Full wwPDB EM Validation Report

Jul 15, 2025 – 08:54 PM JST

PDB ID	:	9JUJ / pdb_00009juj
EMDB ID	:	EMD-61827
Title	:	Structure of Arabidopsis thaliana ABCB1 in the inward-facing conformation
Authors	:	Chen, Q.; Su, N.; Guo, J.
Deposited on	:	2024-10-08
Resolution	:	3.40 Å(reported)

This is a Full wwPDB EM 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/EMValidationReportHelp
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:

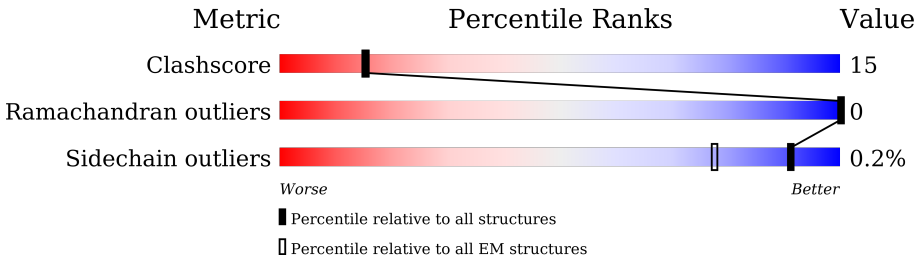
EMDB validation analysis	:	FAILED
MolProbity	:	4-5-2 with Phenix2.0rc1
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ	:	FAILED
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.44

1 Overall quality at a glance (i)

The following experimental techniques were used to determine the structure:
ELECTRON MICROSCOPY

The reported resolution of this entry is 3.40 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)	EM structures (#Entries)
Clashscore	210492	15764
Ramachandran outliers	207382	16835
Sidechain outliers	206894	16415

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the 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%

Mol	Chain	Length	Quality of chain
1	A	1327	60% 28% 12%

2 Entry composition (i)

There is only 1 type of molecule in this entry. The entry contains 8971 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, 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 ABC transporter B family member 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	1165	8971	5736	1543	1651	41	0	0

There are 41 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-40	MET	-	initiating methionine	UNP Q9ZR72
A	-39	ASP	-	expression tag	UNP Q9ZR72
A	-38	TYR	-	expression tag	UNP Q9ZR72
A	-37	LYS	-	expression tag	UNP Q9ZR72
A	-36	ASP	-	expression tag	UNP Q9ZR72
A	-35	ASP	-	expression tag	UNP Q9ZR72
A	-34	ASP	-	expression tag	UNP Q9ZR72
A	-33	ASP	-	expression tag	UNP Q9ZR72
A	-32	LYS	-	expression tag	UNP Q9ZR72
A	-31	TRP	-	expression tag	UNP Q9ZR72
A	-30	SER	-	expression tag	UNP Q9ZR72
A	-29	HIS	-	expression tag	UNP Q9ZR72
A	-28	PRO	-	expression tag	UNP Q9ZR72
A	-27	GLN	-	expression tag	UNP Q9ZR72
A	-26	PHE	-	expression tag	UNP Q9ZR72
A	-25	GLU	-	expression tag	UNP Q9ZR72
A	-24	LYS	-	expression tag	UNP Q9ZR72
A	-23	GLY	-	expression tag	UNP Q9ZR72
A	-22	GLY	-	expression tag	UNP Q9ZR72
A	-21	GLY	-	expression tag	UNP Q9ZR72
A	-20	GLY	-	expression tag	UNP Q9ZR72
A	-19	SER	-	expression tag	UNP Q9ZR72
A	-18	GLY	-	expression tag	UNP Q9ZR72
A	-17	GLY	-	expression tag	UNP Q9ZR72
A	-16	SER	-	expression tag	UNP Q9ZR72
A	-15	ALA	-	expression tag	UNP Q9ZR72
A	-14	TRP	-	expression tag	UNP Q9ZR72
A	-13	SER	-	expression tag	UNP Q9ZR72

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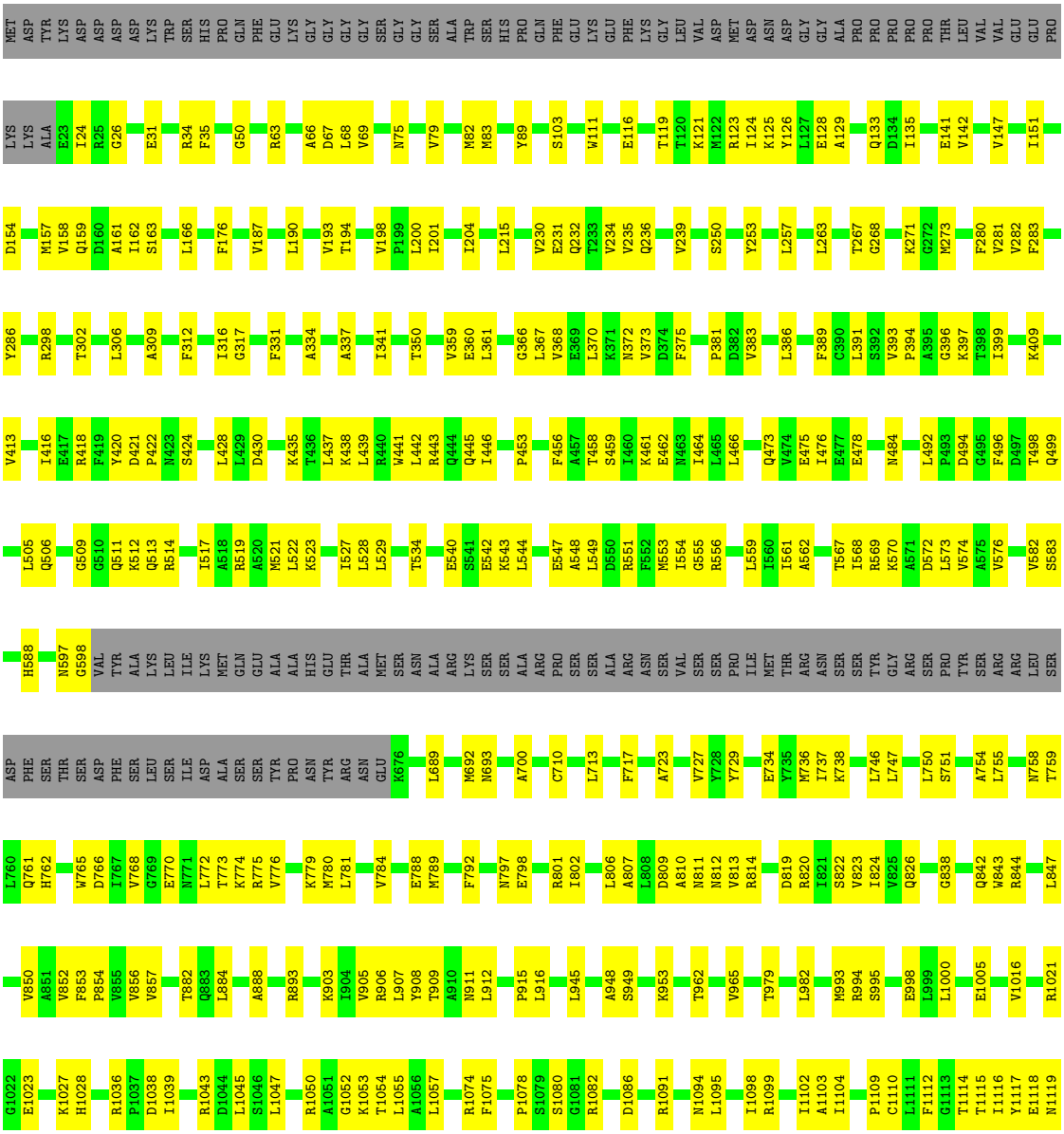
Chain	Residue	Modelled	Actual	Comment	Reference
A	-12	HIS	-	expression tag	UNP Q9ZR72
A	-11	PRO	-	expression tag	UNP Q9ZR72
A	-10	GLN	-	expression tag	UNP Q9ZR72
A	-9	PHE	-	expression tag	UNP Q9ZR72
A	-8	GLU	-	expression tag	UNP Q9ZR72
A	-7	LYS	-	expression tag	UNP Q9ZR72
A	-6	GLU	-	expression tag	UNP Q9ZR72
A	-5	PHE	-	expression tag	UNP Q9ZR72
A	-4	LYS	-	expression tag	UNP Q9ZR72
A	-3	GLY	-	expression tag	UNP Q9ZR72
A	-2	LEU	-	expression tag	UNP Q9ZR72
A	-1	VAL	-	expression tag	UNP Q9ZR72
A	0	ASP	-	expression tag	UNP Q9ZR72

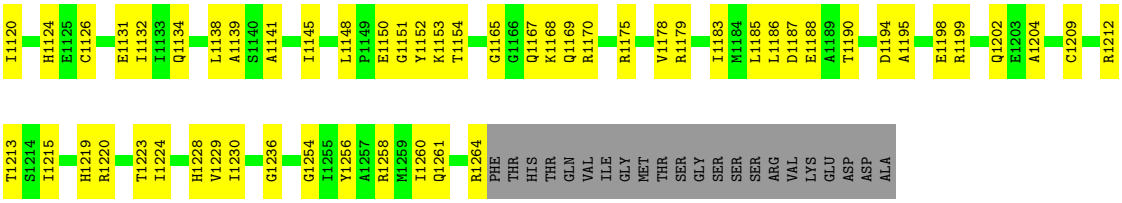
3 Residue-property plots (i)

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. 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. 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: ABC transporter B family member 1

Chain A:




I1120
H1124
E1125
C1126
E1131
I1132
I1133
Q1134
L1138
A1139
S1140
A1141
I1145
L1148
P1149
E1150
G1151
Y1152
K1153
T1154
G1165
G1166
Q1167
K1168
Q1169
R1170
R1175
V1178
R1179
I1183
M1184
L1185
L1186
D1187
E1188
A1189
T1190
D1194
A1195
E1198
R1199
Q1202
E1203
A1204
C1209
R1212
T1213
S1214
I1215
H1219
R1220
T1223
I1224
H1228
V1229
I1230
G1236
G1254
I1255
Y1256
A1257
R1258
M1259
I1260
Q1261
R1264
PHE
THR
HIS
THR
GLN
VAL
ILE
GLY
MET
THR
SER
GLY
SER
SER
SER
ARG
VAL
LYS
GLU
ASP
ASP
ALA

4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	96978	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	TFS KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/Å^2$)	52	Depositor
Minimum defocus (nm)	800	Depositor
Maximum defocus (nm)	1400	Depositor
Magnification	Not provided	
Image detector	GATAN K2 QUANTUM (4k x 4k)	Depositor

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	0.33	0/9137	0.53	0/12366

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	8971	0	9116	264	0
All	All	8971	0	9116	264	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 15.

All (264) 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:239:VAL:HG11	1:A:1110:CYS:SG	2.25	0.77
1:A:204:ILE:HG13	1:A:281:VAL:HG21	1.67	0.76
1:A:151:ILE:HG22	1:A:882:THR:HG23	1.69	0.74
1:A:820:ARG:O	1:A:824:ILE:HG12	1.87	0.74
1:A:257:LEU:HB3	1:A:774:LYS:HD3	1.67	0.73

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:116:GLU:OE1	1:A:159:GLN:NE2	2.22	0.73
1:A:1104:ILE:HG22	1:A:1185:LEU:HB2	1.71	0.73
1:A:157:MET:SD	1:A:341:ILE:HD12	2.29	0.72
1:A:458:THR:HG22	1:A:459:SER:H	1.55	0.71
1:A:75:ASN:HB2	1:A:82:MET:HB3	1.72	0.70
1:A:441:TRP:O	1:A:445:GLN:NE2	2.25	0.70
1:A:373:VAL:HG11	1:A:389:PHE:HB3	1.74	0.69
1:A:842:GLN:NE2	1:A:843:TRP:O	2.26	0.68
1:A:123:ARG:NH2	1:A:151:ILE:O	2.27	0.68
1:A:234:VAL:HG12	1:A:792:PHE:HE2	1.58	0.68
1:A:372:ASN:HD22	1:A:424:SER:HB2	1.60	0.66
1:A:464:ILE:HG22	1:A:522:LEU:HD12	1.78	0.66
1:A:124:ILE:HD12	1:A:909:THR:HG22	1.78	0.65
1:A:540:GLU:HB2	1:A:543:LYS:HE3	1.78	0.65
1:A:1141:ALA:HA	1:A:1170:ARG:HD2	1.78	0.65
1:A:576:VAL:HB	1:A:583:SER:HB2	1.79	0.65
1:A:1036:ARG:HE	1:A:1039:ILE:HD13	1.61	0.65
1:A:1050:ARG:HB3	1:A:1053:LYS:HB3	1.78	0.64
1:A:1167:GLN:HG2	1:A:1170:ARG:HH21	1.61	0.63
1:A:528:LEU:HD21	1:A:549:LEU:HD12	1.80	0.63
1:A:492:LEU:HD11	1:A:505:LEU:HD21	1.80	0.63
1:A:788:GLU:OE2	1:A:1005:GLU:N	2.32	0.63
1:A:273:MET:HA	1:A:759:THR:HG22	1.80	0.62
1:A:1190:THR:HG1	1:A:1219:HIS:HE2	1.48	0.62
1:A:1115:THR:HB	1:A:1153:LYS:HB2	1.82	0.62
1:A:439:LEU:H	1:A:442:LEU:HD13	1.63	0.62
1:A:824:ILE:HD12	1:A:979:THR:HG23	1.82	0.61
1:A:1114:THR:N	1:A:1118:GLU:OE2	2.32	0.61
1:A:413:VAL:HG22	1:A:529:LEU:HD12	1.81	0.61
1:A:24:ILE:HG22	1:A:26:GLY:H	1.67	0.60
1:A:1078:PRO:HG2	1:A:1091:ARG:HH21	1.66	0.60
1:A:812:ASN:OD1	1:A:813:VAL:N	2.36	0.59
1:A:1212:ARG:HG3	1:A:1213:THR:H	1.68	0.59
1:A:775:ARG:O	1:A:779:LYS:HG2	2.03	0.59
1:A:555:GLY:O	1:A:556:ARG:HD3	2.03	0.58
1:A:809:ASP:OD1	1:A:810:ALA:N	2.37	0.58
1:A:1141:ALA:HB1	1:A:1170:ARG:HH11	1.69	0.58
1:A:119:THR:O	1:A:123:ARG:HG3	2.04	0.57
1:A:823:VAL:HG11	1:A:982:LEU:HD12	1.85	0.57
1:A:461:LYS:NZ	1:A:496:PHE:O	2.36	0.57
1:A:807:ALA:O	1:A:811:ASN:ND2	2.38	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:370:LEU:HD13	1:A:391:LEU:HB2	1.88	0.56
1:A:473:GLN:HA	1:A:476:ILE:HD12	1.87	0.56
1:A:568:ILE:HG22	1:A:588:HIS:NE2	2.20	0.56
1:A:298:ARG:HG3	1:A:736:MET:HE1	1.87	0.56
1:A:437:LEU:HB3	1:A:442:LEU:HD11	1.87	0.56
1:A:1021:ARG:CZ	1:A:1023:GLU:HB3	2.36	0.56
1:A:1220:ARG:NH2	1:A:1223:THR:O	2.38	0.55
1:A:35:PHE:HD2	1:A:121:LYS:HG3	1.71	0.55
1:A:511:GLN:HA	1:A:514:ARG:HE	1.72	0.55
1:A:394:PRO:HG2	1:A:397:LYS:HB2	1.89	0.55
1:A:1094:ASN:OD1	1:A:1095:LEU:N	2.39	0.55
1:A:1198:GLU:OE2	1:A:1202:GLN:NE2	2.39	0.55
1:A:83:MET:SD	1:A:949:SER:OG	2.57	0.55
1:A:492:LEU:HD23	1:A:494:ASP:H	1.72	0.55
1:A:567:THR:HA	1:A:570:LYS:HD3	1.88	0.55
1:A:1115:THR:N	1:A:1118:GLU:OE2	2.33	0.55
1:A:458:THR:HG22	1:A:459:SER:N	2.21	0.55
1:A:126:TYR:HD1	1:A:341:ILE:HG23	1.71	0.54
1:A:700:ALA:HB2	1:A:768:VAL:HG21	1.88	0.54
1:A:838:GLY:HA2	1:A:965:VAL:HG22	1.89	0.54
1:A:780:MET:HG2	1:A:1000:LEU:HD11	1.89	0.54
1:A:717:PHE:HD1	1:A:747:LEU:HD11	1.72	0.54
1:A:446:ILE:HG23	1:A:529:LEU:HD23	1.90	0.54
1:A:798:GLU:HB2	1:A:801:ARG:HG2	1.89	0.54
1:A:1220:ARG:HH21	1:A:1224:ILE:HA	1.73	0.54
1:A:466:LEU:HD21	1:A:519:ARG:HH11	1.73	0.53
1:A:727:VAL:HG12	1:A:736:MET:HG3	1.89	0.53
1:A:693:ASN:HB2	1:A:772:LEU:HD13	1.90	0.53
1:A:1102:ILE:HG13	1:A:1183:ILE:HB	1.89	0.53
1:A:232:GLN:O	1:A:236:GLN:HG2	2.09	0.53
1:A:1167:GLN:O	1:A:1170:ARG:HG2	2.08	0.53
1:A:1186:LEU:N	1:A:1215:ILE:O	2.38	0.53
1:A:268:GLY:HA2	1:A:766:ASP:OD2	2.09	0.53
1:A:1021:ARG:CZ	1:A:1086:ASP:HA	2.39	0.53
1:A:574:VAL:HB	1:A:588:HIS:HD2	1.73	0.53
1:A:126:TYR:CD1	1:A:341:ILE:HG23	2.43	0.52
1:A:360:GLU:HA	1:A:441:TRP:CE3	2.45	0.52
1:A:761:GLN:HG3	1:A:762:HIS:N	2.25	0.52
1:A:819:ASP:OD2	1:A:820:ARG:NH1	2.42	0.52
1:A:453:PRO:HG2	1:A:512:LYS:HE2	1.91	0.52
1:A:797:ASN:HB3	1:A:802:ILE:HD11	1.92	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:905:VAL:O	1:A:909:THR:HG23	2.09	0.52
1:A:854:PRO:HA	1:A:857:VAL:HG22	1.91	0.52
1:A:1220:ARG:HB3	1:A:1224:ILE:HD12	1.91	0.52
1:A:413:VAL:O	1:A:416:ILE:HG22	2.09	0.52
1:A:994:ARG:HD2	1:A:995:SER:N	2.25	0.52
1:A:521:MET:SD	1:A:549:LEU:HD21	2.49	0.51
1:A:215:LEU:HB3	1:A:267:THR:HG22	1.92	0.51
1:A:776:VAL:O	1:A:780:MET:HG3	2.11	0.51
1:A:194:THR:O	1:A:198:VAL:HG23	2.10	0.51
1:A:31:GLU:O	1:A:34:ARG:HG2	2.10	0.51
1:A:157:MET:HE2	1:A:337:ALA:HB1	1.91	0.51
1:A:1021:ARG:H	1:A:1021:ARG:HD3	1.76	0.51
1:A:190:LEU:HA	1:A:193:VAL:HG22	1.93	0.51
1:A:754:ALA:O	1:A:758:ASN:HB2	2.11	0.51
1:A:713:LEU:HD23	1:A:750:LEU:HD22	1.91	0.51
1:A:1057:LEU:HA	1:A:1230:ILE:HG23	1.93	0.50
1:A:1139:ALA:HA	1:A:1204:ALA:HB1	1.93	0.50
1:A:912:LEU:C	1:A:915:PRO:HD2	2.36	0.50
1:A:713:LEU:HD13	1:A:754:ALA:HA	1.93	0.50
1:A:124:ILE:HD13	1:A:908:TYR:CD2	2.47	0.50
1:A:201:ILE:HD13	1:A:282:VAL:HG22	1.94	0.49
1:A:373:VAL:HG13	1:A:386:LEU:HB3	1.93	0.49
1:A:765:TRP:CG	1:A:822:SER:HG	2.30	0.49
1:A:253:TYR:O	1:A:257:LEU:HG	2.13	0.49
1:A:506:GLN:HG3	1:A:509:GLY:H	1.78	0.49
1:A:844:ARG:HA	1:A:847:LEU:HB2	1.94	0.49
1:A:1038:ASP:OD1	1:A:1039:ILE:HD12	2.12	0.49
1:A:1199:ARG:HG2	1:A:1199:ARG:HH11	1.77	0.49
1:A:770:GLU:O	1:A:774:LYS:HG2	2.12	0.49
1:A:542:GLU:OE2	1:A:542:GLU:N	2.28	0.49
1:A:850:VAL:HA	1:A:853:PHE:HB2	1.95	0.49
1:A:1165:GLY:O	1:A:1169:GLN:HG2	2.13	0.49
1:A:1148:LEU:HD13	1:A:1154:THR:HG23	1.94	0.48
1:A:572:ASP:OD1	1:A:573:LEU:N	2.47	0.48
1:A:66:ALA:HB2	1:A:309:ALA:HB2	1.96	0.48
1:A:250:SER:HA	1:A:781:LEU:HD23	1.96	0.48
1:A:466:LEU:HD21	1:A:519:ARG:NH1	2.27	0.48
1:A:476:ILE:HA	1:A:522:LEU:HD11	1.95	0.48
1:A:125:LYS:O	1:A:128:GLU:HG3	2.14	0.48
1:A:1043:ARG:N	1:A:1236:GLY:O	2.47	0.48
1:A:1117:TYR:CE1	1:A:1132:ILE:HD12	2.48	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:758:ASN:HA	1:A:761:GLN:HG2	1.96	0.48
1:A:780:MET:HE3	1:A:806:LEU:HG	1.94	0.48
1:A:1103:ALA:HB2	1:A:1179:ARG:HG2	1.95	0.48
1:A:157:MET:O	1:A:334:ALA:HB1	2.14	0.47
1:A:1027:LYS:HD3	1:A:1028:HIS:HB2	1.95	0.47
1:A:1095:LEU:O	1:A:1099:ARG:HB2	2.14	0.47
1:A:747:LEU:HD12	1:A:750:LEU:HD12	1.95	0.47
1:A:283:PHE:HB2	1:A:751:SER:HB3	1.96	0.47
1:A:801:ARG:HE	1:A:801:ARG:HA	1.79	0.47
1:A:66:ALA:HB1	1:A:306:LEU:HD23	1.97	0.47
1:A:1256:TYR:CE2	1:A:1260:ILE:HD11	2.49	0.47
1:A:727:VAL:O	1:A:736:MET:HG3	2.14	0.47
1:A:907:LEU:O	1:A:911:ASN:ND2	2.47	0.47
1:A:540:GLU:O	1:A:543:LYS:HG3	2.14	0.47
1:A:476:ILE:HG12	1:A:522:LEU:HD11	1.96	0.47
1:A:1016:VAL:HG21	1:A:1098:ILE:HG12	1.97	0.47
1:A:389:PHE:HD1	1:A:582:VAL:HB	1.80	0.46
1:A:689:LEU:HD21	1:A:772:LEU:HD21	1.96	0.46
1:A:781:LEU:HA	1:A:784:VAL:HG12	1.96	0.46
1:A:1074:ARG:HH11	1:A:1091:ARG:HA	1.79	0.46
1:A:422:PRO:HG3	1:A:435:LYS:HE2	1.97	0.46
1:A:547:GLU:O	1:A:551:ARG:NH2	2.32	0.46
1:A:79:VAL:HB	1:A:953:LYS:HG2	1.96	0.46
1:A:129:ALA:O	1:A:133:GLN:HG2	2.14	0.46
1:A:393:VAL:HG12	1:A:399:ILE:HD13	1.97	0.46
1:A:734:GLU:O	1:A:738:LYS:HG2	2.15	0.46
1:A:1175:ARG:HA	1:A:1178:VAL:HG12	1.98	0.46
1:A:1080:SER:O	1:A:1082:ARG:NH1	2.49	0.46
1:A:409:LYS:HE2	1:A:561:ILE:HD11	1.97	0.46
1:A:903:LYS:NZ	1:A:906:ARG:HE	2.13	0.46
1:A:544:LEU:O	1:A:548:ALA:N	2.49	0.46
1:A:798:GLU:O	1:A:802:ILE:HG12	2.16	0.46
1:A:758:ASN:OD1	1:A:761:GLN:NE2	2.49	0.45
1:A:823:VAL:HA	1:A:826:GLN:HG2	1.98	0.45
1:A:157:MET:CE	1:A:337:ALA:HB1	2.46	0.45
1:A:366:GLY:HA2	1:A:430:ASP:HB3	1.98	0.45
1:A:710:CYS:HA	1:A:713:LEU:HD12	1.97	0.45
1:A:34:ARG:HG3	1:A:35:PHE:CD1	2.51	0.45
1:A:1228:HIS:ND1	1:A:1229:VAL:HG13	2.31	0.45
1:A:157:MET:HE2	1:A:337:ALA:C	2.42	0.45
1:A:1120:ILE:HG22	1:A:1178:VAL:HG11	1.98	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1175:ARG:O	1:A:1178:VAL:HG12	2.17	0.45
1:A:597:ASN:OD1	1:A:598:GLY:N	2.49	0.45
1:A:375:PHE:CE1	1:A:421:ASP:HB2	2.52	0.45
1:A:1109:PRO:O	1:A:1168:LYS:HD2	2.16	0.45
1:A:723:ALA:O	1:A:727:VAL:HG23	2.16	0.45
1:A:773:THR:HB	1:A:814:ARG:HB2	1.98	0.45
1:A:68:LEU:HD22	1:A:945:LEU:HD13	1.98	0.45
1:A:280:PHE:HA	1:A:751:SER:HB2	1.99	0.45
1:A:368:VAL:HA	1:A:428:LEU:O	2.17	0.45
1:A:521:MET:HE2	1:A:521:MET:HA	1.99	0.45
1:A:553:MET:SD	1:A:554:ILE:N	2.90	0.45
1:A:475:GLU:HA	1:A:478:GLU:HB2	1.98	0.44
1:A:755:LEU:O	1:A:759:THR:HG23	2.17	0.44
1:A:418:ARG:HD2	1:A:439:LEU:HD13	1.99	0.44
1:A:574:VAL:HB	1:A:588:HIS:CD2	2.51	0.44
1:A:689:LEU:HD11	1:A:772:LEU:HD11	1.99	0.44
1:A:1131:GLU:O	1:A:1134:GLN:HG3	2.17	0.44
1:A:494:ASP:OD2	1:A:498:THR:HG22	2.18	0.44
1:A:200:LEU:O	1:A:204:ILE:HG12	2.18	0.44
1:A:534:THR:HG22	1:A:562:ALA:HB2	2.00	0.44
1:A:141:GLU:HG2	1:A:142:VAL:H	1.81	0.44
1:A:1254:GLY:O	1:A:1258:ARG:NH1	2.26	0.44
1:A:689:LEU:HD22	1:A:993:MET:HE2	1.99	0.44
1:A:350:THR:HG22	1:A:420:TYR:HE2	1.83	0.43
1:A:1109:PRO:HG2	1:A:1168:LYS:HG2	1.99	0.43
1:A:1145:ILE:HG22	1:A:1152:TYR:HB2	2.00	0.43
1:A:1120:ILE:HB	1:A:1132:ILE:HD13	2.00	0.43
1:A:381:PRO:O	1:A:383:VAL:HG13	2.18	0.43
1:A:948:ALA:HB1	1:A:962:THR:HB	2.01	0.43
1:A:312:PHE:O	1:A:316:ILE:HG12	2.18	0.43
1:A:462:GLU:OE2	1:A:903:LYS:HD2	2.19	0.43
1:A:162:ILE:HA	1:A:166:LEU:HB2	2.00	0.43
1:A:443:ARG:O	1:A:523:LYS:NZ	2.49	0.43
1:A:298:ARG:HD3	1:A:737:ILE:HD11	2.00	0.43
1:A:135:ILE:HD12	1:A:893:ARG:HG2	2.00	0.43
1:A:157:MET:HE2	1:A:337:ALA:O	2.19	0.43
1:A:484:ASN:H	1:A:548:ALA:HB2	1.84	0.43
1:A:1124:HIS:HD2	1:A:1126:CYS:HB2	1.82	0.43
1:A:187:VAL:HG22	1:A:302:THR:HG21	2.01	0.42
1:A:232:GLN:HA	1:A:235:VAL:HG22	2.00	0.42
1:A:372:ASN:OD1	1:A:373:VAL:N	2.51	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1109:PRO:HG2	1:A:1168:LYS:HE3	2.01	0.42
1:A:1150:GLU:CD	1:A:1151:GLY:N	2.77	0.42
1:A:1187:ASP:CG	1:A:1188:GLU:H	2.27	0.42
1:A:1261:GLN:HA	1:A:1264:ARG:HE	1.84	0.42
1:A:994:ARG:O	1:A:998:GLU:HG2	2.20	0.42
1:A:1047:LEU:HD11	1:A:1055:LEU:HD23	2.00	0.42
1:A:1054:THR:OG1	1:A:1209:CYS:HB3	2.20	0.42
1:A:458:THR:CG2	1:A:459:SER:H	2.27	0.42
1:A:1045:LEU:HD21	1:A:1047:LEU:HB2	2.01	0.42
1:A:63:ARG:NH1	1:A:67:ASP:OD1	2.53	0.42
1:A:359:VAL:HG12	1:A:361:LEU:H	1.84	0.42
1:A:366:GLY:N	1:A:556:ARG:HH22	2.17	0.42
1:A:789:MET:HB2	1:A:1075:PHE:O	2.20	0.42
1:A:234:VAL:HG12	1:A:792:PHE:CE2	2.47	0.41
1:A:438:LYS:O	1:A:439:LEU:HB3	2.19	0.41
1:A:1199:ARG:HG2	1:A:1199:ARG:NH1	2.35	0.41
1:A:50:GLY:O	1:A:103:SER:HB3	2.20	0.41
1:A:111:TRP:HB3	1:A:163:SER:O	2.20	0.41
1:A:230:VAL:O	1:A:234:VAL:HG22	2.19	0.41
1:A:372:ASN:ND2	1:A:424:SER:HB2	2.32	0.41
1:A:126:TYR:OH	1:A:147:VAL:HG13	2.20	0.41
1:A:569:ARG:NH1	1:A:588:HIS:CE1	2.89	0.41
1:A:161:ALA:O	1:A:166:LEU:N	2.53	0.41
1:A:367:LEU:H	1:A:430:ASP:HB3	1.84	0.41
1:A:396:GLY:HA2	1:A:554:ILE:HA	2.01	0.41
1:A:689:LEU:HA	1:A:692:MET:HG2	2.02	0.41
1:A:69:VAL:HG12	1:A:729:TYR:HE2	1.85	0.41
1:A:250:SER:HA	1:A:781:LEU:CD2	2.50	0.41
1:A:1194:ASP:OD1	1:A:1195:ALA:N	2.53	0.41
1:A:271:LYS:HE3	1:A:762:HIS:ND1	2.35	0.41
1:A:459:SER:HB2	1:A:499:GLN:OE1	2.21	0.41
1:A:527:ILE:HA	1:A:556:ARG:HG3	2.03	0.41
1:A:746:LEU:O	1:A:750:LEU:HG	2.21	0.41
1:A:123:ARG:CZ	1:A:154:ASP:HB3	2.51	0.41
1:A:166:LEU:HA	1:A:331:PHE:HZ	1.85	0.41
1:A:176:PHE:HA	1:A:317:GLY:HA2	2.02	0.41
1:A:484:ASN:HD21	1:A:517:ILE:HB	1.85	0.41
1:A:852:VAL:O	1:A:856:VAL:HG23	2.21	0.41
1:A:884:LEU:HD13	1:A:911:ASN:ND2	2.35	0.41
1:A:67:ASP:HB3	1:A:89:TYR:CZ	2.56	0.41
1:A:116:GLU:HG3	1:A:916:LEU:HD12	2.02	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1038:ASP:OD1	1:A:1038:ASP:N	2.53	0.41
1:A:1116:ILE:HA	1:A:1119:ASN:ND2	2.36	0.40
1:A:119:THR:OG1	1:A:158:VAL:HG13	2.21	0.40
1:A:453:PRO:HG3	1:A:513:GLN:OE1	2.21	0.40
1:A:456:PHE:HE1	1:A:888:ALA:HA	1.86	0.40
1:A:1134:GLN:O	1:A:1138:LEU:HG	2.21	0.40
1:A:1195:ALA:O	1:A:1199:ARG:HG3	2.22	0.40
1:A:555:GLY:C	1:A:556:ARG:HD3	2.46	0.40
1:A:236:GLN:NE2	1:A:1112:PHE:CE1	2.89	0.40
1:A:409:LYS:HD2	1:A:559:LEU:HD13	2.02	0.40
1:A:231:GLU:O	1:A:235:VAL:HG13	2.22	0.40
1:A:765:TRP:HA	1:A:768:VAL:HG12	2.04	0.40
1:A:1052:GLY:HA3	1:A:1212:ARG:HH21	1.86	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 PDB entries followed by that with respect to all EM entries.

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	1161/1327 (88%)	1106 (95%)	55 (5%)	0	100	100

There are no Ramachandran outliers to report.

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 PDB entries followed by that with respect to all EM entries.

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	949/1087 (87%)	947 (100%)	2 (0%)	92 96

All (2) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	263	LEU
1	A	286	TYR

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

Mol	Chain	Res	Type
1	A	70	ASN
1	A	136	GLN
1	A	208	HIS
1	A	236	GLN
1	A	261	GLN
1	A	387	ASN
1	A	445	GLN
1	A	484	ASN
1	A	506	GLN
1	A	863	GLN
1	A	899	ASN
1	A	1124	HIS

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 oligosaccharides 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.