



# Full wwPDB X-ray Structure Validation Report ⓘ

Mar 13, 2018 – 02:49 pm GMT

PDB ID : 2V18  
Title : Crystal structure of the T. thermophilus dodecin  
Authors : Meissner, B.; Essen, L.-O.  
Deposited on : 2007-05-22  
Resolution : 2.59 Å(reported)

This is a Full wwPDB X-ray Structure Validation Report for a publicly released PDB entry.

We welcome your comments at [validation@mail.wwpdb.org](mailto:validation@mail.wwpdb.org)

A user guide is available at

<https://www.wwpdb.org/validation/2017/XrayValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

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

MolProbity : 4.02b-467  
Mogul : 1.7.3 (157068), CSD as539be (2018)  
Xtriage (Phenix) : 1.13  
EDS : trunk31020  
Percentile statistics : 20171227.v01 (using entries in the PDB archive December 27th 2017)  
Refmac : 5.8.0158  
CCP4 : 7.0 (Gargrove)  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : trunk31020

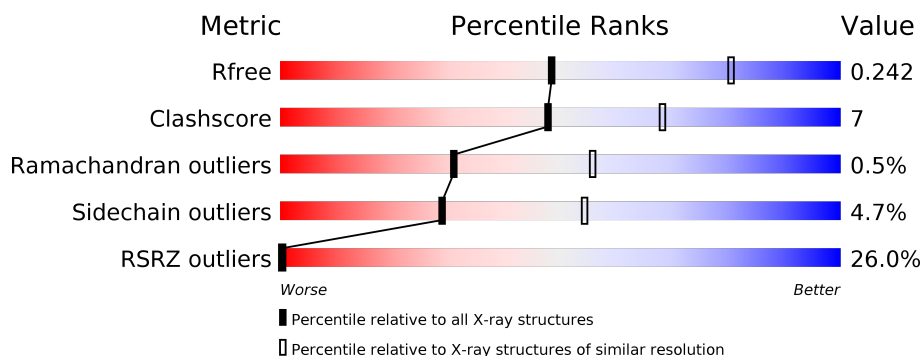
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.59 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))
$R_{free}$	111664	2767 (2.60-2.60)
Clashscore	122126	3110 (2.60-2.60)
Ramachandran outliers	120053	3062 (2.60-2.60)
Sidechain outliers	120020	3062 (2.60-2.60)
RSRZ outliers	108989	2706 (2.60-2.60)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments on the lower bar indicate the fraction of residues that contain outliers for  $\geq 3$ , 2, 1 and 0 types of geometric quality criteria. 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	68	<div> <div>32%</div> <div>87% 10% .</div> </div>
1	B	68	<div> <div>28%</div> <div>88% 9% .</div> </div>
1	C	68	<div> <div>16%</div> <div>85% 12% .</div> </div>
1	D	68	<div> <div>26%</div> <div>93% . .</div> </div>
1	E	68	<div> <div>24%</div> <div>82% 13% .</div> </div>
1	F	68	<div> <div>25%</div> <div>88% 10% .</div> </div>

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Mol	Chain	Length	Quality of chain
1	G	68	
1	H	68	
1	I	68	
1	J	68	
1	K	68	
1	L	68	

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
3	COA	J	201	-	-	-	X
3	COA	K	201	X	-	-	-

## 2 Entry composition

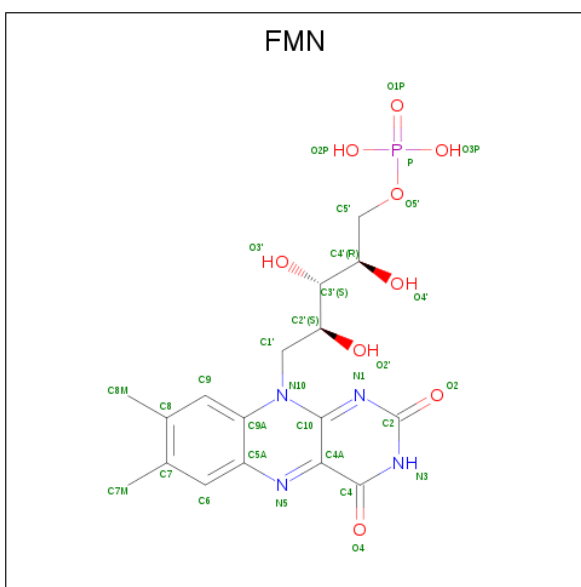
There are 4 unique types of molecules in this entry. The entry contains 7201 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 DODECIN.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
1	A	68	Total	C	N	O	0	0	1
			531	338	94	99			
1	B	68	Total	C	N	O	0	0	1
			531	338	94	99			
1	C	68	Total	C	N	O	0	0	1
			531	338	94	99			
1	D	68	Total	C	N	O	0	0	1
			531	338	94	99			
1	E	68	Total	C	N	O	0	0	1
			531	338	94	99			
1	F	68	Total	C	N	O	0	0	1
			531	338	94	99			
1	G	68	Total	C	N	O	0	0	1
			531	338	94	99			
1	H	68	Total	C	N	O	0	0	1
			531	338	94	99			
1	I	68	Total	C	N	O	0	0	1
			531	338	94	99			
1	J	68	Total	C	N	O	0	0	1
			531	338	94	99			
1	K	68	Total	C	N	O	0	0	1
			531	338	94	99			
1	L	68	Total	C	N	O	0	0	1
			531	338	94	99			

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



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	A	1	Total 31	C 17	N 4	O 9	P 1	0	0
2	B	1	Total 31	C 17	N 4	O 9	P 1	0	0
2	C	1	Total 31	C 17	N 4	O 9	P 1	0	0
2	D	1	Total 31	C 17	N 4	O 9	P 1	0	0
2	E	1	Total 31	C 17	N 4	O 9	P 1	0	0
2	F	1	Total 31	C 17	N 4	O 9	P 1	0	0
2	G	1	Total 31	C 17	N 4	O 9	P 1	0	0
2	H	1	Total 31	C 17	N 4	O 9	P 1	0	0
2	I	1	Total 31	C 17	N 4	O 9	P 1	0	0
2	J	1	Total 31	C 17	N 4	O 9	P 1	0	0
2	K	1	Total 31	C 17	N 4	O 9	P 1	0	0
2	L	1	Total 31	C 17	N 4	O 9	P 1	0	0

- Molecule 3 is COENZYME A (three-letter code: COA) (formula:  $\text{C}_{21}\text{H}_{36}\text{N}_7\text{O}_{16}\text{P}_3\text{S}$ ).



Mol	Chain	Residues	Atoms						ZeroOcc	AltConf
3	B	1	Total 48	C 21	N 7	O 16	P 3	S 1	0	0
3	C	1	Total 48	C 21	N 7	O 16	P 3	S 1	0	0
3	D	1	Total 48	C 21	N 7	O 16	P 3	S 1	0	0
3	E	1	Total 48	C 21	N 7	O 16	P 3	S 1	0	0
3	F	1	Total 48	C 21	N 7	O 16	P 3	S 1	0	0
3	G	1	Total 48	C 21	N 7	O 16	P 3	S 1	0	0
3	I	1	Total 48	C 21	N 7	O 16	P 3	S 1	0	0
3	J	1	Total 48	C 21	N 7	O 16	P 3	S 1	0	0
3	K	1	Total 48	C 21	N 7	O 16	P 3	S 1	0	0

- Molecule 4 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	1	Total	O	0
			1	1	
4	B	1	Total	O	0
			1	1	
4	C	3	Total	O	0
			3	3	

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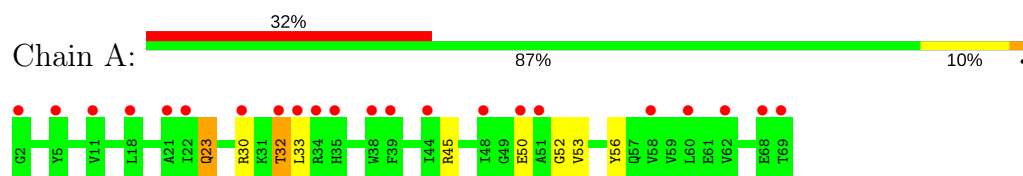
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Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	D	3	Total 3	O 3	0	0
4	E	2	Total 2	O 2	0	0
4	F	5	Total 5	O 5	0	0
4	G	2	Total 2	O 2	0	0
4	H	2	Total 2	O 2	0	0
4	I	2	Total 2	O 2	0	0
4	J	2	Total 2	O 2	0	0
4	K	1	Total 1	O 1	0	0
4	L	1	Total 1	O 1	0	0

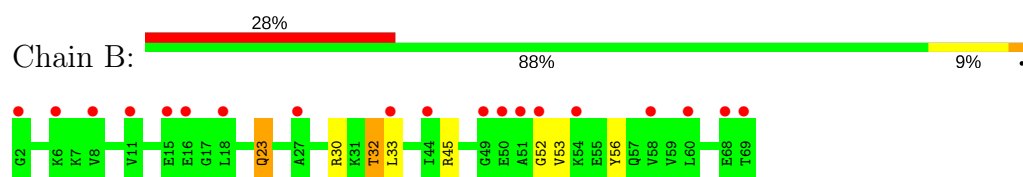
### 3 Residue-property plots [i](#)

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 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.

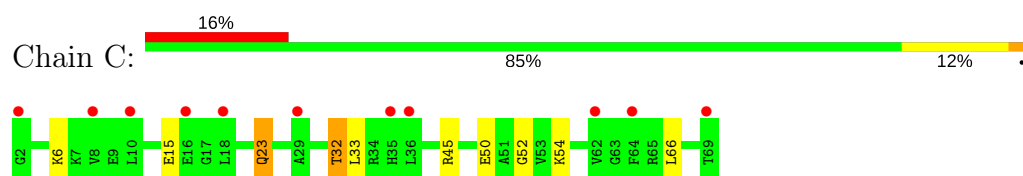
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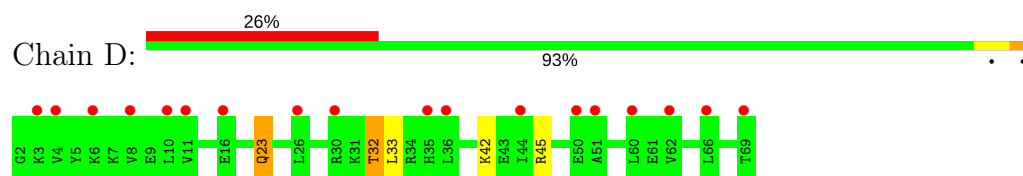
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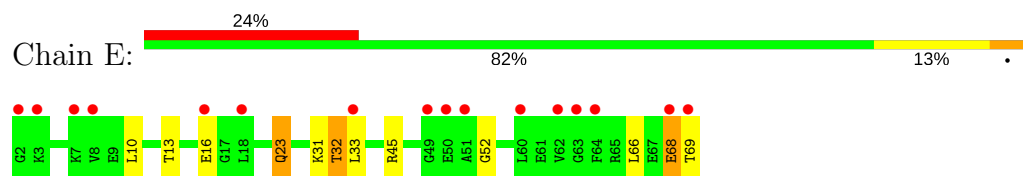
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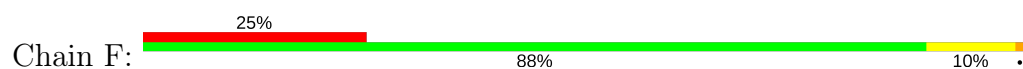
#### • Molecule 1: DODECIN



#### • Molecule 1: DODECIN



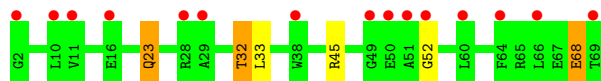
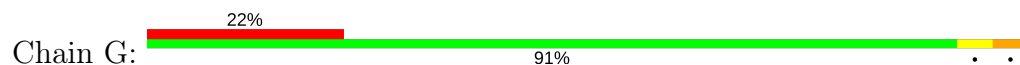
#### • Molecule 1: DODECIN



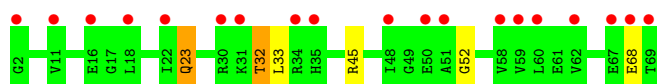




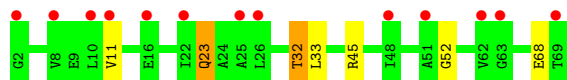
- Molecule 1: DODECIN



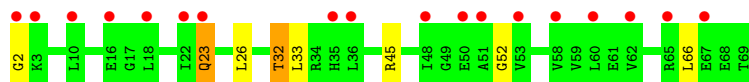
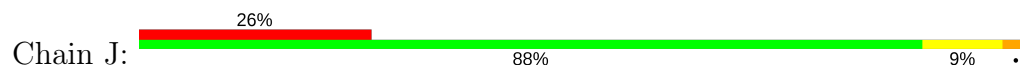
- Molecule 1: DODECIN



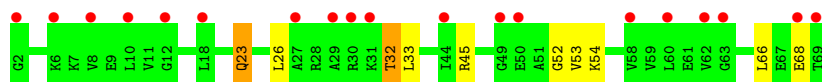
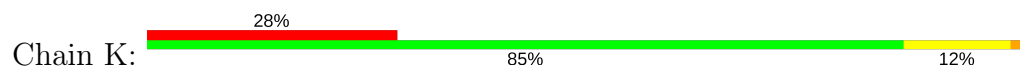
- Molecule 1: DODECIN



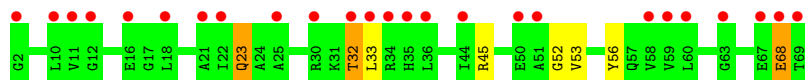
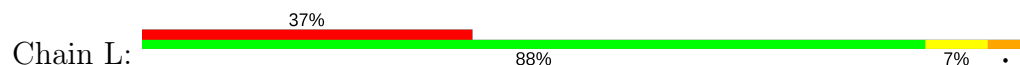
- Molecule 1: DODECIN



- Molecule 1: DODECIN



- Molecule 1: DODECIN



## 4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	67.48Å 98.04Å 137.59Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	24.76 – 2.59 24.76 – 2.59	Depositor EDS
% Data completeness (in resolution range)	76.2 (24.76-2.59) 76.2 (24.76-2.59)	Depositor EDS
$R_{merge}$	0.08	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	2.71 (at 2.60Å)	Xtriage
Refinement program	REFMAC 5.2.0019	Depositor
R, $R_{free}$	0.219 , 0.244 0.219 , 0.242	Depositor DCC
$R_{free}$ test set	1125 reflections (5.11%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	41.4	Xtriage
Anisotropy	0.606	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.32 , 58.6	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.46$ , $\langle L^2 \rangle = 0.29$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
$F_o, F_c$ correlation	0.88	EDS
Total number of atoms	7201	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	61.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.33% of the height of the origin peak. No significant pseudotranslation is detected.*

<sup>1</sup>Intensities estimated from amplitudes.

<sup>2</sup>Theoretical values of  $\langle |L| \rangle$ ,  $\langle L^2 \rangle$  for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

## 5 Model quality

### 5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: COA, 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	0.47	0/537	0.59	0/720
1	B	0.50	0/537	0.59	0/720
1	C	0.56	0/537	0.62	0/720
1	D	0.49	0/537	0.62	0/720
1	E	0.58	1/537 (0.2%)	0.64	0/720
1	F	0.53	0/537	0.63	1/720 (0.1%)
1	G	0.53	0/537	0.61	0/720
1	H	0.47	0/537	0.60	0/720
1	I	0.50	0/537	0.60	0/720
1	J	0.49	0/537	0.61	0/720
1	K	0.50	0/537	0.59	0/720
1	L	0.48	0/537	0.60	0/720
All	All	0.51	1/6444 (0.0%)	0.61	1/8640 (0.0%)

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	E	16	GLU	CG-CD	5.21	1.59	1.51

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	F	30	ARG	NE-CZ-NH2	5.29	122.95	120.30

There are no chirality outliers.

There are no planarity outliers.

## 5.2 Too-close contacts

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	531	0	545	6	0
1	B	531	0	545	8	0
1	C	531	0	545	13	1
1	D	531	0	545	7	0
1	E	531	0	545	9	1
1	F	531	0	545	7	0
1	G	531	0	545	6	1
1	H	531	0	545	4	0
1	I	531	0	545	7	0
1	J	531	0	545	10	0
1	K	531	0	545	10	1
1	L	531	0	545	6	0
2	A	31	0	19	1	0
2	B	31	0	19	1	0
2	C	31	0	19	1	0
2	D	31	0	19	1	0
2	E	31	0	19	1	0
2	F	31	0	19	1	0
2	G	31	0	19	1	0
2	H	31	0	19	1	0
2	I	31	0	19	1	0
2	J	31	0	19	1	0
2	K	31	0	19	2	0
2	L	31	0	19	1	0
3	B	48	0	32	4	0
3	C	48	0	32	7	0
3	D	48	0	32	7	0
3	E	48	0	32	2	0
3	F	48	0	32	6	0
3	G	48	0	32	6	0
3	I	48	0	32	4	0
3	J	48	0	32	9	0
3	K	48	0	32	7	0
4	A	1	0	0	0	0
4	B	1	0	0	1	0
4	C	3	0	0	2	0
4	D	3	0	0	1	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
4	E	2	0	0	0	0
4	F	5	0	0	1	0
4	G	2	0	0	0	0
4	H	2	0	0	0	0
4	I	2	0	0	0	0
4	J	2	0	0	0	0
4	K	1	0	0	0	0
4	L	1	0	0	0	0
All	All	7201	0	7056	94	2

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 7.

All (94) 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:I:32:THR:HG21	3:I:201:COA:O5A	1.26	1.30
1:G:32:THR:HG21	3:G:201:COA:O5A	1.29	1.28
1:E:32:THR:HG21	3:E:201:COA:O5A	1.30	1.25
1:D:32:THR:HG21	3:D:201:COA:O5A	1.31	1.24
1:C:32:THR:HG21	3:C:201:COA:O5A	1.38	1.20
1:K:32:THR:HG21	3:K:201:COA:O5A	1.41	1.15
1:B:32:THR:HG21	3:B:201:COA:O5A	1.55	1.07
1:I:32:THR:CG2	3:I:201:COA:O5A	2.18	0.90
1:K:32:THR:CG2	3:K:201:COA:O5A	2.25	0.85
1:J:32:THR:HG21	3:J:201:COA:O5A	1.78	0.84
1:G:32:THR:CG2	3:G:201:COA:O5A	2.23	0.83
3:F:201:COA:H141	3:F:201:COA:O9P	1.86	0.75
1:J:32:THR:HG23	3:J:201:COA:H51A	1.69	0.75
1:B:32:THR:HG23	3:B:201:COA:H52A	1.70	0.73
1:E:45:ARG:HD3	2:J:101:FMN:HM72	1.71	0.72
1:A:30:ARG:HD2	4:B:2001:HOH:O	1.90	0.72
3:D:201:COA:H141	3:D:201:COA:O9P	1.88	0.71
3:K:201:COA:O9P	3:K:201:COA:H141	1.91	0.70
1:D:32:THR:CG2	3:D:201:COA:O5A	2.26	0.69
1:F:32:THR:HG21	3:F:201:COA:O5A	1.93	0.69
1:D:23:GLN:HE22	1:E:52:GLY:HA3	1.59	0.68
1:F:69:THR:N	4:F:2005:HOH:O	2.28	0.67
1:D:45:ARG:HD3	2:I:101:FMN:HM72	1.77	0.67
1:J:32:THR:HG23	3:J:201:COA:C5B	2.26	0.66
2:B:101:FMN:HM72	1:F:45:ARG:HD3	1.81	0.62

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:F:101:FMN:HM72	1:G:45:ARG:HD3	1.81	0.62
1:B:32:THR:HG23	3:B:201:COA:C5B	2.29	0.62
3:J:201:COA:O9P	3:J:201:COA:H141	2.01	0.61
1:H:23:GLN:HE22	1:I:52:GLY:HA3	1.65	0.60
1:J:52:GLY:HA3	1:L:23:GLN:HE22	1.65	0.60
1:B:45:ARG:HD3	2:G:101:FMN:HM72	1.84	0.59
1:A:23:GLN:HE22	1:B:52:GLY:HA3	1.66	0.59
2:C:101:FMN:HM72	1:J:45:ARG:HD3	1.85	0.58
1:G:23:GLN:HE22	1:H:52:GLY:HA3	1.70	0.57
1:J:23:GLN:HE22	1:K:52:GLY:HA3	1.68	0.57
1:B:32:THR:HG22	1:B:33:LEU:HG	1.87	0.57
1:C:66:LEU:HD21	3:J:201:COA:H143	1.86	0.57
1:G:32:THR:HG22	1:G:33:LEU:HG	1.87	0.56
2:A:101:FMN:HM72	1:H:45:ARG:HD3	1.88	0.56
1:E:32:THR:HG22	1:E:33:LEU:HG	1.88	0.56
1:B:23:GLN:HE22	1:C:52:GLY:HA3	1.71	0.56
1:C:32:THR:HG23	3:C:201:COA:H51A	1.88	0.56
1:C:45:ARG:HD3	2:E:101:FMN:HM72	1.87	0.55
1:J:32:THR:HG22	1:J:33:LEU:HG	1.88	0.55
1:D:32:THR:HG22	1:D:33:LEU:HG	1.90	0.54
1:G:52:GLY:HA3	1:I:23:GLN:HE22	1.73	0.54
1:H:32:THR:HG22	1:H:33:LEU:HG	1.89	0.54
3:F:201:COA:H142	3:G:201:COA:C3P	2.38	0.54
2:D:101:FMN:HM72	1:K:45:ARG:HD3	1.89	0.54
1:C:32:THR:HG22	1:C:33:LEU:HG	1.89	0.53
1:L:32:THR:HG22	1:L:33:LEU:HG	1.89	0.53
1:I:32:THR:HG22	1:I:33:LEU:HG	1.91	0.53
1:F:32:THR:HG22	1:F:33:LEU:HG	1.90	0.53
2:H:101:FMN:HM72	1:L:45:ARG:HD3	1.90	0.52
1:C:66:LEU:CD2	3:J:201:COA:H143	2.38	0.52
1:C:54:LYS:HD3	4:C:2003:HOH:O	2.10	0.52
3:K:201:COA:CEP	3:K:201:COA:O9P	2.57	0.52
1:K:32:THR:HG22	1:K:33:LEU:HG	1.91	0.52
3:F:201:COA:H142	3:G:201:COA:H31	1.92	0.51
3:G:201:COA:O9P	3:G:201:COA:H141	2.11	0.51
1:A:32:THR:HG22	1:A:33:LEU:HG	1.91	0.51
1:F:32:THR:HG23	3:F:201:COA:H51A	1.93	0.50
1:D:32:THR:HG23	3:D:201:COA:H51A	1.94	0.49
3:I:201:COA:H141	3:I:201:COA:O9P	2.12	0.49
1:K:32:THR:HG23	3:K:201:COA:H52A	1.94	0.49
1:A:45:ARG:HD3	2:L:101:FMN:HM72	1.94	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:32:THR:HG21	3:F:201:COA:P2A	2.52	0.48
1:I:45:ARG:HD3	2:K:101:FMN:HM72	1.96	0.48
1:A:52:GLY:HA3	1:C:23:GLN:HE22	1.78	0.48
3:D:201:COA:O9P	3:D:201:COA:CEP	2.58	0.48
1:C:54:LYS:CD	4:C:2003:HOH:O	2.60	0.47
1:E:23:GLN:HE22	1:F:52:GLY:HA3	1.78	0.47
3:D:201:COA:O4B	3:K:201:COA:H133	2.15	0.47
1:J:26:LEU:HD12	1:K:53:VAL:HG23	1.96	0.47
1:K:23:GLN:HE22	1:L:52:GLY:HA3	1.79	0.46
1:E:68:GLU:HG2	1:E:69:THR:N	2.30	0.46
3:D:201:COA:O5A	3:K:201:COA:N4P	2.49	0.45
3:C:201:COA:H21	1:J:66:LEU:HD11	1.98	0.45
3:C:201:COA:H143	1:E:66:LEU:CD2	2.46	0.45
1:D:42:LYS:HG3	4:D:2003:HOH:O	2.17	0.44
1:C:6:LYS:HD3	3:J:201:COA:H141	1.99	0.44
1:K:26:LEU:HD12	1:L:53:VAL:HG23	2.00	0.44
1:C:32:THR:HG23	3:C:201:COA:C5B	2.48	0.43
3:I:201:COA:H143	1:K:66:LEU:CD2	2.48	0.43
3:C:201:COA:H22	1:E:10:LEU:HD21	2.00	0.43
1:C:50:GLU:HA	1:C:50:GLU:OE1	2.18	0.42
1:L:53:VAL:HG11	1:L:56:TYR:CZ	2.55	0.41
1:B:53:VAL:HG11	1:B:56:TYR:CZ	2.55	0.41
3:B:201:COA:H72	3:G:201:COA:O1A	2.21	0.41
1:E:13:THR:O	1:J:2:GLY:N	2.53	0.41
3:C:201:COA:H142	3:J:201:COA:C3P	2.51	0.41
1:I:11:VAL:HG11	2:K:101:FMN:HM71	2.02	0.41
1:A:53:VAL:HG11	1:A:56:TYR:CZ	2.56	0.41
3:E:201:COA:C3P	3:J:201:COA:H142	2.51	0.41

All (2) 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:15:GLU:OE2	1:E:31:LYS:NZ[4_456]	1.83	0.37
1:G:68:GLU:OE1	1:K:54:LYS:NZ[1_455]	2.09	0.11

## 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	66/68 (97%)	65 (98%)	1 (2%)	0	100	100
1	B	66/68 (97%)	65 (98%)	1 (2%)	0	100	100
1	C	66/68 (97%)	65 (98%)	1 (2%)	0	100	100
1	D	66/68 (97%)	65 (98%)	1 (2%)	0	100	100
1	E	66/68 (97%)	65 (98%)	1 (2%)	0	100	100
1	F	66/68 (97%)	65 (98%)	0	1 (2%)	11	23
1	G	66/68 (97%)	65 (98%)	1 (2%)	0	100	100
1	H	66/68 (97%)	65 (98%)	1 (2%)	0	100	100
1	I	66/68 (97%)	65 (98%)	0	1 (2%)	11	23
1	J	66/68 (97%)	66 (100%)	0	0	100	100
1	K	66/68 (97%)	65 (98%)	0	1 (2%)	11	23
1	L	66/68 (97%)	65 (98%)	0	1 (2%)	11	23
All	All	792/816 (97%)	781 (99%)	7 (1%)	4 (0%)	31	56

All (4) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	I	68	GLU
1	K	68	GLU
1	F	68	GLU
1	L	68	GLU

### 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	53/54 (98%)	50 (94%)	3 (6%)	23	45
1	B	53/54 (98%)	50 (94%)	3 (6%)	23	45
1	C	53/54 (98%)	51 (96%)	2 (4%)	36	63
1	D	53/54 (98%)	51 (96%)	2 (4%)	36	63
1	E	53/54 (98%)	50 (94%)	3 (6%)	23	45
1	F	53/54 (98%)	51 (96%)	2 (4%)	36	63
1	G	53/54 (98%)	50 (94%)	3 (6%)	23	45
1	H	53/54 (98%)	50 (94%)	3 (6%)	23	45
1	I	53/54 (98%)	51 (96%)	2 (4%)	36	63
1	J	53/54 (98%)	51 (96%)	2 (4%)	36	63
1	K	53/54 (98%)	51 (96%)	2 (4%)	36	63
1	L	53/54 (98%)	50 (94%)	3 (6%)	23	45
All	All	636/648 (98%)	606 (95%)	30 (5%)	29	54

All (30) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	23	GLN
1	A	32	THR
1	A	50	GLU
1	B	23	GLN
1	B	30	ARG
1	B	32	THR
1	C	23	GLN
1	C	32	THR
1	D	23	GLN
1	D	32	THR
1	E	23	GLN
1	E	32	THR
1	E	68	GLU
1	F	23	GLN
1	F	32	THR
1	G	23	GLN
1	G	32	THR
1	G	68	GLU
1	H	23	GLN
1	H	32	THR

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Mol	Chain	Res	Type
1	H	68	GLU
1	I	23	GLN
1	I	32	THR
1	J	23	GLN
1	J	32	THR
1	K	23	GLN
1	K	32	THR
1	L	23	GLN
1	L	32	THR
1	L	68	GLU

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (12) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	23	GLN
1	B	23	GLN
1	C	23	GLN
1	D	23	GLN
1	E	23	GLN
1	F	23	GLN
1	G	23	GLN
1	H	23	GLN
1	I	23	GLN
1	J	23	GLN
1	K	23	GLN
1	L	23	GLN

### 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

21 ligands are modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with  $|Z| > 2$  is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# $ Z  > 2$	Counts	RMSZ	# $ Z  > 2$
2	FMN	A	101	-	31,33,33	1.29	4 (12%)	39,50,50	1.88	6 (15%)
2	FMN	B	101	-	31,33,33	1.27	3 (9%)	39,50,50	1.84	6 (15%)
3	COA	B	201	-	41,50,50	1.70	3 (7%)	51,75,75	1.72	4 (7%)
2	FMN	C	101	-	31,33,33	1.32	4 (12%)	39,50,50	1.93	6 (15%)
3	COA	C	201	-	41,50,50	1.66	3 (7%)	51,75,75	1.57	1 (1%)
2	FMN	D	101	-	31,33,33	1.40	3 (9%)	39,50,50	1.92	5 (12%)
3	COA	D	201	-	41,50,50	1.72	3 (7%)	51,75,75	1.80	4 (7%)
2	FMN	E	101	-	31,33,33	1.29	3 (9%)	39,50,50	1.77	6 (15%)
3	COA	E	201	-	41,50,50	1.75	3 (7%)	51,75,75	1.67	4 (7%)
2	FMN	F	101	-	31,33,33	1.24	4 (12%)	39,50,50	1.99	7 (17%)
3	COA	F	201	-	41,50,50	1.64	3 (7%)	51,75,75	1.73	3 (5%)
2	FMN	G	101	-	31,33,33	1.36	4 (12%)	39,50,50	1.83	5 (12%)
3	COA	G	201	-	41,50,50	1.79	3 (7%)	51,75,75	1.77	6 (11%)
2	FMN	H	101	-	31,33,33	1.23	4 (12%)	39,50,50	1.85	6 (15%)
2	FMN	I	101	-	31,33,33	1.34	4 (12%)	39,50,50	1.92	7 (17%)
3	COA	I	201	-	41,50,50	1.68	3 (7%)	51,75,75	1.68	2 (3%)
2	FMN	J	101	-	31,33,33	1.31	3 (9%)	39,50,50	1.94	7 (17%)
3	COA	J	201	-	41,50,50	1.71	3 (7%)	51,75,75	1.67	3 (5%)
2	FMN	K	101	-	31,33,33	1.36	3 (9%)	39,50,50	1.76	6 (15%)
3	COA	K	201	-	41,50,50	1.70	3 (7%)	51,75,75	1.79	3 (5%)
2	FMN	L	101	-	31,33,33	1.39	4 (12%)	39,50,50	1.79	5 (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	A	101	-	-	0/16/18/18	0/3/3/3
2	FMN	B	101	-	-	0/16/18/18	0/3/3/3
3	COA	B	201	-	-	0/44/64/64	0/3/3/3
2	FMN	C	101	-	-	0/16/18/18	0/3/3/3
3	COA	C	201	-	-	0/44/64/64	0/3/3/3
2	FMN	D	101	-	-	0/16/18/18	0/3/3/3
3	COA	D	201	-	-	0/44/64/64	0/3/3/3
2	FMN	E	101	-	-	0/16/18/18	0/3/3/3
3	COA	E	201	-	-	0/44/64/64	0/3/3/3
2	FMN	F	101	-	-	0/16/18/18	0/3/3/3
3	COA	F	201	-	-	0/44/64/64	0/3/3/3
2	FMN	G	101	-	-	0/16/18/18	0/3/3/3
3	COA	G	201	-	-	0/44/64/64	0/3/3/3
2	FMN	H	101	-	-	0/16/18/18	0/3/3/3
2	FMN	I	101	-	-	0/16/18/18	0/3/3/3
3	COA	I	201	-	-	0/44/64/64	0/3/3/3
2	FMN	J	101	-	-	0/16/18/18	0/3/3/3
3	COA	J	201	-	-	0/44/64/64	0/3/3/3
2	FMN	K	101	-	-	0/16/18/18	0/3/3/3
3	COA	K	201	-	1/1/11/13	0/44/64/64	0/3/3/3
2	FMN	L	101	-	-	0/16/18/18	0/3/3/3

All (70) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	F	101	FMN	C5A-N5	2.00	1.38	1.35
2	H	101	FMN	C5A-N5	2.04	1.38	1.35
2	C	101	FMN	C5A-N5	2.10	1.38	1.35
2	G	101	FMN	C5A-N5	2.29	1.38	1.35
3	I	201	COA	C2A-N1A	2.31	1.38	1.33
2	I	101	FMN	C5A-N5	2.32	1.38	1.35
2	J	101	FMN	C4-N3	2.37	1.37	1.33
2	E	101	FMN	C4-N3	2.39	1.37	1.33
2	L	101	FMN	C5A-N5	2.43	1.39	1.35
2	A	101	FMN	C4-N3	2.49	1.37	1.33
2	F	101	FMN	C4-N3	2.49	1.37	1.33
3	F	201	COA	C2A-N1A	2.51	1.38	1.33
2	A	101	FMN	C5A-N5	2.52	1.39	1.35
3	D	201	COA	C2A-N1A	2.57	1.38	1.33
3	K	201	COA	C2A-N1A	2.61	1.38	1.33
2	H	101	FMN	C4-N3	2.62	1.37	1.33
2	I	101	FMN	C4-N3	2.63	1.37	1.33
3	C	201	COA	C2A-N1A	2.73	1.39	1.33

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	J	201	COA	C2A-N1A	2.80	1.39	1.33
2	L	101	FMN	C4-N3	2.87	1.38	1.33
3	E	201	COA	C2A-N1A	2.98	1.39	1.33
3	G	201	COA	C2A-N1A	2.98	1.39	1.33
2	B	101	FMN	C4-N3	2.98	1.38	1.33
3	B	201	COA	C2A-N1A	2.99	1.39	1.33
2	G	101	FMN	C4-N3	3.04	1.38	1.33
2	K	101	FMN	C4-N3	3.05	1.38	1.33
2	H	101	FMN	C4A-N5	3.05	1.37	1.33
2	C	101	FMN	C4-N3	3.07	1.38	1.33
2	D	101	FMN	C4-N3	3.09	1.38	1.33
2	K	101	FMN	C4A-N5	3.14	1.37	1.33
2	B	101	FMN	C4A-N5	3.18	1.38	1.33
2	F	101	FMN	C4A-N5	3.23	1.38	1.33
2	I	101	FMN	C10-N1	3.25	1.37	1.33
2	H	101	FMN	C10-N1	3.27	1.37	1.33
2	J	101	FMN	C4A-N5	3.30	1.38	1.33
2	E	101	FMN	C4A-N5	3.31	1.38	1.33
2	G	101	FMN	C4A-N5	3.31	1.38	1.33
2	A	101	FMN	C4A-N5	3.40	1.38	1.33
2	I	101	FMN	C4A-N5	3.43	1.38	1.33
2	A	101	FMN	C10-N1	3.43	1.37	1.33
3	F	201	COA	C2A-N3A	3.45	1.37	1.32
2	D	101	FMN	C4A-N5	3.47	1.38	1.33
2	C	101	FMN	C4A-N5	3.52	1.38	1.33
3	D	201	COA	C2A-N3A	3.64	1.38	1.32
2	E	101	FMN	C10-N1	3.64	1.38	1.33
2	B	101	FMN	C10-N1	3.67	1.38	1.33
2	F	101	FMN	C10-N1	3.74	1.38	1.33
3	K	201	COA	C2A-N3A	3.79	1.38	1.32
3	C	201	COA	C2A-N3A	3.83	1.38	1.32
3	G	201	COA	C2A-N3A	3.86	1.38	1.32
3	E	201	COA	C2A-N3A	3.95	1.38	1.32
2	J	101	FMN	C10-N1	4.01	1.38	1.33
2	C	101	FMN	C10-N1	4.02	1.38	1.33
2	D	101	FMN	C10-N1	4.05	1.38	1.33
2	L	101	FMN	C4A-N5	4.05	1.39	1.33
3	I	201	COA	C2A-N3A	4.12	1.38	1.32
3	J	201	COA	C2A-N3A	4.14	1.38	1.32
2	L	101	FMN	C10-N1	4.14	1.38	1.33
3	B	201	COA	C2A-N3A	4.22	1.39	1.32
2	G	101	FMN	C10-N1	4.35	1.39	1.33

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	K	101	FMN	C10-N1	4.43	1.39	1.33
3	I	201	COA	O9P-C9P	8.46	1.40	1.23
3	B	201	COA	O9P-C9P	8.60	1.40	1.23
3	J	201	COA	O9P-C9P	8.72	1.40	1.23
3	C	201	COA	O9P-C9P	8.79	1.41	1.23
3	F	201	COA	O9P-C9P	8.83	1.41	1.23
3	K	201	COA	O9P-C9P	9.08	1.41	1.23
3	D	201	COA	O9P-C9P	9.11	1.41	1.23
3	E	201	COA	O9P-C9P	9.11	1.41	1.23
3	G	201	COA	O9P-C9P	9.32	1.42	1.23

All (102) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	D	201	COA	N3A-C2A-N1A	-10.96	119.48	128.86
3	K	201	COA	N3A-C2A-N1A	-10.54	119.84	128.86
3	J	201	COA	N3A-C2A-N1A	-10.13	120.20	128.86
3	F	201	COA	N3A-C2A-N1A	-10.00	120.31	128.86
3	E	201	COA	N3A-C2A-N1A	-9.85	120.44	128.86
3	I	201	COA	N3A-C2A-N1A	-9.76	120.51	128.86
3	C	201	COA	N3A-C2A-N1A	-9.75	120.52	128.86
3	G	201	COA	N3A-C2A-N1A	-9.73	120.53	128.86
3	B	201	COA	N3A-C2A-N1A	-9.09	121.08	128.86
3	G	201	COA	O6A-CCP-CBP	-3.86	104.33	110.55
2	C	101	FMN	C4A-C4-N3	-3.78	118.09	123.47
2	H	101	FMN	C4A-C4-N3	-3.57	118.39	123.47
2	B	101	FMN	C4A-C4-N3	-3.57	118.40	123.47
2	F	101	FMN	C4A-C4-N3	-3.53	118.46	123.47
2	A	101	FMN	C4A-C4-N3	-3.50	118.49	123.47
2	D	101	FMN	C4A-C4-N3	-3.28	118.81	123.47
2	J	101	FMN	C4A-C4-N3	-3.17	118.96	123.47
2	G	101	FMN	C4A-C4-N3	-3.17	118.97	123.47
3	B	201	COA	C7P-N8P-C9P	-3.11	116.87	122.59
2	L	101	FMN	C4A-C4-N3	-3.04	119.15	123.47
2	I	101	FMN	C4A-C4-N3	-3.01	119.19	123.47
3	B	201	COA	C7P-C6P-C5P	-2.97	107.44	112.31
3	I	201	COA	O6A-CCP-CBP	-2.94	105.82	110.55
2	K	101	FMN	C4A-C4-N3	-2.89	119.36	123.47
3	E	201	COA	P2A-O3A-P1A	-2.85	123.05	132.63
3	F	201	COA	C4B-O4B-C1B	-2.80	106.91	109.83
3	B	201	COA	P2A-O3A-P1A	-2.78	123.28	132.63
2	E	101	FMN	C4A-C4-N3	-2.57	119.82	123.47

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	J	201	COA	P2A-O3A-P1A	-2.53	124.14	132.63
3	F	201	COA	C1B-N9A-C4A	-2.44	122.42	126.64
3	G	201	COA	C1B-N9A-C4A	-2.43	122.44	126.64
3	G	201	COA	C7P-C6P-C5P	-2.35	108.44	112.31
3	D	201	COA	O6A-CCP-CBP	-2.26	106.91	110.55
2	I	101	FMN	C9A-C5A-N5	-2.23	119.15	122.32
3	D	201	COA	P2A-O3A-P1A	-2.20	125.24	132.63
2	C	101	FMN	C9A-C5A-N5	-2.19	119.21	122.32
3	E	201	COA	C7P-C6P-C5P	-2.19	108.71	112.31
3	G	201	COA	C4A-C5A-N7A	-2.11	107.37	109.41
2	F	101	FMN	C9A-C5A-N5	-2.10	119.34	122.32
3	K	201	COA	P2A-O3A-P1A	-2.04	125.78	132.63
3	D	201	COA	CDP-CBP-CCP	2.01	111.51	108.23
2	K	101	FMN	C4-C4A-N5	2.02	120.97	118.70
2	I	101	FMN	P-O5'-C5'	2.02	123.87	118.30
2	B	101	FMN	C4-C4A-N5	2.03	120.98	118.70
2	K	101	FMN	O2'-C2'-C3'	2.03	114.13	109.10
2	A	101	FMN	O3P-P-O5'	2.08	112.27	106.73
2	H	101	FMN	O3P-P-O5'	2.14	112.42	106.73
2	E	101	FMN	O3P-P-O5'	2.21	112.61	106.73
2	J	101	FMN	P-O5'-C5'	2.25	124.50	118.30
2	F	101	FMN	O2'-C2'-C3'	2.33	114.86	109.10
2	J	101	FMN	O2'-C2'-C3'	2.34	114.88	109.10
2	A	101	FMN	O2'-C2'-C3'	2.38	114.97	109.10
3	E	201	COA	O9A-P3B-O8A	2.39	117.05	107.59
2	F	101	FMN	O3P-P-O5'	2.43	113.21	106.73
2	I	101	FMN	O2'-C2'-C3'	2.44	115.12	109.10
2	B	101	FMN	O2'-C2'-C3'	2.48	115.22	109.10
2	D	101	FMN	O2'-C2'-C3'	2.49	115.25	109.10
2	C	101	FMN	O2'-C2'-C3'	2.50	115.28	109.10
2	J	101	FMN	C4-C4A-N5	2.52	121.53	118.70
3	G	201	COA	C4B-O4B-C1B	2.61	112.55	109.83
3	J	201	COA	C3B-C2B-C1B	2.70	105.93	99.94
2	G	101	FMN	O2'-C2'-C3'	2.75	115.89	109.10
2	E	101	FMN	O2'-C2'-C3'	2.76	115.92	109.10
2	H	101	FMN	O2'-C2'-C3'	2.77	115.94	109.10
2	L	101	FMN	O2'-C2'-C3'	3.04	116.61	109.10
2	B	101	FMN	C1'-N10-C9A	3.21	121.16	118.31
2	K	101	FMN	C1'-N10-C9A	3.25	121.20	118.31
2	E	101	FMN	C4A-N5-C5A	3.40	120.32	116.76
2	A	101	FMN	C1'-N10-C9A	3.41	121.34	118.31
2	F	101	FMN	C1'-N10-C9A	3.59	121.50	118.31

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	L	101	FMN	C1'-N10-C9A	3.66	121.56	118.31
2	E	101	FMN	C1'-N10-C9A	3.73	121.62	118.31
2	J	101	FMN	C1'-N10-C9A	3.76	121.66	118.31
3	K	201	COA	CEP-CBP-CAP	3.78	115.37	108.82
2	C	101	FMN	C1'-N10-C9A	3.79	121.67	118.31
2	D	101	FMN	C1'-N10-C9A	3.83	121.71	118.31
2	H	101	FMN	C1'-N10-C9A	3.85	121.74	118.31
2	L	101	FMN	C4A-N5-C5A	3.86	120.80	116.76
2	I	101	FMN	C1'-N10-C9A	3.86	121.75	118.31
2	G	101	FMN	C1'-N10-C9A	3.92	121.79	118.31
2	H	101	FMN	C4A-N5-C5A	3.97	120.92	116.76
2	G	101	FMN	C4A-N5-C5A	4.04	120.99	116.76
2	K	101	FMN	C4A-N5-C5A	4.18	121.14	116.76
2	A	101	FMN	C4A-N5-C5A	4.30	121.26	116.76
2	J	101	FMN	C4A-N5-C5A	4.45	121.42	116.76
2	I	101	FMN	C4A-N5-C5A	4.49	121.47	116.76
2	D	101	FMN	C4A-N5-C5A	4.50	121.47	116.76
2	B	101	FMN	C4A-N5-C5A	4.53	121.51	116.76
2	C	101	FMN	C4A-N5-C5A	4.59	121.57	116.76
2	F	101	FMN	C4A-N5-C5A	4.90	121.89	116.76
2	E	101	FMN	C4-N3-C2	6.92	121.03	115.14
2	L	101	FMN	C4-N3-C2	7.05	121.14	115.14
2	H	101	FMN	C4-N3-C2	7.24	121.31	115.14
2	B	101	FMN	C4-N3-C2	7.29	121.35	115.14
2	G	101	FMN	C4-N3-C2	7.33	121.39	115.14
2	C	101	FMN	C4-N3-C2	7.40	121.44	115.14
2	K	101	FMN	C4-N3-C2	7.50	121.53	115.14
2	D	101	FMN	C4-N3-C2	7.56	121.58	115.14
2	A	101	FMN	C4-N3-C2	7.58	121.59	115.14
2	I	101	FMN	C4-N3-C2	7.62	121.63	115.14
2	F	101	FMN	C4-N3-C2	7.76	121.74	115.14
2	J	101	FMN	C4-N3-C2	7.81	121.79	115.14

All (1) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
3	K	201	COA	CAP

There are no torsion outliers.

There are no ring outliers.

21 monomers are involved in 58 short contacts:



Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	101	FMN	1	0
2	B	101	FMN	1	0
3	B	201	COA	4	0
2	C	101	FMN	1	0
3	C	201	COA	7	0
2	D	101	FMN	1	0
3	D	201	COA	7	0
2	E	101	FMN	1	0
3	E	201	COA	2	0
2	F	101	FMN	1	0
3	F	201	COA	6	0
2	G	101	FMN	1	0
3	G	201	COA	6	0
2	H	101	FMN	1	0
2	I	101	FMN	1	0
3	I	201	COA	4	0
2	J	101	FMN	1	0
3	J	201	COA	9	0
2	K	101	FMN	2	0
3	K	201	COA	7	0
2	L	101	FMN	1	0

## 5.7 Other polymers [i](#)

There are no such residues in this entry.

## 5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

## 6 Fit of model and data

### 6.1 Protein, DNA and RNA chains

In the following table, the column labelled ‘#RSRZ> 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95<sup>th</sup> percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled ‘Q< 0.9’ lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å <sup>2</sup> )	Q<0.9
1	A	68/68 (100%)	1.87	22 (32%) 0 0	58, 62, 66, 71	0
1	B	68/68 (100%)	1.61	19 (27%) 0 0	58, 62, 66, 71	0
1	C	68/68 (100%)	1.48	11 (16%) 1 1	58, 62, 66, 71	0
1	D	68/68 (100%)	1.52	18 (26%) 0 0	58, 62, 66, 71	0
1	E	68/68 (100%)	1.56	16 (23%) 0 0	58, 62, 66, 71	0
1	F	68/68 (100%)	1.45	17 (25%) 0 0	58, 62, 66, 71	0
1	G	68/68 (100%)	1.34	15 (22%) 0 0	58, 62, 66, 71	0
1	H	68/68 (100%)	1.66	19 (27%) 0 0	58, 62, 66, 71	0
1	I	68/68 (100%)	1.37	13 (19%) 1 0	58, 62, 66, 71	0
1	J	68/68 (100%)	1.42	18 (26%) 0 0	58, 62, 66, 71	0
1	K	68/68 (100%)	1.59	19 (27%) 0 0	58, 62, 66, 71	0
1	L	68/68 (100%)	1.69	25 (36%) 0 0	58, 62, 66, 71	0
All	All	816/816 (100%)	1.55	212 (25%) 0 0	58, 62, 67, 71	0

All (212) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	K	69	THR	16.0
1	C	69	THR	12.8
1	L	69	THR	9.1
1	A	69	THR	7.0
1	E	69	THR	6.4
1	H	69	THR	6.4
1	J	2	GLY	6.0
1	E	50	GLU	5.8
1	E	49	GLY	5.3
1	L	68	GLU	5.2
1	H	2	GLY	5.1

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Mol	Chain	Res	Type	RSRZ
1	D	50	GLU	5.1
1	A	30	ARG	5.0
1	D	69	THR	5.0
1	A	2	GLY	5.0
1	F	8	VAL	4.9
1	B	51	ALA	4.9
1	C	2	GLY	4.7
1	B	68	GLU	4.7
1	I	69	THR	4.6
1	F	2	GLY	4.5
1	D	51	ALA	4.4
1	L	30	ARG	4.4
1	C	10	LEU	4.3
1	I	51	ALA	4.3
1	A	50	GLU	4.2
1	I	2	GLY	4.2
1	E	51	ALA	4.2
1	G	50	GLU	4.2
1	F	50	GLU	4.1
1	A	34	ARG	4.1
1	J	51	ALA	4.1
1	J	16	GLU	4.1
1	A	33	LEU	4.1
1	D	60	LEU	3.9
1	C	8	VAL	3.9
1	H	58	VAL	3.9
1	G	2	GLY	3.9
1	A	51	ALA	3.9
1	G	49	GLY	3.9
1	A	35	HIS	3.9
1	L	34	ARG	3.8
1	H	31	LYS	3.8
1	E	68	GLU	3.8
1	D	16	GLU	3.7
1	E	16	GLU	3.7
1	K	50	GLU	3.7
1	A	58	VAL	3.7
1	B	16	GLU	3.7
1	L	50	GLU	3.7
1	B	69	THR	3.6
1	H	30	ARG	3.6
1	J	18	LEU	3.6

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Mol	Chain	Res	Type	RSRZ
1	I	8	VAL	3.5
1	A	39	PHE	3.4
1	G	69	THR	3.4
1	A	38	TRP	3.4
1	B	15	GLU	3.3
1	A	11	VAL	3.3
1	L	58	VAL	3.3
1	C	16	GLU	3.3
1	F	16	GLU	3.3
1	B	50	GLU	3.3
1	I	16	GLU	3.2
1	K	49	GLY	3.2
1	H	50	GLU	3.2
1	D	11	VAL	3.2
1	E	62	VAL	3.1
1	A	60	LEU	3.1
1	F	64	PHE	3.1
1	A	32	THR	3.1
1	K	2	GLY	3.1
1	K	31	LYS	3.1
1	F	69	THR	3.1
1	E	8	VAL	3.0
1	B	52	GLY	3.0
1	G	52	GLY	3.0
1	K	27	ALA	3.0
1	B	2	GLY	3.0
1	F	15	GLU	2.9
1	F	60	LEU	2.9
1	F	63	GLY	2.9
1	E	3	LYS	2.9
1	K	60	LEU	2.9
1	H	11	VAL	2.9
1	A	62	VAL	2.9
1	F	6	LYS	2.8
1	L	33	LEU	2.8
1	D	8	VAL	2.8
1	J	60	LEU	2.8
1	C	36	LEU	2.8
1	G	60	LEU	2.8
1	B	33	LEU	2.8
1	A	68	GLU	2.8
1	G	66	LEU	2.8

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Mol	Chain	Res	Type	RSRZ
1	H	60	LEU	2.8
1	K	8	VAL	2.7
1	H	67	GLU	2.7
1	J	50	GLU	2.7
1	I	26	LEU	2.7
1	J	48	ILE	2.7
1	K	68	GLU	2.7
1	I	62	VAL	2.7
1	L	67	GLU	2.6
1	H	34	ARG	2.6
1	I	25	ALA	2.6
1	A	18	LEU	2.6
1	H	18	LEU	2.6
1	D	10	LEU	2.6
1	L	22	ILE	2.6
1	J	65	ARG	2.6
1	L	12	GLY	2.6
1	L	60	LEU	2.6
1	D	3	LYS	2.6
1	B	8	VAL	2.6
1	L	25	ALA	2.6
1	A	22	ILE	2.6
1	L	32	THR	2.5
1	K	10	LEU	2.5
1	L	35	HIS	2.5
1	H	16	GLU	2.5
1	K	62	VAL	2.5
1	L	44	ILE	2.5
1	G	38	TRP	2.5
1	H	68	GLU	2.5
1	J	3	LYS	2.5
1	A	44	ILE	2.5
1	G	10	LEU	2.5
1	L	11	VAL	2.5
1	J	35	HIS	2.4
1	H	22	ILE	2.4
1	C	18	LEU	2.4
1	J	53	VAL	2.4
1	F	68	GLU	2.4
1	B	49	GLY	2.4
1	B	27	ALA	2.4
1	L	21	ALA	2.4

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Mol	Chain	Res	Type	RSRZ
1	I	10	LEU	2.4
1	A	48	ILE	2.4
1	D	44	ILE	2.4
1	D	36	LEU	2.4
1	K	12	GLY	2.3
1	K	63	GLY	2.3
1	J	58	VAL	2.3
1	H	48	ILE	2.3
1	C	64	PHE	2.3
1	H	51	ALA	2.3
1	L	36	LEU	2.3
1	I	22	ILE	2.3
1	G	29	ALA	2.3
1	B	18	LEU	2.3
1	F	10	LEU	2.3
1	J	67	GLU	2.3
1	F	58	VAL	2.3
1	H	62	VAL	2.3
1	K	58	VAL	2.3
1	B	58	VAL	2.3
1	E	63	GLY	2.3
1	L	63	GLY	2.2
1	D	66	LEU	2.2
1	L	18	LEU	2.2
1	F	62	VAL	2.2
1	B	6	LYS	2.2
1	E	18	LEU	2.2
1	F	51	ALA	2.2
1	G	51	ALA	2.2
1	E	64	PHE	2.2
1	G	64	PHE	2.2
1	J	23	GLN	2.2
1	J	10	LEU	2.2
1	L	10	LEU	2.2
1	D	62	VAL	2.2
1	G	16	GLU	2.2
1	L	16	GLU	2.2
1	J	36	LEU	2.2
1	K	18	LEU	2.2
1	D	6	LYS	2.2
1	E	7	LYS	2.2
1	L	59	VAL	2.2

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Mol	Chain	Res	Type	RSRZ
1	A	21	ALA	2.2
1	D	30	ARG	2.2
1	E	60	LEU	2.2
1	K	6	LYS	2.1
1	H	35	HIS	2.1
1	C	29	ALA	2.1
1	C	62	VAL	2.1
1	F	30	ARG	2.1
1	L	2	GLY	2.1
1	L	51	ALA	2.1
1	B	44	ILE	2.1
1	E	33	LEU	2.1
1	I	48	ILE	2.1
1	F	44	ILE	2.1
1	B	60	LEU	2.1
1	C	35	HIS	2.1
1	K	29	ALA	2.1
1	I	11	VAL	2.1
1	A	5	TYR	2.1
1	D	35	HIS	2.1
1	K	44	ILE	2.1
1	D	26	LEU	2.1
1	E	2	GLY	2.1
1	I	63	GLY	2.1
1	B	54	LYS	2.0
1	K	30	ARG	2.0
1	B	11	VAL	2.0
1	G	11	VAL	2.0
1	J	22	ILE	2.0
1	D	4	VAL	2.0
1	H	59	VAL	2.0
1	J	62	VAL	2.0
1	G	28	ARG	2.0

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

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

## 6.3 Carbohydrates ⓘ

There are no carbohydrates in this entry.

## 6.4 Ligands

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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å <sup>2</sup> )	Q<0.9
3	COA	J	201	48/48	0.77	0.40	80,87,93,95	0
3	COA	F	201	48/48	0.80	0.33	42,56,61,63	0
2	FMN	E	101	31/31	0.85	0.25	46,47,66,67	0
2	FMN	J	101	31/31	0.86	0.21	46,47,67,67	0
2	FMN	G	101	31/31	0.87	0.23	46,48,67,67	0
2	FMN	C	101	31/31	0.87	0.29	46,48,66,67	0
2	FMN	I	101	31/31	0.87	0.25	46,47,67,67	0
3	COA	B	201	48/48	0.87	0.27	46,51,56,59	0
3	COA	C	201	48/48	0.87	0.30	60,73,81,83	0
2	FMN	B	101	31/31	0.88	0.21	46,47,66,67	0
2	FMN	K	101	31/31	0.88	0.24	46,47,66,67	0
2	FMN	D	101	31/31	0.88	0.23	46,47,67,67	0
2	FMN	F	101	31/31	0.88	0.24	46,47,66,67	0
3	COA	K	201	48/48	0.88	0.29	53,60,65,67	0
2	FMN	L	101	31/31	0.89	0.31	46,48,67,67	0
2	FMN	A	101	31/31	0.89	0.23	46,48,66,67	0
3	COA	D	201	48/48	0.89	0.31	42,55,62,64	0
2	FMN	H	101	31/31	0.90	0.25	46,47,67,67	0
3	COA	G	201	48/48	0.90	0.25	41,61,73,79	0
3	COA	E	201	48/48	0.92	0.25	44,55,68,72	0
3	COA	I	201	48/48	0.93	0.23	41,47,53,55	0

## 6.5 Other polymers

There are no such residues in this entry.