



Full wwPDB X-ray Structure Validation Report

Jan 19, 2022 – 02:53 am GMT

PDB ID : 7P7P
Title : Crystal structure of ERAP2 aminopeptidase in complex with phosphinic pseudotriptide((1R)-1-Amino-3-phenylpropyl){(2S)-3-(((2S)-1-amino-1-oxo-3-phenylpropan-2-yl)amino)-2-{{3-(2-hydroxyphenyl)-isoxazol-5-yl}methyl}-3-oxopropyl}phosphinic acid
Authors : Giastas, P.; Stratikos, E.; Mpakali, A.
Deposited on : 2021-07-20
Resolution : 3.00 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 following versions of software and data (see [references](#) ) were used in the production of this report:

MolProbity : 4.02b-467
Mogul : 1.8.4, CSD as541be (2020)
Xtrriage (Phenix) : 1.13
EDS : 2.24
buster-report : 1.1.7 (2018)
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac : 5.8.0267
CCP4 : 7.1.010 (Gargrove)
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.24

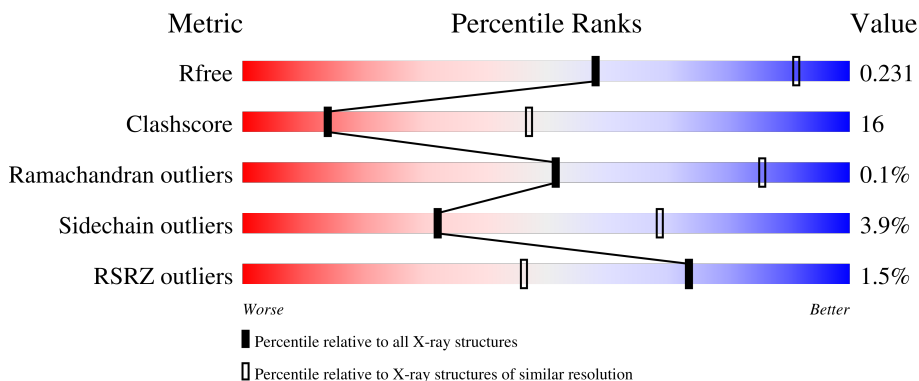
1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 3.00 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	2092 (3.00-3.00)
Clashscore	141614	2416 (3.00-3.00)
Ramachandran outliers	138981	2333 (3.00-3.00)
Sidechain outliers	138945	2336 (3.00-3.00)
RSRZ outliers	127900	1990 (3.00-3.00)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions $\leq 5\%$. The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	962	<div style="display: flex; align-items: center;"> <div style="width: 2%; height: 10px; background-color: red; margin-right: 2px;"></div> <div style="width: 65%; height: 10px; background-color: green; margin-right: 2px;"></div> <div style="width: 28%; height: 10px; background-color: yellow; margin-right: 2px;"></div> <div style="width: 5%; height: 10px; background-color: grey; margin-right: 2px;"></div> </div> <p style="margin-left: 20px;">65% 28% • 5%</p>
1	B	962	<div style="display: flex; align-items: center;"> <div style="width: 2%; height: 10px; background-color: red; margin-right: 2px;"></div> <div style="width: 57%; height: 10px; background-color: green; margin-right: 2px;"></div> <div style="width: 32%; height: 10px; background-color: yellow; margin-right: 2px;"></div> <div style="width: 9%; height: 10px; background-color: grey; margin-right: 2px;"></div> </div> <p style="margin-left: 20px;">57% 32% • 9%</p>
2	C	4	<div style="width: 100%; height: 10px; background-color: yellow;"></div> <p style="text-align: center;">100%</p>
3	D	4	<div style="display: flex; align-items: center;"> <div style="width: 50%; height: 10px; background-color: green; margin-right: 2px;"></div> <div style="width: 50%; height: 10px; background-color: yellow; margin-right: 2px;"></div> </div> <p style="text-align: center;">50% 50%</p>
4	E	2	<div style="width: 100%; height: 10px; background-color: yellow;"></div> <p style="text-align: center;">100%</p>

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Mol	Chain	Length	Quality of chain
4	H	2	 100%
4	I	2	 50%
5	F	3	 100%
6	G	5	 20%  80%

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
12	EDO	A	1111	-	-	-	X

2 Entry composition [i](#)

There are 16 unique types of molecules in this entry. The entry contains 14990 atoms, of which 76 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 Endoplasmic reticulum aminopeptidase 2.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	911	7330	4719	1219	1359	33	0	1	0
1	B	871	6839	4407	1134	1274	24	0	0	0

There are 6 discrepancies between the modelled and reference sequences:

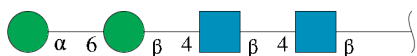
Chain	Residue	Modelled	Actual	Comment	Reference
A	392	ASN	LYS	variant	UNP Q6P179
A	961	ARG	-	expression tag	UNP Q6P179
A	962	HIS	-	expression tag	UNP Q6P179
B	392	ASN	LYS	variant	UNP Q6P179
B	961	ARG	-	expression tag	UNP Q6P179
B	962	HIS	-	expression tag	UNP Q6P179

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



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
			Total	C	N	O			
2	C	4	50	28	2	20	0	0	0

- Molecule 3 is an oligosaccharide called alpha-D-mannopyranose-(1-6)-beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose.



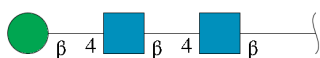
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
			Total	C	N	O			
3	D	4	50	28	2	20	0	0	0

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



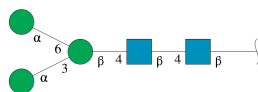
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
			Total	C	N	O			
4	E	2	28	16	2	10	0	0	0
4	H	2	28	16	2	10	0	0	0
4	I	2	28	16	2	10	0	0	0

- Molecule 5 is an oligosaccharide called beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose.



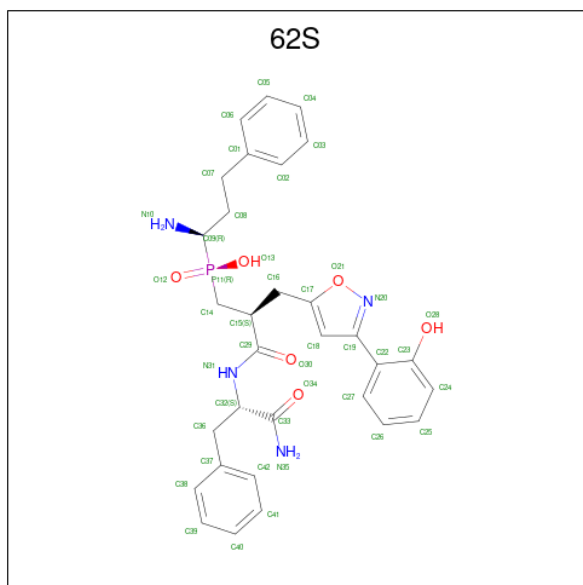
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
			Total	C	N	O			
5	F	3	39	22	2	15	0	0	0

- 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)-2-acetamido-2-deoxy-beta-D-glucopyranose.



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
			Total	C	N	O			
6	G	5	61	34	2	25	0	0	0

- Molecule 7 is [(2 {S})-3-[[[(2 {S})-1-azanyl-1-oxidanylidene-3-phenyl-propan-2-yl]amino]-2-[[3-(2-hydroxyphenyl)-1,2-oxazol-5-yl]methyl]-3-oxidanylidene-propyl]-[(1 {R})-1-azanyl-3-phenyl-propyl]phosphinic acid (three-letter code: 62S) (formula: C₃₁H₃₅N₄O₆P).



Mol	Chain	Residues	Atoms						ZeroOcc	AltConf
			Total	C	H	N	O	P		
7	A	1	77	31	35	4	6	1	0	0
7	B	1	77	31	35	4	6	1	0	0

- Molecule 8 is 2-acetamido-2-deoxy-beta-D-glucopyranose (three-letter code: NAG) (formula: C₈H₁₅NO₆).



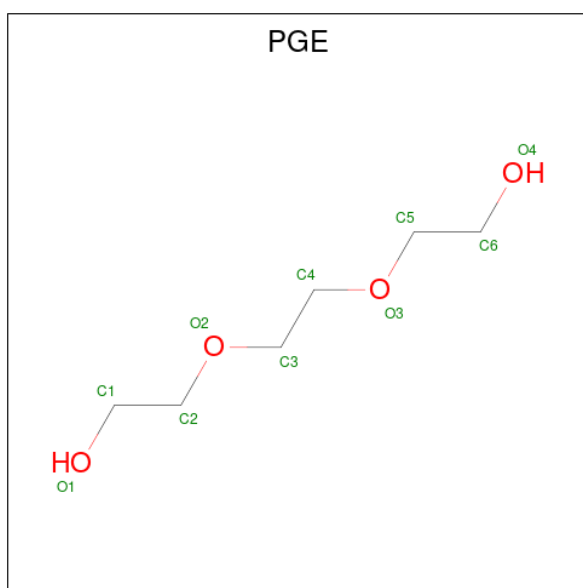
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
			Total	C	N	O		
8	A	1	Total 14	8	1	5	0	0
8	A	1	Total 14	8	1	5	0	0
8	A	1	Total 14	8	1	5	0	0
8	A	1	Total 14	8	1	5	0	0
8	B	1	Total 14	8	1	5	0	0
8	B	1	Total 14	8	1	5	0	0
8	B	1	Total 14	8	1	5	0	0
8	B	1	Total 14	8	1	5	0	0
8	B	1	Total 14	8	1	5	0	0
8	B	1	Total 14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

- Molecule 9 is DI(HYDROXYETHYL)ETHER (three-letter code: PEG) (formula: C₄H₁₀O₃).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
9	A	1	Total	C	O	0	0
			7	4	3		
9	A	1	Total	C	O	0	0
			7	4	3		

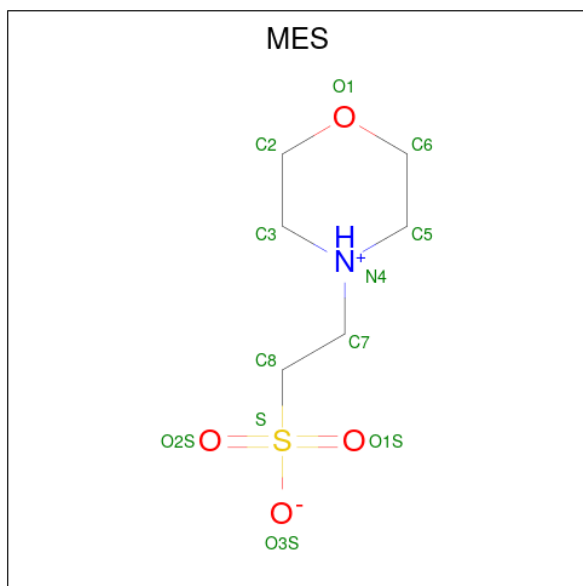
- Molecule 10 is TRIETHYLENE GLYCOL (three-letter code: PGE) (formula: C₆H₁₄O₄).



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

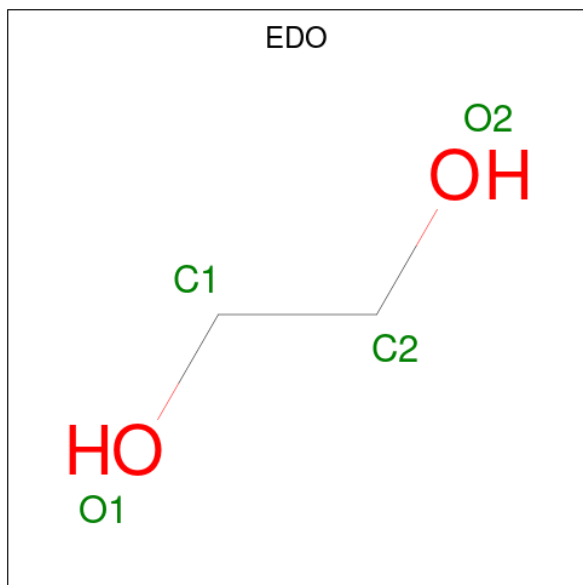
- Molecule 11 is 2-(N-MORPHOLINO)-ETHANESULFONIC ACID (three-letter code: MES)

(formula: C₆H₁₃NO₄S).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
			Total	C	N	O	S		
11	A	1	12	6	1	4	1	0	0

- Molecule 12 is 1,2-ETHANEDIOL (three-letter code: EDO) (formula: C₂H₆O₂).



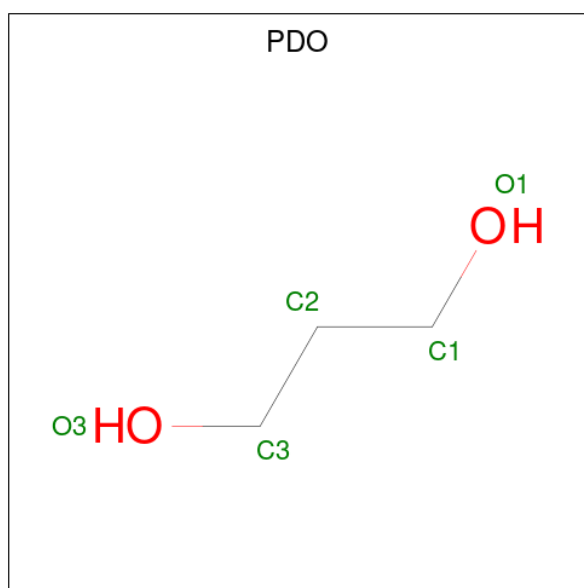
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
			Total	C	O		
12	A	1	4	2	2	0	0
12	A	1	4	2	2	0	0

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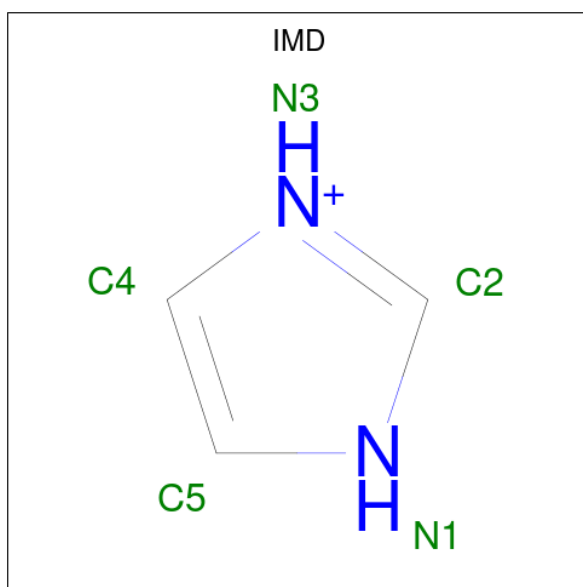
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
12	A	1	Total C O 4 2 2	0	0
12	A	1	Total C O 4 2 2	0	0
12	A	1	Total C H O 10 2 6 2	0	0
12	A	1	Total C O 4 2 2	0	0
12	A	1	Total C O 4 2 2	0	0

- Molecule 13 is 1,3-PROPANDIOL (three-letter code: PDO) (formula: C₃H₈O₂).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
13	A	1	Total C O 5 3 2	0	0
13	B	1	Total C O 5 3 2	0	0

- Molecule 14 is IMIDAZOLE (three-letter code: IMD) (formula: C₃H₅N₂).



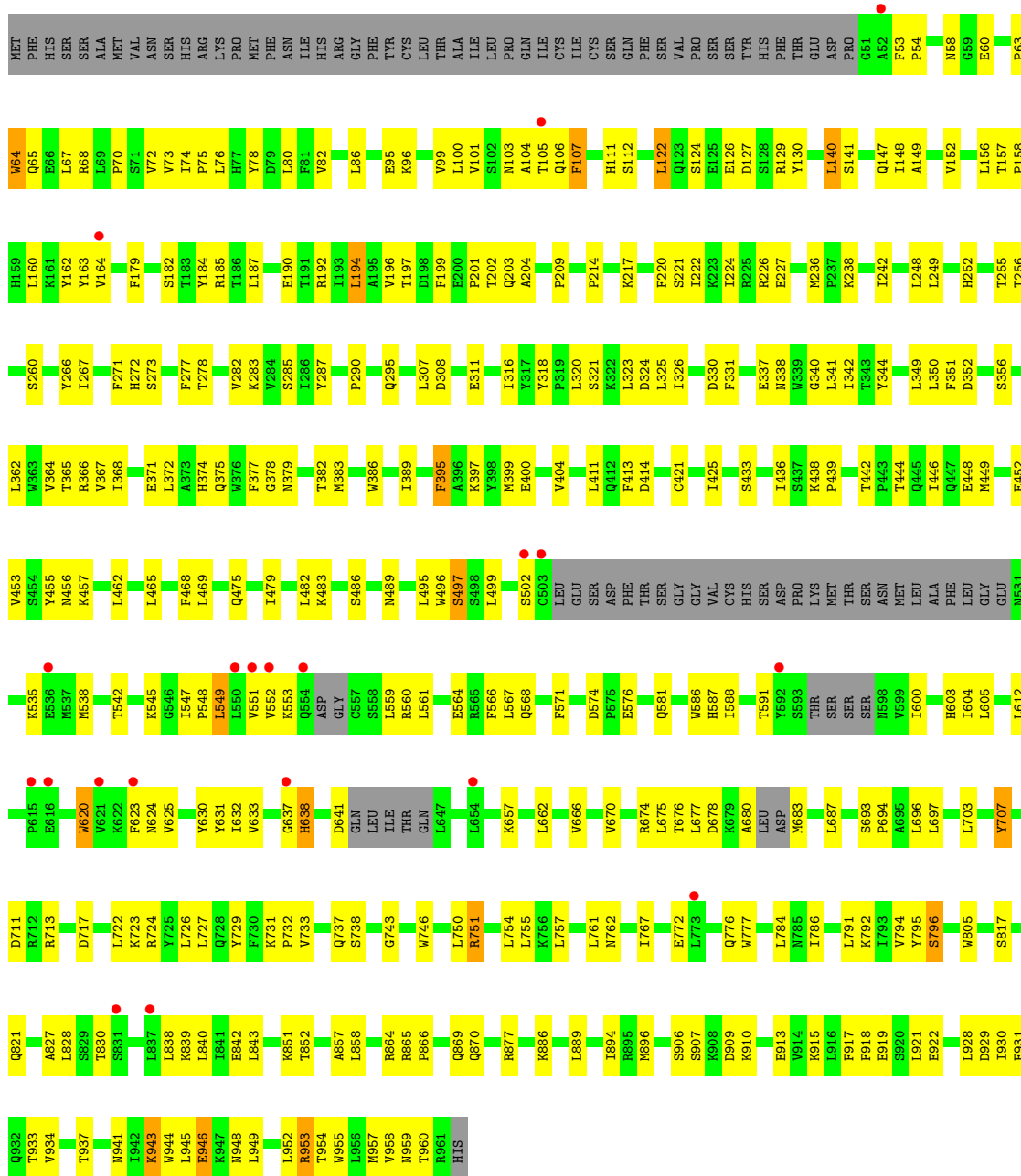
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
14	A	1	Total C N 5 3 2	0	0

- Molecule 15 is ZINC ION (three-letter code: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
15	A	1	Total Zn 1 1	0	0
15	B	1	Total Zn 1 1	0	0


- Molecule 16 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
16	A	121	Total O 121 121	0	0
16	B	35	Total O 35 35	0	0





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

Chain E:  100%



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

Chain H:  100%



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

Chain I:  50% 50%



- Molecule 5: beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain F:  100%



- 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)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain G:  20% 80%



4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α , β , γ	75.34Å 134.62Å 129.14Å 90.00° 90.48° 90.00°	Depositor
Resolution (Å)	50.19 – 3.00 50.19 – 3.00	Depositor EDS
% Data completeness (in resolution range)	94.5 (50.19-3.00) 94.5 (50.19-3.00)	Depositor EDS
R_{merge}	0.06	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.58 (at 3.01Å)	Xtrriage
Refinement program	PHENIX 1.17.1_3660, PHENIX 1.17.1_3660	Depositor
R, R_{free}	0.180 , 0.231 0.180 , 0.231	Depositor DCC
R_{free} test set	2265 reflections (4.64%)	wwPDB-VP
Wilson B-factor (Å ²)	79.5	Xtrriage
Anisotropy	0.020	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	(Not available) , (Not available)	EDS
L-test for twinning ²	$\langle L \rangle = 0.48$, $\langle L^2 \rangle = 0.31$	Xtrriage
Estimated twinning fraction	0.010 for -h,-l,-k 0.000 for -h,l,k 0.025 for h,-k,-l	Xtrriage
F_o, F_c correlation	0.95	EDS
Total number of atoms	14990	wwPDB-VP
Average B, all atoms (Å ²)	92.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.14% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

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

5 Model quality [i](#)

5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: PEG, NAG, PDO, ZN, MAN, BMA, MES, 62S, IMD, EDO, PGE

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	0.55	0/7514	0.75	5/10190 (0.0%)
1	B	0.49	0/7009	0.69	3/9536 (0.0%)
All	All	0.52	0/14523	0.72	8/19726 (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	1
1	B	0	2
All	All	0	3

There are no bond length outliers.

All (8) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	511	GLY	N-CA-C	-5.56	99.20	113.10
1	A	215	LEU	CA-CB-CG	5.46	127.86	115.30
1	A	859	LEU	CA-CB-CG	-5.31	103.09	115.30
1	A	341	LEU	CB-CG-CD2	-5.20	102.17	111.00
1	B	67	LEU	CA-CB-CG	5.13	127.09	115.30
1	A	843	LEU	CB-CG-CD2	-5.09	102.34	111.00
1	B	717	ASP	CB-CG-OD1	5.07	122.87	118.30
1	B	620	TRP	CA-CB-CG	5.07	123.33	113.70

There are no chirality outliers.

All (3) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	270	ASP	Peptide
1	B	637	GLY	Peptide
1	B	638	HIS	Peptide

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	7330	0	7172	177	0
1	B	6839	0	6480	270	0
2	C	50	0	43	2	0
3	D	50	0	43	0	0
4	E	28	0	25	0	0
4	H	28	0	25	0	0
4	I	28	0	25	0	0
5	F	39	0	34	4	0
6	G	61	0	52	4	0
7	A	42	35	0	3	0
7	B	42	35	0	1	0
8	A	56	0	52	4	0
8	B	84	0	78	0	0
9	A	14	0	20	0	0
10	A	10	0	14	1	0
11	A	12	0	12	1	0
12	A	28	6	42	3	0
13	A	5	0	8	0	0
13	B	5	0	8	0	0
14	A	5	0	5	0	0
15	A	1	0	0	0	0
15	B	1	0	0	0	0
16	A	121	0	0	1	0
16	B	35	0	0	1	0
All	All	14914	76	14138	454	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 16.

All (454) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:945:LEU:HB3	1:B:949:LEU:CD2	1.61	1.29
1:B:945:LEU:HB3	1:B:949:LEU:HD22	1.13	1.09
1:B:945:LEU:HA	1:B:949:LEU:HD13	1.10	1.08
1:B:945:LEU:CB	1:B:949:LEU:HD22	1.94	0.98
1:B:945:LEU:CA	1:B:949:LEU:HD13	1.95	0.95
1:B:182:SER:HB2	1:B:330:ASP:HB2	1.48	0.95
1:B:342:ILE:HG22	1:B:344:TYR:CE1	2.09	0.87
1:B:945:LEU:HB3	1:B:949:LEU:HD21	1.57	0.86
1:B:866:PRO:HA	1:B:869:GLN:HG3	1.60	0.83
1:B:945:LEU:HA	1:B:949:LEU:CD1	2.02	0.83
1:B:703:LEU:HD23	1:B:726:LEU:HD22	1.60	0.81
1:B:762:ASN:HA	1:B:767:ILE:HD11	1.63	0.81
1:B:316:ILE:HD11	1:B:483:LYS:HG2	1.62	0.81
1:B:623:PHE:HB2	1:B:633:VAL:HG21	1.61	0.80
1:B:104:ALA:HB2	1:B:158:PRO:HD3	1.62	0.79
1:B:80:LEU:HD23	1:B:222:ILE:CD1	2.12	0.79
1:B:678:ASP:HA	1:B:955:TRP:CH2	2.18	0.77
1:A:67:LEU:HD23	1:A:441:GLU:HB3	1.66	0.77
1:B:465:LEU:HG	1:B:469:LEU:HD13	1.68	0.75
1:B:838:LEU:HD22	1:B:842:GLU:HG3	1.67	0.75
1:B:549:LEU:HD21	1:B:564:GLU:HG3	1.69	0.73
1:B:196:VAL:HG13	1:B:267:ILE:HD11	1.69	0.72
1:B:549:LEU:HB3	1:B:566:PHE:HD2	1.53	0.72
1:B:713:ARG:HH12	1:B:906:SER:HB2	1.55	0.72
1:A:873:TRP:CZ2	1:A:877:ARG:HD3	2.25	0.71
1:B:678:ASP:HA	1:B:955:TRP:HH2	1.53	0.71
1:A:505:GLU:HB3	1:A:508:PHE:CE2	2.26	0.71
1:B:282:VAL:HG21	1:B:318:TYR:HD2	1.57	0.70
1:B:548:PRO:HB3	1:B:586:TRP:CE3	2.26	0.70
1:A:354:LYS:HE2	12:A:1113:EDO:H21	1.73	0.69
1:B:697:LEU:HD21	1:B:750:LEU:HD13	1.74	0.69
1:A:442:THR:O	1:A:446:ILE:HG13	1.91	0.69
1:B:722:LEU:O	1:B:724:ARG:N	2.19	0.69
1:A:603:HIS:CD2	1:A:612:LEU:HD21	2.27	0.69
1:B:54:PRO:HG2	1:B:65:GLN:CB	2.22	0.69
1:B:285:SER:HB2	1:B:324:ASP:OD1	1.94	0.68
1:B:737:GLN:HG3	1:B:754:LEU:HD12	1.75	0.68
1:A:331:PHE:CE2	1:A:333:PRO:HG2	2.29	0.68
1:B:337:GLU:HA	1:B:342:ILE:HD13	1.75	0.67
1:B:342:ILE:CG2	1:B:344:TYR:CE1	2.76	0.67
1:B:436:ILE:HG22	1:B:542:THR:HA	1.75	0.67
1:B:364:VAL:O	1:B:368:ILE:HG13	1.94	0.67

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:838:LEU:CD2	1:B:842:GLU:HG3	2.24	0.67
1:B:957:MET:HA	1:B:960:THR:HB	1.75	0.67
1:B:943:LYS:HA	1:B:946:GLU:HG2	1.77	0.67
1:B:571:PHE:HB2	1:B:574:ASP:HB2	1.77	0.67
1:A:710:MET:HB2	1:A:719:SER:HB3	1.77	0.66
1:B:323:LEU:HD12	1:B:340:GLY:HA2	1.78	0.66
1:B:389:ILE:HG21	1:B:449:MET:HB3	1.76	0.66
1:A:365:THR:HG21	1:A:411:LEU:CD1	2.27	0.65
1:A:465:LEU:HD11	1:A:469:LEU:HD11	1.77	0.65
5:F:1:NAG:O7	5:F:1:NAG:O3	2.13	0.65
1:A:542:THR:HG22	1:A:543:LEU:CD2	2.27	0.64
1:B:928:LEU:HG	1:B:930:ILE:HG22	1.78	0.64
1:A:421:CYS:O	1:A:425:ILE:HG13	1.97	0.64
1:A:563:GLN:OE1	1:A:585:LEU:HA	1.97	0.64
1:A:273:SER:H	6:G:5:MAN:H62	1.62	0.64
1:B:124:SER:N	1:B:130:TYR:O	2.31	0.63
1:B:196:VAL:HG13	1:B:267:ILE:CD1	2.28	0.63
1:A:945:LEU:HD22	1:A:949:LEU:HD12	1.81	0.63
1:B:400:GLU:O	1:B:404:VAL:HG12	1.98	0.63
1:A:122:LEU:HD11	1:A:162:TYR:HB3	1.81	0.63
1:A:786:ILE:HD13	1:A:794:VAL:HG11	1.79	0.63
1:A:659:ARG:NH1	1:A:690:GLU:OE2	2.29	0.63
1:B:323:LEU:HD21	1:B:372:LEU:HD21	1.81	0.63
1:B:703:LEU:HD23	1:B:726:LEU:CD2	2.28	0.63
1:B:945:LEU:CD2	1:B:949:LEU:HD11	2.29	0.63
1:A:724:ARG:O	1:A:728:GLN:HG3	1.99	0.63
1:B:864:ARG:HD2	1:B:864:ARG:O	1.99	0.63
1:A:238:LYS:HD2	1:A:241:THR:OG1	1.98	0.62
1:A:398:TYR:OH	1:A:466:LYS:HD3	1.99	0.62
1:B:141:SER:CB	1:B:148:ILE:HG22	2.29	0.62
1:B:948:ASN:O	1:B:952:LEU:HB2	2.00	0.62
1:A:242:ILE:HG12	1:A:250:GLU:HB3	1.81	0.62
1:B:497:SER:HA	1:B:535:LYS:HE3	1.82	0.62
1:B:680:ALA:HB2	1:B:683:MET:CB	2.29	0.62
1:A:545:LYS:HD2	1:A:565:ARG:NH2	2.14	0.62
1:B:82:VAL:HG22	1:B:224:ILE:HG12	1.80	0.62
1:A:105:THR:HG22	1:A:107:PHE:H	1.64	0.61
1:B:792:LYS:O	1:B:796:SER:HB2	2.00	0.61
1:B:80:LEU:HD23	1:B:222:ILE:HD12	1.80	0.61
1:B:378:GLY:O	1:B:382:THR:HB	2.00	0.61
1:B:549:LEU:CD2	1:B:564:GLU:HG3	2.32	0.60

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:363:TRP:HB2	12:A:1116:EDO:H12	1.83	0.60
1:A:386:TRP:CD1	1:A:446:ILE:HD13	2.36	0.60
1:A:362:LEU:O	1:A:366:ARG:HG3	2.01	0.60
1:B:140:LEU:HD12	1:B:149:ALA:HB3	1.82	0.60
1:B:757:LEU:O	1:B:761:LEU:HG	2.01	0.60
1:A:67:LEU:CD2	1:A:441:GLU:HB3	2.32	0.60
1:B:566:PHE:CE2	1:B:632:ILE:HD12	2.36	0.60
1:A:361:LYS:O	1:A:365:THR:HG22	2.02	0.60
1:A:845:MET:O	1:A:886:LYS:HE3	2.02	0.59
1:B:351:PHE:CE1	1:B:356:SER:HB3	2.37	0.59
1:B:382:THR:O	1:B:489:ASN:HA	2.02	0.59
1:B:196:VAL:HA	1:B:267:ILE:HG12	1.84	0.59
1:A:663:ILE:HG21	1:A:698:GLU:HG2	1.84	0.59
1:B:915:LYS:O	1:B:919:GLU:HG2	2.02	0.59
1:A:128:SER:O	1:A:131:MET:HB2	2.01	0.59
1:B:224:ILE:HD11	1:B:266:TYR:HB2	1.85	0.59
1:A:139:VAL:HG22	1:A:150:LEU:HD22	1.84	0.59
1:B:242:ILE:HD12	1:B:252:HIS:NE2	2.18	0.59
1:B:140:LEU:CD1	1:B:149:ALA:HB3	2.32	0.58
1:B:101:VAL:HG12	1:B:158:PRO:HA	1.84	0.58
1:B:840:LEU:HB3	1:B:858:LEU:HD21	1.84	0.58
5:F:2:NAG:O3	5:F:3:BMA:H2	2.03	0.58
1:B:697:LEU:HD21	1:B:750:LEU:CD1	2.34	0.58
1:B:64:TRP:CD2	1:B:70:PRO:HG3	2.39	0.58
1:B:591:THR:HG23	1:B:600:ILE:HG23	1.85	0.58
1:A:96:LYS:HD2	10:A:1108:PGE:H32	1.86	0.58
1:A:293:ARG:O	1:A:296:THR:HG22	2.03	0.58
1:B:852:THR:HG21	1:B:886:LYS:HE3	1.86	0.58
1:B:918:PHE:O	1:B:922:GLU:HG2	2.03	0.58
1:B:680:ALA:HA	1:B:683:MET:N	2.19	0.58
1:A:395:PHE:HE2	1:A:495:LEU:HD21	1.68	0.57
1:B:111:HIS:HA	1:B:147:GLN:HA	1.86	0.57
1:B:452:GLU:HG3	7:B:1501:62S:C25	2.34	0.57
1:B:907:SER:OG	1:B:909:ASP:HB3	2.05	0.57
1:B:674:ARG:O	1:B:675:LEU:HD23	2.05	0.57
1:A:367:VAL:HG22	7:A:1101:62S:C27	2.35	0.57
1:B:63:PRO:HB2	1:B:107:PHE:CE2	2.39	0.57
1:B:727:LEU:O	1:B:731:LYS:HB2	2.04	0.56
1:A:95:GLU:OE1	1:A:209:PRO:HD2	2.06	0.56
1:B:201:PRO:HG2	1:B:202:THR:HG23	1.87	0.56
1:A:660:VAL:HG12	1:A:695:ALA:HA	1.87	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:763:HIS:CD2	1:A:765:PRO:HD2	2.39	0.56
1:A:663:ILE:CG2	1:A:698:GLU:HG2	2.36	0.56
1:B:362:LEU:O	1:B:365:THR:HG22	2.05	0.56
1:A:778:MET:HG3	1:A:807:TYR:CD2	2.41	0.56
1:B:272:HIS:ND1	1:B:290:PRO:HB3	2.21	0.56
1:B:421:CYS:O	1:B:425:ILE:HG13	2.05	0.56
1:A:293:ARG:NH2	6:G:2:NAG:O3	2.39	0.55
1:B:238:LYS:O	1:B:238:LYS:HG3	2.06	0.55
1:B:465:LEU:HD13	1:B:538:MET:CE	2.36	0.55
1:B:917:PHE:CE1	1:B:921:LEU:HD21	2.41	0.55
1:B:933:THR:O	1:B:937:THR:HG22	2.07	0.55
1:A:272:HIS:CD2	1:A:290:PRO:HB3	2.42	0.55
1:B:199:PHE:CD1	1:B:204:ALA:HA	2.41	0.55
1:B:623:PHE:CB	1:B:633:VAL:HG21	2.34	0.55
1:A:192:ARG:HA	1:B:190:GLU:HG2	1.89	0.55
1:A:492:ASN:OD1	1:A:542:THR:HG21	2.07	0.55
1:B:197:THR:HG23	1:B:266:TYR:O	2.07	0.55
1:B:433:SER:O	1:B:545:LYS:HD3	2.06	0.55
1:A:802:THR:HG22	1:A:836:LYS:HZ1	1.72	0.55
1:B:479:ILE:O	1:B:483:LYS:HG3	2.06	0.55
1:A:193:ILE:HG13	1:B:190:GLU:HG3	1.89	0.55
1:A:579:ALA:O	1:A:582:GLU:HG2	2.07	0.54
5:F:1:NAG:H62	5:F:2:NAG:C1	2.36	0.54
1:A:687:LEU:HD11	1:A:699:GLY:HA3	1.88	0.54
1:A:647:LEU:HD13	1:A:686:TYR:CE2	2.42	0.54
1:B:954:THR:HG22	1:B:958:VAL:HG21	1.89	0.54
1:B:743:GLY:H	1:B:751:ARG:NH2	2.05	0.54
1:B:930:ILE:HA	1:B:933:THR:CG2	2.37	0.54
1:B:386:TRP:CD1	1:B:446:ILE:HD13	2.42	0.54
1:B:442:THR:O	1:B:446:ILE:HG13	2.08	0.54
1:B:839:LYS:O	1:B:843:LEU:HG	2.08	0.54
1:A:226:ARG:HG3	1:A:227:GLU:O	2.08	0.54
1:A:418:LEU:HD21	1:A:627:SER:HB3	1.91	0.53
1:A:626:ASP:OD2	1:A:655:ARG:NH1	2.41	0.53
1:A:702:TYR:O	1:A:705:SER:HB3	2.07	0.53
1:B:397:LYS:O	1:B:400:GLU:HG2	2.07	0.53
1:B:551:VAL:HG21	1:B:564:GLU:OE2	2.08	0.53
1:B:762:ASN:HA	1:B:767:ILE:CD1	2.35	0.53
1:A:351:PHE:HA	16:A:1203:HOH:O	2.09	0.53
1:A:479:ILE:O	1:A:483:LYS:HG3	2.09	0.53
1:A:670:VAL:HG11	1:A:677:LEU:CD1	2.38	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:863:ALA:HB2	1:A:901:THR:HG22	1.90	0.52
1:A:764:ALA:HB3	1:A:765:PRO:HD3	1.91	0.52
1:A:870:GLN:O	1:A:873:TRP:N	2.42	0.52
1:B:362:LEU:O	1:B:362:LEU:HD12	2.09	0.52
1:A:791:LEU:HD11	1:A:795:TYR:CZ	2.44	0.52
1:B:937:THR:O	1:B:941:ASN:HB2	2.09	0.52
1:A:796:SER:HB3	1:A:827:ALA:HA	1.92	0.52
1:B:468:PHE:HD1	1:B:469:LEU:HD12	1.73	0.52
1:A:622:LYS:HE3	1:A:658:ASP:CG	2.29	0.52
1:B:224:ILE:HD11	1:B:266:TYR:CB	2.40	0.52
1:B:372:LEU:O	1:B:375:GLN:HG2	2.10	0.52
1:B:475:GLN:O	1:B:479:ILE:HG13	2.09	0.52
1:B:438:LYS:HG2	1:B:439:PRO:CD	2.40	0.52
1:B:104:ALA:HB2	1:B:158:PRO:CD	2.37	0.51
1:A:127:ASP:HB2	1:A:160:LEU:HD23	1.91	0.51
1:B:945:LEU:HD23	1:B:949:LEU:HD11	1.91	0.51
1:B:122:LEU:HD23	1:B:163:TYR:O	2.10	0.51
1:B:101:VAL:HG21	1:B:156:LEU:CB	2.40	0.51
1:B:870:GLN:OE1	1:B:910:LYS:NZ	2.43	0.51
1:B:930:ILE:HA	1:B:933:THR:HG22	1.93	0.51
1:A:399:MET:HE3	1:A:402:ILE:HD11	1.93	0.51
1:B:127:ASP:OD1	1:B:129:ARG:HG3	2.11	0.51
1:B:365:THR:HG21	1:B:411:LEU:HD12	1.92	0.51
1:B:362:LEU:HA	1:B:365:THR:HG22	1.92	0.51
1:A:448:GLU:OE2	1:A:929:ASP:N	2.39	0.51
1:B:141:SER:HB2	1:B:148:ILE:HG22	1.93	0.50
1:B:395:PHE:HE2	1:B:495:LEU:HD21	1.76	0.50
1:A:710:MET:CB	1:A:719:SER:HB3	2.39	0.50
1:A:905:PHE:HB2	1:A:938:ILE:HD13	1.92	0.50
1:A:828:LEU:HB3	1:A:840:LEU:HD11	1.93	0.50
1:B:945:LEU:O	1:B:949:LEU:HB2	2.12	0.50
1:B:157:THR:N	1:B:162:TYR:OH	2.44	0.50
1:B:214:PRO:HA	1:B:260:SER:HB3	1.93	0.50
1:B:95:GLU:OE1	1:B:209:PRO:HD2	2.12	0.50
1:B:103:ASN:O	1:B:105:THR:HG23	2.12	0.50
1:B:126:GLU:OE1	1:B:160:LEU:HA	2.12	0.50
1:B:786:ILE:HD13	1:B:794:VAL:HG11	1.94	0.50
1:A:362:LEU:HD13	1:A:411:LEU:HB3	1.94	0.50
1:A:670:VAL:HG11	1:A:677:LEU:HD13	1.94	0.50
1:A:888:ASP:O	1:A:894:ILE:HG13	2.12	0.50
1:B:63:PRO:HB2	1:B:107:PHE:CD2	2.47	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:100:LEU:O	1:B:100:LEU:HD12	2.11	0.50
1:A:122:LEU:HD12	1:A:163:TYR:O	2.12	0.50
1:B:438:LYS:HG2	1:B:439:PRO:HD2	1.93	0.50
1:B:497:SER:HB2	1:B:535:LYS:CE	2.42	0.49
1:B:805:TRP:CE2	1:B:828:LEU:HD22	2.47	0.49
1:B:934:VAL:HA	1:B:937:THR:CG2	2.42	0.49
1:A:666:VAL:HG12	1:A:680:ALA:HB2	1.95	0.49
1:A:780:SER:CB	1:A:784:LEU:HG	2.43	0.49
1:A:774:PHE:HB2	1:A:794:VAL:HG13	1.94	0.49
1:B:344:TYR:HE2	1:B:367:VAL:HG12	1.77	0.49
1:B:76:LEU:HD11	1:B:100:LEU:HG	1.95	0.49
1:B:591:THR:HG23	1:B:600:ILE:CG2	2.42	0.49
1:B:641:ASP:OD1	1:B:641:ASP:N	2.41	0.49
1:B:452:GLU:O	1:B:456:ASN:HB2	2.12	0.49
1:B:777:TRP:HB2	1:B:784:LEU:HD22	1.95	0.49
1:A:382:THR:O	1:A:489:ASN:HA	2.13	0.49
1:B:272:HIS:CE1	1:B:290:PRO:HB3	2.48	0.49
1:B:737:GLN:HA	1:B:737:GLN:OE1	2.12	0.49
1:B:786:ILE:CD1	1:B:794:VAL:HG11	2.42	0.49
1:B:366:ARG:HD2	1:B:413:PHE:CE1	2.48	0.48
1:B:397:LYS:HD2	1:B:455:TYR:HB3	1.94	0.48
1:B:707:TYR:HE2	1:B:761:LEU:CD2	2.26	0.48
1:B:676:THR:OG1	1:B:678:ASP:OD1	2.29	0.48
1:A:337:GLU:OE2	7:A:1101:62S:N10	2.46	0.48
1:B:342:ILE:HD11	1:B:375:GLN:NE2	2.29	0.48
1:B:934:VAL:HA	1:B:937:THR:HG22	1.94	0.48
1:A:286:ILE:HG13	1:A:300:LEU:HB2	1.95	0.48
1:A:884:LEU:HA	1:A:884:LEU:HD23	1.64	0.48
1:B:750:LEU:HD12	1:B:750:LEU:O	2.13	0.48
1:B:751:ARG:O	1:B:755:LEU:HG	2.14	0.48
1:B:955:TRP:H	1:B:955:TRP:HE3	1.61	0.48
1:A:548:PRO:HB3	1:A:586:TRP:CE3	2.48	0.48
1:B:395:PHE:CD2	1:B:462:LEU:HD11	2.49	0.48
1:A:547:ILE:HG13	1:A:548:PRO:HD2	1.96	0.48
1:A:88:SER:HB3	1:A:90:ASP:OD2	2.13	0.47
1:A:239:VAL:HG23	1:A:240:LYS:HB2	1.95	0.47
1:A:875:PHE:O	1:A:879:ASN:ND2	2.46	0.47
1:B:910:LYS:HD3	1:B:913:GLU:OE2	2.12	0.47
1:A:244:LEU:HB2	1:A:248:LEU:O	2.13	0.47
1:B:674:ARG:C	1:B:675:LEU:HD23	2.35	0.47
1:B:754:LEU:O	1:B:757:LEU:N	2.47	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:298:TYR:OH	1:A:365:THR:HB	2.13	0.47
1:A:873:TRP:CH2	1:A:877:ARG:HD3	2.49	0.47
1:B:278:THR:HG22	1:B:308:ASP:OD1	2.14	0.47
1:B:945:LEU:HD22	1:B:949:LEU:HD11	1.94	0.47
1:A:232:ALA:HA	1:A:267:ILE:O	2.15	0.47
1:A:75:PRO:HD2	1:A:216:PHE:HD1	1.78	0.47
1:B:325:LEU:HD23	1:B:349:LEU:HD11	1.96	0.47
1:A:587:HIS:CD2	1:A:606:LYS:HD3	2.49	0.47
1:A:660:VAL:HG12	1:A:695:ALA:CA	2.44	0.47
1:B:248:LEU:HD22	6:G:1:NAG:H83	1.95	0.47
1:A:62:PHE:CZ	1:A:149:ALA:HB2	2.50	0.47
1:A:95:GLU:O	1:A:165:ALA:HA	2.15	0.47
1:A:106:GLN:O	1:A:152:VAL:HG22	2.14	0.47
1:A:659:ARG:HH11	1:A:690:GLU:CD	2.18	0.47
1:B:106:GLN:HA	1:B:152:VAL:CG2	2.44	0.47
1:B:182:SER:CB	1:B:330:ASP:HB2	2.33	0.47
1:B:307:LEU:O	1:B:311:GLU:HG3	2.14	0.47
1:B:465:LEU:HD13	1:B:538:MET:HE3	1.95	0.47
1:B:549:LEU:HB3	1:B:566:PHE:CD2	2.41	0.47
1:B:624:ASN:CB	1:B:631:TYR:HE1	2.28	0.47
1:B:731:LYS:N	1:B:732:PRO:HD2	2.29	0.47
1:B:733:VAL:HG12	1:B:754:LEU:CD1	2.45	0.47
1:B:944:TRP:O	1:B:948:ASN:HB2	2.14	0.47
1:B:952:LEU:C	1:B:953:ARG:HD3	2.34	0.47
1:A:561:LEU:HD12	1:A:610:ASP:HB3	1.97	0.47
1:A:731:LYS:N	1:A:732:PRO:HD2	2.29	0.47
1:B:236:MET:HE3	1:B:256:THR:HA	1.96	0.47
1:A:756:LYS:HE3	1:A:760:ASP:OD2	2.15	0.47
1:A:588:ILE:HB	1:A:590:LEU:HD21	1.96	0.46
1:B:337:GLU:HA	1:B:342:ILE:CD1	2.45	0.46
1:A:421:CYS:O	1:A:424:VAL:HG12	2.14	0.46
8:A:1105:NAG:C8	8:A:1105:NAG:C3	2.94	0.46
1:B:337:GLU:HG3	1:B:374:HIS:HB3	1.98	0.46
1:B:226:ARG:HG3	1:B:227:GLU:O	2.16	0.46
1:B:559:LEU:O	1:B:612:LEU:N	2.31	0.46
1:B:662:LEU:O	1:B:666:VAL:HG22	2.15	0.46
1:B:194:LEU:HD23	1:B:194:LEU:N	2.31	0.46
1:A:182:SER:OG	1:A:330:ASP:HB2	2.16	0.46
1:A:570:VAL:HG12	1:A:577:TRP:HD1	1.81	0.46
1:B:58:ASN:HB3	1:B:60:GLU:H	1.79	0.46
1:B:566:PHE:O	1:B:567:LEU:HD22	2.16	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:200:GLU:HG2	1:A:201:PRO:HA	1.98	0.46
1:A:802:THR:HG22	1:A:836:LYS:CE	2.45	0.46
1:B:112:SER:HB2	1:B:209:PRO:HB3	1.98	0.46
1:B:80:LEU:HB3	1:B:222:ILE:HD13	1.97	0.46
1:B:273:SER:HB3	1:B:287:TYR:CD1	2.51	0.46
1:B:72:VAL:HG23	1:B:73:VAL:HG13	1.98	0.46
1:B:687:LEU:CB	1:B:696:LEU:HD13	2.46	0.46
1:A:548:PRO:HG2	1:A:631:TYR:HB3	1.99	0.45
1:A:830:THR:HA	1:A:865:ARG:NE	2.30	0.45
1:B:795:TYR:O	1:B:827:ALA:HB1	2.17	0.45
1:B:889:LEU:CD1	1:B:928:LEU:HD22	2.45	0.45
1:B:817:SER:O	1:B:821:GLN:HG3	2.16	0.45
1:B:918:PHE:CE2	1:B:931:PHE:HA	2.52	0.45
1:A:434:ARG:NH2	1:A:454:SER:OG	2.47	0.45
1:A:889:LEU:HG	1:A:928:LEU:HD21	1.98	0.45
1:A:739:TRP:HE3	1:A:790:VAL:HG21	1.80	0.45
1:B:737:GLN:CG	1:B:754:LEU:HD12	2.43	0.45
1:A:220:PHE:O	1:A:256:THR:HG23	2.16	0.45
1:A:550:LEU:O	1:A:633:VAL:HA	2.16	0.45
1:B:96:LYS:HA	1:B:164:VAL:O	2.17	0.45
1:B:678:ASP:HA	1:B:955:TRP:CZ2	2.49	0.45
1:A:542:THR:HG22	1:A:543:LEU:HG	1.99	0.45
11:A:1109:MES:H81	11:A:1109:MES:H51	1.74	0.45
1:B:707:TYR:CE1	1:B:711:ASP:HB2	2.52	0.45
1:A:148:ILE:HD12	1:A:148:ILE:HA	1.67	0.45
1:A:718:ILE:HG23	1:A:956:LEU:HD12	1.99	0.45
1:B:271:PHE:CD2	1:B:326:ILE:HD11	2.51	0.45
6:G:3:BMA:H62	6:G:5:MAN:H2	1.48	0.45
1:A:638:HIS:O	1:A:642:GLN:HG2	2.16	0.45
1:A:647:LEU:HD21	1:A:659:ARG:HG2	1.98	0.45
1:A:140:LEU:HD11	1:A:151:LEU:HD11	1.98	0.45
1:A:457:LYS:HE3	1:A:630:TYR:CE2	2.52	0.45
1:A:510:SER:HA	1:A:511:GLY:HA2	1.64	0.45
1:B:482:LEU:O	1:B:486:SER:HB3	2.17	0.45
1:B:954:THR:CG2	1:B:958:VAL:HG21	2.45	0.45
1:A:54:PRO:HG2	1:A:62:PHE:HB3	1.99	0.44
1:A:474:PHE:O	1:A:478:ILE:HG12	2.17	0.44
8:A:1105:NAG:C8	8:A:1105:NAG:H3	2.46	0.44
1:B:604:ILE:HG22	1:B:605:LEU:H	1.81	0.44
1:B:952:LEU:O	1:B:953:ARG:HD3	2.16	0.44
1:B:221:SER:OG	1:B:255:THR:HG22	2.17	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:877:ARG:HG2	1:B:917:PHE:CZ	2.52	0.44
1:A:327:ALA:HB2	1:A:349:LEU:HD23	1.98	0.44
1:A:544:GLN:HG2	12:A:1110:EDO:H11	1.99	0.44
1:A:647:LEU:HD23	1:A:647:LEU:HA	1.82	0.44
1:A:770:ALA:CB	1:A:797:VAL:HG21	2.46	0.44
1:A:915:LYS:O	1:A:919:GLU:HG3	2.16	0.44
1:A:432:SER:N	1:A:936:GLU:OE2	2.49	0.44
1:B:152:VAL:HG11	16:B:1627:HOH:O	2.16	0.44
1:B:248:LEU:C	1:B:249:LEU:HD12	2.38	0.44
1:A:723:LYS:HG3	1:A:761:LEU:HB3	2.00	0.44
1:B:352:ASP:O	1:B:356:SER:HB2	2.17	0.44
1:B:552:VAL:HG12	1:B:561:LEU:HD22	2.00	0.44
1:B:588:ILE:HG23	1:B:631:TYR:CE2	2.53	0.44
1:B:282:VAL:HA	1:B:321:SER:O	2.18	0.44
1:B:497:SER:HB2	1:B:535:LYS:HE2	2.00	0.44
1:A:238:LYS:HD2	1:A:241:THR:HG1	1.82	0.44
1:B:86:LEU:N	1:B:86:LEU:HD23	2.33	0.44
1:B:272:HIS:HE1	2:C:2:NAG:H81	1.82	0.44
1:B:277:PHE:CE1	1:B:283:LYS:HG3	2.53	0.44
1:B:318:TYR:CE2	1:B:323:LEU:HB2	2.53	0.44
1:B:453:VAL:O	1:B:457:LYS:HB3	2.17	0.44
1:A:123:GLN:HG2	1:A:134:GLY:HA3	1.99	0.44
1:A:715:ILE:HG22	1:A:715:ILE:O	2.18	0.44
1:A:841:ILE:HD13	1:A:859:LEU:HD21	2.00	0.44
1:B:666:VAL:O	1:B:670:VAL:HG23	2.18	0.44
1:A:200:GLU:CG	1:A:201:PRO:HA	2.48	0.43
1:A:484:LYS:HD3	1:A:485:PHE:CE2	2.53	0.43
1:A:626:ASP:OD1	1:A:657:LYS:HB2	2.18	0.43
1:A:732:PRO:O	1:A:736:ARG:HG3	2.19	0.43
1:A:922:GLU:HA	1:A:926:SER:O	2.16	0.43
1:B:104:ALA:H	1:B:158:PRO:HG3	1.83	0.43
1:B:379:ASN:OD1	1:B:379:ASN:N	2.52	0.43
1:A:285:SER:HB2	1:A:324:ASP:OD1	2.18	0.43
1:B:436:ILE:HG22	1:B:542:THR:CA	2.47	0.43
1:B:603:HIS:ND1	1:B:604:ILE:HD12	2.32	0.43
1:A:330:ASP:OD1	1:A:851:LYS:HD2	2.18	0.43
1:A:802:THR:HG22	1:A:836:LYS:NZ	2.33	0.43
1:B:404:VAL:HG11	1:B:413:PHE:CD2	2.53	0.43
1:B:141:SER:HB3	1:B:148:ILE:HG22	1.99	0.43
1:B:928:LEU:HG	1:B:930:ILE:CG2	2.47	0.43
5:F:2:NAG:H4	5:F:3:BMA:O2	2.18	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:666:VAL:HG11	1:A:680:ALA:HA	2.01	0.43
1:A:770:ALA:HB3	1:A:797:VAL:HG21	2.01	0.43
1:B:548:PRO:CG	1:B:588:ILE:HD11	2.49	0.43
1:A:745:VAL:O	1:A:749:MET:HG3	2.18	0.43
1:B:857:ALA:HA	1:B:896:MET:CE	2.49	0.43
1:B:928:LEU:HB3	1:B:931:PHE:CE2	2.54	0.43
1:B:444:THR:O	1:B:448:GLU:HG3	2.19	0.43
1:B:677:LEU:HD13	1:B:952:LEU:HD13	1.99	0.43
1:A:139:VAL:HG22	1:A:150:LEU:CD2	2.47	0.43
1:B:465:LEU:HD13	1:B:538:MET:HE2	2.00	0.43
1:A:236:MET:SD	1:A:320:LEU:HD13	2.59	0.42
1:A:624:ASN:HB2	1:A:631:TYR:CE1	2.54	0.42
1:A:833:HIS:HB2	1:A:836:LYS:HD2	2.00	0.42
1:B:64:TRP:CE2	1:B:70:PRO:HG3	2.54	0.42
1:B:217:LYS:HE3	1:B:382:THR:HG22	2.00	0.42
1:B:337:GLU:HB3	1:B:371:GLU:OE2	2.20	0.42
1:B:791:LEU:HD12	1:B:791:LEU:HA	1.70	0.42
1:B:479:ILE:CG2	1:B:483:LYS:HE3	2.49	0.42
1:B:830:THR:O	1:B:830:THR:HG22	2.19	0.42
1:A:610:ASP:OD1	1:A:611:THR:N	2.48	0.42
1:A:641:ASP:O	1:A:645:THR:OG1	2.35	0.42
1:A:654:LEU:N	1:A:654:LEU:HD12	2.34	0.42
1:B:318:TYR:CZ	1:B:320:LEU:HB2	2.54	0.42
1:B:377:PHE:HE2	1:B:399:MET:HG3	1.84	0.42
1:A:279:SER:HB2	1:A:308:ASP:OD1	2.18	0.42
1:A:300:LEU:O	1:A:300:LEU:HD12	2.20	0.42
1:B:955:TRP:HA	1:B:958:VAL:HB	2.02	0.42
1:A:792:LYS:HD2	1:A:826:TYR:CD1	2.55	0.42
1:A:68:ARG:HH11	1:A:68:ARG:HD2	1.67	0.42
1:B:591:THR:CG2	1:B:625:VAL:HG12	2.50	0.42
1:B:738:SER:O	1:B:751:ARG:HD3	2.19	0.42
1:B:743:GLY:H	1:B:751:ARG:HH22	1.66	0.42
1:A:323:LEU:HD12	1:A:324:ASP:H	1.84	0.42
1:A:334:GLY:N	7:A:1101:62S:O30	2.41	0.42
1:A:683:MET:O	1:A:686:TYR:HD2	2.03	0.42
1:A:838:LEU:O	1:A:842:GLU:HG3	2.19	0.42
1:B:78:TYR:HB2	1:B:220:PHE:CD2	2.55	0.42
1:B:894:ILE:HA	1:B:894:ILE:HD13	1.80	0.42
1:B:414:ASP:OD2	1:B:657:LYS:NZ	2.32	0.42
1:B:190:GLU:OE1	1:B:192:ARG:NH1	2.39	0.42
1:B:677:LEU:O	1:B:677:LEU:HD23	2.20	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:112:SER:HB3	1:B:148:ILE:HD13	2.02	0.41
1:B:187:LEU:O	1:B:187:LEU:HD23	2.20	0.41
1:B:338:ASN:HB2	1:B:341:LEU:O	2.19	0.41
1:B:576:GLU:H	1:B:576:GLU:HG3	1.59	0.41
1:A:96:LYS:HA	1:A:164:VAL:O	2.20	0.41
1:A:620:TRP:NE1	1:A:646:GLN:HG3	2.34	0.41
1:B:571:PHE:CE2	1:B:943:LYS:HD2	2.56	0.41
1:A:866:PRO:HA	1:A:869:GLN:HG2	2.02	0.41
1:B:75:PRO:HA	1:B:99:VAL:HG12	2.03	0.41
1:B:772:GLU:O	1:B:776:GLN:HG2	2.20	0.41
1:A:677:LEU:HD12	1:A:677:LEU:HA	1.81	0.41
1:B:954:THR:HB	1:B:955:TRP:CE3	2.55	0.41
1:A:713:ARG:HD2	1:A:713:ARG:HA	1.90	0.41
1:B:271:PHE:CE2	1:B:326:ILE:HD11	2.56	0.41
1:B:318:TYR:CE2	1:B:320:LEU:HB2	2.56	0.41
1:A:219:ASN:OD1	1:A:258:LYS:HD3	2.20	0.41
1:A:263:LEU:O	1:A:338:ASN:HB3	2.21	0.41
1:A:537:MET:HG3	1:A:587:HIS:O	2.21	0.41
1:A:739:TRP:CE3	1:A:790:VAL:HG21	2.56	0.41
1:B:693:SER:N	1:B:694:PRO:HD2	2.36	0.41
1:A:193:ILE:HG13	1:B:190:GLU:CG	2.51	0.41
8:A:1105:NAG:H3	8:A:1105:NAG:H82	2.02	0.41
1:B:249:LEU:HD12	1:B:249:LEU:N	2.35	0.41
1:A:106:GLN:HB3	1:A:107:PHE:HD1	1.86	0.41
1:A:227:GLU:HG3	2:C:1:NAG:H83	2.02	0.41
1:B:74:ILE:O	1:B:74:ILE:HG22	2.20	0.41
1:B:330:ASP:OD2	1:B:851:LYS:HE3	2.21	0.41
1:B:496:TRP:HA	1:B:499:LEU:HD12	2.03	0.41
1:A:324:ASP:C	1:A:325:LEU:HD12	2.41	0.41
1:A:626:ASP:HA	1:A:657:LYS:HB2	2.03	0.41
1:B:224:ILE:CD1	1:B:266:TYR:HB2	2.50	0.41
1:B:777:TRP:HB2	1:B:784:LEU:CD2	2.51	0.41
1:B:184:TYR:CE2	1:B:192:ARG:HB2	2.55	0.40
1:B:547:ILE:HB	1:B:630:TYR:CE2	2.56	0.40
1:B:106:GLN:C	1:B:152:VAL:HG22	2.41	0.40
1:B:372:LEU:HD23	1:B:372:LEU:HA	1.76	0.40
1:A:342:ILE:CG2	1:A:371:GLU:HG3	2.51	0.40
1:B:386:TRP:CB	1:B:446:ILE:HG23	2.52	0.40
8:A:1105:NAG:H83	8:A:1105:NAG:O3	2.22	0.40
1:B:295:GLN:HB3	1:B:350:LEU:HB3	2.04	0.40
1:A:91:PHE:CE2	1:A:170:ALA:HB3	2.56	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:352:ASP:OD2	1:A:355:THR:OG1	2.39	0.40
1:B:282:VAL:HG22	1:B:320:LEU:O	2.22	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	906/962 (94%)	858 (95%)	48 (5%)	0	100	100
1	B	859/962 (89%)	801 (93%)	56 (6%)	2 (0%)	47	82
All	All	1765/1924 (92%)	1659 (94%)	104 (6%)	2 (0%)	51	85

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	638	HIS
1	B	723	LYS

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	796/865 (92%)	771 (97%)	25 (3%)	40	75
1	B	707/865 (82%)	674 (95%)	33 (5%)	26	63

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
All	All	1503/1730 (87%)	1445 (96%)	58 (4%)	32 69

All (58) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	79	ASP
1	A	95	GLU
1	A	132	LYS
1	A	185	ARG
1	A	192	ARG
1	A	194	LEU
1	A	312	LYS
1	A	339	TRP
1	A	371	GLU
1	A	383	MET
1	A	476	LYS
1	A	504	LEU
1	A	505	GLU
1	A	508	PHE
1	A	545	LYS
1	A	563	GLN
1	A	571	PHE
1	A	582	GLU
1	A	627	SER
1	A	650	ASN
1	A	678	ASP
1	A	746	TRP
1	A	829	SER
1	A	864	ARG
1	A	893	ASP
1	B	53	PHE
1	B	64	TRP
1	B	68	ARG
1	B	107	PHE
1	B	122	LEU
1	B	140	LEU
1	B	179	PHE
1	B	185	ARG
1	B	194	LEU
1	B	203	GLN
1	B	331	PHE
1	B	383	MET

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Mol	Chain	Res	Type
1	B	395	PHE
1	B	497	SER
1	B	502	SER
1	B	549	LEU
1	B	553	LYS
1	B	560	ARG
1	B	568	GLN
1	B	581	GLN
1	B	587	HIS
1	B	620	TRP
1	B	707	TYR
1	B	729	TYR
1	B	746	TRP
1	B	751	ARG
1	B	796	SER
1	B	865	ARG
1	B	929	ASP
1	B	943	LYS
1	B	946	GLU
1	B	953	ARG
1	B	959	ASN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (4) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	806	ASN
1	B	272	HIS
1	B	581	GLN
1	B	879	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](#)

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

5.5 Carbohydrates i

22 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	1,2	14,14,15	0.63	0	17,19,21	0.60	0
2	NAG	C	2	2	14,14,15	0.55	0	17,19,21	0.69	0
2	BMA	C	3	2	11,11,12	1.22	2 (18%)	15,15,17	1.29	2 (13%)
2	MAN	C	4	2	11,11,12	2.78	3 (27%)	15,15,17	1.91	3 (20%)
3	NAG	D	1	1,3	14,14,15	0.14	0	17,19,21	0.72	0
3	NAG	D	2	3	14,14,15	0.37	0	17,19,21	0.60	0
3	BMA	D	3	3	11,11,12	0.87	1 (9%)	15,15,17	1.70	3 (20%)
3	MAN	D	4	3	11,11,12	1.23	2 (18%)	15,15,17	1.19	2 (13%)
4	NAG	E	1	4,1	14,14,15	0.43	0	17,19,21	1.11	1 (5%)
4	NAG	E	2	4	14,14,15	0.88	1 (7%)	17,19,21	0.71	0
5	NAG	F	1	1,5	14,14,15	0.75	1 (7%)	17,19,21	1.16	1 (5%)
5	NAG	F	2	5	14,14,15	1.18	1 (7%)	17,19,21	1.20	1 (5%)
5	BMA	F	3	5	11,11,12	2.07	3 (27%)	15,15,17	1.20	1 (6%)
6	NAG	G	1	6,1	14,14,15	0.65	1 (7%)	17,19,21	0.59	0
6	NAG	G	2	6	14,14,15	1.19	1 (7%)	17,19,21	1.00	1 (5%)
6	BMA	G	3	6	11,11,12	1.00	1 (9%)	15,15,17	1.75	5 (33%)
6	MAN	G	4	6	11,11,12	2.05	5 (45%)	15,15,17	1.19	2 (13%)
6	MAN	G	5	6	11,11,12	3.05	6 (54%)	15,15,17	2.82	5 (33%)
4	NAG	H	1	4,1	14,14,15	0.51	0	17,19,21	0.49	0
4	NAG	H	2	4	14,14,15	0.43	0	17,19,21	0.53	0
4	NAG	I	1	4,1	14,14,15	0.59	0	17,19,21	0.55	0
4	NAG	I	2	4	14,14,15	1.08	1 (7%)	17,19,21	1.67	3 (17%)

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	1,2	-	0/6/23/26	0/1/1/1
2	NAG	C	2	2	-	2/6/23/26	0/1/1/1
2	BMA	C	3	2	-	0/2/19/22	0/1/1/1
2	MAN	C	4	2	-	0/2/19/22	0/1/1/1
3	NAG	D	1	1,3	-	0/6/23/26	0/1/1/1
3	NAG	D	2	3	-	0/6/23/26	0/1/1/1
3	BMA	D	3	3	-	0/2/19/22	0/1/1/1
3	MAN	D	4	3	-	2/2/19/22	0/1/1/1
4	NAG	E	1	4,1	-	1/6/23/26	0/1/1/1
4	NAG	E	2	4	-	2/6/23/26	0/1/1/1
5	NAG	F	1	1,5	-	4/6/23/26	0/1/1/1
5	NAG	F	2	5	-	0/6/23/26	0/1/1/1
5	BMA	F	3	5	-	2/2/19/22	0/1/1/1
6	NAG	G	1	6,1	-	1/6/23/26	0/1/1/1
6	NAG	G	2	6	-	2/6/23/26	0/1/1/1
6	BMA	G	3	6	-	0/2/19/22	0/1/1/1
6	MAN	G	4	6	-	0/2/19/22	0/1/1/1
6	MAN	G	5	6	-	2/2/19/22	0/1/1/1
4	NAG	H	1	4,1	-	0/6/23/26	0/1/1/1
4	NAG	H	2	4	-	0/6/23/26	0/1/1/1
4	NAG	I	1	4,1	-	1/6/23/26	0/1/1/1
4	NAG	I	2	4	-	1/6/23/26	0/1/1/1

All (29) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	C	4	MAN	O5-C1	6.76	1.54	1.43
6	G	5	MAN	C4-C3	5.54	1.66	1.52
5	F	3	BMA	O5-C1	4.67	1.51	1.43
6	G	5	MAN	C2-C3	4.30	1.58	1.52
2	C	4	MAN	O5-C5	4.17	1.51	1.43
5	F	2	NAG	O5-C1	4.09	1.50	1.43
6	G	5	MAN	C4-C5	3.95	1.61	1.53
2	C	4	MAN	C1-C2	3.86	1.61	1.52
6	G	4	MAN	C2-C3	3.75	1.58	1.52
6	G	2	NAG	O5-C1	-3.70	1.37	1.43
6	G	5	MAN	C1-C2	3.62	1.60	1.52
4	I	2	NAG	O5-C1	3.38	1.49	1.43
6	G	4	MAN	C4-C3	3.15	1.60	1.52
4	E	2	NAG	C1-C2	3.04	1.56	1.52
3	D	4	MAN	O5-C5	2.83	1.49	1.43
6	G	5	MAN	O4-C4	2.83	1.49	1.43

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
6	G	4	MAN	C1-C2	2.54	1.58	1.52
2	C	3	BMA	C2-C3	-2.49	1.48	1.52
6	G	5	MAN	O5-C1	2.48	1.47	1.43
5	F	3	BMA	C1-C2	2.46	1.57	1.52
6	G	3	BMA	O5-C5	2.39	1.48	1.43
2	C	3	BMA	O3-C3	-2.34	1.37	1.43
5	F	1	NAG	O5-C1	2.29	1.47	1.43
6	G	4	MAN	O5-C1	-2.23	1.40	1.43
6	G	1	NAG	O5-C1	-2.23	1.40	1.43
3	D	4	MAN	C4-C5	2.14	1.57	1.53
6	G	4	MAN	O3-C3	2.13	1.48	1.43
5	F	3	BMA	O4-C4	2.08	1.47	1.43
3	D	3	BMA	C1-C2	2.08	1.56	1.52

All (30) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
6	G	5	MAN	C1-O5-C5	6.98	121.65	112.19
2	C	4	MAN	C1-O5-C5	4.77	118.66	112.19
4	I	2	NAG	C1-O5-C5	4.53	118.33	112.19
3	D	3	BMA	C1-O5-C5	4.46	118.23	112.19
6	G	5	MAN	C1-C2-C3	4.33	114.99	109.67
6	G	5	MAN	C2-C3-C4	4.30	118.33	110.89
6	G	5	MAN	C3-C4-C5	4.03	117.42	110.24
4	E	1	NAG	C1-O5-C5	3.74	117.26	112.19
2	C	4	MAN	O5-C1-C2	3.69	116.46	110.77
5	F	2	NAG	C1-O5-C5	3.64	117.13	112.19
5	F	1	NAG	C1-O5-C5	3.48	116.91	112.19
5	F	3	BMA	C1-O5-C5	3.45	116.86	112.19
6	G	3	BMA	C3-C4-C5	3.31	116.14	110.24
2	C	3	BMA	C1-C2-C3	-3.07	105.89	109.67
4	I	2	NAG	C4-C3-C2	-2.89	106.78	111.02
3	D	3	BMA	O5-C1-C2	2.86	115.19	110.77
6	G	3	BMA	C6-C5-C4	-2.84	106.36	113.00
3	D	3	BMA	O2-C2-C3	-2.79	104.54	110.14
2	C	3	BMA	O2-C2-C3	-2.59	104.94	110.14
4	I	2	NAG	C1-C2-N2	2.51	114.77	110.49
6	G	3	BMA	O5-C1-C2	-2.48	106.95	110.77
3	D	4	MAN	C1-O5-C5	2.43	115.49	112.19
6	G	5	MAN	O5-C1-C2	2.36	114.41	110.77
2	C	4	MAN	O2-C2-C1	2.35	113.96	109.15
6	G	3	BMA	C2-C3-C4	2.32	114.90	110.89

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	D	4	MAN	O2-C2-C3	-2.19	105.74	110.14
6	G	2	NAG	C3-C4-C5	2.19	114.15	110.24
6	G	4	MAN	O2-C2-C1	2.08	113.42	109.15
6	G	3	BMA	C1-C2-C3	-2.06	107.14	109.67
6	G	4	MAN	O5-C5-C6	2.04	110.40	107.20

There are no chirality outliers.

All (20) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
5	F	3	BMA	C4-C5-C6-O6
5	F	3	BMA	O5-C5-C6-O6
5	F	1	NAG	O5-C5-C6-O6
5	F	1	NAG	C4-C5-C6-O6
5	F	1	NAG	C1-C2-N2-C7
3	D	4	MAN	C4-C5-C6-O6
2	C	2	NAG	C8-C7-N2-C2
2	C	2	NAG	O7-C7-N2-C2
6	G	2	NAG	O5-C5-C6-O6
6	G	2	NAG	C4-C5-C6-O6
3	D	4	MAN	O5-C5-C6-O6
6	G	5	MAN	O5-C5-C6-O6
4	E	1	NAG	O5-C5-C6-O6
6	G	1	NAG	O5-C5-C6-O6
5	F	1	NAG	C3-C2-N2-C7
4	I	1	NAG	O5-C5-C6-O6
4	I	2	NAG	C4-C5-C6-O6
4	E	2	NAG	C4-C5-C6-O6
6	G	5	MAN	C4-C5-C6-O6
4	E	2	NAG	O5-C5-C6-O6

There are no ring outliers.

9 monomers are involved in 10 short contacts:

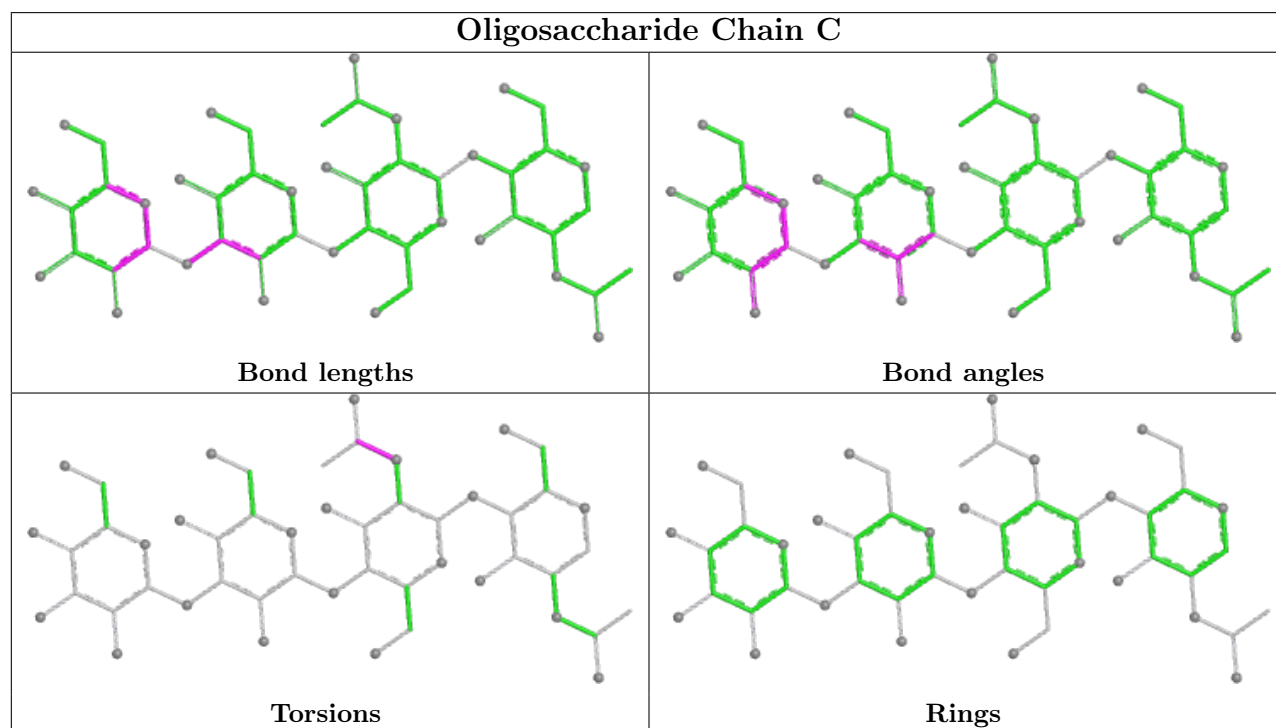
Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	C	1	NAG	1	0
5	F	2	NAG	3	0
6	G	2	NAG	1	0
5	F	1	NAG	2	0
6	G	5	MAN	2	0
6	G	3	BMA	1	0

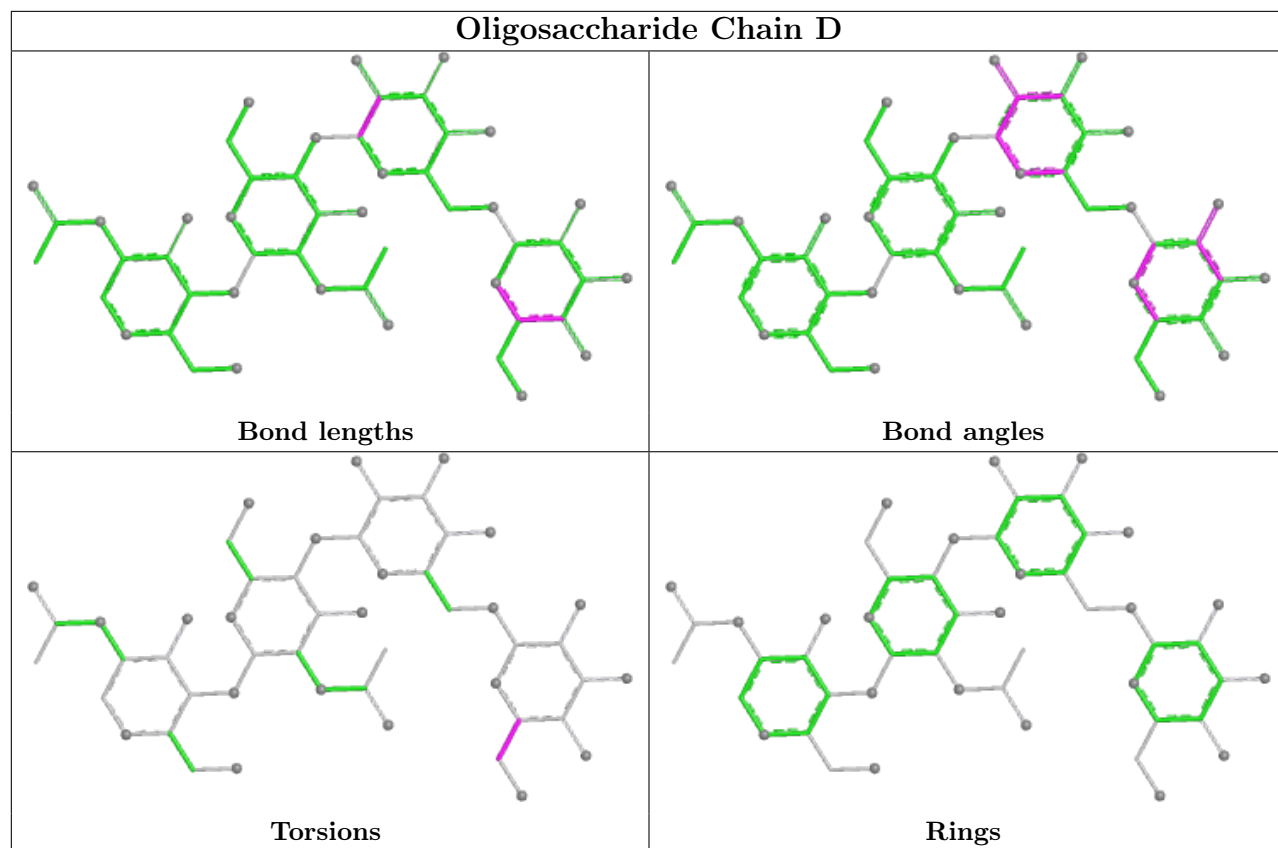
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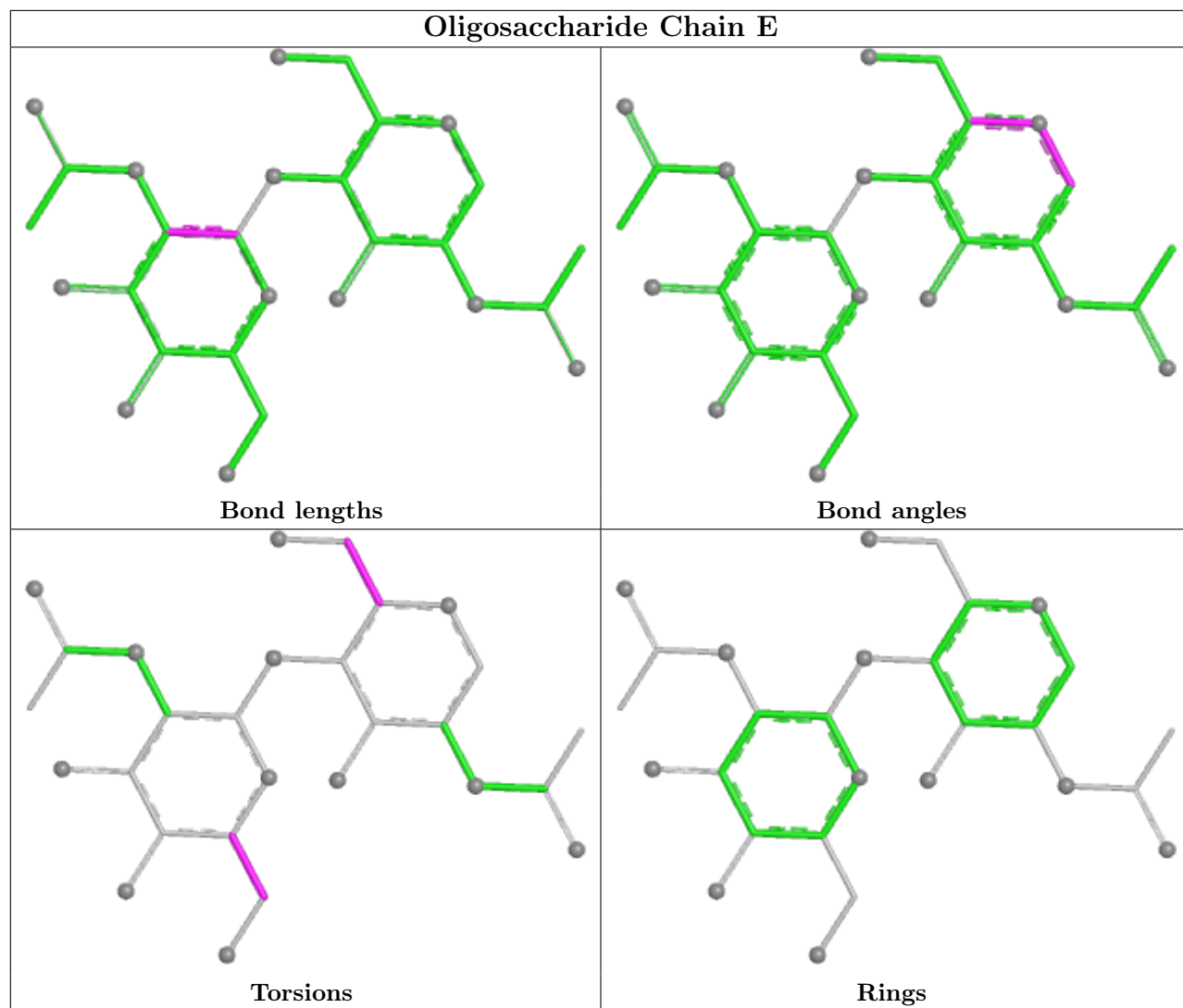
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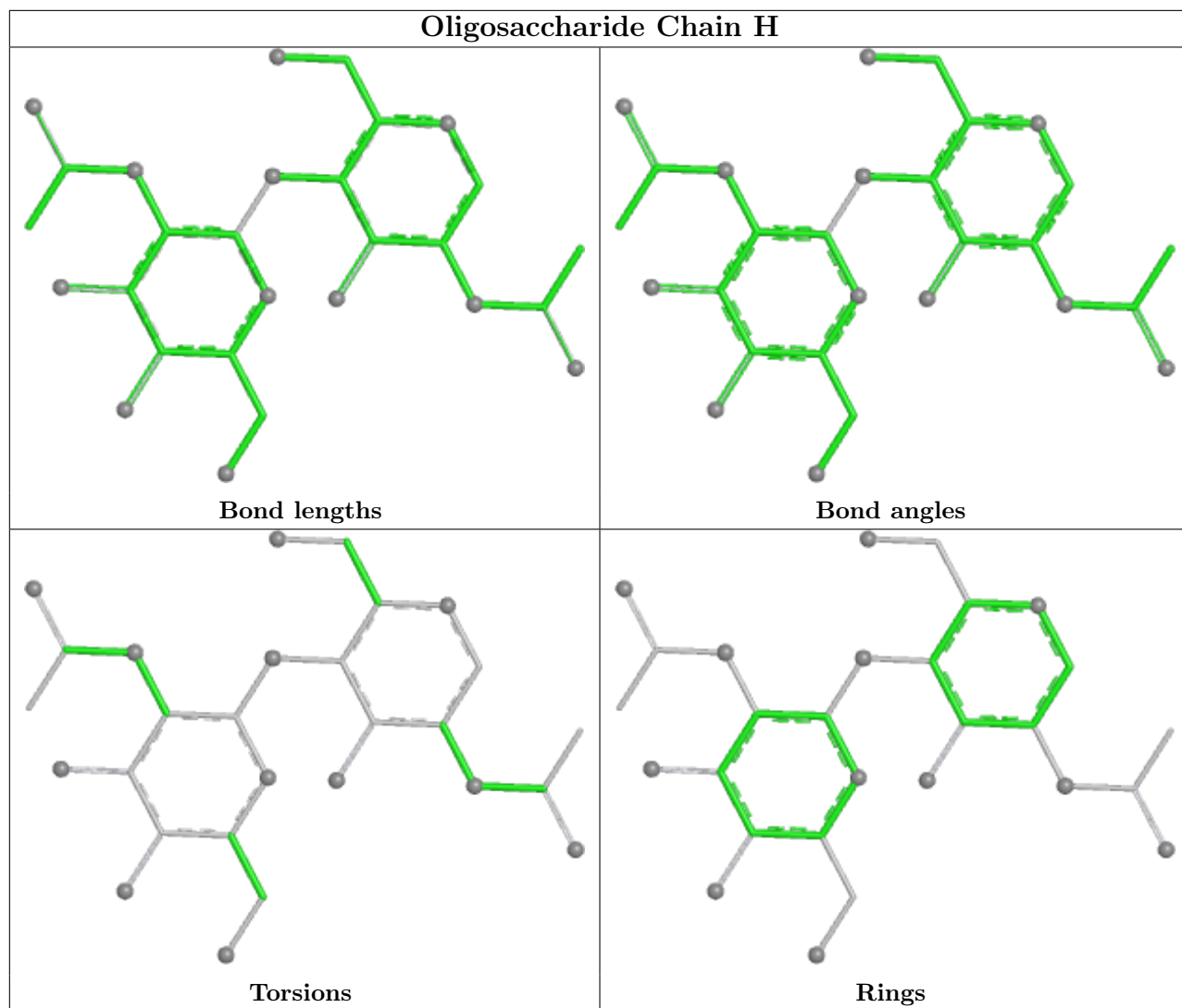
Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	C	2	NAG	1	0
6	G	1	NAG	1	0
5	F	3	BMA	2	0

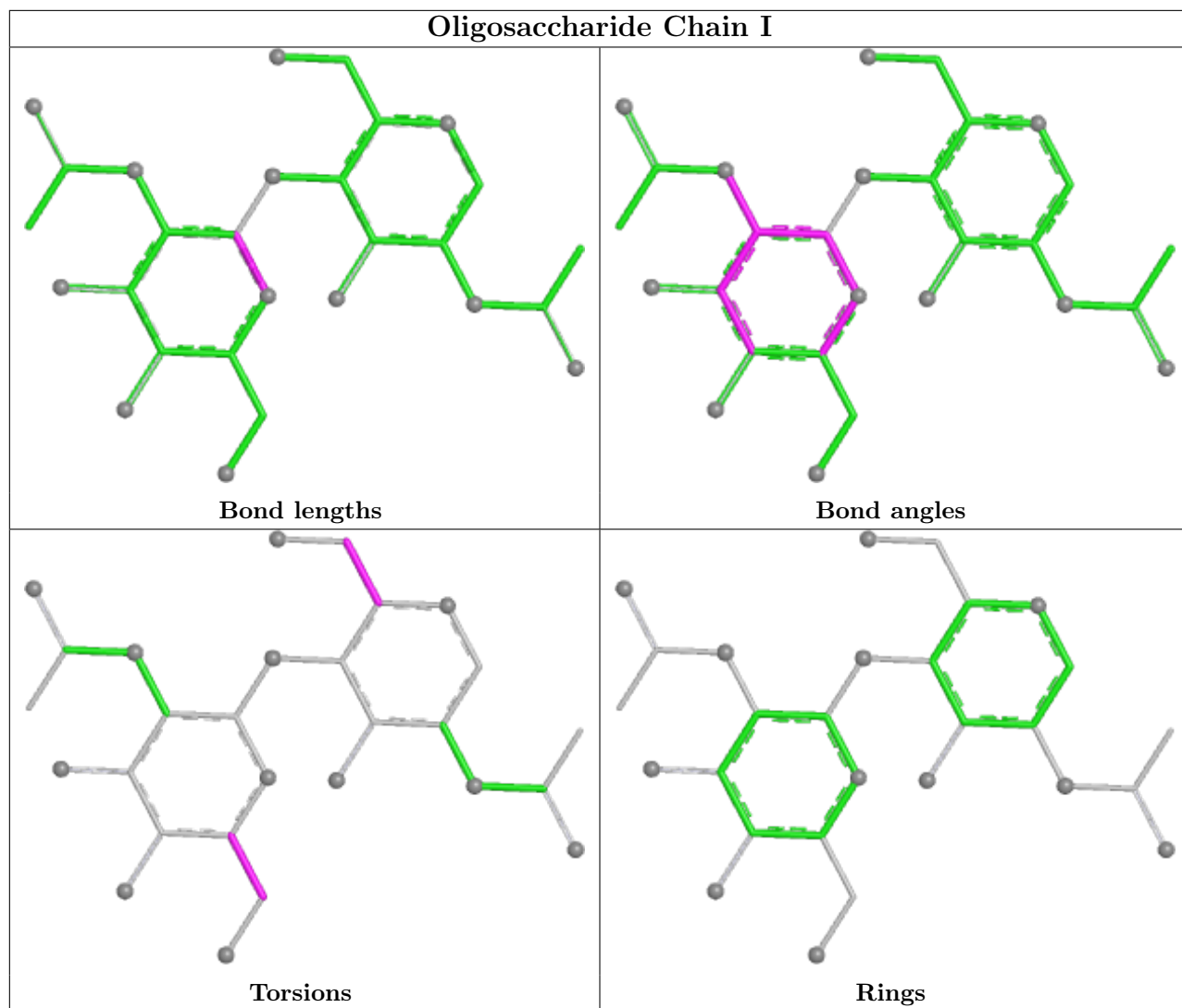
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for oligosaccharide.

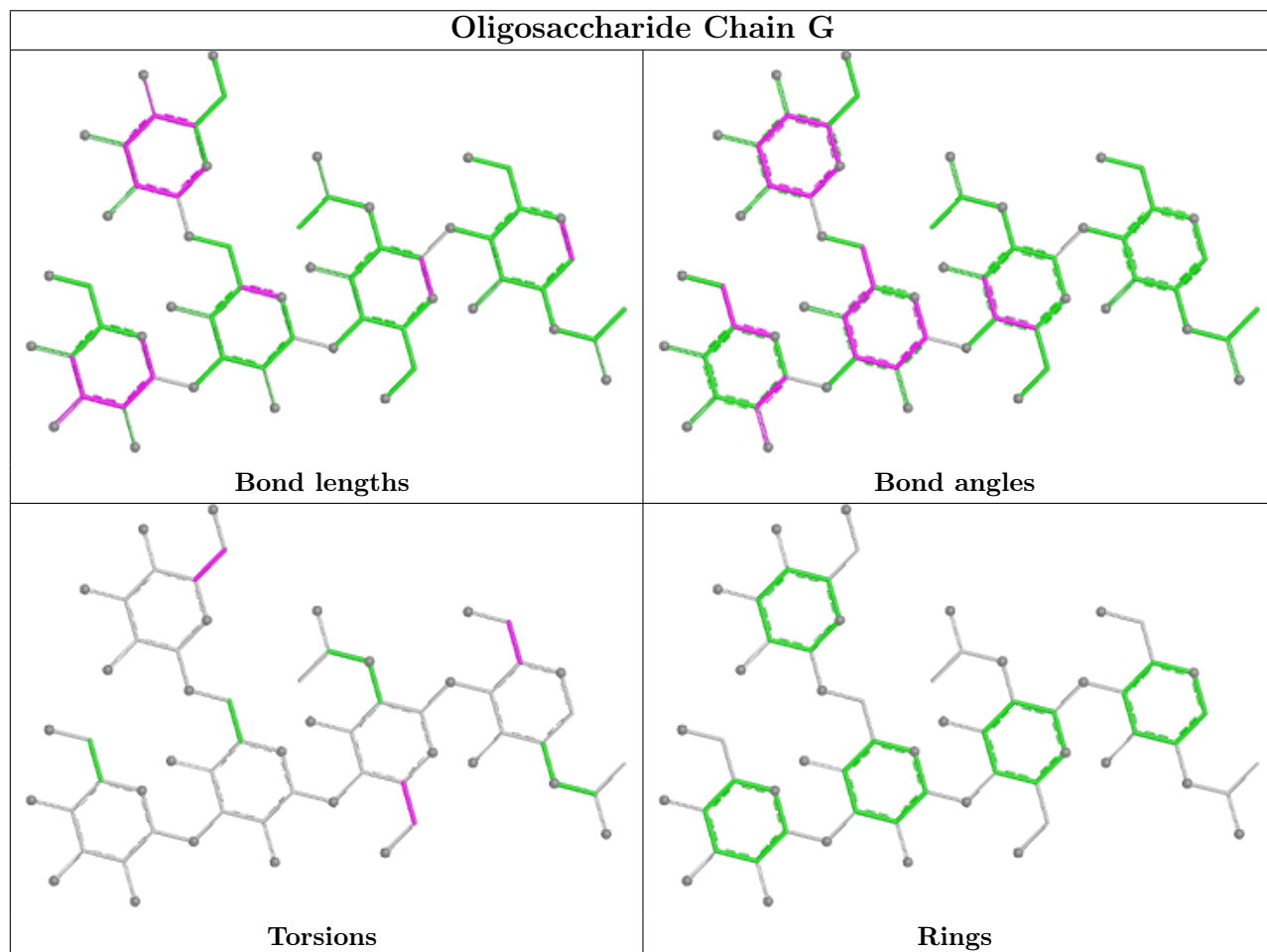
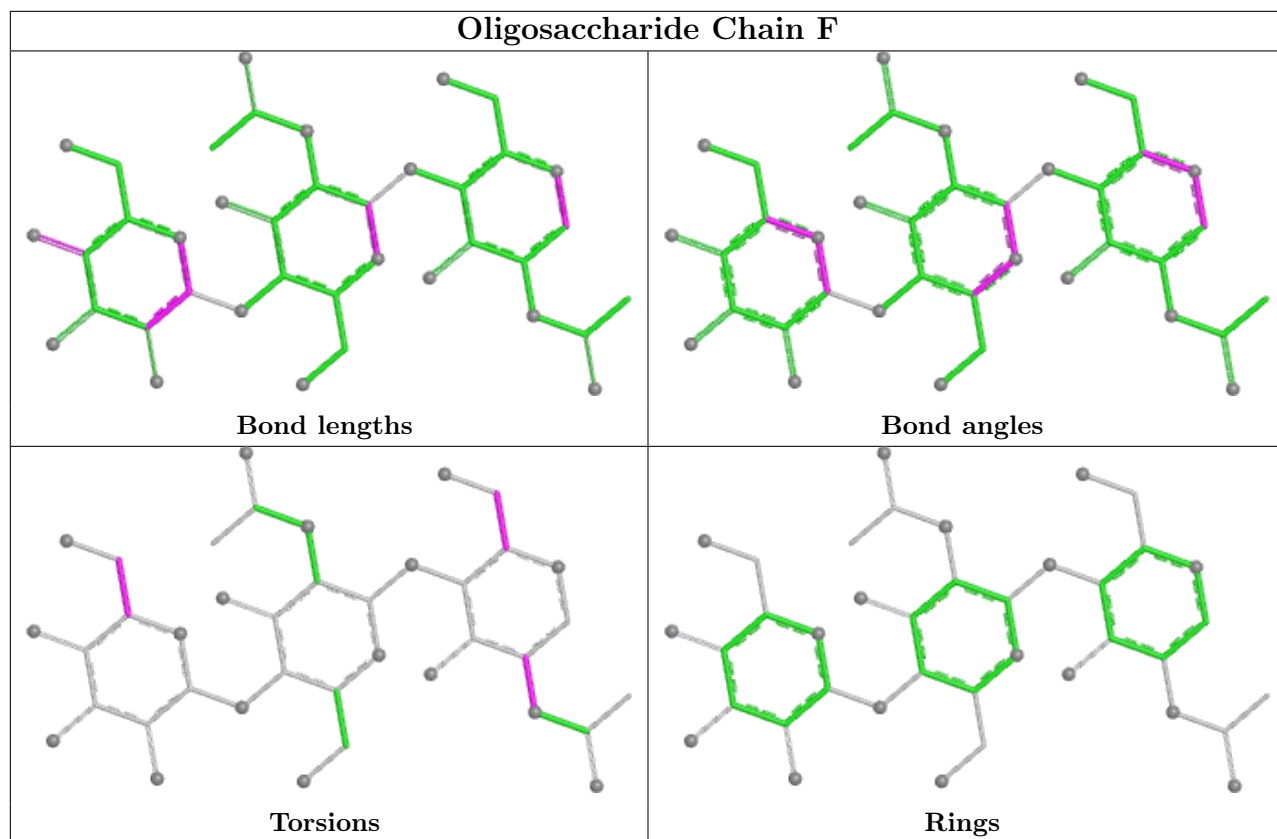












5.6 Ligand geometry [i](#)

Of 28 ligands modelled in this entry, 2 are monoatomic - leaving 26 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
14	IMD	A	1114	-	3,5,5	0.37	0	4,5,5	0.64	0
8	NAG	B	1503	1	14,14,15	0.80	1 (7%)	17,19,21	0.49	0
8	NAG	B	1505	1	14,14,15	0.34	0	17,19,21	0.63	0
12	EDO	A	1115	-	3,3,3	0.68	0	2,2,2	0.12	0
13	PDO	A	1112	-	4,4,4	0.43	0	3,3,3	0.29	0
8	NAG	A	1104	1	14,14,15	0.27	0	17,19,21	0.59	0
8	NAG	B	1504	1	14,14,15	1.10	1 (7%)	17,19,21	0.89	1 (5%)
8	NAG	B	1506	1	14,14,15	1.16	2 (14%)	17,19,21	0.51	0
11	MES	A	1109	-	12,12,12	2.27	1 (8%)	14,16,16	1.83	4 (28%)
10	PGE	A	1108	-	9,9,9	0.53	0	8,8,8	0.38	0
12	EDO	A	1118	-	3,3,3	0.64	0	2,2,2	0.09	0
8	NAG	A	1105	1	14,14,15	0.54	0	17,19,21	2.32	3 (17%)
12	EDO	A	1110	-	3,3,3	0.56	0	2,2,2	0.28	0
13	PDO	B	1508	-	4,4,4	0.36	0	3,3,3	0.40	0
9	PEG	A	1107	-	6,6,6	0.51	0	5,5,5	0.31	0
7	62S	B	1501	15	38,45,45	3.17	13 (34%)	46,62,62	1.81	14 (30%)
7	62S	A	1101	15	38,45,45	3.28	6 (15%)	46,62,62	1.91	11 (23%)
12	EDO	A	1116	-	3,3,3	0.52	0	2,2,2	0.28	0
9	PEG	A	1106	-	6,6,6	0.51	0	5,5,5	0.38	0
12	EDO	A	1117	-	3,3,3	0.73	0	2,2,2	0.09	0
8	NAG	A	1102	1	14,14,15	0.58	0	17,19,21	0.65	0
8	NAG	B	1507	1	14,14,15	1.05	1 (7%)	17,19,21	1.20	2 (11%)
12	EDO	A	1113	-	3,3,3	0.84	0	2,2,2	0.29	0
8	NAG	A	1103	1	14,14,15	2.17	4 (28%)	17,19,21	1.82	4 (23%)
8	NAG	B	1502	1	14,14,15	0.99	1 (7%)	17,19,21	1.14	1 (5%)
12	EDO	A	1111	-	3,3,3	0.55	0	2,2,2	0.15	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
14	IMD	A	1114	-	-	-	0/1/1/1
8	NAG	B	1503	1	-	2/6/23/26	0/1/1/1
8	NAG	B	1505	1	-	2/6/23/26	0/1/1/1
12	EDO	A	1115	-	-	1/1/1/1	-
13	PDO	A	1112	-	-	1/2/2/2	-
8	NAG	A	1104	1	-	3/6/23/26	0/1/1/1
8	NAG	B	1504	1	-	2/6/23/26	0/1/1/1
8	NAG	B	1506	1	-	1/6/23/26	0/1/1/1
11	MES	A	1109	-	-	4/6/14/14	0/1/1/1
10	PGE	A	1108	-	-	3/7/7/7	-
12	EDO	A	1118	-	-	0/1/1/1	-
8	NAG	A	1105	1	-	3/6/23/26	0/1/1/1
12	EDO	A	1110	-	-	0/1/1/1	-
13	PDO	B	1508	-	-	1/2/2/2	-
9	PEG	A	1107	-	-	3/4/4/4	-
7	62S	B	1501	15	-	14/32/40/40	0/4/4/4
7	62S	A	1101	15	-	9/32/40/40	0/4/4/4
12	EDO	A	1116	-	-	1/1/1/1	-
9	PEG	A	1106	-	-	1/4/4/4	-
12	EDO	A	1117	-	-	0/1/1/1	-
8	NAG	A	1102	1	-	0/6/23/26	0/1/1/1
8	NAG	B	1507	1	-	1/6/23/26	0/1/1/1
12	EDO	A	1113	-	-	0/1/1/1	-
8	NAG	A	1103	1	-	1/6/23/26	0/1/1/1
8	NAG	B	1502	1	-	2/6/23/26	0/1/1/1
12	EDO	A	1111	-	-	0/1/1/1	-

All (30) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
7	A	1101	62S	P11-C14	16.41	1.95	1.79
7	B	1501	62S	P11-C14	13.92	1.93	1.79
7	B	1501	62S	C29-N31	7.60	1.50	1.34
11	A	1109	MES	C8-S	-7.29	1.67	1.77
7	A	1101	62S	C29-N31	7.23	1.50	1.34
7	B	1501	62S	C33-N35	6.51	1.49	1.32
7	A	1101	62S	C33-N35	5.51	1.46	1.32
8	A	1103	NAG	O5-C1	5.18	1.52	1.43
8	B	1504	NAG	O5-C1	3.78	1.49	1.43

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
8	A	1103	NAG	C1-C2	3.52	1.57	1.52
8	B	1506	NAG	C1-C2	3.32	1.57	1.52
8	B	1502	NAG	O5-C1	3.31	1.49	1.43
8	B	1507	NAG	O5-C1	3.25	1.48	1.43
8	A	1103	NAG	C8-C7	-3.24	1.43	1.50
8	A	1103	NAG	O7-C7	3.12	1.30	1.23
7	B	1501	62S	C19-N20	2.86	1.38	1.33
7	B	1501	62S	C18-C17	2.77	1.43	1.39
7	B	1501	62S	C32-C33	2.70	1.58	1.52
8	B	1503	NAG	C1-C2	2.57	1.56	1.52
7	B	1501	62S	C15-C29	2.56	1.56	1.51
8	B	1506	NAG	O5-C1	2.54	1.47	1.43
7	B	1501	62S	C06-C01	2.54	1.44	1.38
7	A	1101	62S	O28-C23	2.43	1.41	1.36
7	B	1501	62S	C27-C22	2.40	1.43	1.40
7	B	1501	62S	C22-C19	2.33	1.55	1.48
7	B	1501	62S	O28-C23	2.31	1.41	1.36
7	B	1501	62S	C04-C03	2.25	1.44	1.38
7	A	1101	62S	C04-C03	2.24	1.43	1.38
7	B	1501	62S	C36-C37	2.03	1.56	1.51
7	A	1101	62S	C06-C01	2.00	1.43	1.38

All (40) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
8	A	1105	NAG	C2-N2-C7	8.65	135.23	122.90
7	A	1101	62S	C17-C16-C15	-6.26	105.93	114.21
7	B	1501	62S	P11-C09-C08	4.96	121.06	111.10
8	A	1103	NAG	C1-O5-C5	4.58	118.40	112.19
7	A	1101	62S	P11-C09-C08	-4.48	102.11	111.10
11	A	1109	MES	C5-N4-C3	4.01	117.85	108.83
8	B	1502	NAG	C1-O5-C5	3.86	117.42	112.19
7	B	1501	62S	C15-C29-N31	3.73	122.66	116.21
7	B	1501	62S	C22-C19-N20	3.63	126.75	120.96
8	A	1103	NAG	C2-N2-C7	-3.50	117.92	122.90
7	A	1101	62S	C08-C07-C01	3.41	125.03	113.18
7	B	1501	62S	C32-C33-N35	3.39	122.49	116.69
7	A	1101	62S	C27-C22-C23	3.34	123.68	117.45
7	A	1101	62S	C27-C22-C19	-3.17	111.95	119.68
7	A	1101	62S	O30-C29-C15	-3.14	118.03	122.12
8	B	1507	NAG	C1-O5-C5	3.12	116.41	112.19
7	B	1501	62S	O30-C29-C15	-3.07	118.13	122.12

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
7	B	1501	62S	C36-C32-N31	3.05	117.21	110.79
8	B	1504	NAG	C1-O5-C5	3.00	116.25	112.19
7	B	1501	62S	C19-C18-C17	2.97	110.02	106.02
7	A	1101	62S	O13-P11-C09	-2.85	100.47	106.87
8	A	1103	NAG	O5-C5-C4	2.80	117.63	110.83
7	B	1501	62S	C18-C19-N20	-2.79	104.90	109.97
7	A	1101	62S	C19-C18-C17	-2.69	102.41	106.02
7	A	1101	62S	C22-C19-N20	-2.68	116.67	120.96
7	B	1501	62S	C08-C07-C01	2.66	122.44	113.18
8	A	1105	NAG	C1-O5-C5	2.58	115.69	112.19
7	A	1101	62S	C06-C01-C02	2.52	122.13	118.17
7	B	1501	62S	C17-C16-C15	2.46	117.46	114.21
7	A	1101	62S	C36-C32-N31	-2.42	105.68	110.79
7	B	1501	62S	O34-C33-N35	-2.38	118.85	123.00
11	A	1109	MES	C7-N4-C5	2.30	117.11	111.23
7	B	1501	62S	C32-N31-C29	2.30	126.59	121.67
11	A	1109	MES	O3S-S-C8	2.17	109.27	105.77
8	B	1507	NAG	C2-N2-C7	2.12	125.92	122.90
7	B	1501	62S	C36-C32-C33	-2.12	104.89	110.94
8	A	1103	NAG	O4-C4-C3	2.09	115.17	110.35
11	A	1109	MES	O2S-S-C8	2.09	109.43	106.92
8	A	1105	NAG	C8-C7-N2	2.06	119.59	116.10
7	B	1501	62S	O30-C29-N31	-2.04	119.16	122.93

There are no chirality outliers.

All (55) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
7	A	1101	62S	C16-C15-C29-N31
7	A	1101	62S	C16-C15-C29-O30
7	A	1101	62S	C08-C09-P11-O12
7	A	1101	62S	C15-C14-P11-O12
7	A	1101	62S	C15-C14-P11-O13
7	B	1501	62S	P11-C14-C15-C16
7	B	1501	62S	C29-C15-C16-C17
7	B	1501	62S	C16-C15-C29-N31
7	B	1501	62S	C16-C15-C29-O30
7	B	1501	62S	C18-C19-C22-C23
7	B	1501	62S	C15-C14-P11-O12
7	B	1501	62S	C15-C14-P11-O13
8	A	1105	NAG	C3-C2-N2-C7
8	B	1507	NAG	C3-C2-N2-C7

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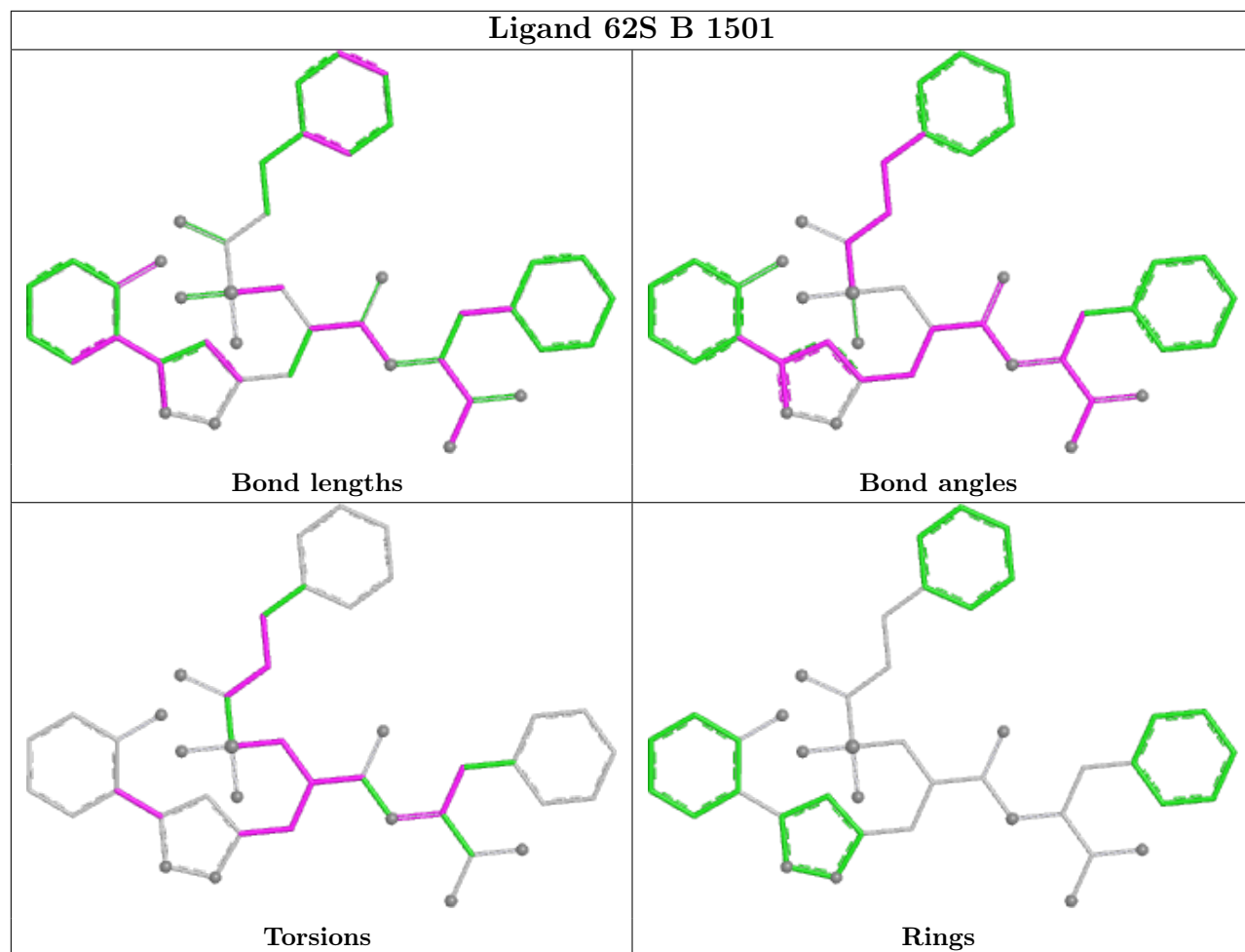
Mol	Chain	Res	Type	Atoms
11	A	1109	MES	N4-C7-C8-S
11	A	1109	MES	C7-C8-S-O2S
13	B	1508	PDO	C1-C2-C3-O3
8	B	1504	NAG	C4-C5-C6-O6
8	B	1502	NAG	O5-C5-C6-O6
8	B	1505	NAG	O5-C5-C6-O6
8	B	1504	NAG	O5-C5-C6-O6
8	B	1502	NAG	C4-C5-C6-O6
8	B	1505	NAG	C4-C5-C6-O6
8	A	1105	NAG	C8-C7-N2-C2
8	A	1105	NAG	O7-C7-N2-C2
9	A	1107	PEG	O1-C1-C2-O2
7	B	1501	62S	C36-C32-N31-C29
11	A	1109	MES	C7-C8-S-O3S
12	A	1115	EDO	O1-C1-C2-O2
8	A	1104	NAG	O5-C5-C6-O6
8	A	1103	NAG	O5-C5-C6-O6
9	A	1107	PEG	O2-C3-C4-O4
8	B	1506	NAG	O5-C5-C6-O6
7	B	1501	62S	N31-C32-C36-C37
7	A	1101	62S	C14-C15-C16-C17
7	B	1501	62S	C33-C32-C36-C37
10	A	1108	PGE	O2-C3-C4-O3
9	A	1106	PEG	C1-C2-O2-C3
8	B	1503	NAG	C4-C5-C6-O6
7	B	1501	62S	C33-C32-N31-C29
10	A	1108	PGE	C4-C3-O2-C2
8	A	1104	NAG	C1-C2-N2-C7
9	A	1107	PEG	C4-C3-O2-C2
10	A	1108	PGE	O3-C5-C6-O4
11	A	1109	MES	C7-C8-S-O1S
7	B	1501	62S	C01-C07-C08-C09
7	B	1501	62S	C15-C16-C17-C18
7	A	1101	62S	C14-C15-C29-N31
8	B	1503	NAG	O5-C5-C6-O6
12	A	1116	EDO	O1-C1-C2-O2
8	A	1104	NAG	C3-C2-N2-C7
13	A	1112	PDO	O1-C1-C2-C3
7	A	1101	62S	C18-C19-C22-C23
7	A	1101	62S	C07-C08-C09-N10
7	B	1501	62S	C07-C08-C09-N10

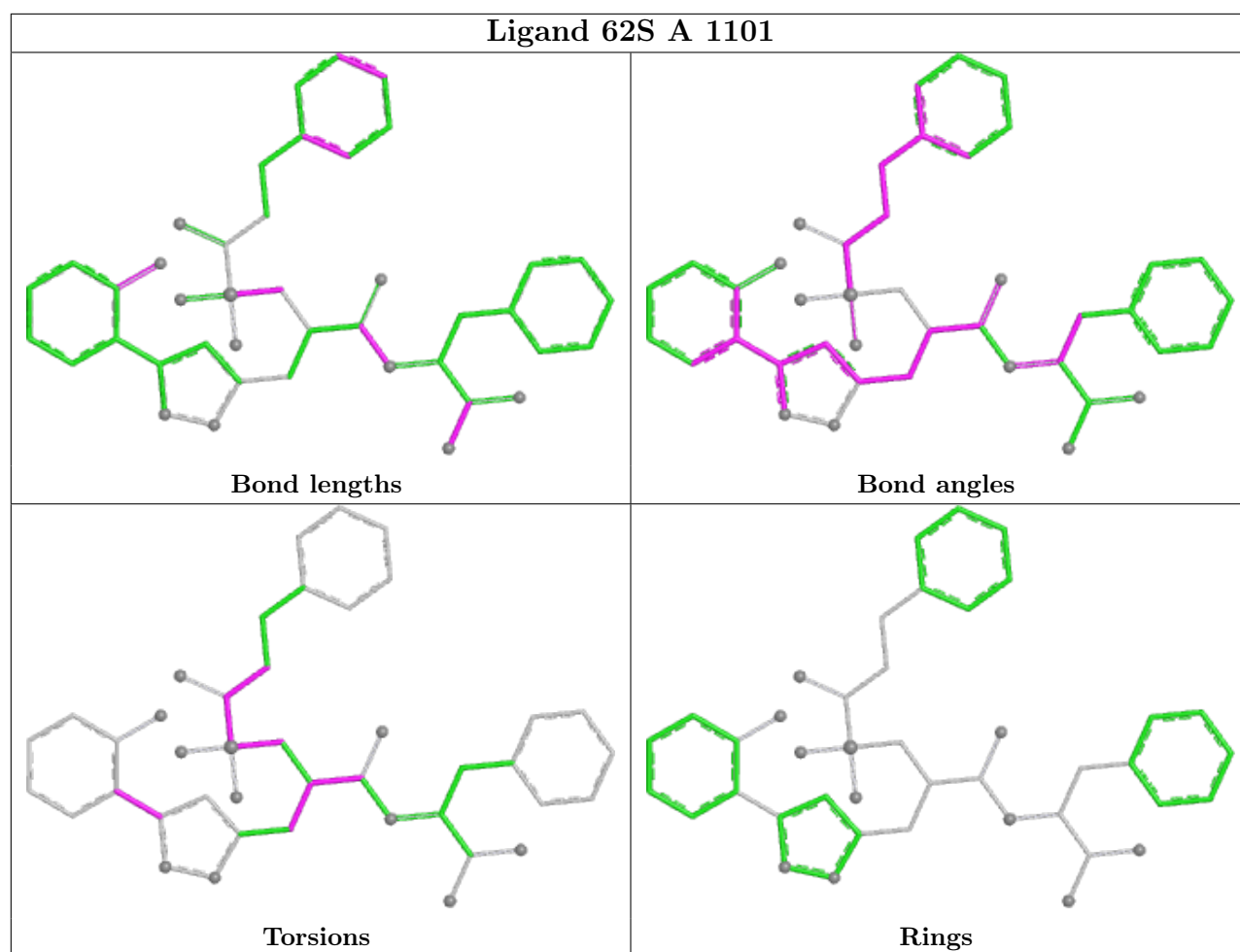
There are no ring outliers.

8 monomers are involved in 13 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
11	A	1109	MES	1	0
10	A	1108	PGE	1	0
8	A	1105	NAG	4	0
12	A	1110	EDO	1	0
7	B	1501	62S	1	0
7	A	1101	62S	3	0
12	A	1116	EDO	1	0
12	A	1113	EDO	1	0

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





5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

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, 95th percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled ‘Q < 0.9’ lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å ²)	Q<0.9
1	A	911/962 (94%)	-0.35	6 (0%) 87 69	39, 70, 124, 190	0
1	B	871/962 (90%)	-0.13	20 (2%) 60 31	38, 108, 163, 240	0
All	All	1782/1924 (92%)	-0.25	26 (1%) 73 46	38, 85, 153, 240	0

All (26) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	554	GLN	4.2
1	B	502	SER	3.3
1	B	616	GLU	3.1
1	B	623	PHE	3.0
1	B	621	VAL	2.9
1	B	654	LEU	2.8
1	B	637	GLY	2.8
1	B	592	TYR	2.7
1	B	773	LEU	2.6
1	A	514	CYS	2.5
1	A	573	GLU	2.4
1	B	831	SER	2.4
1	B	550	LEU	2.3
1	B	615	PRO	2.3
1	B	837	LEU	2.2
1	B	503	CYS	2.2
1	B	536	GLU	2.2
1	B	164	VAL	2.1
1	A	559	LEU	2.1
1	A	511	GLY	2.1
1	B	551	VAL	2.1
1	B	552	VAL	2.1
1	B	105	THR	2.1
1	B	52	ALA	2.0

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Mol	Chain	Res	Type	RSRZ
1	A	515	HIS	2.0
1	A	516	SER	2.0

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

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

6.3 Carbohydrates [i](#)

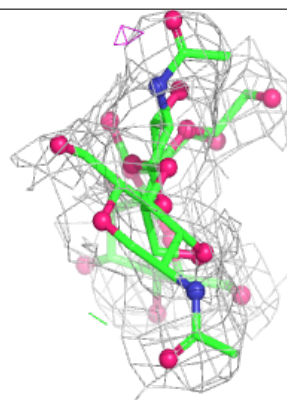
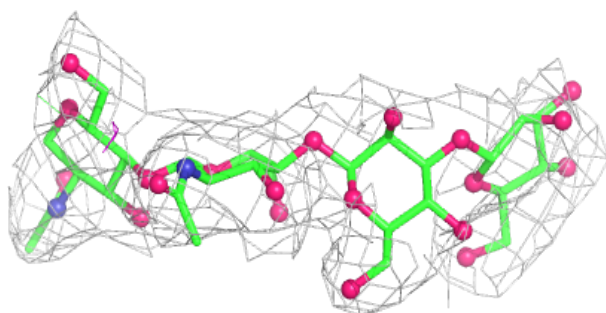
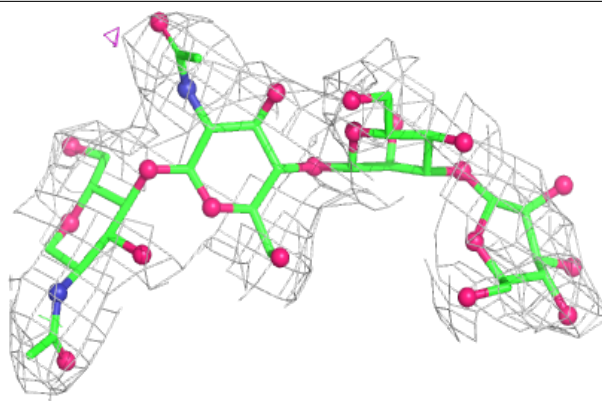
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q<0.9' lists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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
2	MAN	C	4	11/12	0.76	0.31	143,171,177,180	0
5	BMA	F	3	11/12	0.77	0.34	115,153,157,163	0
4	NAG	I	2	14/15	0.79	0.31	145,161,169,171	0
3	MAN	D	4	11/12	0.82	0.24	175,183,188,195	0
6	MAN	G	4	11/12	0.82	0.24	107,123,148,155	0
6	MAN	G	5	11/12	0.82	0.19	57,104,116,121	0
3	BMA	D	3	11/12	0.84	0.16	141,161,172,181	0
4	NAG	E	2	14/15	0.84	0.24	156,170,176,177	0
4	NAG	H	2	14/15	0.85	0.20	97,132,151,156	0
2	BMA	C	3	11/12	0.86	0.17	151,159,169,175	0
4	NAG	I	1	14/15	0.86	0.16	99,138,150,160	0
5	NAG	F	2	14/15	0.89	0.30	112,147,152,159	0
6	NAG	G	2	14/15	0.91	0.16	94,114,123,125	0
5	NAG	F	1	14/15	0.93	0.30	161,169,180,186	0
6	BMA	G	3	11/12	0.93	0.09	94,119,126,131	0
4	NAG	H	1	14/15	0.93	0.21	102,115,139,139	0
2	NAG	C	2	14/15	0.93	0.14	101,116,134,142	0
4	NAG	E	1	14/15	0.94	0.16	96,114,132,157	0
3	NAG	D	2	14/15	0.96	0.13	90,102,124,151	0
2	NAG	C	1	14/15	0.96	0.14	70,93,109,114	0
3	NAG	D	1	14/15	0.97	0.16	67,83,89,89	0
6	NAG	G	1	14/15	0.97	0.13	54,73,77,94	0

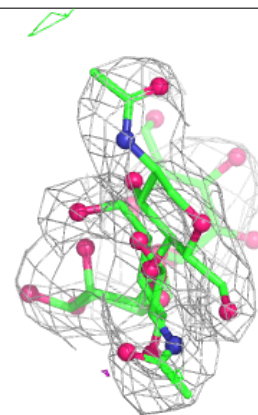
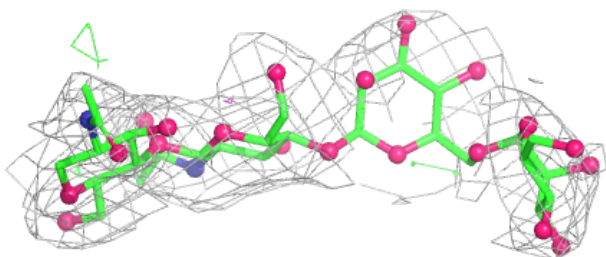
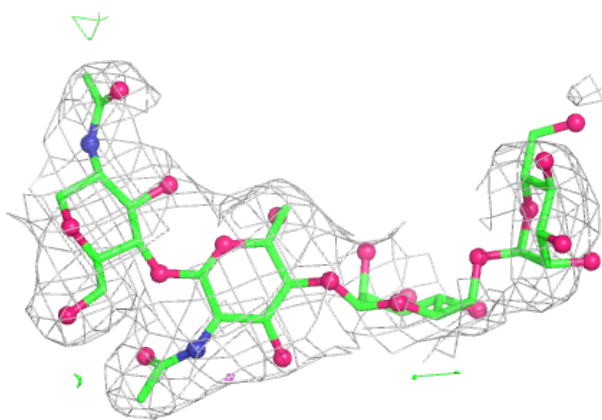
The following is a graphical depiction of the model fit to experimental electron density for oligosaccharide. Each fit is shown from different orientation to approximate a three-dimensional view.

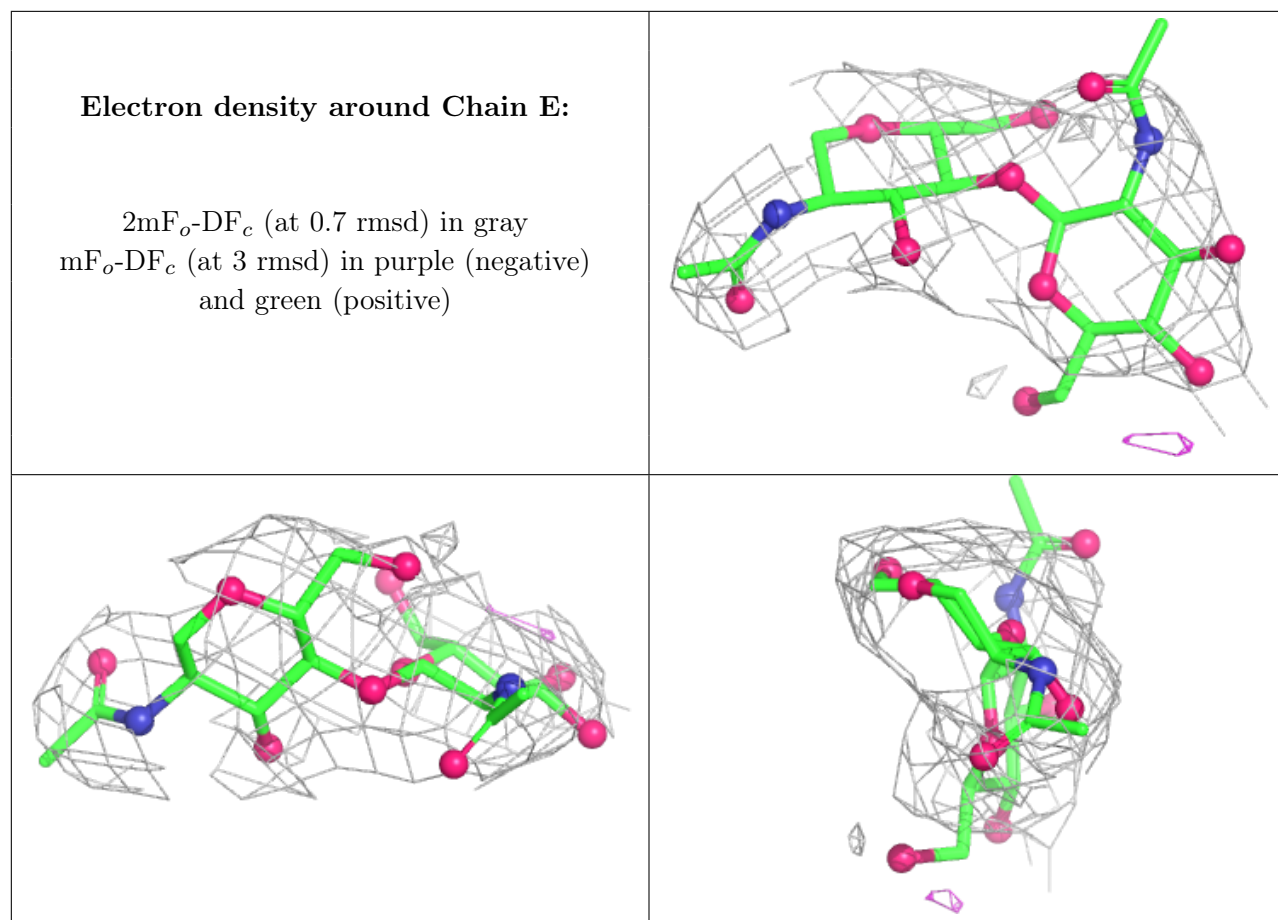
Electron density around Chain C:

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

**Electron density around Chain D:**

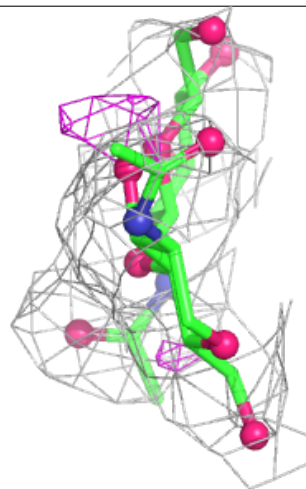
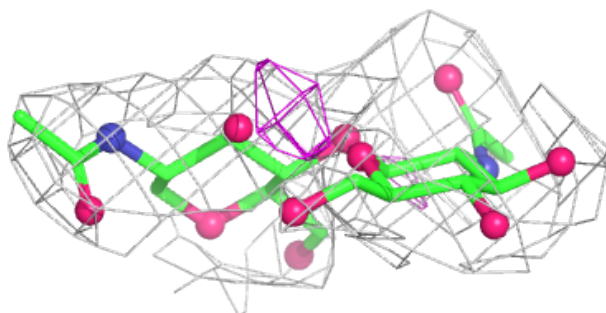
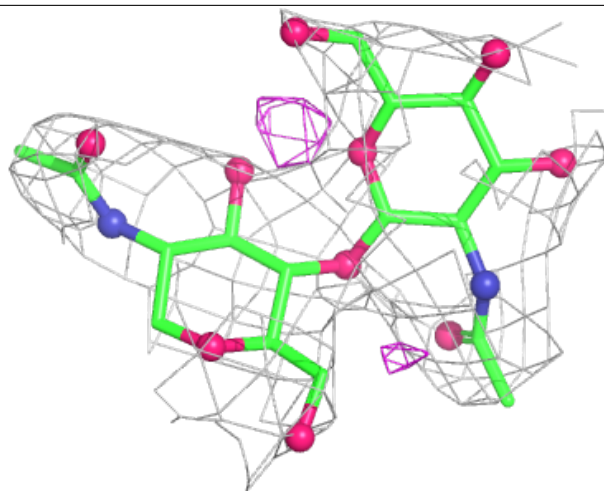
$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)





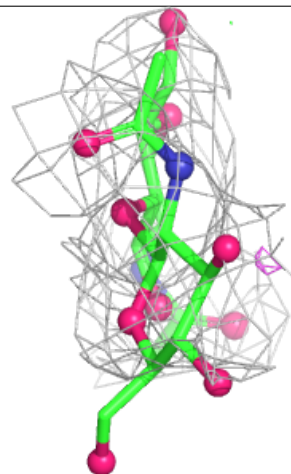
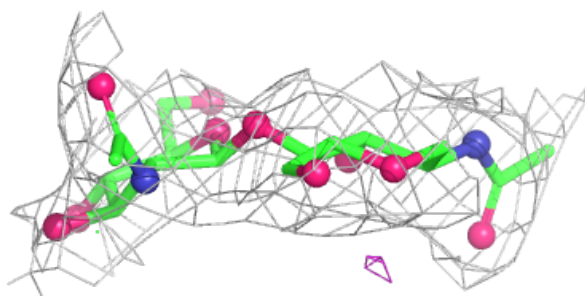
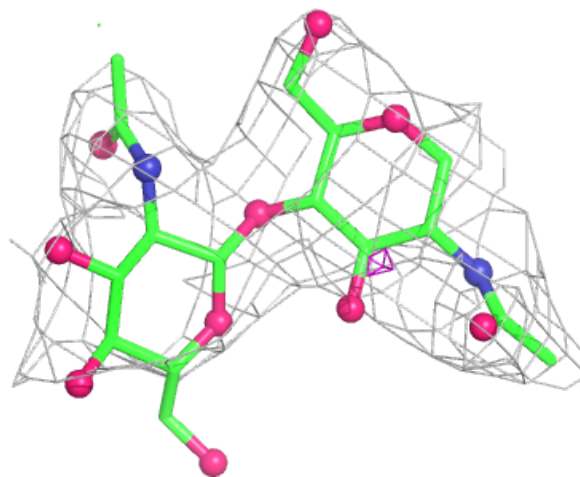
Electron density around Chain H:

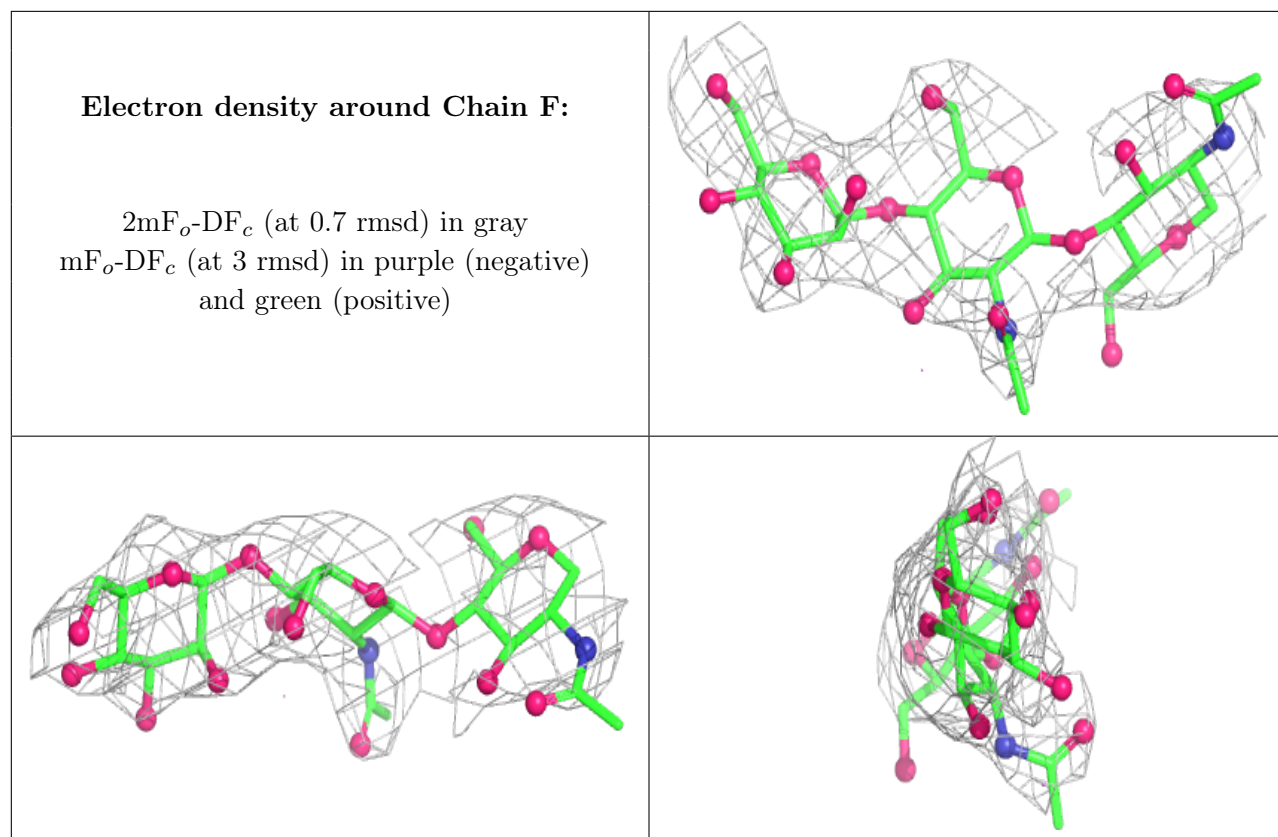
$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)

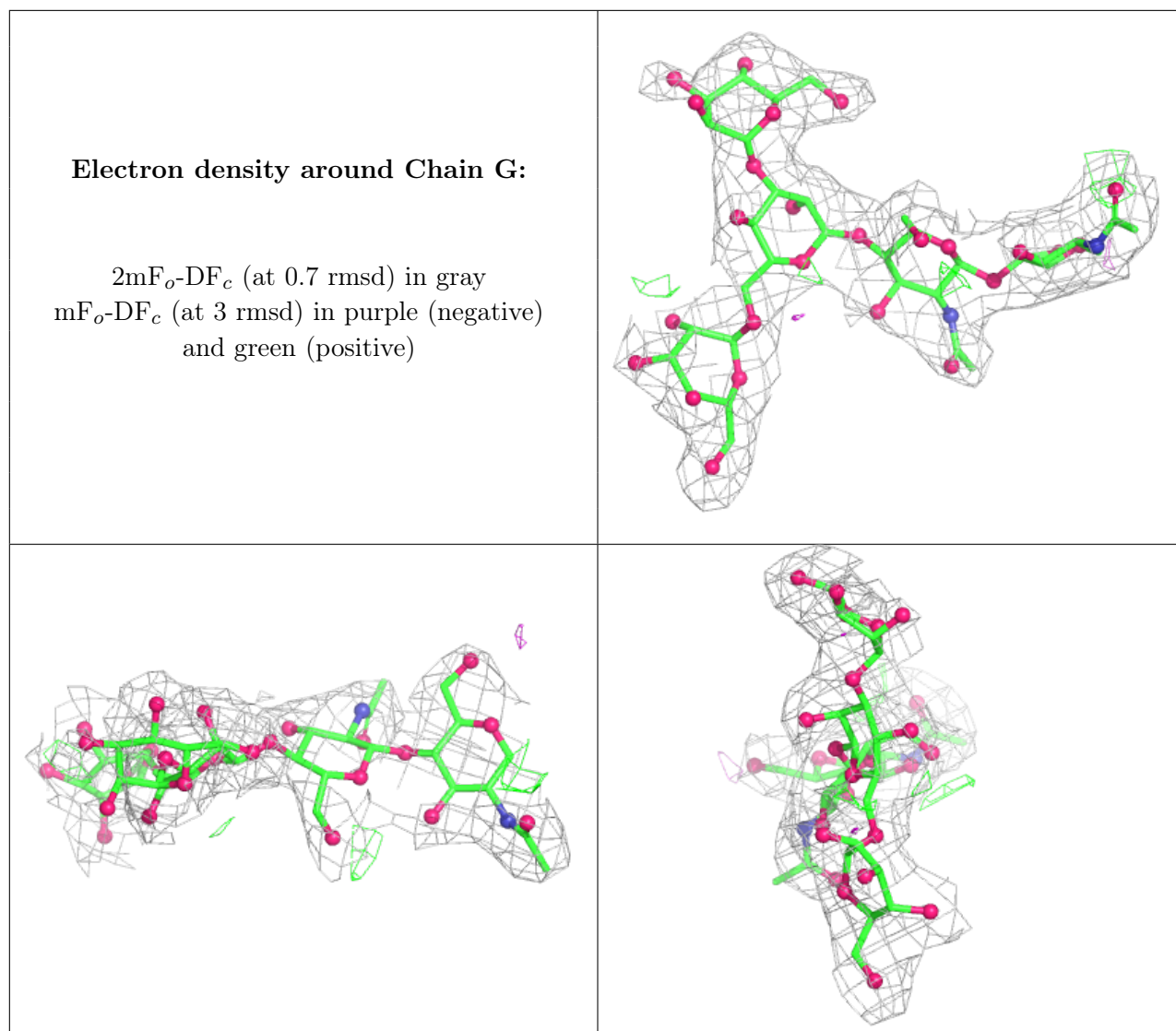


Electron density around Chain I:

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







6.4 Ligands [i](#)

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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
8	NAG	B	1504	14/15	0.75	0.26	144,165,175,182	0
12	EDO	A	1110	4/4	0.75	0.36	121,123,125,127	0
8	NAG	B	1506	14/15	0.79	0.39	172,179,187,187	0
12	EDO	A	1111	4/4	0.80	0.46	116,116,117,117	0
8	NAG	A	1104	14/15	0.81	0.28	153,167,181,184	0
8	NAG	B	1507	14/15	0.81	0.25	149,171,180,180	0
8	NAG	B	1503	14/15	0.82	0.26	175,193,205,212	0

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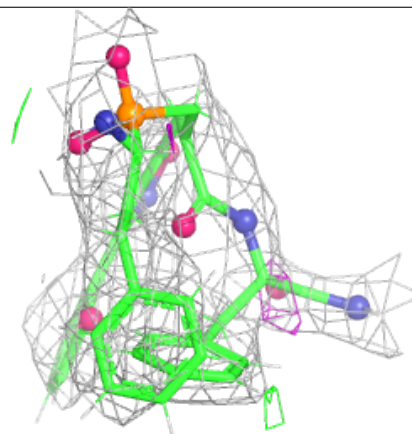
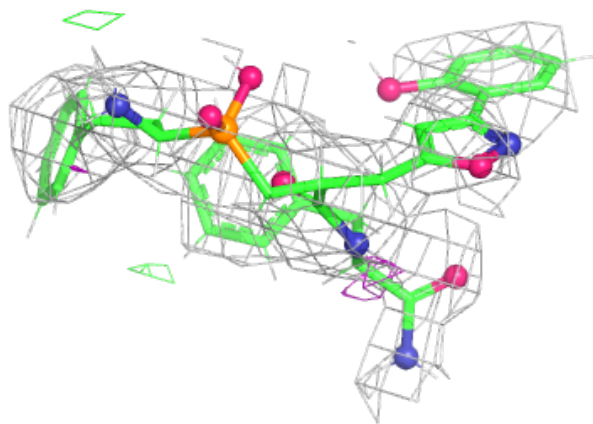
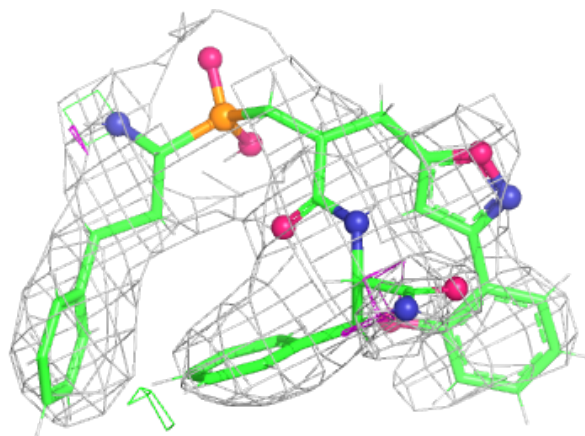
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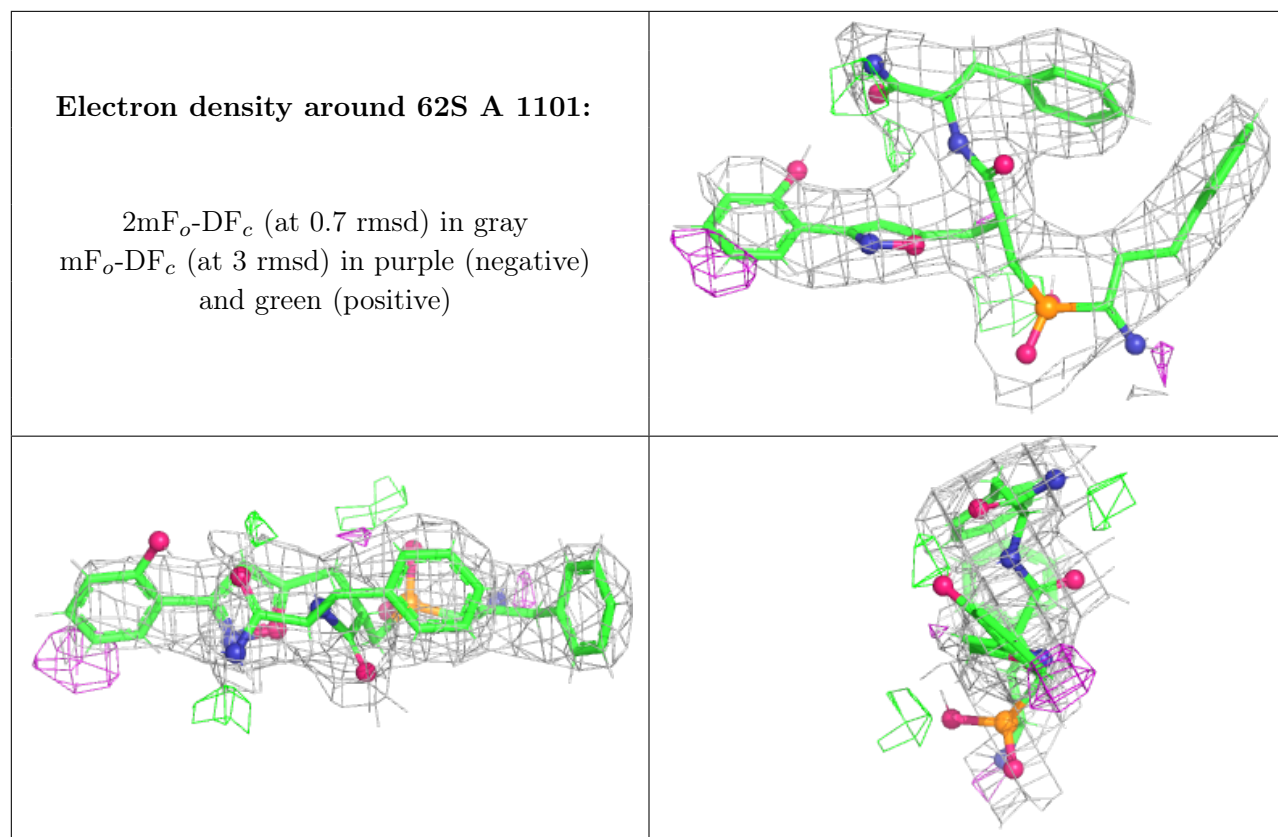
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(\AA^2)	Q<0.9
8	NAG	A	1102	14/15	0.82	0.17	124,131,136,139	0
11	MES	A	1109	12/12	0.83	0.23	106,146,352,353	0
8	NAG	A	1103	14/15	0.83	0.19	93,134,148,154	0
10	PGE	A	1108	10/10	0.83	0.41	72,121,132,137	0
12	EDO	A	1115	4/4	0.83	0.82	87,98,100,105	0
8	NAG	B	1502	14/15	0.84	0.26	136,153,159,160	0
9	PEG	A	1106	7/7	0.85	0.26	85,100,114,114	0
13	PDO	B	1508	5/5	0.85	0.18	117,122,130,133	0
8	NAG	B	1505	14/15	0.86	0.20	115,142,159,163	0
12	EDO	A	1113	4/4	0.87	0.34	64,83,100,100	0
13	PDO	A	1112	5/5	0.88	0.25	87,91,97,98	0
12	EDO	A	1117	4/4	0.90	0.82	77,77,82,83	0
8	NAG	A	1105	14/15	0.93	0.10	136,151,166,170	0
12	EDO	A	1116	4/4	0.94	0.22	81,98,115,115	0
9	PEG	A	1107	7/7	0.94	0.09	104,113,121,124	0
14	IMD	A	1114	5/5	0.94	0.23	116,117,120,122	0
12	EDO	A	1118	4/4	0.95	0.67	49,72,86,87	0
7	62S	B	1501	42/42	0.95	0.33	70,104,156,175	0
7	62S	A	1101	42/42	0.97	0.31	40,89,181,207	0
15	ZN	A	1119	1/1	0.99	0.21	45,45,45,45	0
15	ZN	B	1509	1/1	1.00	0.21	66,66,66,66	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 62S B 1501:

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





6.5 Other polymers [i](#)

There are no such residues in this entry.