



## Full wwPDB EM Validation Report ⓘ

Jan 4, 2026 – 01:19 AM JST

PDB ID : 9LKM / pdb\_00009lkm  
EMDB ID : EMD-63182  
Title : Focused map of C1ql1-gC1q trimer and BAI3-eCUB complex  
Authors : Liao, L.; Niu, F.; Wei, Z.  
Deposited on : 2025-01-16  
Resolution : 3.34 Å(reported)  
Based on initial models : ., 4qq2

This is a Full wwPDB EM Validation Report for a publicly released PDB entry.

We welcome your comments at [validation@mail.wwpdb.org](mailto: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>.

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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 Phenix2.0  
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)  
EM percentile statistics : **NOT EXECUTED**  
MapQ : **FAILED**  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.47

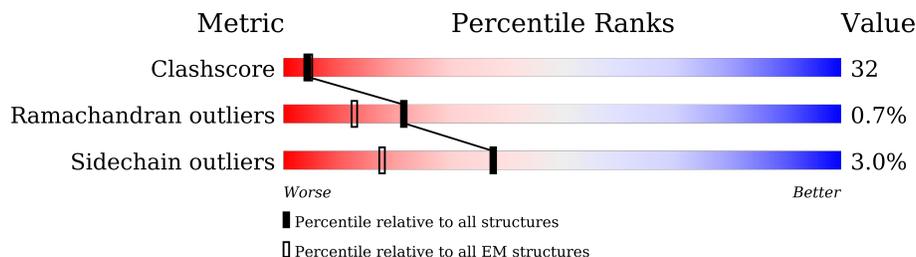
# 1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

*ELECTRON MICROSCOPY*

The reported resolution of this entry is 3.34 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  $\geq 3$ , 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  $\leq 5\%$ .

Mol	Chain	Length	Quality of chain
1	A	140	57% 36% 6%
1	B	140	62% 32% 6%
1	C	140	48% 32% 20%
1	H	140	11% 9% 79%
2	D	238	19% 45% 31%

## 2 Entry composition i

There are 3 unique types of molecules in this entry. The entry contains 4445 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 C1q-related factor.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	132	1017	643	170	200	4	0	0
1	B	132	1017	643	170	200	4	0	0
1	C	112	869	553	142	172	2	0	0
1	H	29	206	120	39	45	2	0	0

There are 24 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	119	GLY	-	expression tag	UNP O88992
A	120	PRO	-	expression tag	UNP O88992
A	121	GLY	-	expression tag	UNP O88992
A	122	SER	-	expression tag	UNP O88992
A	123	GLU	-	expression tag	UNP O88992
A	124	PHE	-	expression tag	UNP O88992
B	119	GLY	-	expression tag	UNP O88992
B	120	PRO	-	expression tag	UNP O88992
B	121	GLY	-	expression tag	UNP O88992
B	122	SER	-	expression tag	UNP O88992
B	123	GLU	-	expression tag	UNP O88992
B	124	PHE	-	expression tag	UNP O88992
C	119	GLY	-	expression tag	UNP O88992
C	120	PRO	-	expression tag	UNP O88992
C	121	GLY	-	expression tag	UNP O88992
C	122	SER	-	expression tag	UNP O88992
C	123	GLU	-	expression tag	UNP O88992
C	124	PHE	-	expression tag	UNP O88992
H	119	GLY	-	expression tag	UNP O88992
H	120	PRO	-	expression tag	UNP O88992
H	121	GLY	-	expression tag	UNP O88992
H	122	SER	-	expression tag	UNP O88992

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Chain	Residue	Modelled	Actual	Comment	Reference
H	123	GLU	-	expression tag	UNP O88992
H	124	PHE	-	expression tag	UNP O88992

- Molecule 2 is a protein called Adhesion G protein-coupled receptor B3.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	D	164	1333	860	218	242	13	0	0

There are 9 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
D	22	ALA	-	expression tag	UNP O60242
D	23	GLY	-	expression tag	UNP O60242
D	24	SER	ALA	conflict	UNP O60242
D	254	GLU	-	expression tag	UNP O60242
D	255	ASN	-	expression tag	UNP O60242
D	256	LEU	-	expression tag	UNP O60242
D	257	TYR	-	expression tag	UNP O60242
D	258	PHE	-	expression tag	UNP O60242
D	259	GLN	-	expression tag	UNP O60242

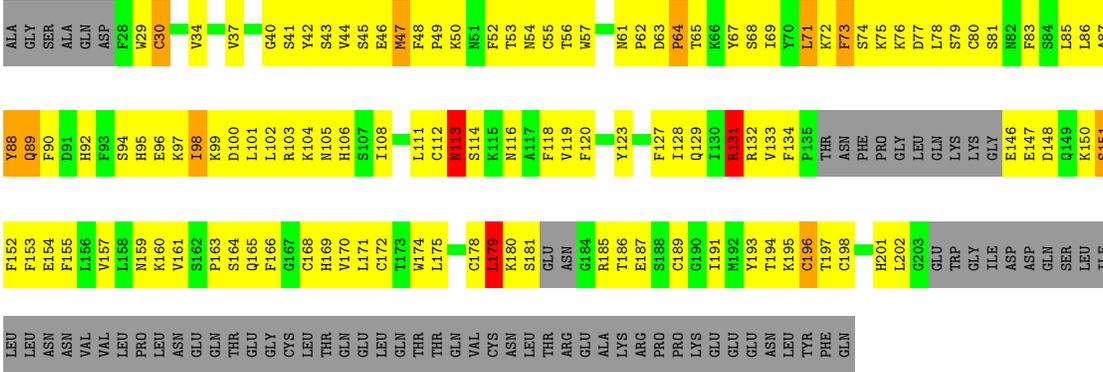
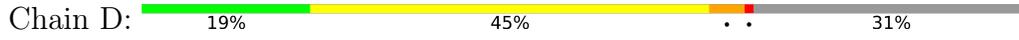
- Molecule 3 is CALCIUM ION (CCD ID: CA) (formula: Ca) (labeled as "Ligand of Interest" by depositor).

Mol	Chain	Residues	Atoms		AltConf
3	A	2	Total	Ca	0
			2	2	
3	C	1	Total	Ca	0
			1	1	



Tyr  
Ser  
Thr  
Phe  
Ser  
Gly  
Phe  
Ile  
Ile  
Tyr  
Ser  
Ser  
Asp

• Molecule 2: Adhesion G protein-coupled receptor B3



## 4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	73947	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	NONE	Depositor
Microscope	TFS KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ( $e^-/\text{\AA}^2$ )	50	Depositor
Minimum defocus (nm)	1500	Depositor
Maximum defocus (nm)	2500	Depositor
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor

## 5 Model quality [i](#)

### 5.1 Standard geometry [i](#)

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	0.50	0/1042	0.65	0/1410
1	B	0.42	0/1042	0.64	1/1410 (0.1%)
1	C	0.44	0/891	0.61	0/1204
1	H	0.46	0/207	0.64	0/278
2	D	0.91	1/1367 (0.1%)	1.23	2/1840 (0.1%)
All	All	0.63	1/4549 (0.0%)	0.86	3/6142 (0.0%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand. A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
2	D	0	1

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	D	85	LEU	C-O	5.45	1.30	1.23

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	D	170	VAL	N-CA-C	-6.28	104.63	110.53
1	B	169	ASN	N-CA-C	-5.96	106.62	114.31
2	D	89	GLN	CA-C-O	-5.30	115.46	121.72

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
2	D	131	ARG	Sidechain

## 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	1017	0	946	46	0
1	B	1017	0	946	32	0
1	C	869	0	798	43	0
1	H	206	0	186	19	0
2	D	1333	0	1285	156	0
3	A	2	0	0	0	0
3	C	1	0	0	0	0
All	All	4445	0	4161	273	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 32.

All (273) 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)
2:D:52:PHE:HB2	2:D:55:CYS:SG	1.76	1.25
2:D:67:TYR:HB3	2:D:157:VAL:CG1	1.89	1.01
2:D:198:CYS:H	2:D:202:LEU:HD12	1.24	0.98
2:D:34:VAL:HG12	2:D:37:VAL:HG21	1.49	0.95
1:C:137:LYS:HG3	1:C:243:ASN:HA	1.49	0.94
2:D:52:PHE:CB	2:D:55:CYS:SG	2.56	0.93
2:D:54:ASN:HA	2:D:133:VAL:HG12	1.50	0.93
1:C:232:ILE:HD13	1:H:194:LEU:HB2	1.54	0.88
1:A:168:CYS:SG	1:A:174:TYR:CE1	2.66	0.88
1:C:147:LYS:HA	1:C:164:GLY:HA3	1.57	0.87
1:C:231:PHE:O	1:H:194:LEU:HD12	1.76	0.84
2:D:68:SER:HB2	2:D:160:LYS:HE2	1.58	0.83
1:C:183:ARG:HB2	1:C:240:HIS:HB2	1.59	0.82
2:D:131:ARG:HG3	2:D:133:VAL:HG13	1.60	0.81
1:B:149:ASP:HA	1:B:161:ALA:HB1	1.66	0.78
2:D:45:SER:HB2	2:D:148:ASP:HB3	1.66	0.78

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:168:CYS:SG	1:A:174:TYR:CZ	2.76	0.78
2:D:52:PHE:O	2:D:55:CYS:SG	2.42	0.78
1:A:129:ARG:NH1	1:B:256:TYR:HB3	2.00	0.76
2:D:179:LEU:O	2:D:186:THR:HA	1.86	0.75
2:D:169:HIS:HA	2:D:172:CYS:HB2	1.69	0.74
2:D:171:LEU:HD21	2:D:193:TYR:HB3	1.69	0.73
1:A:140:HIS:HB2	1:A:146:LEU:CD2	2.19	0.72
2:D:67:TYR:HB3	2:D:157:VAL:HG11	1.73	0.71
2:D:175:LEU:CD2	2:D:191:ILE:HB	2.21	0.70
1:A:183:ARG:HA	1:A:240:HIS:HB2	1.74	0.69
1:A:181:LEU:HD11	1:A:213:TYR:HB3	1.75	0.68
1:C:186:ASP:HB2	1:H:186:ASP:OD2	1.95	0.67
2:D:112:CYS:C	2:D:114:SER:H	2.02	0.66
2:D:104:LYS:HB3	2:D:106:HIS:CD2	2.31	0.66
2:D:53:THR:HG23	2:D:134:PHE:H	1.60	0.66
1:C:216:ALA:HB2	1:H:206:ALA:HB2	1.78	0.65
2:D:77:ASP:OD2	2:D:147:GLU:HB3	1.96	0.65
2:D:45:SER:CB	2:D:148:ASP:HB3	2.27	0.64
2:D:88:TYR:HE2	2:D:98:ILE:HG22	1.62	0.64
2:D:94:SER:HB2	2:D:98:ILE:HB	1.79	0.64
1:B:223:HIS:NE2	1:B:258:ASP:OD2	2.31	0.64
2:D:30:CYS:SG	2:D:52:PHE:HB2	2.38	0.63
2:D:50:LYS:HB3	2:D:52:PHE:CD1	2.34	0.63
1:A:191:TRP:HB2	1:A:235:ASP:O	1.99	0.63
2:D:34:VAL:HG12	2:D:37:VAL:CG2	2.26	0.63
2:D:42:TYR:HB3	2:D:46:GLU:HB3	1.80	0.63
1:A:128:PRO:HB3	1:A:170:ILE:HD13	1.81	0.62
2:D:97:LYS:HD2	2:D:100:ASP:HB3	1.81	0.62
1:C:149:ASP:O	1:C:161:ALA:HB1	1.99	0.62
2:D:175:LEU:HD21	2:D:191:ILE:HB	1.80	0.62
2:D:171:LEU:HD21	2:D:193:TYR:CB	2.29	0.62
2:D:147:GLU:HA	2:D:150:LYS:HB2	1.81	0.62
1:C:165:LYS:HG3	1:C:231:PHE:HB3	1.82	0.61
2:D:98:ILE:O	2:D:104:LYS:HD2	1.99	0.61
1:C:182:MET:HE1	1:H:188:THR:O	2.00	0.61
2:D:171:LEU:O	2:D:175:LEU:HG	2.00	0.61
1:C:151:VAL:HG21	1:C:154:ASN:HB2	1.82	0.61
1:C:245:ASN:HB3	1:C:247:TYR:CE1	2.35	0.61
1:B:191:TRP:NE1	1:B:205:ILE:HD13	2.15	0.61
1:C:160:ASP:HB2	1:C:163:SER:OG	2.00	0.61
1:A:168:CYS:SG	1:A:174:TYR:OH	2.58	0.60

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:194:THR:O	2:D:195:LYS:HB2	2.01	0.60
2:D:72:LYS:HB2	2:D:120:PHE:CE1	2.36	0.60
1:C:175:PHE:HB2	1:C:255:ILE:HD11	1.82	0.60
1:C:245:ASN:HB3	1:C:247:TYR:HE1	1.67	0.60
1:B:171:PRO:HG3	1:B:226:ALA:HB2	1.82	0.60
1:B:139:PRO:HG2	2:D:92:HIS:CE1	2.37	0.60
1:A:210:ASP:OD2	1:B:209:ALA:HB2	2.02	0.59
2:D:198:CYS:H	2:D:202:LEU:CD1	2.08	0.59
2:D:69:ILE:HG21	2:D:128:ILE:HD12	1.84	0.59
2:D:67:TYR:HB3	2:D:157:VAL:HG13	1.81	0.59
2:D:175:LEU:HD23	2:D:191:ILE:HD12	1.83	0.59
2:D:42:TYR:HD1	2:D:46:GLU:HG2	1.68	0.59
2:D:164:SER:O	2:D:168:CYS:N	2.35	0.59
1:A:215:TYR:OH	1:B:204:ALA:HA	2.03	0.59
1:B:191:TRP:CD1	1:B:205:ILE:HD13	2.38	0.59
1:A:245:ASN:HB3	1:A:247:TYR:CE1	2.36	0.58
2:D:56:THR:HG22	2:D:131:ARG:HA	1.85	0.58
1:C:229:GLU:OE2	1:H:197:ASN:HA	2.04	0.58
1:A:146:LEU:HD12	1:A:232:ILE:HG21	1.86	0.58
2:D:48:PHE:CG	2:D:132:ARG:HD3	2.39	0.58
2:D:178:CYS:C	2:D:180:LYS:N	2.61	0.58
2:D:83:PHE:CD1	2:D:132:ARG:HG3	2.39	0.58
2:D:88:TYR:CE2	2:D:98:ILE:HG22	2.38	0.57
2:D:114:SER:C	2:D:116:ASN:H	2.13	0.57
2:D:53:THR:CG2	2:D:134:PHE:HB3	2.34	0.57
2:D:89:GLN:OE1	2:D:123:TYR:HB3	2.03	0.57
1:A:243:ASN:N	1:A:243:ASN:OD1	2.36	0.57
2:D:53:THR:HG22	2:D:54:ASN:ND2	2.19	0.57
1:A:191:TRP:NE1	1:A:205:ILE:HD12	2.20	0.57
2:D:90:PHE:O	2:D:127:PHE:HB2	2.05	0.57
2:D:61:ASN:ND2	2:D:64:PRO:HA	2.19	0.57
1:A:133:TYR:HD1	1:A:251:SER:HB3	1.68	0.56
1:B:191:TRP:HB2	1:B:235:ASP:O	2.04	0.56
2:D:78:LEU:HD12	2:D:78:LEU:H	1.70	0.56
2:D:146:GLU:O	2:D:150:LYS:HG3	2.05	0.56
1:B:202:ALA:HB2	1:B:220:VAL:HG11	1.87	0.56
2:D:45:SER:HB2	2:D:148:ASP:CB	2.35	0.56
2:D:74:SER:C	2:D:76:LYS:H	2.14	0.56
1:C:235:ASP:HB2	1:H:191:TRP:O	2.05	0.56
2:D:30:CYS:SG	2:D:52:PHE:CB	2.94	0.55
1:A:245:ASN:HB3	1:A:247:TYR:HE1	1.70	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:102:LEU:C	2:D:104:LYS:N	2.63	0.55
2:D:57:TRP:CZ3	2:D:153:PHE:HE2	2.24	0.55
1:C:133:TYR:HE1	1:C:249:THR:HB	1.71	0.55
2:D:112:CYS:O	2:D:114:SER:N	2.38	0.55
2:D:147:GLU:HA	2:D:150:LYS:HD2	1.88	0.55
2:D:77:ASP:HB3	2:D:151:SER:OG	2.07	0.55
1:A:140:HIS:HB2	1:A:146:LEU:HD23	1.87	0.55
2:D:198:CYS:N	2:D:202:LEU:HD12	2.08	0.55
2:D:123:TYR:HB2	2:D:128:ILE:HD11	1.89	0.54
2:D:198:CYS:O	2:D:202:LEU:HB2	2.07	0.54
2:D:201:HIS:O	2:D:202:LEU:HD23	2.07	0.54
2:D:44:VAL:O	2:D:47:MET:HG2	2.08	0.54
1:A:244:SER:O	1:A:246:LYS:HG3	2.07	0.54
1:H:186:ASP:CG	1:H:187:GLY:H	2.15	0.54
2:D:94:SER:HB2	2:D:98:ILE:CG1	2.39	0.53
2:D:62:PRO:HB2	2:D:67:TYR:CD2	2.44	0.53
2:D:112:CYS:C	2:D:114:SER:N	2.66	0.53
2:D:88:TYR:HB3	2:D:108:ILE:CD1	2.39	0.53
1:A:186:ASP:OD2	1:A:238:LYS:HG3	2.08	0.53
2:D:78:LEU:HB2	2:D:81:SER:HB3	1.91	0.53
2:D:154:GLU:HB2	2:D:174:TRP:HZ2	1.73	0.53
1:A:163:SER:O	1:A:165:LYS:HG3	2.08	0.52
1:C:145:VAL:HG12	1:C:233:LYS:HB2	1.91	0.52
2:D:179:LEU:HB3	2:D:186:THR:HG23	1.90	0.52
1:C:141:GLU:O	1:C:144:GLU:HG2	2.09	0.52
1:B:151:VAL:HG13	1:B:161:ALA:HB2	1.91	0.52
2:D:90:PHE:CZ	2:D:127:PHE:HB3	2.45	0.52
2:D:178:CYS:C	2:D:180:LYS:H	2.18	0.52
2:D:34:VAL:CG1	2:D:37:VAL:HG21	2.30	0.51
2:D:95:HIS:O	2:D:129:GLN:NE2	2.42	0.51
1:A:127:VAL:HB	1:A:128:PRO:HD3	1.92	0.51
1:B:233:LYS:HD3	1:B:234:LEU:N	2.25	0.51
1:C:167:THR:HG23	1:C:167:THR:O	2.11	0.51
1:A:181:LEU:HD23	1:A:240:HIS:ND1	2.26	0.51
2:D:40:GLY:HA3	2:D:155:PHE:CZ	2.46	0.51
2:D:29:TRP:CB	2:D:96:GLU:HG3	2.41	0.51
1:A:148:PHE:HB2	1:A:159:TYR:OH	2.11	0.50
2:D:153:PHE:CZ	2:D:155:PHE:HD2	2.29	0.50
2:D:87:ALA:HB2	2:D:111:LEU:HD11	1.94	0.50
1:B:165:LYS:HG2	1:B:231:PHE:HB3	1.94	0.50
1:A:140:HIS:HB3	1:A:144:GLU:OE2	2.11	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:163:PRO:HG3	2:D:196:CYS:HB2	1.94	0.49
2:D:178:CYS:O	2:D:180:LYS:N	2.44	0.49
2:D:198:CYS:HB2	2:D:202:LEU:HG	1.95	0.49
2:D:98:ILE:HA	2:D:104:LYS:HZ2	1.77	0.49
1:C:230:VAL:CG1	1:H:194:LEU:HD11	2.43	0.49
1:C:212:ASN:HA	1:H:210:ASP:OD2	2.12	0.49
1:C:183:ARG:CB	1:C:240:HIS:HB2	2.39	0.49
1:C:230:VAL:HG13	1:H:194:LEU:HD11	1.95	0.48
1:C:232:ILE:HD13	1:H:194:LEU:HD13	1.94	0.48
1:C:233:LYS:N	1:H:193:ASP:O	2.46	0.48
2:D:63:ASP:C	2:D:65:THR:H	2.22	0.48
1:A:190:MET:CB	1:A:237:GLY:HA3	2.43	0.48
1:B:244:SER:O	1:B:246:LYS:HG3	2.14	0.48
2:D:104:LYS:HB3	2:D:106:HIS:NE2	2.27	0.48
2:D:88:TYR:HB3	2:D:108:ILE:HD13	1.96	0.48
1:A:165:LYS:HD3	1:A:229:GLU:OE2	2.14	0.48
1:A:210:ASP:O	1:A:211:GLN:HB2	2.14	0.48
1:B:128:PRO:HG2	1:B:257:SER:OG	2.14	0.47
2:D:63:ASP:O	2:D:65:THR:N	2.47	0.47
1:B:197:ASN:N	1:B:229:GLU:O	2.41	0.47
2:D:48:PHE:HB2	2:D:132:ARG:NH2	2.29	0.47
2:D:67:TYR:HB3	2:D:157:VAL:HG12	1.91	0.47
2:D:94:SER:HB2	2:D:98:ILE:CB	2.43	0.47
1:A:175:PHE:HB2	1:A:255:ILE:HD11	1.96	0.47
2:D:193:TYR:CE1	2:D:197:THR:HG22	2.50	0.47
1:B:137:LYS:C	1:B:138:ASN:HD22	2.23	0.47
2:D:42:TYR:HA	2:D:46:GLU:OE1	2.15	0.46
1:C:183:ARG:HG3	1:C:213:TYR:CE1	2.51	0.46
2:D:80:CYS:HA	2:D:83:PHE:O	2.16	0.46
2:D:103:ARG:C	2:D:105:ASN:N	2.70	0.46
2:D:78:LEU:HB2	2:D:81:SER:CB	2.45	0.46
2:D:94:SER:HB3	2:D:98:ILE:H	1.80	0.46
2:D:96:GLU:O	2:D:100:ASP:N	2.46	0.46
1:A:179:HIS:HB3	1:A:215:TYR:HD2	1.81	0.46
2:D:90:PHE:CE1	2:D:129:GLN:HB2	2.50	0.46
2:D:114:SER:C	2:D:116:ASN:N	2.72	0.46
1:B:151:VAL:CG1	1:B:161:ALA:HB2	2.46	0.46
1:C:147:LYS:CA	1:C:164:GLY:HA3	2.39	0.46
2:D:71:LEU:HD23	2:D:155:PHE:HB3	1.98	0.46
2:D:114:SER:CB	2:D:119:VAL:HG22	2.46	0.46
1:C:182:MET:HE1	1:H:188:THR:C	2.41	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:145:VAL:HA	1:C:233:LYS:HA	1.98	0.46
1:A:181:LEU:HD22	1:A:247:TYR:HD2	1.81	0.45
2:D:74:SER:C	2:D:76:LYS:N	2.73	0.45
2:D:179:LEU:O	2:D:186:THR:CA	2.62	0.45
2:D:180:LYS:O	2:D:181:SER:C	2.59	0.45
1:A:133:TYR:HE1	1:A:249:THR:HB	1.82	0.45
1:B:133:TYR:HE1	1:B:249:THR:HB	1.82	0.45
2:D:99:LYS:O	2:D:100:ASP:C	2.57	0.45
2:D:159:ASN:C	2:D:161:VAL:H	2.24	0.45
1:A:192:ALA:C	1:A:193:ASP:OD1	2.60	0.45
2:D:193:TYR:HE1	2:D:197:THR:HG22	1.82	0.45
1:B:234:LEU:HD12	1:B:234:LEU:HA	1.83	0.44
2:D:69:ILE:HG21	2:D:128:ILE:CD1	2.48	0.44
1:A:221:ILE:HD11	1:C:253:PHE:HD1	1.82	0.44
1:C:171:PRO:HB3	1:C:225:ASP:HA	2.00	0.44
1:A:215:TYR:HE1	1:B:205:ILE:H	1.66	0.44
2:D:88:TYR:N	2:D:88:TYR:CD1	2.84	0.44
2:D:198:CYS:HB2	2:D:202:LEU:CG	2.47	0.44
2:D:53:THR:HG21	2:D:134:PHE:HB3	1.99	0.44
1:B:202:ALA:HB1	1:B:218:ASN:ND2	2.33	0.44
2:D:48:PHE:HB2	2:D:132:ARG:HH21	1.82	0.44
2:D:74:SER:HB2	2:D:76:LYS:HD3	2.00	0.44
2:D:98:ILE:HA	2:D:104:LYS:NZ	2.32	0.44
2:D:113:ASN:N	2:D:113:ASN:HD22	2.15	0.44
2:D:168:CYS:O	2:D:171:LEU:HB3	2.18	0.44
1:A:146:LEU:HD12	1:A:232:ILE:CG2	2.46	0.44
1:B:178:TYR:CE1	1:B:218:ASN:HB3	2.53	0.44
1:A:139:PRO:HB2	1:A:183:ARG:NH2	2.33	0.43
1:C:141:GLU:OE1	1:C:238:LYS:HG2	2.18	0.43
2:D:114:SER:HB3	2:D:119:VAL:HG22	2.00	0.43
2:D:165:GLN:CD	2:D:165:GLN:H	2.26	0.43
2:D:73:PHE:CE2	2:D:153:PHE:CD1	3.06	0.43
1:C:184:GLY:O	1:C:212:ASN:HB2	2.18	0.43
2:D:179:LEU:N	2:D:189:CYS:SG	2.91	0.43
1:A:190:MET:HA	1:A:237:GLY:HA3	2.01	0.43
1:B:148:PHE:HB2	1:B:159:TYR:OH	2.18	0.43
1:B:191:TRP:HB3	1:B:235:ASP:HB3	2.00	0.43
1:C:137:LYS:HA	1:C:242:GLY:O	2.18	0.43
1:C:232:ILE:CD1	1:H:194:LEU:HD13	2.48	0.43
2:D:175:LEU:O	2:D:179:LEU:HD12	2.18	0.43
2:D:94:SER:HB2	2:D:98:ILE:HG12	2.00	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:68:SER:O	2:D:157:VAL:HA	2.19	0.43
2:D:169:HIS:CA	2:D:172:CYS:HB2	2.45	0.43
2:D:178:CYS:C	2:D:189:CYS:SG	3.02	0.43
1:C:234:LEU:HD13	1:H:190:MET:HE2	2.01	0.43
2:D:44:VAL:HG11	2:D:79:SER:HB2	2.00	0.43
2:D:53:THR:O	2:D:54:ASN:HB2	2.18	0.43
1:A:166:PHE:HB3	1:A:230:VAL:HG22	2.01	0.42
1:A:133:TYR:CD1	1:A:251:SER:HB3	2.53	0.42
2:D:34:VAL:CG1	2:D:37:VAL:HG11	2.49	0.42
2:D:101:LEU:HB2	2:D:104:LYS:HE3	2.01	0.42
1:B:133:TYR:CD2	1:B:152:VAL:HB	2.55	0.42
2:D:104:LYS:O	2:D:105:ASN:C	2.62	0.42
2:D:166:PHE:CD1	2:D:166:PHE:C	2.98	0.42
1:A:191:TRP:HE1	1:A:205:ILE:HD12	1.84	0.42
2:D:53:THR:HG23	2:D:134:PHE:HB3	2.02	0.42
2:D:153:PHE:CD1	2:D:154:GLU:N	2.88	0.42
1:H:184:GLY:N	1:H:211:GLN:HG3	2.34	0.42
1:C:178:TYR:CG	1:C:232:ILE:HD12	2.55	0.42
2:D:43:SER:HA	2:D:152:PHE:HA	2.02	0.42
2:D:102:LEU:C	2:D:104:LYS:H	2.27	0.41
1:B:188:THR:O	1:B:207:GLN:HA	2.19	0.41
2:D:57:TRP:CZ3	2:D:153:PHE:CE2	3.06	0.41
2:D:86:LEU:HD11	2:D:131:ARG:HB3	2.02	0.41
2:D:42:TYR:CD1	2:D:46:GLU:HG2	2.50	0.41
2:D:56:THR:HB	2:D:129:GLN:HE21	1.86	0.41
2:D:75:LYS:C	2:D:77:ASP:N	2.75	0.41
1:B:182:MET:HG3	1:B:190:MET:CG	2.51	0.41
1:C:154:ASN:ND2	1:C:159:TYR:O	2.50	0.41
1:C:234:LEU:HD13	1:H:190:MET:CE	2.51	0.41
2:D:75:LYS:HD2	2:D:114:SER:OG	2.20	0.41
2:D:61:ASN:OD1	2:D:62:PRO:HD2	2.20	0.41
1:A:170:ILE:O	1:A:174:TYR:OH	2.33	0.41
2:D:69:ILE:HB	2:D:123:TYR:O	2.21	0.41
1:A:143:TYR:HA	1:A:234:LEU:O	2.21	0.41
2:D:75:LYS:HG2	2:D:75:LYS:O	2.21	0.41
1:C:147:LYS:HD3	1:C:162:ALA:O	2.21	0.41
2:D:72:LYS:HE2	2:D:118:PHE:CD1	2.56	0.41
1:B:199:GLN:HG3	1:B:201:ARG:HE	1.86	0.40
2:D:47:MET:HE3	2:D:47:MET:HB3	1.62	0.40
2:D:73:PHE:N	2:D:73:PHE:CD1	2.89	0.40
2:D:120:PHE:CE2	2:D:178:CYS:HB2	2.56	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:H:194:LEU:HB3	1:H:202:ALA:HB3	2.03	0.40
2:D:75:LYS:O	2:D:76:LYS:C	2.65	0.40
1:A:147:LYS:HE2	1:A:163:SER:C	2.46	0.40
1:A:132:PHE:HA	1:A:153:THR:O	2.20	0.40
1:A:177:THR:HG21	1:B:219:SER:OG	2.22	0.40
1:B:143:TYR:HD1	1:B:233:LYS:NZ	2.19	0.40
1:C:165:LYS:HG2	1:C:166:PHE:N	2.37	0.40
2:D:41:SER:C	2:D:42:TYR:CG	3.00	0.40
2:D:185:ARG:NE	2:D:187:GLU:HB3	2.37	0.40
2:D:98:ILE:HD13	2:D:104:LYS:HD3	2.04	0.40
2:D:159:ASN:C	2:D:161:VAL:N	2.80	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	130/140 (93%)	120 (92%)	10 (8%)	0	100	100
1	B	130/140 (93%)	120 (92%)	10 (8%)	0	100	100
1	C	108/140 (77%)	101 (94%)	7 (6%)	0	100	100
1	H	27/140 (19%)	23 (85%)	4 (15%)	0	100	100
2	D	158/238 (66%)	137 (87%)	17 (11%)	4 (2%)	4	25
All	All	553/798 (69%)	501 (91%)	48 (9%)	4 (1%)	21	50

All (4) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	D	113	ASN
2	D	64	PRO
2	D	49	PRO

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Mol	Chain	Res	Type
2	D	179	LEU

### 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	105/111 (95%)	103 (98%)	2 (2%)	52	72
1	B	105/111 (95%)	104 (99%)	1 (1%)	73	84
1	C	90/111 (81%)	90 (100%)	0	100	100
1	H	20/111 (18%)	20 (100%)	0	100	100
2	D	154/222 (69%)	143 (93%)	11 (7%)	12	38
All	All	474/666 (71%)	460 (97%)	14 (3%)	37	62

All (14) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	243	ASN
1	A	245	ASN
1	B	238	LYS
2	D	30	CYS
2	D	47	MET
2	D	71	LEU
2	D	73	PHE
2	D	88	TYR
2	D	98	ILE
2	D	113	ASN
2	D	131	ARG
2	D	151	SER
2	D	179	LEU
2	D	196	CYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (8) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	140	HIS
1	A	158	ASN
1	B	138	ASN
1	C	158	ASN
2	D	105	ASN
2	D	110	GLN
2	D	113	ASN
2	D	122	GLN

### 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](#)

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

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

### 5.7 Other polymers [i](#)

There are no such residues in this entry.

## 5.8 Polymer linkage issues

There are no chain breaks in this entry.