



# Full wwPDB X-ray Structure Validation Report ⓘ

May 22, 2020 – 11:46 pm BST

PDB ID : 2GSW  
Title : Crystal Structure of the Putative NADPH-dependent Azobenzene FMN-Reductase YhdA from *Bacillus subtilis*, Northeast Structural Genomics Target SR135  
Authors : Forouhar, F.; Hussain, M.; Jayaraman, S.; Shen, J.; Cooper, B.; Cunningham, K.; Janjua, H.; Ma, L.-C.; Xiao, R.; Acton, T.B.; Montelione, G.T.; Hunt, J.F.; Tong, L.; Northeast Structural Genomics Consortium (NESG)  
Deposited on : 2006-04-26  
Resolution : 2.92 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.

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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 : 2.11  
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) : 2.11

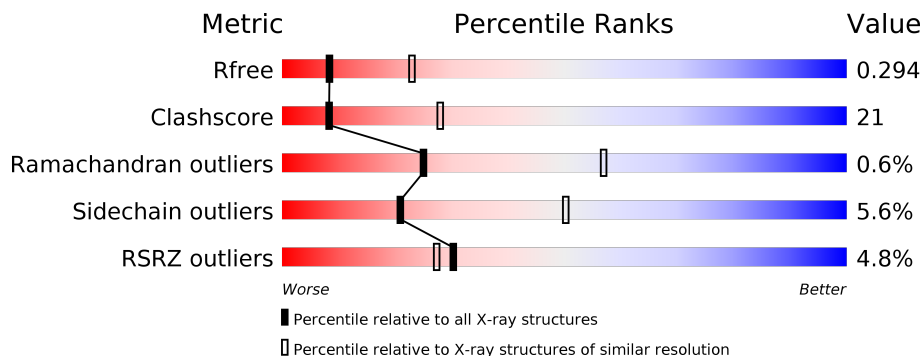
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.92 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	2307 (2.94-2.90)
Clashscore	141614	2531 (2.94-2.90)
Ramachandran outliers	138981	2462 (2.94-2.90)
Sidechain outliers	138945	2464 (2.94-2.90)
RSRZ outliers	127900	2248 (2.94-2.90)

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 on 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	182	 5% 61% 28% 8%
1	B	182	 5% 62% 27% 8%
1	C	182	 2% 59% 29% 8%
1	D	182	 5% 61% 27% 8%

## 2 Entry composition i

There are 3 unique types of molecules in this entry. The entry contains 5307 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 yhdA.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	Se			
1	A	168	1285	819	220	241	5	0	0	0
1	B	168	1285	819	220	241	5	0	0	0
1	C	168	1285	819	220	241	5	0	0	0
1	D	168	1285	819	220	241	5	0	0	0

There are 56 discrepancies between the modelled and reference sequences:

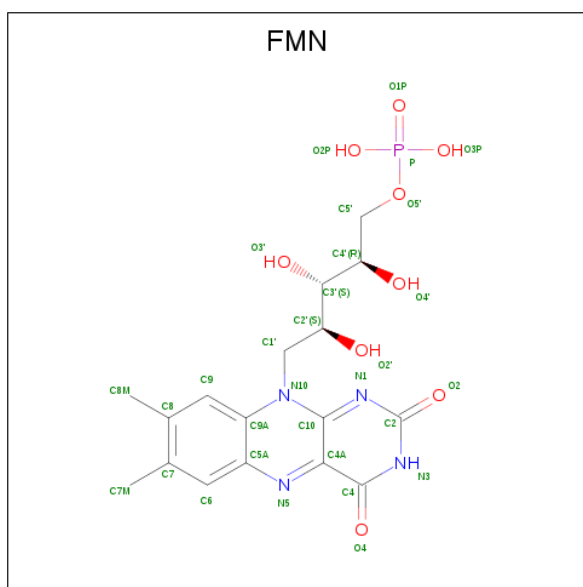
Chain	Residue	Modelled	Actual	Comment	Reference
A	1	MSE	MET	MODIFIED RESIDUE	GB 2633257
A	3	MSE	MET	MODIFIED RESIDUE	GB 2633257
A	78	MSE	MET	MODIFIED RESIDUE	GB 2633257
A	118	MSE	MET	MODIFIED RESIDUE	GB 2633257
A	122	MSE	MET	MODIFIED RESIDUE	GB 2633257
A	165	MSE	MET	MODIFIED RESIDUE	GB 2633257
A	175	LEU	-	CLONING ARTIFACT	GB 2633257
A	176	GLU	-	CLONING ARTIFACT	GB 2633257
A	177	HIS	-	EXPRESSION TAG	GB 2633257
A	178	HIS	-	EXPRESSION TAG	GB 2633257
A	179	HIS	-	EXPRESSION TAG	GB 2633257
A	180	HIS	-	EXPRESSION TAG	GB 2633257
A	181	HIS	-	EXPRESSION TAG	GB 2633257
A	182	HIS	-	EXPRESSION TAG	GB 2633257
B	1	MSE	MET	MODIFIED RESIDUE	GB 2633257
B	3	MSE	MET	MODIFIED RESIDUE	GB 2633257
B	78	MSE	MET	MODIFIED RESIDUE	GB 2633257
B	118	MSE	MET	MODIFIED RESIDUE	GB 2633257
B	122	MSE	MET	MODIFIED RESIDUE	GB 2633257
B	165	MSE	MET	MODIFIED RESIDUE	GB 2633257
B	175	LEU	-	CLONING ARTIFACT	GB 2633257

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Chain	Residue	Modelled	Actual	Comment	Reference
B	176	GLU	-	CLONING ARTIFACT	GB 2633257
B	177	HIS	-	EXPRESSION TAG	GB 2633257
B	178	HIS	-	EXPRESSION TAG	GB 2633257
B	179	HIS	-	EXPRESSION TAG	GB 2633257
B	180	HIS	-	EXPRESSION TAG	GB 2633257
B	181	HIS	-	EXPRESSION TAG	GB 2633257
B	182	HIS	-	EXPRESSION TAG	GB 2633257
C	1	MSE	MET	MODIFIED RESIDUE	GB 2633257
C	3	MSE	MET	MODIFIED RESIDUE	GB 2633257
C	78	MSE	MET	MODIFIED RESIDUE	GB 2633257
C	118	MSE	MET	MODIFIED RESIDUE	GB 2633257
C	122	MSE	MET	MODIFIED RESIDUE	GB 2633257
C	165	MSE	MET	MODIFIED RESIDUE	GB 2633257
C	175	LEU	-	CLONING ARTIFACT	GB 2633257
C	176	GLU	-	CLONING ARTIFACT	GB 2633257
C	177	HIS	-	EXPRESSION TAG	GB 2633257
C	178	HIS	-	EXPRESSION TAG	GB 2633257
C	179	HIS	-	EXPRESSION TAG	GB 2633257
C	180	HIS	-	EXPRESSION TAG	GB 2633257
C	181	HIS	-	EXPRESSION TAG	GB 2633257
C	182	HIS	-	EXPRESSION TAG	GB 2633257
D	1	MSE	MET	MODIFIED RESIDUE	GB 2633257
D	3	MSE	MET	MODIFIED RESIDUE	GB 2633257
D	78	MSE	MET	MODIFIED RESIDUE	GB 2633257
D	118	MSE	MET	MODIFIED RESIDUE	GB 2633257
D	122	MSE	MET	MODIFIED RESIDUE	GB 2633257
D	165	MSE	MET	MODIFIED RESIDUE	GB 2633257
D	175	LEU	-	CLONING ARTIFACT	GB 2633257
D	176	GLU	-	CLONING ARTIFACT	GB 2633257
D	177	HIS	-	EXPRESSION TAG	GB 2633257
D	178	HIS	-	EXPRESSION TAG	GB 2633257
D	179	HIS	-	EXPRESSION TAG	GB 2633257
D	180	HIS	-	EXPRESSION TAG	GB 2633257
D	181	HIS	-	EXPRESSION TAG	GB 2633257
D	182	HIS	-	EXPRESSION TAG	GB 2633257

- Molecule 2 is FLAVIN MONONUCLEOTIDE (three-letter code: FMN) (formula: C<sub>17</sub>H<sub>21</sub>N<sub>4</sub>O<sub>9</sub>P).

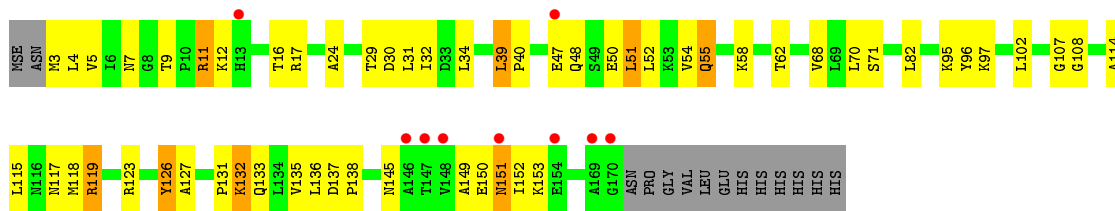


Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	A	1	Total	C	N	O	P	0	0
			31	17	4	9	1		
2	B	1	Total	C	N	O	P	0	0
			31	17	4	9	1		
2	C	1	Total	C	N	O	P	0	0
			31	17	4	9	1		
2	D	1	Total	C	N	O	P	0	0
			31	17	4	9	1		

- Molecule 3 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	9	Total	O	0	0
			9	9		
3	B	5	Total	O	0	0
			5	5		
3	C	13	Total	O	0	0
			13	13		
3	D	16	Total	O	0	0
			16	16		





## 4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	52.44Å 99.30Å 69.44Å 90.00° 103.34° 90.00°	Depositor
Resolution (Å)	29.72 – 2.92 29.72 – 2.92	Depositor EDS
% Data completeness (in resolution range)	84.5 (29.72-2.92) 94.5 (29.72-2.92)	Depositor EDS
$R_{merge}$	0.08	Depositor
$R_{sym}$	0.07	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	3.43 (at 2.90Å)	Xtrriage
Refinement program	CNS 1.1, XTALVIEW	Depositor
R, $R_{free}$	0.260 , 0.291 0.268 , 0.294	Depositor DCC
$R_{free}$ test set	2699 reflections (9.44%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	63.3	Xtrriage
Anisotropy	0.315	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.31 , 62.2	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.48$ , $\langle L^2 \rangle = 0.31$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
$F_o, F_c$ correlation	0.89	EDS
Total number of atoms	5307	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	59.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The analyses of the Patterson function reveals a significant off-origin peak that is 26.59 % of the origin peak, indicating pseudo-translational symmetry. The chance of finding a peak of this or larger height randomly in a structure without pseudo-translational symmetry is equal to 2.5633e-03. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

<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: FMN

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

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z  >5	RMSZ	# Z  >5
1	A	0.48	0/1300	0.77	5/1750 (0.3%)
1	B	0.45	0/1300	0.80	5/1750 (0.3%)
1	C	0.49	0/1300	0.79	5/1750 (0.3%)
1	D	0.45	0/1300	1.00	6/1750 (0.3%)
All	All	0.47	0/5200	0.85	21/7000 (0.3%)

There are no bond length outliers.

All (21) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	D	119	ARG	NE-CZ-NH1	-19.74	110.43	120.30
1	D	119	ARG	NE-CZ-NH2	18.41	129.50	120.30
1	B	11	ARG	NE-CZ-NH1	-13.95	113.33	120.30
1	D	11	ARG	NE-CZ-NH2	-13.42	113.59	120.30
1	A	11	ARG	NE-CZ-NH1	-13.05	113.77	120.30
1	C	11	ARG	NE-CZ-NH2	-12.87	113.86	120.30
1	B	11	ARG	NE-CZ-NH2	11.86	126.23	120.30
1	C	11	ARG	NE-CZ-NH1	11.73	126.16	120.30
1	D	11	ARG	NE-CZ-NH1	11.70	126.15	120.30
1	A	11	ARG	NE-CZ-NH2	11.13	125.86	120.30
1	D	119	ARG	CD-NE-CZ	10.23	137.92	123.60
1	B	119	ARG	NE-CZ-NH2	-9.97	115.31	120.30
1	C	119	ARG	NE-CZ-NH1	8.98	124.79	120.30
1	C	119	ARG	NE-CZ-NH2	-8.61	116.00	120.30
1	A	119	ARG	NE-CZ-NH2	-7.92	116.34	120.30
1	B	119	ARG	NE-CZ-NH1	7.76	124.18	120.30
1	A	119	ARG	NE-CZ-NH1	7.24	123.92	120.30
1	C	11	ARG	CD-NE-CZ	6.42	132.58	123.60
1	D	11	ARG	CD-NE-CZ	6.20	132.28	123.60
1	B	11	ARG	CD-NE-CZ	6.09	132.13	123.60

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	11	ARG	CD-NE-CZ	6.01	132.01	123.60

There are no chirality outliers.

There are no planarity outliers.

## 5.2 Too-close contacts

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	1285	0	1326	54	0
1	B	1285	0	1326	54	0
1	C	1285	0	1326	65	0
1	D	1285	0	1326	63	0
2	A	31	0	19	0	0
2	B	31	0	19	0	0
2	C	31	0	19	1	0
2	D	31	0	19	1	0
3	A	9	0	0	1	0
3	B	5	0	0	2	0
3	C	13	0	0	0	0
3	D	16	0	0	3	0
All	All	5307	0	5380	223	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 21.

All (223) 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:3:MSE:HE2	1:A:29:THR:HG21	1.46	0.93
1:B:3:MSE:HE2	1:B:29:THR:HG21	1.49	0.92
1:C:3:MSE:HE2	1:C:29:THR:HG21	1.51	0.90
1:D:3:MSE:HE2	1:D:29:THR:HG21	1.53	0.90
1:A:48:GLN:HA	1:A:51:LEU:HD13	1.57	0.85
1:B:48:GLN:HA	1:B:51:LEU:HD13	1.58	0.83
1:C:48:GLN:HA	1:C:51:LEU:HD13	1.61	0.82

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:131:PRO:HD3	3:D:214:HOH:O	1.79	0.82
1:D:48:GLN:HA	1:D:51:LEU:HD13	1.62	0.81
1:B:55:GLN:HE21	1:B:55:GLN:H	1.27	0.79
1:A:55:GLN:HE21	1:A:55:GLN:H	1.29	0.79
1:D:55:GLN:H	1:D:55:GLN:HE21	1.30	0.77
1:C:55:GLN:HE21	1:C:55:GLN:H	1.31	0.76
1:A:132:LYS:HA	1:A:132:LYS:HE3	1.74	0.70
1:D:55:GLN:NE2	1:D:55:GLN:H	1.91	0.69
1:B:55:GLN:NE2	1:B:55:GLN:H	1.91	0.68
1:D:132:LYS:HA	1:D:132:LYS:HE3	1.75	0.68
1:A:55:GLN:NE2	1:A:55:GLN:H	1.92	0.68
1:B:132:LYS:HE3	1:B:132:LYS:HA	1.76	0.68
1:C:132:LYS:HA	1:C:132:LYS:HE3	1.76	0.68
1:C:132:LYS:HD2	1:D:126:TYR:OH	1.95	0.67
1:C:55:GLN:NE2	1:C:55:GLN:H	1.93	0.66
1:D:71:SER:HB2	1:D:82:LEU:HD22	1.78	0.65
1:D:126:TYR:HD1	3:D:218:HOH:O	1.78	0.65
1:D:119:ARG:HH11	1:D:133:GLN:NE2	1.95	0.65
1:C:71:SER:HB2	1:C:82:LEU:HD22	1.80	0.64
1:A:4:LEU:HD12	1:A:30:ASP:O	1.98	0.64
1:B:150:GLU:HG2	3:B:205:HOH:O	1.97	0.63
1:C:4:LEU:HD12	1:C:30:ASP:O	2.00	0.62
1:D:138:PRO:HG2	3:D:217:HOH:O	2.01	0.60
1:B:4:LEU:HD12	1:B:30:ASP:O	2.02	0.60
1:C:7:ASN:O	1:C:34:LEU:HB2	2.02	0.60
1:C:126:TYR:OH	1:D:132:LYS:HD2	2.01	0.59
1:B:71:SER:HB2	1:B:82:LEU:HD22	1.84	0.59
1:A:95:LYS:HG2	1:A:96:TYR:HD2	1.68	0.59
1:A:71:SER:HB2	1:A:82:LEU:HD22	1.85	0.59
1:C:95:LYS:HG2	1:C:96:TYR:HD2	1.68	0.58
1:B:95:LYS:HG2	1:B:96:TYR:HD2	1.68	0.58
1:C:115:LEU:HD11	1:C:135:VAL:HG22	1.84	0.58
1:D:51:LEU:C	1:D:55:GLN:HE22	2.06	0.58
1:D:4:LEU:HD12	1:D:30:ASP:O	2.04	0.58
1:C:95:LYS:HG2	1:C:96:TYR:CD2	2.39	0.58
1:A:90:SER:HB2	3:A:210:HOH:O	2.02	0.58
1:C:39:LEU:HB3	1:C:40:PRO:HD2	1.87	0.57
1:D:11:ARG:HD3	2:D:204:FMN:O1P	2.04	0.57
1:B:115:LEU:HD23	1:B:118:MSE:CE	2.33	0.57
1:A:115:LEU:HD11	1:A:135:VAL:HG22	1.86	0.57
1:A:7:ASN:O	1:A:34:LEU:HB2	2.04	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:7:ASN:O	1:D:34:LEU:HB2	2.04	0.57
1:B:51:LEU:C	1:B:55:GLN:HE22	2.08	0.57
1:C:51:LEU:C	1:C:55:GLN:HE22	2.07	0.57
1:A:95:LYS:HG2	1:A:96:TYR:CD2	2.39	0.56
1:C:115:LEU:HD23	1:C:118:MSE:CE	2.35	0.56
1:D:95:LYS:HG2	1:D:96:TYR:HD2	1.69	0.56
1:B:115:LEU:HD11	1:B:135:VAL:HG22	1.85	0.56
1:B:39:LEU:HB3	1:B:40:PRO:HD2	1.86	0.56
1:C:115:LEU:HD23	1:C:118:MSE:HE3	1.86	0.56
1:A:51:LEU:C	1:A:55:GLN:HE22	2.09	0.56
1:D:107:GLY:HA2	1:D:137:ASP:OD1	2.06	0.55
1:D:95:LYS:HG2	1:D:96:TYR:CD2	2.40	0.55
1:C:70:LEU:HG	1:C:102:LEU:HD22	1.88	0.55
1:A:39:LEU:HB3	1:A:40:PRO:HD2	1.89	0.55
1:A:149:ALA:HB3	1:A:151:ASN:HD21	1.72	0.55
1:B:95:LYS:HG2	1:B:96:TYR:CD2	2.42	0.55
1:C:58:LYS:O	1:C:62:THR:HG22	2.07	0.55
1:B:58:LYS:O	1:B:62:THR:HG22	2.07	0.55
1:D:115:LEU:HD11	1:D:135:VAL:HG22	1.88	0.54
1:D:39:LEU:HB3	1:D:40:PRO:HD2	1.89	0.54
1:B:7:ASN:O	1:B:34:LEU:HB2	2.08	0.54
1:D:115:LEU:HD23	1:D:118:MSE:CE	2.38	0.53
1:A:24:ALA:HA	1:A:29:THR:OG1	2.08	0.53
1:A:115:LEU:HD23	1:A:118:MSE:CE	2.38	0.53
1:A:149:ALA:O	1:A:152:ILE:HG22	2.08	0.53
1:B:149:ALA:O	1:B:152:ILE:HG22	2.08	0.53
1:A:58:LYS:O	1:A:62:THR:HG22	2.09	0.53
1:D:115:LEU:HD23	1:D:118:MSE:HE3	1.91	0.53
1:D:149:ALA:O	1:D:152:ILE:HG22	2.08	0.53
1:A:70:LEU:HG	1:A:102:LEU:HD22	1.90	0.52
1:D:119:ARG:HH11	1:D:133:GLN:HE21	1.56	0.52
1:D:150:GLU:HA	1:D:153:LYS:HG3	1.92	0.52
1:A:48:GLN:C	1:A:50:GLU:H	2.13	0.52
1:B:130:ILE:HG13	1:B:130:ILE:O	2.09	0.52
1:B:3:MSE:O	1:B:29:THR:HB	2.10	0.52
1:D:24:ALA:HA	1:D:29:THR:OG1	2.10	0.52
1:B:115:LEU:HD23	1:B:118:MSE:HE3	1.92	0.52
1:B:151:ASN:HD22	1:B:152:ILE:N	2.07	0.52
1:D:3:MSE:O	1:D:29:THR:HB	2.10	0.52
1:B:24:ALA:HA	1:B:29:THR:OG1	2.10	0.51
1:A:150:GLU:HA	1:A:153:LYS:HG3	1.93	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:12:LYS:O	1:A:17:ARG:HD3	2.09	0.51
1:A:3:MSE:O	1:A:29:THR:HB	2.11	0.51
1:D:48:GLN:C	1:D:50:GLU:H	2.14	0.51
1:C:3:MSE:O	1:C:29:THR:HB	2.11	0.51
1:B:54:VAL:O	1:B:58:LYS:HG3	2.10	0.51
1:B:150:GLU:HA	1:B:153:LYS:HG3	1.93	0.51
1:C:11:ARG:HD3	2:C:203:FMN:O1P	2.11	0.51
1:C:150:GLU:HA	1:C:153:LYS:HG3	1.93	0.51
1:B:12:LYS:O	1:B:17:ARG:HD3	2.12	0.50
1:C:149:ALA:O	1:C:152:ILE:HG22	2.10	0.50
1:C:51:LEU:O	1:C:55:GLN:NE2	2.44	0.50
1:C:24:ALA:HA	1:C:29:THR:OG1	2.11	0.50
1:B:119:ARG:NH1	1:B:133:GLN:NE2	2.59	0.50
1:D:149:ALA:HB3	1:D:151:ASN:HD21	1.75	0.50
1:B:48:GLN:C	1:B:50:GLU:H	2.15	0.49
1:D:47:GLU:N	1:D:47:GLU:OE1	2.42	0.49
1:C:48:GLN:C	1:C:50:GLU:H	2.15	0.49
1:C:132:LYS:HB2	1:D:126:TYR:OH	2.12	0.49
1:D:54:VAL:O	1:D:58:LYS:HG3	2.12	0.49
1:C:115:LEU:HA	1:C:118:MSE:HE3	1.93	0.49
1:C:107:GLY:HA2	1:C:137:ASP:OD1	2.11	0.49
1:B:149:ALA:HB3	1:B:151:ASN:HD21	1.77	0.49
1:A:87:ASP:OD1	1:C:74:TYR:HB3	2.12	0.49
1:B:7:ASN:OD1	1:B:9:THR:HG22	2.11	0.49
1:D:51:LEU:O	1:D:55:GLN:NE2	2.42	0.49
1:A:136:LEU:CD2	1:A:152:ILE:HG12	2.43	0.49
1:B:47:GLU:OE1	1:B:47:GLU:N	2.41	0.49
1:C:149:ALA:HB3	1:C:151:ASN:HD21	1.77	0.49
1:C:54:VAL:O	1:C:58:LYS:HG3	2.13	0.49
1:C:151:ASN:HD22	1:C:152:ILE:N	2.09	0.49
1:D:151:ASN:HD22	1:D:152:ILE:N	2.10	0.49
1:B:68:VAL:HG12	1:B:70:LEU:CD1	2.42	0.48
1:D:58:LYS:O	1:D:62:THR:HG22	2.12	0.48
1:A:47:GLU:N	1:A:47:GLU:OE1	2.40	0.48
1:D:70:LEU:HG	1:D:102:LEU:HD22	1.95	0.48
1:B:39:LEU:HD12	1:B:39:LEU:N	2.29	0.48
1:A:115:LEU:HD23	1:A:118:MSE:HE3	1.95	0.48
1:D:7:ASN:OD1	1:D:9:THR:HG22	2.14	0.48
1:D:12:LYS:O	1:D:17:ARG:HD3	2.13	0.48
1:A:115:LEU:HA	1:A:118:MSE:HE3	1.96	0.47
1:A:151:ASN:HD22	1:A:151:ASN:N	2.11	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:151:ASN:HD22	1:A:152:ILE:N	2.12	0.47
1:C:151:ASN:HD22	1:C:151:ASN:N	2.12	0.47
1:D:115:LEU:HA	1:D:118:MSE:HE3	1.96	0.47
1:C:47:GLU:N	1:C:47:GLU:OE1	2.41	0.47
1:C:127:ALA:O	1:D:131:PRO:HG3	2.14	0.47
1:C:126:TYR:OH	1:D:132:LYS:HB2	2.15	0.47
1:A:54:VAL:O	1:A:58:LYS:HG3	2.14	0.47
1:B:107:GLY:HA2	1:B:137:ASP:OD1	2.14	0.46
1:C:114:ALA:O	1:C:118:MSE:HG3	2.15	0.46
1:C:131:PRO:O	1:D:123:ARG:NH1	2.48	0.46
1:D:51:LEU:HB3	1:D:52:LEU:H	1.52	0.46
1:A:107:GLY:HA2	1:A:137:ASP:OD1	2.16	0.46
1:A:68:VAL:HG12	1:A:70:LEU:CD1	2.45	0.46
1:B:9:THR:O	1:B:9:THR:HG23	2.15	0.46
1:C:9:THR:CG2	1:C:16:THR:HB	2.45	0.46
1:C:51:LEU:HB3	1:C:52:LEU:H	1.50	0.46
1:B:151:ASN:N	1:B:151:ASN:HD22	2.13	0.46
1:A:39:LEU:N	1:A:39:LEU:HD12	2.31	0.45
1:B:71:SER:HB3	1:B:118:MSE:SE	2.66	0.45
1:B:136:LEU:CD2	1:B:152:ILE:HG12	2.46	0.45
1:C:136:LEU:CD2	1:C:152:ILE:HG12	2.47	0.45
1:D:151:ASN:HD22	1:D:151:ASN:N	2.14	0.45
1:D:9:THR:CG2	1:D:16:THR:HB	2.47	0.45
1:B:153:LYS:HE3	3:B:205:HOH:O	2.16	0.45
1:C:39:LEU:HD12	1:C:39:LEU:N	2.31	0.45
1:A:115:LEU:HD11	1:A:135:VAL:CG2	2.47	0.45
1:D:119:ARG:NH1	1:D:133:GLN:NE2	2.64	0.45
1:B:51:LEU:O	1:B:55:GLN:NE2	2.47	0.45
1:C:115:LEU:HA	1:C:118:MSE:CE	2.46	0.45
1:C:3:MSE:HE3	1:C:68:VAL:HG21	1.97	0.44
1:A:119:ARG:NH1	1:A:133:GLN:NE2	2.66	0.44
1:B:51:LEU:HB3	1:B:52:LEU:H	1.49	0.44
1:A:109:LYS:NZ	1:D:108:GLY:O	2.33	0.44
1:D:39:LEU:N	1:D:39:LEU:HD12	2.32	0.44
1:A:130:ILE:O	1:A:130:ILE:HG13	2.16	0.44
1:C:119:ARG:NH2	1:D:123:ARG:HG3	2.33	0.44
1:C:119:ARG:NH1	1:C:133:GLN:NE2	2.65	0.44
1:D:115:LEU:HA	1:D:118:MSE:CE	2.48	0.44
1:D:136:LEU:CD2	1:D:152:ILE:HG12	2.47	0.44
1:C:54:VAL:HG12	1:C:58:LYS:HE3	2.00	0.44
1:B:70:LEU:HG	1:B:102:LEU:HD22	2.00	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:114:ALA:O	1:D:118:MSE:HG3	2.18	0.44
1:B:115:LEU:HA	1:B:118:MSE:CE	2.48	0.44
1:C:115:LEU:HD11	1:C:135:VAL:CG2	2.48	0.44
1:D:52:LEU:O	1:D:55:GLN:NE2	2.51	0.44
1:A:52:LEU:O	1:A:55:GLN:NE2	2.51	0.43
1:B:5:VAL:HG22	1:B:68:VAL:HB	1.98	0.43
1:D:3:MSE:HE3	1:D:68:VAL:HG21	2.00	0.43
1:A:51:LEU:O	1:A:55:GLN:NE2	2.46	0.43
1:C:131:PRO:HG3	1:D:127:ALA:O	2.19	0.43
1:B:68:VAL:HG12	1:B:70:LEU:HD11	2.01	0.43
1:B:115:LEU:HD11	1:B:135:VAL:CG2	2.48	0.43
1:B:54:VAL:HG12	1:B:58:LYS:HE3	1.99	0.43
1:B:115:LEU:HA	1:B:118:MSE:HE3	2.00	0.43
1:A:5:VAL:HG22	1:A:68:VAL:HB	2.00	0.42
1:B:109:LYS:NZ	1:C:108:GLY:O	2.40	0.42
1:C:7:ASN:OD1	1:C:9:THR:HG22	2.19	0.42
1:B:54:VAL:CG1	1:B:58:LYS:HE3	2.49	0.42
1:C:130:ILE:HG13	1:C:130:ILE:O	2.20	0.42
1:A:54:VAL:HG12	1:A:58:LYS:HE3	2.01	0.42
1:A:74:TYR:O	1:A:75:HIS:HB2	2.20	0.42
1:B:119:ARG:HH11	1:B:133:GLN:NE2	2.17	0.42
1:C:123:ARG:HD2	1:D:119:ARG:NH1	2.35	0.42
1:A:3:MSE:HB3	1:A:29:THR:HG22	2.02	0.42
1:D:5:VAL:HG22	1:D:68:VAL:HB	2.01	0.42
1:A:115:LEU:HA	1:A:118:MSE:CE	2.49	0.42
1:A:136:LEU:HD22	1:A:152:ILE:HG12	2.01	0.41
1:B:74:TYR:O	1:B:75:HIS:HB2	2.20	0.41
1:C:12:LYS:O	1:C:17:ARG:HD3	2.20	0.41
1:A:149:ALA:HB3	1:A:151:ASN:ND2	2.35	0.41
1:A:94:PHE:O	1:A:95:LYS:C	2.58	0.41
1:C:5:VAL:HG22	1:C:68:VAL:HB	2.01	0.41
1:A:9:THR:O	1:A:9:THR:HG23	2.20	0.41
1:B:69:LEU:HD12	1:B:69:LEU:HA	1.88	0.41
1:C:52:LEU:O	1:C:55:GLN:NE2	2.53	0.41
1:D:115:LEU:HD11	1:D:135:VAL:CG2	2.51	0.41
1:D:31:LEU:HD12	1:D:32:ILE:H	1.84	0.41
1:B:31:LEU:HD12	1:B:32:ILE:H	1.85	0.41
1:C:119:ARG:HH11	1:C:133:GLN:NE2	2.19	0.41
1:C:54:VAL:CG1	1:C:58:LYS:HE3	2.50	0.41
1:C:123:ARG:NH1	1:D:131:PRO:O	2.52	0.41
1:A:54:VAL:CG1	1:A:58:LYS:HE3	2.50	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:91:SER:O	1:C:95:LYS:HB2	2.20	0.41
1:D:54:VAL:HG12	1:D:58:LYS:HE3	2.02	0.41
1:A:7:ASN:OD1	1:A:9:THR:HG22	2.21	0.40
1:A:9:THR:CG2	1:A:16:THR:HB	2.51	0.40
1:B:136:LEU:HD22	1:B:152:ILE:HG12	2.03	0.40
1:C:94:PHE:O	1:C:95:LYS:C	2.60	0.40
1:D:62:THR:HA	1:D:97:LYS:NZ	2.36	0.40
1:A:62:THR:HA	1:A:97:LYS:NZ	2.36	0.40
1:D:68:VAL:HG12	1:D:70:LEU:CD1	2.51	0.40
1:C:31:LEU:HD12	1:C:32:ILE:H	1.87	0.40
1:C:136:LEU:HD22	1:C:152:ILE:HG12	2.01	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	166/182 (91%)	143 (86%)	22 (13%)	1 (1%)	25	57
1	B	166/182 (91%)	142 (86%)	23 (14%)	1 (1%)	25	57
1	C	166/182 (91%)	142 (86%)	23 (14%)	1 (1%)	25	57
1	D	166/182 (91%)	140 (84%)	25 (15%)	1 (1%)	25	57
All	All	664/728 (91%)	567 (85%)	93 (14%)	4 (1%)	25	57

All (4) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	51	LEU
1	B	51	LEU
1	C	51	LEU
1	D	51	LEU



### 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	138/145 (95%)	130 (94%)	8 (6%)	20	48
1	B	138/145 (95%)	130 (94%)	8 (6%)	20	48
1	C	138/145 (95%)	130 (94%)	8 (6%)	20	48
1	D	138/145 (95%)	131 (95%)	7 (5%)	24	54
All	All	552/580 (95%)	521 (94%)	31 (6%)	21	50

All (31) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	39	LEU
1	A	53	LYS
1	A	55	GLN
1	A	117	ASN
1	A	126	TYR
1	A	132	LYS
1	A	145	ASN
1	A	151	ASN
1	B	39	LEU
1	B	53	LYS
1	B	55	GLN
1	B	117	ASN
1	B	126	TYR
1	B	132	LYS
1	B	145	ASN
1	B	151	ASN
1	C	39	LEU
1	C	53	LYS
1	C	55	GLN
1	C	117	ASN
1	C	126	TYR
1	C	132	LYS
1	C	145	ASN
1	C	151	ASN

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Mol	Chain	Res	Type
1	D	39	LEU
1	D	55	GLN
1	D	117	ASN
1	D	126	TYR
1	D	132	LYS
1	D	145	ASN
1	D	151	ASN

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (18) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	13	HIS
1	A	55	GLN
1	A	84	ASN
1	A	133	GLN
1	A	151	ASN
1	B	55	GLN
1	B	84	ASN
1	B	133	GLN
1	B	151	ASN
1	C	13	HIS
1	C	55	GLN
1	C	84	ASN
1	C	133	GLN
1	C	151	ASN
1	D	55	GLN
1	D	84	ASN
1	D	133	GLN
1	D	151	ASN

### 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 carbohydrates in this entry.

## 5.6 Ligand geometry [i](#)

4 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	FMN	A	201	-	31,33,33	4.65	12 (38%)	40,50,50	3.43	13 (32%)
2	FMN	B	202	-	31,33,33	4.79	12 (38%)	40,50,50	3.32	13 (32%)
2	FMN	D	204	-	31,33,33	4.80	13 (41%)	40,50,50	3.24	12 (30%)
2	FMN	C	203	-	31,33,33	4.71	13 (41%)	40,50,50	3.27	12 (30%)

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	FMN	A	201	-	-	0/18/18/18	0/3/3/3
2	FMN	B	202	-	-	0/18/18/18	0/3/3/3
2	FMN	D	204	-	-	0/18/18/18	0/3/3/3
2	FMN	C	203	-	-	0/18/18/18	0/3/3/3

All (50) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	202	FMN	C4A-C10	20.01	1.58	1.38
2	D	204	FMN	C4A-C10	19.77	1.58	1.38
2	A	201	FMN	C4A-C10	19.60	1.58	1.38
2	C	203	FMN	C4A-C10	19.29	1.58	1.38
2	B	202	FMN	C4-N3	8.07	1.47	1.33
2	D	204	FMN	C4-N3	7.96	1.46	1.33

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	C	203	FMN	C4-N3	7.59	1.46	1.33
2	A	201	FMN	C4-N3	7.08	1.45	1.33
2	B	202	FMN	C2-N3	6.74	1.51	1.38
2	D	204	FMN	C2-N3	6.60	1.51	1.38
2	D	204	FMN	C9-C9A	6.56	1.53	1.40
2	C	203	FMN	C9-C9A	6.28	1.53	1.40
2	B	202	FMN	C9-C9A	6.26	1.53	1.40
2	A	201	FMN	C9-C9A	6.25	1.53	1.40
2	C	203	FMN	C2-N3	5.76	1.49	1.38
2	D	204	FMN	C5A-N5	5.74	1.44	1.35
2	A	201	FMN	C2-N3	5.69	1.49	1.38
2	C	203	FMN	C5A-N5	5.49	1.44	1.35
2	A	201	FMN	C9A-C5A	5.45	1.53	1.42
2	A	201	FMN	C5A-N5	5.38	1.44	1.35
2	C	203	FMN	C9A-C5A	5.35	1.53	1.42
2	B	202	FMN	C5A-N5	5.25	1.44	1.35
2	C	203	FMN	C5'-C4'	5.14	1.59	1.51
2	B	202	FMN	C9A-C5A	5.10	1.52	1.42
2	D	204	FMN	C5'-C4'	5.04	1.58	1.51
2	A	201	FMN	C5'-C4'	4.95	1.58	1.51
2	D	204	FMN	C9A-C5A	4.92	1.52	1.42
2	D	204	FMN	C6-C7	4.49	1.49	1.37
2	C	203	FMN	C6-C7	4.45	1.49	1.37
2	B	202	FMN	C9A-N10	4.35	1.44	1.38
2	B	202	FMN	C6-C7	4.34	1.48	1.37
2	A	201	FMN	C6-C7	4.25	1.48	1.37
2	C	203	FMN	C10-N1	4.17	1.38	1.33
2	B	202	FMN	C5'-C4'	4.14	1.57	1.51
2	D	204	FMN	C9A-N10	4.13	1.44	1.38
2	C	203	FMN	C9A-N10	3.86	1.43	1.38
2	A	201	FMN	C9A-N10	3.86	1.43	1.38
2	C	203	FMN	C8-C7	3.63	1.50	1.40
2	D	204	FMN	C8-C7	3.44	1.49	1.40
2	D	204	FMN	C10-N1	3.30	1.37	1.33
2	A	201	FMN	C10-N1	3.19	1.37	1.33
2	A	201	FMN	C8-C7	3.16	1.48	1.40
2	B	202	FMN	C8-C7	3.11	1.48	1.40
2	B	202	FMN	C2'-C3'	-3.09	1.47	1.53
2	C	203	FMN	C2'-C3'	-3.07	1.47	1.53
2	B	202	FMN	C10-N1	2.92	1.37	1.33
2	D	204	FMN	C2'-C3'	-2.77	1.48	1.53
2	C	203	FMN	C6-C5A	2.73	1.46	1.41

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	201	FMN	C2'-C3'	-2.50	1.48	1.53
2	D	204	FMN	C6-C5A	2.34	1.45	1.41

All (50) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	201	FMN	C1'-N10-C9A	11.13	127.06	118.29
2	C	203	FMN	C4-N3-C2	9.79	123.41	115.14
2	A	201	FMN	C4-N3-C2	9.60	123.25	115.14
2	B	202	FMN	C4-N3-C2	9.58	123.23	115.14
2	D	204	FMN	C4-N3-C2	9.43	123.11	115.14
2	B	202	FMN	C5A-C9A-N10	9.18	124.37	117.72
2	B	202	FMN	C1'-N10-C9A	8.95	125.33	118.29
2	C	203	FMN	C1'-N10-C9A	8.87	125.27	118.29
2	D	204	FMN	C5A-C9A-N10	8.80	124.09	117.72
2	C	203	FMN	C5A-C9A-N10	8.57	123.93	117.72
2	A	201	FMN	C5A-C9A-N10	8.56	123.92	117.72
2	D	204	FMN	C1'-N10-C9A	8.42	124.92	118.29
2	B	202	FMN	C4A-C4-N3	-5.40	116.04	123.43
2	D	204	FMN	C4A-C4-N3	-5.27	116.23	123.43
2	D	204	FMN	C7M-C7-C8	5.19	131.38	120.74
2	C	203	FMN	C4A-N5-C5A	5.19	121.95	116.77
2	C	203	FMN	C7M-C7-C8	5.15	131.29	120.74
2	A	201	FMN	C9A-N10-C10	-5.08	115.26	121.91
2	A	201	FMN	C7M-C7-C8	5.08	131.14	120.74
2	B	202	FMN	C9A-N10-C10	-5.05	115.29	121.91
2	D	204	FMN	C4A-N5-C5A	4.97	121.74	116.77
2	A	201	FMN	C4A-C4-N3	-4.96	116.65	123.43
2	C	203	FMN	C4A-C4-N3	-4.95	116.66	123.43
2	D	204	FMN	C7M-C7-C6	-4.94	108.52	120.34
2	B	202	FMN	C7M-C7-C8	4.93	130.84	120.74
2	B	202	FMN	C4A-N5-C5A	4.90	121.67	116.77
2	A	201	FMN	C7M-C7-C6	-4.89	108.64	120.34
2	C	203	FMN	C7M-C7-C6	-4.87	108.69	120.34
2	C	203	FMN	C9A-N10-C10	-4.83	115.59	121.91
2	B	202	FMN	C7M-C7-C6	-4.81	108.82	120.34
2	D	204	FMN	C9A-N10-C10	-4.78	115.64	121.91
2	A	201	FMN	C4A-N5-C5A	4.78	121.54	116.77
2	D	204	FMN	C6-C5A-N5	3.81	123.25	119.05
2	B	202	FMN	C6-C5A-N5	3.80	123.24	119.05
2	C	203	FMN	C6-C5A-N5	3.77	123.21	119.05
2	B	202	FMN	C9A-C5A-N5	-3.53	116.84	122.36

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	C	203	FMN	C9A-C5A-N5	-3.50	116.88	122.36
2	A	201	FMN	C6-C5A-N5	3.48	122.89	119.05
2	D	204	FMN	C9A-C5A-N5	-3.40	117.05	122.36
2	A	201	FMN	C9A-C5A-N5	-3.27	117.25	122.36
2	A	201	FMN	C4'-C3'-C2'	2.64	118.86	113.36
2	D	204	FMN	O3'-C3'-C4'	-2.38	103.06	108.81
2	C	203	FMN	C4'-C3'-C2'	2.30	118.15	113.36
2	B	202	FMN	O3'-C3'-C4'	-2.27	103.34	108.81
2	A	201	FMN	O3'-C3'-C4'	-2.26	103.36	108.81
2	D	204	FMN	C4'-C3'-C2'	2.19	117.91	113.36
2	B	202	FMN	C4'-C3'-C2'	2.08	117.69	113.36
2	B	202	FMN	C9-C9A-C5A	-2.05	116.38	119.88
2	C	203	FMN	O3'-C3'-C4'	-2.02	103.93	108.81
2	A	201	FMN	C9-C9A-C5A	-2.01	116.44	119.88

There are no chirality outliers.

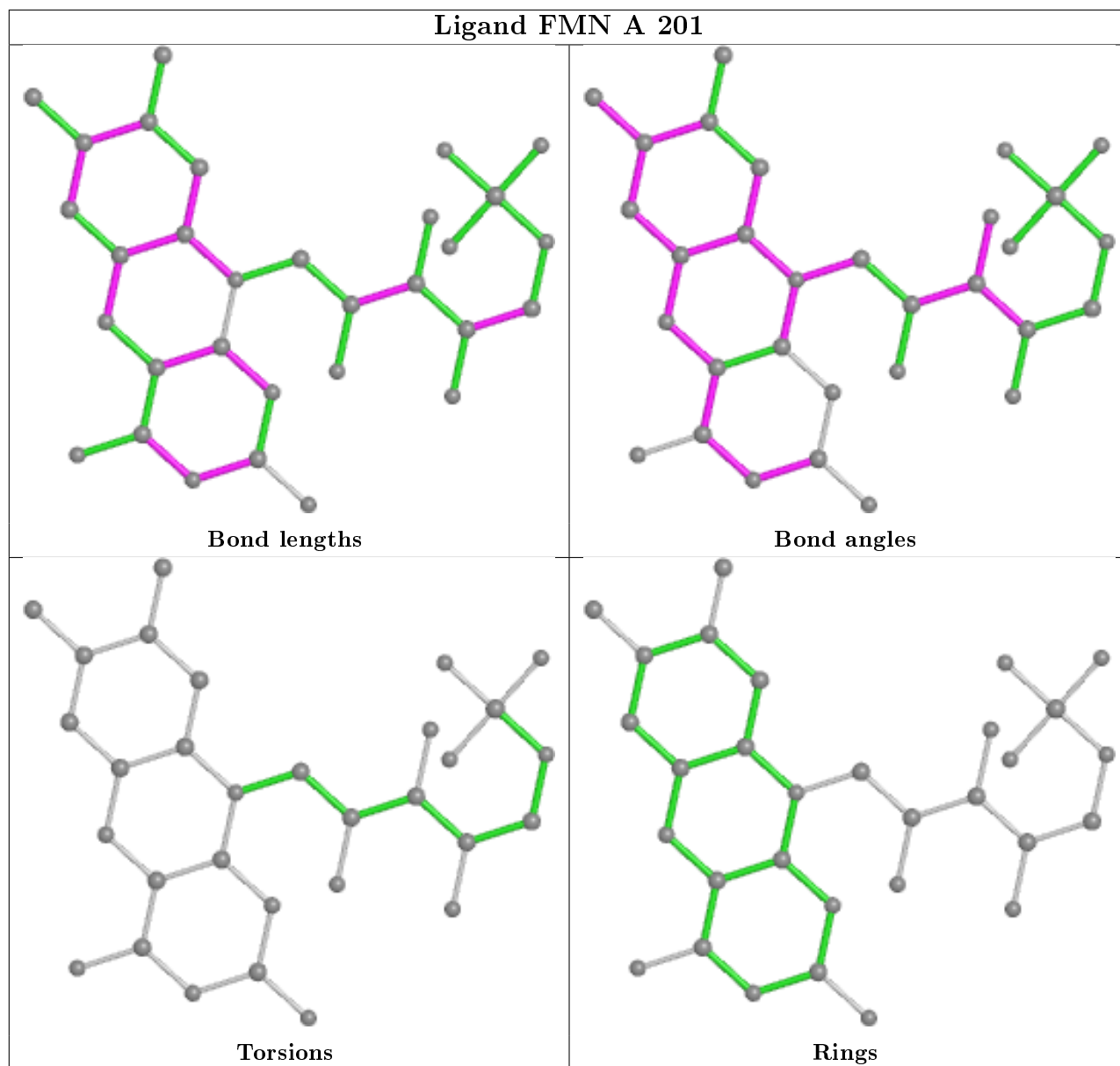
There are no torsion outliers.

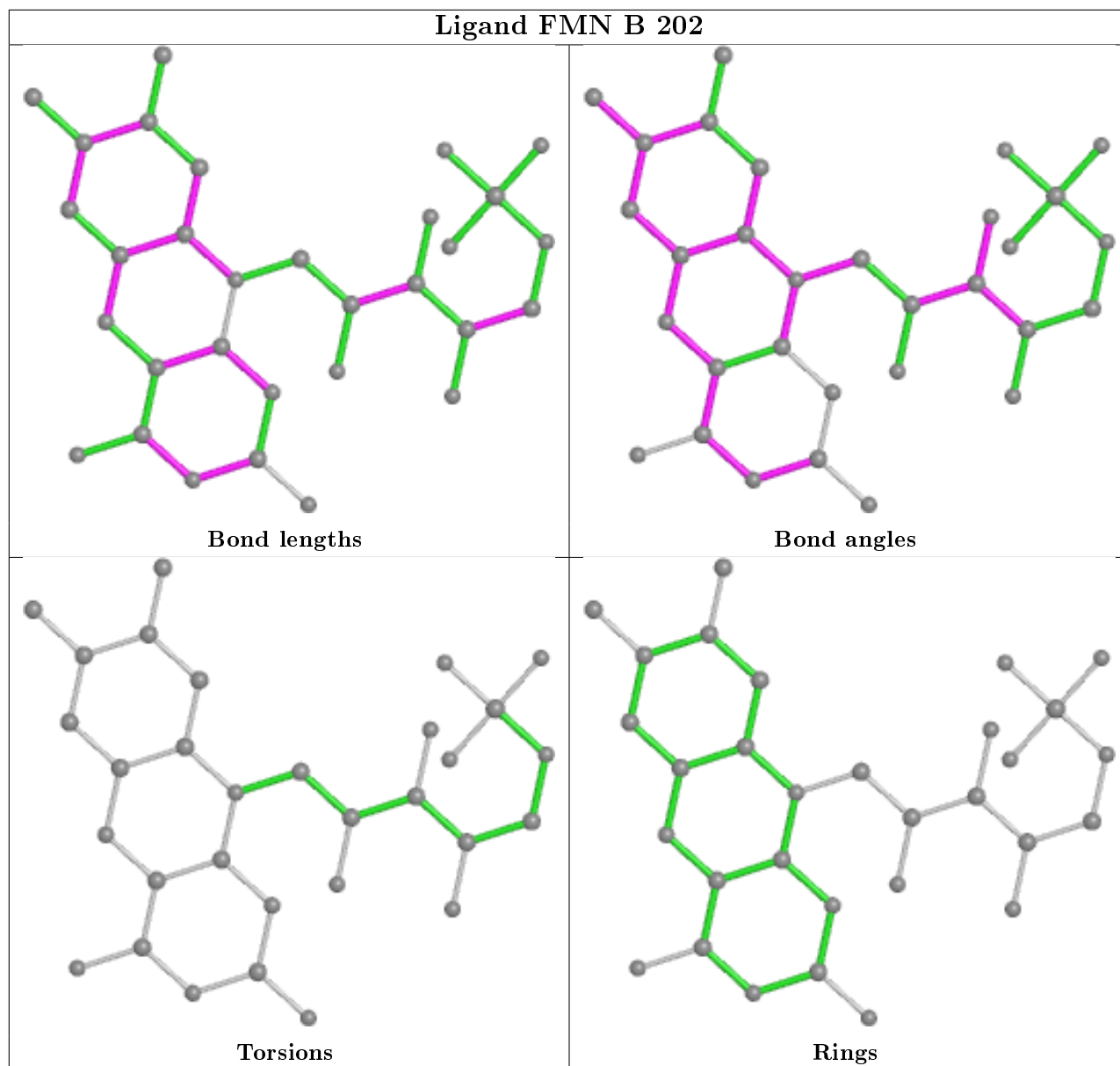
There are no ring outliers.

2 monomers are involved in 2 short contacts:

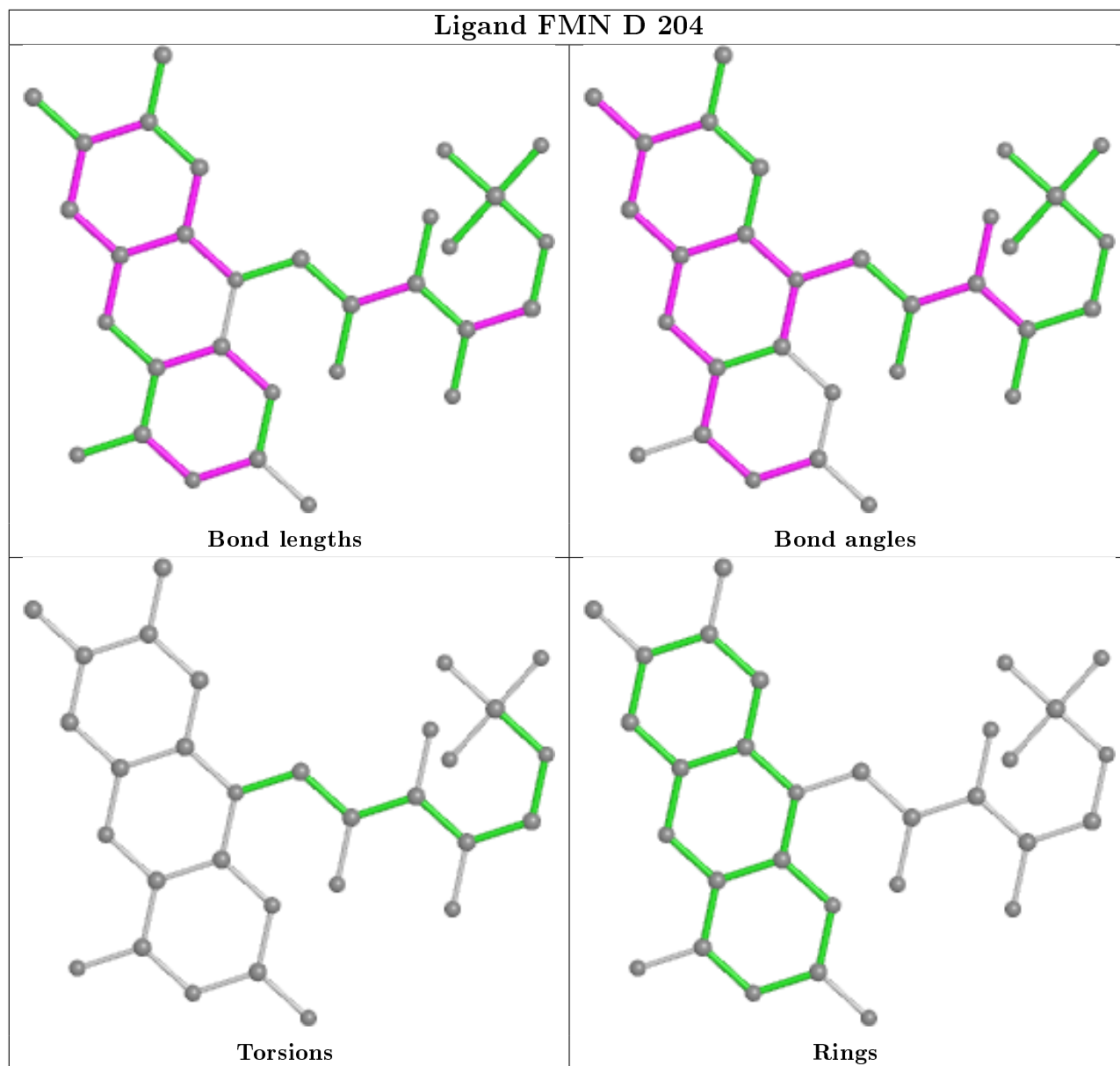
Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	D	204	FMN	1	0
2	C	203	FMN	1	0

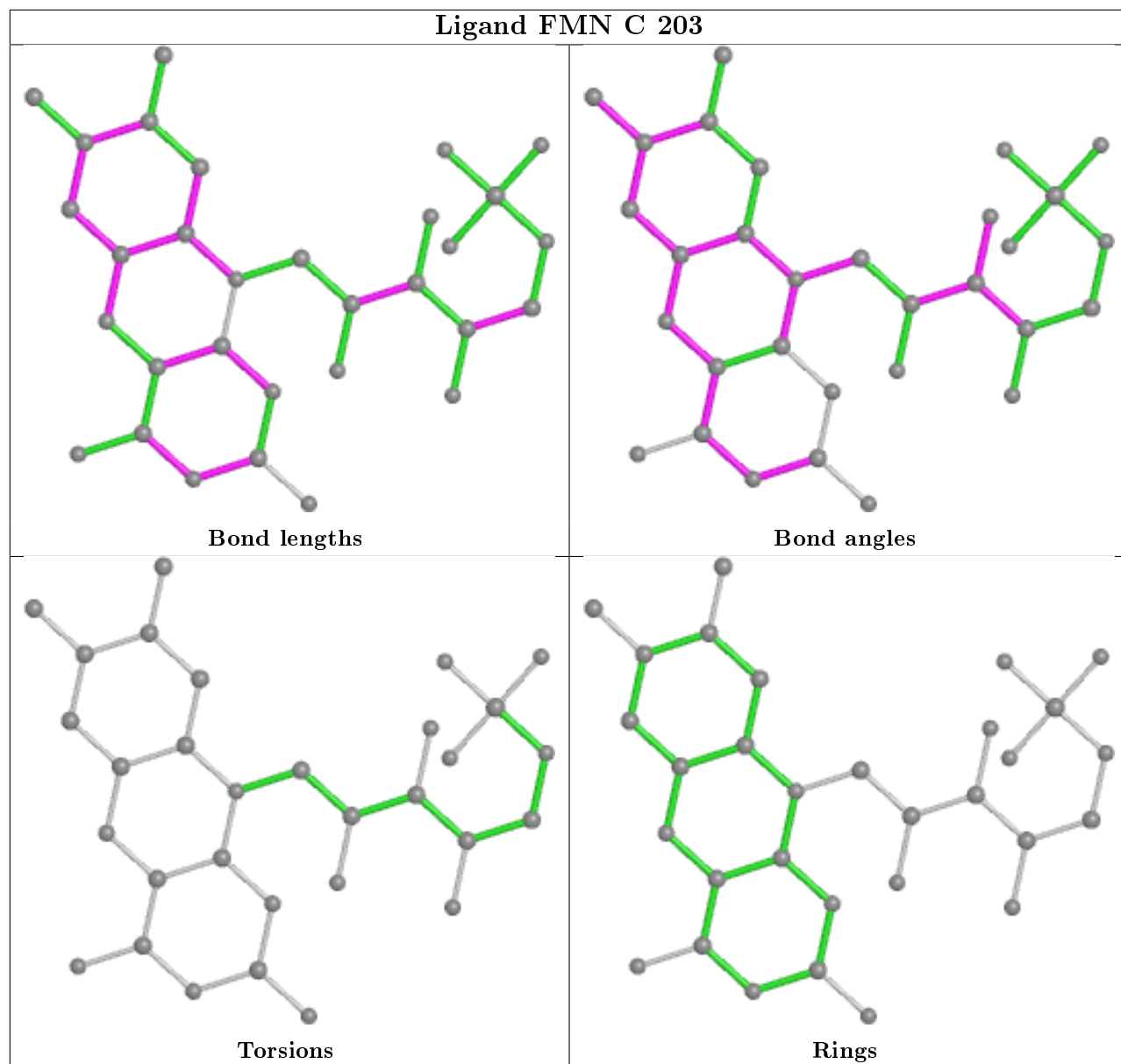
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. 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	163/182 (89%)	0.34	9 (5%) 25 22	25, 63, 77, 84	0
1	B	163/182 (89%)	0.41	10 (6%) 21 18	27, 64, 78, 84	0
1	C	163/182 (89%)	0.32	3 (1%) 68 67	24, 62, 77, 83	0
1	D	163/182 (89%)	0.38	9 (5%) 25 22	26, 63, 77, 83	0
All	All	652/728 (89%)	0.36	31 (4%) 30 27	24, 63, 77, 84	0

All (31) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	D	169	ALA	5.2
1	A	46	ALA	4.7
1	B	46	ALA	4.0
1	B	170	GLY	3.5
1	D	147	THR	3.1
1	D	13	HIS	3.0
1	A	45	GLU	2.9
1	B	142	ASP	2.9
1	C	47	GLU	2.7
1	C	144	GLU	2.7
1	B	49	SER	2.7
1	A	150	GLU	2.7
1	A	144	GLU	2.5
1	A	164	SER	2.4
1	D	170	GLY	2.4
1	A	166	PHE	2.3
1	A	168	LYS	2.3
1	D	151	ASN	2.2
1	B	65	ASP	2.2
1	D	154	GLU	2.2
1	A	13	HIS	2.2

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Mol	Chain	Res	Type	RSRZ
1	B	134	LEU	2.1
1	C	13	HIS	2.1
1	B	47	GLU	2.1
1	D	47	GLU	2.1
1	A	49	SER	2.1
1	B	45	GLU	2.1
1	B	50	GLU	2.1
1	B	169	ALA	2.1
1	D	146	ALA	2.0
1	D	148	VAL	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 carbohydrates in this entry.

## 6.4 Ligands [i](#)

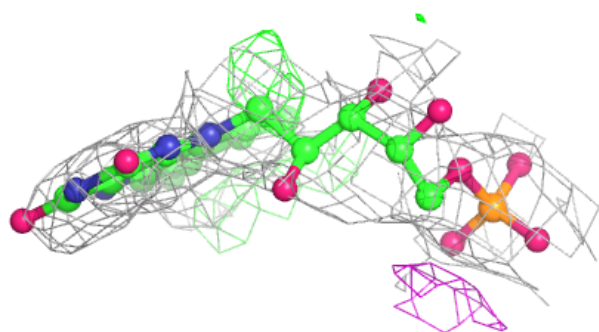
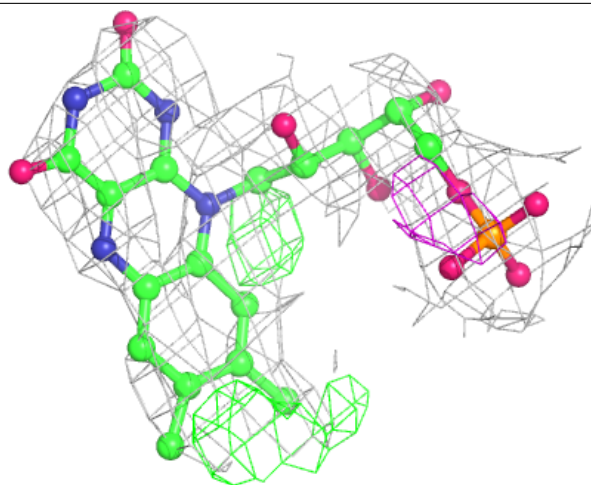
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95<sup>th</sup> percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 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	FMN	C	203	31/31	0.77	0.29	76,89,91,92	0
2	FMN	A	201	31/31	0.78	0.30	78,84,88,89	0
2	FMN	D	204	31/31	0.83	0.26	88,91,93,94	0
2	FMN	B	202	31/31	0.84	0.26	87,96,97,97	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.

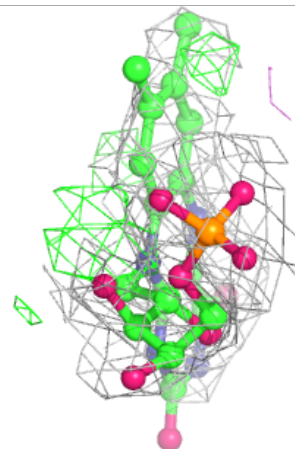
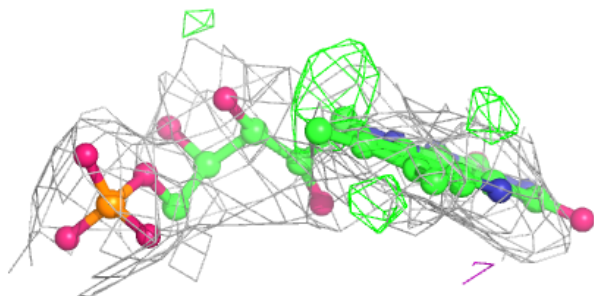
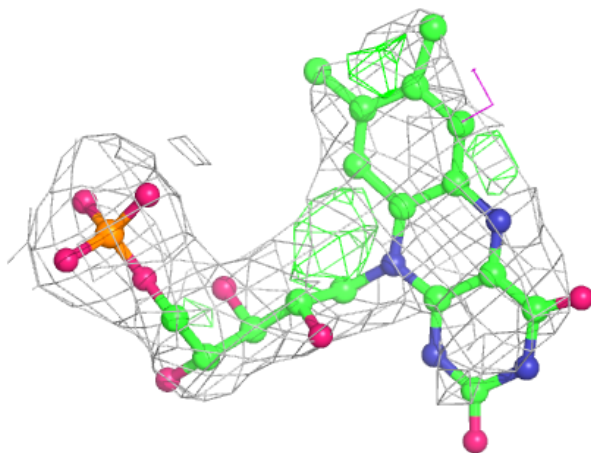
**Electron density around FMN C 203:**

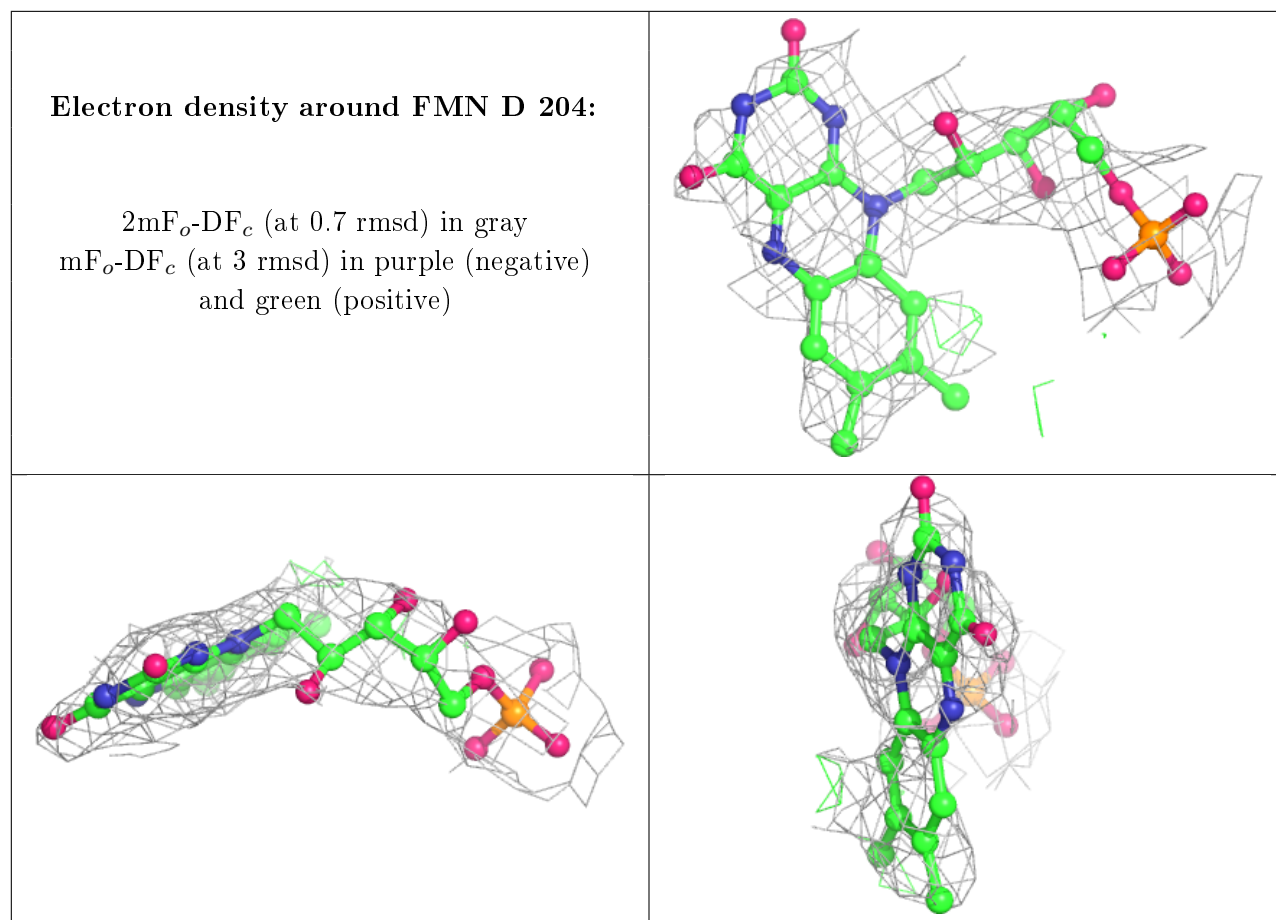
$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)

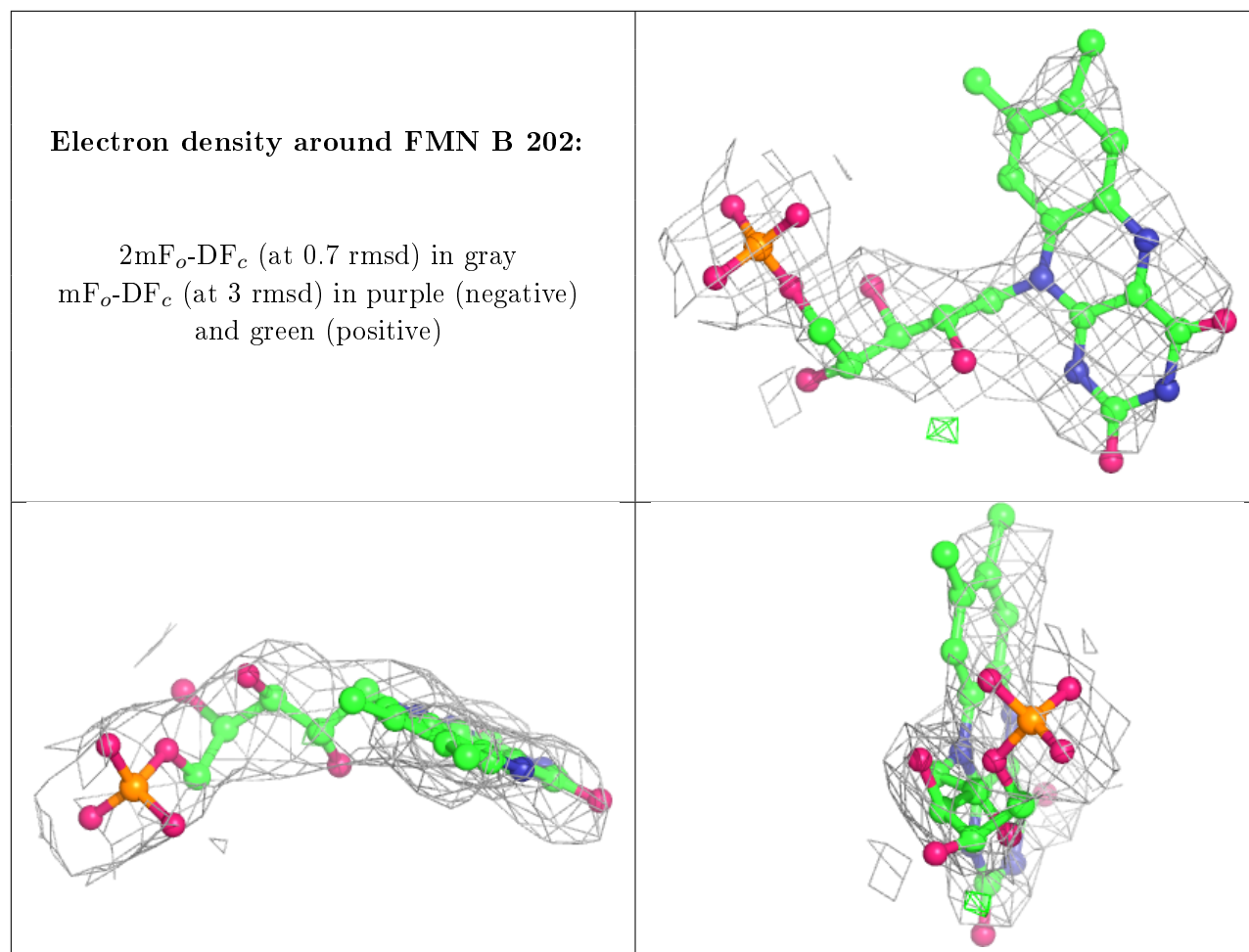


**Electron density around FMN A 201:**

$2mF_o-DF_c$  (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.