



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 9, 2026 – 09:37 PM UTC

PDB ID : 1ICV / pdb_00001icv
Title : THE STRUCTURE OF ESCHERICHIA COLI NITROREDUCTASE COM-
PLEXED WITH NICOTINIC ACID
Authors : Lovering, A.L.; Hyde, E.I.; Searle, P.F.; White, S.A.
Deposited on : 2001-04-02
Resolution : 2.40 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

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>.

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)
Xtriage (Phenix)	:	NOT EXECUTED
EDS	:	NOT EXECUTED
Buster-report	:	wwPDB partial adaption of 1.1.7 (2018)
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.49

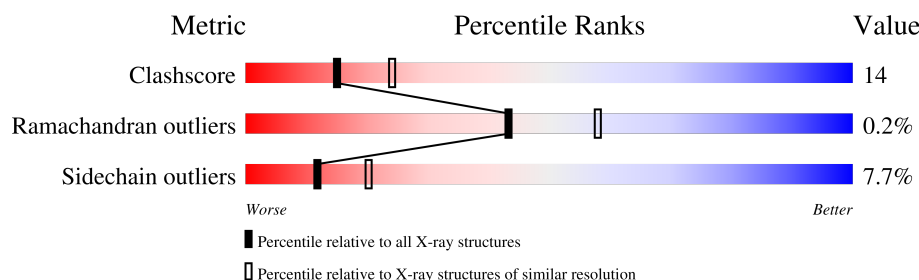
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.40 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))
Clashscore	190562	5391 (2.40-2.40)
Ramachandran outliers	187476	5320 (2.40-2.40)
Sidechain outliers	187428	5321 (2.40-2.40)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions $\leq 5\%$.

Note EDS was not executed.

Mol	Chain	Length	Quality of chain
1	A	217	73% 22% 5%
1	B	217	68% 25% 6%
1	C	217	75% 21% .
1	D	217	71% 24% 5%

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
2	FMN	A	701	-	X	-	-
2	FMN	B	703	X	X	-	-
2	FMN	C	705	X	X	-	-
2	FMN	D	707	X	X	-	-

2 Entry composition

There are 4 unique types of molecules in this entry. The entry contains 7511 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.

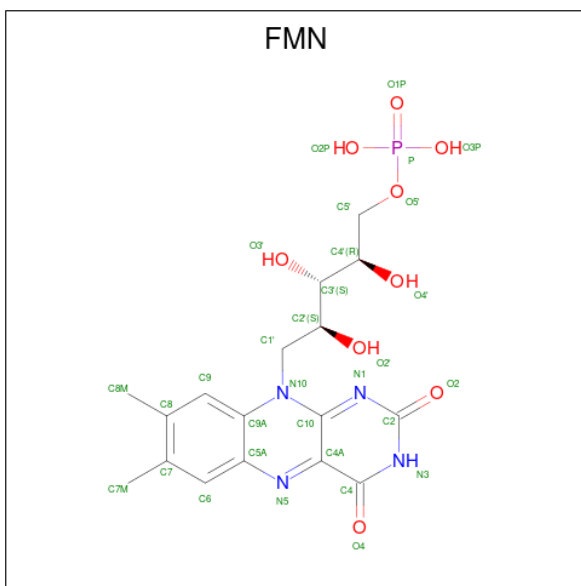
- Molecule 1 is a protein called OXYGEN-INSENSITIVE NAD(P)H NITROREDUCTASE.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
1	A	216	Total	C	N	O	S	Se	0	0	0
			1677	1065	287	320	1	4			
1	B	216	Total	C	N	O	S	Se	0	0	0
			1677	1065	287	320	1	4			
1	C	216	Total	C	N	O	S	Se	0	0	0
			1677	1065	287	320	1	4			
1	D	216	Total	C	N	O	S	Se	0	0	0
			1677	1065	287	320	1	4			

There are 20 discrepancies between the modelled and reference sequences:

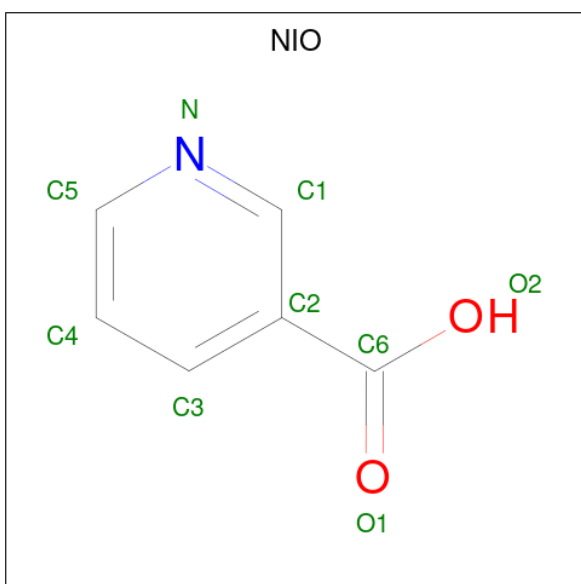
Chain	Residue	Modelled	Actual	Comment	Reference
A	1	MSE	MET	modified residue	UNP P38489
A	75	MSE	MET	modified residue	UNP P38489
A	90	MSE	MET	modified residue	UNP P38489
A	127	MSE	MET	modified residue	UNP P38489
A	139	MSE	MET	modified residue	UNP P38489
B	1	MSE	MET	modified residue	UNP P38489
B	75	MSE	MET	modified residue	UNP P38489
B	90	MSE	MET	modified residue	UNP P38489
B	127	MSE	MET	modified residue	UNP P38489
B	139	MSE	MET	modified residue	UNP P38489
C	1	MSE	MET	modified residue	UNP P38489
C	75	MSE	MET	modified residue	UNP P38489
C	90	MSE	MET	modified residue	UNP P38489
C	127	MSE	MET	modified residue	UNP P38489
C	139	MSE	MET	modified residue	UNP P38489
D	1	MSE	MET	modified residue	UNP P38489
D	75	MSE	MET	modified residue	UNP P38489
D	90	MSE	MET	modified residue	UNP P38489
D	127	MSE	MET	modified residue	UNP P38489
D	139	MSE	MET	modified residue	UNP P38489

- Molecule 2 is FLAVIN MONONUCLEOTIDE (CCD ID: FMN) (formula: $C_{17}H_{21}N_4O_9P$).



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 NICOTINIC ACID (CCD ID: NIO) (formula: $C_6H_5NO_2$).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	1	Total C N O 9 6 1 2	0	0
3	B	1	Total C N O 9 6 1 2	0	0
3	C	1	Total C N O 9 6 1 2	0	0
3	D	1	Total C N O 9 6 1 2	0	0

- Molecule 4 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	164	Total O 164 164	0	0
4	B	179	Total O 179 179	0	0
4	C	157	Total O 157 157	0	0
4	D	143	Total O 143 143	0	0

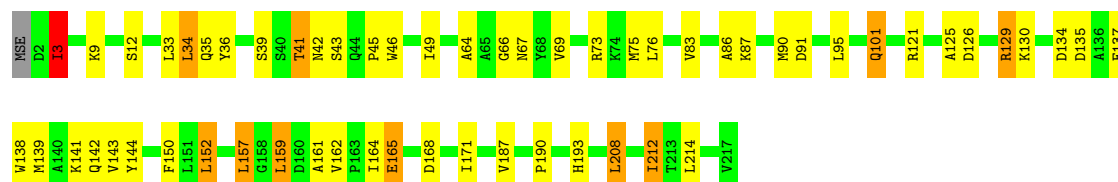
3 Residue-property plots

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. 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. 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.

Note EDS was not executed.

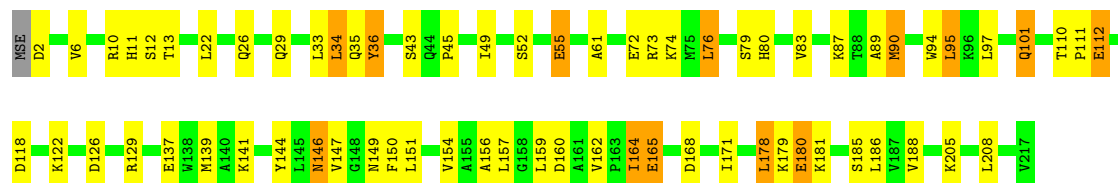
• Molecule 1: OXYGEN-INSENSITIVE NAD(P)H NITROREDUCTASE

Chain A: 



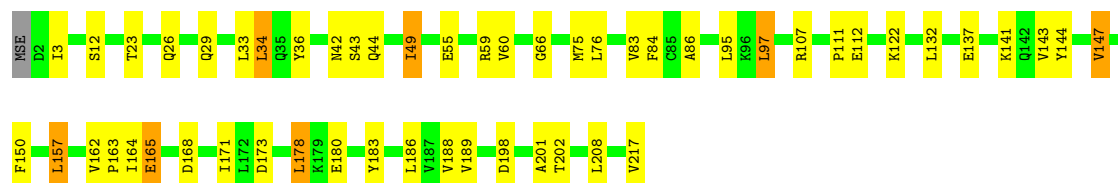
• Molecule 1: OXYGEN-INSENSITIVE NAD(P)H NITROREDUCTASE

Chain B: 



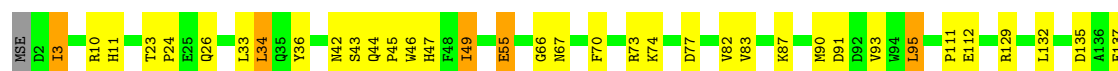
• Molecule 1: OXYGEN-INSENSITIVE NAD(P)H NITROREDUCTASE

Chain C: 



• Molecule 1: OXYGEN-INSENSITIVE NAD(P)H NITROREDUCTASE

Chain D: 



M138	M139	A140	K141	Q142	V143	Y144	F150	G153	V154	L167	P163	I164	E165	D173	L178	K179	E180	K181	G182	Y183	V189	P190	V191	S206	R207	L208	P209	G210	N211	I212	T213	L214	T215	E216	V217
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4 Data and refinement statistics

Xtriage (Phenix) and EDS were not executed - this section is therefore incomplete.

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α , β , γ	57.74Å 119.57Å 143.61Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	100.00 – 2.40	Depositor
% Data completeness (in resolution range)	(Not available) (100.00-2.40)	Depositor
R_{merge}	0.05	Depositor
R_{sym}	4.90	Depositor
Refinement program	CNS	Depositor
R, R_{free}	0.198 , 0.242	Depositor
Estimated twinning fraction	No twinning to report.	Xtriage
Total number of atoms	7511	wwPDB-VP
Average B, all atoms (Å ²)	20.0	wwPDB-VP

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: NIO, 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	0.41	0/1708	0.90	6/2306 (0.3%)
1	B	0.44	0/1708	0.88	4/2306 (0.2%)
1	C	0.42	0/1708	0.89	3/2306 (0.1%)
1	D	0.42	0/1708	0.91	6/2306 (0.3%)
All	All	0.42	0/6832	0.89	19/9224 (0.2%)

There are no bond length outliers.

All (19) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	D	3	ILE	N-CA-C	-6.67	102.69	112.04
1	D	178	LEU	N-CA-C	6.38	117.89	111.07
1	B	36	TYR	N-CA-C	6.34	120.03	112.93
1	C	164	ILE	N-CA-C	6.34	117.15	107.77
1	D	165	GLU	N-CA-C	-6.16	106.09	113.97
1	D	189	VAL	N-CA-C	6.07	114.16	108.15
1	D	213	THR	N-CA-C	5.90	120.48	113.28
1	A	36	TYR	N-CA-C	5.89	120.08	113.02
1	A	165	GLU	N-CA-C	-5.75	106.61	113.97
1	A	35	GLN	N-CA-C	5.70	117.17	111.07
1	B	164	ILE	N-CA-C	5.66	116.04	108.11
1	A	164	ILE	N-CA-C	5.61	116.13	107.78
1	C	36	TYR	N-CA-C	5.51	119.10	112.93
1	A	134	ASP	N-CA-C	-5.48	105.90	112.59
1	D	36	TYR	N-CA-C	5.36	119.52	113.15
1	B	178	LEU	N-CA-C	5.28	116.72	111.07
1	B	165	GLU	N-CA-C	-5.27	107.22	113.97
1	C	165	GLU	N-CA-C	-5.09	107.11	113.72
1	A	3	ILE	N-CA-C	-5.08	105.44	112.50

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	1677	0	1661	54	0
1	B	1677	0	1661	52	0
1	C	1677	0	1661	44	0
1	D	1677	0	1661	57	0
2	A	31	0	18	1	0
2	B	31	0	19	3	0
2	C	31	0	16	3	0
2	D	31	0	16	4	0
3	A	9	0	5	0	0
3	B	9	0	5	0	0
3	C	9	0	5	0	0
3	D	9	0	5	0	0
4	A	164	0	0	5	0
4	B	179	0	0	2	0
4	C	157	0	0	3	0
4	D	143	0	0	4	0
All	All	7511	0	6733	186	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 14.

All (186) 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:C:49:ILE:HG23	1:C:83:VAL:HB	1.23	1.15
1:C:75:MSE:HE3	1:C:188:VAL:HG11	1.46	0.97
1:D:49:ILE:CG2	1:D:83:VAL:HB	1.95	0.94
1:C:60:VAL:HG12	1:C:75:MSE:HE1	1.51	0.92
1:C:60:VAL:HG12	1:C:75:MSE:CE	2.05	0.86
1:B:90:MSE:HA	1:B:90:MSE:HE2	1.62	0.81
1:C:49:ILE:CG2	1:C:83:VAL:HB	2.07	0.80

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:129:ARG:HG2	1:A:130:LYS:N	1.99	0.76
1:C:49:ILE:HD11	1:D:217:VAL:HG22	1.68	0.76
1:D:211:ASN:HD22	1:D:212:ILE:N	1.84	0.74
1:D:49:ILE:HG22	1:D:83:VAL:HB	1.71	0.73
1:D:49:ILE:HG23	1:D:83:VAL:HB	1.73	0.71
1:D:49:ILE:C	1:D:49:ILE:HD13	2.18	0.68
1:C:137:GLU:HG3	1:D:137:GLU:CD	2.21	0.65
1:A:9:LYS:HE2	4:A:743:HOH:O	1.97	0.65
1:D:111:PRO:HG2	1:D:112:GLU:OE2	1.98	0.64
1:A:101:GLN:HG3	1:B:208:LEU:HD23	1.80	0.64
1:B:55:GLU:H	1:B:55:GLU:CD	2.04	0.64
1:C:86:ALA:HB2	1:C:143:VAL:HG21	1.78	0.63
1:D:179:LYS:HG3	4:D:833:HOH:O	1.97	0.63
1:A:144:TYR:CE1	1:B:141:LYS:HD3	2.33	0.63
1:D:209:PRO:HB2	1:D:211:ASN:ND2	2.13	0.63
1:C:141:LYS:HD3	1:D:144:TYR:CE1	2.34	0.62
1:A:41:THR:HG22	1:A:43:SER:HB3	1.82	0.62
1:C:198:ASP:OD2	1:C:201:ALA:HB2	2.00	0.61
1:A:152:LEU:HG	1:B:149:ASN:ND2	2.15	0.61
1:C:26:GLN:HA	1:C:29:GLN:HE21	1.66	0.60
1:C:34:LEU:HD13	1:C:150:PHE:CD2	2.37	0.60
1:C:165:GLU:HG3	2:C:705:FMN:H6	1.84	0.59
1:C:49:ILE:HD11	1:D:217:VAL:CG2	2.31	0.59
1:D:180:GLU:H	1:D:180:GLU:CD	2.09	0.58
1:D:211:ASN:HD22	1:D:211:ASN:C	2.09	0.58
1:D:129:ARG:O	1:D:129:ARG:HD3	2.04	0.58
1:C:12:SER:HB3	1:C:162:VAL:HG23	1.85	0.58
1:B:110:THR:HB	1:B:112:GLU:OE2	2.04	0.57
1:B:49:ILE:HB	1:B:83:VAL:HB	1.86	0.57
1:A:86:ALA:HB2	1:A:143:VAL:HG21	1.87	0.57
1:C:157:LEU:HD13	1:D:3:ILE:HG22	1.86	0.56
1:A:41:THR:HG23	1:A:121:ARG:HE	1.71	0.56
1:C:157:LEU:HD13	1:D:3:ILE:CG2	2.36	0.56
1:B:154:VAL:HG13	1:B:159:LEU:HB2	1.87	0.56
1:A:91:ASP:O	1:A:95:LEU:HD23	2.05	0.56
1:A:64:ALA:HB2	1:A:75:MSE:CE	2.36	0.55
1:A:95:LEU:HD12	1:A:121:ARG:HG2	1.87	0.55
1:D:47:HIS:HB2	1:D:183:TYR:CE2	2.42	0.55
1:B:43:SER:OG	1:B:45:PRO:HD3	2.07	0.55
1:A:64:ALA:HB2	1:A:75:MSE:HE1	1.88	0.55
1:A:67:ASN:HB2	4:A:730:HOH:O	2.06	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:72:GLU:HG2	1:B:76:LEU:HD22	1.88	0.54
1:B:90:MSE:HA	1:B:90:MSE:CE	2.37	0.54
1:B:26:GLN:NE2	1:B:159:LEU:HD21	2.22	0.54
1:D:55:GLU:H	1:D:55:GLU:CD	2.14	0.54
1:A:43:SER:HB2	1:A:90:MSE:HE1	1.90	0.54
1:B:2:ASP:O	1:B:6:VAL:HG23	2.08	0.54
1:A:3:ILE:O	1:A:3:ILE:HD13	2.07	0.54
1:A:168:ASP:CG	1:A:171:ILE:HG12	2.32	0.54
1:A:34:LEU:HD13	1:A:150:PHE:CD2	2.44	0.53
1:C:23:THR:OG1	1:C:26:GLN:HG3	2.08	0.53
1:C:173:ASP:HA	1:C:178:LEU:HD22	1.89	0.53
1:D:214:LEU:HD23	1:D:215:THR:N	2.24	0.53
1:C:107:ARG:HH11	1:C:107:ARG:HB3	1.74	0.53
1:B:61:ALA:CB	1:B:76:LEU:HD13	2.40	0.52
1:A:90:MSE:HG3	1:A:95:LEU:HD21	1.91	0.52
4:C:726:HOH:O	1:D:213:THR:HA	2.08	0.52
1:A:126:ASP:HA	1:A:129:ARG:CD	2.39	0.52
1:C:84:PHE:CD1	1:C:147:VAL:HG12	2.45	0.52
1:C:95:LEU:HD13	1:C:122:LYS:HG2	1.93	0.51
1:A:208:LEU:HD12	1:B:101:GLN:HG3	1.91	0.51
1:B:146:ASN:C	1:B:146:ASN:HD22	2.19	0.51
1:B:90:MSE:SE	1:B:95:LEU:HD13	2.61	0.51
1:A:162:VAL:O	1:A:190:PRO:HD2	2.11	0.51
1:C:60:VAL:CG1	1:C:75:MSE:CE	2.86	0.51
1:B:126:ASP:OD1	1:B:129:ARG:NH2	2.44	0.51
2:C:705:FMN:O4'	1:D:42:ASN:HB2	2.11	0.50
1:D:73:ARG:NH1	1:D:77:ASP:OD1	2.44	0.50
1:D:129:ARG:HD3	1:D:129:ARG:C	2.36	0.50
1:A:49:ILE:HB	1:A:83:VAL:HB	1.92	0.50
1:D:211:ASN:ND2	1:D:212:ILE:HG12	2.26	0.50
1:D:91:ASP:OD1	1:D:93:VAL:HB	2.12	0.50
1:A:141:LYS:HD3	1:B:144:TYR:CE1	2.46	0.49
1:B:13:THR:OG1	1:B:160:ASP:HB3	2.12	0.49
1:A:66:GLY:O	1:A:69:VAL:HG23	2.11	0.49
1:C:111:PRO:HG2	1:C:112:GLU:OE2	2.12	0.49
1:C:144:TYR:CE1	1:D:141:LYS:HD3	2.48	0.48
1:B:118:ASP:O	1:B:122:LYS:HB2	2.13	0.48
1:A:126:ASP:HA	1:A:129:ARG:HD3	1.95	0.48
1:B:26:GLN:HA	1:B:29:GLN:HE21	1.79	0.48
1:C:42:ASN:HB2	2:D:707:FMN:O4'	2.13	0.48
1:C:49:ILE:CD1	1:D:217:VAL:HG22	2.40	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:10:ARG:HG2	1:D:11:HIS:N	2.27	0.48
1:A:45:PRO:HA	1:A:87:LYS:HD3	1.94	0.48
1:D:90:MSE:SE	1:D:95:LEU:HD13	2.64	0.48
1:B:34:LEU:HD13	1:B:150:PHE:CD2	2.49	0.48
1:C:55:GLU:HB2	4:C:777:HOH:O	2.14	0.48
1:D:135:ASP:O	1:D:139:MSE:HG3	2.15	0.47
1:D:163:PRO:HA	1:D:189:VAL:HG22	1.94	0.47
1:A:41:THR:HG23	1:A:41:THR:O	2.13	0.47
1:A:129:ARG:HA	1:A:135:ASP:HB2	1.96	0.47
1:D:10:ARG:HD2	4:D:711:HOH:O	2.14	0.47
1:A:41:THR:CG2	1:A:121:ARG:HG3	2.45	0.47
1:C:165:GLU:CG	2:C:705:FMN:H6	2.44	0.47
1:D:46:TRP:HB3	1:D:143:VAL:HG22	1.95	0.47
1:A:12:SER:HB3	1:A:162:VAL:HG23	1.96	0.46
1:A:41:THR:HG23	1:A:121:ARG:NE	2.30	0.46
1:B:137:GLU:HG2	1:B:141:LYS:HE3	1.96	0.46
1:C:75:MSE:HE3	1:C:188:VAL:CG1	2.32	0.46
1:D:209:PRO:HB2	1:D:211:ASN:HD21	1.81	0.46
1:B:112:GLU:CD	1:B:112:GLU:H	2.23	0.46
1:A:42:ASN:HB2	2:B:703:FMN:O4'	2.15	0.46
1:D:10:ARG:HH22	2:D:707:FMN:P	2.39	0.46
1:D:74:LYS:HG3	4:D:794:HOH:O	2.15	0.46
1:D:165:GLU:HG3	2:D:707:FMN:H6	1.98	0.45
1:C:217:VAL:CG2	1:D:49:ILE:HD11	2.46	0.45
1:A:46:TRP:HB3	1:A:143:VAL:HG22	1.97	0.45
1:A:73:ARG:N	4:A:831:HOH:O	2.49	0.45
1:B:180:GLU:H	1:B:180:GLU:CD	2.24	0.45
1:C:217:VAL:HG22	1:D:49:ILE:HD11	1.98	0.45
1:A:137:GLU:O	1:A:141:LYS:HG3	2.17	0.45
1:B:61:ALA:HB2	1:B:76:LEU:HD13	1.98	0.45
1:D:153:GLY:O	1:D:157:LEU:HD22	2.16	0.45
1:B:87:LYS:NZ	1:B:89:ALA:O	2.50	0.45
1:B:147:VAL:O	1:B:151:LEU:HG	2.16	0.45
1:B:185:SER:C	1:B:186:LEU:HD12	2.42	0.45
1:C:137:GLU:HG3	1:D:137:GLU:HG3	1.97	0.45
1:D:211:ASN:ND2	1:D:211:ASN:C	2.74	0.45
1:A:41:THR:O	1:A:41:THR:CG2	2.63	0.45
1:D:165:GLU:CG	2:D:707:FMN:H6	2.47	0.45
1:B:12:SER:HB3	1:B:162:VAL:HG23	1.98	0.44
1:C:180:GLU:HG2	4:C:751:HOH:O	2.16	0.44
1:A:165:GLU:HG3	2:A:701:FMN:H6	1.98	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:35:GLN:HG2	1:B:36:TYR:CD1	2.52	0.44
1:B:168:ASP:CG	1:B:171:ILE:HG12	2.43	0.44
1:D:87:LYS:HA	1:D:182:GLY:O	2.18	0.44
1:B:74:LYS:HG3	4:B:768:HOH:O	2.18	0.44
1:A:73:ARG:HG3	1:A:73:ARG:HH11	1.83	0.44
1:D:24:PRO:HD2	4:D:777:HOH:O	2.18	0.44
1:B:87:LYS:HE3	1:B:94:TRP:CG	2.53	0.44
1:D:73:ARG:HD3	1:D:77:ASP:OD2	2.18	0.44
1:B:90:MSE:HE1	1:B:94:TRP:CD1	2.52	0.43
1:C:43:SER:O	1:C:44:GLN:C	2.60	0.43
1:A:212:ILE:HD13	1:B:97:LEU:HD21	2.00	0.43
1:B:87:LYS:HE3	1:B:94:TRP:CD2	2.53	0.43
1:A:193:HIS:HE1	4:A:723:HOH:O	2.02	0.43
4:A:857:HOH:O	1:B:55:GLU:HG3	2.18	0.43
1:A:45:PRO:HB2	1:A:139:MSE:HB3	2.01	0.43
1:A:214:LEU:HD23	1:A:214:LEU:C	2.44	0.43
1:B:164:ILE:HB	1:B:188:VAL:HB	2.01	0.43
1:C:137:GLU:HG3	1:D:137:GLU:OE1	2.17	0.43
1:A:157:LEU:HB3	1:A:159:LEU:HD22	1.99	0.43
1:B:52:SER:HB3	1:B:80:HIS:CD2	2.53	0.43
1:A:34:LEU:HD13	1:A:150:PHE:CE2	2.54	0.43
1:A:161:ALA:HA	1:A:190:PRO:O	2.19	0.43
1:B:87:LYS:NZ	1:B:90:MSE:HE2	2.34	0.43
1:D:179:LYS:HD2	1:D:183:TYR:O	2.19	0.43
1:D:214:LEU:HD23	1:D:214:LEU:C	2.44	0.42
1:B:101:GLN:HG2	4:B:710:HOH:O	2.19	0.42
1:B:179:LYS:C	1:B:181:LYS:H	2.27	0.42
1:C:55:GLU:OE2	1:C:59:ARG:HD2	2.20	0.42
1:C:107:ARG:HB3	1:C:107:ARG:NH1	2.35	0.42
1:C:107:ARG:HD2	1:D:206:SER:HB2	2.01	0.42
1:C:137:GLU:HG3	1:D:137:GLU:CG	2.49	0.42
1:A:41:THR:HG21	1:A:121:ARG:HG3	2.01	0.42
1:B:205:LYS:NZ	2:B:703:FMN:O3P	2.52	0.42
1:B:90:MSE:HG2	1:B:139:MSE:SE	2.69	0.42
1:C:168:ASP:CG	1:C:171:ILE:HG12	2.45	0.42
1:C:178:LEU:HB3	1:C:183:TYR:O	2.19	0.42
1:D:34:LEU:HD13	1:D:150:PHE:CD2	2.54	0.42
1:B:22:LEU:HD13	1:B:79:SER:HB3	2.02	0.41
1:C:97:LEU:HD13	1:C:97:LEU:O	2.19	0.41
1:B:111:PRO:HG2	1:B:112:GLU:OE2	2.20	0.41
1:A:3:ILE:HG13	1:B:156:ALA:CB	2.49	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:162:VAL:O	1:A:162:VAL:HG13	2.20	0.41
1:A:138:TRP:O	1:A:142:GLN:HG2	2.20	0.41
1:B:10:ARG:HG2	1:B:11:HIS:N	2.36	0.41
1:A:39:SER:HB3	1:A:46:TRP:CH2	2.56	0.41
1:D:154:VAL:HA	1:D:157:LEU:HD23	2.03	0.41
1:D:173:ASP:HA	1:D:178:LEU:HD22	2.02	0.41
1:A:125:ALA:O	1:A:129:ARG:HD2	2.20	0.41
1:A:137:GLU:HG2	1:A:141:LYS:HE3	2.03	0.41
1:C:163:PRO:HA	1:C:189:VAL:HG22	2.03	0.41
1:D:23:THR:OG1	1:D:26:GLN:HG3	2.21	0.41
1:D:43:SER:O	1:D:44:GLN:C	2.64	0.41
1:B:162:VAL:O	1:B:162:VAL:HG13	2.21	0.40
1:A:126:ASP:OD1	1:A:129:ARG:NH1	2.54	0.40
1:B:165:GLU:HB2	2:B:703:FMN:H6	2.02	0.40
1:A:95:LEU:HD22	1:A:95:LEU:N	2.36	0.40

There are no symmetry-related clashes.

5.3 Torsion angles

5.3.1 Protein backbone

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	214/217 (99%)	212 (99%)	2 (1%)	0	100	100
1	B	214/217 (99%)	209 (98%)	5 (2%)	0	100	100
1	C	214/217 (99%)	210 (98%)	3 (1%)	1 (0%)	24	37
1	D	214/217 (99%)	208 (97%)	5 (2%)	1 (0%)	24	37
All	All	856/868 (99%)	839 (98%)	15 (2%)	2 (0%)	43	58

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	C	66	GLY
1	D	66	GLY

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	178/174 (102%)	165 (93%)	13 (7%)	13	22
1	B	178/174 (102%)	165 (93%)	13 (7%)	13	22
1	C	178/174 (102%)	165 (93%)	13 (7%)	13	22
1	D	178/174 (102%)	162 (91%)	16 (9%)	9	15
All	All	712/696 (102%)	657 (92%)	55 (8%)	12	20

All (55) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	3	ILE
1	A	33	LEU
1	A	34	LEU
1	A	41	THR
1	A	76	LEU
1	A	101	GLN
1	A	129	ARG
1	A	152	LEU
1	A	157	LEU
1	A	159	LEU
1	A	187	VAL
1	A	208	LEU
1	A	212	ILE
1	B	33	LEU
1	B	34	LEU
1	B	55	GLU
1	B	73	ARG
1	B	76	LEU
1	B	90	MSE
1	B	95	LEU

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Mol	Chain	Res	Type
1	B	101	GLN
1	B	112	GLU
1	B	146	ASN
1	B	157	LEU
1	B	178	LEU
1	B	180	GLU
1	C	3	ILE
1	C	33	LEU
1	C	34	LEU
1	C	49	ILE
1	C	76	LEU
1	C	97	LEU
1	C	132	LEU
1	C	147	VAL
1	C	157	LEU
1	C	178	LEU
1	C	186	LEU
1	C	202	THR
1	C	208	LEU
1	D	33	LEU
1	D	34	LEU
1	D	45	PRO
1	D	49	ILE
1	D	55	GLU
1	D	67	ASN
1	D	70	PHE
1	D	82	VAL
1	D	95	LEU
1	D	132	LEU
1	D	157	LEU
1	D	178	LEU
1	D	180	GLU
1	D	191	VAL
1	D	208	LEU
1	D	211	ASN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (14) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	67	ASN
1	A	101	GLN
1	A	193	HIS

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Mol	Chain	Res	Type
1	B	29	GLN
1	B	101	GLN
1	B	146	ASN
1	B	149	ASN
1	C	29	GLN
1	C	35	GLN
1	D	29	GLN
1	D	101	GLN
1	D	149	ASN
1	D	210	GLN
1	D	211	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 oligosaccharides in this entry.

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	$\# Z > 2$
3	NIO	C	708	-	9,9,9	3.30	4 (44%)	11,11,11	1.57	2 (18%)
2	FMN	B	703	-	33,33,33	2.66	16 (48%)	48,50,50	5.73	31 (64%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
2	FMN	D	707	-	33,33,33	2.61	13 (39%)	48,50,50	8.14	30 (62%)
3	NIO	D	706	-	9,9,9	3.29	4 (44%)	11,11,11	1.57	2 (18%)
3	NIO	A	704	-	9,9,9	3.27	4 (44%)	11,11,11	1.52	2 (18%)
2	FMN	C	705	-	33,33,33	2.72	16 (48%)	48,50,50	6.21	34 (70%)
2	FMN	A	701	-	33,33,33	2.59	15 (45%)	48,50,50	4.39	25 (52%)
3	NIO	B	702	-	9,9,9	3.33	4 (44%)	11,11,11	1.51	2 (18%)

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	NIO	C	708	-	-	0/4/4/4	0/1/1/1
2	FMN	B	703	-	3/3/4/4	7/18/18/18	0/3/3/3
2	FMN	D	707	-	2/2/4/4	8/18/18/18	0/3/3/3
3	NIO	D	706	-	-	0/4/4/4	0/1/1/1
3	NIO	A	704	-	-	0/4/4/4	0/1/1/1
2	FMN	C	705	-	3/3/4/4	6/18/18/18	0/3/3/3
2	FMN	A	701	-	-	6/18/18/18	0/3/3/3
3	NIO	B	702	-	-	0/4/4/4	0/1/1/1

All (76) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	C	705	FMN	C9A-C5A	7.86	1.53	1.41
2	B	703	FMN	C9A-C5A	7.79	1.53	1.41
2	D	707	FMN	C9A-C5A	7.44	1.53	1.41
2	A	701	FMN	C9A-C5A	7.33	1.52	1.41
3	C	708	NIO	C3-C2	6.50	1.49	1.39
3	B	702	NIO	C3-C2	6.41	1.49	1.39
3	A	704	NIO	C3-C2	6.40	1.49	1.39
3	D	706	NIO	C3-C2	6.40	1.49	1.39
2	C	705	FMN	C6-C5A	5.21	1.47	1.40
2	D	707	FMN	C6-C5A	5.00	1.47	1.40
3	D	706	NIO	C1-N	4.87	1.44	1.34
2	B	703	FMN	C6-C5A	4.86	1.47	1.40
3	B	702	NIO	C1-N	4.84	1.44	1.34
3	C	708	NIO	C1-N	4.72	1.44	1.34
2	A	701	FMN	C6-C5A	4.71	1.47	1.40

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	C	705	FMN	C9-C9A	4.69	1.47	1.39
2	B	703	FMN	C9-C9A	4.59	1.47	1.39
3	A	704	NIO	C1-N	4.57	1.44	1.34
2	D	707	FMN	C9-C9A	4.43	1.46	1.39
2	A	701	FMN	C10-N10	4.43	1.46	1.37
2	D	707	FMN	C10-N10	4.35	1.46	1.37
2	A	701	FMN	C9-C9A	4.26	1.46	1.39
2	C	705	FMN	C10-N10	4.23	1.46	1.37
3	D	706	NIO	C4-C5	4.07	1.49	1.37
3	B	702	NIO	C4-C5	4.05	1.49	1.37
3	A	704	NIO	C4-C5	4.04	1.49	1.37
3	C	708	NIO	C4-C5	3.99	1.49	1.37
2	B	703	FMN	C10-N10	3.91	1.45	1.37
2	C	705	FMN	C2'-C3'	3.90	1.60	1.53
2	B	703	FMN	C2-N3	3.89	1.47	1.39
2	D	707	FMN	C2'-C3'	3.67	1.59	1.53
2	A	701	FMN	C2'-C3'	3.66	1.59	1.53
2	C	705	FMN	O2-C2	-3.65	1.17	1.24
2	B	703	FMN	C2'-C3'	3.61	1.59	1.53
2	A	701	FMN	O4'-C4'	3.57	1.50	1.43
2	A	701	FMN	C2-N3	3.46	1.46	1.39
2	D	707	FMN	C2-N3	3.44	1.46	1.39
2	D	707	FMN	O2-C2	-3.33	1.17	1.24
2	D	707	FMN	C1'-N10	3.28	1.55	1.47
3	C	708	NIO	O2-C6	3.27	1.40	1.30
2	D	707	FMN	O4'-C4'	3.26	1.50	1.43
2	B	703	FMN	O4'-C4'	3.22	1.50	1.43
2	C	705	FMN	C2-N3	3.20	1.46	1.39
2	B	703	FMN	O2-C2	-3.20	1.18	1.24
2	A	701	FMN	O2-C2	-3.20	1.18	1.24
2	C	705	FMN	O4'-C4'	3.18	1.50	1.43
2	A	701	FMN	C1'-N10	3.16	1.55	1.47
2	D	707	FMN	C8-C7	3.15	1.48	1.40
2	C	705	FMN	C8-C7	3.10	1.48	1.40
2	C	705	FMN	C1'-N10	3.10	1.55	1.47
2	B	703	FMN	C1'-N10	3.06	1.55	1.47
3	A	704	NIO	O2-C6	2.96	1.39	1.30
3	B	702	NIO	O2-C6	2.89	1.39	1.30
3	D	706	NIO	O2-C6	2.83	1.38	1.30
2	C	705	FMN	C6-C7	2.82	1.43	1.39
2	B	703	FMN	C8-C7	2.76	1.47	1.40
2	C	705	FMN	O2'-C2'	2.72	1.49	1.43

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	D	707	FMN	O3'-C3'	2.72	1.49	1.43
2	B	703	FMN	C6-C7	2.72	1.43	1.39
2	A	701	FMN	C5'-C4'	2.63	1.55	1.51
2	B	703	FMN	O2'-C2'	2.59	1.48	1.43
2	A	701	FMN	O3'-C3'	2.58	1.49	1.43
2	A	701	FMN	C8-C7	2.54	1.47	1.40
2	D	707	FMN	C6-C7	2.54	1.43	1.39
2	B	703	FMN	O3'-C3'	2.31	1.48	1.43
2	A	701	FMN	O2'-C2'	2.28	1.48	1.43
2	B	703	FMN	C5'-C4'	2.28	1.54	1.51
2	C	705	FMN	O3'-C3'	2.28	1.48	1.43
2	C	705	FMN	C4A-C10	2.25	1.50	1.44
2	B	703	FMN	C2-N1	2.23	1.41	1.36
2	A	701	FMN	C4A-C10	2.18	1.50	1.44
2	C	705	FMN	C2-N1	2.11	1.41	1.36
2	B	703	FMN	C4A-C10	2.10	1.50	1.44
2	A	701	FMN	C6-C7	2.09	1.42	1.39
2	C	705	FMN	C9-C8	2.07	1.42	1.39
2	D	707	FMN	C4A-C10	2.00	1.50	1.44

All (128) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	D	707	FMN	C4'-C3'-C2'	32.78	168.13	113.57
2	D	707	FMN	C5'-C4'-C3'	21.05	151.94	112.22
2	D	707	FMN	C5A-N5-C4A	17.99	147.19	118.09
2	D	707	FMN	C9A-C5A-N5	-17.21	104.19	122.45
2	C	705	FMN	O3'-C3'-C4'	16.79	147.09	108.93
2	B	703	FMN	C5A-N5-C4A	16.77	145.22	118.09
2	B	703	FMN	C9A-C5A-N5	-15.48	106.03	122.45
2	C	705	FMN	C5A-N5-C4A	14.87	142.14	118.09
2	D	707	FMN	C4-C4A-N5	13.46	136.80	118.21
2	C	705	FMN	C9A-C5A-N5	-13.41	108.22	122.45
2	A	701	FMN	C5A-N5-C4A	12.86	138.89	118.09
2	D	707	FMN	C6-C5A-N5	11.88	138.16	118.44
2	C	705	FMN	O4'-C4'-C3'	11.49	136.13	109.25
2	D	707	FMN	O2'-C2'-C3'	-11.38	82.62	109.25
2	A	701	FMN	C9A-C5A-N5	-10.86	110.93	122.45
2	C	705	FMN	C1'-C2'-C3'	10.82	138.98	109.66
2	B	703	FMN	O5'-C5'-C4'	-10.37	81.67	109.36
2	B	703	FMN	C4-C4A-N5	10.11	132.18	118.21
2	A	701	FMN	C9-C9A-N10	9.69	134.88	121.85

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	703	FMN	O5'-P-O1P	9.68	132.59	106.44
2	A	701	FMN	C9A-N10-C10	9.66	135.48	120.75
2	A	701	FMN	C5A-C9A-N10	-9.25	109.61	117.97
2	C	705	FMN	C9A-N10-C10	9.05	134.54	120.75
2	B	703	FMN	C9A-N10-C10	8.74	134.07	120.75
2	B	703	FMN	C1'-C2'-C3'	8.68	133.20	109.66
2	D	707	FMN	C1'-C2'-C3'	8.59	132.96	109.66
2	C	705	FMN	C4-C4A-N5	8.33	129.72	118.21
2	D	707	FMN	C10-C4A-N5	-8.26	107.95	124.81
2	D	707	FMN	O2'-C2'-C1'	8.22	144.00	110.20
2	C	705	FMN	C5'-C4'-C3'	-8.20	96.75	112.22
2	B	703	FMN	C4'-C3'-C2'	-8.15	100.01	113.57
2	D	707	FMN	O4'-C4'-C3'	-8.12	90.24	109.25
2	B	703	FMN	C6-C5A-N5	8.07	131.83	118.44
2	C	705	FMN	C9-C9A-N10	7.91	132.50	121.85
2	A	701	FMN	C4-C4A-N5	7.86	129.06	118.21
2	B	703	FMN	C9-C9A-N10	7.85	132.41	121.85
2	C	705	FMN	C2'-C1'-N10	7.80	147.06	110.20
2	C	705	FMN	C4'-C3'-C2'	-7.54	101.02	113.57
2	C	705	FMN	C6-C5A-N5	7.32	130.59	118.44
2	C	705	FMN	O2'-C2'-C3'	7.13	125.94	109.25
2	B	703	FMN	C10-C4A-N5	-7.10	110.31	124.81
2	C	705	FMN	O4'-C4'-C5'	7.03	125.50	109.99
2	C	705	FMN	O3'-C3'-C2'	-6.90	93.26	108.93
2	B	703	FMN	C5A-C9A-N10	-6.88	111.75	117.97
2	D	707	FMN	O3'-C3'-C4'	-6.75	93.60	108.93
2	C	705	FMN	C5A-C9A-N10	-6.67	111.94	117.97
2	A	701	FMN	C6-C5A-N5	6.56	129.33	118.44
2	B	703	FMN	O3'-C3'-C2'	-6.46	94.25	108.93
2	A	701	FMN	C4A-C10-N10	-6.46	107.24	116.48
2	D	707	FMN	C9A-N10-C10	6.22	130.24	120.75
2	C	705	FMN	C10-C4A-N5	-5.91	112.74	124.81
2	D	707	FMN	O4'-C4'-C5'	-5.83	97.13	109.99
2	B	703	FMN	C5'-C4'-C3'	-5.82	101.24	112.22
2	C	705	FMN	C4A-C10-N10	-5.35	108.83	116.48
2	B	703	FMN	O3'-C3'-C4'	5.09	120.50	108.93
2	A	701	FMN	O2'-C2'-C1'	5.03	130.88	110.20
2	C	705	FMN	O2'-C2'-C1'	-4.93	89.95	110.20
2	B	703	FMN	C4A-C10-N10	-4.91	109.46	116.48
2	C	705	FMN	O3P-P-O1P	4.89	129.88	110.83
2	A	701	FMN	C10-C4A-N5	-4.85	114.90	124.81
2	B	703	FMN	O4'-C4'-C3'	4.78	120.43	109.25

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	D	707	FMN	O3'-C3'-C2'	-4.71	98.23	108.93
2	B	703	FMN	O2P-P-O5'	-4.64	94.56	106.67
2	A	701	FMN	C4'-C3'-C2'	4.63	121.27	113.57
2	D	707	FMN	O5'-C5'-C4'	-4.51	97.33	109.36
2	C	705	FMN	O5'-C5'-C4'	-4.50	97.35	109.36
2	A	701	FMN	N10-C10-N1	4.41	131.48	118.51
2	C	705	FMN	N10-C10-N1	4.28	131.11	118.51
2	D	707	FMN	C10-N1-C2	4.20	125.93	116.85
2	A	701	FMN	C5'-C4'-C3'	4.16	120.06	112.22
2	B	703	FMN	N10-C10-N1	4.13	130.67	118.51
2	B	703	FMN	O4-C4-C4A	-4.07	115.78	126.53
2	B	703	FMN	C10-N1-C2	4.06	125.64	116.85
2	D	707	FMN	O4-C4-C4A	-4.06	115.82	126.53
2	D	707	FMN	O2P-P-O5'	3.94	116.94	106.67
2	A	701	FMN	O4-C4-C4A	-3.93	116.16	126.53
2	C	705	FMN	O4-C4-C4A	-3.85	116.36	126.53
2	C	705	FMN	C10-N1-C2	3.77	125.01	116.85
2	C	705	FMN	O5'-P-O1P	-3.72	96.39	106.44
2	D	707	FMN	C9-C9A-N10	3.47	126.52	121.85
2	D	707	FMN	C5A-C9A-N10	-3.43	114.87	117.97
2	A	701	FMN	C10-N1-C2	3.42	124.26	116.85
2	C	705	FMN	C9-C9A-C5A	-3.41	114.01	120.03
3	C	708	NIO	C5-N-C1	3.39	122.79	116.85
3	D	706	NIO	C5-N-C1	3.33	122.68	116.85
3	A	704	NIO	C5-N-C1	3.33	122.68	116.85
3	B	702	NIO	C5-N-C1	3.26	122.57	116.85
2	B	703	FMN	C2'-C1'-N10	3.25	125.56	110.20
2	B	703	FMN	O3P-P-O2P	-3.17	95.91	107.80
2	D	707	FMN	O3P-P-O5'	-3.15	98.46	106.67
2	C	705	FMN	C9A-C9-C8	3.03	125.31	119.22
2	B	703	FMN	O4-C4-N3	2.96	125.68	120.11
2	A	701	FMN	O4-C4-N3	2.88	125.52	120.11
2	D	707	FMN	O5'-P-O1P	2.86	114.18	106.44
2	C	705	FMN	O2P-P-O1P	-2.84	99.77	110.83
2	B	703	FMN	O4'-C4'-C5'	-2.83	103.75	109.99
2	D	707	FMN	O4-C4-N3	2.77	125.31	120.11
2	C	705	FMN	O4-C4-N3	2.75	125.29	120.11
2	B	703	FMN	C9-C9A-C5A	-2.72	115.22	120.03
2	B	703	FMN	C9A-C9-C8	2.68	124.62	119.22
2	D	707	FMN	C4A-C10-N10	-2.67	112.66	116.48
2	D	707	FMN	N10-C10-N1	2.63	126.25	118.51
2	A	701	FMN	O2P-P-O5'	2.62	113.49	106.67

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	D	707	FMN	C8M-C8-C9	-2.61	114.97	119.57
3	D	706	NIO	C2-C1-N	-2.60	119.63	123.50
2	A	701	FMN	C9A-C9-C8	2.60	124.45	119.22
3	C	708	NIO	C2-C1-N	-2.58	119.66	123.50
2	A	701	FMN	C9-C9A-C5A	-2.57	115.49	120.03
2	A	701	FMN	C8M-C8-C9	-2.51	115.15	119.57
2	A	701	FMN	O4'-C4'-C3'	2.47	115.03	109.25
3	B	702	NIO	C2-C1-N	-2.47	119.83	123.50
2	C	705	FMN	C8M-C8-C9	-2.46	115.24	119.57
3	A	704	NIO	C2-C1-N	-2.46	119.84	123.50
2	B	703	FMN	C8M-C8-C9	-2.43	115.28	119.57
2	D	707	FMN	N3-C2-N1	-2.43	114.33	119.50
2	C	705	FMN	C8M-C8-C7	2.40	125.66	120.76
2	A	701	FMN	C8M-C8-C7	2.40	125.66	120.76
2	B	703	FMN	C8M-C8-C7	2.35	125.55	120.76
2	D	707	FMN	C8M-C8-C7	2.31	125.49	120.76
2	C	705	FMN	O2P-P-O5'	2.28	112.63	106.67
2	A	701	FMN	N3-C2-N1	-2.26	114.69	119.50
2	B	703	FMN	N3-C2-N1	-2.24	114.73	119.50
2	C	705	FMN	N3-C2-N1	-2.22	114.78	119.50
2	D	707	FMN	C4A-C4-N3	2.20	118.87	113.25
2	A	701	FMN	O3'-C3'-C2'	-2.11	104.14	108.93
2	A	701	FMN	O3P-P-O1P	2.10	119.03	110.83
2	B	703	FMN	C4A-C4-N3	2.08	118.54	113.25
2	C	705	FMN	C4A-C4-N3	2.00	118.35	113.25

All (8) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
2	B	703	FMN	C3'
2	B	703	FMN	C4'
2	B	703	FMN	C2'
2	C	705	FMN	C3'
2	C	705	FMN	C2'
2	C	705	FMN	C4'
2	D	707	FMN	C2'
2	D	707	FMN	C3'

All (27) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	701	FMN	N10-C1'-C2'-C3'

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Mol	Chain	Res	Type	Atoms
2	A	701	FMN	O2'-C2'-C3'-O3'
2	A	701	FMN	O2'-C2'-C3'-C4'
2	B	703	FMN	C2'-C1'-N10-C10
2	B	703	FMN	N10-C1'-C2'-C3'
2	B	703	FMN	C1'-C2'-C3'-O3'
2	B	703	FMN	C1'-C2'-C3'-C4'
2	B	703	FMN	C3'-C4'-C5'-O5'
2	B	703	FMN	O4'-C4'-C5'-O5'
2	C	705	FMN	C2'-C1'-N10-C9A
2	C	705	FMN	C2'-C1'-N10-C10
2	C	705	FMN	C1'-C2'-C3'-O3'
2	C	705	FMN	C3'-C4'-C5'-O5'
2	D	707	FMN	N10-C1'-C2'-C3'
2	D	707	FMN	C1'-C2'-C3'-O3'
2	D	707	FMN	C2'-C3'-C4'-O4'
2	D	707	FMN	C2'-C3'-C4'-C5'
2	D	707	FMN	C3'-C4'-C5'-O5'
2	D	707	FMN	O2'-C2'-C3'-C4'
2	C	705	FMN	O3'-C3'-C4'-O4'
2	D	707	FMN	O4'-C4'-C5'-O5'
2	C	705	FMN	C2'-C3'-C4'-O4'
2	D	707	FMN	C4'-C5'-O5'-P
2	A	701	FMN	C2'-C3'-C4'-O4'
2	A	701	FMN	C4'-C5'-O5'-P
2	B	703	FMN	C4'-C5'-O5'-P
2	A	701	FMN	O3'-C3'-C4'-O4'

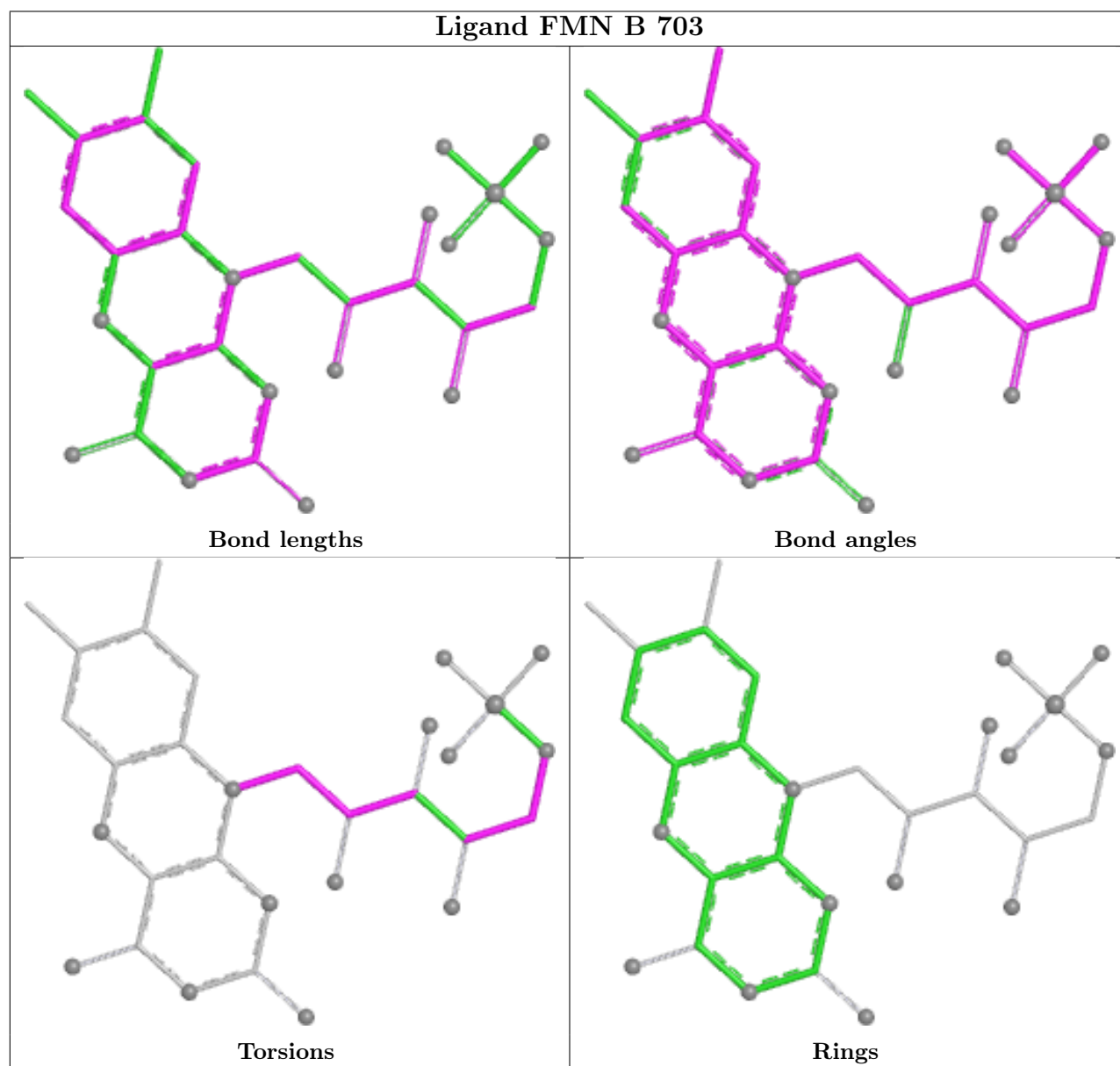
There are no ring outliers.

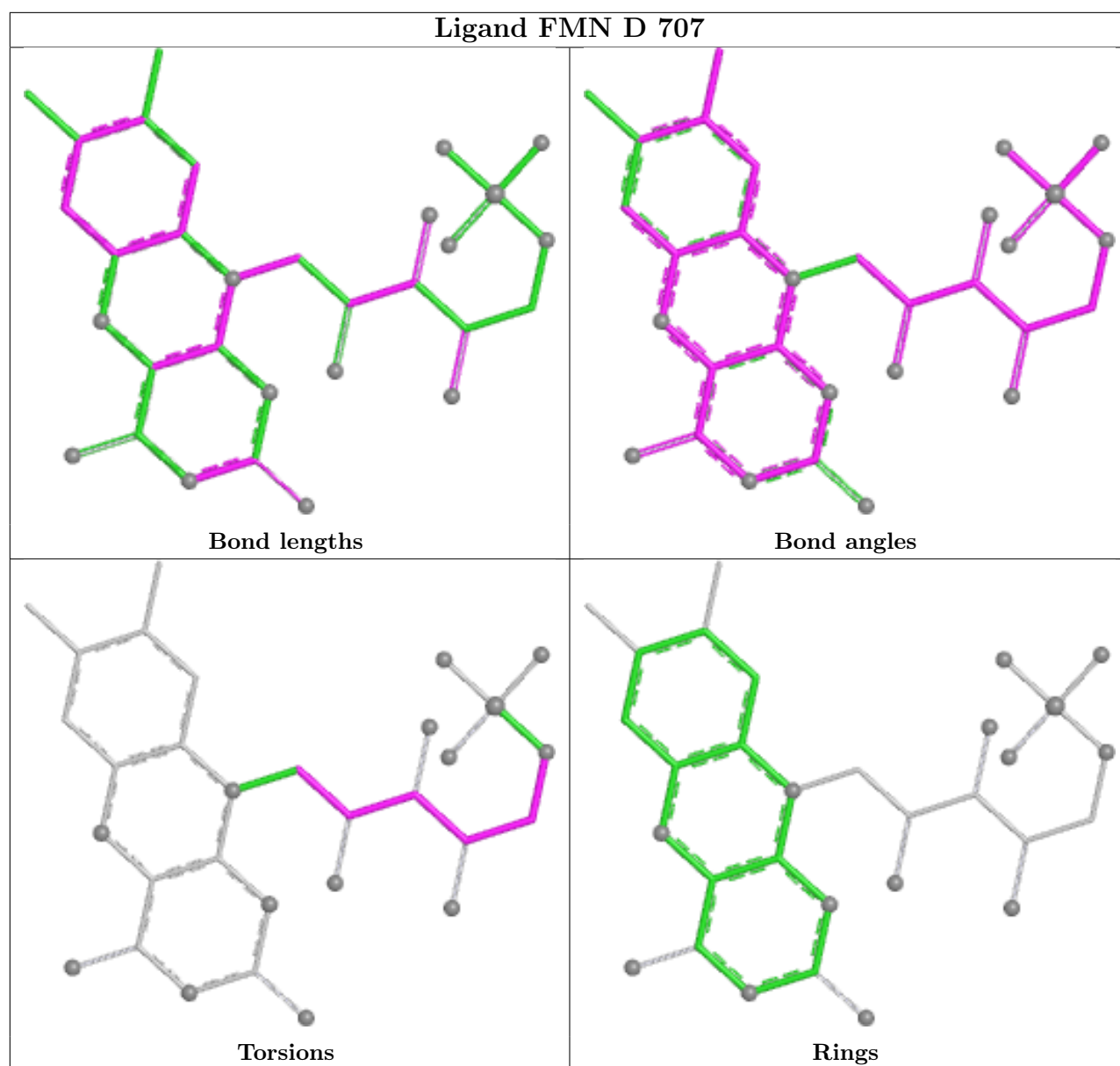
4 monomers are involved in 11 short contacts:

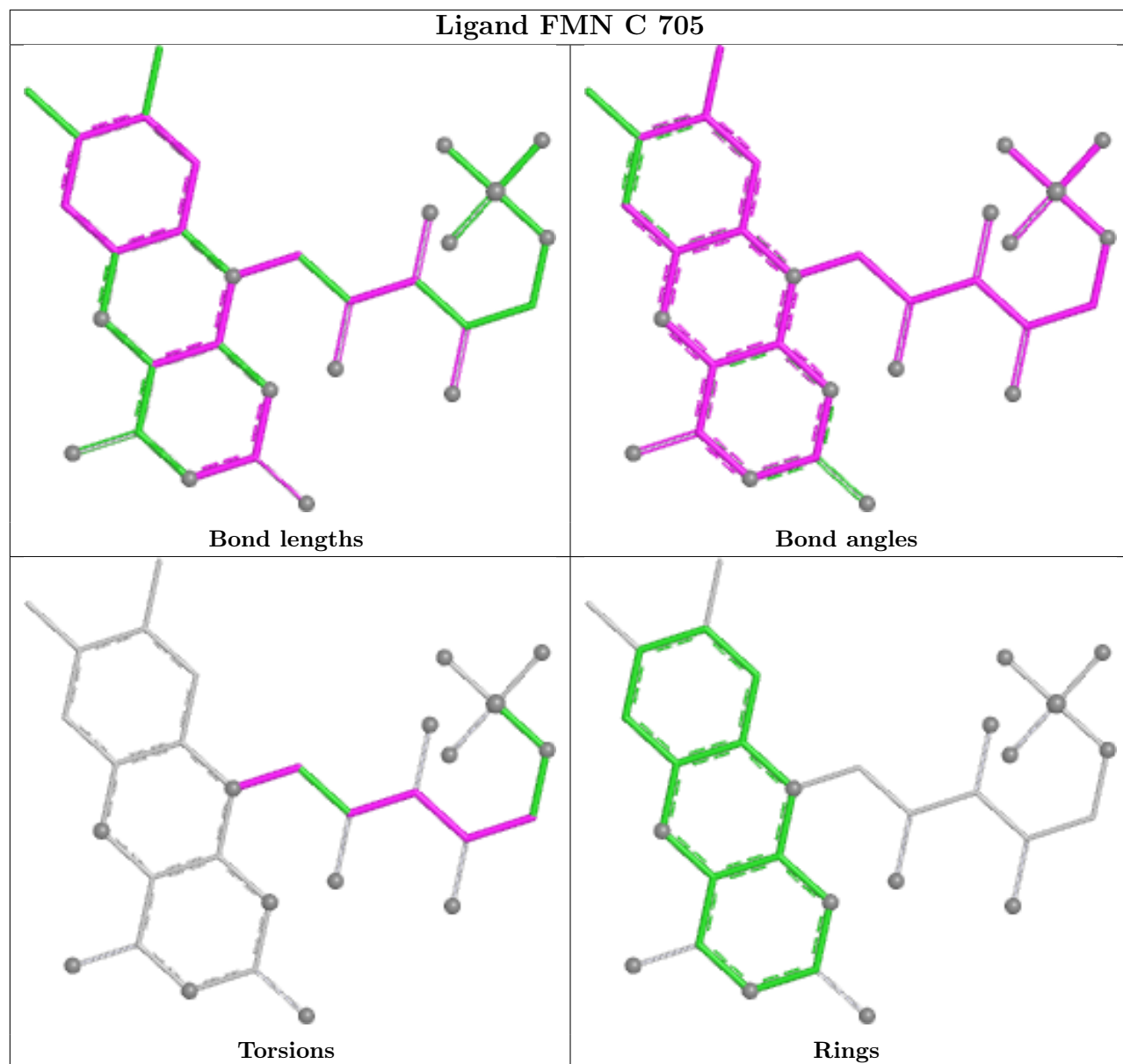
Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	B	703	FMN	3	0
2	D	707	FMN	4	0
2	C	705	FMN	3	0
2	A	701	FMN	1	0

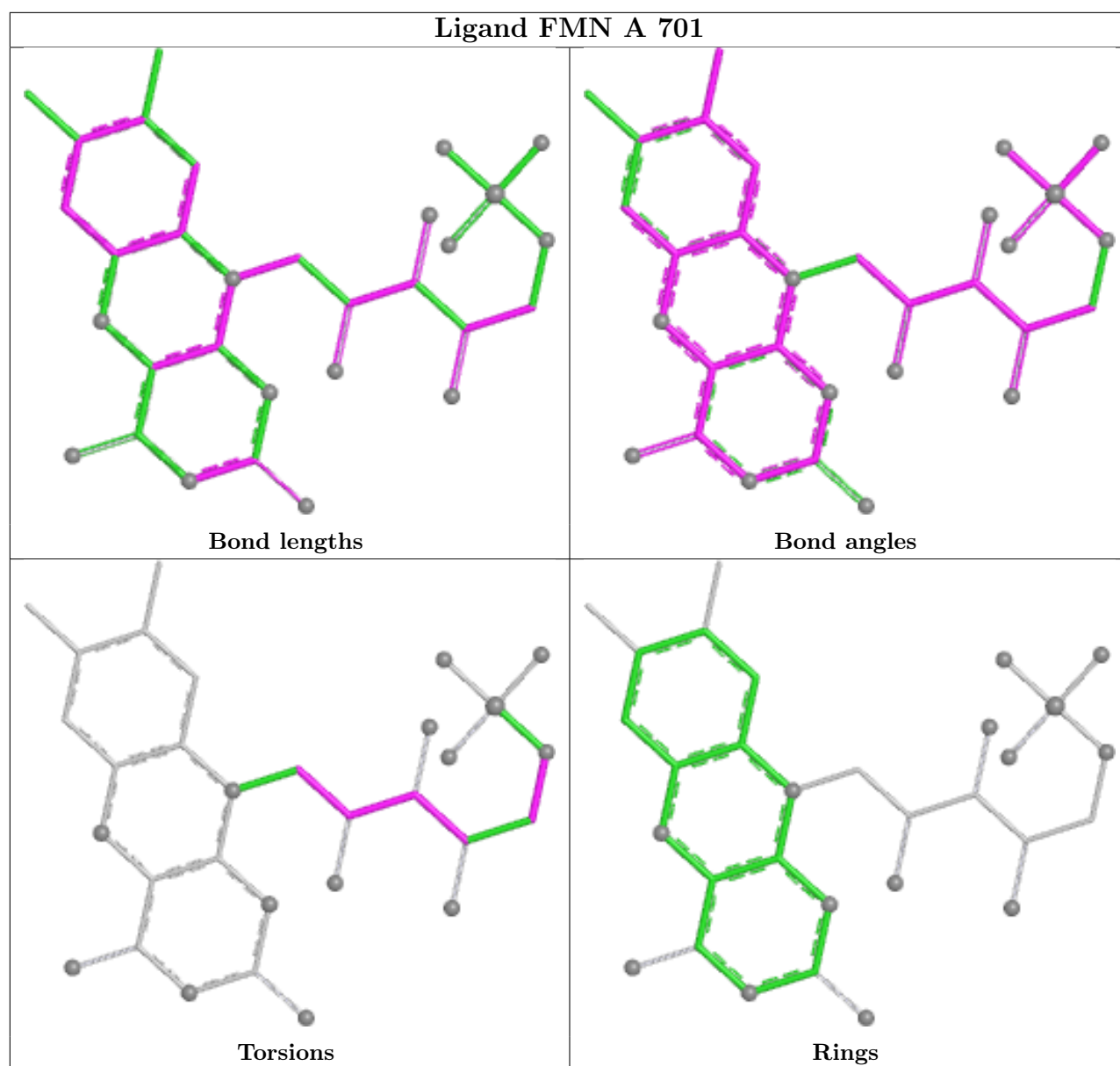
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. 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

EDS was not executed - this section is therefore empty.

6.2 Non-standard residues in protein, DNA, RNA chains

EDS was not executed - this section is therefore empty.

6.3 Carbohydrates

EDS was not executed - this section is therefore empty.

6.4 Ligands

EDS was not executed - this section is therefore empty.

6.5 Other polymers

EDS was not executed - this section is therefore empty.