



Full wwPDB EM Validation Report ⓘ

Mar 9, 2023 – 10:34 am GMT

PDB ID : 8B5L
EMDB ID : EMD-15860
Title : Cryo-EM structure of ribosome-Sec61-TRAP (TRanslocon Associated Protein) translocon complex
Authors : Pauwels, E.; Shewakramani, N.R.; De Wijngaert, B.; Vermeire, K.; Das, K.
Deposited on : 2022-09-23
Resolution : 2.86 Å (reported)
Based on initial models : 3J7Q, 6MTE

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

We welcome your comments at validation@mail.wwpdb.org

A user guide is available at

<https://www.wwpdb.org/validation/2017/EMValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

The following versions of software and data (see [references ⓘ](#)) were used in the production of this report:

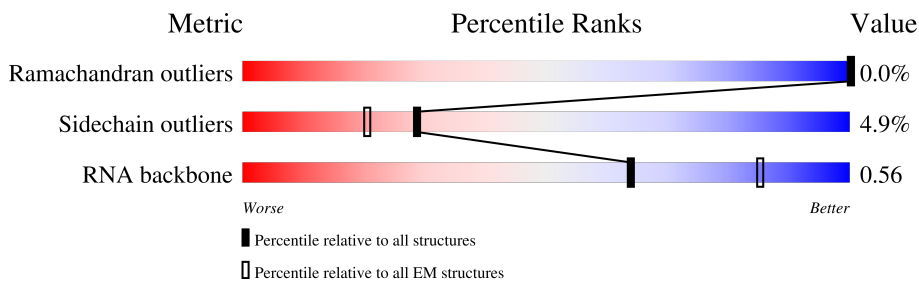
EMDB validation analysis : 0.0.1.dev43
Mogul : 1.8.4, CSD as541be (2020)
MolProbity : 4.02b-467
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ : 1.9.9
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.32.1

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 2.86 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.




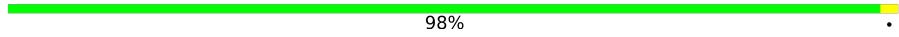
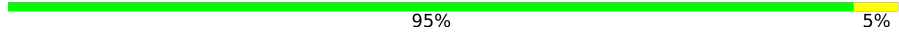

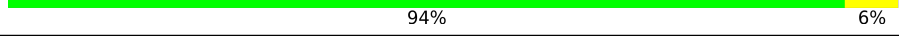



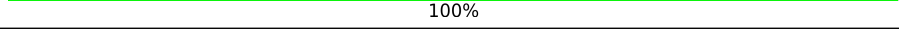
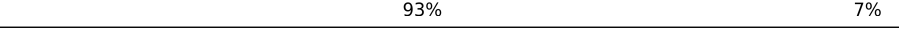
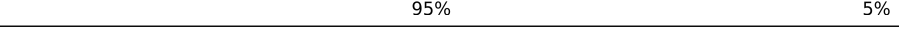
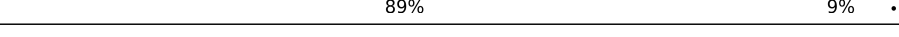
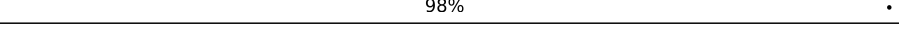
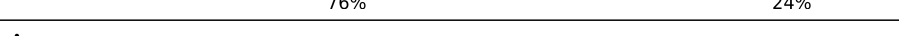
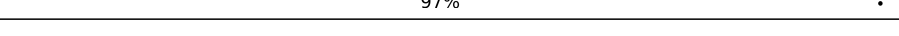
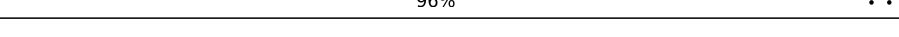
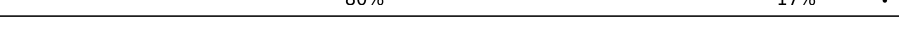
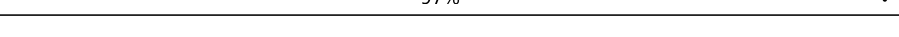
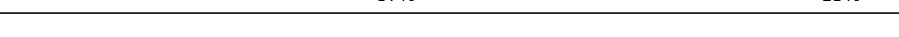






Metric	Whole archive (#Entries)	EM structures (#Entries)
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826
RNA backbone	4643	859

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 ≥ 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	h	122	
2	P	153	
3	d	107	
4	5	4808	
5	G	319	
6	e	128	
7	t	185	
8	S	176	

Continued on next page...

Continued from previous page...

Mol	Chain	Length	Quality of chain
9	I	214	 91% 5%
10	D	293	 98%
11	V	131	 95% 5%
12	E	291	 72% 26%
13	J	170	 94% 6%
14	q	286	 24% 51% 47%
15	k	70	 90% 9%
16	b	245	 40% 58%
17	m	52	 100%
18	Z	135	 93% 7%
19	T	159	 95% 5%
20	i	105	 89% 9%
21	F	225	 98%
22	n	25	 76% 24%
23	L	211	 97%
24	O	203	 96%
25	8	156	 80% 17%
26	C	362	 97%
27	Y	134	 87% 13%
28	B	394	 97%
29	R	196	 85% 7% 8%
30	X	118	 95% 5%
31	p	91	 89% 11%
32	M	138	 98%
33	H	190	 96%

Continued on next page...

Continued from previous page...

Mol	Chain	Length	Quality of chain
34	7	120	90% 10%
35	r	124	94% 6%
36	Q	188	96% ..
37	f	109	96% .
38	a	147	98% ..
39	A	257	91% 5% .
40	g	114	92% 8%
41	K	173	42% 81% . 16%
42	u	68	97% ..
43	v	183	43% 83% . 14%
44	j	86	99% .
45	N	203	95% 5%
46	o	103	95% 5%
47	s	476	97% .
48	c	98	91% 9%
49	W	157	37% . 60%
50	l	50	88% 12%
51	U	99	88% 12%

2 Entry composition

There are 53 unique types of molecules in this entry. The entry contains 145148 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, the AltConf column contains the number of residues with at least one atom in alternate conformation and the Trace column contains the number of residues modelled with at most 2 atoms.

- Molecule 1 is a protein called 60S ribosomal protein L35.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	h	122	1013	640	204	168	1	0	0

- Molecule 2 is a protein called 60S ribosomal protein L17.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	P	153	1242	777	241	215	9	0	0

- Molecule 3 is a protein called 60S ribosomal protein L31.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	d	107	888	560	171	155	2	0	0

- Molecule 4 is a RNA chain called 28S rRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
4	5	3619	77665	34619	14204	25223	3619	0	0

- Molecule 5 is a protein called 60S ribosomal protein L7a.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	G	233	1879	1199	361	315	4	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
G	244	GLY	CYS	conflict	UNP G1STW0

- Molecule 6 is a protein called Ribosomal protein L32.

Mol	Chain	Residues	Atoms					AltConf	Trace
6	e	128	Total	C	N	O	S	0	0
			1053	667	216	165	5		

- Molecule 7 is a protein called Signal sequence receptor subunit 3.

Mol	Chain	Residues	Atoms					AltConf	Trace
7	t	181	Total	C	N	O	S	0	0
			1459	951	241	264	3		

- Molecule 8 is a protein called 60S ribosomal protein L18a.

Mol	Chain	Residues	Atoms					AltConf	Trace
8	S	176	Total	C	N	O	S	0	0
			1462	930	285	236	11		

- Molecule 9 is a protein called Ribosomal protein L10.

Mol	Chain	Residues	Atoms					AltConf	Trace
9	I	205	Total	C	N	O	S	0	0
			1664	1056	321	274	13		

- Molecule 10 is a protein called Ribosomal_L18_c domain-containing protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
10	D	293	Total	C	N	O	S	0	0
			2391	1512	438	427	14		

- Molecule 11 is a protein called 60S ribosomal protein L23.

Mol	Chain	Residues	Atoms					AltConf	Trace
11	V	131	Total	C	N	O	S	0	0
			979	618	184	172	5		

- Molecule 12 is a protein called 60S ribosomal protein L6.

Mol	Chain	Residues	Atoms					AltConf	Trace
12	E	216	Total	C	N	O	S	0	0
			1729	1115	329	282	3		

- Molecule 13 is a protein called 60S ribosomal protein L11.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
13	J	170	1362	861	254	241	6	0	0

- Molecule 14 is a protein called Translocon-associated protein subunit alpha.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
14	q	153	1222	795	196	228	3	0	0

- Molecule 15 is a protein called 60S ribosomal protein L38.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
15	k	69	569	366	103	99	1	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
k	24	LYS	ASN	conflict	UNP G1U001

- Molecule 16 is a protein called 60S ribosomal protein L29.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
16	b	104	848	527	189	129	3	0	0

- Molecule 17 is a protein called Ubiquitin-60S ribosomal protein L40.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
17	m	52	430	267	90	67	6	0	0

- Molecule 18 is a protein called 60S ribosomal protein L27.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
18	Z	135	1107	714	208	182	3	0	0

- Molecule 19 is a protein called 60S ribosomal protein L21.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
19	T	159	1298	823	252	217	6	0	0

- Molecule 20 is a protein called 60S ribosomal protein L36.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
20	i	102	830	520	176	129	5	0	0

- Molecule 21 is a protein called 60S ribosomal protein L7.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
21	F	225	1875	1205	358	303	9	0	0

- Molecule 22 is a protein called 60S ribosomal protein L41.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
22	n	25	239	145	64	27	3	0	0

- Molecule 23 is a protein called 60S ribosomal protein L13.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
23	L	210	1702	1065	354	279	4	0	0

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
L	74	ARG	HIS	conflict	UNP G1TKB3
L	190	ARG	HIS	conflict	UNP G1TKB3

- Molecule 24 is a protein called 60S ribosomal protein L13a.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
24	O	199	1630	1051	319	255	5	0	0

- Molecule 25 is a RNA chain called 5.8S rRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
25	8	151	3208	1432	564	1062	150	0	0

- Molecule 26 is a protein called 60S ribosomal protein L4.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
26	C	362	2884	1813	577	480	14	0	0

- Molecule 27 is a protein called Ribosomal protein L26.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
27	Y	134	1115	700	226	186	3	0	0

- Molecule 28 is a protein called Ribosomal protein L3.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
28	B	394	3172	2020	597	542	13	0	0

- Molecule 29 is a protein called Ribosomal protein L19.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
29	R	180	1508	933	328	238	9	0	0

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
R	38	ARG	HIS	conflict	UNP G1TYL6
R	151	ARG	HIS	conflict	UNP G1TYL6

- Molecule 30 is a protein called Ribosomal_L23eN domain-containing protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
30	X	118	967	618	181	167	1	0	0

- Molecule 31 is a protein called 60S ribosomal protein L37a.

Mol	Chain	Residues	Atoms					AltConf	Trace
31	p	91	Total	C	N	O	S	0	0
			708	445	136	120	7		

- Molecule 32 is a protein called 60S ribosomal protein L14.

Mol	Chain	Residues	Atoms					AltConf	Trace
32	M	138	Total	C	N	O	S	0	0
			1137	727	221	182	7		

- Molecule 33 is a protein called 60S ribosomal protein L9.

Mol	Chain	Residues	Atoms					AltConf	Trace
33	H	190	Total	C	N	O	S	0	0
			1516	954	284	272	6		

- Molecule 34 is a RNA chain called 5S rRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
34	7	120	Total	C	N	O	P	0	0
			2558	1141	456	842	119		

- Molecule 35 is a protein called 60S ribosomal protein L28.

Mol	Chain	Residues	Atoms					AltConf	Trace
35	r	124	Total	C	N	O	S	0	0
			994	616	205	167	6		

- Molecule 36 is a protein called Ribosomal protein L18.

Mol	Chain	Residues	Atoms					AltConf	Trace
36	Q	187	Total	C	N	O	S	0	0
			1515	946	315	250	4		

- Molecule 37 is a protein called 60S ribosomal protein L35a.

Mol	Chain	Residues	Atoms					AltConf	Trace
37	f	109	Total	C	N	O	S	0	0
			876	555	174	143	4		

- Molecule 38 is a protein called 60S ribosomal protein L27a.

Mol	Chain	Residues	Atoms					AltConf	Trace
38	a	147	Total	C	N	O	S	0	0
			1162	734	239	185	4		

- Molecule 39 is a protein called Ribosomal protein L8.

Mol	Chain	Residues	Atoms					AltConf	Trace
39	A	248	Total	C	N	O	S	0	0
			1898	1189	389	314	6		

- Molecule 40 is a protein called 60S ribosomal protein L34.

Mol	Chain	Residues	Atoms					AltConf	Trace
40	g	114	Total	C	N	O	S	0	0
			906	566	187	147	6		

- Molecule 41 is a protein called Translocon-associated protein subunit delta.

Mol	Chain	Residues	Atoms					AltConf	Trace
41	K	146	Total	C	N	O	S	0	0
			1159	739	195	223	2		

- Molecule 42 is a protein called Protein transport protein Sec61 subunit gamma.

Mol	Chain	Residues	Atoms					AltConf	Trace
42	u	67	Total	C	N	O	S	0	0
			535	350	93	88	4		

- Molecule 43 is a protein called Translocon-associated protein subunit beta.

Mol	Chain	Residues	Atoms					AltConf	Trace
43	v	158	Total	C	N	O	S	0	0
			1229	792	207	228	2		

- Molecule 44 is a protein called Ribosomal protein L37.

Mol	Chain	Residues	Atoms					AltConf	Trace
44	j	86	Total	C	N	O	S	0	0
			705	434	155	111	5		

- Molecule 45 is a protein called Ribosomal protein L15.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
45	N	203	1701	1072	359	266	4	0	0

- Molecule 46 is a protein called 60S ribosomal protein L36a-like.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
46	o	103	842	528	172	136	6	0	0

- Molecule 47 is a protein called Protein transport protein Sec61 subunit alpha isoform 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
47	s	464	3589	2355	578	632	24	0	0

- Molecule 48 is a protein called 60S ribosomal protein L30.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
48	c	98	761	481	134	140	6	0	0

- Molecule 49 is a protein called Ribosomal protein L24.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
49	W	63	528	337	103	85	3	0	0

- Molecule 50 is a protein called 60S ribosomal protein L39-like.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
50	l	50	447	286	96	64	1	0	0

- Molecule 51 is a protein called 60S ribosomal protein L22.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
51	U	99	809	519	141	147	2	0	0

- Molecule 52 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms	AltConf
52	P	1	Total Mg 1 1	0
52	5	161	Total Mg 161 161	0
52	I	1	Total Mg 1 1	0
52	V	1	Total Mg 1 1	0
52	8	5	Total Mg 5 5	0
52	7	7	Total Mg 7 7	0
52	a	1	Total Mg 1 1	0
52	A	1	Total Mg 1 1	0

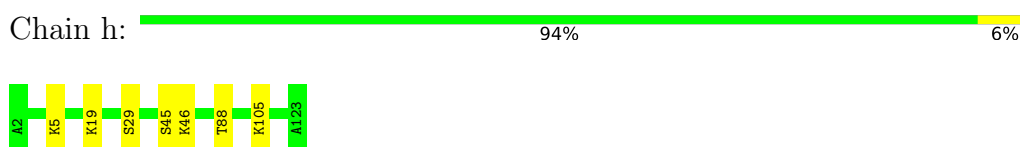
- Molecule 53 is ZINC ION (three-letter code: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms	AltConf
53	m	1	Total Zn 1 1	0
53	p	1	Total Zn 1 1	0
53	g	1	Total Zn 1 1	0
53	j	1	Total Zn 1 1	0
53	o	1	Total Zn 1 1	0

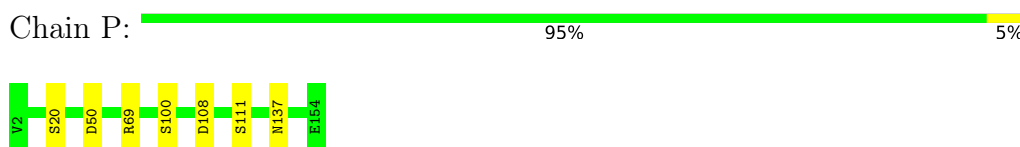
3 Residue-property plots

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.

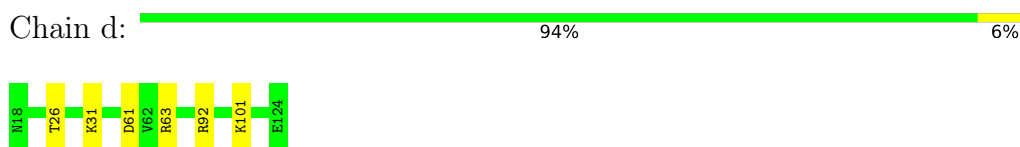
- Molecule 1: 60S ribosomal protein L35



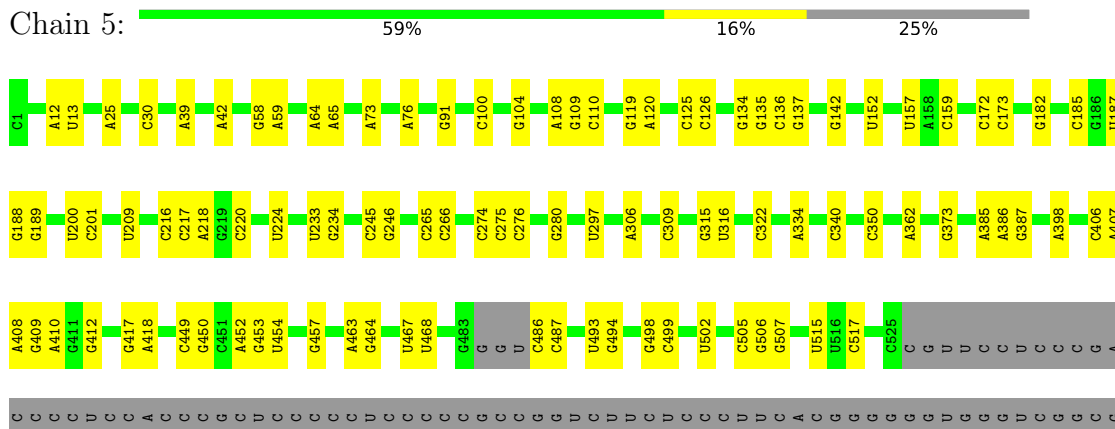
- Molecule 2: 60S ribosomal protein L17




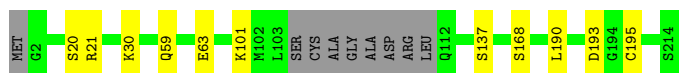
- Molecule 3: 60S ribosomal protein L31



- Molecule 4: 28S rRNA



Chain I:  91% 5%



- Molecule 10: Ribosomal_L18_c domain-containing protein

Chain D:  98%



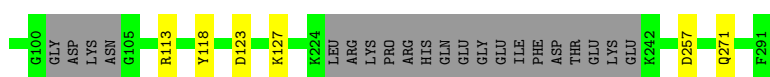
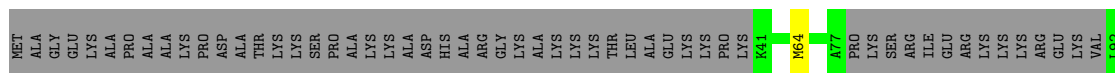
- Molecule 11: 60S ribosomal protein L23

Chain V:  95% 5%



- Molecule 12: 60S ribosomal protein L6

Chain E:  72% 26%



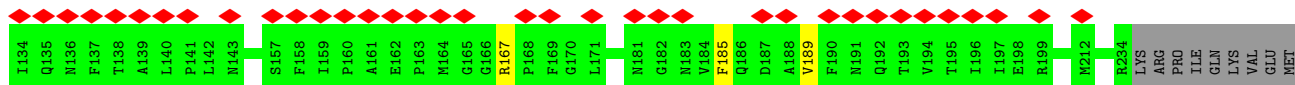
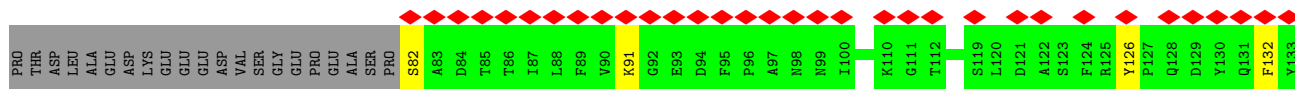
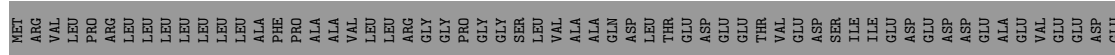
- Molecule 13: 60S ribosomal protein L11

Chain J:  94% 6%



- Molecule 14: Translocon-associated protein subunit alpha

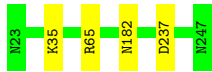
Chain q:  24% 51% 47%





- Molecule 21: 60S ribosomal protein L7

Chain F: 98%



- Molecule 22: 60S ribosomal protein L41

Chain n: 76%



- Molecule 23: 60S ribosomal protein L13

Chain L: 97%



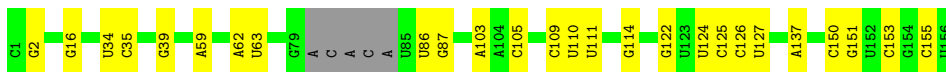
- Molecule 24: 60S ribosomal protein L13a

Chain O: 96%



- Molecule 25: 5.8S rRNA

Chain 8: 80%



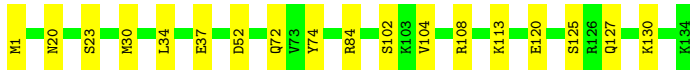
- Molecule 26: 60S ribosomal protein L4

Chain C: 97%



- Molecule 27: Ribosomal protein L26

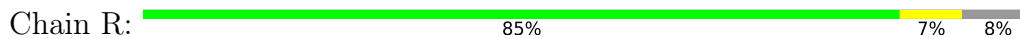
Chain Y: 87%



- Molecule 28: Ribosomal protein L3



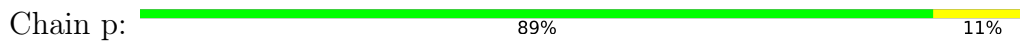
- Molecule 29: Ribosomal protein L19



- Molecule 30: Ribosomal_L23eN domain-containing protein



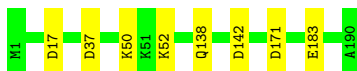
- Molecule 31: 60S ribosomal protein L37a



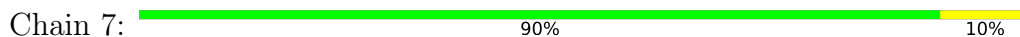
- Molecule 32: 60S ribosomal protein L14

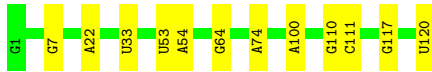


- Molecule 33: 60S ribosomal protein L9

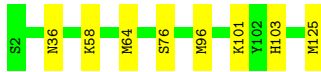


- Molecule 34: 5S rRNA

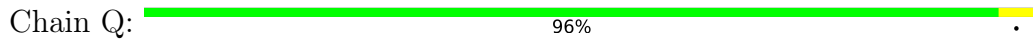




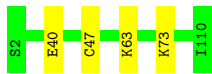
- Molecule 35: 60S ribosomal protein L28



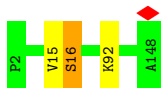
- Molecule 36: Ribosomal protein L18



- Molecule 37: 60S ribosomal protein L35a



- Molecule 38: 60S ribosomal protein L27a



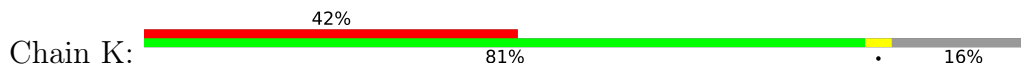
- Molecule 39: Ribosomal protein L8



- Molecule 40: 60S ribosomal protein L34

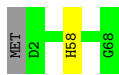


- Molecule 41: Translocon-associated protein subunit delta

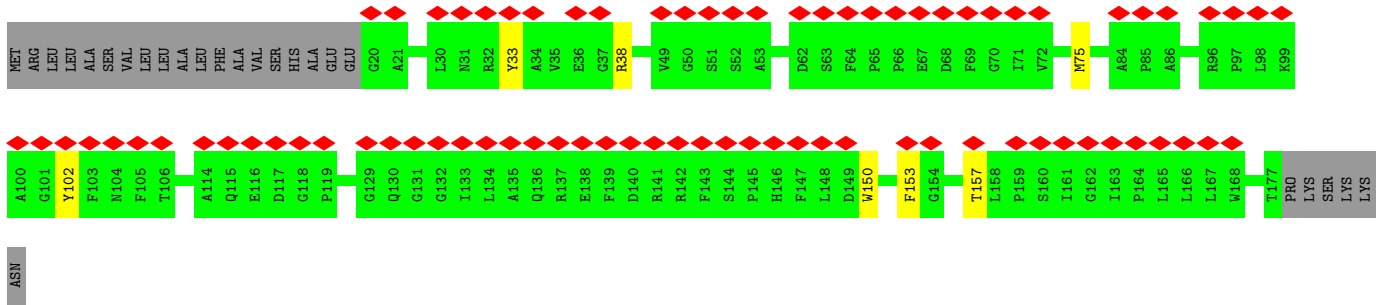
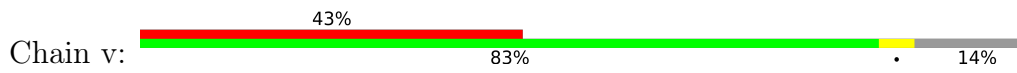




- Molecule 42: Protein transport protein Sec61 subunit gamma



- Molecule 43: Translocon-associated protein subunit beta



- Molecule 44: Ribosomal protein L37



- Molecule 45: Ribosomal protein L15

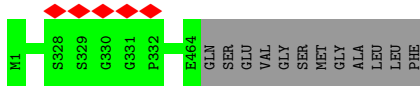


- Molecule 46: 60S ribosomal protein L36a-like

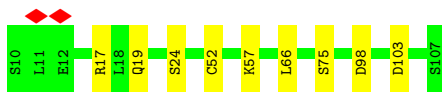
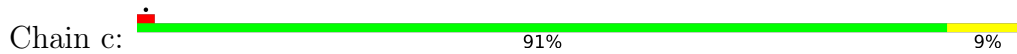




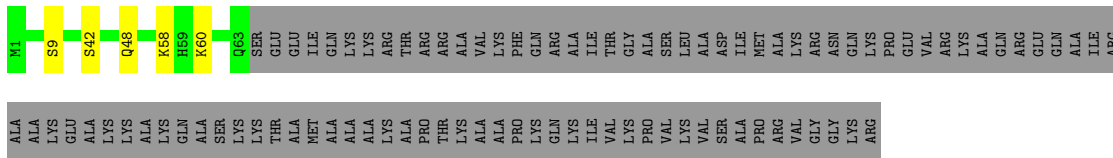
- Molecule 47: Protein transport protein Sec61 subunit alpha isoform 1



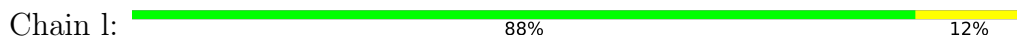
- Molecule 48: 60S ribosomal protein L30



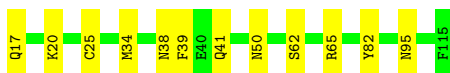
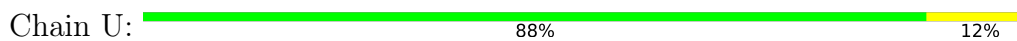
- Molecule 49: Ribosomal protein L24



- Molecule 50: 60S ribosomal protein L39-like



- Molecule 51: 60S ribosomal protein L22



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	119208	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	NONE	Depositor
Microscope	TFS GLACIOS	Depositor
Voltage (kV)	200	Depositor
Electron dose ($e^-/\text{\AA}^2$)	0.8	Depositor
Minimum defocus (nm)	600	Depositor
Maximum defocus (nm)	1800	Depositor
Magnification	120000	Depositor
Image detector	FEI FALCON III (4k x 4k)	Depositor
Maximum map value	0.351	Depositor
Minimum map value	-0.161	Depositor
Average map value	0.001	Depositor
Map value standard deviation	0.015	Depositor
Recommended contour level	0.01527	Depositor
Map size (\AA)	432.96002, 432.96002, 432.96002	wwPDB
Map dimensions	352, 352, 352	wwPDB
Map angles ($^\circ$)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (\AA)	1.23, 1.23, 1.23	Depositor

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: UR3, MLZ, OMC, E6G, 5MC, E7G, B8K, BGH, OMU, B8H, OMG, I4U, ZN, P4U, MG, A2M, PSU, 1MA, P7G, 7MG

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	h	0.28	0/1021	0.58	0/1348
2	P	0.33	0/1268	0.62	1/1700 (0.1%)
3	d	0.39	0/903	0.61	0/1216
4	5	0.41	2/85271 (0.0%)	0.78	11/132978 (0.0%)
5	G	0.33	0/1910	0.61	1/2569 (0.0%)
6	e	0.30	0/1071	0.57	0/1429
7	t	0.57	0/1489	0.65	0/2011
8	S	0.33	0/1501	0.61	2/2012 (0.1%)
9	I	0.36	0/1702	0.59	1/2272 (0.0%)
10	D	0.32	0/2437	0.56	0/3264
11	V	0.38	0/993	0.58	0/1332
12	E	0.30	0/1762	0.57	0/2362
13	J	0.33	0/1385	0.68	0/1852
14	q	0.38	0/1251	0.52	0/1699
15	k	0.35	0/575	0.70	0/761
16	b	0.31	0/861	0.68	1/1138 (0.1%)
17	m	0.33	0/425	0.64	0/561
18	Z	0.35	0/1130	0.61	2/1507 (0.1%)
19	T	0.34	0/1326	0.60	0/1770
20	i	0.29	0/841	0.62	0/1112
21	F	0.31	0/1911	0.54	0/2549
22	n	0.26	0/240	0.80	0/305
23	L	0.33	0/1733	0.62	0/2316
24	O	0.32	0/1662	0.57	0/2222
25	8	0.39	0/3581	0.74	0/5577
26	C	0.35	0/2927	0.58	0/3932
27	Y	0.32	0/1132	0.63	0/1504
28	B	0.30	0/3240	0.54	0/4339
29	R	0.29	0/1524	0.64	0/2013
30	X	0.31	0/984	0.68	1/1323 (0.1%)
31	p	0.34	0/718	0.57	0/953

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
32	M	0.33	0/1158	0.60	0/1547
33	H	0.31	0/1535	0.61	2/2063 (0.1%)
34	7	0.39	0/2858	0.75	0/4455
35	r	0.35	0/1010	0.60	0/1354
36	Q	0.31	0/1539	0.63	0/2054
37	f	0.32	0/895	0.61	0/1198
38	a	0.30	0/1191	0.77	3/1590 (0.2%)
39	A	0.37	0/1936	0.60	0/2596
40	g	0.31	0/916	0.63	0/1220
41	K	0.32	0/1188	0.51	0/1619
42	u	0.29	0/545	0.56	0/728
43	v	0.32	0/1261	0.52	0/1717
44	j	0.32	0/720	0.59	0/952
45	N	0.36	0/1746	0.62	0/2338
46	o	0.33	0/855	0.61	0/1128
47	s	0.30	0/3668	0.49	0/4974
48	c	0.31	0/771	0.61	1/1034 (0.1%)
49	W	0.32	0/541	0.58	0/720
50	l	0.27	0/459	0.59	0/608
51	U	0.37	0/823	0.82	1/1104 (0.1%)
All	All	0.38	2/154389 (0.0%)	0.72	27/226925 (0.0%)

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	5	732	C	O3'-P	24.55	1.90	1.61
4	5	1390	G	O3'-P	23.25	1.89	1.61

All (27) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
38	a	16	SER	N-CA-CB	17.05	136.08	110.50
38	a	15	VAL	N-CA-C	-10.39	82.95	111.00
4	5	732	C	P-O3'-C3'	-9.70	108.06	119.70
4	5	732	C	C5'-C4'-O4'	-7.43	100.18	109.10
4	5	732	C	O3'-P-O5'	6.39	116.14	104.00
4	5	2253	C	C2-N1-C1'	6.22	125.64	118.80
9	I	193	ASP	CB-CG-OD1	6.19	123.87	118.30
4	5	1594	U	C2-N1-C1'	6.12	125.04	117.70
18	Z	103	ASP	CB-CG-OD1	6.09	123.79	118.30
4	5	100	C	C2-N1-C1'	5.79	125.17	118.80
51	U	41	GLN	CA-CB-CG	5.71	125.97	113.40

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	5	1372	C	C2-N1-C1'	5.68	125.04	118.80
16	b	36	ASP	CB-CG-OD1	5.66	123.39	118.30
4	5	4659	C	N3-C2-O2	-5.65	117.94	121.90
8	S	147	ASP	CB-CG-OD1	5.64	123.38	118.30
48	c	103	ASP	CB-CG-OD1	5.56	123.31	118.30
33	H	142	ASP	CB-CG-OD1	5.46	123.21	118.30
4	5	4659	C	N1-C2-O2	5.41	122.15	118.90
33	H	17	ASP	CB-CG-OD1	5.39	123.15	118.30
38	a	15	VAL	CB-CA-C	-5.38	101.19	111.40
18	Z	92	ASP	CB-CG-OD1	5.33	123.09	118.30
30	X	71	LEU	CA-CB-CG	5.30	127.48	115.30
5	G	141	ASP	CB-CG-OD1	5.22	123.00	118.30
4	5	4613	A	O4'-C1'-N9	5.19	112.35	108.20
8	S	82	LEU	CA-CB-CG	5.10	127.03	115.30
4	5	4506	C	N1-C2-O2	5.05	121.93	118.90
2	P	108	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](#)

Due to software issues we are unable to calculate clashes - this section is therefore empty.

5.3 Torsion angles [i](#)

5.3.1 Protein backbone [i](#)

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all PDB entries followed by that with respect to all EM entries.

The Analysed column shows the number of residues for which the backbone conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	h	120/122 (98%)	119 (99%)	1 (1%)	0	100	100
2	P	151/153 (99%)	148 (98%)	3 (2%)	0	100	100
3	d	105/107 (98%)	102 (97%)	3 (3%)	0	100	100

Continued on next page...

Continued from previous page...

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
5	G	229/319 (72%)	219 (96%)	10 (4%)	0	100	100
6	e	126/128 (98%)	122 (97%)	4 (3%)	0	100	100
7	t	179/185 (97%)	174 (97%)	5 (3%)	0	100	100
8	S	174/176 (99%)	168 (97%)	6 (3%)	0	100	100
9	I	201/214 (94%)	193 (96%)	8 (4%)	0	100	100
10	D	291/293 (99%)	284 (98%)	7 (2%)	0	100	100
11	V	129/131 (98%)	128 (99%)	1 (1%)	0	100	100
12	E	208/291 (72%)	198 (95%)	9 (4%)	1 (0%)	29	57
13	J	168/170 (99%)	159 (95%)	9 (5%)	0	100	100
14	q	151/286 (53%)	150 (99%)	1 (1%)	0	100	100
15	k	67/70 (96%)	65 (97%)	2 (3%)	0	100	100
16	b	100/245 (41%)	97 (97%)	3 (3%)	0	100	100
17	m	49/52 (94%)	46 (94%)	3 (6%)	0	100	100
18	Z	133/135 (98%)	130 (98%)	3 (2%)	0	100	100
19	T	157/159 (99%)	152 (97%)	5 (3%)	0	100	100
20	i	100/105 (95%)	95 (95%)	5 (5%)	0	100	100
21	F	223/225 (99%)	215 (96%)	8 (4%)	0	100	100
22	n	23/25 (92%)	23 (100%)	0	0	100	100
23	L	208/211 (99%)	201 (97%)	7 (3%)	0	100	100
24	O	197/203 (97%)	192 (98%)	5 (2%)	0	100	100
26	C	359/362 (99%)	343 (96%)	16 (4%)	0	100	100
27	Y	132/134 (98%)	130 (98%)	2 (2%)	0	100	100
28	B	392/394 (100%)	382 (97%)	10 (3%)	0	100	100
29	R	178/196 (91%)	174 (98%)	4 (2%)	0	100	100
30	X	116/118 (98%)	112 (97%)	4 (3%)	0	100	100
31	p	89/91 (98%)	85 (96%)	4 (4%)	0	100	100
32	M	136/138 (99%)	131 (96%)	5 (4%)	0	100	100
33	H	188/190 (99%)	184 (98%)	4 (2%)	0	100	100
35	r	122/124 (98%)	120 (98%)	2 (2%)	0	100	100
36	Q	185/188 (98%)	175 (95%)	10 (5%)	0	100	100
37	f	107/109 (98%)	104 (97%)	3 (3%)	0	100	100

Continued on next page...

Continued from previous page...

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
38	a	145/147 (99%)	138 (95%)	6 (4%)	1 (1%)	22	50
39	A	246/257 (96%)	229 (93%)	17 (7%)	0	100	100
40	g	112/114 (98%)	110 (98%)	2 (2%)	0	100	100
41	K	144/173 (83%)	143 (99%)	1 (1%)	0	100	100
42	u	65/68 (96%)	65 (100%)	0	0	100	100
43	v	156/183 (85%)	153 (98%)	3 (2%)	0	100	100
44	j	84/86 (98%)	84 (100%)	0	0	100	100
45	N	201/203 (99%)	193 (96%)	8 (4%)	0	100	100
46	o	101/103 (98%)	93 (92%)	8 (8%)	0	100	100
47	s	462/476 (97%)	454 (98%)	8 (2%)	0	100	100
48	c	96/98 (98%)	96 (100%)	0	0	100	100
49	W	61/157 (39%)	57 (93%)	4 (7%)	0	100	100
50	l	48/50 (96%)	44 (92%)	4 (8%)	0	100	100
51	U	97/99 (98%)	88 (91%)	9 (9%)	0	100	100
All	All	7511/8263 (91%)	7267 (97%)	242 (3%)	2 (0%)	100	100

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
38	a	16	SER
12	E	118	TYR

5.3.2 Protein sidechains [i](#)

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all PDB entries followed by that with respect to all EM entries.

The Analysed column shows the number of residues for which the sidechain conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	h	109/109 (100%)	102 (94%)	7 (6%)	17	41
2	P	134/134 (100%)	128 (96%)	6 (4%)	27	57
3	d	98/98 (100%)	92 (94%)	6 (6%)	18	43
5	G	200/272 (74%)	189 (94%)	11 (6%)	21	49

Continued on next page...

Continued from previous page...

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
6	e	114/114 (100%)	111 (97%)	3 (3%)	46	75
7	t	161/164 (98%)	160 (99%)	1 (1%)	86	95
8	S	157/157 (100%)	151 (96%)	6 (4%)	33	64
9	I	175/181 (97%)	165 (94%)	10 (6%)	20	47
10	D	247/247 (100%)	242 (98%)	5 (2%)	55	80
11	V	101/101 (100%)	94 (93%)	7 (7%)	15	38
12	E	190/251 (76%)	184 (97%)	6 (3%)	39	69
13	J	143/143 (100%)	133 (93%)	10 (7%)	15	37
14	q	133/249 (53%)	126 (95%)	7 (5%)	22	50
15	k	64/65 (98%)	58 (91%)	6 (9%)	8	23
16	b	84/184 (46%)	78 (93%)	6 (7%)	14	36
17	m	47/47 (100%)	47 (100%)	0	100	100
18	Z	117/117 (100%)	108 (92%)	9 (8%)	13	32
19	T	139/139 (100%)	131 (94%)	8 (6%)	20	46
20	i	86/89 (97%)	77 (90%)	9 (10%)	7	18
21	F	196/196 (100%)	192 (98%)	4 (2%)	55	80
22	n	24/24 (100%)	18 (75%)	6 (25%)	0	1
23	L	175/176 (99%)	170 (97%)	5 (3%)	42	72
24	O	171/173 (99%)	167 (98%)	4 (2%)	50	78
26	C	301/301 (100%)	289 (96%)	12 (4%)	31	62
27	Y	124/124 (100%)	106 (86%)	18 (14%)	3	8
28	B	342/342 (100%)	332 (97%)	10 (3%)	42	72
29	R	159/175 (91%)	146 (92%)	13 (8%)	11	29
30	X	106/106 (100%)	101 (95%)	5 (5%)	26	56
31	p	74/74 (100%)	64 (86%)	10 (14%)	4	9
32	M	117/117 (100%)	114 (97%)	3 (3%)	46	75
33	H	169/169 (100%)	163 (96%)	6 (4%)	35	66
35	r	108/108 (100%)	100 (93%)	8 (7%)	13	35
36	Q	164/165 (99%)	157 (96%)	7 (4%)	29	59
37	f	88/88 (100%)	84 (96%)	4 (4%)	27	57
38	a	119/119 (100%)	118 (99%)	1 (1%)	81	93

Continued on next page...

Continued from previous page...

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
39	A	190/199 (96%)	177 (93%)	13 (7%)	16	38
40	g	98/98 (100%)	89 (91%)	9 (9%)	9	24
41	K	127/146 (87%)	121 (95%)	6 (5%)	26	56
42	u	58/59 (98%)	57 (98%)	1 (2%)	60	83
43	v	131/152 (86%)	124 (95%)	7 (5%)	22	50
44	j	73/73 (100%)	72 (99%)	1 (1%)	67	86
45	N	171/171 (100%)	161 (94%)	10 (6%)	20	46
46	o	91/91 (100%)	86 (94%)	5 (6%)	21	49
47	s	389/398 (98%)	389 (100%)	0	100	100
48	c	84/84 (100%)	76 (90%)	8 (10%)	8	23
49	W	55/126 (44%)	50 (91%)	5 (9%)	9	25
50	l	47/47 (100%)	41 (87%)	6 (13%)	4	11
51	U	89/89 (100%)	78 (88%)	11 (12%)	4	12
All	All	6539/7051 (93%)	6218 (95%)	321 (5%)	29	54

All (321) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	h	5	LYS
1	h	19	LYS
1	h	29	SER
1	h	45	SER
1	h	46	LYS
1	h	88	THR
1	h	105	LYS
2	P	20	SER
2	P	50	ASP
2	P	69	ARG
2	P	100	SER
2	P	111	SER
2	P	137	ASN
3	d	26	THR
3	d	31	LYS
3	d	61	ASP
3	d	63	ARG
3	d	92	ARG
3	d	101	LYS

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
5	G	116	LEU
5	G	141	ASP
5	G	160	LYS
5	G	172	GLU
5	G	237	LEU
5	G	249	ARG
5	G	284	ASP
5	G	287	ARG
5	G	288	ARG
5	G	308	LYS
5	G	313	GLU
6	e	11	LYS
6	e	25	SER
6	e	70	LEU
7	t	35	ASN
8	S	30	MET
8	S	67	VAL
8	S	90	THR
8	S	93	MET
8	S	99	ASP
8	S	147	ASP
9	I	20	SER
9	I	21	ARG
9	I	30	LYS
9	I	59	GLN
9	I	63	GLU
9	I	101	LYS
9	I	137	SER
9	I	168	SER
9	I	190	LEU
9	I	195	CYS
10	D	34	LYS
10	D	45	ASN
10	D	113	PHE
10	D	128	ASP
10	D	293	ARG
11	V	18	LEU
11	V	43	LYS
11	V	69	LYS
11	V	87	SER
11	V	111	GLU
11	V	125	CYS

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
11	V	131	ARG
12	E	64	MET
12	E	113	ARG
12	E	123	ASP
12	E	127	LYS
12	E	257	ASP
12	E	271	GLN
13	J	12	MET
13	J	14	GLU
13	J	41	GLU
13	J	47	THR
13	J	58	ARG
13	J	59	SER
13	J	72	CYS
13	J	84	GLU
13	J	118	LYS
13	J	119	TYR
14	q	82	SER
14	q	91	LYS
14	q	126	TYR
14	q	132	PHE
14	q	167	ARG
14	q	185	PHE
14	q	189	VAL
15	k	6	GLU
15	k	9	LYS
15	k	30	ASP
15	k	40	ARG
15	k	58	GLN
15	k	67	LYS
16	b	19	ASN
16	b	27	GLN
16	b	50	ASN
16	b	57	MET
16	b	63	LYS
16	b	68	ARG
18	Z	5	MET
18	Z	53	VAL
18	Z	57	MET
18	Z	59	LYS
18	Z	99	ASP
18	Z	103	ASP

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
18	Z	106	LEU
18	Z	123	LYS
18	Z	132	GLN
19	T	16	SER
19	T	40	VAL
19	T	52	MET
19	T	69	GLN
19	T	83	LYS
19	T	88	ARG
19	T	117	LYS
19	T	157	GLU
20	i	12	ASN
20	i	19	LYS
20	i	27	SER
20	i	34	THR
20	i	42	ASP
20	i	46	GLU
20	i	56	ARG
20	i	76	ARG
20	i	88	GLU
21	F	35	LYS
21	F	65	ARG
21	F	182	ASN
21	F	237	ASP
22	n	1	MET
22	n	8	LYS
22	n	10	MET
22	n	14	LYS
22	n	17	ARG
22	n	18	ARG
23	L	106	SER
23	L	124	LEU
23	L	164	GLU
23	L	184	MET
23	L	204	GLU
24	O	5	GLN
24	O	61	ARG
24	O	113	ASP
24	O	190	SER
26	C	16	GLU
26	C	20	LYS
26	C	80	ARG

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
26	C	95	MET
26	C	122	TYR
26	C	138	MET
26	C	268	ARG
26	C	275	SER
26	C	278	ASN
26	C	312	ARG
26	C	335	MET
26	C	353	ARG
27	Y	1	MET
27	Y	20	ASN
27	Y	23	SER
27	Y	30	MET
27	Y	34	LEU
27	Y	37	GLU
27	Y	52	ASP
27	Y	72	GLN
27	Y	74	TYR
27	Y	84	ARG
27	Y	102	SER
27	Y	104	VAL
27	Y	108	ARG
27	Y	113	LYS
27	Y	120	GLU
27	Y	125	SER
27	Y	127	GLN
27	Y	130	LYS
28	B	19	ARG
28	B	134	CYS
28	B	146	LEU
28	B	148	LYS
28	B	194	LEU
28	B	297	LYS
28	B	306	ASP
28	B	329	ASP
28	B	362	LYS
28	B	366	LYS
29	R	12	SER
29	R	16	ARG
29	R	52	ARG
29	R	59	SER
29	R	105	LEU

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
29	R	116	ASP
29	R	119	MET
29	R	122	SER
29	R	136	ARG
29	R	149	LYS
29	R	153	LYS
29	R	158	GLN
29	R	175	GLU
30	X	50	LYS
30	X	57	GLN
30	X	85	SER
30	X	118	ASP
30	X	151	ASN
31	p	3	LYS
31	p	21	SER
31	p	24	LYS
31	p	28	LYS
31	p	32	SER
31	p	40	SER
31	p	63	THR
31	p	81	SER
31	p	84	ARG
31	p	90	LYS
32	M	44	ARG
32	M	59	ASP
32	M	62	LEU
33	H	37	ASP
33	H	50	LYS
33	H	52	LYS
33	H	138	GLN
33	H	171	ASP
33	H	183	GLU
35	r	36	ASN
35	r	58	LYS
35	r	64	MET
35	r	76	SER
35	r	96	MET
35	r	101	LYS
35	r	103	HIS
35	r	125	MET
36	Q	8	ASN
36	Q	53	MET

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
36	Q	68	ARG
36	Q	79	THR
36	Q	108	ARG
36	Q	134	ARG
36	Q	183	SER
37	f	40	GLU
37	f	47	CYS
37	f	63	LYS
37	f	73	LYS
38	a	92	LYS
39	A	14	SER
39	A	28	ARG
39	A	101	VAL
39	A	102	LEU
39	A	115	CYS
39	A	135	THR
39	A	152	SER
39	A	194	ASN
39	A	200	ARG
39	A	208	GLU
39	A	223	SER
39	A	245	ARG
39	A	247	ARG
40	g	31	VAL
40	g	33	LEU
40	g	44	SER
40	g	54	ARG
40	g	67	LEU
40	g	75	SER
40	g	81	SER
40	g	106	VAL
40	g	114	GLN
41	K	30	GLN
41	K	137	ASP
41	K	149	THR
41	K	151	VAL
41	K	171	ILE
41	K	172	GLN
42	u	58	HIS
43	v	33	TYR
43	v	38	ARG
43	v	75	MET

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
43	v	102	TYR
43	v	150	TRP
43	v	153	PHE
43	v	157	THR
44	j	55	ARG
45	N	5	LYS
45	N	37	HIS
45	N	80	THR
45	N	90	ASN
45	N	98	LEU
45	N	104	GLU
45	N	126	THR
45	N	140	LYS
45	N	153	LYS
45	N	166	SER
46	o	27	LYS
46	o	42	ASP
46	o	78	ARG
46	o	99	ARG
46	o	102	GLN
48	c	17	ARG
48	c	19	GLN
48	c	24	SER
48	c	52	CYS
48	c	57	LYS
48	c	66	LEU
48	c	75	SER
48	c	98	ASP
49	W	9	SER
49	W	42	SER
49	W	48	GLN
49	W	58	LYS
49	W	60	LYS
50	l	2	SER
50	l	20	ASN
50	l	21	ARG
50	l	29	MET
50	l	37	TYR
50	l	46	ARG
51	U	17	GLN
51	U	20	LYS
51	U	25	CYS

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
51	U	34	MET
51	U	38	ASN
51	U	39	PHE
51	U	50	ASN
51	U	62	SER
51	U	65	ARG
51	U	82	TYR
51	U	95	ASN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (18) such sidechains are listed below:

Mol	Chain	Res	Type
2	P	137	ASN
3	d	121	ASN
5	G	117	GLN
16	b	94	HIS
21	F	62	GLN
30	X	151	ASN
31	p	72	ASN
35	r	36	ASN
35	r	83	ASN
36	Q	57	ASN
39	A	132	ASN
39	A	162	ASN
39	A	205	ASN
41	K	30	GLN
43	v	115	GLN
46	o	36	GLN
47	s	259	GLN
50	l	20	ASN

5.3.3 RNA [i](#)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
25	8	149/156 (95%)	26 (17%)	1 (0%)
34	7	119/120 (99%)	12 (10%)	0
4	5	3590/4808 (74%)	696 (19%)	56 (1%)
All	All	3858/5084 (75%)	734 (19%)	57 (1%)

All (734) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
4	5	12	A
4	5	13	U
4	5	25	A
4	5	30	C
4	5	39	A
4	5	42	A
4	5	58	G
4	5	59	A
4	5	64	A
4	5	65	A
4	5	73	A
4	5	76	A
4	5	91	G
4	5	104	G
4	5	108	A
4	5	109	G
4	5	110	C
4	5	119	G
4	5	120	A
4	5	126	C
4	5	134	G
4	5	135	G
4	5	136	C
4	5	137	G
4	5	142	G
4	5	152	U
4	5	157	U
4	5	159	C
4	5	172	C
4	5	173	C
4	5	182	G
4	5	185	C
4	5	187	U
4	5	188	G
4	5	189	G
4	5	200	U
4	5	201	C
4	5	209	U
4	5	216	C
4	5	217	C
4	5	218	A
4	5	220	C
4	5	224	U

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
4	5	233	U
4	5	234	G
4	5	246	G
4	5	265	C
4	5	266	C
4	5	274	C
4	5	275	C
4	5	276	C
4	5	280	G
4	5	297	U
4	5	306	A
4	5	309	C
4	5	315	G
4	5	316	U
4	5	322	C
4	5	334	A
4	5	340	C
4	5	350	C
4	5	362	A
4	5	373	G
4	5	386	A
4	5	387	G
4	5	406	C
4	5	407	A
4	5	408	A
4	5	409	G
4	5	410	A
4	5	412	G
4	5	418	A
4	5	449	C
4	5	450	G
4	5	452	A
4	5	453	G
4	5	454	U
4	5	457	G
4	5	463	A
4	5	464	G
4	5	467	U
4	5	468	U
4	5	487	C
4	5	493	U
4	5	494	G

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
4	5	498	G
4	5	499	C
4	5	502	U
4	5	505	C
4	5	506	G
4	5	507	G
4	5	515	U
4	5	517	C
4	5	660	G
4	5	663	C
4	5	678	G
4	5	679	C
4	5	680	A
4	5	691	G
4	5	698	C
4	5	699	G
4	5	721	C
4	5	722	U
4	5	723	G
4	5	724	G
4	5	725	G
4	5	726	A
4	5	731	C
4	5	734	G
4	5	738	G
4	5	742	A
4	5	744	G
4	5	753	G
4	5	756	G
4	5	758	C
4	5	763	C
4	5	787	C
4	5	790	G
4	5	791	C
4	5	792	G
4	5	793	C
4	5	795	A
4	5	797	C
4	5	798	C
4	5	799	C
4	5	800	U
4	5	814	A

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
4	5	824	C
4	5	825	G
4	5	828	A
4	5	830	C
4	5	831	A
4	5	832	G
4	5	833	C
4	5	834	A
4	5	835	G
4	5	838	C
4	5	839	G
4	5	841	C
4	5	844	A
4	5	845	U
4	5	856	A
4	5	859	G
4	5	860	A
4	5	861	G
4	5	864	A
4	5	866	A
4	5	867	C
4	5	868	C
4	5	869	U
4	5	872	G
4	5	879	C
4	5	884	U
4	5	987	C
4	5	988	G
4	5	994	C
4	5	996	C
4	5	1066	A
4	5	1070	U
4	5	1071	C
4	5	1072	C
4	5	1073	C
4	5	1074	C
4	5	1084	C
4	5	1086	G
4	5	1101	C
4	5	1102	G
4	5	1103	G
4	5	1105	C

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
4	5	1106	C
4	5	1107	C
4	5	1121	G
4	5	1122	C
4	5	1123	C
4	5	1124	A
4	5	1126	G
4	5	1127	G
4	5	1129	G
4	5	1131	G
4	5	1132	U
4	5	1133	C
4	5	1135	C
4	5	1136	G
4	5	1206	C
4	5	1208	C
4	5	1209	G
4	5	1210	C
4	5	1214	A
4	5	1215	G
4	5	1216	C
4	5	1217	G
4	5	1219	G
4	5	1220	C
4	5	1224	C
4	5	1228	G
4	5	1229	U
4	5	1231	G
4	5	1236	C
4	5	1237	G
4	5	1239	U
4	5	1240	G
4	5	1245	C
4	5	1248	C
4	5	1258	C
4	5	1270	A2M
4	5	1274	A
4	5	1281	A
4	5	1298	A
4	5	1302	G
4	5	1303	G
4	5	1309	C

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
4	5	1310	G
4	5	1315	A
4	5	1316	A
4	5	1321	G
4	5	1323	C
4	5	1324	G
4	5	1331	A
4	5	1338	G
4	5	1341	A
4	5	1342	A
4	5	1346	C
4	5	1348	G
4	5	1349	C
4	5	1350	G
4	5	1366	C
4	5	1367	G
4	5	1369	C
4	5	1370	G
4	5	1376	G
4	5	1384	C
4	5	1389	G
4	5	1393	C
4	5	1394	U
4	5	1395	U
4	5	1400	U
4	5	1401	C
4	5	1402	C
4	5	1412	G
4	5	1437	G
4	5	1438	C
4	5	1439	G
4	5	1452	A
4	5	1453	G
4	5	1456	C
4	5	1457	G
4	5	1469	U
4	5	1472	G
4	5	1478	A
4	5	1479	A2M
4	5	1489	A2M
4	5	1502	A
4	5	1517	G

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
4	5	1521	C
4	5	1529	G
4	5	1533	U
4	5	1537	PSU
4	5	1546	U
4	5	1551	U
4	5	1557	U
4	5	1567	G
4	5	1568	A
4	5	1579	G
4	5	1580	OMG
4	5	1586	A
4	5	1588	G
4	5	1589	A
4	5	1595	C
4	5	1609	G
4	5	1616	C
4	5	1631	C
4	5	1632	PSU
4	5	1633	C
4	5	1660	G
4	5	1670	C
4	5	1673	G
4	5	1680	G
4	5	1681	A
4	5	1685	A
4	5	1689	G
4	5	1692	G
4	5	1694	C
4	5	1695	U
4	5	1696	U
4	5	1699	G
4	5	1700	G
4	5	1703	G
4	5	1707	C
4	5	1711	C
4	5	1712	U
4	5	1714	A
4	5	1715	A
4	5	1720	U
4	5	1726	A
4	5	1743	A

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
4	5	1744	A
4	5	1746	C
4	5	1751	C
4	5	1754	G
4	5	1758	G
4	5	1760	G
4	5	1767	C
4	5	1774	G
4	5	1775	G
4	5	1776	A
4	5	1781	G
4	5	1794	G
4	5	1808	G
4	5	1821	U
4	5	1828	U
4	5	1829	G
4	5	1836	A
4	5	1838	G
4	5	1857	U
4	5	1859	C
4	5	1860	C
4	5	1861	G
4	5	1869	U
4	5	1870	C
4	5	1871	A
4	5	1887	G
4	5	1890	G
4	5	1896	U
4	5	1897	A
4	5	1900	G
4	5	1901	A
4	5	1903	A
4	5	1910	U
4	5	1913	U
4	5	1919	U
4	5	1923	A
4	5	1924	G
4	5	1926	C
4	5	1929	A
4	5	1930	A
4	5	1931	U
4	5	1933	C

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
4	5	1936	U
4	5	1940	G
4	5	1941	A
4	5	1942	G
4	5	1946	G
4	5	1947	U
4	5	1965	A
4	5	1968	A
4	5	1969	A
4	5	1986	A
4	5	1987	U
4	5	1991	G
4	5	1994	G
4	5	1995	G
4	5	2008	A
4	5	2023	U
4	5	2029	U
4	5	2031	G
4	5	2032	G
4	5	2036	A
4	5	2037	G
4	5	2039	G
4	5	2041	G
4	5	2044	A
4	5	2045	G
4	5	2047	G
4	5	2048	A
4	5	2049	G
4	5	2102	G
4	5	2103	C
4	5	2110	U
4	5	2111	A
4	5	2118	G
4	5	2122	A
4	5	2132	C
4	5	2143	A
4	5	2144	G
4	5	2149	G
4	5	2156	A
4	5	2174	G
4	5	2176	G
4	5	2191	G

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
4	5	2194	C
4	5	2203	A
4	5	2238	A
4	5	2241	U
4	5	2260	A
4	5	2265	OMC
4	5	2267	OMG
4	5	2268	U
4	5	2276	G
4	5	2284	C
4	5	2293	G
4	5	2314	G
4	5	2318	G
4	5	2331	C
4	5	2332	C
4	5	2333	U
4	5	2334	C
4	5	2338	U
4	5	2346	G
4	5	2347	C
4	5	2348	C
4	5	2349	G
4	5	2356	A
4	5	2363	C
4	5	2372	A
4	5	2380	A
4	5	2387	G
4	5	2389	G
4	5	2390	G
4	5	2396	A
4	5	2403	C
4	5	2426	C
4	5	2429	G
4	5	2432	C
4	5	2444	A
4	5	2461	G
4	5	2462	G
4	5	2463	G
4	5	2470	C
4	5	2481	G
4	5	2483	G
4	5	2492	G

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
4	5	2496	C
4	5	2504	U
4	5	2505	G
4	5	2512	C
4	5	2529	G
4	5	2530	U
4	5	2538	A
4	5	2539	A
4	5	2550	U
4	5	2551	U
4	5	2554	G
4	5	2558	G
4	5	2559	C
4	5	2564	G
4	5	2566	U
4	5	2568	A
4	5	2569	G
4	5	2583	U
4	5	2586	A
4	5	2587	A
4	5	2596	G
4	5	2597	G
4	5	2598	A
4	5	2602	G
4	5	2606	U
4	5	2607	A
4	5	2612	U
4	5	2630	A
4	5	2631	U
4	5	2633	U
4	5	2657	C
4	5	2669	U
4	5	2670	G
4	5	2685	G
4	5	2688	A
4	5	2698	G
4	5	2741	G
4	5	3330	C
4	5	3336	A
4	5	3337	C
4	5	3338	U
4	5	3349	G

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
4	5	3357	G
4	5	3358	G
4	5	3367	A
4	5	3380	A
4	5	3389	U
4	5	3394	A
4	5	3396	G
4	5	3405	C
4	5	3443	A
4	5	3444	A
4	5	3446	G
4	5	3461	PSU
4	5	3480	A
4	5	3485	G
4	5	3488	A
4	5	3491	A
4	5	3492	A
4	5	3493	C
4	5	3495	A
4	5	3496	PSU
4	5	3505	U
4	5	3506	A
4	5	3509	G
4	5	3510	U
4	5	3516	A
4	5	3517	A
4	5	3519	G
4	5	3520	C
4	5	3524	OMG
4	5	3542	C
4	5	3543	G
4	5	3544	C
4	5	3546	U
4	5	3549	A
4	5	3551	G
4	5	3570	U
4	5	3572	U
4	5	3609	A
4	5	3610	C
4	5	3611	G
4	5	3621	G
4	5	3630	G

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
4	5	3633	A
4	5	3637	A
4	5	3638	A
4	5	3639	G
4	5	3640	A
4	5	3647	U
4	5	3648	G
4	5	3649	A
4	5	3659	U
4	5	3670	G
4	5	3671	G
4	5	3683	G
4	5	3684	A
4	5	3687	A
4	5	3788	C
4	5	3789	G
4	5	3794	U
4	5	3801	A
4	5	3804	G
4	5	3812	G
4	5	3814	G
4	5	3816	C
4	5	3825	G
4	5	3844	C
4	5	3847	C
4	5	3848	U
4	5	3849	G
4	5	3853	C
4	5	3855	A
4	5	3904	C
4	5	3908	C
4	5	3909	U
4	5	3910	C
4	5	3912	G
4	5	3916	A
4	5	3929	G
4	5	3930	G
4	5	3937	G
4	5	3940	U
4	5	3941	G
4	5	3942	G
4	5	3944	G

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
4	5	3949	A
4	5	3971	G
4	5	3975	U
4	5	3979	A
4	5	3997	A
4	5	4000	G
4	5	4001	A
4	5	4012	G
4	5	4014	A
4	5	4017	A
4	5	4019	A
4	5	4027	A
4	5	4037	G
4	5	4039	PSU
4	5	4050	A
4	5	4051	G
4	5	4052	OMU
4	5	4053	A
4	5	4060	C
4	5	4064	C
4	5	4065	C
4	5	4076	G
4	5	4078	C
4	5	4081	C
4	5	4085	A
4	5	4095	C
4	5	4096	C
4	5	4117	G
4	5	4118	U
4	5	4119	G
4	5	4123	G
4	5	4124	A
4	5	4126	A
4	5	4133	C
4	5	4140	A
4	5	4141	U
4	5	4142	A
4	5	4144	C
4	5	4165	U
4	5	4167	C
4	5	4168	A
4	5	4176	G

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
4	5	4186	G
4	5	4194	G
4	5	4195	A
4	5	4196	PSU
4	5	4198	U
4	5	4210	A
4	5	4240	OMG
4	5	4246	PSU
4	5	4256	A
4	5	4257	A
4	5	4258	U
4	5	4259	A
4	5	4264	A
4	5	4265	C
4	5	4266	G
4	5	4268	G
4	5	4269	A2M
4	5	4270	G
4	5	4294	A
4	5	4295	G
4	5	4306	C
4	5	4313	G
4	5	4319	G
4	5	4321	G
4	5	4332	G
4	5	4335	A
4	5	4336	A
4	5	4373	U
4	5	4382	PSU
4	5	4383	OMG
4	5	4398	G
4	5	4402	A
4	5	4416	C
4	5	4418	A
4	5	4423	U
4	5	4441	C
4	5	4446	A
4	5	4455	U
4	5	4465	G
4	5	4466	C
4	5	4476	C
4	5	4479	C

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
4	5	4480	A
4	5	4482	C
4	5	4487	A
4	5	4490	G
4	5	4492	G
4	5	4498	G
4	5	4501	G
4	5	4503	C
4	5	4504	C
4	5	4506	C
4	5	4508	G
4	5	4512	G
4	5	4518	C
4	5	4519	C
4	5	4607	G
4	5	4609	G
4	5	4610	C
4	5	4611	G
4	5	4612	G
4	5	4613	A
4	5	4614	G
4	5	4621	U
4	5	4622	C
4	5	4624	U
4	5	4634	C
4	5	4638	G
4	5	4639	C
4	5	4640	G
4	5	4642	G
4	5	4651	G
4	5	4653	G
4	5	4654	G
4	5	4658	G
4	5	4659	C
4	5	4660	C
4	5	4661	C
4	5	4664	U
4	5	4665	C
4	5	4670	G
4	5	4676	C
4	5	4682	A
4	5	4683	C

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
4	5	4687	C
4	5	4688	G
4	5	4689	U
4	5	4690	G
4	5	4695	A
4	5	4697	C
4	5	4699	G
4	5	4704	U
4	5	4705	A
4	5	4715	U
4	5	4727	U
4	5	4729	C
4	5	4732	G
4	5	4745	U
4	5	4753	A
4	5	4756	G
4	5	4761	U
4	5	4779	U
4	5	4780	G
4	5	4786	C
4	5	4789	C
4	5	4793	C
4	5	4801	G
25	8	2	G
25	8	16	G
25	8	34	U
25	8	35	C
25	8	39	G
25	8	59	A
25	8	62	A
25	8	63	U
25	8	86	U
25	8	87	G
25	8	103	A
25	8	105	C
25	8	109	C
25	8	110	U
25	8	111	U
25	8	114	G
25	8	122	G
25	8	124	U
25	8	125	C

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
25	8	126	C
25	8	127	U
25	8	137	A
25	8	150	C
25	8	151	G
25	8	153	C
25	8	155	C
34	7	7	G
34	7	22	A
34	7	33	U
34	7	53	U
34	7	54	A
34	7	64	G
34	7	74	A
34	7	100	A
34	7	110	G
34	7	111	C
34	7	117	G
34	7	120	U

All (57) RNA pucker outliers are listed below:

Mol	Chain	Res	Type
4	5	12	A
4	5	125	C
4	5	134	G
4	5	217	C
4	5	245	C
4	5	275	C
4	5	385	A
4	5	406	C
4	5	417	G
4	5	486	C
4	5	493	U
4	5	722	U
4	5	829	G
4	5	987	C
4	5	1065	G
4	5	1102	G
4	5	1123	C
4	5	1125	C
4	5	1207	G

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
4	5	1235	G
4	5	1273	G
4	5	1314	G
4	5	1400	U
4	5	1588	G
4	5	1743	A
4	5	1757	G
4	5	1918	A
4	5	1929	A
4	5	1985	G
4	5	2028	G
4	5	2109	C
4	5	2345	A
4	5	2482	U
4	5	2504	U
4	5	2538	A
4	5	2597	G
4	5	3335	G
4	5	3357	G
4	5	3620	G
4	5	3636	G
4	5	3793	G
4	5	3847	C
4	5	3940	U
4	5	3978	U
4	5	4000	G
4	5	4117	G
4	5	4141	U
4	5	4194	G
4	5	4445	U
4	5	4465	G
4	5	4623	G
4	5	4660	C
4	5	4664	U
4	5	4675	G
4	5	4686	U
4	5	4786	C
25	8	124	U

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

66 non-standard protein/DNA/RNA residues are modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. 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 $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# $ Z > 2$	Counts	RMSZ	# $ Z > 2$
4	OMC	5	3619	4	19,22,23	2.26	5 (26%)	26,31,34	0.95	3 (11%)
4	E7G	5	1736	4	24,27,28	5.35	7 (29%)	30,40,43	2.21	10 (33%)
4	P7G	5	1848	4	24,28,29	6.31	6 (25%)	27,41,44	1.35	3 (11%)
4	5MC	5	3514	4	18,22,23	1.99	4 (22%)	26,32,35	1.37	3 (11%)
4	PSU	5	4188	4	18,21,22	2.01	6 (33%)	22,30,33	1.95	5 (22%)
4	A2M	5	398	4	18,25,26	4.08	5 (27%)	18,36,39	1.22	1 (5%)
4	OMG	5	2616	4	18,26,27	2.83	4 (22%)	19,38,41	1.25	3 (15%)
4	OMG	5	2267	4	18,26,27	1.06	1 (5%)	19,38,41	1.14	2 (10%)
4	A2M	5	1489	52,4	18,25,26	4.07	5 (27%)	18,36,39	1.22	1 (5%)
4	A2M	5	1810	52,4	18,25,26	0.98	0	18,36,39	1.25	2 (11%)
4	P7G	5	3612	4	24,28,29	6.43	6 (25%)	27,41,44	1.38	3 (11%)
4	OMG	5	1477	4	18,26,27	2.84	5 (27%)	19,38,41	1.25	3 (15%)
4	1MA	5	1266	4	16,25,26	2.25	4 (25%)	18,37,40	1.50	3 (16%)
4	OMG	5	3524	4	18,26,27	2.84	4 (22%)	19,38,41	1.23	3 (15%)
4	7MG	5	2365	4	22,26,27	1.45	4 (18%)	29,39,42	2.67	8 (27%)
4	OMC	5	4282	4	19,22,23	0.96	1 (5%)	26,31,34	1.04	1 (3%)
4	PSU	5	2351	4	18,21,22	1.98	5 (27%)	22,30,33	1.82	4 (18%)
4	PSU	5	4039	4	18,21,22	1.98	5 (27%)	22,30,33	1.91	4 (18%)
4	PSU	5	4374	4	18,21,22	2.00	6 (33%)	22,30,33	1.93	4 (18%)
4	A2M	5	1479	4	18,25,26	4.05	5 (27%)	18,36,39	1.34	2 (11%)
4	BGH	5	3631	4	25,29,30	6.33	13 (52%)	31,43,46	2.34	9 (29%)
4	PSU	5	4149	4	18,21,22	1.59	5 (27%)	22,30,33	2.11	5 (22%)
4	OMU	5	4366	4	19,22,23	3.09	7 (36%)	26,31,34	1.84	6 (23%)
4	OMG	5	4383	4	18,26,27	2.84	5 (27%)	19,38,41	1.27	3 (15%)
17	MLZ	m	72	17	8,9,10	0.48	0	4,9,11	0.52	0
4	B8H	5	4042	4	19,22,23	2.01	7 (36%)	22,32,35	2.05	3 (13%)
4	OMC	5	2265	52,4	19,22,23	2.24	5 (26%)	26,31,34	0.94	2 (7%)
4	OMG	5	1260	4	18,26,27	2.82	4 (22%)	19,38,41	1.21	3 (15%)
4	P4U	5	1292	4	21,24,25	2.43	7 (33%)	27,33,36	1.14	2 (7%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
4	7MG	5	1560	4	22,26,27	5.21	6 (27%)	29,39,42	2.10	8 (27%)
4	A2M	5	3455	4	18,25,26	4.07	5 (27%)	18,36,39	1.23	1 (5%)
4	OMG	5	4116	4	18,26,27	1.06	1 (5%)	19,38,41	1.23	3 (15%)
4	PSU	5	1632	4	18,21,22	1.95	5 (27%)	22,30,33	1.97	4 (18%)
4	PSU	5	1537	4	18,21,22	2.02	6 (33%)	22,30,33	1.85	4 (18%)
4	B8H	5	3494	4	19,22,23	1.99	7 (36%)	22,32,35	1.92	3 (13%)
4	A2M	5	3557	4	18,25,26	4.04	5 (27%)	18,36,39	1.21	1 (5%)
4	OMG	5	1580	52,4	18,26,27	1.16	1 (5%)	19,38,41	1.15	2 (10%)
4	OMG	5	4240	4	18,26,27	2.83	4 (22%)	19,38,41	1.23	3 (15%)
4	PSU	5	4246	4	18,21,22	1.98	5 (27%)	22,30,33	1.94	5 (22%)
4	OMG	5	4369	4	18,26,27	2.83	4 (22%)	19,38,41	1.24	3 (15%)
4	PSU	5	4196	52,4	18,21,22	1.95	5 (27%)	22,30,33	1.91	4 (18%)
4	I4U	5	1614	4	21,24,25	2.55	7 (33%)	27,34,37	1.07	1 (3%)
4	OMC	5	2704	4	19,22,23	2.24	5 (26%)	26,31,34	0.95	2 (7%)
4	PSU	5	3461	4	18,21,22	2.00	5 (27%)	22,30,33	1.81	4 (18%)
26	MLZ	C	333	26	8,9,10	0.47	0	4,9,11	0.64	0
4	B8K	5	4436	4	24,28,29	5.80	7 (29%)	30,42,45	2.30	7 (23%)
4	OMU	5	4052	4	19,22,23	3.10	7 (36%)	26,31,34	1.80	6 (23%)
4	A2M	5	1270	4	18,25,26	0.97	1 (5%)	18,36,39	1.23	2 (11%)
4	B8H	5	1799	4	19,22,23	2.01	7 (36%)	22,32,35	2.05	3 (13%)
4	PSU	5	3496	4	18,21,22	1.98	6 (33%)	22,30,33	1.78	5 (22%)
4	E6G	5	4101	4	20,27,28	1.98	3 (15%)	22,39,42	2.09	5 (22%)
4	1MA	5	4161	4	16,25,26	2.26	3 (18%)	18,37,40	1.42	3 (16%)
4	PSU	5	1638	4	18,21,22	2.00	6 (33%)	22,30,33	1.89	4 (18%)
4	PSU	5	3447	4	18,21,22	1.95	5 (27%)	22,30,33	1.83	4 (18%)
4	OMC	5	2647	4	19,22,23	2.26	5 (26%)	26,31,34	0.93	2 (7%)
4	OMC	5	3601	4	19,22,23	2.25	5 (26%)	26,31,34	0.94	2 (7%)
4	5MC	5	4193	4	18,22,23	1.01	2 (11%)	26,32,35	1.37	3 (11%)
4	OMC	5	2208	4	19,22,23	2.26	5 (26%)	26,31,34	0.94	2 (7%)
4	A2M	5	3450	4	18,25,26	4.08	5 (27%)	18,36,39	1.22	1 (5%)
4	OMC	5	3433	4	19,22,23	2.24	5 (26%)	26,31,34	0.95	2 (7%)
4	A2M	5	4269	52,4	18,25,26	4.05	6 (33%)	18,36,39	1.21	1 (5%)
4	B8K	5	3629	4	24,28,29	5.87	7 (29%)	30,42,45	2.26	7 (23%)
4	PSU	5	4382	4	18,21,22	1.97	5 (27%)	22,30,33	1.95	5 (22%)
4	UR3	5	4276	4	19,22,23	1.01	1 (5%)	26,32,35	1.52	2 (7%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
4	PSU	5	4277	4	18,21,22	1.92	4 (22%)	22,30,33	1.87	4 (18%)
4	OMG	5	2207	4	18,26,27	2.83	4 (22%)	19,38,41	1.20	3 (15%)

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
4	OMC	5	3619	4	-	1/9/27/28	0/2/2/2
4	E7G	5	1736	4	-	3/9/39/40	0/3/3/3
4	P7G	5	1848	4	-	0/10/40/41	0/3/3/3
4	5MC	5	3514	4	-	0/7/25/26	0/2/2/2
4	PSU	5	4188	4	-	0/7/25/26	0/2/2/2
4	A2M	5	398	4	-	1/5/27/28	0/3/3/3
4	OMG	5	2616	4	-	1/5/27/28	0/3/3/3
4	OMG	5	2267	4	-	2/5/27/28	0/3/3/3
4	A2M	5	1489	52,4	-	3/5/27/28	0/3/3/3
4	A2M	5	1810	52,4	-	0/5/27/28	0/3/3/3
4	P7G	5	3612	4	-	3/10/40/41	0/3/3/3
4	OMG	5	1477	4	-	0/5/27/28	0/3/3/3
4	1MA	5	1266	4	-	0/3/25/26	0/3/3/3
4	OMG	5	3524	4	-	2/5/27/28	0/3/3/3
4	7MG	5	2365	4	-	0/7/37/38	0/3/3/3
4	OMC	5	4282	4	-	2/9/27/28	0/2/2/2
4	PSU	5	2351	4	-	0/7/25/26	0/2/2/2
4	PSU	5	4039	4	-	2/7/25/26	0/2/2/2
4	PSU	5	4374	4	-	0/7/25/26	0/2/2/2
4	A2M	5	1479	4	-	2/5/27/28	0/3/3/3
4	BGH	5	3631	4	-	2/13/43/44	0/3/3/3
4	PSU	5	4149	4	-	2/7/25/26	0/2/2/2
4	OMU	5	4366	4	-	1/9/27/28	0/2/2/2
4	OMG	5	4383	4	-	3/5/27/28	0/3/3/3
17	MLZ	m	72	17	-	1/7/8/10	-
4	B8H	5	4042	4	-	2/7/25/26	0/2/2/2
4	OMC	5	2265	52,4	-	2/9/27/28	0/2/2/2
4	OMG	5	1260	4	-	1/5/27/28	0/3/3/3
4	P4U	5	1292	4	-	4/10/29/30	0/2/2/2
4	7MG	5	1560	4	-	0/7/37/38	0/3/3/3

Continued on next page...

Continued from previous page...

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
4	A2M	5	3455	4	-	0/5/27/28	0/3/3/3
4	OMG	5	4116	4	-	1/5/27/28	0/3/3/3
4	PSU	5	1632	4	-	2/7/25/26	0/2/2/2
4	PSU	5	1537	4	-	2/7/25/26	0/2/2/2
4	B8H	5	3494	4	-	2/7/25/26	0/2/2/2
4	A2M	5	3557	4	-	1/5/27/28	0/3/3/3
4	OMG	5	1580	52,4	-	0/5/27/28	0/3/3/3
4	OMG	5	4240	4	-	3/5/27/28	0/3/3/3
4	PSU	5	4246	4	-	5/7/25/26	0/2/2/2
4	OMG	5	4369	4	-	1/5/27/28	0/3/3/3
4	PSU	5	4196	52,4	-	5/7/25/26	0/2/2/2
4	I4U	5	1614	4	-	1/9/29/30	0/2/2/2
4	OMC	5	2704	4	-	1/9/27/28	0/2/2/2
4	PSU	5	3461	4	-	2/7/25/26	0/2/2/2
26	MLZ	C	333	26	-	0/7/8/10	-
4	B8K	5	4436	4	-	0/11/41/42	0/3/3/3
4	OMU	5	4052	4	-	3/9/27/28	0/2/2/2
4	A2M	5	1270	4	-	3/5/27/28	0/3/3/3
4	B8H	5	1799	4	-	0/7/25/26	0/2/2/2
4	PSU	5	3496	4	-	3/7/25/26	0/2/2/2
4	E6G	5	4101	4	-	3/6/28/29	0/3/3/3
4	1MA	5	4161	4	-	1/3/25/26	0/3/3/3
4	PSU	5	1638	4	-	0/7/25/26	0/2/2/2
4	PSU	5	3447	4	-	0/7/25/26	0/2/2/2
4	OMC	5	2647	4	-	1/9/27/28	0/2/2/2
4	OMC	5	3601	4	-	0/9/27/28	0/2/2/2
4	5MC	5	4193	4	-	4/7/25/26	0/2/2/2
4	OMC	5	2208	4	-	0/9/27/28	0/2/2/2
4	A2M	5	3450	4	-	0/5/27/28	0/3/3/3
4	OMC	5	3433	4	-	4/9/27/28	0/2/2/2
4	A2M	5	4269	52,4	-	3/5/27/28	0/3/3/3
4	B8K	5	3629	4	-	3/11/41/42	0/3/3/3
4	PSU	5	4382	4	-	3/7/25/26	0/2/2/2
4	UR3	5	4276	4	-	0/7/25/26	0/2/2/2
4	PSU	5	4277	4	-	0/7/25/26	0/2/2/2
4	OMG	5	2207	4	-	3/5/27/28	0/3/3/3

All (311) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	5	3629	B8K	C8-N9	-26.25	1.31	1.46
4	5	3631	BGH	C8-N9	-26.13	1.31	1.46
4	5	4436	B8K	C8-N9	-25.90	1.31	1.46
4	5	3612	P7G	C8-N9	-25.18	1.31	1.46
4	5	1848	P7G	C8-N9	-24.68	1.32	1.46
4	5	1560	7MG	C8-N9	-21.35	1.34	1.46
4	5	1736	E7G	C8-N9	-19.43	1.35	1.46
4	5	3612	P7G	C8-N7	-14.55	1.32	1.45
4	5	1848	P7G	C8-N7	-14.18	1.32	1.45
4	5	1736	E7G	C8-N7	-13.39	1.33	1.45
4	5	4052	OMU	O4-C4	11.28	1.46	1.24
4	5	4366	OMU	O4-C4	11.18	1.46	1.24
4	5	3455	A2M	O4'-C1'	10.67	1.56	1.41
4	5	3450	A2M	O4'-C1'	10.66	1.55	1.41
4	5	1489	A2M	O4'-C1'	10.64	1.55	1.41
4	5	398	A2M	O4'-C1'	10.64	1.55	1.41
4	5	4269	A2M	O4'-C1'	10.58	1.55	1.41
4	5	3557	A2M	O4'-C1'	10.55	1.55	1.41
4	5	1479	A2M	O4'-C1'	10.47	1.55	1.41
4	5	1479	A2M	C3'-C4'	-10.11	1.27	1.53
4	5	4269	A2M	C3'-C4'	-10.05	1.27	1.53
4	5	398	A2M	C3'-C4'	-10.03	1.27	1.53
4	5	1489	A2M	C3'-C4'	-10.02	1.27	1.53
4	5	3450	A2M	C3'-C4'	-9.98	1.27	1.53
4	5	3557	A2M	C3'-C4'	-9.98	1.27	1.53
4	5	3612	P7G	O6-C6	9.97	1.40	1.23
4	5	1848	P7G	O6-C6	9.96	1.40	1.23
4	5	3455	A2M	C3'-C4'	-9.91	1.27	1.53
4	5	1560	7MG	O6-C6	9.30	1.41	1.23
4	5	3631	BGH	C3'-C4'	-9.19	1.29	1.53
4	5	1614	I4U	O2-C2	8.86	1.40	1.23
4	5	2616	OMG	O6-C6	8.86	1.41	1.23
4	5	4240	OMG	O6-C6	8.85	1.41	1.23
4	5	4383	OMG	O6-C6	8.82	1.41	1.23
4	5	3524	OMG	O6-C6	8.81	1.41	1.23
4	5	2207	OMG	O6-C6	8.81	1.41	1.23
4	5	4369	OMG	O6-C6	8.81	1.41	1.23
4	5	1477	OMG	O6-C6	8.80	1.41	1.23
4	5	1260	OMG	O6-C6	8.75	1.41	1.23
4	5	1736	E7G	O6-C6	8.47	1.39	1.23
4	5	3629	B8K	O6-C6	8.42	1.39	1.23
4	5	3631	BGH	O6-C6	8.41	1.39	1.23
4	5	1292	P4U	O2-C2	8.36	1.39	1.23

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	5	4436	B8K	O6-C6	8.33	1.39	1.23
4	5	4161	1MA	C6-N6	7.65	1.47	1.27
4	5	1266	1MA	C6-N6	7.61	1.47	1.27
4	5	3631	BGH	O4'-C4'	7.50	1.61	1.45
4	5	3433	OMC	C4-N4	6.73	1.49	1.33
4	5	3619	OMC	C4-N4	6.72	1.49	1.33
4	5	2208	OMC	C4-N4	6.71	1.49	1.33
4	5	3601	OMC	C4-N4	6.70	1.49	1.33
4	5	2704	OMC	C4-N4	6.69	1.49	1.33
4	5	2647	OMC	C4-N4	6.69	1.49	1.33
4	5	2265	OMC	C4-N4	6.66	1.49	1.33
4	5	4101	E6G	O6-C6	6.41	1.40	1.35
4	5	2616	OMG	C2-N2	6.30	1.49	1.34
4	5	4383	OMG	C2-N2	6.22	1.49	1.34
4	5	3524	OMG	C2-N2	6.21	1.48	1.34
4	5	1477	OMG	C2-N2	6.20	1.48	1.34
4	5	2207	OMG	C2-N2	6.19	1.48	1.34
4	5	4369	OMG	C2-N2	6.17	1.48	1.34
4	5	4240	OMG	C2-N2	6.12	1.48	1.34
4	5	1260	OMG	C2-N2	6.08	1.48	1.34
4	5	1479	A2M	C3'-C2'	5.89	1.66	1.52
4	5	3455	A2M	C3'-C2'	5.85	1.66	1.52
4	5	398	A2M	C3'-C2'	5.83	1.65	1.52
4	5	3450	A2M	C3'-C2'	5.76	1.65	1.52
4	5	1489	A2M	C3'-C2'	5.74	1.65	1.52
4	5	3557	A2M	C3'-C2'	5.72	1.65	1.52
4	5	4269	A2M	C3'-C2'	5.67	1.65	1.52
4	5	3450	A2M	O4'-C4'	4.92	1.56	1.45
4	5	3455	A2M	O4'-C4'	4.92	1.56	1.45
4	5	3514	5MC	C4-N4	4.90	1.46	1.34
4	5	398	A2M	O4'-C4'	4.90	1.56	1.45
4	5	1489	A2M	O4'-C4'	4.85	1.55	1.45
4	5	3557	A2M	O4'-C4'	4.77	1.55	1.45
4	5	4269	A2M	O4'-C4'	4.73	1.55	1.45
4	5	3631	BGH	C2-N2	4.65	1.45	1.34
4	5	1736	E7G	C2-N2	4.64	1.45	1.34
4	5	3514	5MC	C2-N1	-4.64	1.29	1.40
4	5	4246	PSU	C6-C5	4.63	1.40	1.35
4	5	3447	PSU	C6-C5	4.63	1.40	1.35
4	5	4436	B8K	C2-N2	4.63	1.45	1.34
4	5	1848	P7G	C2-N2	4.63	1.45	1.34
4	5	3496	PSU	C6-C5	4.62	1.40	1.35

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	5	1537	PSU	C6-C5	4.61	1.40	1.35
4	5	3612	P7G	C2-N2	4.59	1.45	1.34
4	5	1479	A2M	O4'-C4'	4.59	1.55	1.45
4	5	3629	B8K	C2-N2	4.58	1.45	1.34
4	5	3461	PSU	C6-C5	4.58	1.40	1.35
4	5	4277	PSU	C6-C5	4.58	1.40	1.35
4	5	3631	BGH	O4'-C1'	-4.56	1.31	1.42
4	5	4188	PSU	C6-C5	4.48	1.40	1.35
4	5	4374	PSU	C6-C5	4.47	1.40	1.35
4	5	1632	PSU	C6-C5	4.45	1.40	1.35
4	5	4039	PSU	C6-C5	4.44	1.40	1.35
4	5	4382	PSU	C6-C5	4.43	1.40	1.35
4	5	2351	PSU	C6-C5	4.42	1.40	1.35
4	5	1638	PSU	C6-C5	4.37	1.40	1.35
4	5	4052	OMU	C2-N1	-4.33	1.31	1.38
4	5	4366	OMU	C2-N1	-4.31	1.31	1.38
4	5	4196	PSU	C6-C5	4.28	1.40	1.35
4	5	3433	OMC	C2-N1	-4.22	1.30	1.40
4	5	3601	OMC	C2-N1	-4.19	1.30	1.40
4	5	3619	OMC	C2-N1	-4.19	1.30	1.40
4	5	2208	OMC	C2-N1	-4.15	1.31	1.40
4	5	2647	OMC	C2-N1	-4.14	1.31	1.40
4	5	1560	7MG	C2-N2	4.13	1.44	1.34
4	5	2265	OMC	C2-N1	-4.07	1.31	1.40
4	5	2704	OMC	C2-N1	-4.05	1.31	1.40
4	5	1560	7MG	C4-N9	-4.01	1.33	1.37
4	5	2647	OMC	O2-C2	-3.88	1.16	1.23
4	5	2265	OMC	O2-C2	-3.86	1.16	1.23
4	5	3619	OMC	O2-C2	-3.86	1.16	1.23
4	5	4101	E6G	C2-N2	3.86	1.41	1.33
4	5	1736	E7G	C6-N1	-3.81	1.31	1.38
4	5	2704	OMC	O2-C2	-3.81	1.16	1.23
4	5	1614	I4U	C2-N1	-3.81	1.31	1.40
4	5	3601	OMC	O2-C2	-3.80	1.16	1.23
4	5	2365	7MG	C4-N9	-3.79	1.33	1.37
4	5	2208	OMC	O2-C2	-3.77	1.16	1.23
4	5	4374	PSU	C4-N3	-3.74	1.31	1.38
4	5	4196	PSU	C4-N3	-3.70	1.32	1.38
4	5	4382	PSU	C4-N3	-3.69	1.32	1.38
4	5	3514	5MC	C6-C5	3.68	1.40	1.34
4	5	3433	OMC	O2-C2	-3.67	1.16	1.23
4	5	2351	PSU	C4-N3	-3.67	1.32	1.38

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	5	1632	PSU	C4-N3	-3.65	1.32	1.38
4	5	4039	PSU	C4-N3	-3.64	1.32	1.38
4	5	4188	PSU	C4-N3	-3.64	1.32	1.38
4	5	1560	7MG	C6-N1	-3.63	1.32	1.38
4	5	1638	PSU	C4-N3	-3.63	1.32	1.38
4	5	3631	BGH	C4-N9	-3.62	1.33	1.37
4	5	4246	PSU	C4-N3	-3.60	1.32	1.38
4	5	3447	PSU	C4-N3	-3.58	1.32	1.38
4	5	1537	PSU	C4-N3	-3.58	1.32	1.38
4	5	1799	B8H	C4-N3	-3.57	1.32	1.38
4	5	4042	B8H	C4-N3	-3.55	1.32	1.38
4	5	4277	PSU	C4-N3	-3.54	1.32	1.38
4	5	4042	B8H	C2-N1	-3.53	1.31	1.38
4	5	1799	B8H	C2-N1	-3.50	1.31	1.38
4	5	3461	PSU	C4-N3	-3.49	1.32	1.38
4	5	1292	P4U	O4-C41	-3.46	1.35	1.45
4	5	3496	PSU	C4-N3	-3.45	1.32	1.38
4	5	4052	OMU	C4-N3	-3.43	1.32	1.38
4	5	4366	OMU	C4-N3	-3.43	1.32	1.38
4	5	3631	BGH	C6-N1	-3.42	1.32	1.38
4	5	1799	B8H	C2-N3	-3.41	1.31	1.38
4	5	3494	B8H	C2-N1	-3.41	1.32	1.38
4	5	3629	B8K	C6-N1	-3.41	1.32	1.38
4	5	4042	B8H	C2-N3	-3.39	1.31	1.38
4	5	4161	1MA	C2-N3	3.39	1.33	1.29
4	5	4436	B8K	C6-N1	-3.36	1.32	1.38
4	5	3629	B8K	C4-N9	-3.35	1.33	1.37
4	5	4149	PSU	C4-N3	-3.34	1.32	1.38
4	5	3494	B8H	C1'-C5	3.34	1.57	1.50
4	5	3494	B8H	C4-N3	-3.33	1.32	1.38
4	5	3631	BGH	C71-N7	3.32	1.47	1.39
4	5	4436	B8K	C71-N7	3.31	1.47	1.39
4	5	3494	B8H	C2-N3	-3.31	1.32	1.38
4	5	4436	B8K	C4-N9	-3.30	1.33	1.37
4	5	3629	B8K	C71-N7	3.26	1.46	1.39
4	5	4039	PSU	C2-N1	-3.26	1.32	1.36
4	5	1638	PSU	C2-N1	-3.26	1.32	1.36
4	5	1848	P7G	C6-N1	-3.22	1.32	1.38
4	5	1614	I4U	O4-C4	3.19	1.41	1.35
4	5	3612	P7G	C6-N1	-3.17	1.32	1.38
4	5	2351	PSU	C2-N1	-3.17	1.32	1.36
4	5	1614	I4U	C5-C4	-3.17	1.38	1.43

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	5	3494	B8H	C6-C5	3.16	1.39	1.34
4	5	1580	OMG	C6-N1	-3.16	1.33	1.37
4	5	1266	1MA	C2-N3	3.16	1.32	1.29
4	5	3461	PSU	C2-N1	-3.15	1.32	1.36
4	5	4188	PSU	C2-N1	-3.14	1.32	1.36
4	5	1477	OMG	C6-N1	-3.14	1.33	1.37
4	5	1292	P4U	O4-C4	3.13	1.38	1.35
4	5	2207	OMG	C6-N1	-3.13	1.33	1.37
4	5	4374	PSU	C2-N1	-3.13	1.32	1.36
4	5	4383	OMG	C6-N1	-3.12	1.33	1.37
4	5	3496	PSU	C2-N1	-3.12	1.32	1.36
4	5	3450	A2M	C6-N6	3.11	1.45	1.34
4	5	3455	A2M	C6-N6	3.11	1.45	1.34
4	5	398	A2M	C6-N6	3.11	1.45	1.34
4	5	4369	OMG	C6-N1	-3.09	1.33	1.37
4	5	1537	PSU	C2-N1	-3.09	1.32	1.36
4	5	1260	OMG	C6-N1	-3.09	1.33	1.37
4	5	3524	OMG	C6-N1	-3.09	1.33	1.37
4	5	4269	A2M	C6-N6	3.09	1.45	1.34
4	5	1489	A2M	C6-N6	3.07	1.45	1.34
4	5	4116	OMG	C6-N1	-3.07	1.33	1.37
4	5	4240	OMG	C6-N1	-3.07	1.33	1.37
4	5	1479	A2M	C6-N6	3.07	1.45	1.34
4	5	3557	A2M	C6-N6	3.07	1.45	1.34
4	5	4196	PSU	C2-N1	-3.06	1.32	1.36
4	5	3447	PSU	C2-N1	-3.00	1.32	1.36
4	5	1292	P4U	C6-C5	2.98	1.41	1.35
4	5	1260	OMG	C5-C6	-2.97	1.41	1.47
4	5	4246	PSU	C2-N1	-2.96	1.32	1.36
4	5	4382	PSU	C2-N1	-2.96	1.32	1.36
4	5	2365	7MG	C6-N1	-2.92	1.33	1.38
4	5	4277	PSU	C2-N1	-2.91	1.32	1.36
4	5	2616	OMG	C6-N1	-2.91	1.33	1.37
4	5	1632	PSU	C2-N1	-2.90	1.32	1.36
4	5	2267	OMG	C6-N1	-2.89	1.33	1.37
4	5	3524	OMG	C5-C6	-2.89	1.41	1.47
4	5	2207	OMG	C5-C6	-2.87	1.41	1.47
4	5	3631	BGH	O2'-C2'	-2.86	1.35	1.42
4	5	4369	OMG	C5-C6	-2.85	1.41	1.47
4	5	1799	B8H	C1'-C5	2.85	1.56	1.50
4	5	1477	OMG	C5-C6	-2.81	1.41	1.47
4	5	1799	B8H	C6-C5	2.80	1.38	1.34

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	5	4042	B8H	C1'-C5	2.80	1.56	1.50
4	5	4240	OMG	C5-C6	-2.80	1.41	1.47
4	5	4383	OMG	C5-C6	-2.78	1.41	1.47
4	5	4042	B8H	C6-C5	2.76	1.38	1.34
4	5	4366	OMU	C2-N3	-2.75	1.33	1.38
4	5	4196	PSU	C6-N1	-2.74	1.31	1.36
4	5	4052	OMU	C2-N3	-2.73	1.33	1.38
4	5	2616	OMG	C5-C6	-2.73	1.41	1.47
4	5	3461	PSU	C6-N1	-2.72	1.31	1.36
4	5	2365	7MG	C5-N7	-2.72	1.32	1.35
4	5	4193	5MC	C6-N1	-2.72	1.33	1.38
4	5	4382	PSU	C6-N1	-2.72	1.31	1.36
4	5	4188	PSU	C6-N1	-2.71	1.31	1.36
4	5	1638	PSU	C6-N1	-2.70	1.31	1.36
4	5	4039	PSU	C6-N1	-2.64	1.31	1.36
4	5	4374	PSU	C6-N1	-2.64	1.31	1.36
4	5	1537	PSU	C6-N1	-2.64	1.31	1.36
4	5	3496	PSU	C6-N1	-2.63	1.31	1.36
4	5	4246	PSU	C6-N1	-2.63	1.31	1.36
4	5	2351	PSU	C6-N1	-2.62	1.31	1.36
4	5	4042	B8H	O4-C4	-2.58	1.18	1.23
4	5	3447	PSU	C6-N1	-2.57	1.31	1.36
4	5	2365	7MG	C5-C4	2.57	1.46	1.38
4	5	1799	B8H	O4-C4	-2.56	1.18	1.23
4	5	1614	I4U	O4-C41	-2.56	1.41	1.47
4	5	1632	PSU	C6-N1	-2.55	1.32	1.36
4	5	4277	PSU	C6-N1	-2.54	1.32	1.36
4	5	4193	5MC	C6-C5	2.51	1.38	1.34
4	5	1292	P4U	C4-N3	2.51	1.34	1.31
4	5	2704	OMC	C6-C5	2.50	1.40	1.35
4	5	2208	OMC	C6-C5	2.49	1.40	1.35
4	5	4149	PSU	C2'-C1'	-2.49	1.50	1.53
4	5	3601	OMC	C6-C5	2.48	1.40	1.35
4	5	2647	OMC	C6-C5	2.46	1.40	1.35
4	5	3433	OMC	C6-C5	2.46	1.40	1.35
4	5	2265	OMC	C6-C5	2.45	1.40	1.35
4	5	1292	P4U	C42-C41	2.44	1.65	1.49
4	5	3619	OMC	C6-C5	2.44	1.40	1.35
4	5	1614	I4U	C6-N1	-2.42	1.32	1.38
4	5	4149	PSU	C2-N3	-2.42	1.33	1.37
4	5	4042	B8H	O2-C2	-2.41	1.18	1.23
4	5	3494	B8H	O4-C4	-2.41	1.19	1.23

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	5	2351	PSU	C2-N3	-2.41	1.33	1.37
4	5	1799	B8H	O2-C2	-2.40	1.18	1.23
4	5	4149	PSU	C6-C5	2.38	1.38	1.35
4	5	3631	BGH	O3'-C3'	2.37	1.48	1.43
4	5	4436	B8K	C2-N1	-2.37	1.31	1.37
4	5	3631	BGH	C2-N1	-2.36	1.31	1.37
4	5	3514	5MC	C6-N1	-2.35	1.34	1.38
4	5	4374	PSU	C2-N3	-2.34	1.33	1.37
4	5	3629	B8K	C2-N1	-2.34	1.31	1.37
4	5	3494	B8H	O2-C2	-2.33	1.18	1.23
4	5	1638	PSU	C2-N3	-2.29	1.33	1.37
4	5	1848	P7G	C2-N3	-2.28	1.32	1.37
4	5	4188	PSU	O4'-C1'	-2.27	1.40	1.43
4	5	3612	P7G	C2-N3	-2.27	1.32	1.37
4	5	4196	PSU	C2-N3	-2.26	1.33	1.37
4	5	1537	PSU	C2-N3	-2.26	1.33	1.37
4	5	4039	PSU	C2-N3	-2.26	1.33	1.37
4	5	1736	E7G	C72-C71	2.25	1.62	1.49
4	5	1266	1MA	C5-C4	-2.24	1.37	1.43
4	5	1292	P4U	C6-N1	-2.24	1.32	1.38
4	5	3631	BGH	O5'-C5'	-2.24	1.39	1.44
4	5	4101	E6G	C2-N1	-2.23	1.31	1.35
4	5	4366	OMU	C6-C5	2.23	1.40	1.35
4	5	4382	PSU	C2-N3	-2.22	1.33	1.37
4	5	4188	PSU	C2-N3	-2.22	1.33	1.37
4	5	4149	PSU	C2-N1	-2.19	1.33	1.36
4	5	1632	PSU	C2-N3	-2.18	1.33	1.37
4	5	3496	PSU	C1'-C5	2.17	1.55	1.50
4	5	2647	OMC	C5-C4	-2.16	1.38	1.42
4	5	3601	OMC	C5-C4	-2.15	1.38	1.42
4	5	4161	1MA	C5-C4	-2.14	1.37	1.43
4	5	3461	PSU	C2-N3	-2.13	1.33	1.37
4	5	2704	OMC	C5-C4	-2.13	1.38	1.42
4	5	3447	PSU	C2-N3	-2.13	1.33	1.37
4	5	4052	OMU	C6-C5	2.13	1.40	1.35
4	5	2208	OMC	C5-C4	-2.12	1.38	1.42
4	5	4246	PSU	C2-N3	-2.11	1.33	1.37
4	5	4366	OMU	C6-N1	-2.11	1.32	1.38
4	5	3619	OMC	C5-C4	-2.10	1.38	1.42
4	5	3496	PSU	C2-N3	-2.10	1.33	1.37
4	5	1270	A2M	C5-C4	2.09	1.46	1.40
4	5	1614	I4U	C2-N3	-2.09	1.32	1.36

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	5	2265	OMC	C5-C4	-2.09	1.38	1.42
4	5	1266	1MA	C8-N7	-2.07	1.31	1.35
4	5	1736	E7G	C4-N9	-2.07	1.35	1.37
4	5	4269	A2M	O5'-C5'	-2.06	1.39	1.44
4	5	4052	OMU	C5-C4	-2.06	1.39	1.43
4	5	4276	UR3	C5-C4	-2.05	1.38	1.43
4	5	1477	OMG	C2-N1	-2.03	1.32	1.37
4	5	4052	OMU	C6-N1	-2.03	1.33	1.38
4	5	4366	OMU	C5-C4	-2.03	1.39	1.43
4	5	1638	PSU	O2-C2	-2.02	1.19	1.23
4	5	4282	OMC	C6-N1	-2.01	1.33	1.38
4	5	4374	PSU	O2-C2	-2.01	1.19	1.23
4	5	1560	7MG	C2-N1	-2.01	1.32	1.37
4	5	4383	OMG	C2-N1	-2.01	1.32	1.37
4	5	3433	OMC	C5-C4	-2.00	1.38	1.42
4	5	1537	PSU	O4'-C1'	-2.00	1.41	1.43

All (222) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	5	2365	7MG	N9-C4-N3	9.33	139.42	125.47
4	5	4149	PSU	N1-C2-N3	6.52	122.52	115.13
4	5	1799	B8H	N3-C2-N1	6.08	121.71	115.14
4	5	4042	B8H	N3-C2-N1	6.02	121.65	115.14
4	5	3494	B8H	N3-C2-N1	5.83	121.44	115.14
4	5	4374	PSU	N1-C2-N3	5.66	121.55	115.13
4	5	4276	UR3	C4-N3-C2	-5.66	119.24	124.56
4	5	4188	PSU	N1-C2-N3	5.64	121.52	115.13
4	5	4246	PSU	N1-C2-N3	5.62	121.50	115.13
4	5	2365	7MG	N9-C8-N7	-5.62	95.35	103.38
4	5	4196	PSU	N1-C2-N3	5.57	121.44	115.13
4	5	1632	PSU	N1-C2-N3	5.54	121.41	115.13
4	5	2365	7MG	C5-C4-N3	-5.53	117.58	128.13
4	5	4039	PSU	N1-C2-N3	5.53	121.39	115.13
4	5	3629	B8K	N9-C8-N7	5.52	110.73	103.33
4	5	4277	PSU	N1-C2-N3	5.51	121.37	115.13
4	5	1537	PSU	N1-C2-N3	5.49	121.35	115.13
4	5	4382	PSU	N1-C2-N3	5.48	121.34	115.13
4	5	4042	B8H	C4-N3-C2	-5.48	120.26	127.35
4	5	1638	PSU	N1-C2-N3	5.47	121.33	115.13
4	5	1799	B8H	C4-N3-C2	-5.44	120.31	127.35
4	5	3461	PSU	N1-C2-N3	5.42	121.27	115.13

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	5	3447	PSU	N1-C2-N3	5.38	121.23	115.13
4	5	2351	PSU	N1-C2-N3	5.35	121.19	115.13
4	5	4436	B8K	N9-C8-N7	5.28	110.41	103.33
4	5	3631	BGH	N9-C8-N7	5.27	110.40	103.33
4	5	4101	E6G	C2-N3-C4	5.21	121.31	115.36
4	5	3496	PSU	N1-C2-N3	5.21	121.03	115.13
4	5	4436	B8K	C5-C6-N1	5.21	120.17	110.99
4	5	1560	7MG	N9-C4-N3	5.09	133.08	125.47
4	5	4366	OMU	N3-C2-N1	5.08	121.63	114.89
4	5	3629	B8K	C5-C6-N1	5.02	119.83	110.99
4	5	1736	E7G	N9-C4-N3	4.99	132.93	125.47
4	5	3494	B8H	C4-N3-C2	-4.98	120.90	127.35
4	5	3631	BGH	C5-C6-N1	4.92	119.66	110.99
4	5	4052	OMU	N3-C2-N1	4.85	121.33	114.89
4	5	1736	E7G	C2-N3-C4	4.85	120.94	112.30
4	5	4101	E6G	N3-C2-N1	-4.80	120.82	127.22
4	5	4436	B8K	C2-N3-C4	4.76	120.78	112.30
4	5	4366	OMU	C4-N3-C2	-4.73	120.35	126.58
4	5	1736	E7G	C5-C4-N3	-4.62	119.32	128.13
4	5	4052	OMU	C4-N3-C2	-4.60	120.51	126.58
4	5	3629	B8K	C2-N3-C4	4.58	120.46	112.30
4	5	1560	7MG	C5-C6-N1	4.53	118.98	110.99
4	5	1736	E7G	C5-C6-N1	4.52	118.96	110.99
4	5	1736	E7G	N9-C8-N7	4.51	109.82	103.38
4	5	3631	BGH	C2-N3-C4	4.49	120.30	112.30
4	5	1560	7MG	C2-N3-C4	4.46	120.24	112.30
4	5	3631	BGH	C72-C71-N7	4.37	125.43	118.86
4	5	4193	5MC	C5-C6-N1	-4.36	118.85	123.34
4	5	4436	B8K	C72-C71-N7	4.36	125.42	118.86
4	5	4101	E6G	C61-O6-C6	-4.35	113.25	117.56
4	5	1848	P7G	N9-C8-N7	4.33	109.58	103.38
4	5	3612	P7G	N9-C8-N7	4.30	109.53	103.38
4	5	3629	B8K	C72-C71-N7	4.28	125.29	118.86
4	5	1614	I4U	C5-C4-N3	-4.27	118.41	124.91
4	5	1632	PSU	C4-N3-C2	-4.25	120.22	126.34
4	5	3631	BGH	N9-C4-N3	4.23	131.79	125.47
4	5	3514	5MC	C5-C6-N1	-4.22	119.00	123.34
4	5	4382	PSU	C4-N3-C2	-4.21	120.27	126.34
4	5	4149	PSU	C4-N3-C2	-4.19	120.30	126.34
4	5	4196	PSU	C4-N3-C2	-4.14	120.38	126.34
4	5	4246	PSU	C4-N3-C2	-4.14	120.38	126.34
4	5	4039	PSU	C4-N3-C2	-4.13	120.39	126.34

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	5	1638	PSU	C4-N3-C2	-4.11	120.42	126.34
4	5	1560	7MG	C5-C4-N3	-4.10	120.32	128.13
4	5	2365	7MG	C2-N3-C4	4.08	119.57	112.30
4	5	4374	PSU	C4-N3-C2	-4.04	120.52	126.34
4	5	4277	PSU	C4-N3-C2	-4.00	120.57	126.34
4	5	4188	PSU	C4-N3-C2	-3.99	120.59	126.34
4	5	1537	PSU	C4-N3-C2	-3.97	120.62	126.34
4	5	3455	A2M	N3-C2-N1	-3.92	122.55	128.68
4	5	3447	PSU	C4-N3-C2	-3.90	120.71	126.34
4	5	1266	1MA	N1-C2-N3	-3.90	121.47	126.02
4	5	2351	PSU	C4-N3-C2	-3.89	120.73	126.34
4	5	1489	A2M	N3-C2-N1	-3.87	122.63	128.68
4	5	3461	PSU	C4-N3-C2	-3.85	120.80	126.34
4	5	4269	A2M	N3-C2-N1	-3.84	122.67	128.68
4	5	398	A2M	N3-C2-N1	-3.83	122.69	128.68
4	5	4436	B8K	N9-C4-N3	3.83	131.20	125.47
4	5	3631	BGH	C5-C4-N3	-3.82	120.85	128.13
4	5	1479	A2M	N3-C2-N1	-3.81	122.73	128.68
4	5	1560	7MG	N9-C8-N7	3.77	108.76	103.38
4	5	3496	PSU	C4-N3-C2	-3.72	120.98	126.34
4	5	4161	1MA	N1-C2-N3	-3.72	121.69	126.02
4	5	1292	P4U	C5-C4-N3	-3.70	119.28	124.91
4	5	3557	A2M	N3-C2-N1	-3.66	122.95	128.68
4	5	3450	A2M	N3-C2-N1	-3.66	122.96	128.68
4	5	3629	B8K	N9-C4-N3	3.63	130.90	125.47
4	5	4436	B8K	C5-C4-N3	-3.62	121.23	128.13
4	5	4436	B8K	C6-C5-C4	-3.58	115.23	122.62
4	5	3629	B8K	C6-C5-C4	-3.57	115.25	122.62
4	5	3629	B8K	C5-C4-N3	-3.49	121.47	128.13
4	5	3514	5MC	C5-C4-N3	-3.44	117.96	121.67
4	5	4282	OMC	C2'-C1'-N1	-3.43	107.56	114.22
4	5	4149	PSU	C3'-C2'-C1'	3.41	105.60	101.64
4	5	1810	A2M	N3-C2-N1	-3.38	123.40	128.68
4	5	1799	B8H	O2-C2-N1	-3.36	119.09	122.87
4	5	1638	PSU	O2-C2-N1	-3.35	119.10	122.79
4	5	4277	PSU	O2-C2-N1	-3.35	119.11	122.79
4	5	3612	P7G	C6-C5-N7	3.33	136.31	130.85
4	5	4042	B8H	O2-C2-N1	-3.32	119.13	122.87
4	5	1266	1MA	C5-C6-N1	3.32	118.84	113.90
4	5	4101	E6G	C2-N1-C6	3.30	121.39	116.08
4	5	4161	1MA	C5-C6-N1	3.30	118.82	113.90
4	5	4188	PSU	O2-C2-N1	-3.30	119.16	122.79

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	5	4149	PSU	O2-C2-N1	-3.27	119.19	122.79
4	5	4374	PSU	O2-C2-N1	-3.26	119.20	122.79
4	5	4246	PSU	O2-C2-N1	-3.26	119.20	122.79
4	5	3461	PSU	O2-C2-N1	-3.25	119.22	122.79
4	5	1848	P7G	C6-C5-N7	3.23	136.14	130.85
4	5	4039	PSU	O2-C2-N1	-3.22	119.24	122.79
4	5	3631	BGH	C6-C5-C4	-3.21	116.01	122.62
4	5	4196	PSU	O2-C2-N1	-3.21	119.26	122.79
4	5	1537	PSU	O2-C2-N1	-3.19	119.28	122.79
4	5	4382	PSU	C5-C6-N1	-3.19	117.33	122.11
4	5	3496	PSU	O2-C2-N1	-3.16	119.31	122.79
4	5	1632	PSU	O2-C2-N1	-3.13	119.35	122.79
4	5	3447	PSU	O2-C2-N1	-3.10	119.38	122.79
4	5	4052	OMU	C5-C4-N3	3.09	119.46	114.84
4	5	4196	PSU	C5-C6-N1	-3.06	117.52	122.11
4	5	1632	PSU	C5-C6-N1	-3.05	117.54	122.11
4	5	3494	B8H	O2-C2-N1	-3.04	119.45	122.87
4	5	4366	OMU	C5-C4-N3	3.03	119.37	114.84
4	5	2351	PSU	O2-C2-N1	-3.01	119.48	122.79
4	5	2616	OMG	C8-N7-C5	2.98	108.68	102.99
4	5	4382	PSU	O2-C2-N1	-2.98	119.51	122.79
4	5	4383	OMG	C8-N7-C5	2.98	108.66	102.99
4	5	3631	BGH	C2'-C1'-N9	-2.98	108.09	114.14
4	5	4369	OMG	C8-N7-C5	2.97	108.65	102.99
4	5	4240	OMG	C8-N7-C5	2.96	108.62	102.99
4	5	1477	OMG	C8-N7-C5	2.95	108.62	102.99
4	5	1266	1MA	C8-N7-C5	2.94	108.59	102.99
4	5	3524	OMG	C8-N7-C5	2.93	108.58	102.99
4	5	4161	1MA	C8-N7-C5	2.92	108.55	102.99
4	5	4277	PSU	C5-C6-N1	-2.91	117.75	122.11
4	5	1260	OMG	C8-N7-C5	2.87	108.45	102.99
4	5	4374	PSU	C5-C6-N1	-2.86	117.82	122.11
4	5	1270	A2M	N3-C2-N1	-2.86	124.21	128.68
4	5	4039	PSU	C5-C6-N1	-2.86	117.82	122.11
4	5	2207	OMG	C8-N7-C5	2.86	108.43	102.99
4	5	4246	PSU	C5-C6-N1	-2.84	117.84	122.11
4	5	1560	7MG	C6-C5-N7	2.83	136.37	131.91
4	5	1638	PSU	C5-C6-N1	-2.77	117.96	122.11
4	5	4188	PSU	C5-C6-N1	-2.76	117.97	122.11
4	5	4052	OMU	O4-C4-C5	-2.76	120.31	125.16
4	5	2365	7MG	C5-C6-N1	2.75	115.84	110.99
4	5	1560	7MG	C6-C5-C4	-2.71	117.02	122.62

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	5	4052	OMU	O2-C2-N1	-2.71	119.18	122.79
4	5	3447	PSU	C5-C6-N1	-2.70	118.06	122.11
4	5	2351	PSU	C5-C6-N1	-2.70	118.06	122.11
4	5	4366	OMU	O2-C2-N1	-2.69	119.21	122.79
4	5	4383	OMG	C5-C6-N1	2.67	118.67	113.95
4	5	1537	PSU	C5-C6-N1	-2.66	118.12	122.11
4	5	4116	OMG	C5-C6-N1	2.63	118.59	113.95
4	5	4366	OMU	C5-C6-N1	-2.59	117.46	121.81
4	5	2365	7MG	C5-C4-N9	-2.59	102.99	106.35
4	5	4366	OMU	O4-C4-C5	-2.58	120.62	125.16
4	5	1560	7MG	O6-C6-C5	-2.58	121.21	127.54
4	5	1477	OMG	C5-C6-N1	2.58	118.51	113.95
4	5	1848	P7G	C5-C4-N3	-2.58	119.45	124.00
4	5	3524	OMG	C5-C6-N1	2.57	118.48	113.95
4	5	4369	OMG	C5-C6-N1	2.54	118.44	113.95
4	5	2616	OMG	C5-C6-N1	2.52	118.41	113.95
4	5	3612	P7G	C5-C4-N3	-2.52	119.57	124.00
4	5	4052	OMU	C5-C6-N1	-2.51	117.60	121.81
4	5	1736	E7G	O6-C6-C5	-2.50	121.41	127.54
4	5	1270	A2M	C4-C5-N7	-2.48	106.81	109.40
4	5	2207	OMG	C5-C6-N1	2.47	118.32	113.95
4	5	3461	PSU	C5-C6-N1	-2.47	118.41	122.11
4	5	4240	OMG	C5-C6-N1	2.47	118.31	113.95
4	5	1260	OMG	C5-C6-N1	2.44	118.27	113.95
4	5	4193	5MC	C5-C4-N3	-2.39	119.09	121.67
4	5	1736	E7G	C6-C5-N7	2.38	135.73	131.67
4	5	1810	A2M	C4-C5-N7	-2.35	106.95	109.40
4	5	2365	7MG	O6-C6-C5	-2.35	121.77	127.54
4	5	2267	OMG	C5-C6-N1	2.35	118.10	113.95
4	5	2704	OMC	O2-C2-N3	-2.35	118.51	122.33
4	5	4116	OMG	C8-N7-C5	2.33	107.43	102.99
4	5	2265	OMC	O2-C2-N3	-2.33	118.54	122.33
4	5	1479	A2M	C3'-C2'-C1'	2.32	107.25	102.89
4	5	4383	OMG	C2-N1-C6	-2.32	120.83	125.10
4	5	4188	PSU	O4'-C1'-C2'	2.31	108.40	105.14
4	5	1580	OMG	C5-C6-N1	2.31	118.03	113.95
4	5	1736	E7G	C6-C5-C4	-2.30	117.89	122.62
4	5	2365	7MG	O4'-C1'-N9	2.28	112.40	109.30
4	5	3514	5MC	O2-C2-N3	-2.27	118.63	122.33
4	5	3524	OMG	C2-N1-C6	-2.27	120.92	125.10
4	5	3433	OMC	C5-C6-N1	-2.24	118.05	121.81
4	5	1292	P4U	C41-O4-C4	-2.24	112.68	117.24

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	5	4193	5MC	C3'-C2'-C1'	2.24	105.69	101.43
4	5	2207	OMG	C2-N1-C6	-2.24	120.97	125.10
4	5	2208	OMC	O2-C2-N3	-2.24	118.69	122.33
4	5	2647	OMC	O2-C2-N3	-2.24	118.69	122.33
4	5	3496	PSU	C5-C6-N1	-2.24	118.75	122.11
4	5	4369	OMG	C2-N1-C6	-2.22	121.01	125.10
4	5	1580	OMG	C8-N7-C5	2.21	107.20	102.99
4	5	1477	OMG	C2-N1-C6	-2.21	121.02	125.10
4	5	2267	OMG	C8-N7-C5	2.20	107.19	102.99
4	5	4276	UR3	C1'-N1-C2	2.20	120.70	116.99
4	5	4116	OMG	O6-C6-C5	-2.20	120.08	124.37
4	5	2616	OMG	C2-N1-C6	-2.19	121.06	125.10
4	5	3601	OMC	O2-C2-N3	-2.19	118.77	122.33
4	5	4149	PSU	C5-C6-N1	-2.19	118.83	122.11
4	5	4240	OMG	C2-N1-C6	-2.19	121.07	125.10
4	5	2208	OMC	N1-C2-N3	2.18	122.78	118.81
4	5	1736	E7G	C8-N7-C71	2.18	125.68	120.50
4	5	4101	E6G	C5-C6-N1	-2.17	119.12	123.26
4	5	2704	OMC	N1-C2-N3	2.17	122.76	118.81
4	5	1260	OMG	C2-N1-C6	-2.15	121.14	125.10
4	5	1736	E7G	C2-N1-C6	-2.10	121.27	125.10
4	5	2265	OMC	N1-C2-N3	2.10	122.62	118.81
4	5	3619	OMC	N1-C2-N3	2.09	122.62	118.81
4	5	3631	BGH	C2-N1-C6	-2.09	121.29	125.10
4	5	2647	OMC	N1-C2-N3	2.09	122.61	118.81
4	5	3601	OMC	N1-C2-N3	2.09	122.61	118.81
4	5	4382	PSU	O4'-C1'-C2'	2.08	108.08	105.14
4	5	3433	OMC	N1-C2-N3	2.08	122.59	118.81
4	5	3496	PSU	O4'-C1'-C2'	2.06	108.06	105.14
4	5	3619	OMC	O2-C2-N3	-2.06	118.98	122.33
4	5	3619	OMC	C5-C6-N1	-2.03	118.42	121.81
4	5	4246	PSU	O4'-C1'-C2'	2.01	107.98	105.14

There are no chirality outliers.

All (100) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	5	1260	OMG	C1'-C2'-O2'-CM2
4	5	1270	A2M	C1'-C2'-O2'-CM'
4	5	1292	P4U	N3-C4-O4-C41
4	5	1292	P4U	C3'-C4'-C5'-O5'
4	5	1292	P4U	O4'-C4'-C5'-O5'

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms
4	5	1537	PSU	C3'-C4'-C5'-O5'
4	5	1537	PSU	O4'-C4'-C5'-O5'
4	5	1632	PSU	C2'-C1'-C5-C6
4	5	1736	E7G	O4'-C4'-C5'-O5'
4	5	2207	OMG	C1'-C2'-O2'-CM2
4	5	2265	OMC	C1'-C2'-O2'-CM2
4	5	2267	OMG	O4'-C4'-C5'-O5'
4	5	2267	OMG	C3'-C4'-C5'-O5'
4	5	2616	OMG	C1'-C2'-O2'-CM2
4	5	2647	OMC	C1'-C2'-O2'-CM2
4	5	2704	OMC	C1'-C2'-O2'-CM2
4	5	3433	OMC	C2'-C1'-N1-C2
4	5	3433	OMC	C2'-C1'-N1-C6
4	5	3461	PSU	C3'-C4'-C5'-O5'
4	5	3461	PSU	O4'-C4'-C5'-O5'
4	5	3494	B8H	O4'-C4'-C5'-O5'
4	5	3496	PSU	C3'-C4'-C5'-O5'
4	5	3496	PSU	O4'-C4'-C5'-O5'
4	5	3524	OMG	O4'-C4'-C5'-O5'
4	5	3557	A2M	C1'-C2'-O2'-CM'
4	5	3612	P7G	O4'-C4'-C5'-O5'
4	5	3629	B8K	O4'-C4'-C5'-O5'
4	5	3631	BGH	C3'-C4'-C5'-O5'
4	5	4052	OMU	C1'-C2'-O2'-CM2
4	5	4052	OMU	C3'-C4'-C5'-O5'
4	5	4101	E6G	C5-C6-O6-C61
4	5	4101	E6G	N1-C6-O6-C61
4	5	4116	OMG	C1'-C2'-O2'-CM2
4	5	4149	PSU	O4'-C1'-C5-C4
4	5	4149	PSU	O4'-C1'-C5-C6
4	5	4193	5MC	C2'-C1'-N1-C6
4	5	4196	PSU	C2'-C1'-C5-C4
4	5	4196	PSU	O4'-C4'-C5'-O5'
4	5	4246	PSU	C3'-C4'-C5'-O5'
4	5	4246	PSU	O4'-C4'-C5'-O5'
4	5	4269	A2M	O4'-C4'-C5'-O5'
4	5	4282	OMC	C1'-C2'-O2'-CM2
4	5	4366	OMU	C1'-C2'-O2'-CM2
4	5	4369	OMG	C1'-C2'-O2'-CM2
4	5	4382	PSU	C3'-C4'-C5'-O5'
4	5	4383	OMG	O4'-C4'-C5'-O5'
4	5	4383	OMG	C1'-C2'-O2'-CM2

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms
17	m	72	MLZ	C-CA-CB-CG
4	5	1736	E7G	C3'-C4'-C5'-O5'
4	5	3524	OMG	C3'-C4'-C5'-O5'
4	5	3612	P7G	C3'-C4'-C5'-O5'
4	5	3629	B8K	C3'-C4'-C5'-O5'
4	5	4039	PSU	C3'-C4'-C5'-O5'
4	5	4196	PSU	C3'-C4'-C5'-O5'
4	5	4269	A2M	C3'-C4'-C5'-O5'
4	5	4382	PSU	O4'-C4'-C5'-O5'
4	5	4383	OMG	C3'-C4'-C5'-O5'
4	5	1292	P4U	O4-C41-C42-C43
4	5	3494	B8H	C3'-C4'-C5'-O5'
4	5	3631	BGH	O4'-C4'-C5'-O5'
4	5	4039	PSU	O4'-C4'-C5'-O5'
4	5	4240	OMG	O4'-C4'-C5'-O5'
4	5	4240	OMG	C3'-C4'-C5'-O5'
4	5	4193	5MC	C2'-C1'-N1-C2
4	5	1736	E7G	C72-C71-N7-C8
4	5	4052	OMU	O4'-C4'-C5'-O5'
4	5	4101	E6G	C62-C61-O6-C6
4	5	4161	1MA	C3'-C4'-C5'-O5'
4	5	2207	OMG	O4'-C4'-C5'-O5'
4	5	1479	A2M	C3'-C4'-C5'-O5'
4	5	4246	PSU	C4'-C5'-O5'-P
4	5	1489	A2M	C3'-C2'-O2'-CM'
4	5	4240	OMG	C3'-C2'-O2'-CM2
4	5	4193	5MC	O4'-C1'-N1-C6
4	5	1270	A2M	C4'-C5'-O5'-P
4	5	1489	A2M	C4'-C5'-O5'-P
4	5	3433	OMC	O4'-C1'-N1-C2
4	5	3629	B8K	C4'-C5'-O5'-P
4	5	4193	5MC	O4'-C1'-N1-C2
4	5	1270	A2M	C3'-C4'-C5'-O5'
4	5	3433	OMC	O4'-C1'-N1-C6
4	5	3496	PSU	C4'-C5'-O5'-P
4	5	4269	A2M	C3'-C2'-O2'-CM'
4	5	2265	OMC	O4'-C4'-C5'-O5'
4	5	4282	OMC	C3'-C4'-C5'-O5'
4	5	4042	B8H	O4'-C1'-C5-C4
4	5	4196	PSU	O4'-C1'-C5-C4
4	5	4246	PSU	O4'-C1'-C5-C4
4	5	398	A2M	O4'-C4'-C5'-O5'

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms
4	5	1632	PSU	O4'-C1'-C5-C6
4	5	4042	B8H	O4'-C1'-C5-C6
4	5	4196	PSU	O4'-C1'-C5-C6
4	5	4246	PSU	O4'-C1'-C5-C6
4	5	4382	PSU	O4'-C1'-C5-C6
4	5	2207	OMG	C3'-C4'-C5'-O5'
4	5	3612	P7G	C72-C71-N7-C8
4	5	1614	I4U	C42-C41-O4-C4
4	5	1479	A2M	O4'-C4'-C5'-O5'
4	5	1489	A2M	O4'-C4'-C5'-O5'
4	5	3619	OMC	C4'-C5'-O5'-P

There are no ring outliers.

No monomer is involved in short contacts.

5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 183 ligands modelled in this entry, 183 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.

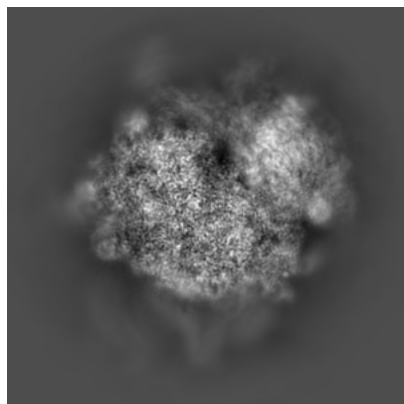
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-15860. These allow visual inspection of the internal detail of the map and identification of artifacts.

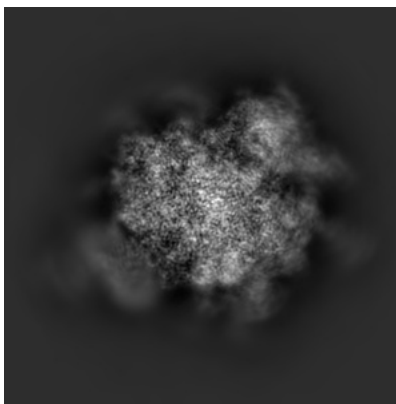
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

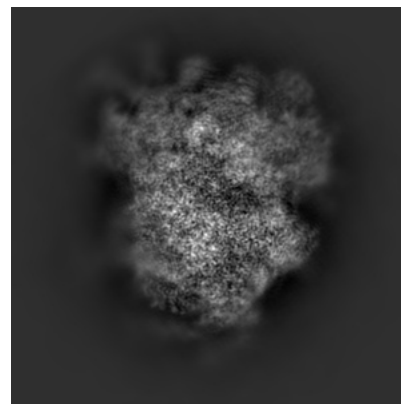
6.1.1 Primary map



X

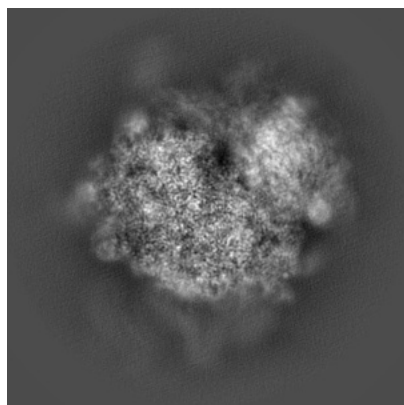


Y

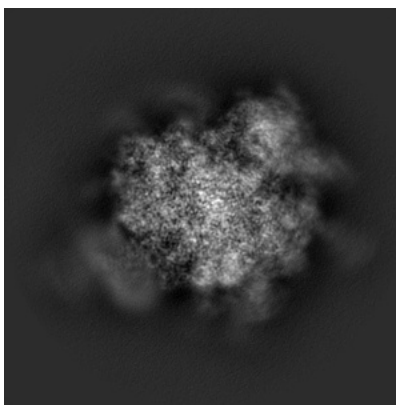


Z

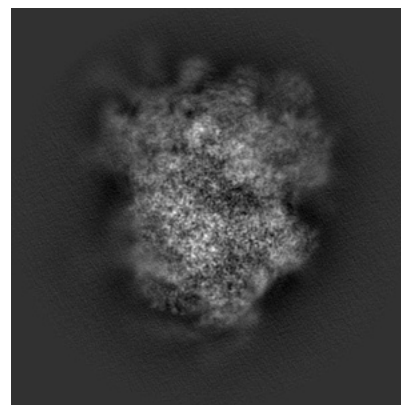
6.1.2 Raw map



X



Y

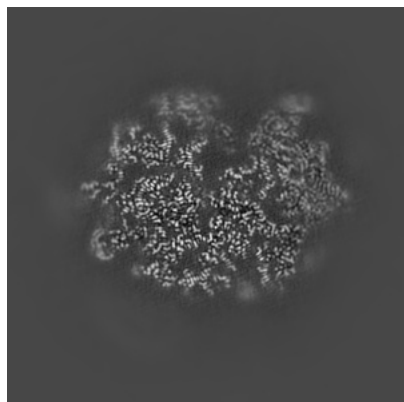


Z

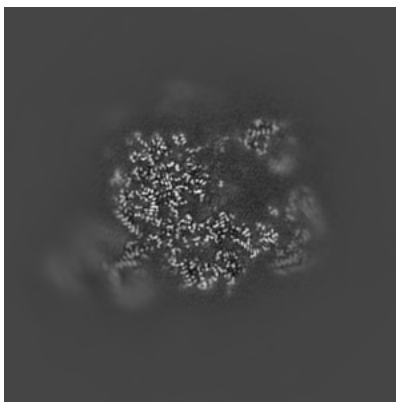
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

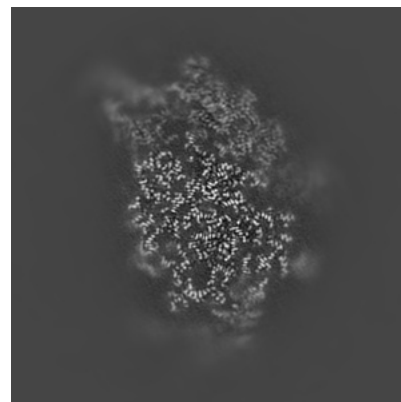
6.2.1 Primary map



X Index: 176

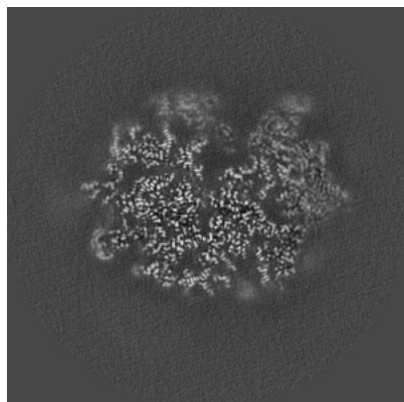


Y Index: 176

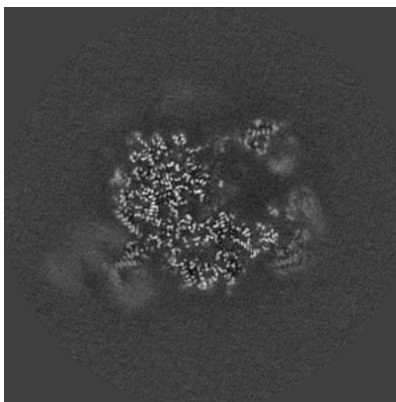


Z Index: 176

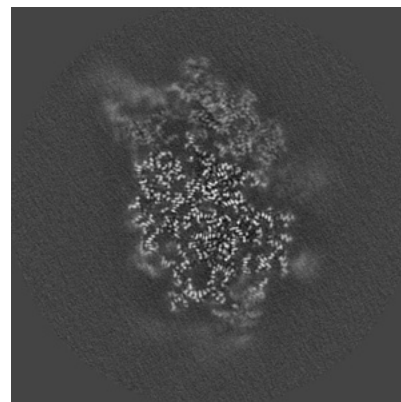
6.2.2 Raw map



X Index: 176



Y Index: 176

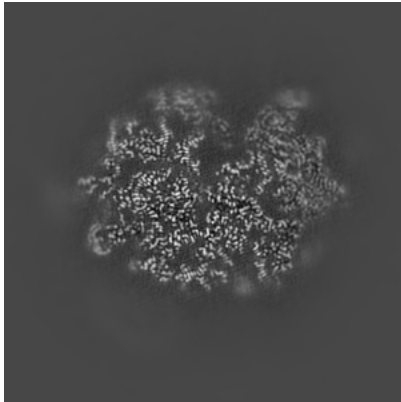


Z Index: 176

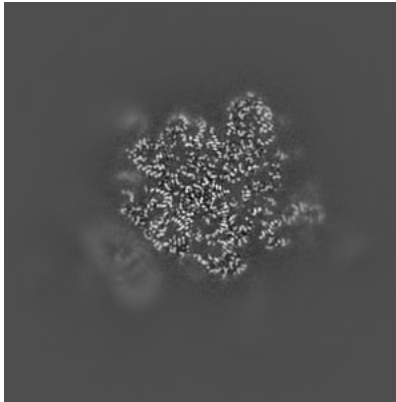
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

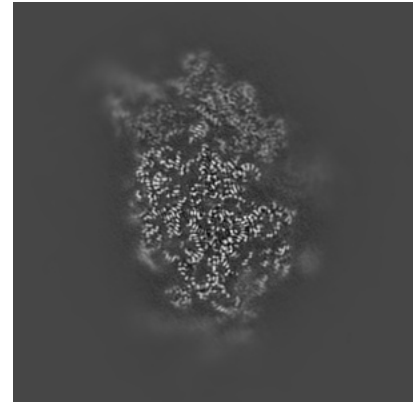
6.3.1 Primary map



X Index: 176

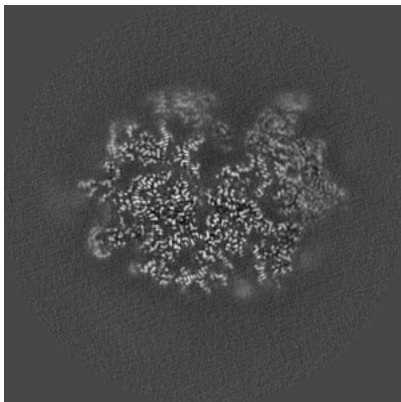


Y Index: 147

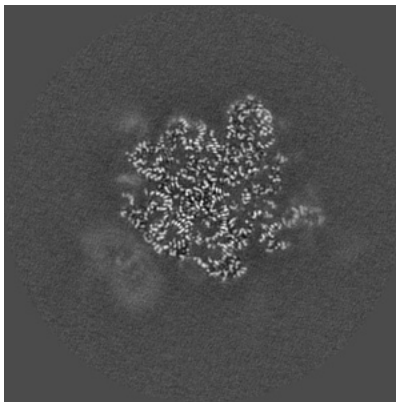


Z Index: 179

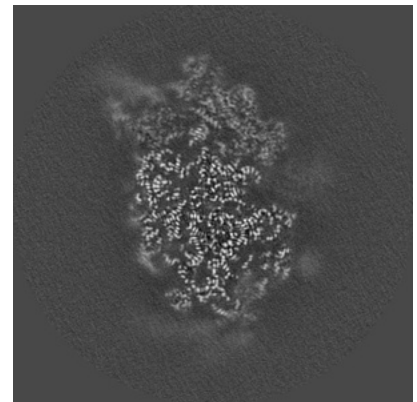
6.3.2 Raw map



X Index: 176



Y Index: 147

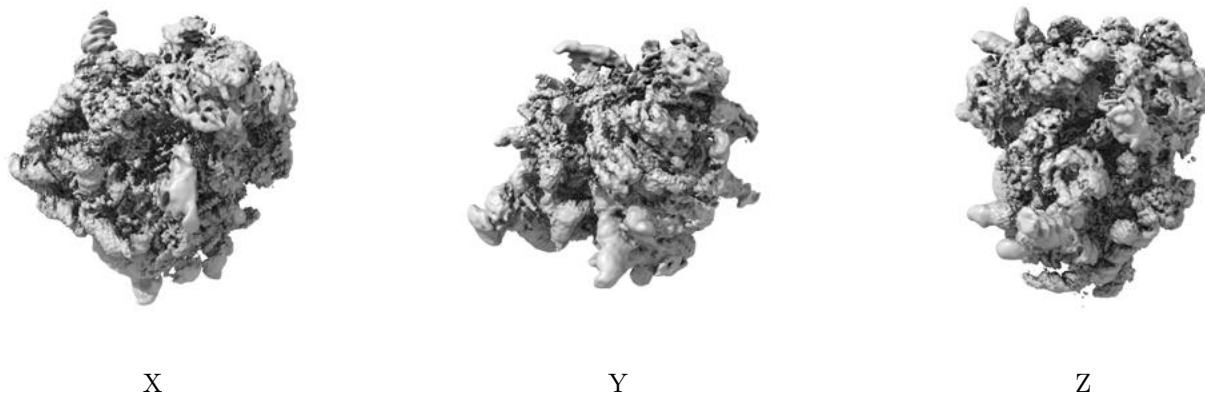


Z Index: 179

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

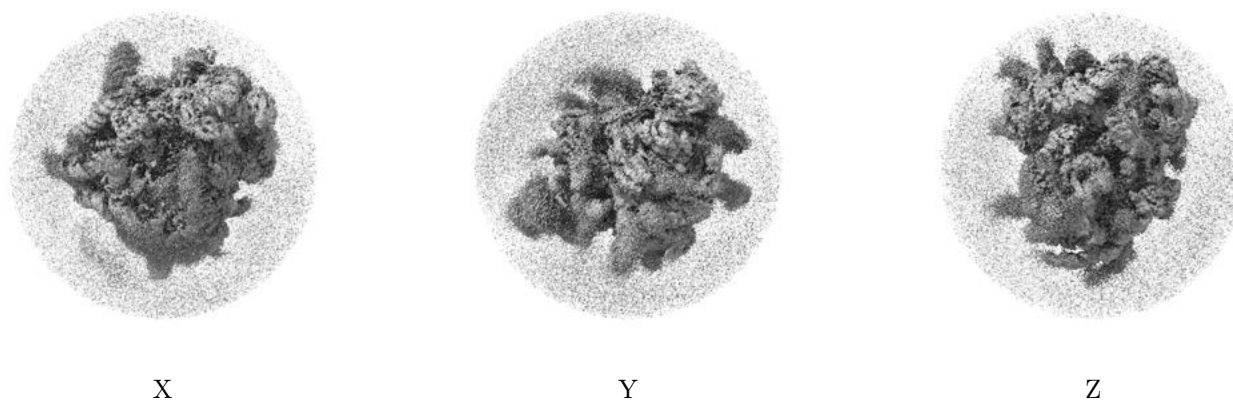
6.4 Orthogonal surface views [i](#)

6.4.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.01527. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.4.2 Raw map



These images show the 3D surface of the raw map. The raw map's contour level was selected so that its surface encloses the same volume as the primary map does at its recommended contour level.

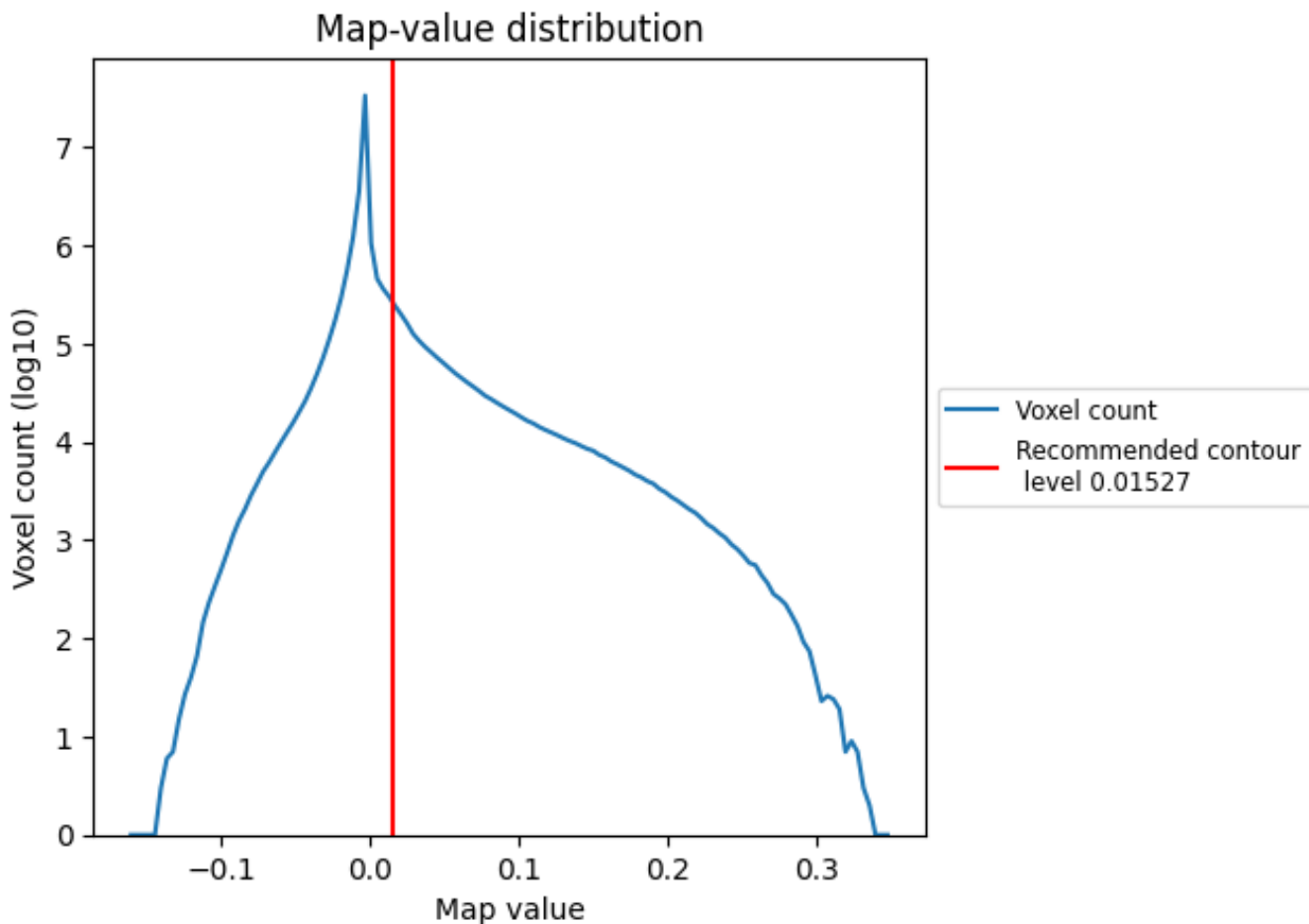
6.5 Mask visualisation [i](#)

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

7 Map analysis [i](#)

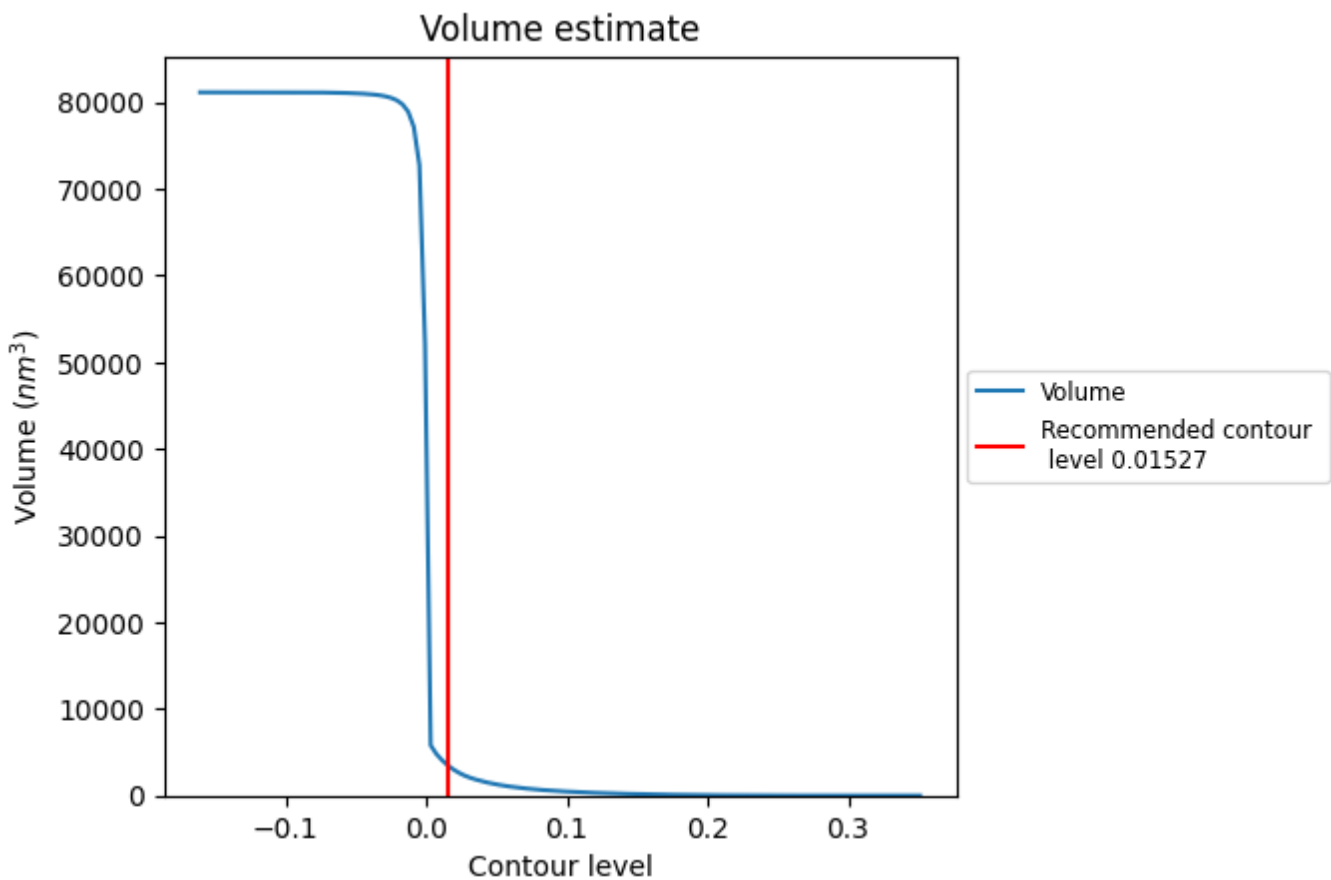
This section contains the results of statistical analysis of the map.

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.

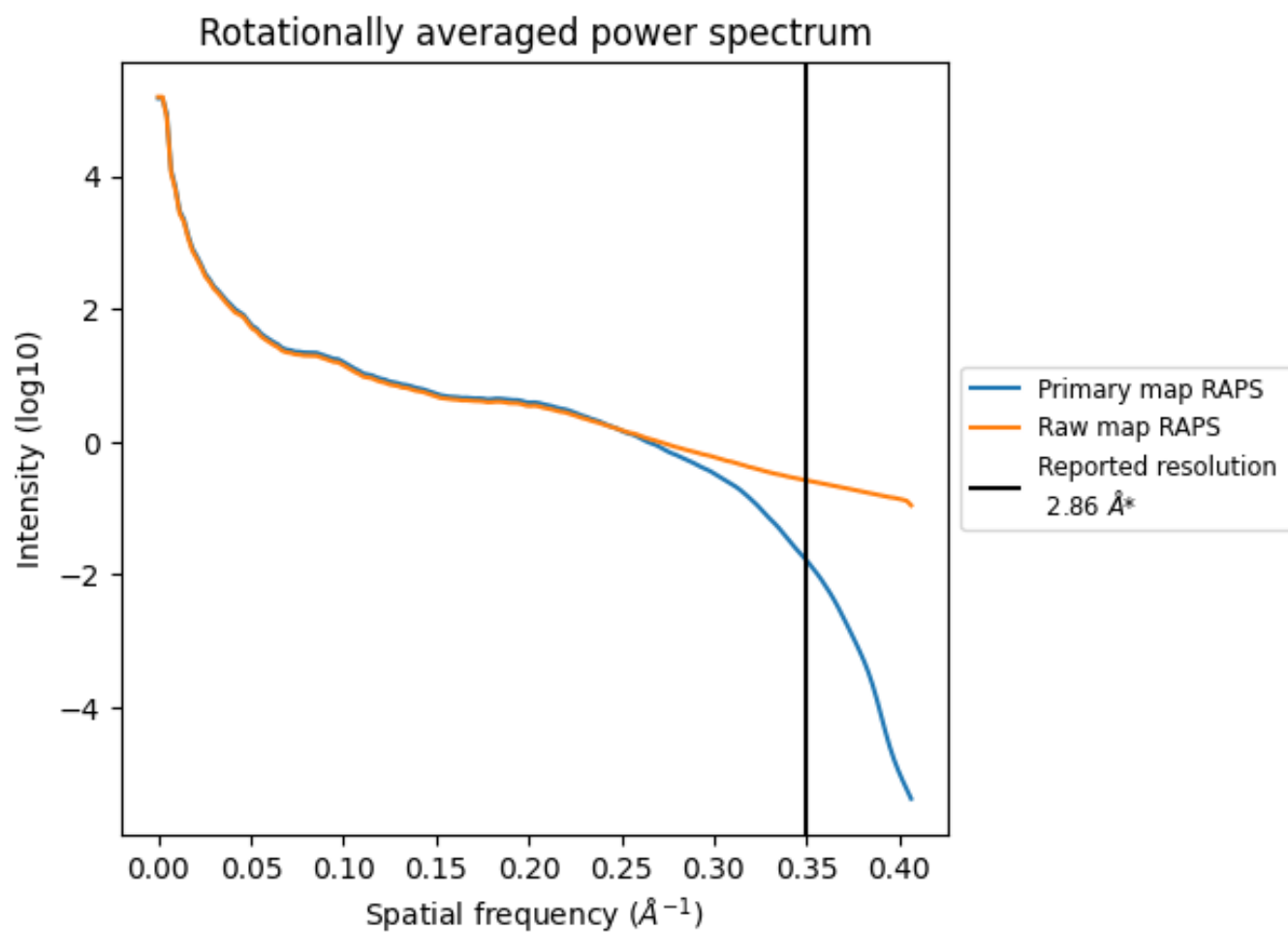
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 3499 nm³; this corresponds to an approximate mass of 3161 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

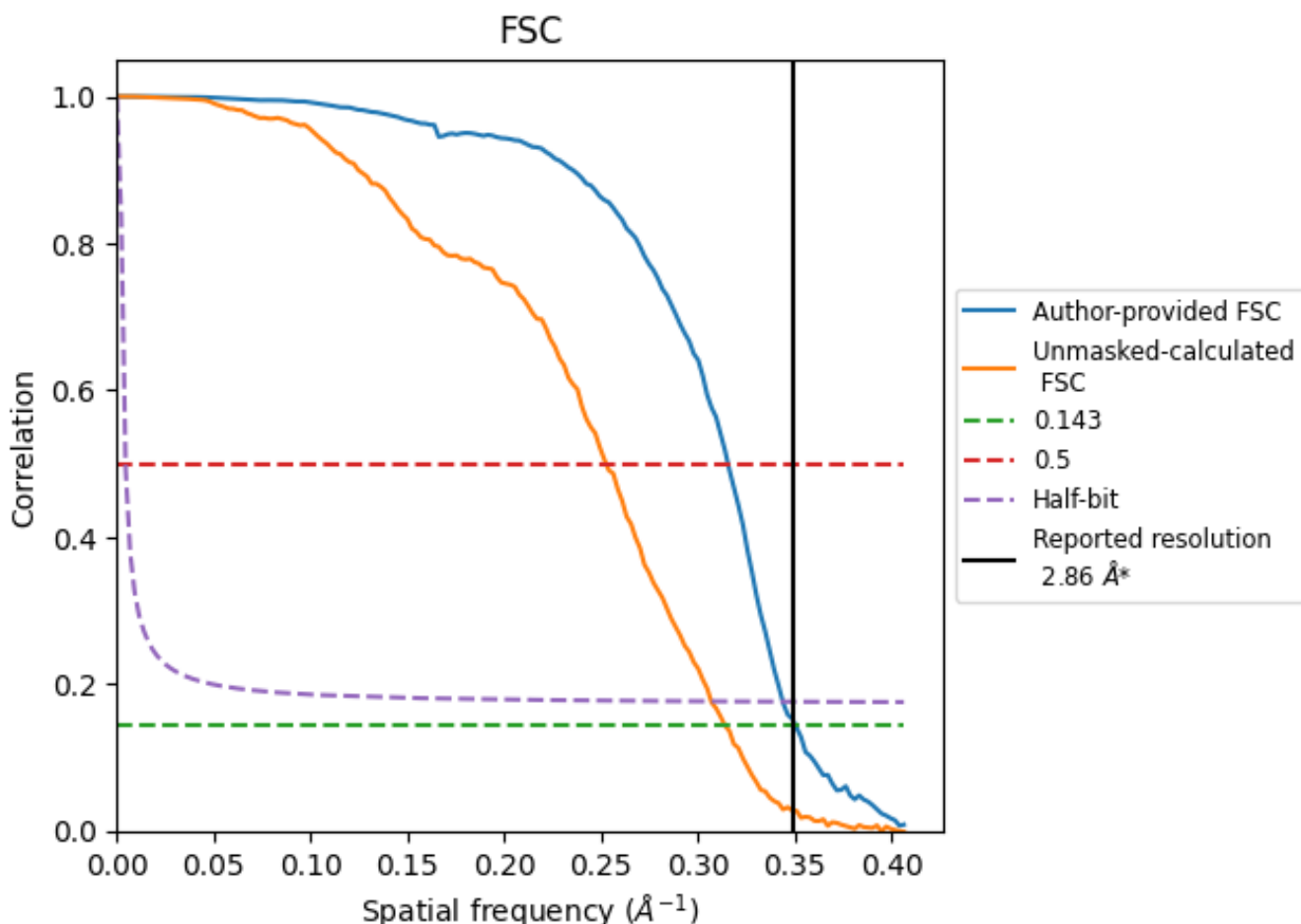


*Reported resolution corresponds to spatial frequency of 0.350 Å⁻¹

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 0.350 Å⁻¹

8.2 Resolution estimates [i](#)

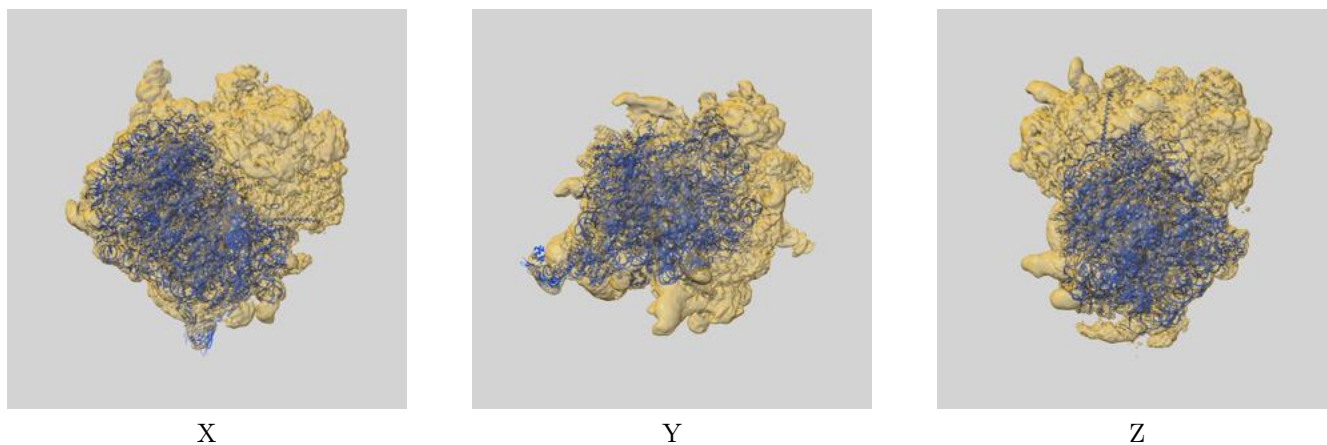
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	2.86	-	-
Author-provided FSC curve	2.85	3.17	2.91
Unmasked-calculated*	3.18	3.96	3.26

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 3.18 differs from the reported value 2.86 by more than 10 %

9 Map-model fit [i](#)

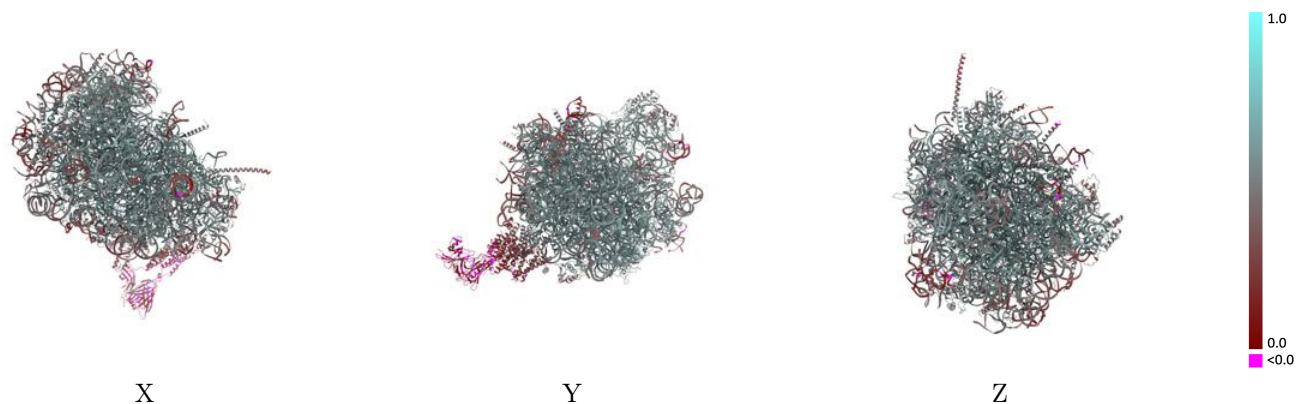
This section contains information regarding the fit between EMDB map EMD-15860 and PDB model 8B5L. Per-residue inclusion information can be found in section 3 on page 14.

9.1 Map-model overlay [i](#)



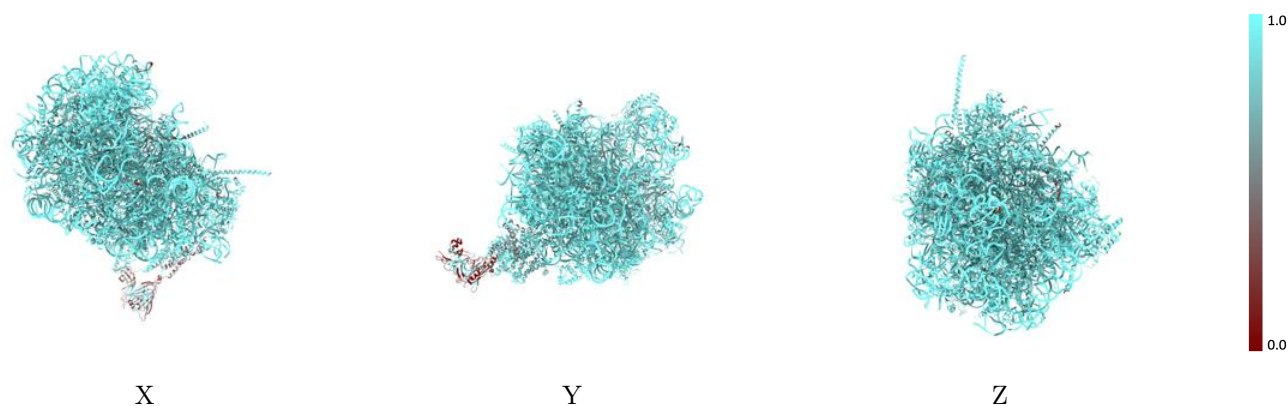
The images above show the 3D surface view of the map at the recommended contour level 0.01527 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



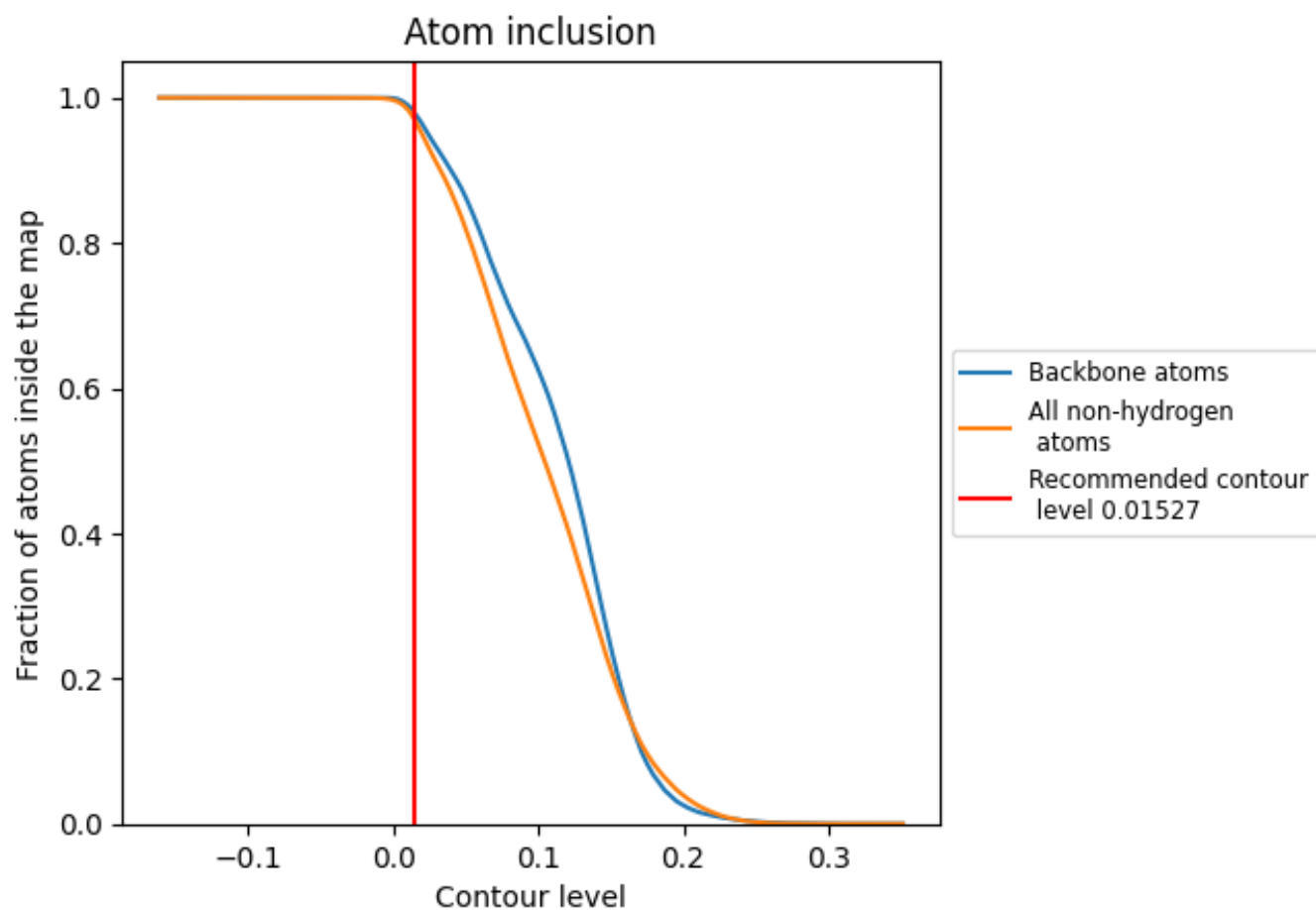
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.01527).







































































9.4 Atom inclusion [i](#)



At the recommended contour level, 98% of all backbone atoms, 97% 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 (0.01527) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.9682	 0.5050
5	 0.9935	 0.5160
7	 0.9992	 0.5490
8	 0.9947	 0.5370
A	 0.9777	 0.5760
B	 0.9845	 0.5590
C	 0.9799	 0.5560
D	 0.9862	 0.5150
E	 0.9839	 0.5230
F	 0.9713	 0.5520
G	 0.9721	 0.4900
H	 0.9824	 0.5390
I	 0.9752	 0.5550
J	 0.9727	 0.4730
K	 0.4630	 0.0490
L	 0.9547	 0.5200
M	 0.9873	 0.5320
N	 0.9858	 0.5850
O	 0.9873	 0.5570
P	 0.9760	 0.5630
Q	 0.9710	 0.5660
R	 0.9598	 0.5060
S	 0.9815	 0.5610
T	 0.9715	 0.5440
U	 0.9722	 0.4550
V	 0.9791	 0.5710
W	 0.9764	 0.5550
X	 0.9511	 0.5350
Y	 0.9731	 0.5310
Z	 0.9851	 0.5230
a	 0.9752	 0.5690
b	 0.9460	 0.4790
c	 0.9556	 0.5170
d	 0.9673	 0.5430
e	 0.9764	 0.5790



Continued on next page...

Continued from previous page...

Chain	Atom inclusion	Q-score
f	 0.9786	 0.5840
g	 0.9598	 0.5530
h	 0.9632	 0.5290
i	 0.9724	 0.5190
j	 0.9822	 0.5800
k	 0.9461	 0.4820
l	 0.9625	 0.5570
m	 0.9688	 0.5630
n	 0.9128	 0.5070
o	 0.9804	 0.5620
p	 0.9623	 0.5610
q	 0.5000	 0.0890
r	 0.9864	 0.5540
s	 0.8718	 0.2790
t	 0.7413	 0.2090
u	 0.8956	 0.3230
v	 0.4588	 0.0720