



## Full wwPDB EM Validation Report ⓘ

Jun 20, 2024 – 06:44 AM JST

PDB ID : 7WTZ  
EMDB ID : EMD-32806  
Title : Cryo-EM structure of a human pre-40S ribosomal subunit - State RRP12-B2  
Authors : Cheng, J.; Lau, B.; Thoms, M.; Ameismeier, M.; Berninghausen, O.; Hurt, E.; Beckmann, R.  
Deposited on : 2022-02-05  
Resolution : 3.00 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:

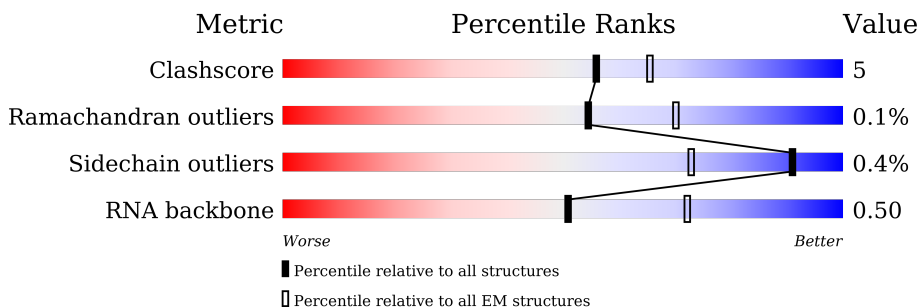
EMDB validation analysis : 0.0.1.dev92  
MolProbity : 4.02b-467  
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)  
MapQ : 1.9.13  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.37.1

# 1 Overall quality at a glance

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

The reported resolution of this entry is 3.00 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.













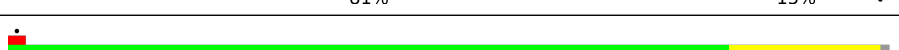
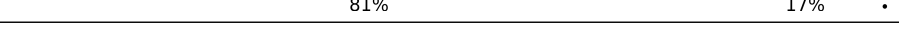
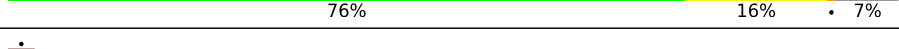



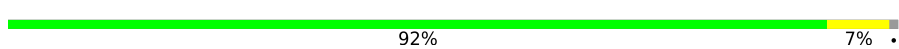

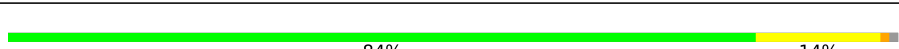
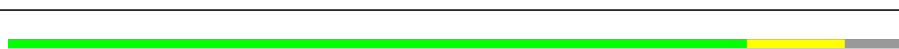

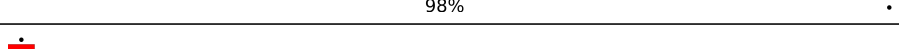
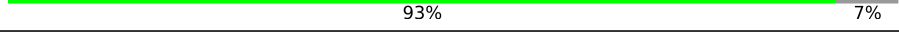

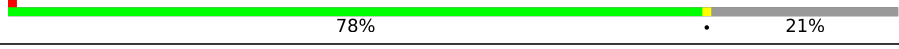
Metric	Whole archive (#Entries)	EM structures (#Entries)
Clashscore	158937	4297
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826
RNA backbone	4643	859

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  $\leq 5\%$ . The upper red bar (where present) indicates the fraction of residues that have poor fit to the EM map (all-atom inclusion  $< 40\%$ ). The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	2	1873	51% 30% 6% • 13%
2	F	204	81% 11% 7%
3	M	132	7% 83% 11% 7%
4	P	145	66% 17% • 17%
5	Q	146	66% 18% 16%
6	R	135	73% 17% • 10%
7	S	152	66% 19% • 14%



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Mol	Chain	Length	Quality of chain
8	T	145	 86% 13%
9	Z	125	 49% 9% 42%
10	c	69	 88% 12%
11	f	156	 46% 53%
12	A	295	 63% 11% 27%
13	B	264	 70% 11% 19%
14	C	293	 63% 12% 26%
15	E	263	 89% 10%
16	G	249	 71% 21% 8%
17	H	194	 81% 15%
18	I	208	 81% 17%
19	J	194	 76% 16% 7%
20	L	158	 87% 8%
21	N	151	 87% 12%
22	O	151	 76% 13% 11%
23	V	83	 92% 7%
24	W	130	 83% 16%
25	X	143	 84% 14%
26	Y	133	 83% 11% 7%
27	b	84	 98%
28	e	59	 93% 7%
29	x	252	 71% 29%
30	y	412	 78% 21%
31	u	804	 78% 22%
32	w	437	 57% 43%

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Mol	Chain	Length	Quality of chain
33	t	475	 27% 73%
34	K	1297	 5% 61% 8% 30%

## 2 Entry composition [i](#)

There are 35 unique types of molecules in this entry. The entry contains 85113 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 18S rRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
1	2	1624	34680	15479	6228	11350	1623	0	0

- Molecule 2 is a protein called 40S ribosomal protein S5.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	F	189	1495	934	284	270	7	0	0

- Molecule 3 is a protein called 40S ribosomal protein S12.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	M	123	953	598	169	177	9	0	0

- Molecule 4 is a protein called 40S ribosomal protein S15.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	P	120	984	625	184	168	7	0	0

- Molecule 5 is a protein called 40S ribosomal protein S16.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	Q	122	969	616	180	170	3	0	0

- Molecule 6 is a protein called 40S ribosomal protein S17.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
6	R	122	990	621	184	182	3	0	0

- Molecule 7 is a protein called 40S ribosomal protein S18.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
7	S	130	1083	686	214	182	1	0	0

- Molecule 8 is a protein called 40S ribosomal protein S19.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
8	T	144	1122	703	217	199	3	0	0

- Molecule 9 is a protein called 40S ribosomal protein S25.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
9	Z	72	574	368	104	101	1	0	0

- Molecule 10 is a protein called 40S ribosomal protein S28.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
10	c	61	471	288	95	86	2	0	0

- Molecule 11 is a protein called Ubiquitin-40S ribosomal protein S27a.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
11	f	73	596	375	115	99	7	0	0

- Molecule 12 is a protein called 40S ribosomal protein SA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
12	A	216	1705	1083	299	315	8	0	0

- Molecule 13 is a protein called 40S ribosomal protein S3a.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
13	B	213	1729	1098	309	308	14	0	0

- Molecule 14 is a protein called 40S ribosomal protein S2.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
14	C	218	1690	1094	289	297	10	0	0

- Molecule 15 is a protein called 40S ribosomal protein S4, X isoform.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
15	E	262	2076	1324	386	358	8	0	0

- Molecule 16 is a protein called 40S ribosomal protein S6.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
16	G	230	1862	1164	371	320	7	0	0

- Molecule 17 is a protein called 40S ribosomal protein S7.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
17	H	186	1501	957	276	267	1	0	0

- Molecule 18 is a protein called 40S ribosomal protein S8.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
18	I	205	1682	1056	331	290	5	0	0

- Molecule 19 is a protein called 40S ribosomal protein S9.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
19	J	180	1499	955	300	242	2	0	0

- Molecule 20 is a protein called 40S ribosomal protein S11.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
20	L	151	1229	782	230	211	6	0	0

- Molecule 21 is a protein called 40S ribosomal protein S13.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
21	N	149	1202	770	228	203	1	0	0

- Molecule 22 is a protein called 40S ribosomal protein S14.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
22	O	135	1009	618	198	187	6	0	0

- Molecule 23 is a protein called 40S ribosomal protein S21.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
23	V	82	625	384	116	120	5	0	0

- Molecule 24 is a protein called 40S ribosomal protein S15a.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
24	W	129	1034	659	193	176	6	0	0

- Molecule 25 is a protein called 40S ribosomal protein S23.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
25	X	141	1098	693	219	183	3	0	0

- Molecule 26 is a protein called 40S ribosomal protein S24.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
26	Y	124	1014	641	198	170	5	0	0

- Molecule 27 is a protein called 40S ribosomal protein S27.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
27	b	82	640	402	118	113	7	0	0

- Molecule 28 is a protein called 40S ribosomal protein S30.



Mol	Chain	Residues	Atoms					AltConf	Trace
28	e	55	Total	C	N	O	S	0	0
			438	271	95	71	1		

- Molecule 29 is a protein called RNA-binding protein PNO1.

Mol	Chain	Residues	Atoms					AltConf	Trace
29	x	178	Total	C	N	O	S	0	0
			1391	891	252	244	4		

- Molecule 30 is a protein called RNA-binding protein NOB1.

Mol	Chain	Residues	Atoms					AltConf	Trace
30	y	325	Total	C	N	O	S	0	0
			2568	1622	473	463	10		

- Molecule 31 is a protein called Pre-rRNA-processing protein TSR1 homolog.

Mol	Chain	Residues	Atoms					AltConf	Trace
31	u	629	Total	C	N	O	S	0	0
			5062	3249	902	887	24		

- Molecule 32 is a protein called Bystin.

Mol	Chain	Residues	Atoms					AltConf	Trace
32	w	249	Total	C	N	O	S	0	0
			2027	1322	354	342	9		

- Molecule 33 is a protein called Protein LTV1 homolog.

Mol	Chain	Residues	Atoms					AltConf	Trace
33	t	127	Total	C	N	O	S	0	0
			1066	661	204	199	2		

- Molecule 34 is a protein called RRP12-like protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
34	K	909	Total	C	N	O	S	0	0
			7047	4520	1216	1266	45		

- Molecule 35 is ZINC ION (three-letter code: ZN) (formula: Zn).

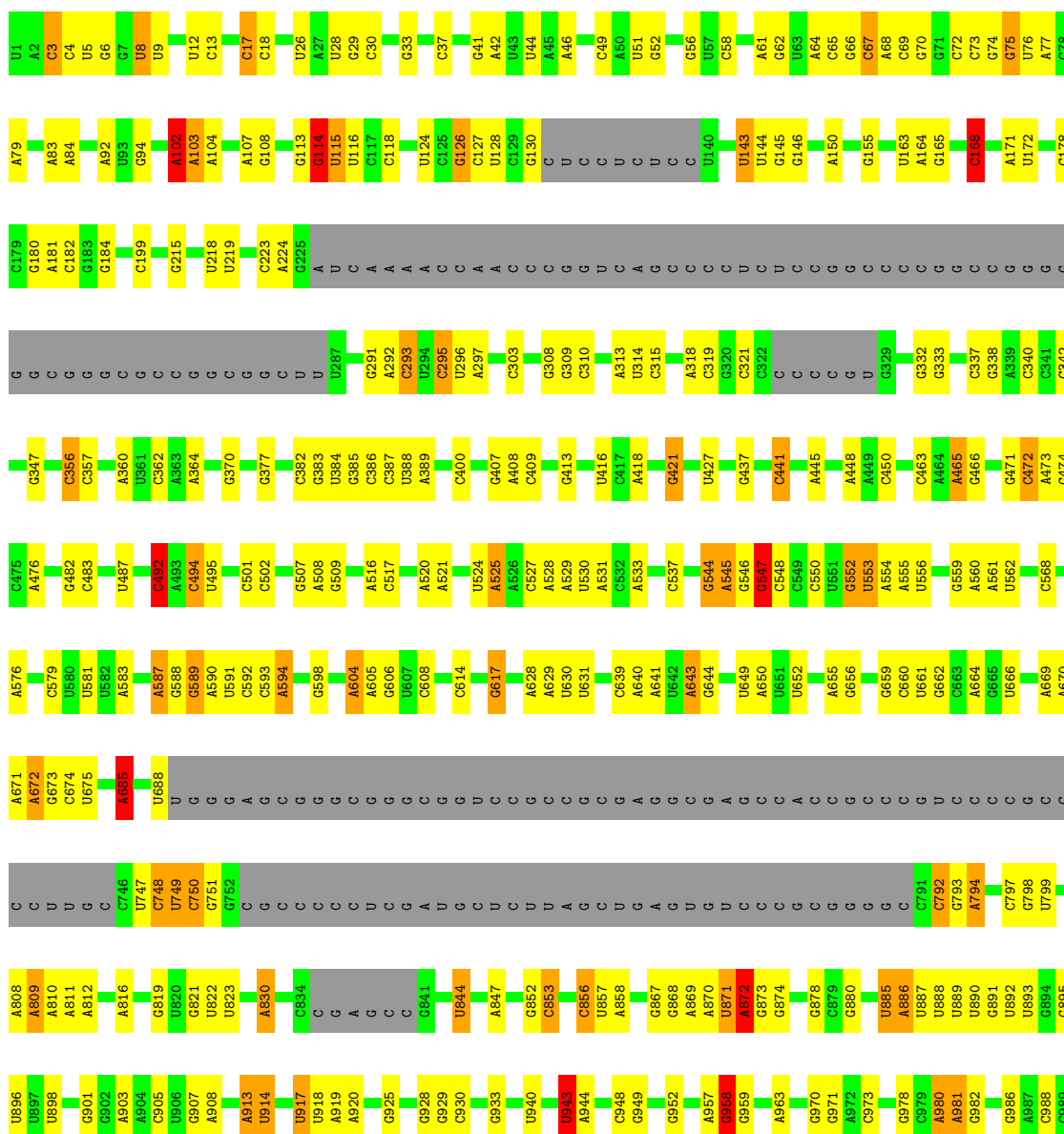
<b>Mol</b>	<b>Chain</b>	<b>Residues</b>	<b>Atoms</b>		<b>AltConf</b>
35	f	1	Total 1	Zn 1	0
35	y	1	Total 1	Zn 1	0

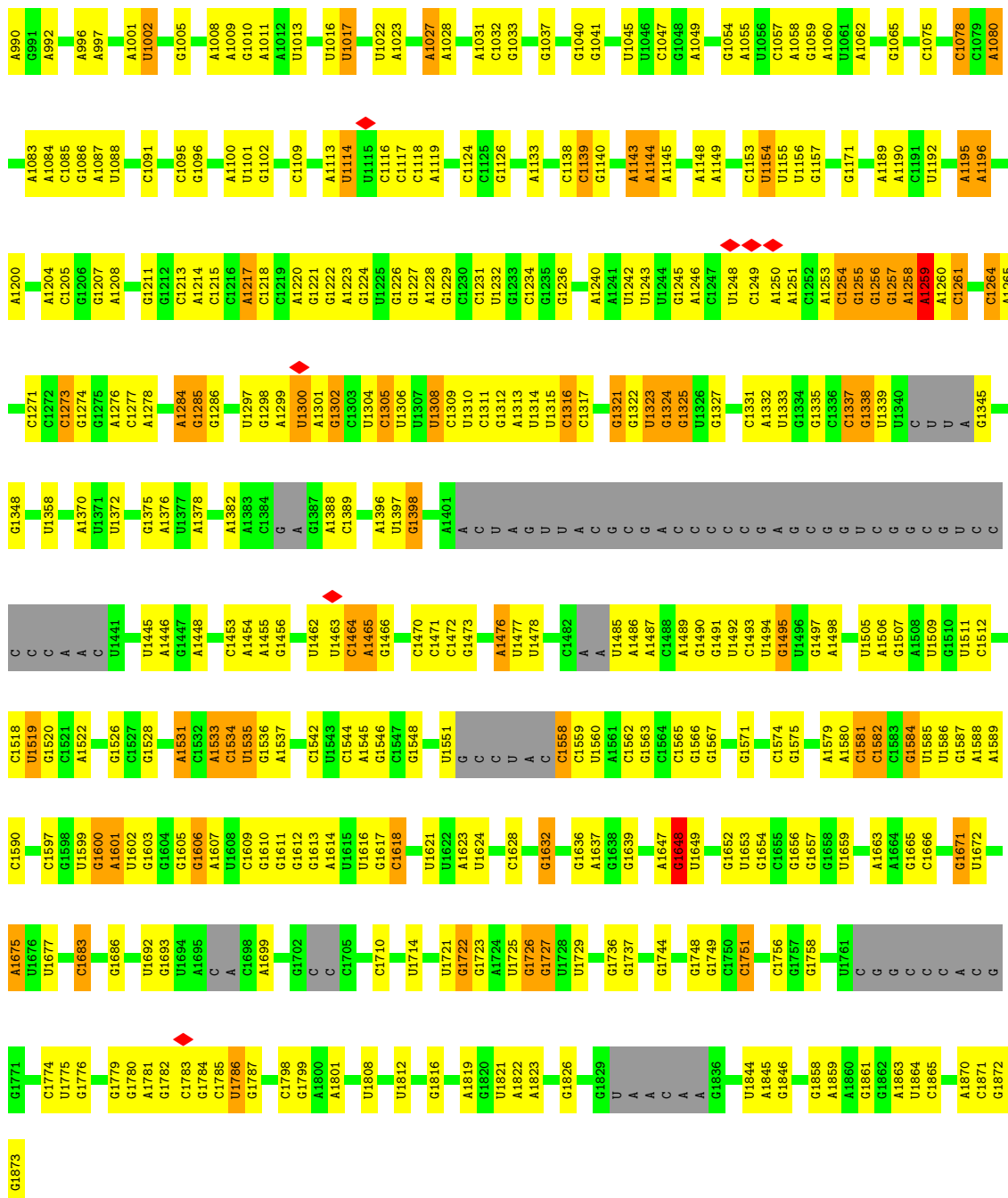
### 3 Residue-property plots [i](#)

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion in map density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red diamond above a residue indicates a poor fit to the EM map for this residue (all-atom inclusion < 40%). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

- Molecule 1: 18S rRNA

Chain 2: 



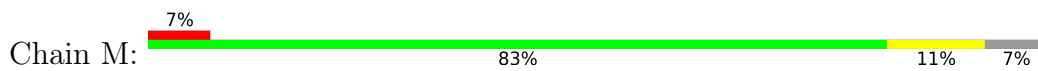


• Molecule 2: 40S ribosomal protein S5

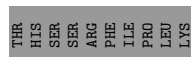
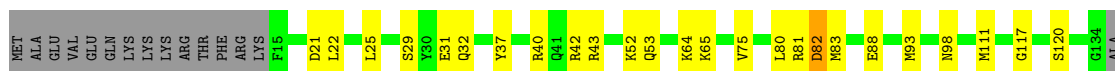
Chain F:



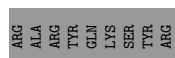
• Molecule 3: 40S ribosomal protein S12



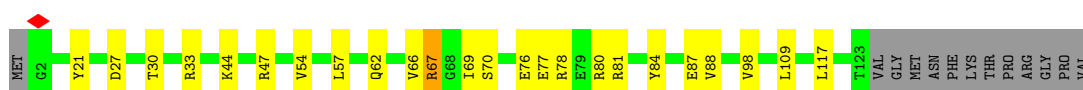
• Molecule 4: 40S ribosomal protein S15



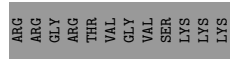
• Molecule 5: 40S ribosomal protein S16



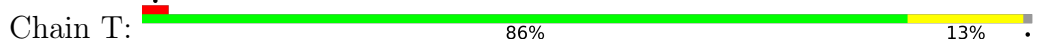
• Molecule 6: 40S ribosomal protein S17



• Molecule 7: 40S ribosomal protein S18

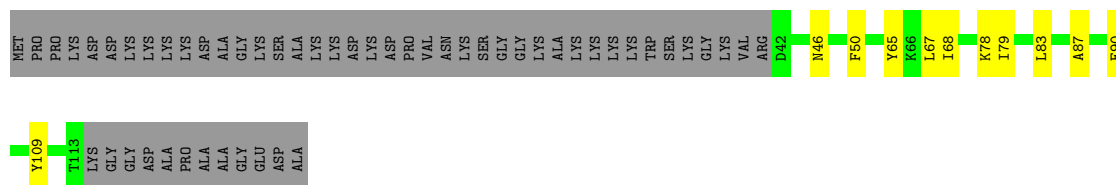


• Molecule 8: 40S ribosomal protein S19



• Molecule 9: 40S ribosomal protein S25

Chain Z: 49% 9% 42%



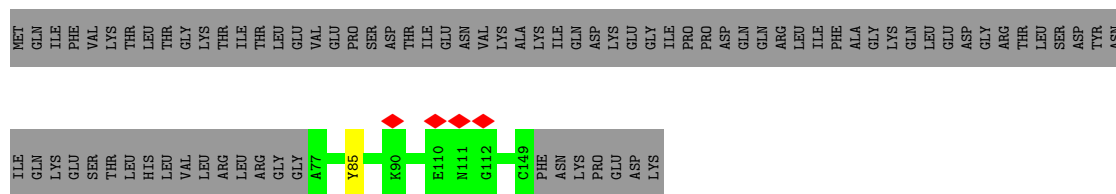
- Molecule 10: 40S ribosomal protein S28

Chain c: 88% 12%



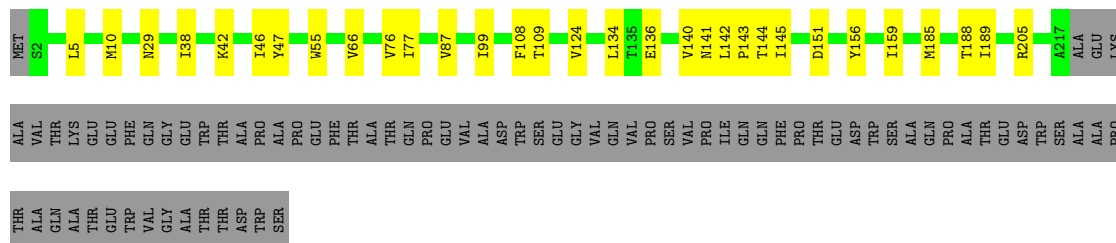
- Molecule 11: Ubiquitin-40S ribosomal protein S27a

Chain f: 46% 53%



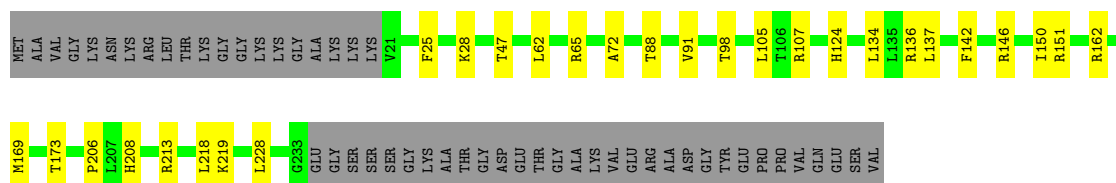
- Molecule 12: 40S ribosomal protein SA

Chain A: 63% 11% 27%



- Molecule 13: 40S ribosomal protein S3a

Chain B: 70% 11% 19%



- Molecule 14: 40S ribosomal protein S2




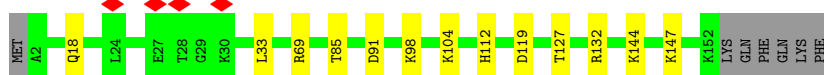
- Molecule 19: 40S ribosomal protein S9

Chain J:  76% 16% 7%




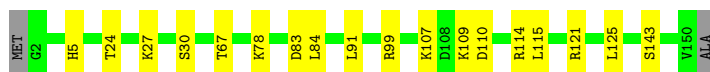
- Molecule 20: 40S ribosomal protein S11

Chain L:  87% 8%




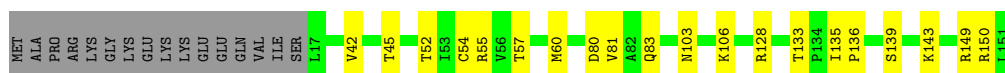
- Molecule 21: 40S ribosomal protein S13

Chain N:  87% 12%



- Molecule 22: 40S ribosomal protein S14

Chain O:  76% 13% 11%




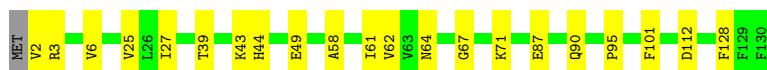
- Molecule 23: 40S ribosomal protein S21

Chain V:  92% 7%




- Molecule 24: 40S ribosomal protein S15a

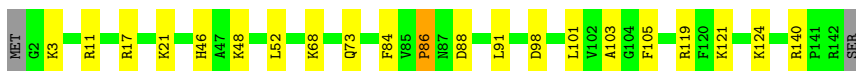
Chain W:  83% 16%



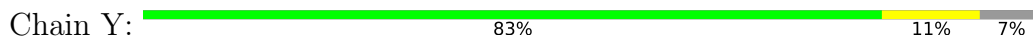
- Molecule 25: 40S ribosomal protein S23

Chain X:  84% 14%





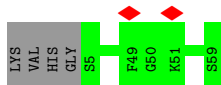
- Molecule 26: 40S ribosomal protein S24



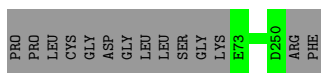
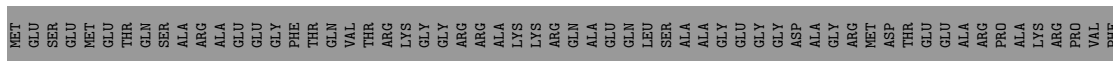
- Molecule 27: 40S ribosomal protein S27



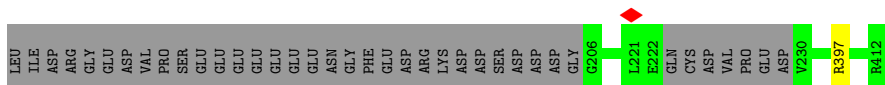
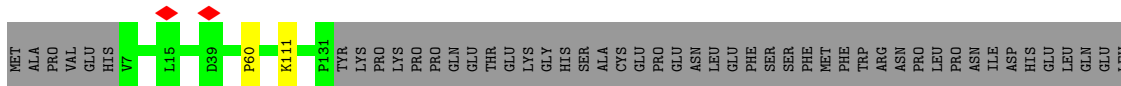
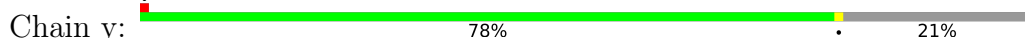
- Molecule 28: 40S ribosomal protein S30



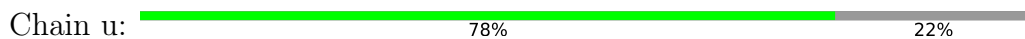
- Molecule 29: RNA-binding protein PNO1

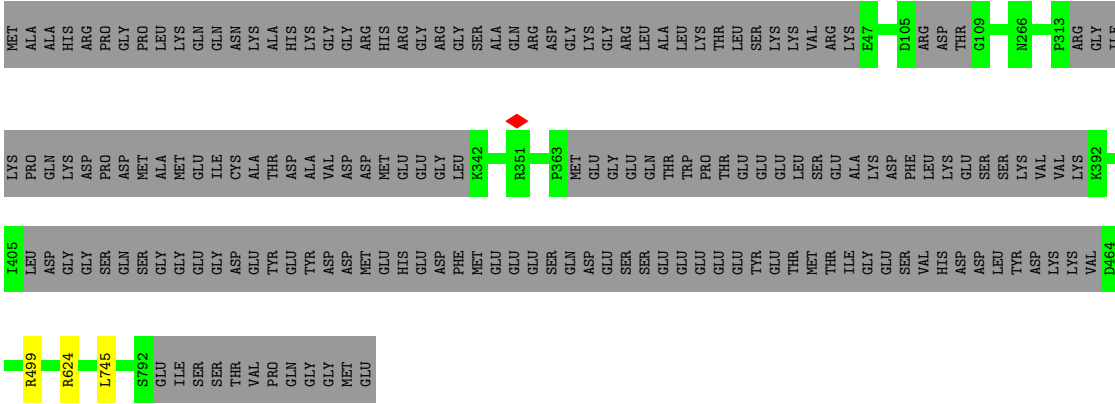


- Molecule 30: RNA-binding protein NOB1

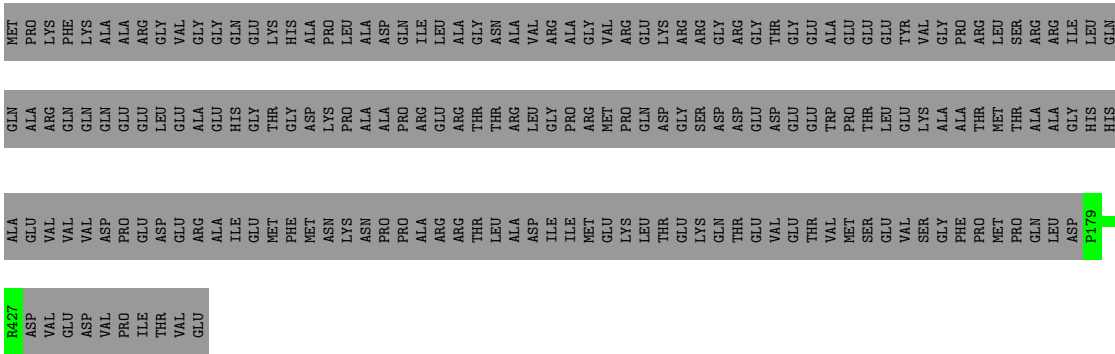


- Molecule 31: Pre-rRNA-processing protein TSR1 homolog

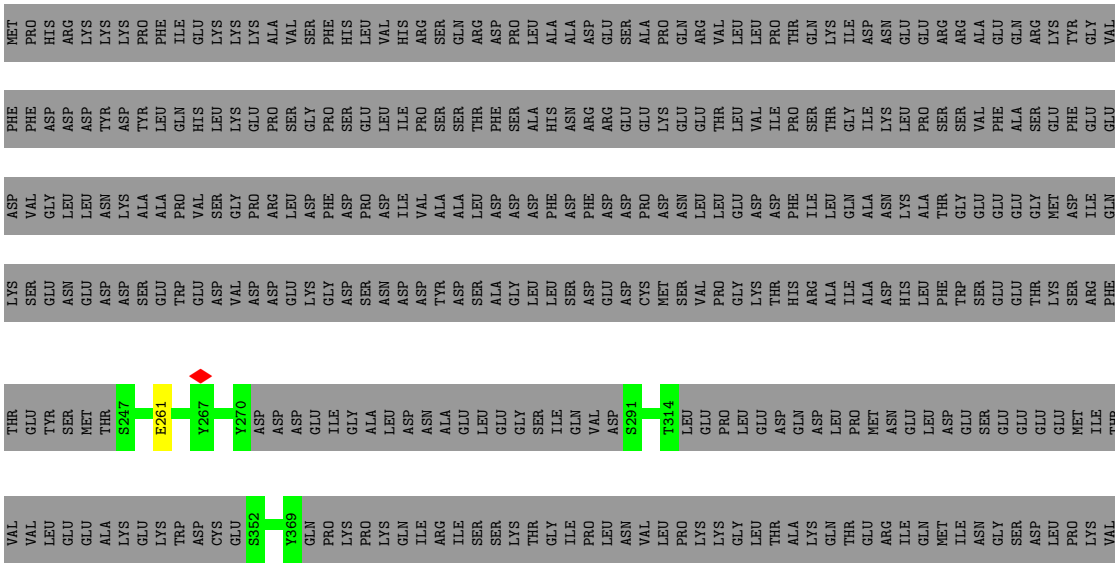




• Molecule 32: Bystin



• Molecule 33: Protein LTV1 homolog





• Molecule 34: RRP12-like protein



MET	GLY	ARG	SER	GLY	LEU	PRO	SER	VAL	VAL	SER	ALA	LYS	LEU	TRP	TRP	GLY	LEU	HIS	SER	SER	ASP	SER	ASN	GLY	ASP	VAL	PRO	LEU	GLY	SER	ARG	GLY	ASP	ARG	PRO	GLY	LEU	THR	VAL	ASP	ALA	VAL	LYS	LEU	HIS	ASN
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GLU	LEU	GLN	SER	GLY	SER	LEU	ARG	GLY	LEU	THR	VAL	GLY	GLY	LEU	VAL	LEU	THR	LEU	VAL	THR	GLY	ASP	THR	ASN	VAL	T106	F107	S108	K109	V110	Q111	R112	F113	W114	E115	S116	N117	S118	A119	A120
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H121	K122	E123	T124	C125	A126	V127	L128	A129	A130	V131	T132	E133	V134	I135	R136	S137	Q138	G139	G140	K141	E142	T143	E144	A150	T153	T154	M155	E156	A157	V158	E159	L171	L175	K176	R177	V178	V182	K186	F194	Q201	S204	L210	V213	L214	L217	A218
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K223	Q224	ASP	LEU	GLU	ALA	TRP	GLY	TYR	P232	L241	T245	R253	L264	K265	G266	SER	GLU	PHE	MET	PHE	GLU	LYS	ALA	PRO	ALA	HIS	H278	Q290	K294	S295	GLY	GLY	SER	LYS	GLU	A301	H306	L310	L315	H338	V341	L352	F353	Y377	V378	P379
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S380	E381	P386	W390	L391	M400	L401	V402	D407	L410	L413	A434	C446	D453	S460	A461	S462	M471	F472	V475	V535	V539	V547	V572	I614	L618	Q619	W620	P633	V636	A637	I638	K641	G642	L643	L647	D656
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L657	V701	ALA	GLY	ASP	THR	A708	R711	T716	Y720	D725	L780	Q788	F802	A807	Q811	R834	L837	K838	L840	L841	H842	I843	K846	I859	I863	L864	C865	T866	E868	V869	R874	L881	F888	L889	G892	S893
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H894	Q895	C901	Y903	L904	V904	C919	S920	I921	L927	L928	L950	V968	V975	L978	M986	I989	F1017	E1018	K1021	L1022	L1023	L1024	H1029	R1030	V1031	L1032	V1033	R1036	K1037	A1040	R1041	A1042	K1043	ARG	HIS	ARG	ALA	LEU	TRP	SER	GLN	ALA	GLU	GLY	VAL	GLU	ASP
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GLU	PRO	GLU	ASN	PHE	LEU	ASP	PRO	ASP	PRO	GLU	LYS	VAL	VAL	VAL	VAL	LEU	PRO	GLY	LEU	GLY	PRO	ILE	ILE	LEU	ALA	ALA	ARG	GLY	GLY	ARG	GLY	GLY	ASP	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	ASP
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GLU	GLU	MET	ALA	ASP	PRO	MET	GLU	ASP	VAL	VAL	ILE	ARG	ASN	LYS	LYS	LYS	LYS	LYS	HIS	GLN	GLN	ARG	ASN	LEU	LEU	VAL	ILE	ILE	ILE	ILE	ILE	ILE	ILE	ILE	ILE	ILE	ILE	ILE	ILE	ILE	ILE	ILE	ILE	ILE	ILE	ILE	ILE	ILE	ILE	ILE
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LYS	LYS	ALA	LYS	GLY	ASP	VAL	VAL	LYS	LYS	ARG	PRO	ASP	PRO	PRO	LYS	LYS	LYS	LYS	LYS	GLN	GLN	ARG	ASN	LEU	LEU	LEU	VAL	ILE	ILE	ILE	ILE	ILE	ILE	ILE	ILE	ILE	ILE	ILE	ILE	ILE	ILE	ILE	ILE	ILE	ILE	ILE	ILE	ILE	ILE	ILE	ILE	ILE
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ARG	PRO
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## 4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	48362	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION; Relion	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ( $e^-/\text{\AA}^2$ )	44	Depositor
Minimum defocus (nm)	800	Depositor
Maximum defocus (nm)	2500	Depositor
Magnification	Not provided	
Image detector	GATAN K2 SUMMIT (4k x 4k)	Depositor
Maximum map value	0.516	Depositor
Minimum map value	-0.257	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.012	Depositor
Recommended contour level	0.02	Depositor
Map size ( $\text{\AA}$ )	381.24, 381.24, 381.24	wwPDB
Map dimensions	360, 360, 360	wwPDB
Map angles ( $^\circ$ )	90.0, 90.0, 90.0	wwPDB
Pixel spacing ( $\text{\AA}$ )	1.059, 1.059, 1.059	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:  
ZN

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	2	0.39	5/38775 (0.0%)	1.02	164/60417 (0.3%)
2	F	0.26	0/1516	0.56	0/2037
3	M	0.24	0/963	0.49	0/1291
4	P	0.30	0/1003	0.63	1/1341 (0.1%)
5	Q	0.26	0/982	0.63	0/1318
6	R	0.36	0/1002	0.67	1/1345 (0.1%)
7	S	0.26	0/1100	0.64	0/1475
8	T	0.27	0/1142	0.58	0/1530
9	Z	0.27	0/580	0.61	0/780
10	c	0.26	0/473	0.63	0/633
11	f	0.25	0/607	0.53	0/802
12	A	0.31	0/1742	0.56	0/2367
13	B	0.28	0/1756	0.56	0/2350
14	C	0.32	0/1726	0.58	0/2332
15	E	0.30	0/2118	0.63	2/2849 (0.1%)
16	G	0.29	0/1885	0.64	1/2510 (0.0%)
17	H	0.28	0/1524	0.60	1/2042 (0.0%)
18	I	0.30	0/1711	0.64	0/2282
19	J	0.29	0/1524	0.62	0/2035
20	L	0.31	0/1250	0.60	0/1673
21	N	0.28	0/1226	0.55	0/1649
22	O	0.34	0/1022	0.70	1/1372 (0.1%)
23	V	0.28	0/631	0.58	0/844
24	W	0.30	0/1051	0.61	0/1406
25	X	0.32	0/1116	0.63	0/1490
26	Y	0.28	0/1031	0.59	0/1370
27	b	0.28	0/653	0.59	0/876
28	e	0.28	0/443	0.61	0/582
29	x	0.29	0/1413	0.57	0/1906
30	y	0.29	0/2618	0.66	1/3536 (0.0%)
31	u	0.29	0/5187	0.59	1/7011 (0.0%)
32	w	0.27	0/2074	0.57	0/2806

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z  >5	RMSZ	# Z  >5
33	t	0.29	0/1075	0.62	0/1424
34	K	0.28	0/7182	0.58	1/9732 (0.0%)
All	All	0.34	5/90101 (0.0%)	0.83	174/129413 (0.1%)

All (5) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	2	1196	A	C6-N1	-7.04	1.30	1.35
1	2	685	A	C6-N6	-6.02	1.29	1.33
1	2	830	A	C6-N1	-5.69	1.31	1.35
1	2	872	A	C6-N1	-5.18	1.31	1.35
1	2	844	U	N3-C4	-5.06	1.33	1.38

All (174) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	2	844	U	C5-C4-O4	23.82	140.19	125.90
1	2	844	U	N3-C4-O4	-21.31	104.48	119.40
1	2	914	U	C5-C4-O4	20.94	138.46	125.90
1	2	914	U	N3-C4-O4	-19.63	105.66	119.40
1	2	917	U	N3-C4-O4	-13.84	109.71	119.40
1	2	872	A	N1-C6-N6	-13.77	110.34	118.60
1	2	830	A	N1-C6-N6	-13.63	110.42	118.60
1	2	917	U	C5-C4-O4	13.39	133.93	125.90
1	2	1453	C	N1-C2-O2	10.66	125.30	118.90
1	2	1196	A	N1-C6-N6	-10.47	112.32	118.60
1	2	501	C	C2-N1-C1'	10.39	130.24	118.80
1	2	501	C	N1-C2-O2	10.10	124.96	118.90
1	2	1453	C	C2-N1-C1'	10.02	129.82	118.80
1	2	356	C	C2-N1-C1'	9.94	129.73	118.80
1	2	356	C	N1-C2-O2	9.79	124.78	118.90
1	2	293	C	N1-C2-O2	9.66	124.70	118.90
1	2	685	A	C5-C6-N1	9.39	122.39	117.70
1	2	492	C	N3-C2-O2	-9.28	115.40	121.90
1	2	685	A	N1-C6-N6	-9.00	113.20	118.60
30	y	60	PRO	CA-N-CD	-8.99	98.91	111.50
1	2	830	A	C5-C6-N6	8.96	130.87	123.70
1	2	872	A	C5-C6-N6	8.86	130.79	123.70
1	2	685	A	C6-N1-C2	-8.84	113.30	118.60
1	2	1683	C	N1-C2-O2	8.75	124.15	118.90
1	2	1865	C	N1-C2-O2	8.52	124.01	118.90
1	2	830	A	N1-C2-N3	-8.45	125.08	129.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	2	293	C	C2-N1-C1'	8.43	128.08	118.80
1	2	1453	C	N3-C2-O2	-8.36	116.05	121.90
1	2	1254	C	N1-C2-O2	8.25	123.85	118.90
1	2	8	U	N3-C4-O4	-8.21	113.66	119.40
1	2	501	C	N3-C2-O2	-8.21	116.16	121.90
1	2	844	U	C2-N3-C4	8.12	131.87	127.00
1	2	1683	C	C2-N1-C1'	8.10	127.71	118.80
1	2	1774	C	N3-C2-O2	-8.03	116.28	121.90
1	2	1865	C	C2-N1-C1'	7.93	127.53	118.80
1	2	666	U	C2-N1-C1'	7.90	127.18	117.70
1	2	914	U	C2-N3-C4	7.78	131.67	127.00
1	2	1751	C	C2-N1-C1'	7.74	127.32	118.80
1	2	1273	C	N3-C2-O2	-7.74	116.48	121.90
1	2	1590	C	N1-C2-O2	7.72	123.53	118.90
1	2	356	C	N3-C2-O2	-7.66	116.54	121.90
1	2	293	C	N3-C2-O2	-7.56	116.61	121.90
1	2	1254	C	C2-N1-C1'	7.54	127.09	118.80
1	2	1144	A	C6-N1-C2	-7.50	114.10	118.60
1	2	1774	C	N1-C2-O2	7.46	123.38	118.90
6	R	109	LEU	CA-CB-CG	7.41	132.33	115.30
1	2	501	C	C6-N1-C2	-7.39	117.34	120.30
1	2	1022	U	C2-N1-C1'	7.38	126.56	117.70
15	E	139	LEU	CA-CB-CG	7.35	132.21	115.30
1	2	1624	U	C2-N1-C1'	7.33	126.49	117.70
1	2	427	U	N3-C2-O2	-7.29	117.09	122.20
1	2	853	C	C2-N1-C1'	7.27	126.80	118.80
1	2	1520	G	C4-N9-C1'	7.21	135.87	126.50
1	2	553	U	C5-C6-N1	7.19	126.30	122.70
1	2	356	C	C6-N1-C1'	-7.17	112.20	120.80
1	2	1751	C	N1-C2-O2	7.15	123.19	118.90
1	2	1865	C	N3-C2-O2	-7.14	116.90	121.90
1	2	501	C	C6-N1-C1'	-7.02	112.37	120.80
1	2	914	U	N1-C2-N3	-6.99	110.70	114.90
1	2	1139	C	C2-N1-C1'	6.97	126.47	118.80
1	2	1453	C	C6-N1-C1'	-6.89	112.54	120.80
1	2	427	U	C2-N1-C1'	6.88	125.96	117.70
1	2	1139	C	N3-C2-O2	-6.78	117.15	121.90
22	O	80	ASP	CB-CG-OD1	6.72	124.35	118.30
1	2	1683	C	N3-C2-O2	-6.70	117.21	121.90
1	2	1139	C	N1-C2-O2	6.70	122.92	118.90
1	2	914	U	C4-C5-C6	-6.69	115.68	119.70
1	2	1683	C	C6-N1-C2	-6.68	117.63	120.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	2	1453	C	C6-N1-C2	-6.65	117.64	120.30
1	2	547	G	P-O3'-C3'	6.46	127.45	119.70
1	2	630	U	C2-N1-C1'	6.43	125.42	117.70
1	2	853	C	N1-C2-O2	6.42	122.75	118.90
1	2	853	C	N3-C2-O2	-6.38	117.44	121.90
1	2	856	C	C2-N1-C1'	6.36	125.80	118.80
1	2	1600	G	N3-C4-C5	-6.35	125.42	128.60
1	2	1337	C	N1-C2-O2	6.35	122.71	118.90
1	2	1139	C	C6-N1-C2	-6.35	117.76	120.30
1	2	1520	G	C8-N9-C1'	-6.33	118.77	127.00
1	2	1624	U	N3-C2-O2	-6.29	117.80	122.20
1	2	441	C	C2-N1-C1'	6.26	125.68	118.80
1	2	1590	C	C2-N1-C1'	6.23	125.65	118.80
1	2	1600	G	C4-N9-C1'	6.22	134.58	126.50
1	2	1520	G	N3-C4-N9	6.14	129.68	126.00
1	2	178	C	N1-C2-O2	6.13	122.58	118.90
1	2	1590	C	N3-C2-O2	-6.13	117.61	121.90
1	2	1261	C	N1-C2-O2	6.08	122.55	118.90
1	2	427	U	N1-C2-O2	6.06	127.04	122.80
1	2	1683	C	C5-C6-N1	6.06	124.03	121.00
1	2	943	U	C2-N1-C1'	6.05	124.97	117.70
1	2	1316	C	P-O3'-C3'	6.05	126.97	119.70
1	2	749	U	C2-N1-C1'	6.02	124.92	117.70
1	2	1144	A	N1-C2-N3	6.02	132.31	129.30
1	2	853	C	C6-N1-C2	-6.01	117.90	120.30
1	2	1601	A	P-O3'-C3'	6.00	126.91	119.70
1	2	1600	G	N3-C4-N9	5.92	129.55	126.00
1	2	1558	C	P-O3'-C3'	5.91	126.80	119.70
1	2	1271	C	N1-C2-O2	5.88	122.43	118.90
1	2	1196	A	C5-C6-N6	5.87	128.39	123.70
1	2	659	G	C4-N9-C1'	5.87	134.12	126.50
1	2	293	C	C6-N1-C1'	-5.86	113.76	120.80
1	2	1254	C	C5-C6-N1	5.86	123.93	121.00
1	2	1624	U	N1-C2-O2	5.85	126.90	122.80
1	2	114	G	P-O3'-C3'	5.84	126.70	119.70
1	2	1254	C	N3-C2-O2	-5.83	117.82	121.90
1	2	1865	C	C6-N1-C2	-5.83	117.97	120.30
1	2	1196	A	N1-C2-N3	5.80	132.20	129.30
15	E	38	LEU	CA-CB-CG	5.79	128.62	115.30
1	2	823	U	C2-N1-C1'	5.79	124.65	117.70
1	2	844	U	N1-C2-O2	5.78	126.84	122.80
1	2	872	A	N1-C2-N3	-5.77	126.42	129.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	2	630	U	N1-C2-O2	5.77	126.84	122.80
1	2	844	U	N1-C2-N3	-5.76	111.44	114.90
31	u	745	LEU	CA-CB-CG	5.75	128.53	115.30
1	2	1520	G	N3-C4-C5	-5.75	125.72	128.60
1	2	342	C	C2-N1-C1'	5.75	125.12	118.80
1	2	1590	C	C6-N1-C2	-5.75	118.00	120.30
1	2	1305	C	N1-C2-O2	5.75	122.35	118.90
1	2	1453	C	C5-C6-N1	5.67	123.84	121.00
16	G	111	LEU	CA-CB-CG	5.67	128.33	115.30
1	2	356	C	C6-N1-C2	-5.66	118.04	120.30
1	2	1259	A	C2-N3-C4	5.66	113.43	110.60
1	2	501	C	C5-C6-N1	5.59	123.80	121.00
1	2	830	A	C6-N1-C2	5.59	121.96	118.60
1	2	102	A	P-O3'-C3'	5.59	126.41	119.70
1	2	1751	C	C6-N1-C1'	-5.59	114.09	120.80
1	2	8	U	N3-C2-O2	5.58	126.11	122.20
1	2	492	C	C6-N1-C2	-5.58	118.07	120.30
1	2	1078	C	C2-N1-C1'	5.56	124.92	118.80
1	2	823	U	N3-C2-O2	-5.55	118.31	122.20
1	2	844	U	C4-C5-C6	-5.55	116.37	119.70
1	2	1601	A	OP2-P-O3'	5.54	117.39	105.20
1	2	1618	C	N1-C2-O2	5.53	122.22	118.90
1	2	1648	G	P-O3'-C3'	5.52	126.33	119.70
1	2	630	U	N3-C2-O2	-5.52	118.34	122.20
1	2	1016	U	N3-C2-O2	-5.52	118.34	122.20
1	2	1016	U	N1-C2-O2	5.47	126.63	122.80
1	2	1273	C	C6-N1-C2	-5.44	118.12	120.30
1	2	1022	U	N1-C2-O2	5.39	126.57	122.80
1	2	168	C	N1-C2-O2	5.38	122.13	118.90
1	2	856	C	N1-C2-O2	5.38	122.13	118.90
1	2	293	C	C6-N1-C2	-5.38	118.15	120.30
1	2	1078	C	C6-N1-C2	-5.38	118.15	120.30
1	2	465	A	P-O3'-C3'	5.38	126.15	119.70
1	2	1261	C	C2-N1-C1'	5.34	124.68	118.80
1	2	143	U	P-O3'-C3'	5.33	126.09	119.70
1	2	1534	C	P-O3'-C3'	5.33	126.09	119.70
1	2	1337	C	C2-N1-C1'	5.28	124.61	118.80
1	2	1254	C	C6-N1-C1'	-5.28	114.47	120.80
1	2	1865	C	C6-N1-C1'	-5.25	114.50	120.80
1	2	666	U	C6-N1-C1'	-5.21	113.91	121.20
1	2	748	C	C5-C6-N1	5.19	123.59	121.00
1	2	750	C	C2-N1-C1'	5.17	124.49	118.80

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	2	1261	C	N3-C2-O2	-5.17	118.28	121.90
1	2	494	C	N1-C2-O2	5.16	122.00	118.90
1	2	1305	C	N3-C2-O2	-5.16	118.28	121.90
34	K	471	MET	CA-CB-CG	5.16	122.08	113.30
1	2	958	G	C4-N9-C1'	5.15	133.19	126.50
1	2	1683	C	C6-N1-C1'	-5.15	114.62	120.80
1	2	1751	C	N3-C2-O2	-5.12	118.31	121.90
1	2	321	C	C2-N1-C1'	5.12	124.43	118.80
1	2	340	C	N1-C2-O2	5.12	121.97	118.90
1	2	8	U	N1-C2-O2	-5.11	119.23	122.80
1	2	199	C	N1-C2-O2	5.11	121.96	118.90
17	H	36	LEU	CA-CB-CG	5.10	127.04	115.30
1	2	579	C	N1-C2-O2	5.10	121.96	118.90
1	2	750	C	N1-C2-O2	5.09	121.96	118.90
1	2	943	U	C5-C4-O4	-5.08	122.85	125.90
1	2	1314	U	N3-C2-O2	-5.08	118.64	122.20
1	2	853	C	O4'-C1'-N1	5.04	112.23	108.20
1	2	886	A	C4-N9-C1'	5.03	135.35	126.30
1	2	823	U	N1-C2-O2	5.02	126.31	122.80
1	2	593	C	C2-N1-C1'	5.01	124.31	118.80
1	2	492	C	C5-C4-N4	5.00	123.70	120.20
4	P	82	ASP	CB-CG-OD1	5.00	122.80	118.30

There are no chirality outliers.

There are no planarity outliers.

## 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	2	34680	0	17507	265	0
2	F	1495	0	1549	13	0
3	M	953	0	990	9	0
4	P	984	0	1028	18	0
5	Q	969	0	1030	18	0
6	R	990	0	1037	25	0
7	S	1083	0	1140	21	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
8	T	1122	0	1153	14	0
9	Z	574	0	627	7	0
10	c	471	0	499	0	0
11	f	596	0	627	0	0
12	A	1705	0	1706	23	0
13	B	1729	0	1803	17	0
14	C	1690	0	1777	23	0
15	E	2076	0	2177	19	0
16	G	1862	0	2018	39	0
17	H	1501	0	1593	19	0
18	I	1682	0	1769	21	0
19	J	1499	0	1618	24	0
20	L	1229	0	1302	8	0
21	N	1202	0	1289	12	0
22	O	1009	0	1034	14	0
23	V	625	0	628	7	0
24	W	1034	0	1080	15	0
25	X	1098	0	1167	13	0
26	Y	1014	0	1082	9	0
27	b	640	0	665	0	0
28	e	438	0	484	0	0
29	x	1391	0	1467	0	0
30	y	2568	0	2624	0	0
31	u	5062	0	5113	0	0
32	w	2027	0	2126	0	0
33	t	1066	0	1070	0	0
34	K	7047	0	7310	77	0
35	f	1	0	0	0	0
35	y	1	0	0	0	0
All	All	85113	0	70089	612	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 5.

All (612) 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)
24:W:101:PHE:O	24:W:128:PHE:HA	1.39	1.21
1:2:533:A:H61	1:2:550:C:N4	1.52	1.07
1:2:1710:C:H42	1:2:1823:A:N6	1.52	1.05
1:2:533:A:N6	1:2:550:C:H42	1.54	1.04

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:2:1710:C:N4	1:2:1823:A:H61	1.59	0.98
22:O:42:VAL:O	22:O:55:ARG:HA	1.64	0.97
6:R:21:TYR:CE2	6:R:69:ILE:HG23	2.00	0.96
1:2:1710:C:H42	1:2:1823:A:H61	0.96	0.90
1:2:685:A:N6	1:2:917:U:H3	1.71	0.89
1:2:8:U:N3	1:2:1196:A:N6	2.21	0.88
1:2:1398:G:H1	1:2:1448:A:H2	1.23	0.87
1:2:685:A:N6	1:2:917:U:N3	2.27	0.82
1:2:8:U:H3	1:2:1196:A:N6	1.78	0.82
6:R:21:TYR:OH	6:R:69:ILE:HD12	1.81	0.80
14:C:183:LYS:HA	14:C:195:LEU:O	1.83	0.78
1:2:8:U:C4	1:2:1196:A:N6	2.54	0.76
1:2:1245:G:C6	1:2:1255:G:N2	2.53	0.76
1:2:1710:C:N3	1:2:1823:A:N1	2.37	0.72
1:2:1236:G:H21	1:2:1522:A:H62	1.38	0.72
1:2:1259:A:N6	1:2:1519:U:OP1	2.23	0.71
1:2:1333:U:O2	1:2:1495:G:N2	2.25	0.69
1:2:1091:C:HO2'	24:W:2:VAL:N	1.90	0.69
6:R:21:TYR:CZ	6:R:69:ILE:HD12	2.28	0.69
1:2:928:G:H1	1:2:1013:U:H3	1.40	0.68
1:2:952:G:H21	22:O:52:THR:HG21	1.58	0.68
4:P:111:MET:HB3	7:S:117:ILE:HG12	1.76	0.67
1:2:957:A:H3'	1:2:958:G:H21	1.59	0.67
2:F:92:ILE:HD13	2:F:169:ILE:HD11	1.77	0.66
17:H:51:ILE:HD11	17:H:176:VAL:HG12	1.76	0.66
5:Q:23:ALA:HB1	5:Q:68:ILE:HD11	1.77	0.66
7:S:105:ASN:OD1	7:S:108:ARG:NH2	2.29	0.66
4:P:75:VAL:HA	4:P:93:MET:O	1.95	0.65
1:2:533:A:N1	1:2:550:C:N3	2.44	0.65
1:2:65:C:N4	16:G:134:GLY:O	2.30	0.65
17:H:69:LEU:HD22	17:H:96:ALA:HB2	1.79	0.65
5:Q:53:GLU:O	5:Q:57:LEU:HB2	1.97	0.64
18:I:101:ILE:HD12	18:I:190:LEU:HD11	1.78	0.64
34:K:863:ILE:HG22	34:K:919:CYS:HB3	1.77	0.64
16:G:7:PHE:HD1	16:G:113:ILE:HD11	1.63	0.64
25:X:98:ASP:OD2	25:X:140:ARG:NH2	2.31	0.64
6:R:21:TYR:HE2	6:R:69:ILE:CG2	2.11	0.64
1:2:925:G:H1	1:2:1017:U:H3	1.46	0.64
6:R:21:TYR:HE2	6:R:69:ILE:HG23	1.56	0.64
4:P:52:LYS:HG3	4:P:80:LEU:HD11	1.79	0.63
1:2:1156:U:OP1	24:W:71:LYS:NZ	2.32	0.63

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:2:64:A:H2	1:2:83:A:H62	1.47	0.62
1:2:67:C:H41	16:G:163:ASN:HA	1.63	0.62
1:2:925:G:OP1	21:N:121:ARG:NH1	2.33	0.62
1:2:940:U:H3	1:2:1002:U:H3	1.46	0.62
7:S:86:ARG:HH11	7:S:106:LYS:HE2	1.63	0.62
34:K:807:ALA:O	34:K:811:GLN:NE2	2.33	0.62
6:R:21:TYR:CE2	6:R:69:ILE:CG2	2.79	0.62
1:2:164:A:H3'	1:2:165:G:H21	1.65	0.62
1:2:492:C:N4	1:2:507:G:OP2	2.24	0.62
1:2:1599:U:OP2	9:Z:46:ASN:ND2	2.33	0.62
13:B:72:ALA:HB3	22:O:128:ARG:HH22	1.65	0.62
1:2:1264:C:N4	1:2:1518:C:N3	2.47	0.61
1:2:1398:G:N1	1:2:1448:A:C2	2.63	0.61
1:2:103:A:OP2	1:2:356:C:N4	2.29	0.61
6:R:66:VAL:HG21	34:K:614:ILE:HG23	1.82	0.61
19:J:111:GLN:HE21	19:J:123:ILE:HG13	1.64	0.61
12:A:38:ILE:HD11	12:A:47:TYR:HB3	1.83	0.61
12:A:156:TYR:HA	23:V:60:ARG:HG2	1.83	0.61
20:L:119:ASP:O	20:L:147:LYS:NZ	2.34	0.61
14:C:242:ASP:OD1	14:C:246:LYS:NZ	2.33	0.60
1:2:126:G:OP1	16:G:198:ARG:NH1	2.34	0.60
22:O:106:LYS:HE3	22:O:136:PRO:HD2	1.84	0.60
34:K:837:LEU:HA	34:K:840:LEU:HD12	1.84	0.60
1:2:1486:A:C6	1:2:1487:A:N6	2.69	0.60
12:A:124:VAL:HG11	12:A:134:LEU:HD21	1.84	0.59
16:G:59:GLN:OE1	16:G:72:ARG:NH2	2.35	0.59
17:H:145:ARG:NH2	24:W:49:GLU:OE2	2.34	0.59
34:K:402:VAL:HG21	34:K:446:CYS:HB3	1.83	0.59
22:O:106:LYS:HD2	22:O:135:ILE:HG22	1.84	0.59
1:2:1311:C:H41	3:M:36:ARG:HH22	1.48	0.59
15:E:126:VAL:HA	15:E:141:THR:HA	1.85	0.59
26:Y:4:THR:OG1	26:Y:32:LYS:NZ	2.35	0.59
1:2:1613:G:OP1	4:P:42:ARG:NH1	2.31	0.58
6:R:66:VAL:HG11	34:K:618:LEU:HD21	1.85	0.58
1:2:1472:C:OP2	34:K:834:ARG:NH2	2.36	0.58
16:G:121:ILE:HG21	16:G:124:LEU:HD12	1.84	0.58
1:2:1060:A:O2'	1:2:1062:A:N6	2.36	0.58
1:2:1486:A:N6	1:2:1487:A:N6	2.51	0.58
1:2:1192:U:OP2	25:X:119:ARG:NH2	2.29	0.58
17:H:60:ILE:HD11	17:H:92:VAL:HG22	1.86	0.58
22:O:57:THR:H	22:O:60:MET:HE3	1.68	0.58

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
34:K:217:LEU:HB3	34:K:241:LEU:HD21	1.85	0.58
21:N:99:ARG:HE	21:N:115:LEU:HD21	1.69	0.58
1:2:928:G:H2'	1:2:929:G:C8	2.39	0.58
16:G:136:LYS:NZ	16:G:175:LYS:O	2.34	0.58
1:2:525:A:N7	1:2:589:G:O6	2.37	0.57
15:E:11:ARG:HA	15:E:28:ALA:HB2	1.86	0.57
17:H:158:LEU:HD11	17:H:187:PHE:HD2	1.69	0.57
1:2:1075:C:OP1	21:N:107:LYS:NZ	2.37	0.57
7:S:124:ARG:NH1	7:S:130:ARG:O	2.37	0.57
13:B:134:LEU:HB3	13:B:219:LYS:HB3	1.86	0.57
15:E:11:ARG:HH21	15:E:21:ASP:H	1.53	0.57
25:X:68:LYS:HB3	25:X:91:LEU:HD22	1.86	0.57
1:2:1565:C:OP2	8:T:101:ARG:NH1	2.37	0.57
1:2:115:U:OP1	1:2:382:C:O2'	2.21	0.57
17:H:129:ILE:O	17:H:133:LEU:HB2	2.05	0.57
5:Q:8:GLN:N	5:Q:99:TYR:HH	2.03	0.57
14:C:251:LEU:HD12	23:V:23:ILE:HG13	1.85	0.57
8:T:28:LEU:HA	8:T:110:LEU:HD21	1.87	0.57
24:W:44:HIS:NE2	24:W:112:ASP:OD2	2.37	0.57
1:2:1616:U:O4	4:P:40:ARG:NH2	2.37	0.56
14:C:131:GLY:HA3	14:C:216:MET:HB3	1.86	0.56
34:K:1024:LEU:HD12	34:K:1032:LEU:HD11	1.87	0.56
1:2:1245:G:C5	1:2:1255:G:N2	2.74	0.56
1:2:1722:G:O6	1:2:1812:U:O2	2.23	0.56
1:2:124:U:OP1	16:G:201:LYS:NZ	2.37	0.56
1:2:913:A:H1'	17:H:66:VAL:HB	1.86	0.56
34:K:377:TYR:HB2	34:K:390:TRP:HH2	1.71	0.56
1:2:816:A:OP2	19:J:10:ARG:NH2	2.38	0.56
4:P:29:SER:OG	4:P:32:GLN:OE1	2.23	0.56
34:K:838:LYS:O	34:K:841:LEU:HB3	2.05	0.56
1:2:1606:G:H5'	8:T:86:GLY:HA2	1.88	0.56
5:Q:54:PRO:O	5:Q:58:LEU:HB2	2.05	0.56
1:2:416:U:HO2'	1:2:652:U:HO2'	1.53	0.56
1:2:1456:G:H1'	34:K:711:ARG:HD2	1.88	0.56
6:R:77:GLU:HA	6:R:80:ARG:HG2	1.88	0.56
1:2:1143:A:H5'	14:C:190:SER:HB3	1.88	0.56
1:2:1398:G:N1	1:2:1448:A:H2	1.99	0.56
1:2:1636:G:H1'	2:F:164:ARG:HH12	1.71	0.56
7:S:104:ASP:OD2	7:S:108:ARG:NH1	2.38	0.56
1:2:1611:G:H4'	7:S:86:ARG:HH21	1.71	0.55
1:2:1095:C:N3	1:2:1149:A:N1	2.53	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
16:G:23:LYS:HD3	16:G:41:LEU:HD12	1.89	0.55
16:G:216:ARG:NH1	16:G:219:GLU:OE2	2.34	0.55
1:2:1253:A:HO2'	1:2:1666:C:HO2'	1.53	0.55
17:H:47:ALA:HB3	17:H:63:PHE:HB2	1.86	0.55
18:I:154:LYS:O	18:I:157:LYS:NZ	2.38	0.55
4:P:81:ARG:NH2	4:P:117:GLY:O	2.40	0.55
1:2:421:G:H5'	20:L:98:LYS:HG3	1.89	0.55
22:O:103:ASN:OD1	22:O:139:SER:OG	2.25	0.55
1:2:1144:A:H2'	1:2:1145:A:C8	2.40	0.55
1:2:1284:A:O4'	1:2:1312:G:N2	2.39	0.55
34:K:1021:LYS:O	34:K:1029:HIS:NE2	2.39	0.55
1:2:1563:G:H5''	8:T:121:ARG:HH21	1.72	0.55
19:J:170:PRO:O	19:J:175:ARG:NH1	2.40	0.55
1:2:382:C:H2'	1:2:383:G:H8	1.72	0.55
1:2:1607:A:N6	1:2:1632:G:O2'	2.38	0.55
1:2:1256:G:H21	1:2:1659:U:H5'	1.73	0.54
5:Q:19:ALA:HB2	5:Q:75:GLY:HA3	1.89	0.54
21:N:99:ARG:NH1	21:N:143:SER:OG	2.40	0.54
1:2:1398:G:O6	1:2:1448:A:N1	2.40	0.54
8:T:98:SER:OG	8:T:101:ARG:NH2	2.39	0.54
25:X:101:LEU:HB3	25:X:124:LYS:HB2	1.89	0.54
34:K:377:TYR:HB2	34:K:390:TRP:CH2	2.42	0.54
24:W:101:PHE:O	24:W:128:PHE:CA	2.33	0.54
1:2:1005:G:OP2	13:B:162:ARG:NH2	2.41	0.54
1:2:1257:G:H4'	1:2:1258:A:H5'	1.90	0.54
4:P:53:GLN:NE2	4:P:82:ASP:OD1	2.39	0.54
6:R:44:LYS:HG2	6:R:47:ARG:HH22	1.72	0.54
18:I:103:LEU:HD22	18:I:170:LYS:HB3	1.88	0.54
1:2:1845:A:H2'	1:2:1846:G:C8	2.43	0.54
12:A:77:ILE:HG12	12:A:99:ILE:HB	1.89	0.54
1:2:94:G:HO2'	1:2:508:A:HO2'	1.53	0.54
1:2:656:G:O2'	14:C:227:ARG:NH1	2.41	0.54
1:2:913:A:H2	17:H:99:ARG:H	1.55	0.53
1:2:1725:U:H2'	1:2:1726:G:H8	1.73	0.53
15:E:162:ILE:HG22	15:E:169:ILE:HA	1.90	0.53
15:E:139:LEU:HD11	15:E:169:ILE:HD11	1.89	0.53
1:2:1124:C:H5''	13:B:150:ILE:HG12	1.90	0.53
34:K:716:THR:O	34:K:720:TYR:HB2	2.08	0.53
1:2:587:A:H5'	1:2:592:C:H41	1.74	0.53
21:N:91:LEU:HD12	21:N:125:LEU:HD12	1.90	0.53
1:2:1748:G:H1	1:2:1786:U:H3	1.56	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
13:B:47:THR:OG1	13:B:65:ARG:NH1	2.42	0.53
18:I:205:ARG:O	18:I:205:ARG:NH1	2.42	0.53
1:2:1478:U:OP1	34:K:874:ARG:NH1	2.42	0.53
13:B:62:LEU:HD11	13:B:91:VAL:HG22	1.90	0.53
24:W:3:ARG:HD3	24:W:6:VAL:HG12	1.91	0.53
25:X:52:LEU:HD11	25:X:73:GLN:HB2	1.91	0.53
1:2:1471:C:N3	34:K:711:ARG:NH1	2.57	0.53
18:I:89:GLU:HA	18:I:92:ARG:HD2	1.90	0.53
1:2:1610:G:N2	7:S:85:ASN:OD1	2.42	0.52
4:P:37:TYR:O	4:P:42:ARG:NH1	2.42	0.52
6:R:54:VAL:HA	6:R:57:LEU:HG	1.92	0.52
34:K:986:MET:HA	34:K:989:ILE:HG12	1.92	0.52
7:S:30:ILE:HG22	7:S:36:VAL:HG11	1.92	0.52
1:2:1584:G:OP1	8:T:77:LYS:NZ	2.38	0.52
23:V:21:ASN:HB3	24:W:67:GLY:HA3	1.92	0.52
34:K:112:ARG:HH21	34:K:126:ALA:HB2	1.75	0.52
1:2:1228:A:H2'	1:2:1229:G:C8	2.45	0.52
16:G:49:VAL:HB	16:G:115:LYS:HB3	1.92	0.52
6:R:62:GLN:HB3	34:K:620:TRP:HZ3	1.75	0.52
16:G:219:GLU:HA	16:G:222:GLU:HG3	1.92	0.52
13:B:88:THR:HA	13:B:98:THR:HA	1.90	0.52
1:2:1195:A:H2'	1:2:1196:A:C8	2.45	0.52
7:S:28:PHE:HA	7:S:31:THR:HB	1.92	0.52
1:2:1528:G:O2'	1:2:1666:C:OP1	2.27	0.52
34:K:633:PRO:HB2	34:K:636:VAL:HB	1.92	0.52
1:2:521:A:OP1	19:J:45:ARG:NH1	2.40	0.51
3:M:42:LEU:O	3:M:45:ARG:NH1	2.38	0.51
7:S:3:LEU:N	9:Z:90:GLU:OE1	2.43	0.51
17:H:147:LYS:HE2	17:H:153:LEU:HD22	1.92	0.51
1:2:28:U:H2'	1:2:29:G:H8	1.75	0.51
1:2:617:G:H4'	25:X:88:ASP:HB3	1.92	0.51
14:C:108:LYS:HE2	14:C:233:LEU:HD13	1.93	0.51
34:K:539:VAL:HG22	34:K:547:VAL:HG21	1.92	0.51
7:S:26:ILE:HD11	7:S:52:LEU:HA	1.93	0.51
15:E:206:ASP:HB2	15:E:222:LEU:HD23	1.92	0.51
18:I:142:SER:HB2	18:I:145:ILE:HD12	1.91	0.51
24:W:87:GLU:OE1	24:W:90:GLN:NE2	2.43	0.51
9:Z:50:PHE:HZ	9:Z:87:ALA:HB2	1.74	0.51
34:K:1037:LYS:O	34:K:1041:ARG:N	2.43	0.51
20:L:18:GLN:HB2	20:L:33:LEU:HD22	1.92	0.51
1:2:1473:G:N2	1:2:1476:A:OP2	2.37	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:2:1726:G:H2'	1:2:1727:G:H8	1.76	0.51
34:K:386:PRO:O	34:K:390:TRP:HB2	2.10	0.51
1:2:1276:A:H61	1:2:1321:G:H1	1.58	0.51
4:P:40:ARG:HH21	4:P:43:ARG:HD3	1.75	0.51
1:2:747:U:O2'	17:H:109:ARG:NE	2.42	0.51
1:2:798:G:H4'	17:H:108:SER:HB2	1.91	0.51
18:I:48:VAL:HG11	18:I:54:LYS:HD2	1.93	0.51
18:I:19:LYS:HD2	18:I:20:PRO:HD2	1.94	0.51
19:J:136:ARG:HE	19:J:158:ASP:HB3	1.75	0.51
20:L:104:LYS:O	25:X:11:ARG:NH2	2.44	0.51
1:2:107:A:H2'	1:2:108:G:C8	2.46	0.50
4:P:64:LYS:NZ	4:P:88:GLU:O	2.44	0.50
1:2:1653:U:H3	1:2:1671:G:H1	1.58	0.50
2:F:167:LYS:NZ	2:F:171:GLU:OE2	2.37	0.50
6:R:66:VAL:HG11	34:K:618:LEU:CD2	2.41	0.50
34:K:131:VAL:HG22	34:K:135:ILE:HG13	1.93	0.50
1:2:69:C:OP2	16:G:164:LYS:NZ	2.41	0.50
1:2:1300:U:OP1	4:P:52:LYS:NZ	2.45	0.50
16:G:2:LYS:O	16:G:108:VAL:HA	2.11	0.50
18:I:69:SER:OG	18:I:191:GLU:OE1	2.27	0.50
1:2:1531:A:H4'	1:2:1605:G:H4'	1.93	0.50
1:2:1536:G:H2'	1:2:1537:A:C8	2.47	0.50
5:Q:43:GLU:HA	5:Q:45:ARG:HH11	1.76	0.50
24:W:39:THR:HG22	24:W:43:LYS:HE2	1.93	0.50
5:Q:58:LEU:HB3	5:Q:62:ARG:HD2	1.94	0.50
22:O:45:THR:HG22	22:O:52:THR:HG22	1.93	0.50
1:2:145:G:H2'	1:2:146:G:C8	2.47	0.50
1:2:1338:G:OP1	34:K:1037:LYS:N	2.41	0.50
7:S:120:HIS:HE1	7:S:124:ARG:HH21	1.58	0.50
13:B:136:ARG:HB2	13:B:218:LEU:HD11	1.92	0.50
17:H:66:VAL:HG22	17:H:96:ALA:HB1	1.94	0.50
1:2:986:G:OP2	1:2:988:C:N4	2.43	0.49
6:R:87:GLU:HG2	6:R:88:VAL:HG23	1.92	0.49
7:S:39:ARG:HH21	8:T:38:LYS:HB2	1.77	0.49
1:2:552:G:H2'	1:2:553:U:C6	2.47	0.49
12:A:141:ASN:ND2	23:V:31:SER:O	2.36	0.49
1:2:171:A:H5''	16:G:177:GLN:HG2	1.93	0.49
1:2:524:U:OP1	1:2:525:A:O2'	2.27	0.49
1:2:1084:A:OP1	1:2:1858:G:O2'	2.25	0.49
1:2:5:U:H2'	1:2:6:G:H8	1.76	0.49
1:2:1786:U:H2'	1:2:1787:G:H8	1.76	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
5:Q:51:LEU:HD12	5:Q:52:LEU:HD12	1.94	0.49
34:K:656:ASP:OD1	34:K:656:ASP:N	2.45	0.49
1:2:1037:G:H4'	1:2:1845:A:H4'	1.93	0.49
1:2:1302:G:C2	1:2:1308:U:O4	2.65	0.49
16:G:78:SER:HB3	16:G:92:ARG:HG3	1.95	0.49
21:N:24:THR:O	21:N:27:LYS:NZ	2.44	0.49
34:K:391:LEU:HD11	34:K:434:ALA:HB1	1.94	0.49
1:2:3:C:O2	19:J:18:ARG:NH2	2.46	0.49
17:H:43:LEU:HD22	17:H:68:GLN:HB2	1.95	0.49
34:K:472:PHE:HA	34:K:475:VAL:HG12	1.93	0.49
34:K:928:LEU:HD23	34:K:968:VAL:HG12	1.94	0.49
12:A:42:LYS:HE3	12:A:46:ILE:HB	1.95	0.49
1:2:296:U:O2'	15:E:131:VAL:O	2.25	0.49
1:2:885:U:O2	1:2:901:G:N2	2.38	0.49
12:A:108:PHE:HB2	12:A:136:GLU:HG3	1.95	0.49
13:B:124:HIS:HA	13:B:137:LEU:O	2.13	0.49
18:I:139:LYS:HD3	18:I:141:ARG:HH22	1.77	0.49
1:2:4:C:H5'	14:C:230:THR:HG21	1.95	0.49
5:Q:39:LEU:HD12	5:Q:51:LEU:HD13	1.95	0.49
1:2:1345:G:OP2	1:2:1370:A:O2'	2.31	0.48
1:2:816:A:P	19:J:10:ARG:HH22	2.36	0.48
1:2:1032:C:H5''	21:N:109:LYS:HD2	1.95	0.48
1:2:1648:G:N2	1:2:1675:A:OP2	2.38	0.48
4:P:53:GLN:HG3	4:P:83:MET:SD	2.53	0.48
6:R:84:TYR:HB3	12:A:205:ARG:HH12	1.79	0.48
34:K:290:GLN:HB3	34:K:294:LYS:NZ	2.28	0.48
1:2:1253:A:O2'	1:2:1666:C:O2'	2.28	0.48
1:2:1464:C:HO2'	1:2:1465:A:H8	1.61	0.48
1:2:1614:A:OP2	4:P:42:ARG:NH2	2.44	0.48
18:I:42:ARG:HB3	18:I:59:ARG:HG2	1.94	0.48
34:K:780:LEU:O	34:K:788:GLN:NE2	2.43	0.48
34:K:865:CYS:HA	34:K:868:GLU:HB2	1.94	0.48
4:P:21:ASP:OD1	4:P:22:LEU:N	2.40	0.48
12:A:29:ASN:HB3	12:A:151:ASP:HB3	1.94	0.48
26:Y:14:THR:HG22	26:Y:21:LYS:HG2	1.95	0.48
1:2:527:C:H2'	1:2:528:A:H8	1.78	0.48
1:2:871:U:H3'	1:2:872:A:H4'	1.95	0.48
1:2:1234:C:H5''	1:2:1246:A:H61	1.79	0.48
1:2:656:G:H5'	1:2:662:G:N2	2.29	0.48
1:2:943:U:H2'	1:2:944:A:C8	2.49	0.48
1:2:1195:A:H2'	1:2:1196:A:H8	1.79	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
16:G:135:PRO:HG2	16:G:141:ILE:HD13	1.94	0.48
1:2:508:A:H3'	1:2:509:G:H8	1.78	0.48
1:2:1562:C:H2'	1:2:1563:G:H8	1.78	0.48
19:J:60:LEU:HD22	19:J:70:ARG:HA	1.96	0.48
1:2:51:U:H2'	1:2:52:G:C8	2.48	0.48
1:2:1606:G:HO2'	1:2:1607:A:H8	1.59	0.48
17:H:93:VAL:HG11	17:H:133:LEU:HD12	1.96	0.48
34:K:975:VAL:HA	34:K:978:LEU:HB2	1.96	0.48
6:R:81:ARG:O	12:A:205:ARG:NH1	2.46	0.48
18:I:61:ASP:OD1	18:I:61:ASP:N	2.46	0.48
34:K:869:VAL:O	34:K:874:ARG:NH2	2.40	0.48
1:2:507:G:OP2	26:Y:104:ARG:NH2	2.47	0.48
19:J:128:VAL:O	19:J:132:GLN:HG2	2.13	0.48
34:K:315:LEU:HD13	34:K:352:LEU:HD23	1.96	0.48
1:2:483:C:H5''	25:X:48:LYS:HE3	1.96	0.47
1:2:685:A:H1'	24:W:58:ALA:HB2	1.96	0.47
1:2:748:C:H42	1:2:794:A:H61	1.62	0.47
8:T:77:LYS:HD3	8:T:94:ARG:HH21	1.78	0.47
1:2:643:A:OP1	19:J:39:ASN:ND2	2.47	0.47
13:B:107:ARG:NH1	22:O:133:THR:O	2.47	0.47
15:E:45:ILE:HG13	15:E:61:VAL:HG21	1.96	0.47
16:G:48:TYR:OH	16:G:119:LYS:O	2.32	0.47
16:G:57:ASP:HA	16:G:106:LEU:HA	1.95	0.47
17:H:109:ARG:HG2	17:H:110:THR:H	1.79	0.47
1:2:1323:U:H2'	1:2:1324:G:O4'	2.13	0.47
3:M:48:HIS:ND1	3:M:112:LYS:O	2.42	0.47
6:R:66:VAL:CG2	34:K:614:ILE:HG23	2.45	0.47
1:2:980:A:H2'	1:2:981:A:C8	2.49	0.47
1:2:1536:G:H2'	1:2:1537:A:H8	1.77	0.47
14:C:166:ARG:HB2	14:C:248:TYR:CD1	2.49	0.47
34:K:201:GLN:HB3	34:K:210:LEU:HD13	1.97	0.47
1:2:1245:G:C6	1:2:1255:G:C2	3.03	0.47
1:2:1656:G:H2'	1:2:1657:G:H8	1.80	0.47
12:A:66:VAL:HG21	12:A:185:MET:HB2	1.95	0.47
16:G:1:MET:HG2	16:G:24:LEU:HD21	1.95	0.47
16:G:7:PHE:O	16:G:11:GLY:N	2.48	0.47
9:Z:68:ILE:HB	9:Z:109:TYR:HB2	1.97	0.47
16:G:48:TYR:HE1	16:G:116:LYS:HD2	1.80	0.47
1:2:84:A:N3	1:2:150:A:O2'	2.46	0.47
1:2:1218:C:H1'	1:2:1683:C:H42	1.80	0.47
16:G:85:ARG:O	16:G:87:ARG:NH1	2.48	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:2:581:U:OP1	19:J:133:ARG:NH2	2.47	0.46
1:2:640:A:H2'	1:2:641:A:C8	2.50	0.46
7:S:18:THR:HG21	7:S:33:ILE:HG22	1.97	0.46
12:A:108:PHE:HB3	12:A:140:VAL:HG21	1.97	0.46
25:X:105:PHE:HD1	25:X:121:LYS:HB3	1.79	0.46
34:K:921:ILE:HD11	34:K:950:LEU:HD13	1.97	0.46
34:K:338:HIS:HB3	34:K:341:VAL:HG22	1.96	0.46
1:2:67:C:N4	16:G:168:LYS:O	2.38	0.46
1:2:948:C:H2'	1:2:949:G:H8	1.80	0.46
1:2:1722:G:O6	1:2:1812:U:C2	2.69	0.46
1:2:1779:G:H2'	1:2:1780:G:C8	2.51	0.46
5:Q:57:LEU:HD21	5:Q:115:TYR:CG	2.51	0.46
25:X:46:HIS:CD2	25:X:103:ALA:HB2	2.51	0.46
26:Y:54:VAL:HG22	26:Y:76:TYR:HB2	1.97	0.46
1:2:1302:G:N2	1:2:1308:U:O4	2.48	0.46
1:2:1758:G:C2	1:2:1775:U:O2	2.68	0.46
6:R:30:THR:HA	6:R:33:ARG:HG2	1.97	0.46
6:R:66:VAL:CG1	34:K:618:LEU:HD21	2.46	0.46
14:C:196:ILE:HB	14:C:223:TYR:HB2	1.95	0.46
34:K:245:THR:HG21	34:K:310:LEU:HD11	1.97	0.46
1:2:1562:C:H2'	1:2:1563:G:C8	2.51	0.46
1:2:1821:U:H2'	1:2:1822:A:C8	2.50	0.46
16:G:58:LYS:HA	16:G:107:SER:HB2	1.97	0.46
21:N:30:SER:HB2	21:N:67:THR:HA	1.97	0.46
1:2:297:A:H5'	15:E:132:GLY:HA2	1.98	0.46
1:2:1845:A:H2'	1:2:1846:G:H8	1.80	0.46
5:Q:71:ARG:HG3	5:Q:73:LYS:HZ2	1.81	0.46
9:Z:79:ILE:HG23	9:Z:83:LEU:HD23	1.96	0.46
1:2:5:U:H2'	1:2:6:G:C8	2.51	0.46
17:H:140:VAL:HG11	17:H:193:GLN:HG3	1.98	0.46
34:K:113:PHE:HD1	34:K:127:VAL:HG21	1.81	0.46
1:2:857:U:H2'	1:2:858:A:C8	2.51	0.46
5:Q:42:ILE:HG22	5:Q:44:PRO:HD2	1.97	0.46
1:2:12:U:H2'	1:2:13:C:C6	2.51	0.46
1:2:218:U:O2	18:I:184:ARG:NH2	2.37	0.46
2:F:71:ARG:NH2	2:F:148:ASN:OD1	2.35	0.46
1:2:527:C:H4'	19:J:121:LYS:HD2	1.97	0.45
1:2:1047:C:H5''	22:O:143:LYS:HA	1.98	0.45
1:2:115:U:H2'	1:2:116:U:C6	2.51	0.45
1:2:996:A:H2'	1:2:997:A:C8	2.52	0.45
1:2:1337:C:OP1	34:K:1036:ARG:NH2	2.50	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:2:1781:A:H2'	1:2:1782:G:C8	2.50	0.45
16:G:102:VAL:HG13	16:G:106:LEU:HD12	1.97	0.45
34:K:535:VAL:HG12	34:K:572:VAL:HG11	1.97	0.45
1:2:492:C:OP2	26:Y:107:ARG:NH2	2.47	0.45
1:2:528:A:H2'	1:2:529:A:H8	1.80	0.45
1:2:1609:C:H3'	7:S:132:ARG:HH12	1.82	0.45
13:B:146:ARG:HD3	13:B:206:PRO:HG3	1.98	0.45
8:T:31:PRO:HG3	8:T:102:ARG:HE	1.82	0.45
8:T:56:ARG:HG2	8:T:103:VAL:HG21	1.99	0.45
16:G:135:PRO:HB3	16:G:144:LEU:HD12	1.97	0.45
18:I:88:ASN:ND2	18:I:205:ARG:HE	2.14	0.45
21:N:110:ASP:OD1	21:N:114:ARG:NH1	2.50	0.45
34:K:881:LEU:HB3	34:K:927:LEU:HD11	1.99	0.45
1:2:1277:C:H2'	1:2:1278:A:H8	1.82	0.45
3:M:84:LYS:HE3	3:M:88:TRP:HE1	1.81	0.45
14:C:172:ASN:ND2	19:J:95:ASP:OD2	2.36	0.45
26:Y:104:ARG:O	26:Y:108:LYS:HG2	2.16	0.45
1:2:1485:U:H2'	1:2:1486:A:H8	1.81	0.45
1:2:1581:C:H5''	1:2:1582:C:H5	1.82	0.45
1:2:1597:C:H4'	1:2:1603:G:C6	2.51	0.45
2:F:154:LEU:HD22	2:F:177:LEU:HD23	1.99	0.45
14:C:137:VAL:HG21	14:C:244:ILE:HD12	1.99	0.45
24:W:25:VAL:O	24:W:62:VAL:HA	2.16	0.45
34:K:378:VAL:O	34:K:379:PRO:C	2.54	0.45
1:2:544:G:H2'	1:2:545:A:H8	1.82	0.45
14:C:183:LYS:HE2	24:W:95:PRO:HA	1.99	0.45
18:I:3:ILE:O	18:I:30:GLY:N	2.44	0.45
8:T:126:GLN:OE1	8:T:129:ARG:NH1	2.50	0.45
34:K:1037:LYS:HA	34:K:1040:ALA:HB3	1.99	0.45
16:G:7:PHE:O	16:G:11:GLY:CA	2.65	0.45
12:A:5:LEU:HD21	23:V:41:LYS:HA	1.99	0.44
15:E:107:GLY:HA2	15:E:189:LEU:HD22	2.00	0.44
1:2:223:C:H2'	1:2:224:A:C8	2.52	0.44
1:2:293:C:HO2'	1:2:295:C:H6	1.65	0.44
1:2:661:U:OP2	25:X:3:LYS:NZ	2.46	0.44
1:2:1726:G:H2'	1:2:1727:G:C8	2.51	0.44
6:R:27:ASP:HB3	6:R:30:THR:HG22	1.98	0.44
12:A:109:THR:N	12:A:136:GLU:OE2	2.50	0.44
15:E:45:ILE:HD12	15:E:80:ILE:HD12	1.99	0.44
34:K:410:LEU:HD23	34:K:413:LEU:HD12	1.99	0.44
34:K:840:LEU:HA	34:K:843:ILE:HG12	2.00	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:2:792:C:H2'	1:2:793:G:H8	1.82	0.44
34:K:643:LEU:HB3	34:K:647:LEU:HD23	2.00	0.44
1:2:528:A:H2'	1:2:529:A:C8	2.53	0.44
1:2:1588:A:H2'	1:2:1589:A:C8	2.52	0.44
1:2:1725:U:H2'	1:2:1726:G:C8	2.51	0.44
16:G:7:PHE:O	16:G:11:GLY:HA2	2.18	0.44
18:I:57:ALA:HB2	18:I:183:GLY:HA2	2.00	0.44
21:N:5:HIS:CE1	21:N:121:ARG:HG3	2.53	0.44
12:A:134:LEU:HD22	12:A:144:THR:HG21	1.98	0.44
14:C:166:ARG:HB3	14:C:247:THR:HB	1.99	0.44
18:I:84:ASN:ND2	18:I:90:LEU:HD23	2.32	0.44
1:2:1605:G:OP1	8:T:84:ARG:NH2	2.44	0.44
1:2:1606:G:H22	1:2:1632:G:H2'	1.82	0.44
1:2:1652:G:H1	1:2:1672:U:H3	1.66	0.44
8:T:77:LYS:HA	8:T:94:ARG:HG2	2.00	0.44
20:L:85:THR:HG22	20:L:112:HIS:HA	1.99	0.44
1:2:546:G:H2'	1:2:547:G:H3'	1.99	0.44
1:2:561:A:O2'	19:J:134:HIS:NE2	2.34	0.44
3:M:69:CYS:HA	3:M:74:ILE:HB	2.00	0.44
34:K:1017:PHE:HZ	34:K:1033:VAL:HG12	1.82	0.44
1:2:520:A:H5''	19:J:12:THR:HG23	1.99	0.44
1:2:1285:G:H1	3:M:56:CYS:HA	1.83	0.44
1:2:1785:C:O2'	1:2:1786:U:O4'	2.36	0.44
1:2:495:U:OP1	15:E:49:ARG:NH1	2.51	0.44
2:F:102:LEU:HB2	9:Z:67:LEU:HD12	1.99	0.44
5:Q:43:GLU:HG3	5:Q:44:PRO:HD3	2.00	0.44
12:A:76:VAL:HG12	12:A:87:VAL:HG13	2.00	0.44
17:H:101:LEU:O	17:H:116:ARG:NH1	2.51	0.44
1:2:145:G:O6	16:G:178:ARG:NH2	2.49	0.43
1:2:168:C:O2'	16:G:132:ARG:O	2.29	0.43
1:2:561:A:H2'	1:2:562:U:O4'	2.18	0.43
1:2:1065:G:OP1	22:O:149:ARG:NH2	2.51	0.43
1:2:1331:C:H2'	1:2:1332:A:H8	1.82	0.43
1:2:388:U:H2'	1:2:389:A:C8	2.53	0.43
1:2:1154:U:OP2	14:C:187:ARG:NH2	2.40	0.43
18:I:119:LEU:HD11	18:I:153:LYS:HG2	2.00	0.43
1:2:28:U:H2'	1:2:29:G:C8	2.54	0.43
1:2:1310:U:H5''	3:M:40:LYS:HZ3	1.83	0.43
1:2:1054:G:H2'	1:2:1055:A:C8	2.54	0.43
1:2:1102:G:OP2	13:B:151:ARG:NH1	2.50	0.43
1:2:1542:C:H5''	8:T:62:ARG:HH22	1.83	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
12:A:142:LEU:O	23:V:60:ARG:NH2	2.51	0.43
34:K:214:LEU:HD22	34:K:241:LEU:HD13	2.01	0.43
1:2:1217:A:H2'	1:2:1218:C:C6	2.54	0.43
1:2:1220:A:N3	1:2:1677:U:O2'	2.38	0.43
1:2:1375:G:H2'	1:2:1376:A:C8	2.53	0.43
6:R:70:SER:HA	34:K:614:ILE:HD11	2.01	0.43
6:R:84:TYR:HB3	12:A:205:ARG:NH1	2.34	0.43
7:S:81:ASP:OD1	7:S:81:ASP:N	2.52	0.43
14:C:107:LEU:HD22	14:C:209:VAL:HG13	2.00	0.43
24:W:49:GLU:O	24:W:64:ASN:ND2	2.52	0.43
25:X:17:ARG:O	25:X:21:LYS:HB2	2.18	0.43
1:2:1545:A:N3	1:2:1671:G:O2'	2.45	0.43
2:F:155:CYS:O	2:F:159:ARG:HG3	2.18	0.43
18:I:105:ASP:OD1	18:I:106:SER:N	2.47	0.43
19:J:87:LEU:HD23	19:J:91:LYS:HZ2	1.84	0.43
1:2:649:U:H2'	1:2:650:A:C8	2.54	0.43
1:2:1033:G:N1	1:2:1080:A:O2'	2.40	0.43
12:A:143:PRO:HG3	23:V:32:ILE:HG23	2.01	0.43
34:K:377:TYR:O	34:K:378:VAL:C	2.57	0.43
1:2:819:G:OP1	19:J:79:ARG:NH2	2.38	0.43
15:E:31:PRO:HG2	15:E:38:LEU:HB2	2.00	0.43
1:2:17:C:H2'	1:2:18:C:C6	2.53	0.43
1:2:1113:A:OP1	1:2:1114:U:O2'	2.31	0.43
1:2:1226:G:N1	1:2:1639:G:OP2	2.41	0.43
19:J:110:LEU:HB2	19:J:147:PHE:HB3	2.00	0.43
13:B:105:LEU:HG	13:B:213:ARG:HA	2.01	0.43
14:C:65:LYS:HD2	14:C:273:LEU:HD13	1.99	0.43
1:2:672:A:N6	1:2:1027:A:OP1	2.47	0.42
1:2:1285:G:H5'	3:M:35:ILE:HB	2.01	0.42
1:2:1375:G:H2'	1:2:1376:A:H8	1.83	0.42
1:2:1533:A:H5'	1:2:1637:A:H62	1.84	0.42
15:E:152:PRO:HG2	16:G:216:ARG:HG3	2.01	0.42
34:K:201:GLN:OE1	34:K:204:SER:OG	2.36	0.42
34:K:353:PHE:HD1	34:K:400:ASN:HD22	1.67	0.42
34:K:725:ASP:OD1	34:K:725:ASP:N	2.52	0.42
14:C:66:LEU:HD11	14:C:81:ILE:HG12	2.00	0.42
1:2:114:G:H5'	20:L:132:ARG:HD3	2.01	0.42
1:2:118:C:H1'	1:2:445:A:C5	2.54	0.42
1:2:604:A:N3	1:2:639:C:O2'	2.49	0.42
1:2:748:C:N4	1:2:794:A:H61	2.17	0.42
1:2:1236:G:N2	1:2:1522:A:H62	2.12	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
19:J:94:LEU:HD12	19:J:97:ILE:HD12	2.00	0.42
25:X:84:PHE:CE2	25:X:86:PRO:HA	2.54	0.42
34:K:863:ILE:O	34:K:866:THR:OG1	2.25	0.42
1:2:494:C:N4	1:2:509:G:H21	2.16	0.42
1:2:1189:A:H2'	1:2:1190:A:C8	2.54	0.42
12:A:145:ILE:HG12	12:A:159:ILE:HB	2.00	0.42
34:K:901:CYS:HA	34:K:904:VAL:HG22	2.00	0.42
1:2:49:C:H2'	1:2:472:C:H41	1.84	0.42
1:2:594:A:H61	1:2:643:A:H5''	1.84	0.42
13:B:169:MET:O	13:B:173:THR:OG1	2.32	0.42
13:B:228:LEU:HD12	13:B:228:LEU:HA	1.92	0.42
14:C:271:ASP:OD1	14:C:271:ASP:N	2.51	0.42
16:G:113:ILE:HD13	16:G:113:ILE:HG21	1.89	0.42
21:N:78:LYS:HE2	21:N:78:LYS:HB2	1.73	0.42
24:W:27:ILE:HG13	24:W:61:ILE:HB	2.01	0.42
34:K:889:LEU:HD22	34:K:895:GLN:HG2	2.02	0.42
1:2:808:A:O2'	1:2:809:A:H8	2.02	0.42
1:2:1648:G:H5'	5:Q:125:ARG:HB2	2.01	0.42
1:2:1213:C:H2'	1:2:1214:A:C8	2.54	0.42
2:F:47:LYS:NZ	5:Q:115:TYR:O	2.53	0.42
9:Z:65:TYR:O	9:Z:67:LEU:N	2.52	0.42
12:A:188:THR:HG23	12:A:189:ILE:HG13	2.00	0.42
19:J:140:GLN:NE2	26:Y:64:PHE:O	2.45	0.42
34:K:859:ILE:O	34:K:863:ILE:HG13	2.19	0.42
1:2:102:A:H5'	1:2:104:A:C4	2.55	0.42
26:Y:114:MET:HA	26:Y:117:VAL:HG22	2.02	0.42
34:K:1018:GLU:HB3	34:K:1022:ARG:NH1	2.34	0.42
1:2:1101:U:H2'	1:2:1102:G:C8	2.54	0.42
1:2:1786:U:H2'	1:2:1787:G:C8	2.53	0.42
1:2:867:G:H2'	1:2:868:G:C8	2.54	0.42
19:J:28:GLU:OE2	19:J:44:TRP:NE1	2.42	0.42
1:2:65:C:H4'	16:G:172:LYS:HD3	2.02	0.41
1:2:1485:U:H2'	1:2:1486:A:C8	2.55	0.41
1:2:67:C:H5''	16:G:162:LEU:HD21	2.01	0.41
6:R:76:GLU:OE2	6:R:77:GLU:HG3	2.20	0.41
13:B:25:PHE:HA	13:B:28:LYS:HG3	2.00	0.41
19:J:138:ARG:HG3	19:J:139:LYS:H	1.85	0.41
20:L:91:ASP:HB3	20:L:104:LYS:HE2	2.02	0.41
26:Y:6:THR:HB	26:Y:28:LEU:HB2	2.01	0.41
34:K:888:PHE:HD2	34:K:902:TYR:HB2	1.85	0.41
34:K:1030:ARG:O	34:K:1033:VAL:HG22	2.20	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:2:29:G:H2'	1:2:30:C:C6	2.55	0.41
1:2:1470:C:H2'	1:2:1471:C:H6	1.86	0.41
1:2:1010:G:H2'	1:2:1011:A:H8	1.85	0.41
1:2:1486:A:H2'	1:2:1487:A:C8	2.55	0.41
4:P:98:ASN:HB3	4:P:120:SER:HB3	2.01	0.41
6:R:98:VAL:HG21	6:R:117:LEU:HG	2.02	0.41
15:E:128:LYS:HG2	15:E:140:VAL:HB	2.01	0.41
1:2:885:U:H3	1:2:901:G:H1	1.68	0.41
2:F:49:LEU:HD12	5:Q:50:LYS:HG2	2.02	0.41
15:E:87:MET:HE1	15:E:102:ILE:HG12	2.01	0.41
34:K:113:PHE:HB2	34:K:127:VAL:HG11	2.02	0.41
34:K:182:VAL:O	34:K:186:LYS:HG3	2.21	0.41
34:K:253:ARG:HD2	34:K:306:HIS:CG	2.56	0.41
34:K:407:ASP:OD1	34:K:407:ASP:N	2.53	0.41
1:2:303:C:O2	18:I:184:ARG:NH1	2.53	0.41
1:2:1472:C:O2	34:K:711:ARG:NH2	2.54	0.41
1:2:1781:A:H2'	1:2:1782:G:H8	1.86	0.41
34:K:210:LEU:HA	34:K:213:VAL:HG12	2.03	0.41
1:2:982:G:H21	1:2:1045:U:H1'	1.85	0.41
1:2:1692:U:H2'	1:2:1693:G:C8	2.56	0.41
4:P:22:LEU:HA	4:P:25:LEU:HD12	2.02	0.41
34:K:264:LEU:HD23	34:K:264:LEU:HA	1.91	0.41
2:F:30:ILE:HG21	2:F:36:GLN:HA	2.02	0.41
14:C:165:VAL:HG11	14:C:217:ALA:HB1	2.02	0.41
17:H:61:ILE:HD11	17:H:176:VAL:HG11	2.03	0.41
1:2:674:C:H2'	1:2:675:U:C6	2.56	0.41
1:2:929:G:H2'	1:2:930:C:O4'	2.21	0.41
1:2:973:C:O2	22:O:55:ARG:NH2	2.54	0.41
1:2:1535:U:O2'	2:F:81:ARG:NH1	2.54	0.41
1:2:1736:G:H2'	1:2:1737:G:C8	2.56	0.41
2:F:68:ILE:HD11	2:F:151:ILE:HD11	2.02	0.41
13:B:142:PHE:O	13:B:208:HIS:N	2.47	0.41
14:C:221:ASP:OD1	14:C:221:ASP:N	2.54	0.41
14:C:246:LYS:HA	14:C:249:SER:HB2	2.02	0.41
21:N:83:ASP:OD1	21:N:84:LEU:N	2.53	0.41
34:K:638:ILE:O	34:K:641:LYS:NZ	2.54	0.41
1:2:75:G:H1	16:G:155:GLN:HA	1.86	0.41
7:S:38:ARG:O	7:S:42:HIS:ND1	2.54	0.41
16:G:50:VAL:HG22	16:G:113:ILE:HG22	2.03	0.41
16:G:56:ASN:HB2	16:G:108:VAL:HG12	2.02	0.41
1:2:747:U:H2'	1:2:748:C:C6	2.56	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:2:1139:C:H2'	1:2:1140:G:O4'	2.21	0.40
5:Q:34:VAL:HG12	5:Q:39:LEU:HD22	2.02	0.40
6:R:69:ILE:H	6:R:69:ILE:HG12	1.73	0.40
19:J:60:LEU:HD11	19:J:73:GLU:HG2	2.03	0.40
34:K:223:LYS:HD3	34:K:223:LYS:HA	1.89	0.40
1:2:1154:U:H2'	14:C:192:LEU:HD11	2.03	0.40
1:2:1222:G:H2'	1:2:1223:A:C8	2.56	0.40
1:2:1325:G:O2'	1:2:1327:G:OP2	2.36	0.40
4:P:31:GLU:OE2	4:P:32:GLN:NE2	2.54	0.40
19:J:88:ASP:HB2	19:J:91:LYS:HG2	2.02	0.40
20:L:127:THR:HB	20:L:144:LYS:HG2	2.03	0.40
34:K:171:LEU:O	34:K:175:LEU:HB2	2.21	0.40
1:2:808:A:H5''	15:E:219:ALA:O	2.21	0.40
1:2:1333:U:H3	1:2:1495:G:H1	1.69	0.40
1:2:1748:G:H2'	1:2:1749:G:H8	1.87	0.40
1:2:1798:C:H2'	1:2:1799:G:O4'	2.21	0.40
2:F:100:ILE:HA	2:F:178:ILE:HD11	2.04	0.40
3:M:51:VAL:HG22	3:M:77:ILE:HB	2.03	0.40
7:S:40:TYR:CZ	7:S:97:GLN:HG2	2.56	0.40
7:S:79:ILE:HA	7:S:80:PRO:HD3	1.94	0.40
12:A:10:MET:HB2	12:A:55:TRP:CD1	2.55	0.40
12:A:151:ASP:OD1	12:A:151:ASP:N	2.53	0.40
1:2:218:U:H2'	1:2:219:U:C6	2.56	0.40
1:2:1545:A:H2'	1:2:1546:G:C8	2.56	0.40
1:2:1609:C:H5''	7:S:132:ARG:HH11	1.86	0.40
15:E:126:VAL:HG21	15:E:139:LEU:HD22	2.02	0.40
16:G:2:LYS:HD3	16:G:15:LEU:HD21	2.03	0.40
22:O:54:CYS:SG	22:O:81:VAL:HG22	2.62	0.40
5:Q:117:ARG:NH1	5:Q:123:ASP:OD1	2.41	0.40
7:S:73:ASN:H	7:S:73:ASN:HD22	1.69	0.40
15:E:181:CYS:HB3	15:E:195:ILE:HD11	2.03	0.40
18:I:174:CYS:HB2	18:I:190:LEU:HD21	2.04	0.40
22:O:149:ARG:HE	22:O:150:ARG:H	1.69	0.40
34:K:620:TRP:HD1	34:K:657:LEU:HD23	1.86	0.40

There are no symmetry-related clashes.

## 5.3 Torsion angles

### 5.3.1 Protein backbone

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all 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	
2	F	187/204 (92%)	178 (95%)	9 (5%)	0	100	100
3	M	121/132 (92%)	113 (93%)	8 (7%)	0	100	100
4	P	118/145 (81%)	117 (99%)	1 (1%)	0	100	100
5	Q	120/146 (82%)	116 (97%)	4 (3%)	0	100	100
6	R	120/135 (89%)	115 (96%)	4 (3%)	1 (1%)	19	57
7	S	128/152 (84%)	121 (94%)	7 (6%)	0	100	100
8	T	142/145 (98%)	138 (97%)	4 (3%)	0	100	100
9	Z	70/125 (56%)	66 (94%)	4 (6%)	0	100	100
10	c	59/69 (86%)	57 (97%)	2 (3%)	0	100	100
11	f	71/156 (46%)	64 (90%)	6 (8%)	1 (1%)	11	43
12	A	214/295 (72%)	203 (95%)	11 (5%)	0	100	100
13	B	211/264 (80%)	202 (96%)	9 (4%)	0	100	100
14	C	216/293 (74%)	209 (97%)	6 (3%)	1 (0%)	29	68
15	E	260/263 (99%)	253 (97%)	7 (3%)	0	100	100
16	G	228/249 (92%)	223 (98%)	5 (2%)	0	100	100
17	H	184/194 (95%)	179 (97%)	5 (3%)	0	100	100
18	I	203/208 (98%)	197 (97%)	6 (3%)	0	100	100
19	J	178/194 (92%)	173 (97%)	4 (2%)	1 (1%)	25	64
20	L	149/158 (94%)	144 (97%)	5 (3%)	0	100	100
21	N	147/151 (97%)	146 (99%)	1 (1%)	0	100	100
22	O	133/151 (88%)	125 (94%)	8 (6%)	0	100	100
23	V	80/83 (96%)	78 (98%)	2 (2%)	0	100	100
24	W	127/130 (98%)	122 (96%)	5 (4%)	0	100	100
25	X	139/143 (97%)	134 (96%)	4 (3%)	1 (1%)	22	60
26	Y	122/133 (92%)	119 (98%)	3 (2%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
27	b	80/84 (95%)	77 (96%)	3 (4%)	0	100	100
28	e	53/59 (90%)	50 (94%)	3 (6%)	0	100	100
29	x	176/252 (70%)	172 (98%)	4 (2%)	0	100	100
30	y	319/412 (77%)	303 (95%)	16 (5%)	0	100	100
31	u	619/804 (77%)	592 (96%)	27 (4%)	0	100	100
32	w	247/437 (56%)	241 (98%)	6 (2%)	0	100	100
33	t	119/475 (25%)	103 (87%)	15 (13%)	1 (1%)	19	57
34	K	899/1297 (69%)	858 (95%)	40 (4%)	1 (0%)	51	85
All	All	6239/8138 (77%)	5988 (96%)	244 (4%)	7 (0%)	54	85

All (7) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
34	K	379	PRO
11	f	85	TYR
19	J	138	ARG
6	R	67	ARG
14	C	135	GLY
33	t	261	GLU
25	X	86	PRO

### 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	
2	F	159/170 (94%)	157 (99%)	2 (1%)	69	89
3	M	104/108 (96%)	104 (100%)	0	100	100
4	P	107/130 (82%)	106 (99%)	1 (1%)	78	92
5	Q	103/121 (85%)	103 (100%)	0	100	100
6	R	110/122 (90%)	108 (98%)	2 (2%)	59	85
7	S	114/132 (86%)	112 (98%)	2 (2%)	59	85

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
8	T	114/115 (99%)	112 (98%)	2 (2%)	59	85
9	Z	64/103 (62%)	63 (98%)	1 (2%)	62	86
10	c	52/62 (84%)	52 (100%)	0	100	100
11	f	65/140 (46%)	65 (100%)	0	100	100
12	A	180/243 (74%)	180 (100%)	0	100	100
13	B	194/231 (84%)	194 (100%)	0	100	100
14	C	184/225 (82%)	184 (100%)	0	100	100
15	E	224/225 (100%)	224 (100%)	0	100	100
16	G	200/218 (92%)	199 (100%)	1 (0%)	88	96
17	H	167/174 (96%)	167 (100%)	0	100	100
18	I	178/180 (99%)	177 (99%)	1 (1%)	86	95
19	J	160/168 (95%)	160 (100%)	0	100	100
20	L	135/142 (95%)	134 (99%)	1 (1%)	84	94
21	N	130/131 (99%)	130 (100%)	0	100	100
22	O	105/119 (88%)	104 (99%)	1 (1%)	76	91
23	V	66/67 (98%)	66 (100%)	0	100	100
24	W	112/113 (99%)	112 (100%)	0	100	100
25	X	113/115 (98%)	113 (100%)	0	100	100
26	Y	108/115 (94%)	108 (100%)	0	100	100
27	b	74/76 (97%)	74 (100%)	0	100	100
28	e	45/48 (94%)	45 (100%)	0	100	100
29	x	150/208 (72%)	150 (100%)	0	100	100
30	y	285/367 (78%)	283 (99%)	2 (1%)	84	94
31	u	550/705 (78%)	548 (100%)	2 (0%)	91	97
32	w	217/370 (59%)	217 (100%)	0	100	100
33	t	113/434 (26%)	113 (100%)	0	100	100
34	K	778/1094 (71%)	776 (100%)	2 (0%)	92	97
All	All	5460/6971 (78%)	5440 (100%)	20 (0%)	91	97

All (20) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
2	F	122	ARG

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Mol	Chain	Res	Type
2	F	135	ARG
4	P	65	LYS
6	R	67	ARG
6	R	78	ARG
7	S	73	ASN
7	S	118	ARG
8	T	27	LYS
8	T	111	LYS
9	Z	78	LYS
16	G	98	ARG
18	I	143	LYS
20	L	69	ARG
22	O	83	GLN
30	y	111	LYS
30	y	397	ARG
31	u	499	ARG
31	u	624	ARG
34	K	186	LYS
34	K	379	PRO

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (5) such sidechains are listed below:

Mol	Chain	Res	Type
30	y	218	GLN
31	u	256	HIS
31	u	286	ASN
32	w	397	GLN
34	K	811	GLN

### 5.3.3 RNA [i](#)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
1	2	1609/1873 (85%)	399 (24%)	23 (1%)

All (399) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
1	2	3	C
1	2	9	U
1	2	17	C

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	2	26	U
1	2	33	G
1	2	37	C
1	2	41	G
1	2	42	A
1	2	44	U
1	2	46	A
1	2	56	G
1	2	58	C
1	2	61	A
1	2	62	G
1	2	66	G
1	2	67	C
1	2	68	A
1	2	70	G
1	2	72	C
1	2	73	C
1	2	74	G
1	2	75	G
1	2	76	U
1	2	77	A
1	2	79	A
1	2	92	A
1	2	103	A
1	2	113	G
1	2	114	G
1	2	115	U
1	2	126	G
1	2	127	C
1	2	128	U
1	2	130	G
1	2	143	U
1	2	144	U
1	2	155	G
1	2	163	U
1	2	168	C
1	2	172	U
1	2	181	A
1	2	182	C
1	2	184	G
1	2	215	G
1	2	291	G

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	2	292	A
1	2	295	C
1	2	308	G
1	2	309	G
1	2	310	C
1	2	313	A
1	2	315	C
1	2	318	A
1	2	319	C
1	2	332	G
1	2	333	G
1	2	337	C
1	2	338	G
1	2	347	G
1	2	357	C
1	2	360	A
1	2	362	C
1	2	364	A
1	2	370	G
1	2	377	G
1	2	384	U
1	2	385	G
1	2	386	C
1	2	387	C
1	2	400	C
1	2	407	G
1	2	408	A
1	2	409	C
1	2	413	G
1	2	418	A
1	2	421	G
1	2	437	G
1	2	441	C
1	2	448	A
1	2	450	C
1	2	463	C
1	2	465	A
1	2	466	G
1	2	471	G
1	2	472	C
1	2	473	A
1	2	474	G

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	2	476	A
1	2	482	G
1	2	487	U
1	2	492	C
1	2	502	C
1	2	516	A
1	2	517	C
1	2	525	A
1	2	530	U
1	2	531	A
1	2	537	C
1	2	544	G
1	2	545	A
1	2	548	C
1	2	552	G
1	2	554	A
1	2	555	A
1	2	556	U
1	2	559	G
1	2	560	A
1	2	568	C
1	2	576	A
1	2	583	A
1	2	587	A
1	2	588	G
1	2	589	G
1	2	590	A
1	2	591	U
1	2	594	A
1	2	598	G
1	2	604	A
1	2	605	A
1	2	606	G
1	2	608	C
1	2	614	C
1	2	617	G
1	2	628	A
1	2	629	A
1	2	631	U
1	2	643	A
1	2	644	G
1	2	655	A

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	2	660	C
1	2	664	A
1	2	669	A
1	2	670	A
1	2	671	A
1	2	672	A
1	2	673	G
1	2	685	A
1	2	688	U
1	2	749	U
1	2	750	C
1	2	751	G
1	2	792	C
1	2	794	A
1	2	797	C
1	2	799	U
1	2	809	A
1	2	810	A
1	2	812	A
1	2	821	G
1	2	822	U
1	2	830	A
1	2	844	U
1	2	847	A
1	2	852	G
1	2	853	C
1	2	856	C
1	2	869	A
1	2	870	A
1	2	871	U
1	2	872	A
1	2	873	G
1	2	874	G
1	2	878	G
1	2	880	G
1	2	885	U
1	2	886	A
1	2	887	U
1	2	888	U
1	2	889	U
1	2	890	U
1	2	891	G

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	2	892	U
1	2	893	U
1	2	895	G
1	2	896	U
1	2	898	U
1	2	903	A
1	2	905	C
1	2	907	G
1	2	908	A
1	2	913	A
1	2	914	U
1	2	918	U
1	2	919	A
1	2	920	A
1	2	933	G
1	2	943	U
1	2	959	G
1	2	963	A
1	2	970	G
1	2	971	G
1	2	978	G
1	2	981	A
1	2	990	A
1	2	992	A
1	2	1001	A
1	2	1002	U
1	2	1008	A
1	2	1009	A
1	2	1017	U
1	2	1023	A
1	2	1027	A
1	2	1028	A
1	2	1031	A
1	2	1040	G
1	2	1041	G
1	2	1049	A
1	2	1057	C
1	2	1058	A
1	2	1059	G
1	2	1078	C
1	2	1080	A
1	2	1083	A

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	2	1085	C
1	2	1086	G
1	2	1087	A
1	2	1088	U
1	2	1096	G
1	2	1100	A
1	2	1109	C
1	2	1114	U
1	2	1116	C
1	2	1117	C
1	2	1118	C
1	2	1119	A
1	2	1126	G
1	2	1133	A
1	2	1138	C
1	2	1143	A
1	2	1148	A
1	2	1153	C
1	2	1154	U
1	2	1155	U
1	2	1157	G
1	2	1171	G
1	2	1195	A
1	2	1200	A
1	2	1204	A
1	2	1205	C
1	2	1207	G
1	2	1208	A
1	2	1211	G
1	2	1215	C
1	2	1217	A
1	2	1221	G
1	2	1224	G
1	2	1227	G
1	2	1232	U
1	2	1240	A
1	2	1242	U
1	2	1243	U
1	2	1248	U
1	2	1249	C
1	2	1250	A
1	2	1251	A

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	2	1254	C
1	2	1255	G
1	2	1256	G
1	2	1257	G
1	2	1258	A
1	2	1259	A
1	2	1260	A
1	2	1261	C
1	2	1264	C
1	2	1265	A
1	2	1273	C
1	2	1274	G
1	2	1284	A
1	2	1285	G
1	2	1286	G
1	2	1297	U
1	2	1298	G
1	2	1299	A
1	2	1300	U
1	2	1301	A
1	2	1302	G
1	2	1304	U
1	2	1305	C
1	2	1306	U
1	2	1308	U
1	2	1309	C
1	2	1313	A
1	2	1315	U
1	2	1316	C
1	2	1317	C
1	2	1321	G
1	2	1322	G
1	2	1323	U
1	2	1324	G
1	2	1325	G
1	2	1335	G
1	2	1338	G
1	2	1339	U
1	2	1348	G
1	2	1358	U
1	2	1372	U
1	2	1378	A

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	2	1382	A
1	2	1388	A
1	2	1389	C
1	2	1396	A
1	2	1397	U
1	2	1398	G
1	2	1445	U
1	2	1446	A
1	2	1454	A
1	2	1455	A
1	2	1462	U
1	2	1463	U
1	2	1464	C
1	2	1465	A
1	2	1466	G
1	2	1476	A
1	2	1477	U
1	2	1489	A
1	2	1490	G
1	2	1491	G
1	2	1492	U
1	2	1494	U
1	2	1495	G
1	2	1497	G
1	2	1498	A
1	2	1505	U
1	2	1506	A
1	2	1507	G
1	2	1509	U
1	2	1512	C
1	2	1519	U
1	2	1526	G
1	2	1531	A
1	2	1533	A
1	2	1534	C
1	2	1535	U
1	2	1544	C
1	2	1548	G
1	2	1551	U
1	2	1559	C
1	2	1560	U
1	2	1566	G

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	2	1567	G
1	2	1571	G
1	2	1574	C
1	2	1575	G
1	2	1579	A
1	2	1580	A
1	2	1581	C
1	2	1582	C
1	2	1584	G
1	2	1585	U
1	2	1586	U
1	2	1587	G
1	2	1600	G
1	2	1601	A
1	2	1602	U
1	2	1606	G
1	2	1612	G
1	2	1617	G
1	2	1618	C
1	2	1621	U
1	2	1623	A
1	2	1628	C
1	2	1632	G
1	2	1647	A
1	2	1648	G
1	2	1649	U
1	2	1654	G
1	2	1663	A
1	2	1665	G
1	2	1671	G
1	2	1675	A
1	2	1686	G
1	2	1699	A
1	2	1714	U
1	2	1721	U
1	2	1722	G
1	2	1723	G
1	2	1727	G
1	2	1729	U
1	2	1744	G
1	2	1751	C
1	2	1756	C

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	2	1776	G
1	2	1783	C
1	2	1784	G
1	2	1786	U
1	2	1801	A
1	2	1808	U
1	2	1816	G
1	2	1819	A
1	2	1826	G
1	2	1844	U
1	2	1859	A
1	2	1861	G
1	2	1863	A
1	2	1864	U
1	2	1870	A
1	2	1871	C
1	2	1872	G
1	2	1873	G

All (23) RNA pucker outliers are listed below:

<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	2	102	A
1	2	114	G
1	2	143	U
1	2	180	G
1	2	291	G
1	2	314	U
1	2	332	G
1	2	465	A
1	2	547	G
1	2	604	A
1	2	811	A
1	2	958	G
1	2	980	A
1	2	1231	C
1	2	1316	C
1	2	1338	G
1	2	1493	C
1	2	1511	U
1	2	1534	C
1	2	1558	C

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Mol	Chain	Res	Type
1	2	1601	A
1	2	1648	G
1	2	1726	G

#### 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](#)

Of 2 ligands modelled in this entry, 2 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 [i](#)

There are no chain breaks in this entry.

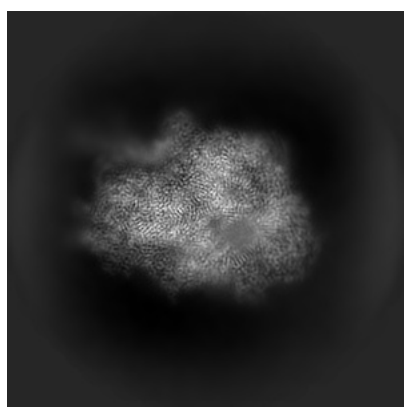
## 6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-32806. These allow visual inspection of the internal detail of the map and identification of artifacts.

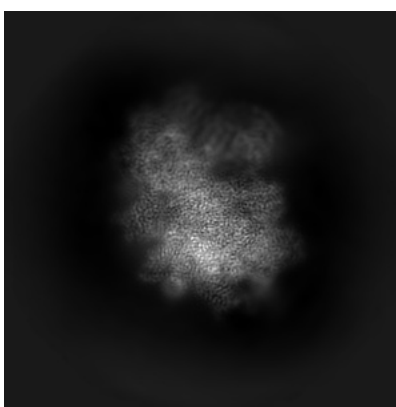
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

### 6.1 Orthogonal projections [i](#)

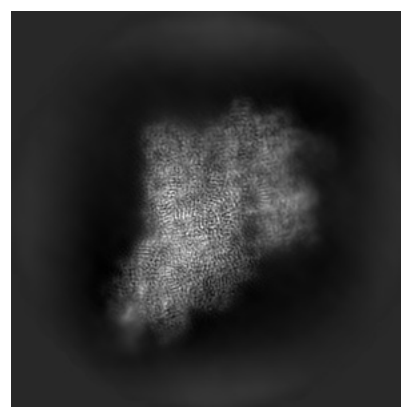
#### 6.1.1 Primary map



X



Y

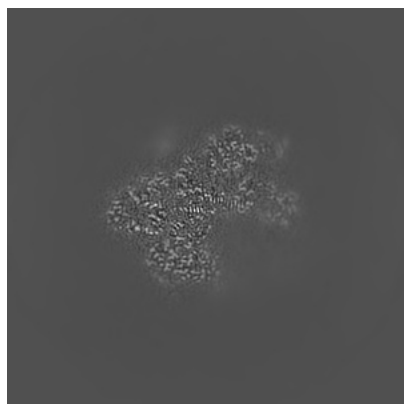


Z

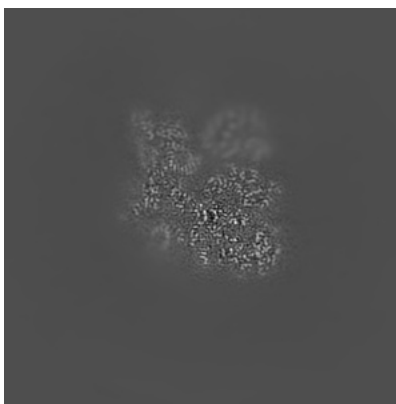
The images above show the map projected in three orthogonal directions.

### 6.2 Central slices [i](#)

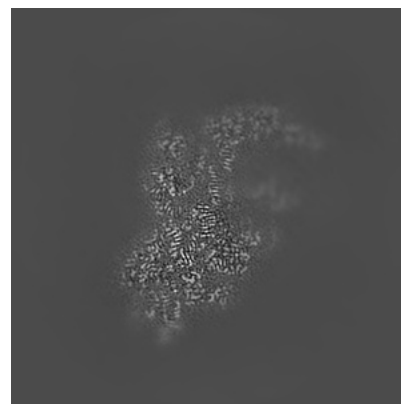
#### 6.2.1 Primary map



X Index: 180



Y Index: 180

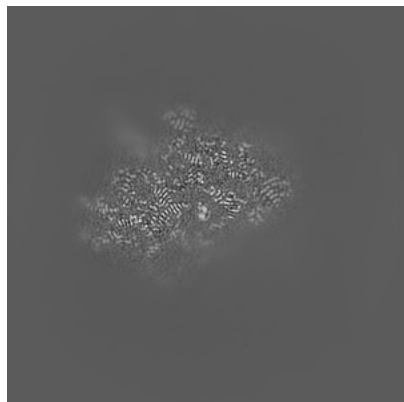


Z Index: 180

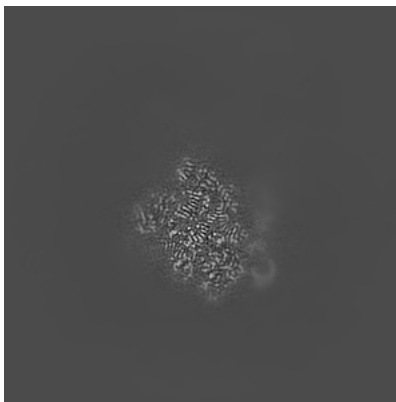
The images above show central slices of the map in three orthogonal directions.

## 6.3 Largest variance slices [i](#)

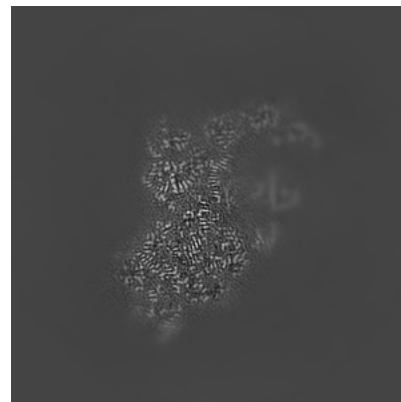
### 6.3.1 Primary map



X Index: 148



Y Index: 133

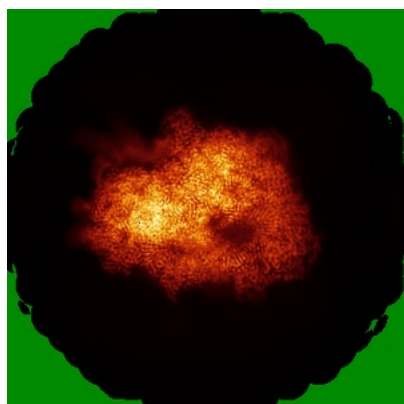


Z Index: 183

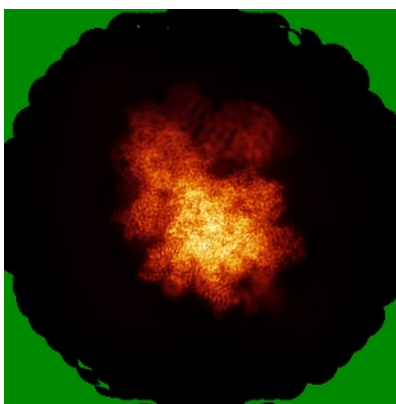
The images above show the largest variance slices of the map in three orthogonal directions.

## 6.4 Orthogonal standard-deviation projections (False-color) [i](#)

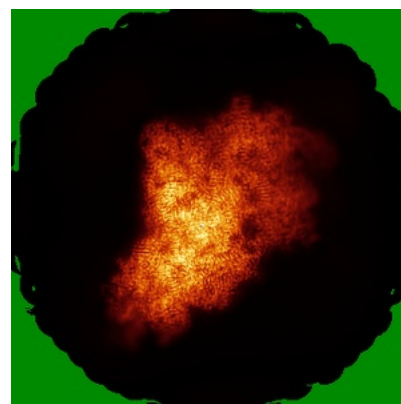
### 6.4.1 Primary map



X



Y



Z

The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

## 6.5 Orthogonal surface views [i](#)

### 6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.02. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

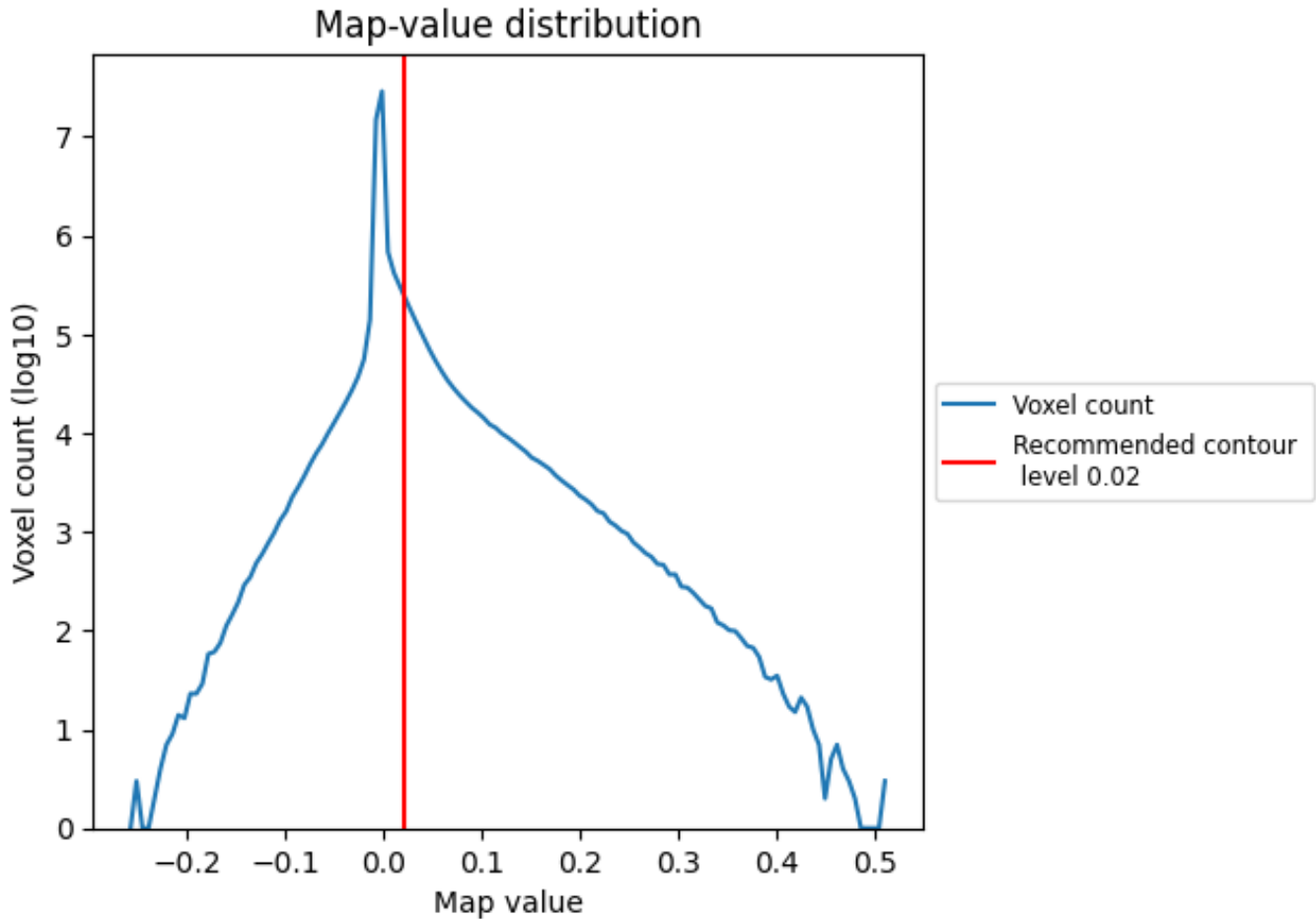
## 6.6 Mask visualisation [i](#)

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

## 7 Map analysis [i](#)

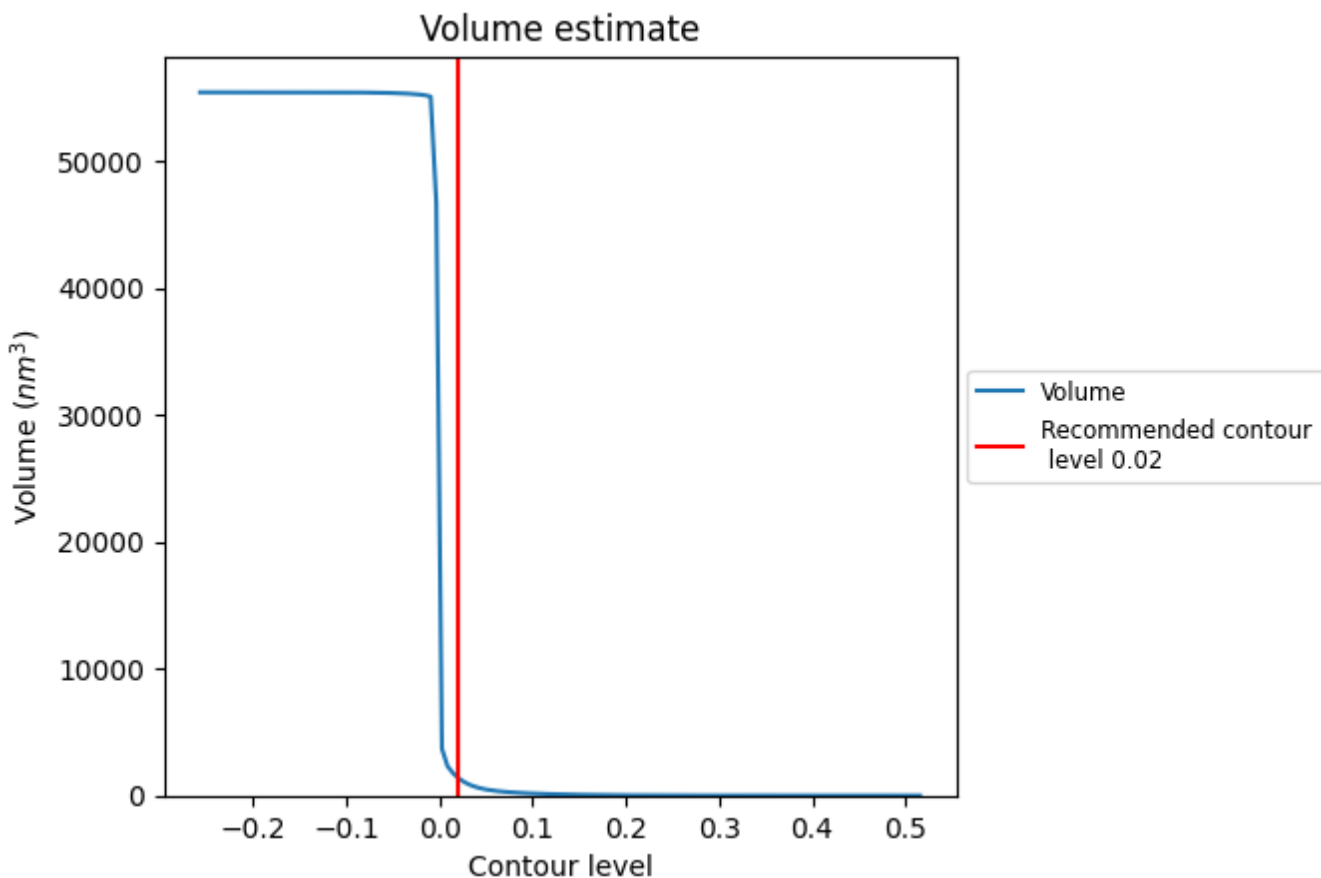
This section contains the results of statistical analysis of the map.

### 7.1 Map-value distribution [i](#)



The map-value distribution is plotted in 128 intervals along the x-axis. The y-axis is logarithmic. A spike in this graph at zero usually indicates that the volume has been masked.

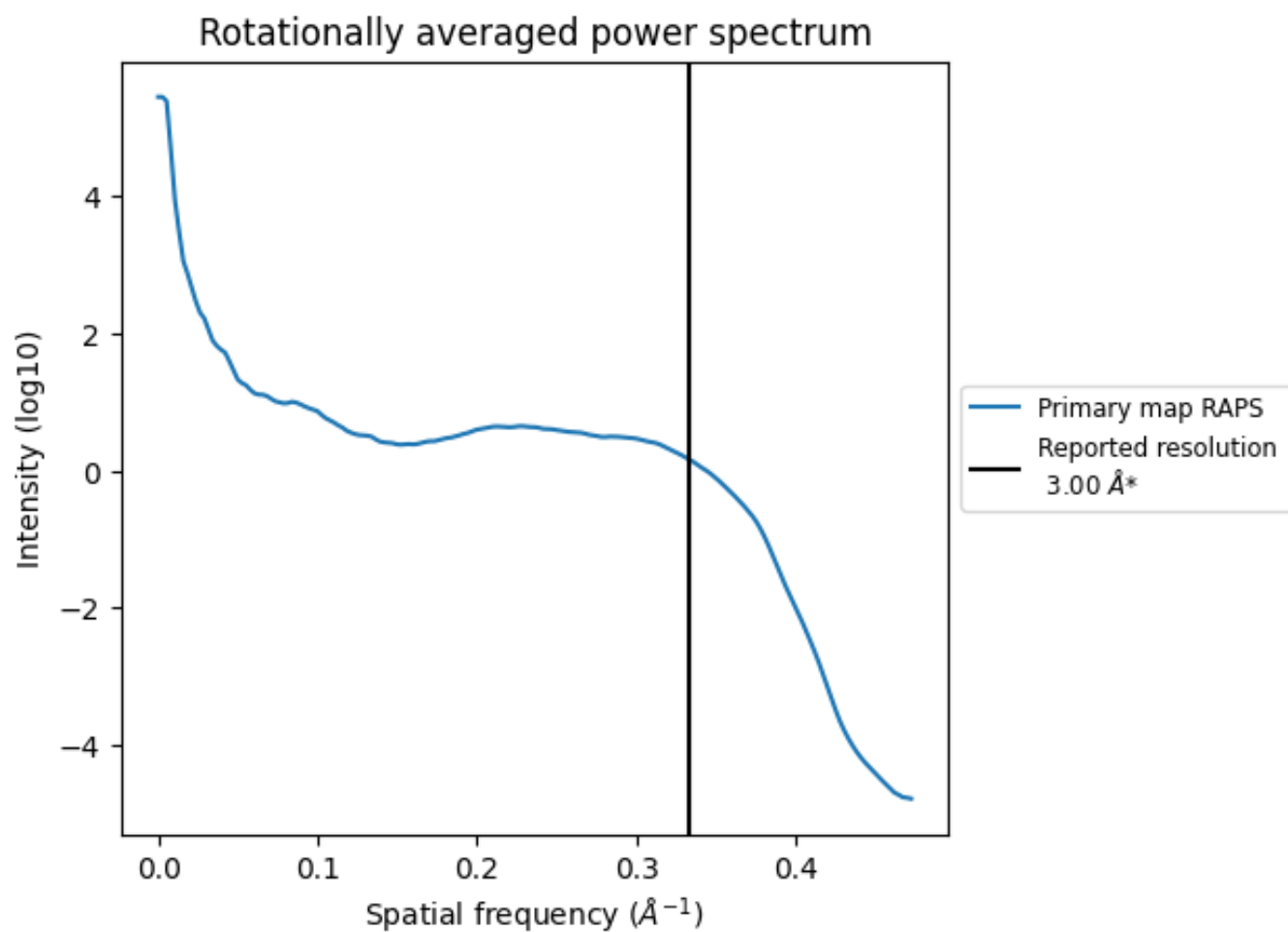
## 7.2 Volume estimate [i](#)



The volume at the recommended contour level is  $1392 \text{ nm}^3$ ; this corresponds to an approximate mass of 1257 kDa.

The volume estimate graph shows how the enclosed volume varies with the contour level. The recommended contour level is shown as a vertical line and the intersection between the line and the curve gives the volume of the enclosed surface at the given level.

### 7.3 Rotationally averaged power spectrum [i](#)

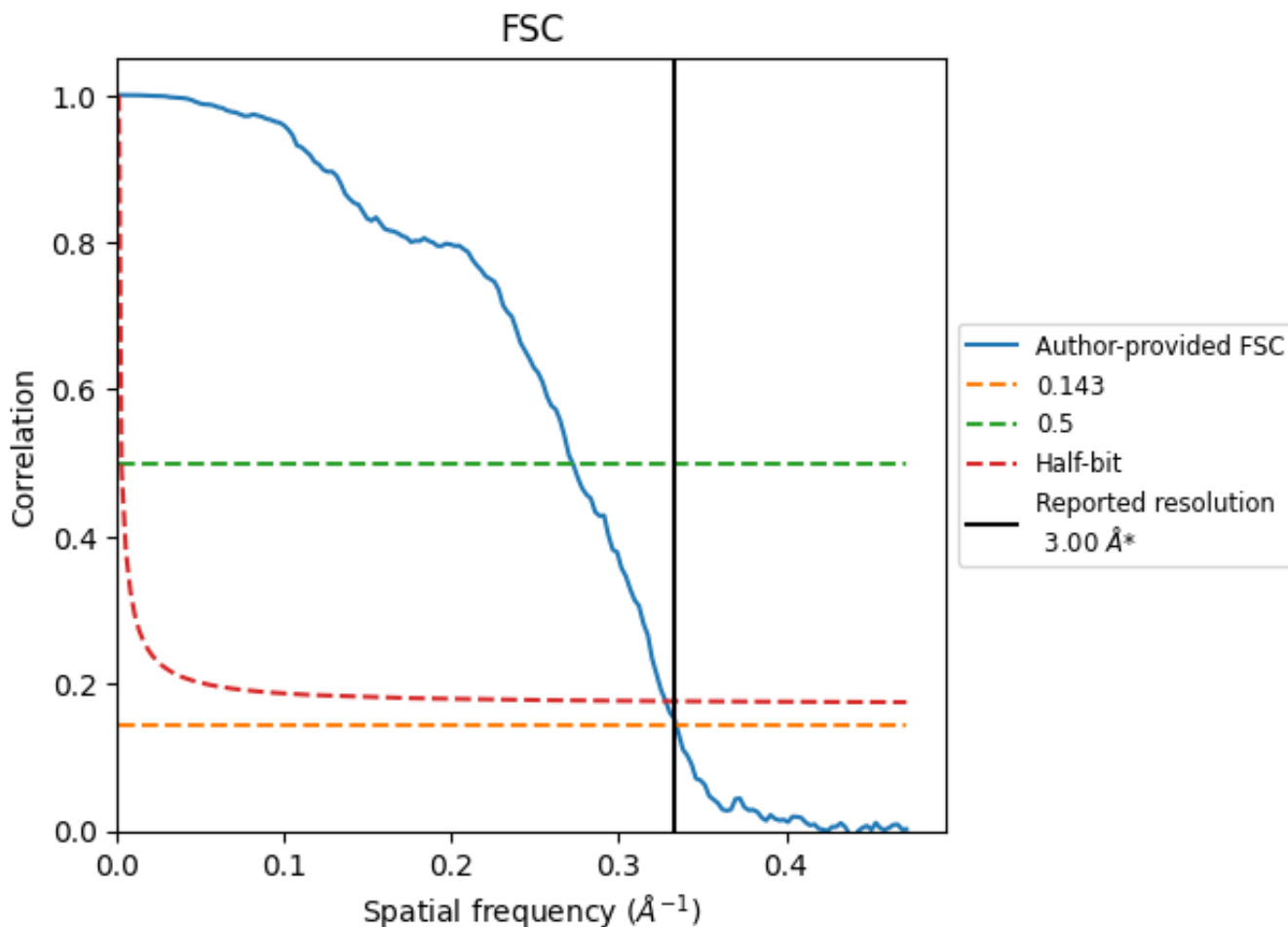


\*Reported resolution corresponds to spatial frequency of 0.333 Å<sup>-1</sup>

## 8 Fourier-Shell correlation [i](#)

Fourier-Shell Correlation (FSC) is the most commonly used method to estimate the resolution of single-particle and subtomogram-averaged maps. The shape of the curve depends on the imposed symmetry, mask and whether or not the two 3D reconstructions used were processed from a common reference. The reported resolution is shown as a black line. A curve is displayed for the half-bit criterion in addition to lines showing the 0.143 gold standard cut-off and 0.5 cut-off.

### 8.1 FSC [i](#)



\*Reported resolution corresponds to spatial frequency of 0.333 Å<sup>-1</sup>



## 8.2 Resolution estimates [i](#)

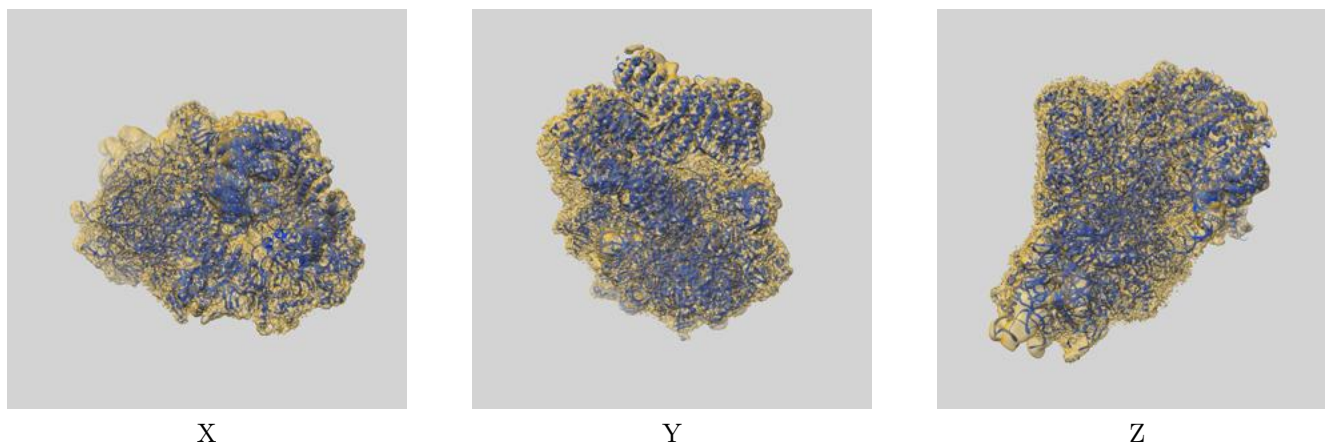
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.00	-	-
Author-provided FSC curve	2.99	3.67	3.05
Unmasked-calculated*	-	-	-

\*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps.

## 9 Map-model fit [i](#)

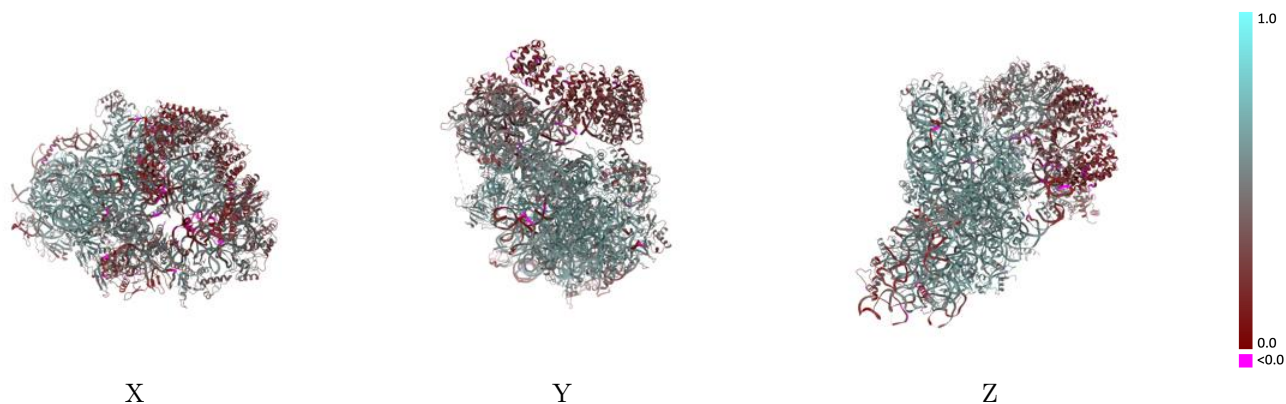
This section contains information regarding the fit between EMDB map EMD-32806 and PDB model 7WTZ. Per-residue inclusion information can be found in section [3](#) on page [11](#).

### 9.1 Map-model overlay [i](#)



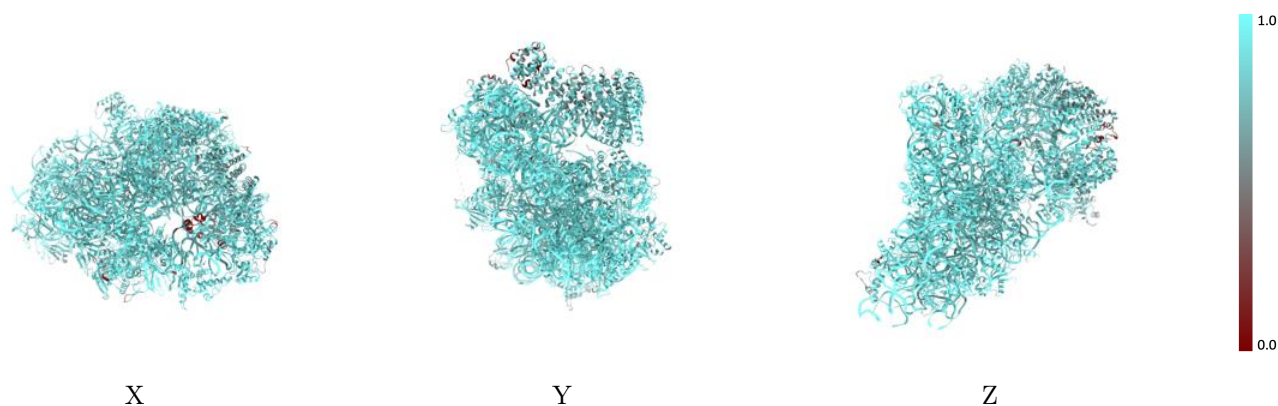
The images above show the 3D surface view of the map at the recommended contour level 0.02 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

## 9.2 Q-score mapped to coordinate model [i](#)



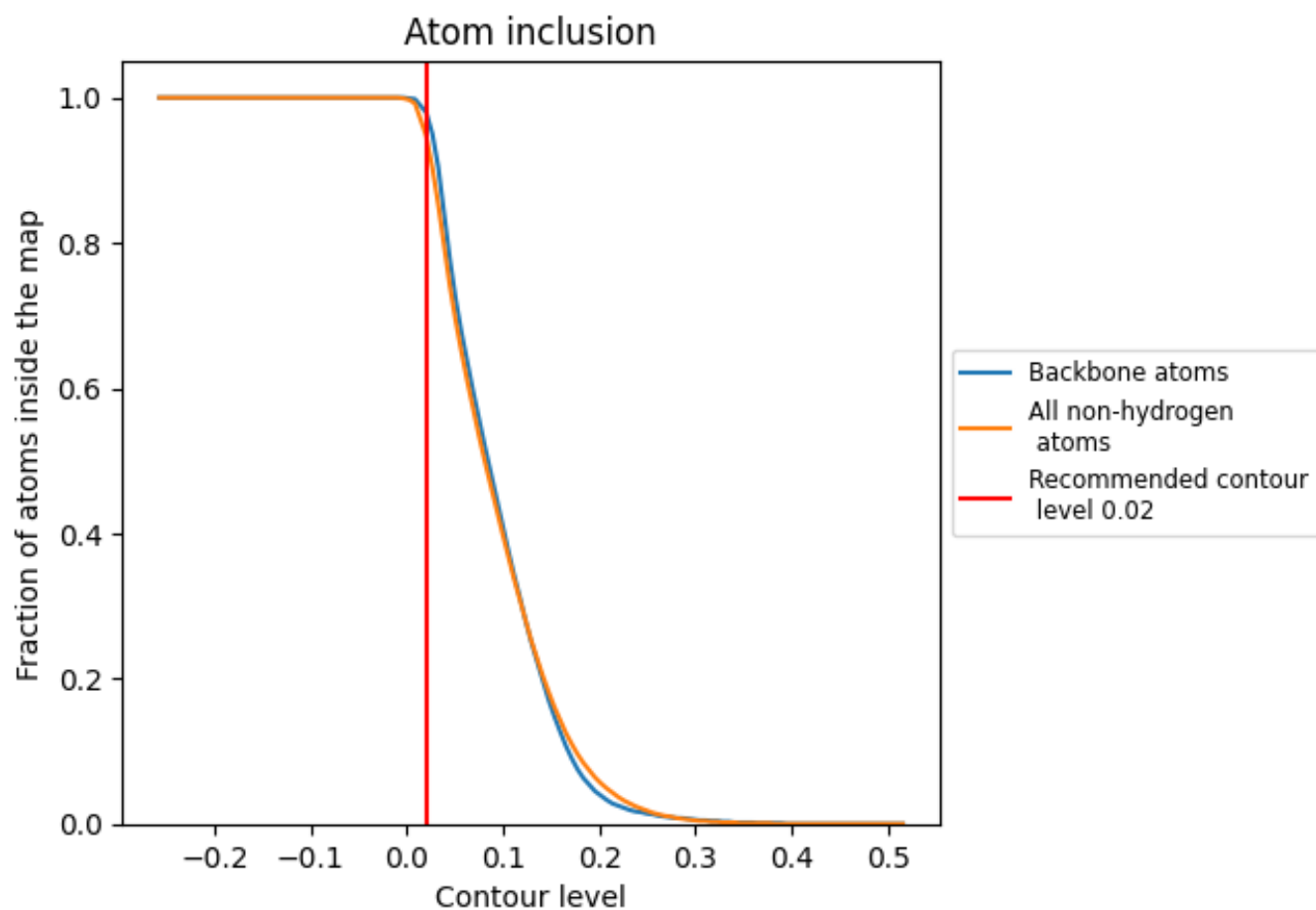
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions at which atoms can be resolved. Low Q-score values may therefore be expected for many entries.

## 9.3 Atom inclusion mapped to coordinate model [i](#)



The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.02).







































































## 9.4 Atom inclusion [i](#)



At the recommended contour level, 98% of all backbone atoms, 95% of all non-hydrogen atoms, are inside the map.

## 9.5 Map-model fit summary

The table lists the average atom inclusion at the recommended contour level (0.02) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.9480	 0.4820
2	 0.9800	 0.5120
A	 0.9840	 0.5950
B	 0.9720	 0.5500
C	 0.9760	 0.5750
E	 0.9880	 0.5990
F	 0.9590	 0.4690
G	 0.8940	 0.3840
H	 0.9190	 0.4580
I	 0.9320	 0.4990
J	 0.9820	 0.5940
K	 0.7770	 0.2080
L	 0.9590	 0.5620
M	 0.7610	 0.2530
N	 0.9950	 0.5720
O	 0.9620	 0.5170
P	 0.9560	 0.4960
Q	 0.8930	 0.4060
R	 0.9010	 0.3720
S	 0.9150	 0.4220
T	 0.9100	 0.4370
V	 0.9800	 0.5840
W	 0.9870	 0.6210
X	 0.9890	 0.6190
Y	 0.9920	 0.5720
Z	 0.8540	 0.3730
b	 0.9830	 0.5530
c	 0.9580	 0.4670
e	 0.9200	 0.5180
f	 0.8760	 0.2990
t	 0.9440	 0.4080
u	 0.9720	 0.5370
w	 0.9520	 0.4530
x	 0.9830	 0.5710
y	 0.9410	 0.4470

