



# Full wwPDB X-ray Structure Validation Report ⓘ

Aug 29, 2023 – 01:41 PM EDT

PDB ID : 3N8X  
Title : Crystal Structure of Cyclooxygenase-1 in Complex with Nimesulide  
Authors : Lee, J.Y.  
Deposited on : 2010-05-28  
Resolution : 2.75 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](mailto: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 types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

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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 : 2.35  
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) : 2.35

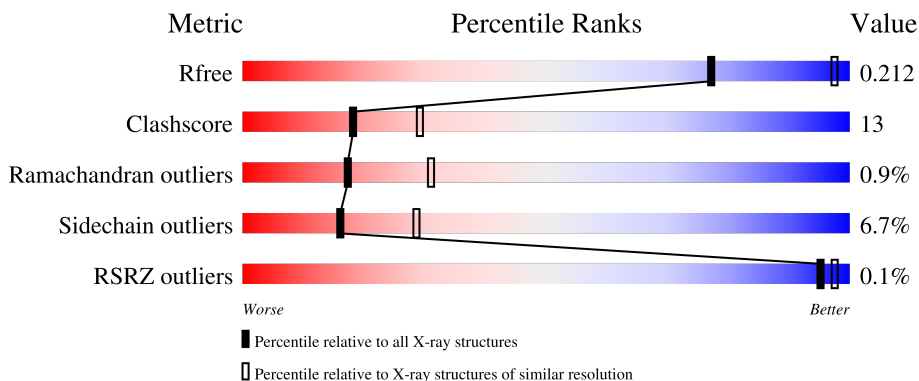
# 1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.75 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



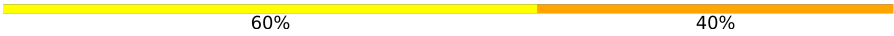
Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
$R_{free}$	130704	1235 (2.78-2.74)
Clashscore	141614	1277 (2.78-2.74)
Ramachandran outliers	138981	1257 (2.78-2.74)
Sidechain outliers	138945	1257 (2.78-2.74)
RSRZ outliers	127900	1207 (2.78-2.74)

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  $\geq 3$ , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions  $\leq 5\%$ . The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	553	68% (green), 29% (yellow), 3% (orange), 0% (red)
1	B	553	70% (green), 27% (yellow), 3% (orange), 0% (red)
2	C	2	100% (orange)
2	E	2	100% (yellow)
2	F	2	50% (yellow), 50% (orange)

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Mol	Chain	Length	Quality of chain
3	D	5	 60% 40%

## 2 Entry composition [i](#)

There are 8 unique types of molecules in this entry. The entry contains 9315 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
			Total	C	N	O	S			
1	A	553	4437	2876	746	788	27	0	0	0
1	B	553	4438	2876	747	787	28	0	1	0

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	92	LEU	MET	conflict	UNP P05979
B	92	LEU	MET	conflict	UNP P05979

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



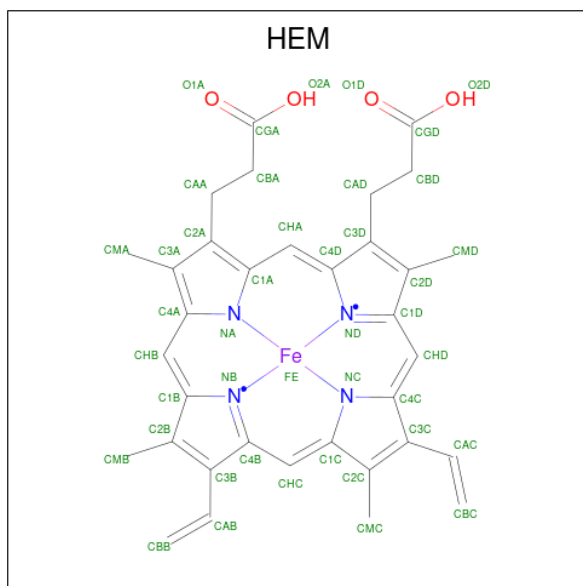
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
			Total	C	N	O			
2	C	2	28	16	2	10	0	0	0
2	E	2	28	16	2	10	0	0	0
2	F	2	28	16	2	10	0	0	0

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



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

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



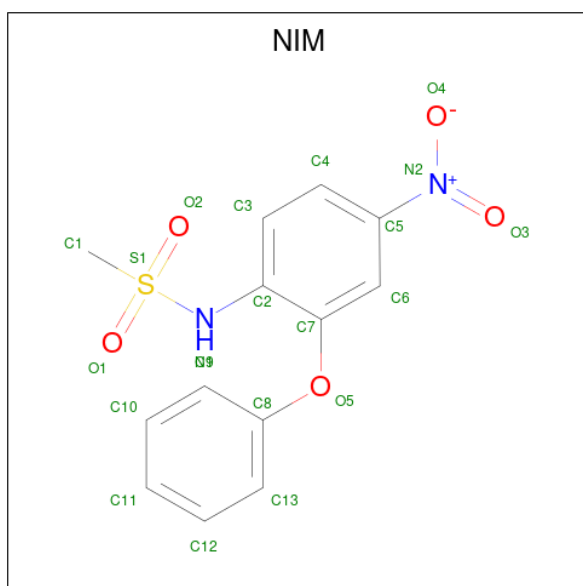
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	
			Total	C	Fe	N			O
4	A	1	43	34	1	4	4	0	0
4	B	1	43	34	1	4	4	0	0

- Molecule 5 is 2-acetamido-2-deoxy-beta-D-glucopyranose (three-letter code: NAG) (formula:  $C_8H_{15}NO_6$ ).



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

- Molecule 6 is 4-NITRO-2-PHENOXYMETHANESULFONANILIDE (three-letter code: NIM) (formula: C<sub>13</sub>H<sub>12</sub>N<sub>2</sub>O<sub>5</sub>S).



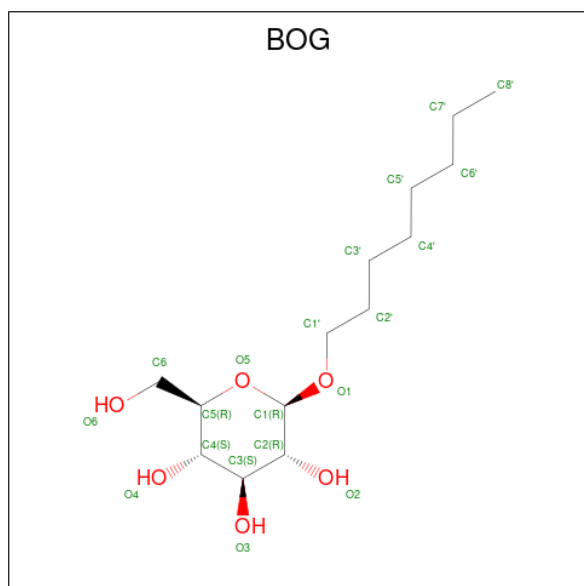
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
			Total	C	N	O	S		
6	A	1	21	13	2	5	1	0	0

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Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
			Total	C	N	O	S		
6	B	1	21	13	2	5	1	0	0

- Molecule 7 is octyl beta-D-glucopyranoside (three-letter code: BOG) (formula:  $C_{14}H_{28}O_6$ ).



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

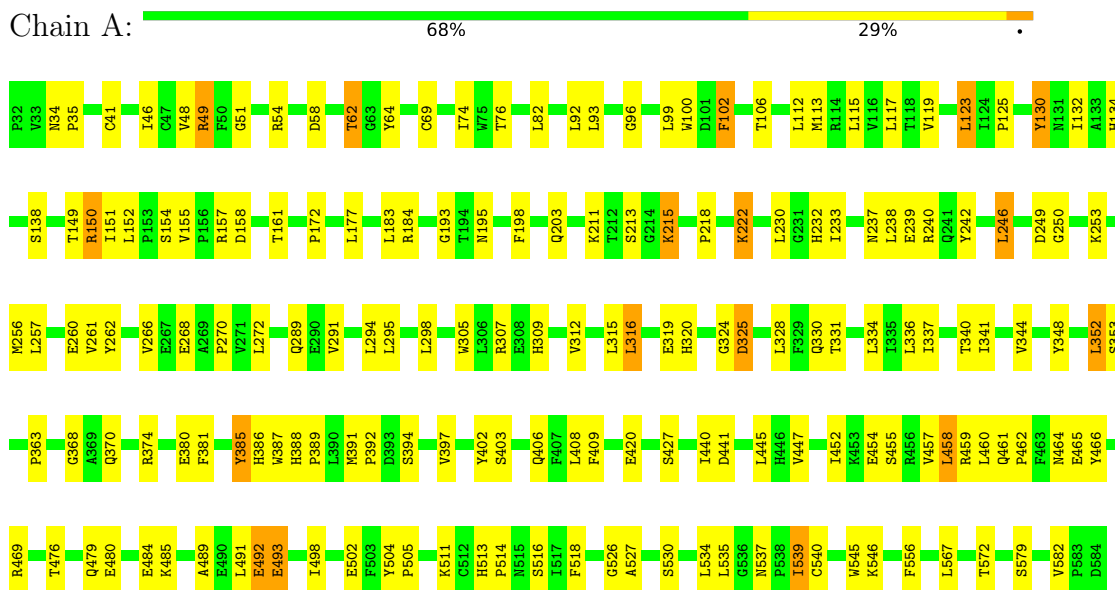
- Molecule 8 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
			Total	O		
8	A	45	45	45	0	0
8	B	54	54	54	0	0

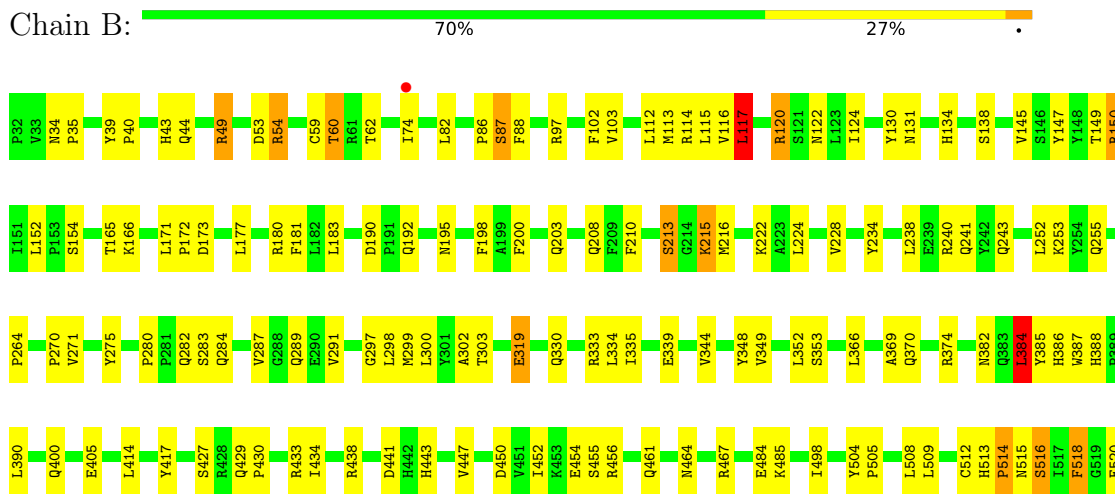
### 3 Residue-property plots

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.

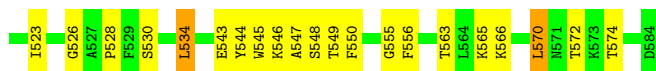
- Molecule 1: Prostaglandin G/H synthase 1



- 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: 100%

MAG1  
MAG2

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

Chain E: 100%

MAG1  
MAG2

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

Chain F: 50% 50%

MAG1  
MAG2

- Molecule 3: beta-D-mannopyranose-(1-6)-beta-D-mannopyranose-(1-6)-beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain D: 60% 40%

MAG1  
MAG2  
BMA3  
BMA4  
BMA5

## 4 Data and refinement statistics

Property	Value	Source
Space group	P 65	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	181.71Å 181.71Å 103.45Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	29.60 – 2.75 29.60 – 2.76	Depositor EDS
% Data completeness (in resolution range)	95.5 (29.60-2.75) 97.2 (29.60-2.76)	Depositor EDS
$R_{merge}$	0.09	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	2.20 (at 2.76Å)	Xtriage
Refinement program	REFMAC 5.5.0102	Depositor
R, $R_{free}$	0.181 , 0.227 0.167 , 0.212	Depositor DCC
$R_{free}$ test set	1246 reflections (2.55%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	57.5	Xtriage
Anisotropy	0.127	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.28 , 20.3	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.51$ , $\langle L^2 \rangle = 0.35$	Xtriage
Estimated twinning fraction	0.074 for h,-h-k,-l	Xtriage
Reported twinning fraction	0.504 for H, K, L 0.496 for -H-K, K, -L	Depositor
Outliers	0 of 48920 reflections	Xtriage
$F_o, F_c$ correlation	0.95	EDS
Total number of atoms	9315	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	56.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.19% of the height of the origin peak. No significant pseudotranslation is detected.*

<sup>1</sup>Intensities estimated from amplitudes.

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

## 5 Model quality [i](#)

### 5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: BOG, BMA, HEM, NAG, NIM

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

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z  >5	RMSZ	# Z  >5
1	A	0.60	0/4575	0.72	1/6223 (0.0%)
1	B	0.62	0/4577	0.72	2/6223 (0.0%)
All	All	0.61	0/9152	0.72	3/12446 (0.0%)

There are no bond length outliers.

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	41	CYS	CA-CB-SG	-6.73	101.88	114.00
1	B	384	LEU	CA-CB-CG	6.05	129.22	115.30
1	B	117	LEU	CA-CB-CG	5.08	126.98	115.30

There are no chirality outliers.

There are no planarity outliers.

### 5.2 Too-close contacts [i](#)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	4437	0	4285	130	0
1	B	4438	0	4293	121	0
2	C	28	0	25	1	0
2	E	28	0	25	0	0
2	F	28	0	25	2	0
3	D	61	0	52	2	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
4	A	43	0	30	2	0
4	B	43	0	30	3	0
5	A	14	0	13	0	0
5	B	14	0	13	0	0
6	A	21	0	12	4	0
6	B	21	0	12	1	0
7	B	40	0	56	5	0
8	A	45	0	0	8	0
8	B	54	0	0	9	0
All	All	9315	0	8871	243	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 13.

All (243) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:387:TRP:HB2	4:B:601:HEM:HBC2	1.42	1.01
1:B:387:TRP:HB2	4:B:601:HEM:CBC	1.97	0.95
1:A:51:GLY:HA3	1:A:54:ARG:NH1	1.83	0.92
1:A:215:LYS:HD2	1:A:222:LYS:HE2	1.56	0.86
1:B:115:LEU:HD23	7:B:1751:BOG:H4'1	1.58	0.86
1:B:49:ARG:HG2	1:B:49:ARG:HH11	1.43	0.83
1:A:294:LEU:HD12	1:A:409:PHE:HD2	1.44	0.82
1:A:49:ARG:HG2	1:A:49:ARG:HH11	1.46	0.81
1:A:246:LEU:HD12	1:A:253:LYS:HA	1.63	0.80
1:B:49:ARG:HH11	1:B:49:ARG:CG	1.94	0.79
1:A:530:SER:O	1:A:534:LEU:HD22	1.83	0.78
1:A:132:ILE:HD13	1:A:458:LEU:HD12	1.65	0.77
1:A:106:THR:HB	8:A:612:HOH:O	1.89	0.72
1:A:218:PRO:HG2	1:A:457:VAL:HG11	1.71	0.72
1:A:294:LEU:HD12	1:A:409:PHE:CD2	2.24	0.71
1:A:150:ARG:HD3	1:A:152:LEU:O	1.89	0.71
1:B:54[A]:ARG:HB2	1:B:54[A]:ARG:HH11	1.53	0.71
1:A:334:LEU:HD11	1:B:138:SER:HA	1.73	0.70
1:B:112:LEU:O	1:B:116:VAL:HG23	1.92	0.69
1:A:34:ASN:HB2	1:A:158:ASP:OD2	1.93	0.69
1:A:388:HIS:N	1:A:389:PRO:HD2	2.07	0.68
1:A:312:VAL:HA	1:A:315:LEU:HD12	1.75	0.68
1:B:43:HIS:O	1:B:62:THR:HG23	1.95	0.67
1:A:49:ARG:HG2	1:A:49:ARG:NH1	2.09	0.67

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:181:PHE:HB3	1:B:509:LEU:HD21	1.78	0.66
1:A:504:TYR:HB3	1:A:505:PRO:HD3	1.77	0.65
1:B:563:THR:HG23	8:B:593:HOH:O	1.95	0.65
1:A:316:LEU:HB3	1:A:328:LEU:HD23	1.80	0.64
1:B:550:PHE:O	1:B:555:GLY:HA3	1.99	0.63
1:B:572:THR:OG1	1:B:574:THR:O	2.15	0.63
1:B:43:HIS:O	1:B:44:GLN:HB2	1.97	0.63
1:A:238:LEU:HD21	1:A:242:TYR:CE2	2.34	0.62
1:B:222:LYS:HD2	8:B:585:HOH:O	1.98	0.62
1:A:238:LEU:HD21	1:A:242:TYR:CZ	2.34	0.62
1:A:154:SER:HB2	1:A:459:ARG:HB2	1.82	0.62
1:A:462:PRO:HG2	1:A:465:GLU:HG2	1.80	0.62
1:A:193:GLY:O	1:A:582:VAL:HG22	2.00	0.61
1:B:87:SER:HB2	7:B:1752:BOG:O2	2.00	0.61
1:A:479:GLN:HE21	1:A:485:LYS:HA	1.66	0.61
1:B:382:ASN:OD1	1:B:386:HIS:HE1	1.84	0.61
1:A:51:GLY:HA3	1:A:54:ARG:HH11	1.63	0.60
1:A:539:ILE:HG13	1:A:540:CYS:N	2.17	0.60
1:B:433:ARG:NH2	1:B:512:CYS:HB2	2.16	0.60
1:A:340:THR:O	1:A:344:VAL:HG23	2.02	0.60
1:B:210:PHE:CE1	1:B:382:ASN:HA	2.37	0.59
1:B:49:ARG:HG2	1:B:49:ARG:NH1	2.12	0.58
1:A:370:GLN:NE2	1:B:369:ALA:O	2.35	0.58
1:B:54[A]:ARG:HH11	1:B:54[A]:ARG:CB	2.16	0.58
1:A:125:PRO:HD2	1:A:151:ILE:HD12	1.84	0.58
1:A:215:LYS:CD	1:A:222:LYS:HE2	2.33	0.57
1:A:344:VAL:O	1:A:348:TYR:HB3	2.04	0.57
1:A:386:HIS:HD2	1:A:388:HIS:HE1	1.50	0.57
1:A:397:VAL:HB	1:A:402:TYR:HE2	1.70	0.57
1:A:240:ARG:NH1	1:A:272:LEU:O	2.37	0.56
1:B:518:PHE:HE2	1:B:523:ILE:HD13	1.70	0.56
1:A:386:HIS:CD2	1:A:388:HIS:HE1	2.23	0.56
1:A:211:LYS:HE3	1:A:289:GLN:NE2	2.21	0.56
1:A:374:ARG:HB3	1:B:374:ARG:NH1	2.20	0.56
1:B:173:ASP:O	1:B:177:LEU:HD23	2.05	0.56
1:B:172:PRO:HB3	1:B:177:LEU:HD21	1.88	0.56
1:B:234:TYR:CE2	1:B:333:ARG:HG3	2.40	0.56
1:A:363:PRO:HG2	1:A:545:TRP:CE2	2.40	0.56
1:B:344:VAL:HA	1:B:348:TYR:HB3	1.87	0.56
1:B:547:ALA:O	1:B:548:SER:C	2.44	0.55
1:A:330:GLN:HB3	1:B:138:SER:HB2	1.89	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:238:LEU:CD2	1:A:242:TYR:CE2	2.90	0.55
1:A:138:SER:HB2	1:B:330:GLN:HB3	1.88	0.55
1:B:299:MET:HG3	1:B:414:LEU:HD23	1.89	0.55
1:B:116:VAL:O	1:B:120:ARG:HB2	2.07	0.54
1:A:125:PRO:HD2	1:A:151:ILE:CD1	2.38	0.54
1:A:230:LEU:HG	1:A:233:ILE:HD12	1.88	0.54
1:A:184:ARG:NH1	1:A:391:MET:O	2.39	0.54
1:B:115:LEU:HD23	7:B:1751:BOG:C4'	2.35	0.54
1:B:518:PHE:CE2	1:B:523:ILE:HD13	2.42	0.54
1:B:319:GLU:HG2	8:B:625:HOH:O	2.07	0.54
1:B:450:ASP:O	1:B:454:GLU:N	2.40	0.54
1:A:489:ALA:HA	1:A:492:GLU:HB2	1.89	0.54
1:B:49:ARG:HH12	1:B:53:ASP:HA	1.73	0.53
1:A:152:LEU:HB2	1:A:466:TYR:CZ	2.44	0.53
1:A:537:ASN:OD1	1:A:539:ILE:HG23	2.09	0.53
1:B:400:GLN:HG3	1:B:417:TYR:OH	2.07	0.53
1:B:255:GLN:HG2	1:B:264:PRO:HA	1.89	0.53
1:B:280:PRO:HB2	1:B:283:SER:HB2	1.90	0.53
1:A:183:LEU:HD13	1:A:445:LEU:HD22	1.90	0.53
1:B:438:ARG:NH1	8:B:590:HOH:O	2.39	0.53
1:A:49:ARG:HH11	1:A:49:ARG:CG	2.17	0.53
1:A:452:ILE:O	1:A:455:SER:HB3	2.09	0.52
1:B:289:GLN:OE1	1:B:291:VAL:HG22	2.09	0.52
1:A:157:ARG:HG3	1:A:459:ARG:CZ	2.40	0.52
1:B:124:ILE:HD11	1:B:528:PRO:HB2	1.91	0.52
1:A:374:ARG:HB3	1:B:374:ARG:HH12	1.75	0.52
1:A:461:GLN:HB3	1:A:462:PRO:HD2	1.92	0.52
1:B:275:TYR:CG	1:B:284:GLN:HG2	2.44	0.52
1:B:145:VAL:HG23	1:B:224:LEU:HD22	1.91	0.51
1:A:195:ASN:ND2	1:A:427:SER:HA	2.26	0.51
1:A:260:GLU:HB2	1:A:262:TYR:CE1	2.45	0.51
1:A:291:VAL:O	1:A:294:LEU:CD2	2.58	0.51
1:B:335:ILE:O	1:B:339:GLU:HG3	2.10	0.51
1:B:563:THR:HG22	1:B:565:LYS:N	2.26	0.51
3:D:4:BMA:O6	3:D:5:BMA:H4	2.10	0.51
1:B:113:MET:O	1:B:117:LEU:HD13	2.10	0.51
1:A:157:ARG:HG3	1:A:459:ARG:NH1	2.26	0.50
1:A:381:PHE:O	1:A:385:TYR:HB2	2.11	0.50
1:B:563:THR:CG2	8:B:593:HOH:O	2.55	0.50
1:A:381:PHE:CE1	1:A:385:TYR:CD1	3.00	0.50
1:A:527:ALA:HA	1:A:530:SER:HB3	1.92	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:172:PRO:HB2	1:A:177:LEU:HD22	1.93	0.50
1:B:208:GLN:OE1	1:B:228:VAL:HA	2.12	0.50
1:A:237:ASN:OD1	1:A:239:GLU:HB2	2.13	0.49
1:A:256:MET:O	1:A:257:LEU:HD23	2.11	0.49
1:B:530:SER:O	1:B:534:LEU:HD22	2.13	0.49
1:A:250:GLY:HA2	1:A:325:ASP:OD1	2.13	0.49
1:B:287:VAL:HG11	1:B:302:ALA:HB1	1.93	0.49
1:B:130:TYR:HB3	1:B:134:HIS:O	2.13	0.49
1:A:403:SER:HB3	1:A:406:GLN:HG3	1.94	0.49
1:A:389:PRO:HD3	1:A:440:ILE:HG12	1.95	0.49
1:B:243:GLN:HG3	1:B:270:PRO:HD2	1.93	0.48
1:A:155:VAL:O	1:A:459:ARG:HD2	2.14	0.48
1:B:172:PRO:O	1:B:456:ARG:NH2	2.46	0.48
1:B:213:SER:OG	1:B:215:LYS:NZ	2.46	0.48
1:A:130:TYR:HB3	1:A:134:HIS:O	2.13	0.48
1:A:352:LEU:HD23	6:A:701:NIM:C8	2.43	0.48
1:A:93:LEU:HD23	1:A:100:TRP:CH2	2.49	0.48
1:B:352:LEU:HD21	1:B:387:TRP:HH2	1.78	0.48
1:B:384:LEU:HD11	1:B:526:GLY:HA2	1.95	0.48
1:B:504:TYR:HB3	1:B:505:PRO:HD3	1.96	0.48
1:B:513:HIS:C	1:B:514:PRO:O	2.51	0.48
1:B:390:LEU:HD21	1:B:434:ILE:HD11	1.96	0.47
1:A:198:PHE:CZ	1:A:352:LEU:HD13	2.49	0.47
1:B:352:LEU:HD21	1:B:387:TRP:CH2	2.49	0.47
1:B:190:ASP:HA	1:B:433:ARG:HB2	1.97	0.47
3:D:2:NAG:O7	3:D:2:NAG:C3	2.62	0.47
1:A:250:GLY:N	1:A:325:ASP:OD1	2.46	0.47
1:B:299:MET:HG3	1:B:414:LEU:CD2	2.45	0.47
1:B:544:TYR:O	1:B:546:LYS:N	2.42	0.47
1:A:58:ASP:OD2	1:B:546:LYS:HB3	2.15	0.47
1:B:287:VAL:HA	8:B:594:HOH:O	2.15	0.47
1:A:388:HIS:CE1	1:A:447:VAL:HG11	2.51	0.46
1:A:268:GLU:HG3	8:A:597:HOH:O	2.15	0.46
1:B:198:PHE:C	1:B:198:PHE:CD2	2.88	0.46
1:A:203:GLN:HA	4:A:601:HEM:HBC2	1.98	0.46
1:A:363:PRO:HG2	1:A:545:TRP:CD2	2.49	0.46
1:A:387:TRP:HB2	4:A:601:HEM:HAC	1.97	0.46
1:B:54[A]:ARG:CB	1:B:54[A]:ARG:NH1	2.78	0.46
1:A:502:GLU:HB2	1:A:505:PRO:HG2	1.98	0.46
1:B:484:GLU:HG2	1:B:485:LYS:H	1.80	0.46
1:A:392:PRO:HG2	1:A:394:SER:O	2.16	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:403:SER:HB3	1:A:406:GLN:HE21	1.81	0.46
1:A:112:LEU:O	1:A:113:MET:C	2.52	0.45
1:B:300:LEU:O	1:B:303:THR:HB	2.16	0.45
1:B:334:LEU:HD13	1:B:549:THR:HG22	1.98	0.45
1:B:441:ASP:OD1	1:B:443:HIS:ND1	2.39	0.45
1:A:215:LYS:HD2	1:A:222:LYS:CE	2.36	0.45
1:A:388:HIS:N	1:A:389:PRO:CD	2.76	0.45
1:A:184:ARG:NH1	1:A:441:ASP:HB2	2.31	0.45
1:B:120:ARG:HA	7:B:1751:BOG:H62	1.97	0.45
1:A:380:GLU:HG2	1:A:466:TYR:CE1	2.51	0.45
1:A:408:LEU:HB3	1:A:409:PHE:CD1	2.51	0.45
1:B:203:GLN:NE2	4:B:601:HEM:C4B	2.85	0.45
1:B:113:MET:HE3	1:B:117:LEU:CD1	2.47	0.45
1:A:344:VAL:HG11	1:A:534:LEU:HD11	1.99	0.45
1:A:291:VAL:O	1:A:294:LEU:HD22	2.17	0.45
1:A:198:PHE:C	1:A:198:PHE:CD2	2.91	0.44
1:A:238:LEU:CD1	2:F:1:NAG:H4	2.48	0.44
1:A:319:GLU:HB3	1:A:320:HIS:CD2	2.52	0.44
1:B:238:LEU:O	1:B:241:GLN:HB3	2.18	0.44
1:A:324:GLY:HA3	8:A:17:HOH:O	2.18	0.44
1:A:511:LYS:HA	8:A:606:HOH:O	2.18	0.44
1:A:513:HIS:HB2	1:A:516:SER:OG	2.18	0.44
1:B:195:ASN:ND2	1:B:427:SER:HA	2.32	0.44
1:A:462:PRO:HB2	8:A:596:HOH:O	2.16	0.44
1:B:504:TYR:CZ	1:B:508:LEU:HD11	2.53	0.43
1:A:353:SER:HA	6:A:701:NIM:C5	2.48	0.43
1:A:353:SER:HA	6:A:701:NIM:N2	2.33	0.43
1:A:469:ARG:HG3	1:A:469:ARG:HH11	1.84	0.43
1:B:102:PHE:O	1:B:103:VAL:C	2.56	0.43
1:B:114:ARG:HA	1:B:117:LEU:HD22	2.00	0.43
1:B:240:ARG:HG3	1:B:271:VAL:HG11	1.99	0.43
1:B:88:PHE:HB2	7:B:1752:BOG:H3'1	2.01	0.43
1:B:566:LYS:HG3	8:B:600:HOH:O	2.17	0.43
1:B:117:LEU:HB3	1:B:366:LEU:HD21	2.01	0.43
1:B:384:LEU:HD11	1:B:526:GLY:CA	2.47	0.43
1:B:452:ILE:O	1:B:455:SER:HB3	2.18	0.43
1:A:289:GLN:HG2	8:A:609:HOH:O	2.19	0.43
1:A:113:MET:O	1:A:117:LEU:HD13	2.19	0.43
1:A:291:VAL:O	1:A:294:LEU:HD23	2.18	0.43
1:A:370:GLN:HE22	1:B:369:ALA:C	2.21	0.42
1:B:382:ASN:HB3	8:B:608:HOH:O	2.19	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:498:ILE:HG13	1:B:498:ILE:O	2.18	0.42
1:B:34:ASN:HA	1:B:35:PRO:HD2	1.86	0.42
1:A:119:VAL:O	1:A:123:LEU:HD23	2.19	0.42
1:A:305:TRP:HE3	1:A:336:LEU:HD23	1.83	0.42
1:B:464:ASN:HA	1:B:467:ARG:HG3	2.01	0.42
1:A:250:GLY:CA	1:A:325:ASP:OD1	2.68	0.42
1:B:200:PHE:CD1	1:B:297:GLY:HA3	2.54	0.42
1:B:353:SER:HA	6:B:1701:NIM:N2	2.34	0.42
1:B:192:GLN:HG2	1:B:515:ASN:O	2.20	0.42
1:A:125:PRO:HB3	1:B:543:GLU:CD	2.40	0.42
1:A:341:ILE:HG23	1:A:534:LEU:HB3	2.02	0.42
1:A:502:GLU:HG2	8:A:12:HOH:O	2.20	0.42
1:B:130:TYR:O	1:B:149:THR:HA	2.20	0.42
1:A:34:ASN:HA	1:A:35:PRO:HD3	1.83	0.42
1:B:59:CYS:O	1:B:60:THR:C	2.58	0.42
1:B:131:ASN:HB2	1:B:147:TYR:CD1	2.55	0.42
1:B:166:LYS:HD3	1:B:166:LYS:HA	1.89	0.42
1:A:316:LEU:HD21	1:A:331:THR:HG22	2.02	0.42
1:A:526:GLY:HA3	6:A:701:NIM:H10	2.01	0.42
1:A:62:THR:HG22	1:A:64:TYR:N	2.35	0.42
1:A:334:LEU:HA	1:A:337:ILE:HD12	2.01	0.42
1:B:253:LYS:HB3	1:B:264:PRO:HG3	2.01	0.42
1:A:316:LEU:HB3	1:A:328:LEU:CD2	2.48	0.41
1:B:39:TYR:N	1:B:40:PRO:HD3	2.35	0.41
1:A:464:ASN:HD21	1:A:498:ILE:HG13	1.86	0.41
1:B:344:VAL:O	1:B:348:TYR:HB3	2.19	0.41
1:B:513:HIS:O	1:B:516:SER:HB2	2.20	0.41
1:A:309:HIS:CD2	1:A:309:HIS:C	2.93	0.41
1:A:238:LEU:HD13	2:F:1:NAG:H4	2.02	0.41
1:A:261:VAL:H	1:A:307:ARG:HH21	1.68	0.41
1:B:49:ARG:CG	1:B:49:ARG:NH1	2.64	0.41
1:B:215:LYS:HD2	1:B:216:MET:HG3	2.03	0.41
1:A:149:THR:OG1	1:A:150:ARG:N	2.54	0.41
1:B:388:HIS:CE1	1:B:447:VAL:HG11	2.55	0.41
1:A:368:GLY:HA2	1:B:370:GLN:NE2	2.35	0.41
1:B:344:VAL:O	1:B:349:VAL:HG23	2.21	0.41
1:B:384:LEU:HD23	1:B:384:LEU:C	2.41	0.41
1:B:429:GLN:HA	1:B:430:PRO:HD3	1.90	0.41
1:A:46:ILE:HG22	1:A:48:VAL:HG23	2.02	0.41
1:A:113:MET:O	1:A:117:LEU:CD1	2.69	0.41
1:B:113:MET:CE	1:B:117:LEU:CD1	2.99	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:514:PRO:HA	8:B:18:HOH:O	2.21	0.41
1:A:102:PHE:C	1:A:102:PHE:CD1	2.95	0.41
1:B:275:TYR:CD2	1:B:284:GLN:HG2	2.56	0.41
1:A:370:GLN:NE2	1:B:369:ALA:C	2.74	0.40
2:C:1:NAG:H61	2:C:2:NAG:C7	2.52	0.40
1:B:150:ARG:NH1	1:B:154:SER:HB3	2.36	0.40
1:A:161:THR:HB	8:A:20:HOH:O	2.21	0.40
1:A:491:LEU:O	1:A:493:GLU:N	2.55	0.40
1:B:566:LYS:O	1:B:570:LEU:HB2	2.21	0.40
1:A:420:GLU:CD	1:A:572:THR:HB	2.41	0.40
1:B:280:PRO:C	1:B:282:GLN:N	2.74	0.40
1:A:260:GLU:HB2	1:A:262:TYR:HE1	1.85	0.40
1:A:266:VAL:O	1:A:270:PRO:HA	2.21	0.40
1:B:152:LEU:HD13	1:B:461:GLN:OE1	2.22	0.40

There are no symmetry-related clashes.

## 5.3 Torsion angles [i](#)

### 5.3.1 Protein backbone [i](#)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	551/553 (100%)	496 (90%)	49 (9%)	6 (1%)	14	25
1	B	552/553 (100%)	500 (91%)	48 (9%)	4 (1%)	22	39
All	All	1103/1106 (100%)	996 (90%)	97 (9%)	10 (1%)	17	31

All (10) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	545	TRP
1	A	96	GLY
1	A	492	GLU
1	A	69	CYS

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Mol	Chain	Res	Type
1	A	249	ASP
1	B	60	THR
1	A	514	PRO
1	A	579	SER
1	B	86	PRO
1	B	514	PRO

### 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	476/488 (98%)	440 (92%)	36 (8%)	13	23
1	B	476/488 (98%)	447 (94%)	29 (6%)	18	33
All	All	952/976 (98%)	887 (93%)	65 (7%)	16	28

All (65) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	49	ARG
1	A	62	THR
1	A	74	ILE
1	A	76	THR
1	A	82	LEU
1	A	92	LEU
1	A	99	LEU
1	A	102	PHE
1	A	115	LEU
1	A	123	LEU
1	A	130	TYR
1	A	150	ARG
1	A	213	SER
1	A	215	LYS
1	A	222	LYS
1	A	232	HIS
1	A	246	LEU

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	A	295	LEU
1	A	298	LEU
1	A	316	LEU
1	A	325	ASP
1	A	352	LEU
1	A	385	TYR
1	A	454	GLU
1	A	458	LEU
1	A	460	LEU
1	A	476	THR
1	A	480	GLU
1	A	484	GLU
1	A	493	GLU
1	A	518	PHE
1	A	535	LEU
1	A	539	ILE
1	A	546	LYS
1	A	556	PHE
1	A	567	LEU
1	B	49	ARG
1	B	54[A]	ARG
1	B	54[B]	ARG
1	B	74	ILE
1	B	82	LEU
1	B	87	SER
1	B	97	ARG
1	B	117	LEU
1	B	120	ARG
1	B	122	ASN
1	B	150	ARG
1	B	165	THR
1	B	171	LEU
1	B	180	ARG
1	B	183	LEU
1	B	213	SER
1	B	215	LYS
1	B	252	LEU
1	B	298	LEU
1	B	319	GLU
1	B	384	LEU
1	B	385	TYR
1	B	405	GLU

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Mol	Chain	Res	Type
1	B	516	SER
1	B	518	PHE
1	B	520	GLU
1	B	534	LEU
1	B	556	PHE
1	B	570	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (10) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	95	HIS
1	A	284	GLN
1	A	382	ASN
1	A	406	GLN
1	A	442	HIS
1	A	479	GLN
1	B	122	ASN
1	B	134	HIS
1	B	370	GLN
1	B	386	HIS

### 5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

## 5.5 Carbohydrates [i](#)

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	C	1	2,1	14,14,15	0.68	0	17,19,21	1.28	3 (17%)
2	NAG	C	2	2	14,14,15	0.64	0	17,19,21	1.36	2 (11%)
3	NAG	D	1	3,1	14,14,15	0.82	0	17,19,21	1.70	2 (11%)
3	NAG	D	2	3	14,14,15	0.63	0	17,19,21	1.32	2 (11%)
3	BMA	D	3	3	11,11,12	0.78	0	15,15,17	1.43	3 (20%)
3	BMA	D	4	3	11,11,12	0.74	0	15,15,17	0.71	0
3	BMA	D	5	3	11,11,12	0.66	0	15,15,17	1.05	1 (6%)
2	NAG	E	1	2,1	14,14,15	0.58	0	17,19,21	1.09	1 (5%)
2	NAG	E	2	2	14,14,15	0.66	0	17,19,21	1.17	1 (5%)
2	NAG	F	1	2,1	14,14,15	0.89	0	17,19,21	2.02	5 (29%)
2	NAG	F	2	2	14,14,15	0.77	0	17,19,21	1.14	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	-	0/6/23/26	0/1/1/1
3	NAG	D	2	3	-	2/6/23/26	0/1/1/1
3	BMA	D	3	3	-	2/2/19/22	0/1/1/1
3	BMA	D	4	3	-	1/2/19/22	0/1/1/1
3	BMA	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	-	0/6/23/26	0/1/1/1
2	NAG	F	1	2,1	-	0/6/23/26	0/1/1/1
2	NAG	F	2	2	-	3/6/23/26	0/1/1/1

There are no bond length outliers.

All (21) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	D	1	NAG	C1-O5-C5	5.09	119.09	112.19
2	F	1	NAG	C1-O5-C5	4.85	118.77	112.19
2	F	1	NAG	O5-C1-C2	3.96	117.54	111.29
2	E	2	NAG	C2-N2-C7	-3.75	117.56	122.90
3	D	2	NAG	O5-C1-C2	-3.12	106.36	111.29

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	F	2	NAG	O5-C1-C2	-3.01	106.54	111.29
3	D	3	BMA	C1-O5-C5	2.99	116.25	112.19
2	C	2	NAG	C4-C3-C2	2.68	114.95	111.02
2	F	1	NAG	O7-C7-C8	-2.64	117.16	122.06
2	C	1	NAG	C3-C4-C5	2.53	114.75	110.24
2	C	1	NAG	O5-C1-C2	-2.51	107.32	111.29
3	D	1	NAG	O4-C4-C3	-2.41	104.77	110.35
2	C	1	NAG	C4-C3-C2	2.36	114.48	111.02
2	C	2	NAG	O5-C5-C4	-2.35	105.11	110.83
2	F	1	NAG	C4-C3-C2	-2.32	107.62	111.02
3	D	2	NAG	C4-C3-C2	-2.16	107.85	111.02
3	D	3	BMA	O5-C5-C4	-2.15	105.59	110.83
3	D	3	BMA	C6-C5-C4	2.15	118.05	113.00
3	D	5	BMA	C1-O5-C5	2.12	115.06	112.19
2	E	1	NAG	O4-C4-C5	2.08	114.46	109.30
2	F	1	NAG	C8-C7-N2	2.01	119.50	116.10

There are no chirality outliers.

All (10) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	D	2	NAG	C3-C2-N2-C7
3	D	3	BMA	O5-C5-C6-O6
3	D	5	BMA	O5-C5-C6-O6
3	D	5	BMA	C4-C5-C6-O6
2	F	2	NAG	O5-C5-C6-O6
2	F	2	NAG	C4-C5-C6-O6
3	D	2	NAG	O5-C5-C6-O6
3	D	4	BMA	O5-C5-C6-O6
2	F	2	NAG	C3-C2-N2-C7
3	D	3	BMA	C4-C5-C6-O6

All (1) ring outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	D	5	BMA	C1-C2-C3-C4-C5-O5

6 monomers are involved in 5 short contacts:

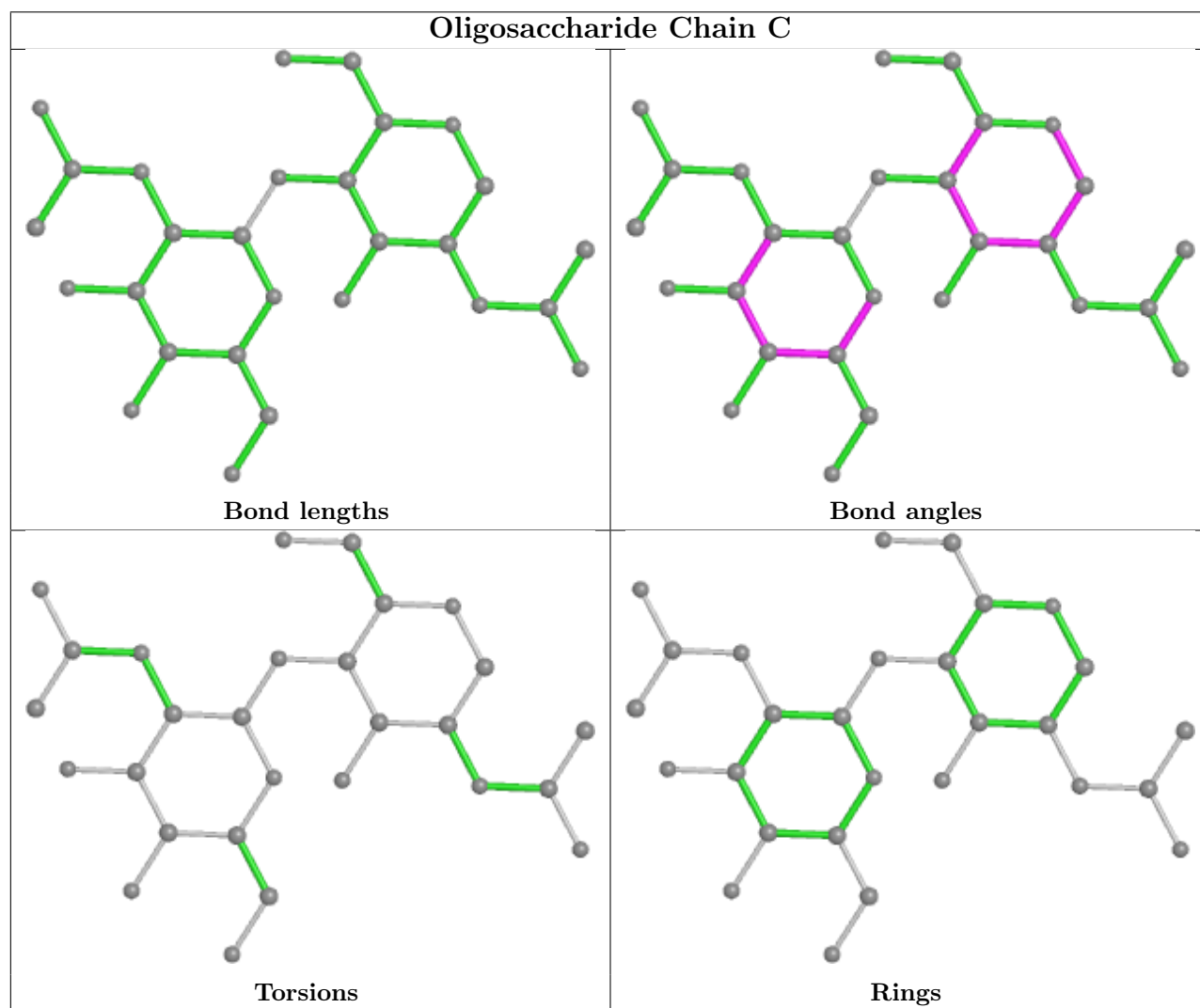
Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	F	1	NAG	2	0

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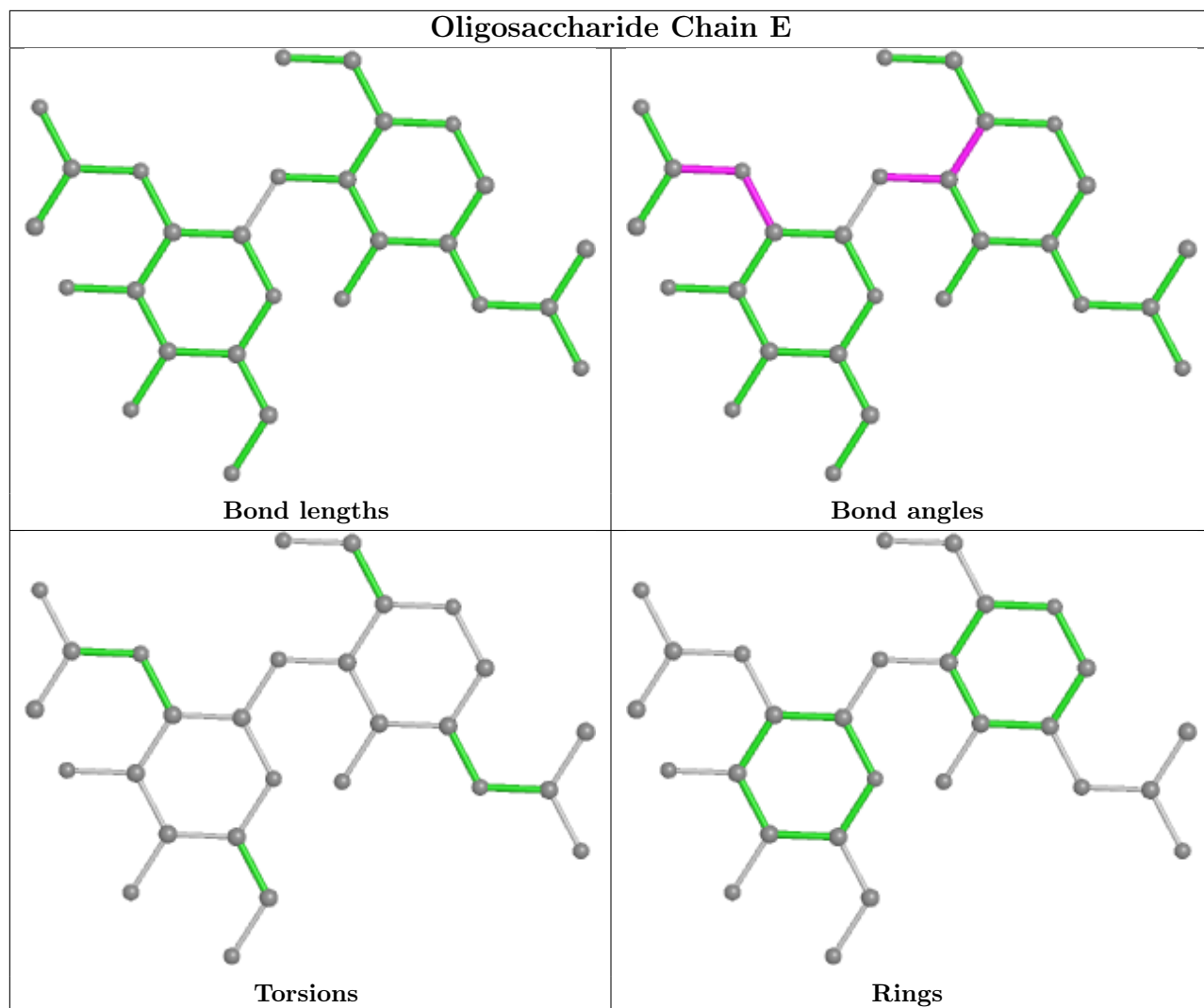
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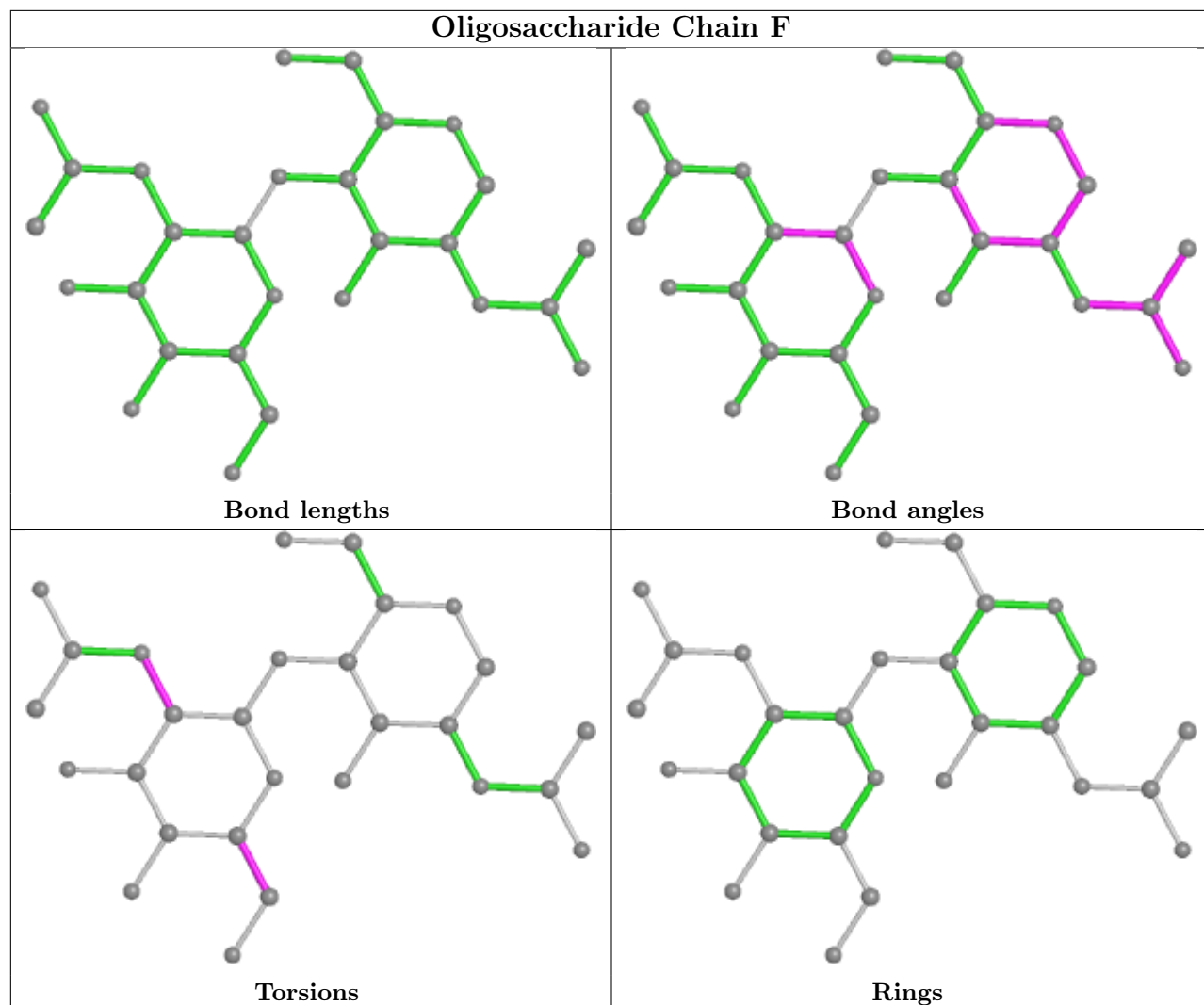
Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	D	2	NAG	1	0
3	D	5	BMA	1	0
2	C	1	NAG	1	0
2	C	2	NAG	1	0
3	D	4	BMA	1	0

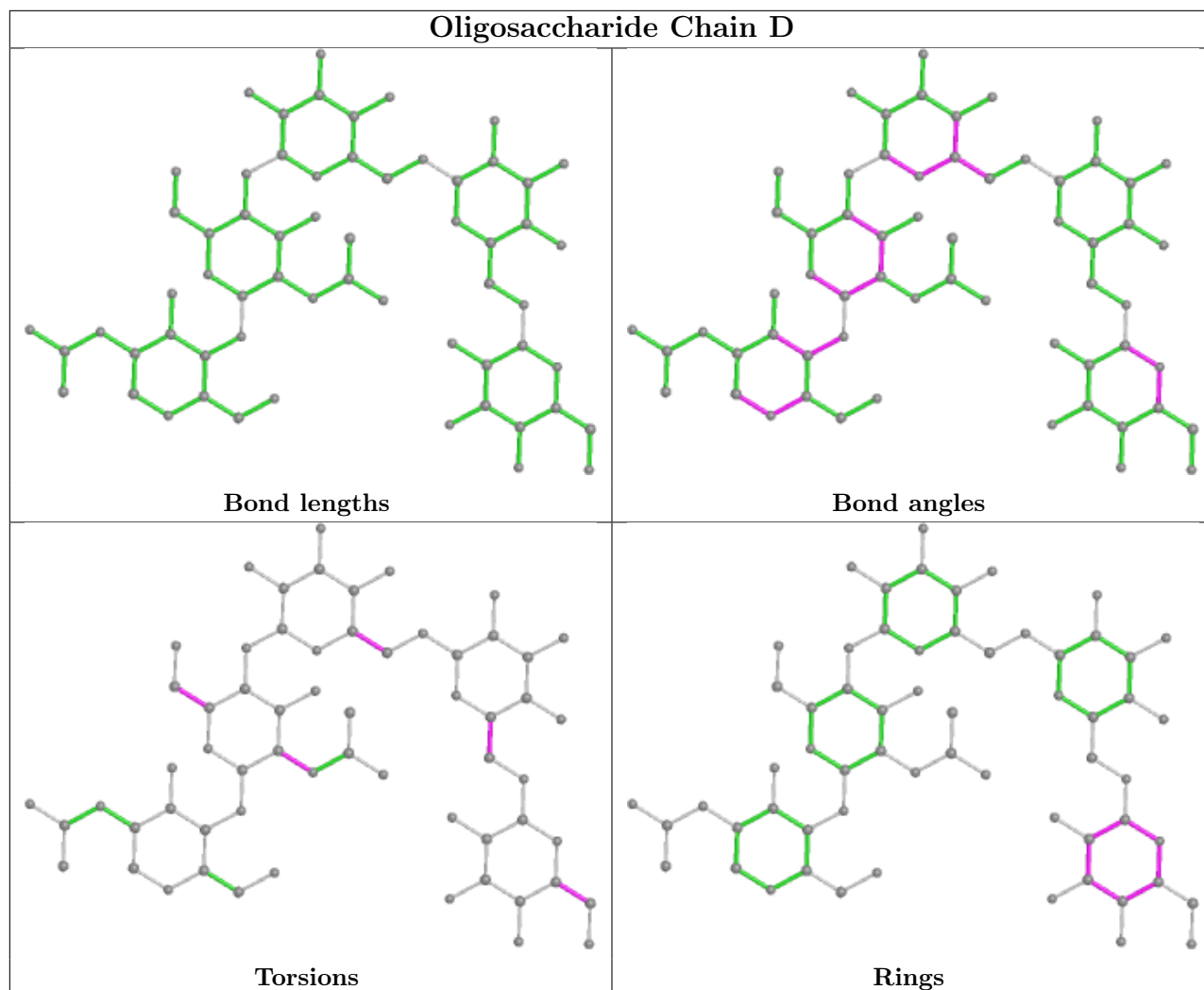
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for oligosaccharide.











## 5.6 Ligand geometry [i](#)

8 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	$\# Z  > 2$
4	HEM	A	601	1	41,50,50	2.02	7 (17%)	45,82,82	1.47	6 (13%)
6	NIM	B	1701	-	21,22,22	3.13	6 (28%)	29,31,31	1.89	3 (10%)
7	BOG	B	1752	-	20,20,20	0.82	1 (5%)	25,25,25	1.45	5 (20%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
4	HEM	B	601	8,1	41,50,50	2.03	6 (14%)	45,82,82	1.76	10 (22%)
7	BOG	B	1751	-	20,20,20	0.76	0	25,25,25	2.17	7 (28%)
6	NIM	A	701	-	21,22,22	3.45	5 (23%)	29,31,31	2.04	5 (17%)
5	NAG	A	681	1	14,14,15	0.74	0	17,19,21	1.67	6 (35%)
5	NAG	B	1661	1	14,14,15	0.61	0	17,19,21	0.98	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
4	HEM	A	601	1	-	2/12/54/54	-
6	NIM	B	1701	-	-	0/11/13/13	0/2/2/2
7	BOG	B	1752	-	-	6/11/31/31	0/1/1/1
4	HEM	B	601	8,1	-	5/12/54/54	-
7	BOG	B	1751	-	-	7/11/31/31	0/1/1/1
6	NIM	A	701	-	-	0/11/13/13	0/2/2/2
5	NAG	A	681	1	-	2/6/23/26	0/1/1/1
5	NAG	B	1661	1	-	2/6/23/26	0/1/1/1

All (25) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
6	A	701	NIM	O3-N2	12.75	1.44	1.22
6	B	1701	NIM	O3-N2	10.09	1.39	1.22
4	B	601	HEM	C3D-C2D	8.49	1.54	1.36
4	A	601	HEM	C3D-C2D	8.35	1.54	1.36
6	B	1701	NIM	C2-N1	-5.97	1.32	1.42
6	A	701	NIM	C2-N1	-5.64	1.33	1.42
4	B	601	HEM	C3C-C2C	-5.06	1.33	1.40
6	B	1701	NIM	C5-N2	-4.75	1.33	1.45
6	B	1701	NIM	O2-S1	4.15	1.50	1.43
6	A	701	NIM	C5-N2	-4.15	1.35	1.45
4	A	601	HEM	C3C-C2C	-3.99	1.34	1.40
6	A	701	NIM	O1-S1	3.87	1.50	1.43
4	B	601	HEM	C3C-CAC	3.80	1.55	1.47
6	B	1701	NIM	O1-S1	3.70	1.50	1.43
6	A	701	NIM	O2-S1	3.63	1.49	1.43
4	A	601	HEM	C3C-CAC	3.06	1.54	1.47

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	A	601	HEM	FE-ND	3.04	2.11	1.96
4	B	601	HEM	CAB-C3B	3.00	1.55	1.47
4	A	601	HEM	CAB-C3B	2.93	1.55	1.47
4	A	601	HEM	CAA-C2A	2.55	1.55	1.52
6	B	1701	NIM	S1-N1	-2.43	1.60	1.63
4	A	601	HEM	CMA-C3A	2.24	1.56	1.51
7	B	1752	BOG	O1-C1	2.13	1.43	1.40
4	B	601	HEM	FE-ND	2.03	2.06	1.96
4	B	601	HEM	CMA-C3A	2.01	1.55	1.51

All (42) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
6	A	701	NIM	O2-S1-O1	-8.40	106.78	118.85
6	B	1701	NIM	O2-S1-O1	-6.65	109.29	118.85
4	B	601	HEM	C4D-ND-C1D	5.95	111.22	105.07
6	B	1701	NIM	C1-S1-N1	5.55	112.96	106.63
7	B	1751	BOG	C4-C3-C2	-5.42	101.36	110.82
7	B	1751	BOG	C1'-O1-C1	-5.12	105.35	113.84
4	A	601	HEM	C4D-ND-C1D	4.84	110.07	105.07
7	B	1751	BOG	O1-C1-C2	-4.22	101.71	108.30
4	B	601	HEM	CBA-CAA-C2A	-4.10	105.63	112.62
6	A	701	NIM	C6-C5-N2	3.59	121.91	118.75
6	B	1701	NIM	O1-S1-C1	3.55	113.98	108.28
7	B	1752	BOG	O5-C1-C2	-3.38	103.20	110.35
4	A	601	HEM	C4B-CHC-C1C	3.18	126.75	122.56
7	B	1752	BOG	O5-C5-C4	-3.15	103.98	109.69
5	A	681	NAG	C1-C2-N2	-3.09	105.21	110.49
5	A	681	NAG	O3-C3-C2	2.91	115.48	109.47
4	B	601	HEM	CHB-C1B-NB	2.84	127.89	124.38
7	B	1751	BOG	O5-C1-C2	-2.84	104.34	110.35
4	B	601	HEM	CMA-C3A-C4A	-2.75	124.24	128.46
6	A	701	NIM	C1-S1-N1	2.75	109.76	106.63
5	A	681	NAG	O5-C5-C6	2.66	111.38	107.20
4	B	601	HEM	C4C-CHD-C1D	2.59	125.98	122.56
7	B	1751	BOG	C1-O5-C5	2.59	118.77	113.69
6	A	701	NIM	C7-O5-C8	2.58	124.45	118.00
6	A	701	NIM	O1-S1-C1	2.50	112.30	108.28
5	A	681	NAG	C3-C4-C5	-2.36	106.03	110.24
4	A	601	HEM	CMD-C2D-C1D	2.36	128.63	125.04
4	B	601	HEM	CHA-C4D-ND	2.34	127.27	124.38
7	B	1752	BOG	C3-C4-C5	-2.29	106.16	110.24

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
7	B	1752	BOG	C4-C3-C2	-2.28	106.85	110.82
4	A	601	HEM	C2C-C3C-C4C	2.28	108.49	106.90
7	B	1751	BOG	O5-C5-C6	-2.27	100.79	106.44
7	B	1751	BOG	O2-C2-C3	2.24	115.53	110.35
7	B	1752	BOG	O5-C1-O1	2.21	115.21	109.97
5	A	681	NAG	C1-O5-C5	2.18	115.15	112.19
4	B	601	HEM	O1A-CGA-CBA	-2.18	116.09	123.08
4	A	601	HEM	CMA-C3A-C4A	-2.13	125.18	128.46
4	A	601	HEM	CHA-C4D-ND	2.12	127.00	124.38
4	B	601	HEM	O2A-CGA-CBA	2.06	120.65	114.03
4	B	601	HEM	O2D-CGD-CBD	2.06	120.64	114.03
5	A	681	NAG	O4-C4-C5	2.05	114.40	109.30
4	B	601	HEM	C1B-NB-C4B	2.04	107.18	105.07

There are no chirality outliers.

All (24) torsion outliers are listed below:

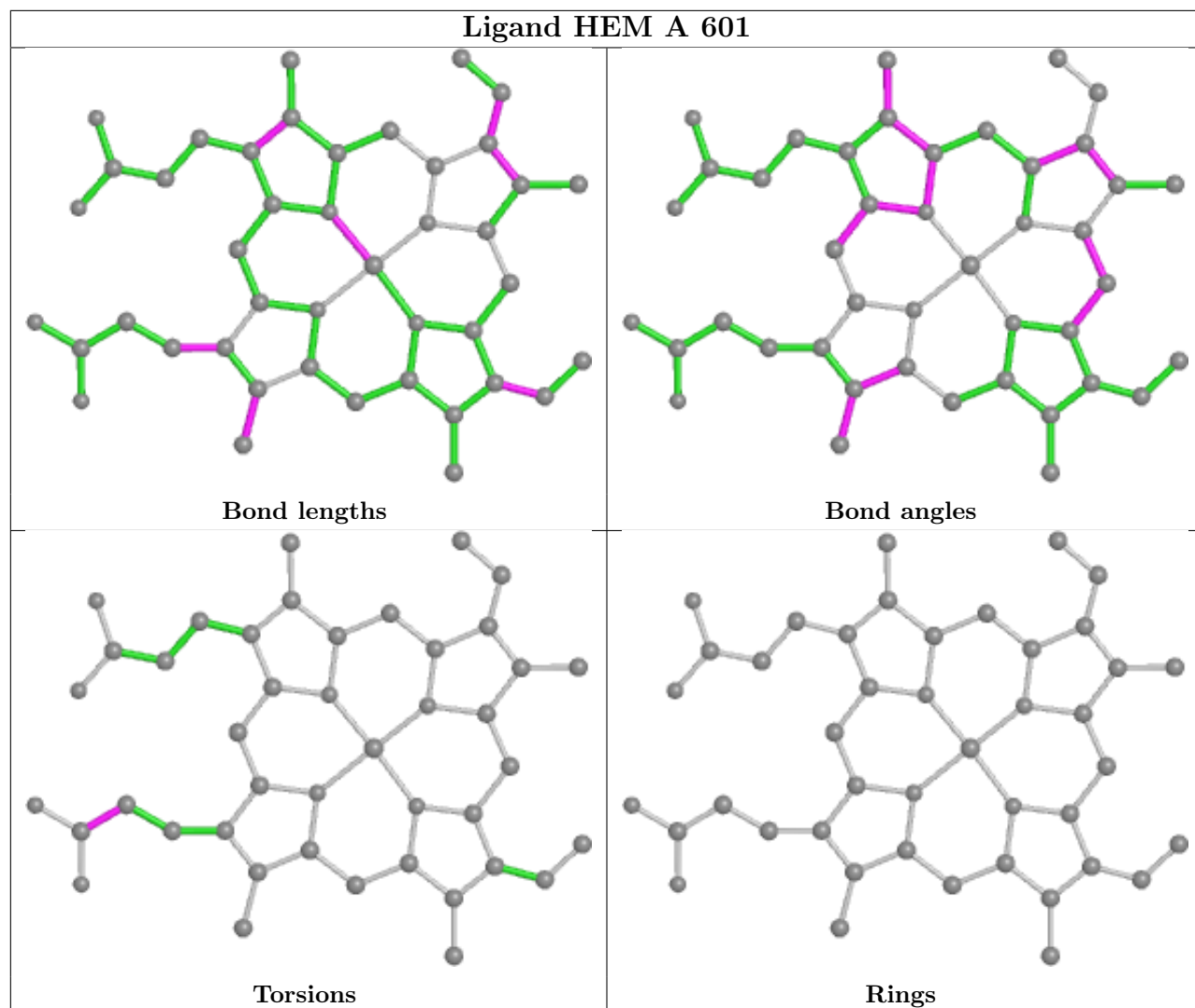
Mol	Chain	Res	Type	Atoms
5	A	681	NAG	O5-C5-C6-O6
5	B	1661	NAG	O5-C5-C6-O6
5	A	681	NAG	C4-C5-C6-O6
4	B	601	HEM	C2A-CAA-CBA-CGA
5	B	1661	NAG	C4-C5-C6-O6
7	B	1752	BOG	O1-C1'-C2'-C3'
7	B	1751	BOG	C3'-C4'-C5'-C6'
7	B	1752	BOG	C3'-C4'-C5'-C6'
7	B	1752	BOG	O5-C5-C6-O6
7	B	1752	BOG	C4'-C5'-C6'-C7'
7	B	1751	BOG	O1-C1'-C2'-C3'
7	B	1751	BOG	C2'-C1'-O1-C1
7	B	1752	BOG	O5-C1-O1-C1'
7	B	1751	BOG	C2'-C3'-C4'-C5'
7	B	1751	BOG	C5'-C6'-C7'-C8'
4	A	601	HEM	CAA-CBA-CGA-O2A
7	B	1751	BOG	C4-C5-C6-O6
7	B	1751	BOG	C4'-C5'-C6'-C7'
4	B	601	HEM	CAD-CBD-CGD-O2D
4	A	601	HEM	CAA-CBA-CGA-O1A
4	B	601	HEM	CAD-CBD-CGD-O1D
4	B	601	HEM	CAA-CBA-CGA-O2A
4	B	601	HEM	CAA-CBA-CGA-O1A
7	B	1752	BOG	C1'-C2'-C3'-C4'

There are no ring outliers.

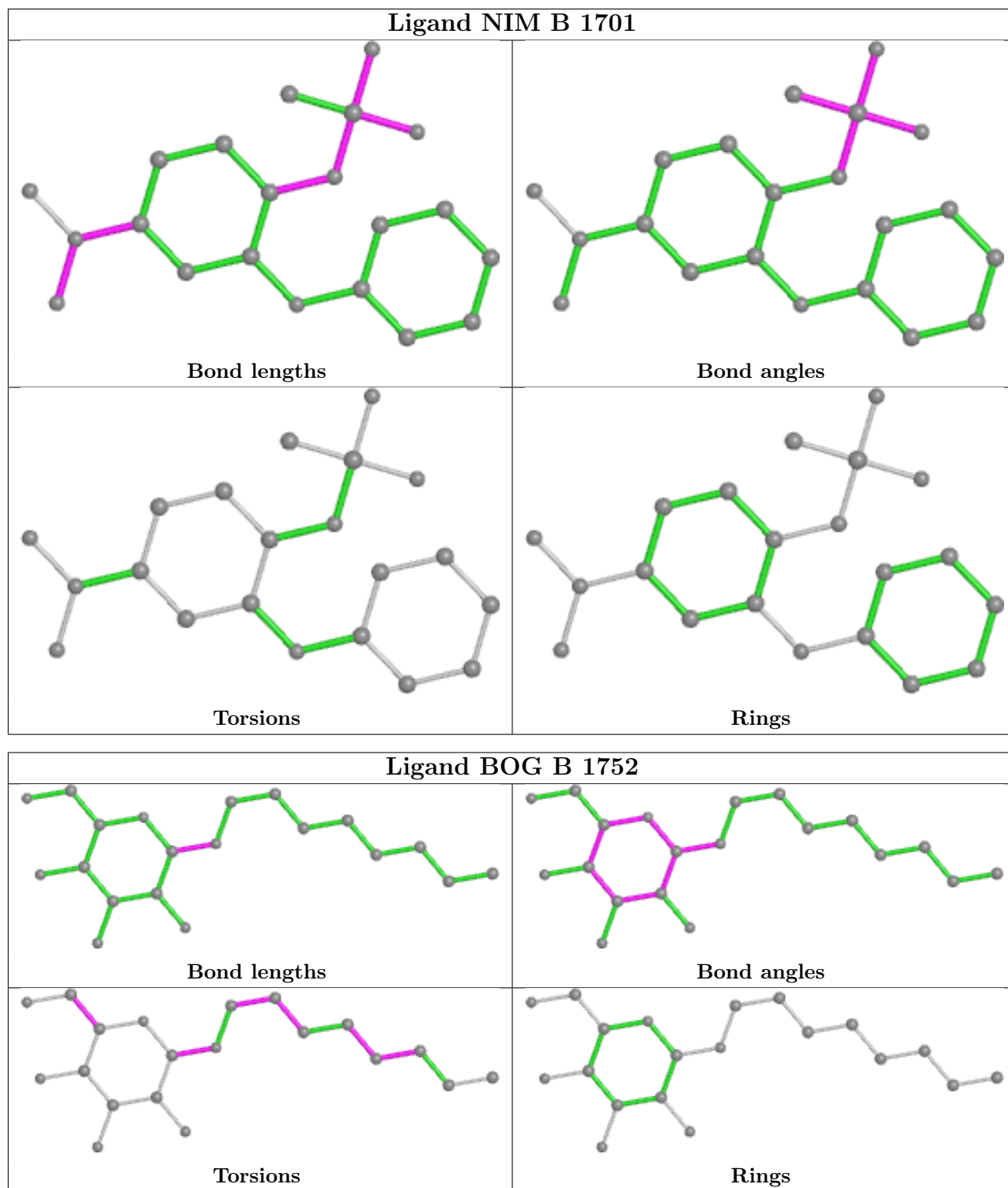
6 monomers are involved in 15 short contacts:

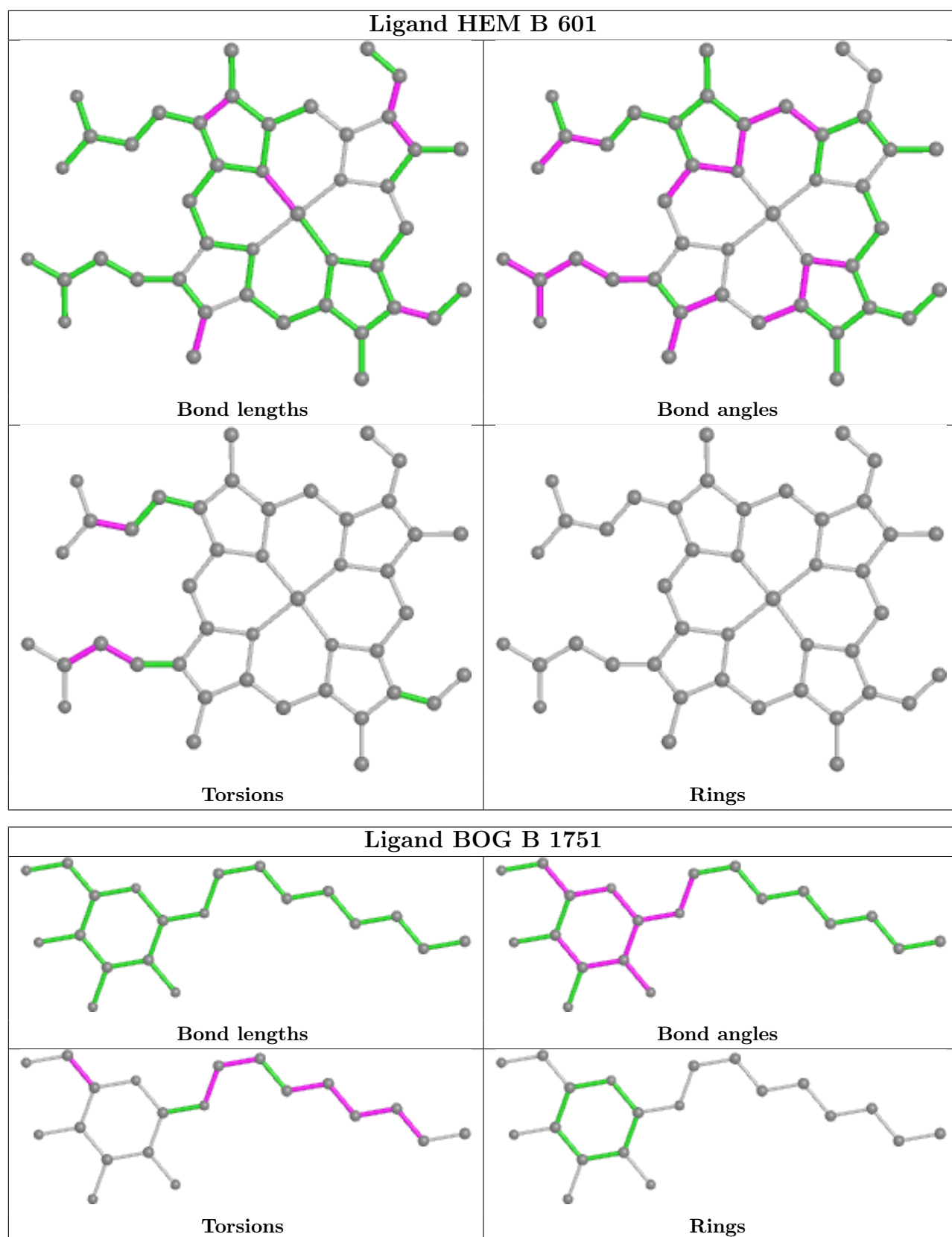
Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	A	601	HEM	2	0
6	B	1701	NIM	1	0
7	B	1752	BOG	2	0
4	B	601	HEM	3	0
7	B	1751	BOG	3	0
6	A	701	NIM	4	0

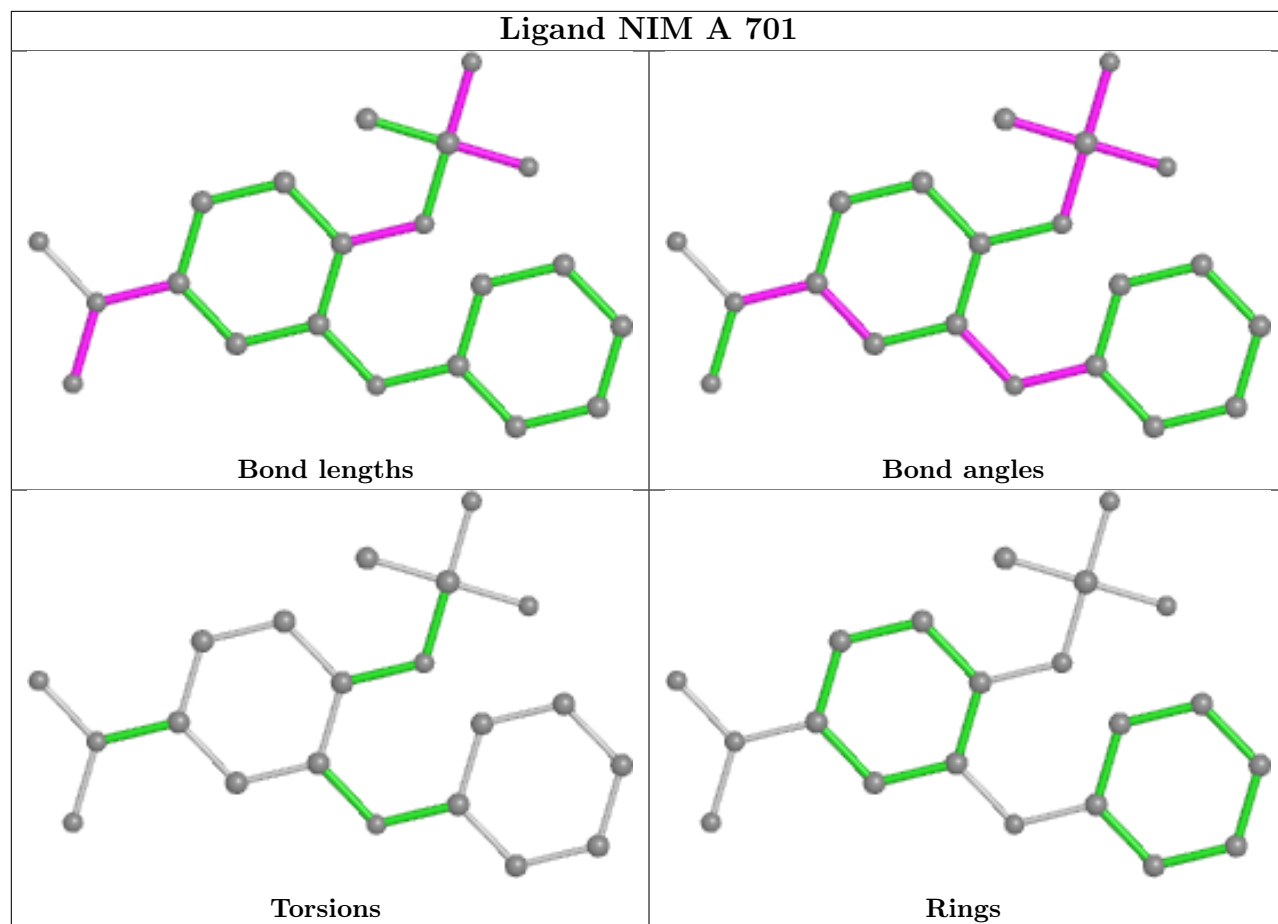
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included.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











## 5.7 Other polymers [i](#)

There are no such residues in this entry.

## 5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

## 6 Fit of model and data [i](#)

### 6.1 Protein, DNA and RNA chains [i](#)

In the following table, the column labelled ‘#RSRZ> 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95<sup>th</sup> 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 <sup>2</sup> )	Q<0.9
1	A	553/553 (100%)	-0.58	0 100   100	39, 56, 76, 82	0
1	B	553/553 (100%)	-0.55	1 (0%) 95   97	37, 54, 74, 85	0
All	All	1106/1106 (100%)	-0.56	1 (0%) 95   97	37, 55, 75, 85	0

All (1) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	74	ILE	3.1

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

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

### 6.3 Carbohydrates [i](#)

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95<sup>th</sup> 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.

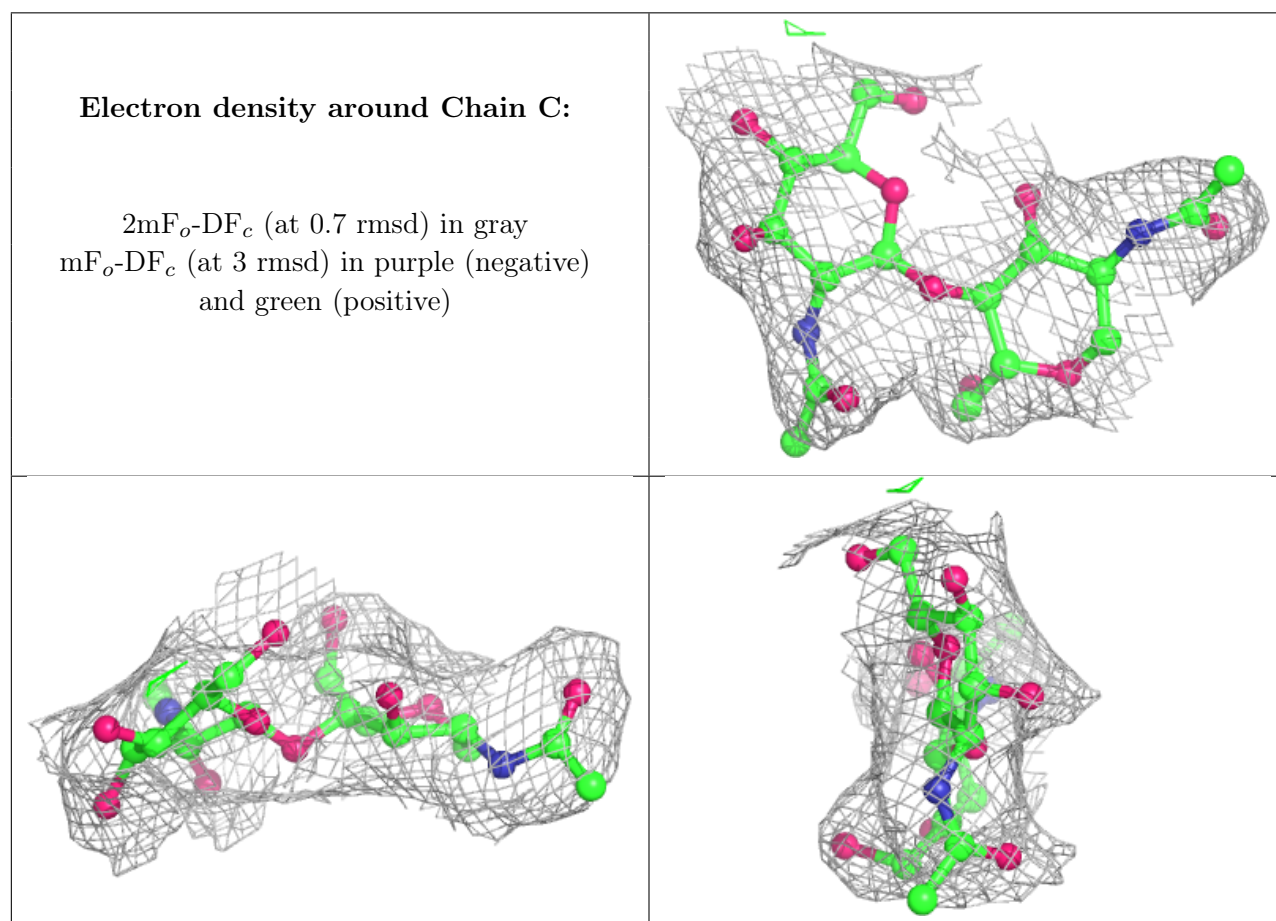
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å <sup>2</sup> )	Q<0.9
3	BMA	D	4	11/12	0.89	0.15	84,88,91,94	0
2	NAG	F	2	14/15	0.91	0.18	57,61,64,66	0
2	NAG	C	2	14/15	0.93	0.20	91,95,99,99	0
2	NAG	C	1	14/15	0.94	0.17	84,90,92,92	0
3	BMA	D	5	11/12	0.94	0.19	93,96,97,98	0
3	NAG	D	2	14/15	0.95	0.19	60,63,68,68	0
3	NAG	D	1	14/15	0.96	0.10	44,47,50,56	0
3	BMA	D	3	11/12	0.96	0.18	71,74,76,82	0

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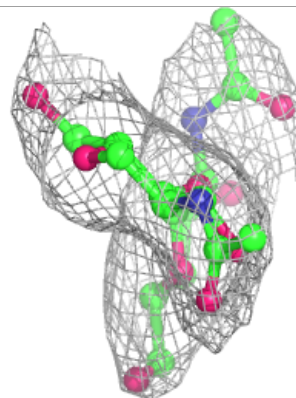
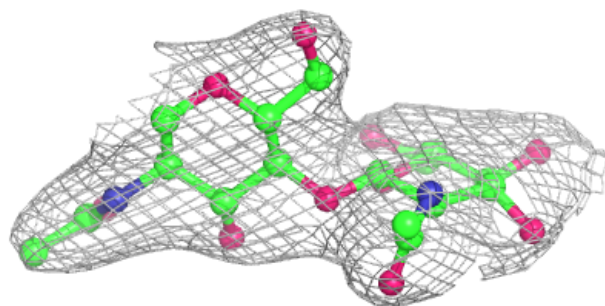
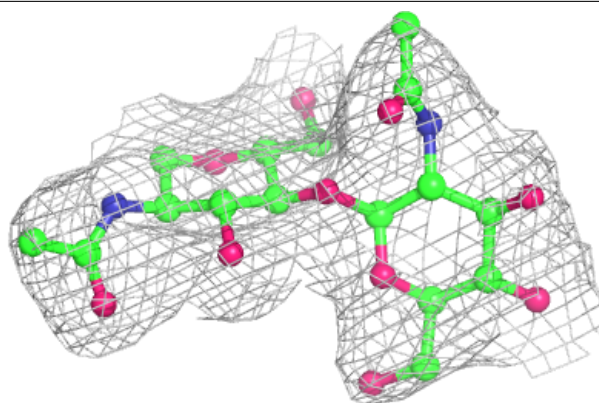
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors( $\text{\AA}^2$ )	Q<0.9
2	NAG	E	1	14/15	0.97	0.09	68,71,75,80	0
2	NAG	E	2	14/15	0.97	0.16	83,85,86,88	0
2	NAG	F	1	14/15	0.98	0.10	40,44,48,50	0

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

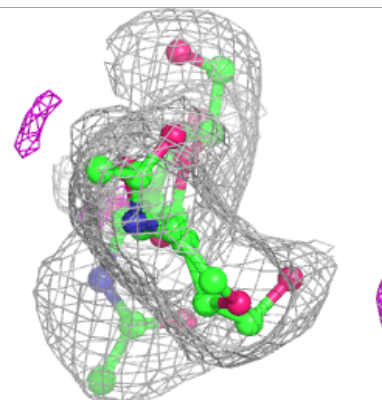
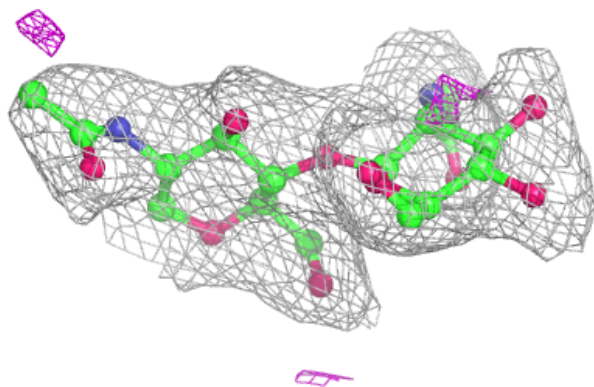
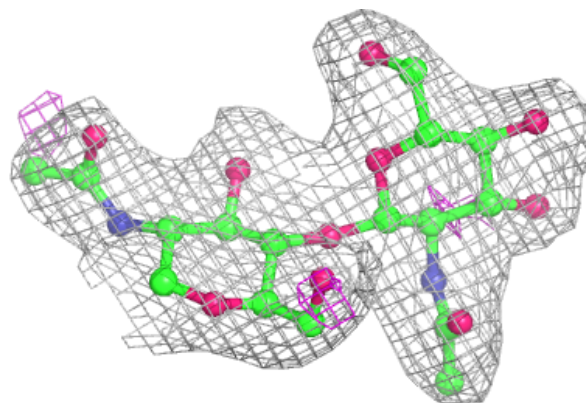


**Electron density around Chain E:**

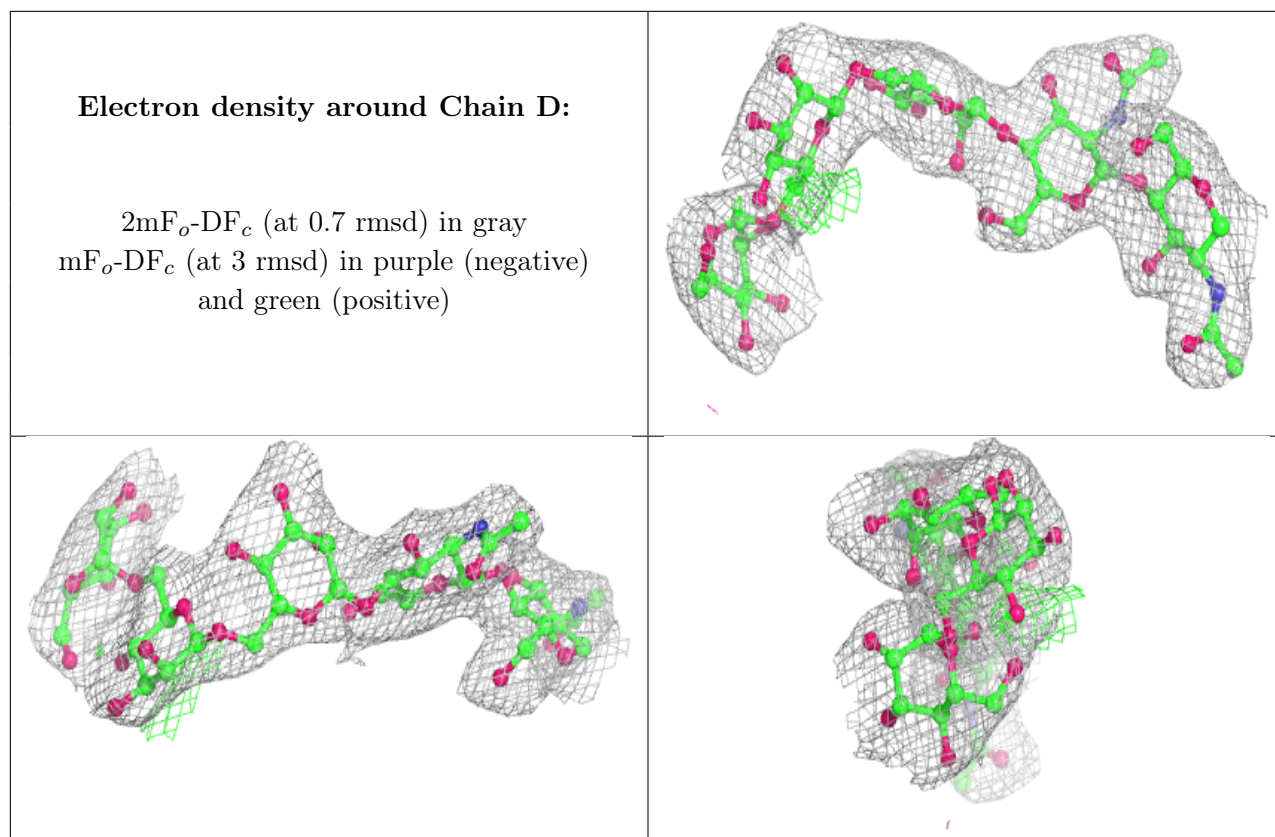
$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)

**Electron density around Chain F:**

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







## 6.4 Ligands [i](#)

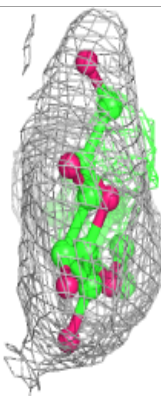
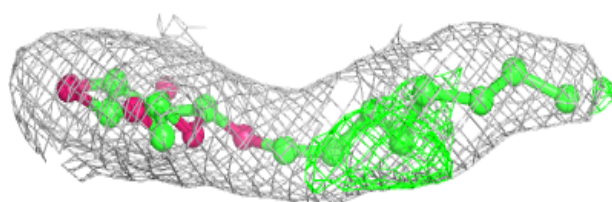
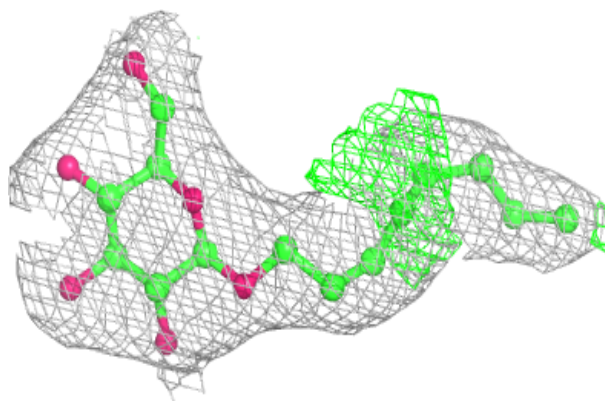
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95<sup>th</sup> percentile and maximum values of B factors of atoms in the group. The column labelled 'Q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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors( $\text{\AA}^2$ )	Q<0.9
7	BOG	B	1752	20/20	0.92	0.14	65,70,73,74	0
7	BOG	B	1751	20/20	0.94	0.16	45,48,50,52	0
5	NAG	A	681	14/15	0.95	0.19	65,67,69,69	0
5	NAG	B	1661	14/15	0.95	0.18	71,75,78,78	0
4	HEM	A	601	43/43	0.96	0.13	40,49,57,60	0
4	HEM	B	601	43/43	0.96	0.14	48,54,63,68	0
6	NIM	A	701	21/21	0.99	0.10	55,59,65,66	0
6	NIM	B	1701	21/21	0.99	0.10	49,53,57,60	0

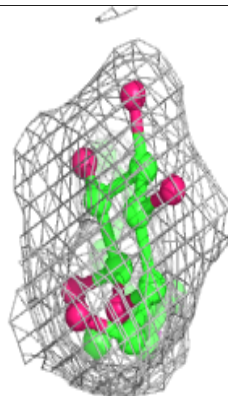
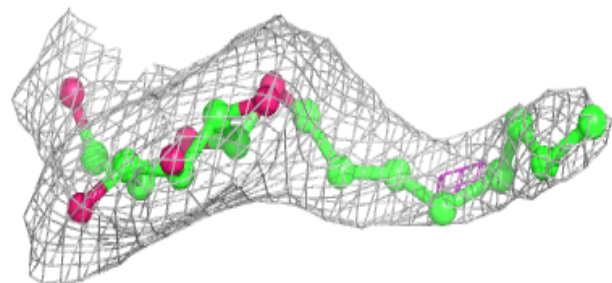
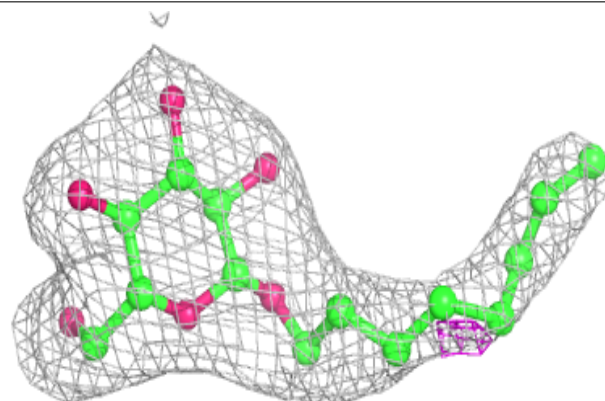
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation to approximate a three-dimensional view.

**Electron density around BOG B 1752:**

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

**Electron density around BOG B 1751:**

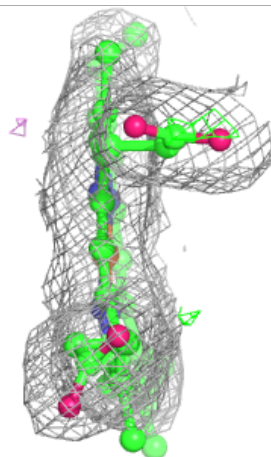
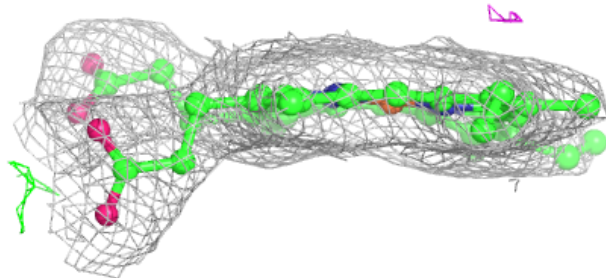
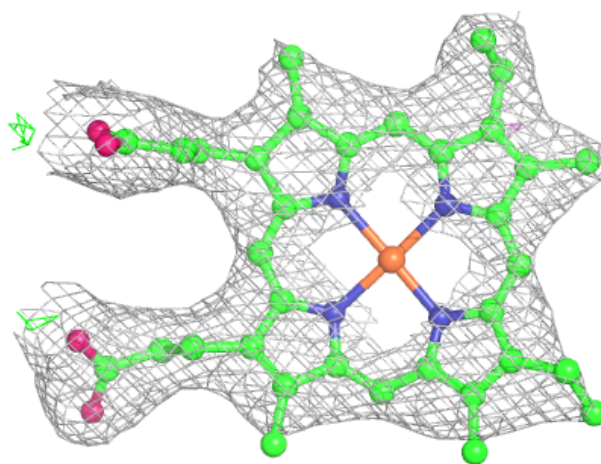
$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)





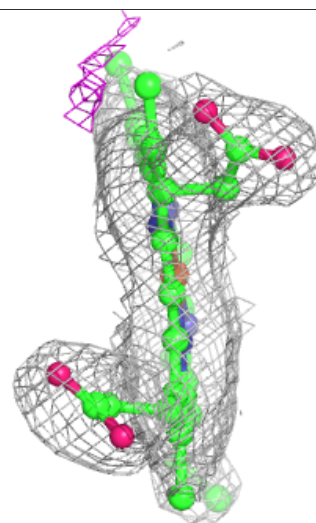
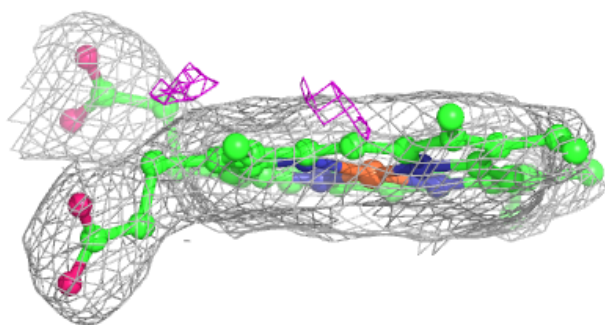
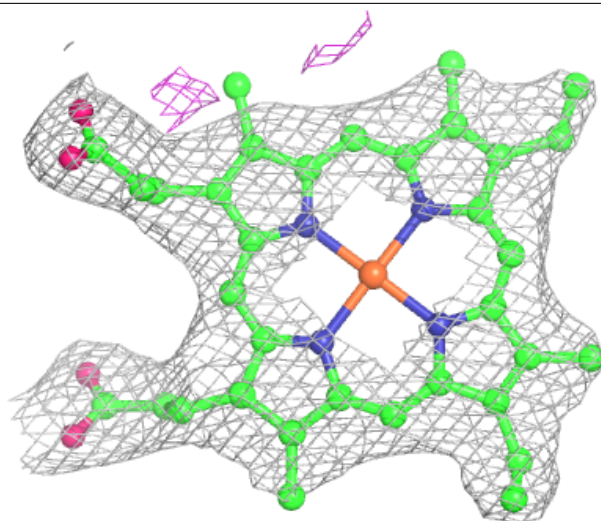
**Electron density around HEM A 601:**

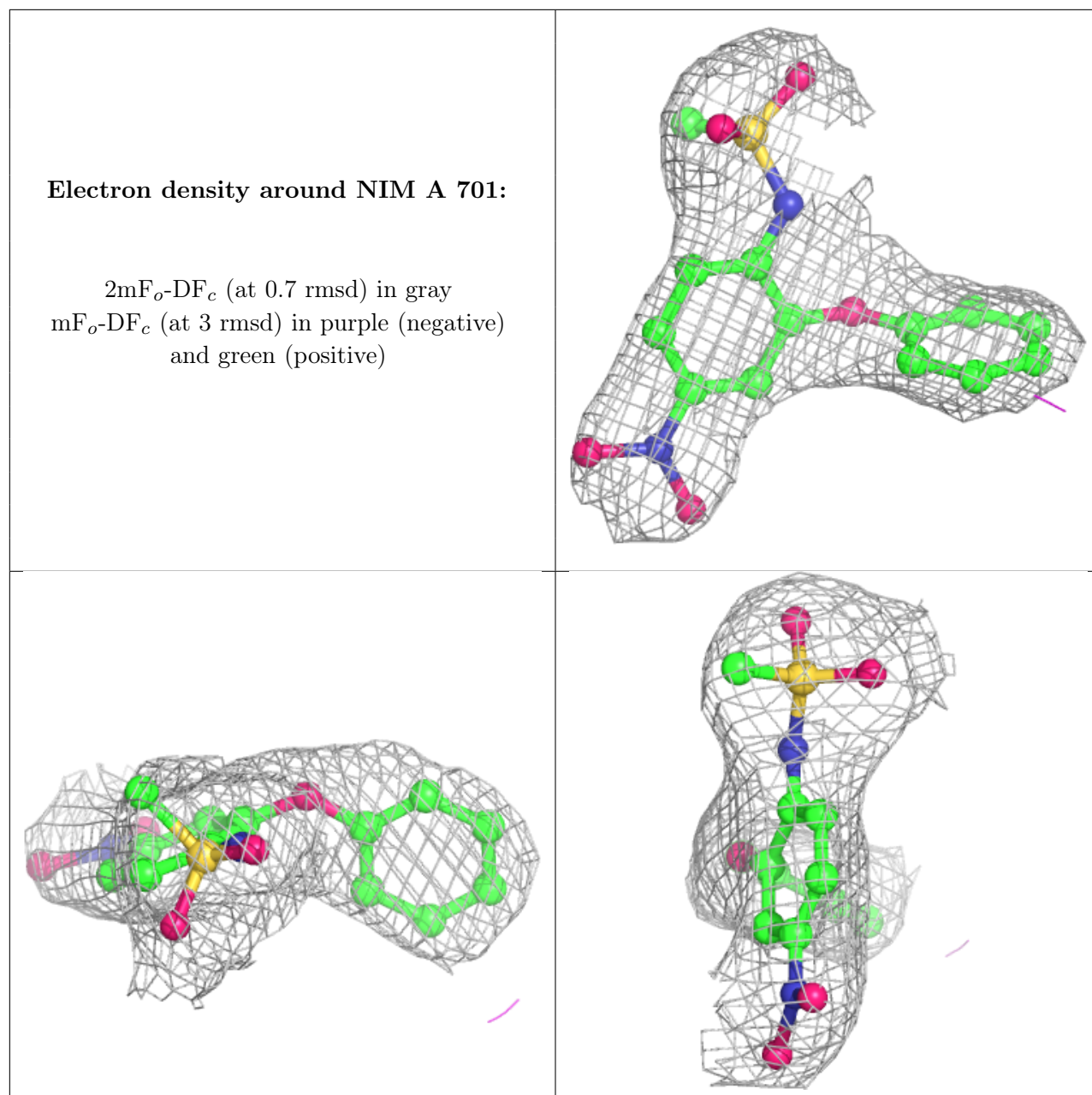
$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)

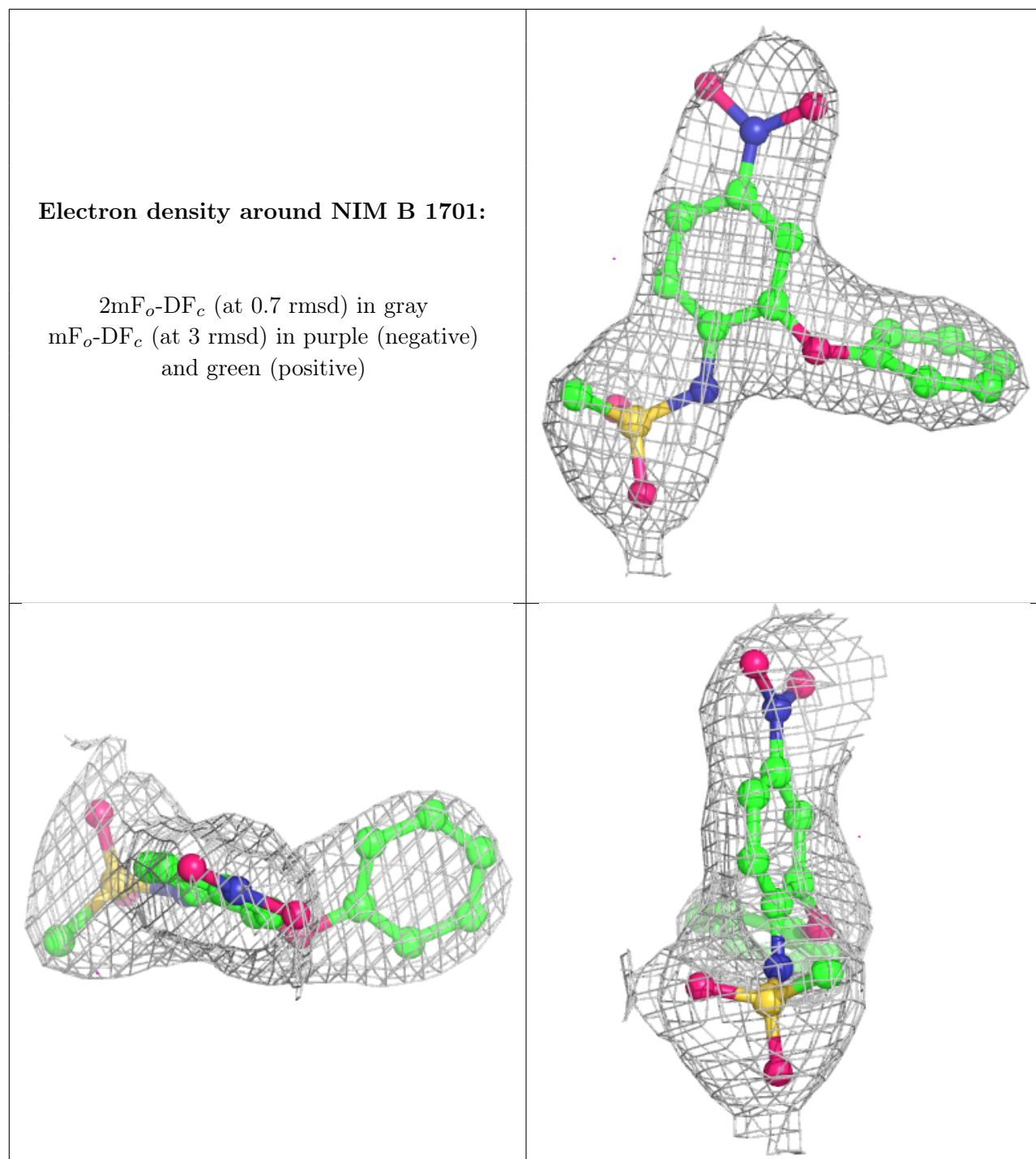


**Electron density around HEM B 601:**

$2mF_o-DF_c$  (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.