



## Full wwPDB EM Validation Report ⓘ

May 4, 2024 – 02:04 pm BST

PDB ID : 5GAP  
EMDB ID : EMD-8014  
Title : Body region of the U4/U6.U5 tri-snRNP  
Authors : Nguyen, T.H.D.; Galej, W.P.; Oubridge, C.; Bai, X.C.; Newman, A.; Scheres, S.; Nagai, K.  
Deposited on : 2015-12-15  
Resolution : 3.60 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](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:

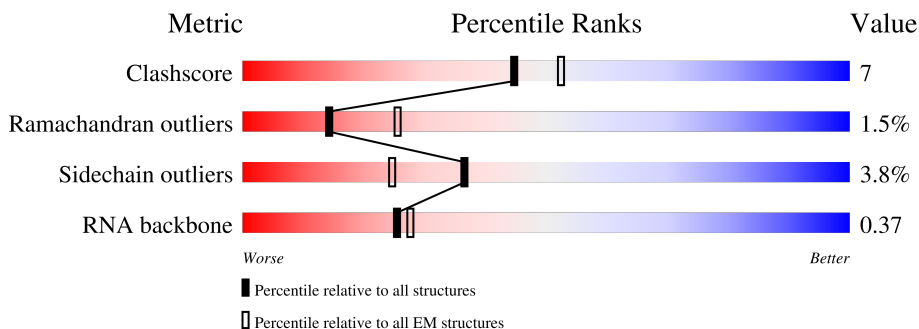
EMDB validation analysis : 0.0.1.dev92  
MolProbity : 4.02b-467  
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)  
MapQ : **FAILED**  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.36.2

# 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 3.60 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	158937	4297
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826
RNA backbone	4643	859

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	V	67	42% (green), 37% (yellow), 19% (orange), 2% (red), 0% (grey)
2	W	112	23% (green), 17% (yellow), 10% (orange), 50% (grey)
3	U	214	6% (green), 2% (yellow), 91% (grey)
4	x	82	100% (green)
5	A	2413	47% (green), 9% (yellow), 44% (grey)
6	H	465	59% (green), 18% (yellow), 23% (grey)
7	J	899	64% (green), 16% (yellow), 1% (orange), 19% (grey)

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Mol	Chain	Length	Quality of chain
8	D	143	 76% 21% ..
9	F	494	 65% 18% • 16%
10	G	469	 59% 9% 32%
11	K	126	 70% 25% ..
12	B	2163	 • 97%

## 2 Entry composition

There are 12 unique types of molecules in this entry. The entry contains 31576 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 RNA chain called U4 snRNA, 5' region, nucleotides 1-67.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
1	V	67	1426	637	247	475	67	0	0

- Molecule 2 is a RNA chain called U6 snRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
2	W	56	1190	533	210	391	56	0	0

- Molecule 3 is a RNA chain called U5 snRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
3	U	20	414	186	64	144	20	0	0

- Molecule 4 is a protein called unknown protein.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
4	x	82	410	246	82	82	0	0

- Molecule 5 is a protein called Pre-mRNA-splicing factor 8.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	A	1349	11066	7094	1901	2031	40	0	0

- Molecule 6 is a protein called U4/U6 small nuclear ribonucleoprotein PRP4.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
6	H	357	2789	1743	501	532	13	0	0

- Molecule 7 is a protein called Pre-mRNA-splicing factor 6.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
7	J	729	5822	3726	992	1079	25	0	0

- Molecule 8 is a protein called Spliceosomal protein DIB1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
8	D	140	1151	728	200	212	11	0	0

- Molecule 9 is a protein called Pre-mRNA-processing factor 31.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
9	F	415	3218	2052	575	580	11	0	0

- Molecule 10 is a protein called U4/U6 small nuclear ribonucleoprotein PRP3.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
10	G	318	2632	1659	469	488	16	0	0

- Molecule 11 is a protein called 13 kDa ribonucleoprotein-associated protein.

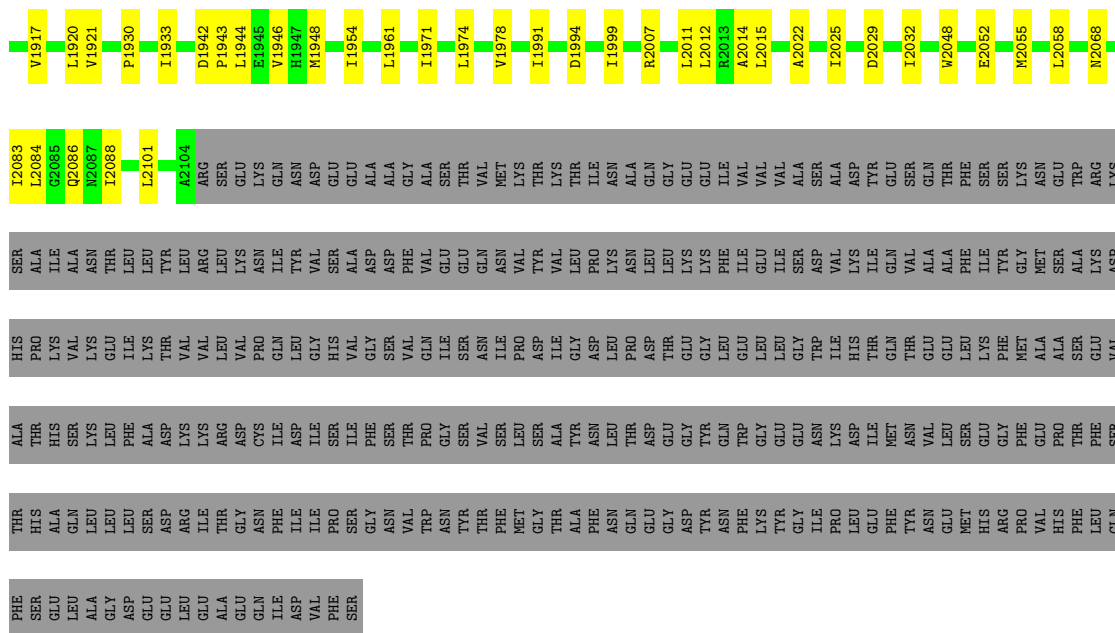
Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
11	K	124	936	597	161	174	4	0	0

- Molecule 12 is a protein called Pre-mRNA-splicing helicase BRR2.

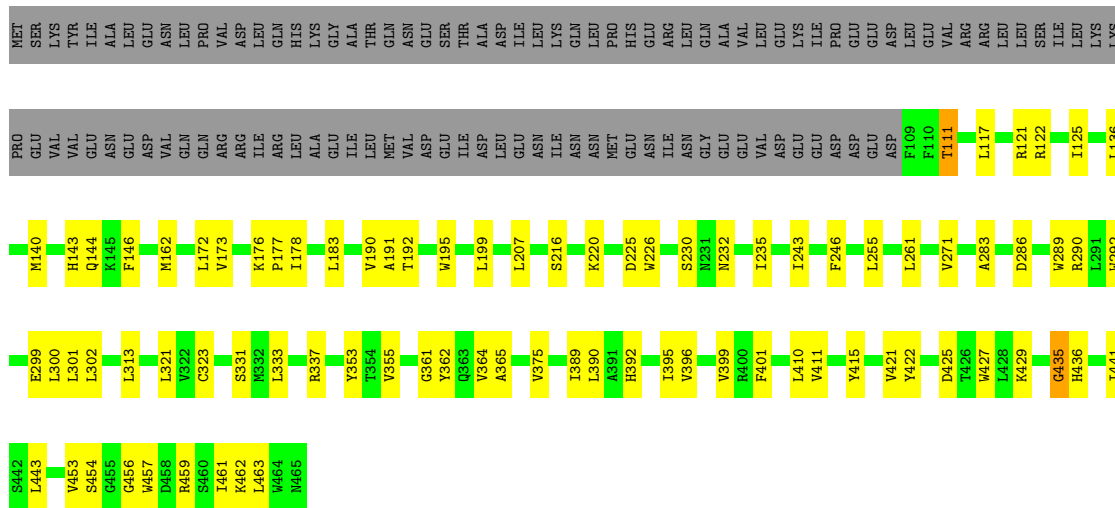
Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
12	B	71	522	326	89	106	1	0	0



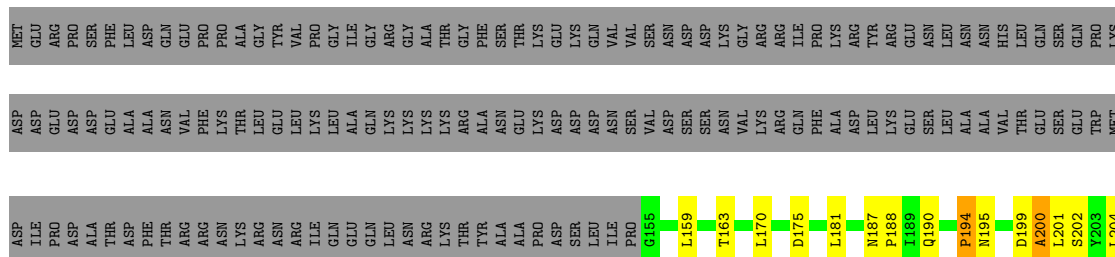
I1632	I1407	L1409	L852	LEU	GLY	PRO	ASN	HIS	HIS	ALA	GLU	TRP	PRO	HIS	PRO	LYS	LYS	ILE	MET
S1413	L1412	L1050	T853	LEU	GLN	THR	L1063	HIS	ASN	LEU	GLU	PHE	ASP	GLU	PRO	ASP	GLY	ASN	SER
W1414	S1413	F1063	1857	ARG	THR	THR	T1064	LYS	THR	PHE	TYR	ASP	ASP	GLU	ASP	GLN	ASN	GLU	GLY
I1646	W1414	L1065	1874	ILE	ILE	THR	L1066	LYS	THR	PHE	GLY	PRO	PRO	GLU	ALA	ASN	ILE	VAL	ILE
F1649	A1427	M1067	1882	ASN	TYR	THR	M1067	ASN	LEU	ASN	PHE	PRO	PRO	PRO	LYS	TYR	ASP	PRO	PRO
W1654	GLY	M1275	L914	LEU	ARG	GLY	L1070	LEU	LEU	ASN	LEU	ASN	SER	LEU	VAL	ASP	VAL	PHE	PRO
I1657	MET	E1276	L919	PRO	TYR	THR	I1073	LYS	LYS	GLN	ARG	PRO	PRO	TYR	VAL	ARG	VAL	GLU	GLU
I1668	THR	E1277	W922	PRO	ARG	THR	I1082	VAL	ASN	PHE	ILE	THR	THR	LEU	ILE	THR	THR	THR	ASP
L1669	HIS	E1277	Y923	THR	HIS	GLY	T1083	GLY	LYS	ILE	PHE	SER	SER	GLU	ASP	GLN	ASP	GLU	ASP
V1681	THR	V1278	L939	ARG	GLN	ALA	K1085	ASN	THR	ALA	ASP	VAL	VAL	GLY	ASN	VAL	VAL	VAL	ASP
Y1743	GLU	W1281	A943	SER	ARG	ASN	M1086	SER	ASN	ASN	ASN	VAL	VAL	LEU	ASN	VAL	VAL	VAL	ALA
S1749	D1433	F1312	P947	ASN	ALA	CYS	W1087	ASN	THR	ALA	SER	ILE	ILE	ARG	ASP	ILE	ILE	THR	PRO
P1768	I1437	G1318	T950	ILE	LYS	ILE	V1089	ILE	THR	LYS	LEU	SER	SER	GLU	GLU	SER	GLU	GLU	PRO
I1777	F1451	I1319	T960	VAL	LYS	ASP	F1092	VAL	THR	ALA	ALA	VAL	VAL	THR	THR	THR	THR	THR	PRO
B1778	W1458	L1320	T980	THR	THR	ARG	K1093	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	PRO
L1779	Y1461	M1321	W971	THR	THR	ILE	D1094	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	PRO
F1791	Y1512	A1322	W972	LYS	ILE	ASP	M1095	LYS	ALA	LYS	LYS	LYS	LYS	LYS	LYS	LYS	LYS	LYS	PRO
K1795	K1535	G1324	T978	GLN	TYR	MET	V1098	GLN	ALA	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	PRO
P1796	L1536	W1335	W982	LEU	TYR	MET	L1103	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	PRO
S1801	W1537	L1339	W989	LEU	TYR	MET	I1104	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	PRO
A1811	Y1542	L1342	W991	LEU	TYR	MET	L1107	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	PRO
R1820	K1538	T1344	W992	LEU	TYR	MET	I1113	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	PRO
Q1827	L1538	W1344	W993	LEU	TYR	MET	F1114	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	PRO
L1823	E1558	E1354	W994	LEU	TYR	MET	Q1115	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	PRO
L1835	H1559	P1355	W995	LEU	TYR	MET	Y1116	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	PRO
N1836	T1560	L1360	P1010	LEU	TYR	MET	L1125	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	PRO
S1837	T1560	L1366	W1011	LEU	TYR	MET	L1126	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	PRO
L1843	A1578	I1367	W1012	LEU	TYR	MET	Y1161	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	PRO
L1850	S1599	Q1368	P1021	LEU	TYR	MET	M1170	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	PRO
T1881	Q1600	Q1368	F1022	LEU	TYR	MET	T1183	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	PRO
I1893	I1601	K1372	L1023	LEU	TYR	MET	T1183	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	PRO
W1911	P1602	L1375	Y1025	LEU	TYR	MET	I216	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	PRO
K1912	R1605	L1375	W1027	LEU	TYR	MET	M1221	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	PRO
T1913	F1606	F1383	W1028	LEU	TYR	MET	I1230	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	PRO
	T1607	P1384	T1029	LEU	TYR	MET	I1230	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	PRO
	L1608	P1385	I1032	LEU	TYR	MET	L1238	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	PRO
	W1609	A1386	W1038	LEU	TYR	MET	L1238	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	PRO
	W1610	V1387	W1039	LEU	TYR	MET	V1250	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	PRO
	T1613	L1394	W1047	LEU	TYR	MET	Y1251	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	PRO
	I1614	A1402	W1048	LEU	TYR	MET	N1254	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	PRO
	F1623			LEU	TYR	MET		LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	PRO



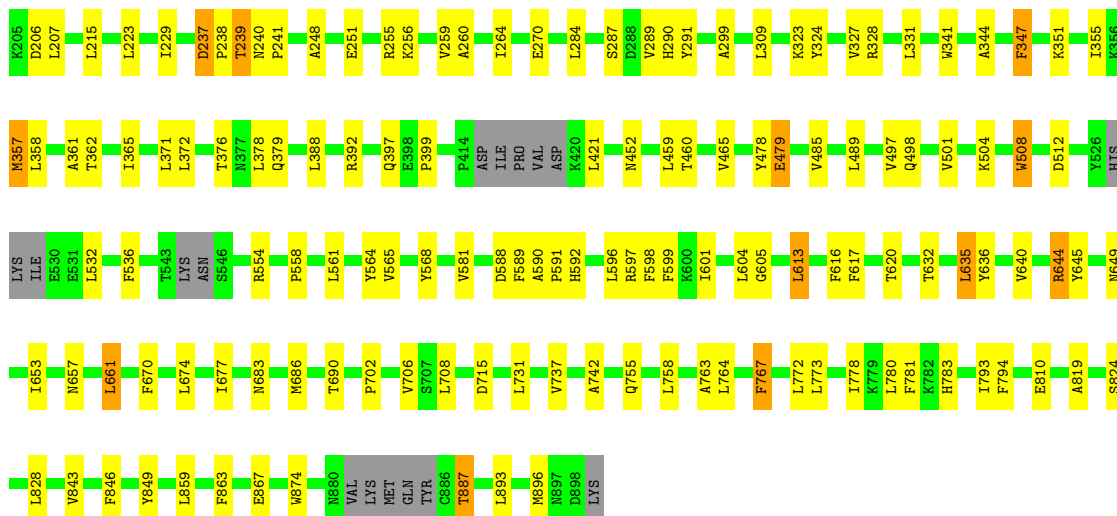
• Molecule 6: U4/U6 small nuclear ribonucleoprotein PRP4



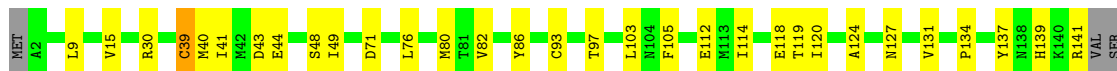
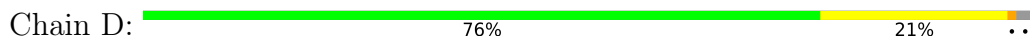
• Molecule 7: Pre-mRNA-splicing factor 6



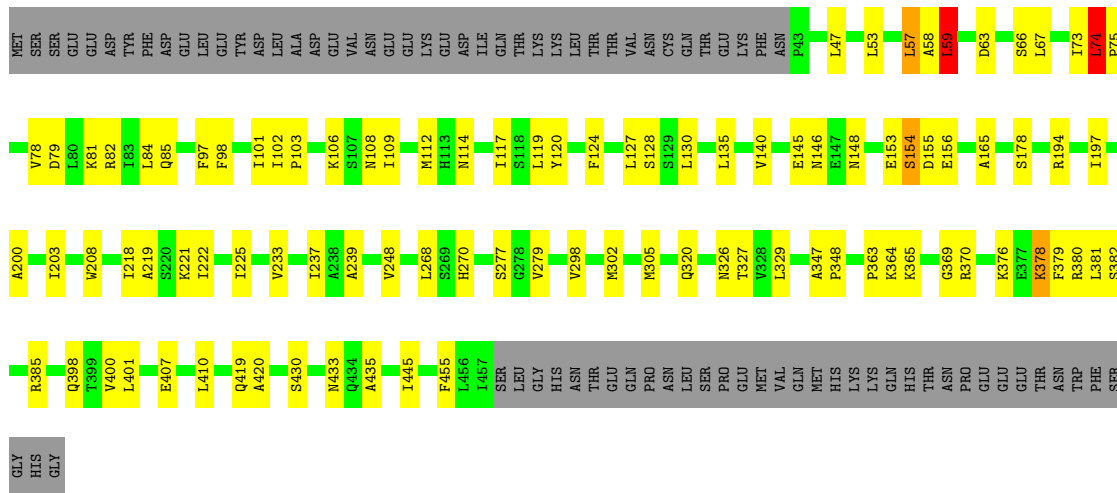




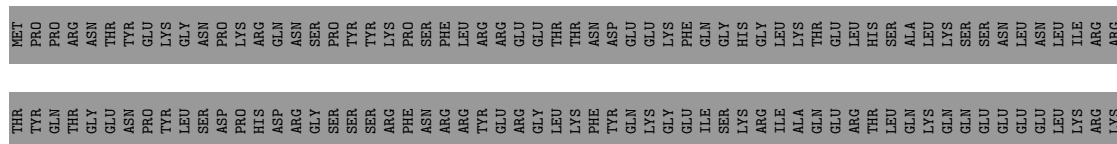
• Molecule 8: Spliceosomal protein DIB1



• Molecule 9: Pre-mRNA-processing factor 31



• Molecule 10: U4/U6 small nuclear ribonucleoprotein PRP3







LEU ASN  
THR ALA  
THR THR  
THR ASP  
SER ALA  
MET MET  
ASP ASP  
ALA ALA  
GLN GLN  
MET MET  
LEU LEU  
ILE ILE  
GLN GLN  
GLY GLY  
VAL VAL  
ASN ASN  
VAL VAL  
TYR TYR  
TRP TRP  
ASP ASP  
VAL VAL  
ASP ASP  
ASN ASN  
PRO PRO  
LEU LEU  
LEU LEU  
ARG ARG  
GLN GLN  
ILE ILE  
PRO PRO  
HIS HIS  
PHE PHE  
ASN ASN  
ASN ASN  
ASP ASP  
SER SER  
SER SER  
LYS LYS  
ILE ILE  
LEU LEU  
GLY GLY  
LEU LEU  
LYS LYS  
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ILE ILE  
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TYR TYR  
ASP ASP  
ILE ILE  
MET MET  
ALA ALA  
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GLU GLU  
ASP ASP  
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GLU GLU  
ILE ILE  
ASN ASN  
VAL VAL  
LYS LYS

## 4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	140155	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING ONLY	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ( $e^-/\text{\AA}^2$ )	38	Depositor
Minimum defocus (nm)	500	Depositor
Maximum defocus (nm)	3500	Depositor
Magnification	35714	Depositor
Image detector	GATAN K2 SUMMIT (4k x 4k)	Depositor

## 5 Model quality [i](#)

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

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with  $|Z| > 5$  is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z  >5	RMSZ	# Z  >5
1	V	0.36	0/1593	0.79	1/2480 (0.0%)
2	W	0.38	0/1328	0.84	2/2061 (0.1%)
3	U	0.32	0/459	0.76	0/710
5	A	0.42	1/11327 (0.0%)	0.73	2/15348 (0.0%)
6	H	0.38	0/2845	0.71	0/3843
7	J	0.44	0/5934	0.80	2/8039 (0.0%)
8	D	0.42	0/1172	0.75	1/1578 (0.1%)
9	F	0.43	0/3273	0.80	2/4413 (0.0%)
10	G	0.41	0/2687	0.69	0/3611
11	K	0.45	0/949	0.81	0/1292
12	B	0.42	0/529	0.69	0/716
All	All	0.42	1/32096 (0.0%)	0.76	10/44091 (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
5	A	0	3
9	F	0	1
12	B	0	1
All	All	0	5

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	A	825	SER	CB-OG	5.40	1.49	1.42

All (10) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
7	J	613	LEU	CA-CB-CG	7.12	131.69	115.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	A	979	SER	C-N-CD	-6.95	105.32	120.60
1	V	17	A	C2'-C3'-O3'	6.90	124.74	113.70
2	W	55	G	C2'-C3'-O3'	5.73	122.87	113.70
9	F	74	LEU	CA-CB-CG	5.58	128.14	115.30
9	F	155	ASP	N-CA-C	5.34	125.42	111.00
7	J	532	LEU	CA-CB-CG	5.30	127.49	115.30
8	D	103	LEU	CA-CB-CG	5.26	127.41	115.30
2	W	48	C	C2'-C3'-O3'	5.21	122.04	113.70
5	A	831	ARG	NE-CZ-NH1	5.10	122.85	120.30

There are no chirality outliers.

All (5) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
5	A	1278	VAL	Peptide
5	A	1994	ASP	Peptide
5	A	979	SER	Peptide
12	B	423	ILE	Peptide
9	F	154	SER	Peptide

## 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	V	1426	0	716	22	0
2	W	1190	0	603	14	0
3	U	414	0	213	4	0
4	x	410	0	89	0	0
5	A	11066	0	11078	138	0
6	H	2789	0	2725	53	0
7	J	5822	0	5792	103	0
8	D	1151	0	1138	17	0
9	F	3218	0	3297	53	0
10	G	2632	0	2599	27	0
11	K	936	0	987	24	0
12	B	522	0	506	5	0
All	All	31576	0	29743	413	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 7.

All (413) 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)
5:A:1578:ALA:HB1	5:A:1602:PRO:HB3	1.40	1.02
5:A:1275:MET:HE2	5:A:1281:ASN:ND2	1.92	0.84
10:G:272:VAL:HG12	10:G:280:VAL:HG21	1.59	0.81
5:A:1067:ASN:HB2	5:A:1083:THR:HG21	1.64	0.80
7:J:199:ASP:O	7:J:201:LEU:N	2.14	0.79
9:F:347:ALA:HB1	9:F:348:PRO:HD2	1.69	0.74
7:J:598:PHE:HA	7:J:601:ILE:HD12	1.68	0.74
11:K:16:LEU:HD21	11:K:124:LEU:HD11	1.69	0.74
11:K:24:VAL:HG13	11:K:33:LEU:CD1	2.19	0.72
6:H:441:ILE:HG22	6:H:456:GLY:HA2	1.69	0.72
7:J:361:ALA:HB1	7:J:371:LEU:HD13	1.72	0.72
1:V:18:A:OP2	9:F:378:LYS:NZ	2.24	0.70
7:J:849:TYR:CD2	7:J:859:LEU:HD11	2.27	0.70
8:D:86:TYR:CD2	8:D:124:ALA:HB1	2.27	0.69
5:A:960:THR:HG21	9:F:455:PHE:CZ	2.29	0.68
5:A:1668:ILE:HD13	5:A:1801:SER:HB3	1.76	0.68
5:A:1050:LEU:HD22	5:A:1170:MET:HE3	1.77	0.67
5:A:1946:VAL:HG21	7:J:229:ILE:HG21	1.77	0.66
11:K:16:LEU:CD2	11:K:124:LEU:HD11	2.25	0.66
7:J:264:ILE:HD13	7:J:284:LEU:HD11	1.78	0.66
7:J:863:PHE:CE1	7:J:893:LEU:HD11	2.32	0.65
5:A:1835:LEU:HD21	5:A:1843:LEU:HD11	1.79	0.64
9:F:135:LEU:HD22	9:F:208:TRP:CD1	2.33	0.64
7:J:351:LYS:O	7:J:355:ILE:HG13	1.98	0.64
7:J:251:GLU:OE2	7:J:259:VAL:HG23	1.99	0.62
7:J:597:ARG:HE	7:J:620:THR:HG22	1.64	0.62
7:J:601:ILE:HD13	7:J:640:VAL:HG11	1.80	0.62
9:F:74:LEU:HB3	9:F:75:PRO:HD3	1.80	0.62
3:U:93:G:N1	3:U:94:C:C4	2.68	0.62
9:F:53:LEU:HD22	9:F:73:ILE:HG12	1.81	0.62
11:K:24:VAL:HG22	11:K:102:ILE:HD11	1.82	0.61
5:A:1342:LEU:CD2	5:A:1360:LEU:HD21	2.30	0.61
6:H:411:VAL:HG12	6:H:443:LEU:HD21	1.81	0.61
5:A:1063:PHE:CE1	5:A:1086:ASN:HB3	2.35	0.61
5:A:1089:VAL:HG22	5:A:1098:VAL:HG22	1.82	0.61
7:J:452:ASN:CB	7:J:497:VAL:HG21	2.30	0.61
9:F:127:LEU:HD11	9:F:140:VAL:HG11	1.82	0.61

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
6:H:283:ALA:HB2	6:H:313:LEU:HG	1.83	0.61
5:A:1559:HIS:HB3	5:A:1613:THR:HG21	1.82	0.60
5:A:2025:ILE:HD12	5:A:2058:LEU:HD22	1.83	0.60
11:K:64:LEU:CD2	11:K:98:ILE:HD13	2.31	0.60
5:A:1578:ALA:CB	5:A:1602:PRO:HB3	2.25	0.60
6:H:192:THR:HG21	6:H:461:ILE:CD1	2.32	0.60
2:W:31:G:H4'	2:W:32:U:OP1	2.01	0.60
1:V:58:G:H2'	1:V:59:C:O4'	2.02	0.60
7:J:204:LEU:HD23	9:F:433:ASN:HD22	1.66	0.60
9:F:233:VAL:HG11	9:F:237:ILE:HG21	1.84	0.59
5:A:1971:ILE:HD11	5:A:2012:LEU:HD21	1.83	0.59
5:A:1082:ILE:HD13	5:A:1113:ILE:HD11	1.84	0.59
3:U:93:G:N2	3:U:94:C:C2	2.70	0.59
7:J:465:VAL:HG11	7:J:501:VAL:HG22	1.84	0.59
7:J:702:PRO:O	7:J:706:VAL:HG23	2.02	0.59
6:H:395:ILE:HD11	6:H:415:TYR:CD1	2.38	0.59
7:J:613:LEU:O	7:J:617:PHE:CD2	2.56	0.59
10:G:342:PHE:HB3	10:G:424:ILE:HD11	1.85	0.59
7:J:590:ALA:HB3	7:J:591:PRO:HD3	1.85	0.58
9:F:218:ILE:O	9:F:222:ILE:HG23	2.04	0.58
10:G:341:VAL:HG11	10:G:463:PHE:CD1	2.39	0.58
7:J:341:TRP:CD1	7:J:365:ILE:HD11	2.39	0.58
8:D:86:TYR:CG	8:D:124:ALA:HB1	2.38	0.58
5:A:1023:LEU:HD13	5:A:1451:PHE:CD1	2.39	0.58
6:H:375:VAL:HG11	6:H:427:TRP:CH2	2.39	0.58
5:A:1092:PHE:O	5:A:1093:LYS:C	2.42	0.57
7:J:204:LEU:HD22	9:F:380:ARG:O	2.04	0.57
7:J:758:LEU:HD21	11:K:75:ASN:HB2	1.86	0.57
7:J:536:PHE:HB3	7:J:564:TYR:CZ	2.40	0.57
6:H:162:MET:HB3	6:H:421:VAL:HG21	1.87	0.57
5:A:1312:PHE:CE2	5:A:1360:LEU:HD23	2.40	0.56
10:G:368:LEU:HD13	10:G:370:LEU:HD13	1.87	0.56
5:A:808:ILE:O	5:A:811:ILE:HG22	2.05	0.56
5:A:1599:SER:O	5:A:1602:PRO:HD2	2.05	0.56
2:W:84:C:H3'	10:G:350:PRO:HB3	1.88	0.56
10:G:365:LEU:HD22	10:G:382:VAL:HG12	1.88	0.56
5:A:1275:MET:CE	5:A:1281:ASN:CG	2.74	0.55
5:A:1275:MET:HE3	5:A:1281:ASN:CG	2.27	0.55
5:A:1394:LEU:HD11	5:A:1553:ILE:HD13	1.88	0.55
11:K:64:LEU:HD22	11:K:98:ILE:HD13	1.88	0.55
12:B:387:GLU:O	12:B:388:GLN:CB	2.54	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
5:A:1339:LEU:HD21	5:A:1402:ALA:HB2	1.88	0.55
7:J:327:VAL:HG11	7:J:344:ALA:HB2	1.89	0.55
7:J:846:PHE:CD1	7:J:859:LEU:HD13	2.42	0.55
5:A:1961:LEU:HG	5:A:2084:LEU:HG	1.88	0.55
7:J:215:LEU:HD13	9:F:398:GLN:NE2	2.22	0.55
9:F:98:PHE:HA	9:F:101:ILE:HG22	1.88	0.55
1:V:10:C:H2'	1:V:11:A:O4'	2.06	0.54
5:A:882:ILE:CD1	5:A:1238:LEU:HD21	2.37	0.54
10:G:352:ILE:HD12	10:G:400:ILE:HG23	1.89	0.54
11:K:54:MET:HB3	11:K:64:LEU:HD11	1.89	0.54
1:V:58:G:C6	1:V:59:C:C4	2.96	0.54
2:W:49:A:O2'	2:W:50:G:OP2	2.22	0.54
5:A:831:ARG:NH2	5:A:978:ILE:HG23	2.22	0.54
9:F:194:ARG:O	9:F:197:ILE:HG13	2.08	0.54
7:J:616:PHE:O	7:J:620:THR:HG23	2.06	0.54
5:A:874:ILE:HD13	5:A:1065:LEU:HD22	1.90	0.53
9:F:329:LEU:HD22	11:K:60:PRO:HG3	1.90	0.53
7:J:204:LEU:CD1	9:F:381:LEU:HD23	2.38	0.53
11:K:39:GLU:O	11:K:43:THR:HG23	2.08	0.53
6:H:390:LEU:HB3	10:G:428:TRP:CE3	2.43	0.53
5:A:1921:VAL:HG21	5:A:1948:MET:HE1	1.91	0.53
7:J:299:ALA:HB1	7:J:309:LEU:HD13	1.90	0.53
12:B:423:ILE:HG23	12:B:424:PRO:HD3	1.91	0.53
7:J:617:PHE:CD2	7:J:644:ARG:CZ	2.91	0.53
5:A:1354:GLU:N	5:A:1355:PRO:CD	2.72	0.53
7:J:204:LEU:HD23	9:F:433:ASN:ND2	2.23	0.53
2:W:77:G:H2'	2:W:78:G:O4'	2.09	0.53
5:A:1946:VAL:HG21	7:J:229:ILE:CG2	2.39	0.52
6:H:436:HIS:HA	6:H:462:LYS:HE3	1.90	0.52
11:K:40:ALA:O	11:K:43:THR:OG1	2.21	0.52
7:J:215:LEU:HD13	9:F:398:GLN:HE22	1.74	0.52
5:A:1791:PHE:CE2	5:A:1794:LEU:HD22	2.44	0.52
7:J:781:PHE:CZ	7:J:793:ILE:HG13	2.45	0.52
9:F:106:LYS:O	9:F:109:ILE:HG22	2.09	0.52
5:A:939:LEU:HD21	9:F:445:ILE:HD11	1.92	0.52
7:J:376:THR:HG22	7:J:388:LEU:HD13	1.91	0.51
7:J:737:VAL:HG22	7:J:767:PHE:CD1	2.44	0.51
5:A:753:TYR:HB2	8:D:41:ILE:HD11	1.92	0.51
5:A:1063:PHE:CZ	5:A:1086:ASN:HB3	2.46	0.51
7:J:561:LEU:HB3	7:J:596:LEU:HD21	1.92	0.51
9:F:268:LEU:HD13	9:F:270:HIS:CE1	2.45	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
5:A:1600:GLN:NE2	8:D:134:PRO:O	2.43	0.51
6:H:192:THR:HG21	6:H:461:ILE:HD13	1.92	0.51
7:J:204:LEU:HD11	9:F:381:LEU:HD23	1.92	0.51
7:J:601:ILE:HG12	7:J:617:PHE:CZ	2.46	0.51
7:J:605:GLY:HA3	7:J:887:THR:HG21	1.92	0.51
9:F:145:GLU:HG3	9:F:197:ILE:HD11	1.91	0.51
11:K:24:VAL:HG13	11:K:33:LEU:HD11	1.93	0.51
1:V:35:G:N2	1:V:43:C:C2	2.79	0.51
5:A:1669:LEU:HB3	5:A:1681:VAL:HG21	1.93	0.51
5:A:2015:LEU:HD23	5:A:2022:ALA:HB3	1.93	0.51
6:H:207:LEU:HD22	6:H:463:LEU:HG	1.91	0.51
7:J:201:LEU:O	7:J:202:SER:C	2.49	0.51
10:G:382:VAL:HG21	10:G:392:TYR:CD2	2.45	0.51
9:F:57:LEU:HD21	9:F:108:ASN:HA	1.92	0.51
3:U:93:G:C2	3:U:94:C:C4	2.99	0.51
5:A:982:TYR:CD2	5:A:1104:ILE:HG23	2.46	0.51
5:A:1066:LEU:HD11	5:A:1113:ILE:HG23	1.93	0.51
5:A:1387:VAL:HG12	5:A:1610:TRP:CE3	2.46	0.51
9:F:74:LEU:HD13	9:F:78:VAL:HB	1.93	0.51
6:H:246:PHE:HB3	6:H:255:LEU:HD22	1.93	0.50
7:J:661:LEU:HD22	7:J:670:PHE:HB3	1.92	0.50
11:K:53:ILE:HD11	11:K:102:ILE:HG12	1.92	0.50
5:A:788:GLU:HB2	7:J:181:LEU:HD23	1.93	0.50
5:A:1318:GLY:O	5:A:1321:MET:O	2.30	0.50
7:J:778:ILE:HG23	7:J:794:PHE:CE1	2.47	0.50
5:A:1578:ALA:HB1	5:A:1602:PRO:CB	2.28	0.50
5:A:1387:VAL:HG12	5:A:1610:TRP:CD2	2.47	0.50
9:F:298:VAL:HG12	9:F:302:MET:HB2	1.92	0.50
9:F:102:ILE:N	9:F:103:PRO:CD	2.75	0.50
6:H:111:THR:HG22	10:G:216:TYR:HB3	1.94	0.49
11:K:26:GLN:HB3	11:K:110:ILE:HG21	1.94	0.49
7:J:372:LEU:O	7:J:376:THR:HG23	2.12	0.49
1:V:21:C:H2'	1:V:22:G:O4'	2.12	0.49
5:A:1560:THR:HG21	5:A:1609:TRP:NE1	2.27	0.49
5:A:1893:ILE:HD12	5:A:1978:VAL:HG22	1.95	0.49
6:H:425:ASP:HB2	10:G:174:LEU:HD23	1.93	0.49
9:F:320:GLN:HE22	9:F:326:ASN:HB3	1.78	0.49
6:H:122:ARG:O	6:H:125:ILE:HG12	2.13	0.49
7:J:601:ILE:HG12	7:J:617:PHE:CE1	2.47	0.49
10:G:368:LEU:HD11	10:G:381:ILE:HD12	1.94	0.49
6:H:390:LEU:HD13	10:G:428:TRP:HB2	1.95	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
7:J:465:VAL:CG1	7:J:501:VAL:HG22	2.43	0.49
5:A:1183:THR:HG23	5:A:1221:ASN:HB3	1.94	0.49
5:A:1933:ILE:HG21	5:A:1944:LEU:HD21	1.94	0.49
1:V:34:G:H2'	1:V:35:G:O4'	2.12	0.49
5:A:1791:PHE:CZ	5:A:1794:LEU:HD22	2.47	0.49
9:F:112:MET:HE1	9:F:203:ILE:HD12	1.95	0.49
7:J:195:ASN:O	7:J:199:ASP:N	2.46	0.49
7:J:207:LEU:HD12	9:F:382:SER:CB	2.43	0.49
1:V:22:G:C2	1:V:23:C:C2	3.00	0.48
7:J:248:ALA:HA	7:J:264:ILE:HD11	1.94	0.48
7:J:251:GLU:HB3	7:J:260:ALA:HB2	1.96	0.48
7:J:341:TRP:CE3	7:J:361:ALA:HB2	2.48	0.48
10:G:347:LEU:HD11	10:G:371:ARG:HD3	1.93	0.48
6:H:121:ARG:O	6:H:125:ILE:HG23	2.14	0.48
6:H:243:ILE:HG13	6:H:261:LEU:HD13	1.94	0.48
7:J:239:THR:N	7:J:240:ASN:HA	2.28	0.48
7:J:674:LEU:CD2	7:J:690:THR:HG21	2.43	0.48
5:A:1010:PRO:HG2	5:A:1012:TRP:CZ2	2.49	0.48
6:H:459:ARG:NH2	11:K:72:GLU:O	2.46	0.48
1:V:22:G:C6	1:V:23:C:C4	3.02	0.48
5:A:1275:MET:CE	5:A:1281:ASN:ND2	2.70	0.48
7:J:190:GLN:O	7:J:194:PRO:HD2	2.13	0.48
5:A:1657:ILE:HA	5:A:1811:ALA:CB	2.44	0.48
7:J:170:LEU:HD13	7:J:175:ASP:OD2	2.14	0.48
12:B:404:GLY:O	12:B:407:GLN:HB2	2.13	0.48
5:A:1050:LEU:HD22	5:A:1170:MET:CE	2.42	0.48
6:H:176:LYS:HB3	6:H:177:PRO:HD2	1.95	0.48
7:J:256:LYS:HD2	7:J:259:VAL:HG22	1.96	0.48
7:J:674:LEU:HD22	7:J:690:THR:HG21	1.96	0.48
8:D:93:CYS:SG	8:D:120:ILE:HG21	2.54	0.48
11:K:54:MET:SD	11:K:64:LEU:CD1	3.02	0.48
5:A:1286:TRP:CZ2	5:A:1302:LEU:HD11	2.49	0.47
7:J:187:ASN:N	7:J:188:PRO:HD2	2.28	0.47
9:F:225:ILE:HG22	9:F:248:VAL:HG21	1.96	0.47
5:A:1407:ILE:HG21	5:A:1412:LEU:HD21	1.94	0.47
7:J:378:LEU:HD13	7:J:379:GLN:HA	1.96	0.47
5:A:1126:LEU:HD21	5:A:1161:TYR:CG	2.50	0.47
5:A:1820:ARG:O	5:A:1824:GLN:N	2.44	0.47
1:V:58:G:C5	1:V:59:C:C5	3.03	0.47
5:A:1974:LEU:O	5:A:1978:VAL:HG23	2.14	0.47
5:A:2052:GLU:OE1	10:G:291:THR:OG1	2.31	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:V:35:G:C2	1:V:43:C:C2	3.03	0.47
1:V:58:G:C2	1:V:59:C:C2	3.03	0.47
5:A:765:ASP:CG	7:J:163:THR:HG21	2.35	0.47
5:A:853:THR:O	5:A:857:ILE:HG12	2.14	0.47
7:J:645:TYR:O	7:J:649:ASN:N	2.46	0.47
9:F:130:LEU:HD11	9:F:178:SER:HB3	1.97	0.47
9:F:320:GLN:HE22	9:F:326:ASN:CB	2.28	0.47
5:A:1414:TRP:HA	5:A:1558:GLU:HG2	1.95	0.47
8:D:30:ARG:HA	8:D:82:VAL:HG12	1.95	0.47
5:A:1632:ILE:HD11	5:A:1649:PHE:CE1	2.49	0.47
5:A:1777:ILE:N	5:A:1777:ILE:HD12	2.30	0.47
6:H:125:ILE:HG22	6:H:337:ARG:HB3	1.95	0.47
6:H:435:GLY:N	7:J:731:LEU:HD13	2.30	0.47
11:K:67:LEU:N	11:K:68:PRO:CD	2.76	0.47
9:F:277:SER:HB2	9:F:279:VAL:HG12	1.95	0.47
10:G:293:TRP:O	10:G:297:VAL:HG13	2.15	0.47
1:V:50:G:C6	1:V:51:U:N3	2.83	0.47
7:J:324:TYR:CD1	7:J:347:PHE:CE2	3.03	0.47
5:A:756:LEU:HD13	8:D:44:GLU:HG3	1.97	0.46
5:A:1632:ILE:HD11	5:A:1649:PHE:CD1	2.49	0.46
6:H:289:TRP:CD2	6:H:313:LEU:HD21	2.50	0.46
6:H:321:LEU:HD11	6:H:333:LEU:HB3	1.97	0.46
7:J:498:GLN:HE21	7:J:498:GLN:N	2.13	0.46
5:A:1601:ILE:N	5:A:1602:PRO:CD	2.79	0.46
5:A:1542:TYR:O	5:A:1546:VAL:HG23	2.16	0.46
7:J:323:LYS:O	7:J:327:VAL:HG23	2.16	0.46
11:K:79:VAL:HG13	11:K:121:ILE:HG12	1.98	0.46
5:A:1372:LYS:HG2	5:A:1383:PHE:CE2	2.51	0.46
5:A:1605:ARG:HG2	5:A:1823:LEU:HA	1.98	0.46
7:J:238:PRO:C	7:J:240:ASN:HA	2.35	0.46
5:A:819:LYS:O	5:A:823:TRP:N	2.48	0.46
6:H:176:LYS:HB3	6:H:177:PRO:CD	2.46	0.46
7:J:289:VAL:HG23	7:J:290:HIS:N	2.31	0.46
1:V:37:U:H2'	1:V:39:C:C5	2.51	0.45
9:F:219:ALA:HA	9:F:239:ALA:HB2	1.97	0.45
5:A:1368:GLN:O	5:A:1372:LYS:HG3	2.16	0.45
6:H:235:ILE:HD11	6:H:243:ILE:HG13	1.98	0.45
6:H:365:ALA:HB2	6:H:375:VAL:HG13	1.98	0.45
7:J:706:VAL:HG22	7:J:742:ALA:CB	2.46	0.45
5:A:1115:GLN:HA	5:A:1115:GLN:OE1	2.17	0.45
7:J:568:TYR:CZ	7:J:581:VAL:HG21	2.52	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
11:K:54:MET:CG	11:K:64:LEU:HD11	2.46	0.45
5:A:914:LEU:HD22	5:A:1505:ASP:HB2	1.97	0.45
5:A:971:MET:HG3	5:A:979:SER:HA	1.99	0.45
5:A:1948:MET:HE3	5:A:1954:ILE:HD12	1.98	0.45
7:J:159:LEU:O	7:J:163:THR:HG23	2.17	0.45
7:J:504:LYS:HG3	7:J:508:TRP:CZ3	2.51	0.45
2:W:49:A:C5	5:A:1646:ILE:HD13	2.51	0.45
5:A:1413:SER:N	5:A:1743:TYR:OH	2.50	0.45
6:H:173:VAL:HB	6:H:178:ILE:HD11	1.98	0.45
5:A:1335:TRP:CD1	5:A:1367:ILE:HG13	2.50	0.45
5:A:1911:TRP:CH2	5:A:1943:PRO:HA	2.52	0.45
6:H:323:CYS:SG	6:H:355:VAL:HG21	2.57	0.45
5:A:1092:PHE:O	5:A:1095:MET:N	2.50	0.45
5:A:1795:LYS:N	5:A:1796:PRO:CD	2.79	0.45
11:K:20:ILE:HD13	11:K:79:VAL:HG21	1.99	0.45
5:A:1614:ILE:HG22	5:A:1638:ILE:HD13	1.99	0.45
6:H:177:PRO:HB3	6:H:457:TRP:HA	1.99	0.45
6:H:243:ILE:HG12	6:H:261:LEU:HB2	1.99	0.45
8:D:9:LEU:HD13	8:D:15:VAL:HA	1.98	0.45
5:A:1850:LEU:HD12	5:A:1930:PRO:HG3	1.98	0.45
6:H:395:ILE:HD11	6:H:415:TYR:CE1	2.52	0.45
9:F:112:MET:CE	9:F:203:ILE:HD12	2.46	0.45
2:W:50:G:N3	2:W:50:G:C2'	2.80	0.44
5:A:1375:LEU:HD22	5:A:1607:THR:HG23	1.98	0.44
7:J:763:ALA:HB1	7:J:773:LEU:CD1	2.47	0.44
1:V:8:U:O2'	12:B:390:LYS:NZ	2.46	0.44
5:A:755:ASP:OD1	5:A:756:LEU:N	2.50	0.44
5:A:919:LEU:HD13	5:A:990:ILE:HD13	1.99	0.44
5:A:1021:PRO:O	5:A:1025:VAL:HG23	2.17	0.44
5:A:1946:VAL:CG2	7:J:229:ILE:HG21	2.47	0.44
6:H:117:LEU:HD13	6:H:301:LEU:HD12	1.98	0.44
7:J:478:TYR:O	7:J:479:GLU:CB	2.66	0.44
2:W:61:C:H2'	2:W:62:A:H8	1.82	0.44
5:A:1025:VAL:HG22	5:A:1262:MET:HG2	2.00	0.44
6:H:195:TRP:CG	6:H:220:LYS:HG3	2.52	0.44
6:H:390:LEU:HD13	10:G:428:TRP:CG	2.53	0.44
6:H:392:HIS:HD2	6:H:396:VAL:HG22	1.82	0.44
5:A:1085:LYS:O	5:A:1088:VAL:HG13	2.17	0.44
9:F:47:LEU:HD13	9:F:97:PHE:HB3	1.99	0.44
7:J:780:LEU:O	7:J:783:HIS:HB2	2.18	0.44
9:F:59:LEU:HD21	9:F:66:SER:HB3	1.99	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
8:D:97:THR:O	8:D:141:ARG:NH2	2.51	0.44
8:D:97:THR:HG21	8:D:105:PHE:CE1	2.53	0.44
6:H:183:LEU:HD23	6:H:190:VAL:HB	1.99	0.44
7:J:201:LEU:HD23	9:F:379:PHE:CZ	2.52	0.44
5:A:1125:LEU:CD2	5:A:1230:ILE:HG23	2.47	0.44
5:A:1458:TRP:CH2	5:A:1494:LEU:HD11	2.53	0.44
7:J:604:LEU:HB3	7:J:613:LEU:CD2	2.48	0.44
5:A:1461:TYR:CE1	5:A:1494:LEU:HD13	2.52	0.43
1:V:58:G:C4	1:V:59:C:C6	3.06	0.43
5:A:1385:PRO:HB2	5:A:1437:ILE:HD11	1.99	0.43
5:A:1601:ILE:N	5:A:1602:PRO:HD2	2.33	0.43
5:A:1961:LEU:HD12	5:A:2084:LEU:HD23	2.00	0.43
5:A:1320:LEU:HD23	5:A:1367:ILE:HD13	2.01	0.43
5:A:1837:SER:N	5:A:2084:LEU:HD21	2.34	0.43
8:D:39:CYS:SG	8:D:40:MET:N	2.91	0.43
5:A:1657:ILE:HA	5:A:1811:ALA:HB1	2.01	0.43
7:J:686:MET:O	7:J:690:THR:HG23	2.19	0.43
2:W:34:A:N6	2:W:47:A:C8	2.87	0.43
5:A:1028:TRP:NE1	5:A:1032:ILE:HD11	2.34	0.43
6:H:172:LEU:HD13	7:J:755:GLN:HG3	2.00	0.43
6:H:261:LEU:HB3	6:H:292:TRP:CZ3	2.53	0.43
7:J:737:VAL:HG22	7:J:767:PHE:CG	2.54	0.43
5:A:1047:ALA:HB3	5:A:1251:TYR:HB3	2.01	0.42
5:A:2011:LEU:HD23	5:A:2055:MET:HG3	2.01	0.42
6:H:125:ILE:HG22	6:H:337:ARG:CB	2.49	0.42
5:A:1070:LEU:HD21	5:A:1113:ILE:CD1	2.50	0.42
6:H:191:ALA:HB2	6:H:226:TRP:CZ2	2.54	0.42
7:J:207:LEU:HD12	9:F:382:SER:OG	2.19	0.42
7:J:846:PHE:CE1	7:J:859:LEU:HD13	2.55	0.42
8:D:120:ILE:HG22	8:D:131:VAL:CG1	2.50	0.42
2:W:34:A:C6	2:W:50:G:C6	3.07	0.42
7:J:565:VAL:HG11	7:J:599:PHE:CB	2.48	0.42
7:J:843:VAL:HG21	7:J:896:MET:HE2	2.01	0.42
8:D:97:THR:HG22	8:D:141:ARG:HA	2.00	0.42
1:V:33:A:H2'	1:V:34:G:O4'	2.18	0.42
5:A:943:ALA:O	5:A:947:PRO:HA	2.20	0.42
6:H:401:PHE:CE1	6:H:410:LEU:HG	2.55	0.42
7:J:207:LEU:HD13	9:F:430:SER:CB	2.50	0.42
7:J:485:VAL:O	7:J:489:LEU:HG	2.19	0.42
2:W:81:G:H2'	2:W:82:A:C8	2.54	0.42
5:A:2084:LEU:HD22	5:A:2086:GLN:CD	2.40	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
6:H:390:LEU:HD11	10:G:463:PHE:CD1	2.54	0.42
9:F:117:ILE:HD12	9:F:128:SER:CB	2.50	0.42
5:A:1601:ILE:HB	5:A:1602:PRO:HD3	2.01	0.42
9:F:114:ASN:HA	9:F:117:ILE:HG22	2.01	0.42
9:F:381:LEU:HD22	9:F:385:ARG:HB3	2.01	0.42
1:V:22:G:C4	1:V:23:C:C5	3.08	0.42
6:H:207:LEU:HD13	6:H:463:LEU:HD21	2.01	0.42
7:J:358:LEU:O	7:J:362:THR:HG23	2.19	0.42
7:J:653:ILE:HG21	7:J:677:ILE:HD13	2.02	0.42
8:D:49:ILE:HD12	8:D:114:ILE:HG13	2.02	0.42
10:G:272:VAL:HG22	10:G:300:GLN:NE2	2.35	0.42
5:A:1837:SER:HB3	5:A:2084:LEU:HD11	2.01	0.42
2:W:77:G:H4'	11:K:113:GLN:HG3	2.01	0.42
5:A:1085:LYS:HG3	5:A:1107:LEU:HD13	2.02	0.42
5:A:1811:ALA:HA	5:A:2101:LEU:HD13	2.02	0.42
5:A:1881:THR:HG21	5:A:1920:LEU:HD23	2.02	0.42
6:H:140:MET:HA	6:H:143:HIS:CD2	2.55	0.42
1:V:55:U:N3	7:J:200:ALA:O	2.53	0.42
2:W:65:U:H2'	2:W:66:C:C6	2.55	0.42
5:A:762:VAL:HG22	7:J:159:LEU:HD22	2.02	0.42
9:F:124:PHE:CE2	9:F:127:LEU:HD13	2.55	0.41
1:V:17:A:C2	1:V:18:A:C4	3.08	0.41
5:A:922:VAL:HG13	5:A:923:TYR:CD1	2.55	0.41
5:A:1948:MET:CE	5:A:1954:ILE:HD12	2.50	0.41
5:A:2083:ILE:HD11	10:G:287:ILE:HG12	2.02	0.41
6:H:290:ARG:NE	6:H:299:GLU:OE2	2.53	0.41
1:V:35:G:C2	1:V:36:A:C8	3.08	0.41
11:K:33:LEU:HD21	11:K:35:LYS:HG3	2.02	0.41
5:A:831:ARG:HH21	5:A:978:ILE:HG23	1.85	0.41
7:J:207:LEU:HD12	9:F:382:SER:HB2	2.03	0.41
7:J:392:ARG:HB3	7:J:397:GLN:HE22	1.84	0.41
9:F:369:GLY:O	9:F:370:ARG:C	2.58	0.41
2:W:45:A:C2'	2:W:46:U:OP1	2.69	0.41
2:W:45:A:C6	2:W:46:U:C4	3.08	0.41
3:U:93:G:C2	3:U:94:C:N3	2.89	0.41
5:A:2012:LEU:HA	5:A:2015:LEU:HD12	2.03	0.41
7:J:824:SER:O	7:J:828:LEU:HG	2.20	0.41
5:A:1048:VAL:HG22	5:A:1250:VAL:HG22	2.02	0.41
5:A:2014:ALA:HB1	5:A:2058:LEU:HD23	2.03	0.41
5:A:2029:ASP:HB3	5:A:2032:ILE:HD12	2.03	0.41
6:H:390:LEU:HD11	10:G:463:PHE:HD1	1.85	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
7:J:706:VAL:HG22	7:J:742:ALA:HB1	2.03	0.41
8:D:119:THR:HG22	8:D:131:VAL:HG21	2.01	0.41
10:G:341:VAL:HG22	10:G:428:TRP:CB	2.50	0.41
5:A:788:GLU:CB	7:J:181:LEU:HD23	2.51	0.41
5:A:1073:ILE:HD13	5:A:1116:TYR:CD1	2.55	0.41
5:A:1654:TRP:CZ3	5:A:1779:LEU:HD12	2.56	0.41
8:D:49:ILE:HG23	8:D:114:ILE:HG12	2.02	0.41
9:F:74:LEU:HD23	9:F:203:ILE:HB	2.03	0.41
10:G:257:GLU:HA	10:G:260:ILE:HG22	2.02	0.41
5:A:1026:TYR:O	5:A:1029:THR:OG1	2.33	0.41
5:A:1038:ILE:HG23	5:A:1039:TRP:CD2	2.55	0.41
5:A:1320:LEU:HD11	5:A:1366:ARG:HB3	2.02	0.41
5:A:1375:LEU:HD23	5:A:1375:LEU:HA	1.97	0.41
5:A:1999:ILE:HD13	5:A:2007:ARG:NH2	2.36	0.41
7:J:215:LEU:CD2	9:F:400:VAL:HG22	2.51	0.41
7:J:632:THR:HA	7:J:635:LEU:HD21	2.02	0.41
7:J:778:ILE:CG2	7:J:810:GLU:HG3	2.51	0.41
10:G:363:LEU:HD11	10:G:391:PHE:CD2	2.56	0.41
12:B:391:PHE:O	12:B:392:ARG:C	2.60	0.41
1:V:19:U:H4'	1:V:20:A:C8	2.56	0.41
5:A:1321:MET:O	5:A:1322:ALA:CB	2.69	0.41
6:H:353:TYR:CZ	11:K:126:ILE:HD11	2.56	0.41
6:H:364:VAL:HG12	6:H:365:ALA:N	2.36	0.41
10:G:341:VAL:HG12	10:G:381:ILE:HG23	2.02	0.41
11:K:12:ALA:HB1	11:K:16:LEU:HD23	2.03	0.41
5:A:1039:TRP:CD2	5:A:1271:PRO:HG3	2.55	0.40
7:J:764:LEU:HD23	7:J:764:LEU:HA	1.96	0.40
10:G:355:LYS:O	10:G:359:ASN:ND2	2.53	0.40
5:A:1913:THR:O	5:A:1917:VAL:HG23	2.21	0.40
5:A:2084:LEU:HB3	5:A:2086:GLN:HB3	2.02	0.40
5:A:1344:THR:HG21	5:A:1537:TRP:CD2	2.57	0.40
7:J:327:VAL:O	7:J:331:LEU:HG	2.21	0.40
9:F:119:LEU:CD1	9:F:197:ILE:HG22	2.50	0.40
10:G:339:CYS:SG	10:G:340:LYS:N	2.94	0.40
5:A:1216:ILE:HG13	5:A:1254:ASN:HB3	2.03	0.40
5:A:1458:TRP:CZ3	5:A:1494:LEU:HD11	2.56	0.40
6:H:183:LEU:HD21	6:H:453:VAL:HG21	2.03	0.40
6:H:410:LEU:HD23	6:H:410:LEU:HA	1.95	0.40
7:J:223:LEU:HD23	9:F:420:ALA:HB1	2.03	0.40
7:J:565:VAL:HG11	7:J:599:PHE:CG	2.56	0.40
7:J:617:PHE:CE2	7:J:644:ARG:HD3	2.56	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
5:A:816:ILE:HD12	5:A:817:LYS:N	2.36	0.40
6:H:399:VAL:CG1	6:H:410:LEU:HD22	2.51	0.40
6:H:453:VAL:HG22	6:H:463:LEU:HD22	2.04	0.40
7:J:344:ALA:HB3	7:J:357:MET:CE	2.52	0.40
8:D:112:GLU:CD	8:D:137:TYR:HH	2.25	0.40
9:F:200:ALA:HA	9:F:203:ILE:HG12	2.03	0.40
9:F:233:VAL:HG11	9:F:237:ILE:CG2	2.51	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
5	A	1343/2413 (56%)	1226 (91%)	104 (8%)	13 (1%)	15 55
6	H	355/465 (76%)	301 (85%)	48 (14%)	6 (2%)	9 45
7	J	719/899 (80%)	650 (90%)	56 (8%)	13 (2%)	8 43
8	D	138/143 (96%)	126 (91%)	11 (8%)	1 (1%)	22 61
9	F	413/494 (84%)	364 (88%)	38 (9%)	11 (3%)	5 35
10	G	316/469 (67%)	283 (90%)	32 (10%)	1 (0%)	41 75
11	K	122/126 (97%)	111 (91%)	9 (7%)	2 (2%)	9 46
12	B	69/2163 (3%)	57 (83%)	8 (12%)	4 (6%)	1 18
All	All	3475/7172 (48%)	3118 (90%)	306 (9%)	51 (2%)	14 47

All (51) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
5	A	1093	LYS
5	A	1278	VAL
5	A	2088	ILE

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
6	H	362	TYR
7	J	479	GLU
7	J	592	HIS
7	J	683	ASN
9	F	74	LEU
9	F	363	PRO
9	F	407	GLU
11	K	106	ASP
12	B	388	GLN
12	B	393	GLU
5	A	979	SER
6	H	361	GLY
7	J	200	ALA
8	D	127	ASN
9	F	59	LEU
9	F	79	ASP
9	F	148	ASN
9	F	165	ALA
9	F	435	ALA
12	B	424	PRO
5	A	980	PRO
5	A	1322	ALA
5	A	1623	PHE
5	A	1768	PRO
6	H	216	SER
6	H	435	GLY
7	J	867	GLU
9	F	58	ALA
9	F	146	ASN
9	F	365	LYS
5	A	1324	GLY
5	A	1535	LYS
5	A	2068	ASN
6	H	429	LYS
7	J	237	ASP
7	J	819	ALA
10	G	266	PRO
12	B	392	ARG
5	A	1386	ALA
6	H	230	SER
7	J	206	ASP
7	J	287	SER

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Mol	Chain	Res	Type
7	J	399	PRO
5	A	1638	ILE
7	J	558	PRO
11	K	82	PRO
7	J	241	PRO
7	J	887	THR

### 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
5	A	1216/2182 (56%)	1194 (98%)	22 (2%)	59 81
6	H	305/410 (74%)	290 (95%)	15 (5%)	25 59
7	J	627/813 (77%)	600 (96%)	27 (4%)	29 63
8	D	129/132 (98%)	121 (94%)	8 (6%)	18 53
9	F	346/445 (78%)	324 (94%)	22 (6%)	17 52
10	G	289/436 (66%)	283 (98%)	6 (2%)	53 78
11	K	102/104 (98%)	90 (88%)	12 (12%)	5 28
12	B	56/1955 (3%)	52 (93%)	4 (7%)	14 48
All	All	3070/6477 (47%)	2954 (96%)	116 (4%)	36 66

All (116) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
5	A	753	TYR
5	A	755	ASP
5	A	757	GLU
5	A	758	LEU
5	A	765	ASP
5	A	831	ARG
5	A	852	LEU
5	A	950	THR
5	A	971	MET

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
5	A	972	MET
5	A	1004	ASP
5	A	1103	LEU
5	A	1268	ARG
5	A	1276	GLU
5	A	1277	GLU
5	A	1282	ASP
5	A	1512	ARG
5	A	1749	SER
5	A	1827	GLN
5	A	1942	ASP
5	A	1991	ILE
5	A	2048	TRP
6	H	111	THR
6	H	136	LEU
6	H	144	GLN
6	H	146	PHE
6	H	199	LEU
6	H	225	ASP
6	H	232	ASN
6	H	271	VAL
6	H	286	ASP
6	H	300	LEU
6	H	302	LEU
6	H	331	SER
6	H	389	ILE
6	H	422	TYR
6	H	454	SER
7	J	194	PRO
7	J	237	ASP
7	J	239	THR
7	J	255	ARG
7	J	270	GLU
7	J	291	TYR
7	J	328	ARG
7	J	347	PHE
7	J	357	MET
7	J	421	LEU
7	J	459	LEU
7	J	460	THR
7	J	508	TRP
7	J	512	ASP

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
7	J	554	ARG
7	J	588	ASP
7	J	589	PHE
7	J	635	LEU
7	J	636	TYR
7	J	644	ARG
7	J	657	ASN
7	J	661	LEU
7	J	708	LEU
7	J	715	ASP
7	J	767	PHE
7	J	772	LEU
7	J	874	TRP
8	D	39	CYS
8	D	43	ASP
8	D	48	SER
8	D	71	ASP
8	D	76	LEU
8	D	80	MET
8	D	118	GLU
8	D	139	HIS
9	F	57	LEU
9	F	59	LEU
9	F	63	ASP
9	F	67	LEU
9	F	74	LEU
9	F	81	LYS
9	F	82	ARG
9	F	84	LEU
9	F	85	GLN
9	F	120	TYR
9	F	153	GLU
9	F	154	SER
9	F	156	GLU
9	F	221	LYS
9	F	305	MET
9	F	327	THR
9	F	364	LYS
9	F	376	LYS
9	F	378	LYS
9	F	401	LEU
9	F	410	LEU

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
9	F	419	GLN
10	G	189	THR
10	G	199	ASP
10	G	278	MET
10	G	285	GLN
10	G	329	MET
10	G	395	LEU
11	K	11	LEU
11	K	21	LEU
11	K	32	GLN
11	K	33	LEU
11	K	34	LYS
11	K	46	ARG
11	K	64	LEU
11	K	69	LEU
11	K	79	VAL
11	K	93	VAL
11	K	113	GLN
11	K	119	ASP
12	B	387	GLU
12	B	390	LYS
12	B	396	HIS
12	B	403	SER

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (27) such sidechains are listed below:

<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
5	A	1030	GLN
5	A	1087	ASN
5	A	1190	ASN
5	A	1273	GLN
5	A	1281	ASN
5	A	1368	GLN
5	A	1695	ASN
5	A	1737	GLN
5	A	1831	GLN
5	A	1856	ASN
5	A	1869	ASN
5	A	2018	ASN
6	H	303	GLN
6	H	306	HIS
7	J	397	GLN

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Mol	Chain	Res	Type
7	J	498	GLN
7	J	537	GLN
7	J	578	GLN
7	J	673	GLN
7	J	733	ASN
9	F	148	ASN
9	F	320	GLN
9	F	331	HIS
10	G	276	ASN
10	G	300	GLN
11	K	38	ASN
11	K	45	ASN

### 5.3.3 RNA [i](#)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
1	V	66/67 (98%)	29 (43%)	6 (9%)
2	W	54/112 (48%)	20 (37%)	9 (16%)
3	U	19/214 (8%)	8 (42%)	1 (5%)
All	All	139/393 (35%)	57 (41%)	16 (11%)

All (57) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
1	V	2	U
1	V	11	A
1	V	18	A
1	V	19	U
1	V	20	A
1	V	22	G
1	V	25	U
1	V	26	A
1	V	29	A
1	V	31	U
1	V	32	G
1	V	33	A
1	V	34	G
1	V	35	G
1	V	36	A
1	V	37	U
1	V	39	C

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	V	40	G
1	V	41	U
1	V	45	A
1	V	46	G
1	V	55	U
1	V	56	U
1	V	57	U
1	V	59	C
1	V	64	U
1	V	65	G
1	V	66	A
1	V	67	A
2	W	28	U
2	W	29	U
2	W	31	G
2	W	32	U
2	W	33	C
2	W	38	U
2	W	45	A
2	W	46	U
2	W	47	A
2	W	49	A
2	W	50	G
2	W	56	A
2	W	61	C
2	W	75	A
2	W	76	A
2	W	83	A
2	W	84	C
2	W	85	C
2	W	86	G
2	W	87	U
3	U	93	G
3	U	94	C
3	U	95	C
3	U	96	U
3	U	97	U
3	U	99	U
3	U	101	C
3	U	103	A

All (16) RNA pucker outliers are listed below:

Mol	Chain	Res	Type
1	V	17	A
1	V	19	U
1	V	31	U
1	V	39	C
1	V	44	G
1	V	45	A
2	W	31	G
2	W	32	U
2	W	45	A
2	W	48	C
2	W	49	A
2	W	55	G
2	W	75	A
2	W	83	A
2	W	84	C
3	U	95	C

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

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

#### 5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

#### 5.6 Ligand geometry [i](#)

There are no ligands in this entry.

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

There are no such residues in this entry.

#### 5.8 Polymer linkage issues [i](#)

The following chains have linkage breaks:

Mol	Chain	Number of breaks
4	x	1
5	A	1

All chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	x	62:UNK	C	101:UNK	N	54.04
1	A	1860:VAL	C	1861:THR	N	4.50

## 6 Map visualisation

This section contains visualisations of the EMDB entry EMD-8014. These allow visual inspection of the internal detail of the map and identification of artifacts.

No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

### 6.1 Orthogonal projections

This section was not generated.

### 6.2 Central slices

This section was not generated.

### 6.3 Largest variance slices

This section was not generated.

### 6.4 Orthogonal standard-deviation projections (False-color)

This section was not generated.

### 6.5 Orthogonal surface views

This section was not generated.

### 6.6 Mask visualisation

This section was not generated. No masks/segmentation were deposited.

## 7 Map analysis

This section contains the results of statistical analysis of the map.

### 7.1 Map-value distribution

This section was not generated.

### 7.2 Volume estimate versus contour level

This section was not generated.

### 7.3 Rotationally averaged power spectrum

This section was not generated. The rotationally averaged power spectrum had issues being displayed.

## 8 Fourier-Shell correlation

This section was not generated. No FSC curve or half-maps provided.

## 9 Map-model fit

This section was not generated.