Full wwPDB X-ray Structure Validation Report (i)

May 15, 2020 – 09:39 pm BST

PDB ID	:	1UM0
Title	:	Crystal structure of chorismate synthase complexed with FMN
Authors	:	Ahn, H.J.; Yoon, H.J.; Lee, B.; Suh, S.W.
Deposited on	:	2003-09-18
Resolution	:	1.95 Å(reported)

The following versions of software and data (see references (i)) were used in the production of this report:

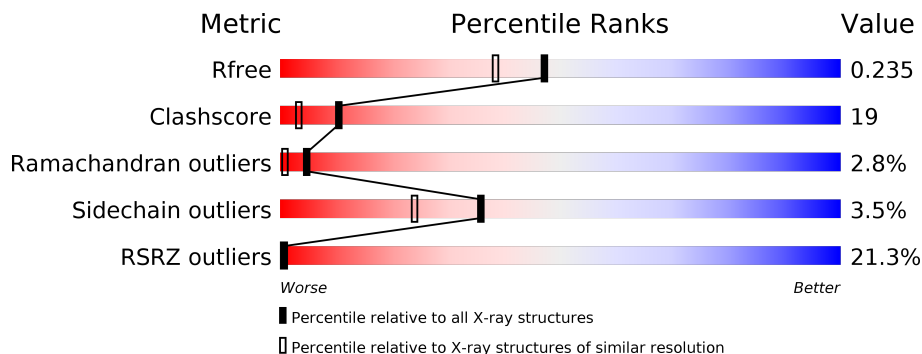|		
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.11
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & 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 1.95 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	Percentile Ranks	Value
Rfree		0.235
Clashscore		19
Ramachandran outliers		2.8%
Sidechain outliers		3.5%
RSRZ outliers		21.3%

Worse ← → *Better*

▮ Percentile relative to all X-ray structures

▯ Percentile relative to X-ray structures of similar resolution

Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R$_{free}$	130704	2580 (1.96-1.96)
Clashscore	141614	2705 (1.96-1.96)
Ramachandran outliers	138981	2678 (1.96-1.96)
Sidechain outliers	138945	2678 (1.96-1.96)
RSRZ outliers	127900	2539 (1.96-1.96)

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 >=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 <=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	365	14% / 76% / 21% •
1	B	365	28% / 71% / 25% •
1	C	365	28% / 67% / 29% •
1	D	365	14% / 71% / 26% ••

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 crite-

ria:

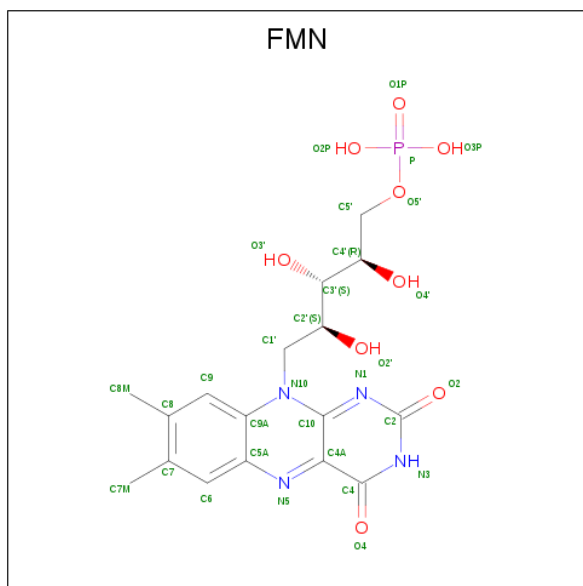| Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
2	FMN	B	2400	-	-	-	X
2	FMN	C	3400	-	-	-	X

2 Entry composition (i)

There are 3 unique types of molecules in this entry. The entry contains 11843 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 Chorismate synthase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	365	Total	C	N	O	S	36	0	0
			2816	1768	502	532	14			
1	B	365	Total	C	N	O	S	36	0	0
			2816	1768	502	532	14			
1	C	365	Total	C	N	O	S	36	0	0
			2816	1768	502	532	14			
1	D	365	Total	C	N	O	S	36	0	0
			2816	1768	502	532	14			

- Molecule 2 is FLAVIN MONONUCLEOTIDE (three-letter code: 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		

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Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
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	158	Total	O	0	0
			158	158		
3	B	84	Total	O	0	0
			84	84		
3	C	76	Total	O	0	0
			76	76		
3	D	137	Total	O	0	0
			137	137		

3 Residue-property plots ⓘ

These plots are drawn for all protein, RNA and DNA 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 geometr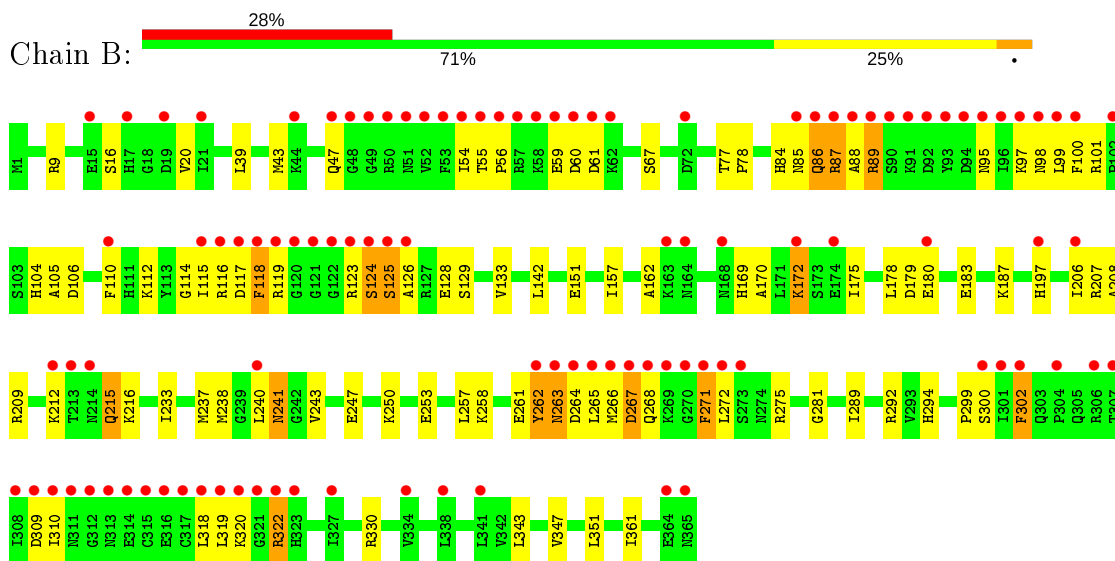ic quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red dot above a residue indicates a poor fit to the electron density (RSRZ > 2). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.
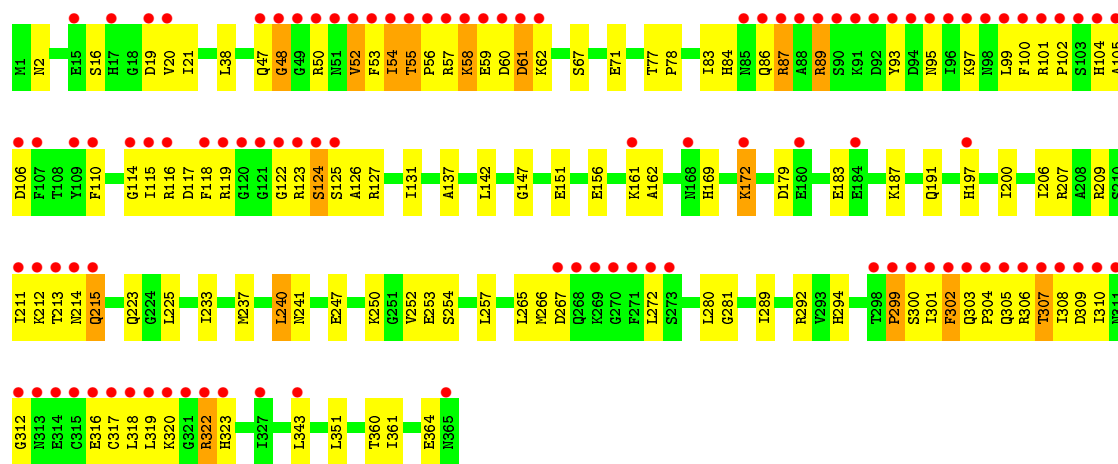
- Molecule 1: Chorismate synthase

- Molecule 1: Chorismate synthase

- Molecule 1: Chorismate synthase

M1 N2 E15 S16 H17 G18 D19 V20 I21 L38 Q47 G48 G49 R50 N51 V52 F53 I54 T55 P56 R57 K58 E59 D60 D61 K62 S67 E71 T77 P78 I83 H84 N85 Q86 R87 A88 A89 S90 K91 D92 Y93 D94 N95 I96 K97 N98 L99 F100 R101 P102 S103 H104 A105

D106 F107 T108 Y109 F110 G114 I115 R116 D117 F118 R119 G120 G121 G122 R123 S124 S125 A126 R127 I131 A137 L142 G147 E151 E156 K161 A162 N168 H169 K172 D179 E180 E183 E184 K187 Q191 H197 I200 I206 R207 A208 R209 S210

I211 K212 T213 M214 Q215 Q223 G224 L225 I233 M237 L240 N241 E247 K250 G251 V252 E253 S254 L257 L265 M266 D267 Q268 K269 G270 F271 L272 S273 L280 G281 I289 R292 V293 H294 T298 P299 S300 I301 F302 Q303 P304 Q305 R306 T307 I308 D309 I310 N311

G312 N313 E314 C315 E316 C317 L318 L319 K320 G321 R322 H323 I327 L343 L351 T360 I361 E364 N365

• **Molecule 1: Chorismate synthase**

Chain D:

14%

71% 26%

M1 N2 R9 S16 H17 G18 D19 V20 I21 G22 D35 L38 L39 E40 N41 E42 M43 R46 G49 R50 I54 T55 P56 R57 K58 E59 D60 D61 K62 S67 F70 S74 I83 H84 N85 Q86 R87 A88 R89 S90 A91 D92 Y93 D94 N95 I96 K97 N98 L99

S103 H104 A105 D106 I115 R116 D117 F118 R119 G120 G121 G122 R123 S124 S125 A126 R127 E128 I131 G147 I154 I157 A162 N168 H169 A170 L171 K172 S173 E174 L178 D179 E180 E183 K187 I190 Q191 H197 I206 R207 A208 I211 K212 Q215

L221 G224 L225 Y226 A227 K228 I233 A234 E235 A236 M237 L240 N241 E247 K250 G251 V252 E253 S254 L257 Y262 L265 M266 D267 Q268 L272 M283 E288 H294 P295 K296 P299 S300 I301 F302 R306 D309 I310 I318 L319 K320 G321 R322

I327 A328 I329 L351 T360 I361 E364 N365

4   Data and refinement statistics (i)

Property	Value	Source
Space group	I 4	Depositor
Cell constants a, b, c, α, β, γ	146.69Å 146.69Å 132.31Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	29.90 – 1.95 29.90 – 1.95	Depositor EDS
% Data completeness (in resolution range)	99.4 (29.90-1.95) 99.5 (29.90-1.95)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$<I/\sigma(I)>$ [1]	4.29 (at 1.95Å)	Xtriage
Refinement program	CNS 1.1	Depositor
R, R_{free}	0.214 , 0.243 0.207 , 0.235	Depositor DCC
R_{free} test set	10100 reflections (10.03%)	wwPDB-VP
Wilson B-factor (Å^2)	27.0	Xtriage
Anisotropy	0.326	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.38 , 57.0	EDS
L-test for twinning[2]	$<|L|> = 0.51, <L^2> = 0.34$	Xtriage
Estimated twinning fraction	0.028 for -k,-h,-l	Xtriage
F_o,F_c correlation	0.94	EDS
Total number of atoms	11843	wwPDB-VP
Average B, all atoms (Å^2)	44.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.02% of the height of the origin peak. No significant pseudotranslation is detected.*

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[1] Intensities estimated from amplitudes.

[2] Theoretical values of $<|L|>$, $<L^2>$ 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	0.34	0/2857	0.63	2/3833 (0.1%)
1	B	0.31	0/2857	0.59	2/3833 (0.1%)
1	C	0.31	0/2857	0.58	2/3833 (0.1%)
1	D	0.33	0/2857	0.61	2/3833 (0.1%)
All	All	0.32	0/11428	0.60	8/15332 (0.1%)

There are no bond length outliers.

All (8) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	D	89	ARG	NE-CZ-NH2	7.41	124.00	120.30
1	A	89	ARG	NE-CZ-NH2	7.34	123.97	120.30
1	A	87	ARG	NE-CZ-NH2	7.32	123.96	120.30
1	D	87	ARG	NE-CZ-NH2	7.30	123.95	120.30
1	B	87	ARG	NE-CZ-NH2	7.26	123.93	120.30
1	C	89	ARG	NE-CZ-NH2	7.26	123.93	120.30
1	B	89	ARG	NE-CZ-NH2	7.25	123.93	120.30
1	C	87	ARG	NE-CZ-NH2	7.23	123.91	120.30

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts (i)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	2816	0	2852	91	0
1	B	2816	0	2852	110	1
1	C	2816	0	2852	147	4
1	D	2816	0	2852	111	3
2	A	31	0	19	4	0
2	B	31	0	19	7	0
2	C	31	0	19	3	0
2	D	31	0	19	6	0
3	A	158	0	0	3	0
3	B	84	0	0	2	0
3	C	76	0	0	0	0
3	D	137	0	0	7	0
All	All	11843	0	11484	420	5

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 19.

All (420) 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:307:THR:HG23	1:C:308:ILE:H	1.25	0.97
1:D:105:ALA:H	1:D:123:ARG:HH12	1.07	0.94
1:A:322:ARG:H	1:A:322:ARG:NH1	1.70	0.90
1:B:281:GLY:HA3	1:C:105:ALA:HB2	1.54	0.89
1:A:322:ARG:HH11	1:A:322:ARG:N	1.71	0.89
1:C:267:ASP:HB2	1:C:272:LEU:HD21	1.54	0.88
1:B:105:ALA:H	1:B:123:ARG:HH12	0.94	0.87
1:C:322:ARG:H	1:C:322:ARG:HH11	1.23	0.86
1:D:105:ALA:H	1:D:123:ARG:NH1	1.74	0.86
1:B:105:ALA:N	1:B:123:ARG:HH12	1.72	0.85
1:A:318:LEU:HD12	1:A:320:LYS:HE3	1.59	0.85
1:D:21:ILE:HG13	1:D:131:ILE:HD11	1.60	0.84
1:D:318:LEU:HD12	1:D:320:LYS:HE3	1.57	0.83
1:C:21:ILE:HG13	1:C:131:ILE:HD11	1.60	0.83
1:B:105:ALA:H	1:B:123:ARG:NH1	1.77	0.83
1:A:302:PHE:HE2	1:A:318:LEU:HD11	1.43	0.82
1:C:197:HIS:HB3	1:C:302:PHE:HB3	1.61	0.82
1:D:322:ARG:HH11	1:D:322:ARG:H	1.29	0.79
1:D:105:ALA:N	1:D:123:ARG:HH22	1.81	0.78
1:A:361:ILE:O	1:A:365:ASN:OXT	2.03	0.77
1:C:102:PRO:HG2	1:C:305:GLN:HB3	1.66	0.77
1:B:238:MET:HE3	1:B:243:VAL:O	1.84	0.77

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:169:HIS:O	1:A:172:LYS:HD3	1.86	0.76
1:C:122:GLY:O	1:C:123:ARG:HG2	1.85	0.76
1:A:123:ARG:HG3	1:A:124:SER:H	1.52	0.75
1:B:318:LEU:HD12	1:B:320:LYS:HE3	1.67	0.74
1:C:300:SER:HA	1:C:305:GLN:HE22	1.52	0.73
1:A:322:ARG:HH11	1:A:322:ARG:H	0.86	0.73
1:C:212:LYS:HD3	1:C:215:GLN:HG2	1.71	0.73
1:C:322:ARG:HH11	1:C:322:ARG:N	1.86	0.72
1:B:302:PHE:HE2	1:B:318:LEU:HD11	1.54	0.72
1:D:302:PHE:HE2	1:D:318:LEU:HD11	1.54	0.72
1:C:117:ASP:CG	1:C:118:PHE:H	1.93	0.72
1:B:169:HIS:HA	1:B:172:LYS:HE3	1.72	0.72
1:A:351:LEU:HD22	1:B:361:ILE:HD12	1.73	0.71
1:B:128:GLU:HG3	1:C:225:LEU:HD13	1.72	0.70
1:B:105:ALA:HB3	1:B:123:ARG:HH22	1.56	0.70
1:C:61:ASP:HA	1:C:84:HIS:O	1.91	0.70
1:A:75:THR:HA	1:C:115:ILE:HD12	1.74	0.70
1:A:45:ARG:HD2	3:A:1524:HOH:O	1.91	0.70
1:B:183:GLU:HG2	1:B:187:LYS:HE3	1.74	0.69
1:C:322:ARG:H	1:C:322:ARG:HD3	1.58	0.69
1:D:169:HIS:CD2	1:D:172:LYS:HE3	2.27	0.69
1:C:197:HIS:HB2	1:C:303:GLN:HG3	1.74	0.69
1:B:56:PRO:HA	1:B:59:GLU:HB2	1.74	0.69
1:C:307:THR:HG23	1:C:308:ILE:N	2.06	0.68
1:A:128:GLU:HG3	1:D:225:LEU:HD13	1.73	0.68
1:C:169:HIS:HA	1:C:172:LYS:NZ	2.09	0.68
1:B:104:HIS:HD2	1:B:123:ARG:HD2	1.59	0.68
1:A:302:PHE:CE2	1:A:318:LEU:HD11	2.26	0.67
1:A:169:HIS:CD2	1:A:172:LYS:HE3	2.29	0.67
1:D:253:GLU:O	1:D:257:LEU:HD13	1.94	0.67
1:C:102:PRO:HG2	1:C:305:GLN:CB	2.25	0.67
1:D:49:GLY:O	1:D:174:GLU:HA	1.95	0.67
1:A:300:SER:H	2:A:1400:FMN:HM82	1.59	0.67
1:D:322:ARG:HB2	1:D:322:ARG:NH1	2.10	0.67
1:D:105:ALA:N	1:D:123:ARG:HH12	1.87	0.66
1:A:225:LEU:HD13	1:D:128:GLU:HG3	1.77	0.66
1:B:101:ARG:HH11	1:B:101:ARG:HG3	1.61	0.65
1:C:322:ARG:HD3	1:C:322:ARG:N	2.11	0.65
1:D:85:ASN:ND2	1:D:86:GLN:HG3	2.11	0.65
2:B:2400:FMN:O3P	1:C:280:LEU:HD12	1.96	0.65
1:D:169:HIS:O	1:D:172:LYS:HD3	1.95	0.65

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:55:THR:H	1:C:56:PRO:CD	2.09	0.65
1:A:51:ASN:OD1	1:A:52:VAL:HG23	1.97	0.65
1:A:241:ASN:HB3	2:A:1400:FMN:H3'	1.79	0.65
1:B:100:PHE:HB2	1:C:266:MET:HE3	1.80	0.64
1:D:169:HIS:NE2	1:D:172:LYS:HE3	2.12	0.64
1:C:322:ARG:HB2	1:C:322:ARG:NH1	2.13	0.64
1:D:115:ILE:HD12	1:D:115:ILE:O	1.98	0.63
1:A:157:ILE:HD13	1:A:190:ILE:HD11	1.80	0.63
1:C:305:GLN:HB2	1:C:317:CYS:SG	2.39	0.63
1:B:247:GLU:OE1	1:B:294:HIS:HE1	1.82	0.63
1:C:97:LYS:NZ	1:C:97:LYS:HB2	2.14	0.62
1:A:241:ASN:ND2	1:D:228:LYS:NZ	2.47	0.62
1:C:247:GLU:OE2	1:C:252:VAL:HG22	1.99	0.62
1:C:52:VAL:HB	1:C:56:PRO:HB3	1.82	0.62
1:A:318:LEU:HD12	1:A:320:LYS:CE	2.29	0.62
1:B:320:LYS:H	1:B:320:LYS:HD2	1.63	0.62
1:C:301:ILE:H	1:C:305:GLN:NE2	1.98	0.61
1:C:247:GLU:HB2	1:C:292:ARG:HB2	1.82	0.61
1:B:264:ASP:C	1:B:265:LEU:HD12	2.21	0.61
1:D:128:GLU:HG2	3:D:4505:HOH:O	2.00	0.61
1:D:241:ASN:ND2	3:D:4433:HOH:O	2.34	0.60
1:B:253:GLU:O	1:B:257:LEU:HD13	2.01	0.60
1:C:318:LEU:HD12	1:C:320:LYS:HE3	1.81	0.60
1:A:330:ARG:HB3	1:A:330:ARG:HH21	1.65	0.60
1:D:322:ARG:HH11	1:D:322:ARG:N	1.99	0.60
1:A:54:ILE:HG22	1:A:55:THR:N	2.15	0.60
1:C:308:ILE:HG12	1:C:309:ASP:N	2.17	0.59
1:A:262:TYR:O	1:A:275:ARG:HD3	2.03	0.59
1:A:247:GLU:OE1	1:A:294:HIS:HE1	1.86	0.59
1:A:21:ILE:HG13	1:A:131:ILE:HD11	1.82	0.59
1:A:361:ILE:HD11	1:B:361:ILE:HD11	1.84	0.59
1:B:266:MET:H	1:C:307:THR:HA	1.68	0.58
1:A:161:LYS:HE2	3:A:1441:HOH:O	2.02	0.58
1:A:55:THR:O	1:A:59:GLU:HG2	2.02	0.58
1:B:116:ARG:HD3	1:B:310:ILE:HD13	1.86	0.58
1:D:21:ILE:HG23	1:D:83:ILE:HB	1.86	0.58
1:D:162:ALA:HB1	1:D:179:ASP:HB2	1.85	0.58
1:A:320:LYS:H	1:A:320:LYS:HD2	1.67	0.57
1:B:265:LEU:HG	1:C:306:ARG:O	2.04	0.57
1:A:361:ILE:HD12	1:B:351:LEU:HD22	1.87	0.57
1:A:300:SER:H	2:A:1400:FMN:C8M	2.17	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:330:ARG:HB3	1:A:330:ARG:NH2	2.20	0.57
1:D:116:ARG:H	1:D:116:ARG:HD2	1.69	0.57
1:B:241:ASN:HD21	2:B:2400:FMN:H5'2	1.68	0.57
1:B:97:LYS:HB2	1:B:97:LYS:NZ	2.20	0.57
1:C:302:PHE:N	1:C:323:HIS:HD2	2.03	0.57
1:C:351:LEU:HD22	1:D:361:ILE:HD12	1.86	0.57
1:C:308:ILE:HD11	1:C:312:GLY:HA2	1.86	0.56
1:D:247:GLU:OE1	1:D:294:HIS:HE1	1.88	0.56
1:C:322:ARG:H	1:C:322:ARG:NH1	1.99	0.56
1:D:122:GLY:O	1:D:123:ARG:HG2	2.06	0.56
1:A:241:ASN:HD21	1:D:228:LYS:NZ	2.03	0.56
1:B:67:SER:HB3	1:D:16:SER:HB3	1.87	0.56
1:C:116:ARG:HD3	1:C:310:ILE:HG21	1.88	0.56
1:C:54:ILE:O	1:C:55:THR:HG23	2.06	0.56
1:A:296:LYS:HD2	1:D:262:TYR:CE1	2.41	0.56
1:B:271:PHE:HD1	1:B:271:PHE:H	1.54	0.56
1:C:253:GLU:O	1:C:257:LEU:HD13	2.04	0.56
1:C:316:GLU:HG2	1:C:318:LEU:H	1.71	0.56
1:C:106:ASP:HA	1:C:118:PHE:CZ	2.41	0.56
1:C:19:ASP:HA	1:C:86:GLN:OE1	2.06	0.56
1:D:104:HIS:HB3	1:D:123:ARG:NH2	2.20	0.56
1:A:122:GLY:O	1:A:124:SER:N	2.39	0.56
1:B:99:LEU:HA	1:B:309:ASP:HA	1.88	0.56
1:C:124:SER:O	1:C:126:ALA:N	2.39	0.56
1:C:55:THR:H	1:C:56:PRO:HD3	1.71	0.56
1:A:20:VAL:HG22	1:A:84:HIS:ND1	2.21	0.55
1:B:322:ARG:HD3	1:B:322:ARG:N	2.21	0.55
1:C:172:LYS:H	1:C:172:LYS:HD3	1.69	0.55
1:C:99:LEU:O	1:C:99:LEU:HD12	2.05	0.55
1:D:124:SER:HA	1:D:127:ARG:HD2	1.88	0.55
1:A:123:ARG:CG	1:A:124:SER:H	2.20	0.55
1:D:207:ARG:HG2	1:D:208:ALA:N	2.21	0.55
1:B:16:SER:HB3	1:D:67:SER:HB3	1.87	0.55
1:C:267:ASP:HB2	1:C:272:LEU:CD2	2.32	0.55
1:C:100:PHE:CE2	1:C:310:ILE:HA	2.42	0.55
1:C:250:LYS:HE3	1:C:253:GLU:HB3	1.88	0.54
1:D:21:ILE:HD12	1:D:22:GLY:H	1.71	0.54
1:B:263:ASN:HD21	1:C:299:PRO:HA	1.72	0.54
1:C:38:LEU:HD23	1:C:38:LEU:C	2.27	0.54
1:B:197:HIS:HB3	1:B:302:PHE:HB3	1.89	0.54
1:C:197:HIS:O	1:C:303:GLN:HG3	2.08	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:54:ILE:HG22	1:A:55:THR:H	1.72	0.54
1:C:58:LYS:N	1:C:58:LYS:HD3	2.21	0.54
1:D:106:ASP:H	1:D:123:ARG:HH22	1.56	0.54
1:C:320:LYS:HD2	1:C:320:LYS:H	1.72	0.53
1:C:95:ASN:HB2	1:C:319:LEU:HD23	1.90	0.53
1:D:105:ALA:H	1:D:123:ARG:CZ	2.20	0.53
1:A:75:THR:HA	1:C:115:ILE:CD1	2.38	0.53
1:B:105:ALA:HB3	1:B:123:ARG:NH2	2.23	0.53
1:B:54:ILE:HB	1:B:59:GLU:OE2	2.09	0.53
1:C:212:LYS:HD3	1:C:215:GLN:CG	2.36	0.53
1:C:250:LYS:HB3	1:C:254:SER:OG	2.08	0.53
1:C:320:LYS:HD2	1:C:320:LYS:N	2.24	0.53
1:C:322:ARG:HB2	1:C:322:ARG:HH11	1.74	0.53
1:A:264:ASP:OD1	1:A:275:ARG:HD2	2.09	0.53
1:A:318:LEU:O	1:A:320:LYS:HD2	2.09	0.53
1:C:104:HIS:HB3	1:C:123:ARG:HH21	1.74	0.53
1:C:151:GLU:OE1	1:C:209:ARG:NH1	2.42	0.53
1:C:307:THR:CG2	1:C:308:ILE:H	2.08	0.53
1:D:105:ALA:N	1:D:123:ARG:NH2	2.55	0.53
1:B:206:ILE:HD12	1:B:206:ILE:N	2.25	0.52
1:D:300:SER:H	2:D:4400:FMN:HM82	1.74	0.52
1:D:97:LYS:HB2	1:D:97:LYS:NZ	2.24	0.52
1:A:330:ARG:CB	1:A:330:ARG:HH21	2.22	0.52
1:C:101:ARG:HD2	1:C:319:LEU:HD11	1.90	0.52
1:D:106:ASP:N	1:D:123:ARG:HH22	2.08	0.52
1:D:169:HIS:NE2	1:D:180:GLU:HB3	2.24	0.52
1:D:206:ILE:N	1:D:206:ILE:HD12	2.24	0.52
1:D:54:ILE:HG22	1:D:58:LYS:HD2	1.92	0.52
1:B:169:HIS:HE1	1:B:183:GLU:OE2	1.92	0.52
1:D:302:PHE:CE2	1:D:318:LEU:HD11	2.41	0.52
1:C:187:LYS:O	1:C:191:GLN:HG3	2.09	0.52
1:C:265:LEU:HD22	1:C:265:LEU:N	2.25	0.52
1:D:58:LYS:HG3	1:D:59:GLU:HG2	1.91	0.52
1:B:151:GLU:OE1	1:B:209:ARG:NH1	2.41	0.52
1:D:174:GLU:H	1:D:174:GLU:CD	2.14	0.52
1:B:123:ARG:HE	1:B:124:SER:H	1.58	0.51
1:D:250:LYS:HB3	1:D:254:SER:OG	2.10	0.51
1:C:48:GLY:HA2	1:C:52:VAL:HG21	1.93	0.51
1:D:169:HIS:HE1	1:D:183:GLU:OE2	1.93	0.51
1:B:101:ARG:NH1	1:B:106:ASP:OD2	2.43	0.51
1:B:20:VAL:HG22	1:B:84:HIS:ND1	2.25	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:233:ILE:O	1:C:237:MET:HG2	2.10	0.51
1:A:48:GLY:O	1:A:49:GLY:C	2.48	0.51
1:A:97:LYS:NZ	1:A:97:LYS:HB2	2.26	0.51
1:D:322:ARG:N	1:D:322:ARG:HD3	2.26	0.51
1:A:169:HIS:HE1	1:A:183:GLU:OE2	1.94	0.51
1:C:183:GLU:HG2	1:C:187:LYS:HE3	1.92	0.50
1:C:50:ARG:NH2	1:C:323:HIS:HA	2.26	0.50
1:C:147:GLY:HA2	1:C:211:ILE:HD12	1.92	0.50
1:B:183:GLU:CG	1:B:187:LYS:HE3	2.40	0.50
1:C:169:HIS:HA	1:C:172:LYS:HZ2	1.76	0.50
1:A:241:ASN:ND2	1:D:228:LYS:HZ3	2.08	0.50
1:A:162:ALA:HB1	1:A:179:ASP:HB2	1.93	0.50
1:B:98:ASN:O	1:B:310:ILE:HG13	2.10	0.50
1:B:267:ASP:OD2	1:B:268:GLN:HG3	2.11	0.50
1:C:162:ALA:HB1	1:C:179:ASP:HB2	1.92	0.50
1:B:162:ALA:HB1	1:B:179:ASP:HB2	1.94	0.50
1:B:250:LYS:HE2	1:B:257:LEU:HD21	1.94	0.50
1:A:128:GLU:HG3	1:D:225:LEU:CD1	2.40	0.50
1:B:9:ARG:HD2	3:B:2423:HOH:O	2.11	0.50
1:D:105:ALA:H	1:D:123:ARG:NH2	2.10	0.50
1:A:304:PRO:HB3	1:A:316:GLU:OE1	2.11	0.50
1:B:258:LYS:HG2	1:C:200:ILE:HG22	1.93	0.50
3:B:2470:HOH:O	1:D:115:ILE:HD11	2.12	0.50
1:C:52:VAL:HB	1:C:56:PRO:CB	2.42	0.49
1:D:211:ILE:O	1:D:211:ILE:HG22	2.12	0.49
1:A:320:LYS:HD2	1:A:320:LYS:N	2.28	0.49
1:C:156:GLU:OE1	1:C:161:LYS:HG2	2.12	0.49
1:A:9:ARG:HD2	3:A:1447:HOH:O	2.12	0.49
1:A:67:SER:HB3	1:C:16:SER:HB3	1.94	0.49
1:C:100:PHE:CD1	1:C:106:ASP:HB3	2.47	0.49
1:D:123:ARG:NH2	3:D:4478:HOH:O	2.45	0.49
1:D:116:ARG:N	1:D:116:ARG:HD2	2.27	0.49
1:D:169:HIS:CE1	1:D:172:LYS:HE3	2.48	0.49
1:B:54:ILE:HG22	1:B:55:THR:N	2.27	0.49
1:B:47:GLN:HE22	1:B:60:ASP:HB2	1.78	0.49
1:D:104:HIS:CE1	1:D:299:PRO:HB2	2.47	0.49
1:C:100:PHE:HB3	1:C:106:ASP:HB2	1.95	0.49
1:D:296:LYS:HE3	1:D:299:PRO:HG3	1.95	0.49
1:B:172:LYS:H	1:B:172:LYS:HD3	1.77	0.49
1:B:262:TYR:HD1	1:B:263:ASN:N	2.11	0.49
1:C:54:ILE:O	1:C:55:THR:OG1	2.27	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:16:SER:HB3	1:C:67:SER:HB3	1.95	0.48
1:B:115:ILE:HD12	1:D:74:SER:O	2.12	0.48
1:B:101:ARG:HD2	1:B:319:LEU:HD21	1.94	0.48
1:B:241:ASN:CG	2:B:2400:FMN:H3'	2.34	0.48
1:D:187:LYS:O	1:D:191:GLN:HG3	2.13	0.48
1:B:169:HIS:O	1:B:172:LYS:HD3	2.13	0.48
1:C:117:ASP:CG	1:C:118:PHE:N	2.64	0.48
1:C:104:HIS:HD2	1:C:123:ARG:HE	1.61	0.48
1:A:262:TYR:CE1	1:D:296:LYS:HD2	2.48	0.48
1:D:9:ARG:HD2	3:D:4468:HOH:O	2.12	0.48
1:C:247:GLU:OE1	1:C:294:HIS:HE1	1.96	0.48
1:C:100:PHE:CE1	1:C:310:ILE:HG12	2.48	0.48
1:A:314:GLU:HG3	1:D:268:GLN:HG3	1.95	0.48
1:B:142:LEU:C	1:B:142:LEU:HD23	2.34	0.48
1:C:142:LEU:C	1:C:142:LEU:HD23	2.34	0.48
1:A:169:HIS:NE2	1:A:172:LYS:HE3	2.29	0.48
1:D:87:ARG:HB2	1:D:88:ALA:H	1.47	0.48
1:A:21:ILE:HG23	1:A:83:ILE:HB	1.96	0.48
1:A:46:ARG:NH1	1:A:330:ARG:HH12	2.11	0.47
1:D:320:LYS:H	1:D:320:LYS:HD2	1.79	0.47
1:D:124:SER:O	1:D:126:ALA:N	2.46	0.47
1:C:200:ILE:HD12	1:C:200:ILE:O	2.14	0.47
1:C:48:GLY:HA2	1:C:52:VAL:CG2	2.44	0.47
1:A:241:ASN:HD21	1:D:228:LYS:HZ1	1.61	0.47
1:D:322:ARG:HD3	1:D:322:ARG:H	1.78	0.47
1:D:360:THR:HG23	1:D:364:GLU:OE1	2.14	0.47
1:C:213:THR:O	1:C:214:ASN:HB2	2.14	0.47
1:C:322:ARG:CB	1:C:322:ARG:HH11	2.28	0.47
1:B:299:PRO:HD2	2:B:2400:FMN:H9	1.96	0.47
1:C:304:PRO:HG3	1:C:318:LEU:CD2	2.45	0.47
1:C:302:PHE:CE2	1:C:320:LYS:HA	2.49	0.47
1:C:100:PHE:HD1	1:C:106:ASP:HB3	1.79	0.47
1:C:305:GLN:O	1:C:317:CYS:HB3	2.15	0.47
1:D:97:LYS:HA	3:D:4500:HOH:O	2.13	0.47
1:D:154:ILE:HG21	1:D:157:ILE:HD11	1.97	0.47
1:C:123:ARG:O	1:C:124:SER:HB2	2.15	0.47
1:C:104:HIS:CD2	1:C:123:ARG:HE	2.33	0.47
1:B:157:ILE:HD12	1:B:175:ILE:HD12	1.96	0.47
1:D:170:ALA:HB2	1:D:178:LEU:HD23	1.97	0.47
1:B:207:ARG:HA	1:B:289:ILE:O	2.15	0.46
1:A:322:ARG:N	1:A:322:ARG:HD3	2.31	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:58:LYS:N	1:C:58:LYS:CD	2.79	0.46
1:C:38:LEU:HD22	1:C:137:ALA:HB1	1.96	0.46
1:B:110:PHE:O	1:B:114:GLY:HA2	2.15	0.46
1:B:104:HIS:CD2	1:B:123:ARG:HD2	2.46	0.46
1:B:241:ASN:ND2	2:B:2400:FMN:H3'	2.30	0.46
1:D:241:ASN:HB3	2:D:4400:FMN:H3'	1.98	0.46
1:B:247:GLU:OE1	1:B:294:HIS:CE1	2.66	0.46
1:B:258:LYS:NZ	1:B:261:GLU:OE1	2.48	0.46
1:B:330:ARG:NH2	1:B:330:ARG:HB3	2.31	0.46
1:B:265:LEU:HD23	1:C:306:ARG:HB2	1.97	0.46
1:D:91:LYS:HB2	1:D:92:ASP:H	1.57	0.46
1:B:101:ARG:NH1	1:B:101:ARG:HG3	2.29	0.45
1:C:206:ILE:N	1:C:206:ILE:HD12	2.30	0.45
1:D:123:ARG:NH1	2:D:4400:FMN:O4'	2.50	0.45
1:B:101:ARG:HD2	1:B:319:LEU:HD11	1.98	0.45
1:C:54:ILE:O	1:C:54:ILE:HG22	2.15	0.45
1:D:116:ARG:HG2	1:D:310:ILE:HD13	1.97	0.45
1:B:112:LYS:HZ3	1:C:223:GLN:NE2	2.15	0.45
1:D:265:LEU:HB2	1:D:272:LEU:HD12	1.97	0.45
1:D:99:LEU:HA	1:D:309:ASP:HA	1.97	0.45
1:B:320:LYS:HD2	1:B:320:LYS:N	2.30	0.45
1:B:233:ILE:O	1:B:237:MET:HG2	2.17	0.45
1:B:104:HIS:CE1	1:B:300:SER:HG	2.35	0.45
1:B:85:ASN:O	1:B:86:GLN:HB2	2.17	0.45
1:C:318:LEU:HD12	1:C:320:LYS:CE	2.47	0.45
1:D:267:ASP:HA	3:D:4515:HOH:O	2.15	0.45
1:D:318:LEU:O	1:D:320:LYS:HD2	2.16	0.45
1:C:102:PRO:HG3	1:C:307:THR:HG22	1.98	0.45
1:B:9:ARG:NH1	1:D:2:ASN:OD1	2.49	0.45
1:A:318:LEU:HD13	1:A:318:LEU:C	2.37	0.45
1:A:9:ARG:NH1	1:C:2:ASN:OD1	2.49	0.45
1:B:101:ARG:O	1:B:104:HIS:HB2	2.17	0.44
1:B:170:ALA:HB2	1:B:178:LEU:HD23	1.99	0.44
1:B:212:LYS:HB2	1:B:215:GLN:CB	2.47	0.44
1:B:215:GLN:OE1	1:B:216:LYS:N	2.50	0.44
1:C:102:PRO:N	1:C:307:THR:HG21	2.32	0.44
1:C:93:TYR:HA	1:C:320:LYS:O	2.17	0.44
1:A:99:LEU:HA	1:A:309:ASP:HA	1.99	0.44
1:D:147:GLY:HA3	1:D:212:LYS:HD3	1.98	0.44
1:B:105:ALA:HB2	1:C:281:GLY:HA3	1.99	0.44
1:D:247:GLU:OE2	1:D:252:VAL:HG22	2.17	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:151:GLU:OE2	1:A:207:ARG:NH1	2.39	0.44
1:D:61:ASP:O	1:D:62:LYS:HB2	2.18	0.44
1:C:127:ARG:HG2	1:C:127:ARG:NH1	2.32	0.44
1:D:38:LEU:HD22	1:D:42:GLU:HG2	1.99	0.44
1:A:101:ARG:NH1	1:A:106:ASP:OD2	2.50	0.44
1:B:47:GLN:HE22	1:B:60:ASP:CB	2.30	0.44
1:B:101:ARG:NH1	1:B:118:PHE:CZ	2.85	0.44
1:C:117:ASP:O	1:C:118:PHE:HB2	2.17	0.44
1:B:112:LYS:NZ	1:C:223:GLN:NE2	2.66	0.44
1:A:296:LYS:HE3	1:A:299:PRO:HG3	1.99	0.44
1:B:262:TYR:CD1	1:B:263:ASN:N	2.86	0.43
1:C:169:HIS:HA	1:C:172:LYS:CE	2.47	0.43
1:C:207:ARG:HA	1:C:289:ILE:O	2.18	0.43
1:B:263:ASN:ND2	1:C:299:PRO:HA	2.33	0.43
1:D:123:ARG:CG	1:D:124:SER:N	2.81	0.43
2:D:4400:FMN:H2'	2:D:4400:FMN:H9	2.00	0.43
1:D:54:ILE:CG2	1:D:58:LYS:HD2	2.48	0.43
1:C:102:PRO:HA	1:C:307:THR:HB	2.00	0.43
1:B:330:ARG:CB	1:B:330:ARG:HH21	2.32	0.43
1:A:125:SER:O	1:A:126:ALA:C	2.57	0.43
1:A:123:ARG:HG3	1:A:124:SER:N	2.27	0.43
1:B:272:LEU:HD23	1:B:272:LEU:N	2.33	0.43
1:C:77:THR:HB	1:C:78:PRO:CD	2.49	0.43
1:D:172:LYS:NZ	1:D:173:SER:HA	2.34	0.43
1:A:59:GLU:OE1	1:A:59:GLU:HA	2.18	0.43
1:B:169:HIS:CD2	1:B:180:GLU:HB3	2.53	0.43
1:C:127:ARG:HG2	1:C:127:ARG:HH11	1.84	0.43
1:C:308:ILE:HG12	1:C:309:ASP:H	1.84	0.43
1:A:235:GLU:HB2	1:D:235:GLU:HB2	2.00	0.43
1:B:261:GLU:O	1:B:275:ARG:NH1	2.52	0.43
1:C:265:LEU:HD22	1:C:265:LEU:H	1.84	0.43
2:B:2400:FMN:P	1:C:281:GLY:H	2.41	0.43
1:D:106:ASP:H	1:D:123:ARG:NH2	2.17	0.43
1:D:221:LEU:O	1:D:283:MET:HA	2.18	0.43
1:D:318:LEU:HD12	1:D:320:LYS:CE	2.38	0.43
1:D:300:SER:H	2:D:4400:FMN:C8M	2.30	0.43
1:B:129:SER:O	1:B:133:VAL:HG23	2.19	0.43
1:C:47:GLN:HE22	1:C:60:ASP:CB	2.31	0.43
1:B:262:TYR:O	1:B:263:ASN:O	2.37	0.42
1:A:240:LEU:HD22	2:A:1400:FMN:O2	2.18	0.42
1:A:45:ARG:HH22	1:A:336:GLU:CD	2.22	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:172:LYS:H	1:C:172:LYS:CD	2.32	0.42
1:A:124:SER:O	1:A:126:ALA:N	2.53	0.42
1:A:142:LEU:C	1:A:142:LEU:HD23	2.39	0.42
1:B:117:ASP:OD1	1:B:118:PHE:N	2.52	0.42
1:D:21:ILE:CG2	1:D:83:ILE:HB	2.47	0.42
1:C:110:PHE:O	1:C:114:GLY:N	2.52	0.42
1:D:299:PRO:HG2	2:D:4400:FMN:H4'	2.02	0.42
1:C:21:ILE:HG23	1:C:83:ILE:HB	2.02	0.42
1:D:233:ILE:O	1:D:237:MET:HG2	2.20	0.42
1:B:300:SER:H	2:B:2400:FMN:C8M	2.32	0.42
1:C:169:HIS:HE1	1:C:183:GLU:OE2	2.02	0.42
1:C:320:LYS:CD	1:C:320:LYS:H	2.32	0.42
1:D:106:ASP:OD1	1:D:123:ARG:NH2	2.50	0.42
1:D:35:ASP:CG	1:D:38:LEU:HB2	2.40	0.42
1:B:117:ASP:O	1:B:118:PHE:O	2.38	0.42
1:B:123:ARG:HG3	1:B:124:SER:N	2.34	0.42
1:B:125:SER:O	1:B:126:ALA:HB3	2.19	0.42
1:C:59:GLU:HG2	1:C:59:GLU:O	2.20	0.42
1:C:47:GLN:HE22	1:C:60:ASP:CG	2.23	0.42
1:D:19:ASP:HB2	1:D:85:ASN:O	2.20	0.42
1:A:4:LEU:HB2	1:D:226:TYR:CD1	2.54	0.42
1:D:322:ARG:HB2	1:D:322:ARG:CZ	2.49	0.42
1:D:190:ILE:HD11	1:D:329:ILE:HD11	2.02	0.42
1:C:317:CYS:O	1:C:317:CYS:SG	2.77	0.42
1:A:170:ALA:O	1:A:176:PHE:HA	2.20	0.42
1:A:47:GLN:HE22	1:A:60:ASP:CB	2.32	0.42
1:A:101:ARG:NH2	1:A:123:ARG:HE	2.18	0.42
1:B:265:LEU:N	1:B:265:LEU:HD12	2.35	0.42
1:B:250:LYS:HE3	1:B:253:GLU:HB3	2.02	0.41
1:D:106:ASP:N	1:D:123:ARG:NH2	2.68	0.41
1:A:96:ILE:O	1:A:99:LEU:HG	2.19	0.41
1:D:43:MET:O	1:D:46:ARG:HG2	2.19	0.41
1:A:225:LEU:HD13	1:D:128:GLU:CG	2.48	0.41
1:A:21:ILE:CG2	1:A:83:ILE:HB	2.50	0.41
1:C:240:LEU:HD22	2:C:3400:FMN:O2	2.19	0.41
1:D:197:HIS:HB3	1:D:302:PHE:HB3	2.03	0.41
1:A:169:HIS:CE1	1:A:172:LYS:HE3	2.56	0.41
1:B:39:LEU:O	1:B:43:MET:HG2	2.20	0.41
1:C:20:VAL:HG22	1:C:84:HIS:ND1	2.35	0.41
1:C:99:LEU:HA	1:C:309:ASP:HA	2.01	0.41
1:C:361:ILE:HD12	1:D:351:LEU:HD22	2.02	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:169:HIS:CG	1:A:172:LYS:HE3	2.56	0.41
1:C:54:ILE:O	1:C:55:THR:CB	2.67	0.41
1:A:54:ILE:CG2	1:A:55:THR:N	2.82	0.41
1:C:53:PHE:O	1:C:54:ILE:C	2.58	0.41
1:B:104:HIS:HB3	1:B:123:ARG:NH1	2.34	0.41
1:B:208:ALA:HB3	1:B:289:ILE:HB	2.02	0.41
1:B:322:ARG:N	1:B:322:ARG:CD	2.84	0.41
1:B:169:HIS:NE2	1:B:180:GLU:HB3	2.36	0.41
1:C:300:SER:HB3	2:C:3400:FMN:C8M	2.51	0.41
1:C:97:LYS:HB2	1:C:97:LYS:HZ2	1.85	0.41
1:B:123:ARG:CG	1:B:124:SER:N	2.84	0.41
1:A:233:ILE:O	1:A:237:MET:HG2	2.20	0.41
1:A:247:GLU:OE1	1:A:294:HIS:CE1	2.71	0.41
1:B:250:LYS:HE3	1:B:253:GLU:CB	2.51	0.41
1:C:57:ARG:HG3	1:C:57:ARG:HH11	1.86	0.41
1:C:50:ARG:HH12	2:C:3400:FMN:HM72	1.86	0.40
1:D:288:GLU:HG3	3:D:4520:HOH:O	2.20	0.40
1:A:175:ILE:HG21	1:A:190:ILE:HD12	2.04	0.40
1:A:362:TYR:CE2	1:B:347:VAL:HG13	2.56	0.40
1:A:65:ILE:HD13	1:A:65:ILE:HG21	1.88	0.40
1:B:77:THR:HB	1:B:78:PRO:CD	2.52	0.40
1:C:360:THR:HG23	1:C:364:GLU:OE1	2.21	0.40
1:B:330:ARG:HH21	1:B:330:ARG:HB3	1.86	0.40
1:C:38:LEU:HD23	1:C:38:LEU:O	2.20	0.40
1:C:60:ASP:O	1:C:62:LYS:HD2	2.22	0.40
1:A:116:ARG:HH11	1:A:116:ARG:HG3	1.85	0.40
1:B:247:GLU:HB2	1:B:292:ARG:HB2	2.04	0.40
1:C:318:LEU:O	1:C:320:LYS:HD2	2.21	0.40
1:C:53:PHE:N	1:C:53:PHE:CD1	2.89	0.40

All (5) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:71:GLU:OE1	1:D:89:ARG:NE[6_555]	1.85	0.35
1:B:272:LEU:CD2	1:B:272:LEU:CD2[2_655]	1.87	0.33
1:C:71:GLU:CB	1:D:89:ARG:NH2[6_555]	1.91	0.29
1:C:316:GLU:OE1	1:C:316:GLU:OE1[2_655]	1.98	0.22
1:C:71:GLU:OE1	1:D:89:ARG:CZ[6_555]	2.09	0.11

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	363/365 (100%)	327 (90%)	25 (7%)	11 (3%)	4	0
1	B	363/365 (100%)	323 (89%)	29 (8%)	11 (3%)	4	0
1	C	363/365 (100%)	321 (88%)	32 (9%)	10 (3%)	5	1
1	D	363/365 (100%)	336 (93%)	18 (5%)	9 (2%)	5	1
All	All	1452/1460 (100%)	1307 (90%)	104 (7%)	41 (3%)	5	1

All (41) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	57	ARG
1	A	95	ASN
1	A	116	ARG
1	A	123	ARG
1	A	125	SER
1	B	61	ASP
1	B	95	ASN
1	B	118	PHE
1	B	125	SER
1	B	262	TYR
1	B	263	ASN
1	B	271	PHE
1	C	54	ILE
1	C	55	THR
1	C	124	SER
1	C	125	SER
1	C	307	THR
1	D	124	SER
1	A	49	GLY
1	A	52	VAL
1	B	124	SER
1	C	61	ASP

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Mol	Chain	Res	Type
1	D	56	PRO
1	D	92	ASP
1	D	118	PHE
1	D	125	SER
1	B	88	ALA
1	A	87	ARG
1	A	89	ARG
1	A	97	LYS
1	A	117	ASP
1	C	119	ARG
1	D	86	GLN
1	D	89	ARG
1	B	86	GLN
1	B	267	ASP
1	D	91	LYS
1	C	299	PRO
1	C	48	GLY
1	C	52	VAL
1	D	96	ILE

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	300/300 (100%)	290 (97%)	10 (3%)	38	26
1	B	300/300 (100%)	290 (97%)	10 (3%)	38	26
1	C	300/300 (100%)	290 (97%)	10 (3%)	38	26
1	D	300/300 (100%)	288 (96%)	12 (4%)	31	19
All	All	1200/1200 (100%)	1158 (96%)	42 (4%)	36	24

All (42) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	53	PHE
1	A	61	ASP

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Mol	Chain	Res	Type
1	A	89	ARG
1	A	93	TYR
1	A	103	SER
1	A	168	ASN
1	A	172	LYS
1	A	214	ASN
1	A	240	LEU
1	A	322	ARG
1	B	87	ARG
1	B	89	ARG
1	B	119	ARG
1	B	172	LYS
1	B	215	GLN
1	B	240	LEU
1	B	241	ASN
1	B	302	PHE
1	B	322	ARG
1	B	343	LEU
1	C	58	LYS
1	C	87	ARG
1	C	89	ARG
1	C	172	LYS
1	C	215	GLN
1	C	240	LEU
1	C	241	ASN
1	C	302	PHE
1	C	322	ARG
1	C	343	LEU
1	D	38	LEU
1	D	87	ARG
1	D	89	ARG
1	D	91	LYS
1	D	103	SER
1	D	118	PHE
1	D	123	ARG
1	D	168	ASN
1	D	172	LYS
1	D	215	GLN
1	D	240	LEU
1	D	322	ARG

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (52) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	47	GLN
1	A	85	ASN
1	A	104	HIS
1	A	111	HIS
1	A	168	ASN
1	A	169	HIS
1	A	186	GLN
1	A	191	GLN
1	A	214	ASN
1	A	215	GLN
1	A	223	GLN
1	A	241	ASN
1	A	294	HIS
1	A	313	ASN
1	B	47	GLN
1	B	51	ASN
1	B	111	HIS
1	B	168	ASN
1	B	186	GLN
1	B	191	GLN
1	B	196	ASN
1	B	214	ASN
1	B	223	GLN
1	B	241	ASN
1	B	263	ASN
1	B	294	HIS
1	B	313	ASN
1	C	47	GLN
1	C	51	ASN
1	C	168	ASN
1	C	169	HIS
1	C	186	GLN
1	C	191	GLN
1	C	192	ASN
1	C	214	ASN
1	C	223	GLN
1	C	241	ASN
1	C	294	HIS
1	C	303	GLN
1	C	305	GLN
1	C	313	ASN
1	C	323	HIS
1	D	85	ASN

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Mol	Chain	Res	Type
1	D	104	HIS
1	D	111	HIS
1	D	168	ASN
1	D	186	GLN
1	D	191	GLN
1	D	215	GLN
1	D	223	GLN
1	D	241	ASN
1	D	294	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 carbohydrates in this entry.

5.6 Ligand geometry ⓘ

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	B	2400	-	31,33,33	2.84	13 (41%)	40,50,50	2.97	13 (32%)
2	FMN	D	4400	-	31,33,33	2.81	12 (38%)	40,50,50	3.01	13 (32%)
2	FMN	C	3400	-	31,33,33	2.80	12 (38%)	40,50,50	2.92	14 (35%)
2	FMN	A	1400	-	31,33,33	2.82	11 (35%)	40,50,50	3.04	14 (35%)

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	2400	-	-	4/18/18/18	0/3/3/3
2	FMN	D	4400	-	-	15/18/18/18	0/3/3/3
2	FMN	C	3400	-	-	6/18/18/18	0/3/3/3
2	FMN	A	1400	-	-	4/18/18/18	0/3/3/3

All (48) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	1400	FMN	C4A-C10	9.91	1.48	1.38
2	D	4400	FMN	C4A-C10	9.76	1.48	1.38
2	B	2400	FMN	C4A-C10	9.74	1.48	1.38
2	C	3400	FMN	C4A-C10	9.71	1.48	1.38
2	C	3400	FMN	C4-N3	6.38	1.44	1.33
2	A	1400	FMN	C4-N3	6.24	1.43	1.33
2	B	2400	FMN	C4-N3	6.22	1.43	1.33
2	D	4400	FMN	C4-N3	6.22	1.43	1.33
2	D	4400	FMN	C1'-N10	5.10	1.53	1.48
2	A	1400	FMN	C1'-N10	5.07	1.53	1.48
2	B	2400	FMN	C1'-N10	4.52	1.52	1.48
2	C	3400	FMN	C9A-N10	-3.73	1.33	1.38
2	C	3400	FMN	C10-N1	3.72	1.38	1.33
2	B	2400	FMN	C10-N1	3.51	1.37	1.33
2	D	4400	FMN	C10-N1	3.47	1.37	1.33
2	B	2400	FMN	C5'-C4'	3.39	1.56	1.51
2	C	3400	FMN	C1'-N10	3.28	1.51	1.48
2	B	2400	FMN	C9A-N10	-3.19	1.34	1.38
2	A	1400	FMN	C10-N1	3.12	1.37	1.33
2	C	3400	FMN	C4-C4A	3.08	1.46	1.41
2	D	4400	FMN	C9A-N10	-2.97	1.34	1.38
2	A	1400	FMN	C9A-N10	-2.95	1.34	1.38
2	D	4400	FMN	C4-C4A	2.93	1.46	1.41
2	B	2400	FMN	C4-C4A	2.93	1.46	1.41
2	C	3400	FMN	C4A-N5	2.92	1.37	1.33
2	B	2400	FMN	C4A-N5	2.87	1.37	1.33
2	A	1400	FMN	C4-C4A	2.82	1.46	1.41
2	A	1400	FMN	C8-C7	2.69	1.47	1.40
2	A	1400	FMN	C5'-C4'	2.66	1.55	1.51
2	B	2400	FMN	C8-C7	2.64	1.47	1.40

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	D	4400	FMN	C8-C7	2.62	1.47	1.40
2	C	3400	FMN	C8-C7	2.61	1.47	1.40
2	D	4400	FMN	C4A-N5	2.49	1.36	1.33
2	C	3400	FMN	C5'-C4'	2.44	1.55	1.51
2	A	1400	FMN	C4A-N5	2.43	1.36	1.33
2	A	1400	FMN	C9A-C5A	2.32	1.47	1.42
2	C	3400	FMN	C6-C7	2.26	1.43	1.37
2	D	4400	FMN	C2'-C3'	2.25	1.57	1.53
2	D	4400	FMN	C2-N3	2.25	1.42	1.38
2	D	4400	FMN	C9A-C5A	2.24	1.47	1.42
2	C	3400	FMN	C2-N3	2.23	1.42	1.38
2	B	2400	FMN	C6-C7	2.18	1.43	1.37
2	C	3400	FMN	P-O3P	2.14	1.63	1.54
2	B	2400	FMN	C9A-C5A	2.11	1.46	1.42
2	A	1400	FMN	C2-N3	2.10	1.42	1.38
2	B	2400	FMN	C2-N3	2.07	1.42	1.38
2	D	4400	FMN	C6-C7	2.05	1.42	1.37
2	B	2400	FMN	C2'-C3'	2.03	1.57	1.53

All (54) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	C	3400	FMN	C4-N3-C2	10.98	124.41	115.14
2	B	2400	FMN	C4-N3-C2	10.83	124.29	115.14
2	A	1400	FMN	C4-N3-C2	10.77	124.24	115.14
2	D	4400	FMN	C4-N3-C2	10.73	124.20	115.14
2	A	1400	FMN	C1'-N10-C9A	7.23	123.98	118.29
2	D	4400	FMN	C1'-N10-C9A	7.03	123.83	118.29
2	B	2400	FMN	C5A-C9A-N10	6.96	122.76	117.72
2	A	1400	FMN	C5A-C9A-N10	6.81	122.65	117.72
2	D	4400	FMN	C5A-C9A-N10	6.66	122.55	117.72
2	C	3400	FMN	C5A-C9A-N10	6.39	122.35	117.72
2	B	2400	FMN	C1'-N10-C9A	6.28	123.23	118.29
2	C	3400	FMN	C4A-C4-N3	-6.24	114.90	123.43
2	A	1400	FMN	C4A-C4-N3	-6.17	115.00	123.43
2	D	4400	FMN	C4A-C4-N3	-6.16	115.01	123.43
2	B	2400	FMN	C4A-C4-N3	-6.08	115.12	123.43
2	C	3400	FMN	C1'-N10-C9A	5.49	122.62	118.29
2	C	3400	FMN	C4A-C10-N10	-4.20	115.98	120.30
2	D	4400	FMN	C4A-N5-C5A	3.96	120.73	116.77
2	B	2400	FMN	C4A-N5-C5A	3.79	120.56	116.77
2	B	2400	FMN	C4A-C10-N10	-3.74	116.45	120.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	1400	FMN	C6-C5A-C9A	3.71	123.91	119.05
2	C	3400	FMN	C9A-C5A-N5	-3.70	116.57	122.36
2	A	1400	FMN	C4A-N5-C5A	3.68	120.45	116.77
2	D	4400	FMN	C6-C5A-C9A	3.65	123.83	119.05
2	D	4400	FMN	C4A-C10-N10	-3.58	116.62	120.30
2	B	2400	FMN	C9A-C5A-N5	-3.56	116.80	122.36
2	C	3400	FMN	C4A-N5-C5A	3.55	120.32	116.77
2	A	1400	FMN	C4A-C10-N10	-3.52	116.69	120.30
2	A	1400	FMN	C9A-C5A-N5	-3.51	116.86	122.36
2	D	4400	FMN	C9A-C5A-N5	-3.50	116.89	122.36
2	B	2400	FMN	C6-C5A-C9A	3.49	123.62	119.05
2	C	3400	FMN	C6-C5A-C9A	3.41	123.53	119.05
2	D	4400	FMN	C1'-N10-C10	-3.24	115.50	118.41
2	A	1400	FMN	C1'-N10-C10	-3.23	115.51	118.41
2	B	2400	FMN	C1'-N10-C10	-2.74	115.96	118.41
2	D	4400	FMN	O4'-C4'-C3'	2.73	115.73	109.10
2	C	3400	FMN	O4'-C4'-C3'	2.63	115.49	109.10
2	A	1400	FMN	O4'-C4'-C3'	2.61	115.44	109.10
2	D	4400	FMN	C9-C9A-C5A	-2.51	115.59	119.88
2	B	2400	FMN	C8M-C8-C9	-2.44	114.51	120.34
2	B	2400	FMN	O4'-C4'-C3'	2.43	115.01	109.10
2	A	1400	FMN	C9-C9A-C5A	-2.43	115.73	119.88
2	B	2400	FMN	C4-C4A-C10	-2.41	118.35	119.95
2	A	1400	FMN	C8M-C8-C9	-2.41	114.58	120.34
2	B	2400	FMN	C9-C9A-C5A	-2.35	115.86	119.88
2	A	1400	FMN	C4-C4A-C10	-2.34	118.40	119.95
2	C	3400	FMN	C4-C4A-C10	-2.33	118.41	119.95
2	D	4400	FMN	C8M-C8-C9	-2.30	114.84	120.34
2	A	1400	FMN	O3P-P-O5'	-2.16	100.98	106.73
2	C	3400	FMN	C8M-C8-C9	-2.16	115.18	120.34
2	C	3400	FMN	C1'-N10-C10	-2.14	116.49	118.41
2	D	4400	FMN	C4-C4A-C10	-2.13	118.54	119.95
2	C	3400	FMN	C9-C9A-C5A	-2.12	116.26	119.88
2	C	3400	FMN	C4-C4A-N5	2.03	120.92	118.60

There are no chirality outliers.

All (29) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	B	2400	FMN	C3'-C4'-C5'-O5'
2	D	4400	FMN	C2'-C1'-N10-C10
2	D	4400	FMN	C1'-C2'-C3'-O3'

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Mol	Chain	Res	Type	Atoms
2	D	4400	FMN	C1'-C2'-C3'-C4'
2	D	4400	FMN	C2'-C3'-C4'-O4'
2	D	4400	FMN	O3'-C3'-C4'-O4'
2	D	4400	FMN	C3'-C4'-C5'-O5'
2	D	4400	FMN	O4'-C4'-C5'-O5'
2	D	4400	FMN	C5'-O5'-P-O2P
2	D	4400	FMN	C5'-O5'-P-O3P
2	C	3400	FMN	C3'-C4'-C5'-O5'
2	C	3400	FMN	O4'-C4'-C5'-O5'
2	C	3400	FMN	C5'-O5'-P-O1P
2	C	3400	FMN	C5'-O5'-P-O2P
2	C	3400	FMN	C5'-O5'-P-O3P
2	A	1400	FMN	C2'-C1'-N10-C10
2	A	1400	FMN	C5'-O5'-P-O2P
2	A	1400	FMN	C5'-O5'-P-O3P
2	D	4400	FMN	O2'-C2'-C3'-C4'
2	D	4400	FMN	O3'-C3'-C4'-C5'
2	D	4400	FMN	C2'-C3'-C4'-C5'
2	D	4400	FMN	O2'-C2'-C3'-O3'
2	D	4400	FMN	C5'-O5'-P-O1P
2	D	4400	FMN	C4'-C5'-O5'-P
2	A	1400	FMN	C5'-O5'-P-O1P
2	C	3400	FMN	C4'-C5'-O5'-P
2	B	2400	FMN	O2'-C2'-C3'-C4'
2	B	2400	FMN	C1'-C2'-C3'-O3'
2	B	2400	FMN	O3'-C3'-C4'-C5'

There are no ring outliers.

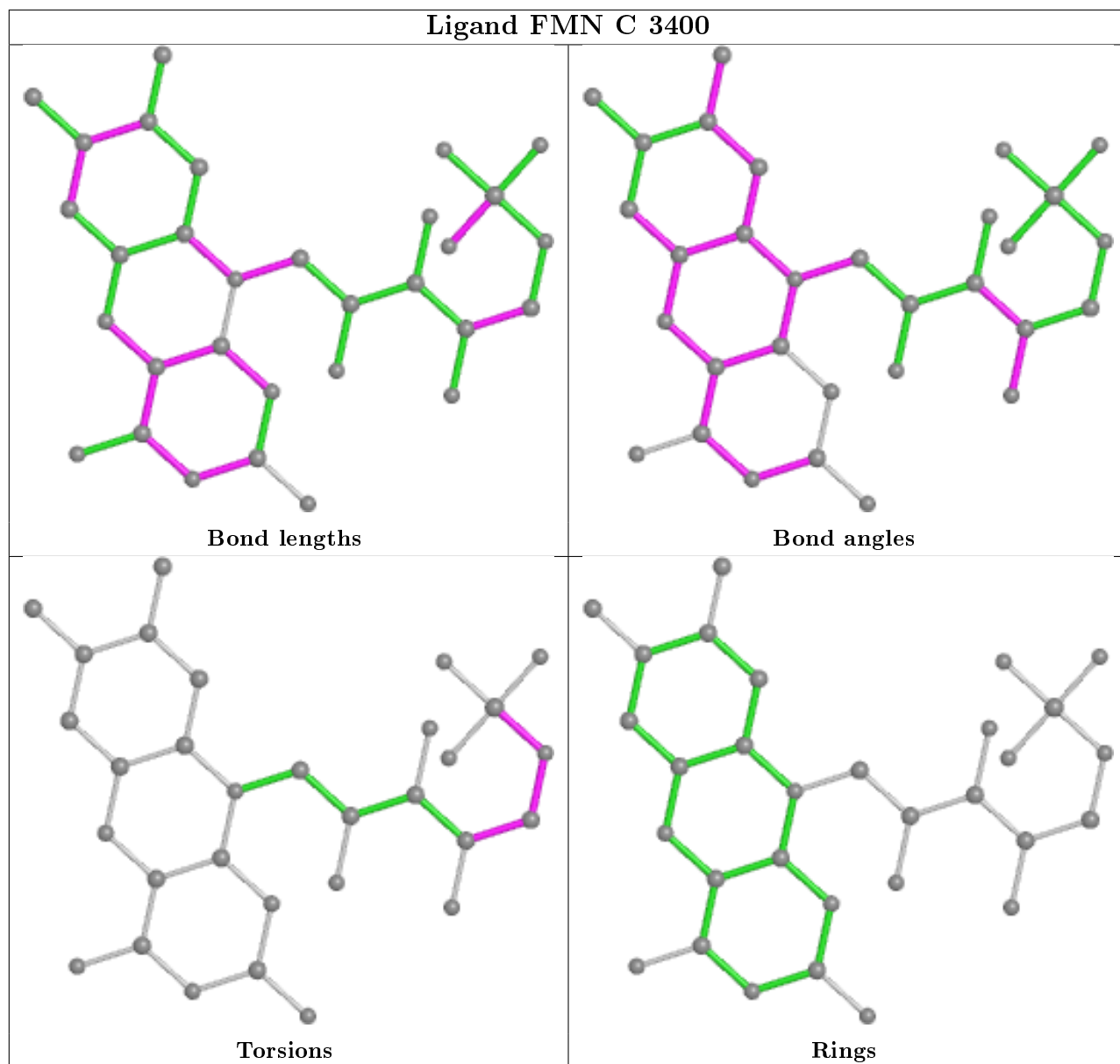4 monomers are involved in 20 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	B	2400	FMN	7	0
2	D	4400	FMN	6	0
2	C	3400	FMN	3	0
2	A	1400	FMN	4	0

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less then 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
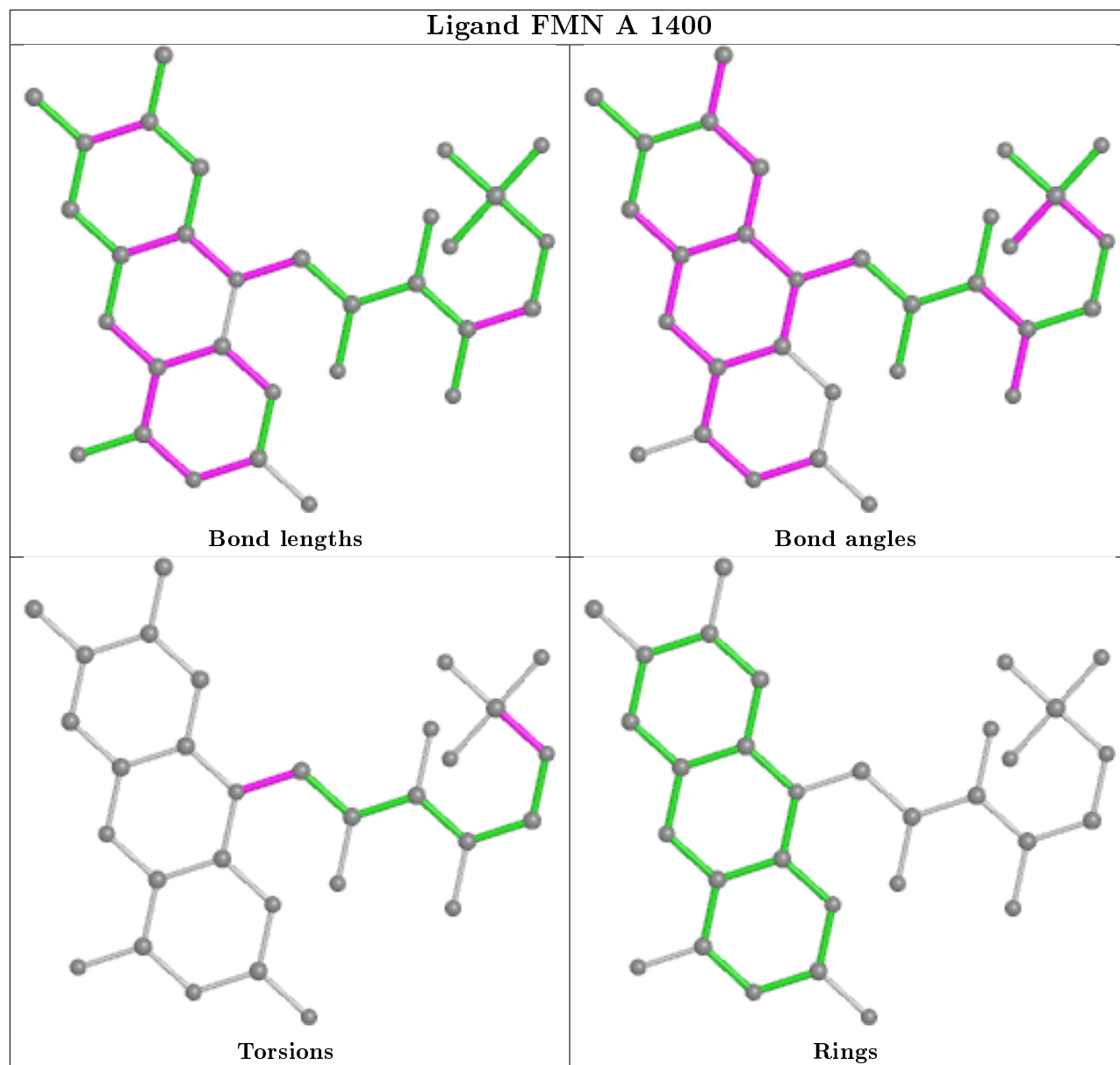
highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified 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.

Ligand FMN B 2400

Bond lengths

Bond angles

Torsions

Rings

Ligand FMN D 4400

Bond lengths

Bond angles

Torsions

Rings

Ligand FMN C 3400

Bond lengths

Bond angles

Torsions

Rings

Ligand FMN A 1400

Bond lengths

Bond angles

Torsions

Rings
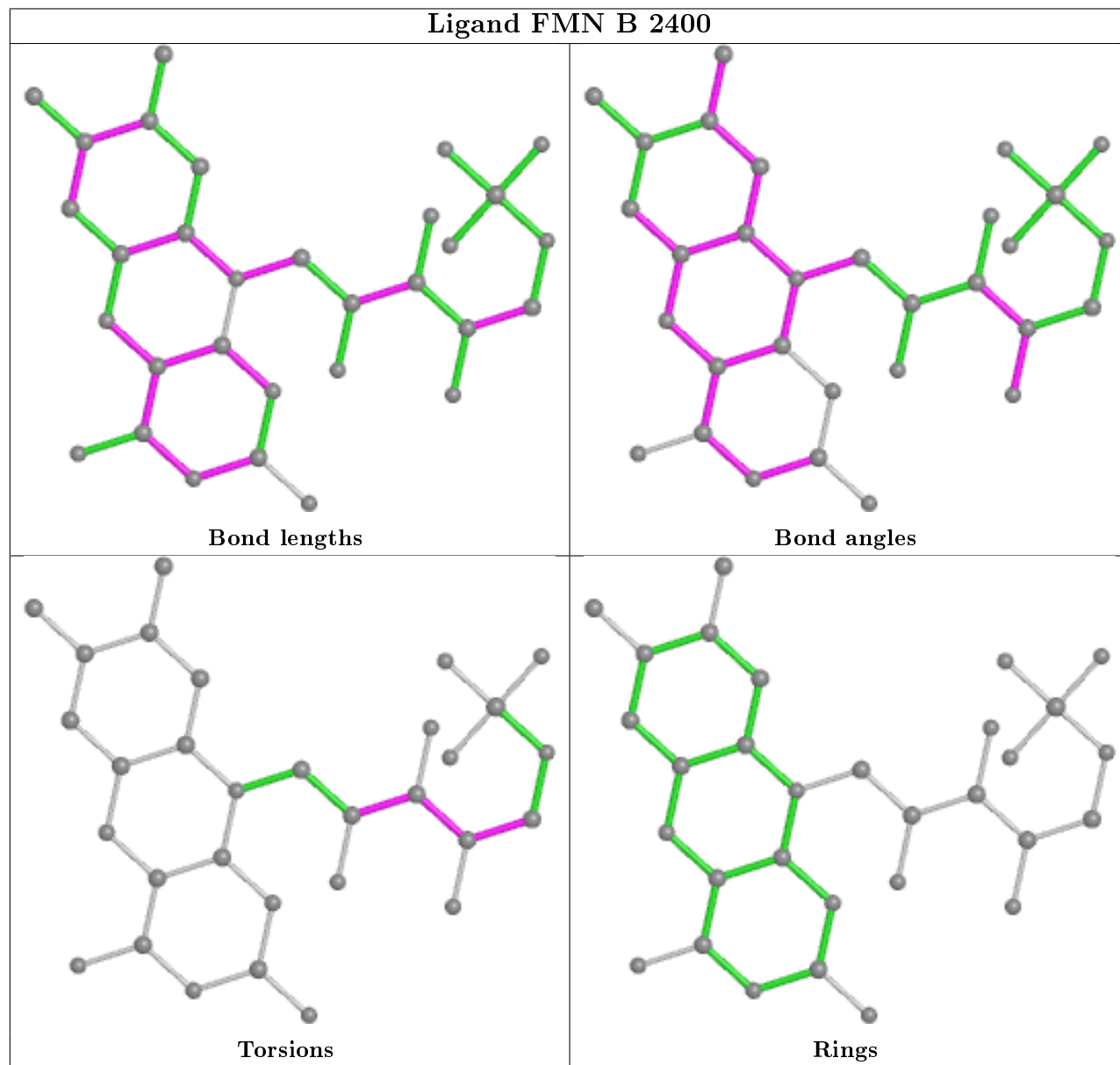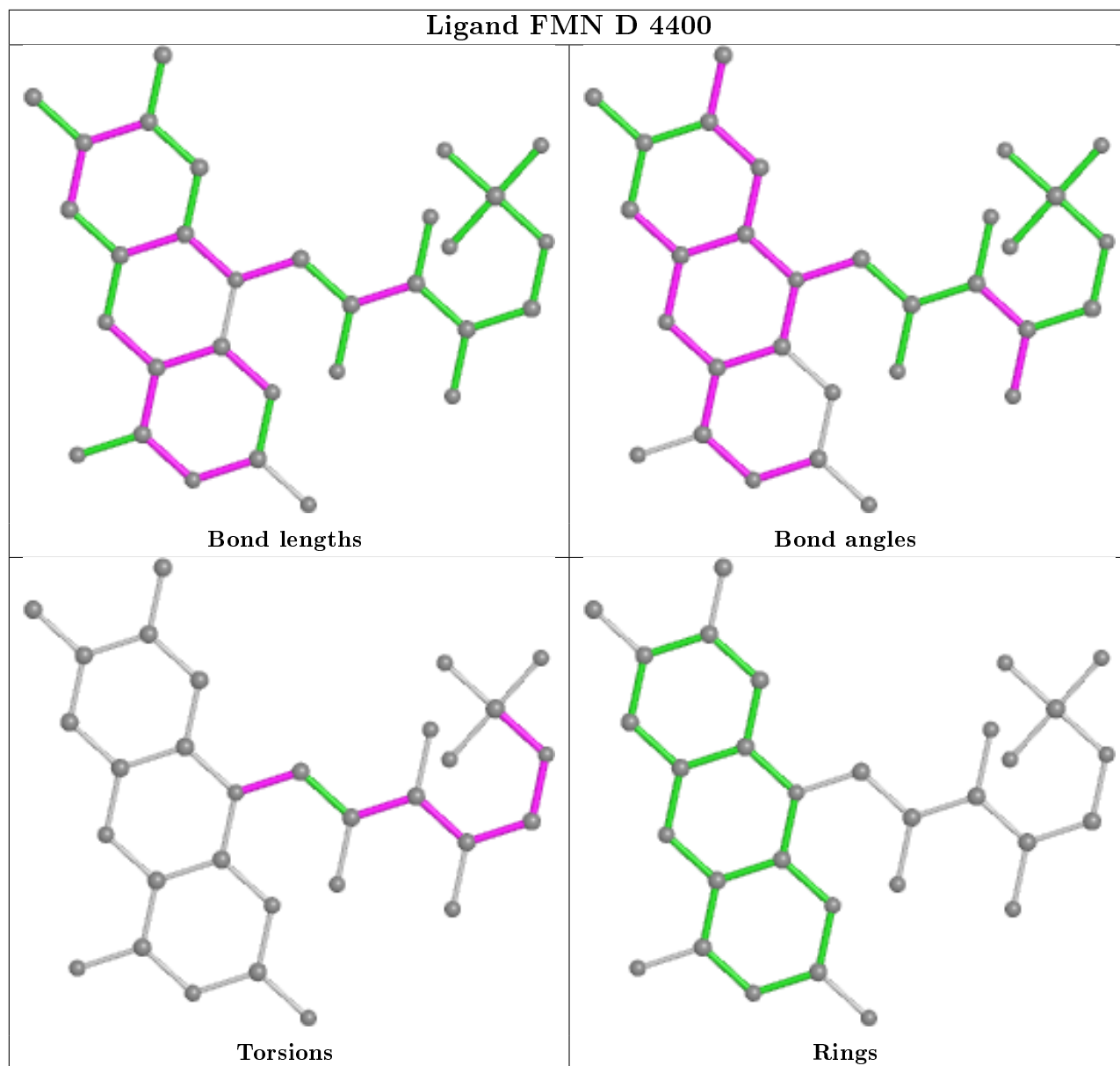
5.7 Other polymers (i)

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

There are no chain breaks in this entry.

6 Fit of model and data (i)

6.1 Protein, DNA and RNA chains (i)

In the following table, the column labelled '#RSRZ> 2' contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 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	365/365 (100%)	1.33	52 (14%)	2	4	16, 26, 116, 158	9 (2%)
1	B	365/365 (100%)	2.17	104 (28%)	0	0	20, 36, 129, 154	9 (2%)
1	C	365/365 (100%)	2.79	103 (28%)	0	0	19, 34, 147, 162	9 (2%)
1	D	365/365 (100%)	1.07	52 (14%)	2	4	17, 28, 100, 134	9 (2%)
All	All	1460/1460 (100%)	1.84	311 (21%)	0	1	16, 30, 130, 162	36 (2%)

All (311) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	C	315	CYS	29.3
1	C	307	THR	28.8
1	C	301	ILE	26.3
1	C	302	PHE	24.8
1	B	121	GLY	22.9
1	C	305	GLN	22.4
1	C	88	ALA	22.2
1	B	53	PHE	21.9
1	B	271	PHE	21.6
1	B	270	GLY	21.6
1	A	53	PHE	21.0
1	B	272	LEU	20.5
1	C	121	GLY	19.6
1	A	88	ALA	18.5
1	B	265	LEU	18.4
1	B	118	PHE	17.6
1	C	99	LEU	17.4
1	C	317	CYS	17.2
1	D	121	GLY	16.9
1	A	55	THR	16.6
1	C	118	PHE	16.5

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Mol	Chain	Res	Type	RSRZ
1	A	54	ILE	16.5
1	B	88	ALA	16.5
1	C	303	GLN	16.1
1	A	93	TYR	16.1
1	A	52	VAL	15.7
1	B	52	VAL	15.5
1	B	56	PRO	15.3
1	D	89	ARG	15.2
1	C	52	VAL	15.0
1	C	314	GLU	14.5
1	B	51	ASN	14.5
1	A	120	GLY	14.5
1	C	120	GLY	14.1
1	C	54	ILE	13.1
1	A	56	PRO	13.1
1	B	54	ILE	13.1
1	C	90	SER	13.0
1	A	50	ARG	12.9
1	D	87	ARG	12.9
1	C	89	ARG	12.9
1	C	102	PRO	12.8
1	B	266	MET	12.8
1	C	304	PRO	12.7
1	C	101	ARG	12.7
1	A	119	ARG	12.7
1	C	56	PRO	12.6
1	C	96	ILE	12.4
1	C	93	TYR	12.4
1	D	90	SER	12.3
1	C	103	SER	12.2
1	C	119	ARG	12.0
1	B	90	SER	12.0
1	B	93	TYR	12.0
1	C	98	ASN	11.9
1	C	86	GLN	11.6
1	A	51	ASN	11.5
1	A	58	LYS	11.4
1	C	58	LYS	11.4
1	A	89	ARG	11.2
1	C	318	LEU	11.2
1	A	49	GLY	11.1
1	D	88	ALA	10.9

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Mol	Chain	Res	Type	RSRZ
1	B	55	THR	10.9
1	A	91	LYS	10.8
1	C	87	ARG	10.7
1	A	92	ASP	10.6
1	C	95	ASN	10.6
1	C	309	ASP	10.5
1	B	57	ARG	10.5
1	B	263	ASN	10.5
1	C	49	GLY	10.4
1	C	320	LYS	10.3
1	B	120	GLY	10.3
1	B	87	ARG	10.1
1	C	321	GLY	10.1
1	A	95	ASN	10.1
1	D	119	ARG	10.0
1	D	91	LYS	9.9
1	B	264	ASP	9.9
1	C	92	ASP	9.9
1	C	300	SER	9.8
1	A	57	ARG	9.7
1	D	123	ARG	9.7
1	C	97	LYS	9.6
1	C	308	ILE	9.4
1	A	60	ASP	9.4
1	C	213	THR	9.4
1	B	49	GLY	9.3
1	A	365	ASN	9.2
1	C	310	ILE	9.2
1	D	56	PRO	9.1
1	D	93	TYR	9.1
1	D	59	GLU	9.0
1	C	59	GLU	8.8
1	C	311	ASN	8.8
1	D	57	ARG	8.8
1	B	119	ARG	8.8
1	C	91	LYS	8.7
1	D	58	LYS	8.7
1	A	118	PHE	8.7
1	C	57	ARG	8.7
1	C	124	SER	8.7
1	B	92	ASP	8.7
1	C	313	ASN	8.6

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Mol	Chain	Res	Type	RSRZ
1	B	268	GLN	8.6
1	B	273	SER	8.6
1	D	122	GLY	8.5
1	C	319	LEU	8.4
1	C	322	ARG	8.4
1	B	214	ASN	8.4
1	D	365	ASN	8.4
1	C	214	ASN	8.2
1	C	100	PHE	8.2
1	B	60	ASP	8.2
1	C	104	HIS	8.2
1	C	122	GLY	8.2
1	C	55	THR	8.2
1	D	120	GLY	8.1
1	C	123	ARG	8.0
1	B	50	ARG	7.9
1	A	123	ARG	7.9
1	B	58	LYS	7.9
1	A	121	GLY	7.8
1	B	89	ARG	7.7
1	C	105	ALA	7.6
1	D	60	ASP	7.5
1	C	306	ARG	7.4
1	B	123	ARG	7.2
1	A	86	GLN	7.2
1	C	269	LYS	7.1
1	C	53	PHE	7.1
1	C	94	ASP	7.0
1	D	92	ASP	6.8
1	B	116	ARG	6.8
1	B	86	GLN	6.7
1	C	272	LEU	6.7
1	B	302	PHE	6.7
1	B	267	ASP	6.6
1	D	96	ILE	6.6
1	B	61	ASP	6.5
1	C	365	ASN	6.5
1	C	312	GLY	6.4
1	A	94	ASP	6.4
1	C	51	ASN	6.3
1	B	315	CYS	6.3
1	A	59	GLU	6.3

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Mol	Chain	Res	Type	RSRZ
1	A	87	ARG	6.3
1	B	313	ASN	6.2
1	B	365	ASN	6.2
1	B	269	LYS	6.1
1	D	118	PHE	6.1
1	A	90	SER	6.1
1	B	213	THR	6.1
1	A	96	ILE	6.1
1	A	124	SER	6.0
1	D	115	ILE	6.0
1	D	124	SER	6.0
1	D	94	ASP	5.9
1	D	95	ASN	5.8
1	C	50	ARG	5.8
1	B	322	ARG	5.8
1	A	117	ASP	5.8
1	C	267	ASP	5.8
1	C	17	HIS	5.8
1	A	17	HIS	5.7
1	D	49	GLY	5.7
1	B	94	ASP	5.7
1	D	97	LYS	5.6
1	B	91	LYS	5.5
1	B	97	LYS	5.5
1	A	122	GLY	5.4
1	B	321	GLY	5.4
1	B	17	HIS	5.4
1	B	122	GLY	5.3
1	B	85	ASN	5.2
1	C	316	GLU	5.2
1	D	321	GLY	5.1
1	C	323	HIS	5.0
1	A	85	ASN	4.9
1	C	48	GLY	4.9
1	B	309	ASP	4.8
1	B	59	GLU	4.8
1	A	115	ILE	4.7
1	C	85	ASN	4.7
1	D	364	GLU	4.7
1	C	268	GLN	4.7
1	D	116	ARG	4.7
1	B	125	SER	4.6

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Mol	Chain	Res	Type	RSRZ
1	B	96	ILE	4.6
1	B	319	LEU	4.6
1	B	95	ASN	4.5
1	C	60	ASP	4.5
1	C	270	GLY	4.5
1	B	312	GLY	4.5
1	D	322	ARG	4.4
1	C	211	ILE	4.4
1	B	172	LYS	4.3
1	D	55	THR	4.3
1	A	19	ASP	4.3
1	B	320	LYS	4.2
1	D	86	GLN	4.2
1	D	125	SER	4.2
1	B	318	LEU	4.1
1	D	19	ASP	4.1
1	C	20	VAL	4.0
1	C	19	ASP	4.0
1	B	98	ASN	3.9
1	C	61	ASP	3.9
1	C	116	ARG	3.8
1	B	306	ARG	3.8
1	A	214	ASN	3.7
1	A	322	ARG	3.7
1	D	17	HIS	3.7
1	D	320	LYS	3.6
1	C	172	LYS	3.6
1	D	302	PHE	3.6
1	B	300	SER	3.6
1	D	85	ASN	3.6
1	D	117	ASP	3.5
1	B	62	LYS	3.5
1	B	212	LYS	3.5
1	A	116	ARG	3.5
1	C	106	ASP	3.5
1	B	307	THR	3.5
1	A	364	GLU	3.4
1	D	318	LEU	3.4
1	B	308	ILE	3.4
1	B	341	LEU	3.4
1	A	126	ALA	3.3
1	A	125	SER	3.3

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Mol	Chain	Res	Type	RSRZ
1	A	241	ASN	3.3
1	C	125	SER	3.3
1	B	168	ASN	3.2
1	A	320	LYS	3.2
1	A	224	GLY	3.2
1	B	126	ALA	3.2
1	D	172	LYS	3.2
1	C	109	TYR	3.2
1	B	19	ASP	3.1
1	B	48	GLY	3.1
1	C	299	PRO	3.1
1	B	21	ILE	3.1
1	C	215	GLN	3.1
1	B	124	SER	3.0
1	C	62	LYS	3.0
1	C	115	ILE	3.0
1	B	99	LEU	3.0
1	B	301	ILE	3.0
1	B	115	ILE	3.0
1	B	311	ASN	2.9
1	C	212	LYS	2.9
1	A	47	GLN	2.8
1	B	174	GLU	2.8
1	B	164	ASN	2.8
1	B	310	ILE	2.7
1	C	110	PHE	2.7
1	C	271	PHE	2.7
1	D	61	ASP	2.7
1	C	197	HIS	2.7
1	C	15	GLU	2.7
1	B	240	LEU	2.6
1	B	197	HIS	2.6
1	B	334	VAL	2.6
1	D	126	ALA	2.6
1	A	61	ASP	2.6
1	B	317	CYS	2.6
1	D	168	ASN	2.6
1	D	180	GLU	2.6
1	D	224	GLY	2.6
1	D	70	PHE	2.5
1	C	180	GLU	2.5
1	A	62	LYS	2.5

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Mol	Chain	Res	Type	RSRZ
1	D	40	GLU	2.5
1	B	110	PHE	2.5
1	B	338	LEU	2.5
1	A	97	LYS	2.5
1	B	100	PHE	2.5
1	B	262	TYR	2.4
1	C	107	PHE	2.4
1	B	323	HIS	2.4
1	D	50	ARG	2.4
1	B	44	LYS	2.4
1	B	180	GLU	2.3
1	B	314	GLU	2.3
1	B	47	GLN	2.3
1	A	321	GLY	2.3
1	A	334	VAL	2.3
1	B	206	ILE	2.3
1	C	273	SER	2.3
1	B	15	GLU	2.2
1	D	54	ILE	2.2
1	D	327	ILE	2.2
1	B	364	GLU	2.2
1	C	298	THR	2.2
1	C	114	GLY	2.2
1	B	327	ILE	2.1
1	B	163	LYS	2.1
1	C	161	LYS	2.1
1	B	102	PRO	2.1
1	B	316	GLU	2.1
1	C	47	GLN	2.1
1	C	184	GLU	2.1
1	A	318	LEU	2.1
1	B	304	PRO	2.1
1	B	117	ASP	2.1
1	C	327	ILE	2.1
1	B	72	ASP	2.0
1	C	168	ASN	2.0
1	D	306	ARG	2.0
1	C	343	LEU	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, 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
2	FMN	C	3400	31/31	0.36	0.59	71,73,87,87	0
2	FMN	B	2400	31/31	0.44	0.41	62,69,82,82	0
2	FMN	D	4400	31/31	0.61	0.29	45,61,70,71	0
2	FMN	A	1400	31/31	0.66	0.30	30,57,66,68	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.
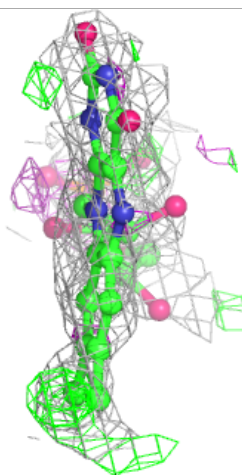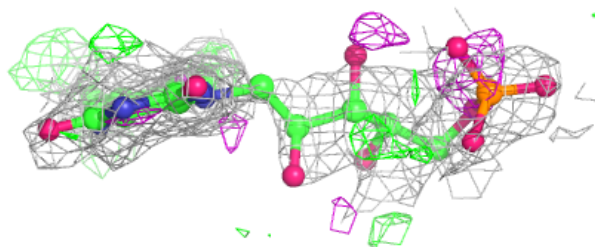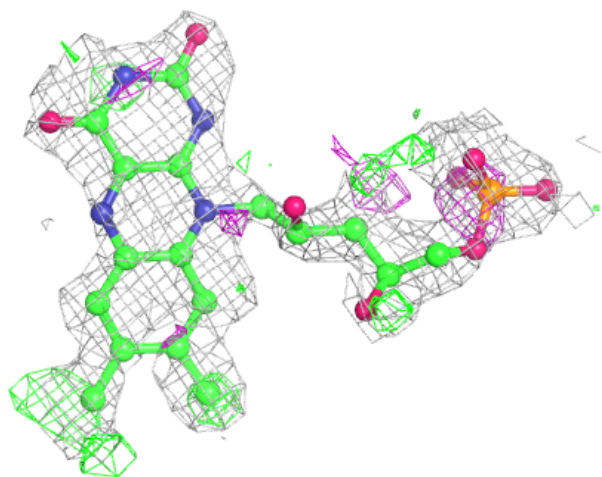
Electron density around FMN C 3400:

$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative) and green (positive)
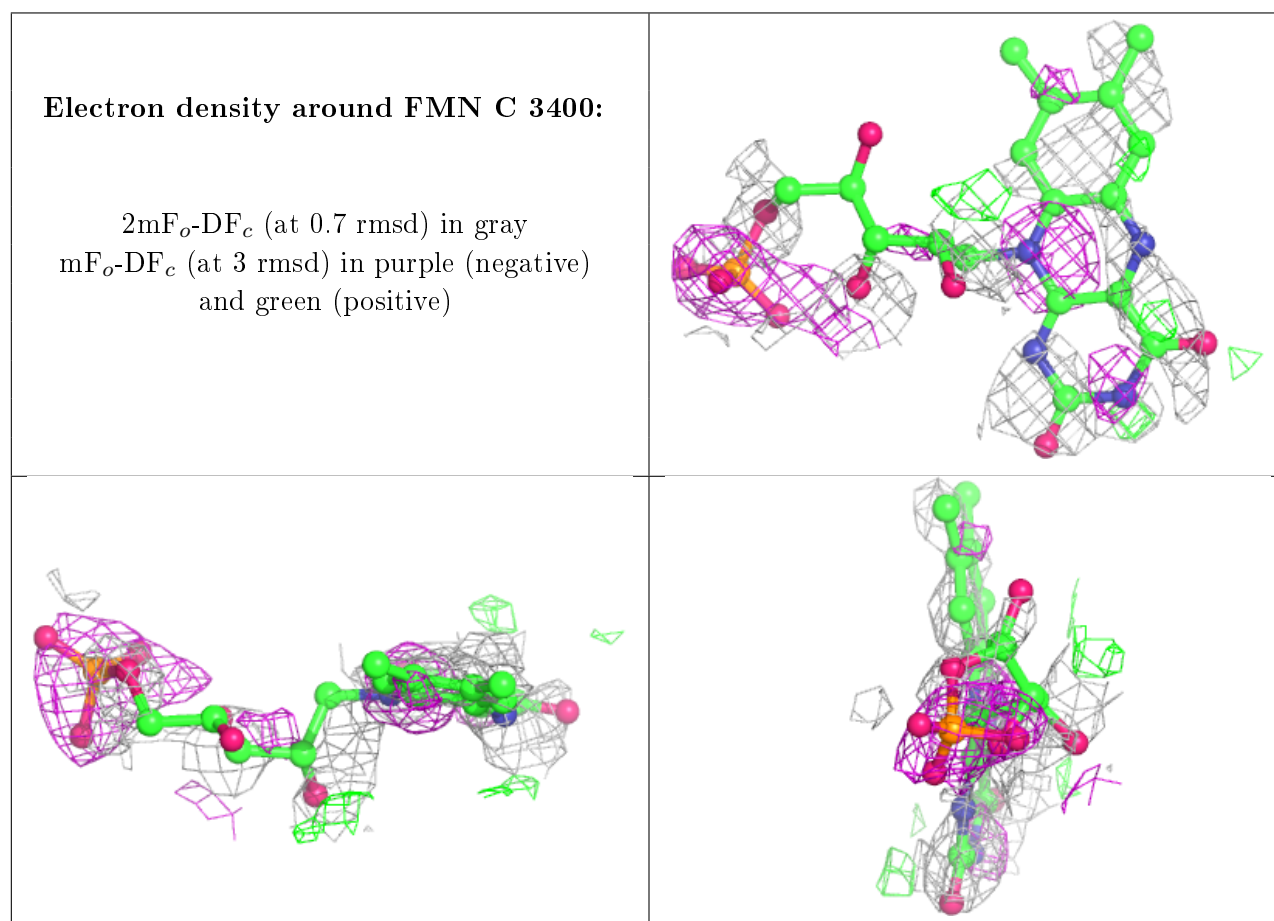
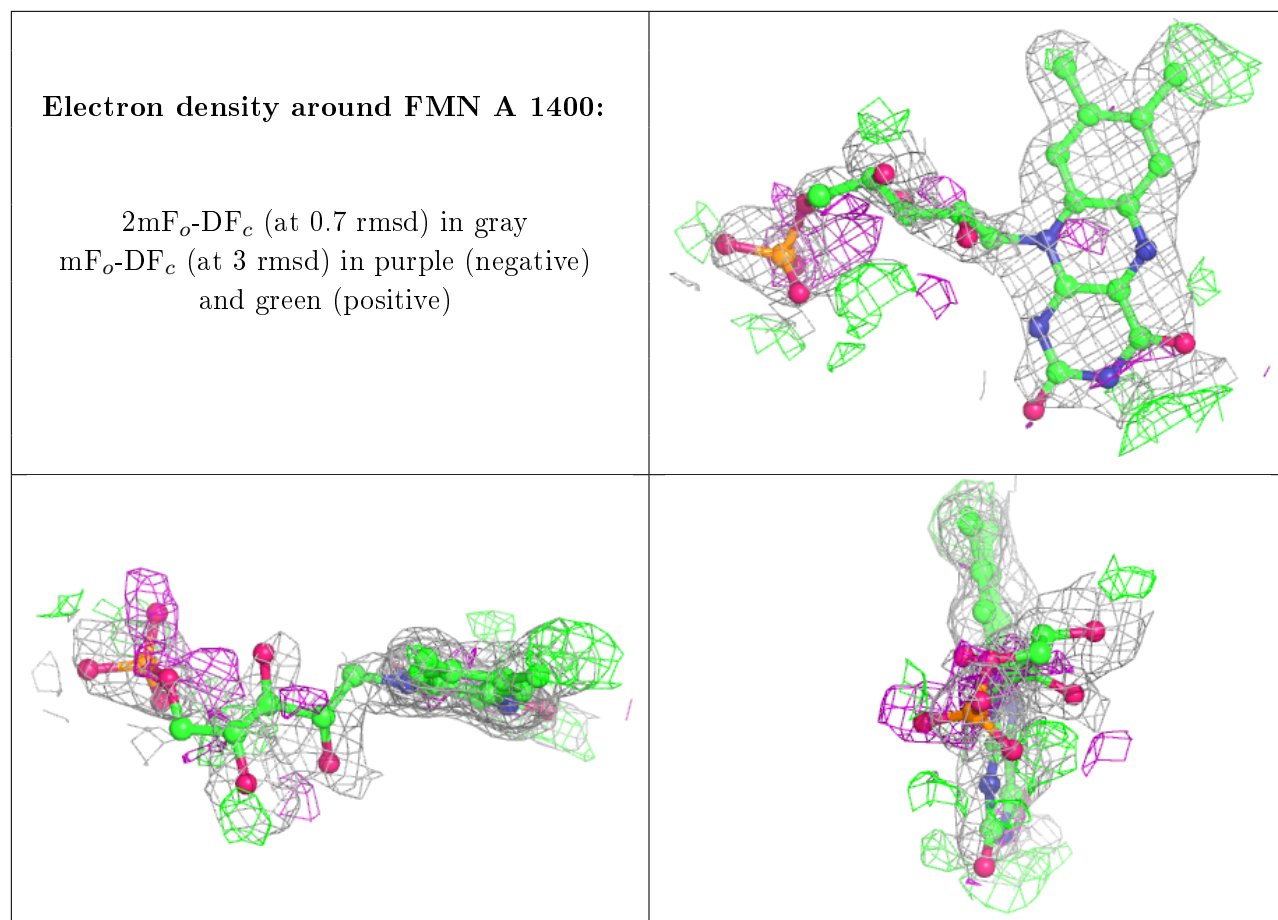**Electron density around FMN B 2400:**

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)
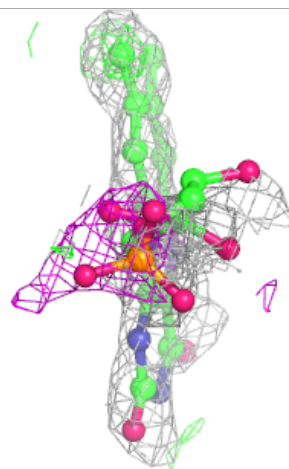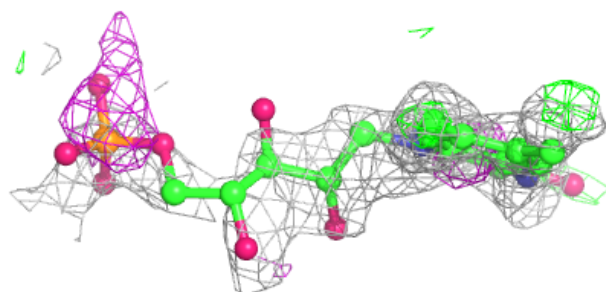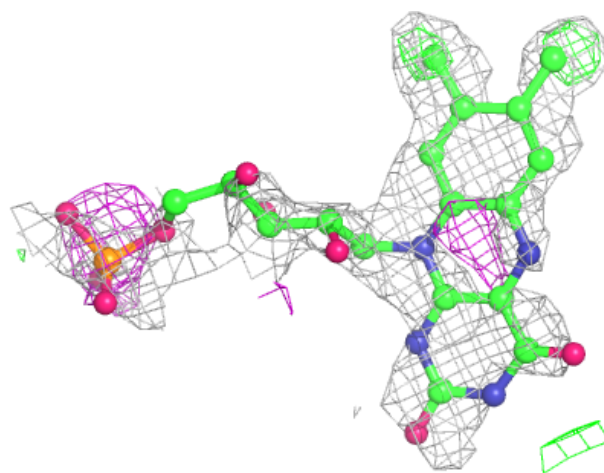
Electron density around FMN D 4400:

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

Electron density around FMN A 1400:

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

6.5 Other polymers (i)

There are no such residues in this entry.