



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 8, 2026 – 03:39 PM UTC

PDB ID : 5URG / pdb_00005urg
Title : rat CYPOR D632F mutant
Authors : Xia, C.; Kim, J.J.
Deposited on : 2017-02-10
Resolution : 2.30 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) : 2.0
EDS : 3.0
Buster-report : wwPDB partial adaption of 1.1.7 (2018)
Percentile statistics : 20250101.v01 (using entries in the PDB archive January 1st 2025)
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) : 2.49

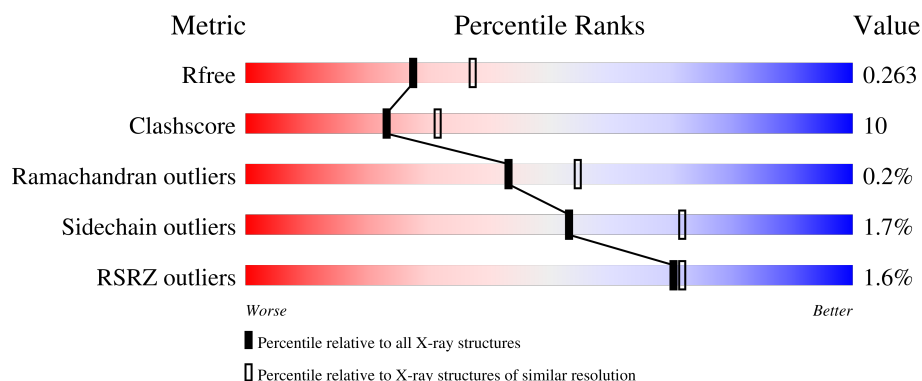
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION



The reported resolution of this entry is 2.30 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}	180053	6319 (2.30-2.30)
Clashscore	190562	6919 (2.30-2.30)
Ramachandran outliers	187476	6854 (2.30-2.30)
Sidechain outliers	187428	6854 (2.30-2.30)
RSRZ outliers	180081	6325 (2.30-2.30)

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 $\leq 5\%$. 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	622	 76% 20% ..
1	B	622	 71% 24% ..

2 Entry composition [i](#)

There are 6 unique types of molecules in this entry. The entry contains 10426 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.

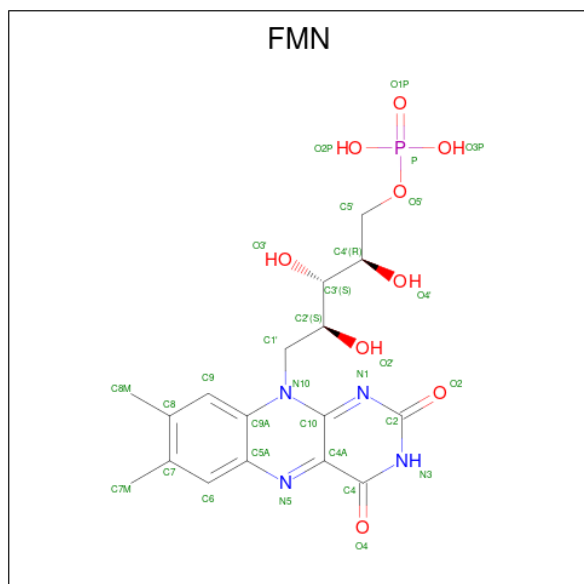
- Molecule 1 is a protein called NADPH–cytochrome P450 reductase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	610	Total	C	N	O	S	0	0	0
			4891	3102	842	924	23			
1	B	604	Total	C	N	O	S	0	0	0
			4845	3073	835	914	23			

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	632	PHE	ASP	engineered mutation	UNP P00388
B	632	PHE	ASP	engineered mutation	UNP P00388

- Molecule 2 is FLAVIN MONONUCLEOTIDE (CCD ID: FMN) (formula: C₁₇H₂₁N₄O₉P).



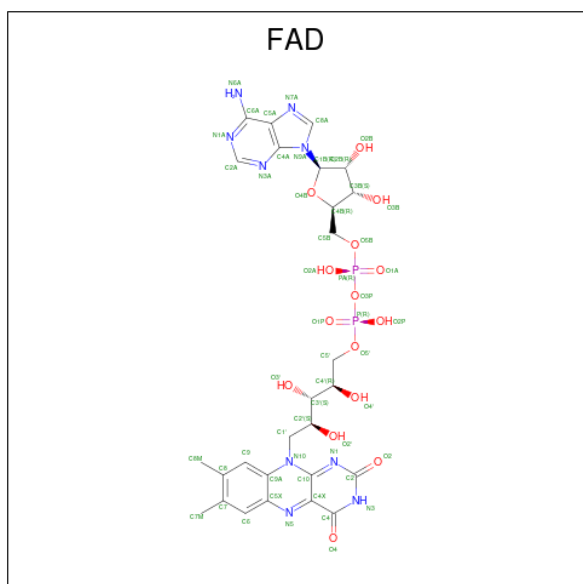
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	A	1	Total	C	N	O	P	0	0
			31	17	4	9	1		

Continued on next page...

Continued from previous page...

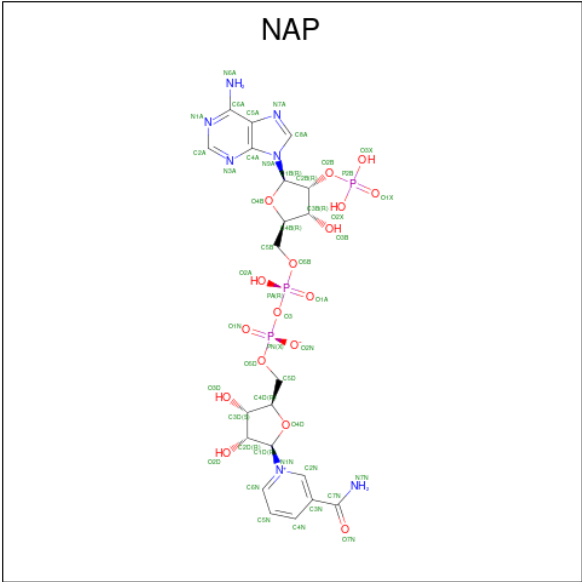
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	B	1	Total	C	N	O	P	0	0
			31	17	4	9	1		

- Molecule 3 is FLAVIN-ADENINE DINUCLEOTIDE (CCD ID: FAD) (formula: $C_{27}H_{33}N_9O_{15}P_2$).



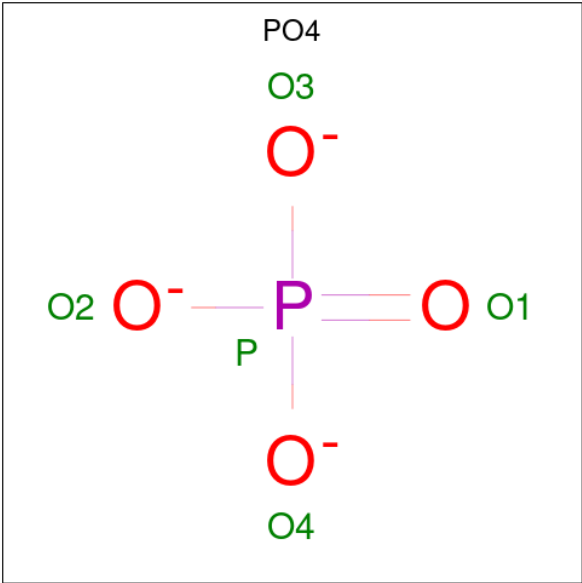
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
3	A	1	Total 53	C 27	N 9	O 15	P 2	0	0
3	B	1	Total 53	C 27	N 9	O 15	P 2	0	0

- Molecule 4 is NADP NICOTINAMIDE-ADENINE-DINUCLEOTIDE PHOSPHATE (CCD ID: NAP) (formula: $\text{C}_{21}\text{H}_{28}\text{N}_7\text{O}_{17}\text{P}_3$).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
4	A	1	Total 45	C 20	N 6	O 16	P 3	0	0
4	B	1	Total 41	C 16	N 6	O 16	P 3	0	0

- Molecule 5 is PHOSPHATE ION (CCD ID: PO4) (formula: O₄P).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
5	A	1	Total	O	P	0	0
			5	4	1		
5	B	1	Total	O	P	0	0
			5	4	1		

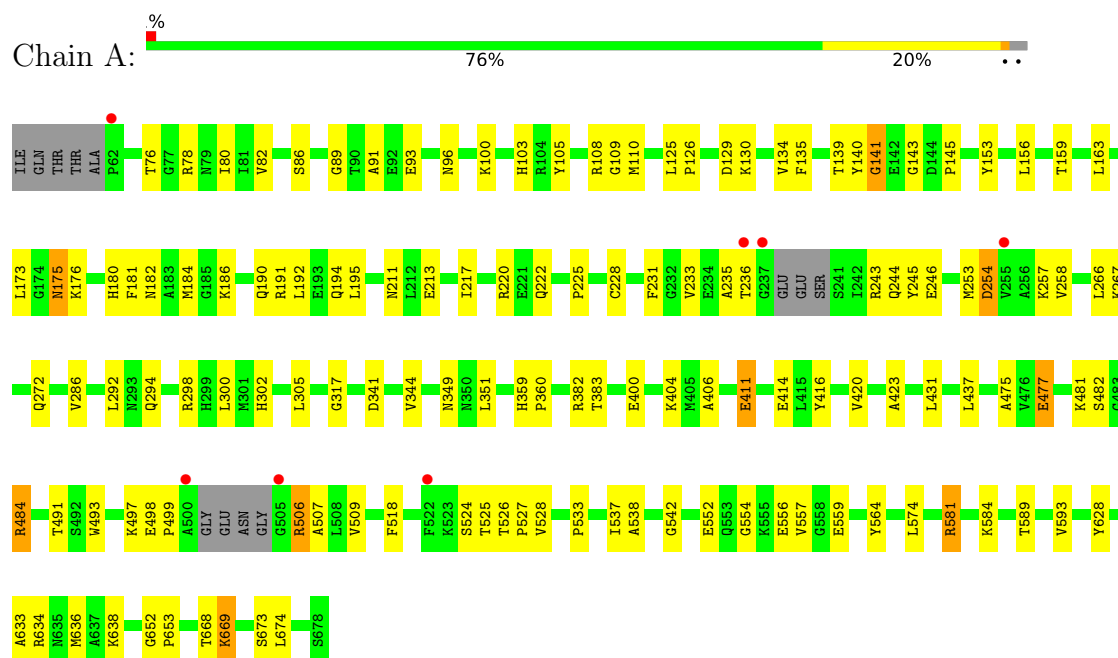
- Molecule 6 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	A	222	Total 222	O 222	0	0
6	B	204	Total 204	O 204	0	0

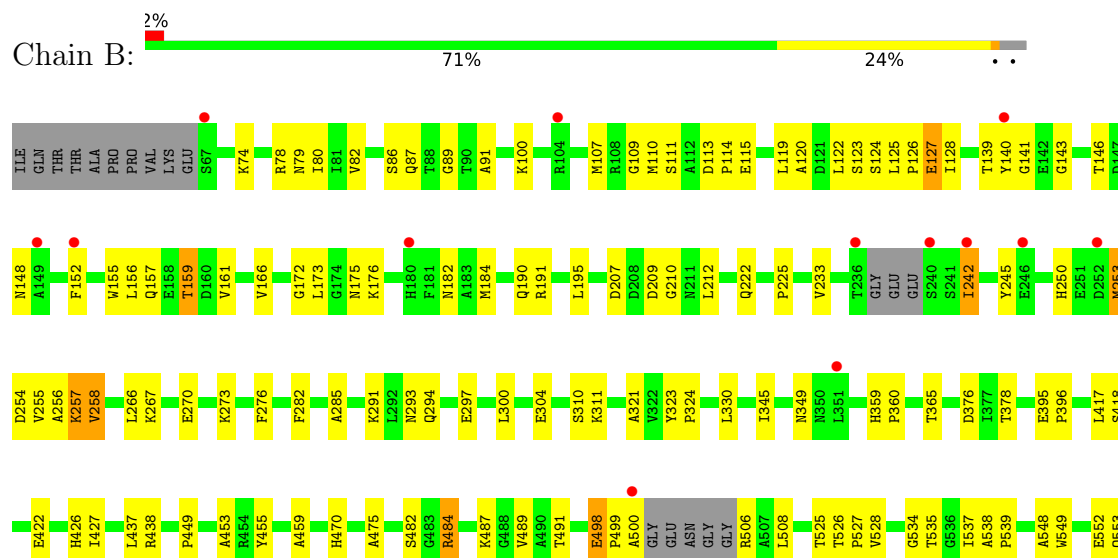
3 Residue-property plots [i](#)

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: NADPH-cytochrome P450 reductase



• Molecule 1: NADPH-cytochrome P450 reductase



E586	T560	Y564	G565	R567	L574	E577	H583	T589	Q590	S596	R597	D612	H615	L616	L619	G624	A625	H626	R634	N635	M636	N642	Y645	V648	M654	E655	H656	V660	K664	R671	V676	H677	S678
------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------

4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α , β , γ	101.35Å 117.39Å 118.99Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	38.58 – 2.30 38.58 – 2.30	Depositor EDS
% Data completeness (in resolution range)	88.4 (38.58-2.30) 88.5 (38.58-2.30)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	3.54 (at 2.29Å)	Xtriage
Refinement program	CNS 1.3	Depositor
R, R_{free}	0.212 , 0.264 0.212 , 0.263	Depositor DCC
R_{free} test set	2850 reflections (5.06%)	wwPDB-VP
Wilson B-factor (Å ²)	42.8	Xtriage
Anisotropy	0.079	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.29 , 20.3	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.32$	Xtriage
Estimated twinning fraction	0.013 for -h,l,k	Xtriage
F_o, F_c correlation	0.95	EDS
Total number of atoms	10426	wwPDB-VP
Average B, all atoms (Å ²)	47.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 15.63% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

²Theoretical 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

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: FAD, NAP, FMN, PO4

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	0.43	0/5009	0.93	14/6776 (0.2%)
1	B	0.40	0/4961	0.90	14/6712 (0.2%)
All	All	0.41	0/9970	0.91	28/13488 (0.2%)

There are no bond length outliers.

All (28) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	253	MET	N-CA-CB	-8.61	96.16	109.34
1	A	159	THR	N-CA-C	7.73	121.40	110.50
1	A	175	ASN	N-CA-C	-7.70	95.82	108.07
1	B	89	GLY	N-CA-C	7.20	123.65	115.08
1	B	427	ILE	N-CA-C	6.97	117.73	110.62
1	A	176	LYS	N-CA-C	-6.86	104.80	113.72
1	A	236	THR	N-CA-CB	-6.75	100.28	111.49
1	A	175	ASN	CB-CA-C	6.43	121.08	110.03
1	A	89	GLY	N-CA-C	6.18	123.56	115.40
1	A	633	ALA	N-CA-C	6.16	119.14	109.96
1	B	489	VAL	N-CA-C	6.13	116.25	110.30
1	A	477	GLU	N-CA-C	-5.82	98.40	110.80
1	B	482	SER	N-CA-C	-5.72	106.26	113.18
1	B	146	THR	N-CA-C	-5.68	101.23	110.20
1	A	254	ASP	N-CA-C	-5.61	101.61	109.96
1	B	258	VAL	N-CA-C	5.58	116.61	108.58
1	B	636	MET	N-CA-C	-5.49	105.19	111.07
1	A	235	ALA	CB-CA-C	-5.45	98.51	109.68
1	B	210	GLY	N-CA-C	-5.39	100.40	113.18
1	A	498	GLU	CA-C-N	5.23	126.38	119.84
1	A	498	GLU	C-N-CA	5.23	126.38	119.84
1	B	596	SER	N-CA-C	5.23	117.72	111.71

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	417	LEU	N-CA-C	5.22	116.97	111.28
1	B	297	GLU	N-CA-C	-5.18	104.90	111.11
1	A	538	ALA	N-CA-C	5.17	121.23	109.81
1	A	498	GLU	CB-CA-C	5.08	116.50	108.88
1	B	498	GLU	CA-C-N	5.07	125.10	119.32
1	B	498	GLU	C-N-CA	5.07	125.10	119.32

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	4891	0	4741	90	0
1	B	4845	0	4690	105	0
2	A	31	0	19	0	0
2	B	31	0	19	0	0
3	A	53	0	31	1	0
3	B	53	0	31	0	0
4	A	45	0	23	4	0
4	B	41	0	19	5	0
5	A	5	0	0	0	0
5	B	5	0	0	0	0
6	A	222	0	0	8	0
6	B	204	0	0	4	0
All	All	10426	0	9573	202	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 10.

All (202) 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:86:SER:HB2	1:B:91:ALA:HB3	1.31	1.11
1:A:175:ASN:O	1:A:181:PHE:CD1	2.14	1.01

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:78:ARG:HG3	1:B:110:MET:HE3	1.47	0.95
1:A:175:ASN:O	1:A:181:PHE:HD1	1.47	0.93
1:A:253:MET:HE2	1:A:257:LYS:HE3	1.57	0.85
1:B:437:LEU:O	1:B:438:ARG:HD3	1.79	0.82
1:B:107:MET:HE2	1:B:233:VAL:HG21	1.62	0.81
1:A:253:MET:HE3	1:A:253:MET:HA	1.62	0.81
1:B:527:PRO:HB2	1:B:625:ALA:HB2	1.63	0.79
1:A:300:LEU:HD22	1:A:574:LEU:HD21	1.65	0.78
1:B:87:GLN:HB3	1:B:140:TYR:OH	1.88	0.74
1:A:86:SER:HB2	1:A:91:ALA:HB3	1.70	0.72
1:B:310:SER:O	1:B:311:LYS:HB2	1.90	0.71
1:B:253:MET:HE2	1:B:257:LYS:HB2	1.70	0.71
1:B:124:SER:O	1:B:127:GLU:HB2	1.93	0.68
1:A:213:GLU:HB2	1:A:382:ARG:NH2	2.09	0.68
1:A:559:GLU:HG2	1:A:589:THR:HG21	1.74	0.68
1:B:349:ASN:OD1	1:B:359:HIS:CE1	2.49	0.66
1:B:250:HIS:HB3	1:B:253:MET:HB2	1.76	0.66
1:B:139:THR:CG2	1:B:143:GLY:HA2	2.25	0.66
1:A:78:ARG:HD3	1:A:110:MET:HB3	1.76	0.65
1:B:635:ASN:HB3	6:B:978:HOH:O	1.96	0.65
4:B:703:NAP:O2A	4:B:703:NAP:H52N	1.97	0.64
1:B:172:GLY:C	1:B:182:ASN:HD21	2.05	0.64
1:B:349:ASN:OD1	1:B:359:HIS:HE1	1.80	0.64
1:B:115:GLU:HB2	1:B:148:ASN:O	1.97	0.63
1:A:78:ARG:HG3	1:A:78:ARG:HH11	1.62	0.63
1:A:317:GLY:HA3	1:A:518:PHE:O	1.99	0.63
1:B:123:SER:O	1:B:126:PRO:HD2	1.99	0.62
1:A:266:LEU:HG	1:A:267:LYS:HG2	1.79	0.62
1:B:300:LEU:HD22	1:B:574:LEU:HD21	1.82	0.61
1:B:525:THR:HG22	1:B:556:GLU:HG2	1.83	0.61
1:B:242:ILE:HD12	1:B:242:ILE:N	2.15	0.61
1:B:125:LEU:HB3	1:B:126:PRO:HD3	1.82	0.61
1:A:298:ARG:HD3	6:A:847:HOH:O	2.01	0.60
1:B:253:MET:HE3	1:B:253:MET:HA	1.83	0.59
1:A:382:ARG:HG3	6:A:894:HOH:O	2.03	0.58
1:A:76:THR:HB	1:A:78:ARG:NH1	2.19	0.57
1:B:191:ARG:O	1:B:195:LEU:HD13	2.04	0.57
1:B:100:LYS:HE2	6:B:968:HOH:O	2.05	0.56
1:B:156:LEU:HB3	1:B:191:ARG:HG2	1.87	0.56
1:A:581:ARG:HH21	1:A:584:LYS:NZ	2.04	0.55
1:A:634:ARG:HG2	1:A:638:LYS:HE2	1.89	0.55

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:253:MET:HG2	1:B:345:ILE:HG21	1.87	0.55
1:B:549:TRP:O	1:B:553:GLN:HG2	2.07	0.55
1:B:254:ASP:HB2	1:B:257:LYS:CG	2.36	0.55
1:A:272:GLN:HA	6:A:907:HOH:O	2.06	0.55
4:A:703:NAP:H4N	6:A:1018:HOH:O	2.05	0.55
1:B:159:THR:OG1	1:B:161:VAL:HG23	2.07	0.55
1:A:668:THR:C	1:A:669:LYS:HD2	2.32	0.54
1:A:411:GLU:HA	1:A:414:GLU:OE1	2.07	0.54
1:A:525:THR:HG22	1:A:556:GLU:HG2	1.89	0.54
1:B:624:GLY:HA2	1:B:671:ARG:NH2	2.23	0.54
1:B:656:HIS:O	1:B:660:VAL:HG23	2.08	0.53
1:B:82:VAL:O	1:B:111:SER:HA	2.08	0.53
1:A:190:GLN:O	1:A:194:GLN:HG3	2.08	0.53
1:B:74:LYS:HG3	1:B:128:ILE:HD11	1.90	0.53
1:B:267:LYS:HD2	1:B:270:GLU:OE1	2.09	0.53
4:A:703:NAP:O2A	4:A:703:NAP:H52N	2.09	0.53
1:B:79:ASN:ND2	1:B:107:MET:SD	2.76	0.53
1:B:615:HIS:CE1	1:B:619:LEU:HD21	2.43	0.53
1:B:139:THR:HG23	1:B:143:GLY:HA2	1.92	0.52
1:B:157:GLN:C	1:B:159:THR:H	2.17	0.52
1:A:243:ARG:O	1:A:351:LEU:HD12	2.10	0.52
1:B:78:ARG:HG3	1:B:110:MET:CE	2.29	0.52
1:B:304:GLU:HG2	1:B:470:HIS:CD2	2.44	0.52
4:A:703:NAP:H6N	4:A:703:NAP:O5D	2.10	0.52
1:A:477:GLU:O	6:A:801:HOH:O	2.19	0.51
1:A:254:ASP:HB2	1:A:257:LYS:HG3	1.92	0.51
1:B:294:GLN:H	1:B:294:GLN:CD	2.19	0.51
1:B:537:ILE:HG13	1:B:537:ILE:O	2.11	0.51
1:A:108:ARG:HG3	1:A:108:ARG:HH11	1.73	0.51
1:A:139:THR:CG2	1:A:143:GLY:HA2	2.40	0.51
1:B:475:ALA:HA	1:B:491:THR:HB	1.92	0.51
1:A:581:ARG:HH21	1:A:584:LYS:HZ3	1.56	0.51
1:A:245:TYR:CE2	1:A:360:PRO:HD3	2.45	0.51
1:B:87:GLN:HB3	1:B:140:TYR:CZ	2.46	0.51
1:B:484:ARG:HD2	1:B:484:ARG:N	2.26	0.51
1:A:400:GLU:OE2	1:A:404:LYS:HE3	2.09	0.51
1:A:93:GLU:OE1	1:A:93:GLU:HA	2.11	0.50
1:A:78:ARG:HG3	1:A:78:ARG:NH1	2.25	0.50
1:B:612:ASP:O	1:B:616:LEU:HG	2.11	0.50
1:A:294:GLN:H	1:A:294:GLN:CD	2.20	0.50
1:B:528:VAL:CG2	1:B:560:THR:HG23	2.42	0.50

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:246:GLU:HB3	1:A:351:LEU:HD21	1.93	0.50
1:A:506:ARG:HB3	6:A:901:HOH:O	2.12	0.49
1:A:416:TYR:O	1:A:420:VAL:HB	2.12	0.49
1:A:475:ALA:HA	1:A:491:THR:HB	1.94	0.49
1:A:497:LYS:HD2	1:A:507:ALA:HB1	1.94	0.49
1:A:217:ILE:HD11	1:A:383:THR:HG21	1.93	0.49
1:A:542:GLY:HA3	6:A:855:HOH:O	2.11	0.49
1:B:626:HIS:HB3	6:B:945:HOH:O	2.13	0.49
1:A:220:ARG:HG2	1:A:220:ARG:HH11	1.78	0.48
1:B:567:ARG:NE	4:B:703:NAP:O1A	2.46	0.48
1:B:642:ASN:HA	1:B:645:TYR:CD2	2.47	0.48
1:A:349:ASN:OD1	1:A:359:HIS:HE1	1.96	0.48
1:A:406:ALA:HB1	6:A:945:HOH:O	2.13	0.48
1:A:673:SER:C	1:A:674:LEU:HD12	2.39	0.48
1:A:145:PRO:HG2	1:A:153:TYR:CG	2.48	0.48
1:B:152:PHE:CZ	1:B:156:LEU:HD11	2.49	0.48
1:B:378:THR:O	1:B:426:HIS:HB3	2.14	0.48
1:B:418:SER:HA	1:B:422:GLU:HB3	1.94	0.48
1:A:493:TRP:CH2	1:A:509:VAL:HG13	2.49	0.48
1:B:321:ALA:HB2	1:B:455:TYR:CE1	2.49	0.48
1:B:506:ARG:HB2	1:B:506:ARG:NH1	2.29	0.47
1:A:244:GLN:HB3	1:A:245:TYR:CD1	2.49	0.47
1:B:266:LEU:O	1:B:267:LYS:HB2	2.14	0.47
4:B:703:NAP:H52N	4:B:703:NAP:PA	2.54	0.47
1:A:669:LYS:HD2	1:A:669:LYS:N	2.30	0.47
1:B:176:LYS:HG3	1:B:207:ASP:CG	2.39	0.47
1:A:537:ILE:O	1:A:537:ILE:HG13	2.14	0.47
1:B:459:ALA:HA	1:B:538:ALA:O	2.15	0.47
1:B:222:GLN:C	1:B:225:PRO:HD2	2.40	0.47
1:B:561:LEU:HD22	1:B:590:GLN:HB2	1.95	0.47
1:A:228:CYS:HB3	1:A:233:VAL:O	2.15	0.47
1:B:74:LYS:NZ	1:B:127:GLU:HG2	2.30	0.47
1:A:213:GLU:HB2	1:A:382:ARG:HH21	1.79	0.47
1:A:253:MET:HG2	1:A:258:VAL:HG22	1.96	0.47
1:A:156:LEU:HB3	1:A:191:ARG:HG2	1.97	0.47
1:A:220:ARG:HG2	1:A:220:ARG:NH1	2.29	0.46
1:A:222:GLN:C	1:A:225:PRO:HD2	2.40	0.46
1:B:125:LEU:HD23	1:B:166:VAL:HG13	1.98	0.46
1:B:534:GLY:HA3	4:B:703:NAP:O2N	2.15	0.46
1:B:567:ARG:HB3	1:B:597:ARG:HD2	1.98	0.46
1:A:82:VAL:HG13	1:A:134:VAL:HB	1.97	0.46

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:173:LEU:N	1:A:173:LEU:HD12	2.31	0.46
1:A:564:TYR:O	1:A:593:VAL:HA	2.16	0.46
1:B:506:ARG:HB2	1:B:506:ARG:HH11	1.81	0.46
1:A:674:LEU:HD12	1:A:674:LEU:N	2.30	0.46
1:B:376:ASP:HB3	1:B:449:PRO:HG2	1.99	0.45
1:B:498:GLU:HA	1:B:499:PRO:HD3	1.85	0.45
1:B:615:HIS:NE2	1:B:619:LEU:HD21	2.31	0.45
1:B:120:ALA:HA	1:B:155:TRP:CZ2	2.51	0.45
1:A:431:LEU:HD23	1:A:437:LEU:HD23	1.99	0.45
1:B:119:LEU:O	1:B:122:LEU:HG	2.16	0.45
1:A:581:ARG:NH2	1:A:584:LYS:NZ	2.64	0.45
1:B:173:LEU:HD12	1:B:173:LEU:N	2.32	0.45
1:A:140:TYR:O	1:A:141:GLY:C	2.60	0.45
1:B:527:PRO:HB2	1:B:625:ALA:CB	2.38	0.45
1:A:96:ASN:O	1:A:100:LYS:HG3	2.16	0.44
1:A:652:GLY:N	1:A:653:PRO:HA	2.30	0.44
1:B:245:TYR:CD2	1:B:360:PRO:HD3	2.51	0.44
1:B:254:ASP:HB2	1:B:257:LYS:HG2	1.98	0.44
1:B:175:ASN:OD1	1:B:209:ASP:HB2	2.17	0.44
1:A:552:GLU:C	1:A:554:GLY:H	2.26	0.44
1:B:172:GLY:C	1:B:182:ASN:ND2	2.75	0.44
1:A:125:LEU:N	1:A:126:PRO:CD	2.80	0.43
1:A:245:TYR:CD2	1:A:360:PRO:HD3	2.53	0.43
1:B:577:GLU:H	1:B:577:GLU:CD	2.26	0.43
1:B:615:HIS:O	1:B:619:LEU:HD22	2.18	0.43
1:B:645:TYR:CE1	1:B:660:VAL:HA	2.54	0.43
1:A:528:VAL:HG13	1:A:628:TYR:CE1	2.54	0.43
1:B:648:VAL:HG12	1:B:654:MET:HE3	1.99	0.43
1:A:482:SER:OG	1:A:484:ARG:HD3	2.18	0.43
1:B:660:VAL:O	1:B:664:LYS:HB2	2.18	0.43
1:A:526:THR:HA	1:A:527:PRO:HD3	1.83	0.42
1:B:80:ILE:O	1:B:109:GLY:HA2	2.19	0.42
1:B:564:TYR:CG	1:B:565:GLY:N	2.87	0.42
1:A:292:LEU:HD11	1:A:302:HIS:HB2	2.02	0.42
1:A:294:GLN:CD	1:A:294:GLN:N	2.77	0.42
4:A:703:NAP:H52N	4:A:703:NAP:PA	2.59	0.42
1:B:323:TYR:CE1	1:B:453:ALA:HB2	2.54	0.42
1:B:676:VAL:HG22	6:B:935:HOH:O	2.19	0.42
1:A:145:PRO:HB3	1:A:184:MET:HE2	2.00	0.42
1:B:155:TRP:C	1:B:157:GLN:H	2.27	0.42
1:A:130:LYS:HA	1:A:231:PHE:CE1	2.55	0.42

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:113:ASP:HA	1:B:114:PRO:HD2	1.90	0.42
1:B:254:ASP:HB2	1:B:257:LYS:HG3	2.01	0.42
1:A:484:ARG:N	1:A:484:ARG:HD2	2.35	0.42
1:A:253:MET:HA	1:A:253:MET:CE	2.42	0.42
1:A:524:SER:O	1:A:557:VAL:HA	2.20	0.42
1:A:182:ASN:O	1:A:186:LYS:HG3	2.20	0.41
1:B:285:ALA:HA	1:B:508:LEU:HD23	2.02	0.41
1:B:548:ALA:O	1:B:552:GLU:HG3	2.19	0.41
1:A:129:ASP:O	1:A:130:LYS:HB2	2.19	0.41
1:A:341:ASP:HB3	1:A:344:VAL:HG23	2.03	0.41
1:B:255:VAL:HG23	1:B:256:ALA:N	2.35	0.41
1:B:273:LYS:HE2	1:B:273:LYS:HB3	1.91	0.41
1:B:395:GLU:OE2	1:B:396:PRO:HD2	2.21	0.41
1:B:577:GLU:CD	1:B:577:GLU:N	2.78	0.41
1:B:583:HIS:HE1	1:B:589:THR:O	2.04	0.41
1:B:535:THR:HG23	4:B:703:NAP:O1N	2.20	0.41
1:B:258:VAL:HG13	1:B:365:THR:HA	2.03	0.41
1:B:191:ARG:CZ	1:B:195:LEU:HD11	2.51	0.41
1:A:135:PHE:CE2	1:A:192:LEU:HD11	2.56	0.41
1:A:286:VAL:HG22	1:A:305:LEU:CD2	2.50	0.41
1:B:291:LYS:HE3	1:B:293:ASN:O	2.21	0.41
1:B:300:LEU:CD2	1:B:535:THR:HG22	2.51	0.41
1:B:499:PRO:O	1:B:500:ALA:HB3	2.21	0.41
1:A:103:HIS:C	1:A:105:TYR:H	2.28	0.40
1:A:423:ALA:HA	1:A:481:LYS:HB2	2.02	0.40
1:B:538:ALA:HB3	1:B:539:PRO:CD	2.51	0.40
1:A:163:LEU:HD12	1:A:195:LEU:HB2	2.03	0.40
1:A:211:ASN:OD1	1:A:213:GLU:HB3	2.21	0.40
1:A:506:ARG:HD3	1:A:506:ARG:H	1.86	0.40
1:A:581:ARG:NH2	1:A:584:LYS:HZ1	2.19	0.40
3:A:702:FAD:HM71	3:A:702:FAD:HM83	1.78	0.40
1:B:276:PHE:CG	1:B:282:PHE:HB2	2.55	0.40
1:B:487:LYS:HE2	1:B:487:LYS:HB3	1.88	0.40
1:A:80:ILE:O	1:A:109:GLY:HA2	2.22	0.40
1:A:533:PRO:HG3	1:A:636:MET:HG3	2.02	0.40
1:B:526:THR:HA	1:B:527:PRO:HD3	1.86	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	604/622 (97%)	571 (94%)	32 (5%)	1 (0%)	43	55
1	B	598/622 (96%)	567 (95%)	30 (5%)	1 (0%)	43	55
All	All	1202/1244 (97%)	1138 (95%)	62 (5%)	2 (0%)	43	55

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	141	GLY
1	A	141	GLY

5.3.2 Protein sidechains

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	521/531 (98%)	514 (99%)	7 (1%)	61	77
1	B	515/531 (97%)	504 (98%)	11 (2%)	47	66
All	All	1036/1062 (98%)	1018 (98%)	18 (2%)	53	72

All (18) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	180	HIS
1	A	411	GLU
1	A	484	ARG
1	A	499	PRO

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	A	506	ARG
1	A	581	ARG
1	A	669	LYS
1	B	127	GLU
1	B	159	THR
1	B	184	MET
1	B	190	GLN
1	B	212	LEU
1	B	242	ILE
1	B	257	LYS
1	B	324	PRO
1	B	330	LEU
1	B	484	ARG
1	B	634	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (20) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	150	GLN
1	A	157	GLN
1	A	271	ASN
1	A	349	ASN
1	A	359	HIS
1	A	399	GLN
1	A	486	ASN
1	A	590	GLN
1	A	592	ASN
1	A	626	HIS
1	A	656	HIS
1	B	87	GLN
1	B	157	GLN
1	B	182	ASN
1	B	359	HIS
1	B	384	ASN
1	B	399	GLN
1	B	590	GLN
1	B	592	ASN
1	B	621	HIS

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains ⓘ

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

5.5 Carbohydrates ⓘ

There are no oligosaccharides in this entry.

5.6 Ligand geometry ⓘ

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	$\# Z > 2$
2	FMN	B	701	-	33,33,33	2.69	14 (42%)	48,50,50	1.60	13 (27%)
4	NAP	B	703	-	44,44,52	1.51	9 (20%)	65,68,80	1.89	14 (21%)
4	NAP	A	703	-	47,49,52	1.50	10 (21%)	67,75,80	1.70	13 (19%)
5	PO4	A	704	-	4,4,4	1.70	0	6,6,6	0.47	0
2	FMN	A	701	-	33,33,33	2.63	13 (39%)	48,50,50	1.64	12 (25%)
5	PO4	B	704	-	4,4,4	1.66	0	6,6,6	0.47	0
3	FAD	B	702	-	58,58,58	2.31	12 (20%)	85,89,89	1.98	18 (21%)
3	FAD	A	702	-	58,58,58	2.30	13 (22%)	85,89,89	2.00	17 (20%)

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	B	701	-	-	0/18/18/18	0/3/3/3

Continued on next page...

Continued from previous page...

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
4	NAP	B	703	-	-	7/27/61/67	0/4/4/5
4	NAP	A	703	-	-	9/31/63/67	0/5/5/5
2	FMN	A	701	-	-	0/18/18/18	0/3/3/3
3	FAD	B	702	-	-	1/34/50/50	0/6/6/6
3	FAD	A	702	-	-	0/34/50/50	0/6/6/6

All (71) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	B	702	FAD	C8A-N7A	8.57	1.48	1.31
3	A	702	FAD	C8A-N7A	8.53	1.48	1.31
2	A	701	FMN	C8M-C8	-6.88	1.38	1.51
2	B	701	FMN	C8M-C8	-6.76	1.38	1.51
3	B	702	FAD	C8M-C8	-6.19	1.39	1.51
3	A	702	FAD	C8A-N9A	6.17	1.48	1.37
3	B	702	FAD	C8A-N9A	6.17	1.48	1.37
3	B	702	FAD	C7M-C7	-6.14	1.39	1.51
3	A	702	FAD	C7M-C7	-6.13	1.39	1.51
3	A	702	FAD	C8M-C8	-6.12	1.39	1.51
2	A	701	FMN	C4A-N5	5.25	1.42	1.30
2	A	701	FMN	C9-C9A	5.19	1.48	1.39
2	B	701	FMN	C4A-N5	5.19	1.41	1.30
2	B	701	FMN	C10-N10	5.18	1.48	1.37
2	B	701	FMN	C9-C9A	5.14	1.48	1.39
2	A	701	FMN	C10-N10	5.13	1.48	1.37
2	B	701	FMN	C9A-N10	4.74	1.49	1.41
2	B	701	FMN	C9A-C5A	4.17	1.47	1.41
2	A	701	FMN	C9A-N10	4.11	1.48	1.41
2	A	701	FMN	C9A-C5A	4.00	1.47	1.41
2	B	701	FMN	C8-C7	3.95	1.50	1.40
3	B	702	FAD	C9A-N10	-3.84	1.34	1.41
3	A	702	FAD	C9A-N10	-3.78	1.34	1.41
2	A	701	FMN	C8-C7	3.76	1.50	1.40
4	A	703	NAP	C2A-N1A	3.68	1.40	1.33
4	A	703	NAP	C2A-N3A	3.66	1.40	1.33
4	B	703	NAP	C2A-N3A	3.62	1.40	1.33
3	B	702	FAD	C2A-N3A	3.61	1.40	1.33
3	A	702	FAD	C2A-N3A	3.61	1.40	1.33
3	A	702	FAD	C2A-N1A	3.60	1.40	1.33
4	B	703	NAP	C2A-N1A	3.59	1.40	1.33
3	B	702	FAD	C2A-N1A	3.58	1.40	1.33
3	A	702	FAD	C10-N1	3.57	1.40	1.33

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	B	702	FAD	C10-N1	3.49	1.40	1.33
2	B	701	FMN	C10-N1	3.39	1.40	1.33
2	A	701	FMN	C10-N1	3.17	1.39	1.33
4	B	703	NAP	C5A-N7A	-3.07	1.33	1.39
4	B	703	NAP	C5A-C4A	-3.06	1.33	1.39
4	A	703	NAP	C5A-C4A	-3.06	1.33	1.39
3	B	702	FAD	C5A-N7A	-3.05	1.33	1.39
4	A	703	NAP	C5A-N7A	-3.05	1.33	1.39
2	A	701	FMN	C6-C5A	3.04	1.44	1.40
2	B	701	FMN	C6-C5A	2.99	1.44	1.40
3	A	702	FAD	C5A-N7A	-2.98	1.33	1.39
3	A	702	FAD	C5A-C4A	-2.88	1.33	1.39
3	B	702	FAD	C5A-C4A	-2.86	1.34	1.39
2	B	701	FMN	C4'-C3'	2.69	1.58	1.53
3	B	702	FAD	C5X-N5	-2.68	1.34	1.39
3	B	702	FAD	C5A-C6A	-2.66	1.33	1.41
4	A	703	NAP	C5A-C6A	-2.66	1.33	1.41
3	A	702	FAD	C5X-N5	-2.65	1.34	1.39
4	B	703	NAP	C5A-C6A	-2.64	1.33	1.41
3	A	702	FAD	C5A-C6A	-2.62	1.33	1.41
4	A	703	NAP	O4D-C1D	2.61	1.44	1.40
4	B	703	NAP	C2N-N1N	-2.53	1.40	1.46
2	B	701	FMN	O2'-C2'	2.48	1.48	1.43
4	B	703	NAP	C1D-N1N	2.48	1.48	1.41
4	B	703	NAP	C8A-N9A	-2.47	1.33	1.37
2	B	701	FMN	C1'-C2'	2.42	1.56	1.52
2	A	701	FMN	O2'-C2'	2.37	1.48	1.43
4	A	703	NAP	C8A-N9A	-2.37	1.33	1.37
4	A	703	NAP	C6N-N1N	2.29	1.40	1.35
2	B	701	FMN	C7M-C7	2.26	1.55	1.51
4	A	703	NAP	C2N-N1N	2.26	1.40	1.35
2	A	701	FMN	C4'-C3'	2.20	1.57	1.53
2	A	701	FMN	C7M-C7	2.19	1.55	1.51
2	A	701	FMN	C6-C7	2.12	1.42	1.39
4	B	703	NAP	C4A-N9A	-2.06	1.33	1.37
2	B	701	FMN	C6-C7	2.04	1.42	1.39
3	A	702	FAD	C4A-N9A	-2.03	1.33	1.37
4	A	703	NAP	C4A-N9A	-2.01	1.33	1.37

All (87) bond angle outliers are listed below:

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	A	702	FAD	N9A-C8A-N7A	-9.49	100.47	113.94
3	B	702	FAD	N9A-C8A-N7A	-9.42	100.57	113.94
3	A	702	FAD	N3A-C2A-N1A	-7.42	117.36	128.58
3	B	702	FAD	N3A-C2A-N1A	-7.26	117.59	128.58
4	A	703	NAP	N3A-C2A-N1A	-7.12	117.80	128.58
4	B	703	NAP	N3A-C2A-N1A	-7.11	117.82	128.58
3	B	702	FAD	C5A-C4A-N3A	-4.65	120.32	126.72
3	A	702	FAD	C5A-C4A-N3A	-4.49	120.54	126.72
4	B	703	NAP	N9A-C8A-N7A	-4.42	107.66	113.94
4	A	703	NAP	N9A-C8A-N7A	-4.39	107.71	113.94
3	A	702	FAD	C5A-C4A-N9A	4.24	110.44	105.81
4	B	703	NAP	C5A-C4A-N3A	-4.24	120.88	126.72
4	A	703	NAP	C5A-C4A-N3A	-4.21	120.92	126.72
4	B	703	NAP	C2N-N1N-C1D	4.10	120.11	114.47
4	B	703	NAP	O4D-C1D-C2D	-4.03	102.10	106.29
2	A	701	FMN	C9A-C5A-N5	3.99	126.69	122.45
2	B	701	FMN	C9A-C5A-N5	3.96	126.66	122.45
3	B	702	FAD	C5A-C4A-N9A	3.94	110.11	105.81
2	A	701	FMN	O4'-C4'-C3'	-3.61	100.80	109.25
3	B	702	FAD	C2A-N3A-C4A	3.58	120.58	111.83
3	A	702	FAD	C2A-N3A-C4A	3.57	120.56	111.83
3	A	702	FAD	C5A-N7A-C8A	3.50	108.94	103.45
3	B	702	FAD	C5A-N7A-C8A	3.39	108.78	103.45
4	A	703	NAP	C2A-N3A-C4A	3.27	119.81	111.83
2	B	701	FMN	O4'-C4'-C3'	-3.26	101.63	109.25
4	B	703	NAP	C2A-N3A-C4A	3.24	119.76	111.83
3	B	702	FAD	C4-N3-C2	-3.14	120.06	125.64
3	A	702	FAD	C4-N3-C2	-3.14	120.06	125.64
4	B	703	NAP	C3D-C2D-C1D	-3.14	95.53	101.46
3	A	702	FAD	C4A-N9A-C8A	3.14	109.03	105.74
4	A	703	NAP	C5A-N7A-C8A	3.11	108.33	103.45
4	B	703	NAP	C5A-N7A-C8A	3.07	108.28	103.45
2	A	701	FMN	C4'-C3'-C2'	-3.00	108.57	113.57
3	A	702	FAD	C10-C4X-N5	-2.98	118.73	124.81
2	B	701	FMN	C5A-C9A-N10	-2.97	115.28	117.97
3	B	702	FAD	C5A-C6A-N6A	-2.97	115.93	123.29
4	B	703	NAP	C5A-C6A-N6A	-2.95	115.97	123.29
3	A	702	FAD	C5A-C6A-N6A	-2.94	116.00	123.29
2	A	701	FMN	O4-C4-N3	-2.86	114.74	120.11
3	B	702	FAD	C10-C4X-N5	-2.84	119.02	124.81
2	B	701	FMN	O4-C4-N3	-2.80	114.84	120.11

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	701	FMN	C5A-C9A-N10	-2.77	115.47	117.97
2	B	701	FMN	C4'-C3'-C2'	-2.70	109.07	113.57
4	A	703	NAP	C5A-C6A-N6A	-2.69	116.63	123.29
4	A	703	NAP	C4D-O4D-C1D	-2.66	107.49	109.92
2	A	701	FMN	O3P-P-O5'	-2.63	99.81	106.67
3	A	702	FAD	C4X-C4-N3	2.63	119.95	113.25
4	B	703	NAP	C6A-C5A-C4A	2.63	120.77	117.18
2	A	701	FMN	C8M-C8-C7	2.59	126.05	120.76
4	A	703	NAP	C6A-C5A-C4A	2.59	120.72	117.18
3	B	702	FAD	C4X-C4-N3	2.58	119.82	113.25
3	B	702	FAD	C4A-N9A-C8A	2.58	108.44	105.74
2	A	701	FMN	C5A-N5-C4A	-2.51	114.03	118.09
2	B	701	FMN	C8M-C8-C7	2.51	125.88	120.76
4	A	703	NAP	C2D-C3D-C4D	-2.50	97.78	102.61
4	B	703	NAP	C4A-N9A-C8A	2.49	108.35	105.74
2	B	701	FMN	C9-C9A-N10	2.47	125.18	121.85
4	A	703	NAP	C4A-C5A-N7A	-2.44	107.79	110.58
4	B	703	NAP	N3A-C4A-N9A	2.41	131.27	127.17
4	B	703	NAP	C4A-C5A-N7A	-2.41	107.82	110.58
2	B	701	FMN	O3P-P-O5'	-2.40	100.40	106.67
3	B	702	FAD	O4-C4-C4X	-2.37	120.28	126.53
2	B	701	FMN	O2P-P-O1P	2.37	120.05	110.83
4	A	703	NAP	C4A-N9A-C8A	2.36	108.21	105.74
2	A	701	FMN	O2P-P-O1P	2.35	120.01	110.83
4	A	703	NAP	N3A-C4A-N9A	2.34	131.15	127.17
3	A	702	FAD	C9A-C5X-N5	-2.33	119.98	122.45
3	B	702	FAD	C6A-C5A-C4A	2.33	120.36	117.18
3	A	702	FAD	O4-C4-C4X	-2.29	120.48	126.53
3	A	702	FAD	C2B-C3B-C4B	-2.29	98.19	102.61
3	B	702	FAD	C9A-C5X-N5	-2.28	120.04	122.45
3	A	702	FAD	C6A-C5A-C4A	2.26	120.27	117.18
2	B	701	FMN	C5A-N5-C4A	-2.26	114.44	118.09
2	A	701	FMN	C8M-C8-C9	-2.23	115.64	119.57
2	B	701	FMN	C8M-C8-C9	-2.21	115.68	119.57
2	A	701	FMN	C7M-C7-C6	-2.21	115.68	119.57
3	A	702	FAD	C4'-C3'-C2'	-2.19	109.93	113.57
2	B	701	FMN	C7M-C7-C6	-2.18	115.73	119.57
4	B	703	NAP	O4D-C1D-N1N	2.17	112.69	110.22
3	B	702	FAD	C4'-C3'-C2'	-2.15	109.99	113.57
2	A	701	FMN	C9-C9A-N10	2.10	124.68	121.85
3	B	702	FAD	O2P-P-O1P	2.09	122.19	112.44
4	A	703	NAP	O4B-C1B-N9A	2.05	112.02	108.09

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	B	702	FAD	C5A-C6A-N1A	2.05	122.71	117.51
3	B	702	FAD	C4-C4X-C10	2.03	120.42	116.93
2	B	701	FMN	O4'-C4'-C5'	-2.03	105.51	109.99
3	A	702	FAD	O2P-P-O1P	2.01	121.80	112.44

There are no chirality outliers.

All (17) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	A	703	NAP	C5B-O5B-PA-O3
4	A	703	NAP	C2B-C1B-N9A-C8A
4	B	703	NAP	C5B-O5B-PA-O1A
4	B	703	NAP	C5B-O5B-PA-O2A
4	B	703	NAP	C5B-O5B-PA-O3
4	B	703	NAP	C2B-C1B-N9A-C8A
4	B	703	NAP	C2B-C1B-N9A-C4A
4	A	703	NAP	C2B-C1B-N9A-C4A
4	A	703	NAP	PN-O3-PA-O5B
4	B	703	NAP	PN-O3-PA-O5B
4	A	703	NAP	C5B-O5B-PA-O1A
4	A	703	NAP	C4B-C5B-O5B-PA
4	A	703	NAP	C2B-O2B-P2B-O1X
4	B	703	NAP	C2B-O2B-P2B-O1X
4	A	703	NAP	O4B-C4B-C5B-O5B
4	A	703	NAP	C3B-C4B-C5B-O5B
3	B	702	FAD	PA-O3P-P-O2P

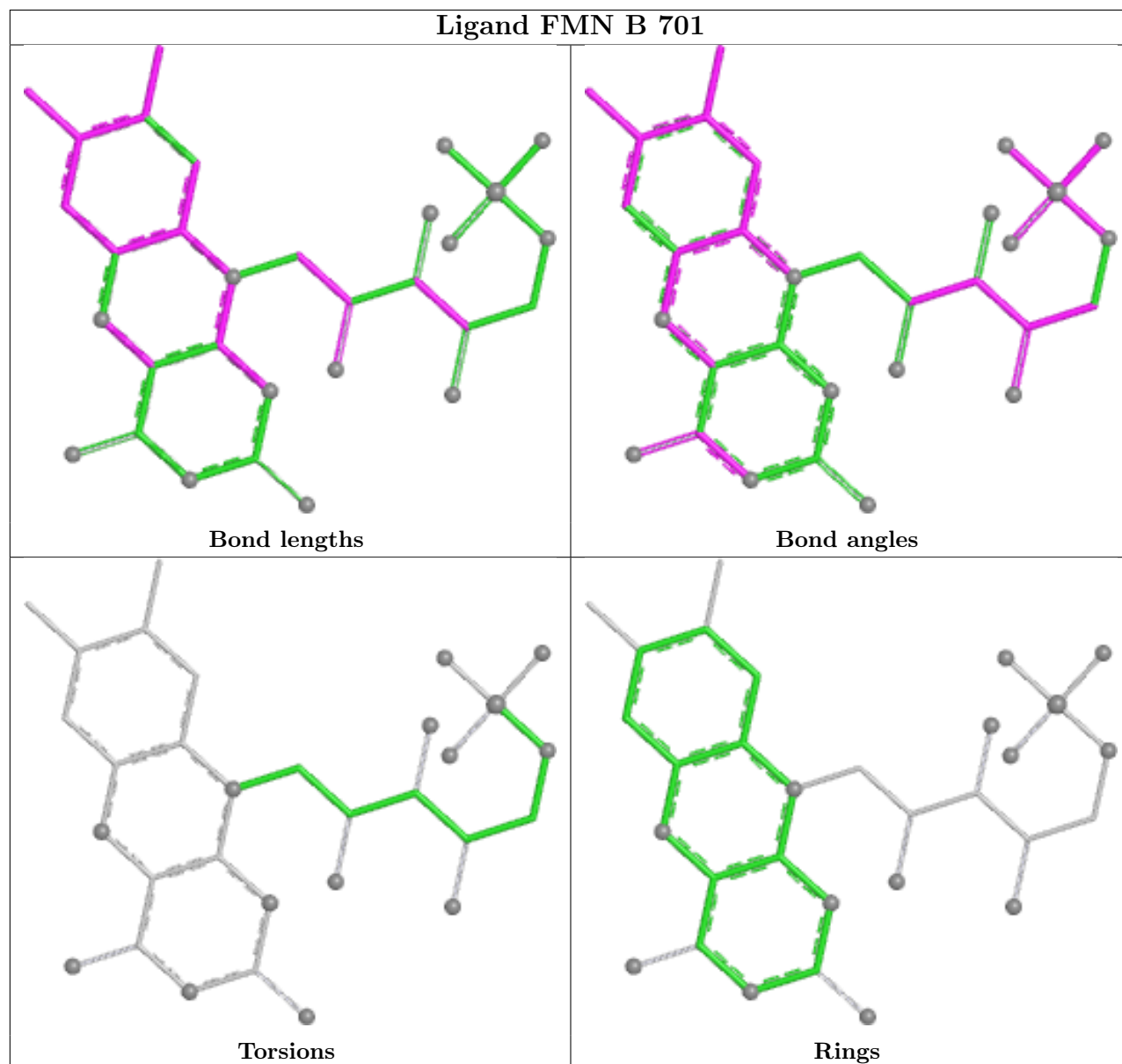
There are no ring outliers.

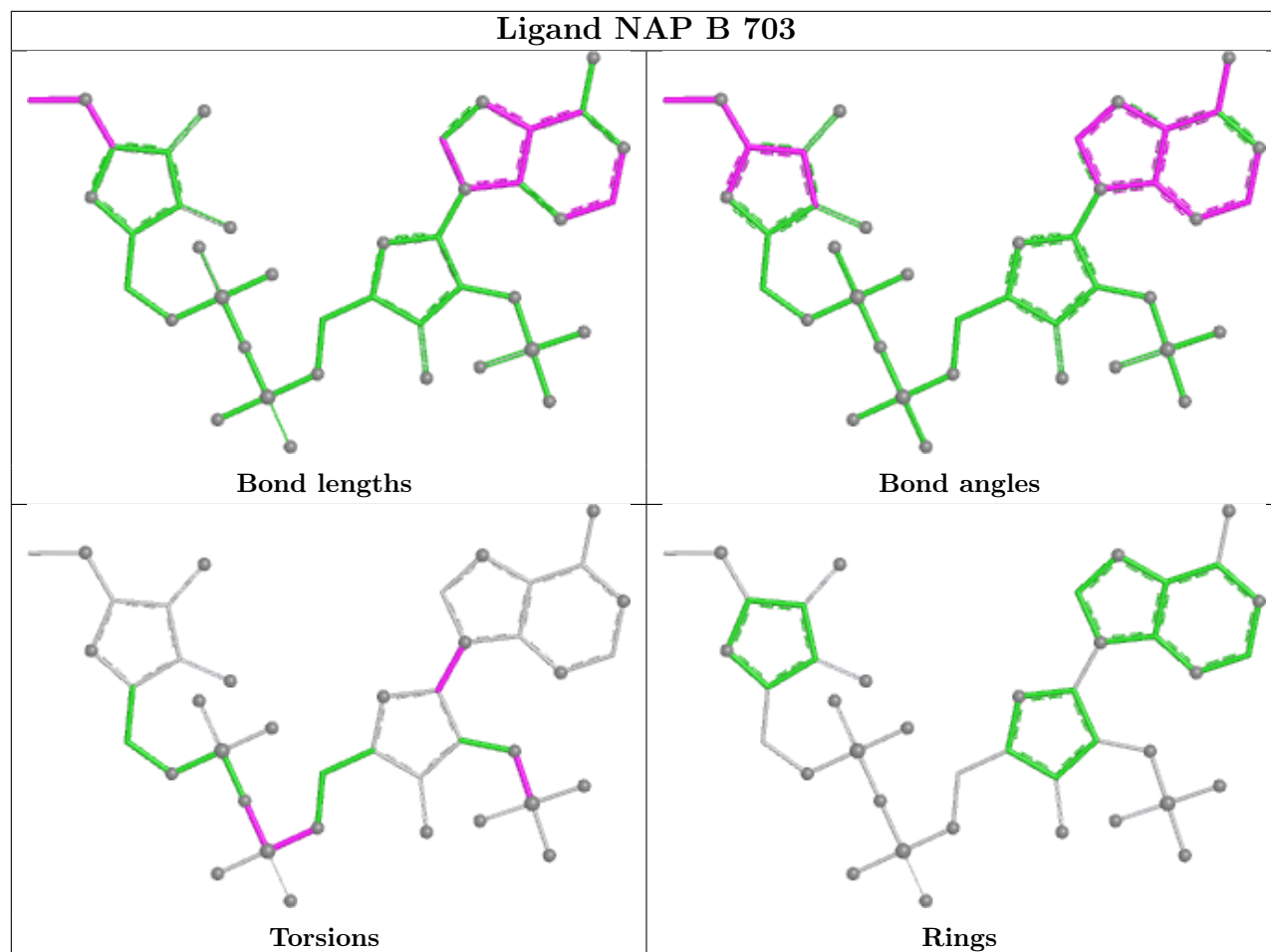
3 monomers are involved in 10 short contacts:

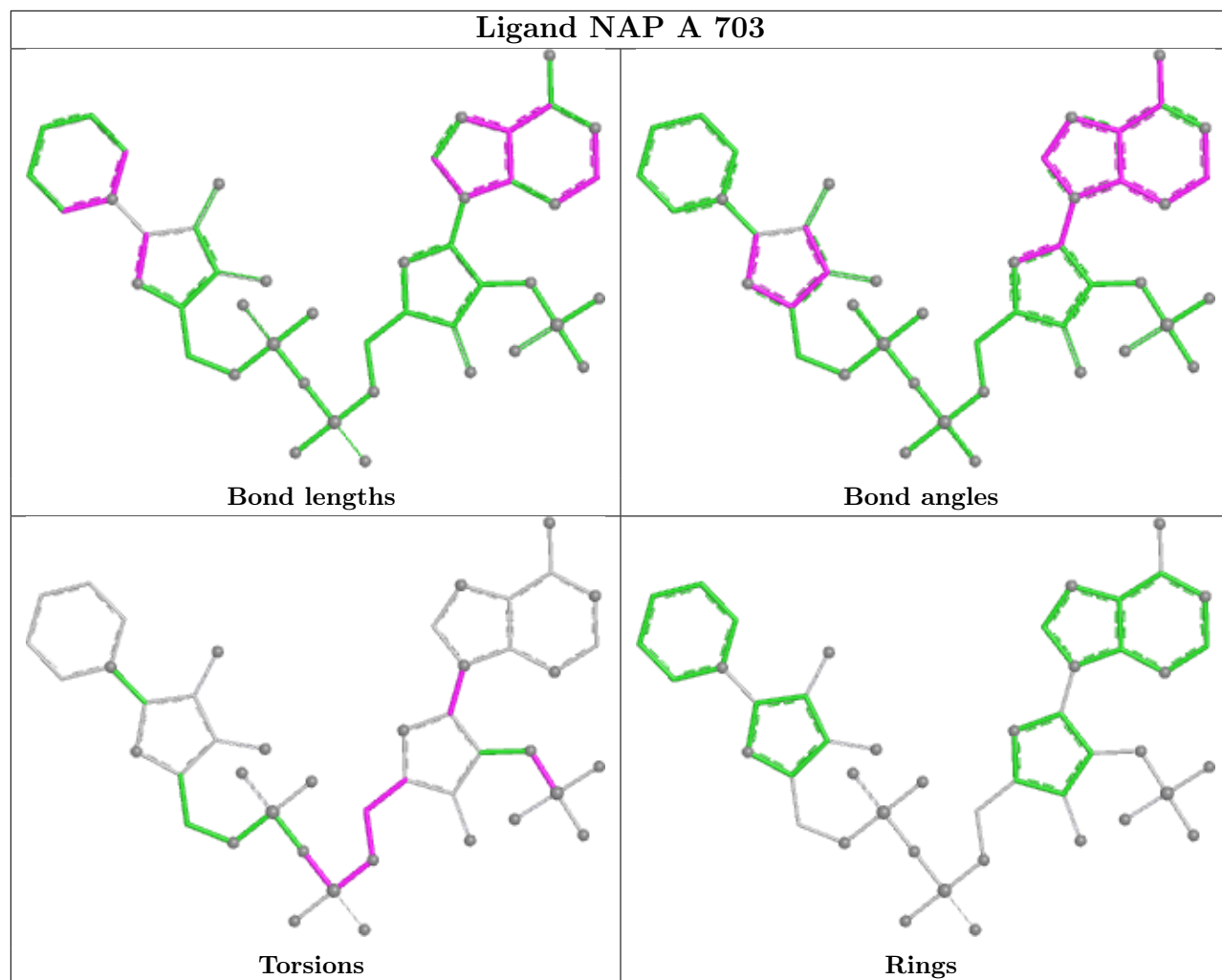
Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	B	703	NAP	5	0
4	A	703	NAP	4	0
3	A	702	FAD	1	0

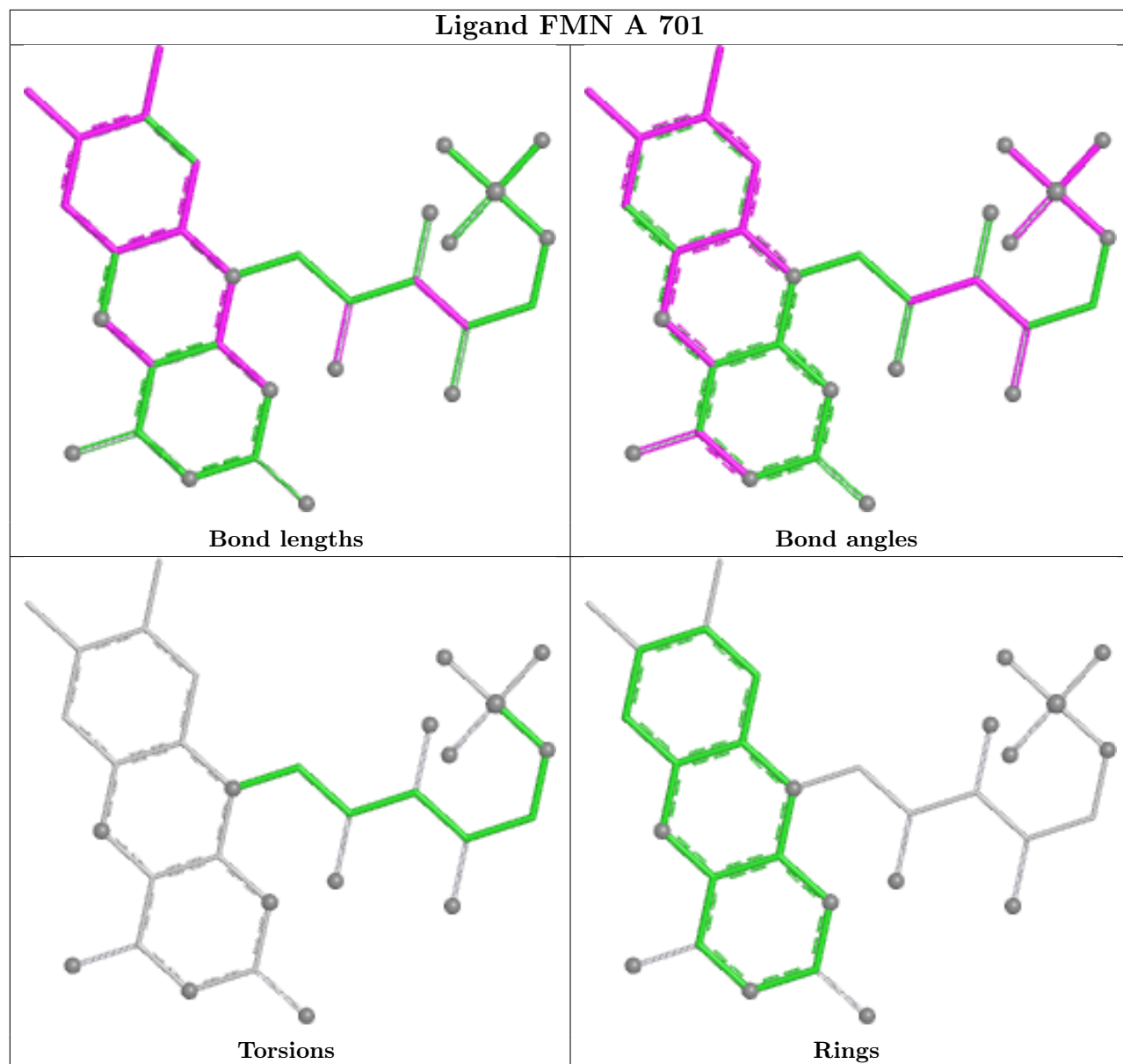
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included.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

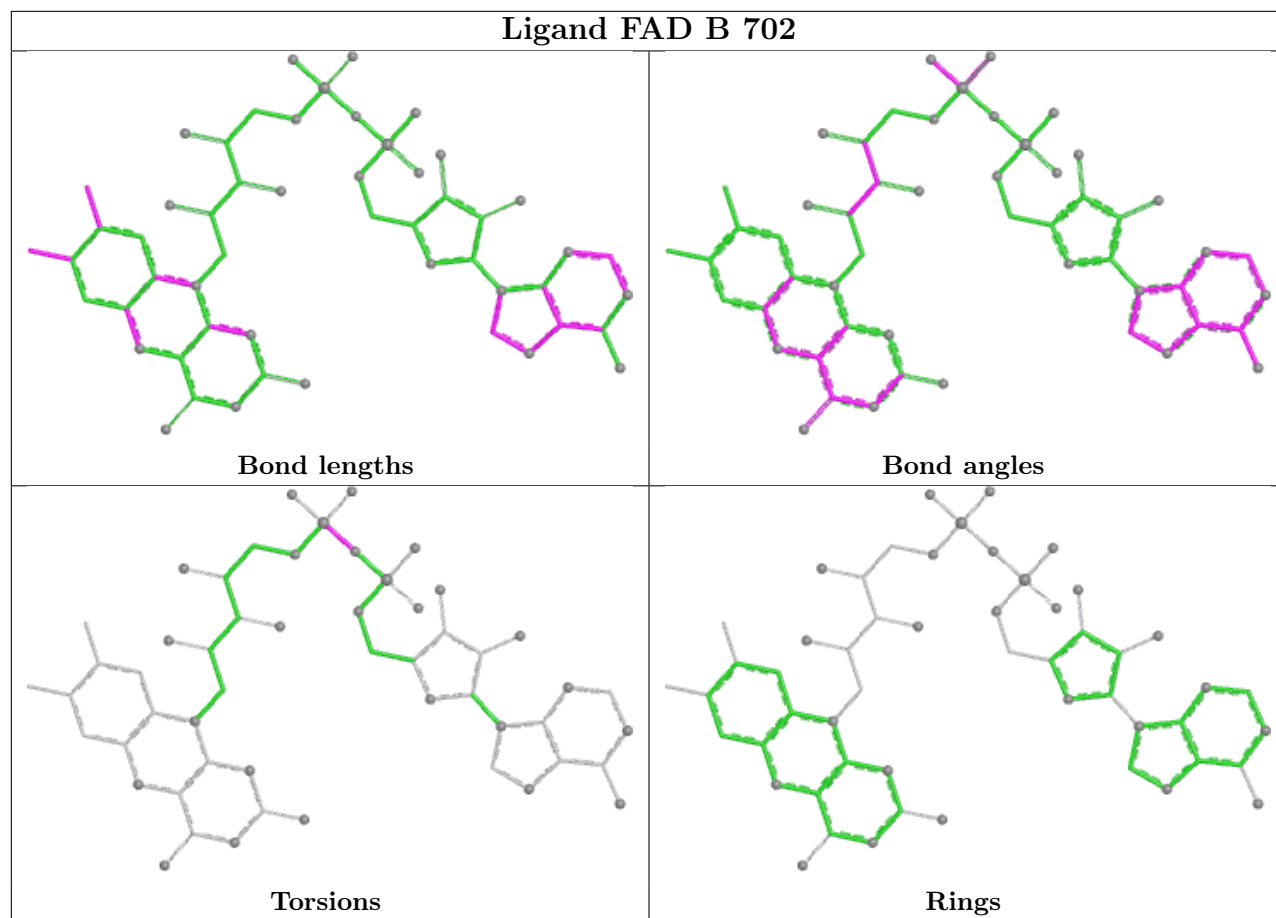
in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.

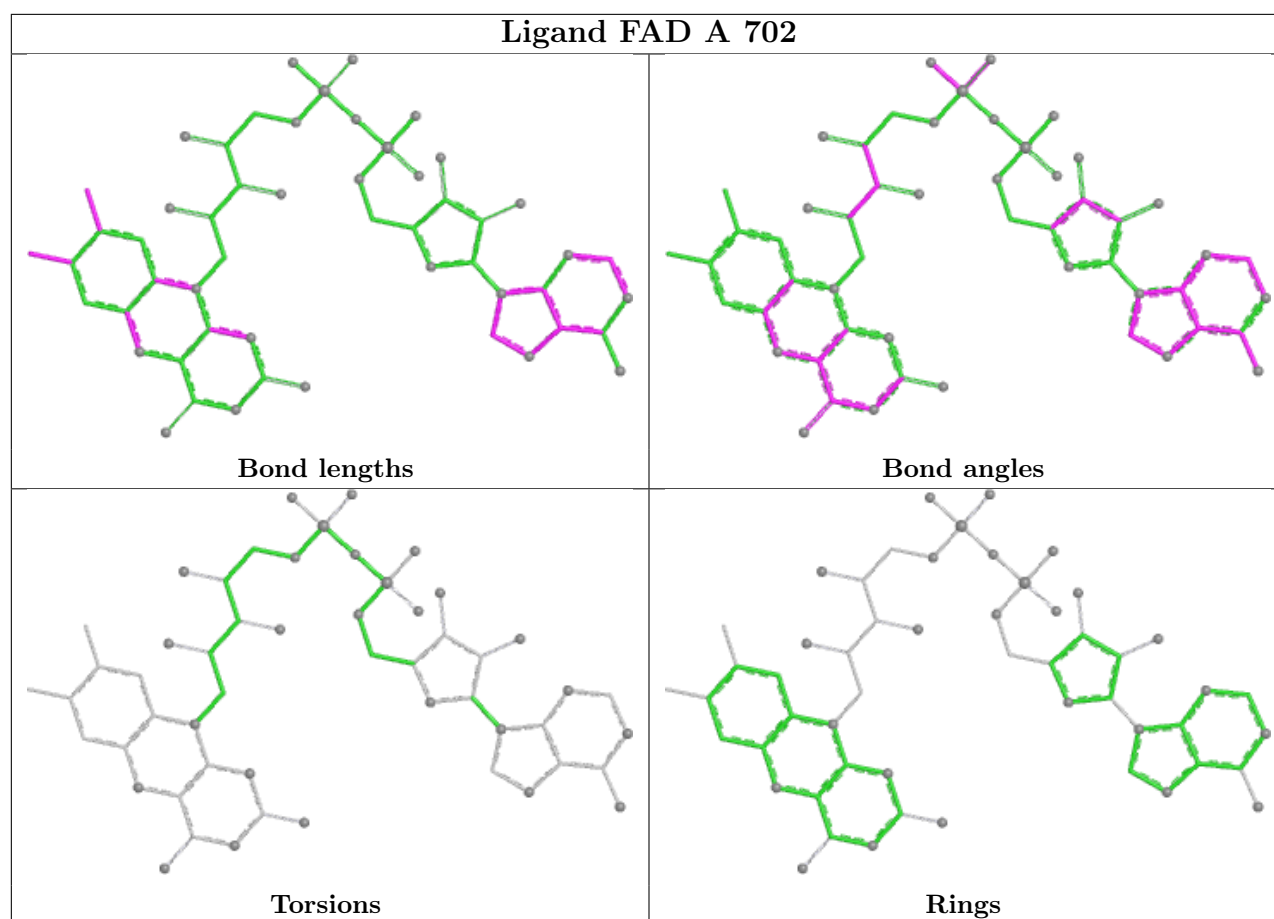












5.7 Other polymers [i](#)

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, 95th percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled ‘Q < 0.9’ lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å ²)	Q<0.9
1	A	610/622 (98%)	-0.01	7 (1%) 78 79	29, 44, 65, 85	0
1	B	604/622 (97%)	0.17	13 (2%) 62 64	27, 48, 78, 98	0
All	All	1214/1244 (97%)	0.08	20 (1%) 70 72	27, 45, 75, 98	0

All (20) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	62	PRO	4.5
1	B	240	SER	3.8
1	A	500	ALA	3.8
1	B	140	TYR	3.4
1	A	522	PHE	3.3
1	B	242	ILE	3.1
1	B	236	THR	3.0
1	A	505	GLY	3.0
1	B	351	LEU	2.8
1	A	237	GLY	2.8
1	A	236	THR	2.7
1	B	252	ASP	2.5
1	B	500	ALA	2.5
1	B	67	SER	2.5
1	B	152	PHE	2.5
1	A	255	VAL	2.3
1	B	149	ALA	2.2
1	B	180	HIS	2.1
1	B	104	ARG	2.1
1	B	246	GLU	2.1

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

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

6.3 Carbohydrates ⓘ

There are no oligosaccharides in this entry.

6.4 Ligands ⓘ

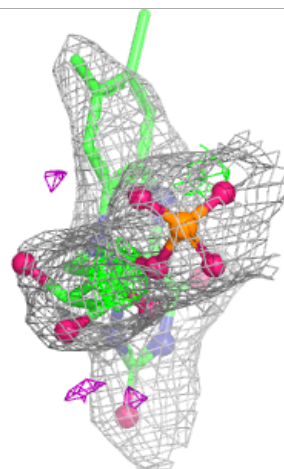
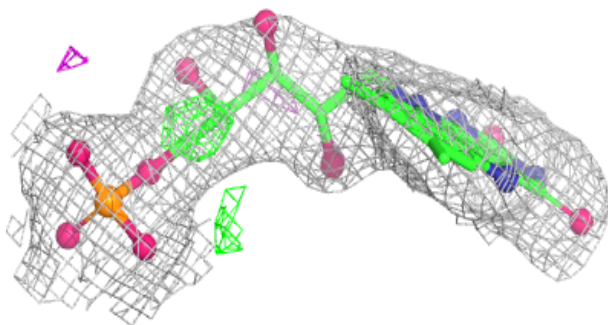
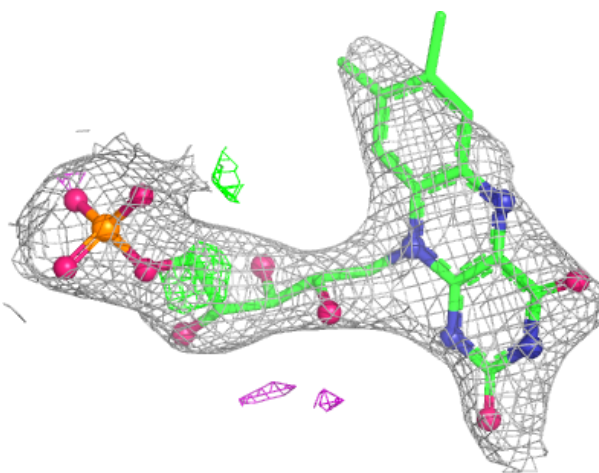
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
5	PO4	A	704	5/5	0.65	0.14	138,138,138,138	0
5	PO4	B	704	5/5	0.79	0.13	97,98,98,99	0
2	FMN	B	701	31/31	0.91	0.12	53,78,80,80	0
2	FMN	A	701	31/31	0.92	0.12	54,59,63,65	0
4	NAP	B	703	41/48	0.95	0.09	35,40,82,90	0
3	FAD	A	702	53/53	0.96	0.07	25,34,48,50	0
3	FAD	B	702	53/53	0.96	0.07	24,34,44,46	0
4	NAP	A	703	45/48	0.96	0.09	26,36,76,77	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.

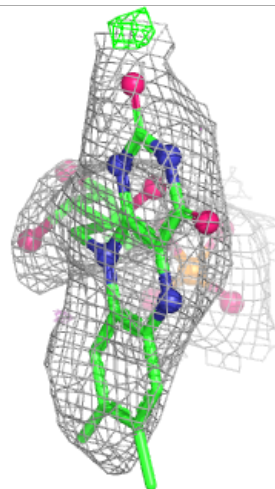
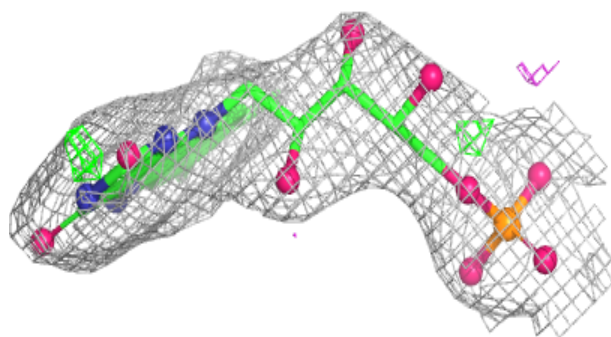
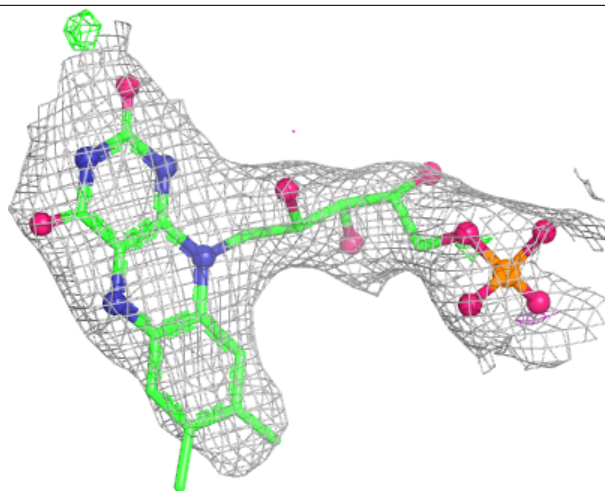
Electron density around FMN B 701:

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



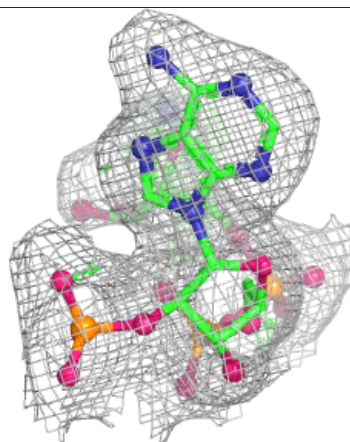
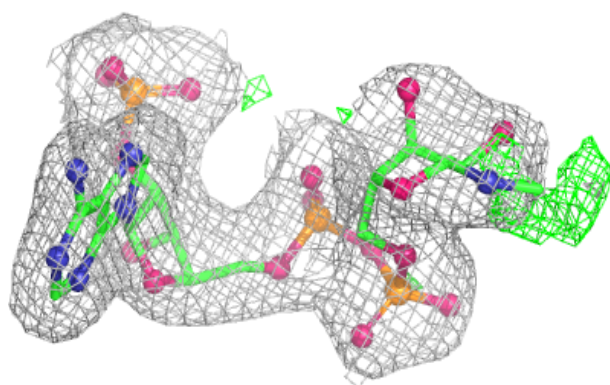
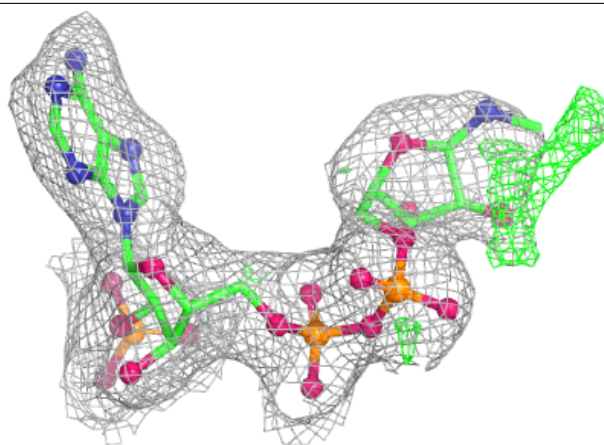
Electron density around FMN A 701:

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

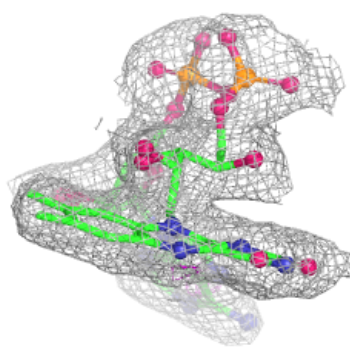
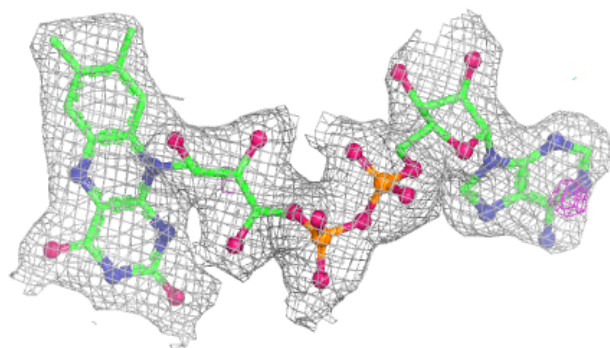
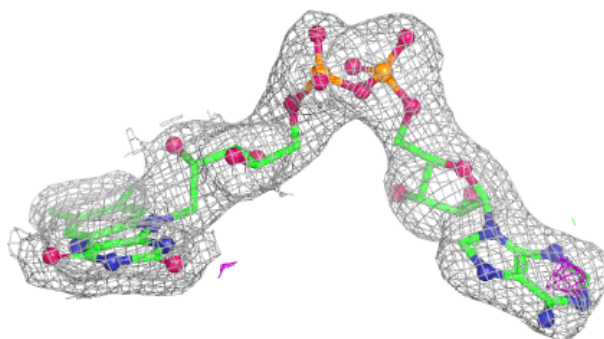


Electron density around NAP B 703:

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

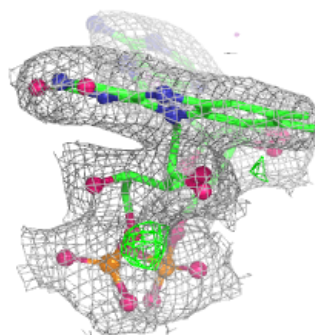
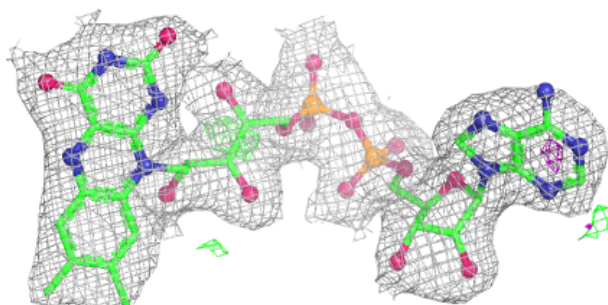
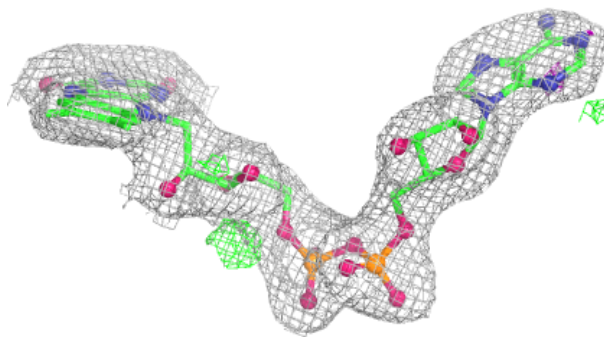
**Electron density around FAD A 702:**

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

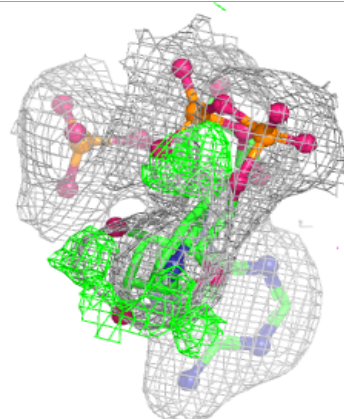
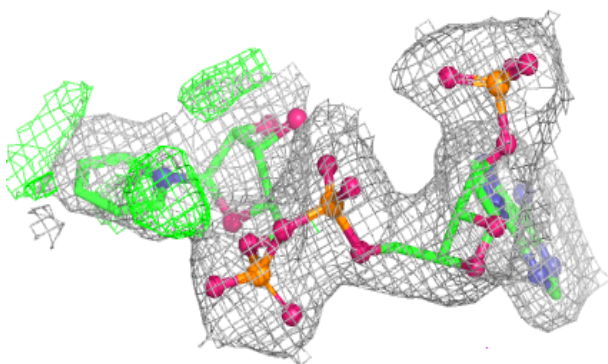
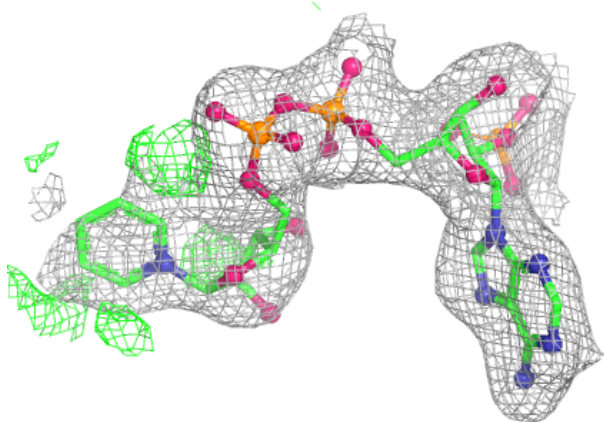


Electron density around FAD B 702:

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

**Electron density around NAP A 703:**

$2mF_o-DF_c$ (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.