Full wwPDB X-ray Structure Validation Report ⓘ

Oct 10, 2021 – 03:41 PM EDT

PDB ID	:	3E0G
Title	:	Structure of the Leukemia Inhibitory Factor Receptor (LIF-R) domains D1-D5
Authors	:	Lupardus, P.J.; Garcia, K.C.
Deposited on	:	2008-07-31
Resolution	:	3.10 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	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.23.2
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)	:	2.23.2
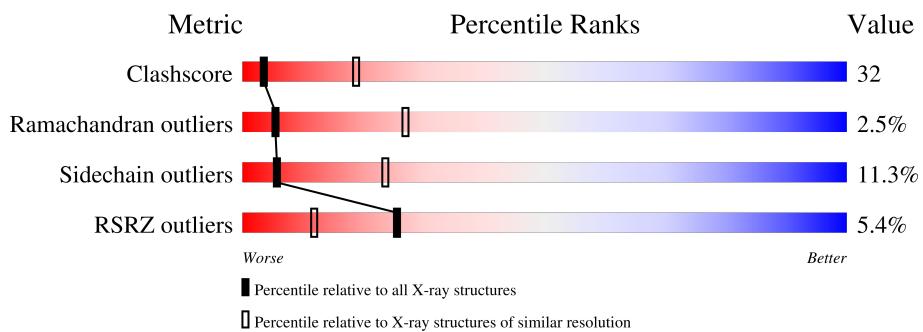
1   Overall quality at a glance ⓘ

The following experimental techniques were used to determine the structure:
X-RAY DIFFRACTION
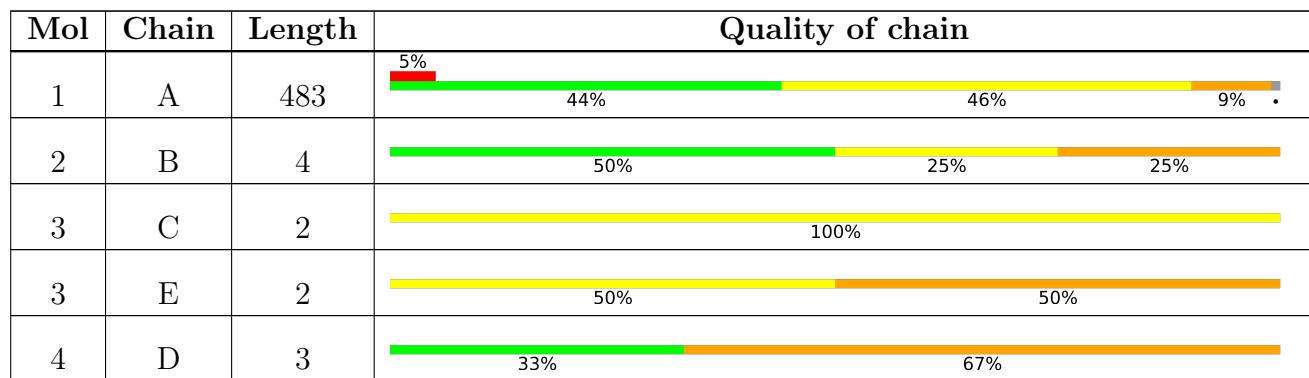
The reported resolution of this entry is 3.10 Å.

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	Percentile Ranks	Value
Clashscore		32
Ramachandran outliers		2.5%
Sidechain outliers		11.3%
RSRZ outliers		5.4%

Worse   *Better*

■ Percentile relative to all X-ray structures

▯ Percentile relative to X-ray structures of similar resolution

Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
Clashscore	141614	1184 (3.10-3.10)
Ramachandran outliers	138981	1141 (3.10-3.10)
Sidechain outliers	138945	1141 (3.10-3.10)
RSRZ outliers	127900	1067 (3.10-3.10)

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	483	5% / 44% / 46% / 9% / ·
2	B	4	50% / 25% / 25%
3	C	2	100%
3	E	2	50% / 50%
4	D	3	33% / 67%

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 crite-

ria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
2	NAG	B	1	X	-	-	-
2	MAN	B	3	X	-	-	-
2	FUC	B	4	X	-	-	-

2 Entry composition (i)

There are 4 unique types of molecules in this entry. The entry contains 3987 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.
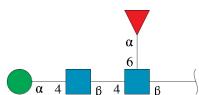
- Molecule 1 is a protein called Leukemia inhibitory factor receptor.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	479	Total 3844	C 2447	N 652	O 729	S 16	0	0	0

There are 6 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	13	GLN	ASN	engineered mutation	UNP P42702
A	34	GLN	ASN	engineered mutation	UNP P42702
A	92	GLN	ASN	engineered mutation	UNP P42702
A	140	GLN	ASN	engineered mutation	UNP P42702
A	192	GLN	ASN	engineered mutation	UNP P42702
A	434	GLN	LYS	engineered mutation	UNP P42702

- Molecule 2 is an oligosaccharide called alpha-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-[alpha-L-fucopyranose-(1-6)]2-acetamido-2-deoxy-beta-D-glucop yranose.
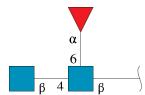

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
2	B	4	Total 49	C 28	N 2	O 19	0	0	0

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

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

- Molecule 4 is an oligosaccharide called 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-[alpha-L-fucopyranose-(1-6)]2-acetamido-2-deoxy-beta-D-glucopyranose.
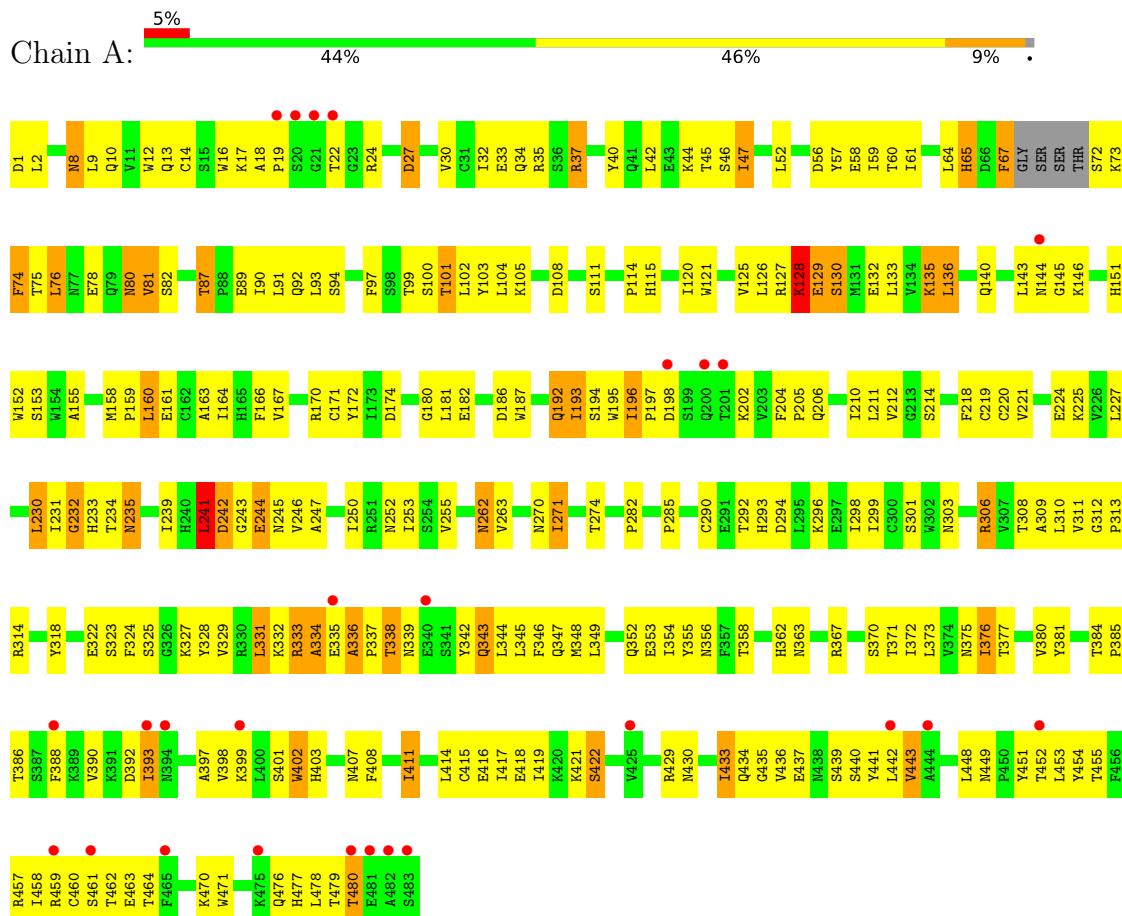

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
4	D	3	Total 38	C 22	N 2	O 14	0	0	0

3 Residue-property plots ⓘ

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red dot above a residue indicates a poor fit to the electron density (RSRZ > 2). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.
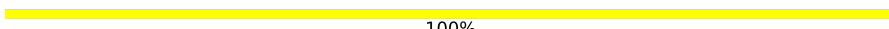
• Molecule 1: Leukemia inhibitory factor receptor

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

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

Chain C:

NAG1 NAG2

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

Chain E:

NAG1 NAG2

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

Chain D:

NAG1 NAG2 FUC3

4 Data and refinement statistics ⓘ

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α, β, γ	90.01Å 143.17Å 80.36Å 90.00° 110.38° 90.00°	Depositor
Resolution (Å)	30.00 – 3.10 19.98 – 3.00	Depositor EDS
% Data completeness (in resolution range)	97.9 (30.00-3.10) 98.3 (19.98-3.00)	Depositor EDS
R_{merge}	0.10	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.78 (at 2.98Å)	Xtriage
Refinement program	REFMAC 5.2.0019	Depositor
R, R_{free}	0.252 , 0.309 0.254 , (Not available)	Depositor DCC
R_{free} test set	No test flags present.	wwPDB-VP
Wilson B-factor (Å^2)	78.2	Xtriage
Anisotropy	0.124	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.25 , 57.7	EDS
L-test for twinning[2]	$< |L| > = 0.45, < L^2 > = 0.27$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.91	EDS
Total number of atoms	3987	wwPDB-VP
Average B, all atoms (Å^2)	94.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.46% of the height of the origin peak. No significant pseudotranslation is detected.*

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[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, FUC, 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	0.48	0/3940	0.79	15/5363 (0.3%)

There are no bond length outliers.

All (15) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	128	LYS	N-CA-C	-11.62	79.63	111.00
1	A	242	ASP	CB-CA-C	-11.05	88.30	110.40
1	A	242	ASP	N-CA-C	10.51	139.39	111.00
1	A	338	THR	CB-CA-C	7.79	132.64	111.60
1	A	128	LYS	CB-CA-C	7.71	125.83	110.40
1	A	393	ILE	CB-CA-C	7.70	126.99	111.60
1	A	334	ALA	CB-CA-C	7.41	121.22	110.10
1	A	232	GLY	N-CA-C	-6.91	95.83	113.10
1	A	338	THR	N-CA-C	-6.76	92.73	111.00
1	A	480	THR	N-CA-C	6.37	128.19	111.00
1	A	130	SER	N-CA-C	6.17	127.67	111.00
1	A	339	ASN	CB-CA-C	5.84	122.08	110.40
1	A	235	ASN	N-CA-C	5.65	126.25	111.00
1	A	241	LEU	N-CA-C	-5.44	96.30	111.00
1	A	480	THR	CB-CA-C	-5.19	97.59	111.60

There are no chirality outliers.

There are no planarity outliers.

5.2   Too-close contacts ⓘ

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen

atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	3844	0	3774	249	0
2	B	49	0	43	1	0
3	C	28	0	25	1	0
3	E	28	0	25	2	0
4	D	38	0	34	3	0
All	All	3987	0	3901	252	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 32.

All (252) 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:81:VAL:HG12	1:A:82:SER:H	0.98	1.14
1:A:133:LEU:N	1:A:133:LEU:HD22	1.82	0.94
1:A:81:VAL:HG12	1:A:82:SER:N	1.78	0.93
1:A:81:VAL:CG1	1:A:82:SER:H	1.83	0.91
1:A:451:TYR:CD2	1:A:479:THR:O	2.24	0.90
1:A:231:ILE:HD12	1:A:263:VAL:HG22	1.53	0.89
1:A:384:THR:HB	1:A:470:LYS:HB2	1.52	0.88
1:A:293:HIS:HA	1:A:381:TYR:O	1.74	0.87
1:A:417:ILE:HG22	1:A:458:ILE:HG22	1.56	0.87
1:A:204:PHE:HB2	1:A:219:CYS:HB2	1.58	0.85
1:A:80:ASN:HD22	1:A:80:ASN:H	1.24	0.84
1:A:18:ALA:HB1	1:A:19:PRO:HD2	1.60	0.84
1:A:127:ARG:O	1:A:164:ILE:O	1.96	0.84
1:A:358:THR:HG23	1:A:371:THR:HG22	1.58	0.84
1:A:57:TYR:HB2	1:A:78:GLU:HB2	1.58	0.84
1:A:459:ARG:HD2	1:A:471:TRP:HE1	1.41	0.82
1:A:349:LEU:HB2	1:A:352:GLN:HG3	1.61	0.82
1:A:451:TYR:CE2	1:A:479:THR:O	2.31	0.81
1:A:27:ASP:HB2	1:A:64:LEU:HD22	1.62	0.81
1:A:323:SER:HB2	1:A:356:ASN:HD22	1.46	0.81
1:A:101:THR:HB	1:A:155:ALA:HA	1.62	0.81
1:A:111:SER:HA	1:A:145:GLY:O	1.83	0.79
1:A:392:ASP:OD1	1:A:393:ILE:O	2.00	0.79
1:A:210:ILE:HD13	1:A:253:ILE:HG21	1.65	0.76
1:A:429:ARG:HH22	1:A:448:LEU:HD21	1.48	0.76
1:A:166:PHE:CD2	1:A:192:GLN:HB3	2.21	0.75

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:455:THR:HG22	1:A:476:GLN:HB3	1.67	0.75
1:A:333:ARG:H	1:A:333:ARG:HD3	1.50	0.74
1:A:61:ILE:HB	1:A:74:PHE:HB3	1.69	0.74
1:A:451:TYR:HD2	1:A:479:THR:O	1.71	0.74
1:A:323:SER:HA	2:B:1:NAG:H82	1.69	0.74
1:A:127:ARG:NH1	1:A:158:MET:HB3	2.03	0.74
1:A:2:LEU:HA	1:A:16:TRP:HA	1.70	0.73
1:A:415:CYS:HA	1:A:460:CYS:HA	1.69	0.73
1:A:67:PHE:HB3	1:A:72:SER:N	2.03	0.73
1:A:282:PRO:HD3	1:A:363:ASN:HB3	1.71	0.73
1:A:81:VAL:HA	3:E:1:NAG:O7	1.89	0.72
1:A:90:ILE:HD13	1:A:104:LEU:HD11	1.71	0.72
1:A:225:LYS:HA	1:A:244:GLU:HG2	1.71	0.72
1:A:239:ILE:HB	1:A:247:ALA:HB3	1.71	0.72
1:A:14:CYS:HB2	1:A:47:ILE:HD13	1.72	0.71
1:A:174:ASP:HA	1:A:182:GLU:OE2	1.91	0.71
1:A:214:SER:H	1:A:253:ILE:HG22	1.56	0.70
1:A:59:ILE:HD11	1:A:76:LEU:HB2	1.74	0.69
1:A:323:SER:CB	1:A:356:ASN:HD22	2.05	0.69
1:A:333:ARG:HD3	1:A:333:ARG:N	2.07	0.69
1:A:327:LYS:HD2	1:A:346:PHE:CZ	2.28	0.69
1:A:1:ASP:H1	1:A:17:LYS:HD3	1.58	0.68
1:A:80:ASN:HD22	1:A:80:ASN:N	1.90	0.68
1:A:42:LEU:HD11	1:A:47:ILE:HG23	1.76	0.67
1:A:296:LYS:O	1:A:348:MET:HB2	1.94	0.67
1:A:323:SER:HB3	1:A:356:ASN:HB3	1.76	0.67
1:A:390:VAL:HB	1:A:477:HIS:HB3	1.77	0.67
1:A:127:ARG:HH12	1:A:158:MET:CB	2.08	0.66
1:A:231:ILE:HG22	1:A:234:THR:HB	1.77	0.66
1:A:225:LYS:HA	1:A:244:GLU:CG	2.25	0.66
1:A:335:GLU:C	1:A:337:PRO:HD3	2.15	0.66
1:A:449:ASN:HB2	1:A:454:TYR:HE2	1.59	0.66
4:D:1:NAG:H62	4:D:2:NAG:O7	1.94	0.66
1:A:37:ARG:O	1:A:37:ARG:NE	2.30	0.65
1:A:196:ILE:HD12	1:A:196:ILE:H	1.62	0.65
1:A:205:PRO:HD2	1:A:218:PHE:CD1	2.33	0.64
1:A:459:ARG:HD2	1:A:471:TRP:NE1	2.13	0.64
1:A:419:ILE:HG12	1:A:429:ARG:HH21	1.62	0.64
1:A:127:ARG:HH12	1:A:158:MET:HB3	1.61	0.63
1:A:282:PRO:HD3	1:A:363:ASN:CB	2.29	0.62
1:A:349:LEU:CB	1:A:352:GLN:HG3	2.29	0.62

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:454:TYR:H	1:A:478:LEU:HD21	1.64	0.62
1:A:230:LEU:HB3	1:A:235:ASN:H	1.64	0.62
1:A:143:LEU:HD23	1:A:146:LYS:HB2	1.82	0.61
1:A:18:ALA:HB1	1:A:19:PRO:CD	2.29	0.61
1:A:323:SER:CB	1:A:356:ASN:HB3	2.29	0.61
1:A:429:ARG:NH2	1:A:448:LEU:HD21	2.14	0.61
1:A:34:GLN:HG3	1:A:52:LEU:HD21	1.82	0.61
1:A:128:LYS:HE3	1:A:128:LYS:HA	1.83	0.61
1:A:230:LEU:HD23	1:A:230:LEU:N	2.16	0.60
1:A:299:ILE:CD1	1:A:345:LEU:HG	2.32	0.60
1:A:457:ARG:HE	1:A:471:TRP:HB3	1.67	0.60
1:A:421:LYS:HG2	1:A:422:SER:H	1.67	0.60
1:A:1:ASP:N	1:A:17:LYS:HD3	2.17	0.59
1:A:377:THR:HB	1:A:464:THR:HG21	1.84	0.59
1:A:125:VAL:HG22	1:A:167:VAL:HG22	1.85	0.59
1:A:221:VAL:HA	1:A:245:ASN:OD1	2.03	0.59
1:A:384:THR:HB	1:A:470:LYS:HE3	1.84	0.58
1:A:436:VAL:HG22	1:A:441:TYR:CZ	2.38	0.58
1:A:220:CYS:HB3	1:A:246:VAL:HG23	1.85	0.58
1:A:166:PHE:CD2	1:A:192:GLN:CB	2.86	0.58
1:A:12:TRP:CD2	1:A:81:VAL:HG21	2.38	0.58
1:A:336:ALA:N	1:A:337:PRO:HD3	2.19	0.58
1:A:12:TRP:CE2	1:A:81:VAL:HG21	2.38	0.57
1:A:37:ARG:O	1:A:37:ARG:CD	2.52	0.57
1:A:429:ARG:HH22	1:A:448:LEU:HD11	1.68	0.57
1:A:285:PRO:HG2	1:A:370:SER:HB3	1.87	0.57
1:A:353:GLU:HG2	1:A:353:GLU:O	2.05	0.57
1:A:419:ILE:CD1	1:A:429:ARG:HE	2.17	0.57
1:A:136:LEU:HG	1:A:152:TRP:CZ2	2.40	0.57
1:A:133:LEU:N	1:A:133:LEU:CD2	2.57	0.57
1:A:306:ARG:N	1:A:306:ARG:HD3	2.19	0.57
1:A:312:GLY:C	1:A:314:ARG:H	2.08	0.57
1:A:164:ILE:HD11	1:A:192:GLN:HG3	1.86	0.57
1:A:459:ARG:HB3	1:A:471:TRP:CD1	2.40	0.56
1:A:127:ARG:NH1	1:A:158:MET:CB	2.69	0.56
1:A:91:LEU:HB3	1:A:105:LYS:O	2.05	0.56
1:A:392:ASP:HA	1:A:399:LYS:HE3	1.88	0.56
1:A:299:ILE:HD13	1:A:345:LEU:HG	1.88	0.56
1:A:451:TYR:HE2	1:A:479:THR:O	1.87	0.55
1:A:429:ARG:NH2	1:A:448:LEU:HD11	2.22	0.55
1:A:80:ASN:HB2	1:A:180:GLY:HA2	1.88	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:128:LYS:HG2	1:A:242:ASP:OD2	2.07	0.55
1:A:214:SER:N	1:A:253:ILE:HG22	2.22	0.55
1:A:80:ASN:H	1:A:80:ASN:ND2	1.98	0.55
1:A:306:ARG:HD3	1:A:306:ARG:H	1.70	0.55
1:A:386:THR:O	1:A:403:HIS:HB3	2.06	0.55
1:A:8:ASN:C	1:A:10:GLN:H	2.10	0.55
1:A:230:LEU:CB	1:A:235:ASN:H	2.19	0.55
1:A:331:LEU:HB3	1:A:344:LEU:HD22	1.89	0.55
1:A:416:GLU:HG2	1:A:430:ASN:HB3	1.88	0.55
1:A:301:SER:HB3	1:A:343:GLN:HB3	1.89	0.55
1:A:105:LYS:HG2	1:A:151:HIS:ND1	2.21	0.54
1:A:290:CYS:HA	1:A:299:ILE:O	2.07	0.54
1:A:327:LYS:HD2	1:A:346:PHE:CE2	2.41	0.54
1:A:33:GLU:HB3	1:A:58:GLU:HB3	1.89	0.54
1:A:312:GLY:O	1:A:314:ARG:N	2.40	0.54
1:A:332:LYS:HD3	1:A:333:ARG:NH1	2.22	0.54
1:A:202:LYS:O	1:A:220:CYS:HA	2.08	0.53
1:A:127:ARG:C	1:A:164:ILE:O	2.45	0.53
1:A:402:TRP:CD1	1:A:441:TYR:HB2	2.44	0.53
1:A:231:ILE:HG23	1:A:232:GLY:H	1.72	0.53
1:A:93:LEU:HD12	1:A:103:TYR:O	2.09	0.53
1:A:19:PRO:HB2	1:A:22:THR:O	2.08	0.52
1:A:480:THR:O	1:A:480:THR:HG23	2.08	0.52
1:A:78:GLU:HA	3:E:1:NAG:H61	1.91	0.52
1:A:429:ARG:HH22	1:A:448:LEU:CD2	2.21	0.52
1:A:414:LEU:HB3	1:A:461:SER:HB3	1.91	0.52
1:A:80:ASN:HB2	1:A:180:GLY:CA	2.40	0.52
1:A:132:GLU:C	1:A:133:LEU:HD22	2.28	0.52
1:A:437:GLU:O	1:A:439:SER:N	2.42	0.51
1:A:164:ILE:HG13	1:A:194:SER:HB2	1.92	0.51
1:A:231:ILE:HD13	1:A:250:ILE:HD13	1.93	0.51
1:A:270:ASN:CG	1:A:271:ILE:H	2.14	0.51
1:A:436:VAL:HG23	1:A:437:GLU:O	2.10	0.51
1:A:457:ARG:NE	1:A:471:TRP:HB3	2.26	0.51
1:A:64:LEU:O	1:A:65:HIS:HB2	2.11	0.50
1:A:454:TYR:N	1:A:478:LEU:HD21	2.26	0.50
1:A:392:ASP:OD2	1:A:398:VAL:HG12	2.12	0.50
1:A:323:SER:HB2	1:A:356:ASN:ND2	2.21	0.49
1:A:336:ALA:N	1:A:337:PRO:CD	2.75	0.49
1:A:61:ILE:HB	1:A:74:PHE:CB	2.40	0.49
1:A:384:THR:CB	1:A:470:LYS:HB2	2.33	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:311:VAL:O	1:A:314:ARG:HG2	2.13	0.48
1:A:433:ILE:HD13	1:A:433:ILE:H	1.77	0.48
1:A:437:GLU:OE1	1:A:437:GLU:HA	2.13	0.48
1:A:397:ALA:HB1	1:A:448:LEU:HD23	1.96	0.48
1:A:32:ILE:HG22	1:A:59:ILE:HG22	1.95	0.48
1:A:158:MET:HE3	1:A:163:ALA:HB3	1.95	0.48
1:A:397:ALA:CB	1:A:448:LEU:HD23	2.44	0.48
1:A:419:ILE:N	1:A:419:ILE:HD12	2.28	0.48
1:A:308:THR:O	1:A:310:LEU:HG	2.14	0.47
1:A:8:ASN:OD1	1:A:10:GLN:HB2	2.14	0.47
1:A:127:ARG:HG2	1:A:133:LEU:HD21	1.95	0.47
1:A:37:ARG:O	1:A:37:ARG:HD2	2.14	0.47
1:A:132:GLU:OE2	1:A:135:LYS:HG3	2.14	0.47
1:A:102:LEU:O	1:A:153:SER:HA	2.15	0.47
1:A:108:ASP:HB3	1:A:121:TRP:CZ2	2.50	0.47
1:A:436:VAL:HG22	1:A:441:TYR:CE2	2.50	0.47
1:A:1:ASP:HB3	1:A:17:LYS:HB3	1.97	0.47
1:A:30:VAL:O	1:A:40:TYR:N	2.44	0.47
1:A:358:THR:HA	1:A:371:THR:HA	1.97	0.47
1:A:422:SER:HB3	1:A:453:LEU:HB2	1.96	0.47
1:A:16:TRP:O	1:A:45:THR:HG21	2.14	0.46
1:A:97:PHE:HE2	1:A:195:TRP:HB2	1.81	0.46
1:A:30:VAL:HA	1:A:60:THR:O	2.16	0.46
1:A:292:THR:HB	1:A:376:ILE:HD11	1.97	0.46
1:A:37:ARG:HE	1:A:37:ARG:C	2.19	0.46
1:A:419:ILE:HG12	1:A:429:ARG:NH2	2.28	0.46
1:A:34:GLN:NE2	1:A:35:ARG:HG2	2.30	0.46
1:A:128:LYS:CE	1:A:129:GLU:H	2.29	0.46
1:A:34:GLN:HG3	1:A:52:LEU:CD2	2.46	0.45
1:A:334:ALA:HB3	1:A:337:PRO:HD2	1.99	0.45
1:A:42:LEU:HD13	1:A:46:SER:O	2.15	0.45
1:A:127:ARG:HH12	1:A:158:MET:HB2	1.78	0.45
1:A:80:ASN:N	1:A:80:ASN:ND2	2.59	0.45
1:A:14:CYS:O	1:A:47:ILE:HD12	2.16	0.45
1:A:419:ILE:HD11	1:A:429:ARG:HE	1.82	0.45
1:A:8:ASN:O	1:A:10:GLN:N	2.49	0.45
1:A:298:ILE:HG12	1:A:376:ILE:HD13	1.99	0.45
1:A:322:GLU:OE1	1:A:325:SER:N	2.49	0.45
1:A:292:THR:OG1	1:A:294:ASP:O	2.35	0.45
1:A:243:GLY:H	1:A:245:ASN:HD22	1.65	0.44
1:A:241:LEU:HB3	1:A:242:ASP:H	1.66	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:73:LYS:NZ	1:A:75:THR:HG22	2.32	0.44
1:A:101:THR:HB	1:A:155:ALA:CA	2.40	0.44
1:A:392:ASP:HB3	1:A:399:LYS:H	1.82	0.44
1:A:402:TRP:HE3	1:A:458:ILE:HD12	1.83	0.44
1:A:451:TYR:HA	1:A:478:LEU:HB3	1.99	0.44
1:A:133:LEU:HD22	1:A:133:LEU:H	1.76	0.44
1:A:97:PHE:HD2	1:A:161:GLU:HG3	1.83	0.44
1:A:196:ILE:O	1:A:198:ASP:OD2	2.36	0.44
1:A:333:ARG:H	1:A:333:ARG:CD	2.23	0.44
1:A:308:THR:O	1:A:309:ALA:HB3	2.18	0.43
1:A:362:HIS:HA	1:A:367:ARG:HG2	2.00	0.43
1:A:459:ARG:HB3	1:A:471:TRP:HD1	1.83	0.43
4:D:1:NAG:HO3	4:D:2:NAG:C1	2.31	0.43
1:A:100:SER:C	1:A:160:LEU:HD22	2.39	0.43
3:C:2:NAG:O3	3:C:2:NAG:H83	2.18	0.43
1:A:12:TRP:CG	1:A:81:VAL:HG21	2.53	0.43
1:A:462:THR:HG22	1:A:463:GLU:N	2.34	0.43
1:A:436:VAL:HG21	1:A:440:SER:O	2.19	0.43
1:A:231:ILE:HG23	1:A:232:GLY:N	2.33	0.43
1:A:327:LYS:HG2	1:A:328:TYR:N	2.32	0.43
1:A:99:THR:OG1	1:A:101:THR:HG23	2.19	0.42
1:A:225:LYS:CA	1:A:244:GLU:HG2	2.43	0.42
1:A:292:THR:CG2	1:A:380:VAL:HA	2.49	0.42
1:A:452:THR:HG22	1:A:452:THR:O	2.19	0.42
1:A:8:ASN:C	1:A:10:GLN:N	2.72	0.42
1:A:353:GLU:HA	1:A:376:ILE:HG22	1.99	0.42
1:A:231:ILE:O	1:A:262:ASN:O	2.37	0.42
1:A:418:GLU:CG	1:A:457:ARG:HB3	2.49	0.42
1:A:44:LYS:HB3	1:A:45:THR:H	1.70	0.42
1:A:94:SER:OG	1:A:103:TYR:HB2	2.20	0.42
1:A:1:ASP:CB	1:A:17:LYS:HB3	2.49	0.42
1:A:193:ILE:HG13	1:A:193:ILE:O	2.20	0.42
1:A:206:GLN:HA	1:A:274:THR:OG1	2.20	0.42
1:A:373:LEU:C	1:A:373:LEU:HD23	2.40	0.41
1:A:120:ILE:O	1:A:171:CYS:HA	2.20	0.41
1:A:384:THR:HA	1:A:385:PRO:HD3	1.93	0.41
1:A:402:TRP:CZ2	1:A:443:VAL:HG11	2.54	0.41
1:A:312:GLY:C	1:A:314:ARG:N	2.73	0.41
1:A:2:LEU:HD13	1:A:76:LEU:HD22	2.03	0.41
1:A:252:ASN:CG	4:D:1:NAG:HN2	2.23	0.41
1:A:336:ALA:O	1:A:338:THR:O	2.38	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:388:PHE:HB2	1:A:401:SER:O	2.21	0.41
1:A:411:ILE:H	1:A:411:ILE:HD13	1.86	0.41
1:A:211:LEU:O	1:A:212:VAL:C	2.59	0.41
1:A:218:PHE:CE2	1:A:263:VAL:HG21	2.55	0.41
1:A:87:THR:HB	1:A:186:ASP:HB2	2.02	0.41
1:A:220:CYS:HB3	1:A:246:VAL:CG2	2.51	0.41
1:A:232:GLY:O	1:A:233:HIS:C	2.58	0.41
1:A:358:THR:CG2	1:A:371:THR:HG22	2.40	0.41
1:A:170:ARG:HG2	1:A:187:TRP:CZ3	2.56	0.40
1:A:408:PHE:O	1:A:435:GLY:HA3	2.20	0.40
1:A:158:MET:HG3	1:A:159:PRO:HD2	2.02	0.40
1:A:205:PRO:HD2	1:A:218:PHE:CE1	2.55	0.40
1:A:120:ILE:HB	1:A:172:TYR:HB3	2.03	0.40
1:A:449:ASN:HB2	1:A:454:TYR:CE2	2.45	0.40
1:A:93:LEU:HG	1:A:193:ILE:HG21	2.02	0.40
1:A:227:LEU:HD23	1:A:227:LEU:HA	1.91	0.40
1:A:318:TYR:HB2	1:A:331:LEU:HD22	2.03	0.40
1:A:323:SER:HB2	1:A:356:ASN:HB3	2.01	0.40
1:A:348:MET:HG2	1:A:355:TYR:OH	2.21	0.40
1:A:354:ILE:O	1:A:354:ILE:HD12	2.22	0.40
1:A:372:ILE:HG23	1:A:372:ILE:O	2.21	0.40

There are no symmetry-related clashes.

5.3 Torsion angles ⓘ

5.3.1 Protein backbone ⓘ

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	475/483 (98%)	380 (80%)	83 (18%)	12 (2%)	5	27

All (12) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	336	ALA
1	A	81	VAL
1	A	197	PRO
1	A	422	SER
1	A	65	HIS
1	A	144	ASN
1	A	313	PRO
1	A	329	VAL
1	A	9	LEU
1	A	376	ILE
1	A	114	PRO
1	A	443	VAL

5.3.2 Protein sidechains ⓘ

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the sidechain conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	442/445 (99%)	392 (89%)	50 (11%)	6	23

All (50) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	8	ASN
1	A	13	GLN
1	A	24	ARG
1	A	27	ASP
1	A	37	ARG
1	A	47	ILE
1	A	56	ASP
1	A	67	PHE
1	A	74	PHE
1	A	76	LEU
1	A	80	ASN
1	A	87	THR
1	A	89	GLU
1	A	92	GLN
1	A	101	THR

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Mol	Chain	Res	Type
1	A	115	HIS
1	A	126	LEU
1	A	128	LYS
1	A	129	GLU
1	A	130	SER
1	A	135	LYS
1	A	136	LEU
1	A	140	GLN
1	A	160	LEU
1	A	181	LEU
1	A	192	GLN
1	A	193	ILE
1	A	196	ILE
1	A	224	GLU
1	A	230	LEU
1	A	241	LEU
1	A	244	GLU
1	A	255	VAL
1	A	262	ASN
1	A	271	ILE
1	A	303	ASN
1	A	306	ARG
1	A	324	PHE
1	A	331	LEU
1	A	333	ARG
1	A	342	TYR
1	A	343	GLN
1	A	347	GLN
1	A	375	ASN
1	A	402	TRP
1	A	407	ASN
1	A	411	ILE
1	A	433	ILE
1	A	434	GLN
1	A	442	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (1) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	262	ASN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates ⓘ

11 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	B	1	1,2	14,14,15	0.72	1 (7%)	17,19,21	0.96	0
2	NAG	B	2	2	14,14,15	0.59	0	17,19,21	0.98	2 (11%)
2	MAN	B	3	2	11,11,12	0.63	0	15,15,17	0.78	0
2	FUC	B	4	2	10,10,11	0.65	0	14,14,16	0.54	0
3	NAG	C	1	1,3	14,14,15	0.45	0	17,19,21	1.18	2 (11%)
3	NAG	C	2	3	14,14,15	0.58	0	17,19,21	0.74	0
4	NAG	D	1	1,4	14,14,15	0.45	0	17,19,21	1.11	1 (5%)
4	NAG	D	2	4	14,14,15	0.52	0	17,19,21	0.89	1 (5%)
4	FUC	D	3	4	10,10,11	0.61	0	14,14,16	0.84	0
3	NAG	E	1	1,3	14,14,15	0.64	0	17,19,21	2.42	6 (35%)
3	NAG	E	2	3	14,14,15	0.63	0	17,19,21	1.30	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	B	1	1,2	1/1/5/7	6/6/23/26	0/1/1/1
2	NAG	B	2	2	-	4/6/23/26	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	MAN	B	3	2	1/1/4/5	2/2/19/22	0/1/1/1
2	FUC	B	4	2	1/1/4/5	-	0/1/1/1
3	NAG	C	1	1,3	-	2/6/23/26	0/1/1/1
3	NAG	C	2	3	-	4/6/23/26	0/1/1/1
4	NAG	D	1	1,4	-	5/6/23/26	0/1/1/1
4	NAG	D	2	4	-	2/6/23/26	0/1/1/1
4	FUC	D	3	4	-	-	0/1/1/1
3	NAG	E	1	1,3	-	4/6/23/26	0/1/1/1
3	NAG	E	2	3	-	4/6/23/26	0/1/1/1

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	1	NAG	C1-C2	2.08	1.55	1.52

All (15) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	E	1	NAG	C1-O5-C5	5.71	119.93	112.19
3	E	1	NAG	O5-C1-C2	4.05	117.68	111.29
3	E	1	NAG	C3-C4-C5	-3.94	103.21	110.24
3	E	1	NAG	O5-C5-C6	3.36	112.47	107.20
4	D	1	NAG	C1-O5-C5	3.32	116.69	112.19
3	C	1	NAG	C1-O5-C5	3.08	116.36	112.19
4	D	2	NAG	C1-O5-C5	2.71	115.87	112.19
3	E	1	NAG	C4-C3-C2	-2.71	107.05	111.02
2	B	2	NAG	C4-C3-C2	2.64	114.89	111.02
3	E	2	NAG	C2-N2-C7	2.55	126.53	122.90
3	E	2	NAG	C1-O5-C5	2.51	115.59	112.19
3	E	2	NAG	O7-C7-C8	-2.39	117.61	122.06
2	B	2	NAG	C1-O5-C5	2.17	115.13	112.19
3	E	1	NAG	O4-C4-C3	2.08	115.15	110.35
3	C	1	NAG	O5-C1-C2	-2.05	108.06	111.29

All (3) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
2	B	1	NAG	C1
2	B	3	MAN	C1
2	B	4	FUC	C1

All (33) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	B	1	NAG	C8-C7-N2-C2
2	B	1	NAG	O7-C7-N2-C2
2	B	2	NAG	C8-C7-N2-C2
2	B	2	NAG	O7-C7-N2-C2
3	C	1	NAG	C8-C7-N2-C2
3	C	1	NAG	O7-C7-N2-C2
3	C	2	NAG	C8-C7-N2-C2
3	C	2	NAG	O7-C7-N2-C2
3	E	1	NAG	C8-C7-N2-C2
3	E	1	NAG	O7-C7-N2-C2
3	E	2	NAG	C3-C2-N2-C7
3	E	2	NAG	C8-C7-N2-C2
3	E	2	NAG	O7-C7-N2-C2
4	D	2	NAG	C8-C7-N2-C2
4	D	2	NAG	O7-C7-N2-C2
2	B	3	MAN	O5-C5-C6-O6
2	B	3	MAN	C4-C5-C6-O6
2	B	2	NAG	O5-C5-C6-O6
2	B	1	NAG	O5-C5-C6-O6
2	B	1	NAG	C1-C2-N2-C7
3	C	2	NAG	C4-C5-C6-O6
2	B	1	NAG	C4-C5-C6-O6
3	C	2	NAG	O5-C5-C6-O6
4	D	1	NAG	C1-C2-N2-C7
2	B	2	NAG	C4-C5-C6-O6
4	D	1	NAG	C8-C7-N2-C2
4	D	1	NAG	O7-C7-N2-C2
4	D	1	NAG	O5-C5-C6-O6
3	E	1	NAG	O5-C5-C6-O6
2	B	1	NAG	C3-C2-N2-C7
3	E	1	NAG	C3-C2-N2-C7
4	D	1	NAG	C3-C2-N2-C7
3	E	2	NAG	C4-C5-C6-O6

There are no ring outliers.

5 monomers are involved in 7 short contacts:
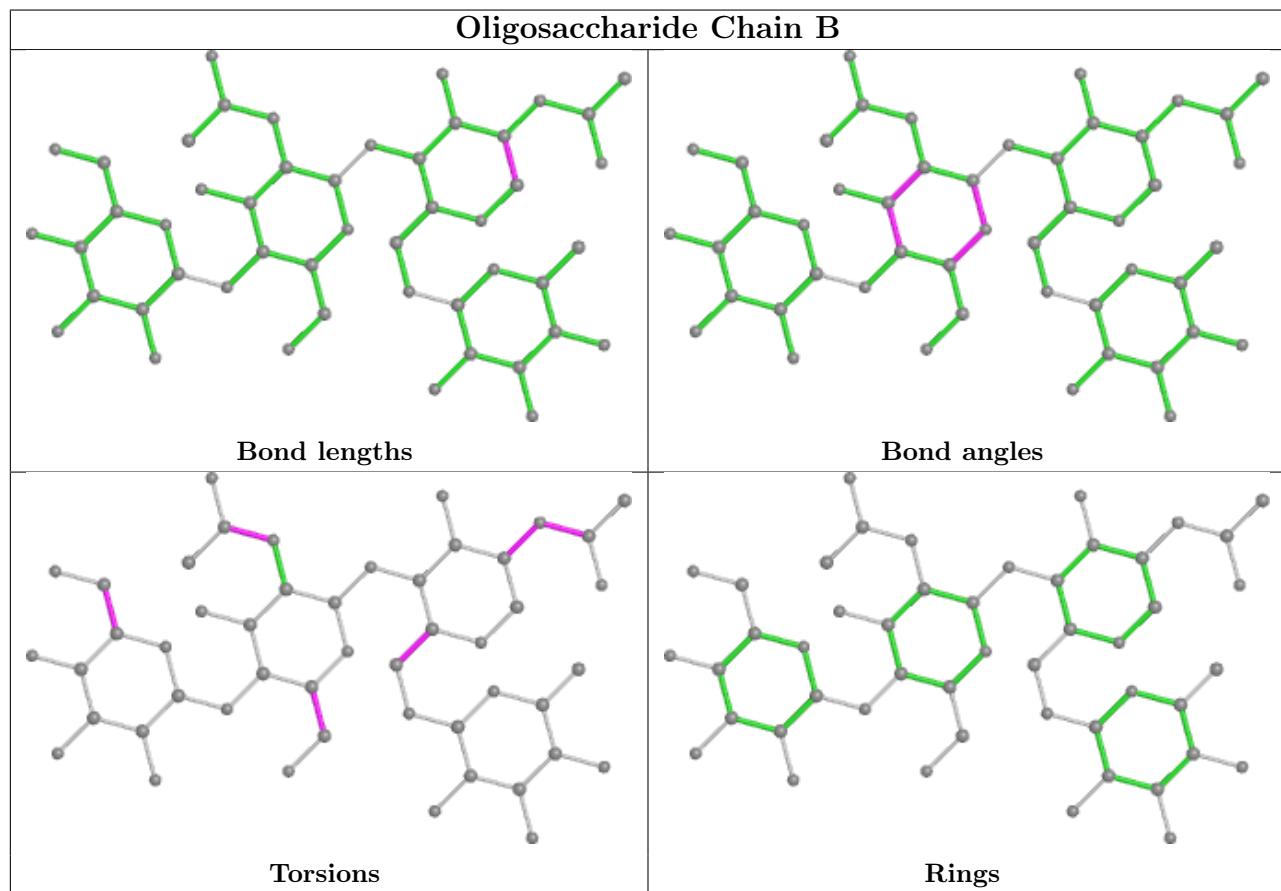
Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	D	2	NAG	2	0
4	D	1	NAG	3	0
3	E	1	NAG	2	0
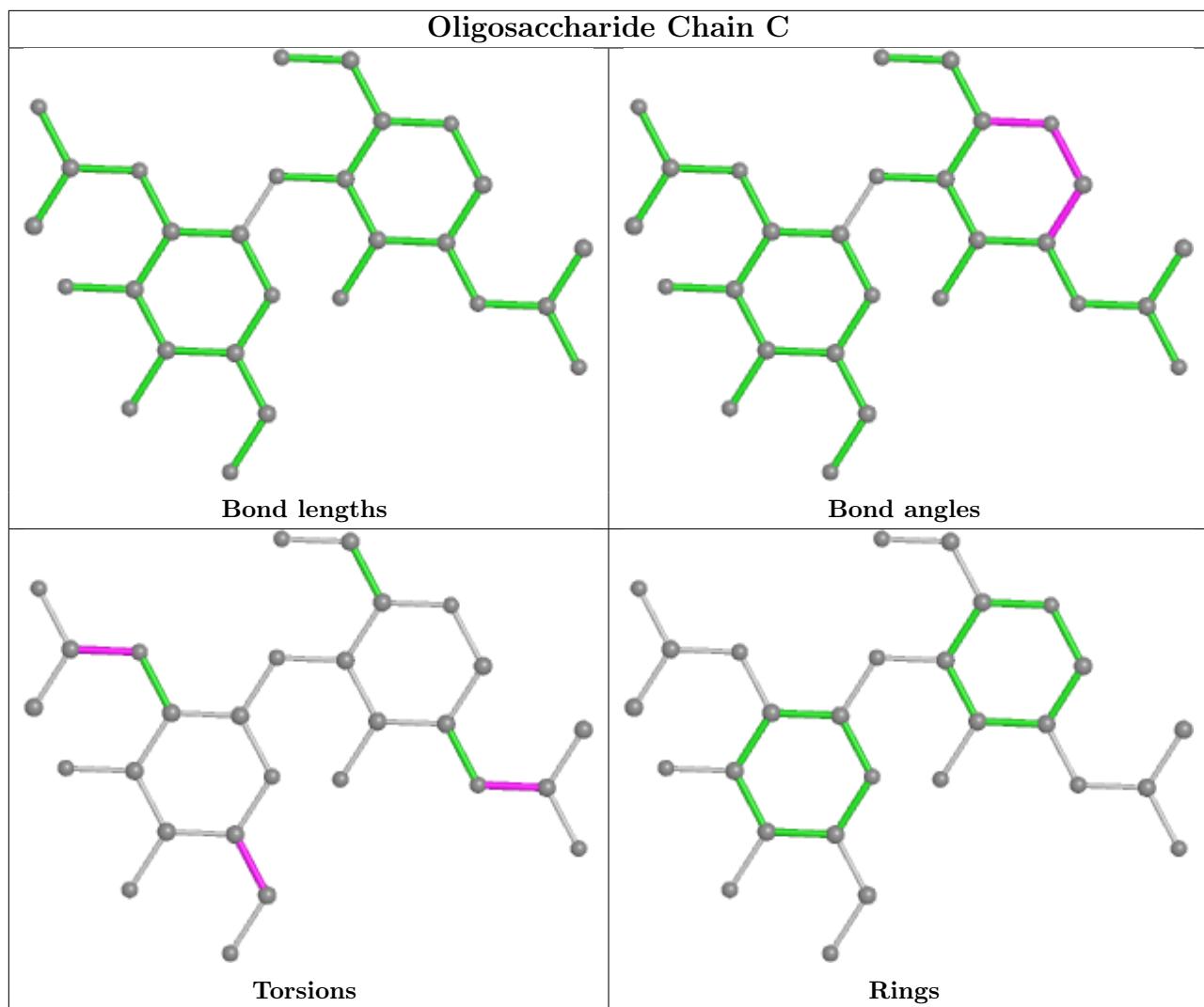
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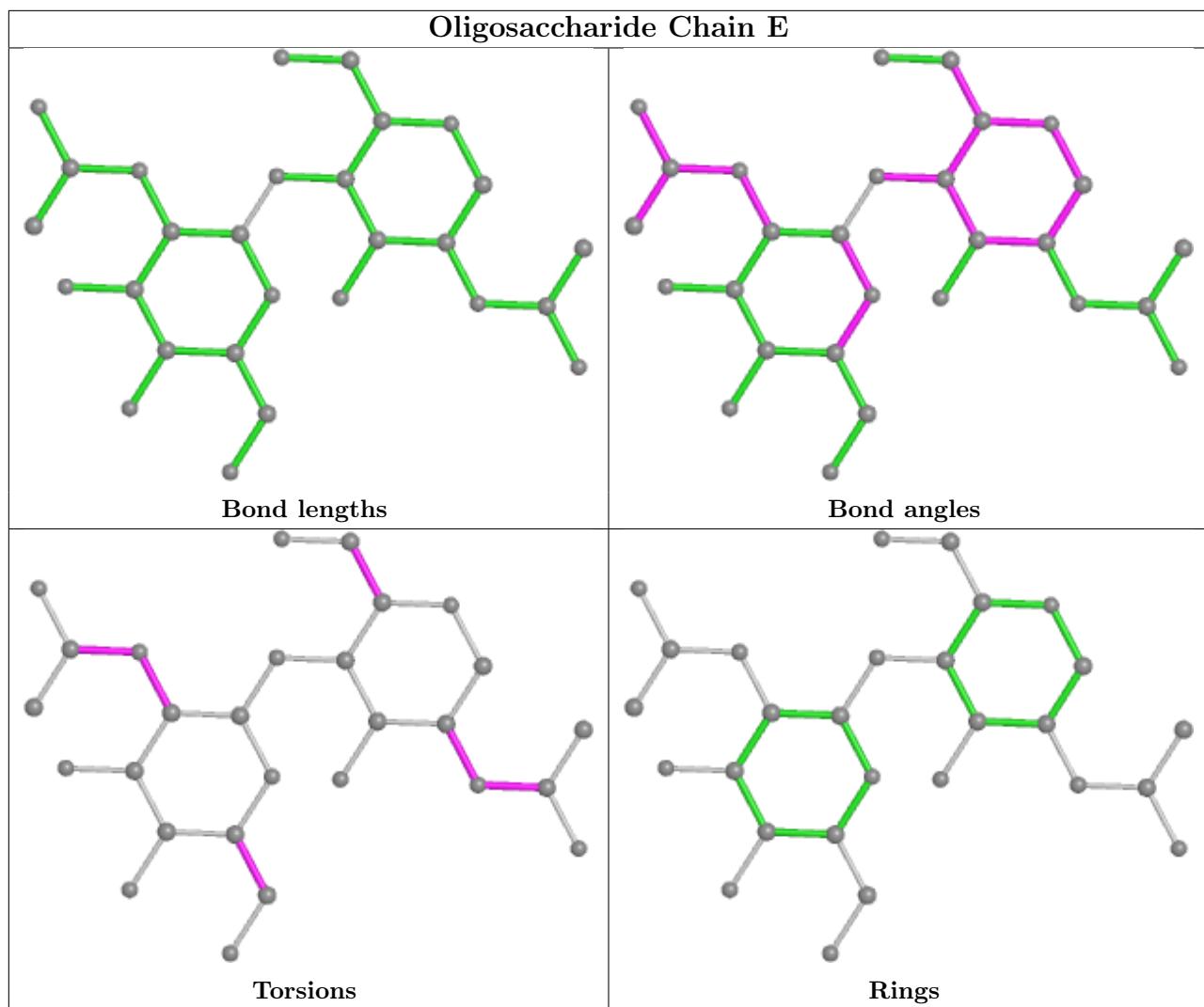
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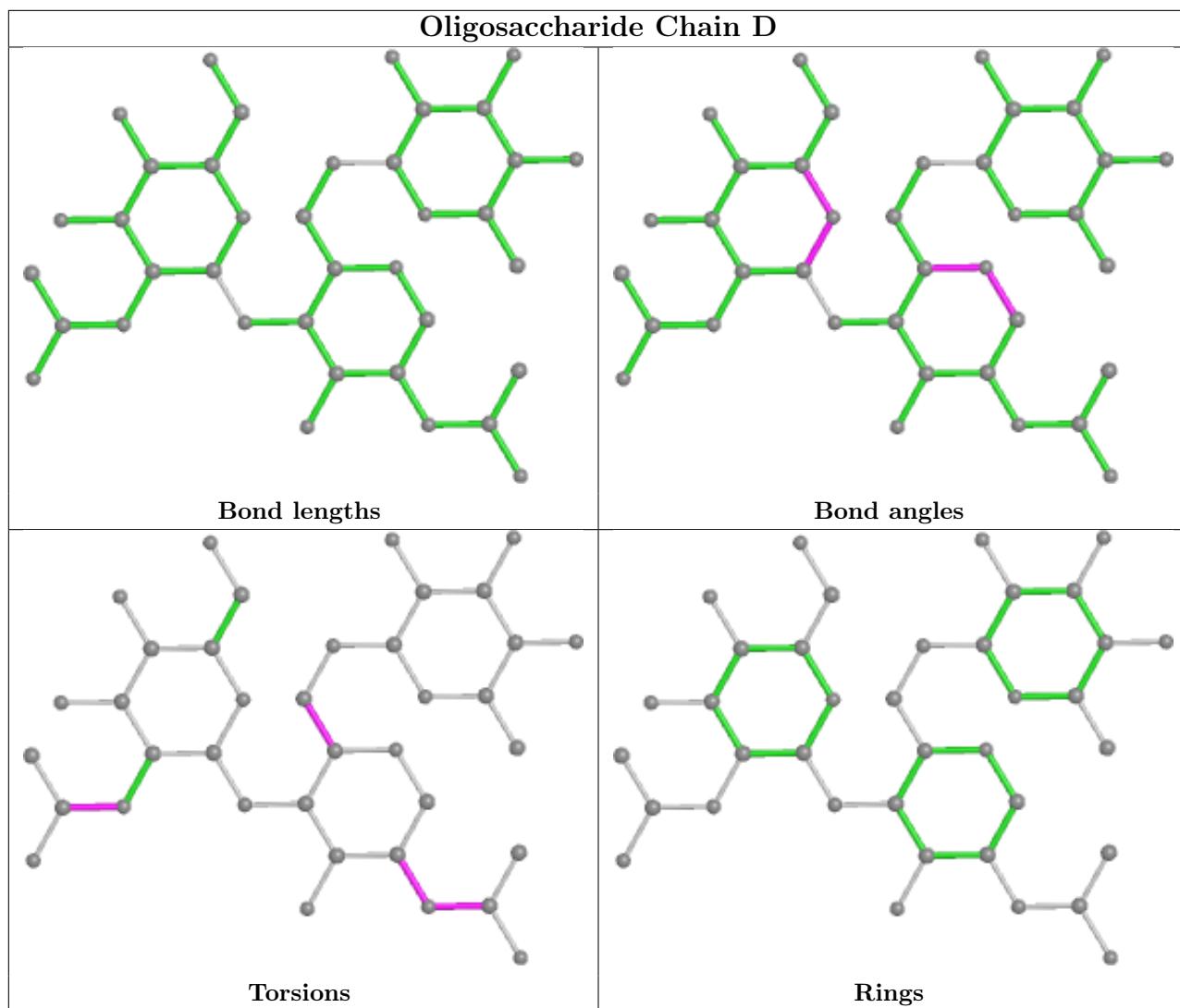
Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	B	1	NAG	1	0
3	C	2	NAG	1	0

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

Oligosaccharide Chain B

Bond lengths

Bond angles

Torsions

Rings

Oligosaccharide Chain C

Bond lengths

Bond angles

Torsions

Rings

Oligosaccharide Chain E

Bond lengths

Bond angles

Torsions

Rings

Oligosaccharide Chain D

Bond lengths

Bond angles

Torsions

Rings

5.6 Ligand geometry ⓘ

There are no ligands in this entry.

5.7 Other polymers ⓘ

There are no such residues in this entry.

5.8 Polymer linkage issues ⓘ

There are no chain breaks in this entry.

6   Fit of model and data ⓘ

6.1   Protein, DNA and RNA chains ⓘ

In the following table, the column labelled '#RSRZ> 2' contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 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(Å²)	Q<0.9
1	A	479/483 (99%)	-0.10	26 (5%)	25	12	33, 80, 176, 190	0

All (26) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	425	VAL	5.6
1	A	482	ALA	4.4
1	A	394	ASN	4.3
1	A	340	GLU	4.3
1	A	399	LYS	3.9
1	A	459	ARG	3.9
1	A	22	THR	3.4
1	A	200	GLN	3.3
1	A	480	THR	3.2
1	A	335	GLU	2.9
1	A	452	THR	2.9
1	A	461	SER	2.9
1	A	475	LYS	2.7
1	A	465	PHE	2.6
1	A	21	GLY	2.5
1	A	444	ALA	2.5
1	A	201	THR	2.5
1	A	393	ILE	2.4
1	A	483	SER	2.4
1	A	388	PHE	2.4
1	A	198	ASP	2.4
1	A	20	SER	2.3
1	A	481	GLU	2.2
1	A	442	LEU	2.2
1	A	19	PRO	2.1
1	A	144	ASN	2.0

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

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

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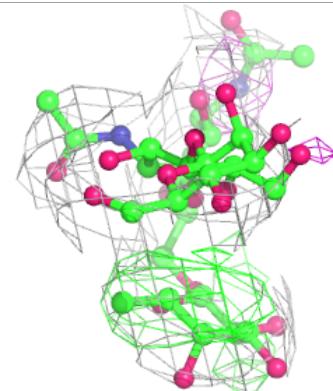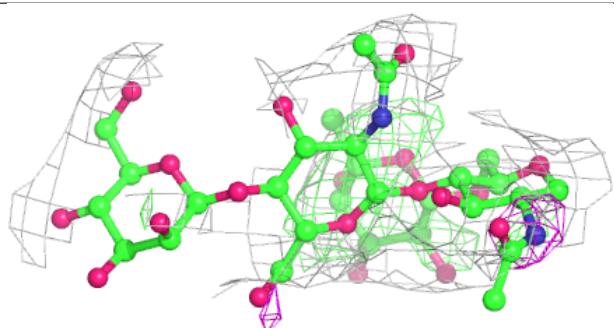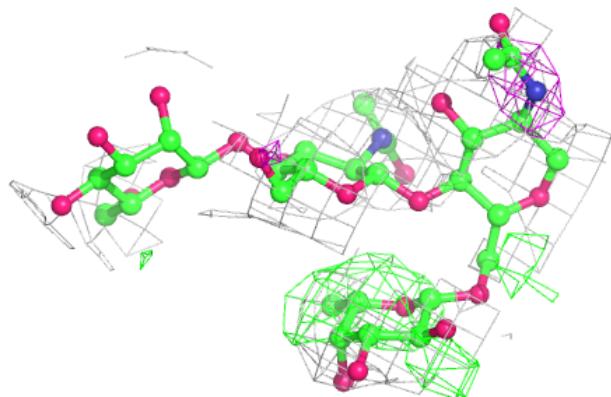
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists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

| Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
3	NAG	E	1	14/15	0.83	0.18	89,91,93,95	0
4	NAG	D	2	14/15	0.84	0.25	104,107,108,108	0
3	NAG	E	2	14/15	0.86	0.27	97,99,102,103	0
3	NAG	C	2	14/15	0.88	0.26	108,109,111,111	0
2	MAN	B	3	11/12	0.89	0.18	116,117,117,117	0
2	FUC	B	4	10/11	0.90	0.17	96,97,97,98	10
2	NAG	B	1	14/15	0.91	0.18	99,103,108,108	0
3	NAG	C	1	14/15	0.92	0.23	102,104,105,107	0
4	NAG	D	1	14/15	0.94	0.14	85,90,100,100	0
2	NAG	B	2	14/15	0.94	0.25	110,112,115,115	0
4	FUC	D	3	10/11	0.95	0.29	102,104,104,104	0
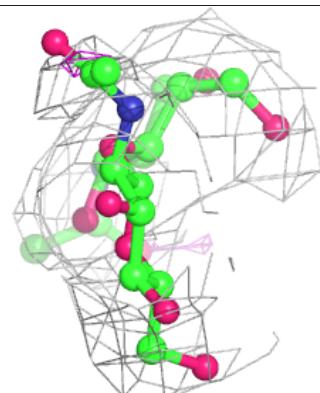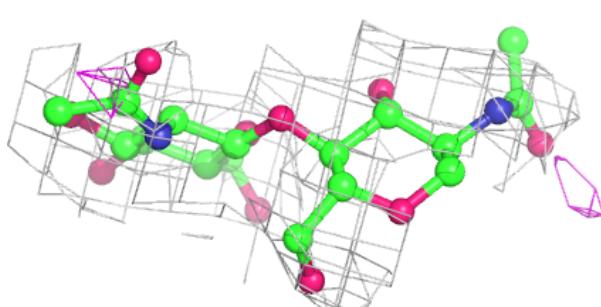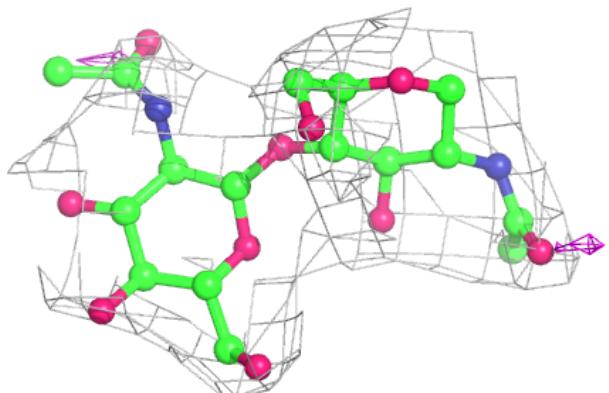
The following is a graphical depiction of the model fit to experimental electron density for oligosaccharide. Each fit is shown from different orientation to approximate a three-dimensional view.
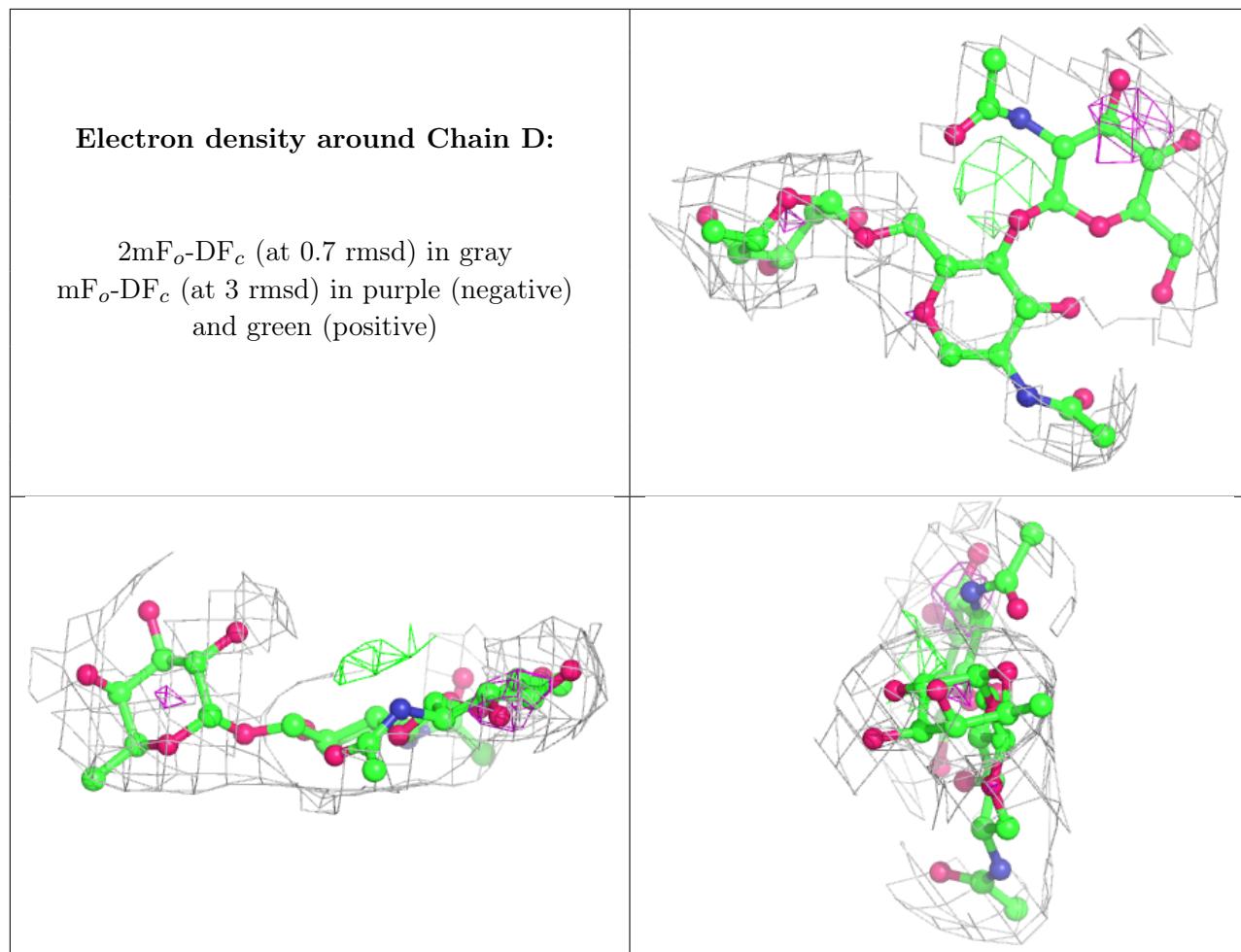
WORLDWIDE
wwPDB
PROTEIN DATA BANK

Electron density around Chain B:

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

Electron density around Chain C:

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

Electron density around Chain E:

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

Electron density around Chain D:

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

6.4   Ligands ⓘ

There are no ligands in this entry.

6.5   Other polymers ⓘ

There are no such residues in this entry.