



# Full wwPDB X-ray Structure Validation Report ⓘ

Dec 1, 2025 – 12:16 PM EST

PDB ID : 9MDF / pdb\_00009mdf  
Title : Crystal structure of Human Prostaglandin reductase 1 (PTGR1) in complex with NADP and Indomethacin  
Authors : Seattle Structural Genomics Center for Infectious Disease; Seattle Structural Genomics Center for Infectious Disease (SSGCID)  
Deposited on : 2024-12-05  
Resolution : 2.10 Å(reported)

This is a Full wwPDB X-ray Structure Validation Report for a publicly released PDB entry.

We welcome your comments at [validation@mail.wwpdb.org](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 : 4-5-2 with Phenix2.0  
Mogul : 2022.3.0, CSD as543be (2022)  
Xtrriage (Phenix) : 2.0  
EDS : 3.0  
buster-report : 1.1.7 (2018)  
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)  
CCP4 : 9.0.010 (Gargrove)  
Density-Fitness : 1.0.12  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.46

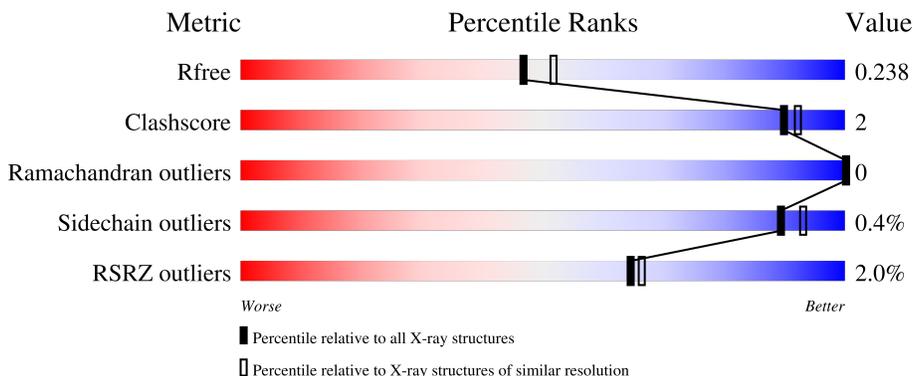
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

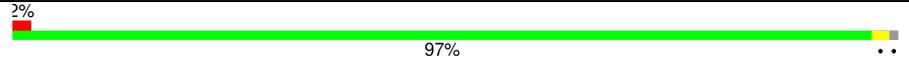
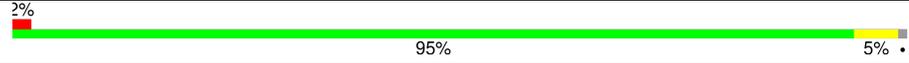
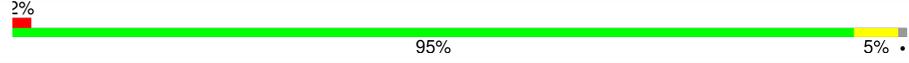
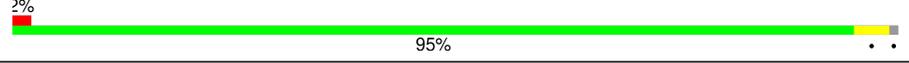
The reported resolution of this entry is 2.10 Å.

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



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
$R_{free}$	164625	6234 (2.10-2.10)
Clashscore	180529	6893 (2.10-2.10)
Ramachandran outliers	177936	6839 (2.10-2.10)
Sidechain outliers	177891	6840 (2.10-2.10)
RSRZ outliers	164620	6234 (2.10-2.10)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower bar indicate the fraction of residues that contain outliers for  $\geq 3$ , 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	331	 2% 97%
1	B	331	 2% 95% 5%
1	C	331	 2% 95% 5%
1	D	331	 2% 95%

## 2 Entry composition i

There are 6 unique types of molecules in this entry. The entry contains 10763 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 reductase 1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	329	2506	1616	407	468	15	0	0	0
1	B	329	2510	1619	408	468	15	0	0	0
1	C	329	2498	1611	406	466	15	0	0	0
1	D	328	2494	1609	405	465	15	0	0	0

There are 24 discrepancies between the modelled and reference sequences:

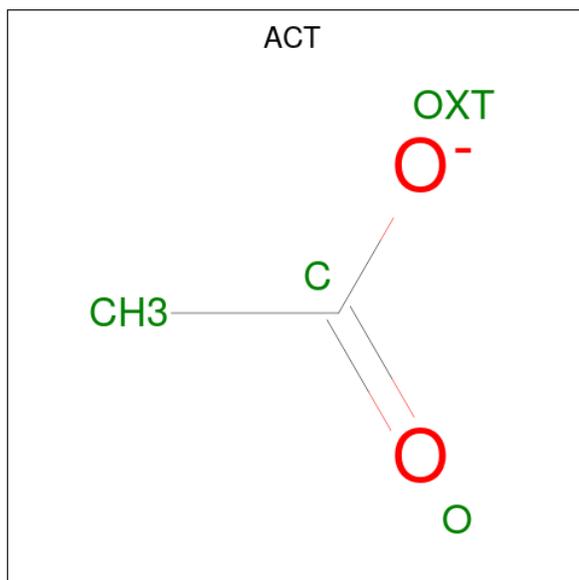
Chain	Residue	Modelled	Actual	Comment	Reference
A	-1	GLY	-	expression tag	UNP Q14914
A	0	PRO	-	expression tag	UNP Q14914
A	1	GLY	-	expression tag	UNP Q14914
A	2	SER	-	expression tag	UNP Q14914
A	3	MET	-	expression tag	UNP Q14914
A	27	SER	ALA	engineered mutation	UNP Q14914
B	-1	GLY	-	expression tag	UNP Q14914
B	0	PRO	-	expression tag	UNP Q14914
B	1	GLY	-	expression tag	UNP Q14914
B	2	SER	-	expression tag	UNP Q14914
B	3	MET	-	expression tag	UNP Q14914
B	27	SER	ALA	engineered mutation	UNP Q14914
C	-1	GLY	-	expression tag	UNP Q14914
C	0	PRO	-	expression tag	UNP Q14914
C	1	GLY	-	expression tag	UNP Q14914
C	2	SER	-	expression tag	UNP Q14914
C	3	MET	-	expression tag	UNP Q14914
C	27	SER	ALA	engineered mutation	UNP Q14914
D	-1	GLY	-	expression tag	UNP Q14914
D	0	PRO	-	expression tag	UNP Q14914
D	1	GLY	-	expression tag	UNP Q14914

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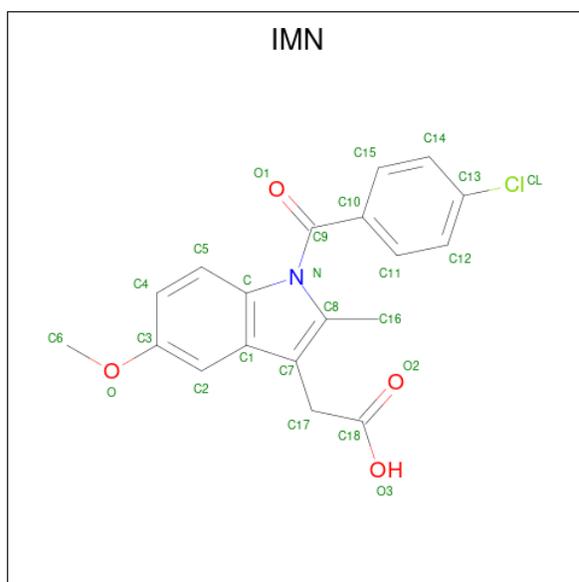
Chain	Residue	Modelled	Actual	Comment	Reference
D	2	SER	-	expression tag	UNP Q14914
D	3	MET	-	expression tag	UNP Q14914
D	27	SER	ALA	engineered mutation	UNP Q14914

- Molecule 2 is ACETATE ION (CCD ID: ACT) (formula:  $C_2H_3O_2$ ).



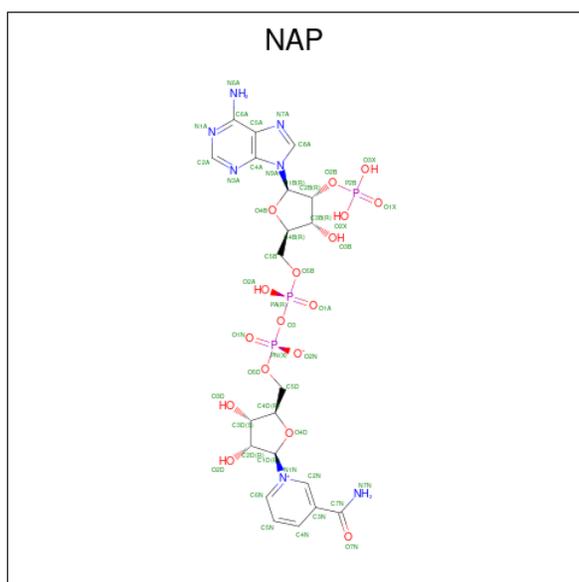
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
2	A	1	Total	C	O	0	0
			4	2	2		

- Molecule 3 is INDOMETHACIN (CCD ID: IMN) (formula:  $C_{19}H_{16}ClNO_4$ ) (labeled as "Ligand of Interest" by depositor).



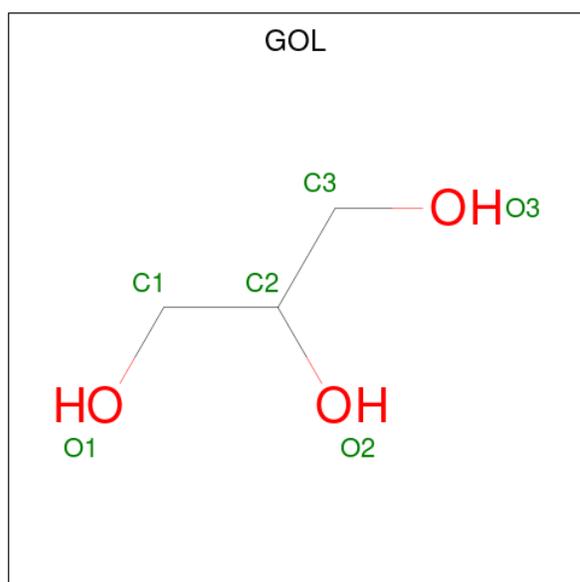
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	
			Total	C	Cl	N			O
3	A	1	Total	C	Cl	N	O	0	0
			25	19	1	1	4		
3	B	1	Total	C	Cl	N	O	0	0
			25	19	1	1	4		
3	C	1	Total	C	Cl	N	O	0	0
			25	19	1	1	4		
3	D	1	Total	C	Cl	N	O	0	0
			25	19	1	1	4		

- Molecule 4 is NADP NICOTINAMIDE-ADENINE-DINUCLEOTIDE PHOSPHATE (CCD ID: NAP) (formula:  $C_{21}H_{28}N_7O_{17}P_3$ ) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
			Total	C	N	O	P		
4	A	1	48	21	7	17	3	0	0
4	B	1	48	21	7	17	3	0	0
4	C	1	48	21	7	17	3	0	0
4	D	1	48	21	7	17	3	0	0

- Molecule 5 is GLYCEROL (CCD ID: GOL) (formula: C<sub>3</sub>H<sub>8</sub>O<sub>3</sub>).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
			Total	C	O		
5	C	1	6	3	3	0	0

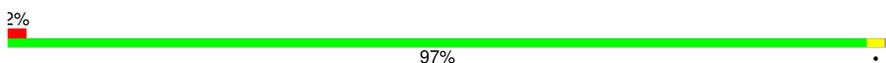
- Molecule 6 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
			Total	O		
6	A	127	127	127	0	0
6	B	127	127	127	0	0
6	C	103	103	103	0	0
6	D	96	96	96	0	0

### 3 Residue-property plots [i](#)

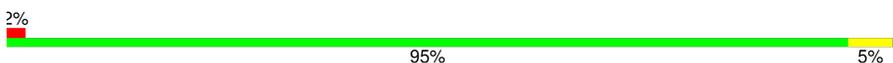
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. 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: Prostaglandin reductase 1

Chain A: 

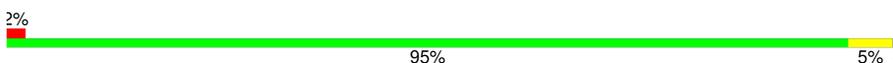


- Molecule 1: Prostaglandin reductase 1

Chain B: 



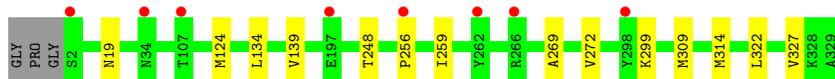
- Molecule 1: Prostaglandin reductase 1

Chain C: 



- Molecule 1: Prostaglandin reductase 1

Chain D: 



## 4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	84.82Å 94.72Å 87.33Å 90.00° 94.88° 90.00°	Depositor
Resolution (Å)	47.36 – 2.10 47.36 – 2.10	Depositor EDS
% Data completeness (in resolution range)	99.8 (47.36-2.10) 99.9 (47.36-2.10)	Depositor EDS
$R_{merge}$	0.20	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	2.34 (at 2.10Å)	Xtrriage
Refinement program	PHENIX dev_5493	Depositor
R, $R_{free}$	0.200 , 0.236 0.205 , 0.238	Depositor DCC
$R_{free}$ test set	3924 reflections (4.88%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	29.3	Xtrriage
Anisotropy	0.507	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.30 , 32.3	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.47$ , $\langle L^2 \rangle = 0.30$	Xtrriage
Estimated twinning fraction	0.027 for l,-k,h	Xtrriage
$F_o, F_c$ correlation	0.94	EDS
Total number of atoms	10763	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	36.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 7.37% 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: GOL, IMN, NAP, ACT

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	0.10	0/2558	0.26	0/3461
1	B	0.10	0/2562	0.27	0/3465
1	C	0.10	0/2550	0.27	0/3452
1	D	0.09	0/2546	0.27	0/3447
All	All	0.10	0/10216	0.27	0/13825

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand. A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	C	0	1

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	C	56	ARG	Sidechain

### 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	2506	0	2555	4	0
1	B	2510	0	2566	8	0
1	C	2498	0	2540	11	0
1	D	2494	0	2534	9	0
2	A	4	0	3	0	0
3	A	25	0	15	1	0
3	B	25	0	15	2	0
3	C	25	0	15	3	0
3	D	25	0	15	2	0
4	A	48	0	25	0	0
4	B	48	0	25	1	0
4	C	48	0	25	0	0
4	D	48	0	25	0	0
5	C	6	0	8	0	0
6	A	127	0	0	0	0
6	B	127	0	0	0	0
6	C	103	0	0	0	0
6	D	96	0	0	0	0
All	All	10763	0	10366	36	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 2.

All (36) 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:32:LEU:HD23	1:B:96:ILE:HD12	1.78	0.66
1:C:256:PRO:HG2	1:C:259:ILE:HD12	1.77	0.65
1:C:178:LYS:HG2	1:C:322:LEU:HD13	1.82	0.60
1:B:52:VAL:HG21	3:B:401:IMN:H63	1.84	0.59
1:D:256:PRO:HG2	1:D:259:ILE:HD12	1.88	0.55
3:A:402:IMN:H163	3:A:402:IMN:C10	2.38	0.54
3:C:402:IMN:C10	3:C:402:IMN:H161	2.38	0.54
1:B:178:LYS:HG2	1:B:322:LEU:HD13	1.89	0.53
1:D:309:MET:HG3	1:D:327:VAL:HG21	1.91	0.53
1:A:299:LYS:HE2	1:A:322:LEU:HD23	1.91	0.53
1:B:309:MET:HG3	1:B:327:VAL:HG21	1.92	0.51
1:A:10:LYS:HE3	1:A:23:GLU:HB2	1.91	0.51
3:B:401:IMN:H163	3:B:401:IMN:C10	2.41	0.50
1:A:178:LYS:HG2	1:A:322:LEU:HD13	1.93	0.49
1:D:134:LEU:HD23	1:D:139:VAL:CG2	2.43	0.48
1:B:5:LYS:HE3	1:B:93:THR:HG21	1.95	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:151:ALA:HB1	1:C:322:LEU:HD12	1.96	0.48
1:A:16:TYR:HE2	1:D:248:THR:HG21	1.79	0.48
1:C:10:LYS:HE3	1:C:23:GLU:HB2	1.96	0.48
1:C:309:MET:HG3	1:C:327:VAL:HG21	1.96	0.48
1:C:52:VAL:HG21	3:C:402:IMN:H63	1.97	0.47
3:D:401:IMN:O1	3:D:401:IMN:H5	2.15	0.47
1:D:124:MET:HG2	1:D:272:VAL:HG11	1.97	0.47
1:C:299:LYS:HE2	1:C:322:LEU:HD23	1.98	0.46
1:C:56:ARG:HG3	1:C:56:ARG:HH11	1.80	0.46
1:B:235:ARG:HG2	1:B:266:ARG:HH21	1.83	0.43
1:D:299:LYS:CE	1:D:322:LEU:HD23	2.49	0.43
1:C:49:TYR:CE1	3:C:402:IMN:H15	2.54	0.42
3:D:401:IMN:H163	3:D:401:IMN:C10	2.50	0.42
1:C:124:MET:HB3	1:C:125:PRO:HD3	2.02	0.41
1:D:19:ASN:ND2	1:D:314:MET:HE1	2.36	0.41
1:B:124:MET:HB3	1:B:125:PRO:HD3	2.03	0.41
1:B:230:MET:O	1:B:263:GLN:NE2	2.55	0.40
1:D:299:LYS:HE2	1:D:322:LEU:HD23	2.03	0.40
1:C:261:ILE:HA	1:D:269:ALA:HB1	2.04	0.40
4:B:402:NAP:O1A	4:B:402:NAP:H4B	2.21	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	327/331 (99%)	323 (99%)	4 (1%)	0	100	100
1	B	327/331 (99%)	323 (99%)	4 (1%)	0	100	100
1	C	327/331 (99%)	324 (99%)	3 (1%)	0	100	100
1	D	326/331 (98%)	323 (99%)	3 (1%)	0	100	100
All	All	1307/1324 (99%)	1293 (99%)	14 (1%)	0	100	100

There are no Ramachandran outliers to report.

### 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	267/270 (99%)	265 (99%)	2 (1%)	81	87
1	B	268/270 (99%)	267 (100%)	1 (0%)	89	93
1	C	265/270 (98%)	264 (100%)	1 (0%)	89	93
1	D	265/270 (98%)	265 (100%)	0	100	100
All	All	1065/1080 (99%)	1061 (100%)	4 (0%)	89	93

All (4) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	107	THR
1	A	146	MET
1	B	108	GLU
1	C	56	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (2) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	12	HIS
1	C	12	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](#)

There are no oligosaccharides in this entry.

## 5.6 Ligand geometry [i](#)

10 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	ACT	A	401	-	3,3,3	1.20	0	3,3,3	1.16	0
3	IMN	D	401	-	25,27,27	2.00	4 (16%)	29,39,39	1.96	8 (27%)
4	NAP	B	402	-	46,52,52	1.80	5 (10%)	61,80,80	1.00	4 (6%)
4	NAP	C	403	-	46,52,52	1.82	5 (10%)	61,80,80	1.02	5 (8%)
4	NAP	D	402	-	46,52,52	1.81	5 (10%)	61,80,80	1.03	5 (8%)
3	IMN	B	401	-	25,27,27	1.69	2 (8%)	29,39,39	1.88	6 (20%)
3	IMN	A	402	-	25,27,27	1.70	3 (12%)	29,39,39	1.87	7 (24%)
3	IMN	C	402	-	25,27,27	1.68	3 (12%)	29,39,39	1.98	5 (17%)
5	GOL	C	401	-	5,5,5	0.32	0	5,5,5	0.29	0
4	NAP	A	403	-	46,52,52	1.83	5 (10%)	61,80,80	0.98	4 (6%)

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
3	IMN	D	401	-	-	2/10/14/14	0/3/3/3
4	NAP	B	402	-	-	7/31/67/67	0/5/5/5
4	NAP	C	403	-	-	7/31/67/67	0/5/5/5
4	NAP	D	402	-	-	5/31/67/67	0/5/5/5
3	IMN	B	401	-	-	2/10/14/14	0/3/3/3
3	IMN	A	402	-	-	4/10/14/14	0/3/3/3

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	IMN	C	402	-	-	4/10/14/14	0/3/3/3
5	GOL	C	401	-	-	4/4/4/4	-
4	NAP	A	403	-	-	6/31/67/67	0/5/5/5

All (32) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	A	403	NAP	P2B-O2B	8.40	1.74	1.59
4	D	402	NAP	P2B-O2B	8.35	1.74	1.59
4	B	402	NAP	P2B-O2B	8.35	1.74	1.59
4	C	403	NAP	P2B-O2B	8.30	1.74	1.59
3	D	401	IMN	C8-N	7.20	1.48	1.36
3	B	401	IMN	C8-N	6.74	1.48	1.36
3	A	402	IMN	C8-N	6.69	1.47	1.36
3	C	402	IMN	C8-N	6.33	1.47	1.36
4	D	402	NAP	PA-O3	4.92	1.64	1.59
4	C	403	NAP	PA-O3	4.88	1.64	1.59
4	A	403	NAP	PA-O3	4.86	1.64	1.59
4	B	402	NAP	PA-O3	4.81	1.64	1.59
4	C	403	NAP	PN-O3	4.77	1.64	1.59
4	A	403	NAP	PN-O3	4.63	1.64	1.59
4	B	402	NAP	PN-O3	4.44	1.64	1.59
4	D	402	NAP	PN-O3	4.37	1.64	1.59
3	D	401	IMN	C7-C1	3.90	1.47	1.41
3	C	402	IMN	C7-C1	3.30	1.46	1.41
3	D	401	IMN	C2-C3	3.01	1.42	1.37
3	B	401	IMN	C7-C1	2.97	1.46	1.41
3	D	401	IMN	C10-C9	-2.82	1.45	1.50
3	A	402	IMN	C7-C1	2.68	1.45	1.41
4	A	403	NAP	O4D-C1D	-2.60	1.37	1.40
4	D	402	NAP	O4D-C1D	-2.60	1.37	1.40
4	C	403	NAP	O4D-C1D	-2.44	1.37	1.40
4	B	402	NAP	O4D-C1D	-2.37	1.37	1.40
4	A	403	NAP	C8A-N7A	-2.30	1.30	1.34
4	B	402	NAP	C8A-N7A	-2.23	1.30	1.34
3	C	402	IMN	C2-C3	2.21	1.40	1.37
4	D	402	NAP	C8A-N7A	-2.18	1.30	1.34
4	C	403	NAP	C8A-N7A	-2.15	1.30	1.34
3	A	402	IMN	C2-C3	2.03	1.40	1.37

All (44) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	C	402	IMN	C10-C9-N	7.08	125.69	117.90
3	D	401	IMN	C10-C9-N	5.92	124.42	117.90
3	B	401	IMN	C10-C9-N	5.91	124.40	117.90
3	A	402	IMN	C10-C9-N	5.38	123.81	117.90
3	B	401	IMN	C17-C7-C8	-4.91	122.08	126.41
3	D	401	IMN	C17-C7-C8	-4.77	122.20	126.41
3	C	402	IMN	C17-C7-C8	-4.41	122.52	126.41
3	A	402	IMN	C7-C17-C18	-4.25	109.23	114.17
3	A	402	IMN	C17-C7-C8	-4.06	122.83	126.41
3	C	402	IMN	C7-C17-C18	-3.79	109.76	114.17
3	D	401	IMN	C16-C8-N	3.14	126.33	122.37
3	B	401	IMN	C16-C8-N	3.06	126.22	122.37
3	B	401	IMN	O-C3-C2	-2.81	116.51	124.40
3	A	402	IMN	O-C3-C2	-2.78	116.59	124.40
3	B	401	IMN	C7-C17-C18	-2.72	111.00	114.17
3	A	402	IMN	C16-C8-N	2.62	125.68	122.37
3	C	402	IMN	O-C3-C2	-2.57	117.19	124.40
3	D	401	IMN	C7-C17-C18	-2.45	111.32	114.17
4	C	403	NAP	O4B-C1B-N9A	2.42	111.96	108.75
4	D	402	NAP	O2N-PN-O1N	2.37	123.47	112.44
3	D	401	IMN	C12-C13-CL	-2.33	115.92	119.36
4	A	403	NAP	O2N-PN-O1N	2.30	123.15	112.44
4	D	402	NAP	P2B-O2B-C2B	-2.30	117.29	123.43
4	B	402	NAP	O2N-PN-O1N	2.29	123.11	112.44
4	C	403	NAP	O2N-PN-O1N	2.27	123.01	112.44
4	C	403	NAP	P2B-O2B-C2B	-2.27	117.37	123.43
3	D	401	IMN	C2-C1-C	-2.21	117.00	119.65
4	D	402	NAP	O4B-C1B-N9A	2.18	111.63	108.75
4	C	403	NAP	O3X-P2B-O2X	2.16	115.90	107.80
3	C	402	IMN	C16-C8-N	2.13	125.06	122.37
4	B	402	NAP	P2B-O2B-C2B	-2.09	117.84	123.43
4	B	402	NAP	O4B-C1B-N9A	2.09	111.52	108.75
4	D	402	NAP	O3X-P2B-O2X	2.09	115.64	107.80
3	D	401	IMN	C14-C15-C10	-2.09	118.57	120.80
4	A	403	NAP	O4B-C1B-N9A	2.07	111.49	108.75
4	A	403	NAP	O2A-PA-O1A	2.07	122.05	112.44
4	D	402	NAP	O2A-PA-O1A	2.06	122.04	112.44
4	A	403	NAP	O3X-P2B-O2X	2.05	115.51	107.80
3	A	402	IMN	O2-C18-C17	-2.05	116.75	122.94
4	C	403	NAP	O2A-PA-O1A	2.05	121.99	112.44
4	B	402	NAP	O3X-P2B-O2X	2.04	115.46	107.80
3	A	402	IMN	C12-C13-CL	-2.04	116.35	119.36
3	D	401	IMN	O-C3-C2	-2.02	118.72	124.40

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	B	401	IMN	O2-C18-C17	-2.01	116.87	122.94

There are no chirality outliers.

All (41) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	A	403	NAP	O4D-C1D-N1N-C6N
4	B	402	NAP	O4D-C1D-N1N-C6N
4	C	403	NAP	O4D-C1D-N1N-C6N
4	D	402	NAP	O4D-C1D-N1N-C6N
3	B	401	IMN	C2-C3-O-C6
3	B	401	IMN	C4-C3-O-C6
3	C	402	IMN	C2-C3-O-C6
3	C	402	IMN	C4-C3-O-C6
3	A	402	IMN	C4-C3-O-C6
3	A	402	IMN	C2-C3-O-C6
5	C	401	GOL	O1-C1-C2-O2
5	C	401	GOL	O1-C1-C2-C3
5	C	401	GOL	C1-C2-C3-O3
5	C	401	GOL	O2-C2-C3-O3
3	A	402	IMN	C18-C17-C7-C1
3	D	401	IMN	C18-C17-C7-C1
3	D	401	IMN	C18-C17-C7-C8
4	A	403	NAP	C4B-C5B-O5B-PA
4	B	402	NAP	C4B-C5B-O5B-PA
4	C	403	NAP	C4B-C5B-O5B-PA
3	A	402	IMN	C18-C17-C7-C8
4	D	402	NAP	C4B-C5B-O5B-PA
3	C	402	IMN	C18-C17-C7-C8
4	B	402	NAP	PA-O3-PN-O2N
4	C	403	NAP	PA-O3-PN-O2N
4	D	402	NAP	PA-O3-PN-O2N
4	A	403	NAP	PA-O3-PN-O2N
4	C	403	NAP	O4B-C4B-C5B-O5B
3	C	402	IMN	C18-C17-C7-C1
4	A	403	NAP	O4D-C1D-N1N-C2N
4	B	402	NAP	O4D-C1D-N1N-C2N
4	C	403	NAP	O4D-C1D-N1N-C2N
4	D	402	NAP	O4D-C1D-N1N-C2N
4	B	402	NAP	O4B-C4B-C5B-O5B
4	A	403	NAP	PA-O3-PN-O1N
4	A	403	NAP	O4B-C4B-C5B-O5B

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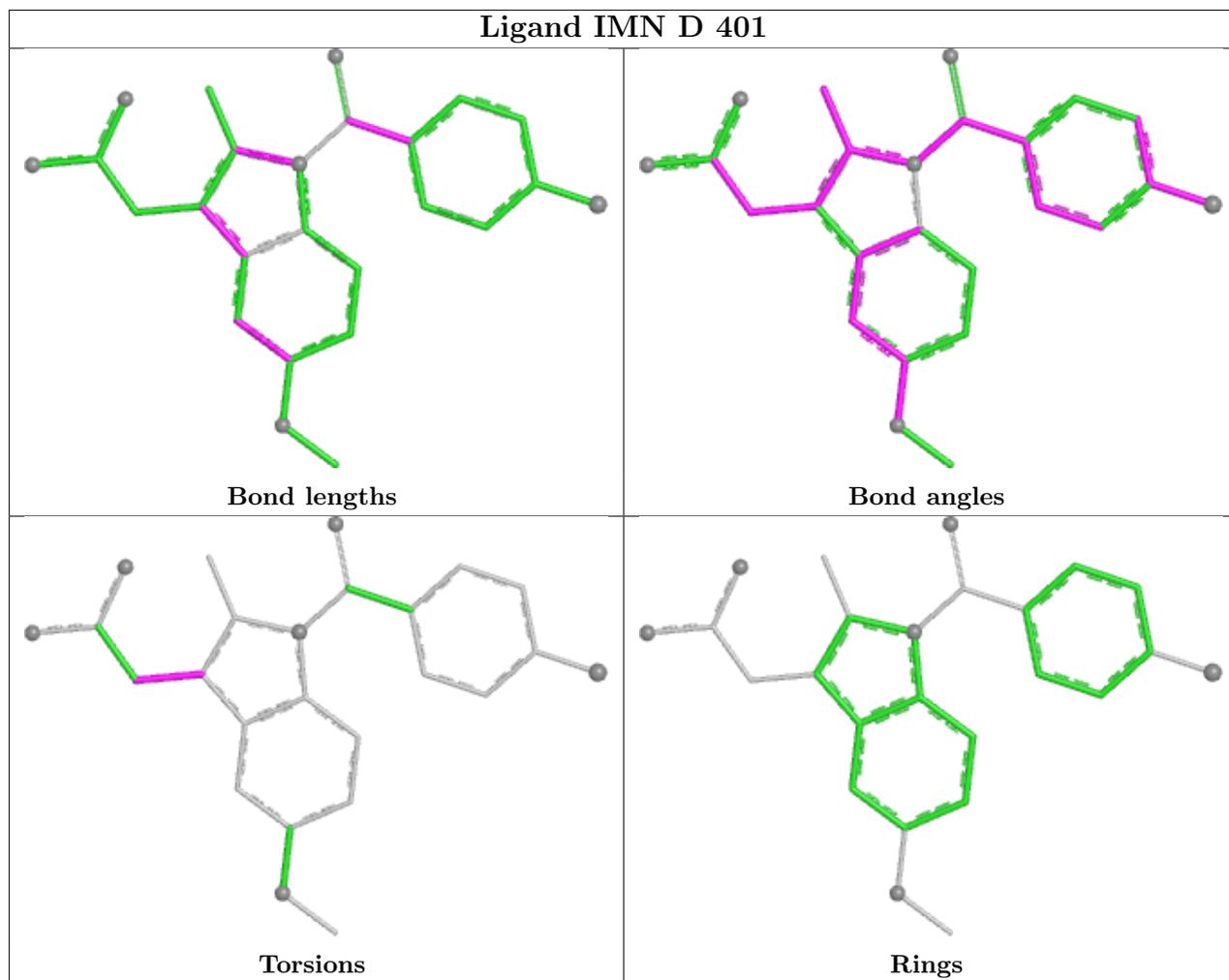
Mol	Chain	Res	Type	Atoms
4	B	402	NAP	C2B-O2B-P2B-O2X
4	C	403	NAP	C1B-C2B-O2B-P2B
4	B	402	NAP	PA-O3-PN-O1N
4	C	403	NAP	PA-O3-PN-O1N
4	D	402	NAP	PA-O3-PN-O1N

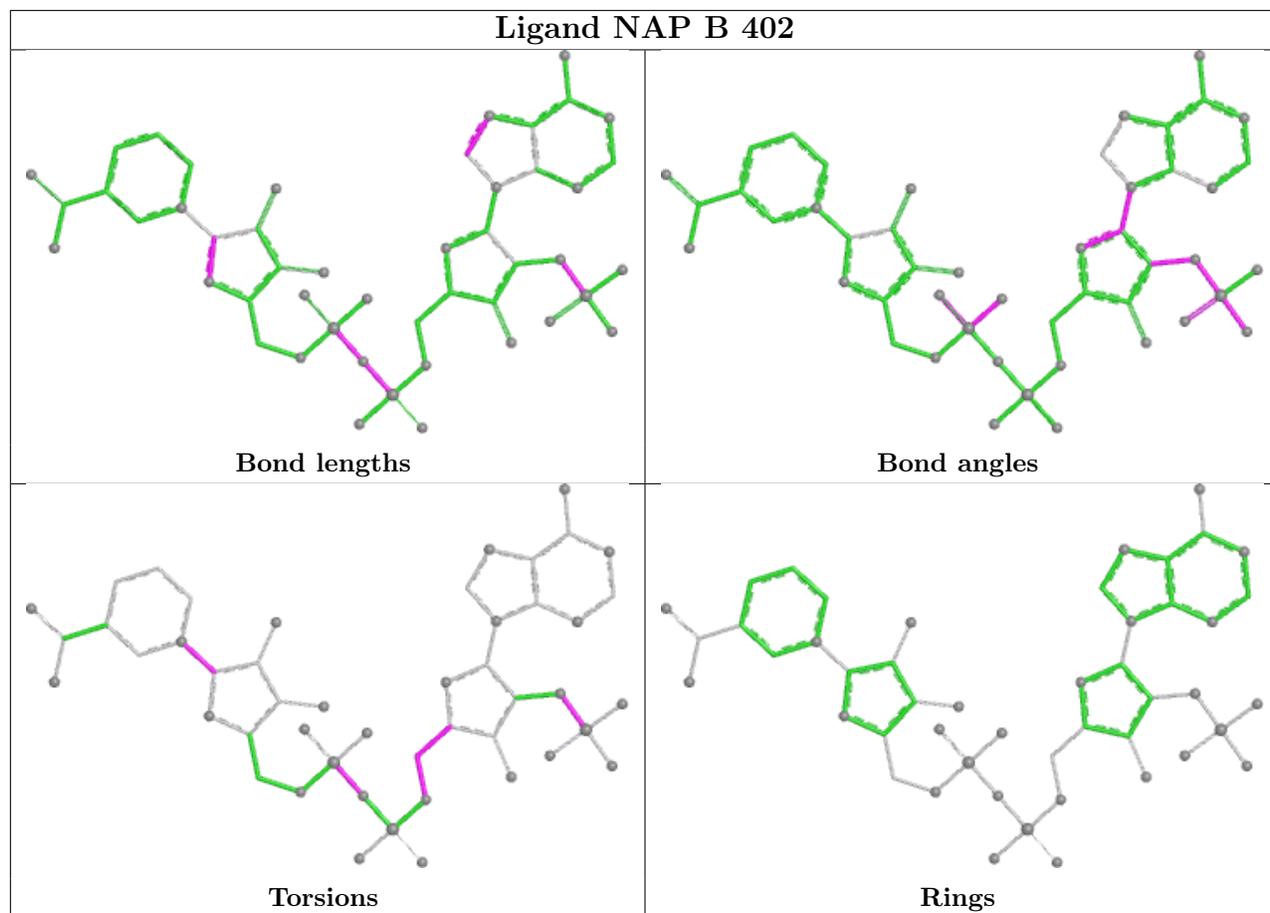
There are no ring outliers.

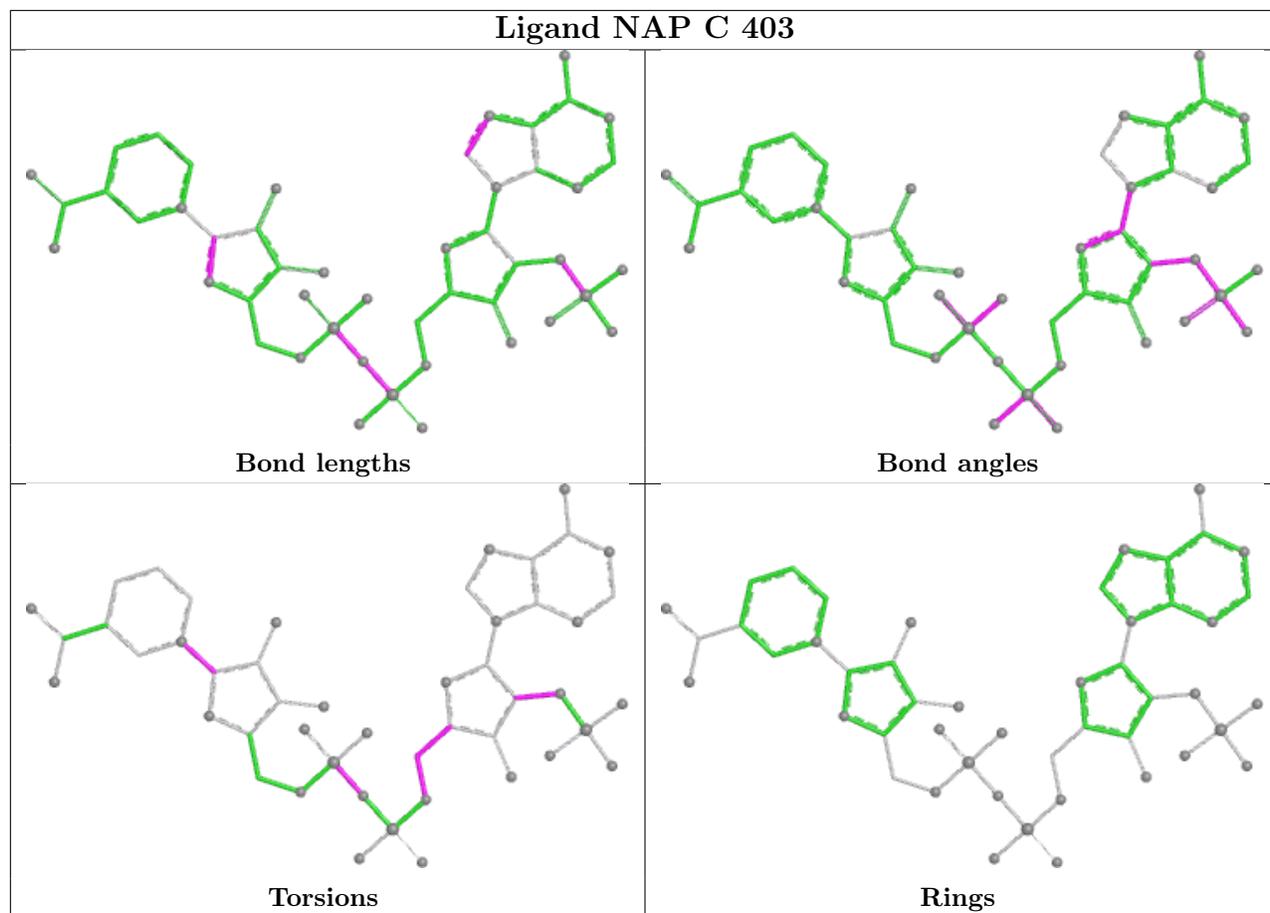
5 monomers are involved in 9 short contacts:

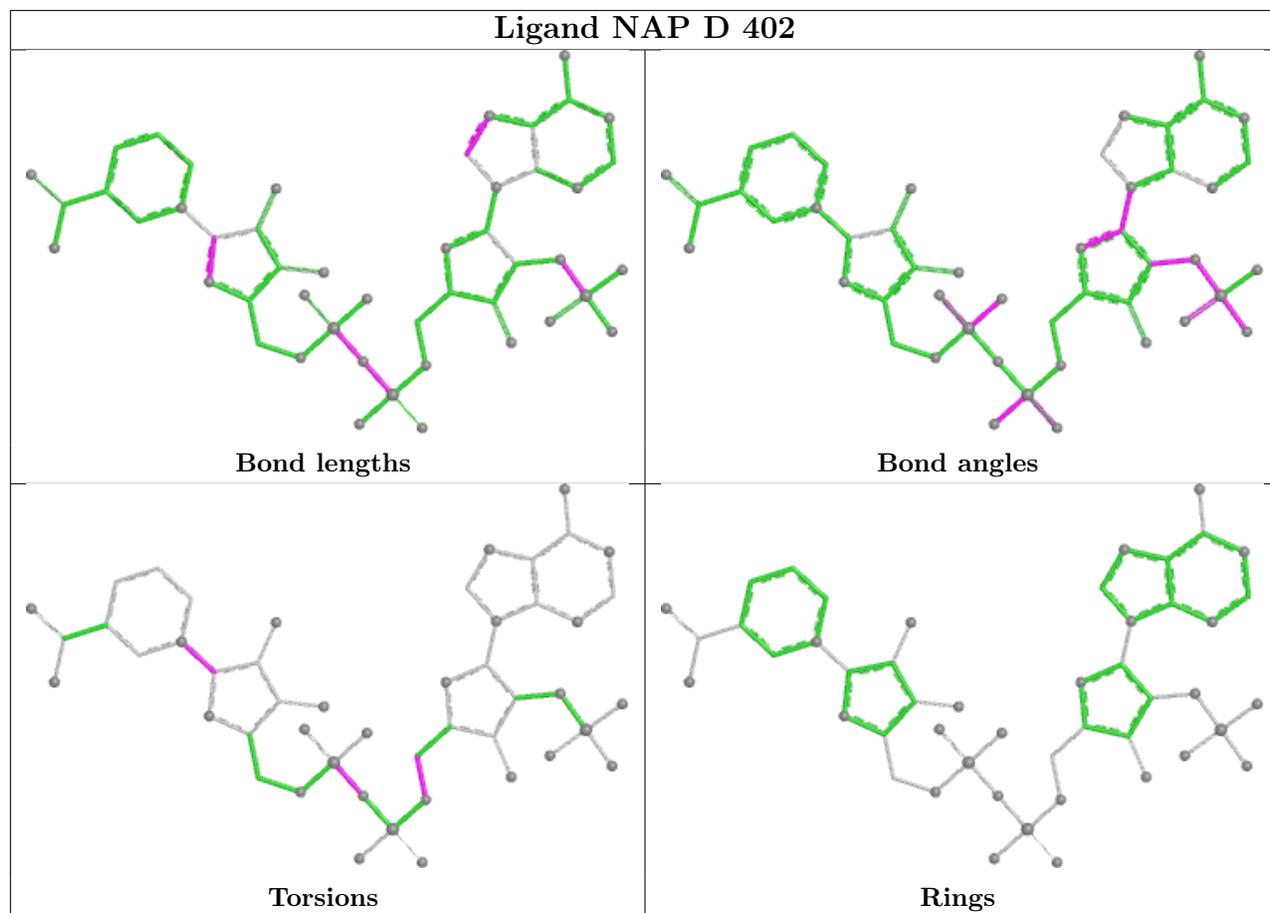
Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	D	401	IMN	2	0
4	B	402	NAP	1	0
3	B	401	IMN	2	0
3	A	402	IMN	1	0
3	C	402	IMN	3	0

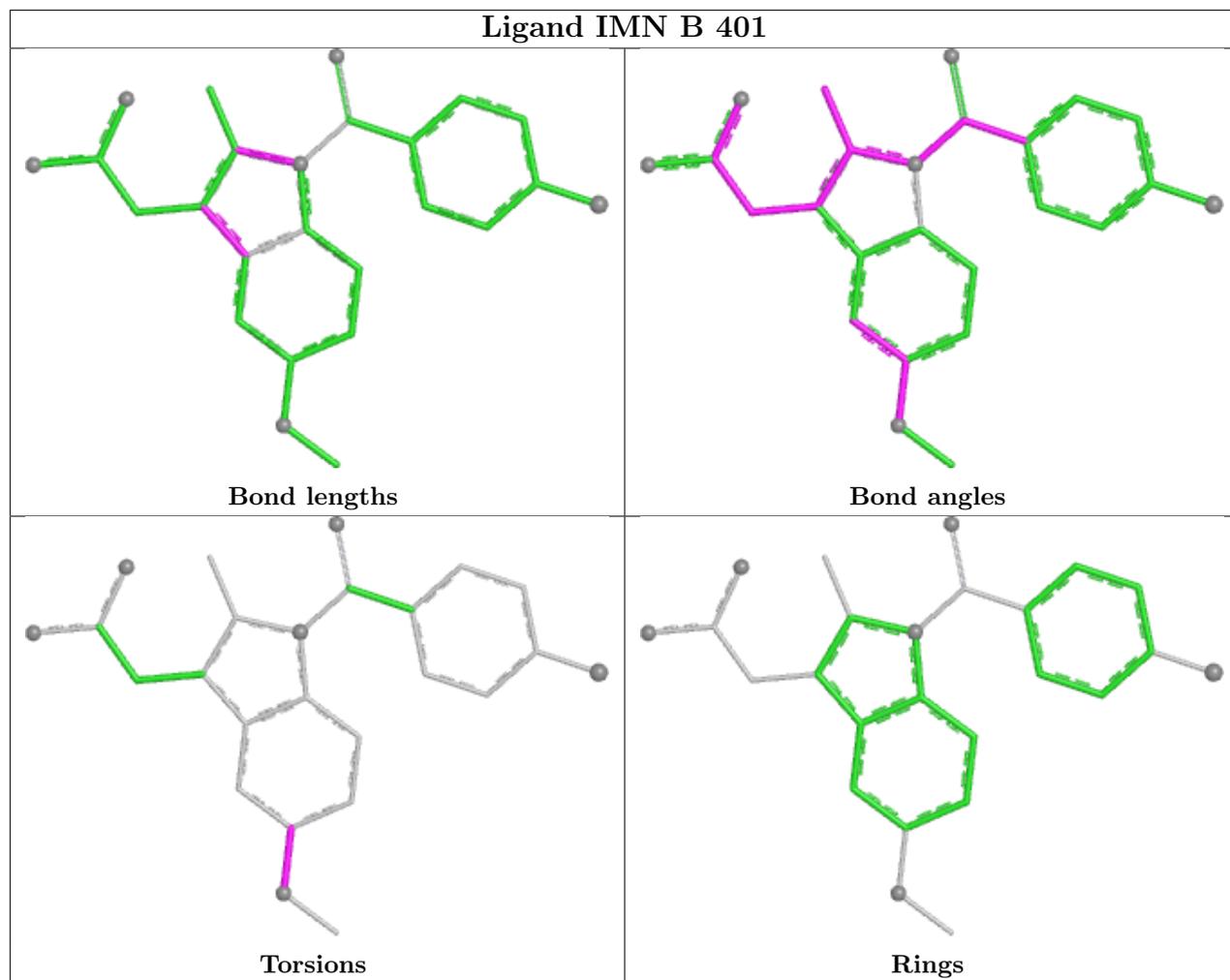
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included.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

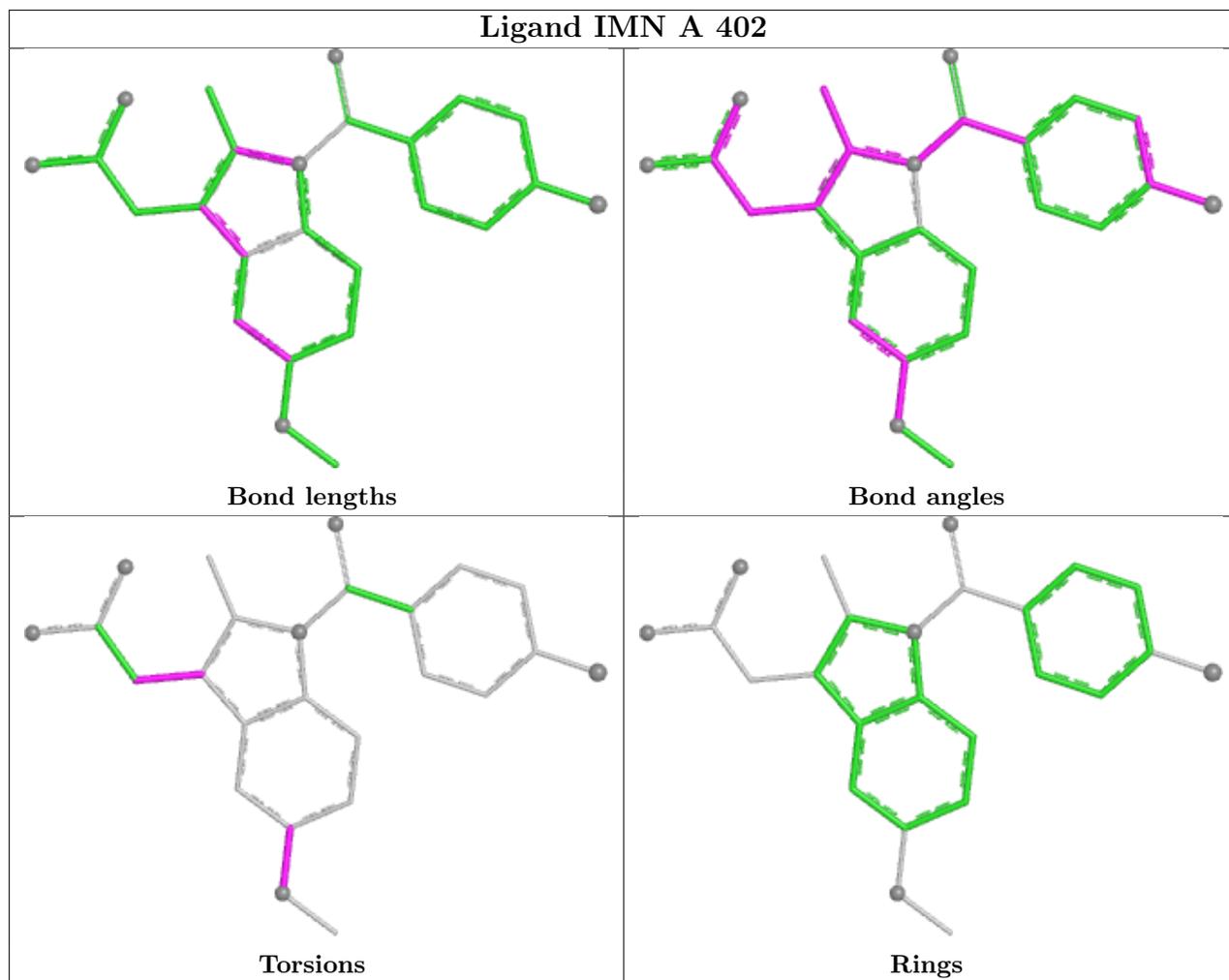


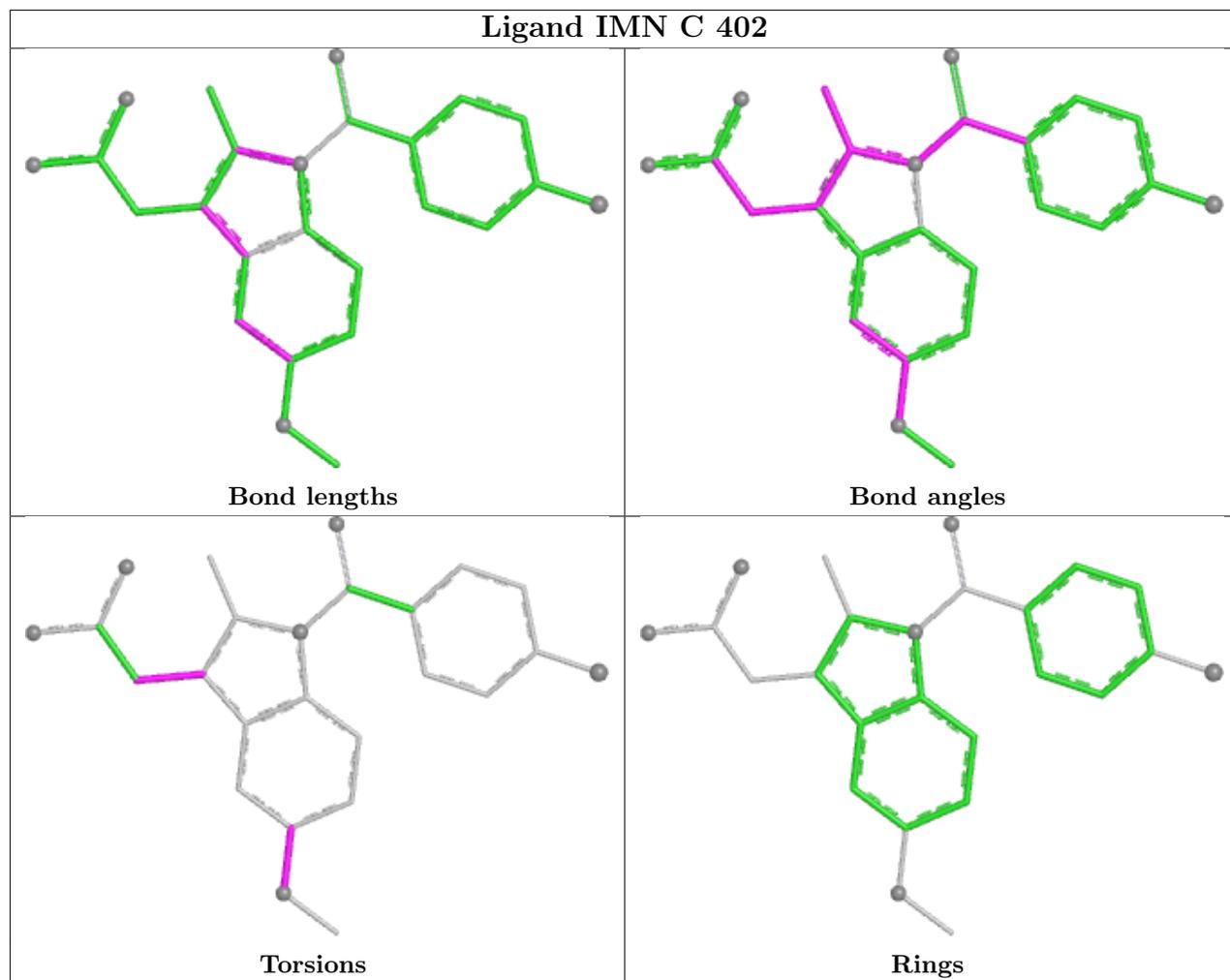


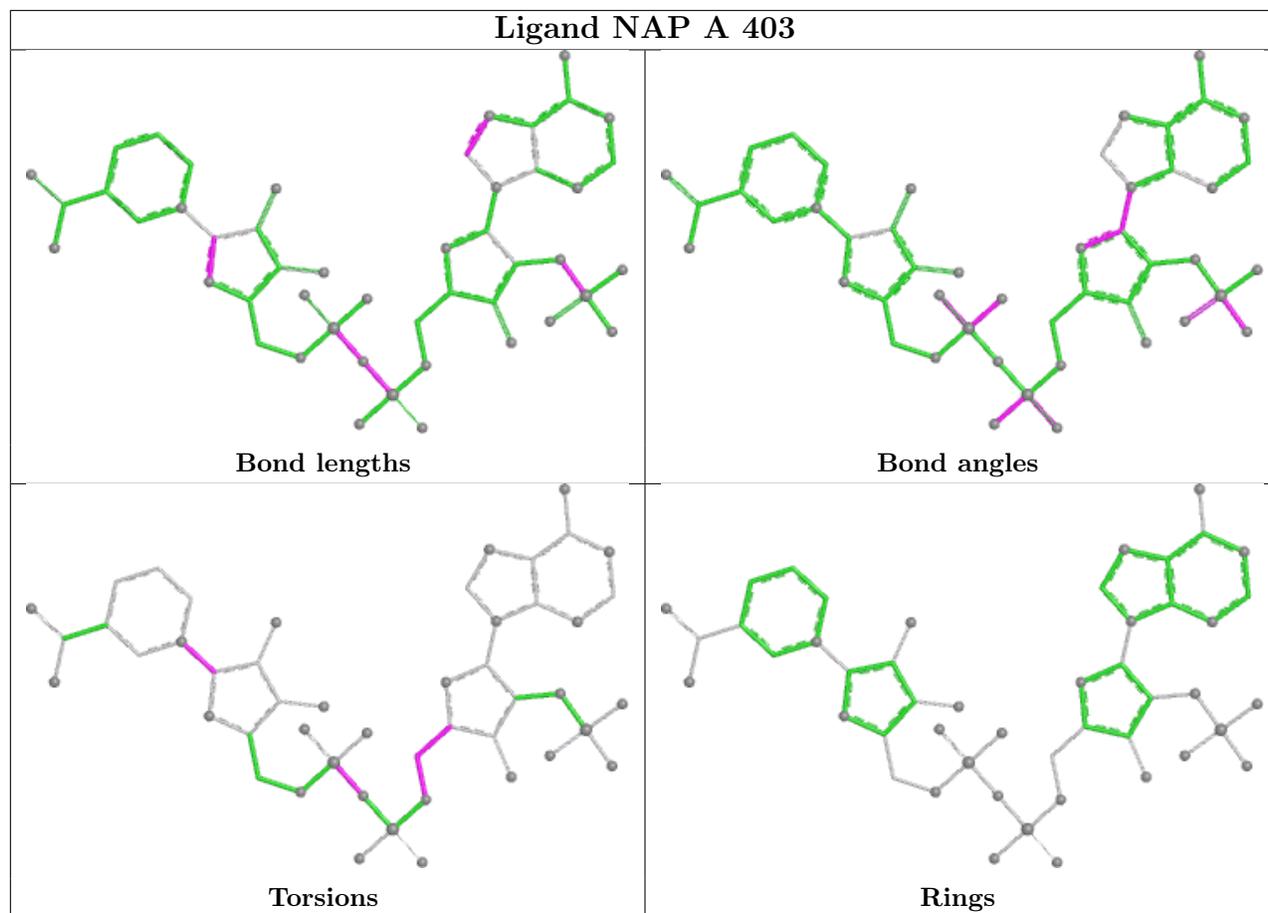












## 5.7 Other polymers [\(i\)](#)

There are no such residues in this entry.

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

There are no chain breaks in this entry.

## 6 Fit of model and data

### 6.1 Protein, DNA and RNA chains

In the following table, the column labelled ‘#RSRZ > 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 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	329/331 (99%)	0.32	7 (2%) 63 65	21, 33, 56, 76	0
1	B	329/331 (99%)	0.18	6 (1%) 67 69	21, 32, 50, 81	0
1	C	329/331 (99%)	0.28	5 (1%) 71 73	24, 36, 54, 66	0
1	D	328/331 (99%)	0.36	8 (2%) 59 61	23, 36, 58, 84	0
All	All	1315/1324 (99%)	0.29	26 (1%) 64 66	21, 34, 55, 84	0

All (26) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	1	GLY	4.0
1	B	257	PRO	3.8
1	A	77	VAL	3.6
1	A	296	ILE	3.4
1	D	34	ASN	3.4
1	D	256	PRO	3.0
1	C	248	THR	2.9
1	D	2	SER	2.8
1	C	1	GLY	2.7
1	D	107	THR	2.7
1	C	298	TYR	2.6
1	B	209	ASP	2.6
1	C	262	TYR	2.6
1	A	2	SER	2.5
1	A	78	ALA	2.5
1	B	266	ARG	2.4
1	A	99	GLY	2.4
1	B	1	GLY	2.4
1	D	262	TYR	2.3
1	C	43	PHE	2.2
1	B	256	PRO	2.2

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Mol	Chain	Res	Type	RSRZ
1	B	298	TYR	2.2
1	D	298	TYR	2.2
1	A	79	LEU	2.1
1	D	266	ARG	2.0
1	D	197	GLU	2.0

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

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

## 6.3 Carbohydrates [i](#)

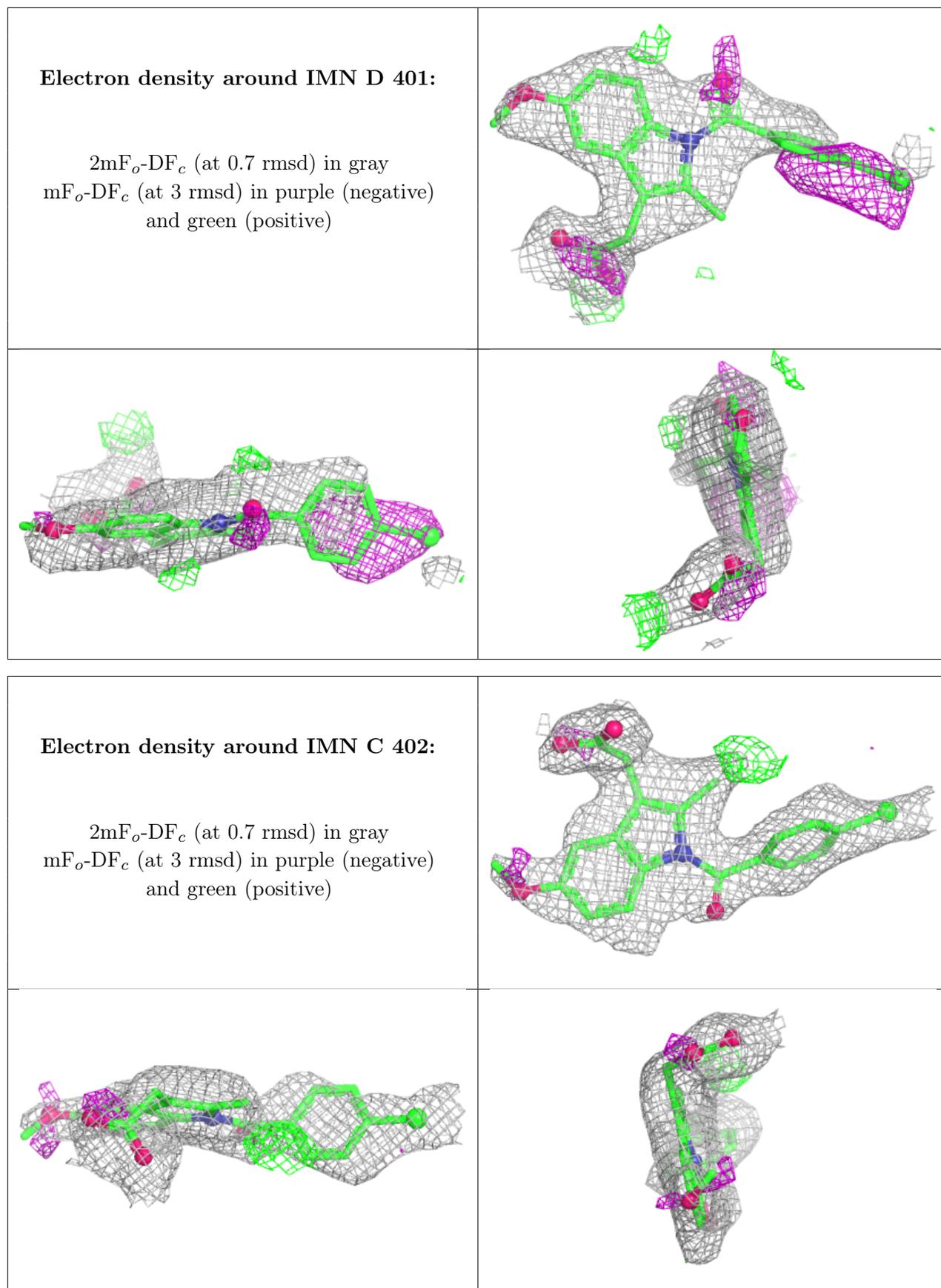
There are no oligosaccharides in this entry.

## 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, 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.

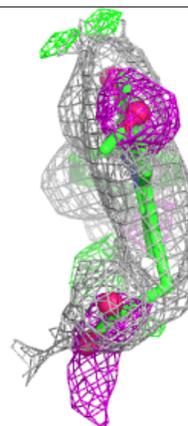
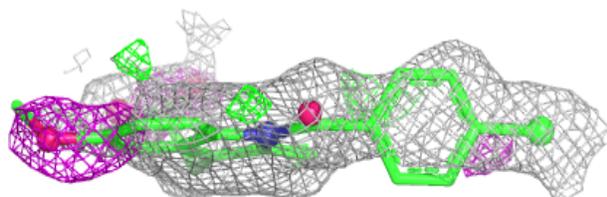
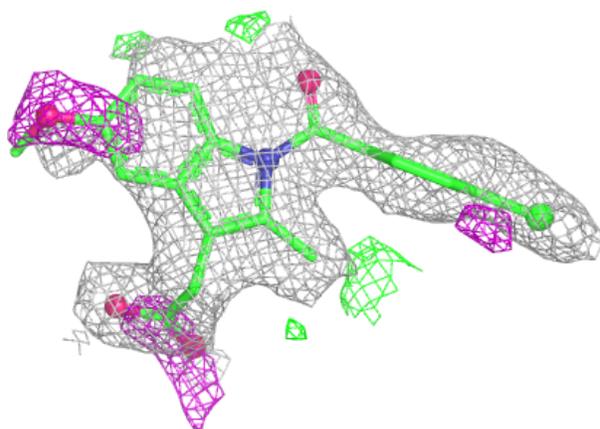
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å <sup>2</sup> )	Q<0.9
2	ACT	A	401	4/4	0.68	0.18	50,53,57,57	0
3	IMN	D	401	25/25	0.71	0.20	34,47,70,85	0
5	GOL	C	401	6/6	0.74	0.18	42,49,52,52	0
3	IMN	C	402	25/25	0.76	0.15	33,47,56,80	0
3	IMN	B	401	25/25	0.77	0.15	35,43,60,68	0
3	IMN	A	402	25/25	0.78	0.15	31,43,57,77	0
4	NAP	C	403	48/48	0.95	0.07	21,27,34,38	0
4	NAP	A	403	48/48	0.96	0.07	19,25,31,33	0
4	NAP	B	402	48/48	0.96	0.07	19,25,29,31	0
4	NAP	D	402	48/48	0.97	0.07	21,27,31,34	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.

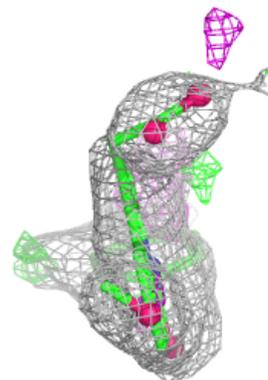
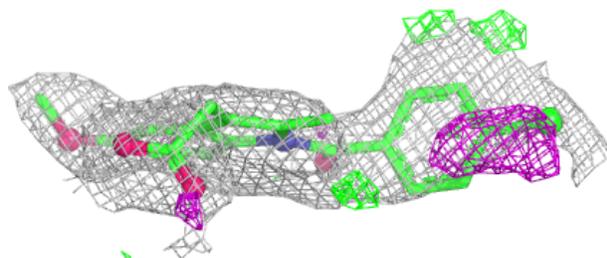
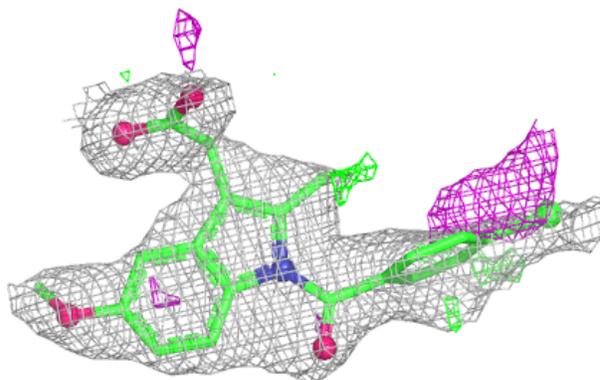


**Electron density around IMN B 401:**

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

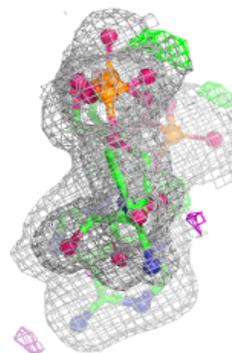
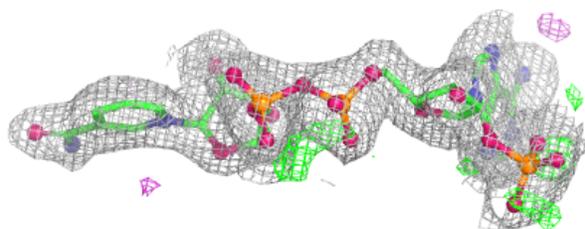
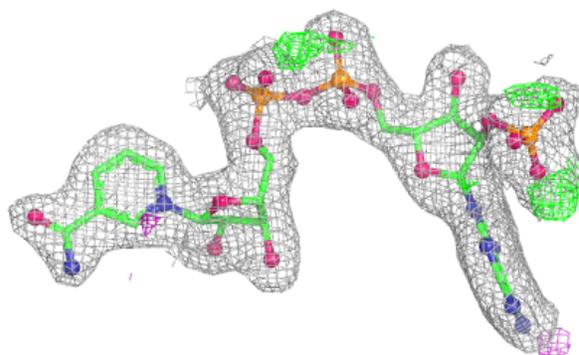
**Electron density around IMN A 402:**

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

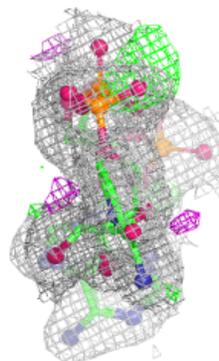
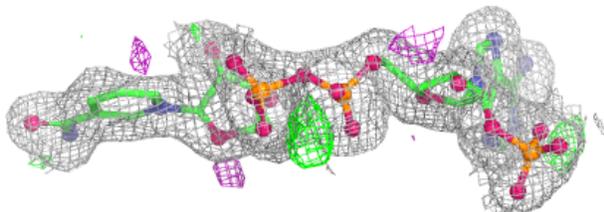
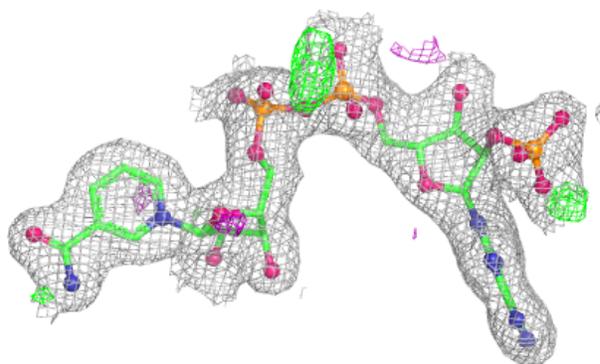


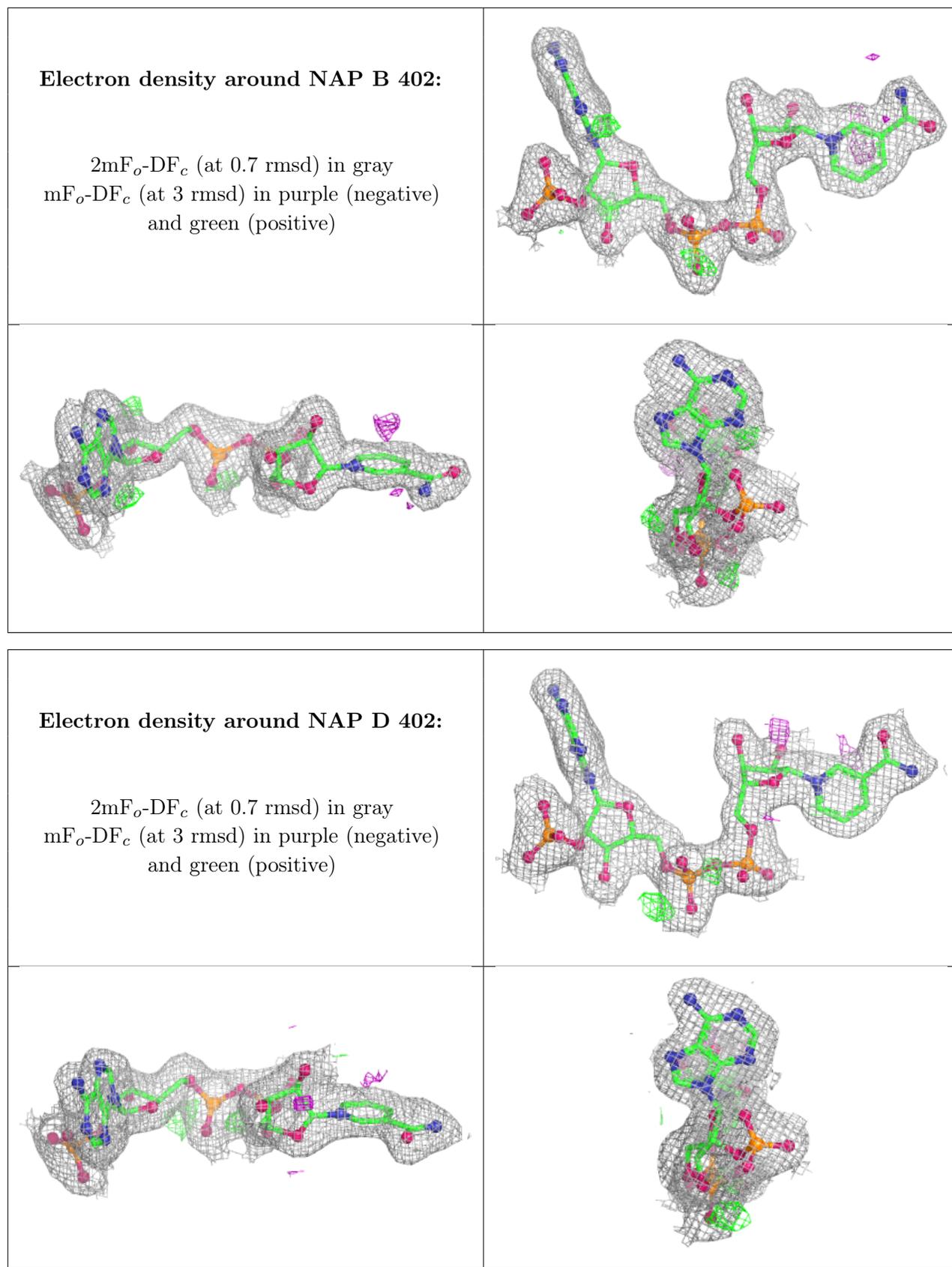
**Electron density around NAP C 403:**

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

**Electron density around NAP A 403:**

$2mF_o-DF_c$  (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.