



wwPDB EM Validation Summary Report ⓘ

Oct 14, 2024 – 01:50 PM JST

PDB ID : 6J6G
EMDB ID : EMD-0686
Title : Cryo-EM structure of the yeast B*-a2 complex at an average resolution of 3.2 angstrom
Authors : Wan, R.; Bai, R.; Yan, C.; Lei, J.; Shi, Y.
Deposited on : 2019-01-15
Resolution : 3.20 Å(reported)

This is a wwPDB EM Validation Summary 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.dev113
Mogul : 1.8.5 (274361), CSD as541be (2020)
MolProbity : 4.02b-467
buster-report : 1.1.7 (2018)
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ : 1.9.13
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.39

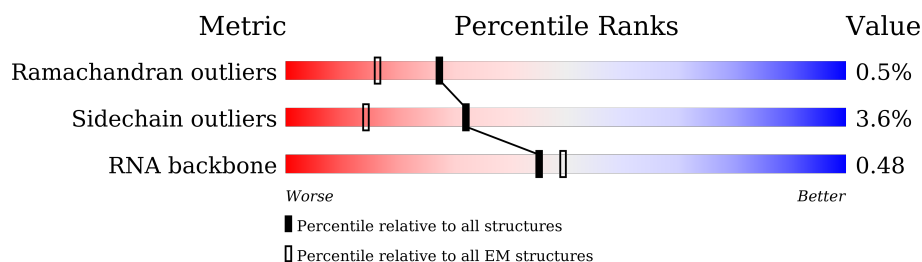
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 3.20 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.



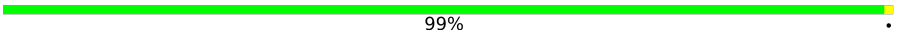


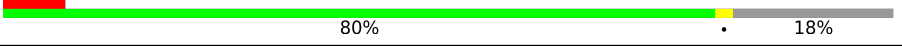



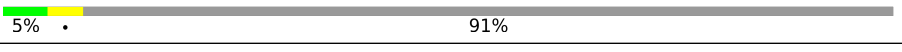


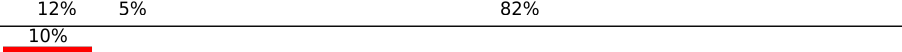



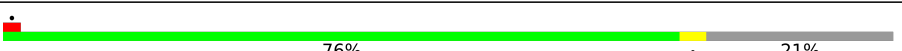




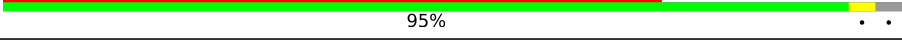
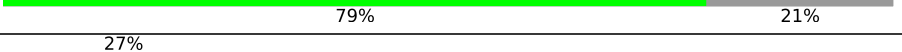

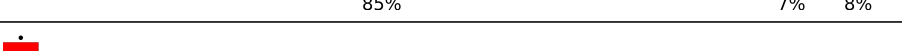
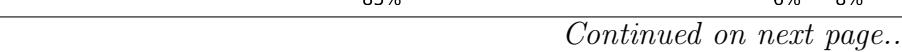

Metric	Whole archive (#Entries)	EM structures (#Entries)
Ramachandran outliers	207382	16835
Sidechain outliers	206894	16415
RNA backbone	6643	2191

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	A	2413	
2	C	1008	
3	J	135	
4	O	451	
5	P	379	
6	Q	364	
7	R	339	
8	S	175	

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Mol	Chain	Length	Quality of chain
9	T	157	
10	Z	577	
11	c	590	
12	d	687	
13	I	215	
14	n	455	
15	H	235	
16	B	679	
17	D	214	
18	E	112	
19	L	1175	
20	v	859	
21	a	111	
22	b	238	
23	t	175	
24	i	94	
24	u	94	
25	m	146	
25	z	146	
26	j	77	
26	x	77	
27	h	86	
27	w	86	
28	e	110	
28	g	110	

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Mol	Chain	Length	Quality of chain
29	k	196	
29	s	196	
30	l	101	
30	y	101	
31	o	503	
31	p	503	
31	q	503	
31	r	503	

2 Entry composition

There are 35 unique types of molecules in this entry. The entry contains 79042 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 Pre-mRNA-splicing factor 8.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	1913	Total	C	N	O	S	0	0
			15793	10154	2714	2868	57		

- Molecule 2 is a protein called Pre-mRNA-splicing factor SNU114.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	C	920	Total	C	N	O	S	0	0
			7348	4733	1223	1362	30		

- Molecule 3 is a protein called Pre-mRNA-splicing factor CWC21.

Mol	Chain	Residues	Atoms				AltConf	Trace
3	J	27	Total	C	N	O	0	0
			190	112	38	40		

- Molecule 4 is a protein called Pre-mRNA-splicing factor PRP46.

Mol	Chain	Residues	Atoms					AltConf	Trace
4	O	357	Total	C	N	O	S	0	0
			2810	1777	493	530	10		

- Molecule 5 is a protein called Pre-mRNA-processing protein 45.

Mol	Chain	Residues	Atoms					AltConf	Trace
5	P	205	Total	C	N	O	S	0	0
			1608	1003	294	304	7		

- Molecule 6 is a protein called Pre-mRNA-splicing factor SLT11.

Mol	Chain	Residues	Atoms					AltConf	Trace
6	Q	292	Total	C	N	O	S	0	0
			2301	1461	399	426	15		

- Molecule 7 is a protein called Pre-mRNA-splicing factor CWC2.

Mol	Chain	Residues	Atoms					AltConf	Trace
7	R	261	Total	C	N	O	S	0	0
			2089	1320	369	388	12		

- Molecule 8 is a protein called Pre-mRNA-splicing factor CWC15.

Mol	Chain	Residues	Atoms					AltConf	Trace
8	S	70	Total	C	N	O	S	0	0
			567	355	113	98	1		

- Molecule 9 is a protein called Pre-mRNA-splicing factor BUD31.

Mol	Chain	Residues	Atoms					AltConf	Trace
9	T	157	Total	C	N	O	S	0	0
			1291	808	240	232	11		

- Molecule 10 is a protein called Pre-mRNA-splicing factor CWC22.

Mol	Chain	Residues	Atoms					AltConf	Trace
10	Z	447	Total	C	N	O	S	0	0
			3651	2343	602	688	18		

- Molecule 11 is a protein called Pre-mRNA-splicing factor CEF1.

Mol	Chain	Residues	Atoms					AltConf	Trace
11	c	436	Total	C	N	O	S	0	0
			2978	1843	552	575	8		

- Molecule 12 is a protein called Pre-mRNA-splicing factor CLF1.

Mol	Chain	Residues	Atoms					AltConf	Trace
12	d	566	Total	C	N	O	S	0	0
			3881	2433	707	732	9		

- Molecule 13 is a protein called Pre-mRNA-splicing factor SYF2.

Mol	Chain	Residues	Atoms					AltConf	Trace
13	I	102	Total	C	N	O	S	0	0
			822	504	152	165	1		

- Molecule 14 is a protein called Pre-mRNA-processing factor 17.

Mol	Chain	Residues	Atoms						AltConf	Trace
14	n	299	Total	C	N	O	P	S	0	0
			1894	1175	340	372	1	6		

- Molecule 15 is a protein called Pre-mRNA-splicing factor ISY1.

Mol	Chain	Residues	Atoms					AltConf	Trace
15	H	70	Total	C	N	O	S	0	0
			617	390	115	111	1		

- Molecule 16 is a RNA chain called ACT1 pre-mRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
16	B	60	Total	C	N	O	P	0	0
			1266	567	213	426	60		

- Molecule 17 is a RNA chain called U5 snRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
17	D	179	Total	C	N	O	P	0	0
			3795	1699	660	1258	178		

- Molecule 18 is a RNA chain called U6 snRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
18	E	103	Total	C	N	O	P	0	0
			2192	982	391	716	103		

- Molecule 19 is a RNA chain called U2 snRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
19	L	208	Total	C	N	O	P	0	0
			4382	1962	732	1480	208		

- Molecule 20 is a protein called Pre-mRNA-splicing factor SYF1.

Mol	Chain	Residues	Atoms					AltConf	Trace
20	v	722	Total	C	N	O	S	0	0
			4625	2893	825	895	12		

- Molecule 21 is a protein called U2 small nuclear ribonucleoprotein B”.

Mol	Chain	Residues	Atoms				AltConf	Trace
21	a	84	Total	C	N	O	0	0
			416	248	84	84		

- Molecule 22 is a protein called U2 small nuclear ribonucleoprotein A'.

Mol	Chain	Residues	Atoms				AltConf	Trace
22	b	169	Total	C	N	O	0	0
			841	503	169	169		

- Molecule 23 is a protein called Pre-mRNA-splicing factor SNT309.

Mol	Chain	Residues	Atoms					AltConf	Trace
23	t	156	Total	C	N	O	S	0	0
			926	585	160	180	1		

- Molecule 24 is a protein called Small nuclear ribonucleoprotein E.

Mol	Chain	Residues	Atoms					AltConf	Trace
24	u	74	Total	C	N	O	S	0	0
			526	346	87	90	3		
24	i	74	Total	C	N	O	S	0	0
			541	358	90	90	3		

- Molecule 25 is a protein called Small nuclear ribonucleoprotein Sm D1.

Mol	Chain	Residues	Atoms					AltConf	Trace
25	m	119	Total	C	N	O	S	0	0
			917	575	163	176	3		
25	z	108	Total	C	N	O	S	0	0
			824	521	142	158	3		

- Molecule 26 is a protein called Small nuclear ribonucleoprotein G.

Mol	Chain	Residues	Atoms					AltConf	Trace
26	j	75	Total	C	N	O	S	0	0
			552	350	98	103	1		
26	x	75	Total	C	N	O	S	0	0
			552	350	98	103	1		

- Molecule 27 is a protein called Small nuclear ribonucleoprotein F.

Mol	Chain	Residues	Atoms					AltConf	Trace
27	h	68	Total	C	N	O	S	0	0
			518	337	96	84	1		
27	w	68	Total	C	N	O	S	0	0
			518	337	96	84	1		

- Molecule 28 is a protein called Small nuclear ribonucleoprotein Sm D2.

Mol	Chain	Residues	Atoms					AltConf	Trace
28	g	101	Total	C	N	O	S	0	0
			785	504	149	128	4		
28	e	101	Total	C	N	O	S	0	0
			785	504	149	128	4		

- Molecule 29 is a protein called Small nuclear ribonucleoprotein-associated protein B.

Mol	Chain	Residues	Atoms					AltConf	Trace
29	k	100	Total	C	N	O	S	0	0
			809	514	150	142	3		
29	s	93	Total	C	N	O	S	0	0
			749	476	138	132	3		

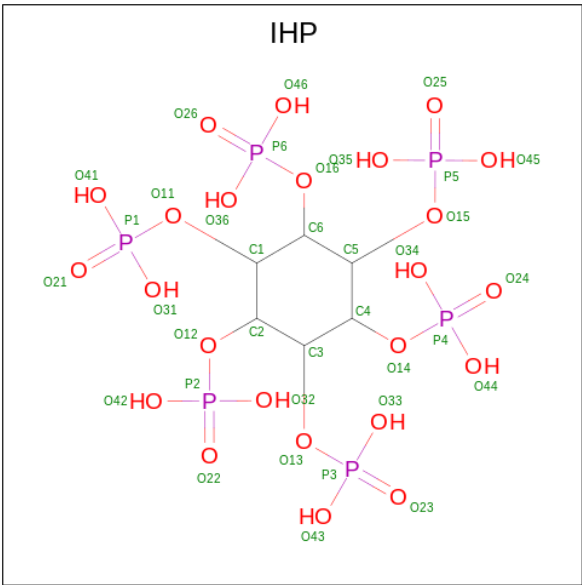
- Molecule 30 is a protein called Small nuclear ribonucleoprotein Sm D3.

Mol	Chain	Residues	Atoms					AltConf	Trace
30	l	83	Total	C	N	O	S	0	0
			641	408	111	120	2		
30	y	81	Total	C	N	O	S	0	0
			616	394	107	113	2		

- Molecule 31 is a protein called Pre-mRNA-processing factor 19.

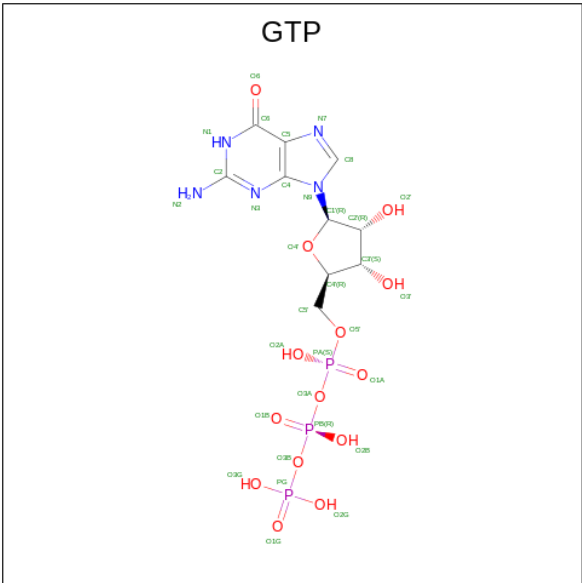
Mol	Chain	Residues	Atoms					AltConf	Trace
31	r	125	Total	C	N	O	S	0	0
			823	521	133	167	2		
31	p	128	Total	C	N	O	S	0	0
			843	532	136	173	2		
31	q	129	Total	C	N	O	S	0	0
			850	537	137	174	2		
31	o	126	Total	C	N	O	S	0	0
			830	525	134	169	2		

- Molecule 32 is INOSITOL HEXAKISPHOSPHATE (three-letter code: IHP) (formula: C₆H₁₈O₂₄P₆).



Mol	Chain	Residues	Atoms				AltConf
32	A	1	Total	C	O	P	0
			36	6	24	6	

- Molecule 33 is GUANOSINE-5'-TRIPHOSPHATE (three-letter code: GTP) (formula: $C_{10}H_{16}N_5O_{14}P_3$).



Mol	Chain	Residues	Atoms					AltConf
33	C	1	Total	C	N	O	P	0
			32	10	5	14	3	

- Molecule 34 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		AltConf
34	C	1	Total 1	Mg 1	0
34	E	5	Total 5	Mg 5	0

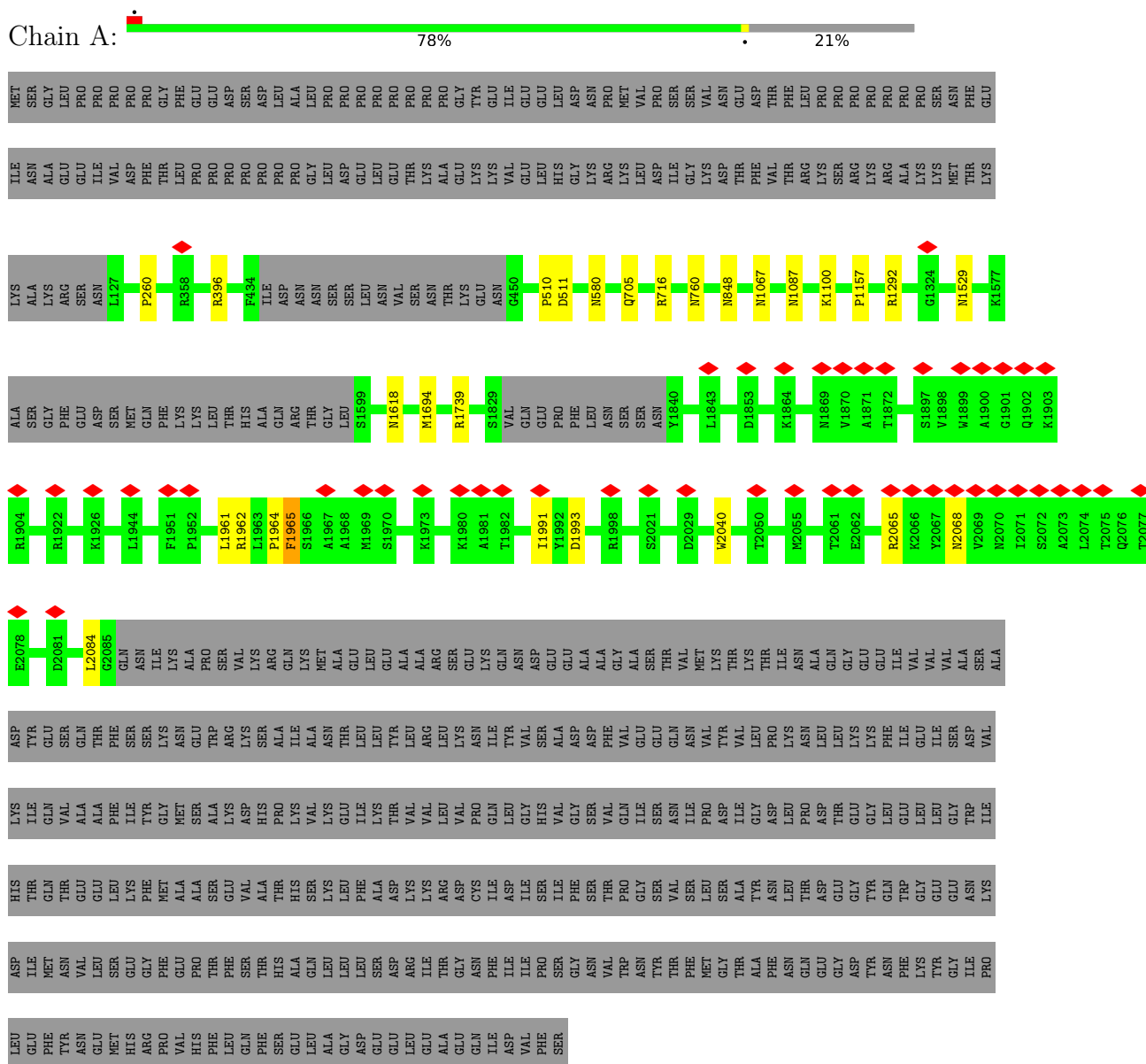
- Molecule 35 is ZINC ION (three-letter code: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		AltConf
35	Q	2	Total 2	Zn 2	0
35	R	1	Total 1	Zn 1	0
35	T	3	Total 3	Zn 3	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: Pre-mRNA-splicing factor 8



• Molecule 2: Pre-mRNA-splicing factor SNU114

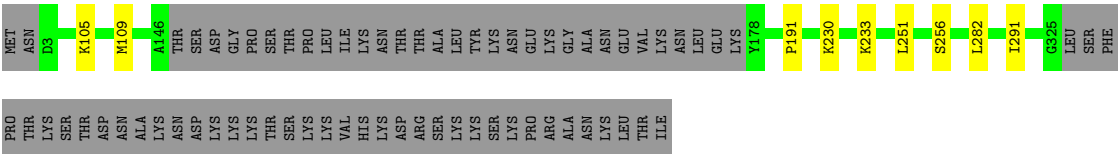
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GLU	MET
GLU	S2
GLU	N28
THR	ARG
LEU	ARG
SER	ARG
GLU	PRO
GLU	GLN
GLN	GLY
ILE	SER
ASP	GLN
LYS	GLN
LYS	GLN
CYS	ARG
GLU	GLN
ALA	GLN
LEU	ARG
LEU	GLN
ALA	ASN
LYS	ALA
LEU	ILE
THR	LYS
THR	LYS
GLU	ALA
TRP	SER
GLN	HIS
GLN	ASP
GLN	LYS
GLN	ALA
ARG	ARG
MET	ARG
SER	PRO
SER	LEU
LEU	ALA
TYR	VAL
THR	GLN
PRO	LYS
ARG	GLN
LYS	ILE
ALA	GLU
ARG	THR
LEU	HIS
THR	MET
GLU	GLU
GLU	LYS
GLN	ARG
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	VAL
	SER
	GLU
	LEU
	ARG
	ASP
	ARG
	TYR

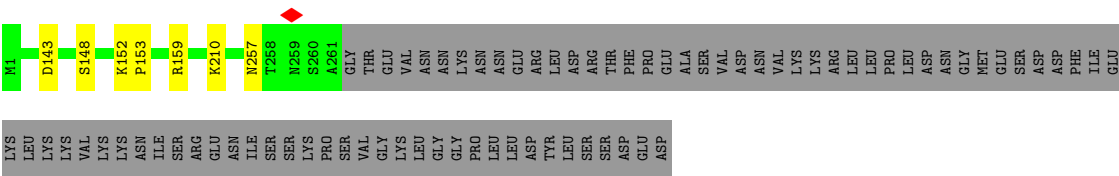
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Position	Residue	Conservation	Order
1	ALA	0.00	1
2	LYS	0.00	2
3	ARG	0.00	3
4	SER	0.00	4
5	ALA	0.00	5
6	SER	0.00	6
7	GLY	0.00	7
8	GLN	0.00	8
9	PRO	0.00	9
10	ASP	0.00	10
11	LEU	0.00	11
12	ILE	0.00	12
13	PRO	0.00	13
14	GLN	0.00	14
15	PHE	0.00	15
16	THR	0.00	16
17	LYS	0.00	17
18	ALA	0.00	18
19	GLU	0.00	19
20	THR	0.00	20
21	SER	0.00	21
22	ASP	0.00	22
23	GLY	0.00	23
24	ALA	0.00	24
25	ASN	0.00	25
26	ALA	0.00	26
27	ASN	0.00	27
28	SER	0.00	28
29	ASP	0.00	29
30	ALA	0.00	30
31	LYS	0.00	31
32	THR	0.00	32
33	ARG	0.00	33
34	THR	0.00	34
35	GLY	0.00	35
36	ARG	0.00	36
37	ASN	0.00	37
38	ASP	0.00	38
39	GLN	0.00	39
40	VAL	0.00	40
41	ALA	0.00	41
42	GLY	0.00	42
43	LEU	0.00	43
44	ASP	0.00	44
45	THR	0.00	45
46	GLY	0.00	46
47	ASP	0.00	47
48	ALA	0.00	48
49	GLY	0.00	49
50	THR	0.00	50
51	GLN	0.00	51
52	ASP	0.00	52
53	GLY	0.00	53
54	VAL	0.00	54
55	THR	0.00	55
56	GLN	0.00	56
57	ASP	0.00	57
58	GLY	0.00	58
59	ILE	0.00	59
60	THR	0.00	60
61	LYS	0.00	61
62	THR	0.00	62
63	ASN	0.00	63
64	VAL	0.00	64
65	ALA	0.00	65
66	VAL	0.00	66
67	ASN	0.00	67
68	VAL	0.00	68
69	LYS	0.00	69
70	LYS	0.00	70
71	ILE	0.00	71
72	GLU	0.00	72
73	GLY	0.00	73
74	THR	0.00	74
75	LYS	0.00	75
76	THR	0.00	76
77	ASN	0.00	77
78	VAL	0.00	78
79	ALA	0.00	79
80	GLY	0.00	80
81	ASP	0.00	81
82	LEU	0.00	82
83	LYS	0.00	83
84	THR	0.00	84
85	GLY	0.00	85
86	ASP	0.00	86
87	THR	0.00	87
88	ASN	0.00	88
89	ARG	0.00	89
90	ASP	0.00	90
91	ASN	0.00	91
92	VAL	0.00	92
93	ARG	0.00	93
94	GLY	0.00	94
95	THR	0.00	95
96	ASN	0.00	96
97	ASP	0.00	97
98	GLN	0.00	98
99	ALA	0.00	99
100	THR	0.00	100
101	GLY	0.00	101
102	GLN	0.00	102
103	PRO	0.00	103
104	THR	0.00	104
105	ALA	0.00	105
106	ILE	0.00	106
107	VAL	0.00	107
108	LYS	0.00	108
109	LYS	0.00	109
110	GLN	0.00	110
111	THR	0.00	111
112	SER	0.00	112
113	THR	0.00	113
114	THR	0.00	114
115	VAL	0.00	115
116	ASN	0.00	116
117	ASP	0.00	117
118			

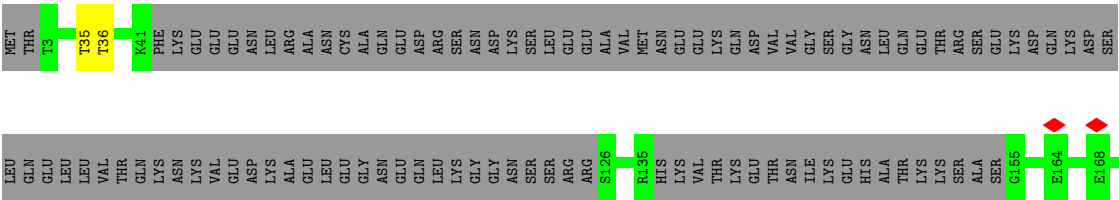




• Molecule 7: Pre-mRNA-splicing factor CWC2



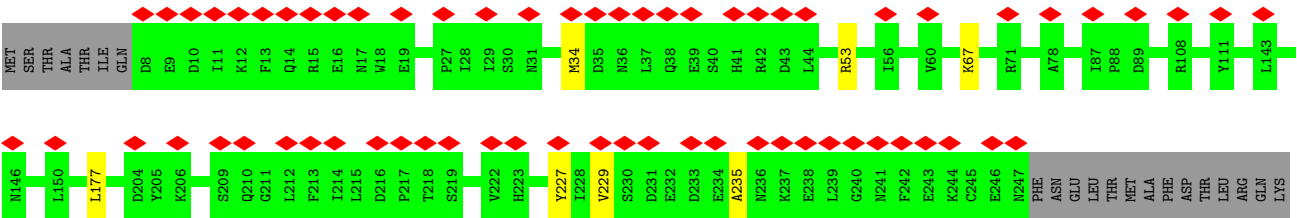
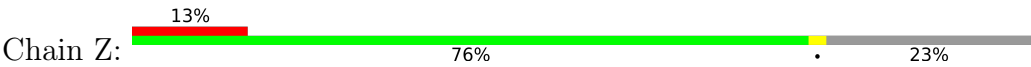
• Molecule 8: Pre-mRNA-splicing factor CWC15



• Molecule 9: Pre-mRNA-splicing factor BUD31

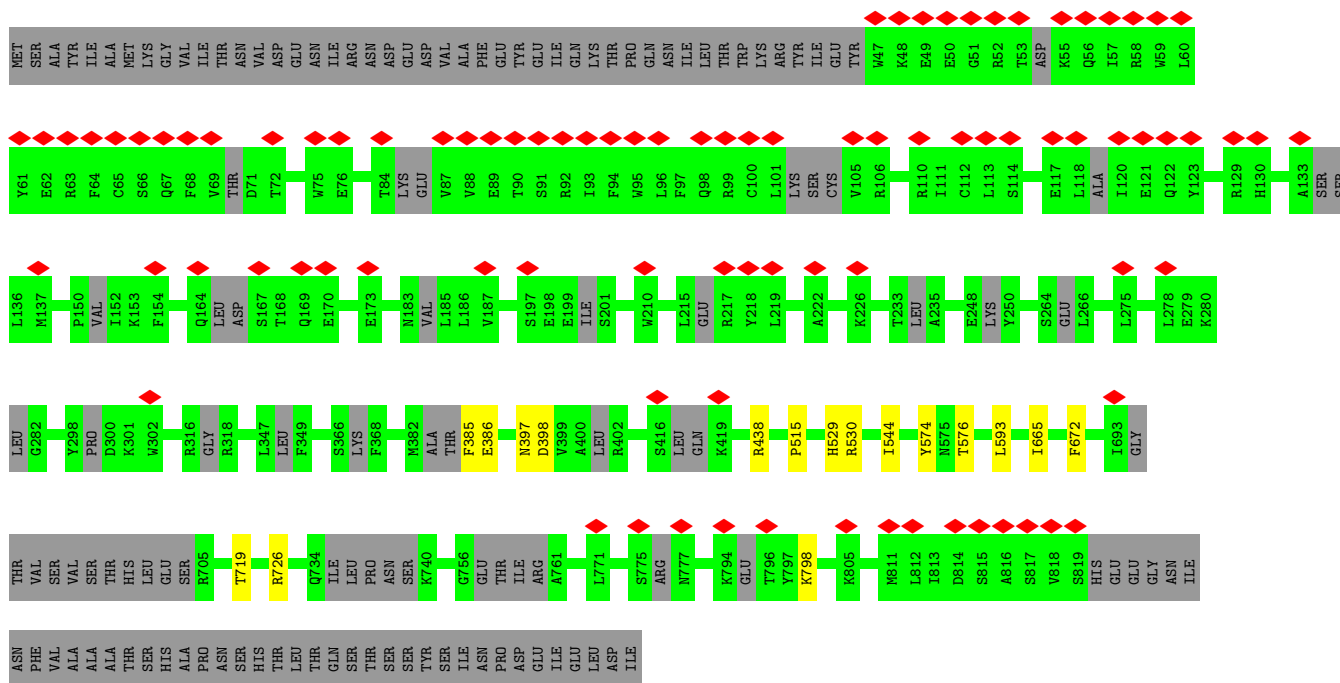
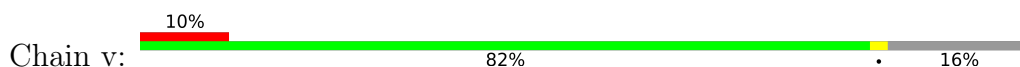


• Molecule 10: Pre-mRNA-splicing factor CWC22

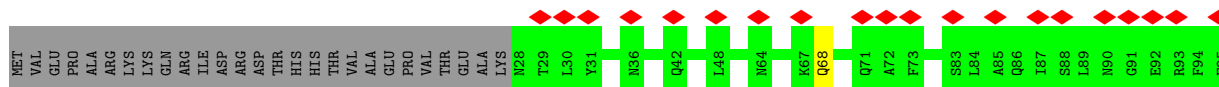
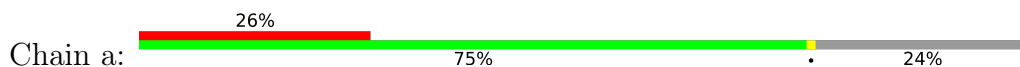


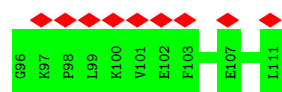


- Molecule 20: Pre-mRNA-splicing factor SYF1

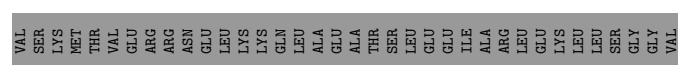
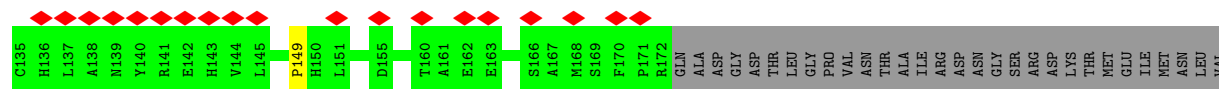
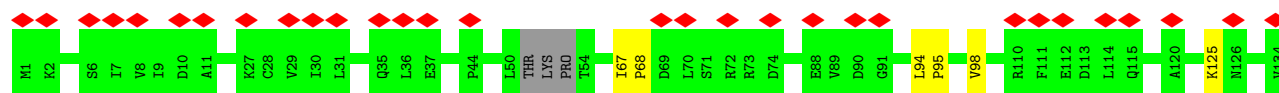


- Molecule 21: U2 small nuclear ribonucleoprotein B''

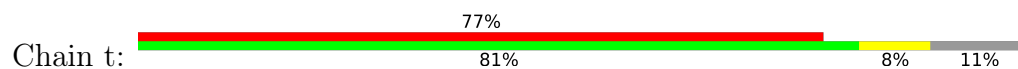




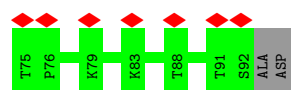
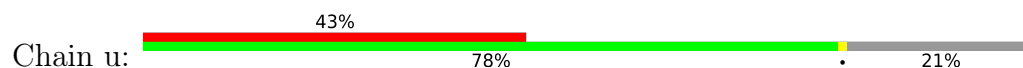
- Molecule 22: U2 small nuclear ribonucleoprotein A'



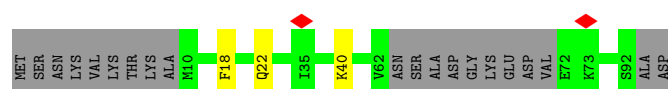
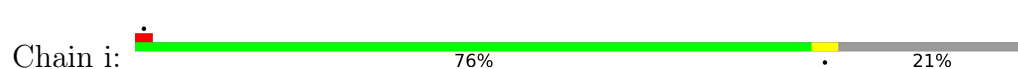
- Molecule 23: Pre-mRNA-splicing factor SNT309



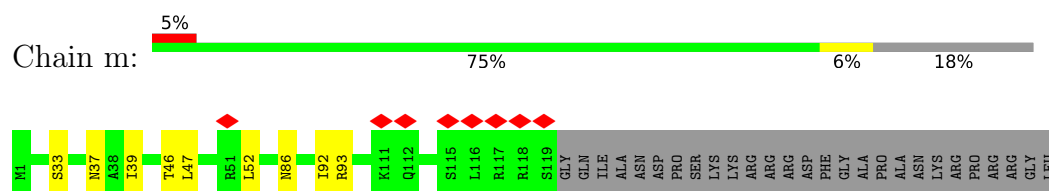
- Molecule 24: Small nuclear ribonucleoprotein E



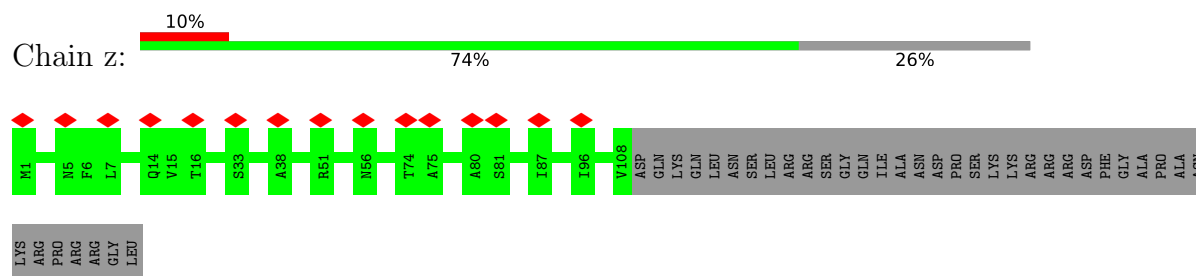
- Molecule 24: Small nuclear ribonucleoprotein E



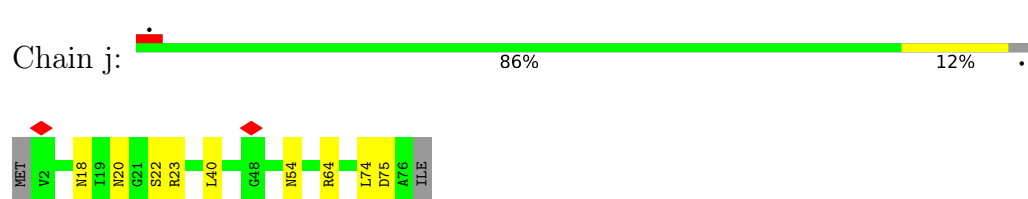
- Molecule 25: Small nuclear ribonucleoprotein Sm D1



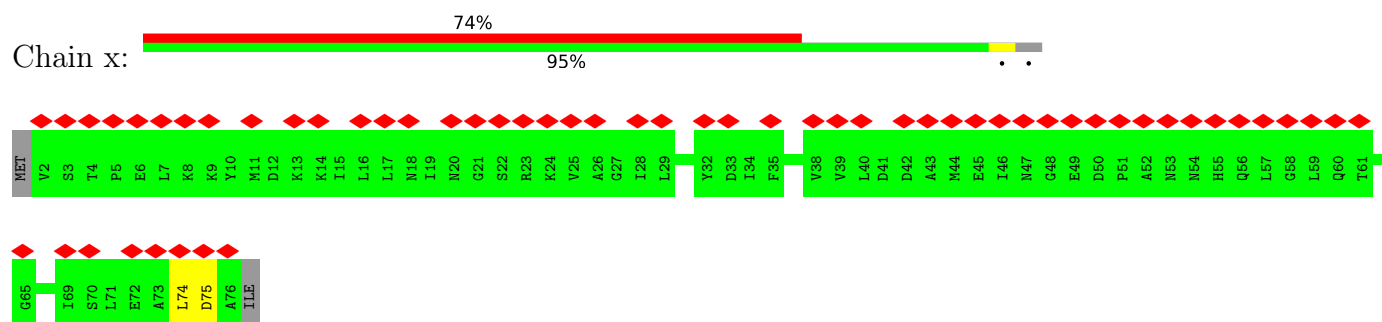
- Molecule 25: Small nuclear ribonucleoprotein Sm D1



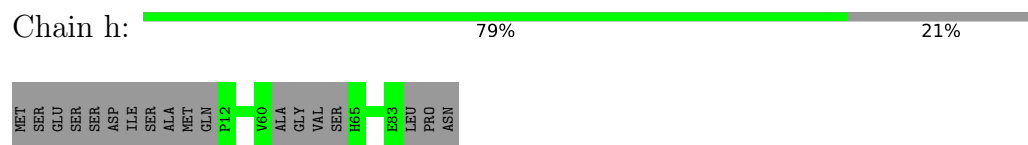
- Molecule 26: Small nuclear ribonucleoprotein G



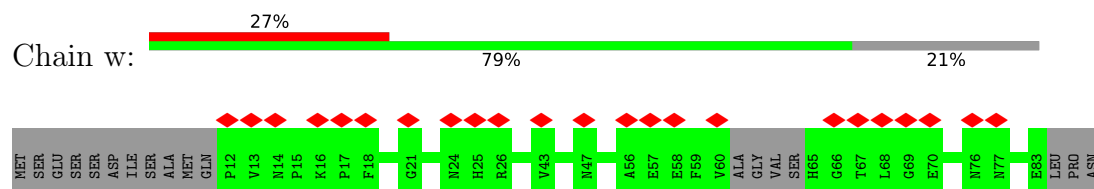
- Molecule 26: Small nuclear ribonucleoprotein G




- Molecule 27: Small nuclear ribonucleoprotein F



- Molecule 27: Small nuclear ribonucleoprotein F




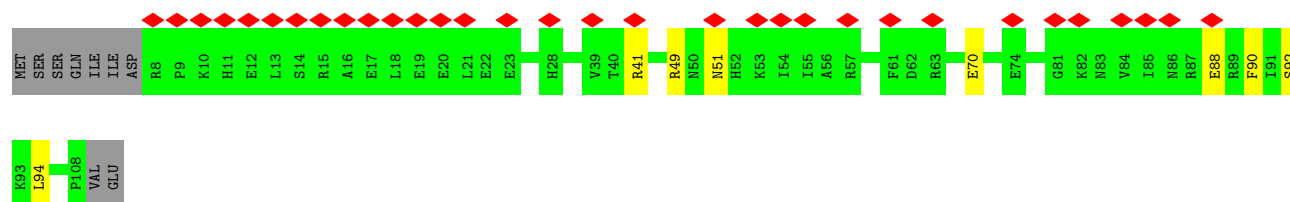
- Molecule 28: Small nuclear ribonucleoprotein Sm D2

Chain g:  85% 6% 8%



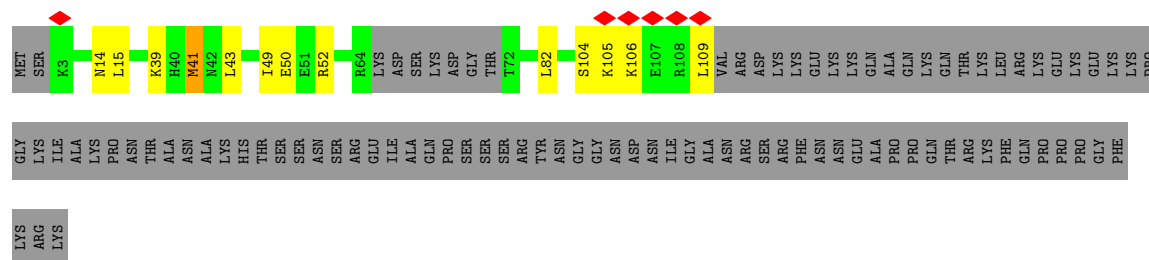
- Molecule 28: Small nuclear ribonucleoprotein Sm D2

Chain e:  29% 85% 7% 8%



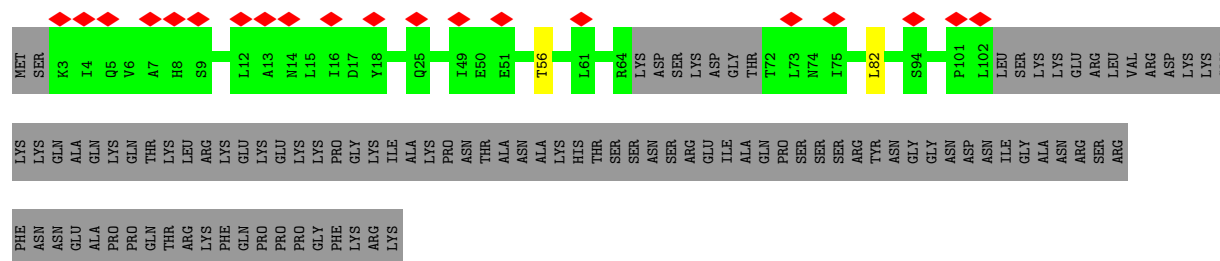
- Molecule 29: Small nuclear ribonucleoprotein-associated protein B

Chain k:  44% 6% 49%



- Molecule 29: Small nuclear ribonucleoprotein-associated protein B

Chain s:  10% 46% 53%

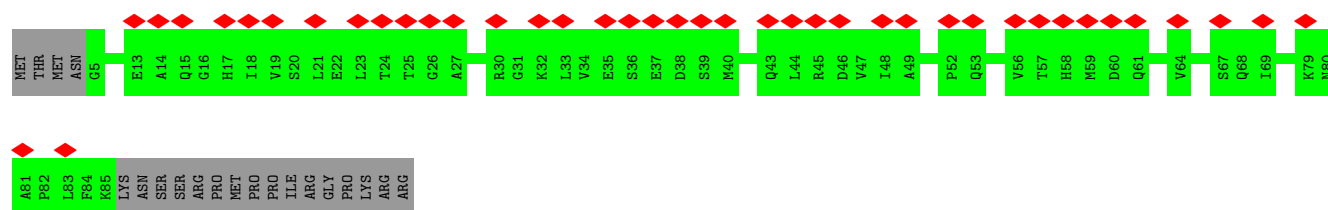
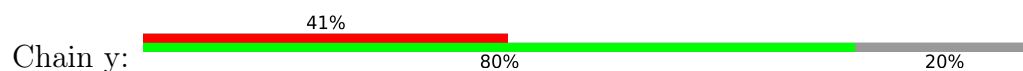


- Molecule 30: Small nuclear ribonucleoprotein Sm D3

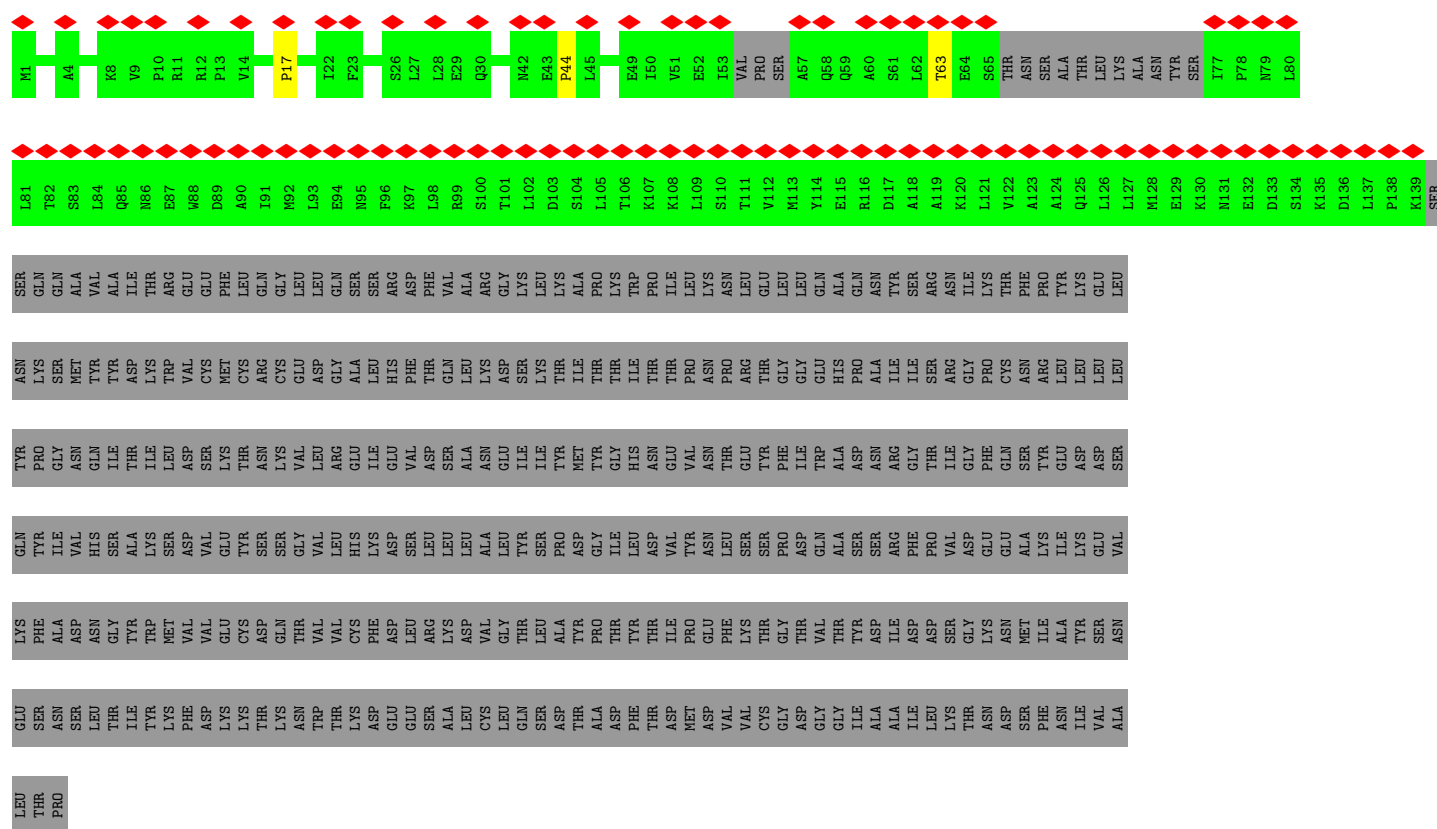
Chain l:  61% 21% 18%



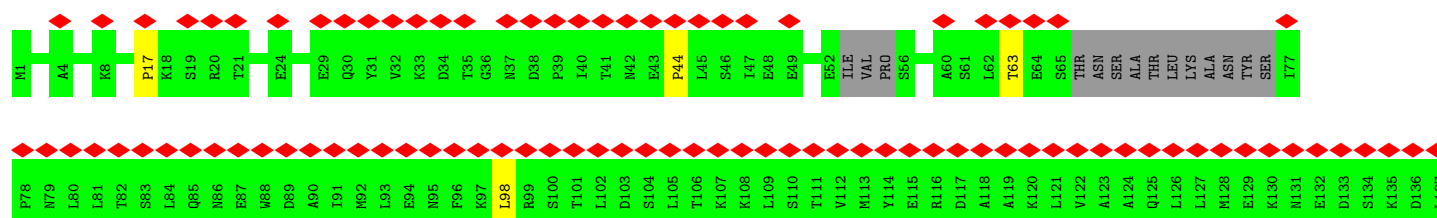
- Molecule 30: Small nuclear ribonucleoprotein Sm D3



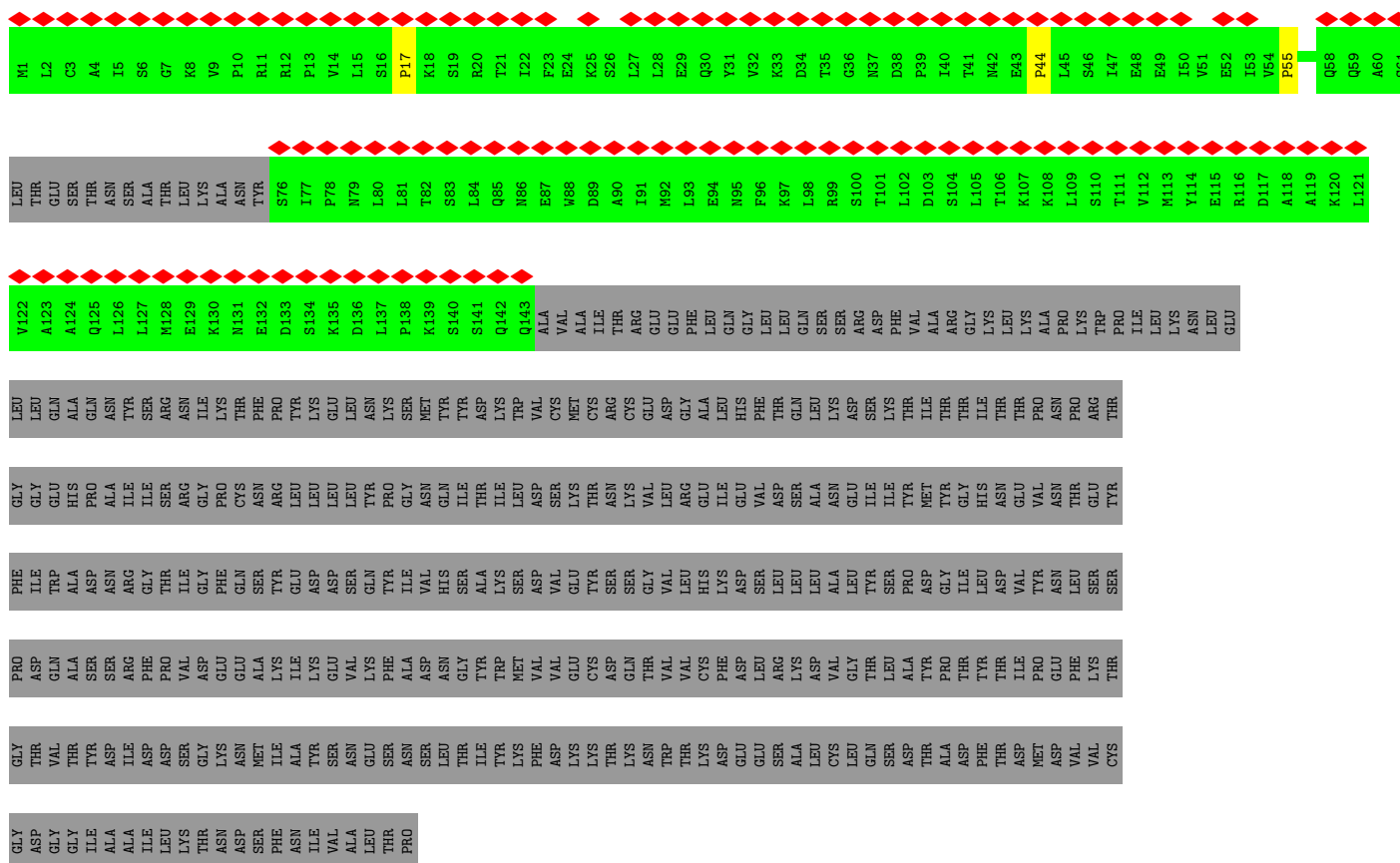
- Molecule 31: Pre-mRNA-processing factor 19



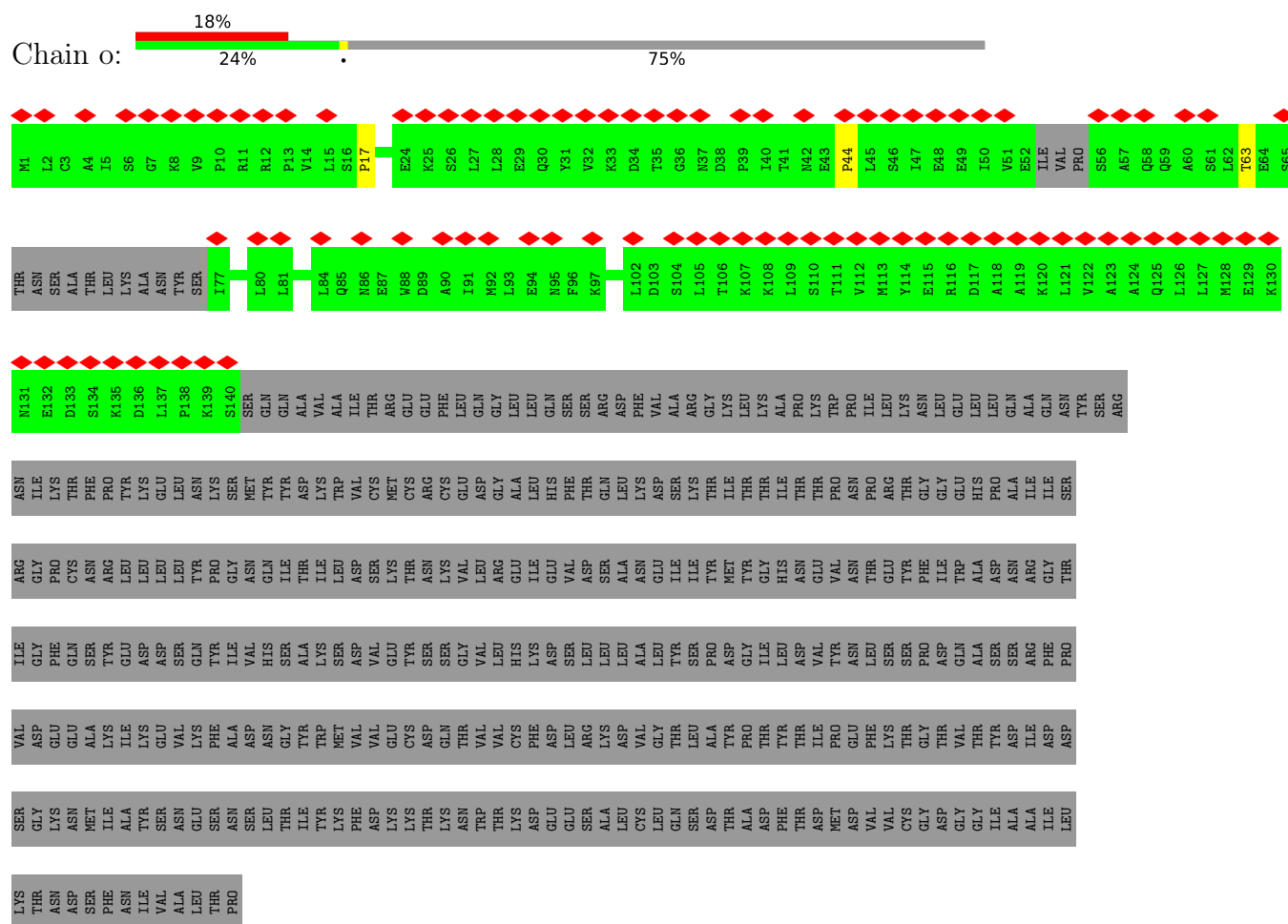
- Molecule 31: Pre-mRNA-processing factor 19



- Molecule 31: Pre-mRNA-processing factor 19



- Molecule 31: Pre-mRNA-processing factor 19



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	555036	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	49.3	Depositor
Minimum defocus (nm)	Not provided	
Maximum defocus (nm)	Not provided	
Magnification	Not provided	
Image detector	GATAN K2 SUMMIT (4k x 4k)	Depositor
Maximum map value	0.343	Depositor
Minimum map value	-0.140	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.007	Depositor
Recommended contour level	0.019	Depositor
Map size (Å)	532.0, 532.0, 532.0	wwPDB
Map dimensions	400, 400, 400	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.33, 1.33, 1.33	Depositor

5 Model quality [i](#)

5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: IHP, GTP, SEP, ZN, MG

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

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	$\# Z > 5$	RMSZ	$\# Z > 5$
1	A	0.37	0/16198	0.56	0/21958
2	C	0.36	0/7503	0.57	0/10159
3	J	0.30	0/191	0.51	0/254
4	O	0.39	0/2872	0.60	0/3902
5	P	0.30	0/1629	0.53	0/2194
6	Q	0.36	0/2339	0.61	0/3154
7	R	0.37	0/2135	0.56	0/2871
8	S	0.27	0/581	0.49	0/776
9	T	0.35	0/1315	0.54	0/1759
10	Z	0.33	0/3712	0.53	0/5004
11	c	0.31	0/2996	0.47	0/4033
12	d	0.33	0/3931	0.48	0/5356
13	I	0.25	0/826	0.42	0/1097
14	n	0.27	0/1894	0.55	0/2529
15	H	0.61	0/631	0.60	0/846
16	B	0.32	0/1411	0.82	0/2191
17	D	0.42	0/4239	0.88	0/6598
18	E	0.51	0/2452	0.89	0/3817
19	L	0.28	1/4877 (0.0%)	0.75	0/7562
20	v	0.42	0/4662	0.51	0/6358
21	a	0.42	0/415	0.56	0/577
22	b	0.68	0/839	0.70	0/1169
23	t	0.29	0/924	0.42	0/1244
24	i	0.29	0/551	0.50	0/750
24	u	0.29	0/535	0.48	0/730
25	m	0.35	0/926	0.55	0/1257
25	z	0.30	0/833	0.53	0/1134
26	j	0.45	0/557	0.54	0/756
26	x	0.34	0/557	0.51	0/756
27	h	0.28	0/529	0.50	0/715
27	w	0.28	0/529	0.50	0/715
28	e	0.38	0/799	0.52	0/1078

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
28	g	0.40	0/799	0.55	0/1078
29	k	0.41	0/815	0.60	0/1092
29	s	0.35	0/755	0.59	0/1014
30	l	0.49	0/650	0.57	0/879
30	y	0.31	0/625	0.50	0/847
31	o	0.28	0/835	0.50	0/1126
31	p	0.25	0/848	0.51	0/1143
31	q	0.30	0/856	0.52	0/1155
31	r	0.29	0/828	0.54	0/1117
All	All	0.37	1/81399 (0.0%)	0.61	0/112750

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
19	L	1120	G	O3'-P	-5.54	1.54	1.61

There are no bond angle outliers.

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	A	1905/2413 (79%)	1815 (95%)	84 (4%)	6 (0%)	37	69
2	C	914/1008 (91%)	881 (96%)	33 (4%)	0	100	100
3	J	25/135 (18%)	23 (92%)	2 (8%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
4	O	355/451 (79%)	318 (90%)	35 (10%)	2 (1%)	22	57
5	P	197/379 (52%)	190 (96%)	7 (4%)	0	100	100
6	Q	288/364 (79%)	264 (92%)	22 (8%)	2 (1%)	19	54
7	R	259/339 (76%)	246 (95%)	11 (4%)	2 (1%)	16	51
8	S	64/175 (37%)	63 (98%)	1 (2%)	0	100	100
9	T	155/157 (99%)	150 (97%)	5 (3%)	0	100	100
10	Z	443/577 (77%)	425 (96%)	16 (4%)	2 (0%)	25	60
11	c	418/590 (71%)	396 (95%)	20 (5%)	2 (0%)	25	60
12	d	534/687 (78%)	513 (96%)	16 (3%)	5 (1%)	14	49
13	I	98/215 (46%)	96 (98%)	2 (2%)	0	100	100
14	n	279/455 (61%)	265 (95%)	12 (4%)	2 (1%)	19	54
15	H	68/235 (29%)	64 (94%)	2 (3%)	2 (3%)	3	24
20	v	666/859 (78%)	642 (96%)	22 (3%)	2 (0%)	37	69
21	a	82/111 (74%)	78 (95%)	3 (4%)	1 (1%)	11	43
22	b	165/238 (69%)	138 (84%)	20 (12%)	7 (4%)	2	17
23	t	150/175 (86%)	145 (97%)	4 (3%)	1 (1%)	19	54
24	i	70/94 (74%)	67 (96%)	3 (4%)	0	100	100
24	u	70/94 (74%)	67 (96%)	3 (4%)	0	100	100
25	m	117/146 (80%)	111 (95%)	6 (5%)	0	100	100
25	z	106/146 (73%)	100 (94%)	6 (6%)	0	100	100
26	j	73/77 (95%)	67 (92%)	5 (7%)	1 (1%)	9	40
26	x	73/77 (95%)	65 (89%)	7 (10%)	1 (1%)	9	40
27	h	64/86 (74%)	60 (94%)	4 (6%)	0	100	100
27	w	64/86 (74%)	61 (95%)	3 (5%)	0	100	100
28	e	99/110 (90%)	95 (96%)	3 (3%)	1 (1%)	13	47
28	g	99/110 (90%)	93 (94%)	4 (4%)	2 (2%)	6	32
29	k	96/196 (49%)	90 (94%)	5 (5%)	1 (1%)	13	47
29	s	89/196 (45%)	83 (93%)	6 (7%)	0	100	100
30	l	81/101 (80%)	79 (98%)	0	2 (2%)	4	28
30	y	79/101 (78%)	75 (95%)	4 (5%)	0	100	100
31	o	120/503 (24%)	115 (96%)	5 (4%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
31	p	122/503 (24%)	118 (97%)	4 (3%)	0	100	100
31	q	125/503 (25%)	116 (93%)	9 (7%)	0	100	100
31	r	119/503 (24%)	112 (94%)	7 (6%)	0	100	100
All	All	8731/13195 (66%)	8286 (95%)	401 (5%)	44 (0%)	27	60

5 of 44 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	260	PRO
1	A	1965	PHE
7	R	152	LYS
7	R	153	PRO
12	d	181	ASN

5.3.2 Protein sidechains ⓘ

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	1737/2182 (80%)	1714 (99%)	23 (1%)	65	83
2	C	830/910 (91%)	817 (98%)	13 (2%)	58	79
3	J	21/121 (17%)	21 (100%)	0	100	100
4	O	312/397 (79%)	309 (99%)	3 (1%)	73	87
5	P	175/328 (53%)	174 (99%)	1 (1%)	84	92
6	Q	265/332 (80%)	258 (97%)	7 (3%)	41	70
7	R	224/296 (76%)	219 (98%)	5 (2%)	47	73
8	S	57/151 (38%)	55 (96%)	2 (4%)	31	63
9	T	141/141 (100%)	140 (99%)	1 (1%)	81	92
10	Z	417/538 (78%)	410 (98%)	7 (2%)	56	78
11	c	214/525 (41%)	196 (92%)	18 (8%)	9	34
12	d	274/633 (43%)	261 (95%)	13 (5%)	22	55
13	I	92/193 (48%)	91 (99%)	1 (1%)	70	86

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
14	n	121/412 (29%)	108 (89%)	13 (11%)	5	24
15	H	68/216 (32%)	48 (71%)	20 (29%)	0	1
20	v	294/786 (37%)	279 (95%)	15 (5%)	20	53
23	t	39/165 (24%)	26 (67%)	13 (33%)	0	0
24	i	55/83 (66%)	52 (94%)	3 (6%)	18	51
24	u	52/83 (63%)	51 (98%)	1 (2%)	52	76
25	m	106/129 (82%)	97 (92%)	9 (8%)	8	34
25	z	95/129 (74%)	95 (100%)	0	100	100
26	j	56/66 (85%)	48 (86%)	8 (14%)	2	13
26	x	56/66 (85%)	55 (98%)	1 (2%)	54	77
27	h	51/77 (66%)	51 (100%)	0	100	100
27	w	51/77 (66%)	51 (100%)	0	100	100
28	e	82/103 (80%)	75 (92%)	7 (8%)	8	34
28	g	82/103 (80%)	77 (94%)	5 (6%)	15	47
29	k	92/176 (52%)	79 (86%)	13 (14%)	3	14
29	s	85/176 (48%)	83 (98%)	2 (2%)	44	71
30	l	72/89 (81%)	53 (74%)	19 (26%)	0	1
30	y	68/89 (76%)	68 (100%)	0	100	100
31	o	60/451 (13%)	57 (95%)	3 (5%)	20	54
31	p	62/451 (14%)	58 (94%)	4 (6%)	14	45
31	q	62/451 (14%)	59 (95%)	3 (5%)	21	55
31	r	60/451 (13%)	57 (95%)	3 (5%)	20	54
All	All	6528/11576 (56%)	6292 (96%)	236 (4%)	32	62

5 of 236 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
15	H	42	LYS
24	i	40	LYS
23	t	76	THR
24	i	18	PHE
29	s	82	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 101 such sidechains are listed below:

Mol	Chain	Res	Type
10	Z	310	HIS
20	v	643	HIS
25	z	21	ASN
10	Z	368	ASN
12	d	147	ASN

5.3.3 RNA ⓘ

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
16	B	58/679 (8%)	24 (41%)	2 (3%)
17	D	177/214 (82%)	54 (30%)	7 (3%)
18	E	102/112 (91%)	35 (34%)	1 (0%)
19	L	197/1175 (16%)	63 (31%)	7 (3%)
All	All	534/2180 (24%)	176 (32%)	17 (3%)

5 of 176 RNA backbone outliers are listed below:

Mol	Chain	Res	Type
16	B	-11	C
16	B	-10	A
16	B	-9	A
16	B	-5	A
16	B	-3	U

5 of 17 RNA pucker outliers are listed below:

Mol	Chain	Res	Type
19	L	1106	G
19	L	1146	G
17	D	150	U
17	D	163	C
18	E	49	A

5.4 Non-standard residues in protein, DNA, RNA chains ⓘ

1 non-standard protein/DNA/RNA residue is 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	$\# Z > 2$
14	SEP	n	73	14	8,9,10	1.52	1 (12%)	8,12,14	1.54	2 (25%)

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
14	SEP	n	73	14	-	3/5/8/10	-

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
14	n	73	SEP	P-O1P	3.29	1.61	1.50

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
14	n	73	SEP	P-OG-CB	-3.21	109.46	118.30
14	n	73	SEP	OG-CB-CA	2.26	110.34	108.14

There are no chirality outliers.

All (3) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
14	n	73	SEP	CB-OG-P-O1P
14	n	73	SEP	CB-OG-P-O2P
14	n	73	SEP	CB-OG-P-O3P

There are no ring outliers.

No monomer is involved in short contacts.

5.5 Carbohydrates ⓘ

There are no oligosaccharides in this entry.

5.6 Ligand geometry

Of 14 ligands modelled in this entry, 12 are monoatomic - leaving 2 for Mogul analysis.

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	$\# Z > 2$
32	IHP	A	3000	-	36,36,36	0.74	0	54,60,60	0.53	0
33	GTP	C	1500	34	26,34,34	1.25	1 (3%)	32,54,54	1.65	6 (18%)

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
32	IHP	A	3000	-	-	11/30/54/54	0/1/1/1
33	GTP	C	1500	34	-	1/18/38/38	0/3/3/3

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
33	C	1500	GTP	C5-C6	-4.38	1.38	1.47

The worst 5 of 6 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
33	C	1500	GTP	PB-O3B-PG	-4.45	117.56	132.83
33	C	1500	GTP	C5-C6-N1	3.34	119.85	113.95
33	C	1500	GTP	C3'-C2'-C1'	3.00	105.49	100.98
33	C	1500	GTP	C8-N7-C5	2.95	108.61	102.99
33	C	1500	GTP	C2-N1-C6	-2.90	119.76	125.10

There are no chirality outliers.

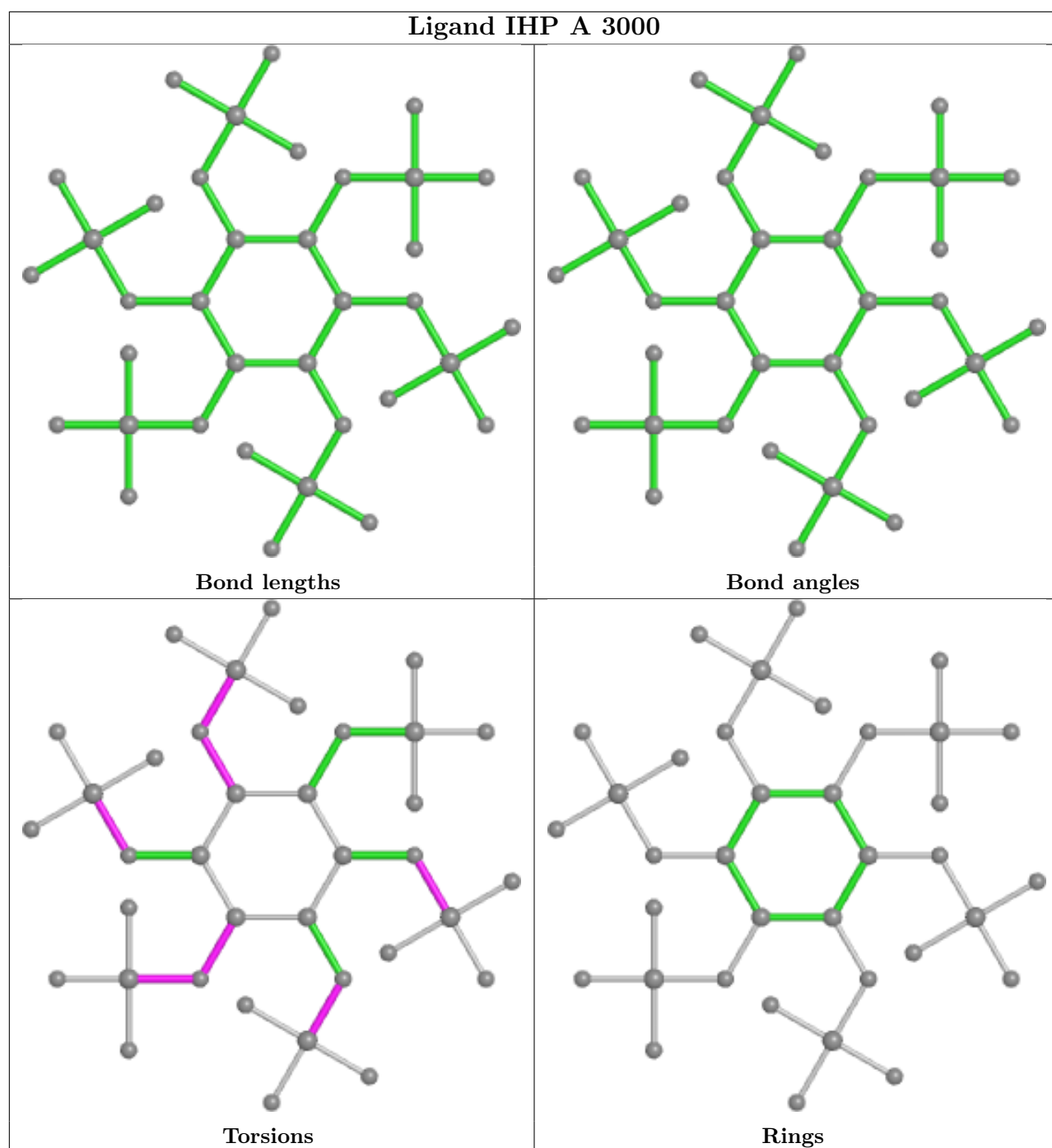
5 of 12 torsion outliers are listed below:

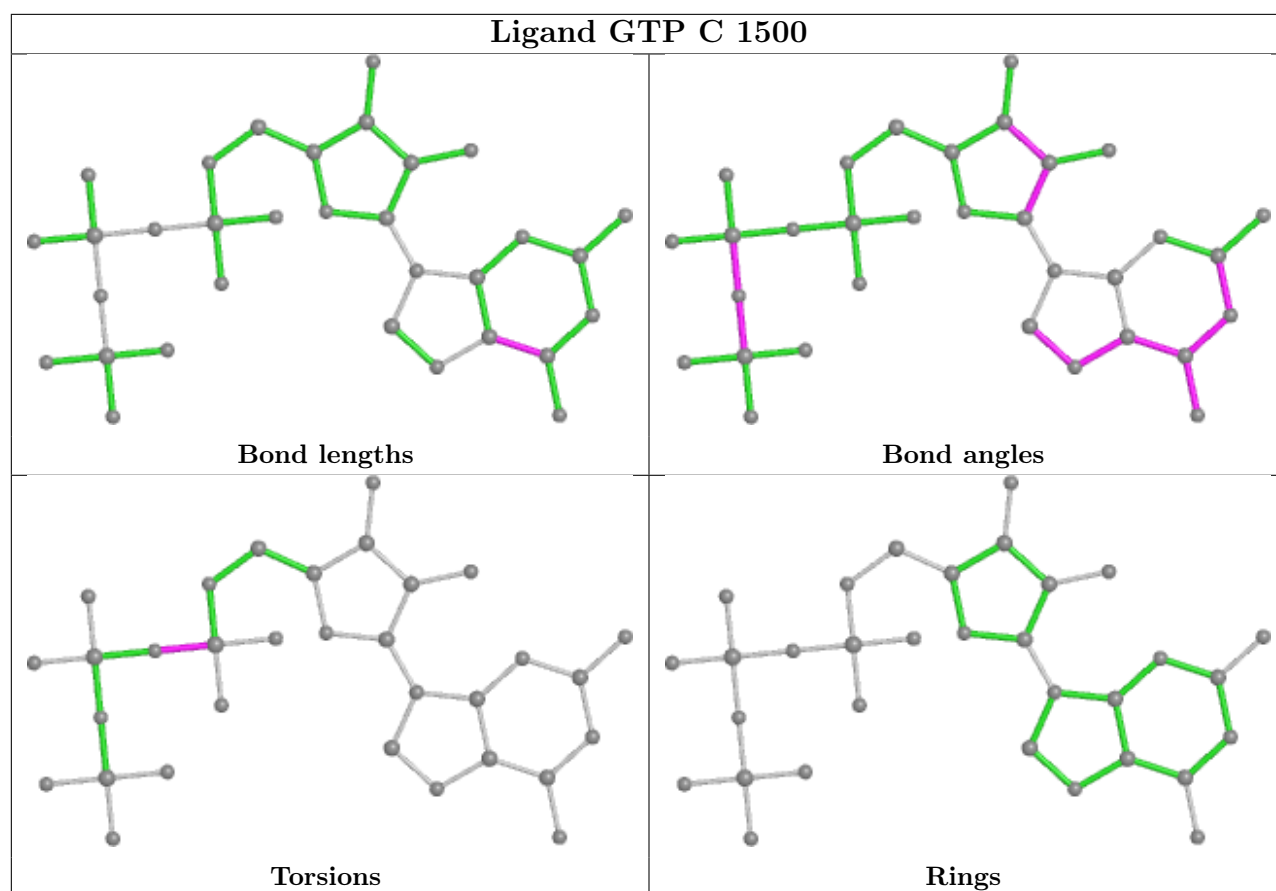
Mol	Chain	Res	Type	Atoms
32	A	3000	IHP	C2-C1-O11-P1
32	A	3000	IHP	C6-C1-O11-P1
32	A	3000	IHP	C1-O11-P1-O31
32	A	3000	IHP	C5-O15-P5-O25
32	A	3000	IHP	C6-O16-P6-O26

There are no ring outliers.

No monomer is involved in short contacts.

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.





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.

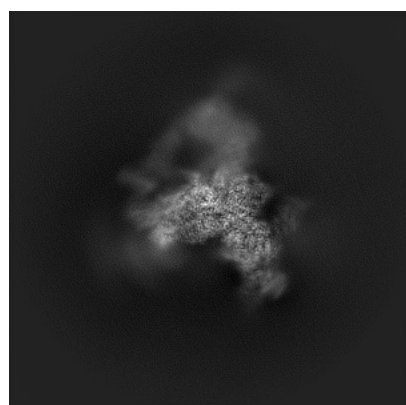
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-0686. These allow visual inspection of the internal detail of the map and identification of artifacts.

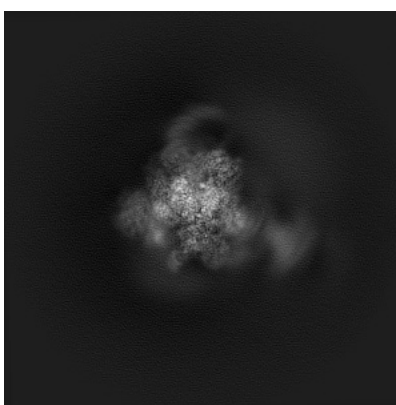
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections [i](#)

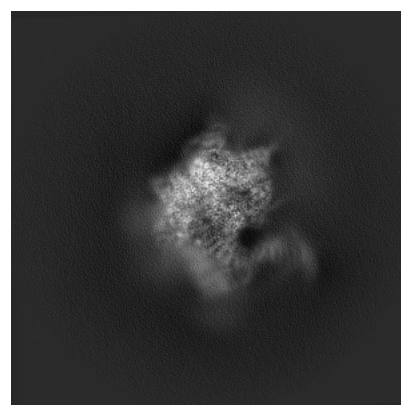
6.1.1 Primary map



X



Y

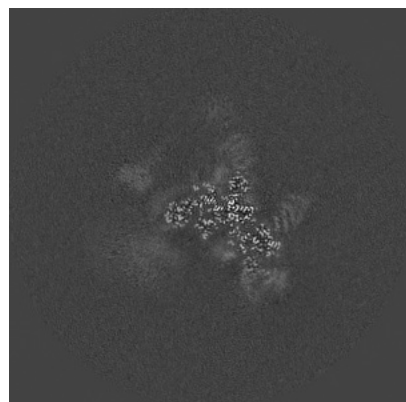


Z

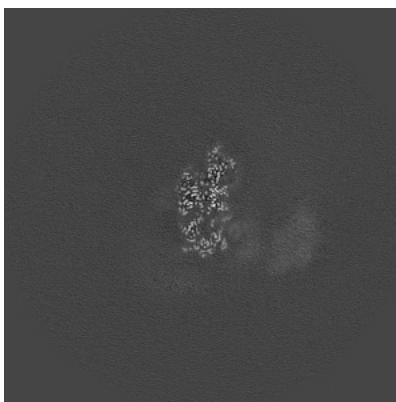
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

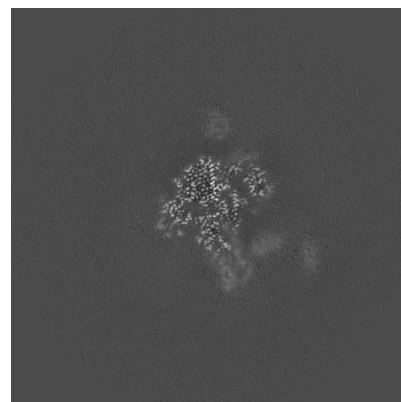
6.2.1 Primary map



X Index: 200



Y Index: 200

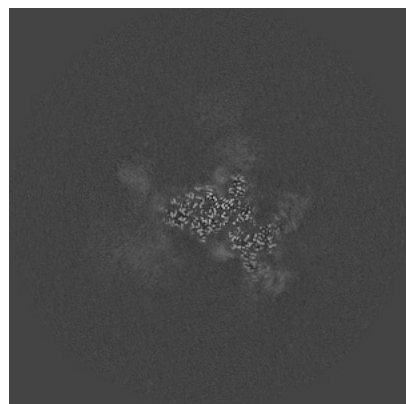


Z Index: 200

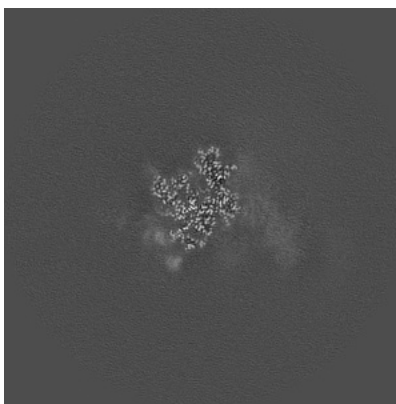
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

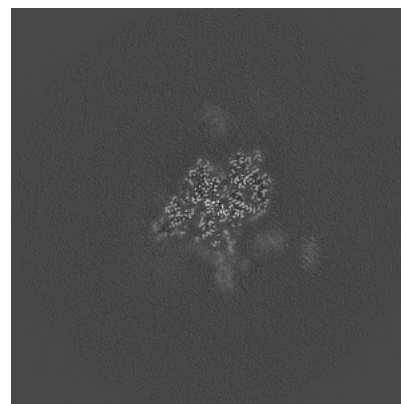
6.3.1 Primary map



X Index: 204



Y Index: 228

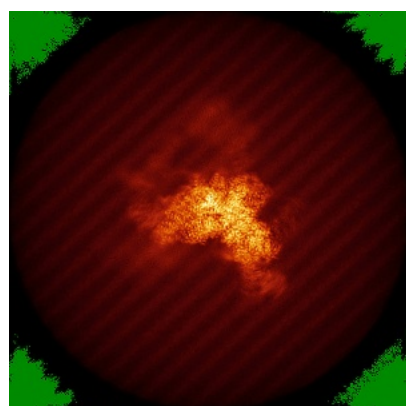


Z Index: 206

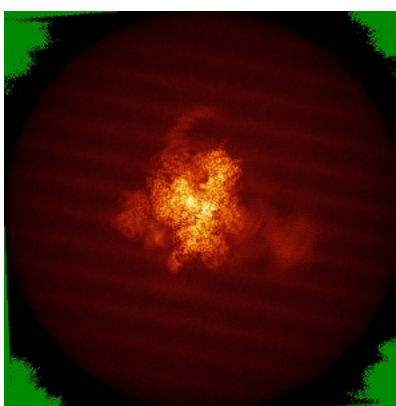
The images above show the largest variance slices of the map in three orthogonal directions.

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

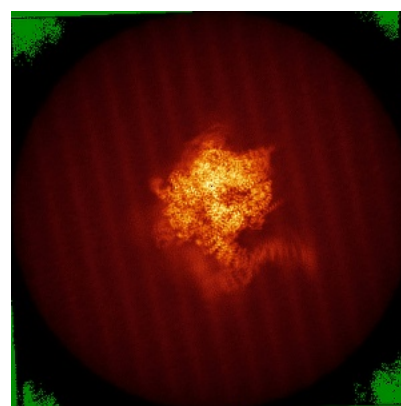
6.4.1 Primary map



X



Y

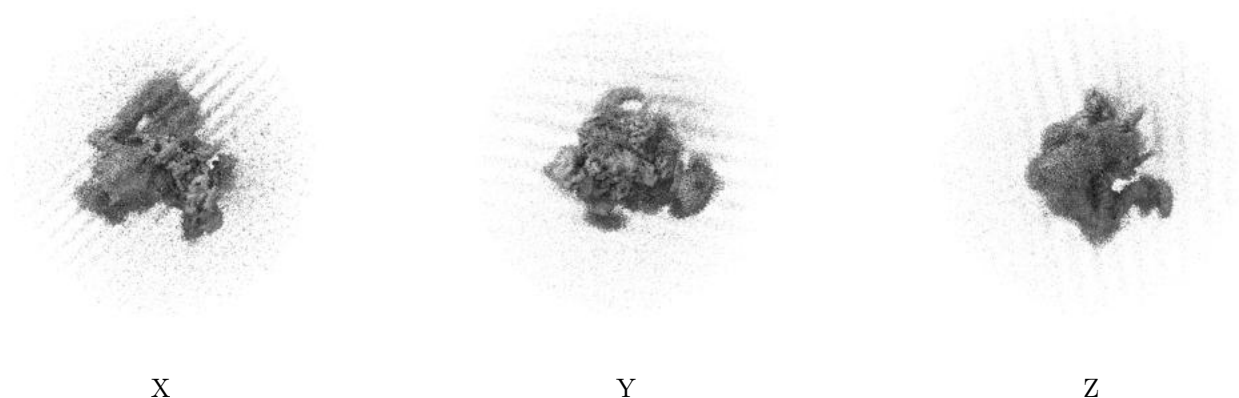


Z

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

6.5 Orthogonal surface views [i](#)

6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.019. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

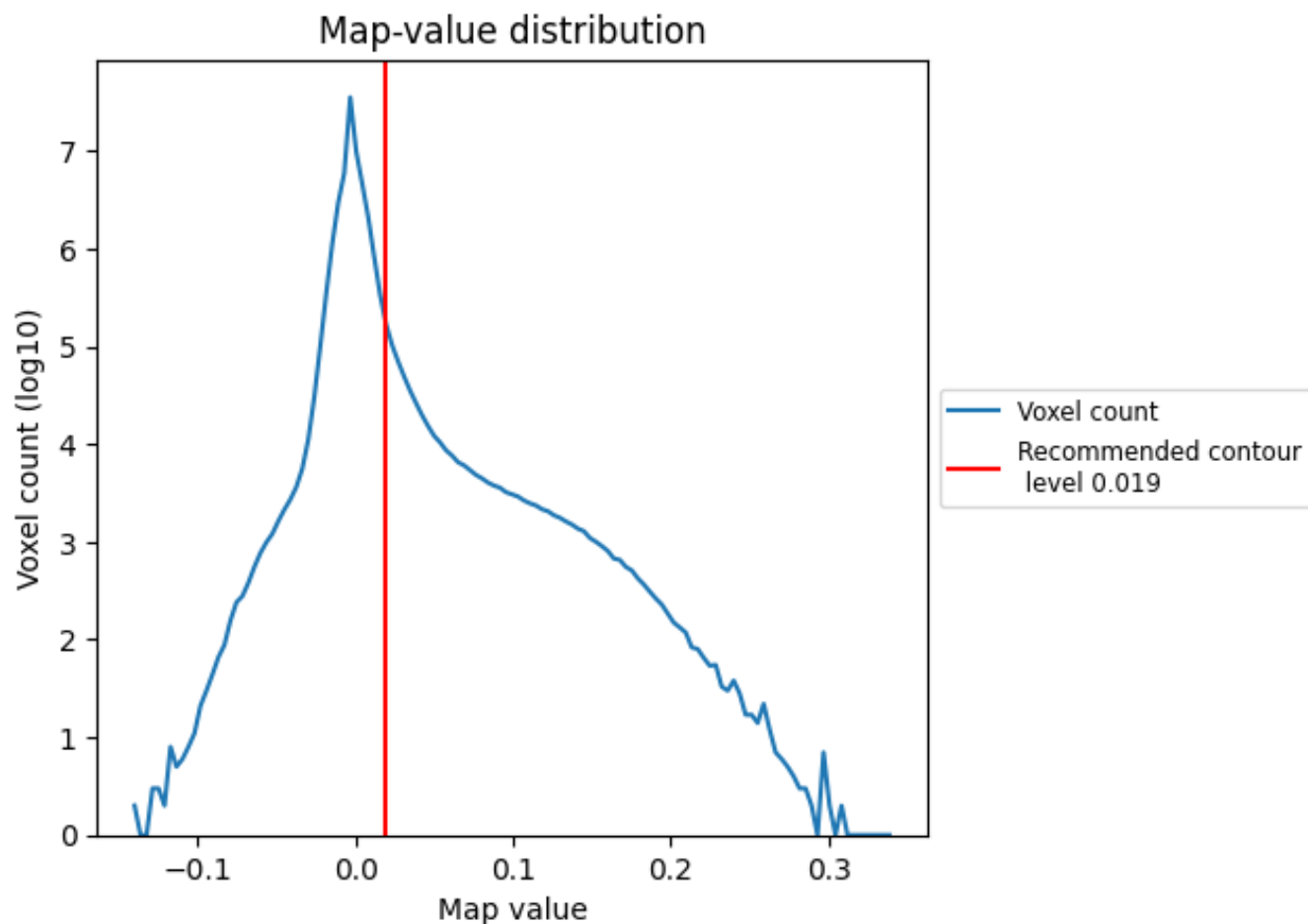
6.6 Mask visualisation [i](#)

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

7 Map analysis [i](#)

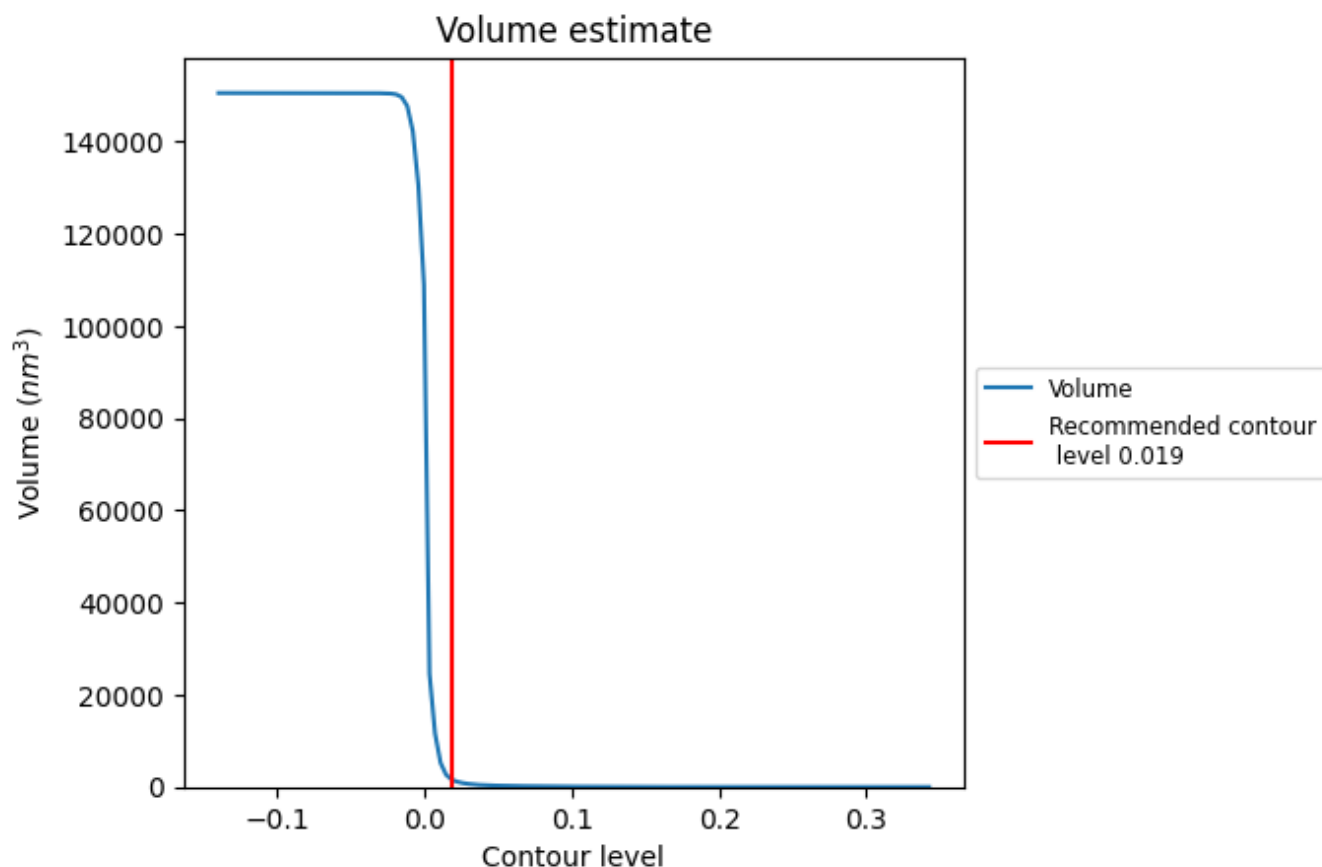
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution [i](#)



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

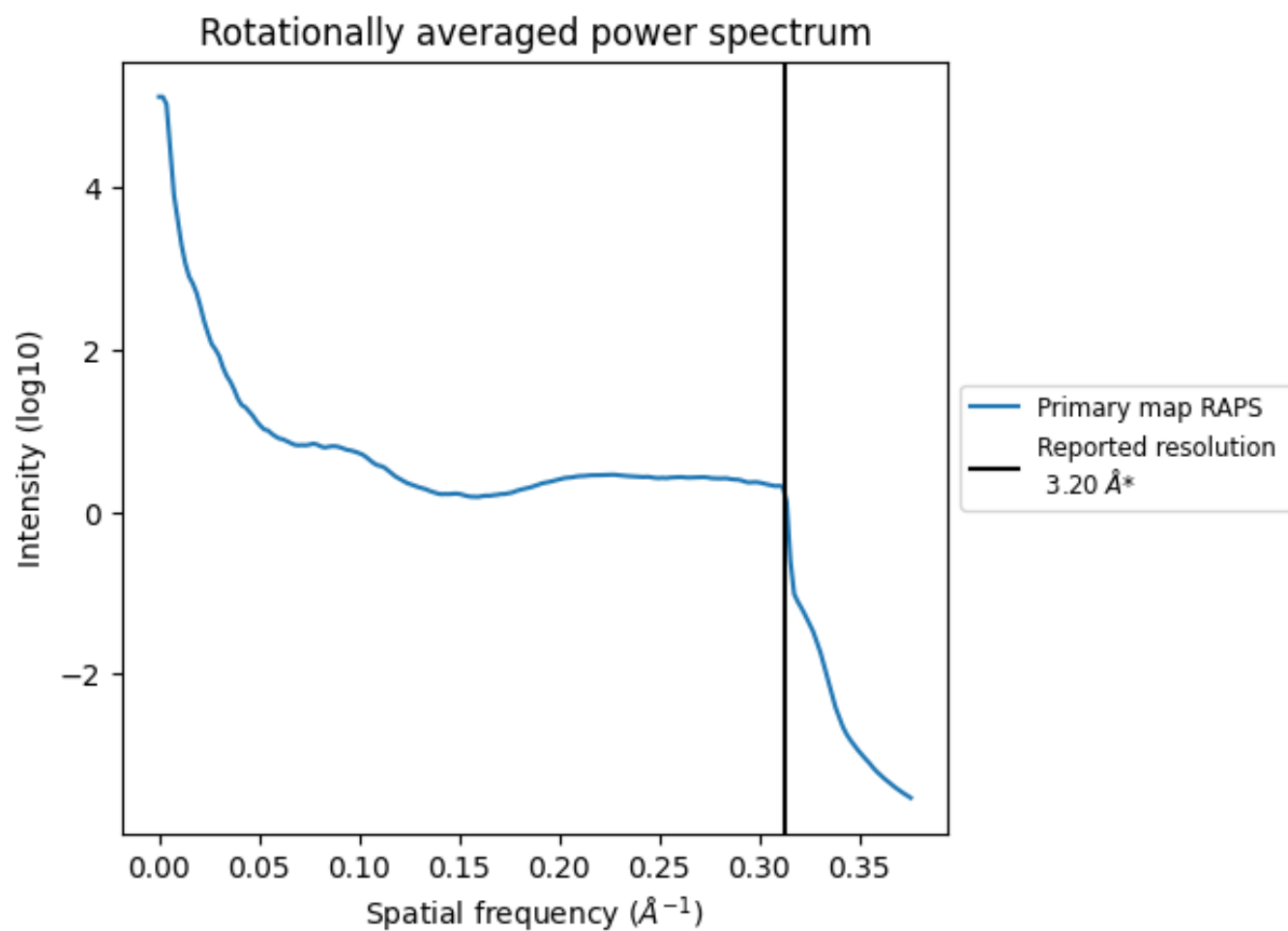
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 1533 nm^3 ; this corresponds to an approximate mass of 1385 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 ⓘ



*Reported resolution corresponds to spatial frequency of 0.312 Å⁻¹

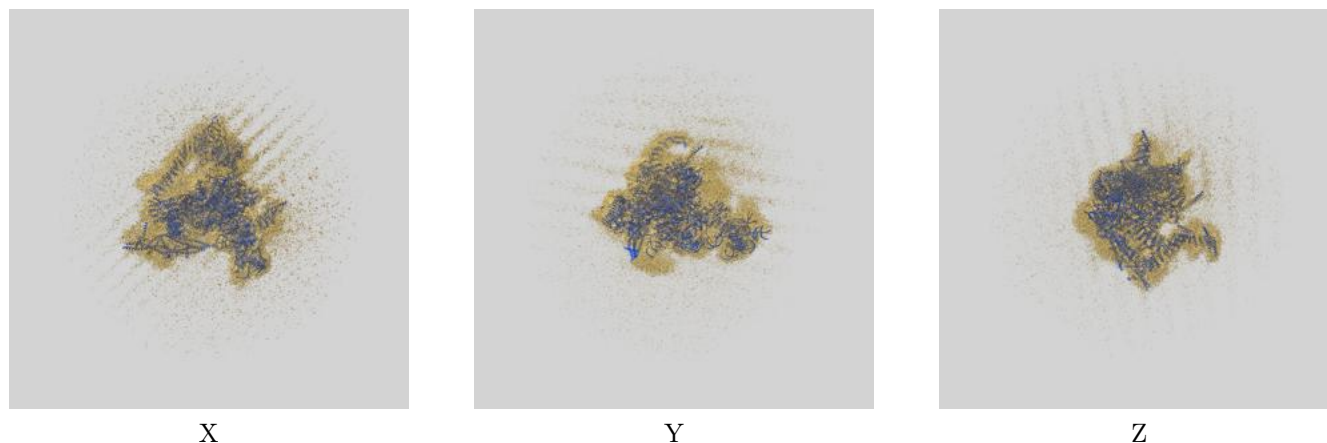
8 Fourier-Shell correlation

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

9 Map-model fit [i](#)

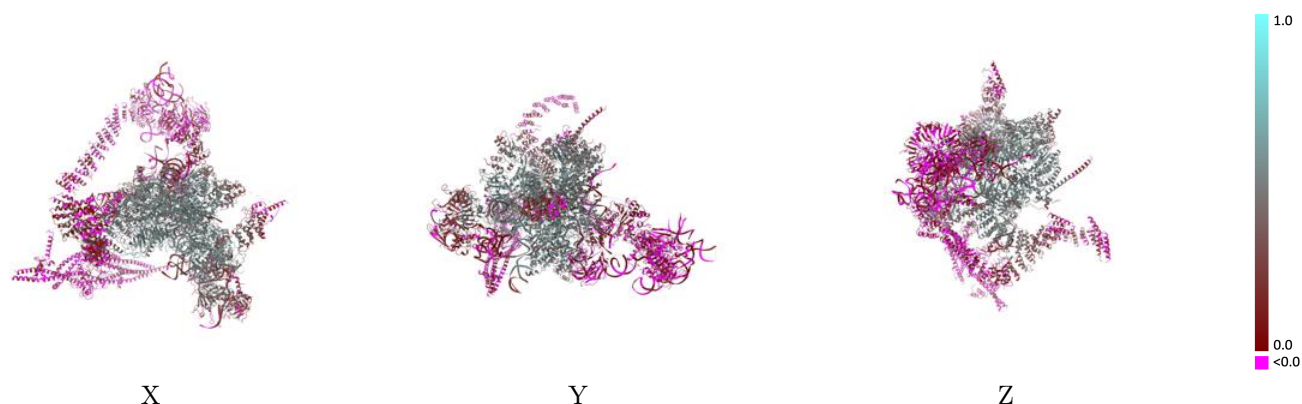
This section contains information regarding the fit between EMDB map EMD-0686 and PDB model 6J6G. Per-residue inclusion information can be found in [section 3](#) on [page 12](#).

9.1 Map-model overlay [i](#)



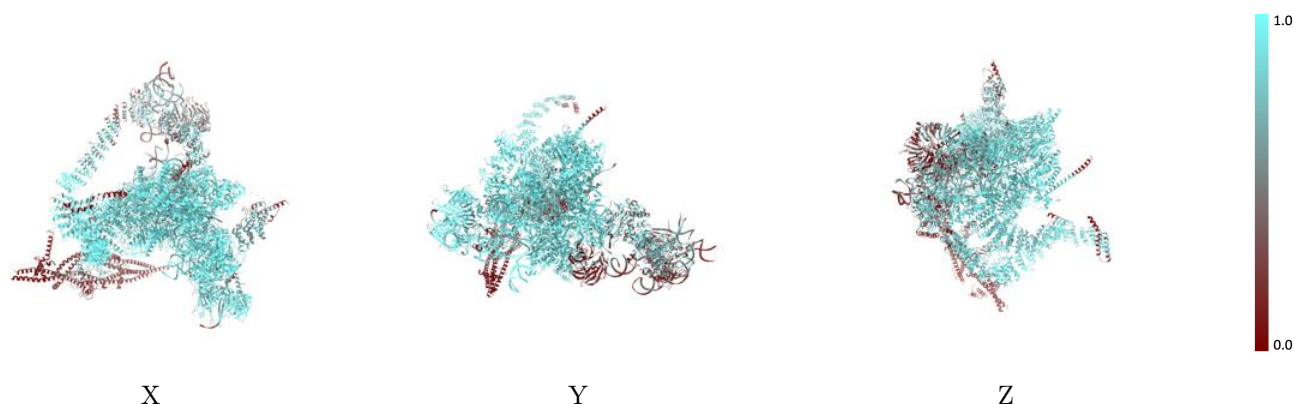
The images above show the 3D surface view of the map at the recommended contour level 0.019 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



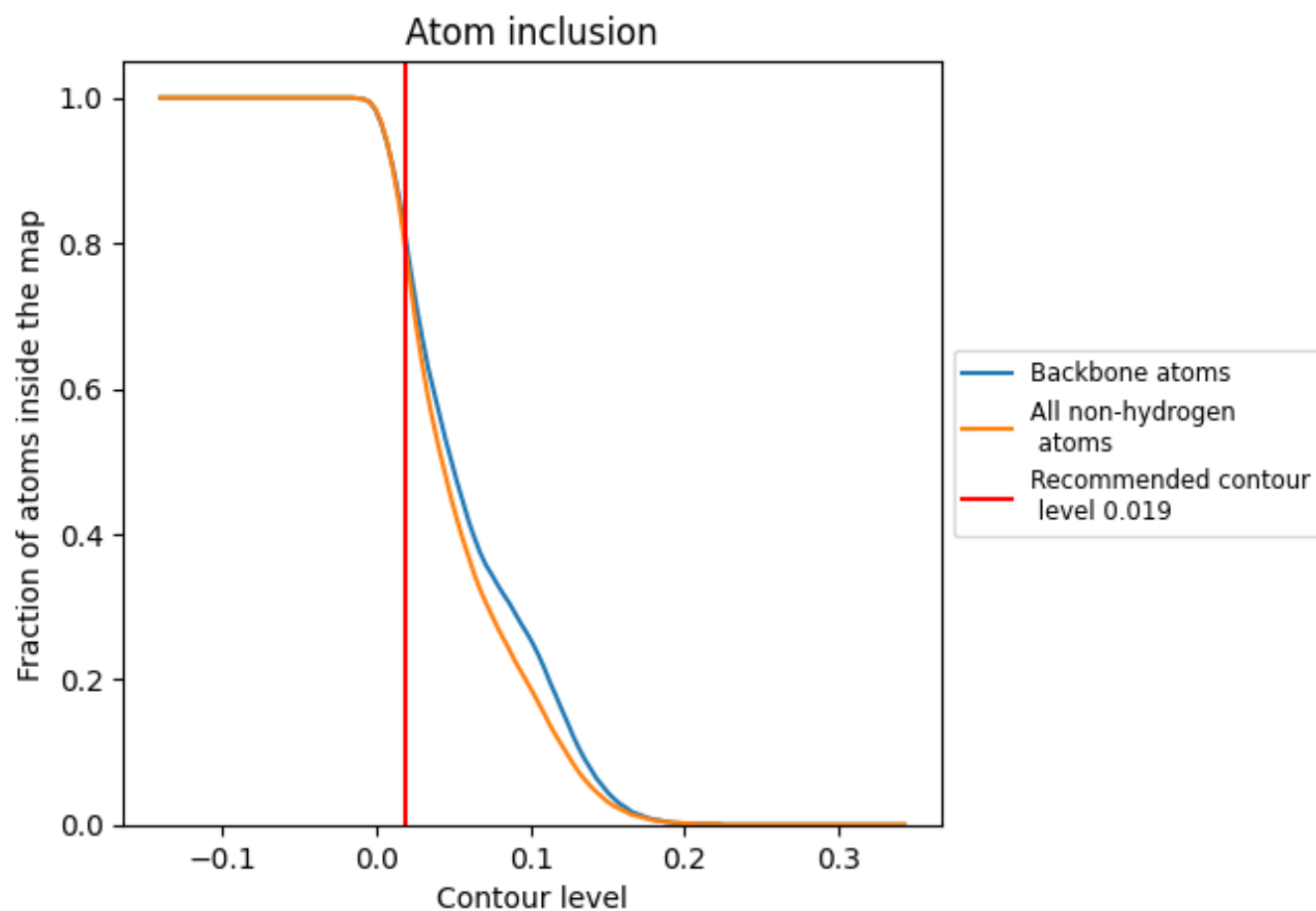
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.019).







































































9.4 Atom inclusion [i](#)



At the recommended contour level, 81% of all backbone atoms, 79% 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 (0.019) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.7910	 0.3170
A	 0.9170	 0.4650
B	 0.8390	 0.2280
C	 0.9560	 0.4980
D	 0.9520	 0.3350
E	 0.9940	 0.4850
H	 0.7880	 0.1160
I	 0.9170	 0.4460
J	 0.9470	 0.5140
L	 0.6160	 0.0890
O	 0.9680	 0.5330
P	 0.8610	 0.4420
Q	 0.9270	 0.4400
R	 0.9480	 0.4880
S	 0.8520	 0.4900
T	 0.9600	 0.5230
Z	 0.7220	 0.3010
a	 0.5940	 0.0290
b	 0.6400	 0.0370
c	 0.5730	 0.2700
d	 0.8870	 0.3180
e	 0.5610	 0.0280
g	 0.8350	 0.1540
h	 0.9130	 0.1340
i	 0.9160	 0.2180
j	 0.8820	 0.2820
k	 0.8230	 0.2940
l	 0.8960	 0.4280
m	 0.8030	 0.2240
n	 0.2200	 0.0850
o	 0.2680	 0.0010
p	 0.2220	 0.0180
q	 0.1170	 0.0040
r	 0.2400	 -0.0030
s	 0.6120	 -0.0010



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Chain	Atom inclusion	Q-score
t	 0.1330	 -0.0220
u	 0.3870	 0.0270
v	 0.8390	 0.1440
w	 0.5560	 0.0120
x	 0.2760	 0.0440
y	 0.4070	 -0.0060
z	 0.6340	 0.0060