



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 10, 2026 – 11:41 AM UTC

PDB ID : 4QAI / pdb_00004qai
Title : P. stipitis OYE2.6-Y78W
Authors : Sullivan, B.; Walton, A.Z.; Stewart, J.D.
Deposited on : 2014-05-05
Resolution : 2.75 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

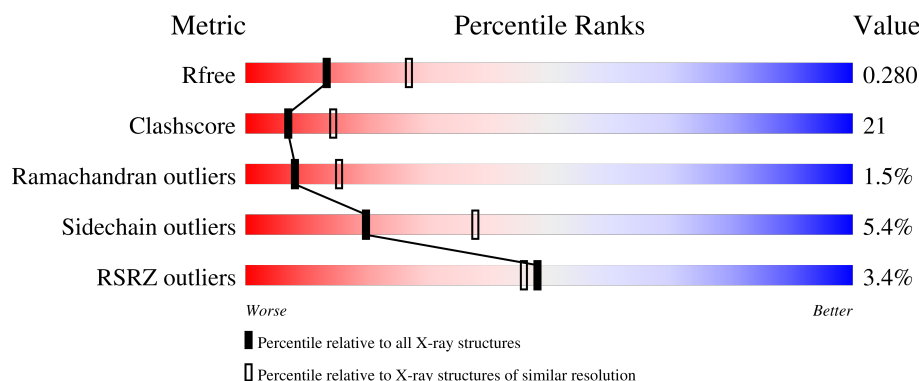
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION






The reported resolution of this entry is 2.75 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	1009 (2.76-2.76)
Clashscore	190562	1044 (2.76-2.76)
Ramachandran outliers	187476	1024 (2.76-2.76)
Sidechain outliers	187428	1024 (2.76-2.76)
RSRZ outliers	180081	1009 (2.76-2.76)

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	407	 67% 31% ..
1	B	407	 72% 27% ..
1	C	407	 69% 28% ..
1	D	407	 10% 51% 43% 6% .
1	E	407	 2% 63% 33% ..

Continued on next page...

Continued from previous page...

Mol	Chain	Length	Quality of chain
1	F	407	

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

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
2	FMN	E	501	-	-	X	-

2 Entry composition

There are 3 unique types of molecules in this entry. The entry contains 19422 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.

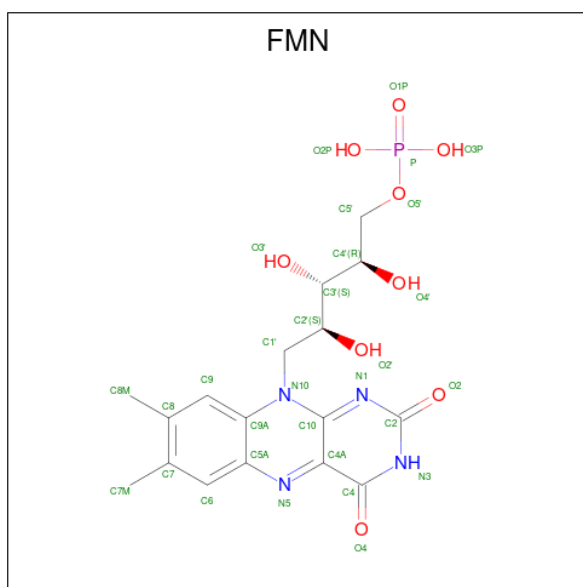
- Molecule 1 is a protein called NADPH dehydrogenase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	404	Total	C	N	O	S	0	6	0
			3203	2029	539	630	5			
1	B	404	Total	C	N	O	S	0	6	0
			3203	2029	539	630	5			
1	C	404	Total	C	N	O	S	0	6	0
			3203	2029	539	630	5			
1	D	404	Total	C	N	O	S	0	6	0
			3201	2027	539	630	5			
1	E	404	Total	C	N	O	S	0	6	0
			3201	2028	539	629	5			
1	F	404	Total	C	N	O	S	0	6	0
			3203	2029	539	630	5			

There are 12 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	78	TRP	TYR	engineered mutation	UNP A3LT82
A	169	ALA	THR	conflict	UNP A3LT82
B	78	TRP	TYR	engineered mutation	UNP A3LT82
B	169	ALA	THR	conflict	UNP A3LT82
C	78	TRP	TYR	engineered mutation	UNP A3LT82
C	169	ALA	THR	conflict	UNP A3LT82
D	78	TRP	TYR	engineered mutation	UNP A3LT82
D	169	ALA	THR	conflict	UNP A3LT82
E	78	TRP	TYR	engineered mutation	UNP A3LT82
E	169	ALA	THR	conflict	UNP A3LT82
F	78	TRP	TYR	engineered mutation	UNP A3LT82
F	169	ALA	THR	conflict	UNP A3LT82

- 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		
2	B	1	Total	C	N	O	P	0	0
			31	17	4	9	1		
2	C	1	Total	C	N	O	P	0	0
			31	17	4	9	1		
2	D	1	Total	C	N	O	P	0	0
			31	17	4	9	1		
2	E	1	Total	C	N	O	P	0	0
			31	17	4	9	1		
2	F	1	Total	C	N	O	P	0	0
			31	17	4	9	1		

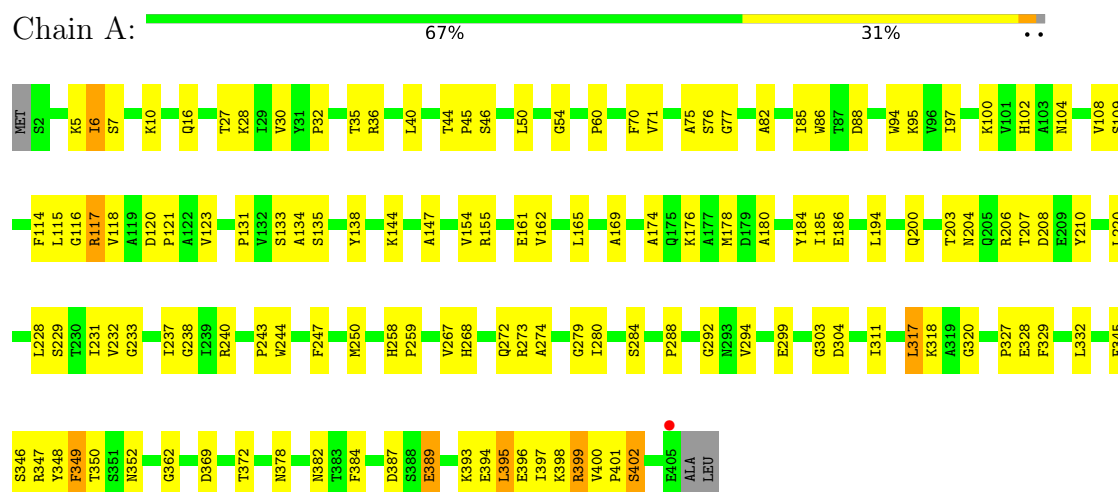
- Molecule 3 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	7	Total	O	0	0
			7	7		
3	B	5	Total	O	0	0
			5	5		
3	C	2	Total	O	0	0
			2	2		
3	D	3	Total	O	0	0
			3	3		
3	E	5	Total	O	0	0
			5	5		

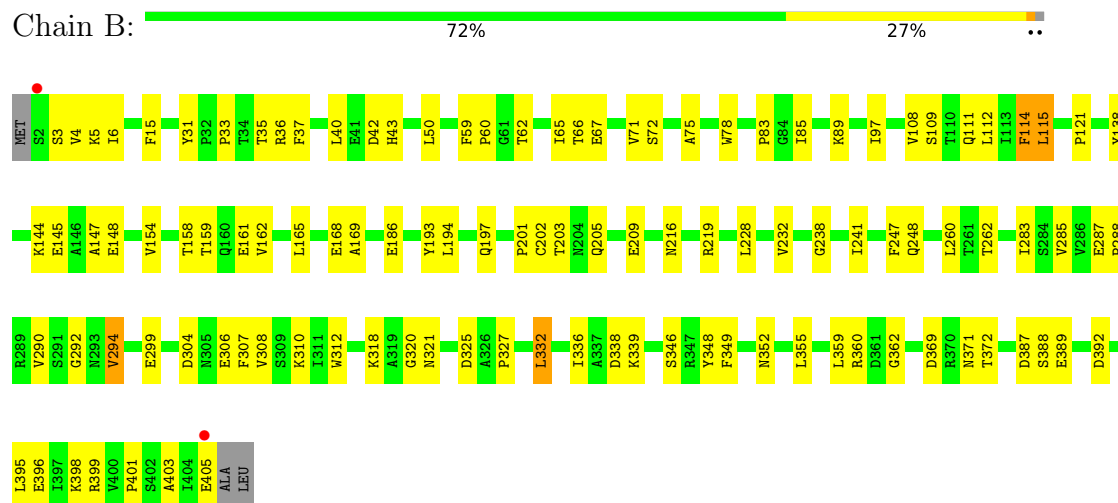
3 Residue-property plots

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

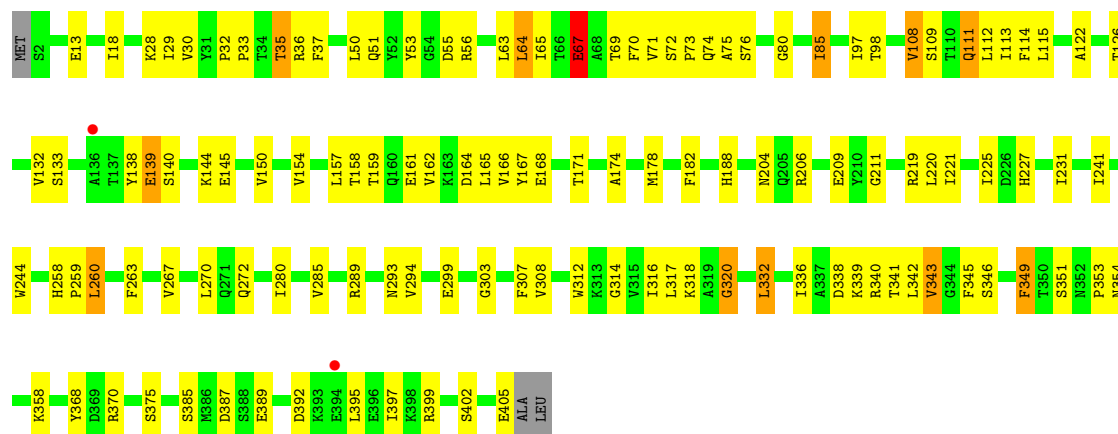


• Molecule 1: NADPH dehydrogenase

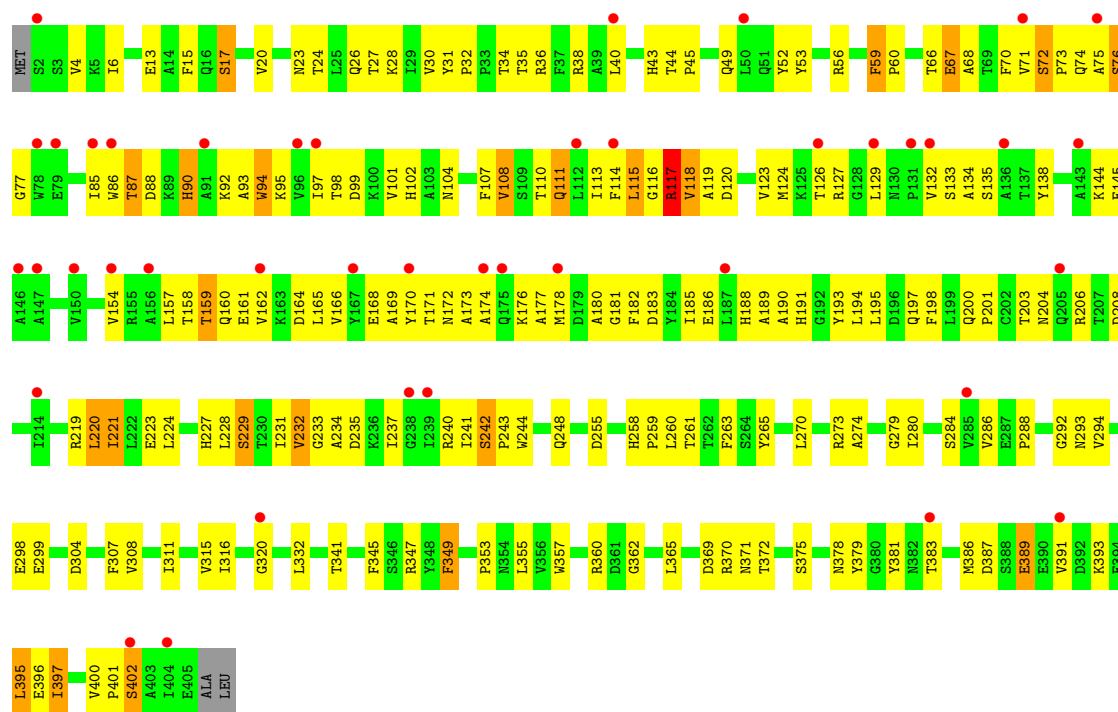


• Molecule 1: NADPH dehydrogenase

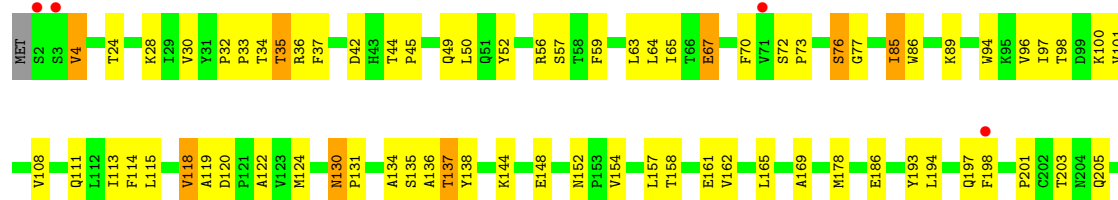


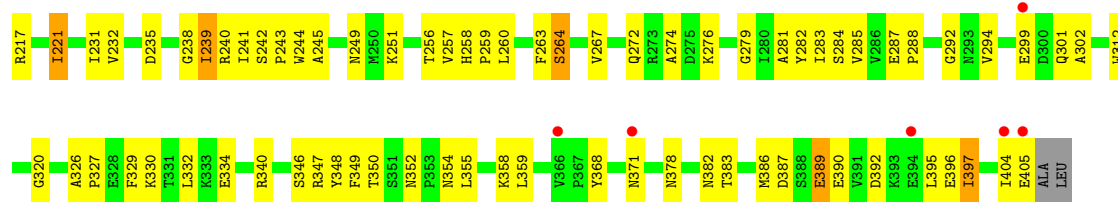


• Molecule 1: NADPH dehydrogenase

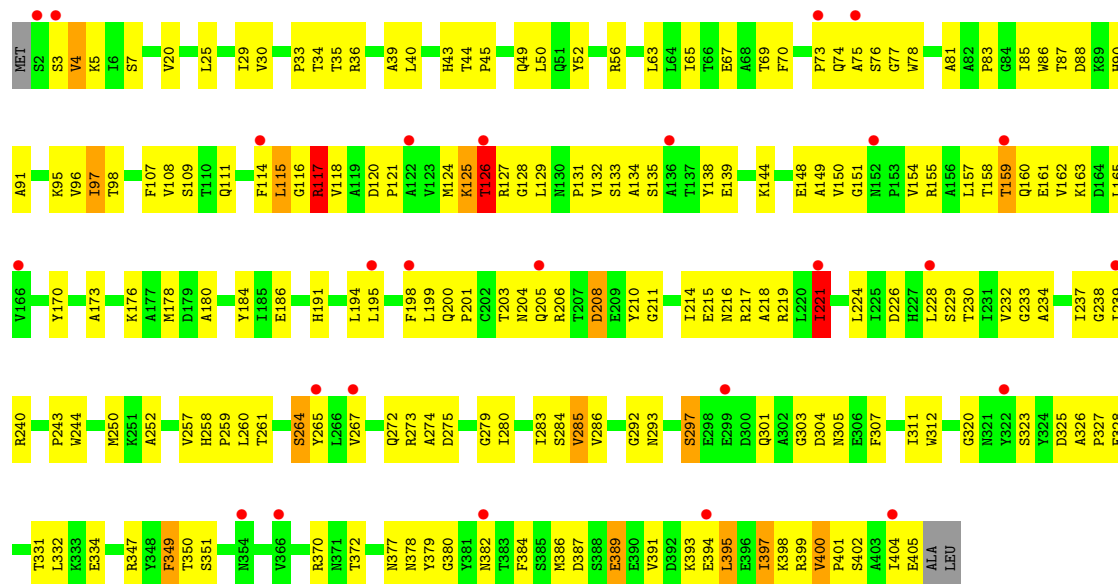


• Molecule 1: NADPH dehydrogenase





● Molecule 1: NADPH dehydrogenase



4 Data and refinement statistics

Property	Value	Source
Space group	H 3 2	Depositor
Cell constants a, b, c, α , β , γ	226.79Å 226.79Å 360.85Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	48.65 – 2.75 48.65 – 2.75	Depositor EDS
% Data completeness (in resolution range)	(Not available) (48.65-2.75) 95.5 (48.65-2.75)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.98 (at 2.73Å)	Xtrriage
Refinement program	PHENIX	Depositor
R, R_{free}	0.224 , 0.280 0.228 , 0.280	Depositor DCC
R_{free} test set	2000 reflections (1.11%)	wwPDB-VP
Wilson B-factor (Å ²)	49.2	Xtrriage
Anisotropy	0.306	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.31 , 31.5	EDS
L-test for twinning ²	$\langle L \rangle = 0.47$, $\langle L^2 \rangle = 0.30$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
F_o, F_c correlation	0.94	EDS
Total number of atoms	19422	wwPDB-VP
Average B, all atoms (Å ²)	55.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The analyses of the Patterson function reveals a significant off-origin peak that is 63.84 % of the origin peak, indicating pseudo-translational symmetry. The chance of finding a peak of this or larger height randomly in a structure without pseudo-translational symmetry is equal to 9.0916e-06. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

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: 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	0.59	0/3293	0.94	7/4476 (0.2%)
1	B	0.64	0/3293	0.92	5/4476 (0.1%)
1	C	0.60	0/3293	0.96	1/4476 (0.0%)
1	D	0.58	0/3293	0.97	8/4476 (0.2%)
1	E	0.59	0/3293	0.91	4/4476 (0.1%)
1	F	0.56	0/3293	0.90	5/4476 (0.1%)
All	All	0.59	0/19758	0.93	30/26856 (0.1%)

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

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

There are no bond length outliers.

All (30) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	200	GLN	CA-C-N	7.83	127.89	119.28
1	A	200	GLN	C-N-CA	7.83	127.89	119.28
1	F	4	VAL	N-CA-C	7.65	118.86	109.30
1	E	130	ASN	CA-C-N	-7.60	111.93	119.76
1	E	130	ASN	C-N-CA	-7.60	111.93	119.76
1	D	59	PHE	CA-C-N	7.07	128.67	119.84
1	D	59	PHE	C-N-CA	7.07	128.67	119.84
1	B	31	TYR	CA-C-N	-6.50	113.68	120.38
1	B	31	TYR	C-N-CA	-6.50	113.68	120.38
1	E	4	VAL	N-CA-C	6.43	116.66	106.88

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	F	44	THR	CA-C-N	6.14	126.10	119.78
1	F	44	THR	C-N-CA	6.14	126.10	119.78
1	A	82	ALA	CA-C-N	6.12	126.31	120.31
1	A	82	ALA	C-N-CA	6.12	126.31	120.31
1	D	4	VAL	N-CA-C	5.95	115.92	106.88
1	A	44	THR	CA-C-N	5.66	125.66	119.89
1	A	44	THR	C-N-CA	5.66	125.66	119.89
1	B	114	PHE	N-CA-C	-5.62	98.46	108.13
1	D	242	SER	CA-C-N	5.62	125.46	119.28
1	D	242	SER	C-N-CA	5.62	125.46	119.28
1	D	72	SER	N-CA-C	5.61	113.06	108.07
1	F	200	GLN	CA-C-N	5.45	125.79	119.47
1	F	200	GLN	C-N-CA	5.45	125.79	119.47
1	B	294	VAL	N-CA-C	5.39	116.43	108.45
1	D	200	GLN	CA-C-N	5.15	126.28	119.84
1	D	200	GLN	C-N-CA	5.15	126.28	119.84
1	C	343	VAL	N-CA-C	5.14	115.25	107.80
1	A	46	SER	N-CA-C	5.06	117.09	109.41
1	B	4	VAL	N-CA-C	5.05	115.12	107.75
1	E	249	ASN	N-CA-C	5.02	118.66	112.24

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	F	3	SER	Peptide

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	3203	0	3130	106	0
1	B	3203	0	3130	67	0
1	C	3203	0	3130	87	0
1	D	3201	0	3126	207	0
1	E	3201	0	3130	126	0
1	F	3203	0	3130	215	0

Continued on next page...

Continued from previous page...

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	A	31	0	19	6	0
2	B	31	0	19	2	0
2	C	31	0	19	2	0
2	D	31	0	19	5	0
2	E	31	0	19	11	0
2	F	31	0	19	6	0
3	A	7	0	0	1	0
3	B	5	0	0	2	0
3	C	2	0	0	1	0
3	D	3	0	0	2	0
3	E	5	0	0	3	0
All	All	19422	0	18890	803	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 21.

All (803) 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:E:347:ARG:NH2	2:E:501:FMN:O2P	1.80	1.13
1:A:399:ARG:HG3	1:A:399:ARG:HH11	1.16	1.11
1:F:393:LYS:HG2	1:F:397:ILE:HD11	1.26	1.11
1:A:346:SER:HB3	2:A:501:FMN:O3P	1.55	1.06
1:F:125:LYS:O	1:F:128:GLY:N	1.88	1.06
1:F:162:VAL:HG11	1:F:210:TYR:CD2	1.91	1.04
1:D:293:ASN:O	1:D:370:ARG:NH2	1.91	1.03
1:E:33:PRO:HD3	1:E:65:ILE:HG21	1.41	1.01
1:A:162:VAL:HG11	1:A:210:TYR:CE2	1.97	0.99
1:D:171:THR:HG23	1:D:231:ILE:CD1	1.95	0.95
1:C:293:ASN:O	1:C:370:ARG:NH2	1.99	0.95
1:D:171:THR:HG23	1:D:231:ILE:HD13	1.49	0.94
1:E:138:TYR:CZ	1:E:154:VAL:HG12	2.01	0.94
1:D:166:VAL:HG21	1:D:223:GLU:OE1	1.66	0.94
1:F:267:VAL:HG12	1:F:311:ILE:HG22	1.49	0.93
1:B:138:TYR:CZ	1:B:154:VAL:HG12	2.05	0.92
1:E:33:PRO:HD3	1:E:65:ILE:CG2	1.99	0.91
1:D:70:PHE:CE1	1:D:76:SER:HA	2.04	0.91
1:A:394[A]:GLU:HG2	1:A:398:LYS:HE2	1.53	0.91
1:F:117:ARG:NH1	1:F:203:THR:HG22	1.85	0.91
1:F:40:LEU:HD21	1:F:402:SER:O	1.70	0.90
1:F:293:ASN:O	1:F:370:ARG:NH2	2.04	0.90

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:393:LYS:O	1:F:397:ILE:HG12	1.71	0.90
1:D:228:LEU:O	1:D:232:VAL:HG23	1.72	0.89
1:F:186:GLU:HA	1:F:238:GLY:O	1.72	0.89
1:D:273:ARG:HG3	1:D:273:ARG:HH11	1.38	0.89
1:B:287:GLU:OE2	1:B:318:LYS:NZ	2.07	0.87
1:A:393:LYS:O	1:A:397:ILE:HG13	1.76	0.86
1:F:404:ILE:HG22	1:F:405:GLU:HG3	1.54	0.86
1:D:221:ILE:HD12	1:D:221:ILE:H	1.39	0.86
1:F:162:VAL:HG11	1:F:210:TYR:HD2	1.37	0.86
1:D:120:ASP:OD1	1:D:123:VAL:HG23	1.75	0.86
1:D:117:ARG:NH1	1:D:203:THR:HG22	1.92	0.85
1:D:258:HIS:CD2	1:F:311:ILE:HG12	2.12	0.84
1:D:378:ASN:ND2	1:D:396:GLU:OE1	2.09	0.83
1:B:346:SER:N	2:B:501:FMN:O1P	2.11	0.83
1:F:393:LYS:CG	1:F:397:ILE:HD11	2.09	0.83
1:D:270:LEU:HD22	1:D:280:ILE:HD13	1.61	0.82
1:C:332:LEU:C	1:C:332:LEU:HD23	2.04	0.82
1:A:117:ARG:NH1	1:A:203:THR:HG22	1.95	0.82
1:F:40:LEU:HD23	1:F:401:PRO:HB2	1.59	0.82
1:D:116:GLY:O	1:D:118:VAL:N	2.12	0.81
1:C:162:VAL:O	1:C:165:LEU:HB2	1.81	0.81
1:D:117:ARG:HB3	1:D:197:GLN:OE1	1.80	0.81
1:A:162:VAL:HG11	1:A:210:TYR:CD2	2.16	0.81
1:C:317:LEU:HD12	1:C:318:LYS:N	1.95	0.80
1:F:162:VAL:CG1	1:F:210:TYR:CE2	2.65	0.80
1:F:215:GLU:OE1	1:F:215:GLU:N	2.13	0.79
1:A:162:VAL:CG1	1:A:210:TYR:CE2	2.66	0.79
1:D:74:GLN:O	1:D:74:GLN:HG3	1.82	0.79
1:F:267:VAL:HG12	1:F:311:ILE:CG2	2.12	0.79
1:A:138:TYR:CZ	1:A:154:VAL:HG12	2.19	0.78
1:E:263:PHE:O	1:E:267:VAL:HG23	1.84	0.78
1:A:178:MET:HE2	1:A:178:MET:HA	1.65	0.77
1:A:399:ARG:HG3	1:A:399:ARG:NH1	1.94	0.77
1:A:70:PHE:CE1	1:A:76:SER:HA	2.21	0.76
1:D:162:VAL:HA	1:D:165:LEU:HD12	1.66	0.76
1:A:40:LEU:HD21	1:A:402:SER:O	1.85	0.76
1:F:114:PHE:CG	1:F:194:LEU:HD22	2.20	0.76
1:E:221:ILE:N	1:E:221:ILE:HD12	2.00	0.76
1:E:135:SER:O	1:E:137:THR:HG23	1.86	0.76
1:D:23:ASN:HB3	1:D:107:PHE:CE1	2.21	0.76
1:D:87:THR:HG23	1:D:90:HIS:CE1	2.20	0.76

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:260:LEU:O	1:E:264:SER:OG	2.03	0.76
1:D:31:TYR:HB2	1:D:349:PHE:CE2	2.21	0.75
1:D:134:ALA:O	1:D:206:ARG:CG	2.34	0.75
1:D:311:ILE:HG12	1:F:258:HIS:CD2	2.22	0.75
1:A:138:TYR:CD2	1:A:144:LYS:HB2	2.21	0.75
1:F:132:VAL:HB	1:F:157:LEU:HD21	1.68	0.75
1:A:399:ARG:HH11	1:A:399:ARG:CG	1.98	0.75
1:D:72:SER:HB2	1:D:73:PRO:CD	2.16	0.74
1:D:115:LEU:N	1:D:115:LEU:HD23	2.02	0.74
1:F:73:PRO:HB3	1:F:127:ARG:NH1	2.02	0.74
1:D:165:LEU:HA	1:D:169:ALA:HB3	1.70	0.74
1:D:248:GLN:NE2	3:D:603:HOH:O	2.10	0.73
1:F:244:TRP:CH2	1:F:303:GLY:HA3	2.24	0.73
1:F:273:ARG:HG3	1:F:273:ARG:HH11	1.54	0.73
1:D:273:ARG:HG3	1:D:273:ARG:NH1	2.04	0.72
1:A:114:PHE:CD1	1:A:194:LEU:HD22	2.24	0.72
1:F:74:GLN:HG3	1:F:114:PHE:HZ	1.53	0.72
1:A:273:ARG:HG3	1:A:273:ARG:HH11	1.54	0.72
1:F:125:LYS:O	1:F:127:ARG:N	2.22	0.72
1:F:117:ARG:CZ	1:F:203:THR:HG22	2.19	0.72
1:E:221:ILE:HD12	1:E:221:ILE:H	1.55	0.72
1:E:326:ALA:HB1	1:E:327:PRO:HA	1.71	0.71
1:F:237:ILE:HB	1:F:280:ILE:HG22	1.72	0.71
1:B:387:ASP:HB3	1:B:389[A]:GLU:OE1	1.90	0.70
1:C:35:THR:O	1:C:36:ARG:HD2	1.90	0.70
1:C:64:LEU:N	1:C:64:LEU:HD23	2.06	0.70
1:D:221:ILE:HD12	1:D:221:ILE:N	2.06	0.70
1:A:75:ALA:HB2	1:A:114:PHE:CD2	2.26	0.70
1:A:138:TYR:CG	1:A:144:LYS:HB2	2.27	0.70
1:D:59:PHE:HD2	1:D:357:TRP:CH2	2.10	0.70
1:F:86:TRP:CD1	1:F:87:THR:HG23	2.26	0.70
1:D:224:LEU:O	1:D:228:LEU:HD12	1.91	0.69
1:F:162:VAL:CG1	1:F:210:TYR:CD2	2.71	0.69
1:F:199:LEU:HD21	1:F:221:ILE:HG12	1.73	0.69
1:E:65:ILE:HD13	3:E:604:HOH:O	1.92	0.69
1:F:148:GLU:O	1:F:151:GLY:N	2.23	0.69
1:F:144:LYS:HE3	1:F:148:GLU:OE2	1.93	0.69
1:D:220:LEU:HD11	1:D:224:LEU:HD11	1.73	0.69
1:D:40:LEU:HD23	1:D:401:PRO:HB2	1.74	0.69
1:D:72:SER:HB2	1:D:73:PRO:HD2	1.74	0.69
1:F:283:ILE:HD12	1:F:312:TRP:CG	2.28	0.69

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:71:VAL:HG12	1:C:112:LEU:HB3	1.75	0.68
1:D:178:MET:SD	1:D:232:VAL:CG1	2.81	0.68
1:F:395:LEU:HD12	1:F:395:LEU:O	1.94	0.68
1:E:330:LYS:NZ	1:E:334:GLU:OE2	2.26	0.68
1:D:74:GLN:NE2	1:D:132:VAL:HG22	2.08	0.68
1:E:33:PRO:HG2	1:E:240:ARG:NH1	2.08	0.68
1:A:165:LEU:HA	1:A:169:ALA:HB3	1.76	0.68
1:F:274:ALA:HA	1:F:279:GLY:N	2.08	0.67
1:B:325:ASP:OD1	3:B:604:HOH:O	2.12	0.67
1:F:162:VAL:HG11	1:F:210:TYR:CE2	2.29	0.67
1:F:379:TYR:CE1	1:F:393:LYS:HG3	2.29	0.67
1:B:42:ASP:OD2	1:B:89:LYS:NZ	2.27	0.67
1:D:258:HIS:ND1	1:D:259:PRO:HD2	2.09	0.67
1:D:178:MET:SD	1:D:232:VAL:HG12	2.34	0.67
1:E:158:THR:OG1	1:E:161:GLU:HG3	1.94	0.67
1:D:132:VAL:HB	1:D:157:LEU:HD21	1.76	0.67
1:A:27:THR:HG23	3:A:607:HOH:O	1.94	0.67
1:B:40:LEU:HD23	1:B:401:PRO:HB2	1.76	0.67
1:D:20:VAL:HG22	1:D:315:VAL:HG21	1.76	0.66
1:F:201:PRO:HG3	1:F:257:VAL:HG23	1.77	0.66
1:E:221:ILE:H	1:E:221:ILE:CD1	2.08	0.66
1:A:6:ILE:HD12	1:A:362:GLY:HA2	1.78	0.66
1:D:170:TYR:O	1:D:173:ALA:HB3	1.94	0.66
1:E:56:ARG:HB3	1:E:349:PHE:HE1	1.60	0.66
1:A:120:ASP:OD1	1:A:123:VAL:HG23	1.95	0.66
1:E:56:ARG:HB3	1:E:349:PHE:CE1	2.31	0.66
1:F:132:VAL:CB	1:F:157:LEU:HD21	2.25	0.66
1:D:118:VAL:HG23	1:D:118:VAL:O	1.96	0.65
1:E:387:ASP:HB3	1:E:389[A]:GLU:HG3	1.78	0.65
1:A:320:GLY:HA2	2:A:501:FMN:C5'	2.27	0.65
1:D:393:LYS:O	1:D:397:ILE:HG12	1.96	0.65
1:B:336:ILE:O	3:B:603:HOH:O	2.14	0.64
1:F:50:LEU:HD13	1:F:97:ILE:HG13	1.79	0.64
1:D:31:TYR:OH	1:D:34:THR:HB	1.97	0.64
1:A:378:ASN:CB	1:A:399:ARG:HD2	2.27	0.64
1:D:221:ILE:HA	1:D:224:LEU:HD12	1.80	0.64
1:B:332:LEU:HD23	1:B:332:LEU:C	2.22	0.64
1:F:229:SER:HA	1:F:237:ILE:HD11	1.79	0.64
1:D:220:LEU:O	1:D:220:LEU:HD12	1.98	0.64
1:D:270:LEU:HD22	1:D:280:ILE:CD1	2.27	0.64
1:F:74:GLN:HG3	1:F:114:PHE:CZ	2.32	0.64

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:174:ALA:HB2	1:D:228:LEU:HD22	1.80	0.64
1:E:355:LEU:HG	1:E:359:LEU:HD12	1.78	0.63
1:F:132:VAL:HB	1:F:157:LEU:CD2	2.27	0.63
1:F:178:MET:SD	1:F:232:VAL:HG12	2.37	0.63
1:B:158:THR:OG1	1:B:161:GLU:HG3	1.98	0.63
1:D:186:GLU:OE2	1:D:240:ARG:HB2	1.98	0.63
1:F:30:VAL:HG13	1:F:63:LEU:O	1.98	0.63
1:F:186:GLU:OE2	1:F:240:ARG:HB2	1.97	0.63
1:F:162:VAL:HG12	1:F:210:TYR:CE2	2.33	0.63
1:D:35:THR:HA	1:D:67:GLU:HB2	1.81	0.63
1:D:201:PRO:HG2	1:D:255:ASP:OD1	1.98	0.63
1:F:75:ALA:HB1	1:F:114:PHE:HA	1.80	0.63
1:F:33:PRO:HG2	1:F:240:ARG:HH11	1.64	0.62
2:D:501:FMN:H2'	2:D:501:FMN:H9	1.80	0.62
1:F:159:THR:O	1:F:159:THR:HG22	1.99	0.62
1:D:178:MET:HA	1:D:178:MET:HE2	1.82	0.62
1:F:243:PRO:O	1:F:259:PRO:HB3	2.00	0.62
1:F:328:GLU:OE2	1:F:328:GLU:HA	2.00	0.62
1:A:60:PRO:HB2	1:B:60:PRO:HB2	1.81	0.62
1:D:113:ILE:HD11	1:D:193:TYR:CE2	2.35	0.62
1:F:260:LEU:O	1:F:264:SER:OG	2.18	0.62
1:E:348:TYR:O	1:E:352:ASN:HB2	1.99	0.61
1:D:134:ALA:O	1:D:206:ARG:HG3	1.99	0.61
1:F:138:TYR:CD1	1:F:144:LYS:HA	2.36	0.61
1:B:288:PRO:HG3	1:B:304:ASP:HA	1.82	0.61
1:D:221:ILE:H	1:D:221:ILE:CD1	2.11	0.61
1:E:33:PRO:HG2	1:E:240:ARG:HH11	1.65	0.61
1:A:77:GLY:HA3	1:A:115:LEU:HD12	1.81	0.61
1:C:18:ILE:HG21	1:C:342:LEU:HD21	1.81	0.61
1:E:197:GLN:O	1:E:203:THR:OG1	2.14	0.61
1:E:283:ILE:HG22	1:E:285:VAL:HG13	1.83	0.61
1:E:354:ASN:OD1	1:E:358:LYS:HE3	2.01	0.61
1:E:59:PHE:CD1	1:E:59:PHE:C	2.79	0.61
1:F:399:ARG:HG3	1:F:399:ARG:HH11	1.64	0.61
1:D:15:PHE:CE1	1:D:360:ARG:HD2	2.36	0.61
1:E:35:THR:H	2:E:501:FMN:C6	2.14	0.61
1:A:317:LEU:HD12	1:A:318:LYS:N	2.16	0.60
1:E:346:SER:HB3	2:E:501:FMN:O3P	2.00	0.60
1:E:35:THR:N	2:E:501:FMN:H6	2.16	0.60
1:D:345:PHE:O	1:D:349:PHE:HB2	2.01	0.60
1:F:133:SER:OG	1:F:134:ALA:N	2.24	0.60

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:320:GLY:HA2	2:F:501:FMN:H5'1	1.83	0.60
1:B:114:PHE:CD1	1:B:194:LEU:HD22	2.37	0.60
2:A:501:FMN:HO4'	2:A:501:FMN:P	2.24	0.60
1:C:241:ILE:HG13	1:C:285:VAL:HG12	1.84	0.60
1:E:347:ARG:CZ	2:E:501:FMN:O2P	2.50	0.60
1:B:396:GLU:OE1	1:B:396:GLU:HA	2.02	0.59
1:E:221:ILE:N	1:E:221:ILE:CD1	2.65	0.59
1:F:109:SER:HB2	1:F:184:TYR:HB2	1.82	0.59
1:A:178:MET:HE2	1:A:178:MET:CA	2.32	0.59
1:B:247:PHE:CD2	1:B:248:GLN:HG3	2.38	0.59
1:D:101:VAL:HG11	1:D:108:VAL:HG12	1.82	0.59
1:E:378:ASN:OD1	1:E:382:ASN:HB2	2.02	0.59
1:F:240:ARG:HA	1:F:284:SER:O	2.02	0.59
1:A:75:ALA:HB2	1:A:114:PHE:CE2	2.37	0.59
1:F:56:ARG:HB3	1:F:349:PHE:CE1	2.37	0.59
1:D:52:TYR:CE1	1:D:56:ARG:CZ	2.85	0.59
1:D:68:ALA:HB1	1:D:113:ILE:HB	1.85	0.59
1:E:347:ARG:HB3	1:E:368:TYR:CD2	2.38	0.59
1:D:93:ALA:C	1:D:95:LYS:H	2.09	0.59
1:D:270:LEU:CD2	1:D:280:ILE:HD13	2.33	0.59
1:F:285:VAL:HG23	1:F:305:ASN:ND2	2.18	0.59
1:D:70:PHE:CZ	1:D:76:SER:HA	2.36	0.59
1:D:174:ALA:HB2	1:D:228:LEU:CD2	2.33	0.59
1:D:75:ALA:HB2	1:D:114:PHE:CE2	2.37	0.58
1:F:114:PHE:CD1	1:F:194:LEU:HD22	2.37	0.58
1:D:102:HIS:C	1:D:104:ASN:H	2.11	0.58
1:E:347:ARG:O	1:E:350:THR:OG1	2.15	0.58
1:F:234:ALA:HA	1:F:237:ILE:HD12	1.86	0.58
1:E:162:VAL:O	1:E:165:LEU:HB2	2.02	0.58
1:D:75:ALA:HB2	1:D:114:PHE:CD2	2.38	0.58
1:D:241:ILE:HD12	1:D:263:PHE:HD1	1.67	0.58
1:D:166:VAL:O	1:D:171:THR:OG1	2.21	0.58
1:D:332:LEU:HD23	1:D:332:LEU:C	2.28	0.58
1:D:164:ASP:O	1:D:168:GLU:HB2	2.04	0.58
1:F:148:GLU:O	1:F:150:VAL:N	2.37	0.58
1:C:138:TYR:CD2	1:C:144:LYS:HB2	2.38	0.58
1:B:158:THR:O	1:B:159:THR:C	2.46	0.58
1:A:77:GLY:CA	1:A:115:LEU:HD12	2.34	0.57
1:C:30:VAL:O	1:C:32:PRO:HD3	2.04	0.57
1:D:158:THR:O	1:D:161:GLU:N	2.37	0.57
1:F:116:GLY:O	1:F:118:VAL:N	2.37	0.57

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:56:ARG:HG2	1:C:349:PHE:CE1	2.39	0.57
1:C:346:SER:HB3	2:C:501:FMN:O3P	2.04	0.57
1:D:227:HIS:NE2	1:D:231:ILE:HD11	2.19	0.57
1:F:285:VAL:HG23	1:F:305:ASN:HD22	1.69	0.57
1:A:237:ILE:O	1:A:280:ILE:HB	2.04	0.57
1:C:33:PRO:HG3	1:C:111:GLN:NE2	2.19	0.57
1:E:65:ILE:CD1	3:E:604:HOH:O	2.52	0.57
1:F:35:THR:H	2:F:501:FMN:H6	1.68	0.57
1:A:6:ILE:CD1	1:A:362:GLY:HA2	2.35	0.57
1:C:272:GLN:HE22	1:E:256:THR:HA	1.70	0.57
1:C:317:LEU:HD12	1:C:318:LYS:H	1.70	0.57
1:D:110:THR:HB	1:D:182:PHE:CE1	2.40	0.57
1:F:404:ILE:O	1:F:405:GLU:HB2	2.05	0.57
1:B:6:ILE:HG13	1:B:362:GLY:HA2	1.87	0.57
1:A:332:LEU:C	1:A:332:LEU:HD23	2.29	0.56
1:B:33:PRO:HD3	1:B:65:ILE:HB	1.86	0.56
1:B:71:VAL:HG12	1:B:112:LEU:HB3	1.87	0.56
1:A:378:ASN:HB2	1:A:399:ARG:HD2	1.87	0.56
1:A:220:LEU:HD12	1:A:220:LEU:O	2.04	0.56
1:A:400:VAL:HB	1:A:401:PRO:HD2	1.85	0.56
1:C:70:PHE:CE1	1:C:76:SER:HA	2.39	0.56
1:C:332:LEU:C	1:C:332:LEU:CD2	2.78	0.56
1:D:59:PHE:CD2	1:D:357:TRP:CH2	2.91	0.56
1:E:73:PRO:O	1:E:76:SER:OG	2.23	0.56
1:F:131:PRO:O	1:F:154:VAL:HA	2.04	0.56
1:B:355:LEU:HG	1:B:359:LEU:HD12	1.85	0.56
1:E:36:ARG:O	1:E:37:PHE:HB2	2.05	0.56
1:A:121:PRO:HG3	1:A:147:ALA:HA	1.87	0.56
1:D:40:LEU:HD21	1:D:402:SER:O	2.06	0.56
1:D:265:TYR:HB2	1:F:261:THR:HG21	1.86	0.56
1:E:70:PHE:HB2	1:E:86:TRP:HZ3	1.71	0.56
1:F:36:ARG:NH2	1:F:380:GLY:O	2.35	0.56
1:F:78:TRP:CE2	1:F:115:LEU:HD11	2.40	0.56
1:F:244:TRP:CZ2	1:F:303:GLY:HA3	2.41	0.56
1:F:33:PRO:HG2	1:F:240:ARG:NH1	2.21	0.56
1:F:95:LYS:HA	1:F:180:ALA:O	2.06	0.56
1:F:178:MET:CG	1:F:232:VAL:HG12	2.35	0.56
1:A:186:GLU:HA	1:A:238:GLY:O	2.04	0.56
1:D:133:SER:OG	1:D:135:SER:O	2.23	0.56
1:F:70:PHE:HB2	1:F:86:TRP:HZ3	1.70	0.56
1:A:40:LEU:HD23	1:A:401:PRO:HB2	1.87	0.56

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:320:GLY:HA2	2:A:501:FMN:H5'1	1.86	0.56
2:D:501:FMN:H2'	2:D:501:FMN:C9	2.36	0.56
1:E:50:LEU:HD11	1:E:100:LYS:HD2	1.87	0.56
1:E:138:TYR:CE1	1:E:154:VAL:HG12	2.39	0.56
1:C:338:ASP:O	1:C:339:LYS:HB2	2.05	0.56
1:E:240:ARG:HA	1:E:284:SER:O	2.05	0.56
1:F:326:ALA:HB1	1:F:327:PRO:HA	1.88	0.56
1:C:74:GLN:O	1:C:74:GLN:HG3	2.05	0.55
1:E:49:GLN:NE2	1:E:67:GLU:OE2	2.34	0.55
1:F:114:PHE:CG	1:F:194:LEU:CD2	2.90	0.55
1:C:72:SER:HB2	1:C:73:PRO:HD2	1.88	0.55
1:D:31:TYR:HB2	1:D:349:PHE:CD2	2.41	0.55
1:D:75:ALA:CB	1:D:114:PHE:CD2	2.89	0.55
1:F:159:THR:OG1	1:F:208:ASP:OD2	2.23	0.55
1:D:308:VAL:HG12	1:D:316:ILE:HD13	1.89	0.55
1:F:34:THR:O	1:F:67:GLU:HB3	2.06	0.55
1:F:351:SER:O	1:F:384:PHE:HB3	2.07	0.55
1:C:108:VAL:HG22	1:C:182:PHE:HD1	1.71	0.55
1:E:396:GLU:OE1	1:E:396:GLU:HA	2.05	0.55
1:F:40:LEU:CD2	1:F:401:PRO:HB2	2.33	0.55
1:F:45:PRO:HA	1:F:49:GLN:OE1	2.06	0.55
1:F:285:VAL:CG2	1:F:305:ASN:ND2	2.70	0.55
1:C:138:TYR:CZ	1:C:154:VAL:HG12	2.42	0.55
1:E:243:PRO:HB2	1:E:244:TRP:CD1	2.41	0.55
1:D:59:PHE:HD2	1:D:357:TRP:CZ2	2.25	0.55
1:D:274:ALA:HA	1:D:279:GLY:CA	2.37	0.55
1:E:52:TYR:O	1:E:56:ARG:NH1	2.39	0.55
1:A:400:VAL:HB	1:A:401:PRO:CD	2.37	0.54
1:B:33:PRO:HD3	1:B:65:ILE:CG2	2.36	0.54
1:F:75:ALA:O	1:F:115:LEU:HD23	2.07	0.54
1:F:229:SER:HA	1:F:237:ILE:CD1	2.37	0.54
1:A:369:ASP:OD2	1:A:372:THR:HG23	2.06	0.54
1:C:53:TYR:OH	1:C:67:GLU:OE2	2.21	0.54
1:D:307:PHE:HB2	1:F:260:LEU:HD13	1.89	0.54
1:E:258:HIS:ND1	1:E:260:LEU:HB2	2.23	0.54
1:D:94:TRP:HA	1:D:97:ILE:HD12	1.88	0.54
1:D:133:SER:OG	1:D:134:ALA:N	2.35	0.54
1:F:40:LEU:HD23	1:F:401:PRO:CB	2.34	0.54
1:C:69:THR:HG22	1:C:85:ILE:HG22	1.90	0.54
1:A:274:ALA:HA	1:A:279:GLY:N	2.23	0.54
1:C:164:ASP:O	1:C:168:GLU:HB2	2.08	0.54

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:392:ASP:OD2	1:C:395:LEU:HB2	2.07	0.54
1:D:117:ARG:HG2	1:D:118:VAL:HG12	1.89	0.54
1:B:241:ILE:HG13	1:B:285:VAL:HG12	1.90	0.54
1:D:171:THR:CG2	1:D:231:ILE:HD13	2.33	0.54
1:E:329:PHE:HB3	1:E:332:LEU:HB3	1.90	0.54
1:F:162:VAL:CG1	1:F:210:TYR:HE2	2.17	0.54
1:A:109:SER:HB2	1:A:184:TYR:HB2	1.89	0.53
1:D:383:THR:O	1:D:386:MET:HG3	2.08	0.53
1:F:74:GLN:OE1	1:F:129:LEU:HD22	2.08	0.53
1:F:75:ALA:HA	1:F:114:PHE:CD1	2.43	0.53
2:A:501:FMN:O3P	2:A:501:FMN:O4'	2.26	0.53
1:B:75:ALA:HB1	1:B:114:PHE:HA	1.90	0.53
1:D:70:PHE:CD1	1:D:76:SER:HA	2.41	0.53
1:E:50:LEU:HA	1:E:97:ILE:HG12	1.91	0.53
1:A:117:ARG:O	1:A:117:ARG:HG3	2.09	0.53
1:E:33:PRO:CD	1:E:65:ILE:HG21	2.29	0.53
1:F:33:PRO:HD3	1:F:65:ILE:HG21	1.90	0.53
1:F:226:ASP:O	1:F:230:THR:HG23	2.08	0.53
1:F:252:ALA:O	1:F:259:PRO:HD3	2.08	0.53
1:F:229:SER:O	1:F:233:GLY:HA2	2.08	0.53
1:D:102:HIS:C	1:D:104:ASN:N	2.66	0.53
1:B:306:GLU:HG3	1:B:310:LYS:HE2	1.90	0.53
1:C:13:GLU:O	1:C:28:LYS:HD2	2.09	0.53
1:D:241:ILE:HD12	1:D:263:PHE:CD1	2.43	0.53
1:D:400:VAL:HB	1:D:401:PRO:CD	2.39	0.53
1:F:148:GLU:C	1:F:150:VAL:H	2.17	0.53
1:F:158:THR:O	1:F:162:VAL:HG23	2.09	0.53
1:E:135:SER:O	1:E:137:THR:N	2.42	0.53
1:F:204:ASN:OD1	1:F:204:ASN:C	2.52	0.53
1:A:399:ARG:NH1	1:A:399:ARG:CG	2.62	0.52
1:F:88:ASP:OD1	1:F:176:LYS:HE3	2.09	0.52
1:F:178:MET:HA	1:F:178:MET:HE2	1.91	0.52
1:B:50:LEU:HA	1:B:97:ILE:HG12	1.91	0.52
1:E:35:THR:H	2:E:501:FMN:C5A	2.22	0.52
1:E:114:PHE:CD1	1:E:194:LEU:HD22	2.45	0.52
1:F:33:PRO:HD3	1:F:65:ILE:CG2	2.40	0.52
1:F:285:VAL:CG2	1:F:305:ASN:HD22	2.22	0.52
1:A:75:ALA:CB	1:A:114:PHE:CD2	2.93	0.52
1:C:111:GLN:OE1	1:C:188:HIS:CD2	2.63	0.52
1:D:93:ALA:C	1:D:95:LYS:N	2.66	0.52
1:F:320:GLY:HA2	2:F:501:FMN:C5'	2.39	0.52

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:221:ILE:HD12	1:C:221:ILE:N	2.25	0.52
1:D:158:THR:O	1:D:160:GLN:N	2.43	0.52
1:F:283:ILE:HD12	1:F:312:TRP:CD1	2.44	0.52
1:A:317:LEU:HD12	1:A:317:LEU:C	2.34	0.52
1:C:308:VAL:HG12	1:C:316:ILE:CD1	2.40	0.52
1:D:74:GLN:HE21	1:D:132:VAL:HG22	1.75	0.52
1:F:155:ARG:HH22	1:F:161:GLU:CD	2.18	0.52
1:A:174:ALA:O	1:A:178:MET:HG2	2.10	0.51
1:E:30:VAL:HG13	1:E:63:LEU:O	2.10	0.51
1:E:35:THR:H	2:E:501:FMN:H6	1.72	0.51
1:E:44:THR:HG22	1:E:45:PRO:HD2	1.92	0.51
1:E:392:ASP:OD2	1:E:395:LEU:HB2	2.10	0.51
1:D:237:ILE:O	1:D:280:ILE:HB	2.10	0.51
1:E:33:PRO:HD3	1:E:65:ILE:CB	2.39	0.51
1:E:77:GLY:HA3	1:E:119:ALA:HB1	1.93	0.51
1:E:287:GLU:OE1	1:E:288:PRO:HD2	2.10	0.51
1:F:273:ARG:HG3	1:F:273:ARG:NH1	2.24	0.51
1:A:267:VAL:HG12	1:A:311:ILE:HG22	1.93	0.51
1:A:347:ARG:O	1:A:350:THR:OG1	2.18	0.51
1:B:78:TRP:CE2	1:B:115:LEU:HD11	2.46	0.51
1:B:392:ASP:OD2	1:B:395:LEU:HB2	2.11	0.51
1:C:108:VAL:HG22	1:C:182:PHE:CD1	2.45	0.51
1:B:216:ASN:OD1	1:B:219:ARG:NH2	2.42	0.51
1:D:190:ALA:HB1	1:D:242:SER:OG	2.11	0.51
1:D:244:TRP:CZ3	1:D:258:HIS:HE1	2.28	0.51
1:F:135:SER:HG	1:F:205[B]:GLN:H	1.55	0.51
1:F:163:LYS:HD3	1:F:210:TYR:OH	2.10	0.51
1:F:224:LEU:O	1:F:228:LEU:HB2	2.11	0.51
1:D:242:SER:HB3	1:D:286:VAL:HG21	1.93	0.51
1:C:51:GLN:HG2	1:C:55:ASP:OD2	2.11	0.50
1:D:158:THR:O	1:D:159:THR:C	2.54	0.50
1:C:336:ILE:HG22	1:C:343:VAL:HG13	1.93	0.50
1:D:53:TYR:OH	1:D:66:THR:HA	2.11	0.50
1:F:135:SER:HG	1:F:205[A]:GLN:H	1.57	0.50
1:A:240:ARG:HA	1:A:284:SER:O	2.11	0.50
1:F:25:LEU:CD2	1:F:107:PHE:CD2	2.94	0.50
1:A:16:GLN:O	1:A:28:LYS:NZ	2.45	0.50
1:D:240:ARG:HA	1:D:284:SER:O	2.12	0.50
1:E:217:ARG:NH2	1:E:257:VAL:HG21	2.26	0.50
1:F:159:THR:O	1:F:159:THR:CG2	2.59	0.50
1:F:399:ARG:HG3	1:F:399:ARG:NH1	2.26	0.50

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:139:GLU:HG2	1:C:140:SER:N	2.27	0.50
1:E:64:LEU:O	1:E:108:VAL:HA	2.12	0.50
1:A:185:ILE:O	1:A:185:ILE:HG13	2.11	0.50
1:B:247:PHE:CD1	1:B:292:GLY:HA3	2.47	0.50
1:C:33:PRO:HG2	2:C:501:FMN:C2	2.42	0.50
1:C:397:ILE:HG22	1:C:397:ILE:O	2.11	0.50
1:D:28:LYS:HD3	1:D:341:THR:O	2.11	0.50
1:D:98:THR:OG1	1:D:181:GLY:HA3	2.11	0.50
1:D:157:LEU:O	1:D:206:ARG:NH1	2.45	0.50
1:E:113:ILE:HG12	1:E:114:PHE:N	2.27	0.50
1:F:304:ASP:OD2	1:F:304:ASP:N	2.43	0.50
1:E:397:ILE:HG22	1:E:397:ILE:O	2.11	0.50
1:A:70:PHE:CD1	1:A:76:SER:HA	2.46	0.50
1:A:178:MET:CG	1:A:232:VAL:HG12	2.41	0.50
1:E:194:LEU:O	1:E:197:GLN:HB2	2.11	0.50
1:E:347:ARG:HD2	1:E:368:TYR:CZ	2.47	0.50
1:F:78:TRP:NE1	1:F:115:LEU:HD11	2.27	0.50
1:F:394[A]:GLU:HG2	1:F:398:LYS:CE	2.41	0.50
1:A:5:LYS:O	1:A:327:PRO:HB3	2.12	0.50
1:C:166:VAL:O	1:C:171:THR:OG1	2.30	0.50
1:D:116:GLY:C	1:D:118:VAL:H	2.19	0.50
1:E:96:VAL:HG11	1:E:404:ILE:HG21	1.94	0.50
1:E:404:ILE:O	1:E:405:GLU:HB2	2.11	0.50
1:F:132:VAL:CG2	1:F:157:LEU:HD21	2.42	0.50
1:A:328:GLU:O	1:A:329:PHE:HB2	2.12	0.49
1:C:50:LEU:HA	1:C:97:ILE:HG12	1.93	0.49
1:E:35:THR:N	2:E:501:FMN:C6	2.75	0.49
1:A:86:TRP:O	1:A:176:LYS:HE2	2.12	0.49
1:A:273:ARG:HG3	1:A:273:ARG:NH1	2.25	0.49
1:D:72:SER:HA	1:D:86:TRP:CE3	2.47	0.49
1:E:387:ASP:HB3	1:E:389[B]:GLU:OE1	2.12	0.49
1:F:117:ARG:O	1:F:117:ARG:HG3	2.10	0.49
1:D:229:SER:HA	1:D:237:ILE:HD11	1.93	0.49
1:F:158:THR:C	1:F:160:GLN:H	2.20	0.49
1:A:378:ASN:OD1	1:A:382:ASN:HB2	2.12	0.49
1:C:113:ILE:HG12	1:C:114:PHE:N	2.27	0.49
1:C:289:ARG:NH2	1:C:320:GLY:O	2.42	0.49
1:D:132:VAL:CB	1:D:157:LEU:HD21	2.43	0.49
1:F:378:ASN:HD22	1:F:399:ARG:HD2	1.76	0.49
1:B:71:VAL:O	1:B:72:SER:HB3	2.12	0.49
1:C:158:THR:O	1:C:159:THR:C	2.54	0.49

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:71:VAL:CG1	1:C:112:LEU:HB3	2.40	0.49
1:D:260:LEU:CD1	1:F:307:PHE:HB2	2.42	0.49
1:E:34:THR:O	1:E:67:GLU:HB3	2.13	0.49
1:E:50:LEU:HD13	1:E:97:ILE:HA	1.95	0.49
1:C:72:SER:O	1:C:75:ALA:HB3	2.13	0.49
1:D:116:GLY:CA	1:D:132:VAL:O	2.61	0.49
1:C:318:LYS:HD2	1:C:341:THR:CG2	2.43	0.48
1:D:88:ASP:OD1	1:D:176:LYS:HE3	2.13	0.48
1:D:110:THR:HB	1:D:182:PHE:CD1	2.48	0.48
1:D:138:TYR:CZ	1:D:154:VAL:HG12	2.48	0.48
1:D:229:SER:O	1:D:233:GLY:HA2	2.13	0.48
1:E:120:ASP:OD1	1:E:122:ALA:HB3	2.13	0.48
1:F:134:ALA:HB2	1:F:198:PHE:CE1	2.49	0.48
1:D:273:ARG:NH1	1:D:273:ARG:CG	2.76	0.48
1:C:317:LEU:HD12	1:C:317:LEU:C	2.38	0.48
1:D:30:VAL:O	1:D:32:PRO:HD3	2.13	0.48
1:E:138:TYR:CE2	1:E:154:VAL:HG12	2.46	0.48
1:A:387:ASP:HB3	1:A:389[A]:GLU:OE2	2.13	0.48
1:B:66:THR:HG23	1:B:109:SER:O	2.13	0.48
1:D:52:TYR:CD1	1:D:56:ARG:NH1	2.81	0.48
1:C:308:VAL:HG12	1:C:316:ILE:HD13	1.94	0.48
1:D:185:ILE:HG13	1:D:185:ILE:O	2.13	0.48
1:E:94:TRP:O	1:E:98:THR:HG23	2.14	0.48
1:E:186:GLU:HA	1:E:238:GLY:O	2.13	0.48
1:A:178:MET:SD	1:A:232:VAL:HG12	2.54	0.48
1:A:394[A]:GLU:CG	1:A:398:LYS:HE2	2.35	0.48
1:D:400:VAL:HB	1:D:401:PRO:HD2	1.96	0.48
1:F:76:SER:OG	1:F:77:GLY:N	2.46	0.48
1:F:85:ILE:HG23	1:F:173:ALA:HB1	1.96	0.48
1:F:125:LYS:O	1:F:126:THR:C	2.57	0.48
1:F:379:TYR:HB2	1:F:397:ILE:HD13	1.94	0.48
1:F:372:THR:HG21	1:F:379:TYR:CD2	2.49	0.48
1:D:45:PRO:HG3	1:D:94:TRP:CE2	2.48	0.48
1:C:244:TRP:CH2	1:C:303:GLY:HA3	2.48	0.47
1:D:308:VAL:HG12	1:D:316:ILE:CD1	2.44	0.47
1:D:74:GLN:HA	1:D:124:MET:HE1	1.94	0.47
1:C:37:PHE:CG	1:C:80:GLY:HA3	2.49	0.47
1:D:117:ARG:O	1:D:117:ARG:HG3	2.13	0.47
1:F:274:ALA:HB2	1:F:279:GLY:HA3	1.95	0.47
1:B:395:LEU:O	1:B:398:LYS:HB2	2.15	0.47
1:C:259:PRO:O	1:C:263:PHE:HD2	1.97	0.47

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:40:LEU:CD2	1:D:401:PRO:HB2	2.44	0.47
1:F:43:HIS:HD2	1:F:86:TRP:HH2	1.63	0.47
1:B:348:TYR:O	1:B:352:ASN:HB2	2.15	0.47
1:E:201:PRO:HG3	1:E:257:VAL:HG23	1.95	0.47
1:A:288:PRO:HG3	1:A:304:ASP:HA	1.97	0.47
1:C:204:ASN:OD1	1:C:204:ASN:C	2.58	0.47
1:C:206:ARG:HB2	1:C:211:GLY:HA3	1.96	0.47
1:D:138:TYR:CE2	1:D:144:LYS:HG3	2.50	0.47
1:F:191:HIS:CE1	1:F:292:GLY:HA2	2.50	0.47
1:B:320:GLY:O	1:B:321:ASN:C	2.57	0.47
1:D:66:THR:OG1	1:D:110:THR:HA	2.15	0.47
1:F:378:ASN:ND2	1:F:399:ARG:HD2	2.30	0.47
1:F:393:LYS:O	1:F:397:ILE:CG1	2.55	0.47
1:A:88:ASP:OD1	1:A:176:LYS:HE3	2.15	0.47
1:B:5:LYS:O	1:B:327:PRO:HB3	2.15	0.47
1:B:144:LYS:O	1:B:148:GLU:HG3	2.14	0.47
1:C:332:LEU:HD23	1:C:332:LEU:O	2.14	0.47
1:C:354:ASN:OD1	1:C:358:LYS:HE3	2.15	0.47
1:D:114:PHE:HD1	1:D:194:LEU:HB2	1.80	0.47
1:D:160:GLN:NE2	1:D:164:ASP:OD1	2.46	0.47
1:E:114:PHE:CG	1:E:194:LEU:HD22	2.49	0.47
1:F:272:GLN:HA	1:F:275:ASP:OD2	2.14	0.47
1:A:348:TYR:O	1:A:352:ASN:HB2	2.15	0.47
1:F:274:ALA:CB	1:F:279:GLY:HA3	2.45	0.47
1:A:138:TYR:CD1	1:A:144:LYS:HA	2.50	0.47
1:D:23:ASN:CB	1:D:107:PHE:CE1	2.97	0.47
1:D:134:ALA:O	1:D:206:ARG:HG2	2.13	0.47
1:E:36:ARG:NH1	1:E:350:THR:HG22	2.30	0.47
1:F:75:ALA:HB2	1:F:114:PHE:CD2	2.50	0.47
1:F:56:ARG:HG3	1:F:56:ARG:HH11	1.79	0.46
1:C:263:PHE:O	1:C:267:VAL:HG23	2.16	0.46
1:E:242:SER:HB2	1:E:245:ALA:HB2	1.98	0.46
1:F:347:ARG:O	1:F:350:THR:OG1	2.20	0.46
1:E:272:GLN:O	1:E:276:LYS:HG3	2.15	0.46
1:F:115:LEU:N	1:F:115:LEU:CD2	2.79	0.46
1:F:116:GLY:C	1:F:118:VAL:H	2.24	0.46
1:F:178:MET:SD	1:F:232:VAL:CG1	3.04	0.46
1:F:221:ILE:CD1	1:F:221:ILE:N	2.79	0.46
1:A:50:LEU:HA	1:A:97:ILE:HG12	1.96	0.46
1:C:336:ILE:HA	1:C:341:THR:HB	1.97	0.46
1:D:72:SER:CB	1:D:73:PRO:CD	2.88	0.46

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:102:HIS:NE2	1:D:183:ASP:OD2	2.41	0.46
1:F:201:PRO:HG3	1:F:257:VAL:CG2	2.44	0.46
1:B:33:PRO:HD3	1:B:65:ILE:HG21	1.97	0.46
1:D:70:PHE:CE2	1:D:76:SER:HB2	2.50	0.46
1:E:389[B]:GLU:HG2	1:E:390:GLU:N	2.25	0.46
1:D:13:GLU:HG3	1:D:13:GLU:O	2.15	0.46
1:D:17:SER:HB3	1:D:26:GLN:OE1	2.16	0.46
1:D:261:THR:OG1	1:F:264:SER:HB2	2.15	0.46
1:B:186:GLU:HA	1:B:238:GLY:O	2.16	0.46
1:D:220:LEU:CD1	1:D:224:LEU:HD11	2.43	0.46
1:E:201:PRO:O	1:E:205[A]:GLN:NE2	2.45	0.46
1:E:292:GLY:O	2:E:501:FMN:H1'2	2.15	0.46
1:E:288:PRO:O	1:E:301:GLN:HG2	2.15	0.46
1:F:91:ALA:HA	1:F:180:ALA:HB2	1.97	0.46
1:C:353:PRO:HG3	1:C:385[B]:SER:OG	2.16	0.46
1:D:6:ILE:HG13	1:D:362:GLY:HA2	1.97	0.46
1:E:144:LYS:HE2	1:E:148:GLU:OE2	2.16	0.46
1:F:237:ILE:O	1:F:280:ILE:HB	2.15	0.46
1:F:386:MET:HE2	1:F:391:VAL:HG22	1.97	0.46
1:B:193:TYR:O	1:B:194:LEU:C	2.60	0.45
1:C:260:LEU:HD21	1:C:307:PHE:CG	2.51	0.45
1:D:45:PRO:HG2	1:D:94:TRP:CD1	2.51	0.45
1:F:35:THR:H	2:F:501:FMN:C6	2.29	0.45
1:F:325:ASP:OD2	1:F:331:THR:HB	2.15	0.45
1:F:5:LYS:O	1:F:327:PRO:HB3	2.15	0.45
1:B:168:GLU:O	1:B:169:ALA:C	2.58	0.45
1:D:67:GLU:O	1:D:68:ALA:C	2.59	0.45
1:E:30:VAL:HG22	1:E:63:LEU:HB3	1.98	0.45
1:F:69:THR:HG23	1:F:83:PRO:O	2.17	0.45
1:F:148:GLU:C	1:F:150:VAL:N	2.73	0.45
1:B:33:PRO:HD3	1:B:65:ILE:CB	2.46	0.45
1:B:228:LEU:O	1:B:232:VAL:HG22	2.16	0.45
1:F:25:LEU:HD23	1:F:107:PHE:CE2	2.50	0.45
1:F:332:LEU:C	1:F:332:LEU:HD23	2.41	0.45
1:F:351:SER:HA	1:F:384:PHE:CG	2.52	0.45
1:B:209:GLU:H	1:B:209:GLU:HG2	1.54	0.45
1:C:29:ILE:O	3:C:601:HOH:O	2.21	0.45
1:D:233:GLY:O	1:D:235:ASP:N	2.50	0.45
1:F:109:SER:CB	1:F:184:TYR:HB2	2.46	0.45
1:F:120:ASP:O	1:F:124:MET:HG2	2.16	0.45
1:F:211:GLY:N	1:F:216:ASN:HB3	2.31	0.45

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:389[A]:GLU:CD	1:B:389[A]:GLU:H	2.23	0.45
1:C:63:LEU:C	1:C:64:LEU:HD23	2.41	0.45
1:D:74:GLN:O	1:D:74:GLN:CG	2.61	0.45
1:F:98:THR:HG22	1:F:108:VAL:HG11	1.99	0.45
1:F:216:ASN:O	1:F:217:ARG:C	2.58	0.45
1:F:218:ALA:HB3	1:F:265:TYR:HE1	1.81	0.45
1:D:258:HIS:HD2	1:F:311:ILE:HG12	1.73	0.45
1:F:50:LEU:HA	1:F:97:ILE:HG12	1.98	0.45
1:F:274:ALA:HB2	1:F:279:GLY:CA	2.47	0.45
1:D:23:ASN:HB3	1:D:107:PHE:CZ	2.51	0.45
1:D:52:TYR:HB2	1:D:381:TYR:CE2	2.51	0.45
1:D:162:VAL:O	1:D:165:LEU:HB2	2.17	0.45
1:F:25:LEU:CD2	1:F:107:PHE:HD2	2.28	0.45
1:C:270:LEU:HD22	1:C:280:ILE:HD13	1.98	0.45
1:D:70:PHE:HE1	1:D:115:LEU:HD21	1.82	0.45
1:F:228:LEU:O	1:F:232:VAL:HG22	2.17	0.45
1:F:378:ASN:OD1	1:F:382:ASN:HB2	2.16	0.45
1:A:45:PRO:HG2	1:A:94:TRP:CD1	2.51	0.45
1:A:134:ALA:O	1:A:206:ARG:CG	2.65	0.45
1:A:268:HIS:O	1:A:272:GLN:HG3	2.17	0.45
1:D:43:HIS:NE2	1:D:127:ARG:NH2	2.65	0.45
1:F:394[A]:GLU:HG2	1:F:398:LYS:HE3	1.99	0.45
1:A:155:ARG:HH12	1:A:161:GLU:CD	2.24	0.44
1:C:132:VAL:O	1:C:133:SER:HB2	2.16	0.44
1:D:34:THR:O	1:D:36:ARG:HG2	2.17	0.44
1:D:241:ILE:HB	1:D:263:PHE:CE1	2.52	0.44
1:D:311:ILE:HD11	1:F:260:LEU:HD12	1.99	0.44
1:E:355:LEU:HG	1:E:359:LEU:CD1	2.44	0.44
1:F:43:HIS:CD2	1:F:86:TRP:HH2	2.34	0.44
1:F:117:ARG:CZ	1:F:203:THR:CG2	2.94	0.44
1:F:178:MET:HE2	1:F:178:MET:CA	2.46	0.44
1:B:65:ILE:HD13	1:B:186:GLU:OE1	2.16	0.44
1:D:117:ARG:HB3	1:D:197:GLN:CD	2.42	0.44
1:B:40:LEU:HD23	1:B:401:PRO:CB	2.47	0.44
1:B:201:PRO:O	1:B:205[B]:GLN:NE2	2.40	0.44
1:C:318:LYS:HD2	1:C:341:THR:HG21	1.99	0.44
1:C:345:PHE:O	1:C:349:PHE:HB2	2.17	0.44
1:F:240:ARG:HH21	1:F:286:VAL:HG22	1.83	0.44
1:A:30:VAL:O	1:A:32:PRO:HD3	2.17	0.44
1:B:59:PHE:O	1:B:62:THR:OG1	2.26	0.44
1:C:260:LEU:HD21	1:C:307:PHE:CD1	2.52	0.44

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:95:LYS:NZ	1:D:99:ASP:OD2	2.44	0.44
1:F:35:THR:N	2:F:501:FMN:H6	2.32	0.44
1:F:260:LEU:HD23	1:F:260:LEU:HA	1.90	0.44
1:A:10:LYS:O	1:A:10:LYS:HG2	2.18	0.44
1:A:70:PHE:HB2	1:A:86:TRP:HZ3	1.83	0.44
1:D:45:PRO:HA	1:D:49:GLN:OE1	2.18	0.44
1:D:71:VAL:O	1:D:86:TRP:HB3	2.17	0.44
1:D:190:ALA:HB2	1:D:241:ILE:HA	1.98	0.44
1:E:131:PRO:HB2	1:E:154:VAL:HB	2.00	0.44
1:F:73:PRO:HB3	1:F:127:ARG:HH11	1.78	0.44
1:C:174:ALA:O	1:C:178:MET:HG2	2.18	0.44
1:D:70:PHE:HB2	1:D:86:TRP:HZ3	1.83	0.44
1:A:247:PHE:CD1	1:A:292:GLY:HA3	2.53	0.44
1:D:116:GLY:C	1:D:118:VAL:N	2.74	0.44
1:D:191:HIS:CE1	1:D:292:GLY:HA2	2.53	0.44
1:E:251:LYS:HD3	1:E:251:LYS:HA	1.81	0.44
1:C:314:GLY:O	1:C:340:ARG:HD3	2.17	0.44
1:C:351:SER:HB3	1:C:368:TYR:HA	2.00	0.44
1:D:178:MET:HE2	1:D:178:MET:CA	2.47	0.44
1:B:162:VAL:O	1:B:165:LEU:HB2	2.18	0.43
1:B:399:ARG:HG3	1:B:399:ARG:HH11	1.83	0.43
1:D:198:PHE:CG	1:D:220:LEU:HD23	2.53	0.43
1:F:25:LEU:HD23	1:F:107:PHE:CD2	2.53	0.43
1:F:195:LEU:HB3	1:F:221:ILE:HD11	2.00	0.43
1:F:394[B]:GLU:CD	1:F:394[B]:GLU:H	2.25	0.43
1:A:54:GLY:HA3	1:A:100:LYS:HD3	2.00	0.43
1:A:204:ASN:OD1	1:A:204:ASN:C	2.61	0.43
1:A:288:PRO:HG3	1:A:303:GLY:O	2.19	0.43
1:D:117:ARG:HG2	1:D:118:VAL:CG1	2.48	0.43
1:F:274:ALA:HA	1:F:279:GLY:CA	2.48	0.43
1:A:45:PRO:HG3	1:A:94:TRP:CE2	2.53	0.43
1:B:197:GLN:HA	1:B:203:THR:OG1	2.18	0.43
1:D:189:ALA:HA	1:D:195:LEU:HB2	1.99	0.43
1:E:340:ARG:HD2	1:E:340:ARG:C	2.43	0.43
1:A:131:PRO:HB2	1:A:154:VAL:HA	2.00	0.43
1:A:258:HIS:ND1	1:A:259:PRO:HD2	2.34	0.43
1:D:86:TRP:HB2	1:D:172:ASN:HD21	1.82	0.43
1:D:240:ARG:NH2	2:D:501:FMN:O3'	2.51	0.43
1:D:241:ILE:C	1:D:243:PRO:HD3	2.44	0.43
1:A:229:SER:O	1:A:233:GLY:HA2	2.19	0.43
1:B:36:ARG:O	1:B:37:PHE:HB2	2.16	0.43

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:98:THR:HG22	1:C:108:VAL:HG11	1.98	0.43
1:C:209:GLU:H	1:C:209:GLU:HG2	1.60	0.43
1:E:130:ASN:HA	1:E:152:ASN:OD1	2.18	0.43
1:E:134:ALA:HB2	1:E:198:PHE:CD1	2.54	0.43
1:A:7[B]:SER:OG	1:A:327:PRO:O	2.26	0.43
1:A:244:TRP:CH2	1:A:303:GLY:HA3	2.53	0.43
1:E:347:ARG:NE	2:E:501:FMN:O2P	2.52	0.43
1:F:158:THR:C	1:F:160:GLN:N	2.76	0.43
1:D:113:ILE:HD11	1:D:193:TYR:CD2	2.53	0.43
1:F:39:ALA:HB3	1:F:81:ALA:O	2.18	0.43
1:F:240:ARG:NH1	2:F:501:FMN:O2'	2.44	0.43
1:C:220:LEU:HD12	1:C:220:LEU:O	2.19	0.43
1:D:6:ILE:HD13	1:D:365:LEU:HD21	2.01	0.43
1:D:161:GLU:O	1:D:165:LEU:HG	2.19	0.43
1:D:389[A]:GLU:H	1:D:389[A]:GLU:HG3	1.60	0.43
1:E:77:GLY:HA3	1:E:119:ALA:CB	2.47	0.43
1:E:120:ASP:O	1:E:124:MET:HG2	2.19	0.43
1:A:116:GLY:O	1:A:118:VAL:N	2.52	0.43
1:C:188:HIS:ND1	1:C:188:HIS:C	2.77	0.43
1:D:369:ASP:OD2	1:D:372:THR:HG23	2.19	0.43
1:E:72:SER:HB2	1:E:73:PRO:HD2	2.01	0.43
1:E:85:ILE:HD13	1:E:94:TRP:CD1	2.53	0.43
1:F:70:PHE:CE1	1:F:76:SER:HA	2.53	0.43
1:C:221:ILE:O	1:C:225:ILE:HG12	2.19	0.43
1:D:74:GLN:NE2	1:D:132:VAL:CG2	2.80	0.43
1:D:171:THR:HG23	1:D:231:ILE:HD11	1.92	0.43
1:D:274:ALA:HA	1:D:279:GLY:N	2.34	0.43
1:F:75:ALA:HA	1:F:114:PHE:CE1	2.54	0.43
1:F:165:LEU:O	1:F:170:TYR:HB2	2.19	0.43
1:D:70:PHE:CE2	1:D:76:SER:CB	3.02	0.42
1:E:113:ILE:HD11	1:E:193:TYR:CG	2.54	0.42
1:E:282:TYR:CD2	1:E:282:TYR:C	2.97	0.42
1:F:205[B]:GLN:OE1	1:F:205[B]:GLN:HA	2.13	0.42
1:A:114:PHE:CG	1:A:194:LEU:HD22	2.54	0.42
1:F:351:SER:HA	1:F:384:PHE:CD2	2.55	0.42
1:F:372:THR:OG1	1:F:380:GLY:HA3	2.19	0.42
1:D:56:ARG:HG2	1:D:353:PRO:HA	2.00	0.42
1:E:28:LYS:HE2	3:E:603:HOH:O	2.19	0.42
1:F:158:THR:O	1:F:160:GLN:N	2.52	0.42
1:F:210:TYR:CD1	1:F:219:ARG:HD2	2.54	0.42
1:A:243:PRO:HB2	1:A:244:TRP:CD1	2.54	0.42

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:285:VAL:HG11	1:B:308:VAL:HG21	2.01	0.42
1:D:113:ILE:HG12	1:D:114:PHE:N	2.35	0.42
1:E:57:SER:HB2	1:E:101:VAL:HG13	2.01	0.42
1:A:35:THR:O	1:A:36:ARG:HD2	2.18	0.42
1:B:6:ILE:HA	1:B:327:PRO:CB	2.49	0.42
1:B:202:CYS:SG	1:B:203:THR:HG23	2.60	0.42
1:D:38:ARG:NH2	1:D:375:SER:OG	2.53	0.42
1:F:132:VAL:HG21	1:F:157:LEU:HD21	2.00	0.42
1:A:396:GLU:HA	1:A:396:GLU:OE1	2.20	0.42
1:C:397:ILE:O	1:C:397:ILE:CG2	2.67	0.42
1:D:24:THR:HG22	1:D:26:GLN:HE22	1.84	0.42
1:D:74:GLN:HB2	1:D:129:LEU:HD13	2.02	0.42
1:F:138:TYR:CE1	1:F:144:LYS:HA	2.54	0.42
1:F:178:MET:HE2	1:F:178:MET:N	2.34	0.42
1:B:219:ARG:HG3	1:B:219:ARG:HH11	1.84	0.42
1:B:283:ILE:HD12	1:B:312:TRP:CG	2.53	0.42
1:E:157:LEU:HD22	1:E:161:GLU:HB3	2.01	0.42
1:E:241:ILE:HG13	1:E:243:PRO:HD3	2.01	0.42
1:E:274:ALA:HA	1:E:279:GLY:N	2.34	0.42
1:F:121:PRO:HA	1:F:131:PRO:HG3	2.01	0.42
1:B:121:PRO:HG3	1:B:147:ALA:HA	2.01	0.42
1:F:157:LEU:O	1:F:206:ARG:NH1	2.47	0.42
1:F:297:SER:O	1:F:301:GLN:HG3	2.20	0.42
1:A:228:LEU:O	1:A:232:VAL:HG22	2.20	0.42
1:D:174:ALA:CB	1:D:228:LEU:CD2	2.98	0.42
1:D:195:LEU:HD21	1:D:224:LEU:CD1	2.49	0.42
1:D:260:LEU:HD23	1:D:260:LEU:HA	1.93	0.42
1:E:113:ILE:HG12	1:E:114:PHE:H	1.84	0.42
1:F:52:TYR:CD2	1:F:52:TYR:C	2.98	0.42
1:F:400:VAL:HB	1:F:401:PRO:CD	2.50	0.42
1:C:56:ARG:HG2	1:C:349:PHE:CD1	2.54	0.41
1:E:178:MET:SD	1:E:232:VAL:HG12	2.60	0.41
1:E:244:TRP:CZ3	1:E:302:ALA:O	2.73	0.41
1:E:387:ASP:HB3	1:E:389[A]:GLU:CG	2.47	0.41
1:D:59:PHE:HA	1:D:60:PRO:HD3	1.84	0.41
1:F:162:VAL:HG12	1:F:210:TYR:HE2	1.79	0.41
1:F:178:MET:HG3	1:F:232:VAL:HG12	2.01	0.41
1:C:65:ILE:HG12	1:C:109:SER:HB3	2.02	0.41
1:C:258:HIS:HA	1:C:259:PRO:HD3	1.93	0.41
1:D:379:TYR:HB3	1:D:397:ILE:HD13	2.01	0.41
1:E:113:ILE:HD11	1:E:193:TYR:CD2	2.55	0.41

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:258:HIS:CE1	1:E:259:PRO:HD2	2.55	0.41
1:F:377:ASN:OD1	1:F:379:TYR:HB3	2.21	0.41
1:A:165:LEU:HA	1:A:169:ALA:CB	2.49	0.41
1:D:177:ALA:O	1:D:180:ALA:HB3	2.19	0.41
1:F:125:LYS:C	1:F:127:ARG:N	2.76	0.41
1:B:332:LEU:C	1:B:332:LEU:CD2	2.93	0.41
1:B:369:ASP:O	1:B:371:ASN:N	2.53	0.41
1:C:132:VAL:HB	1:C:157:LEU:HD21	2.01	0.41
1:C:138:TYR:CG	1:C:144:LYS:HB2	2.55	0.41
1:D:77:GLY:HA3	1:D:119:ALA:HB1	2.03	0.41
1:E:30:VAL:O	1:E:32:PRO:HD3	2.19	0.41
1:E:42:ASP:OD2	1:E:89:LYS:NZ	2.35	0.41
1:F:133:SER:O	1:F:157:LEU:HG	2.21	0.41
1:A:133:SER:HB3	1:A:135:SER:O	2.19	0.41
1:A:345:PHE:O	1:A:349:PHE:HB2	2.20	0.41
1:D:56:ARG:NH1	3:D:602:HOH:O	2.44	0.41
1:D:349:PHE:CE1	1:D:355:LEU:HB3	2.56	0.41
1:E:138:TYR:OH	1:E:154:VAL:N	2.47	0.41
1:F:243:PRO:O	1:F:259:PRO:CB	2.65	0.41
1:A:250:MET:HE3	1:A:250:MET:HB3	1.92	0.41
1:C:167:TYR:HD1	1:C:227:HIS:CE1	2.39	0.41
1:C:219:ARG:HG3	1:C:219:ARG:HH11	1.85	0.41
1:F:250:MET:HE3	1:F:250:MET:HB3	1.91	0.41
1:A:102:HIS:C	1:A:104:ASN:N	2.77	0.41
1:B:283:ILE:HD12	1:B:312:TRP:CD2	2.56	0.41
1:E:154:VAL:HG13	1:E:154:VAL:O	2.20	0.41
1:A:95:LYS:HA	1:A:180:ALA:O	2.21	0.41
1:B:138:TYR:OH	1:B:154:VAL:HG12	2.19	0.41
1:C:122:ALA:O	1:C:126:THR:HG23	2.21	0.41
1:D:92:LYS:O	1:D:95:LYS:HB3	2.21	0.41
1:D:110:THR:HG22	1:D:185:ILE:HG22	2.02	0.41
1:D:111:GLN:OE1	1:D:188:HIS:CD2	2.73	0.41
1:D:244:TRP:HZ3	1:D:258:HIS:HE1	1.68	0.41
1:E:235:ASP:O	1:E:281:ALA:HB2	2.20	0.41
1:F:274:ALA:HA	1:F:279:GLY:H	1.82	0.41
1:A:229:SER:HA	1:A:237:ILE:HD11	2.03	0.41
1:B:15:PHE:CZ	1:B:360:ARG:HB2	2.55	0.41
1:B:290:VAL:HG11	2:B:501:FMN:C5'	2.51	0.41
1:E:56:ARG:CB	1:E:349:PHE:HE1	2.32	0.41
1:E:59:PHE:HD1	1:E:59:PHE:O	2.04	0.41
1:E:201:PRO:HG3	1:E:257:VAL:CG2	2.51	0.41

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:378:ASN:O	1:E:383:THR:HG23	2.20	0.41
1:B:307:PHE:CD2	1:B:307:PHE:C	2.99	0.40
1:C:158:THR:O	1:C:161:GLU:N	2.55	0.40
1:D:45:PRO:HG2	1:D:94:TRP:CG	2.57	0.40
1:D:204:ASN:OD1	1:D:204:ASN:C	2.63	0.40
1:D:240:ARG:HD3	2:D:501:FMN:O2	2.21	0.40
1:E:346:SER:N	2:E:501:FMN:O3P	2.52	0.40
1:C:113:ILE:CG1	1:C:114:PHE:N	2.85	0.40
1:D:260:LEU:CD2	1:D:307:PHE:CD1	3.04	0.40
1:D:347:ARG:HG3	2:D:501:FMN:O3P	2.21	0.40
1:E:392:ASP:HB3	1:E:395:LEU:HB3	2.03	0.40
1:F:129:LEU:HD23	1:F:129:LEU:HA	1.90	0.40
1:F:258:HIS:ND1	1:F:259:PRO:HD2	2.36	0.40
2:A:501:FMN:HM71	2:A:501:FMN:HM83	1.94	0.40
1:C:312:TRP:O	1:C:340:ARG:NH1	2.38	0.40
1:D:219:ARG:O	1:D:223:GLU:HB2	2.22	0.40
1:E:115:LEU:HD12	1:E:118:VAL:HG23	2.03	0.40
1:E:239:ILE:HG13	1:E:240:ARG:N	2.35	0.40
1:F:114:PHE:CD1	1:F:114:PHE:C	3.00	0.40
1:F:134:ALA:HB2	1:F:198:PHE:CD1	2.56	0.40
1:B:43:HIS:O	1:B:83:PRO:HA	2.21	0.40
1:C:389[A]:GLU:CD	1:C:389[A]:GLU:H	2.29	0.40
1:D:288:PRO:HG3	1:D:304:ASP:HA	2.03	0.40
1:E:193:TYR:O	1:E:194:LEU:C	2.63	0.40
1:A:178:MET:HG3	1:A:232:VAL:HG12	2.03	0.40
1:B:338:ASP:O	1:B:339:LYS:HB2	2.21	0.40
1:C:72:SER:HB2	1:C:73:PRO:CD	2.51	0.40
1:D:59:PHE:CD2	1:D:357:TRP:CZ2	3.08	0.40
1:E:283:ILE:HD12	1:E:312:TRP:CG	2.57	0.40
1:F:20:VAL:O	1:F:20:VAL:HG12	2.22	0.40
1:F:95:LYS:O	1:F:96:VAL:C	2.65	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	408/407 (100%)	371 (91%)	32 (8%)	5 (1%)	10	20
1	B	408/407 (100%)	383 (94%)	23 (6%)	2 (0%)	24	43
1	C	408/407 (100%)	384 (94%)	20 (5%)	4 (1%)	12	24
1	D	408/407 (100%)	356 (87%)	41 (10%)	11 (3%)	4	7
1	E	408/407 (100%)	383 (94%)	20 (5%)	5 (1%)	10	20
1	F	408/407 (100%)	361 (88%)	38 (9%)	9 (2%)	5	10
All	All	2448/2442 (100%)	2238 (91%)	174 (7%)	36 (2%)	8	15

All (36) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	85	ILE
1	D	117	ARG
1	E	136	ALA
1	F	117	ARG
1	F	126	THR
1	A	384	PHE
1	A	395	LEU
1	C	67	GLU
1	C	85	ILE
1	D	159	THR
1	D	234	ALA
1	D	391	VAL
1	D	395	LEU
1	F	149	ALA
1	A	117	ARG
1	D	208	ASP
1	E	85	ILE
1	E	169	ALA
1	F	125	LYS
1	F	159	THR
1	F	208	ASP
1	A	208	ASP
1	B	403	ALA
1	C	399	ARG
1	D	76	SER
1	D	90	HIS
1	E	67	GLU

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	F	139	GLU
1	C	320	GLY
1	D	320	GLY
1	E	320	GLY
1	F	90	HIS
1	D	94	TRP
1	D	85	ILE
1	F	221	ILE
1	A	85	ILE

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	348/344 (101%)	335 (96%)	13 (4%)	30	54
1	B	348/344 (101%)	331 (95%)	17 (5%)	22	43
1	C	348/344 (101%)	329 (94%)	19 (6%)	19	37
1	D	348/344 (101%)	322 (92%)	26 (8%)	12	24
1	E	348/344 (101%)	330 (95%)	18 (5%)	21	39
1	F	348/344 (101%)	324 (93%)	24 (7%)	14	26
All	All	2088/2064 (101%)	1971 (94%)	117 (6%)	20	36

All (117) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	6	ILE
1	A	71	VAL
1	A	108	VAL
1	A	207	THR
1	A	231	ILE
1	A	294	VAL
1	A	299	GLU
1	A	317	LEU
1	A	349	PHE

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	A	389[A]	GLU
1	A	389[B]	GLU
1	A	399	ARG
1	A	402	SER
1	B	3	SER
1	B	35	THR
1	B	67	GLU
1	B	108	VAL
1	B	111	GLN
1	B	115	LEU
1	B	145	GLU
1	B	260	LEU
1	B	262	THR
1	B	294	VAL
1	B	299	GLU
1	B	332	LEU
1	B	349	PHE
1	B	372	THR
1	B	388[A]	SER
1	B	388[B]	SER
1	B	405	GLU
1	C	35	THR
1	C	64	LEU
1	C	67	GLU
1	C	108	VAL
1	C	111	GLN
1	C	115	LEU
1	C	139	GLU
1	C	145	GLU
1	C	150	VAL
1	C	231	ILE
1	C	260	LEU
1	C	294	VAL
1	C	299	GLU
1	C	332	LEU
1	C	349	PHE
1	C	375	SER
1	C	387	ASP
1	C	402	SER
1	C	405	GLU
1	D	17	SER
1	D	27	THR

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	D	44	THR
1	D	67	GLU
1	D	87	THR
1	D	108	VAL
1	D	111	GLN
1	D	115	LEU
1	D	117	ARG
1	D	118	VAL
1	D	126	THR
1	D	145	GLU
1	D	220	LEU
1	D	221	ILE
1	D	229	SER
1	D	232	VAL
1	D	294	VAL
1	D	298	GLU
1	D	299	GLU
1	D	349	PHE
1	D	371	ASN
1	D	387	ASP
1	D	389[A]	GLU
1	D	389[B]	GLU
1	D	397	ILE
1	D	402	SER
1	E	4	VAL
1	E	24	THR
1	E	35	THR
1	E	76	SER
1	E	111	GLN
1	E	118	VAL
1	E	137	THR
1	E	221	ILE
1	E	231	ILE
1	E	239	ILE
1	E	264	SER
1	E	294	VAL
1	E	299	GLU
1	E	371	ASN
1	E	386	MET
1	E	389[A]	GLU
1	E	389[B]	GLU
1	E	397	ILE

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	F	4	VAL
1	F	7[A]	SER
1	F	7[B]	SER
1	F	29	ILE
1	F	97	ILE
1	F	111	GLN
1	F	115	LEU
1	F	117	ARG
1	F	126	THR
1	F	214	ILE
1	F	221	ILE
1	F	239	ILE
1	F	264	SER
1	F	285	VAL
1	F	297	SER
1	F	323	SER
1	F	334	GLU
1	F	349	PHE
1	F	387	ASP
1	F	389[A]	GLU
1	F	389[B]	GLU
1	F	395	LEU
1	F	397	ILE
1	F	400	VAL

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (19) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	248	GLN
1	C	22	ASN
1	C	272	GLN
1	C	371	ASN
1	D	49	GLN
1	D	74	GLN
1	D	90	HIS
1	D	191	HIS
1	D	258	HIS
1	D	268	HIS
1	E	227	HIS
1	E	248	GLN
1	E	272	GLN
1	F	130	ASN

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	F	172	ASN
1	F	188	HIS
1	F	191	HIS
1	F	278	GLN
1	F	305	ASN

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

6 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	F	501	-	33,33,33	1.45	4 (12%)	48,50,50	1.21	6 (12%)
2	FMN	D	501	-	33,33,33	1.45	4 (12%)	48,50,50	1.21	6 (12%)
2	FMN	C	501	-	33,33,33	1.45	4 (12%)	48,50,50	1.22	6 (12%)
2	FMN	E	501	-	33,33,33	1.45	4 (12%)	48,50,50	1.21	6 (12%)
2	FMN	A	501	-	33,33,33	1.45	4 (12%)	48,50,50	1.22	6 (12%)
2	FMN	B	501	-	33,33,33	1.44	4 (12%)	48,50,50	1.22	6 (12%)

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	F	501	-	-	5/18/18/18	0/3/3/3
2	FMN	D	501	-	-	4/18/18/18	0/3/3/3
2	FMN	C	501	-	-	3/18/18/18	0/3/3/3
2	FMN	E	501	-	-	8/18/18/18	0/3/3/3
2	FMN	A	501	-	-	4/18/18/18	0/3/3/3
2	FMN	B	501	-	-	8/18/18/18	0/3/3/3

All (24) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	E	501	FMN	C9A-C5A	5.26	1.49	1.41
2	D	501	FMN	C9A-C5A	5.26	1.49	1.41
2	A	501	FMN	C9A-C5A	5.22	1.49	1.41
2	F	501	FMN	C9A-C5A	5.22	1.49	1.41
2	C	501	FMN	C9A-C5A	5.21	1.49	1.41
2	B	501	FMN	C9A-C5A	5.18	1.49	1.41
2	E	501	FMN	C8-C7	3.42	1.49	1.40
2	F	501	FMN	C8-C7	3.40	1.49	1.40
2	A	501	FMN	C8-C7	3.40	1.49	1.40
2	D	501	FMN	C8-C7	3.40	1.49	1.40
2	B	501	FMN	C8-C7	3.40	1.49	1.40
2	C	501	FMN	C8-C7	3.39	1.49	1.40
2	F	501	FMN	C4-N3	-2.47	1.34	1.38
2	C	501	FMN	C4-N3	-2.47	1.34	1.38
2	E	501	FMN	C4-N3	-2.46	1.34	1.38
2	B	501	FMN	C4-N3	-2.44	1.34	1.38
2	A	501	FMN	C4-N3	-2.43	1.34	1.38
2	D	501	FMN	C4-N3	-2.43	1.34	1.38
2	A	501	FMN	C4A-N5	2.26	1.35	1.30
2	B	501	FMN	C4A-N5	2.26	1.35	1.30
2	D	501	FMN	C4A-N5	2.25	1.35	1.30
2	C	501	FMN	C4A-N5	2.24	1.35	1.30
2	E	501	FMN	C4A-N5	2.22	1.35	1.30
2	F	501	FMN	C4A-N5	2.20	1.35	1.30

All (36) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	C	501	FMN	C4-C4A-N5	2.91	122.22	118.21
2	D	501	FMN	C4-C4A-N5	2.84	122.13	118.21
2	B	501	FMN	C4-C4A-N5	2.83	122.11	118.21
2	A	501	FMN	C4-C4A-N5	2.82	122.10	118.21
2	E	501	FMN	C4-C4A-N5	2.80	122.07	118.21
2	F	501	FMN	C4-C4A-N5	2.80	122.07	118.21
2	A	501	FMN	C4A-C10-N1	-2.46	118.56	124.59
2	F	501	FMN	C4A-C10-N1	-2.45	118.58	124.59
2	D	501	FMN	C4A-C10-N1	-2.45	118.59	124.59
2	B	501	FMN	C4A-C10-N1	-2.44	118.60	124.59
2	E	501	FMN	C4A-C10-N1	-2.44	118.60	124.59
2	C	501	FMN	C4A-C10-N1	-2.44	118.61	124.59
2	C	501	FMN	O4-C4-C4A	-2.21	120.71	126.53
2	E	501	FMN	O4-C4-C4A	-2.20	120.73	126.53
2	F	501	FMN	O4-C4-C4A	-2.19	120.76	126.53
2	D	501	FMN	O4-C4-C4A	-2.18	120.77	126.53
2	B	501	FMN	O4-C4-C4A	-2.18	120.79	126.53
2	A	501	FMN	O4-C4-C4A	-2.17	120.80	126.53
2	A	501	FMN	C4A-C10-N10	2.12	119.51	116.48
2	D	501	FMN	C10-N1-C2	2.10	121.40	116.85
2	F	501	FMN	C10-N1-C2	2.10	121.40	116.85
2	B	501	FMN	C10-N1-C2	2.09	121.37	116.85
2	C	501	FMN	C10-N1-C2	2.09	121.37	116.85
2	B	501	FMN	C4A-C10-N10	2.08	119.47	116.48
2	A	501	FMN	C10-N1-C2	2.08	121.36	116.85
2	E	501	FMN	C4A-C10-N10	2.08	119.46	116.48
2	E	501	FMN	C10-N1-C2	2.07	121.34	116.85
2	D	501	FMN	C4A-C10-N10	2.07	119.45	116.48
2	C	501	FMN	C4A-C4-N3	2.07	118.51	113.25
2	C	501	FMN	C4A-C10-N10	2.06	119.44	116.48
2	F	501	FMN	C4A-C10-N10	2.06	119.43	116.48
2	B	501	FMN	C4A-C4-N3	2.05	118.47	113.25
2	A	501	FMN	C4A-C4-N3	2.04	118.46	113.25
2	D	501	FMN	C4A-C4-N3	2.04	118.45	113.25
2	E	501	FMN	C4A-C4-N3	2.04	118.45	113.25
2	F	501	FMN	C4A-C4-N3	2.03	118.43	113.25

There are no chirality outliers.

All (32) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	B	501	FMN	C1'-C2'-C3'-C4'
2	E	501	FMN	C5'-O5'-P-O1P

Continued on next page...

Continued from previous page...

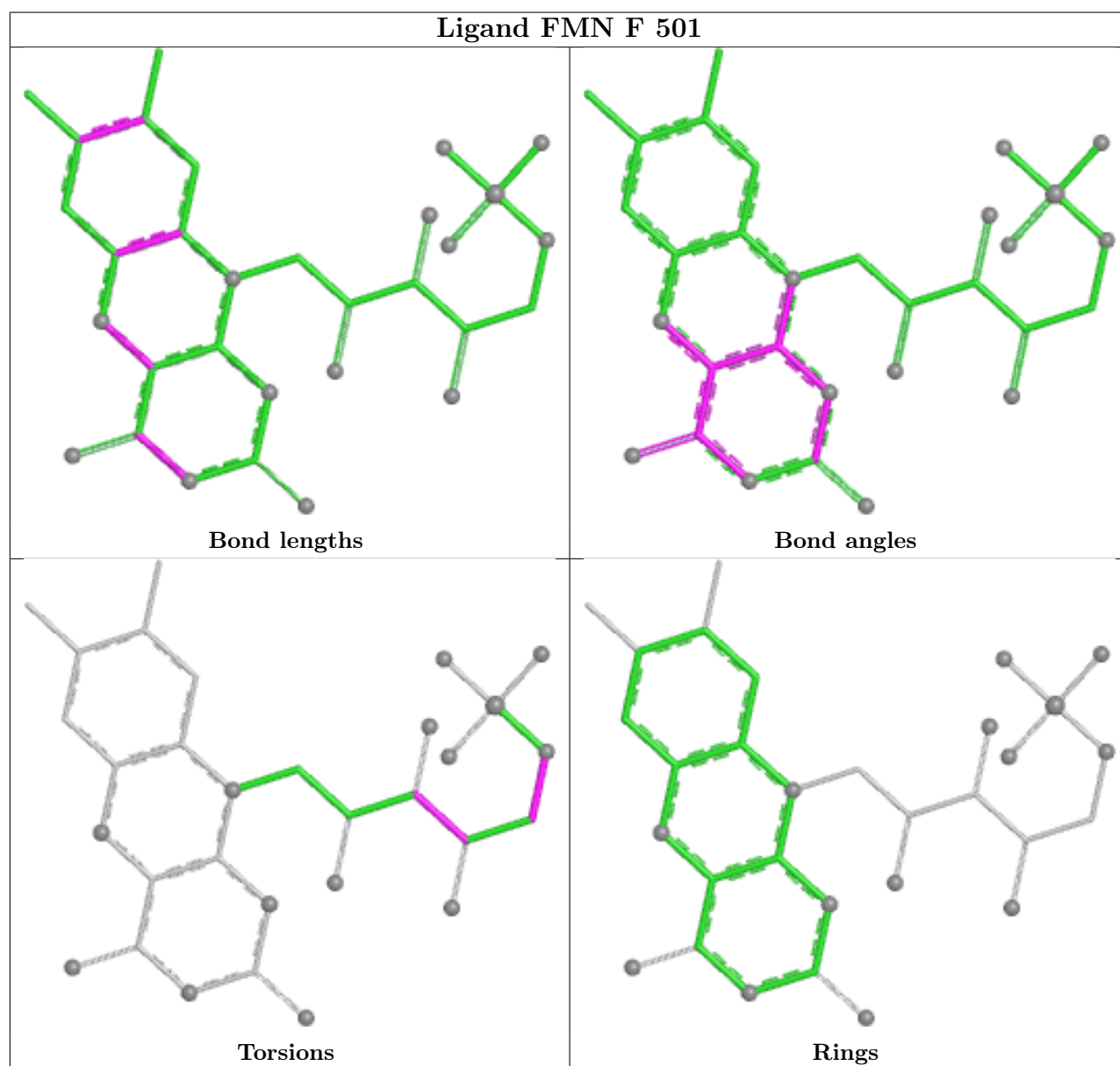
Mol	Chain	Res	Type	Atoms
2	E	501	FMN	C5'-O5'-P-O2P
2	E	501	FMN	C5'-O5'-P-O3P
2	B	501	FMN	C4'-C5'-O5'-P
2	A	501	FMN	C4'-C5'-O5'-P
2	E	501	FMN	C2'-C3'-C4'-O4'
2	F	501	FMN	C2'-C3'-C4'-O4'
2	B	501	FMN	O2'-C2'-C3'-C4'
2	D	501	FMN	C4'-C5'-O5'-P
2	C	501	FMN	C4'-C5'-O5'-P
2	B	501	FMN	O2'-C2'-C3'-O3'
2	E	501	FMN	O3'-C3'-C4'-C5'
2	B	501	FMN	C2'-C3'-C4'-O4'
2	F	501	FMN	O3'-C3'-C4'-C5'
2	A	501	FMN	C2'-C3'-C4'-O4'
2	D	501	FMN	C2'-C3'-C4'-O4'
2	E	501	FMN	O3'-C3'-C4'-O4'
2	F	501	FMN	O3'-C3'-C4'-O4'
2	E	501	FMN	C2'-C3'-C4'-C5'
2	C	501	FMN	C2'-C3'-C4'-O4'
2	E	501	FMN	C4'-C5'-O5'-P
2	F	501	FMN	C4'-C5'-O5'-P
2	A	501	FMN	C5'-O5'-P-O2P
2	B	501	FMN	C5'-O5'-P-O3P
2	A	501	FMN	O3'-C3'-C4'-C5'
2	B	501	FMN	O3'-C3'-C4'-C5'
2	C	501	FMN	O3'-C3'-C4'-C5'
2	D	501	FMN	O3'-C3'-C4'-C5'
2	B	501	FMN	O3'-C3'-C4'-O4'
2	F	501	FMN	C2'-C3'-C4'-C5'
2	D	501	FMN	O2'-C2'-C3'-C4'

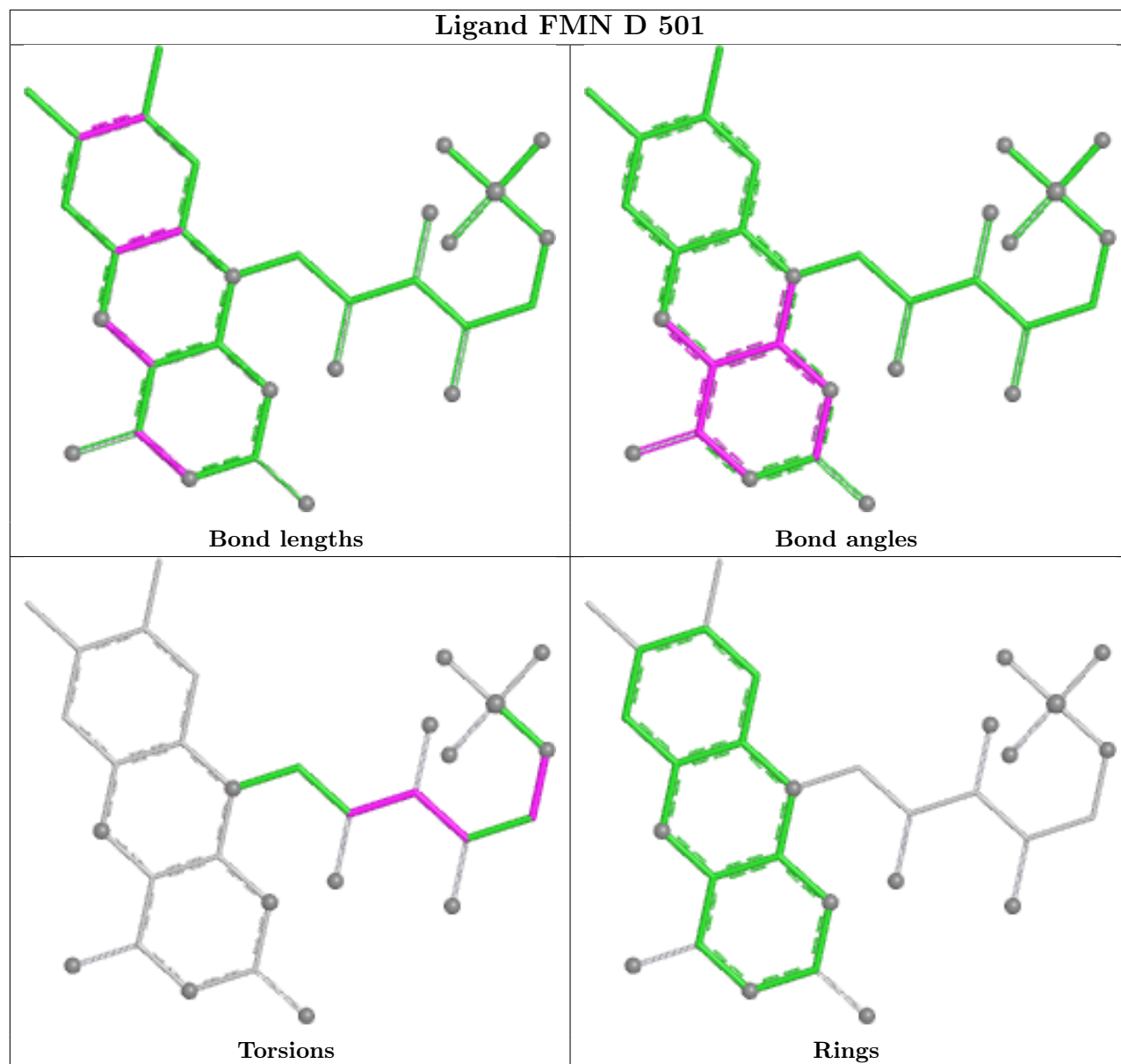
There are no ring outliers.

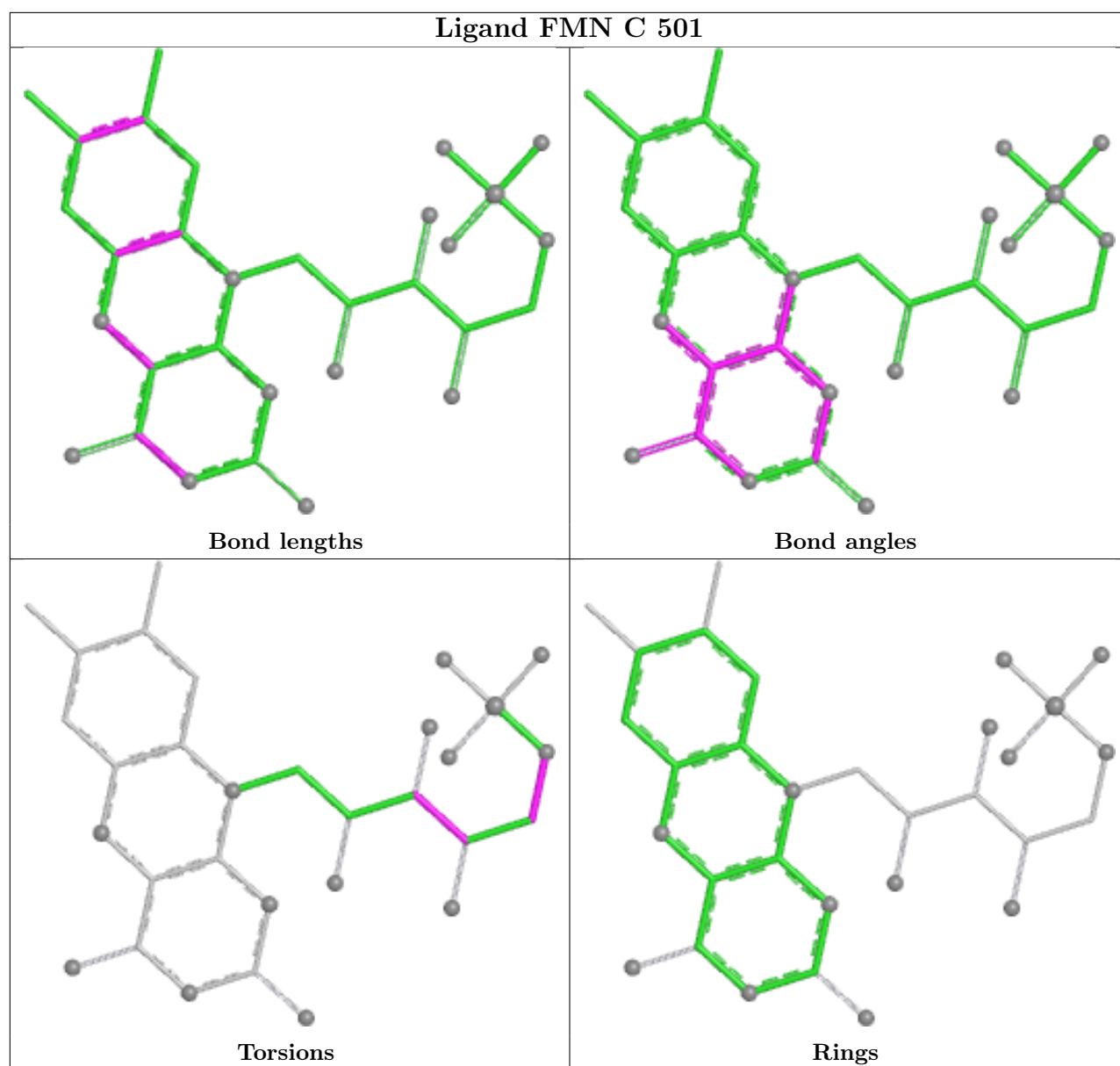
6 monomers are involved in 32 short contacts:

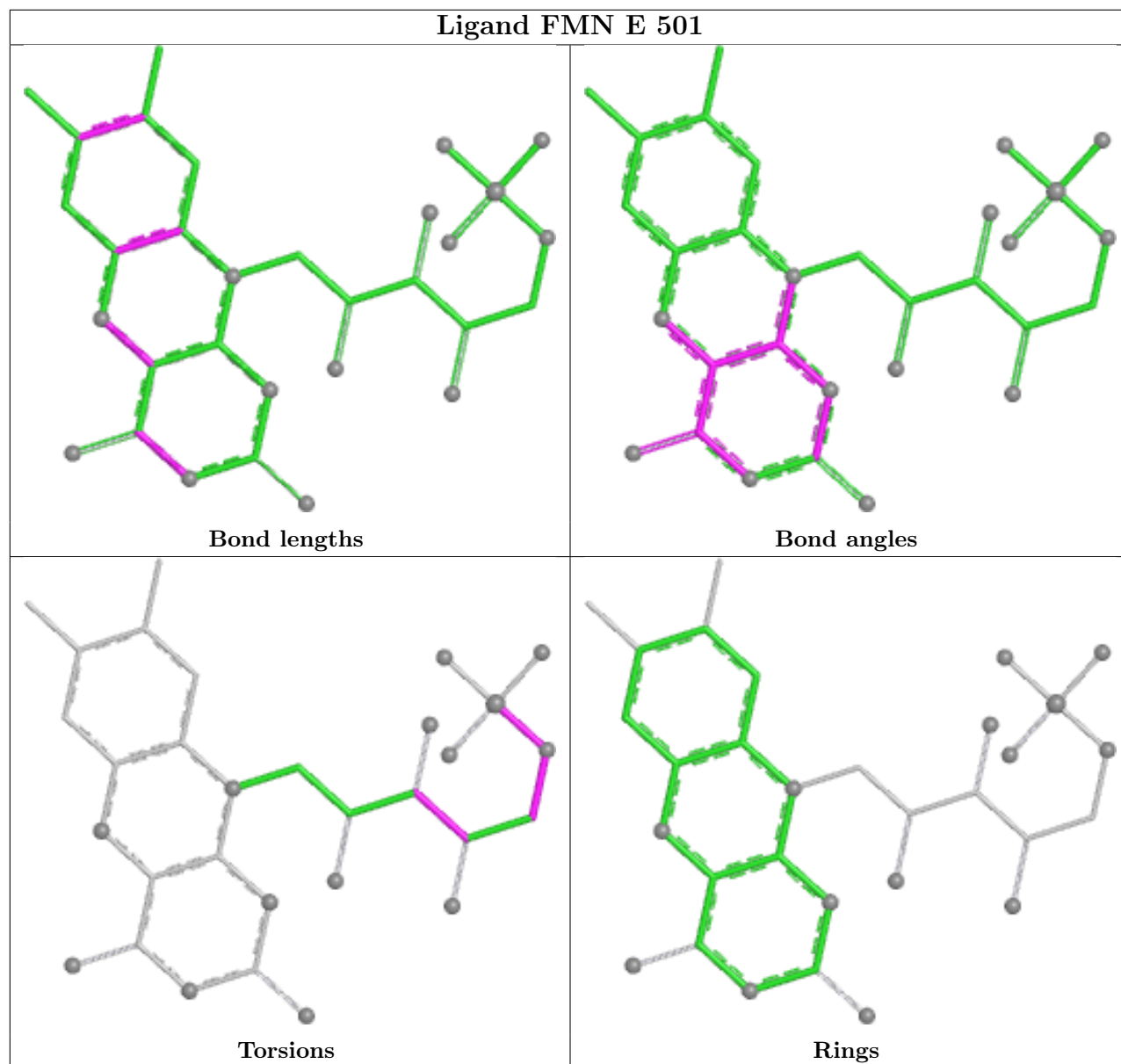
Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	F	501	FMN	6	0
2	D	501	FMN	5	0
2	C	501	FMN	2	0
2	E	501	FMN	11	0
2	A	501	FMN	6	0
2	B	501	FMN	2	0

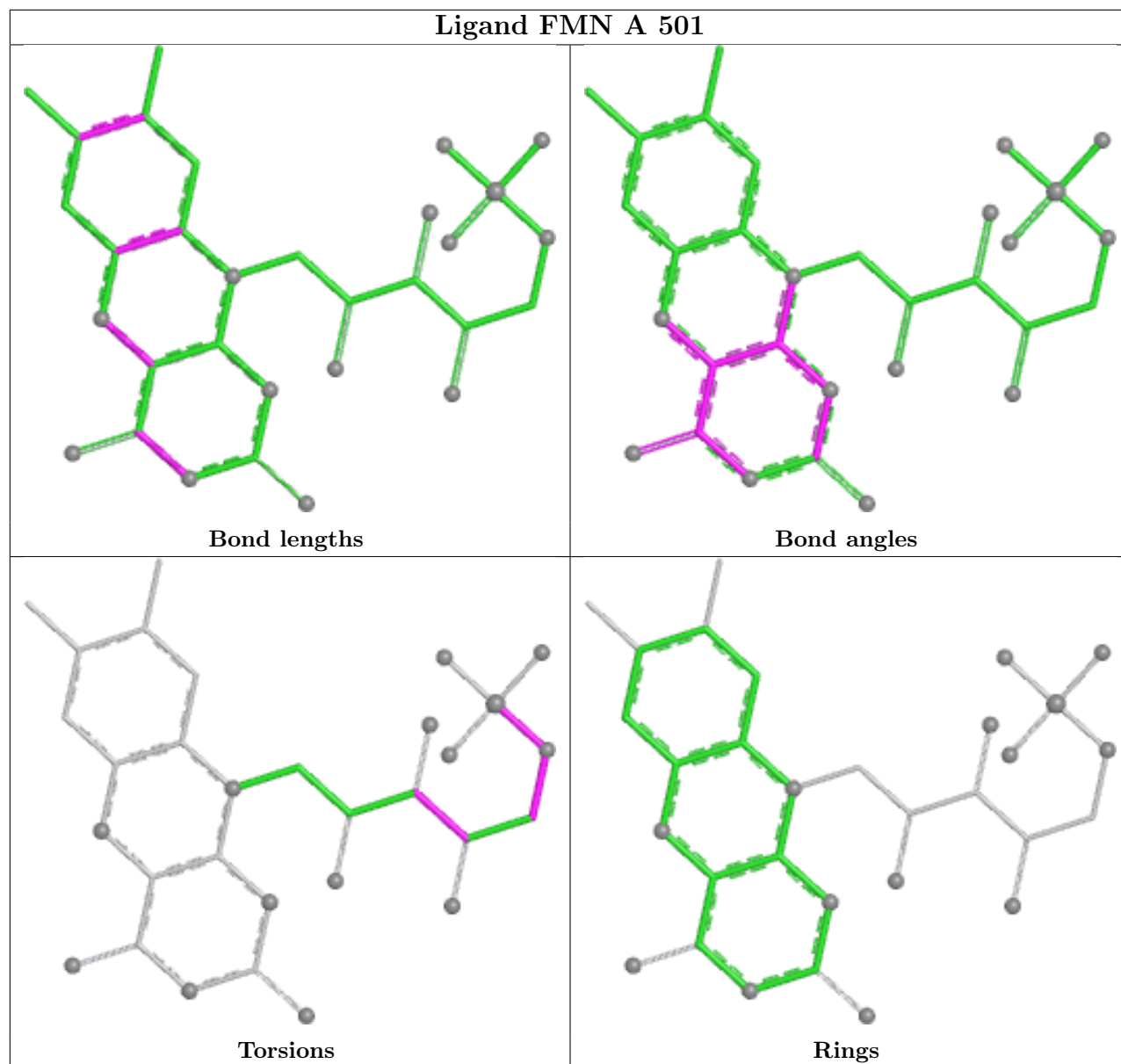
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included.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

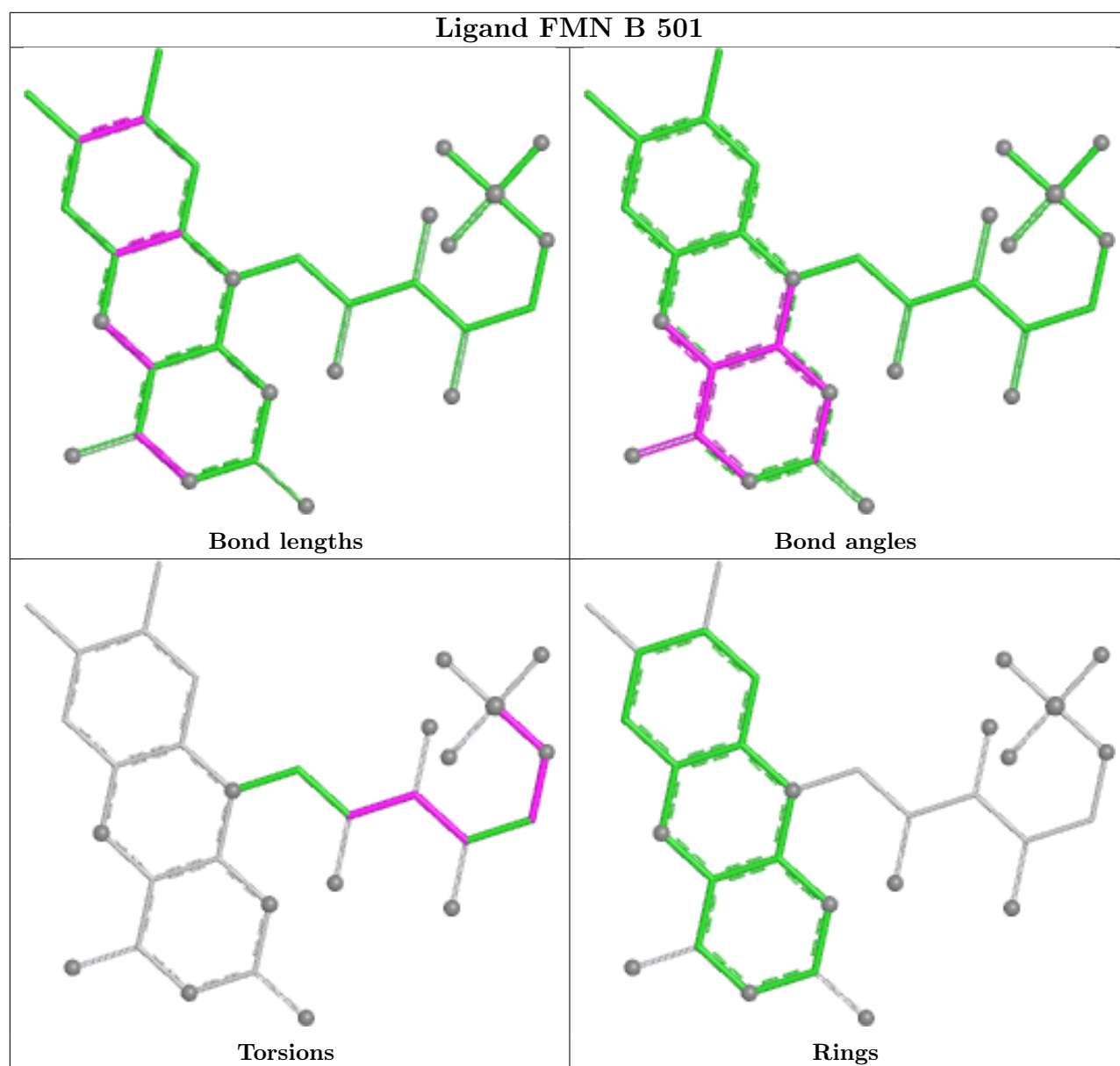












5.7 Other polymers [i](#)

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	404/407 (99%)	-0.20	1 (0%)	91 92	27, 42, 67, 100	6 (1%)
1	B	404/407 (99%)	-0.26	2 (0%)	87 87	21, 37, 55, 96	6 (1%)
1	C	404/407 (99%)	-0.03	2 (0%)	87 87	28, 48, 66, 103	6 (1%)
1	D	404/407 (99%)	0.74	42 (10%)	11 11	40, 63, 90, 111	6 (1%)
1	E	404/407 (99%)	0.35	10 (2%)	58 56	27, 55, 79, 109	6 (1%)
1	F	404/407 (99%)	0.73	26 (6%)	25 25	44, 68, 94, 118	6 (1%)
All	All	2424/2442 (99%)	0.22	83 (3%)	48 46	21, 52, 86, 118	36 (1%)

All (83) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	F	205[A]	GLN	4.8
1	D	238	GLY	4.8
1	D	146	ALA	4.7
1	D	71	VAL	4.4
1	D	85	ILE	4.1
1	E	3	SER	3.6
1	D	126	THR	3.5
1	F	2	SER	3.5
1	D	91	ALA	3.3
1	D	79	GLU	3.2
1	D	174	ALA	3.2
1	F	267	VAL	3.0
1	F	228	LEU	3.0
1	A	405	GLU	3.0
1	D	205[A]	GLN	3.0
1	D	86	TRP	2.9
1	E	198	PHE	2.9
1	E	405	GLU	2.9
1	D	136	ALA	2.9

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
1	F	404	ILE	2.9
1	D	150	VAL	2.8
1	F	166	VAL	2.8
1	D	132	VAL	2.8
1	F	152	ASN	2.8
1	F	198	PHE	2.7
1	E	2	SER	2.7
1	D	391	VAL	2.7
1	E	394[A]	GLU	2.7
1	D	96	VAL	2.6
1	F	3	SER	2.6
1	F	73	PRO	2.6
1	D	114	PHE	2.6
1	F	126	THR	2.5
1	F	265	TYR	2.5
1	F	221	ILE	2.5
1	D	143	ALA	2.5
1	B	405	GLU	2.4
1	D	156	ALA	2.4
1	D	112	LEU	2.4
1	D	2	SER	2.4
1	F	114	PHE	2.4
1	F	136	ALA	2.4
1	D	170	TYR	2.3
1	E	371	ASN	2.3
1	C	136	ALA	2.3
1	F	159	THR	2.3
1	F	394[A]	GLU	2.3
1	F	122	ALA	2.3
1	D	187	LEU	2.3
1	C	394[A]	GLU	2.2
1	D	78	TRP	2.2
1	D	162	VAL	2.2
1	D	75	ALA	2.2
1	D	383	THR	2.2
1	D	40	LEU	2.2
1	E	366	VAL	2.2
1	D	214	ILE	2.2
1	D	175	GLN	2.2
1	E	299	GLU	2.1
1	F	299	GLU	2.1
1	D	131	PRO	2.1

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
1	D	50	LEU	2.1
1	D	285	VAL	2.1
1	D	129	LEU	2.1
1	D	154	VAL	2.1
1	E	71	VAL	2.1
1	E	404	ILE	2.1
1	F	366	VAL	2.1
1	D	167	TYR	2.1
1	D	320	GLY	2.1
1	D	402	SER	2.1
1	D	178	MET	2.1
1	F	195	LEU	2.1
1	F	354	ASN	2.1
1	D	404	ILE	2.1
1	B	2	SER	2.0
1	F	75	ALA	2.0
1	D	97	ILE	2.0
1	F	239	ILE	2.0
1	D	147	ALA	2.0
1	D	239	ILE	2.0
1	F	382	ASN	2.0
1	F	322	TYR	2.0

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

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

6.3 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

6.4 Ligands [i](#)

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 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	E	501	31/31	0.88	0.13	46,60,72,79	0

Continued on next page...

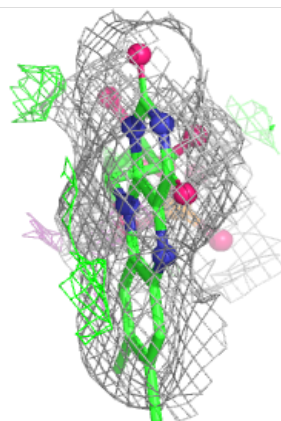
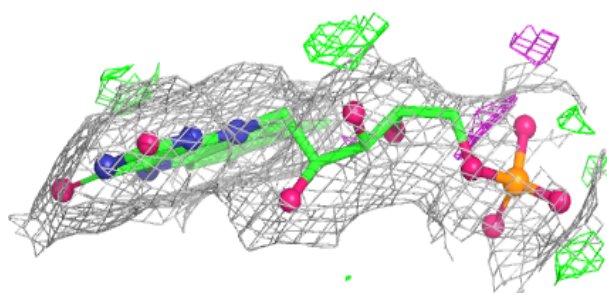
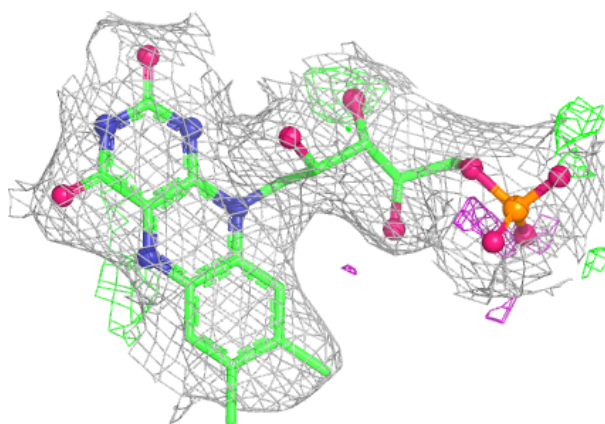
Continued from previous page...

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(\AA^2)	Q<0.9
2	FMN	D	501	31/31	0.89	0.14	47,63,77,92	0
2	FMN	F	501	31/31	0.89	0.13	47,63,81,89	0
2	FMN	A	501	31/31	0.93	0.11	30,43,60,75	0
2	FMN	C	501	31/31	0.94	0.10	37,49,62,68	0
2	FMN	B	501	31/31	0.94	0.11	28,41,58,66	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.

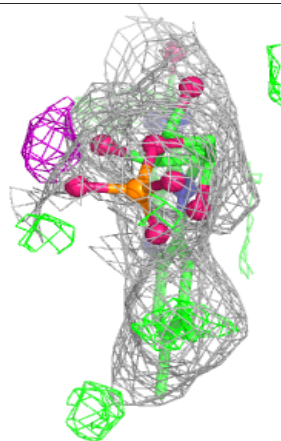
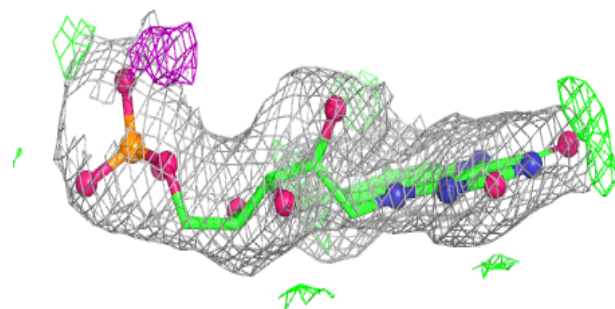
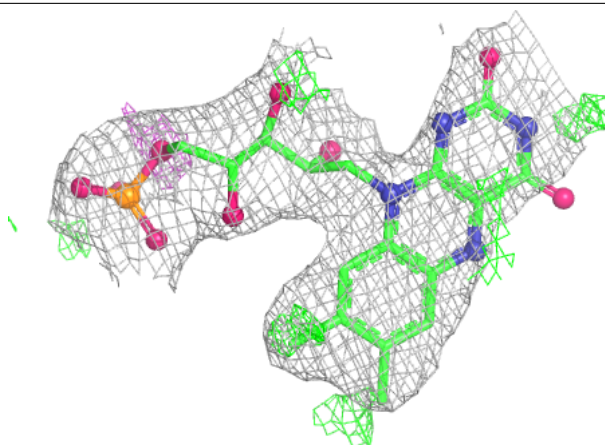
Electron density around FMN E 501:

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



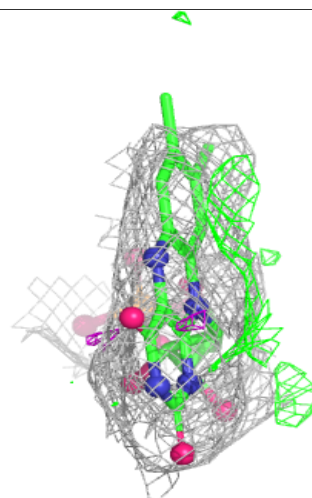
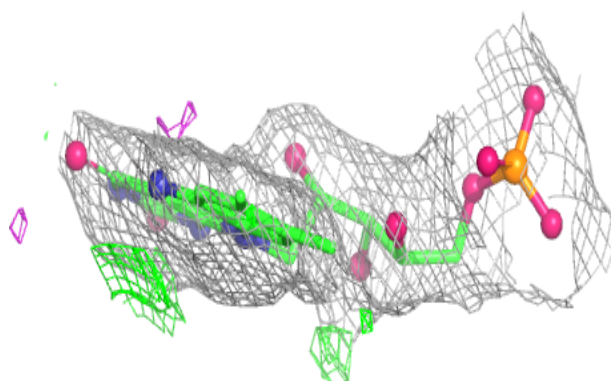
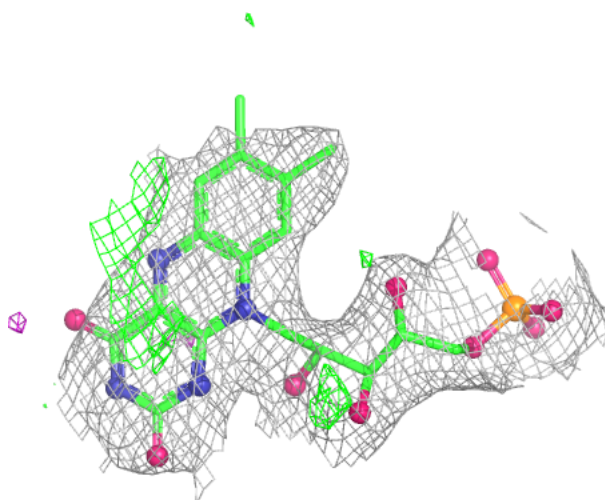
Electron density around FMN D 501:

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



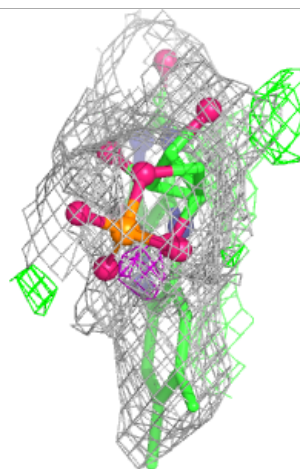
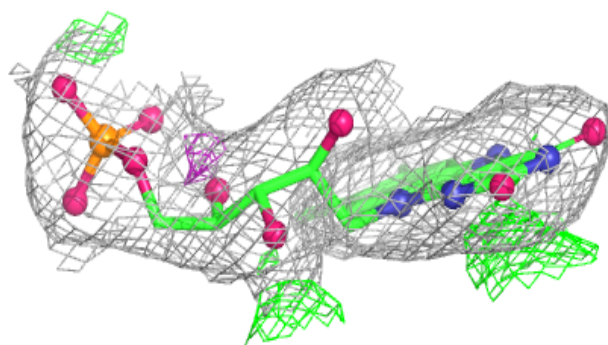
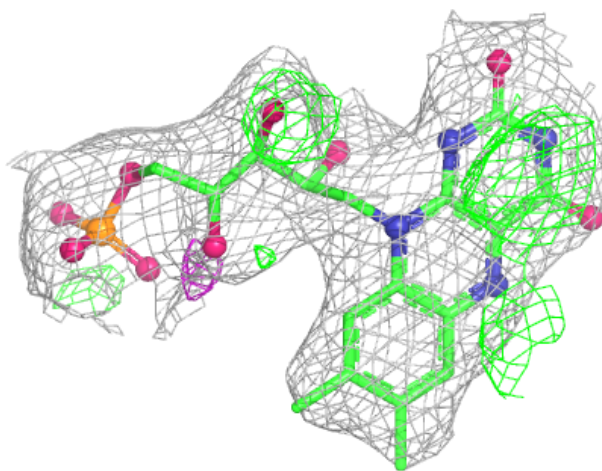
Electron density around FMN F 501:

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



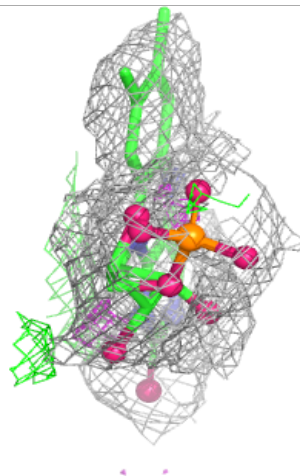
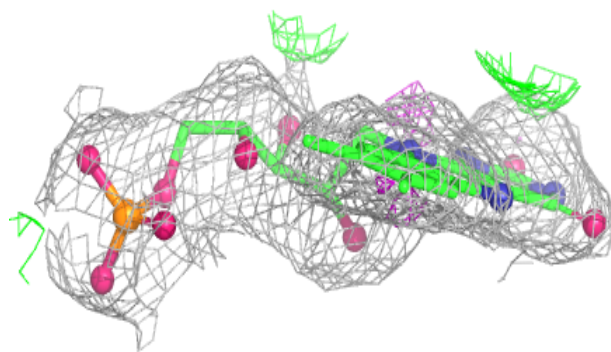
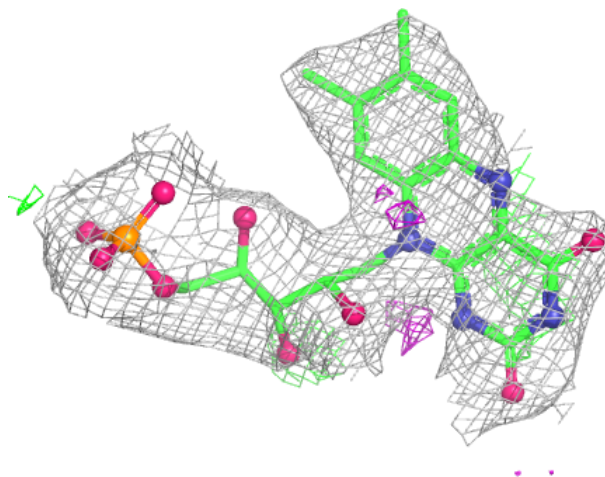
Electron density around FMN A 501:

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



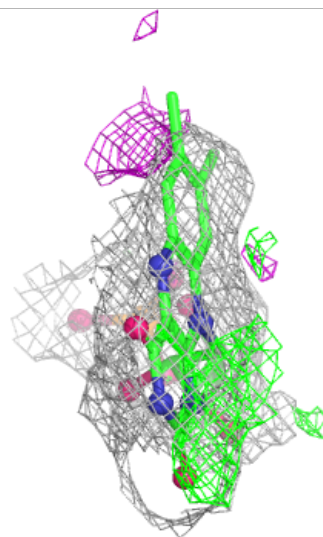
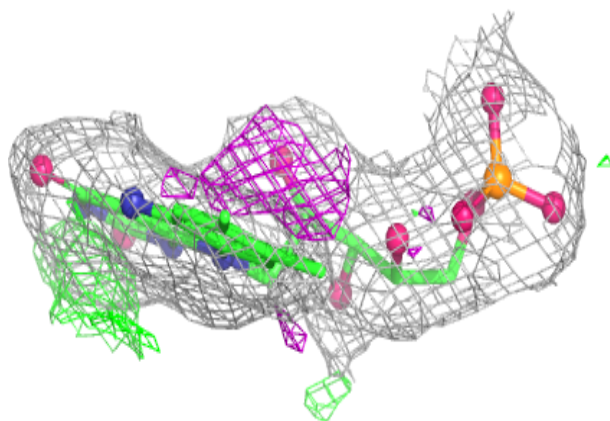
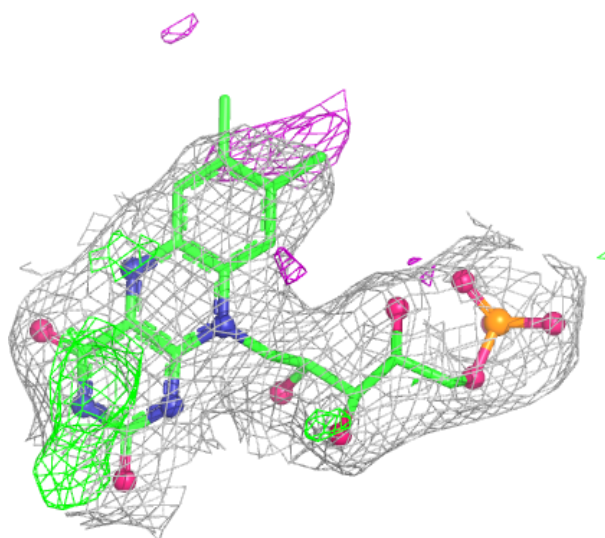
Electron density around FMN C 501:

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



Electron density around FMN B 501:

$2mF_o-DF_c$ (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.