WORLDWIDE wwPDB PROTEIN DATA BANK

Full wwPDB X-ray Structure Validation Report (i)

Dec 10, 2023 – 01:09 am GMT

PDB ID : 2VL6
Title : STRUCTURAL ANALYSIS OF THE SULFOLOBUS SOLFATARICUS MCM PROTEIN N- TERMINAL DOMAIN
Authors : Liu, W.; Pucci, B.; Rossi, M.; Pisani, F.M.; Ladenstein, R.
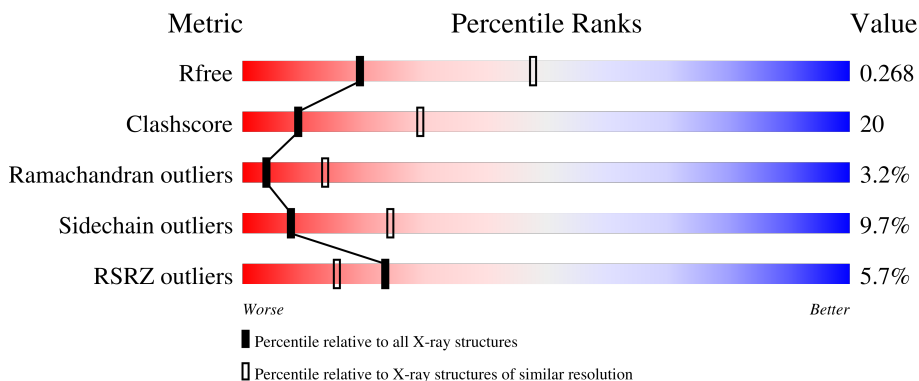Deposited on : 2008-01-08
Resolution : 2.80 Å(reported)

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 2.80 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.

Metric	Percentile Ranks	Value
Rfree		0.268
Clashscore		20
Ramachandran outliers		3.2%
Sidechain outliers		9.7%
RSRZ outliers		5.7%

Worse   *Better*

▮ Percentile relative to all X-ray structures

▯ Percentile relative to X-ray structures of similar resolution

Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	3140 (2.80-2.80)
Clashscore	141614	3569 (2.80-2.80)
Ramachandran outliers	138981	3498 (2.80-2.80)
Sidechain outliers	138945	3500 (2.80-2.80)
RSRZ outliers	127900	3078 (2.80-2.80)

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 <=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	268	3% — 61% · 26% · 8% · ·
1	B	268	5% — 62% · 26% · 8% · ·
1	C	268	9% — 60% · 29% · 6% · ·

2 Entry composition (i)

There are 3 unique types of molecules in this entry. The entry contains 6389 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 MINICHROMOSOME MAINTENANCE PROTEIN MCM.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	259	Total 2116	C 1357	N 358	O 394	S 7	0	0	0
1	B	259	Total 2116	C 1357	N 358	O 394	S 7	0	0	0
1	C	259	Total 2116	C 1357	N 358	O 394	S 7	0	0	0

- Molecule 2 is ZINC ION (three-letter code: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	1	Total 1	Zn 1	0	0
2	B	1	Total 1	Zn 1	0	0
2	C	1	Total 1	Zn 1	0	0

- Molecule 3 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	21	Total 21	O 21	0	0
3	B	9	Total 9	O 9	0	0
3	C	8	Total 8	O 8	0	0

3 Residue-property plots ⓘ

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry 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.
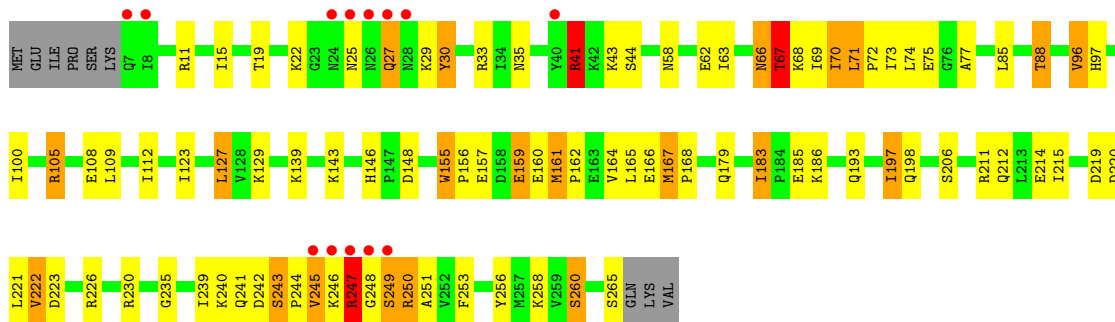
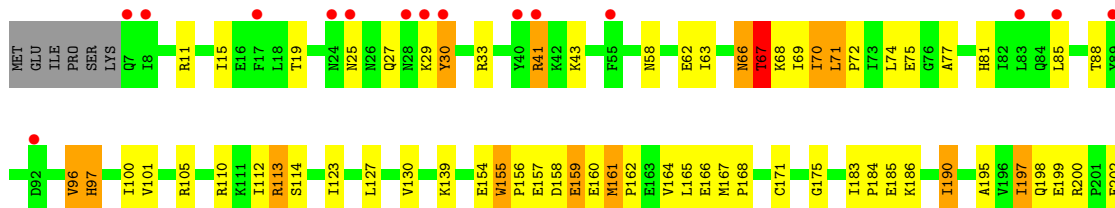- Molecule 1: MINICHROMOSOME MAINTENANCE PROTEIN MCM

Chain A:
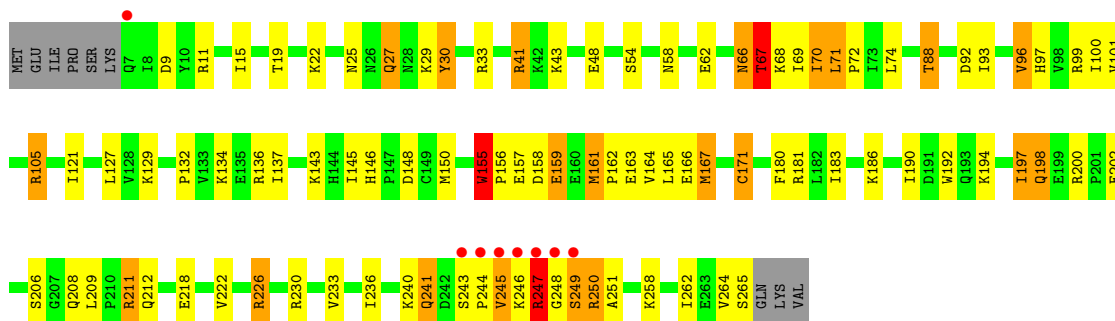
- Molecule 1: MINICHROMOSOME MAINTENANCE PROTEIN MCM

Chain B:

- Molecule 1: MINICHROMOSOME MAINTENANCE PROTEIN MCM

Chain C:
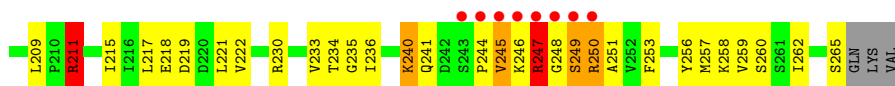
4 Data and refinement statistics ⓘ

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α, β, γ	193.99Å　52.24Å　115.57Å 90.00°　124.15°　90.00°	Depositor
Resolution (Å)	31.88　–　2.80 31.88　–　2.80	Depositor EDS
% Data completeness (in resolution range)	100.0 (31.88-2.80) 100.0 (31.88-2.80)	Depositor EDS
R_{merge}	0.06	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	3.96 (at 2.81Å)	Xtriage
Refinement program	REFMAC 5.2.0019	Depositor
R, R_{free}	0.233　,　0.283 0.225　,　0.268	Depositor DCC
R_{free} test set	1226 reflections (5.10%)	wwPDB-VP
Wilson B-factor (Å^2)	63.0	Xtriage
Anisotropy	0.023	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.31 , 58.2	EDS
L-test for twinning[2]	$< |L| > = 0.50, < L^2 > = 0.33$	Xtriage
Estimated twinning fraction	0.017 for -h-2*l,-k,l	Xtriage
F_o,F_c correlation	0.93	EDS
Total number of atoms	6389	wwPDB-VP
Average B, all atoms (Å^2)	34.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.51% of the height of the origin peak. No significant pseudotranslation is detected.*

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[1]Intensities estimated from amplitudes.
[2]Theoretical values of $< |L| >$, $< L^2 >$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5   Model quality ⓘ

5.1   Standard geometry ⓘ

Bond lengths and bond angles in the following residue types are not validated in this section: ZN

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	1.13	8/2156 (0.4%)	0.94	5/2917 (0.2%)
1	B	1.06	3/2156 (0.1%)	0.86	4/2917 (0.1%)
1	C	1.17	4/2156 (0.2%)	0.89	7/2917 (0.2%)
All	All	1.12	15/6468 (0.2%)	0.90	16/8751 (0.2%)

All (15) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	C	159	GLU	CD-OE1	28.19	1.56	1.25
1	B	159	GLU	CD-OE1	24.32	1.52	1.25
1	C	159	GLU	CD-OE2	23.75	1.51	1.25
1	A	159	GLU	CD-OE1	21.18	1.49	1.25
1	B	159	GLU	CD-OE2	19.66	1.47	1.25
1	A	159	GLU	CD-OE2	17.01	1.44	1.25
1	B	159	GLU	CG-CD	16.29	1.76	1.51
1	C	159	GLU	CG-CD	15.13	1.74	1.51
1	A	159	GLU	CB-CG	15.06	1.80	1.52
1	A	159	GLU	CG-CD	15.00	1.74	1.51
1	C	159	GLU	CB-CG	8.87	1.69	1.52
1	A	163	GLU	CG-CD	6.83	1.62	1.51
1	A	163	GLU	CB-CG	6.23	1.64	1.52
1	A	129	LYS	CD-CE	5.68	1.65	1.51
1	A	155	TRP	CB-CG	5.43	1.60	1.50

All (16) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	41	ARG	NE-CZ-NH2	-10.72	114.94	120.30
1	A	41	ARG	NE-CZ-NH1	10.69	125.64	120.30
1	C	211	ARG	NE-CZ-NH1	-7.62	116.49	120.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	C	159	GLU	CB-CG-CD	-7.47	94.04	114.20
1	C	159	GLU	OE1-CD-OE2	-7.28	114.57	123.30
1	C	159	GLU	CG-CD-OE2	6.99	132.28	118.30
1	A	159	GLU	CB-CG-CD	-6.98	95.36	114.20
1	C	41	ARG	NE-CZ-NH1	-6.30	117.15	120.30
1	A	211	ARG	NE-CZ-NH1	-6.13	117.23	120.30
1	C	41	ARG	NE-CZ-NH2	6.01	123.30	120.30
1	B	159	GLU	CG-CD-OE2	5.88	130.05	118.30
1	B	41	ARG	NE-CZ-NH2	5.70	123.15	120.30
1	C	113	ARG	NE-CZ-NH1	5.62	123.11	120.30
1	B	41	ARG	NE-CZ-NH1	-5.49	117.55	120.30
1	B	109	LEU	CB-CG-CD1	-5.28	102.03	111.00
1	A	155	TRP	N-CA-CB	5.26	120.07	110.60

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	2116	0	2173	99	0
1	B	2116	0	2173	87	1
1	C	2116	0	2173	89	0
2	A	1	0	0	0	0
2	B	1	0	0	0	0
2	C	1	0	0	0	0
3	A	21	0	0	3	0
3	B	9	0	0	1	0
3	C	8	0	0	1	0
All	All	6389	0	6519	257	1

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 20.

All (257) 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:A:159:GLU:CG	1:A:159:GLU:CB	1.80	1.56
1:C:159:GLU:CG	1:C:159:GLU:CD	1.74	1.54
1:B:159:GLU:CD	1:B:159:GLU:CG	1.76	1.52
1:A:250:ARG:HG3	1:A:250:ARG:HH11	1.07	1.09
1:B:127:LEU:HD12	1:B:197:ILE:HD11	1.42	1.00
1:C:250:ARG:HG3	1:C:250:ARG:HH11	1.24	0.99
1:B:211:ARG:HH11	1:B:211:ARG:CG	1.79	0.95
1:A:241:GLN:HB2	1:A:244:PRO:HG3	1.53	0.90
1:B:161:MET:CE	1:B:162:PRO:HD2	2.00	0.90
1:A:161:MET:CE	1:A:162:PRO:HD2	2.02	0.89
1:A:250:ARG:HG3	1:A:250:ARG:NH1	1.87	0.88
1:A:48:GLU:HG2	3:A:2004:HOH:O	1.72	0.88
1:B:161:MET:HE2	1:B:162:PRO:HD2	1.58	0.86
1:A:161:MET:HE3	1:A:162:PRO:HD2	1.60	0.83
1:C:161:MET:HE1	1:C:166:GLU:H	1.45	0.81
1:C:161:MET:CE	1:C:162:PRO:HD2	2.11	0.80
1:C:159:GLU:CD	1:C:159:GLU:CB	2.51	0.79
1:A:43:LYS:O	1:A:96:VAL:O	2.00	0.78
1:A:146:HIS:CE1	1:A:148:ASP:HB2	2.18	0.78
1:B:156:PRO:HG3	1:B:161:MET:HG2	1.66	0.78
1:B:211:ARG:HH11	1:B:211:ARG:HG2	1.49	0.77
1:A:155:TRP:O	1:A:156:PRO:C	2.22	0.77
1:A:41:ARG:HH22	1:A:88:THR:HB	1.49	0.76
1:C:233:VAL:HG12	1:C:262:ILE:HD12	1.65	0.76
1:A:161:MET:HE1	1:A:166:GLU:H	1.52	0.75
1:A:250:ARG:HH11	1:A:250:ARG:CG	1.94	0.75
1:B:161:MET:HE3	1:B:166:GLU:H	1.52	0.74
1:A:68:LYS:NZ	1:B:185:GLU:HG2	2.03	0.74
1:B:159:GLU:CD	1:B:159:GLU:CB	2.57	0.73
1:C:25:ASN:OD1	1:C:27:GLN:NE2	2.21	0.72
1:B:155:TRP:O	1:B:157:GLU:N	2.21	0.72
1:A:241:GLN:CB	1:A:244:PRO:HG3	2.18	0.72
1:A:155:TRP:O	1:A:157:GLU:N	2.23	0.71
1:B:161:MET:HE1	1:B:162:PRO:HD2	1.72	0.71
1:B:183:ILE:HG22	1:B:186:LYS:HB2	1.71	0.70
1:A:96:VAL:O	1:A:97:HIS:HB2	1.92	0.70
1:C:127:LEU:HD12	1:C:197:ILE:HD12	1.74	0.70
1:B:155:TRP:O	1:B:156:PRO:C	2.27	0.69
1:B:146:HIS:CE1	1:B:148:ASP:HB2	2.27	0.69
1:B:161:MET:CE	1:B:166:GLU:H	2.05	0.69
1:C:155:TRP:HB3	1:C:156:PRO:HD3	1.75	0.69
1:A:25:ASN:OD1	1:A:27:GLN:NE2	2.26	0.69

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:159:GLU:CB	1:A:159:GLU:CD	2.62	0.68
1:B:211:ARG:CG	1:B:211:ARG:NH1	2.50	0.68
1:C:218:GLU:HG3	1:C:258:LYS:HE2	1.75	0.68
1:C:215:ILE:HG22	1:C:257:MET:HB3	1.76	0.68
1:C:161:MET:HE2	1:C:162:PRO:HD2	1.76	0.67
1:B:161:MET:SD	1:B:165:LEU:HD12	2.35	0.67
1:B:198:GLN:NE2	1:B:212:GLN:HE21	1.93	0.67
1:C:230:ARG:O	1:C:265:SER:N	2.27	0.67
1:B:183:ILE:CG2	1:B:186:LYS:HB2	2.25	0.66
1:C:156:PRO:CG	1:C:161:MET:HG2	2.26	0.66
1:A:29:LYS:HE2	1:A:33:ARG:HH21	1.60	0.65
1:C:155:TRP:O	1:C:156:PRO:C	2.34	0.65
1:A:127:LEU:HD12	1:A:197:ILE:HD12	1.78	0.65
1:A:211:ARG:HG2	1:A:211:ARG:HH11	1.61	0.65
1:A:250:ARG:O	3:A:2019:HOH:O	2.13	0.65
1:C:161:MET:HE3	1:C:162:PRO:HD2	1.77	0.65
1:C:155:TRP:O	1:C:157:GLU:N	2.30	0.64
1:B:198:GLN:HE21	1:B:212:GLN:HE21	1.44	0.64
1:B:105:ARG:HH11	1:B:105:ARG:HA	1.62	0.64
1:C:29:LYS:HE2	1:C:33:ARG:HH21	1.62	0.64
1:C:112:ILE:HD11	1:C:123:ILE:HD11	1.79	0.64
1:B:70:ILE:O	1:B:74:LEU:HG	1.97	0.63
1:B:183:ILE:HG22	1:B:183:ILE:O	1.98	0.63
1:B:43:LYS:O	1:B:96:VAL:O	2.17	0.63
1:A:136:ARG:HB3	1:A:190:ILE:CG2	2.28	0.63
1:B:25:ASN:OD1	1:B:27:GLN:NE2	2.32	0.63
1:B:96:VAL:O	1:B:97:HIS:HB2	1.99	0.63
1:B:197:ILE:HD13	1:B:215:ILE:CD1	2.28	0.62
1:C:200:ARG:HB3	1:C:202:GLU:OE1	1.99	0.62
1:B:44:SER:OG	1:B:220:ASP:OD2	2.17	0.62
1:C:244:PRO:C	1:C:246:LYS:H	2.03	0.62
1:C:113:ARG:NH1	3:C:2001:HOH:O	2.32	0.61
1:C:156:PRO:HG2	1:C:161:MET:HG2	1.82	0.61
1:B:69:ILE:O	1:B:70:ILE:HB	2.01	0.60
1:B:211:ARG:HH11	1:B:211:ARG:HG3	1.62	0.60
1:C:139:LYS:HD3	1:C:154:GLU:HB3	1.83	0.60
1:C:155:TRP:CH2	1:C:168:PRO:HB3	2.37	0.59
1:C:250:ARG:HG3	1:C:250:ARG:NH1	2.03	0.59
1:B:29:LYS:HE2	1:B:33:ARG:HH21	1.65	0.59
1:B:161:MET:HE3	1:B:166:GLU:HG2	1.84	0.59
1:B:146:HIS:HE1	1:B:148:ASP:HB2	1.67	0.59

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:181:ARG:HD2	1:C:162:PRO:HG3	1.84	0.59
1:A:200:ARG:HB3	1:A:202:GLU:OE2	2.02	0.59
1:C:70:ILE:O	1:C:74:LEU:HG	2.03	0.59
1:A:208:GLN:NE2	1:B:226:ARG:HD3	2.18	0.58
1:A:211:ARG:HH11	1:A:211:ARG:CG	2.14	0.58
1:A:230:ARG:O	1:A:265:SER:N	2.36	0.58
1:C:157:GLU:O	1:C:158:ASP:HB2	2.04	0.58
1:A:167:MET:HE2	1:A:180:PHE:HB2	1.86	0.58
1:B:230:ARG:O	1:B:265:SER:N	2.37	0.57
1:C:240:LYS:HB3	1:C:256:TYR:CD2	2.39	0.57
1:A:143:LYS:HE3	1:A:150:MET:HG3	1.87	0.57
1:B:211:ARG:NH1	1:B:211:ARG:HG3	2.18	0.57
1:A:48:GLU:CG	3:A:2004:HOH:O	2.43	0.56
1:B:97:HIS:NE2	1:B:219:ASP:OD1	2.33	0.56
1:B:63:ILE:HG21	1:B:100:ILE:HG12	1.86	0.56
1:C:161:MET:HE2	1:C:162:PRO:CD	2.35	0.56
1:C:219:ASP:O	1:C:222:VAL:HB	2.07	0.55
1:A:58:ASN:O	1:A:62:GLU:HG2	2.06	0.55
1:A:143:LYS:HE2	1:C:159:GLU:OE2	2.07	0.55
1:A:264:VAL:CG1	1:A:265:SER:N	2.70	0.55
1:B:75:GLU:OE1	1:B:97:HIS:HA	2.06	0.55
1:A:134:LYS:HB3	1:C:253:PHE:O	2.08	0.55
1:A:161:MET:HE2	1:A:162:PRO:HD2	1.85	0.55
1:C:58:ASN:O	1:C:62:GLU:HG2	2.07	0.54
1:C:164:VAL:HG21	1:C:244:PRO:HG3	1.90	0.54
1:A:69:ILE:O	1:A:70:ILE:HB	2.06	0.54
1:A:96:VAL:O	1:A:97:HIS:CB	2.53	0.54
1:A:146:HIS:ND1	1:A:148:ASP:HB2	2.22	0.54
1:B:197:ILE:HD13	1:B:215:ILE:HD13	1.89	0.54
1:A:136:ARG:HB3	1:A:190:ILE:HG22	1.89	0.53
1:B:156:PRO:CG	1:B:161:MET:HG2	2.37	0.53
1:B:244:PRO:C	1:B:246:LYS:H	2.13	0.53
1:A:132:PRO:HB3	1:C:211:ARG:HD3	1.91	0.53
1:C:75:GLU:OE1	1:C:97:HIS:HA	2.09	0.52
1:B:71:LEU:HB3	1:B:72:PRO:CD	2.40	0.52
1:C:66:ASN:O	1:C:68:LYS:N	2.43	0.52
1:B:127:LEU:HD12	1:B:197:ILE:CD1	2.30	0.52
1:A:105:ARG:HA	1:A:105:ARG:HH11	1.75	0.52
1:C:161:MET:HE1	1:C:166:GLU:N	2.19	0.52
1:B:108:GLU:HA	3:B:2002:HOH:O	2.11	0.51
1:A:70:ILE:O	1:A:74:LEU:HG	2.10	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:244:PRO:C	1:A:246:LYS:H	2.13	0.51
1:B:69:ILE:O	1:B:70:ILE:CB	2.59	0.51
1:A:66:ASN:O	1:A:68:LYS:N	2.44	0.51
1:C:184:PRO:HG2	1:C:185:GLU:OE1	2.11	0.51
1:C:71:LEU:HB3	1:C:72:PRO:CD	2.41	0.51
1:C:130:VAL:HG23	1:C:130:VAL:O	2.11	0.51
1:A:145:ILE:HG12	1:C:166:GLU:OE1	2.10	0.51
1:C:43:LYS:O	1:C:96:VAL:O	2.29	0.50
1:C:96:VAL:O	1:C:97:HIS:HB2	2.11	0.50
1:A:29:LYS:CE	1:A:33:ARG:HH21	2.24	0.50
1:A:167:MET:CE	1:A:180:PHE:HB2	2.42	0.50
1:B:161:MET:CE	1:B:166:GLU:HG2	2.42	0.50
1:A:245:VAL:HG13	1:B:167:MET:HE1	1.94	0.49
1:B:58:ASN:O	1:B:62:GLU:HG2	2.11	0.49
1:A:181:ARG:HH22	1:C:159:GLU:CD	2.15	0.49
1:B:96:VAL:O	1:B:97:HIS:CB	2.60	0.49
1:B:240:LYS:HB3	1:B:256:TYR:CD2	2.47	0.49
1:A:105:ARG:HA	1:A:105:ARG:NH1	2.28	0.49
1:B:30:TYR:HA	1:B:33:ARG:HB2	1.95	0.49
1:A:99:ARG:HG2	1:A:99:ARG:HH11	1.77	0.49
1:C:30:TYR:HA	1:C:33:ARG:HB2	1.95	0.49
1:B:167:MET:HB2	1:B:168:PRO:HD2	1.95	0.49
1:B:193:GLN:HB2	1:B:222:VAL:HG22	1.94	0.49
1:A:68:LYS:HZ3	1:B:185:GLU:HG2	1.76	0.48
1:B:239:ILE:HB	1:B:253:PHE:HB3	1.95	0.48
1:A:127:LEU:HD12	1:A:197:ILE:CD1	2.42	0.48
1:C:244:PRO:O	1:C:245:VAL:HB	2.13	0.48
1:A:211:ARG:CG	1:A:211:ARG:NH1	2.75	0.48
1:A:218:GLU:CD	1:A:258:LYS:HE2	2.34	0.48
1:A:164:VAL:O	1:A:165:LEU:HB3	2.14	0.48
1:A:249:SER:H	1:A:250:ARG:CZ	2.27	0.48
1:C:110:ARG:HB2	1:C:199:GLU:OE1	2.14	0.48
1:A:211:ARG:NH2	1:B:223:ASP:OD1	2.47	0.48
1:A:233:VAL:HG12	1:A:262:ILE:HD12	1.95	0.48
1:C:183:ILE:HG22	1:C:186:LYS:HB2	1.96	0.47
1:C:69:ILE:O	1:C:70:ILE:HB	2.13	0.47
1:C:67:THR:HG21	1:C:236:ILE:HD11	1.96	0.47
1:A:156:PRO:HG3	1:A:161:MET:HG2	1.96	0.47
1:C:218:GLU:CG	1:C:258:LYS:HE2	2.45	0.47
1:B:179:GLN:NE2	1:C:247:ARG:HH21	2.12	0.47
1:A:249:SER:HB3	1:B:242:ASP:O	2.15	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:127:LEU:HD11	1:C:195:ALA:HB1	1.97	0.46
1:A:92:ASP:HB3	1:A:93:ILE:HD12	1.97	0.46
1:C:164:VAL:O	1:C:165:LEU:HB3	2.14	0.46
1:C:190:ILE:HD11	1:C:218:GLU:HB3	1.96	0.46
1:C:15:ILE:O	1:C:19:THR:HG23	2.15	0.46
1:C:183:ILE:HG22	1:C:183:ILE:O	2.15	0.46
1:A:243:SER:N	1:A:244:PRO:HD3	2.30	0.46
1:C:221:LEU:HD22	1:C:262:ILE:HG22	1.98	0.46
1:A:190:ILE:O	1:A:190:ILE:HG23	2.16	0.46
1:A:146:HIS:HE1	1:A:148:ASP:HB2	1.76	0.46
1:A:181:ARG:NH1	1:C:166:GLU:OE1	2.49	0.46
1:C:249:SER:O	1:C:250:ARG:HD2	2.15	0.46
1:A:243:SER:N	1:A:244:PRO:CD	2.79	0.46
1:B:22:LYS:HD3	1:B:22:LYS:HA	1.80	0.46
1:B:156:PRO:HG3	1:B:161:MET:HA	1.98	0.46
1:A:71:LEU:N	1:A:72:PRO:HD2	2.31	0.45
1:C:139:LYS:NZ	1:C:156:PRO:O	2.50	0.45
1:C:244:PRO:C	1:C:246:LYS:N	2.69	0.45
1:B:11:ARG:HH21	1:B:77:ALA:HA	1.82	0.45
1:B:105:ARG:HA	1:B:105:ARG:NH1	2.29	0.45
1:C:171:CYS:O	1:C:175:GLY:N	2.45	0.45
1:B:66:ASN:HD22	1:B:66:ASN:HA	1.49	0.45
1:C:66:ASN:HD22	1:C:66:ASN:HA	1.55	0.45
1:C:155:TRP:HA	1:C:155:TRP:CE3	2.50	0.45
1:B:41:ARG:HH22	1:B:88:THR:HB	1.82	0.45
1:C:11:ARG:HH21	1:C:77:ALA:HA	1.81	0.45
1:A:71:LEU:HB3	1:A:72:PRO:CD	2.47	0.45
1:A:66:ASN:O	1:A:67:THR:C	2.55	0.45
1:C:161:MET:SD	1:C:165:LEU:HD12	2.57	0.45
1:C:249:SER:H	1:C:250:ARG:CZ	2.31	0.44
1:A:68:LYS:HZ1	1:B:185:GLU:HG2	1.79	0.44
1:C:250:ARG:HB2	1:C:251:ALA:H	1.64	0.44
1:A:66:ASN:HD22	1:A:66:ASN:HA	1.53	0.44
1:C:127:LEU:CD1	1:C:197:ILE:CD1	2.95	0.44
1:A:15:ILE:O	1:A:19:THR:HG23	2.17	0.44
1:A:69:ILE:O	1:A:70:ILE:CB	2.65	0.44
1:A:9:ASP:OD1	1:A:11:ARG:N	2.50	0.44
1:B:112:ILE:HD11	1:B:123:ILE:HD11	2.00	0.44
1:B:15:ILE:O	1:B:19:THR:HG23	2.17	0.44
1:B:69:ILE:HD11	1:B:73:ILE:HD11	2.00	0.44
1:C:190:ILE:HD13	1:C:190:ILE:HG21	1.74	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:69:ILE:O	1:C:70:ILE:CB	2.65	0.44
1:A:29:LYS:O	1:A:30:TYR:HB2	2.17	0.43
1:A:127:LEU:HD23	1:A:226:ARG:O	2.18	0.43
1:C:81:HIS:O	1:C:85:LEU:HG	2.17	0.43
1:A:161:MET:HE1	1:A:166:GLU:N	2.28	0.43
1:B:66:ASN:O	1:B:68:LYS:N	2.52	0.43
1:C:67:THR:O	1:C:71:LEU:HB2	2.18	0.43
1:A:30:TYR:HA	1:A:33:ARG:HB2	2.00	0.43
1:B:143:LYS:HB2	1:B:183:ILE:HD13	2.01	0.43
1:C:127:LEU:HD12	1:C:197:ILE:CD1	2.47	0.43
1:B:221:LEU:HD23	1:B:221:LEU:HA	1.72	0.43
1:C:63:ILE:HG21	1:C:100:ILE:HG12	2.01	0.43
1:A:22:LYS:HA	1:A:22:LYS:HD3	1.79	0.43
1:C:70:ILE:HG23	1:C:71:LEU:N	2.34	0.43
1:A:192:TRP:CH2	1:A:194:LYS:HB2	2.54	0.43
1:A:183:ILE:HG22	1:A:186:LYS:HB2	2.00	0.42
1:A:208:GLN:HE21	1:B:226:ARG:HD3	1.83	0.42
1:B:71:LEU:HD22	1:B:71:LEU:HA	1.90	0.42
1:B:85:LEU:HD23	1:B:85:LEU:N	2.34	0.42
1:B:243:SER:N	1:B:244:PRO:CD	2.81	0.42
1:A:247:ARG:O	1:A:250:ARG:NE	2.52	0.42
1:B:244:PRO:O	1:B:245:VAL:HB	2.19	0.42
1:B:250:ARG:O	1:B:251:ALA:HB3	2.20	0.42
1:C:250:ARG:NH1	1:C:250:ARG:CG	2.78	0.42
1:A:165:LEU:O	1:C:247:ARG:HA	2.20	0.42
1:C:70:ILE:CG2	1:C:71:LEU:N	2.83	0.42
1:A:171:CYS:HB2	1:A:180:PHE:HE1	1.85	0.42
1:B:214:GLU:OE2	1:B:240:LYS:HD3	2.20	0.42
1:C:127:LEU:CD1	1:C:197:ILE:HD12	2.45	0.42
1:C:217:LEU:HD23	1:C:259:VAL:HB	2.02	0.42
1:B:247:ARG:O	1:B:249:SER:N	2.53	0.42
1:A:250:ARG:HB2	1:A:251:ALA:H	1.64	0.41
1:B:139:LYS:NZ	1:B:156:PRO:O	2.53	0.41
1:A:183:ILE:HG22	1:A:183:ILE:O	2.20	0.41
1:A:198:GLN:NE2	1:A:212:GLN:HE21	2.18	0.41
1:B:67:THR:O	1:B:71:LEU:HB2	2.20	0.41
1:B:219:ASP:O	1:B:222:VAL:HB	2.19	0.41
1:A:161:MET:HE2	1:A:162:PRO:CD	2.50	0.41
1:A:127:LEU:HA	1:A:197:ILE:HD12	2.02	0.41
1:B:235:GLY:HA2	1:B:260:SER:HB2	2.01	0.41
1:A:137:ILE:HG22	1:A:161:MET:HG3	2.03	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:181:ARG:HD3	1:C:166:GLU:OE2	2.20	0.41
1:B:63:ILE:CG2	1:B:100:ILE:HG12	2.51	0.40
1:A:70:ILE:CG2	1:A:71:LEU:N	2.84	0.40
1:A:127:LEU:CD1	1:A:197:ILE:CD1	2.99	0.40
1:C:25:ASN:ND2	1:C:27:GLN:HB3	2.36	0.40
1:C:29:LYS:O	1:C:30:TYR:HB2	2.21	0.40
1:B:164:VAL:O	1:B:165:LEU:HB3	2.22	0.40
1:A:67:THR:HG21	1:A:236:ILE:HD11	2.03	0.40
1:A:156:PRO:HG3	1:A:161:MET:HA	2.04	0.40
1:C:235:GLY:HA2	1:C:260:SER:HB3	2.04	0.40

All (1) 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:B:35:ASN:CG	1:B:35:ASN:ND2[2_556]	2.14	0.06

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	257/268 (96%)	227 (88%)	22 (9%)	8 (3%)	4	14
1	B	257/268 (96%)	228 (89%)	21 (8%)	8 (3%)	4	14
1	C	257/268 (96%)	229 (89%)	19 (7%)	9 (4%)	3	12
All	All	771/804 (96%)	684 (89%)	62 (8%)	25 (3%)	4	13

All (25) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	67	THR
1	A	70	ILE

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Mol	Chain	Res	Type
1	A	155	TRP
1	A	247	ARG
1	B	67	THR
1	B	70	ILE
1	B	155	TRP
1	B	247	ARG
1	C	67	THR
1	C	70	ILE
1	C	155	TRP
1	C	247	ARG
1	A	30	TYR
1	A	245	VAL
1	A	248	GLY
1	B	245	VAL
1	B	248	GLY
1	C	245	VAL
1	C	248	GLY
1	B	30	TYR
1	B	249	SER
1	C	30	TYR
1	C	97	HIS
1	A	249	SER
1	C	249	SER

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	241/250 (96%)	216 (90%)	25 (10%)	7	21
1	B	241/250 (96%)	218 (90%)	23 (10%)	8	25
1	C	241/250 (96%)	219 (91%)	22 (9%)	9	27
All	All	723/750 (96%)	653 (90%)	70 (10%)	8	24

All (70) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	27	GLN
1	A	54	SER
1	A	66	ASN
1	A	67	THR
1	A	71	LEU
1	A	88	THR
1	A	96	VAL
1	A	100	ILE
1	A	101	VAL
1	A	105	ARG
1	A	121	ILE
1	A	158	ASP
1	A	161	MET
1	A	167	MET
1	A	171	CYS
1	A	197	ILE
1	A	198	GLN
1	A	206	SER
1	A	209	LEU
1	A	222	VAL
1	A	226	ARG
1	A	240	LYS
1	A	241	GLN
1	A	247	ARG
1	A	250	ARG
1	B	27	GLN
1	B	41	ARG
1	B	66	ASN
1	B	67	THR
1	B	71	LEU
1	B	88	THR
1	B	96	VAL
1	B	105	ARG
1	B	127	LEU
1	B	129	LYS
1	B	160	GLU
1	B	161	MET
1	B	167	MET
1	B	183	ILE
1	B	197	ILE
1	B	206	SER
1	B	222	VAL
1	B	241	GLN

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Mol	Chain	Res	Type
1	B	243	SER
1	B	247	ARG
1	B	250	ARG
1	B	258	LYS
1	B	260	SER
1	C	41	ARG
1	C	66	ASN
1	C	67	THR
1	C	71	LEU
1	C	88	THR
1	C	96	VAL
1	C	101	VAL
1	C	105	ARG
1	C	114	SER
1	C	160	GLU
1	C	161	MET
1	C	167	MET
1	C	190	ILE
1	C	197	ILE
1	C	198	GLN
1	C	209	LEU
1	C	211	ARG
1	C	234	THR
1	C	240	LYS
1	C	241	GLN
1	C	247	ARG
1	C	250	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (10) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	26	ASN
1	A	66	ASN
1	A	198	GLN
1	B	26	ASN
1	B	66	ASN
1	B	179	GLN
1	B	198	GLN
1	C	26	ASN
1	C	66	ASN
1	C	198	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 monosaccharides in this entry.

5.6 Ligand geometry ⓘ

Of 3 ligands modelled in this entry, 3 are monoatomic - leaving 0 for Mogul analysis.

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

5.7 Other polymers ⓘ

There are no such residues in this entry.

5.8 Polymer linkage issues ⓘ

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	259/268 (96%)	-0.17	8 (3%) 49	39	27, 34, 39, 46	0
1	B	259/268 (96%)	0.04	13 (5%) 28	19	27, 34, 38, 47	0
1	C	259/268 (96%)	0.32	23 (8%) 9	5	27, 34, 39, 47	0
All	All	777/804 (96%)	0.06	44 (5%) 23	15	27, 34, 39, 47	0

All (44) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	C	248	GLY	14.7
1	A	248	GLY	9.9
1	C	247	ARG	7.7
1	B	26	ASN	6.7
1	A	245	VAL	6.6
1	C	249	SER	5.6
1	C	244	PRO	5.5
1	C	245	VAL	5.4
1	C	243	SER	5.4
1	A	249	SER	5.1
1	C	246	LYS	5.0
1	B	248	GLY	4.8
1	C	24	ASN	4.7
1	B	249	SER	4.7
1	B	24	ASN	4.6
1	B	7	GLN	4.5
1	A	243	SER	4.2
1	C	40	TYR	4.1
1	A	244	PRO	4.0
1	A	247	ARG	3.9
1	C	25	ASN	3.6
1	B	245	VAL	3.5
1	C	85	LEU	3.3

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Mol	Chain	Res	Type	RSRZ
1	C	41	ARG	3.3
1	C	92	ASP	3.2
1	C	8	ILE	3.1
1	C	29	LYS	3.1
1	B	25	ASN	3.1
1	B	246	LYS	2.9
1	B	27	GLN	2.9
1	A	7	GLN	2.9
1	C	7	GLN	2.5
1	C	28	ASN	2.5
1	B	247	ARG	2.5
1	C	55	PHE	2.5
1	A	246	LYS	2.4
1	C	250	ARG	2.4
1	C	89	TYR	2.4
1	B	40	TYR	2.3
1	C	17	PHE	2.3
1	B	8	ILE	2.2
1	B	28	ASN	2.2
1	C	30	TYR	2.0
1	C	83	LEU	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 monosaccharides in this entry.

6.4 Ligands ⓘ

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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å²)	Q<0.9
2	ZN	C	1266	1/1	0.98	0.02	58,58,58,58	0
2	ZN	A	1266	1/1	0.99	0.02	52,52,52,52	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
2	ZN	B	1266	1/1	1.00	0.01	51,51,51,51	0

6.5 Other polymers ⓘ

There are no such residues in this entry.