WORLDWIDE wwPDB PROTEIN DATA BANK

Full wwPDB X-ray Structure Validation Report (i)

Nov 1, 2021 – 11:57 AM EDT

PDB ID	:	6XR2
Title	:	Computationally designed right-handed alpha/alpha homotrimeric toroid with 3 repeats per subunit
Authors	:	Hallinan, J.P.; Doyle, L.; Bradley, P.; Stoddard, B.L.
Deposited on	:	2020-07-10
Resolution	:	3.20 Å(reported)

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

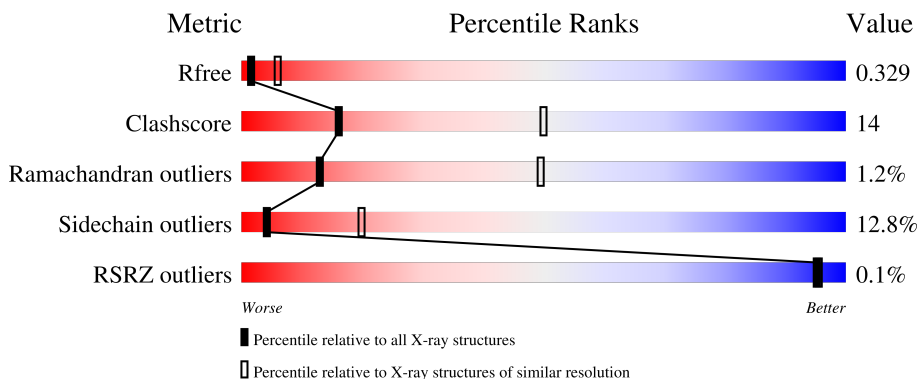|		
MolProbity	:	4.02b-467
Xtriage (Phenix)	:	1.13
EDS	:	2.23.2
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.23.2

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 3.20 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		0.329
Clashscore		14
Ramachandran outliers		1.2%
Sidechain outliers		12.8%
RSRZ outliers		0.1%

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	1133 (3.20-3.20)
Clashscore	141614	1253 (3.20-3.20)
Ramachandran outliers	138981	1234 (3.20-3.20)
Sidechain outliers	138945	1233 (3.20-3.20)
RSRZ outliers	127900	1095 (3.20-3.20)

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	172	65% ... 28% ... 5% ·
1	B	172	75% ... 20% ··
1	C	172	% 67% ... 29% ··
1	D	172	69% ... 26% ··
1	E	172	69% ... 24% ... 6% ··

Continued on next page...

Continued from previous page...

Mol	Chain	Length	Quality of chain
1	F	172	67% 23% 6% ·

2 Entry composition ⓘ

There are 2 unique types of molecules in this entry. The entry contains 7057 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 dTor_3x57R.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
1	A	169	Total	C	N	O	0	0	0
			1201	739	217	245			
1	B	167	Total	C	N	O	0	0	0
			1186	742	219	225			
1	C	170	Total	C	N	O	0	0	0
			1196	745	223	228			
1	D	167	Total	C	N	O	0	0	0
			1140	700	221	219			
1	E	171	Total	C	N	O	0	0	0
			1182	735	222	225			
1	F	165	Total	C	N	O	0	0	0
			1139	709	203	227			

- Molecule 2 is water.

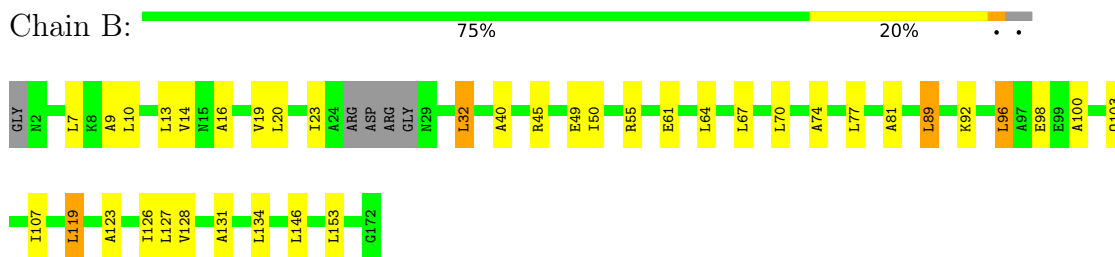| Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	4	Total	O	0	0
			4	4		
2	D	1	Total	O	0	0
			1	1		
2	E	2	Total	O	0	0
			2	2		
2	F	6	Total	O	0	0
			6	6		

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.
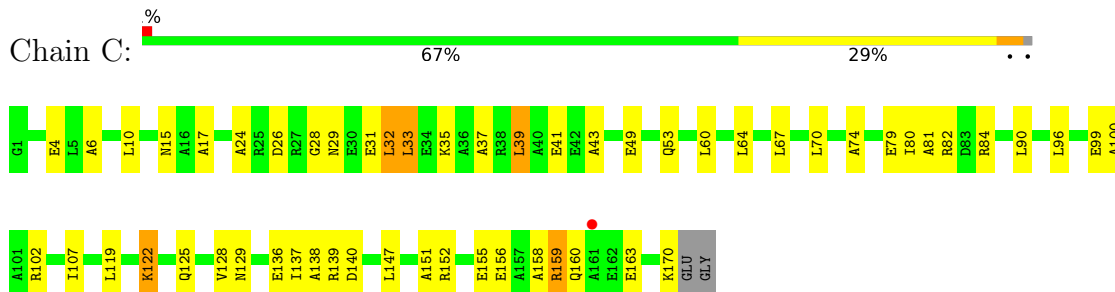
- Molecule 1: dTor_3x57R

Chain A:

- Molecule 1: dTor_3x57R

Chain B:

- Molecule 1: dTor_3x57R

Chain C:

- Molecule 1: dTor_3x57R

Chain D:

L119 I126 L127 V128 V133 L134 A135 E136 I137 A138 R139 D140 R141 G142 R152 A157 A158 R159 A165 R166 R169 K170 E171 G172

• Molecule 1: dTor_3x57R

Chain E: 69%   24%   6% ••

G1 N2 L3 E4 L5 A6 L7 K8 A9 L10 A16 V19 L20 A21 E22 I23 A24 R25 D26 R27 E30 E31 L32 L33 A36 Q46 E49 I50 A54 G58 N59 L60 E61 L62 A63 L67 Q68 A74 A81 R84 GLY N86 E87 L90 L96

R102 Q103 A104 E105 E106 R109 K113 L119 I126 N129 V133 K149 R152 L153 A154 E155 E156 A157 A161 R169 G172

• Molecule 1: dTor_3x57R

Chain F: 67%   23%   6% •

GLY N2 Q11 E22 I23 A24 ARG ASP ARG G28 N29 E30 E31 L32 K35 A36 A37 R38 L39 Q46 A47 E48 R55 N59 L62 A63 L64 L67 L70 I80 A81 L90 A94 A100 Q103 A108 A111 R112 L119 A120 L121 Q125

I126 L127 V128 V133 L134 A135 E136 I137 A138 R139 G142 L146 E156 R159 Q160 A161 E162 E163 I164 Q167 A168 R169 LYS GLU GLY

4 Data and refinement statistics ⓘ

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α, β, γ	57.65Å 78.93Å 112.69Å 90.00° 93.82° 90.00°	Depositor
Resolution (Å)	30.95 – 3.20 30.95 – 3.20	Depositor EDS
% Data completeness (in resolution range)	87.2 (30.95-3.20) 71.5 (30.95-3.20)	Depositor EDS
R_{merge}	0.22	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	2.95 (at 3.18Å)	Xtriage
Refinement program	PHENIX 1.10	Depositor
R, R_{free}	0.243 , 0.329 0.249 , 0.329	Depositor DCC
R_{free} test set	1472 reflections (10.02%)	wwPDB-VP
Wilson B-factor (Å^2)	49.4	Xtriage
Anisotropy	0.318	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.29 , 12.0	EDS
L-test for twinning[2]	$< |L| > = 0.48, < L^2 > = 0.32$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.87	EDS
Total number of atoms	7057	wwPDB-VP
Average B, all atoms (Å^2)	30.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 8.83% of the height of the origin peak. No significant pseudotranslation is detected.*

---

[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 ⓘ

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	0.38	0/1202	0.53	0/1625
1	B	0.26	0/1187	0.44	0/1607
1	C	0.31	0/1198	0.46	0/1623
1	D	0.29	0/1141	0.48	0/1546
1	E	0.45	0/1183	0.57	0/1604
1	F	0.35	0/1140	0.55	1/1552 (0.1%)
All	All	0.35	0/7051	0.51	1/9557 (0.0%)

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	F	28	GLY	C-N-CA	5.37	135.12	121.70

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	1201	0	1140	42	0
1	B	1186	0	1174	27	0
1	C	1196	0	1170	32	0
1	D	1140	0	1057	39	2
1	E	1182	0	1133	52	2
1	F	1139	0	1071	36	0

Continued on next page...

W O R L D W I D E

wwPDB

PROTEIN DATA BANK

Continued from previous page...

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	A	4	0	0	0	0
2	D	1	0	0	0	0
2	E	2	0	0	0	0
2	F	6	0	0	1	0
All	All	7057	0	6745	200	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 14.

All (200) 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:D:172:GLY:HA2	1:E:1:GLY:N	1.53	1.22
1:D:171:GLU:O	1:E:1:GLY:N	1.86	1.08
1:D:172:GLY:HA2	1:E:1:GLY:H2	0.92	1.04
1:D:172:GLY:CA	1:E:1:GLY:H2	1.84	0.89
1:D:15:ASN:HB3	1:F:128:VAL:HG11	1.55	0.87
1:A:14:VAL:CG1	1:A:73:ALA:HA	2.07	0.85
1:A:156:GLU:HB2	1:A:159:ARG:HH21	1.41	0.84
1:A:14:VAL:HG11	1:A:73:ALA:HA	1.59	0.82
1:E:60:LEU:HB3	1:E:119:LEU:HD21	1.63	0.81
1:E:24:ALA:HB2	1:E:32:LEU:HD12	1.65	0.77
1:A:162:GLU:HG2	1:B:13:LEU:HD21	1.66	0.77
1:A:111:ALA:HB2	1:A:119:LEU:HD22	1.65	0.76
1:D:172:GLY:CA	1:E:1:GLY:N	2.42	0.74
1:C:24:ALA:CB	1:C:32:LEU:HB2	2.19	0.71
1:D:55:ARG:NH2	1:D:106:GLU:OE1	2.24	0.70
1:D:26:ASP:N	1:D:26:ASP:OD1	2.24	0.70
1:E:102:ARG:NH1	1:E:106:GLU:OE2	2.25	0.70
1:C:24:ALA:HB2	1:C:32:LEU:HB2	1.75	0.69
1:C:24:ALA:HB2	1:C:32:LEU:CB	2.23	0.69
1:D:55:ARG:NH1	1:D:103:GLN:OE1	2.26	0.69
1:A:147:LEU:HD22	1:B:23:ILE:HG23	1.75	0.68
1:A:162:GLU:HB3	1:B:13:LEU:HD11	1.75	0.68
1:E:60:LEU:O	1:E:119:LEU:HD11	1.94	0.67
1:E:6:ALA:O	1:E:10:LEU:HG	1.95	0.67
1:E:30:GLU:HA	1:E:30:GLU:OE1	1.95	0.67
1:F:30:GLU:N	1:F:30:GLU:OE1	2.29	0.65
1:A:14:VAL:HG11	1:A:73:ALA:CA	2.26	0.65
1:F:37:ALA:HB2	1:F:80:ILE:HG21	1.77	0.65
1:A:39:LEU:HD21	1:C:158:ALA:HB1	1.79	0.65

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:99:GLU:OE1	1:C:102:ARG:NH2	2.28	0.65
1:B:67:LEU:HD22	1:B:100:ALA:HA	1.79	0.64
1:A:24:ALA:HB1	1:A:29:ASN:O	1.97	0.64
1:A:79:GLU:O	1:A:82:ARG:HG2	1.97	0.64
1:A:48:GLU:HG2	1:A:70:LEU:HD11	1.82	0.62
1:D:172:GLY:HA2	1:E:1:GLY:H1	1.58	0.62
1:F:94:ALA:HB2	1:F:137:ILE:HG21	1.82	0.62
1:C:17:ALA:HB2	1:C:39:LEU:HB3	1.82	0.61
1:F:108:ALA:O	1:F:112:ARG:HG3	2.00	0.61
1:C:29:ASN:OD1	1:C:31:GLU:N	2.34	0.61
1:F:163:GLU:O	1:F:167:GLN:HB3	2.01	0.61
1:C:125:GLN:O	1:C:129:ASN:ND2	2.30	0.60
1:E:4:GLU:HA	1:E:7:LEU:HD22	1.84	0.60
1:C:90:LEU:HD22	1:C:137:ILE:HG23	1.83	0.60
1:C:10:LEU:HD22	1:C:43:ALA:HA	1.83	0.60
1:B:67:LEU:HD23	1:B:70:LEU:HD12	1.84	0.60
1:E:68:GLN:OE1	1:E:126:ILE:HG13	2.01	0.59
1:A:60:LEU:HD22	1:A:107:ILE:HG12	1.85	0.59
1:D:70:LEU:HD22	1:D:96:LEU:HG	1.85	0.58
1:D:172:GLY:HA3	1:E:3:LEU:HD11	1.86	0.58
1:E:33:LEU:HD22	1:E:84:ARG:HG3	1.86	0.58
1:F:81:ALA:HB1	1:F:90:LEU:HG	1.84	0.57
1:E:149:LYS:HZ3	1:E:153:LEU:HD21	1.70	0.57
1:A:77:LEU:HD22	1:A:89:LEU:HD21	1.88	0.56
1:B:98:GLU:HG3	1:B:134:LEU:HD21	1.86	0.56
1:B:20:LEU:HB3	1:B:32:LEU:HD22	1.88	0.56
1:D:5:LEU:HD22	1:F:121:LEU:HD12	1.87	0.56
1:F:67:LEU:HD23	1:F:100:ALA:HA	1.88	0.56
1:F:67:LEU:HD21	1:F:103:GLN:HB3	1.87	0.55
1:F:139:ARG:NH1	2:F:201:HOH:O	2.39	0.55
1:D:81:ALA:HB2	1:D:89:LEU:HB3	1.89	0.55
1:E:169:ARG:NH1	1:F:46:GLN:HE21	2.03	0.55
1:A:70:LEU:HD22	1:A:96:LEU:HG	1.89	0.55
1:C:136:GLU:OE1	1:C:139:ARG:NH2	2.38	0.55
1:E:61:GLU:HA	1:E:61:GLU:OE2	2.08	0.54
1:B:81:ALA:HB2	1:B:89:LEU:HB3	1.89	0.53
1:C:24:ALA:HB1	1:C:32:LEU:HB2	1.89	0.53
1:A:133:VAL:O	1:A:137:ILE:HG13	2.07	0.53
1:C:138:ALA:HB3	1:C:147:LEU:HG	1.91	0.53
1:D:133:VAL:O	1:D:137:ILE:HG13	2.08	0.53
1:B:19:VAL:O	1:B:23:ILE:HG13	2.09	0.53

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:102:ARG:NH1	1:A:106:GLU:OE2	2.40	0.53
1:E:8:LYS:HB2	1:E:8:LYS:NZ	2.24	0.53
1:C:33:LEU:HG	1:C:80:ILE:HG23	1.91	0.53
1:C:60:LEU:HD22	1:C:107:ILE:HG12	1.90	0.53
1:D:19:VAL:O	1:D:23:ILE:HG23	2.08	0.53
1:A:81:ALA:HB2	1:A:89:LEU:HB3	1.92	0.52
1:B:64:LEU:HD22	1:B:126:ILE:HD12	1.92	0.52
1:C:37:ALA:HB2	1:C:80:ILE:HG21	1.91	0.52
1:E:20:LEU:HG	1:E:32:LEU:HD22	1.90	0.52
1:D:159:ARG:HH22	1:D:166:ARG:NH2	2.07	0.51
1:E:87:GLU:HA	1:E:90:LEU:HB2	1.91	0.51
1:A:161:ALA:O	1:B:9:ALA:HB1	2.09	0.51
1:B:128:VAL:HG11	1:C:15:ASN:HB3	1.91	0.51
1:A:51:ALA:O	1:A:55:ARG:HG2	2.10	0.51
1:A:138:ALA:HB1	1:A:147:LEU:HG	1.93	0.51
1:B:10:LEU:O	1:B:14:VAL:HG23	2.11	0.51
1:D:64:LEU:HD22	1:D:126:ILE:HD12	1.93	0.51
1:D:169:ARG:HD2	1:E:50:ILE:HD11	1.91	0.51
1:F:156:GLU:OE1	1:F:159:ARG:NE	2.43	0.51
1:E:19:VAL:O	1:E:23:ILE:HG13	2.10	0.50
1:F:55:ARG:HG3	1:F:103:GLN:OE1	2.09	0.50
1:F:59:ASN:HB3	1:F:62:LEU:HB3	1.94	0.50
1:B:131:ALA:HB2	1:B:153:LEU:HB3	1.93	0.50
1:A:44:ALA:HB1	1:A:96:LEU:HD21	1.94	0.50
1:D:51:ALA:O	1:D:55:ARG:N	2.44	0.50
1:E:24:ALA:O	1:E:33:LEU:HD11	2.12	0.49
1:E:60:LEU:CB	1:E:119:LEU:HD21	2.40	0.49
1:A:41:GLU:HA	1:A:77:LEU:HD11	1.93	0.49
1:A:74:ALA:HB2	1:A:96:LEU:HB3	1.92	0.49
1:F:64:LEU:HD22	1:F:126:ILE:HD12	1.94	0.49
1:E:20:LEU:HB3	1:E:36:ALA:HB2	1.94	0.49
1:E:81:ALA:HB1	1:E:90:LEU:HG	1.95	0.49
1:A:81:ALA:HB1	1:A:90:LEU:HG	1.95	0.49
1:E:46:GLN:O	1:E:49:GLU:HG3	2.13	0.49
1:F:63:ALA:O	1:F:67:LEU:HD12	2.13	0.49
1:A:64:LEU:HD22	1:A:126:ILE:HD12	1.93	0.48
1:B:55:ARG:HH11	1:B:103:GLN:NE2	2.11	0.48
1:D:7:LEU:HD23	1:D:10:LEU:HD12	1.95	0.48
1:E:24:ALA:CB	1:E:32:LEU:HB2	2.43	0.48
1:F:24:ALA:HB2	1:F:32:LEU:HB3	1.96	0.47
1:E:24:ALA:HB2	1:E:32:LEU:CD1	2.41	0.47

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:67:LEU:HD22	1:C:100:ALA:HA	1.95	0.47
1:C:35:LYS:HE3	1:C:35:LYS:HB2	1.51	0.47
1:C:37:ALA:O	1:C:41:GLU:HG3	2.15	0.47
1:A:6:ALA:O	1:A:10:LEU:HG	2.15	0.47
1:C:159:ARG:O	1:C:163:GLU:HG3	2.15	0.47
1:F:111:ALA:HB2	1:F:119:LEU:HD12	1.96	0.47
1:A:156:GLU:HB2	1:A:159:ARG:NH2	2.20	0.47
1:C:6:ALA:O	1:C:10:LEU:HG	2.15	0.47
1:D:45:ARG:HA	1:D:48:GLU:HG2	1.96	0.47
1:E:60:LEU:O	1:E:119:LEU:HD21	2.15	0.47
1:F:31:GLU:O	1:F:35:LYS:N	2.42	0.46
1:F:156:GLU:HA	1:F:159:ARG:HG2	1.96	0.46
1:A:158:ALA:HB2	1:B:16:ALA:HB3	1.98	0.46
1:D:165:ALA:HB2	1:E:9:ALA:HB3	1.98	0.46
1:E:152:ARG:HA	1:E:155:GLU:HG2	1.98	0.46
1:A:124:LEU:HD21	1:A:160:GLN:NE2	2.30	0.46
1:D:172:GLY:HA3	1:E:3:LEU:CD1	2.46	0.46
1:E:16:ALA:O	1:E:20:LEU:HB2	2.15	0.46
1:A:98:GLU:HG2	1:A:134:LEU:HD11	1.97	0.45
1:A:134:LEU:HD23	1:A:137:ILE:HD12	1.98	0.45
1:B:64:LEU:HD11	1:B:123:ALA:HB2	1.98	0.45
1:C:74:ALA:HB2	1:C:96:LEU:HB3	1.98	0.45
1:D:6:ALA:O	1:D:10:LEU:N	2.41	0.45
1:E:50:ILE:O	1:E:54:ALA:HB3	2.16	0.45
1:F:156:GLU:O	1:F:160:GLN:HG3	2.17	0.45
1:C:64:LEU:HD23	1:C:67:LEU:HD12	1.98	0.45
1:A:44:ALA:CB	1:A:96:LEU:HD21	2.47	0.45
1:D:61:GLU:HG2	1:D:65:LYS:HE2	1.98	0.45
1:A:1:GLY:O	1:A:4:GLU:HB2	2.17	0.45
1:C:39:LEU:HD12	1:C:39:LEU:HA	1.87	0.44
1:D:23:ILE:HG22	1:F:135:ALA:HB1	1.99	0.44
1:C:81:ALA:HB1	1:C:90:LEU:HG	2.00	0.44
1:C:70:LEU:HD22	1:C:96:LEU:HG	2.00	0.44
1:C:151:ALA:O	1:C:155:GLU:HB2	2.18	0.44
1:C:156:GLU:O	1:C:160:GLN:HG3	2.18	0.44
1:E:105:GLU:HB3	1:E:109:ARG:HH12	1.83	0.44
1:E:129:ASN:O	1:E:133:VAL:HG23	2.18	0.44
1:A:59:ASN:ND2	1:A:62:LEU:HB2	2.33	0.44
1:A:76:VAL:O	1:A:80:ILE:HG13	2.18	0.43
1:B:74:ALA:HB2	1:B:96:LEU:HB2	2.01	0.43
1:E:74:ALA:HB2	1:E:96:LEU:HB3	2.00	0.43

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:15:ASN:OD1	1:F:125:GLN:NE2	2.50	0.43
1:D:127:LEU:HB3	1:D:157:ALA:HB2	2.00	0.43
1:E:7:LEU:HD11	1:E:50:ILE:HG21	2.00	0.43
1:D:64:LEU:HD23	1:D:67:LEU:HD12	1.99	0.43
1:F:121:LEU:HG	1:F:164:ILE:HD12	2.01	0.43
1:B:119:LEU:HD23	1:B:119:LEU:HA	1.90	0.43
1:A:169:ARG:NH1	1:B:49:GLU:OE1	2.47	0.42
1:F:167:GLN:O	1:F:167:GLN:HG3	2.19	0.42
1:A:20:LEU:HB2	1:A:36:ALA:HB2	2.01	0.42
1:E:60:LEU:O	1:E:119:LEU:CD1	2.66	0.42
1:E:61:GLU:OE2	1:E:61:GLU:CA	2.67	0.42
1:E:157:ALA:O	1:E:161:ALA:N	2.43	0.42
1:F:30:GLU:N	1:F:30:GLU:CD	2.72	0.42
1:F:167:GLN:O	1:F:167:GLN:CG	2.67	0.42
1:D:48:GLU:HB3	1:D:70:LEU:HD21	2.00	0.42
1:D:169:ARG:HE	1:D:169:ARG:HB3	1.45	0.42
1:A:20:LEU:CB	1:A:36:ALA:HB2	2.49	0.42
1:B:7:LEU:HD21	1:B:50:ILE:HG21	2.02	0.42
1:F:162:GLU:H	1:F:162:GLU:HG2	1.41	0.42
1:D:74:ALA:HB2	1:D:96:LEU:HB3	2.01	0.42
1:D:135:ALA:CB	1:E:23:ILE:HG12	2.50	0.41
1:E:27:ARG:O	1:E:27:ARG:HG3	2.19	0.41
1:F:39:LEU:HD23	1:F:39:LEU:HA	1.85	0.41
1:F:133:VAL:HG12	1:F:137:ILE:HD12	2.01	0.41
1:D:88:GLU:O	1:D:91:GLU:HB3	2.20	0.41
1:B:146:LEU:HD23	1:B:146:LEU:HA	1.92	0.41
1:F:48:GLU:CG	1:F:70:LEU:HD21	2.50	0.41
1:A:80:ILE:HG13	1:A:80:ILE:H	1.46	0.41
1:E:33:LEU:CD2	1:E:84:ARG:HG3	2.50	0.41
1:D:6:ALA:O	1:D:10:LEU:HG	2.20	0.41
1:E:3:LEU:HB3	1:E:50:ILE:HG23	2.02	0.41
1:C:79:GLU:OE1	1:C:82:ARG:NH1	2.54	0.41
1:C:119:LEU:HA	1:C:122:LYS:HG3	2.02	0.41
1:E:102:ARG:HG3	1:E:103:GLN:N	2.36	0.41
1:F:48:GLU:HG2	1:F:70:LEU:HD11	2.02	0.41
1:A:165:ALA:HB2	1:B:9:ALA:HB3	2.03	0.41
1:B:40:ALA:HB3	1:B:77:LEU:HG	2.02	0.41
1:D:139:ARG:NH1	1:E:22:GLU:O	2.53	0.41
1:E:63:ALA:O	1:E:67:LEU:HG	2.20	0.41
1:F:70:LEU:HD23	1:F:70:LEU:HA	1.93	0.41
1:D:86:ASN:HB3	1:D:89:LEU:HB2	2.03	0.41

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:138:ALA:O	1:F:142:GLY:N	2.46	0.41
1:B:55:ARG:HH11	1:B:103:GLN:HE21	1.69	0.40
1:F:35:LYS:O	1:F:39:LEU:HB2	2.21	0.40
1:A:158:ALA:HB2	1:B:16:ALA:CB	2.50	0.40
1:C:81:ALA:CB	1:C:90:LEU:HG	2.52	0.40
1:B:55:ARG:NH1	1:B:103:GLN:HE21	2.20	0.40
1:D:158:ALA:HB2	1:E:16:ALA:CB	2.51	0.40

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:D:87:GLU:OE2	1:E:58:GLY:O[1_455]	2.08	0.12
1:D:87:GLU:CD	1:E:58:GLY:O[1_455]	2.18	0.02

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	165/172 (96%)	159 (96%)	4 (2%)	2 (1%)	13	49
1	B	163/172 (95%)	159 (98%)	4 (2%)	0	100	100
1	C	168/172 (98%)	163 (97%)	3 (2%)	2 (1%)	13	49
1	D	163/172 (95%)	158 (97%)	1 (1%)	4 (2%)	5	32
1	E	167/172 (97%)	159 (95%)	6 (4%)	2 (1%)	13	49
1	F	161/172 (94%)	156 (97%)	3 (2%)	2 (1%)	13	49
All	All	987/1032 (96%)	954 (97%)	21 (2%)	12 (1%)	13	49

All (12) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	F	29	ASN
1	A	28	GLY
1	C	28	GLY
1	D	141	ARG
1	A	29	ASN
1	C	84	ARG
1	D	57	GLU
1	D	59	ASN
1	E	61	GLU
1	E	25	ARG
1	F	168	ALA
1	D	142	GLY

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	96/123 (78%)	83 (86%)	13 (14%)	4	18
1	B	95/123 (77%)	86 (90%)	9 (10%)	8	32
1	C	93/123 (76%)	80 (86%)	13 (14%)	3	16
1	D	80/123 (65%)	73 (91%)	7 (9%)	10	36
1	E	88/123 (72%)	75 (85%)	13 (15%)	3	14
1	F	87/123 (71%)	73 (84%)	14 (16%)	2	11
All	All	539/738 (73%)	470 (87%)	69 (13%)	4	20

All (69) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	14	VAL
1	A	30	GLU
1	A	39	LEU
1	A	61	GLU
1	A	62	LEU
1	A	79	GLU
1	A	80	ILE

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	A	88	GLU
1	A	89	LEU
1	A	110	GLN
1	A	128	VAL
1	A	133	VAL
1	A	162	GLU
1	B	32	LEU
1	B	45	ARG
1	B	61	GLU
1	B	89	LEU
1	B	92	LYS
1	B	96	LEU
1	B	107	ILE
1	B	119	LEU
1	B	127	LEU
1	C	4	GLU
1	C	26	ASP
1	C	32	LEU
1	C	33	LEU
1	C	39	LEU
1	C	49	GLU
1	C	53	GLN
1	C	122	LYS
1	C	128	VAL
1	C	140	ASP
1	C	152	ARG
1	C	159	ARG
1	C	170	LYS
1	D	15	ASN
1	D	26	ASP
1	D	49	GLU
1	D	128	VAL
1	D	152	ARG
1	D	159	ARG
1	D	169	ARG
1	E	3	LEU
1	E	7	LEU
1	E	8	LYS
1	E	30	GLU
1	E	33	LEU
1	E	46	GLN
1	E	49	GLU

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	E	60	LEU
1	E	61	GLU
1	E	87	GLU
1	E	113	LYS
1	E	149	LYS
1	E	153	LEU
1	F	11	GLN
1	F	22	GLU
1	F	29	ASN
1	F	35	LYS
1	F	39	LEU
1	F	55	ARG
1	F	62	LEU
1	F	67	LEU
1	F	103	GLN
1	F	127	LEU
1	F	128	VAL
1	F	146	LEU
1	F	162	GLU
1	F	163	GLU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (7) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	160	GLN
1	B	103	GLN
1	C	15	ASN
1	E	125	GLN
1	F	15	ASN
1	F	29	ASN
1	F	46	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 ⓘ

There are no ligands in this entry.

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(Å²)	Q<0.9
1	A	169/172 (98%)	-0.37	0	100	100	14, 26, 41, 67	0
1	B	167/172 (97%)	-0.41	0	100	100	11, 23, 40, 54	0
1	C	170/172 (98%)	-0.25	1 (0%)	89	83	13, 31, 51, 60	0
1	D	167/172 (97%)	-0.42	0	100	100	18, 30, 56, 65	0
1	E	171/172 (99%)	-0.36	0	100	100	16, 27, 50, 67	0
1	F	165/172 (95%)	-0.25	0	100	100	19, 33, 58, 70	0
All	All	1009/1032 (97%)	-0.34	1 (0%)	95	95	11, 28, 52, 70	0

All (1) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	C	161	ALA	2.7

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 ⓘ

There are no ligands in this entry.

6.5 Other polymers ⓘ

There are no such residues in this entry.