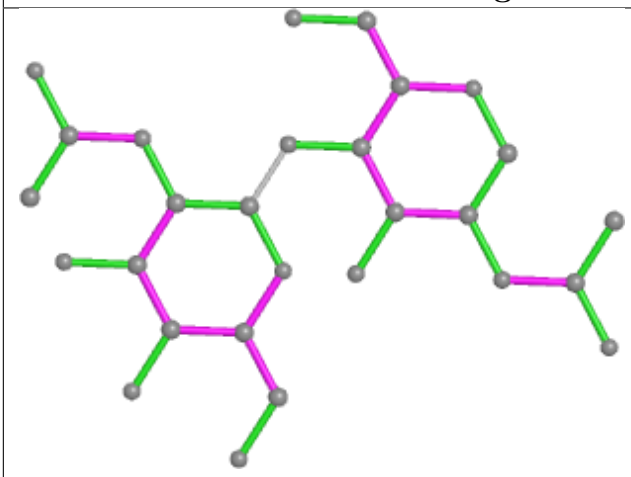


Torsions

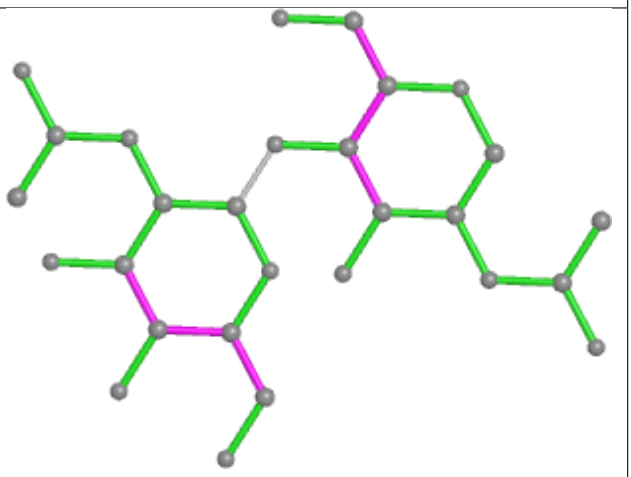


Rings

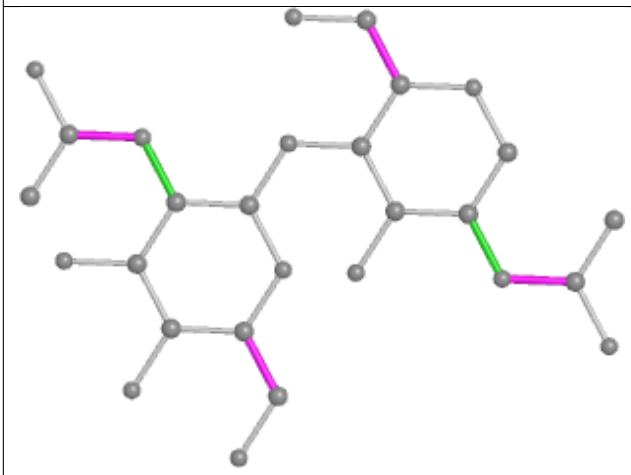
Oligosaccharide Chain D



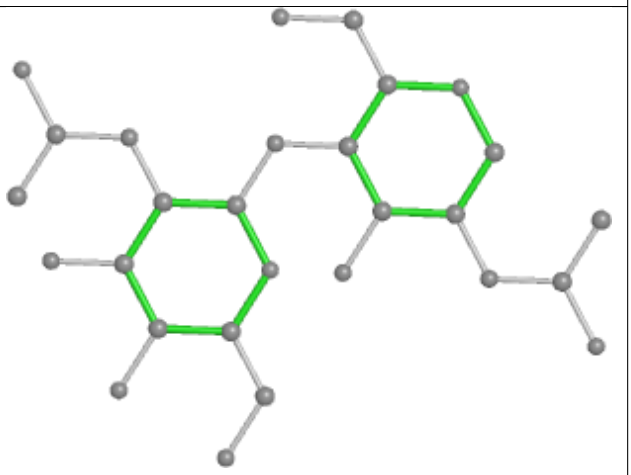
Bond lengths



Bond angles

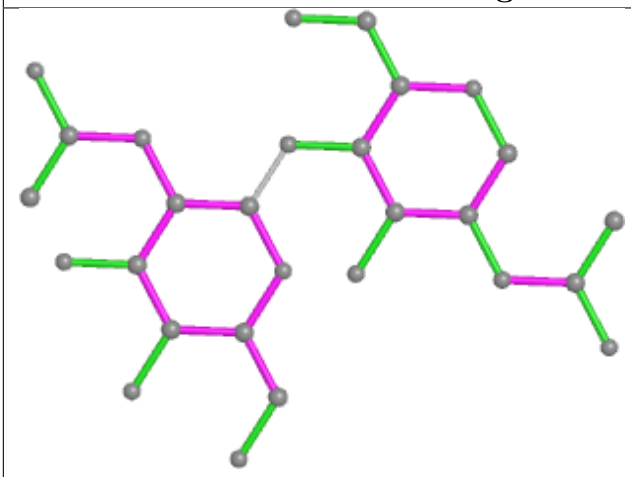


Torsions

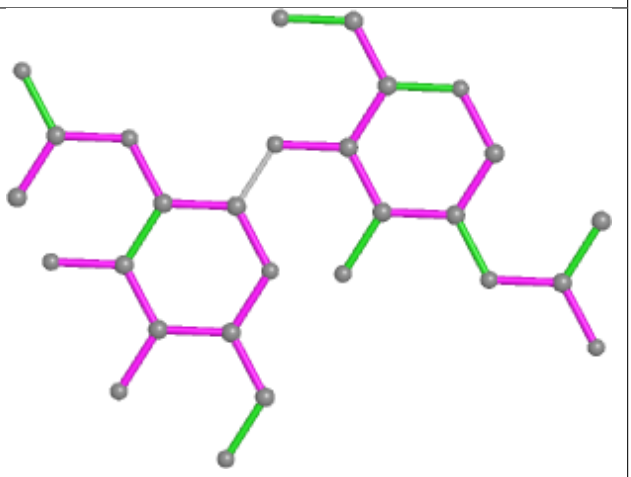


Rings

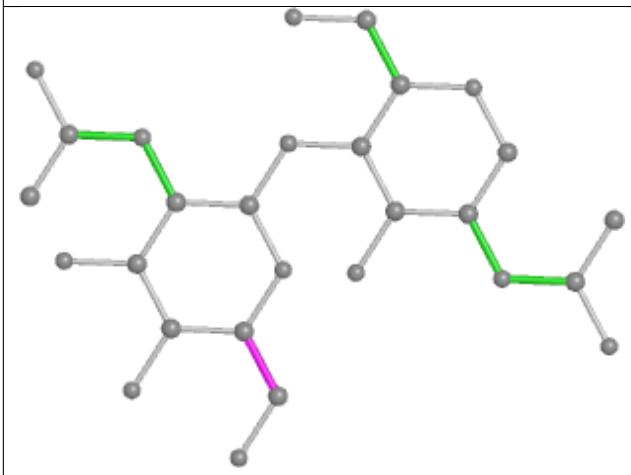
Oligosaccharide Chain E



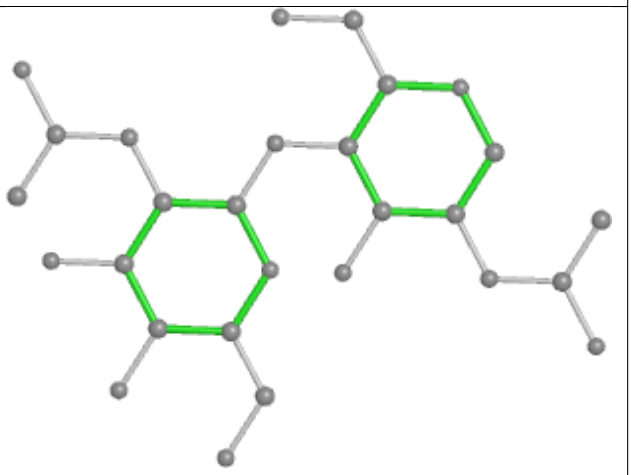
Bond lengths



Bond angles

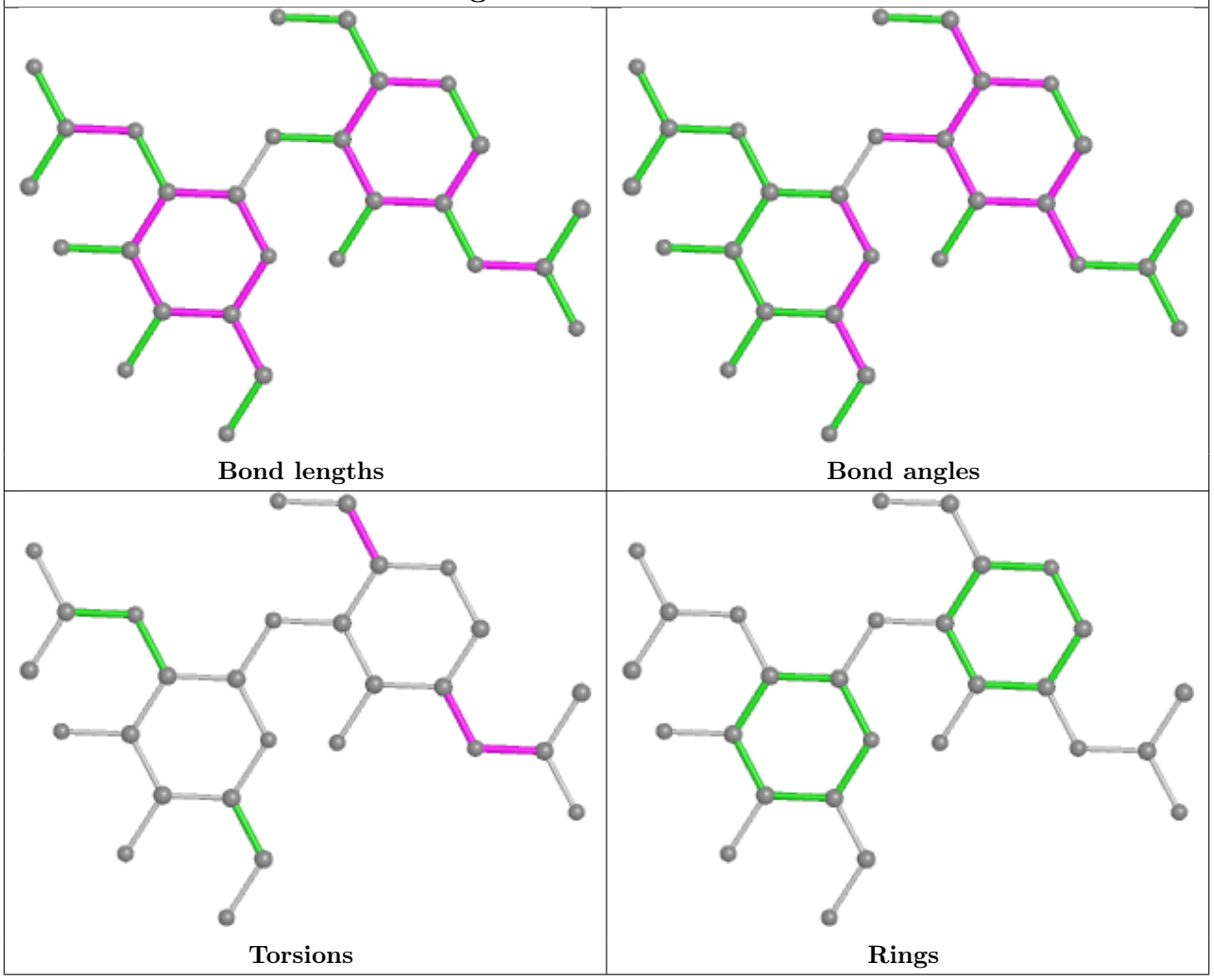


Torsions



Rings

Oligosaccharide Chain F



5.6 Ligand geometry (i)

Of 17 ligands modelled in this entry, 6 are monoatomic - leaving 11 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	$\#\|Z\| > 2$
6	IMD	A	805	-	3,5,5	1.08	0	4,5,5	1.04	0
6	IMD	A	804	-	3,5,5	0.41	0	4,5,5	0.55	0
7	NAG	B	810	1	14,14,15	2.18	5 (35%)	17,19,21	2.23	9 (52%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\|>2$	Counts	RMSZ	$\#\|Z\|>2$
7	NAG	B	811	1	14,14,15	0.70	0	17,19,21	0.92	0
8	MAN	B	809	-	11,11,12	2.08	4 (36%)	15,15,17	1.25	1 (6%)
7	NAG	A	813	1	14,14,15	0.52	0	17,19,21	0.82	0
7	NAG	A	812	1	14,14,15	1.02	1 (7%)	17,19,21	1.48	3 (17%)
6	IMD	A	806	-	3,5,5	1.02	0	4,5,5	0.84	0
6	IMD	B	805	-	3,5,5	1.52	0	4,5,5	0.82	0
6	IMD	B	806	-	3,5,5	1.02	0	4,5,5	0.88	0
6	IMD	B	804	-	3,5,5	0.79	0	4,5,5	0.65	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	NAG	B	811	1	-	2/6/23/26	0/1/1/1
6	IMD	A	804	-	-	-	0/1/1/1
7	NAG	B	810	1	-	4/6/23/26	0/1/1/1
6	IMD	A	805	-	-	-	0/1/1/1
8	MAN	B	809	-	-	2/2/19/22	1/1/1/1
7	NAG	A	813	1	-	2/6/23/26	0/1/1/1
7	NAG	A	812	1	-	4/6/23/26	0/1/1/1
6	IMD	A	806	-	-	-	0/1/1/1
6	IMD	B	805	-	-	-	0/1/1/1
6	IMD	B	806	-	-	-	0/1/1/1
6	IMD	B	804	-	-	-	0/1/1/1

All (10) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
7	B	810	NAG	C4-C3	-4.50	1.40	1.52
8	B	809	MAN	C4-C3	-4.17	1.41	1.52
7	B	810	NAG	C3-C2	-3.83	1.44	1.52
7	B	810	NAG	C7-N2	3.42	1.46	1.34
8	B	809	MAN	O5-C5	3.34	1.50	1.43
7	A	812	NAG	O5-C1	-2.73	1.39	1.43
7	B	810	NAG	O5-C1	-2.53	1.39	1.43
8	B	809	MAN	C2-C3	-2.29	1.49	1.52
8	B	809	MAN	C4-C5	-2.24	1.48	1.53
7	B	810	NAG	O5-C5	2.06	1.47	1.43

All (13) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
7	B	810	NAG	O5-C5-C6	4.35	114.02	107.20
7	A	812	NAG	C1-O5-C5	-3.30	107.72	112.19
7	B	810	NAG	O6-C6-C5	3.16	122.12	111.29
8	B	809	MAN	O5-C5-C6	3.07	112.01	107.20
7	B	810	NAG	O5-C1-C2	-2.93	106.67	111.29
7	A	812	NAG	O5-C5-C4	-2.84	103.93	110.83
7	B	810	NAG	O4-C4-C5	2.79	116.23	109.30
7	B	810	NAG	C2-N2-C7	-2.58	119.23	122.90
7	B	810	NAG	C6-C5-C4	-2.54	107.06	113.00
7	B	810	NAG	O3-C3-C4	-2.50	104.58	110.35
7	B	810	NAG	C4-C3-C2	-2.48	107.39	111.02
7	A	812	NAG	O5-C1-C2	2.31	114.94	111.29
7	B	810	NAG	C1-C2-N2	-2.07	106.95	110.49

There are no chirality outliers.

All (14) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
7	B	810	NAG	C8-C7-N2-C2
7	B	810	NAG	O5-C5-C6-O6
7	A	812	NAG	C8-C7-N2-C2
7	A	812	NAG	O7-C7-N2-C2
7	B	810	NAG	O7-C7-N2-C2
7	B	810	NAG	C4-C5-C6-O6
7	A	813	NAG	C4-C5-C6-O6
7	A	813	NAG	O5-C5-C6-O6
7	A	812	NAG	O5-C5-C6-O6
7	B	811	NAG	C4-C5-C6-O6
7	A	812	NAG	C4-C5-C6-O6
7	B	811	NAG	O5-C5-C6-O6
8	B	809	MAN	C4-C5-C6-O6
8	B	809	MAN	O5-C5-C6-O6

All (1) ring outliers are listed below:

Mol	Chain	Res	Type	Atoms
8	B	809	MAN	C1-C2-C3-C4-C5-O5

2 monomers are involved in 4 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
7	B	810	NAG	2	0
7	A	812	NAG	2	0

5.7 Other polymers (i)

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

The following chains have linkage breaks:

Mol	Chain	Number of breaks
1	A	1

All chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	A	469:LEU	C	470:ASN	N	1.61

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	694/763 (90%)	-0.49	1 (0%)	95	92	17, 31, 55, 87	0
1	B	698/763 (91%)	-0.55	6 (0%)	84	71	12, 30, 54, 90	0
All	All	1392/1526 (91%)	-0.52	7 (0%)	91	81	12, 31, 54, 90	0

All (7) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	134	PRO	2.9
1	B	135	GLN	2.7
1	B	80	GLY	2.7
1	A	80	GLY	2.6
1	B	82	GLY	2.4
1	B	282	GLU	2.3
1	B	202	LYS	2.0

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
1	T0I	B	471	18/19	0.94	0.20	23,47,61,63	0
1	T0I	A	471	18/19	0.96	0.17	24,43,54,54	0

6.3 Carbohydrates

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum,

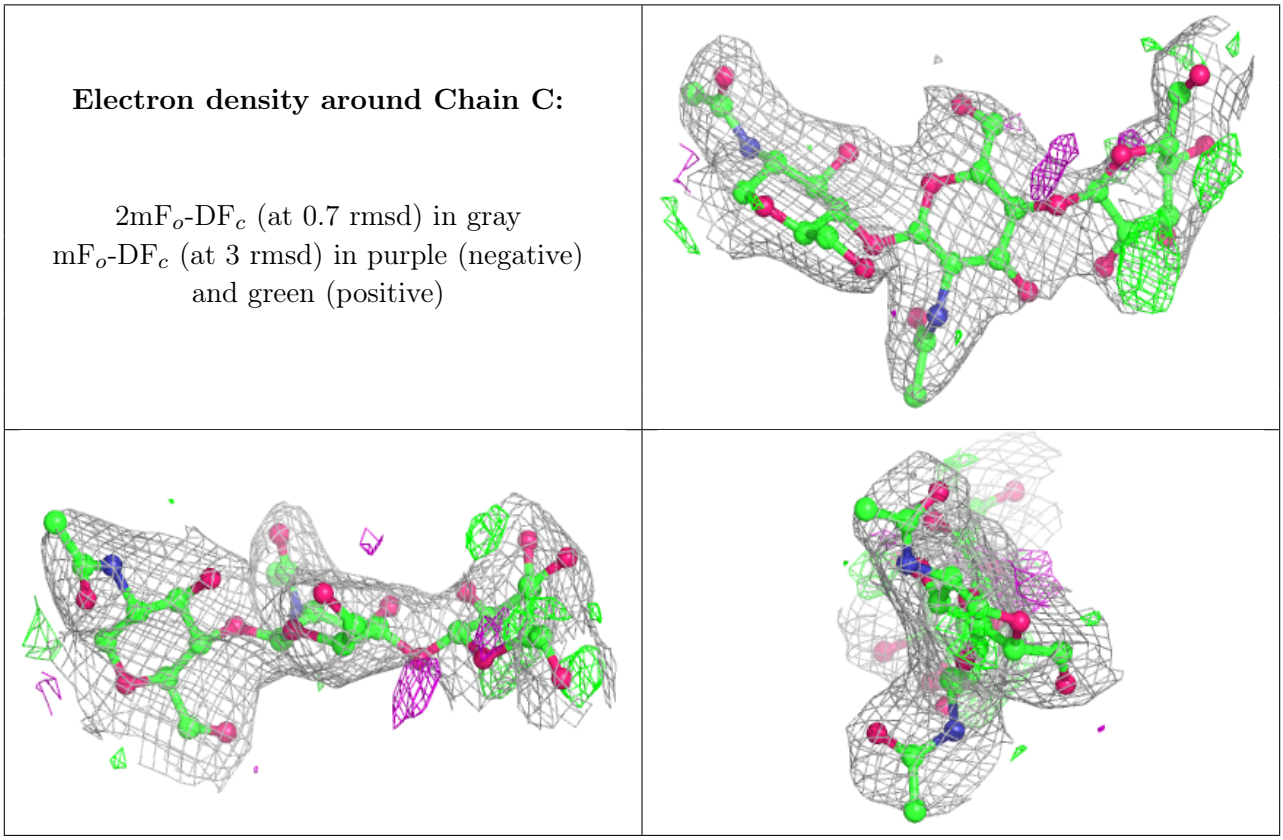
median, 95^{th} percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
2	MAN	C	3	11/12	0.71	0.34	59,84,96,98	0
3	NAG	D	1	14/15	0.74	0.29	70,99,111,112	0
3	NAG	D	2	14/15	0.77	0.48	70,99,111,112	0
3	NAG	F	2	14/15	0.86	0.31	63,94,105,111	0
2	NAG	C	2	14/15	0.89	0.27	46,55,78,83	0
3	NAG	F	1	14/15	0.92	0.17	44,68,83,94	0
3	NAG	E	2	14/15	0.95	0.21	37,55,72,86	0
3	NAG	E	1	14/15	0.97	0.18	24,43,54,59	0
2	NAG	C	1	14/15	0.97	0.15	28,36,46,50	0

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

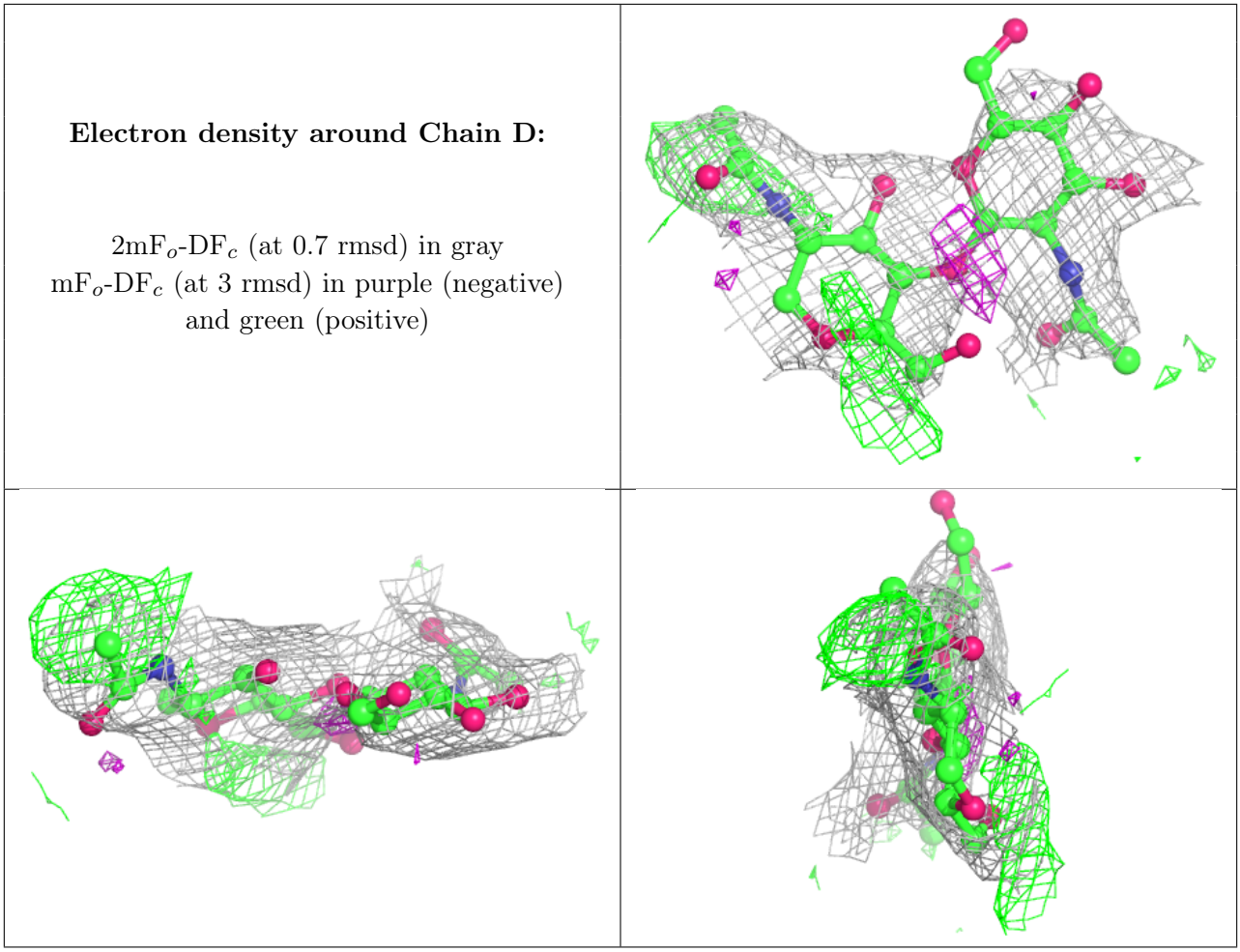
Electron density around Chain C:

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



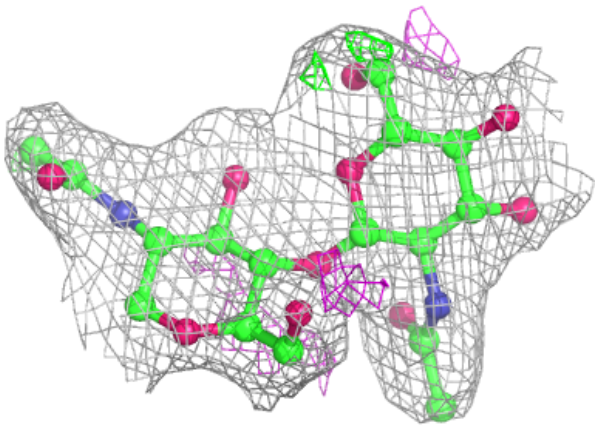
Electron density around Chain D:

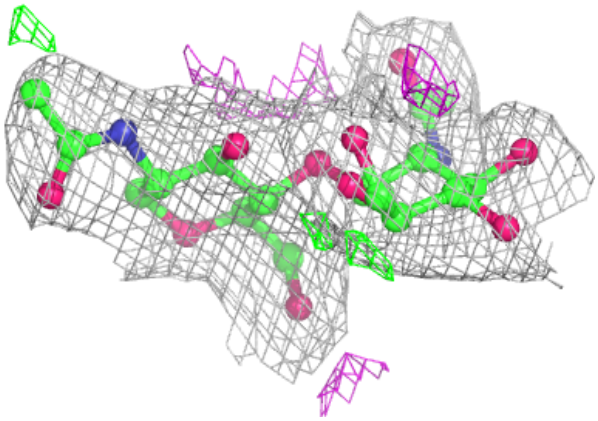
$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)

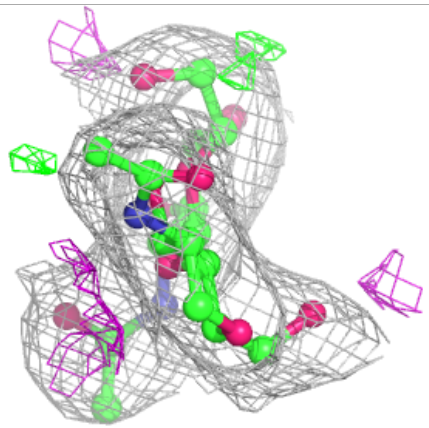


Electron density around Chain E:

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

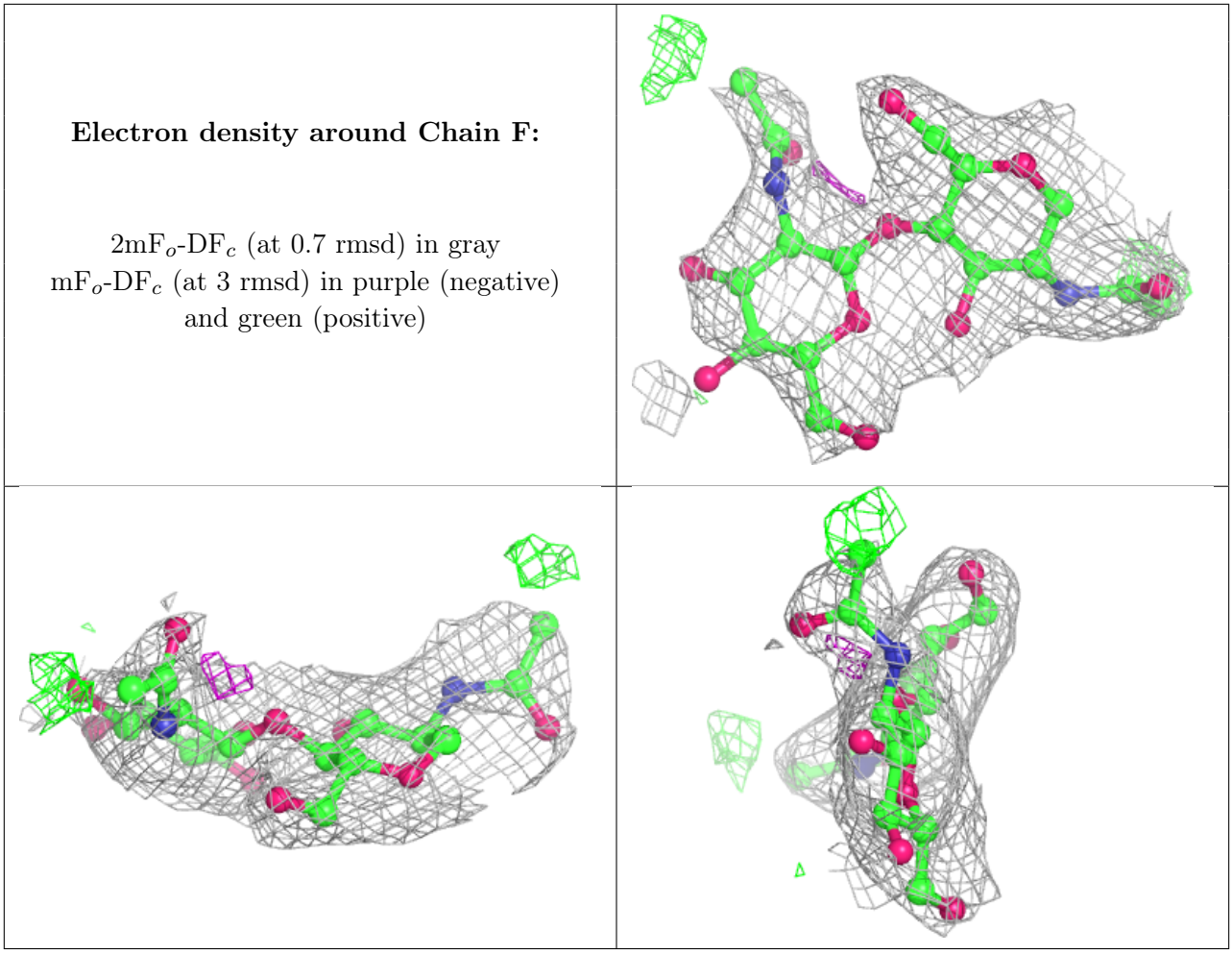






Electron density around Chain F:

$2mF_o$-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
8	MAN	B	809	11/12	0.65	0.48	59,84,96,98	0
7	NAG	B	810	14/15	0.75	0.37	44,75,101,104	0
7	NAG	A	813	14/15	0.76	0.50	0,4,9,9	0
7	NAG	A	812	14/15	0.79	0.41	44,75,101,104	0
5	CA	B	803	1/1	0.81	0.10	33,33,33,33	0
7	NAG	B	811	14/15	0.87	0.51	0,4,9,9	0
5	CA	A	803	1/1	0.92	0.07	22,22,22,22	0
6	IMD	B	805	5/5	0.93	0.30	41,46,48,49	0
6	IMD	A	804	5/5	0.97	0.14	41,46,48,49	0
6	IMD	A	806	5/5	0.97	0.23	41,46,48,49	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
6	IMD	B	804	5/5	0.97	0.14	44,48,54,59	0
5	CA	A	802	1/1	0.97	0.07	30,30,30,30	0
6	IMD	B	806	5/5	0.97	0.24	41,46,48,49	0
4	CU	A	801	1/1	0.98	0.05	22,22,22,22	0
4	CU	B	801	1/1	0.98	0.14	31,31,31,31	0
6	IMD	A	805	5/5	0.98	0.24	41,46,48,49	0
5	CA	B	802	1/1	0.99	0.09	23,23,23,23	0

6.5 Other polymers (i)

There are no such residues in this entry.