



Full wwPDB X-ray Structure Validation Report ⓘ

Sep 5, 2023 – 05:49 AM EDT

PDB ID : 3RQE
Title : Cerebral cavernous malformation 3 (CCM3) in complex with paxillin LD1
Authors : Li, X.; Zhang, R.; Boggon, T.J.
Deposited on : 2011-04-28
Resolution : 2.80 Å(reported)

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

We welcome your comments at validation@mail.wwpdb.org

A user guide is available at

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

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

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

MolProbity : 4.02b-467
Xtriage (Phenix) : 1.13
EDS : 2.35
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

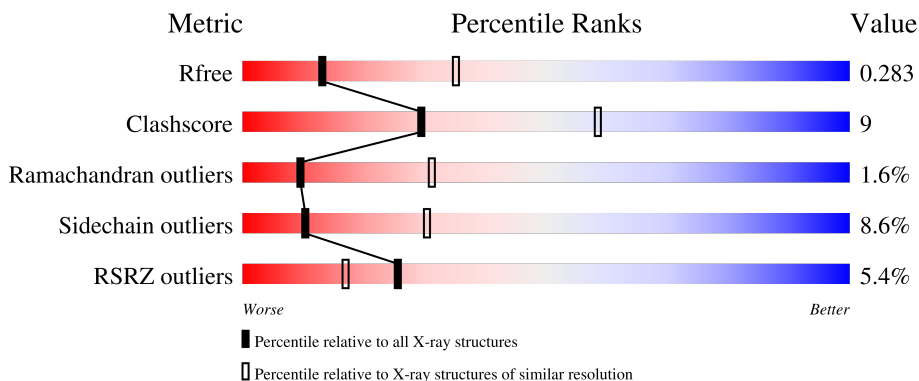
1 Overall quality at a glance i

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	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 $\leq 5\%$. 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	214	<div style="display: flex; align-items: center;"> <div style="width: 6%; height: 10px; background-color: red; margin-right: 5px;"></div> <div style="width: 62%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 22%; height: 10px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 5%; height: 10px; background-color: orange; margin-right: 5px;"></div> <div style="width: 11%; height: 10px; background-color: grey;"></div> </div> <p style="text-align: center;">6% 62% 22% 5% 11%</p>
1	B	214	<div style="display: flex; align-items: center;"> <div style="width: 5%; height: 10px; background-color: red; margin-right: 5px;"></div> <div style="width: 68%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 21%; height: 10px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 10%; height: 10px; background-color: grey;"></div> </div> <p style="text-align: center;">5% 68% 21% • 10%</p>
1	C	214	<div style="display: flex; align-items: center;"> <div style="width: 6%; height: 10px; background-color: red; margin-right: 5px;"></div> <div style="width: 71%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 20%; height: 10px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 5%; height: 10px; background-color: orange; margin-right: 5px;"></div> <div style="width: 11%; height: 10px; background-color: grey;"></div> </div> <p style="text-align: center;">6% 71% 20% • 5%</p>
1	D	214	<div style="display: flex; align-items: center;"> <div style="width: 3%; height: 10px; background-color: red; margin-right: 5px;"></div> <div style="width: 59%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 24%; height: 10px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 13%; height: 10px; background-color: grey;"></div> </div> <p style="text-align: center;">3% 59% 24% • 13%</p>
2	E	14	<div style="display: flex; align-items: center;"> <div style="width: 14%; height: 10px; background-color: red; margin-right: 5px;"></div> <div style="width: 57%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 14%; height: 10px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 29%; height: 10px; background-color: grey;"></div> </div> <p style="text-align: center;">14% 57% 14% 29%</p>

2 Entry composition [i](#)

There are 2 unique types of molecules in this entry. The entry contains 6351 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 Programmed cell death protein 10.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	190	1550	990	263	292	5	0	0	0
1	B	192	1567	1002	264	295	6	0	0	0
1	C	203	1644	1042	278	314	10	0	0	0
1	D	187	1518	972	253	288	5	0	0	0

There are 8 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-1	GLY	-	expression tag	UNP Q9BUL8
A	0	HIS	-	expression tag	UNP Q9BUL8
B	-1	GLY	-	expression tag	UNP Q9BUL8
B	0	HIS	-	expression tag	UNP Q9BUL8
C	-1	GLY	-	expression tag	UNP Q9BUL8
C	0	HIS	-	expression tag	UNP Q9BUL8
D	-1	GLY	-	expression tag	UNP Q9BUL8
D	0	HIS	-	expression tag	UNP Q9BUL8

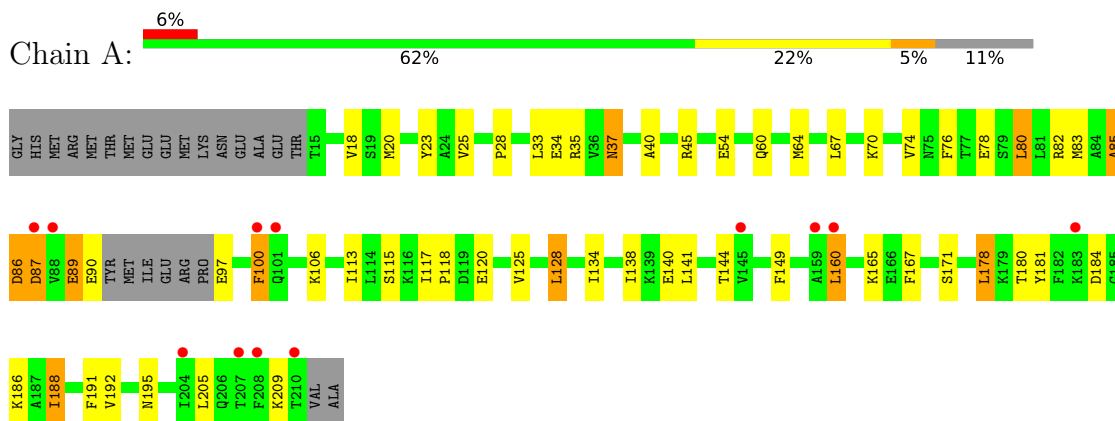
- Molecule 2 is a protein called Paxillin LD1 peptide.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
			Total	C	N	O			
2	E	10	72	44	10	18	0	0	0

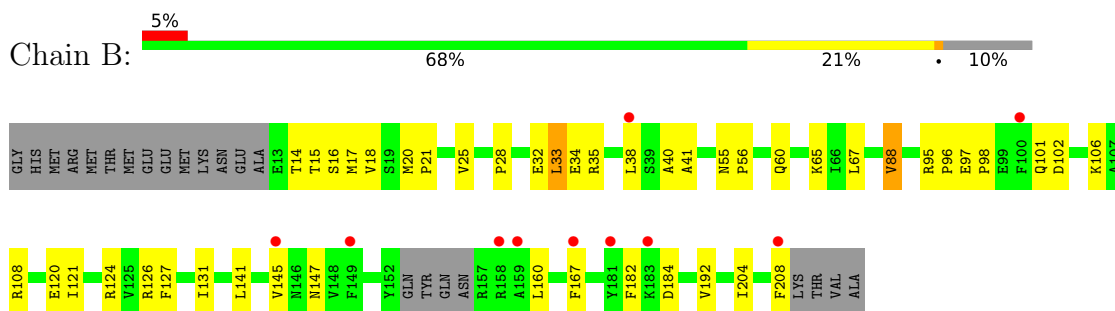
3 Residue-property plots [i](#)

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.

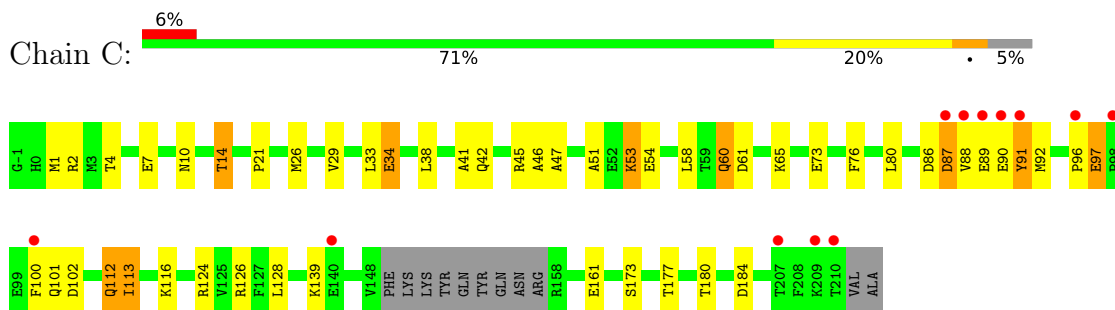
- Molecule 1: Programmed cell death protein 10



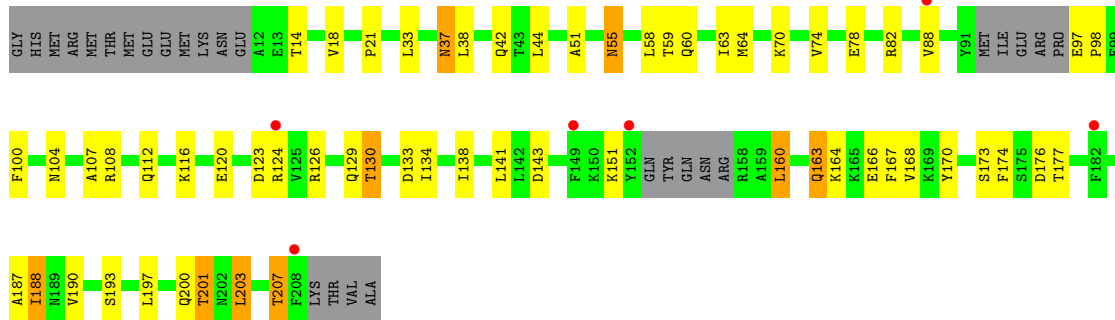
- Molecule 1: Programmed cell death protein 10



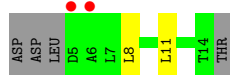
- Molecule 1: Programmed cell death protein 10



- Molecule 1: Programmed cell death protein 10



- Molecule 2: Paxillin LD1 peptide



4 Data and refinement statistics i

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α , β , γ	63.16Å 117.99Å 123.69Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	38.92 – 2.80 38.92 – 2.80	Depositor EDS
% Data completeness (in resolution range)	99.8 (38.92-2.80) 99.9 (38.92-2.80)	Depositor EDS
R_{merge}	0.10	Depositor
R_{sym}	0.10	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.78 (at 2.81Å)	Xtrriage
Refinement program	REFMAC 5.5.0109	Depositor
R, R_{free}	0.240 , 0.295 0.234 , 0.283	Depositor DCC
R_{free} test set	1192 reflections (5.09%)	wwPDB-VP
Wilson B-factor (Å ²)	71.4	Xtrriage
Anisotropy	0.090	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.30 , 49.5	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.33$	Xtrriage
Estimated twinning fraction	0.014 for -h,l,k	Xtrriage
F_o, F_c correlation	0.93	EDS
Total number of atoms	6351	wwPDB-VP
Average B, all atoms (Å ²)	87.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.76% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

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

5 Model quality [i](#)

5.1 Standard geometry [i](#)

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	0.56	0/1572	0.66	0/2113
1	B	0.53	0/1590	0.62	0/2138
1	C	0.56	0/1666	0.64	0/2238
1	D	0.55	0/1539	0.65	0/2069
2	E	0.38	0/71	0.74	0/96
All	All	0.55	0/6438	0.64	0/8654

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 [i](#)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	1550	0	1592	31	0
1	B	1567	0	1609	27	0
1	C	1644	0	1683	36	0
1	D	1518	0	1554	37	0
2	E	72	0	68	1	0
All	All	6351	0	6506	122	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 9.

All (122) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:2:ARG:H	1:C:42:GLN:HE22	1.20	0.89
1:C:2:ARG:H	1:C:42:GLN:NE2	1.72	0.86
1:A:141:LEU:O	1:A:144:THR:HG22	1.86	0.76
1:B:32:GLU:HA	1:B:35:ARG:HH11	1.55	0.71
1:C:89:GLU:O	1:C:92:MET:HG2	1.91	0.70
1:D:197:LEU:O	1:D:201:THR:HG23	1.93	0.69
1:A:74:VAL:HG22	1:A:188:ILE:HG23	1.77	0.66
1:D:97:GLU:HB2	1:D:100:PHE:HD2	1.60	0.66
1:C:97:GLU:HG3	1:C:100:PHE:HB2	1.78	0.65
1:C:10:ASN:O	1:C:14:THR:CG2	2.45	0.65
1:B:33:LEU:HG	1:B:41:ALA:HB2	1.77	0.65
1:B:33:LEU:HD12	1:B:33:LEU:O	2.00	0.61
1:A:89:GLU:O	1:A:90:GLU:HB2	2.00	0.61
1:B:55:ASN:O	1:B:56:PRO:C	2.40	0.59
1:D:37:ASN:C	1:D:37:ASN:HD22	2.05	0.59
1:D:170:TYR:CD2	1:D:200:GLN:NE2	2.70	0.59
1:A:37:ASN:ND2	1:A:40:ALA:H	2.00	0.59
1:A:188:ILE:O	1:A:192:VAL:HG23	2.03	0.58
1:D:97:GLU:HB2	1:D:100:PHE:CD2	2.40	0.56
1:A:33:LEU:O	1:A:35:ARG:N	2.39	0.55
1:D:51:ALA:HB1	1:D:58:LEU:HD23	1.89	0.54
1:C:1:MET:HE1	1:C:45:ARG:HB2	1.88	0.54
1:A:85:ALA:HB2	1:A:115:SER:CB	2.38	0.54
1:C:51:ALA:HB1	1:C:58:LEU:HD23	1.90	0.54
1:B:121:ILE:HG13	1:B:121:ILE:O	2.08	0.54
1:C:10:ASN:O	1:C:14:THR:HG23	2.06	0.54
1:C:10:ASN:O	1:C:14:THR:HG22	2.07	0.53
1:A:85:ALA:O	1:A:86:ASP:C	2.45	0.53
1:C:97:GLU:CG	1:C:100:PHE:HB2	2.38	0.53
1:C:47:ALA:HB1	1:D:44:LEU:HD23	1.91	0.52
1:A:134:ILE:O	1:A:138:ILE:HG13	2.09	0.52
1:C:4:THR:OG1	1:C:7:GLU:HG3	2.10	0.52
1:D:129:GLN:NE2	1:D:133:ASP:OD2	2.43	0.52
1:B:21:PRO:HG2	1:B:60:GLN:HB2	1.92	0.52
1:C:180:THR:O	1:C:184:ASP:HB2	2.10	0.52
1:C:51:ALA:HB1	1:C:58:LEU:CD2	2.40	0.52
1:B:88:VAL:HG13	1:B:108:ARG:CG	2.41	0.51
1:D:167:PHE:C	1:D:167:PHE:CD2	2.83	0.51
1:D:126:ARG:O	1:D:130:THR:OG1	2.29	0.51
1:C:33:LEU:HD11	1:D:58:LEU:HD11	1.92	0.51
1:A:205:LEU:O	1:A:209:LYS:HB2	2.11	0.50
1:A:125:VAL:O	1:A:128:LEU:HB3	2.11	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:124:ARG:O	1:C:128:LEU:HB2	2.12	0.50
1:D:59:THR:O	1:D:63:ILE:HG12	2.12	0.50
1:B:16:SER:HB3	1:B:18:VAL:HG22	1.93	0.50
1:D:74:VAL:HG13	1:D:188:ILE:HG23	1.93	0.50
1:A:149:PHE:HE1	1:A:160:LEU:HB3	1.77	0.50
1:D:173:SER:O	1:D:176:ASP:HB2	2.12	0.50
1:D:70:LYS:O	1:D:74:VAL:HG23	2.12	0.49
1:B:141:LEU:O	1:B:145:VAL:HG23	2.12	0.49
1:A:76:PHE:CE1	1:B:20:MET:HB3	2.48	0.49
1:D:203:LEU:O	1:D:207:THR:OG1	2.24	0.49
1:A:23:TYR:O	1:A:28:PRO:HD3	2.13	0.49
1:C:97:GLU:HG3	1:C:100:PHE:CD2	2.49	0.48
1:A:106:LYS:HE3	1:A:140:GLU:HB3	1.95	0.48
1:C:1:MET:HE1	1:C:45:ARG:CB	2.44	0.48
1:C:88:VAL:O	1:C:92:MET:HB3	2.14	0.48
1:D:38:LEU:HG	1:D:42:GLN:NE2	2.28	0.48
1:D:174:PHE:HA	1:D:193:SER:OG	2.13	0.47
1:A:141:LEU:HD23	1:A:167:PHE:CZ	2.49	0.47
1:B:98:PRO:HA	1:B:101:GLN:HB2	1.96	0.47
1:C:1:MET:HG3	1:C:34:GLU:HG3	1.95	0.47
1:A:67:LEU:HD23	1:B:67:LEU:HD23	1.97	0.47
1:C:76:PHE:CZ	1:C:80:LEU:HD21	2.49	0.47
1:A:188:ILE:HA	1:A:191:PHE:CD2	2.50	0.47
1:D:120:GLU:HA	1:D:120:GLU:OE2	2.14	0.46
1:D:78:GLU:O	1:D:82:ARG:HG3	2.15	0.46
1:A:178:LEU:O	1:A:181:TYR:HB3	2.15	0.46
1:B:32:GLU:HA	1:B:35:ARG:NH1	2.27	0.46
1:A:184:ASP:HB3	1:A:186:LYS:H	1.81	0.46
1:A:60:GLN:HE21	1:A:60:GLN:HA	1.81	0.46
1:B:124:ARG:HG2	1:B:182:PHE:HE1	1.80	0.46
1:C:113:ILE:H	1:C:113:ILE:HG12	1.58	0.46
1:D:160:LEU:HD12	1:D:207:THR:HG22	1.98	0.46
1:A:78:GLU:O	1:A:82:ARG:HG3	2.17	0.45
1:D:107:ALA:HA	1:D:141:LEU:HD13	1.98	0.45
1:B:95:ARG:HA	1:B:96:PRO:HD3	1.84	0.45
1:A:25:VAL:O	1:A:28:PRO:HD2	2.16	0.45
1:D:177:THR:HG21	1:D:190:VAL:HA	1.99	0.45
1:A:83:MET:CE	1:B:17:MET:SD	3.05	0.44
1:C:112:GLN:O	1:C:116:LYS:HG3	2.18	0.44
1:D:21:PRO:HG2	1:D:60:GLN:HE21	1.81	0.44
1:D:134:ILE:O	1:D:138:ILE:HG13	2.17	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:1:MET:HE3	1:C:41:ALA:C	2.38	0.44
1:D:164:LYS:O	1:D:168:VAL:HG23	2.18	0.44
1:C:53:LYS:HG3	1:C:54:GLU:N	2.29	0.43
1:B:33:LEU:HD11	1:B:40:ALA:HB3	2.01	0.43
1:B:88:VAL:HG13	1:B:108:ARG:HG2	1.99	0.43
1:B:88:VAL:HG13	1:B:108:ARG:HG3	2.00	0.43
1:D:197:LEU:O	1:D:201:THR:CG2	2.64	0.43
1:C:26:MET:O	1:C:29:VAL:HB	2.17	0.43
1:D:55:ASN:O	1:D:58:LEU:HB2	2.19	0.43
1:C:96:PRO:HA	1:C:101:GLN:CG	2.48	0.42
1:B:167:PHE:HB2	1:B:204:ILE:HD11	1.99	0.42
1:C:58:LEU:HD11	1:D:33:LEU:HD21	2.01	0.42
1:C:21:PRO:HG2	1:C:60:GLN:HB2	2.00	0.42
1:D:187:ALA:O	1:D:190:VAL:N	2.50	0.42
1:A:64:MET:CE	1:B:192:VAL:HG21	2.50	0.42
1:B:127:PHE:O	1:B:131:ILE:HG12	2.20	0.42
1:C:139:LYS:HA	2:E:8:LEU:HD21	2.00	0.42
1:A:67:LEU:HD23	1:B:67:LEU:CD2	2.50	0.41
1:B:34:GLU:HG2	1:B:38:LEU:HD23	2.02	0.41
1:C:73:GLU:CD	1:D:60:GLN:HE22	2.24	0.41
1:D:177:THR:HG22	1:D:190:VAL:HG22	2.02	0.41
1:A:76:PHE:CE2	1:A:80:LEU:HD22	2.55	0.41
1:C:61:ASP:O	1:C:65:LYS:HG3	2.20	0.41
1:D:51:ALA:HB1	1:D:58:LEU:CD2	2.51	0.41
1:A:85:ALA:HB2	1:A:115:SER:HB3	2.02	0.41
1:B:25:VAL:C	1:B:28:PRO:HD2	2.40	0.41
1:C:7:GLU:OE2	1:C:46:ALA:CB	2.69	0.41
1:C:1:MET:HE3	1:C:42:GLN:HA	2.02	0.41
1:A:60:GLN:HA	1:A:60:GLN:NE2	2.36	0.41
1:D:163:GLN:O	1:D:166:GLU:N	2.53	0.41
1:C:86:ASP:HB3	1:C:87:ASP:H	1.61	0.41
1:D:38:LEU:O	1:D:42:GLN:HG3	2.21	0.40
1:D:60:GLN:O	1:D:64:MET:HG2	2.20	0.40
1:A:97:GLU:HB2	1:A:100:PHE:HD2	1.87	0.40
1:C:91:TYR:CD1	1:C:91:TYR:N	2.89	0.40
1:D:123:ASP:HB3	1:D:126:ARG:HB2	2.03	0.40
1:A:117:ILE:N	1:A:118:PRO:CD	2.83	0.40
1:B:121:ILE:HD12	1:B:127:PHE:CZ	2.57	0.40
1:B:102:ASP:O	1:B:106:LYS:HG2	2.22	0.40

There are no symmetry-related clashes.

5.3 Torsion angles [i](#)

5.3.1 Protein backbone [i](#)

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the backbone conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	186/214 (87%)	164 (88%)	17 (9%)	5 (3%)	5	17
1	B	188/214 (88%)	167 (89%)	20 (11%)	1 (0%)	29	61
1	C	199/214 (93%)	184 (92%)	13 (6%)	2 (1%)	15	44
1	D	181/214 (85%)	160 (88%)	17 (9%)	4 (2%)	6	22
2	E	8/14 (57%)	8 (100%)	0	0	100	100
All	All	762/870 (88%)	683 (90%)	67 (9%)	12 (2%)	9	31

All (12) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	34	GLU
1	A	85	ALA
1	C	34	GLU
1	C	87	ASP
1	A	70	LYS
1	A	87	ASP
1	D	151	LYS
1	A	86	ASP
1	B	147	ASN
1	D	207	THR
1	D	124	ARG
1	D	98	PRO

5.3.2 Protein sidechains [i](#)

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the sidechain conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	173/194 (89%)	154 (89%)	19 (11%)	6	19
1	B	175/194 (90%)	164 (94%)	11 (6%)	18	46
1	C	184/194 (95%)	170 (92%)	14 (8%)	13	36
1	D	169/194 (87%)	153 (90%)	16 (10%)	8	25
2	E	8/12 (67%)	7 (88%)	1 (12%)	4	14
All	All	709/788 (90%)	648 (91%)	61 (9%)	10	30

All (61) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	18	VAL
1	A	20	MET
1	A	37	ASN
1	A	45	ARG
1	A	54	GLU
1	A	80	LEU
1	A	87	ASP
1	A	89	GLU
1	A	100	PHE
1	A	113	ILE
1	A	120	GLU
1	A	128	LEU
1	A	160	LEU
1	A	165	LYS
1	A	171	SER
1	A	178	LEU
1	A	180	THR
1	A	188	ILE
1	A	195	ASN
1	B	14	THR
1	B	15	THR
1	B	33	LEU
1	B	65	LYS
1	B	88	VAL
1	B	97	GLU
1	B	120	GLU
1	B	126	ARG
1	B	160	LEU
1	B	184	ASP
1	B	208	PHE
1	C	14	THR

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Mol	Chain	Res	Type
1	C	38	LEU
1	C	53	LYS
1	C	60	GLN
1	C	90	GLU
1	C	91	TYR
1	C	97	GLU
1	C	102	ASP
1	C	112	GLN
1	C	113	ILE
1	C	126	ARG
1	C	161	GLU
1	C	173	SER
1	C	177	THR
1	D	14	THR
1	D	18	VAL
1	D	37	ASN
1	D	55	ASN
1	D	88	VAL
1	D	104	ASN
1	D	108	ARG
1	D	112	GLN
1	D	116	LYS
1	D	130	THR
1	D	143	ASP
1	D	160	LEU
1	D	163	GLN
1	D	188	ILE
1	D	201	THR
1	D	203	LEU
2	E	11	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (17) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	37	ASN
1	A	60	GLN
1	A	104	ASN
1	A	189	ASN
1	B	55	ASN
1	B	60	GLN
1	B	75	ASN
1	B	101	GLN

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Mol	Chain	Res	Type
1	C	42	GLN
1	C	55	ASN
1	C	60	GLN
1	C	112	GLN
1	D	37	ASN
1	D	42	GLN
1	D	60	GLN
1	D	112	GLN
1	D	189	ASN

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

5.6 Ligand geometry [i](#)

There are no ligands in this entry.

5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

6 Fit of model and data

6.1 Protein, DNA and RNA chains

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

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å ²)	Q<0.9
1	A	190/214 (88%)	0.30	12 (6%) 20 12	44, 81, 116, 158	0
1	B	192/214 (89%)	0.29	10 (5%) 27 18	39, 84, 157, 186	0
1	C	203/214 (94%)	0.16	12 (5%) 22 14	38, 74, 150, 178	0
1	D	187/214 (87%)	0.12	6 (3%) 47 37	39, 78, 148, 180	0
2	E	10/14 (71%)	1.17	2 (20%) 1 0	164, 186, 228, 234	0
All	All	782/870 (89%)	0.23	42 (5%) 25 17	38, 80, 152, 234	0

All (42) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	C	210	THR	6.6
1	C	100	PHE	6.2
1	B	100	PHE	5.3
1	C	89	GLU	4.3
1	C	96	PRO	4.2
1	A	210	THR	4.1
1	A	208	PHE	4.0
2	E	6	ALA	3.8
1	B	159	ALA	3.8
1	A	100	PHE	3.7
1	C	98	PRO	3.6
1	B	145	VAL	3.4
1	A	145	VAL	3.3
1	D	124	ARG	3.2
1	B	183	LYS	3.2
1	D	152	TYR	3.2
1	C	87	ASP	3.1
1	A	159	ALA	3.0
1	D	149	PHE	3.0
1	A	88	VAL	2.9

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Mol	Chain	Res	Type	RSRZ
2	E	5	ASP	2.8
1	B	149	PHE	2.8
1	A	87	ASP	2.7
1	A	160	LEU	2.7
1	D	208	PHE	2.7
1	A	207	THR	2.6
1	B	167	PHE	2.6
1	A	183	LYS	2.6
1	C	207	THR	2.5
1	D	88	VAL	2.5
1	C	209	LYS	2.5
1	C	91	TYR	2.4
1	B	181	TYR	2.3
1	B	158	ARG	2.3
1	A	101	GLN	2.3
1	C	90	GLU	2.2
1	C	140	GLU	2.2
1	A	204	ILE	2.2
1	B	38	LEU	2.1
1	D	182	PHE	2.1
1	C	88	VAL	2.0
1	B	208	PHE	2.0

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

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

6.3 Carbohydrates [\(i\)](#)

There are no monosaccharides in this entry.

6.4 Ligands [\(i\)](#)

There are no ligands in this entry.

6.5 Other polymers [\(i\)](#)

There are no such residues in this entry.