W O R L D W I D E

wwPDB

P R O T E I N   D A T A   B A N K

wwPDB X-ray Structure Validation Summary Report ⓘ

Sep 24, 2023 – 12:17 PM EDT

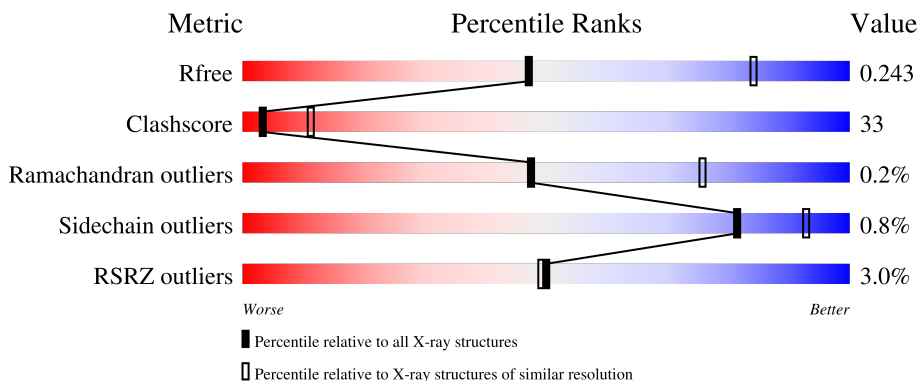|		
PDB ID	:	5U6X
Title	:	COX-1:P6 COMPLEX STRUCTURE
Authors	:	Cingolani, G.; Panella, A.; Perrone, M.G.; Vitale, P.; Smith, W.L.; Scilimati, A.
Deposited on	:	2016-12-09
Resolution	:	2.93 Å(reported)

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 2.93 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		0.243
Clashscore		33
Ramachandran outliers		0.2%
Sidechain outliers		0.8%
RSRZ outliers		3.0%

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	2969 (2.98-2.90)
Clashscore	141614	3218 (2.98-2.90)
Ramachandran outliers	138981	3122 (2.98-2.90)
Sidechain outliers	138945	3124 (2.98-2.90)
RSRZ outliers	127900	2902 (2.98-2.90)

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	600	3% 50% 42% 8%
1	B	600	3% 52% 40% • 8%
2	C	2	50% 50%
2	E	2	50% 50%
2	F	2	100%

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Mol	Chain	Length	Quality of chain
2	H	2	50% 50%
3	D	5	40% 60%
3	G	5	80% 20%

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
6	BOG	A	703	-	-	X	-

2 Entry composition ⓘ

There are 6 unique types of molecules in this entry. The entry contains 9344 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 Prostaglandin G/H synthase 1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	553	Total	C	N	O	S	0	0	0
			4464	2895	751	790	28			
1	B	553	Total	C	N	O	S	0	0	0
			4464	2896	752	788	28			

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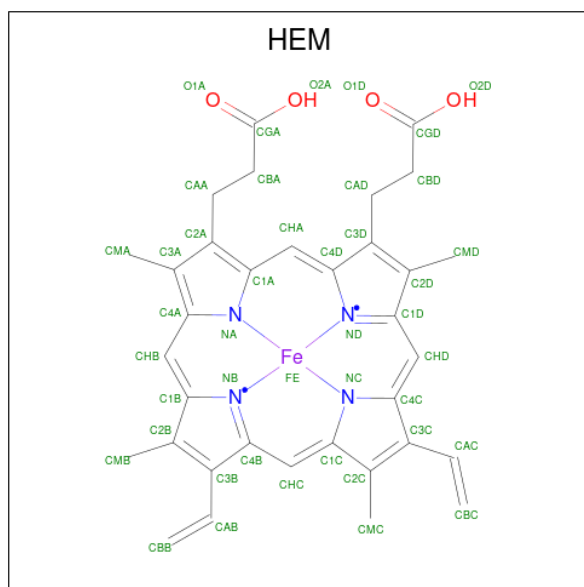

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
2	C	2	Total	C	N	O	0	0	0
			28	16	2	10			
2	E	2	Total	C	N	O	0	0	0
			28	16	2	10			
2	F	2	Total	C	N	O	0	0	0
			28	16	2	10			
2	H	2	Total	C	N	O	0	0	0
			28	16	2	10			

- Molecule 3 is an oligosaccharide called alpha-D-mannopyranose-(1-6)-alpha-D-mannopyran ose-(1-6)-alpha-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose.
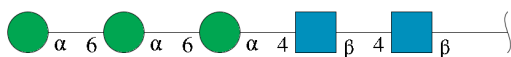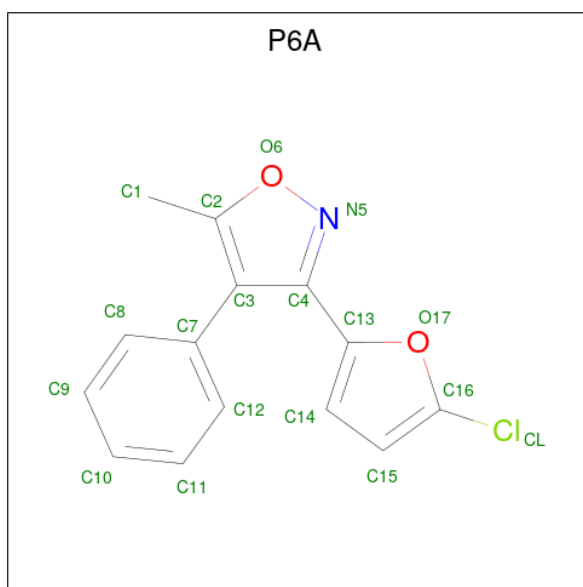
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
3	D	5	Total 61	C 34	N 2	O 25	0	0	0
3	G	5	Total 61	C 34	N 2	O 25	0	0	0

- Molecule 4 is PROTOPORPHYRIN IX CONTAINING FE (three-letter code: HEM) (formula: $C_{34}H_{32}FeN_4O_4$).

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

- Molecule 5 is 3-(5-chlorofuran-2-yl)-5-methyl-4-phenyl-1,2-oxazole (three-letter code: P6A) (formula: $C_{14}H_{10}ClNO_2$).

P6A

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
5	A	1	Total	C	Cl	N	O	0	0
			18	14	1	1	2		
5	B	1	Total	C	Cl	N	O	0	0
			18	14	1	1	2		

- Molecule 6 is octyl beta-D-glucopyranoside (three-letter code: BOG) (formula: $C_{14}H_{28}O_6$).

BOG

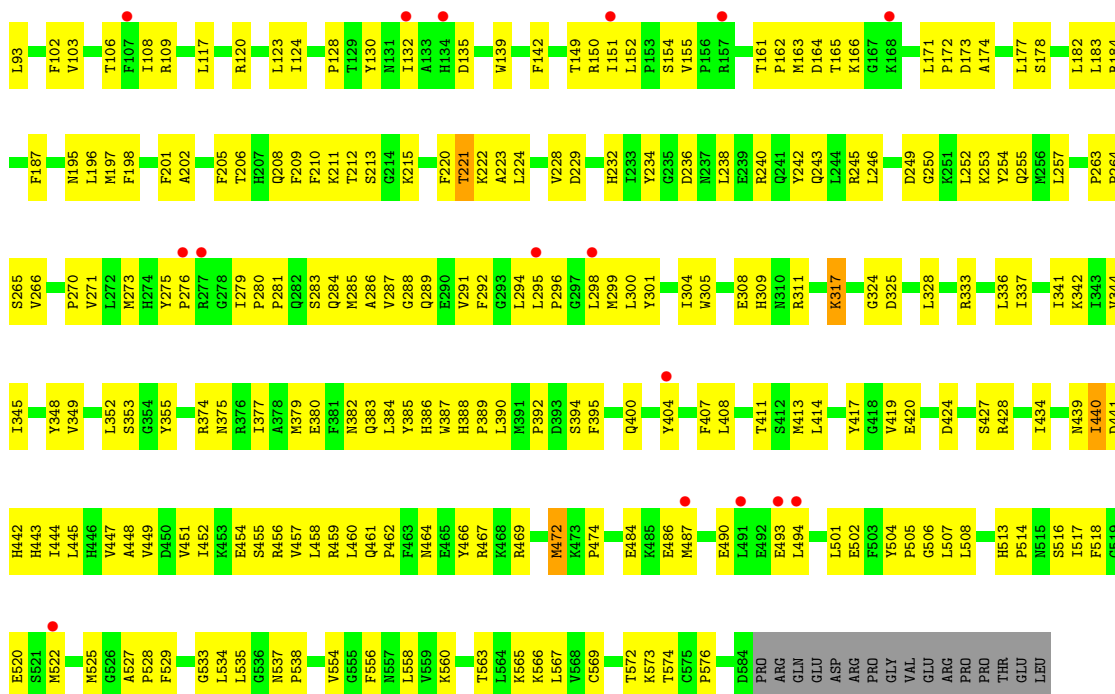| Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
6	A	1	Total	C	O	0	0
			20	14	6		
6	B	1	Total	C	O	0	0
			20	14	6		

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Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
6	B	1	Total 20	C 14	O 6	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: Prostaglandin G/H synthase 1

- Molecule 1: Prostaglandin G/H synthase 1

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

Chain C:

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

Chain E:

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

Chain F:

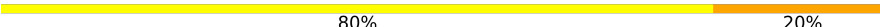• Molecule 2: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain H:

NAG1 NAG2

• Molecule 3: alpha-D-mannopyranose-(1-6)-alpha-D-mannopyranose-(1-6)-alpha-D-mannopyran ose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyra nose

Chain D:

40%   60%

NAG1 NAG2 MAN3 MAN4 MAN5

• Molecule 3: alpha-D-mannopyranose-(1-6)-alpha-D-mannopyranose-(1-6)-alpha-D-mannopyran ose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyra nose

Chain G:

80%   20%

NAG1 NAG2 MAN3 MAN4 MAN5

4 Data and refinement statistics ⓘ

Property	Value	Source
Space group	P 65	Depositor
Cell constants a, b, c, α, β, γ	181.46Å 181.46Å 103.50Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	14.99 – 2.93 46.74 – 2.93	Depositor EDS
% Data completeness (in resolution range)	88.5 (14.99-2.93) 97.1 (46.74-2.93)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	2.44 (at 2.91Å)	Xtriage
Refinement program	PHENIX (dev_2722: ???)	Depositor
R, R_{free}	0.201 , 0.234 0.213 , 0.243	Depositor DCC
R_{free} test set	1831 reflections (4.51%)	wwPDB-VP
Wilson B-factor (Å^2)	67.7	Xtriage
Anisotropy	0.118	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.31 , 33.9	EDS
L-test for twinning[2]	$< |L| > = 0.47, < L^2 > = 0.30$	Xtriage
Estimated twinning fraction	0.469 for h,-h-k,-l	Xtriage
F_o,F_c correlation	0.92	EDS
Total number of atoms	9344	wwPDB-VP
Average B, all atoms (Å^2)	74.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.45% 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, P6A, BOG, NAG, HEM

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	0.38	0/4603	0.56	0/6255
1	B	0.41	0/4603	0.57	0/6254
All	All	0.39	0/9206	0.56	0/12509

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	4464	0	4332	302	0
1	B	4464	0	4339	281	0
2	C	28	0	25	6	0
2	E	28	0	25	1	0
2	F	28	0	25	6	0
2	H	28	0	25	1	0
3	D	61	0	52	9	0
3	G	61	0	52	5	0
4	A	43	0	30	13	0
4	B	43	0	30	18	0
5	A	18	0	0	3	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
5	B	18	0	0	3	0
6	A	20	0	28	10	0
6	B	40	0	56	4	0
All	All	9344	0	9019	602	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 33.

The worst 5 of 602 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:383:GLN:HE22	1:A:455:SER:HB2	1.14	1.05
1:B:383:GLN:HE22	1:B:455:SER:HB2	1.17	1.04
1:B:255:GLN:HG3	1:B:264:PRO:HA	1.45	0.99
1:A:255:GLN:HG3	1:A:264:PRO:HA	1.46	0.98
1:A:221:THR:HG22	1:A:223:ALA:H	1.30	0.97

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	551/600 (92%)	525 (95%)	25 (4%)	1 (0%)	47	76
1	B	551/600 (92%)	526 (96%)	24 (4%)	1 (0%)	47	76
All	All	1102/1200 (92%)	1051 (95%)	49 (4%)	2 (0%)	47	76

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	164	ASP

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Mol	Chain	Res	Type
1	B	164	ASP

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	482/532 (91%)	480 (100%)	2 (0%)	91	97
1	B	482/532 (91%)	476 (99%)	6 (1%)	71	89
All	All	964/1064 (91%)	956 (99%)	8 (1%)	81	93

5 of 8 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	B	472	MET
1	B	440	ILE
1	B	221	THR
1	B	109	ARG
1	B	317	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (5) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	208	GLN
1	A	309	HIS
1	A	383	GLN
1	B	208	GLN
1	B	383	GLN

5.3.3 RNA (i)

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 ⓘ

18 monosaccharides are modelled in this entry.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	#$|Z| > 2$	Counts	RMSZ	#$|Z| > 2$
2	NAG	C	1	2,1	14,14,15	0.49	0	17,19,21	0.96	1 (5%)
2	NAG	C	2	2	14,14,15	0.29	0	17,19,21	0.56	0
3	NAG	D	1	3,1	14,14,15	0.38	0	17,19,21	0.66	0
3	NAG	D	2	3	14,14,15	0.36	0	17,19,21	0.71	0
3	MAN	D	3	3	11,11,12	0.96	0	15,15,17	1.20	2 (13%)
3	MAN	D	4	3	11,11,12	1.46	2 (18%)	15,15,17	1.77	3 (20%)
3	MAN	D	5	3	11,11,12	1.34	2 (18%)	15,15,17	1.29	3 (20%)
2	NAG	E	1	2,1	14,14,15	0.25	0	17,19,21	0.64	0
2	NAG	E	2	2	14,14,15	0.49	0	17,19,21	0.77	1 (5%)
2	NAG	F	1	2,1	14,14,15	0.45	0	17,19,21	1.07	1 (5%)
2	NAG	F	2	2	14,14,15	0.18	0	17,19,21	0.65	1 (5%)
3	NAG	G	1	3,1	14,14,15	0.28	0	17,19,21	0.71	0
3	NAG	G	2	3	14,14,15	0.40	0	17,19,21	0.58	0
3	MAN	G	3	3	11,11,12	1.11	1 (9%)	15,15,17	1.99	5 (33%)
3	MAN	G	4	3	11,11,12	0.63	0	15,15,17	0.99	1 (6%)
3	MAN	G	5	3	11,11,12	0.91	1 (9%)	15,15,17	1.11	0
2	NAG	H	1	2,1	14,14,15	0.33	0	17,19,21	0.70	0
2	NAG	H	2	2	14,14,15	0.55	0	17,19,21	0.75	1 (5%)

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

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

The worst 5 of 6 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	D	4	MAN	C4-C5	3.15	1.59	1.53
3	D	5	MAN	C1-C2	3.03	1.59	1.52
3	G	3	MAN	C1-C2	2.87	1.58	1.52
3	D	4	MAN	C4-C3	2.72	1.59	1.52
3	G	5	MAN	C1-C2	2.53	1.58	1.52

The worst 5 of 19 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	G	3	MAN	C1-O5-C5	4.38	118.12	112.19
3	D	4	MAN	C3-C4-C5	4.32	117.95	110.24
2	F	1	NAG	C1-O5-C5	3.42	116.82	112.19
3	G	3	MAN	O5-C1-C2	3.32	115.90	110.77
3	D	4	MAN	C1-O5-C5	3.17	116.48	112.19

There are no chirality outliers.

5 of 27 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	G	4	MAN	C4-C5-C6-O6
2	H	2	NAG	O5-C5-C6-O6
3	D	4	MAN	O5-C5-C6-O6
3	D	5	MAN	O5-C5-C6-O6
3	G	5	MAN	C4-C5-C6-O6

All (4) ring outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	D	5	MAN	C1-C2-C3-C4-C5-O5
3	G	4	MAN	C1-C2-C3-C4-C5-O5
3	D	3	MAN	C1-C2-C3-C4-C5-O5
3	G	5	MAN	C1-C2-C3-C4-C5-O5

16 monomers are involved in 28 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	F	1	NAG	3	0
3	D	5	MAN	3	0
2	E	2	NAG	1	0
2	H	2	NAG	1	0
3	G	2	NAG	5	0
2	C	1	NAG	3	0
3	D	1	NAG	2	0
3	D	3	MAN	2	0
3	D	4	MAN	2	0
3	D	2	NAG	5	0
3	G	1	NAG	1	0
2	E	1	NAG	1	0
2	F	2	NAG	3	0
2	H	1	NAG	1	0
2	C	2	NAG	3	0
3	G	3	MAN	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.

Oligosaccharide Chain C

Bond lengths

Bond angles

Torsions

Rings

Oligosaccharide Chain E

Bond lengths

Bond angles

Torsions

Rings

Oligosaccharide Chain F

Bond lengths

Bond angles

Torsions

Rings

Oligosaccharide Chain H

Bond lengths

Bond angles

Torsions

Rings

Oligosaccharide Chain D

Bond lengths

Bond angles

Torsions

Rings

Oligosaccharide Chain G

Bond lengths — Bond angles — Torsions — Rings

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	$\#|Z| > 2$
6	BOG	B	704	-	20,20,20	0.46	0	25,25,25	0.60	0
4	HEM	A	701	1	41,50,50	1.84	8 (19%)	45,82,82	2.82	25 (55%)
5	P6A	B	702	-	12,20,20	3.60	6 (50%)	13,28,28	0.95	0
6	BOG	B	703	-	20,20,20	0.46	0	25,25,25	0.59	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	#$|Z|$ > 2	Counts	RMSZ	#$|Z|$ > 2
5	P6A	A	702	-	12,20,20	3.60	8 (66%)	13,28,28	1.05	2 (15%)
6	BOG	A	703	-	20,20,20	0.46	0	25,25,25	0.59	0
4	HEM	B	701	1	41,50,50	2.03	11 (26%)	45,82,82	2.85	21 (46%)

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
6	BOG	B	704	-	-	6/11/31/31	0/1/1/1
4	HEM	A	701	1	-	7/12/54/54	-
5	P6A	B	702	-	-	0/4/8/8	0/3/3/3
6	BOG	B	703	-	-	3/11/31/31	0/1/1/1
5	P6A	A	702	-	-	1/4/8/8	0/3/3/3
6	BOG	A	703	-	-	4/11/31/31	0/1/1/1
4	HEM	B	701	1	-	8/12/54/54	-

The worst 5 of 33 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	A	702	P6A	C9-C8	6.92	1.53	1.38
5	B	702	P6A	C9-C8	6.72	1.53	1.38
5	B	702	P6A	C12-C7	6.54	1.53	1.39
5	A	702	P6A	C12-C7	6.41	1.53	1.39
5	A	702	P6A	C11-C10	5.60	1.52	1.38

The worst 5 of 48 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	A	701	HEM	CHC-C4B-NB	7.57	132.66	124.43
4	B	701	HEM	CHB-C1B-NB	6.91	132.91	124.38
4	B	701	HEM	C4B-C3B-C2B	-6.18	102.21	107.11
4	A	701	HEM	CMA-C3A-C4A	-5.84	119.49	128.46
4	B	701	HEM	C4A-C3A-C2A	5.72	110.97	107.00

There are no chirality outliers.

5 of 29 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	A	701	HEM	C1A-C2A-CAA-CBA
4	A	701	HEM	C3A-C2A-CAA-CBA
4	B	701	HEM	C1A-C2A-CAA-CBA
4	B	701	HEM	C3A-C2A-CAA-CBA
6	A	703	BOG	O5-C1-O1-C1'

There are no ring outliers.

7 monomers are involved in 51 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
6	B	704	BOG	3	0
4	A	701	HEM	13	0
5	B	702	P6A	3	0
6	B	703	BOG	1	0
5	A	702	P6A	3	0
6	A	703	BOG	10	0
4	B	701	HEM	18	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 BOG B 704

Bond lengths

Bond angles

Torsions

Rings

Ligand HEM A 701

Bond lengths

Bond angles

Torsions

Rings

Ligand P6A B 702

Bond lengths

Bond angles

Torsions

Rings

Ligand BOG B 703

Bond lengths

Bond angles

Torsions

Rings

Ligand P6A A 702

Bond lengths

Bond angles

Torsions

Rings

Ligand BOG A 703

Bond lengths

Bond angles

Torsions

Rings

Ligand HEM B 701

Bond lengths

Bond angles

Torsions

Rings
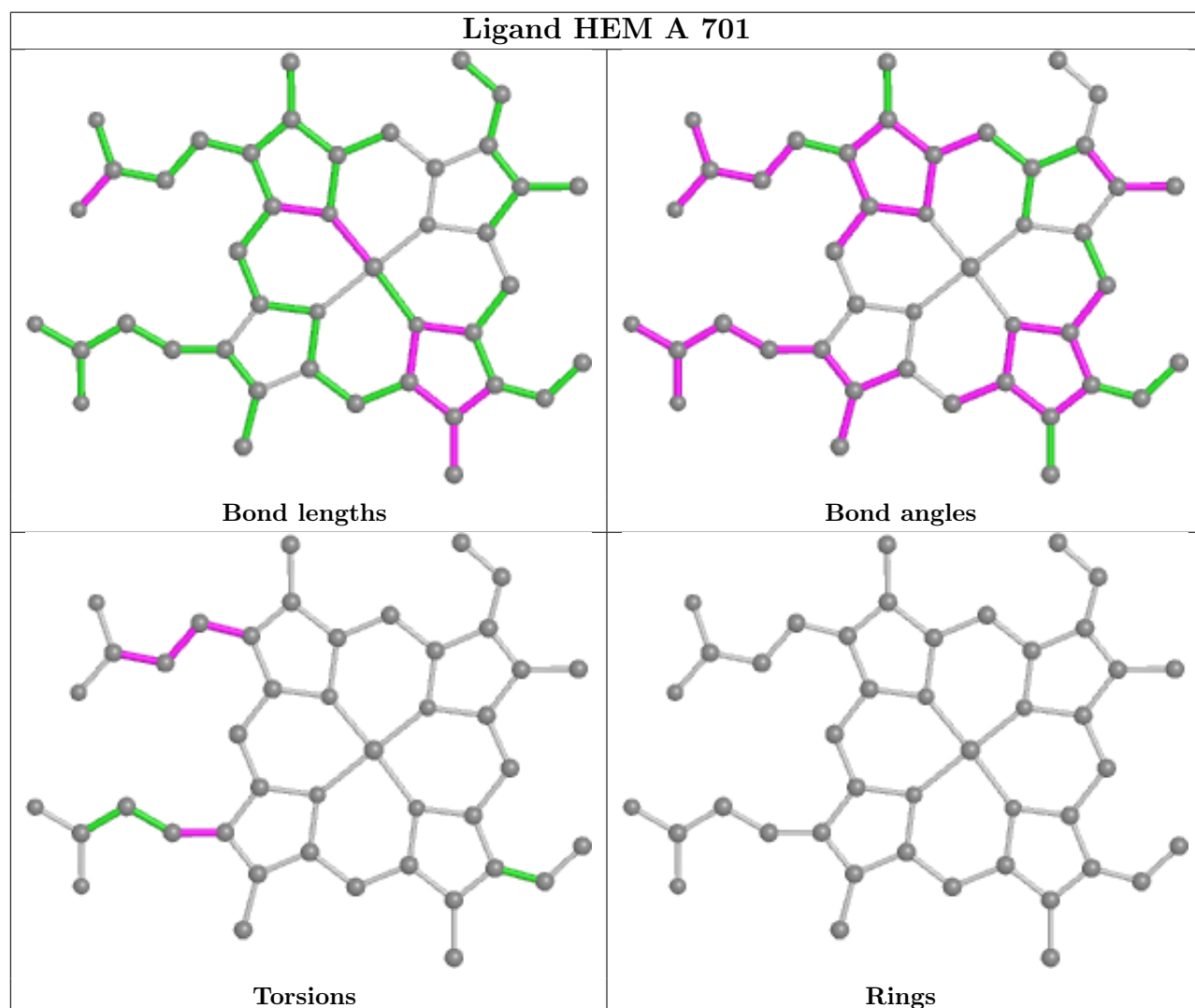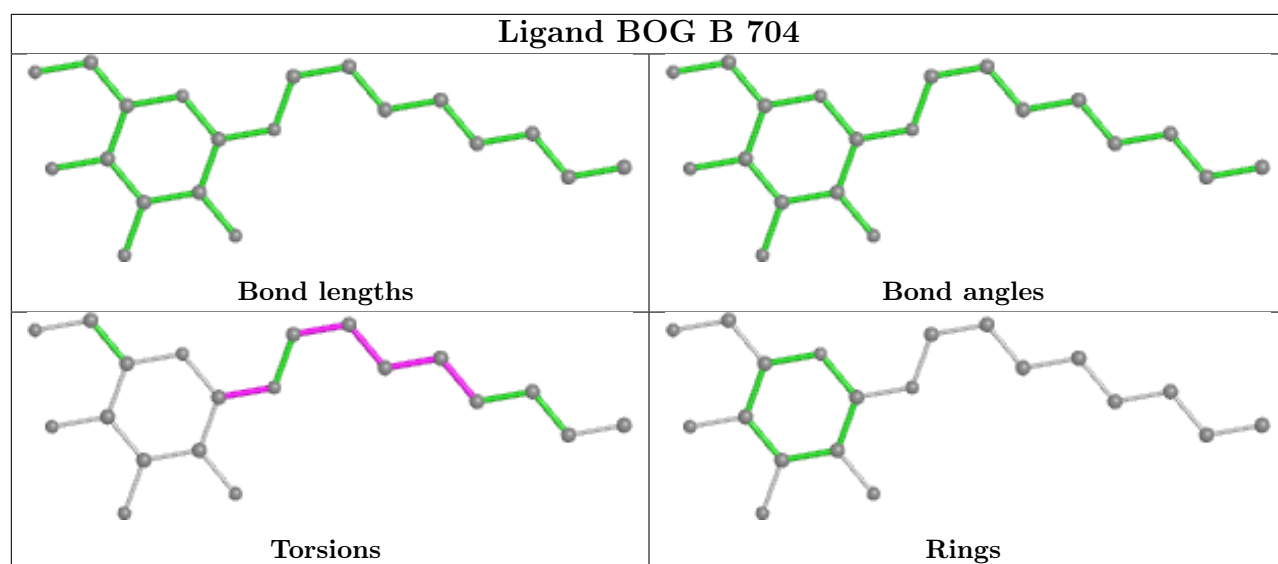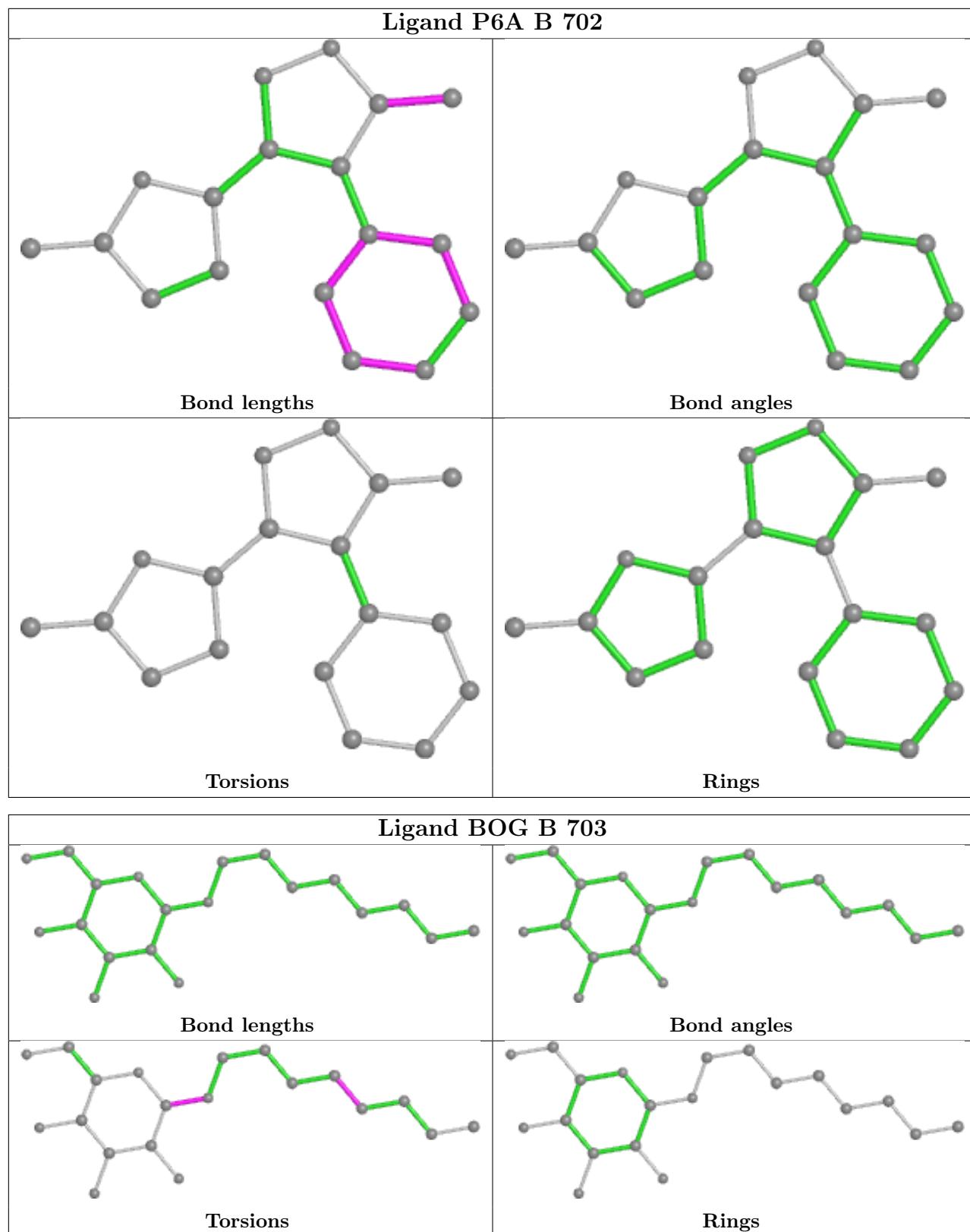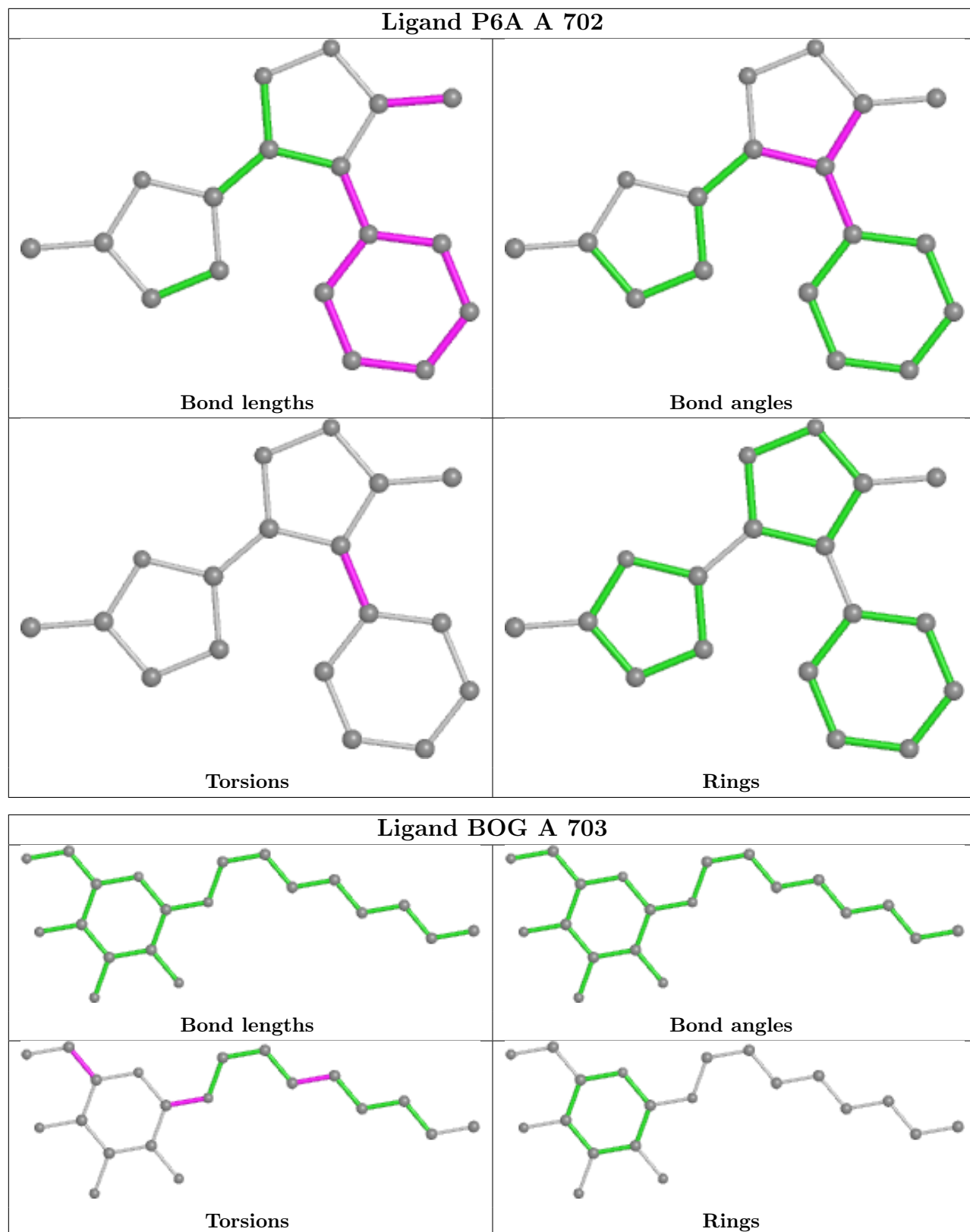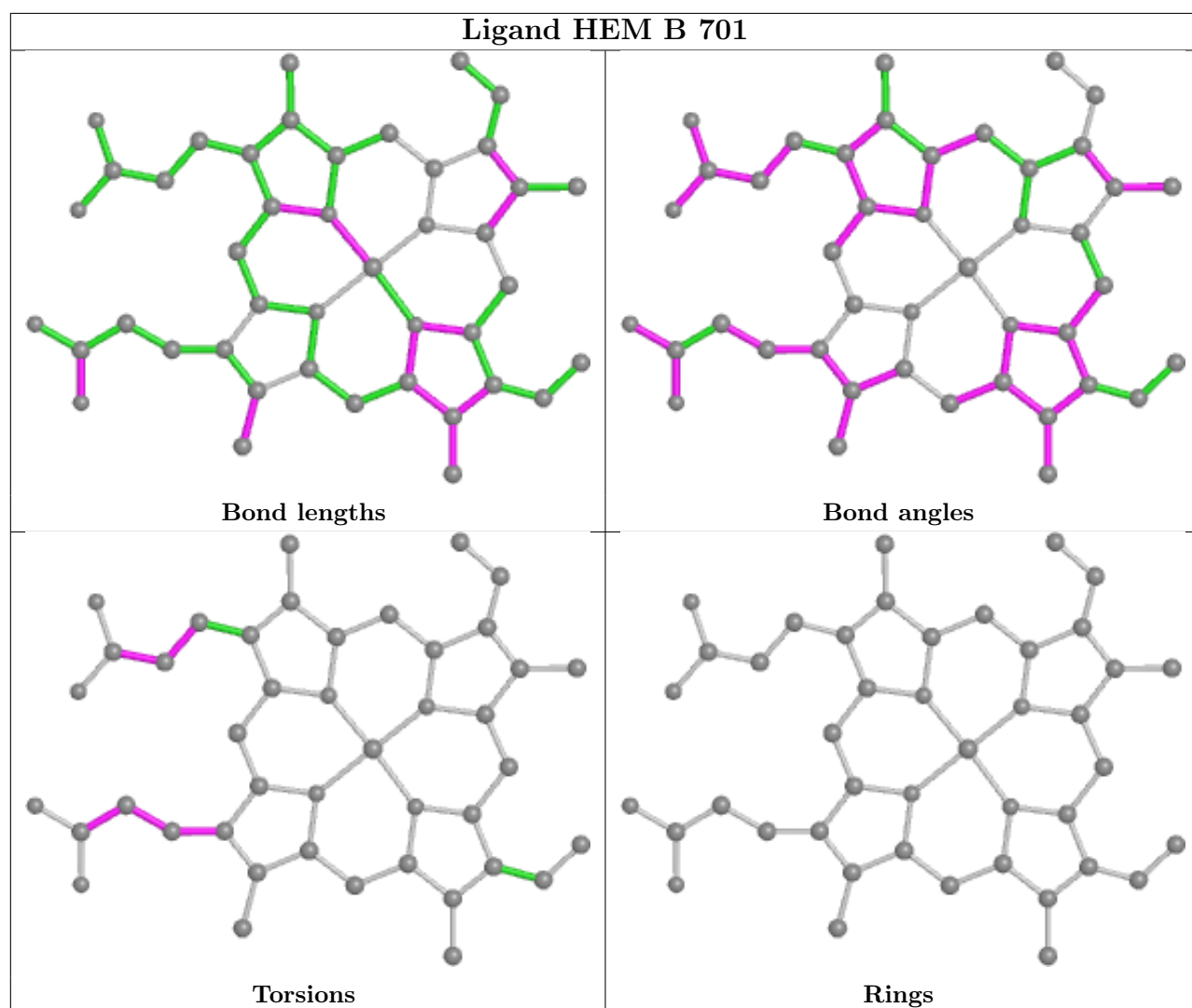
5.7 Other polymers ⓘ

There are no such residues in this entry.

5.8 Polymer linkage issues ⓘ

There are no chain breaks in this entry.

6 Fit of model and data ⓘ

6.1 Protein, DNA and RNA chains ⓘ

In the following table, the column labelled '#RSRZ> 2' contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 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	553/600 (92%)	0.32	17 (3%)	49	48	43, 72, 98, 131	0
1	B	553/600 (92%)	0.34	16 (2%)	51	51	40, 72, 100, 133	0
All	All	1106/1200 (92%)	0.33	33 (2%)	50	49	40, 72, 99, 133	0

The worst 5 of 33 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	276	PRO	4.4
1	A	297	GLY	4.1
1	B	493	GLU	4.0
1	B	151	ILE	3.9
1	A	301	TYR	3.6

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	MAN	D	5	11/12	0.65	0.25	116,131,141,147	0
2	NAG	F	2	14/15	0.72	0.37	110,117,127,128	0
2	NAG	C	2	14/15	0.75	0.38	105,116,126,127	0
3	MAN	G	4	11/12	0.77	0.16	124,138,143,144	0
3	MAN	D	4	11/12	0.78	0.24	131,140,151,156	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($\mathring{A}^2$)	Q<0.9
2	NAG	E	2	14/15	0.83	0.21	83,99,103,107	0
3	MAN	G	5	11/12	0.84	0.23	103,128,149,157	0
2	NAG	H	2	14/15	0.86	0.15	76,102,110,111	0
2	NAG	F	1	14/15	0.87	0.34	81,89,98,110	0
3	NAG	G	2	14/15	0.87	0.25	58,98,116,118	0
3	NAG	D	2	14/15	0.88	0.21	64,98,117,122	0
3	MAN	G	3	11/12	0.89	0.18	114,115,120,133	0
3	MAN	D	3	11/12	0.89	0.16	95,111,128,137	0
2	NAG	E	1	14/15	0.89	0.16	50,81,93,96	0
2	NAG	H	1	14/15	0.90	0.14	48,82,95,95	0
2	NAG	C	1	14/15	0.91	0.34	85,90,98,108	0
3	NAG	D	1	14/15	0.91	0.20	48,69,81,93	0
3	NAG	G	1	14/15	0.94	0.17	45,69,88,90	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
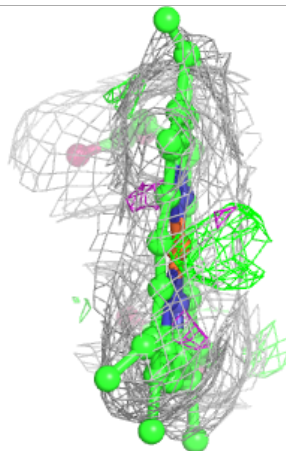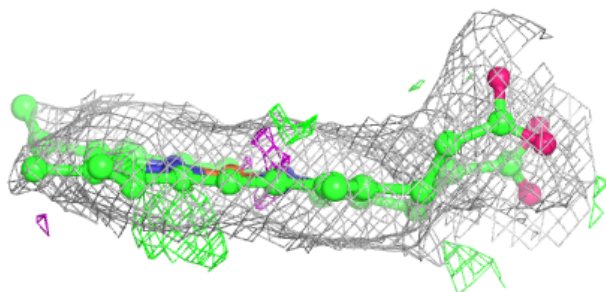mF$_o$-DF$_c$ (at 3 rmsd) in purple (negative)
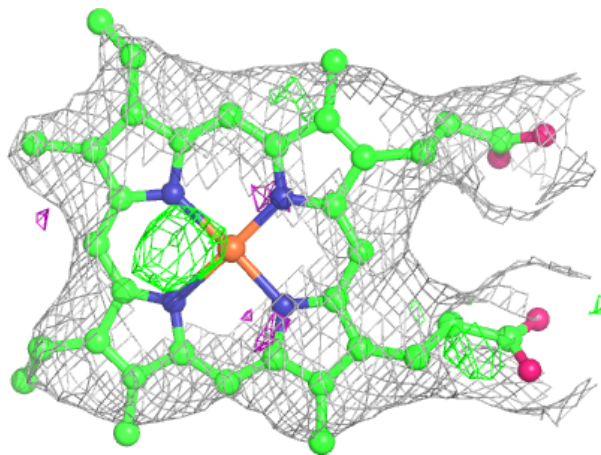and green (positive)
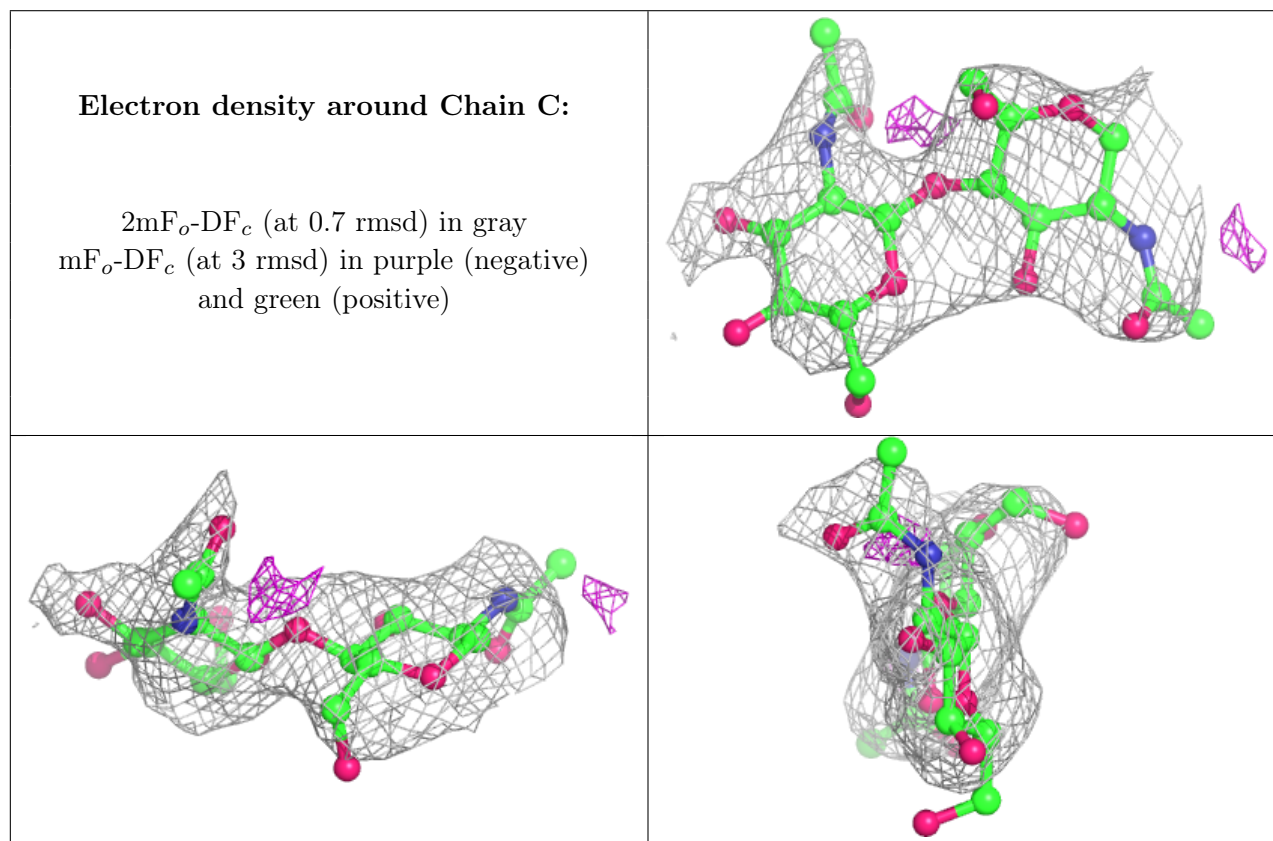
Electron density around Chain E:

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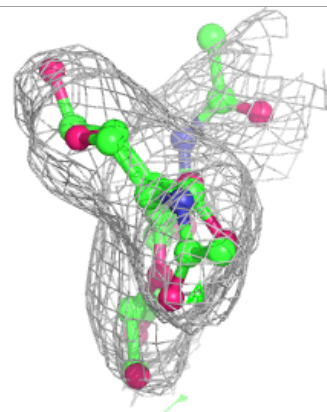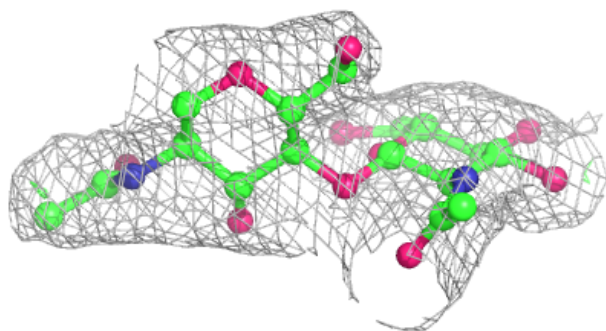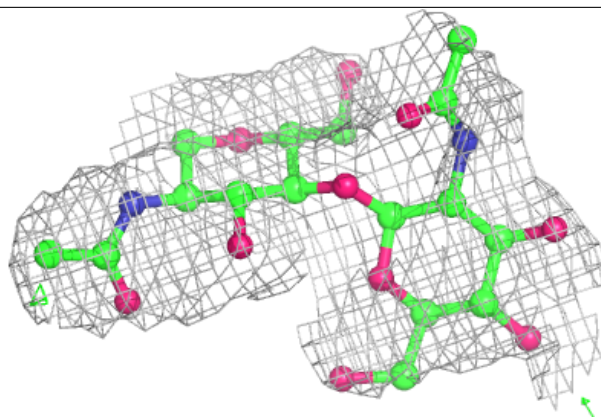
Electron density around Chain F:

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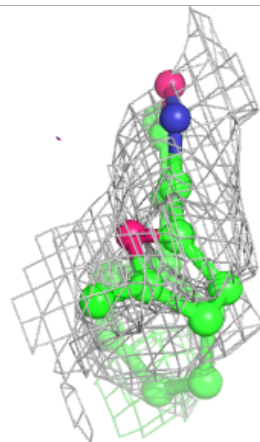and green (positive)
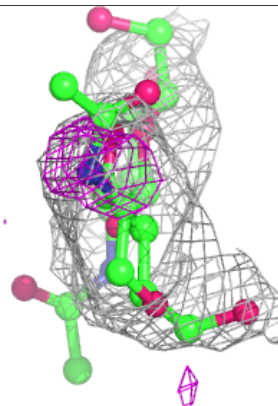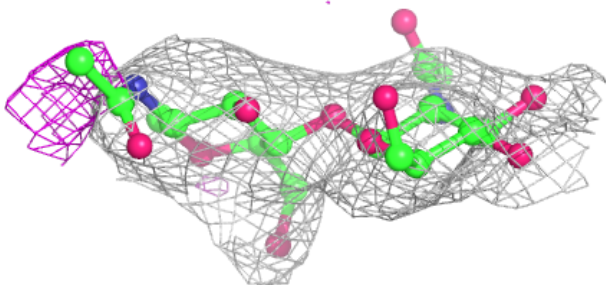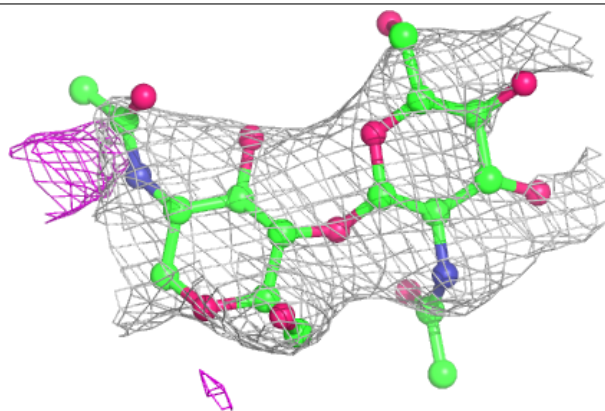
Electron density around Chain H:

2mF$_o$-DF$_c$ (at 0.7 rmsd) in gray
mF$_o$-DF$_c$ (at 3 rmsd) in purple (negative)
and green (positive)
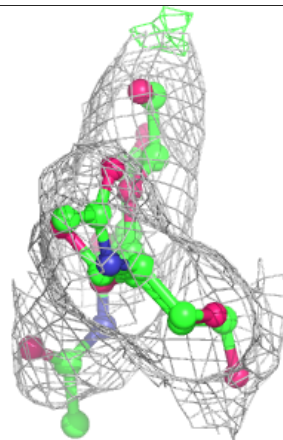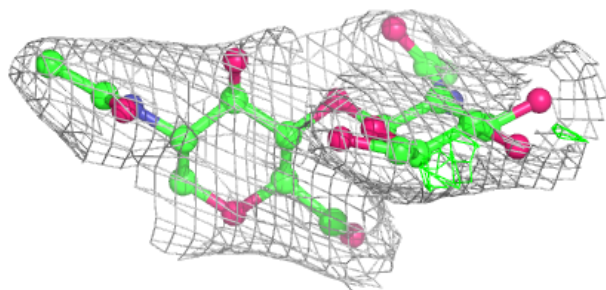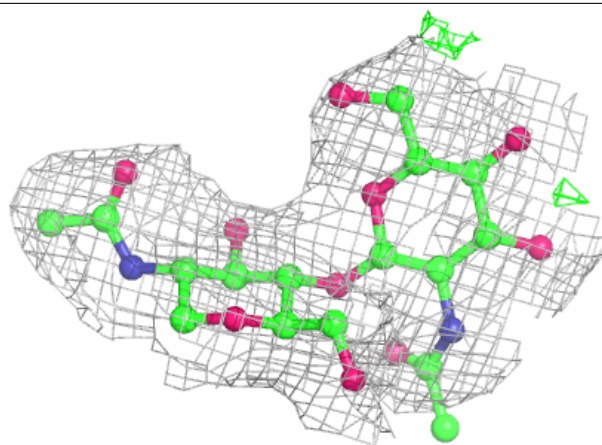
Electron density around Chain D:

2mF$_o$-DF$_c$ (at 0.7 rmsd) in gray
mF$_o$-DF$_c$ (at 3 rmsd) in purple (negative)
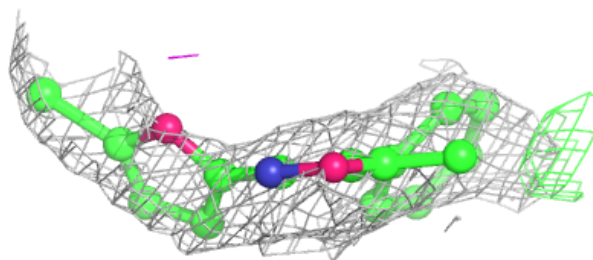and green (positive)

Electron density around Chain G:

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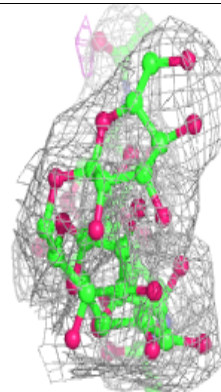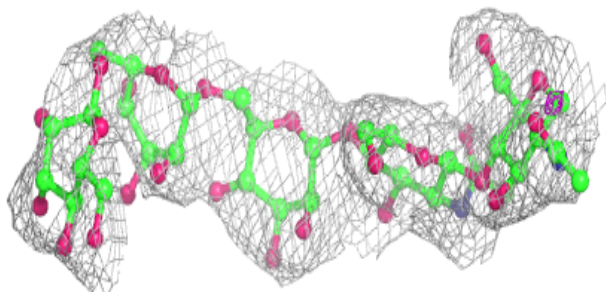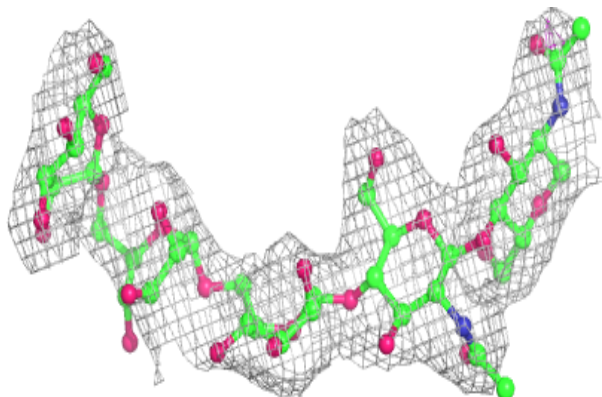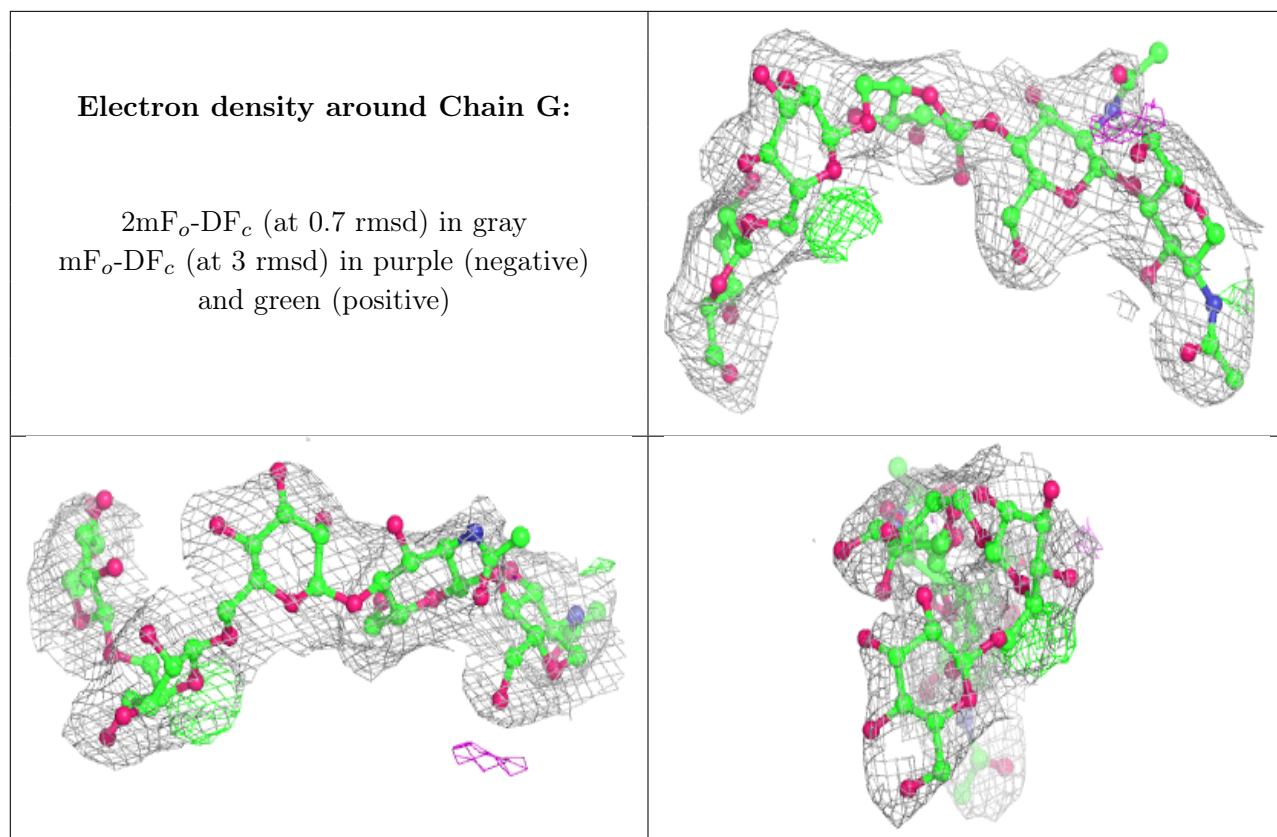
6.4 Ligands (i)

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
5	P6A	A	702	18/18	0.86	0.61	94,136,145,150	0
6	BOG	B	703	20/20	0.86	0.38	62,83,106,110	0
4	HEM	A	701	43/43	0.88	0.23	43,81,99,107	0
5	P6A	B	702	18/18	0.90	0.47	95,131,138,142	0
4	HEM	B	701	43/43	0.90	0.23	40,83,100,105	0
6	BOG	A	703	20/20	0.92	0.27	72,81,115,131	0
6	BOG	B	704	20/20	0.94	0.23	53,65,73,84	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 P6A A 702:

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mF$_o$-DF$_c$ (at 3 rmsd) in purple (negative)
and green (positive)
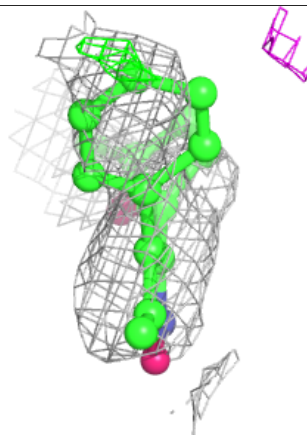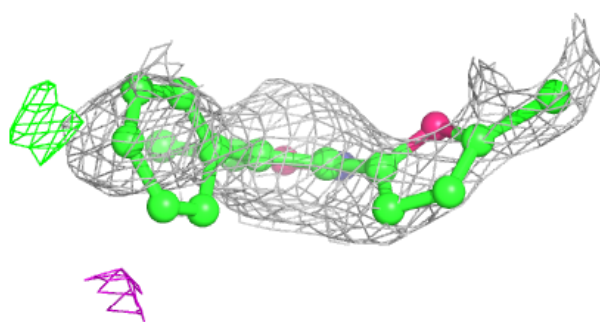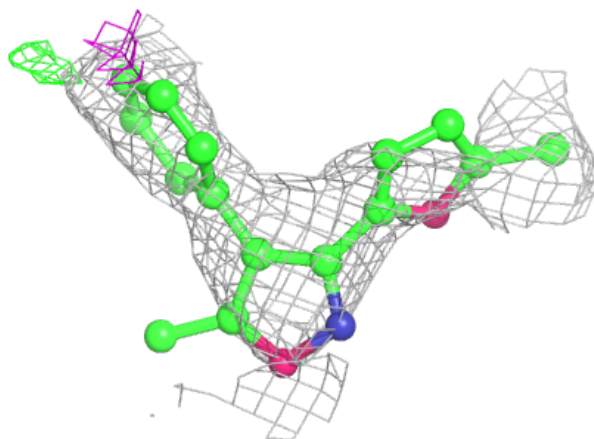
Electron density around BOG B 703:

2mF$_o$-DF$_c$ (at 0.7 rmsd) in gray
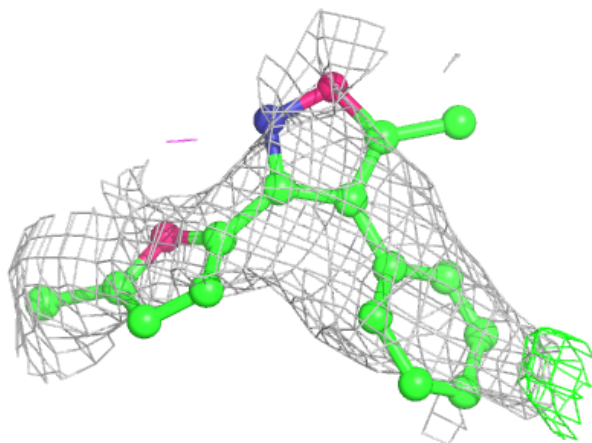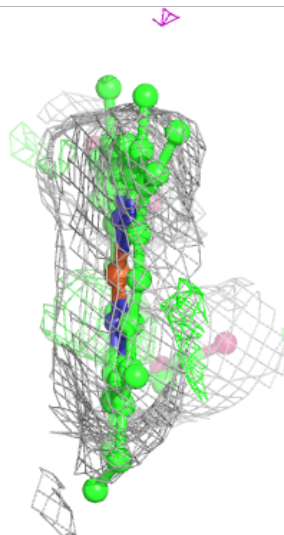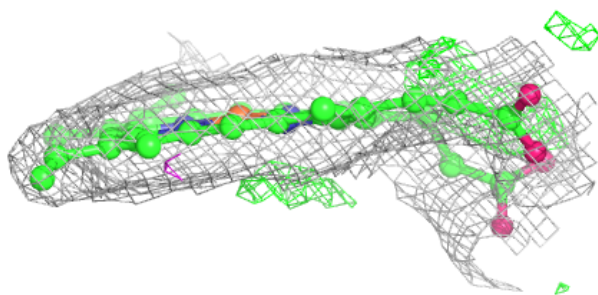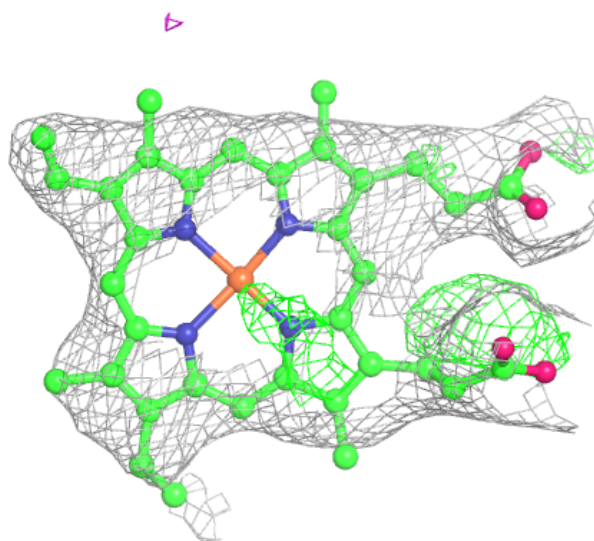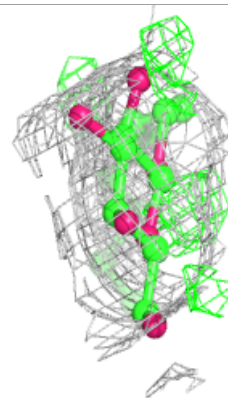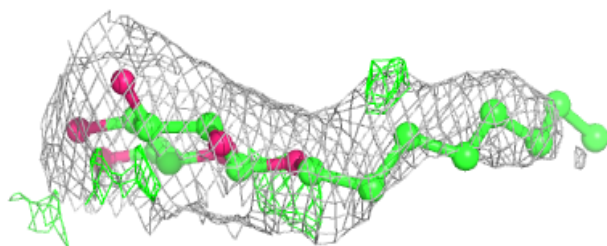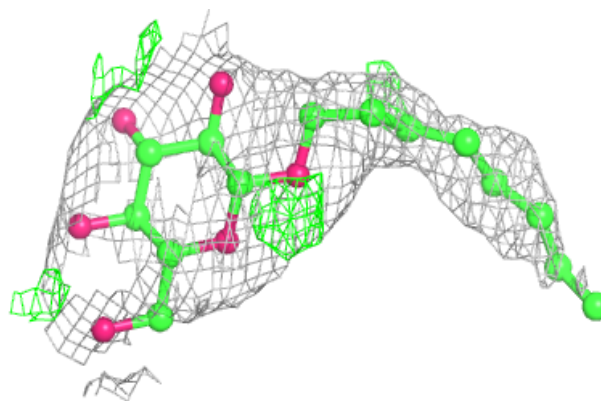mF$_o$-DF$_c$ (at 3 rmsd) in purple (negative)
and green (positive)
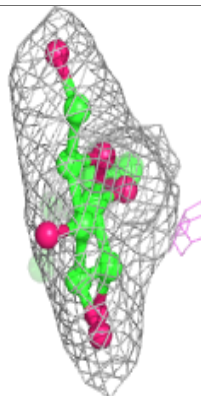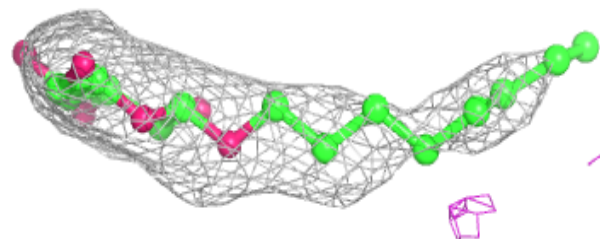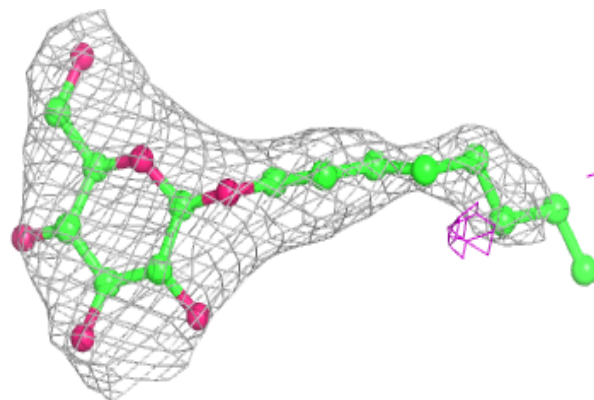
Electron density around HEM A 701:

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

Electron density around P6A B 702:

2mF$_o$-DF$_c$ (at 0.7 rmsd) in gray
mF$_o$-DF$_c$ (at 3 rmsd) in purple (negative)
and green (positive)

Electron density around HEM B 701:

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

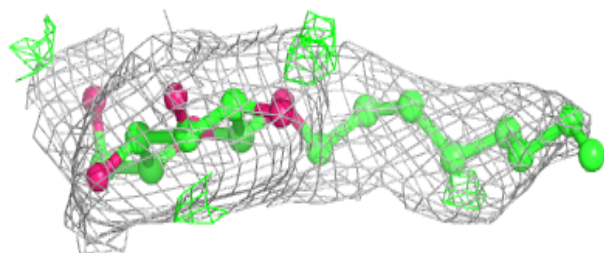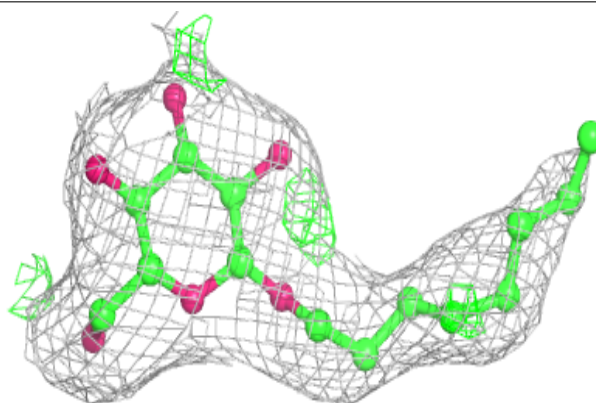**Electron density around BOG A 703:**

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

Electron density around BOG B 704:

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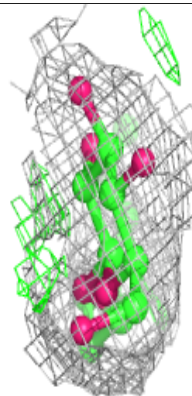
6.5 Other polymers (i)

There are no such residues in this entry.