Full wwPDB NMR Structure Validation Report (i)

Mar 10, 2026 – 07:48 AM UTC

PDB ID	:	1YUB / pdb_00001yub
Title	:	SOLUTION STRUCTURE OF AN RRNA METHYLTRANSFERASE (ERMAM) THAT CONFERS MACROLIDE-LINCOSAMIDE-STREPTOGRAMIN ANTIBIOTIC RESISTANCE, NMR, MINIMIZED AVERAGE STRUCTURE
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Deposited on	:	1997-03-04

This is a Full wwPDB NMR 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/NMRValidationReportHelp
with specific help available everywhere you see the (i) 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 (i)) were used in the production of this report:

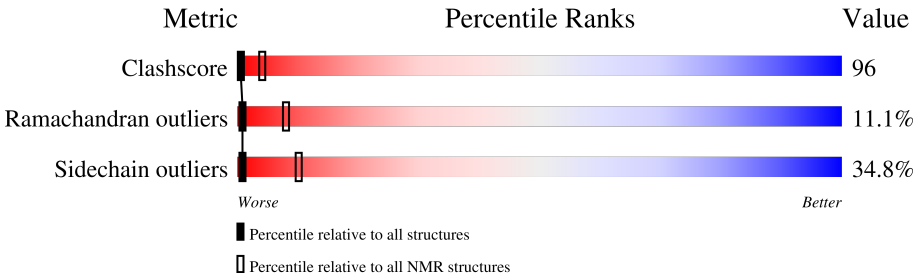
MolProbity	:	4-5-2 with Phenix2.0
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
wwPDB-RCI	:	v_1n_11_5_13_A (Berjanski et al., 2005)
PANAV	:	Wang et al. (2010)
wwPDB-ShiftChecker	:	v1.2
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.49

1 Overall quality at a glance

The following experimental techniques were used to determine the structure:
SOLUTION NMR

The overall completeness of chemical shifts assignment was not calculated.

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)	NMR archive (#Entries)
Clashscore	229148	14424
Ramachandran outliers	224038	12848
Sidechain outliers	223484	12823

The table below summarises the geometric issues observed across the polymeric chains and their fit to the experimental data. The red, orange, yellow and green segments indicate the fraction of residues that contain outliers for >=3, 2, 1 and 0 types of geometric quality criteria. A cyan segment indicates the fraction of residues that are not part of the well-defined cores, and 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	245	17% 49% 28% 7%

2 Ensemble composition and analysis (i)

This entry contains 1 models. Identification of well-defined residues and clustering analysis are not possible.

3 Entry composition (i)

There is only 1 type of molecule in this entry. The entry contains 4158 atoms, of which 2119 are hydrogens and 0 are deuteriums.

- Molecule 1 is a protein called RRNA METHYLTRANSFERASE.

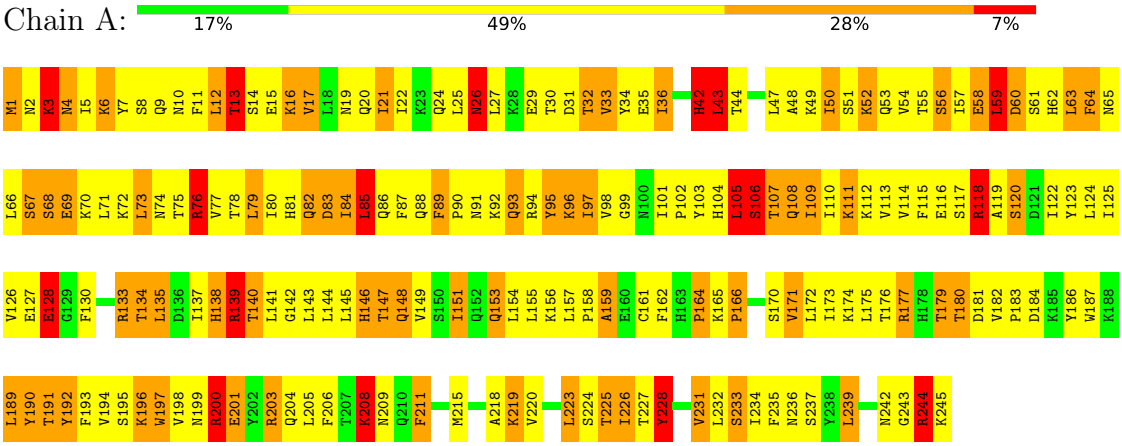
Mol	Chain	Residues	Atoms						Trace
			Total	C	H	N	O	S	
1	A	245	4158	1321	2119	353	362	3	0

4 Residue-property plots (i)

These plots are provided for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic is the same as shown in the summary in section 1 of this report. The second graphic shows the sequence where residues are colour-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 outliers are shown as green connectors. Residues which are classified as ill-defined in the NMR ensemble, are shown in cyan with an underline colour-coded according to the previous scheme. Residues which were present in the experimental sample, but not modelled in the final structure are shown in grey.

- Molecule 1: RRNA METHYLTRANSFERASE

Chain A:



5 Refinement protocol and experimental data overview

The models were refined using the following method: *DG/SA*.

Of the 17 calculated structures, 1 were deposited, based on the following criterion: *LOWEST ENERGY AND LEAST RESTRAINT VIOLATION*.

The following table shows the software used for structure solution, optimisation and refinement.

Software name	Classification	Version
X-PLOR	refinement	3.1
X-PLOR	structure solution	3.1

No chemical shift data was provided.

6 Model quality (i)

6.1 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 (average) 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	1.38	0/2082 (0.0%)	1.30	3/2809 (0.1%)
All	All	1.38	0/2082 (0.0%)	1.30	3/2809 (0.1%)

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	Planarity
1	A	0	9
All	All	0	9

There are no bond-length outliers.

All angle outliers are listed below. They are sorted according to the Z-score.

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	138	HIS	CA-CB-CG	-7.15	106.65	113.80
1	A	89	PHE	CA-CB-CG	-5.21	108.59	113.80
1	A	211	PHE	CA-CB-CG	-5.03	108.77	113.80

There are no chirality outliers.

All planar outliers are listed below.

Mol	Chain	Res	Type	Group
1	A	76	ARG	Sidechain
1	A	94	ARG	Sidechain
1	A	118	ARG	Sidechain
1	A	133	ARG	Sidechain
1	A	139	ARG	Sidechain
1	A	177	ARG	Sidechain
1	A	200	ARG	Sidechain
1	A	203	ARG	Sidechain

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Mol	Chain	Res	Type	Group
1	A	244	ARG	Sidechain

6.2 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 each 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 averaged over the ensemble.

Mol	Chain	Non-H	H(model)	H(added)	Clashes
1	A	2039	2119	2119	401
All	All	2039	2119	2119	401

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 96.

All clashes are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Clash(Å)	Distance(Å)
1:A:64:PHE:CZ	1:A:79:LEU:HD12	1.00	1.92
1:A:189:LEU:HD21	1:A:239:LEU:HD21	1.00	1.11
1:A:143:LEU:HD22	1:A:194:VAL:HG21	0.98	1.35
1:A:194:VAL:O	1:A:198:VAL:HG23	0.93	1.64
1:A:85:LEU:HD22	1:A:109:ILE:HG23	0.92	1.38
1:A:63:LEU:HD22	1:A:77:VAL:HG12	0.91	1.38
1:A:231:VAL:HG22	1:A:235:PHE:CE2	0.88	2.04
1:A:122:ILE:HG23	1:A:175:LEU:HB2	0.88	1.44
1:A:21:ILE:CG1	1:A:172:LEU:HD22	0.87	2.00
1:A:21:ILE:HB	1:A:155:LEU:HD22	0.86	1.44
1:A:109:ILE:O	1:A:113:VAL:HG12	0.86	1.70
1:A:98:VAL:HG22	1:A:123:TYR:HB2	0.85	1.47
1:A:63:LEU:CD2	1:A:77:VAL:HG12	0.84	2.01
1:A:145:LEU:O	1:A:145:LEU:HD12	0.84	1.72
1:A:143:LEU:CD2	1:A:194:VAL:HG21	0.83	2.02
1:A:134:THR:HG22	1:A:145:LEU:HD11	0.83	1.50
1:A:97:ILE:HD11	1:A:119:ALA:HB2	0.82	1.51
1:A:201:GLU:O	1:A:205:LEU:HD12	0.82	1.72
1:A:21:ILE:HD11	1:A:172:LEU:HD13	0.82	1.51
1:A:101:ILE:CG2	1:A:126:VAL:HG12	0.82	2.05
1:A:55:THR:HG21	1:A:88:GLN:OE1	0.81	1.75
1:A:189:LEU:CD2	1:A:239:LEU:HD21	0.81	2.02
1:A:21:ILE:CD1	1:A:172:LEU:HD13	0.80	2.07

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Atom-1	Atom-2	Clash(Å)	Distance(Å)
1:A:35:GLU:HG2	1:A:44:THR:HG23	0.80	1.54
1:A:122:ILE:HG23	1:A:175:LEU:CB	0.80	2.07
1:A:12:LEU:HD21	1:A:162:PHE:CE1	0.80	2.12
1:A:126:VAL:HG21	1:A:130:PHE:HB3	0.79	1.51
1:A:27:LEU:HG	1:A:50:ILE:HG21	0.78	1.53
1:A:52:LYS:CG	1:A:75:THR:HG21	0.78	2.09
1:A:80:ILE:HG21	1:A:84:ILE:HG12	0.77	1.56
1:A:144:LEU:HD13	1:A:191:THR:HG21	0.77	1.57
1:A:33:VAL:HG12	1:A:47:LEU:HD11	0.76	1.57
1:A:21:ILE:HG13	1:A:172:LEU:HD22	0.76	1.56
1:A:139:ARG:C	1:A:140:THR:HG23	0.76	2.06
1:A:64:PHE:CE2	1:A:79:LEU:HD12	0.75	2.17
1:A:21:ILE:CB	1:A:155:LEU:HD22	0.74	2.12
1:A:12:LEU:HD11	1:A:162:PHE:CZ	0.74	2.17
1:A:96:LYS:HD2	1:A:98:VAL:HG23	0.74	1.57
1:A:226:ILE:HD13	1:A:227:THR:N	0.73	1.98
1:A:32:THR:HG23	1:A:53:GLN:HB2	0.73	1.59
1:A:149:VAL:HG12	1:A:177:ARG:HA	0.73	1.60
1:A:155:LEU:HD11	1:A:157:LEU:HD21	0.73	1.59
1:A:141:LEU:C	1:A:141:LEU:HD23	0.72	2.10
1:A:97:ILE:HD11	1:A:119:ALA:CB	0.71	2.15
1:A:25:LEU:HD13	1:A:98:VAL:HG21	0.71	1.60
1:A:146:HIS:CE1	1:A:151:ILE:HD11	0.71	2.21
1:A:80:ILE:HG21	1:A:84:ILE:CG1	0.71	2.15
1:A:99:GLY:O	1:A:124:LEU:HD12	0.71	1.85
1:A:220:VAL:O	1:A:220:VAL:HG13	0.70	1.85
1:A:57:ILE:CD1	1:A:84:ILE:HG21	0.69	2.17
1:A:85:LEU:HD22	1:A:109:ILE:CG2	0.69	2.17
1:A:232:LEU:C	1:A:232:LEU:HD13	0.69	2.11
1:A:149:VAL:HG12	1:A:177:ARG:CA	0.69	2.17
1:A:16:LYS:HE3	1:A:161:CYS:SG	0.68	2.28
1:A:80:ILE:HG23	1:A:87:PHE:CD2	0.68	2.22
1:A:21:ILE:HD13	1:A:22:ILE:N	0.68	2.04
1:A:32:THR:HG23	1:A:53:GLN:CB	0.68	2.19
1:A:215:MET:O	1:A:220:VAL:HG12	0.68	1.89
1:A:134:THR:CG2	1:A:145:LEU:HD11	0.67	2.19
1:A:63:LEU:HD22	1:A:77:VAL:CG1	0.67	2.18
1:A:139:ARG:O	1:A:140:THR:HG23	0.67	1.89
1:A:52:LYS:HG3	1:A:75:THR:HG21	0.67	1.65
1:A:1:MET:SD	1:A:2:ASN:N	0.66	2.68
1:A:158:PRO:O	1:A:159:ALA:HB3	0.66	1.90
1:A:73:LEU:HD12	1:A:73:LEU:C	0.66	2.15

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Atom-1	Atom-2	Clash(Å)	Distance(Å)
1:A:33:VAL:CG1	1:A:47:LEU:HD11	0.66	2.20
1:A:146:HIS:CE1	1:A:151:ILE:CD1	0.65	2.80
1:A:231:VAL:CG2	1:A:235:PHE:CE2	0.64	2.79
1:A:111:LYS:NZ	1:A:144:LEU:HD23	0.64	2.07
1:A:145:LEU:HD12	1:A:145:LEU:C	0.64	2.17
1:A:96:LYS:CD	1:A:98:VAL:HG23	0.64	2.23
1:A:12:LEU:CG	1:A:162:PHE:CZ	0.63	2.81
1:A:239:LEU:HD12	1:A:245:LYS:HB2	0.63	1.71
1:A:12:LEU:CD1	1:A:162:PHE:CZ	0.63	2.82
1:A:80:ILE:HG23	1:A:87:PHE:CE2	0.63	2.29
1:A:135:LEU:C	1:A:135:LEU:HD23	0.63	2.19
1:A:12:LEU:CD2	1:A:162:PHE:CE1	0.63	2.81
1:A:123:TYR:HD2	1:A:172:LEU:HD21	0.62	1.53
1:A:223:LEU:O	1:A:226:ILE:HG22	0.62	1.94
1:A:124:LEU:CD2	1:A:130:PHE:CE2	0.62	2.82
1:A:27:LEU:CG	1:A:50:ILE:HG21	0.62	2.25
1:A:232:LEU:HD13	1:A:232:LEU:O	0.62	1.94
1:A:84:ILE:HG22	1:A:85:LEU:N	0.62	2.10
1:A:145:LEU:O	1:A:149:VAL:HG22	0.61	1.94
1:A:89:PHE:CE1	1:A:113:VAL:CG2	0.61	2.83
1:A:123:TYR:CD2	1:A:172:LEU:HD21	0.61	2.30
1:A:138:HIS:CE1	1:A:226:ILE:HG22	0.60	2.30
1:A:102:PRO:CB	1:A:104:HIS:CE1	0.60	2.85
1:A:144:LEU:CD1	1:A:191:THR:HG21	0.60	2.27
1:A:101:ILE:HG22	1:A:126:VAL:HG12	0.60	1.72
1:A:190:TYR:OH	1:A:232:LEU:HD22	0.60	1.96
1:A:87:PHE:CD1	1:A:87:PHE:O	0.60	2.55
1:A:157:LEU:N	1:A:157:LEU:HD22	0.60	2.12
1:A:101:ILE:HG23	1:A:103:TYR:CD1	0.60	2.32
1:A:146:HIS:NE2	1:A:151:ILE:CD1	0.60	2.65
1:A:151:ILE:HG22	1:A:175:LEU:CG	0.60	2.26
1:A:21:ILE:CG2	1:A:155:LEU:HD22	0.60	2.27
1:A:64:PHE:CZ	1:A:79:LEU:CD1	0.59	2.80
1:A:17:VAL:CG1	1:A:157:LEU:CD1	0.59	2.80
1:A:71:LEU:HD12	1:A:71:LEU:H	0.59	1.56
1:A:155:LEU:CD1	1:A:157:LEU:HD21	0.59	2.28
1:A:34:TYR:HB2	1:A:97:ILE:HG22	0.59	1.73
1:A:197:TRP:O	1:A:197:TRP:CD1	0.59	2.56
1:A:144:LEU:HD13	1:A:191:THR:CG2	0.59	2.26
1:A:13:THR:HG23	1:A:161:CYS:O	0.59	1.98
1:A:139:ARG:C	1:A:140:THR:CG2	0.58	2.75
1:A:52:LYS:CG	1:A:75:THR:CG2	0.58	2.80

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Atom-1	Atom-2	Clash(Å)	Distance(Å)
1:A:197:TRP:CD1	1:A:197:TRP:C	0.58	2.80
1:A:64:PHE:CD1	1:A:64:PHE:N	0.58	2.71
1:A:64:PHE:CE2	1:A:79:LEU:CD1	0.58	2.87
1:A:34:TYR:CE1	1:A:88:GLN:CG	0.58	2.85
1:A:101:ILE:CB	1:A:126:VAL:HG12	0.58	2.28
1:A:189:LEU:O	1:A:193:PHE:CD1	0.58	2.56
1:A:69:GLU:CD	1:A:71:LEU:HD13	0.58	2.23
1:A:101:ILE:O	1:A:103:TYR:CE1	0.58	2.57
1:A:138:HIS:O	1:A:198:VAL:HG11	0.58	1.99
1:A:21:ILE:HG12	1:A:172:LEU:HD22	0.58	1.74
1:A:227:THR:O	1:A:228:TYR:CB	0.58	2.52
1:A:97:ILE:CD1	1:A:119:ALA:HB2	0.57	2.28
1:A:25:LEU:CD1	1:A:98:VAL:HG21	0.57	2.29
1:A:101:ILE:CG2	1:A:126:VAL:CG1	0.57	2.81
1:A:186:TYR:CD1	1:A:186:TYR:N	0.57	2.71
1:A:12:LEU:O	1:A:13:THR:C	0.56	2.48
1:A:137:ILE:CG2	1:A:227:THR:O	0.56	2.52
1:A:148:GLN:NE2	1:A:187:TRP:CH2	0.56	2.73
1:A:12:LEU:HG	1:A:162:PHE:CZ	0.56	2.36
1:A:84:ILE:O	1:A:86:GLN:N	0.56	2.39
1:A:173:ILE:HD12	1:A:173:ILE:N	0.55	2.16
1:A:194:VAL:C	1:A:198:VAL:HG23	0.55	2.26
1:A:21:ILE:HD13	1:A:21:ILE:C	0.55	2.27
1:A:144:LEU:CD1	1:A:191:THR:CG2	0.55	2.85
1:A:155:LEU:HD21	1:A:157:LEU:CD2	0.55	2.31
1:A:62:HIS:O	1:A:63:LEU:CB	0.55	2.54
1:A:155:LEU:CG	1:A:157:LEU:CD2	0.55	2.85
1:A:159:ALA:O	1:A:166:PRO:CG	0.55	2.54
1:A:69:GLU:OE2	1:A:77:VAL:CG2	0.55	2.55
1:A:34:TYR:CE1	1:A:88:GLN:HG3	0.55	2.36
1:A:119:ALA:O	1:A:120:SER:CB	0.55	2.52
1:A:57:ILE:HD12	1:A:84:ILE:HG21	0.55	1.78
1:A:134:THR:C	1:A:146:HIS:NE2	0.54	2.65
1:A:145:LEU:O	1:A:149:VAL:CG2	0.54	2.55
1:A:231:VAL:CG2	1:A:235:PHE:CZ	0.54	2.91
1:A:89:PHE:CE1	1:A:113:VAL:HG21	0.54	2.37
1:A:12:LEU:O	1:A:14:SER:N	0.54	2.41
1:A:101:ILE:HG23	1:A:101:ILE:O	0.54	2.01
1:A:101:ILE:HB	1:A:126:VAL:HG12	0.54	1.80
1:A:111:LYS:HZ3	1:A:144:LEU:HD23	0.54	1.63
1:A:231:VAL:HG22	1:A:235:PHE:CZ	0.54	2.38
1:A:63:LEU:HD23	1:A:78:THR:C	0.53	2.28

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Atom-1	Atom-2	Clash(Å)	Distance(Å)
1:A:80:ILE:HD11	1:A:88:GLN:OE1	0.53	2.02
1:A:102:PRO:HB3	1:A:104:HIS:CE1	0.53	2.37
1:A:114:VAL:HG22	1:A:148:GLN:HB3	0.53	1.80
1:A:15:GLU:O	1:A:19:ASN:CB	0.53	2.57
1:A:44:THR:HB	1:A:62:HIS:CD2	0.53	2.39
1:A:48:ALA:HB2	1:A:54:VAL:HB	0.53	1.79
1:A:43:LEU:HD23	1:A:44:THR:H	0.53	1.64
1:A:63:LEU:CD1	1:A:63:LEU:C	0.53	2.80
1:A:110:ILE:O	1:A:114:VAL:CG1	0.53	2.56
1:A:101:ILE:O	1:A:103:TYR:CD1	0.53	2.61
1:A:151:ILE:CG2	1:A:175:LEU:HD23	0.53	2.34
1:A:197:TRP:O	1:A:197:TRP:CG	0.53	2.62
1:A:232:LEU:C	1:A:232:LEU:CD1	0.53	2.81
1:A:36:ILE:HD11	1:A:57:ILE:HG21	0.53	1.80
1:A:85:LEU:CD2	1:A:109:ILE:HG23	0.53	2.26
1:A:15:GLU:OE2	1:A:42:HIS:CG	0.53	2.62
1:A:43:LEU:O	1:A:44:THR:CB	0.53	2.56
1:A:82:GLN:O	1:A:83:ASP:C	0.53	2.52
1:A:231:VAL:HG22	1:A:235:PHE:CD2	0.53	2.39
1:A:110:ILE:O	1:A:114:VAL:HG12	0.52	2.04
1:A:57:ILE:CG2	1:A:84:ILE:HD13	0.52	2.35
1:A:102:PRO:O	1:A:103:TYR:CB	0.52	2.55
1:A:124:LEU:HD23	1:A:130:PHE:CE2	0.52	2.40
1:A:90:PRO:HG2	1:A:95:TYR:CE2	0.52	2.39
1:A:13:THR:CG2	1:A:161:CYS:O	0.52	2.57
1:A:25:LEU:CD2	1:A:123:TYR:CD2	0.52	2.92
1:A:92:LYS:O	1:A:93:GLN:CB	0.52	2.55
1:A:102:PRO:O	1:A:103:TYR:CD2	0.52	2.62
1:A:135:LEU:CD1	1:A:227:THR:HG22	0.52	2.34
1:A:151:ILE:HG22	1:A:175:LEU:HG	0.52	1.81
1:A:223:LEU:O	1:A:226:ILE:CG2	0.52	2.57
1:A:127:GLU:O	1:A:128:GLU:CB	0.52	2.57
1:A:155:LEU:HD21	1:A:157:LEU:HD21	0.52	1.81
1:A:57:ILE:HD13	1:A:84:ILE:HG21	0.52	1.82
1:A:31:ASP:OD1	1:A:95:TYR:N	0.51	2.43
1:A:59:LEU:HD13	1:A:60:ASP:H	0.51	1.65
1:A:27:LEU:HD13	1:A:96:LYS:HG3	0.51	1.81
1:A:73:LEU:CG	1:A:73:LEU:O	0.51	2.57
1:A:102:PRO:C	1:A:103:TYR:CG	0.51	2.87
1:A:137:ILE:HG21	1:A:228:TYR:HB2	0.51	1.80
1:A:239:LEU:CD1	1:A:244:ARG:C	0.51	2.84
1:A:2:ASN:O	1:A:3:LYS:CG	0.51	2.58

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Atom-1	Atom-2	Clash(Å)	Distance(Å)
1:A:21:ILE:HD11	1:A:172:LEU:CD1	0.51	2.30
1:A:151:ILE:CG2	1:A:175:LEU:CD2	0.51	2.89
1:A:52:LYS:HG2	1:A:75:THR:CG2	0.51	2.36
1:A:186:TYR:CD2	1:A:245:LYS:HD3	0.51	2.41
1:A:31:ASP:O	1:A:32:THR:O	0.51	2.28
1:A:89:PHE:CE1	1:A:113:VAL:HB	0.51	2.41
1:A:147:THR:HG22	1:A:228:TYR:OH	0.51	2.06
1:A:138:HIS:CE1	1:A:223:LEU:O	0.50	2.65
1:A:233:SER:O	1:A:234:ILE:C	0.50	2.54
1:A:127:GLU:O	1:A:127:GLU:CG	0.50	2.59
1:A:55:THR:HG21	1:A:88:GLN:CD	0.50	2.31
1:A:57:ILE:HD13	1:A:80:ILE:HD12	0.50	1.83
1:A:16:LYS:CE	1:A:161:CYS:SG	0.50	2.98
1:A:96:LYS:HE3	1:A:98:VAL:CG2	0.50	2.36
1:A:138:HIS:NE2	1:A:223:LEU:HD12	0.50	2.22
1:A:12:LEU:O	1:A:161:CYS:O	0.50	2.30
1:A:225:THR:O	1:A:226:ILE:C	0.50	2.54
1:A:155:LEU:CG	1:A:157:LEU:HD21	0.50	2.37
1:A:183:PRO:O	1:A:184:ASP:C	0.50	2.53
1:A:12:LEU:HG	1:A:162:PHE:CE2	0.49	2.42
1:A:72:LYS:O	1:A:73:LEU:C	0.49	2.53
1:A:101:ILE:CG2	1:A:101:ILE:O	0.49	2.59
1:A:206:PHE:CD1	1:A:211:PHE:HB2	0.49	2.41
1:A:173:ILE:HD12	1:A:173:ILE:H	0.49	1.66
1:A:17:VAL:HG12	1:A:157:LEU:HG	0.49	1.84
1:A:67:SER:O	1:A:68:SER:O	0.49	2.30
1:A:17:VAL:CG1	1:A:157:LEU:HG	0.49	2.37
1:A:147:THR:HB	1:A:187:TRP:CH2	0.49	2.42
1:A:36:ILE:CD1	1:A:57:ILE:HG21	0.49	2.37
1:A:153:GLN:OE1	1:A:156:LYS:CD	0.49	2.61
1:A:22:ILE:C	1:A:22:ILE:HD12	0.49	2.33
1:A:48:ALA:CB	1:A:54:VAL:HB	0.49	2.38
1:A:73:LEU:O	1:A:73:LEU:HG	0.49	2.07
1:A:147:THR:CB	1:A:187:TRP:CH2	0.49	2.96
1:A:158:PRO:O	1:A:159:ALA:CB	0.49	2.55
1:A:1:MET:O	1:A:2:ASN:C	0.49	2.56
1:A:81:HIS:O	1:A:82:GLN:CB	0.49	2.58
1:A:80:ILE:CG2	1:A:84:ILE:HG12	0.49	2.33
1:A:96:LYS:NZ	1:A:123:TYR:CE1	0.49	2.76
1:A:182:VAL:HG21	1:A:190:TYR:CD2	0.49	2.43
1:A:68:SER:O	1:A:69:GLU:C	0.48	2.55
1:A:9:GLN:HB2	1:A:11:PHE:CZ	0.48	2.44

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Atom-1	Atom-2	Clash(Å)	Distance(Å)
1:A:66:LEU:CD2	1:A:69:GLU:HA	0.48	2.38
1:A:197:TRP:CZ3	1:A:234:ILE:HD13	0.48	2.42
1:A:88:GLN:O	1:A:89:PHE:C	0.48	2.54
1:A:186:TYR:CD1	1:A:244:ARG:O	0.48	2.66
1:A:21:ILE:CG2	1:A:155:LEU:CD2	0.48	2.91
1:A:57:ILE:HG23	1:A:84:ILE:HG21	0.48	1.85
1:A:85:LEU:N	1:A:85:LEU:HD23	0.48	2.24
1:A:65:ASN:O	1:A:66:LEU:C	0.48	2.57
1:A:80:ILE:CG2	1:A:84:ILE:CG1	0.48	2.91
1:A:138:HIS:NE2	1:A:226:ILE:HG22	0.48	2.22
1:A:186:TYR:CE2	1:A:245:LYS:HA	0.48	2.43
1:A:96:LYS:CE	1:A:98:VAL:CG2	0.48	2.91
1:A:194:VAL:O	1:A:195:SER:C	0.48	2.56
1:A:56:SER:HB2	1:A:62:HIS:CG	0.48	2.44
1:A:54:VAL:O	1:A:76:ARG:O	0.48	2.32
1:A:66:LEU:O	1:A:68:SER:N	0.48	2.47
1:A:189:LEU:HD13	1:A:244:ARG:HG2	0.47	1.85
1:A:206:PHE:CD1	1:A:206:PHE:N	0.47	2.79
1:A:87:PHE:CD1	1:A:87:PHE:C	0.47	2.90
1:A:151:ILE:CG2	1:A:175:LEU:HG	0.47	2.38
1:A:155:LEU:HG	1:A:157:LEU:CD2	0.47	2.39
1:A:204:GLN:C	1:A:204:GLN:CD	0.47	2.81
1:A:5:ILE:O	1:A:5:ILE:HG22	0.47	2.08
1:A:176:THR:HG22	1:A:176:THR:O	0.47	2.07
1:A:33:VAL:HG23	1:A:53:GLN:O	0.47	2.09
1:A:88:GLN:O	1:A:90:PRO:N	0.47	2.48
1:A:91:ASN:O	1:A:92:LYS:CB	0.47	2.61
1:A:165:LYS:O	1:A:166:PRO:O	0.47	2.33
1:A:156:LYS:C	1:A:157:LEU:HD22	0.47	2.35
1:A:67:SER:O	1:A:68:SER:C	0.47	2.56
1:A:101:ILE:HG13	1:A:106:SER:CB	0.47	2.39
1:A:34:TYR:HB2	1:A:97:ILE:CG2	0.47	2.39
1:A:56:SER:CB	1:A:62:HIS:HB2	0.47	2.39
1:A:57:ILE:HG22	1:A:84:ILE:HD13	0.47	1.87
1:A:81:HIS:C	1:A:82:GLN:HG3	0.47	2.35
1:A:15:GLU:O	1:A:19:ASN:HB2	0.47	2.09
1:A:25:LEU:HD22	1:A:123:TYR:CD2	0.47	2.45
1:A:33:VAL:CG1	1:A:47:LEU:CD1	0.47	2.91
1:A:1:MET:SD	1:A:1:MET:C	0.46	2.98
1:A:2:ASN:O	1:A:3:LYS:C	0.46	2.55
1:A:88:GLN:O	1:A:90:PRO:HD3	0.46	2.10
1:A:80:ILE:HD13	1:A:84:ILE:HG23	0.46	1.85

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Atom-1	Atom-2	Clash(Å)	Distance(Å)
1:A:95:TYR:O	1:A:119:ALA:O	0.46	2.33
1:A:118:ARG:O	1:A:119:ALA:C	0.46	2.57
1:A:82:GLN:O	1:A:84:ILE:CD1	0.46	2.64
1:A:25:LEU:O	1:A:26:ASN:O	0.46	2.32
1:A:95:TYR:N	1:A:95:TYR:CD1	0.46	2.84
1:A:106:SER:O	1:A:107:THR:C	0.46	2.58
1:A:102:PRO:HB2	1:A:104:HIS:CE1	0.46	2.46
1:A:134:THR:HB	1:A:146:HIS:NE2	0.46	2.26
1:A:80:ILE:HG22	1:A:81:HIS:N	0.46	2.26
1:A:127:GLU:HB3	1:A:170:SER:CB	0.46	2.41
1:A:186:TYR:CE2	1:A:245:LYS:HD3	0.46	2.46
1:A:204:GLN:CD	1:A:204:GLN:O	0.46	2.58
1:A:110:ILE:HA	1:A:113:VAL:CG1	0.46	2.41
1:A:147:THR:OG1	1:A:187:TRP:CZ2	0.46	2.54
1:A:235:PHE:O	1:A:236:ASN:C	0.46	2.59
1:A:24:GLN:O	1:A:25:LEU:C	0.45	2.57
1:A:52:LYS:C	1:A:53:GLN:HG2	0.45	2.36
1:A:123:TYR:CZ	1:A:174:LYS:HG3	0.45	2.46
1:A:13:THR:O	1:A:13:THR:OG1	0.45	2.34
1:A:35:GLU:CD	1:A:35:GLU:O	0.45	2.60
1:A:56:SER:HB2	1:A:62:HIS:ND1	0.45	2.27
1:A:137:ILE:CD1	1:A:231:VAL:HB	0.45	2.41
1:A:148:GLN:NE2	1:A:187:TRP:CZ2	0.45	2.85
1:A:181:ASP:CB	1:A:228:TYR:OH	0.45	2.64
1:A:2:ASN:O	1:A:3:LYS:HG2	0.45	2.11
1:A:151:ILE:HG22	1:A:175:LEU:CD2	0.45	2.42
1:A:190:TYR:OH	1:A:232:LEU:O	0.45	2.34
1:A:88:GLN:O	1:A:90:PRO:CD	0.45	2.65
1:A:146:HIS:NE2	1:A:151:ILE:HD11	0.45	2.24
1:A:192:TYR:O	1:A:193:PHE:C	0.45	2.57
1:A:44:THR:CB	1:A:62:HIS:CD2	0.45	2.99
1:A:141:LEU:C	1:A:141:LEU:CD2	0.45	2.82
1:A:157:LEU:N	1:A:157:LEU:CD2	0.45	2.80
1:A:215:MET:C	1:A:220:VAL:HG12	0.45	2.37
1:A:220:VAL:O	1:A:220:VAL:CG1	0.45	2.58
1:A:62:HIS:O	1:A:63:LEU:HB3	0.44	2.12
1:A:113:VAL:O	1:A:117:SER:HB3	0.44	2.11
1:A:155:LEU:CD2	1:A:157:LEU:CD2	0.44	2.95
1:A:187:TRP:CD1	1:A:187:TRP:C	0.44	2.95
1:A:25:LEU:CD2	1:A:123:TYR:CE2	0.44	3.00
1:A:32:THR:N	1:A:95:TYR:HA	0.44	2.27
1:A:91:ASN:C	1:A:95:TYR:OH	0.44	2.60

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Atom-1	Atom-2	Clash(Å)	Distance(Å)
1:A:189:LEU:HG	1:A:193:PHE:CE1	0.44	2.48
1:A:137:ILE:HB	1:A:143:LEU:CD1	0.44	2.42
1:A:6:LYS:HG2	1:A:7:TYR:CE1	0.44	2.47
1:A:61:SER:O	1:A:65:ASN:HB2	0.44	2.13
1:A:21:ILE:CD1	1:A:21:ILE:C	0.44	2.91
1:A:190:TYR:O	1:A:194:VAL:HG23	0.44	2.13
1:A:194:VAL:HG12	1:A:198:VAL:CG2	0.44	2.42
1:A:59:LEU:HD12	1:A:61:SER:OG	0.44	2.13
1:A:138:HIS:O	1:A:198:VAL:CG1	0.44	2.64
1:A:198:VAL:O	1:A:199:ASN:C	0.44	2.60
1:A:21:ILE:HG13	1:A:172:LEU:CD2	0.44	2.37
1:A:91:ASN:O	1:A:92:LYS:HB2	0.44	2.11
1:A:137:ILE:CG2	1:A:228:TYR:HB2	0.44	2.42
1:A:218:ALA:O	1:A:219:LYS:C	0.44	2.57
1:A:3:LYS:HG3	1:A:4:ASN:N	0.44	2.26
1:A:43:LEU:O	1:A:44:THR:HB	0.44	2.13
1:A:147:THR:HG23	1:A:228:TYR:CE1	0.44	2.48
1:A:4:ASN:O	1:A:5:ILE:HD13	0.43	2.13
1:A:48:ALA:O	1:A:49:LYS:C	0.43	2.61
1:A:114:VAL:HG22	1:A:148:GLN:CB	0.43	2.42
1:A:138:HIS:NE2	1:A:226:ILE:CG2	0.43	2.81
1:A:142:GLY:O	1:A:146:HIS:HB2	0.43	2.13
1:A:17:VAL:HG11	1:A:157:LEU:CD1	0.43	2.42
1:A:21:ILE:HG21	1:A:155:LEU:CD2	0.43	2.43
1:A:137:ILE:HB	1:A:143:LEU:HD12	0.43	1.90
1:A:191:THR:O	1:A:192:TYR:C	0.43	2.60
1:A:244:ARG:HD2	1:A:244:ARG:N	0.43	2.26
1:A:145:LEU:C	1:A:145:LEU:CD1	0.43	2.86
1:A:239:LEU:CD1	1:A:245:LYS:HB2	0.43	2.42
1:A:189:LEU:CD1	1:A:244:ARG:HG2	0.43	2.44
1:A:201:GLU:O	1:A:205:LEU:CD1	0.43	2.57
1:A:208:LYS:O	1:A:209:ASN:HB2	0.43	2.12
1:A:25:LEU:HD22	1:A:123:TYR:CE2	0.43	2.49
1:A:57:ILE:HD13	1:A:80:ILE:CD1	0.43	2.44
1:A:89:PHE:CE1	1:A:113:VAL:CB	0.43	3.01
1:A:155:LEU:HG	1:A:156:LYS:N	0.43	2.29
1:A:171:VAL:HG23	1:A:172:LEU:N	0.43	2.26
1:A:48:ALA:C	1:A:50:ILE:N	0.43	2.76
1:A:97:ILE:CD1	1:A:119:ALA:CB	0.43	2.92
1:A:104:HIS:O	1:A:105:LEU:HB2	0.43	2.13
1:A:15:GLU:OE2	1:A:42:HIS:CD2	0.43	2.71
1:A:58:GLU:O	1:A:59:LEU:O	0.43	2.36

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Atom-1	Atom-2	Clash(Å)	Distance(Å)
1:A:60:ASP:CG	1:A:79:LEU:HD13	0.43	2.39
1:A:137:ILE:HG23	1:A:227:THR:O	0.43	2.12
1:A:180:THR:HG23	1:A:182:VAL:O	0.43	2.13
1:A:48:ALA:HB2	1:A:54:VAL:CB	0.43	2.44
1:A:31:ASP:O	1:A:32:THR:C	0.43	2.61
1:A:124:LEU:HD23	1:A:130:PHE:CD2	0.43	2.49
1:A:155:LEU:CD2	1:A:157:LEU:HD21	0.42	2.44
1:A:25:LEU:O	1:A:26:ASN:C	0.42	2.62
1:A:34:TYR:CB	1:A:97:ILE:HG22	0.42	2.44
1:A:81:HIS:O	1:A:82:GLN:HB2	0.42	2.14
1:A:139:ARG:O	1:A:140:THR:CG2	0.42	2.66
1:A:10:ASN:HB3	1:A:164:PRO:HD3	0.42	1.91
1:A:102:PRO:O	1:A:103:TYR:HB2	0.42	2.14
1:A:239:LEU:HB3	1:A:245:LYS:HB2	0.42	1.92
1:A:133:ARG:HG2	1:A:141:LEU:HD22	0.42	1.90
1:A:190:TYR:O	1:A:191:THR:C	0.42	2.60
1:A:135:LEU:C	1:A:135:LEU:CD2	0.42	2.86
1:A:159:ALA:O	1:A:166:PRO:HG3	0.42	2.15
1:A:228:TYR:O	1:A:228:TYR:CD1	0.42	2.73
1:A:113:VAL:O	1:A:117:SER:CB	0.42	2.68
1:A:91:ASN:C	1:A:92:LYS:HG3	0.41	2.40
1:A:81:HIS:C	1:A:82:GLN:CG	0.41	2.92
1:A:180:THR:CG2	1:A:182:VAL:O	0.41	2.68
1:A:104:HIS:O	1:A:105:LEU:CB	0.41	2.67
1:A:226:ILE:CD1	1:A:228:TYR:N	0.41	2.84
1:A:80:ILE:CG2	1:A:87:PHE:CD2	0.41	3.00
1:A:97:ILE:HD12	1:A:122:ILE:HD12	0.41	1.92
1:A:42:HIS:O	1:A:43:LEU:HB2	0.41	2.15
1:A:147:THR:HG21	1:A:182:VAL:CG2	0.41	2.46
1:A:111:LYS:HG3	1:A:115:PHE:CE2	0.41	2.51
1:A:186:TYR:CE2	1:A:245:LYS:CD	0.41	3.03
1:A:196:LYS:HG2	1:A:201:GLU:OE1	0.41	2.15
1:A:239:LEU:HD13	1:A:244:ARG:C	0.41	2.41
1:A:31:ASP:C	1:A:32:THR:O	0.40	2.64
1:A:151:ILE:HG22	1:A:175:LEU:HD23	0.40	1.92
1:A:13:THR:O	1:A:161:CYS:HB3	0.40	2.17
1:A:17:VAL:CG1	1:A:157:LEU:CG	0.40	3.00
1:A:20:GLN:OE1	1:A:20:GLN:CA	0.40	2.69
1:A:26:ASN:C	1:A:27:LEU:HD23	0.40	2.42
1:A:42:HIS:O	1:A:43:LEU:CB	0.40	2.67
1:A:108:GLN:O	1:A:111:LYS:HB3	0.40	2.16
1:A:153:GLN:OE1	1:A:156:LYS:HD3	0.40	2.15

6.3 Torsion angles (i)

6.3.1 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 NMR 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	243/245 (99%)	158 (65%)	58 (24%)	27 (11%)	1 8
All	All	243/245 (99%)	158 (65%)	58 (24%)	27 (11%)	1 8

All 27 Ramachandran outliers are listed below. They are sorted by the frequency of occurrence in the ensemble.

Mol	Chain	Res	Type
1	A	3	LYS
1	A	4	ASN
1	A	13	THR
1	A	26	ASN
1	A	29	GLU
1	A	32	THR
1	A	42	HIS
1	A	43	LEU
1	A	59	LEU
1	A	67	SER
1	A	68	SER
1	A	82	GLN
1	A	83	ASP
1	A	84	ILE
1	A	85	LEU
1	A	93	GLN
1	A	105	LEU
1	A	106	SER
1	A	128	GLU
1	A	159	ALA
1	A	164	PRO
1	A	166	PRO
1	A	179	THR
1	A	200	ARG
1	A	208	LYS
1	A	228	TYR
1	A	243	GLY

6.3.2 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 NMR 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	233/233 (100%)	152 (65%)	81 (35%)	1 10
All	All	233/233 (100%)	152 (65%)	81 (35%)	1 10

All 81 residues with a non-rotameric sidechain are listed below. They are sorted by the frequency of occurrence in the ensemble.

Mol	Chain	Res	Type
1	A	1	MET
1	A	3	LYS
1	A	6	LYS
1	A	8	SER
1	A	12	LEU
1	A	13	THR
1	A	16	LYS
1	A	17	VAL
1	A	21	ILE
1	A	26	ASN
1	A	30	THR
1	A	33	VAL
1	A	36	ILE
1	A	42	HIS
1	A	43	LEU
1	A	50	ILE
1	A	51	SER
1	A	52	LYS
1	A	56	SER
1	A	58	GLU
1	A	59	LEU
1	A	60	ASP
1	A	63	LEU
1	A	64	PHE
1	A	69	GLU
1	A	70	LYS
1	A	73	LEU
1	A	74	ASN
1	A	76	ARG

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Mol	Chain	Res	Type
1	A	79	LEU
1	A	85	LEU
1	A	95	TYR
1	A	96	LYS
1	A	97	ILE
1	A	105	LEU
1	A	106	SER
1	A	107	THR
1	A	108	GLN
1	A	109	ILE
1	A	111	LYS
1	A	112	LYS
1	A	116	GLU
1	A	118	ARG
1	A	120	SER
1	A	125	ILE
1	A	128	GLU
1	A	134	THR
1	A	135	LEU
1	A	139	ARG
1	A	140	THR
1	A	146	HIS
1	A	147	THR
1	A	148	GLN
1	A	151	ILE
1	A	153	GLN
1	A	154	LEU
1	A	171	VAL
1	A	179	THR
1	A	180	THR
1	A	189	LEU
1	A	190	TYR
1	A	191	THR
1	A	192	TYR
1	A	196	LYS
1	A	197	TRP
1	A	200	ARG
1	A	201	GLU
1	A	203	ARG
1	A	208	LYS
1	A	219	LYS
1	A	223	LEU

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Mol	Chain	Res	Type
1	A	224	SER
1	A	225	THR
1	A	226	ILE
1	A	228	TYR
1	A	231	VAL
1	A	233	SER
1	A	237	SER
1	A	239	LEU
1	A	242	ASN
1	A	244	ARG

6.3.3 RNA

There are no RNA molecules in this entry.

6.4 Non-standard residues in protein, DNA, RNA chains

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

6.5 Carbohydrates

There are no oligosaccharides in this entry.

6.6 Ligand geometry

There are no ligands in this entry.

6.7 Other polymers

There are no such molecules in this entry.

6.8 Polymer linkage issues

There are no chain breaks in this entry.

7 Chemical shift validation

No chemical shift data were provided