WORLDWIDE wwPDB PROTEIN DATA BANK

Full wwPDB X-ray Structure Validation Report (i)

Sep 11, 2023 – 10:33 PM EDT

PDB ID	:	4L75
Title	:	Ca2+-bound D184N mutant MthK RCK domain at 2.4 Angstrom
Authors	:	Smith, F.J.; Rothberg, B.S.
Deposited on	:	2013-06-13
Resolution	:	2.39 Å(reported)

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

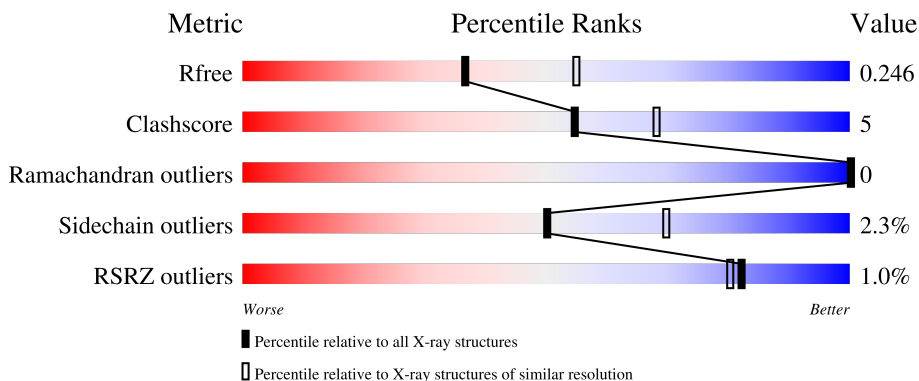|		
MolProbity	:	4.02b-467
Xtriage (Phenix)	:	1.13
EDS	:	2.35.1
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.35.1

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 2.39 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		0.246
Clashscore		5
Ramachandran outliers		0
Sidechain outliers		2.3%
RSRZ outliers		1.0%

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	3907 (2.40-2.40)
Clashscore	141614	4398 (2.40-2.40)
Ramachandran outliers	138981	4318 (2.40-2.40)
Sidechain outliers	138945	4319 (2.40-2.40)
RSRZ outliers	127900	3811 (2.40-2.40)

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	242	% 83% 11% • 5%
1	B	242	78% 14% • 7%
1	C	242	2% 79% 12% • 9%
1	D	242	80% 12% 8%
1	E	242	78% 12% • 9%

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Mol	Chain	Length	Quality of chain
1	F	242	2% 79% 12% · 8%

2 Entry composition ⓘ

There are 3 unique types of molecules in this entry. The entry contains 10580 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 Calcium-gated potassium channel MthK.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	229	Total	C	N	O	S	0	0	0
			1760	1099	315	339	7			
1	B	224	Total	C	N	O	S	0	0	0
			1735	1080	308	340	7			
1	C	221	Total	C	N	O	S	0	0	0
			1693	1057	303	326	7			
1	D	223	Total	C	N	O	S	0	0	0
			1708	1066	303	332	7			
1	E	221	Total	C	N	O	S	0	0	0
			1712	1066	303	336	7			
1	F	223	Total	C	N	O	S	0	0	0
			1729	1078	308	336	7			

There are 78 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	184	ASN	ASP	engineered mutation	UNP O27564
A	337	LEU	-	expression tag	UNP O27564
A	338	VAL	-	expression tag	UNP O27564
A	339	PRO	-	expression tag	UNP O27564
A	340	ARG	-	expression tag	UNP O27564
A	341	GLY	-	expression tag	UNP O27564
A	342	SER	-	expression tag	UNP O27564
A	343	HIS	-	expression tag	UNP O27564
A	344	HIS	-	expression tag	UNP O27564
A	345	HIS	-	expression tag	UNP O27564
A	346	HIS	-	expression tag	UNP O27564
A	347	HIS	-	expression tag	UNP O27564
A	348	HIS	-	expression tag	UNP O27564
B	184	ASN	ASP	engineered mutation	UNP O27564
B	337	LEU	-	expression tag	UNP O27564
B	338	VAL	-	expression tag	UNP O27564
B	339	PRO	-	expression tag	UNP O27564

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Chain	Residue	Modelled	Actual	Comment	Reference
B	340	ARG	-	expression tag	UNP O27564
B	341	GLY	-	expression tag	UNP O27564
B	342	SER	-	expression tag	UNP O27564
B	343	HIS	-	expression tag	UNP O27564
B	344	HIS	-	expression tag	UNP O27564
B	345	HIS	-	expression tag	UNP O27564
B	346	HIS	-	expression tag	UNP O27564
B	347	HIS	-	expression tag	UNP O27564
B	348	HIS	-	expression tag	UNP O27564
C	184	ASN	ASP	engineered mutation	UNP O27564
C	337	LEU	-	expression tag	UNP O27564
C	338	VAL	-	expression tag	UNP O27564
C	339	PRO	-	expression tag	UNP O27564
C	340	ARG	-	expression tag	UNP O27564
C	341	GLY	-	expression tag	UNP O27564
C	342	SER	-	expression tag	UNP O27564
C	343	HIS	-	expression tag	UNP O27564
C	344	HIS	-	expression tag	UNP O27564
C	345	HIS	-	expression tag	UNP O27564
C	346	HIS	-	expression tag	UNP O27564
C	347	HIS	-	expression tag	UNP O27564
C	348	HIS	-	expression tag	UNP O27564
D	184	ASN	ASP	engineered mutation	UNP O27564
D	337	LEU	-	expression tag	UNP O27564
D	338	VAL	-	expression tag	UNP O27564
D	339	PRO	-	expression tag	UNP O27564
D	340	ARG	-	expression tag	UNP O27564
D	341	GLY	-	expression tag	UNP O27564
D	342	SER	-	expression tag	UNP O27564
D	343	HIS	-	expression tag	UNP O27564
D	344	HIS	-	expression tag	UNP O27564
D	345	HIS	-	expression tag	UNP O27564
D	346	HIS	-	expression tag	UNP O27564
D	347	HIS	-	expression tag	UNP O27564
D	348	HIS	-	expression tag	UNP O27564
E	184	ASN	ASP	engineered mutation	UNP O27564
E	337	LEU	-	expression tag	UNP O27564
E	338	VAL	-	expression tag	UNP O27564
E	339	PRO	-	expression tag	UNP O27564
E	340	ARG	-	expression tag	UNP O27564
E	341	GLY	-	expression tag	UNP O27564
E	342	SER	-	expression tag	UNP O27564

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Chain	Residue	Modelled	Actual	Comment	Reference
E	343	HIS	-	expression tag	UNP O27564
E	344	HIS	-	expression tag	UNP O27564
E	345	HIS	-	expression tag	UNP O27564
E	346	HIS	-	expression tag	UNP O27564
E	347	HIS	-	expression tag	UNP O27564
E	348	HIS	-	expression tag	UNP O27564
F	184	ASN	ASP	engineered mutation	UNP O27564
F	337	LEU	-	expression tag	UNP O27564
F	338	VAL	-	expression tag	UNP O27564
F	339	PRO	-	expression tag	UNP O27564
F	340	ARG	-	expression tag	UNP O27564
F	341	GLY	-	expression tag	UNP O27564
F	342	SER	-	expression tag	UNP O27564
F	343	HIS	-	expression tag	UNP O27564
F	344	HIS	-	expression tag	UNP O27564
F	345	HIS	-	expression tag	UNP O27564
F	346	HIS	-	expression tag	UNP O27564
F	347	HIS	-	expression tag	UNP O27564
F	348	HIS	-	expression tag	UNP O27564

- Molecule 2 is CALCIUM ION (three-letter code: CA) (formula: Ca).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	1	Total 1	Ca 1	0	0
2	B	1	Total 1	Ca 1	0	0
2	C	1	Total 1	Ca 1	0	0
2	D	1	Total 1	Ca 1	0	0
2	E	1	Total 1	Ca 1	0	0
2	F	1	Total 1	Ca 1	0	0

- Molecule 3 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	44	Total 44	O 44	0	0
3	B	72	Total 72	O 72	0	0

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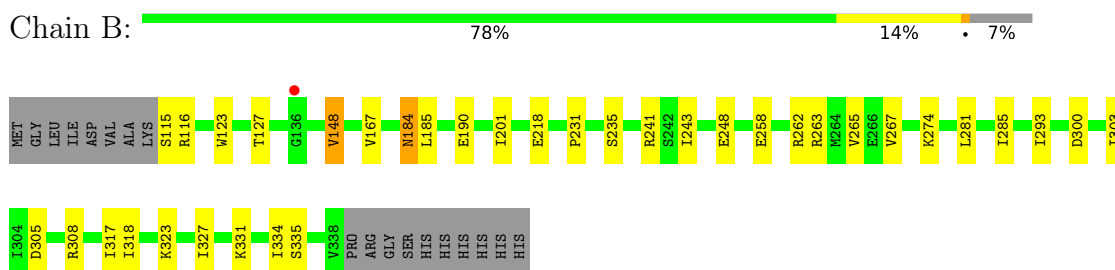| Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	C	20	Total 20	O 20	0	0
3	D	18	Total 18	O 18	0	0
3	E	29	Total 29	O 29	0	0
3	F	54	Total 54	O 54	0	0

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.
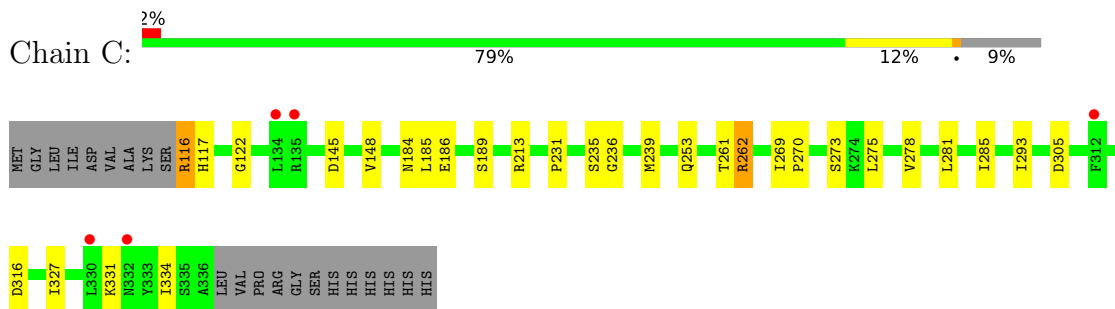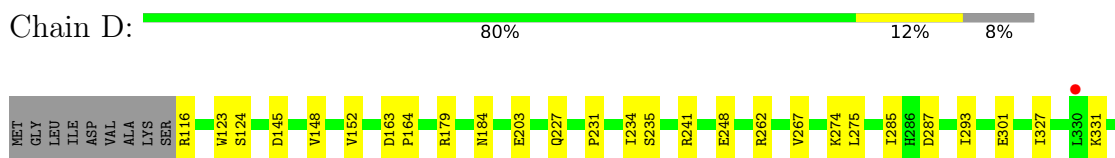
• Molecule 1: Calcium-gated potassium channel MthK
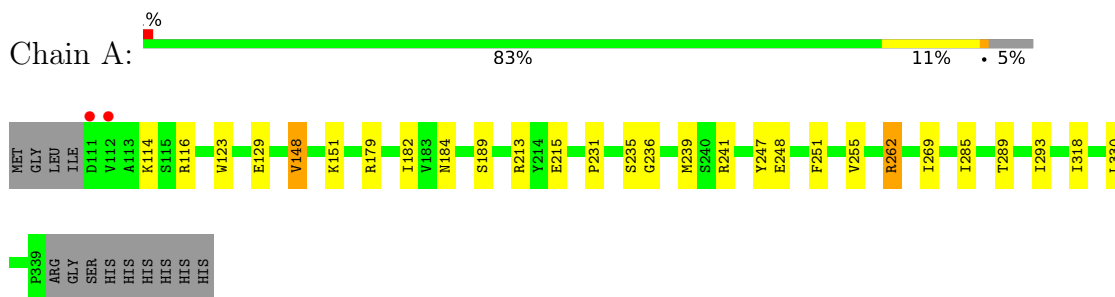
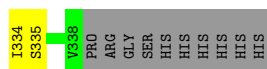• Molecule 1: Calcium-gated potassium channel MthK

• Molecule 1: Calcium-gated potassium channel MthK

• Molecule 1: Calcium-gated potassium channel MthK

I334 S335 V338 PRO ARG GLY SER HIS HIS HIS HIS HIS HIS

• Molecule 1: Calcium-gated potassium channel MthK

Chain E:

78%   12%   •   9%

MET GLY LEU ILE ASP VAL ALA LYS SER R116 E125 E138 V148 R176 C194 I198 I201 E212 R213 Y214 E215 P231 F232 V233 I234 S235 R241 E248 R262 V267 P268 I269 K274 I285 H286 D287 I293 R298 G299 D300 D305 P306

P307 R308 D309 A314 I318 P324 E328 S335 A336 LEU VAL PRO ARG GLY SER HIS HIS HIS HIS HIS HIS
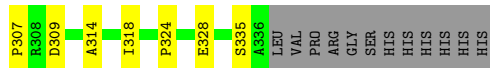
• Molecule 1: Calcium-gated potassium channel MthK

Chain F:

2%

79%   12%   •   8%

MET GLY LEU ILE ASP VAL ALA LYS SER R116 W123 S124 E125 E129 R135 G136 V148 N184 E212 E218 P231 S235 G236 M239 S240 R241 E248 R262 V265 I269 L281 I285 I293 V296 G299 D300 I304 R308

I318 L319 G322 K323 I327 A336 L337 V338 PRO ARG GLY SER HIS HIS HIS HIS HIS HIS
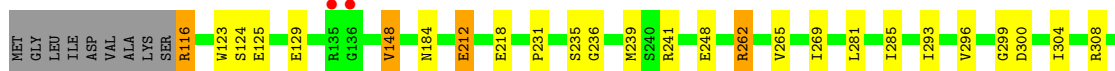
4 Data and refinement statistics ⓘ

Property	Value	Source
Space group	P 65 2 2	Depositor
Cell constants a, b, c, α, β, γ	119.23Å 119.23Å 353.96Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	44.59 – 2.39 44.59 – 2.39	Depositor EDS
% Data completeness (in resolution range)	99.5 (44.59-2.39) 94.7 (44.59-2.39)	Depositor EDS
R_{merge}	0.08	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.23 (at 2.39Å)	Xtriage
Refinement program	PHENIX 1.8.2_1309	Depositor
R, R_{free}	0.196 , 0.245 0.197 , 0.246	Depositor DCC
R_{free} test set	2020 reflections (3.40%)	wwPDB-VP
Wilson B-factor (Å^2)	54.1	Xtriage
Anisotropy	0.093	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.29 , 40.1	EDS
L-test for twinning[2]	$< |L| > = 0.49, < L^2 > = 0.32$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.95	EDS
Total number of atoms	10580	wwPDB-VP
Average B, all atoms (Å^2)	72.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The analyses of the Patterson function reveals a significant off-origin peak that is 43.00 % 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 1.8789e-04. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

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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: CA

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	0.41	0/1782	0.55	0/2407
1	B	0.42	0/1756	0.58	0/2372
1	C	0.34	0/1714	0.52	0/2316
1	D	0.35	0/1729	0.53	0/2339
1	E	0.34	0/1733	0.50	0/2340
1	F	0.40	0/1750	0.54	0/2363
All	All	0.38	0/10464	0.54	0/14137

There are no bond length outliers.

There are no bond angle outliers.

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	1760	0	1774	17	0
1	B	1735	0	1742	23	0
1	C	1693	0	1699	21	0
1	D	1708	0	1705	19	0
1	E	1712	0	1717	23	0
1	F	1729	0	1744	21	0
2	A	1	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	B	1	0	0	0	0
2	C	1	0	0	0	0
2	D	1	0	0	0	0
2	E	1	0	0	0	0
2	F	1	0	0	0	0
3	A	44	0	0	1	0
3	B	72	0	0	1	0
3	C	20	0	0	5	0
3	D	18	0	0	5	0
3	E	29	0	0	4	0
3	F	54	0	0	1	0
All	All	10580	0	10381	107	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 5.

All (107) 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:235:SER:HB2	1:B:231:PRO:HB3	1.52	0.92
1:D:116:ARG:N	3:D:507:HOH:O	2.16	0.78
1:B:218:GLU:OE1	3:B:530:HOH:O	1.99	0.77
1:A:285:ILE:HG21	1:A:293:ILE:HD11	1.72	0.70
1:B:285:ILE:HG21	1:B:293:ILE:HD11	1.73	0.69
1:D:203:GLU:O	3:D:512:HOH:O	2.11	0.68
1:B:218:GLU:OE2	1:E:262:ARG:NH2	2.27	0.68
1:B:303:ILE:HD13	1:F:218:GLU:HG3	1.74	0.68
1:C:235:SER:HB2	1:D:231:PRO:HB3	1.75	0.67
1:D:301:GLU:OE2	3:D:509:HOH:O	2.13	0.66
1:E:235:SER:HB2	1:F:231:PRO:HB3	1.77	0.65
1:D:285:ILE:HG21	1:D:293:ILE:HD11	1.79	0.64
1:B:258:GLU:OE1	1:B:263:ARG:NH1	2.31	0.63
1:E:305:ASP:OD2	3:E:516:HOH:O	2.15	0.63
1:A:262:ARG:HG2	1:B:305:ASP:HB3	1.82	0.61
1:E:176:ARG:NH1	1:E:201:ILE:O	2.34	0.60
1:C:275:LEU:HD13	1:C:334:ILE:HA	1.83	0.60
1:A:241:ARG:HD3	1:A:248:GLU:OE2	2.02	0.60
1:A:231:PRO:HB3	1:B:235:SER:HB2	1.83	0.59
1:D:116:ARG:HB2	1:D:179:ARG:HB2	1.84	0.59
1:C:305:ASP:OD1	3:C:519:HOH:O	2.18	0.57
1:A:213:ARG:NH1	1:A:215:GLU:OE2	2.37	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:275:LEU:HD13	1:D:334:ILE:HA	1.88	0.56
1:F:281:LEU:HB2	1:F:308:ARG:HB3	1.87	0.56
1:E:116:ARG:NH1	1:E:138:GLU:OE1	2.39	0.55
1:E:285:ILE:HG21	1:E:293:ILE:HD11	1.87	0.55
1:B:241:ARG:HD3	1:B:248:GLU:OE2	2.07	0.55
1:B:281:LEU:HB2	1:B:308:ARG:HB3	1.88	0.54
1:F:116:ARG:NH2	3:F:530:HOH:O	2.39	0.54
1:D:145:ASP:O	1:D:148:VAL:HG22	2.08	0.54
1:E:213:ARG:NH1	1:E:215:GLU:OE2	2.41	0.54
1:E:241:ARG:HD3	1:E:248:GLU:OE2	2.08	0.54
1:B:327:ILE:HG22	1:B:331:LYS:HE3	1.91	0.53
1:E:241:ARG:NH1	1:E:248:GLU:OE2	2.34	0.53
1:D:227:GLN:NE2	3:D:506:HOH:O	2.42	0.52
1:F:124:SER:OG	1:F:184:ASN:OD1	2.11	0.52
1:C:145:ASP:O	1:C:148:VAL:HG22	2.09	0.52
1:F:123:TRP:CG	1:F:148:VAL:HG21	2.45	0.51
1:D:287:ASP:OD2	3:D:517:HOH:O	2.18	0.50
1:E:305:ASP:OD1	3:E:509:HOH:O	2.18	0.50
1:C:262:ARG:N	1:C:262:ARG:HD3	2.26	0.50
1:E:287:ASP:OD2	3:E:517:HOH:O	2.19	0.49
1:A:129:GLU:OE2	3:A:526:HOH:O	2.20	0.49
1:F:299:GLY:O	1:F:300:ASP:HB2	2.12	0.49
1:F:285:ILE:HD12	1:F:293:ILE:HD11	1.94	0.49
1:E:298:ARG:NH2	1:E:314:ALA:O	2.40	0.48
1:F:285:ILE:HB	1:F:293:ILE:HD11	1.94	0.48
1:C:116:ARG:NE	3:C:514:HOH:O	2.37	0.48
1:D:274:LYS:HG3	1:D:335:SER:O	2.14	0.48
1:D:327:ILE:HG22	1:D:331:LYS:HE3	1.96	0.47
1:C:122:GLY:HA3	1:C:185:LEU:HD23	1.97	0.47
1:D:241:ARG:HD3	1:D:248:GLU:OE1	2.14	0.47
1:E:125:GLU:HG2	1:F:212:GLU:O	2.15	0.47
1:C:236:GLY:HA2	1:C:239:MET:HE2	1.98	0.46
1:C:231:PRO:HB3	1:D:235:SER:HB2	1.97	0.46
1:B:265:VAL:HG21	1:B:327:ILE:HD12	1.97	0.46
1:D:124:SER:OG	1:D:184:ASN:OD1	2.25	0.46
1:C:186:GLU:O	3:C:506:HOH:O	2.21	0.46
1:E:231:PRO:HB3	1:F:235:SER:HB2	1.98	0.46
1:C:116:ARG:HD2	1:C:117:HIS:ND1	2.30	0.46
1:B:115:SER:OG	1:B:116:ARG:N	2.47	0.45
1:D:267:VAL:HG12	1:D:334:ILE:HD11	1.97	0.45
1:F:241:ARG:HD3	1:F:248:GLU:OE2	2.17	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:275:LEU:HD22	1:C:334:ILE:HG22	1.97	0.45
1:F:236:GLY:HA2	1:F:239:MET:HE2	1.97	0.45
1:E:307:PRO:HB2	1:E:309:ASP:OD1	2.16	0.45
1:A:182:ILE:HD11	1:B:243:ILE:HD11	1.99	0.45
1:C:269:ILE:HD12	1:C:316:ASP:HB2	1.99	0.45
1:F:269:ILE:HD11	1:F:318:ILE:HD11	1.98	0.45
1:C:253:GLN:HG2	1:D:234:ILE:HD11	1.99	0.45
1:C:285:ILE:HG21	1:C:293:ILE:HD11	1.99	0.45
1:A:236:GLY:HA2	1:A:239:MET:HE2	2.00	0.44
1:C:116:ARG:NH1	3:C:516:HOH:O	2.49	0.44
1:E:248:GLU:HG2	1:F:319:LEU:HD11	2.00	0.43
3:E:516:HOH:O	1:F:322:GLY:HA2	2.17	0.43
1:F:262:ARG:HH11	1:F:323:LYS:HD3	1.82	0.43
1:B:267:VAL:HG12	1:B:334:ILE:HD11	2.01	0.43
1:B:167:VAL:HG13	1:B:201:ILE:HD11	2.00	0.43
1:B:127:THR:CG2	1:B:184:ASN:HD21	2.31	0.43
1:B:185:LEU:HD12	1:B:190:GLU:HB3	2.00	0.43
1:C:327:ILE:HG22	1:C:331:LYS:HE3	2.01	0.43
1:A:123:TRP:CG	1:A:148:VAL:HG21	2.54	0.42
1:B:274:LYS:HG3	1:B:335:SER:O	2.19	0.42
1:E:274:LYS:HG3	1:E:335:SER:O	2.19	0.42
1:A:251:PHE:CE1	1:A:255:VAL:HG11	2.54	0.42
1:B:293:ILE:HD12	1:B:318:ILE:CG2	2.50	0.42
1:E:269:ILE:HD11	1:E:318:ILE:HD11	2.01	0.42
1:A:289:THR:HG21	1:A:330:LEU:HA	2.02	0.42
1:A:123:TRP:CZ2	1:A:151:LYS:HD3	2.55	0.41
1:B:123:TRP:CG	1:B:148:VAL:HG21	2.56	0.41
1:C:270:PRO:HD2	1:C:273:SER:HB2	2.02	0.41
1:E:262:ARG:HD2	1:F:304:ILE:O	2.19	0.41
1:C:261:THR:C	1:C:262:ARG:HD3	2.41	0.41
1:E:233:VAL:HA	1:F:129:GLU:HG3	2.03	0.41
1:F:265:VAL:HG21	1:F:327:ILE:HD12	2.02	0.41
1:A:269:ILE:HD11	1:A:318:ILE:HD11	2.02	0.41
1:D:163:ASP:HA	1:D:164:PRO:HD3	1.90	0.41
1:A:247:TYR:HE1	1:B:317:ILE:HG13	1.86	0.41
1:C:213:ARG:NH1	3:C:505:HOH:O	2.54	0.41
1:E:212:GLU:O	1:F:125:GLU:HG2	2.21	0.41
1:E:324:PRO:O	1:E:328:GLU:HG2	2.20	0.41
1:D:123:TRP:CZ3	1:D:152:VAL:HG22	2.56	0.41
1:B:323:LYS:O	1:B:327:ILE:HG12	2.20	0.40
1:E:194:CYS:O	1:E:198:ILE:HG13	2.21	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:293:ILE:HD12	1:A:318:ILE:CG2	2.51	0.40
1:C:213:ARG:HB3	1:C:213:ARG:HH11	1.86	0.40
1:A:116:ARG:HB2	1:A:179:ARG:HB2	2.02	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	227/242 (94%)	224 (99%)	3 (1%)	0	100	100
1	B	222/242 (92%)	220 (99%)	2 (1%)	0	100	100
1	C	219/242 (90%)	217 (99%)	2 (1%)	0	100	100
1	D	221/242 (91%)	217 (98%)	4 (2%)	0	100	100
1	E	219/242 (90%)	216 (99%)	3 (1%)	0	100	100
1	F	221/242 (91%)	218 (99%)	3 (1%)	0	100	100
All	All	1329/1452 (92%)	1312 (99%)	17 (1%)	0	100	100

There are no Ramachandran outliers to report.

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	191/207 (92%)	186 (97%)	5 (3%)	46	66
1	B	191/207 (92%)	187 (98%)	4 (2%)	53	72
1	C	183/207 (88%)	177 (97%)	6 (3%)	38	57
1	D	185/207 (89%)	184 (100%)	1 (0%)	88	95
1	E	188/207 (91%)	184 (98%)	4 (2%)	53	72
1	F	190/207 (92%)	184 (97%)	6 (3%)	39	59
All	All	1128/1242 (91%)	1102 (98%)	26 (2%)	50	70

All (26) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	114	LYS
1	A	148	VAL
1	A	184	ASN
1	A	189	SER
1	A	262	ARG
1	B	148	VAL
1	B	184	ASN
1	B	262	ARG
1	B	300	ASP
1	C	116	ARG
1	C	184	ASN
1	C	189	SER
1	C	262	ARG
1	C	278	VAL
1	C	281	LEU
1	D	262	ARG
1	E	148	VAL
1	E	212	GLU
1	E	262	ARG
1	E	300	ASP
1	F	116	ARG
1	F	148	VAL
1	F	212	GLU
1	F	262	ARG
1	F	296	VAL
1	F	338	VAL

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. There are no such sidechains identified.

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 6 ligands modelled in this entry, 6 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	229/242 (94%)	-0.13	2 (0%)	84 | 82	45, 65, 96, 171	0
1	B	224/242 (92%)	-0.13	1 (0%)	92 | 91	41, 59, 86, 127	0
1	C	221/242 (91%)	0.05	5 (2%)	60 | 58	50, 77, 125, 143	0
1	D	223/242 (92%)	-0.03	1 (0%)	92 | 91	52, 74, 110, 123	0
1	E	221/242 (91%)	0.02	1 (0%)	91 | 89	48, 78, 105, 119	0
1	F	223/242 (92%)	-0.13	4 (1%)	68 | 66	42, 63, 92, 125	0
All	All	1341/1452 (92%)	-0.06	14 (1%)	82 | 80	41, 69, 109, 171	0

All (14) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	C	312	PHE	6.9
1	F	136	GLY	4.9
1	A	112	VAL	4.1
1	A	111	ASP	4.0
1	F	338	VAL	3.4
1	C	330	LEU	2.9
1	C	135	ARG	2.7
1	D	330	LEU	2.4
1	F	336	ALA	2.4
1	E	267	VAL	2.3
1	B	136	GLY	2.2
1	F	135	ARG	2.1
1	C	134	LEU	2.0
1	C	332	ASN	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 (i)

There are no monosaccharides 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	CA	C	401	1/1	0.76	0.06	132,132,132,132	0
2	CA	E	401	1/1	0.86	0.18	121,121,121,121	0
2	CA	D	401	1/1	0.89	0.07	117,117,117,117	0
2	CA	A	401	1/1	0.96	0.09	73,73,73,73	0
2	CA	B	401	1/1	0.97	0.10	81,81,81,81	0
2	CA	F	401	1/1	0.97	0.10	81,81,81,81	0

6.5 Other polymers (i)

There are no such residues in this entry.