Full wwPDB X-ray Structure Validation Report (i)

Feb 6, 2023 – 03:24 pm GMT

PDB ID	:	7R2X
Title	:	Paradendryphiella salina PL8 mannuronate-specific alginate lyase
Authors	:	Fredslung, F.; Welner, D.H.; Wilkens, C.
Deposited on	:	2022-02-06
Resolution	:	3.35 Å(reported)

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

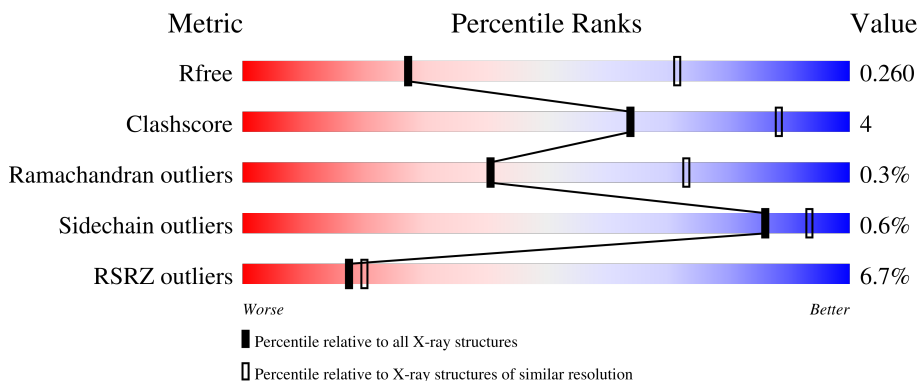|		
MolProbity	:	4.02b-467
Mogul	:	1.8.4, CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.32.1
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.32.1

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 3.35 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
Rfree		0.260
Clashscore		4
Ramachandran outliers		0.3%
Sidechain outliers		0.6%
RSRZ outliers		6.7%

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))
R$_{free}$	130704	1558 (3.42-3.30)
Clashscore	141614	1627 (3.42-3.30)
Ramachandran outliers	138981	1599 (3.42-3.30)
Sidechain outliers	138945	1598 (3.42-3.30)
RSRZ outliers	127900	1507 (3.42-3.30)

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	773	3% / 88% / 11% / •
1	B	773	10% / 86% / 13% / •

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
2	NAG	A	803	-	-	-	X

2 Entry composition ⓘ

There are 3 unique types of molecules in this entry. The entry contains 11928 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 Mannuronic acid specific lyase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	762	Total	C	N	O	S	0	0	0
			5914	3716	983	1193	22			
1	B	762	Total	C	N	O	S	0	0	0
			5914	3716	983	1193	22			

There are 20 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	22	GLU	-	expression tag	UNP A0A5Q5AD67
A	23	PHE	-	expression tag	UNP A0A5Q5AD67
A	787	VAL	-	expression tag	UNP A0A5Q5AD67
A	788	ASP	-	expression tag	UNP A0A5Q5AD67
A	789	HIS	-	expression tag	UNP A0A5Q5AD67
A	790	HIS	-	expression tag	UNP A0A5Q5AD67
A	791	HIS	-	expression tag	UNP A0A5Q5AD67
A	792	HIS	-	expression tag	UNP A0A5Q5AD67
A	793	HIS	-	expression tag	UNP A0A5Q5AD67
A	794	HIS	-	expression tag	UNP A0A5Q5AD67
B	22	GLU	-	expression tag	UNP A0A5Q5AD67
B	23	PHE	-	expression tag	UNP A0A5Q5AD67
B	787	VAL	-	expression tag	UNP A0A5Q5AD67
B	788	ASP	-	expression tag	UNP A0A5Q5AD67
B	789	HIS	-	expression tag	UNP A0A5Q5AD67
B	790	HIS	-	expression tag	UNP A0A5Q5AD67
B	791	HIS	-	expression tag	UNP A0A5Q5AD67
B	792	HIS	-	expression tag	UNP A0A5Q5AD67
B	793	HIS	-	expression tag	UNP A0A5Q5AD67
B	794	HIS	-	expression tag	UNP A0A5Q5AD67

- Molecule 2 is 2-acetamido-2-deoxy-beta-D-glucopyranose (three-letter code: NAG) (formula: $C_8H_{15}NO_6$) (labeled as "Ligand of Interest" by depositor).

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

- Molecule 3 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	1	Total 1	O 1	0	0
3	B	1	Total 1	O 1	0	0

3 Residue-property plots (i)

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

• Molecule 1: Mannuronic acid specific lyase

Chain A:

• Molecule 1: Mannuronic acid specific lyase

Chain B:
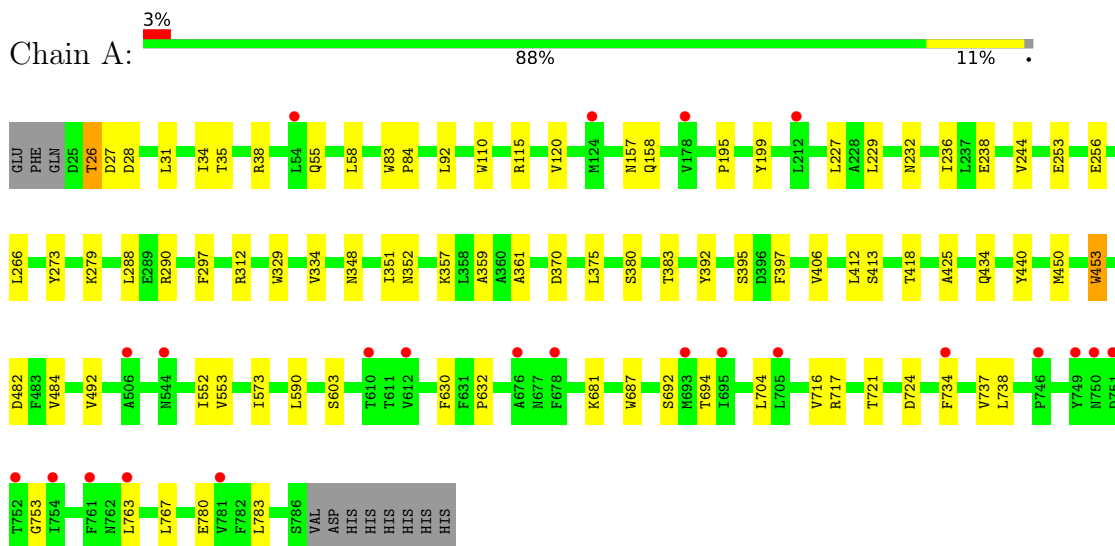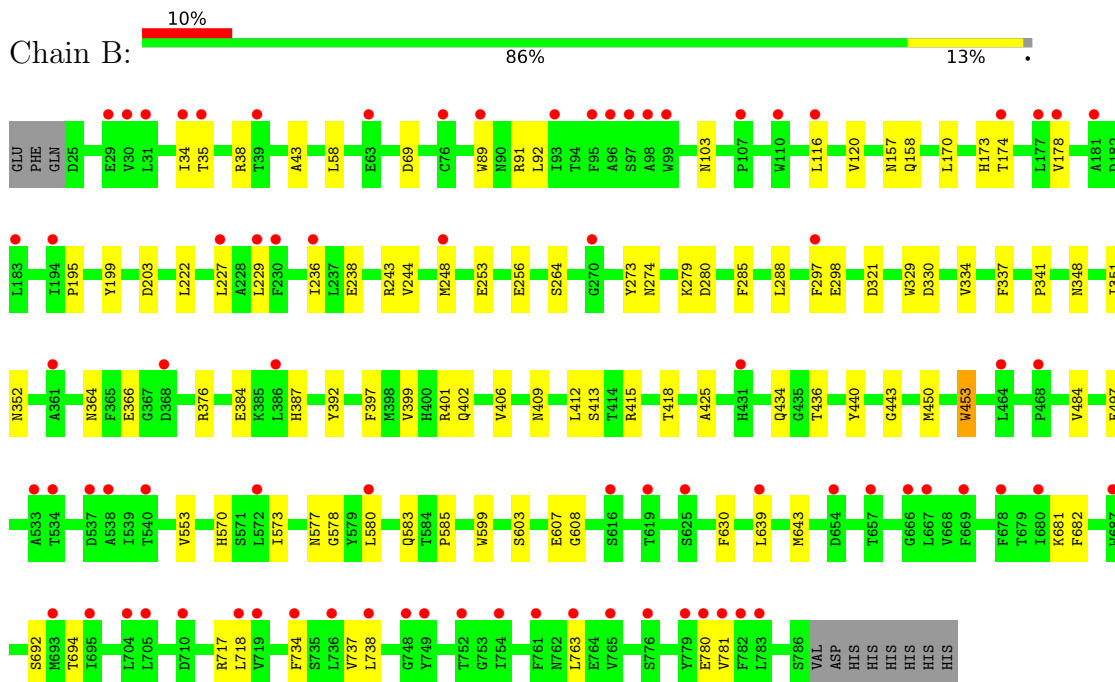
4 Data and refinement statistics ⓘ

Property	Value	Source
Space group	P 31	Depositor
Cell constants a, b, c, α, β, γ	108.89Å　　108.89Å　　150.49Å 90.00°　　　90.00°　　　120.00°	Depositor
Resolution (Å)	47.15　–　3.35 47.15　–　3.35	Depositor EDS
% Data completeness (in resolution range)	99.1 (47.15-3.35) 99.2 (47.15-3.35)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$<I/\sigma(I)>$ [1]	1.21 (at 3.33Å)	Xtriage
Refinement program	ISOLDE, PHENIX 1.19.2_4158, REFMAC 5	Depositor
R, R_{free}	0.207　,　0.245 0.223　,　0.260	Depositor DCC
R_{free} test set	1430 reflections (5.00%)	wwPDB-VP
Wilson B-factor (Å^2)	133.4	Xtriage
Anisotropy	0.407	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.28 , 117.7	EDS
L-test for twinning [2]	$<|L|> = 0.44, <L^2> = 0.27$	Xtriage
Estimated twinning fraction	0.046 for -h,-k,l 0.067 for h,-h-k,-l 0.057 for -k,-h,-l	Xtriage
F_o,F_c correlation	0.95	EDS
Total number of atoms	11928	wwPDB-VP
Average B, all atoms (Å^2)	184.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.67% 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: 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	0.24	0/6055	0.46	0/8255
1	B	0.24	0/6055	0.46	0/8255
All	All	0.24	0/12110	0.46	0/16510

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts ⓘ

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	5914	0	5547	45	0
1	B	5914	0	5546	53	0
2	A	42	0	39	2	0
2	B	56	0	52	0	0
3	A	1	0	0	0	0
3	B	1	0	0	0	0
All	All	11928	0	11184	97	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 4.

All (97) 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:734:PHE:HB3	1:A:763:LEU:HB3	1.72	0.70
1:A:279:LYS:HD2	1:A:352:ASN:HB2	1.77	0.67
1:A:694:THR:HB	1:A:737:VAL:HB	1.77	0.67
1:A:753:GLY:HA2	1:B:366:GLU:HG2	1.76	0.66
1:B:415:ARG:NH2	1:B:484:VAL:O	2.31	0.64
1:A:687:TRP:HB3	1:A:716:VAL:HG21	1.79	0.64
1:B:253:GLU:HB2	1:B:256:GLU:HB2	1.79	0.63
1:B:279:LYS:HD2	1:B:352:ASN:HB2	1.81	0.63
1:B:392:TYR:HB2	1:B:397:PHE:HB3	1.81	0.62
1:B:681:LYS:HA	1:B:692:SER:HA	1.82	0.62
1:A:412:LEU:HD22	1:A:434:GLN:HG2	1.82	0.62
1:A:717:ARG:NH1	1:A:780:GLU:OE2	2.31	0.62
1:A:359:ALA:HA	1:A:375:LEU:HD13	1.82	0.61
1:B:580:LEU:HD13	1:B:643:MET:HG2	1.83	0.60
1:B:264:SER:HA	1:B:274:ASN:HD21	1.66	0.60
1:B:334:VAL:HG11	1:B:348:ASN:HB3	1.83	0.59
1:B:43:ALA:O	1:B:103:ASN:ND2	2.36	0.59
1:B:244:VAL:HG11	1:B:288:LEU:HD12	1.84	0.58
1:A:110:TRP:CZ2	2:A:803:NAG:H62	2.37	0.58
1:B:35:THR:HA	1:B:229:LEU:HD13	1.86	0.58
1:A:704:LEU:HB2	1:A:721:THR:HB	1.87	0.57
1:A:58:LEU:HD22	1:A:115:ARG:HH21	1.69	0.57
1:B:92:LEU:HD22	1:B:120:VAL:HA	1.87	0.57
1:A:450:MET:HA	1:A:453:TRP:HB2	1.87	0.56
1:A:253:GLU:HB2	1:A:256:GLU:HB2	1.88	0.56
1:B:387:HIS:NE2	1:B:402:GLN:OE1	2.39	0.56
1:B:734:PHE:HB3	1:B:763:LEU:HB3	1.87	0.56
1:A:238:GLU:HG2	1:A:297:PHE:HE1	1.71	0.56
1:B:195:PRO:HG2	1:B:227:LEU:HD13	1.88	0.55
1:B:38:ARG:HD3	1:B:229:LEU:HD12	1.89	0.55
1:B:203:ASP:OD2	1:B:243:ARG:NH2	2.38	0.55
1:A:35:THR:HA	1:A:229:LEU:HD13	1.89	0.54
1:A:38:ARG:HD3	1:A:229:LEU:HD12	1.90	0.54
1:B:34:ILE:HG22	1:B:229:LEU:HD11	1.89	0.54
1:B:717:ARG:NH1	1:B:780:GLU:OE2	2.37	0.54
1:B:413:SER:HB3	1:B:484:VAL:HB	1.90	0.53
1:B:412:LEU:HD22	1:B:434:GLN:HG2	1.90	0.53
1:A:55:GLN:HE21	2:A:803:NAG:H61	1.74	0.53
1:B:450:MET:HA	1:B:453:TRP:HB2	1.92	0.52
1:B:58:LEU:HD21	1:B:116:LEU:HD23	1.91	0.51
1:A:92:LEU:HD22	1:A:120:VAL:HA	1.93	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:425:ALA:HA	1:B:603:SER:HA	1.92	0.51
1:A:31:LEU:HD21	1:A:232:ASN:HA	1.91	0.51
1:B:321:ASP:HA	1:B:443:GLY:HA3	1.93	0.51
1:B:376:ARG:NH1	1:B:384:GLU:OE1	2.44	0.51
1:B:199:TYR:CZ	1:B:236:ILE:HG23	2.46	0.51
1:B:157:ASN:OD1	1:B:158:GLN:N	2.44	0.50
1:A:413:SER:HB3	1:A:484:VAL:HB	1.94	0.50
1:B:248:MET:SD	1:B:285:PHE:HB2	2.52	0.50
1:A:681:LYS:HA	1:A:692:SER:HA	1.94	0.49
1:B:298:GLU:OE2	1:B:364:ASN:ND2	2.45	0.49
1:B:682:PHE:HZ	1:B:738:LEU:HD22	1.78	0.49
1:A:290:ARG:HG3	1:A:361:ALA:HB2	1.94	0.48
1:B:570:HIS:CE1	1:B:585:PRO:HB3	2.48	0.48
1:B:238:GLU:HG2	1:B:297:PHE:HE1	1.77	0.48
1:B:38:ARG:HH22	1:B:222:LEU:HG	1.78	0.48
1:A:34:ILE:HG22	1:A:229:LEU:HD11	1.94	0.48
1:A:26:THR:O	1:A:28:ASP:N	2.46	0.48
1:A:266:LEU:HD21	1:A:395:SER:HB3	1.95	0.48
1:B:329:TRP:NE1	1:B:351:ILE:HA	2.29	0.47
1:A:552:ILE:HG21	1:A:590:LEU:HD13	1.95	0.47
1:B:409:ASN:ND2	1:B:436:THR:O	2.36	0.47
1:A:244:VAL:HG11	1:A:288:LEU:HD12	1.95	0.47
1:B:484:VAL:HG22	1:B:497:GLU:HA	1.96	0.46
1:A:157:ASN:OD1	1:A:158:GLN:N	2.49	0.46
1:A:630:PHE:CE2	1:A:632:PRO:HG3	2.51	0.45
1:A:26:THR:C	1:A:28:ASP:H	2.20	0.45
1:A:724:ASP:HB2	1:A:767:LEU:HD13	1.98	0.45
1:B:553:VAL:HB	1:B:573:ILE:HB	1.97	0.45
1:B:174:THR:O	1:B:178:VAL:HG22	2.18	0.44
1:A:738:LEU:HD11	1:A:783:LEU:HD22	1.98	0.44
1:B:89:TRP:HB2	1:B:170:LEU:HD13	2.00	0.44
1:A:380:SER:HB2	1:A:383:THR:OG1	2.17	0.44
1:B:694:THR:HB	1:B:737:VAL:HB	2.00	0.44
1:A:392:TYR:HB2	1:A:397:PHE:HB3	2.00	0.43
1:A:199:TYR:CZ	1:A:236:ILE:HG23	2.53	0.43
1:A:553:VAL:HB	1:A:573:ILE:HB	2.01	0.43
1:A:492:VAL:HG23	1:A:704:LEU:HD13	2.00	0.43
1:A:329:TRP:NE1	1:A:351:ILE:HA	2.34	0.42
1:B:334:VAL:HG12	1:B:337:PHE:HB2	2.01	0.42
1:A:195:PRO:HG2	1:A:227:LEU:HD13	2.02	0.42
1:B:577:ASN:HB3	1:B:630:PHE:HE1	1.85	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:341:PRO:HG3	1:B:607:GLU:HG3	2.02	0.42
1:A:290:ARG:HD2	1:A:357:LYS:O	2.20	0.41
1:A:425:ALA:HA	1:A:603:SER:HA	2.02	0.41
1:A:334:VAL:HG11	1:A:348:ASN:HB3	2.02	0.41
1:B:279:LYS:NZ	1:B:280:ASP:OD1	2.47	0.41
1:A:406:VAL:HB	1:A:440:TYR:HB2	2.02	0.41
1:A:83:TRP:HD1	1:A:84:PRO:HD2	1.86	0.41
1:B:330:ASP:O	1:B:334:VAL:HG23	2.20	0.41
1:B:399:VAL:HG12	1:B:401:ARG:HG3	2.03	0.41
1:B:69:ASP:OD2	1:B:91:ARG:NH2	2.37	0.40
1:B:406:VAL:HB	1:B:440:TYR:HB2	2.03	0.40
1:B:578:GLY:HA3	1:B:639:LEU:HD11	2.02	0.40
1:B:599:TRP:N	1:B:608:GLY:O	2.48	0.40
1:A:312:ARG:NH2	1:A:370:ASP:O	2.54	0.40
1:B:718:LEU:HB3	1:B:781:VAL:HG23	2.03	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	760/773 (98%)	718 (94%)	40 (5%)	2 (0%)	41	73
1	B	760/773 (98%)	719 (95%)	39 (5%)	2 (0%)	41	73
All	All	1520/1546 (98%)	1437 (94%)	79 (5%)	4 (0%)	41	73

All (4) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	27	ASP
1	A	418	THR
1	B	418	THR

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Mol	Chain	Res	Type
1	B	583	GLN

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	636/647 (98%)	632 (99%)	4 (1%)	86	93
1	B	636/647 (98%)	633 (100%)	3 (0%)	88	94
All	All	1272/1294 (98%)	1265 (99%)	7 (1%)	86	93

All (7) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	26	THR
1	A	273	TYR
1	A	453	TRP
1	A	482	ASP
1	B	173	HIS
1	B	273	TYR
1	B	453	TRP

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. There are no such sidechains identified.

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 ⓘ

There are no monosaccharides in this entry.

5.6 Ligand geometry ⓘ

7 ligands 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	A	801	1	14,14,15	0.27	0	17,19,21	0.44	0
2	NAG	B	802	1	14,14,15	0.27	0	17,19,21	0.53	0
2	NAG	A	802	1	14,14,15	0.27	0	17,19,21	0.45	0
2	NAG	B	801	1	14,14,15	0.26	0	17,19,21	0.47	0
2	NAG	B	803	1	14,14,15	0.18	0	17,19,21	0.42	0
2	NAG	B	804	1	14,14,15	0.23	0	17,19,21	0.42	0
2	NAG	A	803	1	14,14,15	0.27	0	17,19,21	0.36	0

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	NAG	A	801	1	-	0/6/23/26	0/1/1/1
2	NAG	B	802	1	-	2/6/23/26	0/1/1/1
2	NAG	A	802	1	-	0/6/23/26	0/1/1/1
2	NAG	B	801	1	-	2/6/23/26	0/1/1/1
2	NAG	B	803	1	-	0/6/23/26	0/1/1/1
2	NAG	B	804	1	-	0/6/23/26	0/1/1/1
2	NAG	A	803	1	-	2/6/23/26	0/1/1/1

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (6) torsion outliers are listed below:

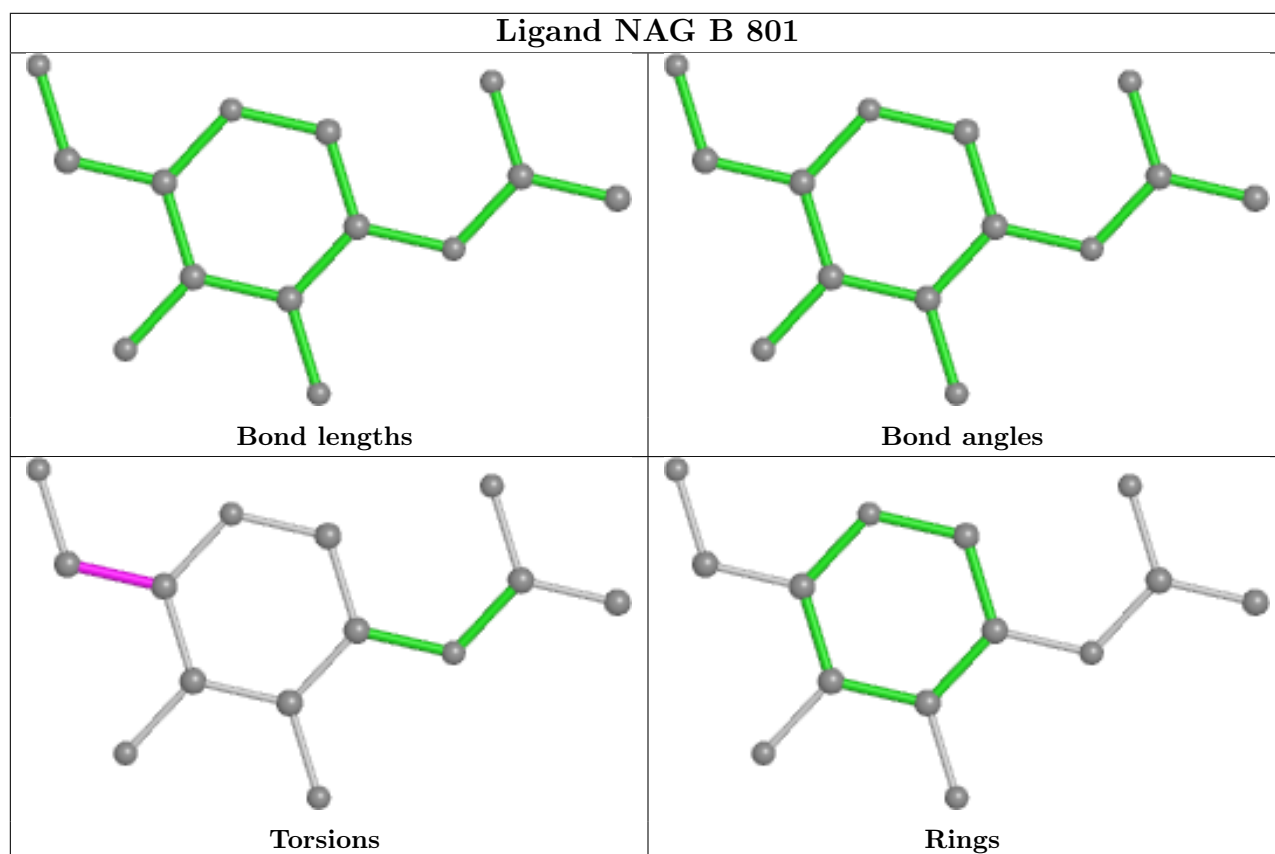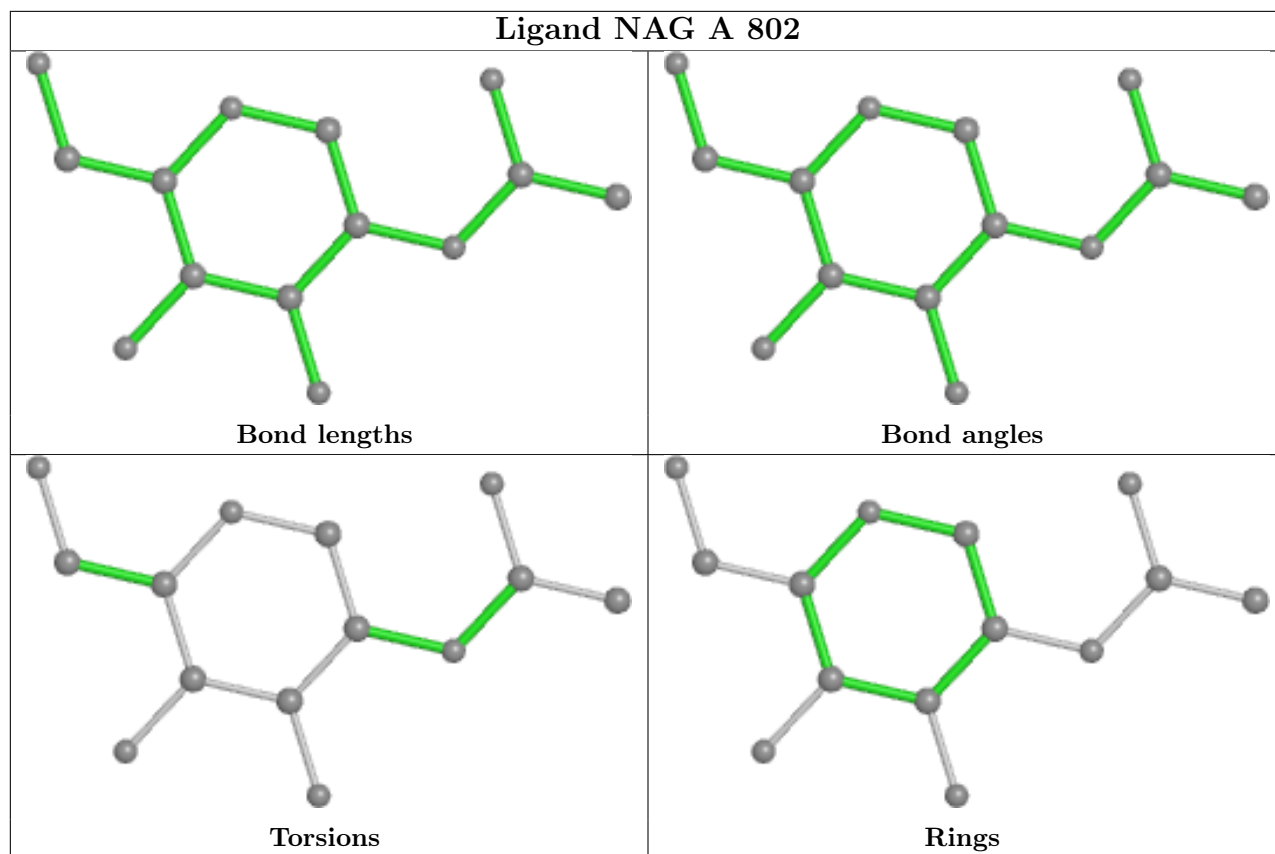| Mol	Chain	Res	Type	Atoms
2	B	801	NAG	O5-C5-C6-O6
2	B	802	NAG	O5-C5-C6-O6
2	B	801	NAG	C4-C5-C6-O6
2	A	803	NAG	C4-C5-C6-O6
2	B	802	NAG	C4-C5-C6-O6
2	A	803	NAG	O5-C5-C6-O6

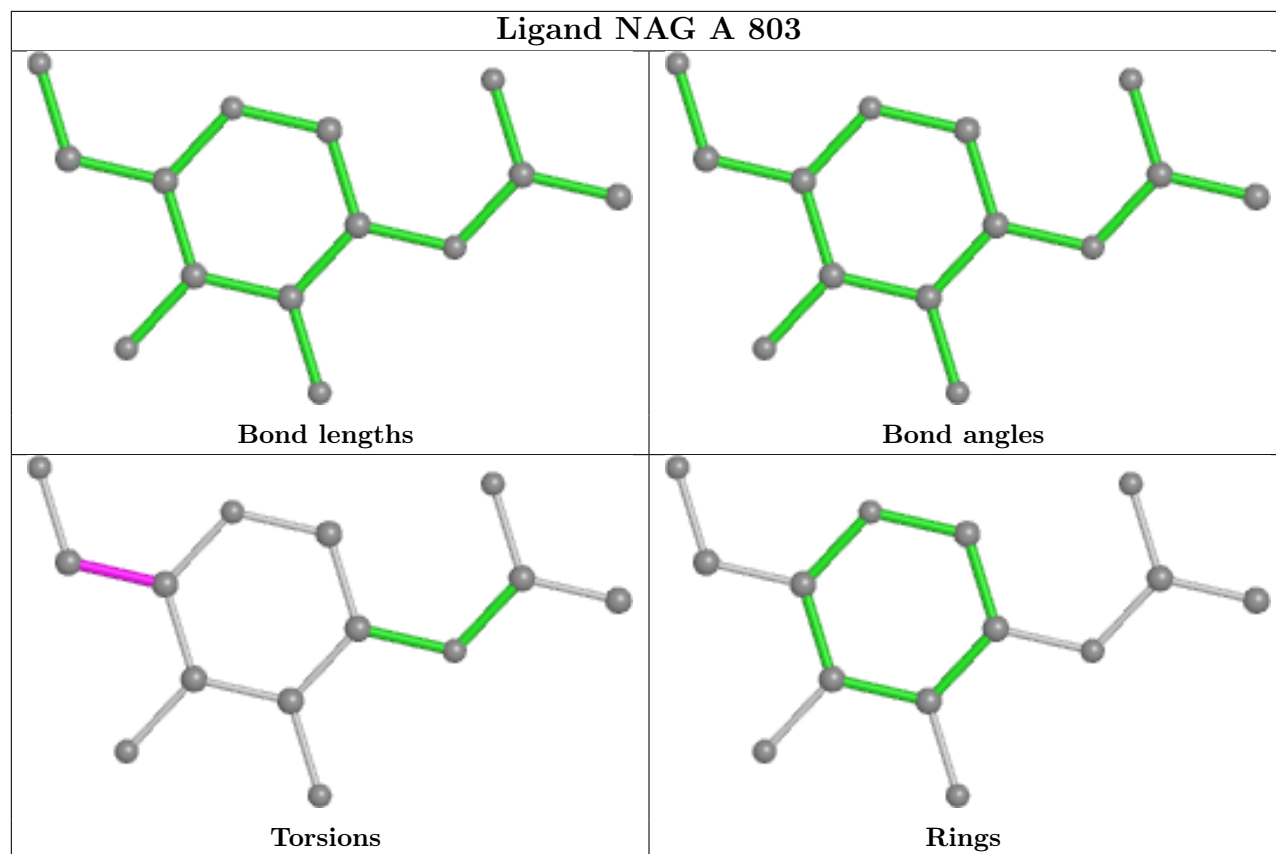There are no ring outliers.

1 monomer is involved in 2 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	803	NAG	2	0

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

Ligand NAG A 801

Bond lengths

Bond angles

Torsions

Rings

Ligand NAG B 802

Bond lengths

Bond angles

Torsions

Rings

Ligand NAG A 802

Bond lengths

Bond angles

Torsions

Rings

Ligand NAG B 801

Bond lengths

Bond angles

Torsions

Rings

Ligand NAG B 803

Bond lengths

Bond angles

Torsions

Rings

Ligand NAG B 804

Bond lengths

Bond angles

Torsions

Rings

Ligand NAG A 803
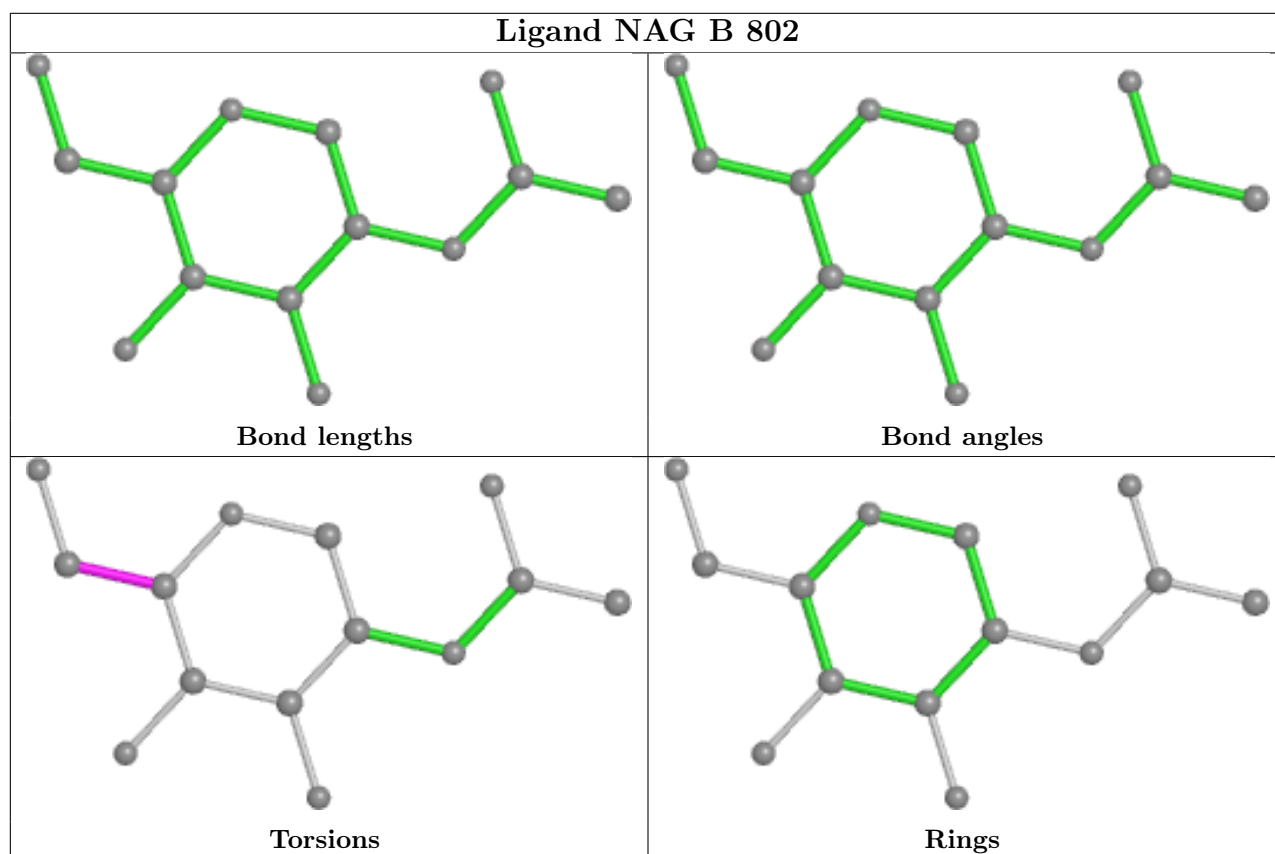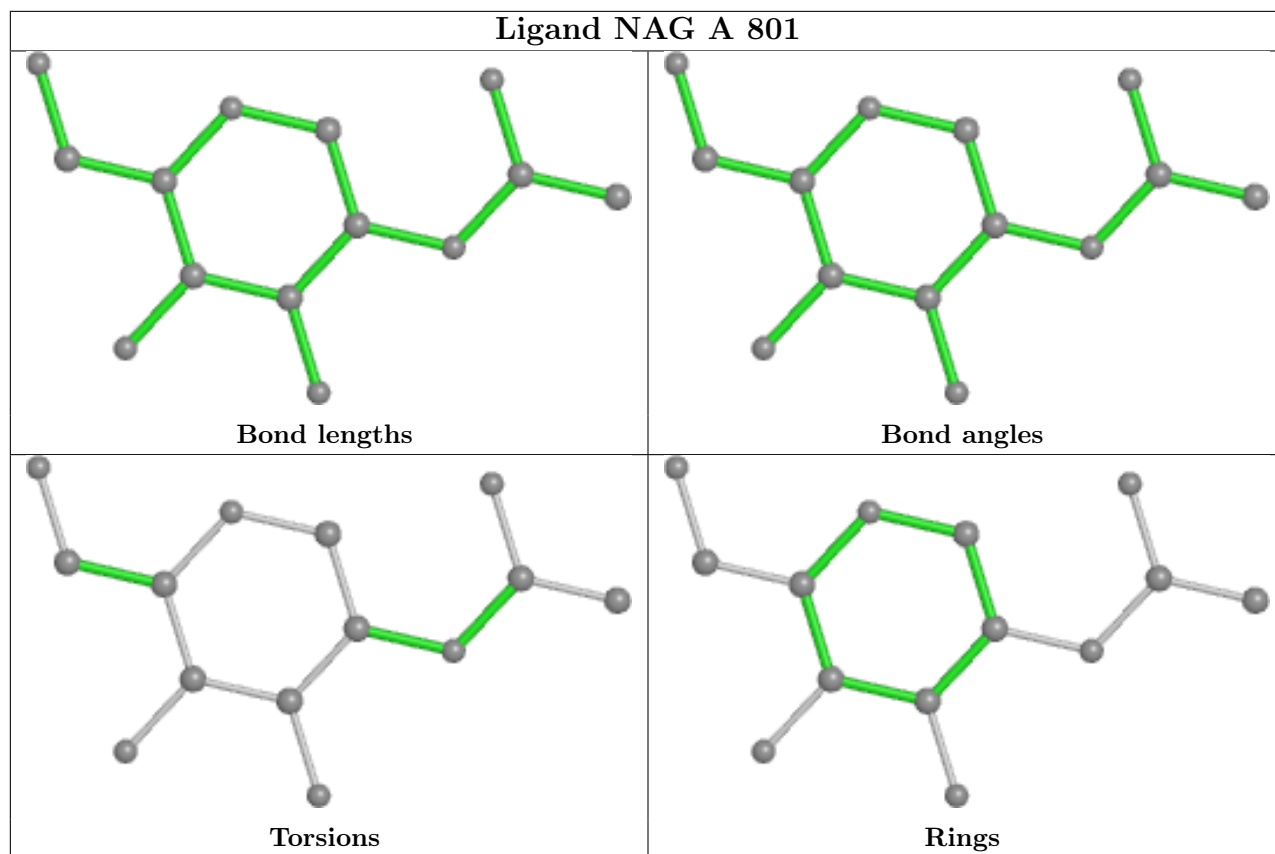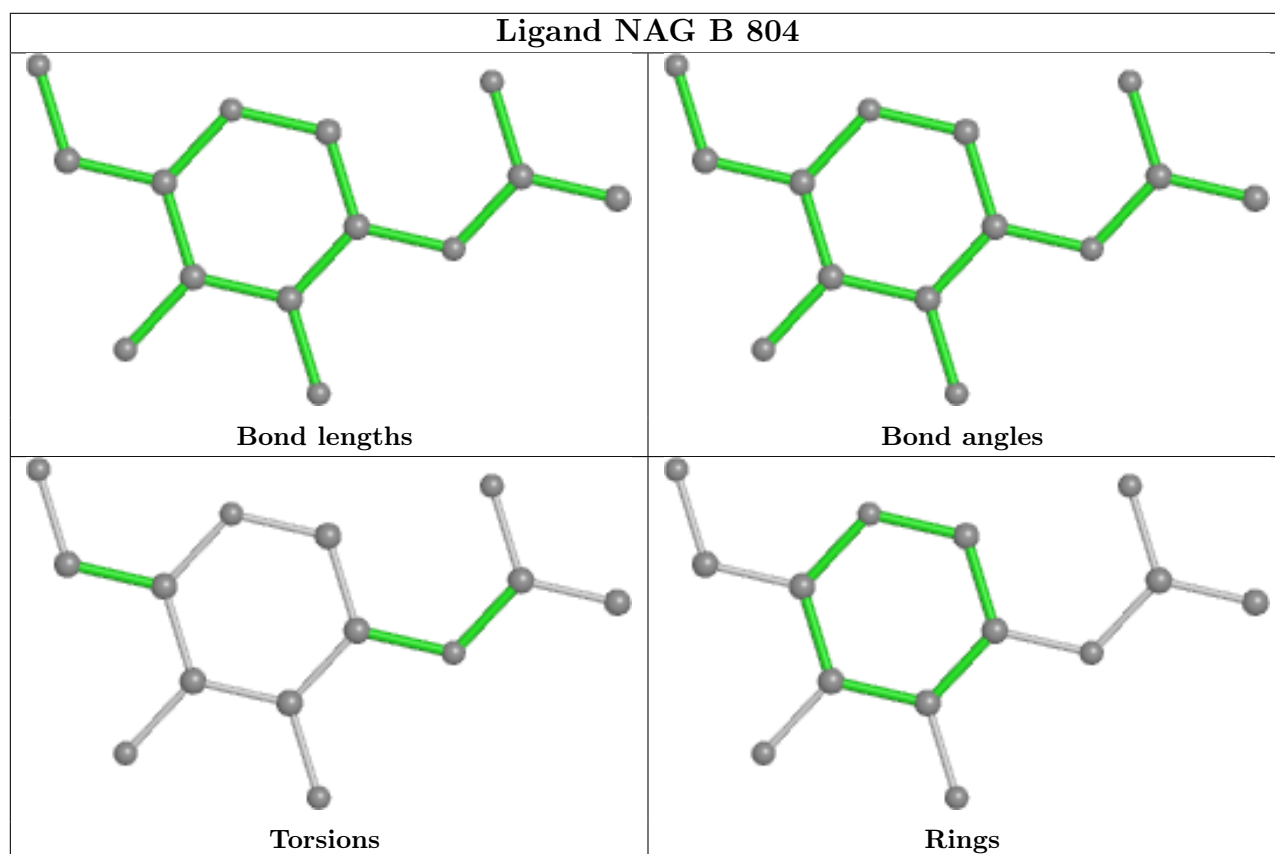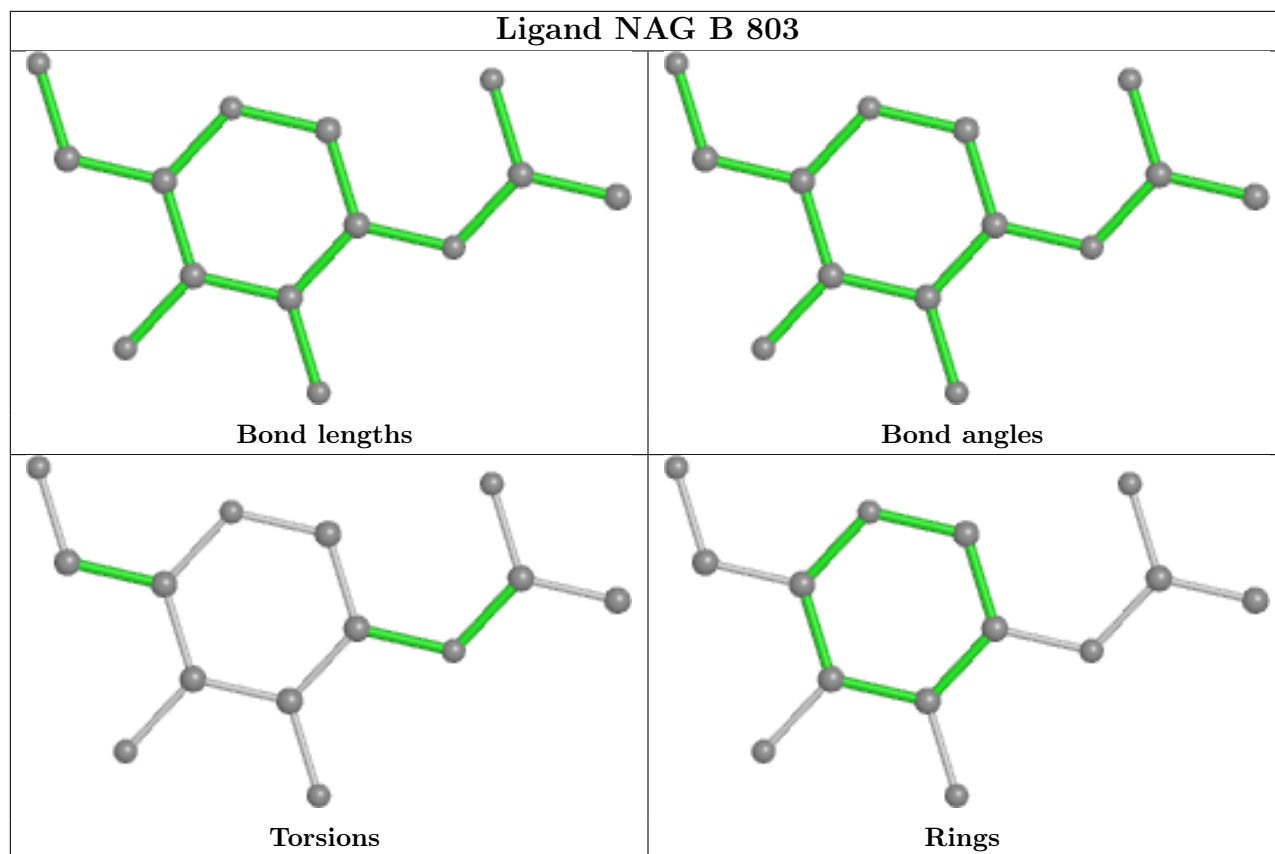
5.7 Other polymers ⓘ

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(Å^2)	Q<0.9
1	A	762/773 (98%)	0.16	23 (3%)	50	53	98, 156, 228, 469	0
1	B	762/773 (98%)	0.46	79 (10%)	6	7	119, 203, 296, 377	0
All	All	1524/1546 (98%)	0.31	102 (6%)	17	20	98, 176, 282, 469	0

All (102) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	178	VAL	10.2
1	B	763	LEU	8.4
1	B	734	PHE	7.8
1	A	506	ALA	6.6
1	B	174	THR	6.0
1	B	678	PHE	5.7
1	A	734	PHE	5.6
1	B	30	VAL	5.4
1	B	761	PHE	5.4
1	B	297	PHE	4.9
1	A	752	THR	4.8
1	B	736	LEU	4.6
1	A	750	ASN	4.5
1	A	754	ILE	4.5
1	B	781	VAL	4.4
1	B	181	ALA	4.4
1	B	116	LEU	4.3
1	B	95	PHE	4.2
1	B	99	TRP	4.1
1	B	667	LEU	4.1
1	B	718	LEU	4.0
1	B	229	LEU	4.0
1	B	230	PHE	3.9
1	A	749	TYR	3.8

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Mol	Chain	Res	Type	RSRZ
1	B	779	TYR	3.7
1	B	34	ILE	3.6
1	B	695	ILE	3.5
1	B	63	GLU	3.5
1	B	749	TYR	3.5
1	B	669	PHE	3.4
1	B	765	VAL	3.4
1	B	107	PRO	3.3
1	B	752	THR	3.3
1	B	236	ILE	3.3
1	A	751	ASP	3.3
1	B	666	GLY	3.2
1	B	270	GLY	3.1
1	B	783	LEU	3.1
1	B	31	LEU	3.1
1	B	680	ILE	3.0
1	B	639	LEU	3.0
1	B	248	MET	3.0
1	B	719	VAL	2.9
1	B	464	LEU	2.9
1	B	183	LEU	2.9
1	B	534	THR	2.9
1	B	780	GLU	2.9
1	B	368	ASP	2.9
1	A	54	LEU	2.8
1	B	110	TRP	2.8
1	A	610	THR	2.8
1	B	572	LEU	2.7
1	B	96	ALA	2.7
1	B	29	GLU	2.7
1	B	538	ALA	2.7
1	B	194	ILE	2.7
1	B	710	ASP	2.7
1	B	580	LEU	2.6
1	A	695	ILE	2.6
1	A	212	LEU	2.6
1	B	537	ASP	2.6
1	A	693	MET	2.6
1	A	678	PHE	2.5
1	B	39	THR	2.5
1	B	619	THR	2.5
1	B	704	LEU	2.5

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Mol	Chain	Res	Type	RSRZ
1	B	177	LEU	2.5
1	B	361	ALA	2.5
1	B	754	ILE	2.5
1	A	746	PRO	2.4
1	B	76	CYS	2.4
1	B	93	ILE	2.4
1	B	687	TRP	2.4
1	A	124	MET	2.4
1	B	693	MET	2.3
1	B	468	PRO	2.3
1	B	705	LEU	2.3
1	B	431	HIS	2.3
1	B	782	PHE	2.3
1	B	89	TRP	2.2
1	B	540	THR	2.2
1	A	178	VAL	2.2
1	B	97	SER	2.2
1	B	738	LEU	2.2
1	B	654	ASP	2.2
1	A	761	PHE	2.2
1	B	657	THR	2.2
1	B	776	SER	2.2
1	A	763	LEU	2.1
1	B	616	SER	2.1
1	B	35	THR	2.1
1	A	705	LEU	2.1
1	B	748	GLY	2.1
1	B	98	ALA	2.1
1	A	781	VAL	2.1
1	A	544	ASN	2.1
1	B	227	LEU	2.1
1	A	676	ALA	2.0
1	B	386	LEU	2.0
1	A	612	VAL	2.0
1	B	625	SER	2.0
1	B	533	ALA	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 (i)

There are no monosaccharides in this entry.

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
2	NAG	A	803	14/15	0.77	0.41	226,241,249,250	0
2	NAG	A	802	14/15	0.85	0.22	148,155,160,161	0
2	NAG	B	803	14/15	0.89	0.20	178,193,197,197	0
2	NAG	B	804	14/15	0.90	0.23	181,189,201,202	0
2	NAG	B	801	14/15	0.91	0.33	183,194,204,208	0
2	NAG	B	802	14/15	0.91	0.17	160,182,204,218	0
2	NAG	A	801	14/15	0.92	0.23	147,180,200,204	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.
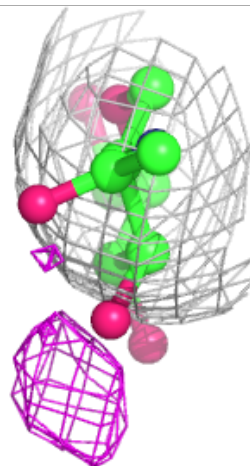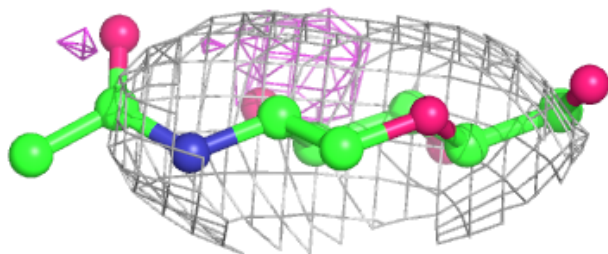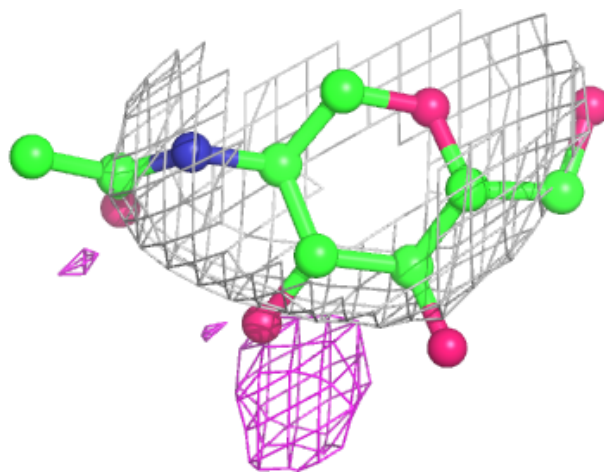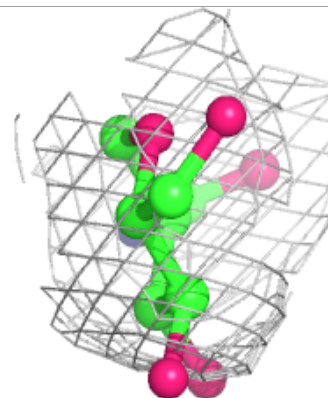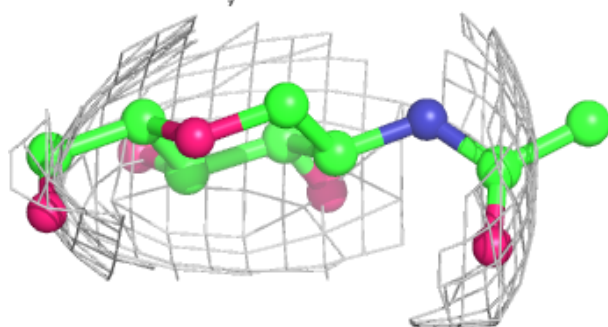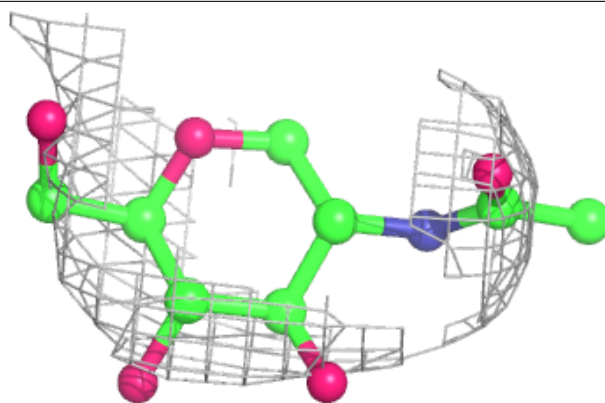
Electron density around NAG A 803:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)
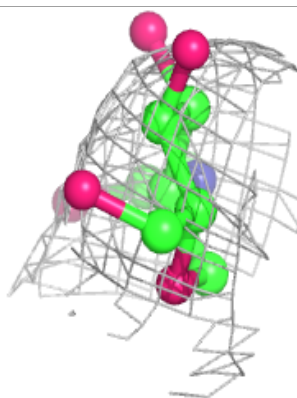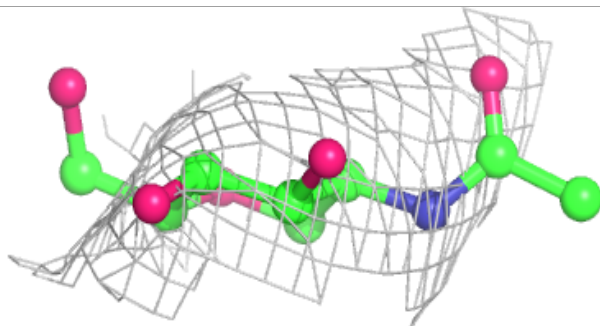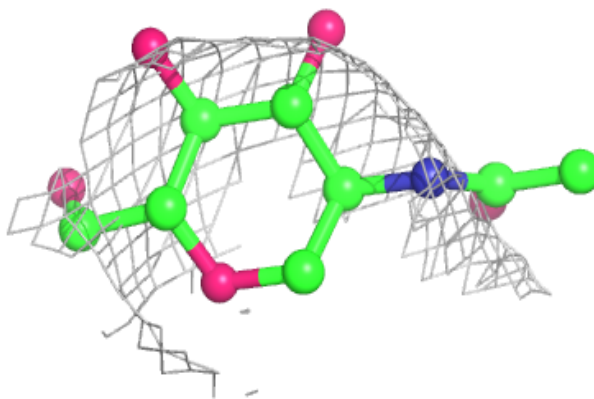
Electron density around NAG A 802:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)
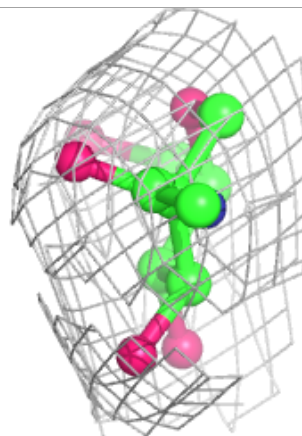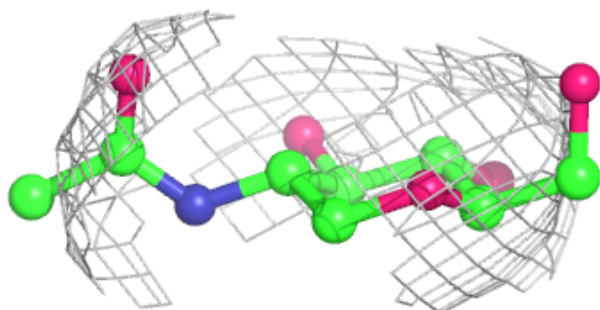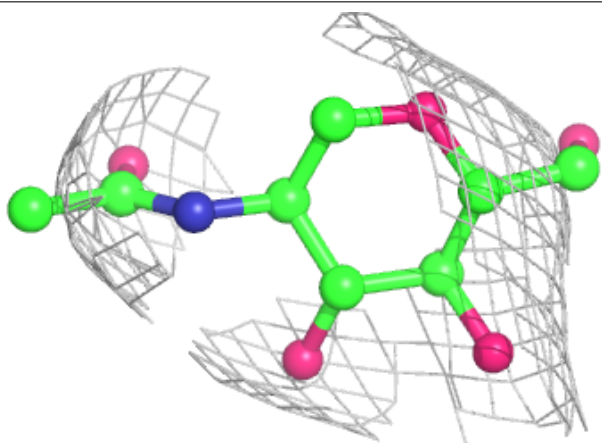
Electron density around NAG B 803:

$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
and green (positive)
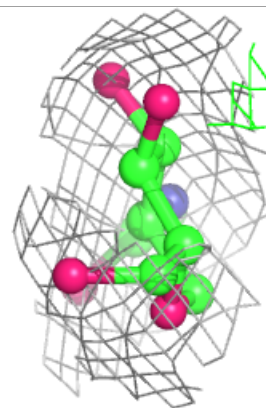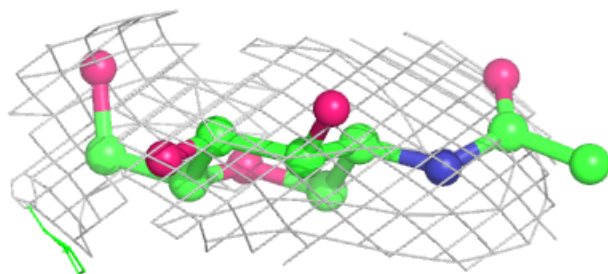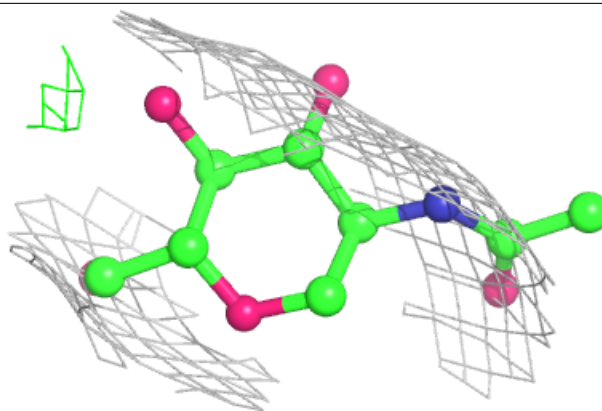
Electron density around NAG B 804:

$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
and green (positive)
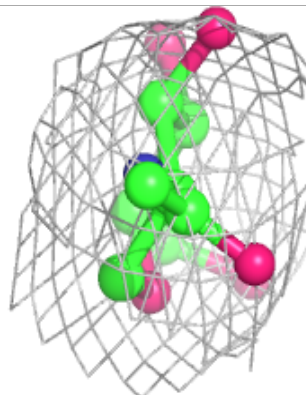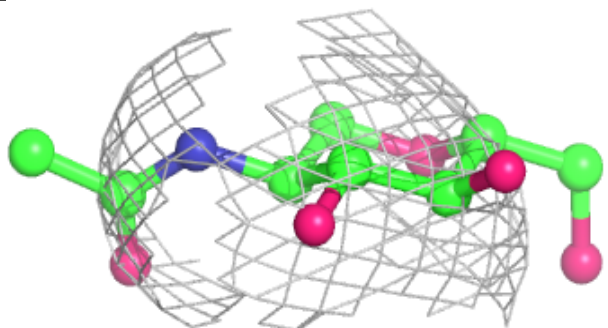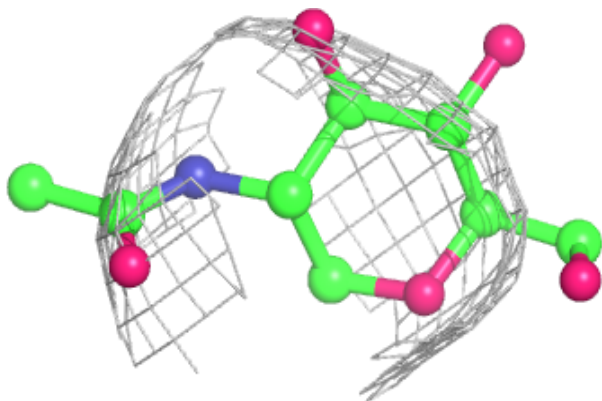
Electron density around NAG B 801:

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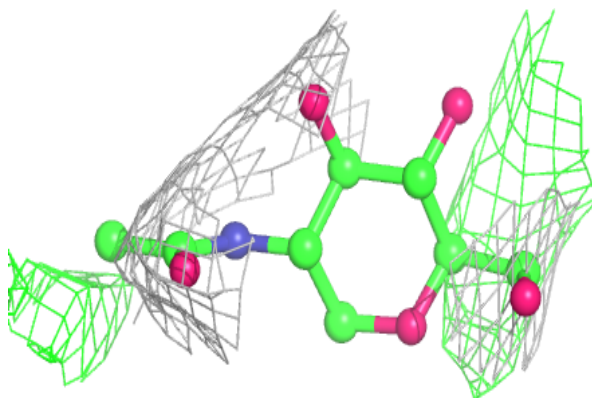$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
and green (positive)

Electron density around NAG B 802:

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

Electron density around NAG A 801:

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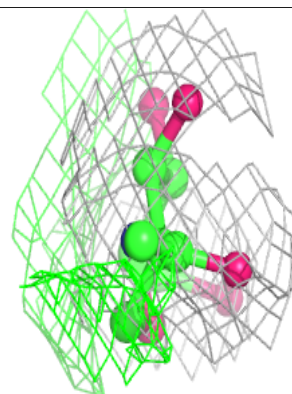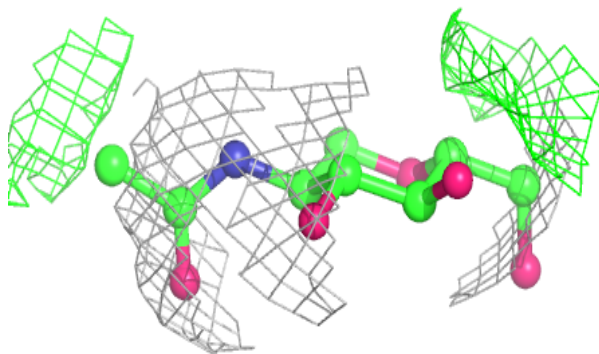
6.5 Other polymers (i)

There are no such residues in this entry.