Full wwPDB EM Validation Report ⓘ

Dec 18, 2022 – 07:59 am GMT

PDB ID	:	7ABF
EMDB ID	:	EMD-11694
Title	:	Human pre-Bact-1 spliceosome core structure
Authors	:	Townsend, C.; Kastner, B.; Leelaram, M.N.; Bertram, K.; Stark, H.; Luehrmann, R.
Deposited on	:	2020-09-07
Resolution	:	3.90 Å(reported)

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

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

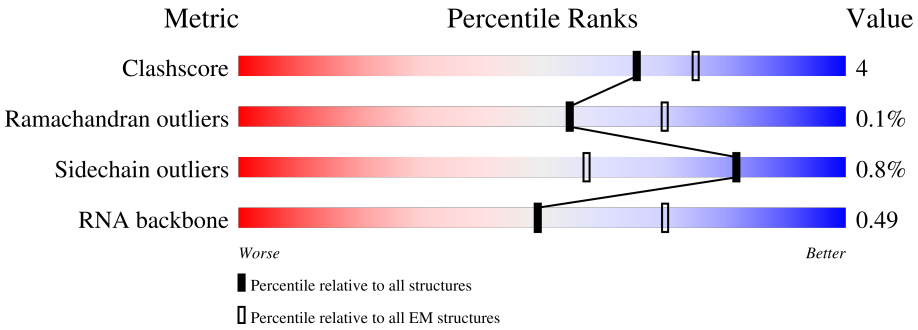
EMDB validation analysis	:	0.0.1.dev43
Mogul	:	1.8.4, CSD as541be (2020)
MolProbity	:	4.02b-467
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ	:	1.9.9
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.31.3

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 3.90 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



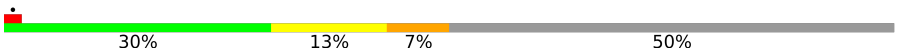
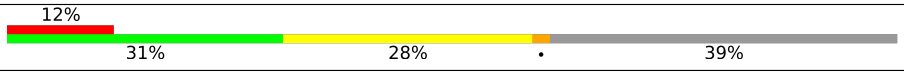
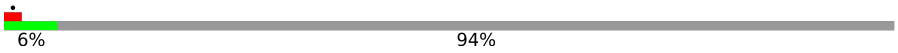
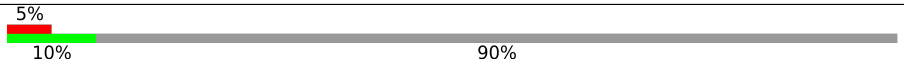
Metric	Whole archive (#Entries)	EM structures (#Entries)
Clashscore	158937	4297
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826
RNA backbone	4643	859

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the bar indicate the fraction of residues that contain outliers for >=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 <=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	Q	144	8% 93%
2	I	312	5% 54% 44%
3	A	2335	10% 68% 29%
4	r	972	8% 87% 13%
5	N	199	28% 72%
6	q	73	7% 100%
7	R	229	96%

Continued on next page...

Continued from previous page...

Mol	Chain	Length	Quality of chain
8	5	116	
9	6	106	
10	X	641	
11	v	536	
12	G	514	
13	Z	230	
14	K	439	
15	A4	1077	

2 Entry composition

There are 18 unique types of molecules in this entry. The entry contains 25904 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 Protein BUD31 homolog.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	Q	138	850	542	151	155	2	0	0

- Molecule 2 is a protein called Pre-mRNA-splicing factor 38A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	I	176	1151	752	201	195	3	0	0

- Molecule 3 is a protein called Pre-mRNA-processing-splicing factor 8.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	A	1656	10522	6814	1920	1763	25	0	0

- Molecule 4 is a protein called 116 kDa U5 small nuclear ribonucleoprotein component.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	r	844	5120	3284	935	894	7	0	0

- Molecule 5 is a protein called Zinc finger matrin-type protein 2.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
5	N	56	295	181	58	56	0	0

- Molecule 6 is a protein called Ubiquitin-like protein 5.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
6	q	73	523	343	88	91	1	0	0

- Molecule 7 is a protein called Spliceosome-associated protein CWC15 homolog.

Mol	Chain	Residues	Atoms				AltConf	Trace
7	R	9	Total	C	N	O	0	0
			45	27	9	9		

- Molecule 8 is a RNA chain called U5 small nuclear RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
8	5	58	Total	C	N	O	P	0	0
			1220	547	203	412	58		

- Molecule 9 is a RNA chain called U6 small nuclear RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
9	6	65	Total	C	N	O	P	0	0
			1392	622	257	448	65		

- Molecule 10 is a protein called WW domain-binding protein 11.

Mol	Chain	Residues	Atoms				AltConf	Trace
10	X	36	Total	C	N	O	0	0
			182	110	36	36		

- Molecule 11 is a protein called SNW domain-containing protein 1.

Mol	Chain	Residues	Atoms				AltConf	Trace
11	v	55	Total	C	N	O	0	0
			275	165	55	55		

- Molecule 12 is a protein called Pleiotropic regulator 1.

Mol	Chain	Residues	Atoms				AltConf	Trace
12	G	320	Total	C	N	O	0	0
			1604	964	320	320		

- Molecule 13 is a RNA chain called MINX M3 RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
13	Z	29	Total	C	N	O	P	0	0
			622	278	116	199	29		

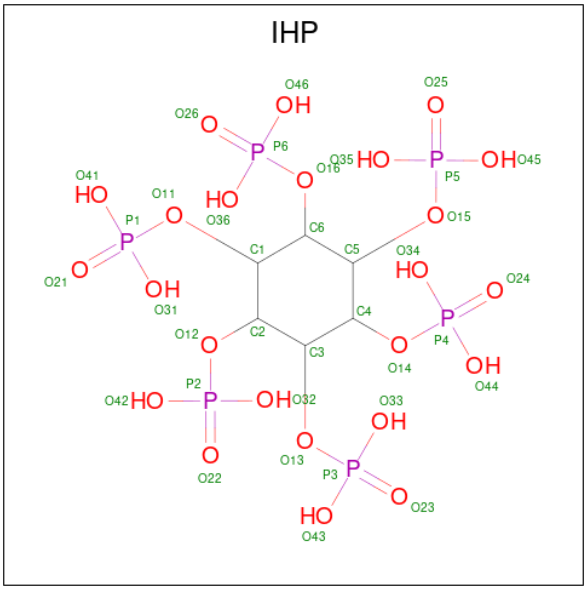
- Molecule 14 is a protein called Microfibrillar-associated protein 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
14	K	123	Total	C	N	O	S	0	0
			799	504	156	137	2		

- Molecule 15 is a protein called Transcription elongation regulator 1.

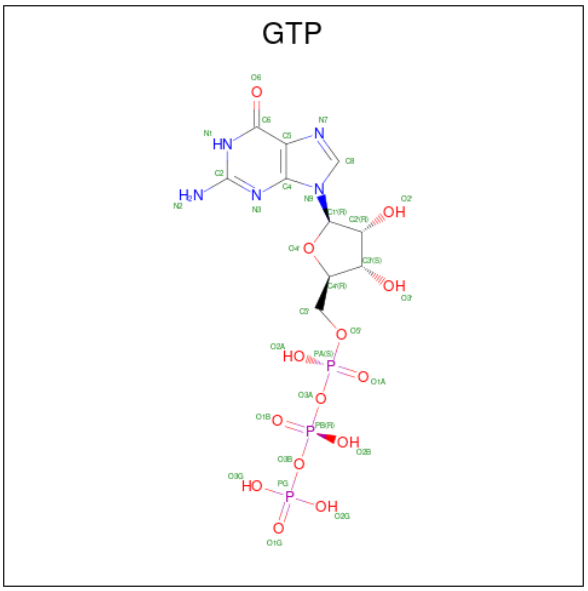
Mol	Chain	Residues	Atoms				AltConf	Trace
15	A4	246	Total	C	N	O	0	0
			1235	743	246	246		

- Molecule 16 is INOSITOL HEXAKISPHOSPHATE (three-letter code: IHP) (formula: $C_6H_{18}O_{24}P_6$).



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

- Molecule 17 is GUANOSINE-5'-TRIPHOSPHATE (three-letter code: GTP) (formula: $C_{10}H_{16}N_5O_{14}P_3$).



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

- Molecule 18 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

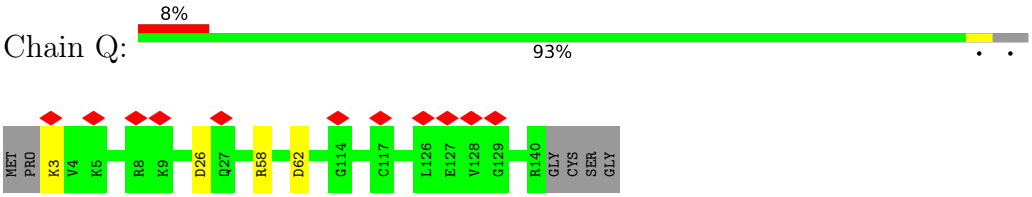
Mol	Chain	Residues	Atoms		AltConf
18	r	1	Total	Mg	0
			1	1	

3 Residue-property plots (i)

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

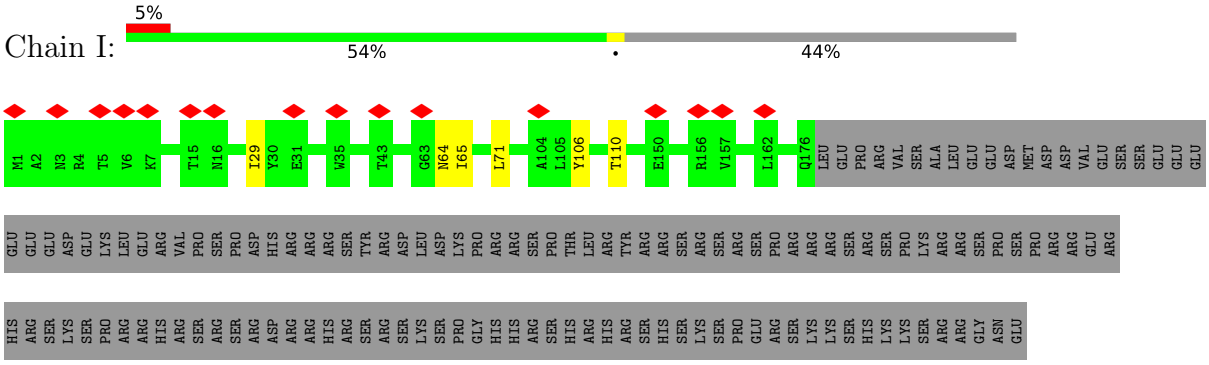
• Molecule 1: Protein BUD31 homolog

Chain Q:



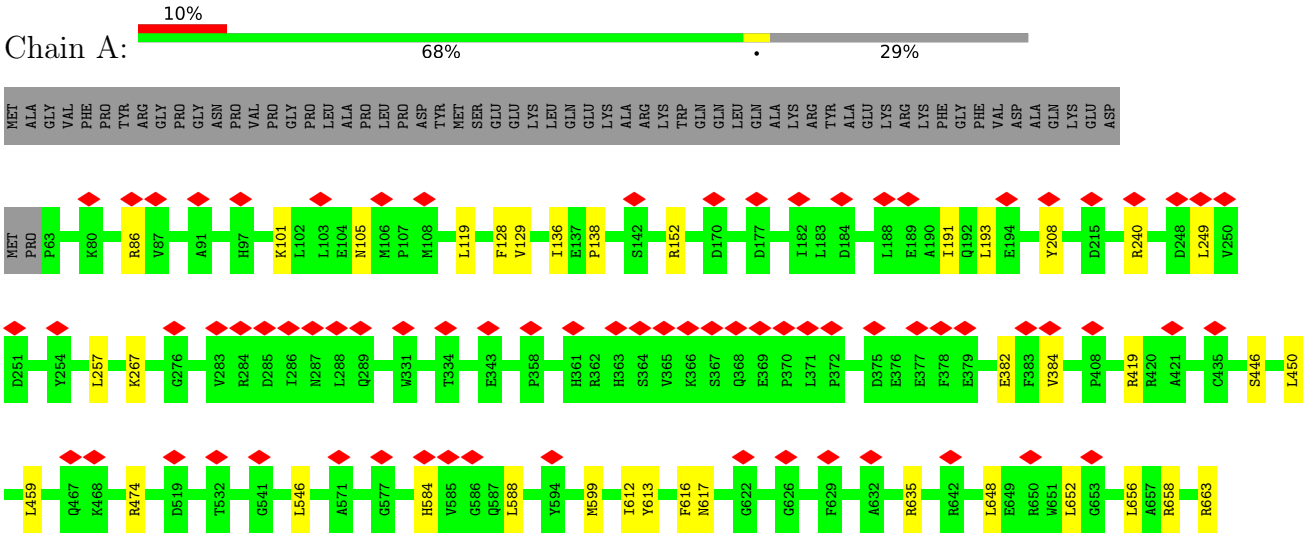
• Molecule 2: Pre-mRNA-splicing factor 38A

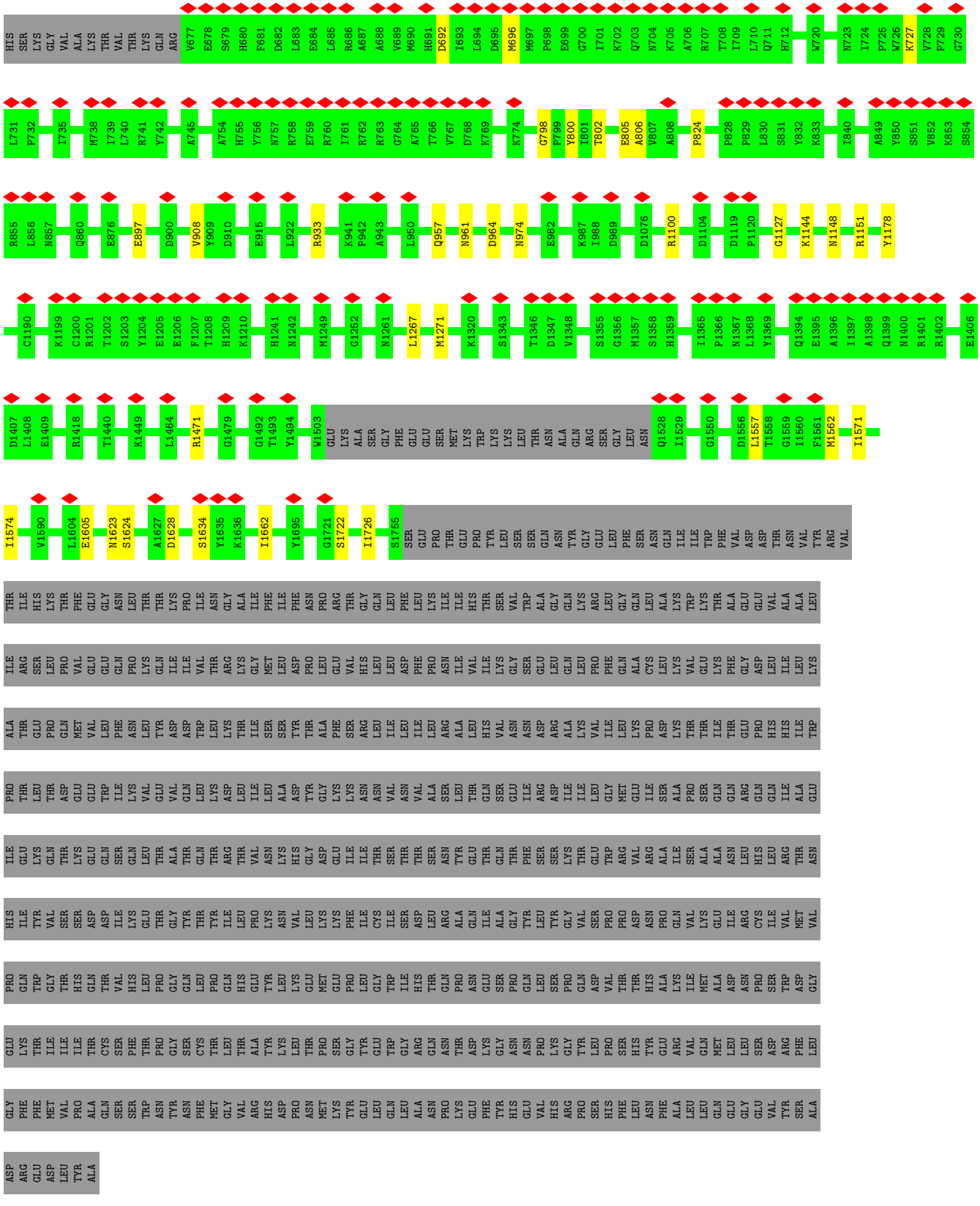
Chain I:



• Molecule 3: Pre-mRNA-processing-splicing factor 8

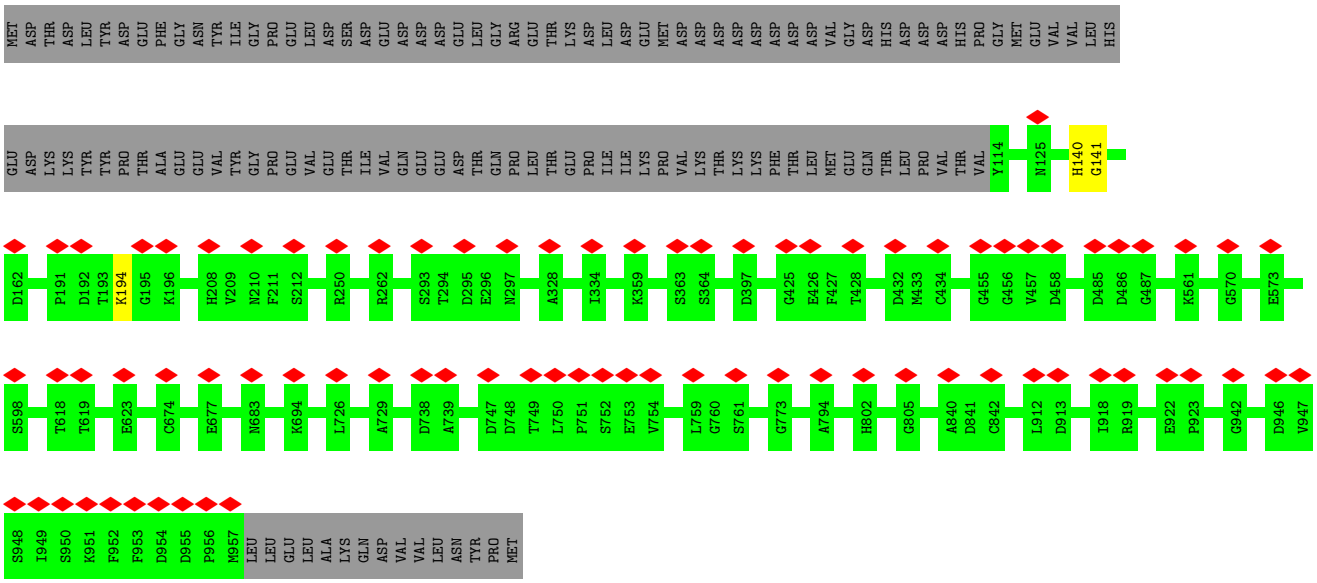
Chain A:



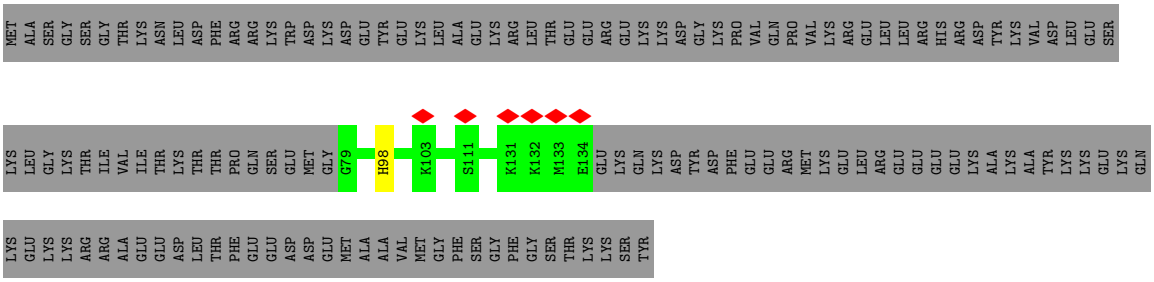


• Molecule 4: 116 kDa U5 small nuclear ribonucleoprotein component

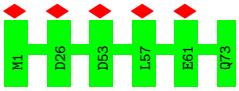
Chain r:



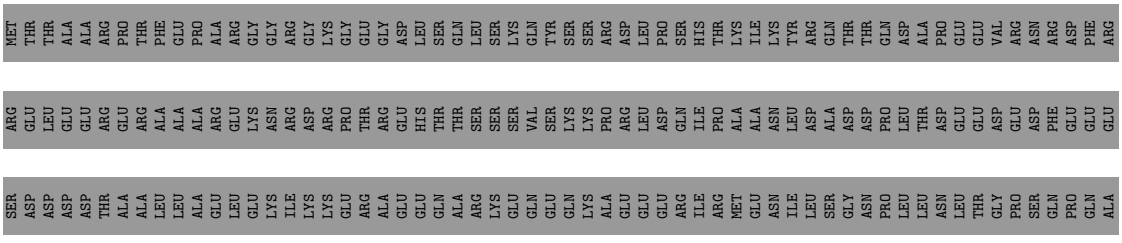
• Molecule 5: Zinc finger matrin-type protein 2

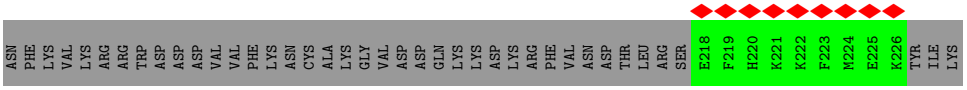


• Molecule 6: Ubiquitin-like protein 5



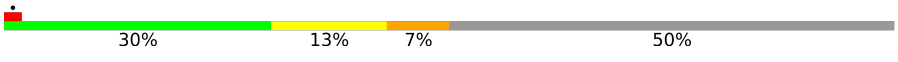
• Molecule 7: Spliceosome-associated protein CWC15 homolog

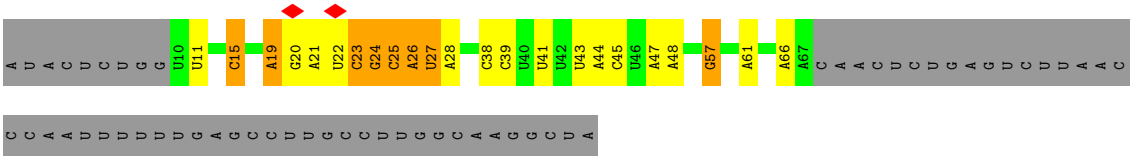




• Molecule 8: U5 small nuclear RNA

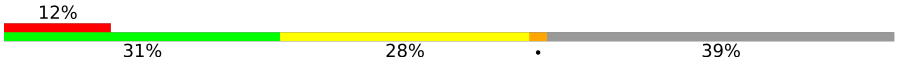
Chain 5:

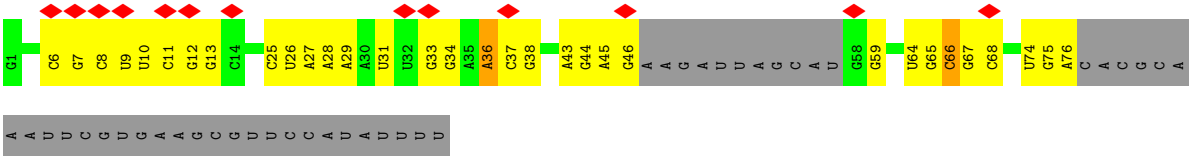




• Molecule 9: U6 small nuclear RNA

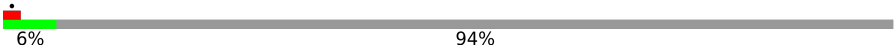
Chain 6:

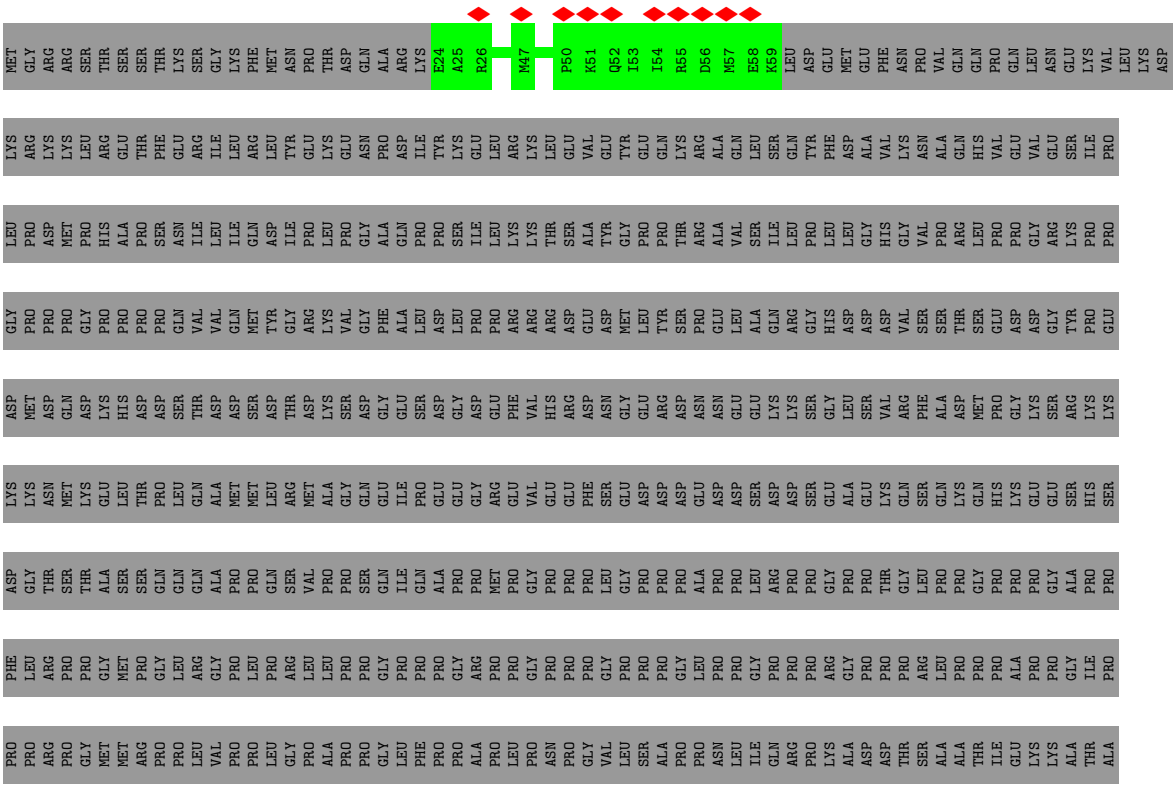


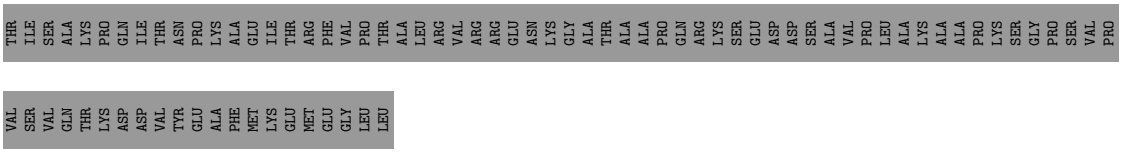


• Molecule 10: WW domain-binding protein 11

Chain X:

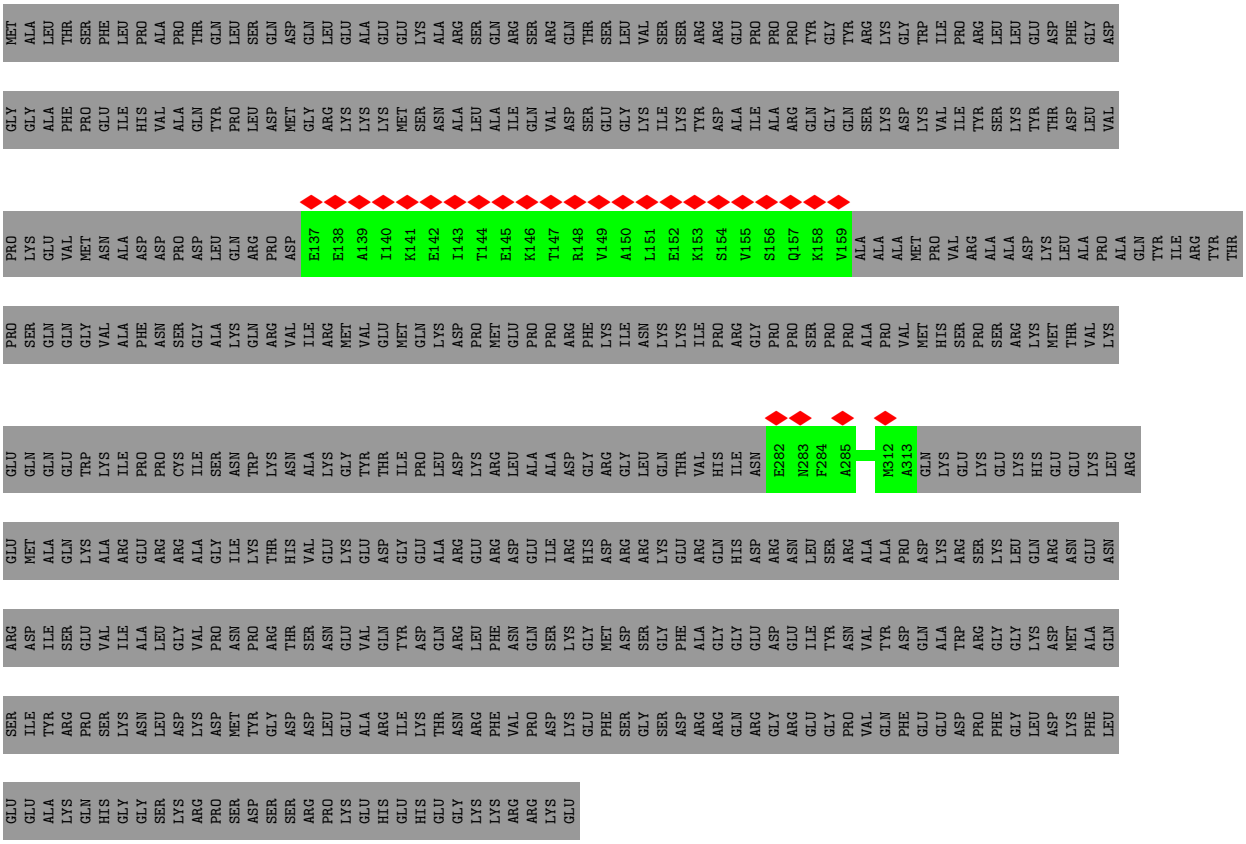






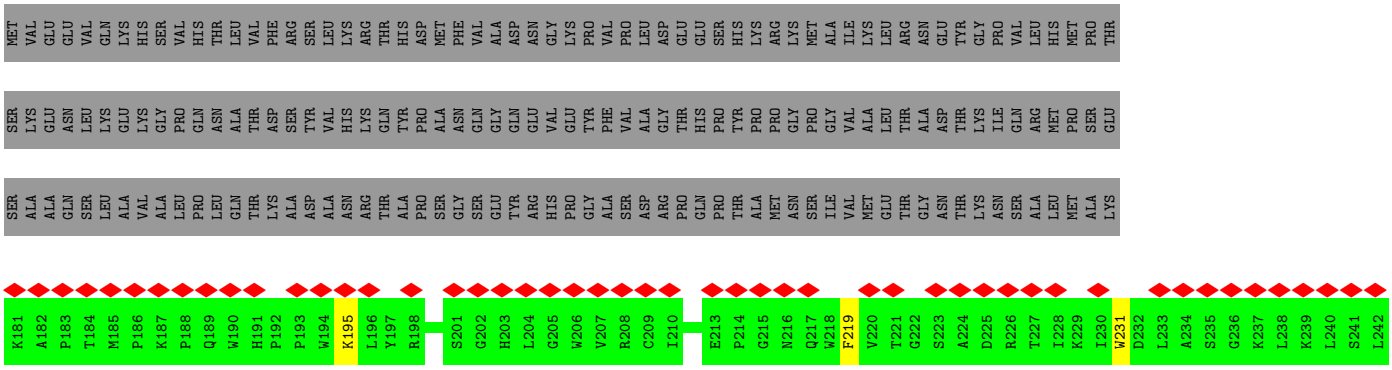
• Molecule 11: SNW domain-containing protein 1

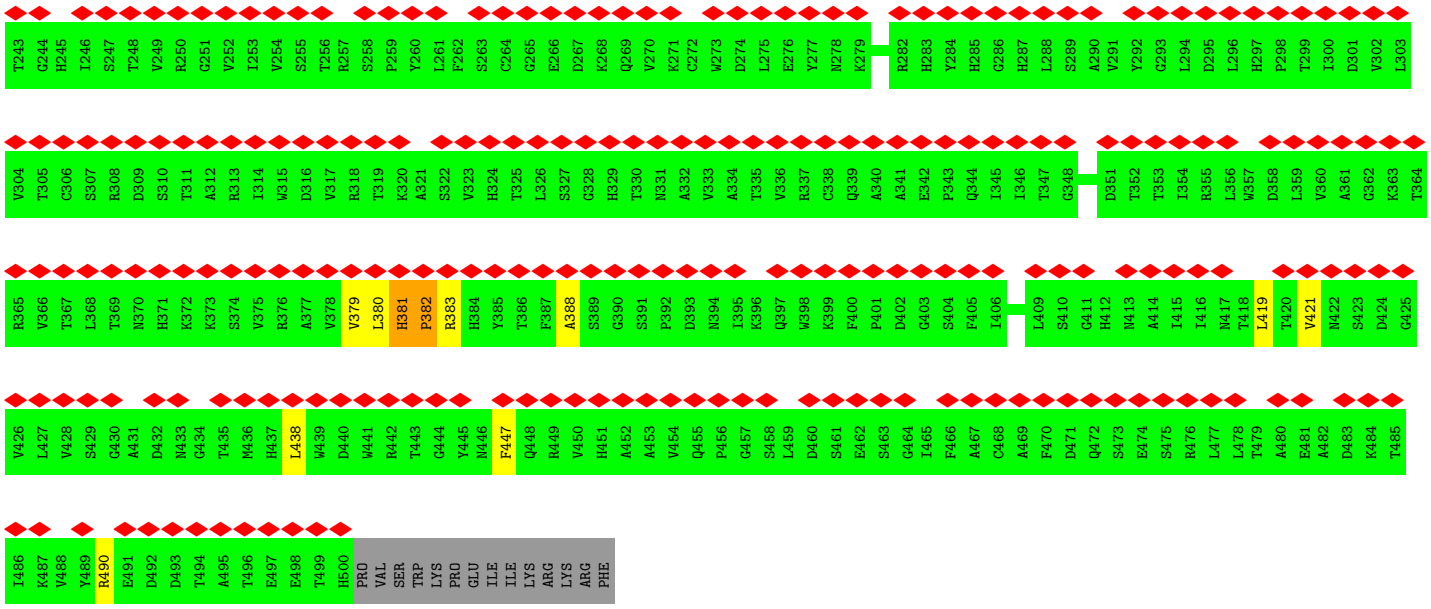
Chain v:



• Molecule 12: Pleiotropic regulator 1

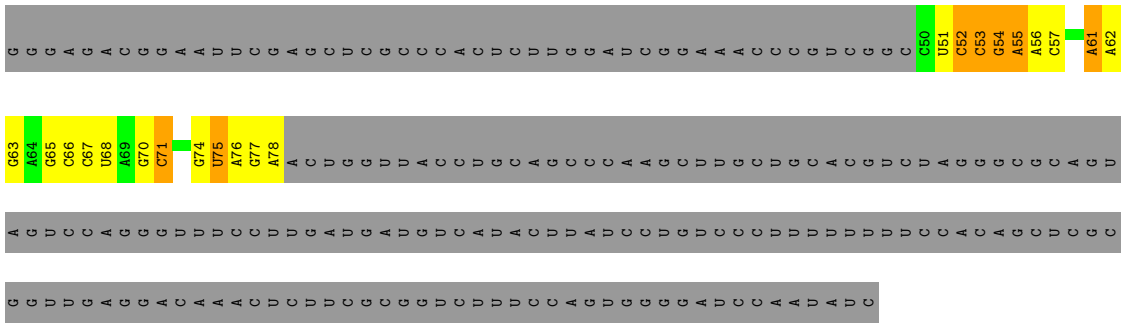
Chain G:





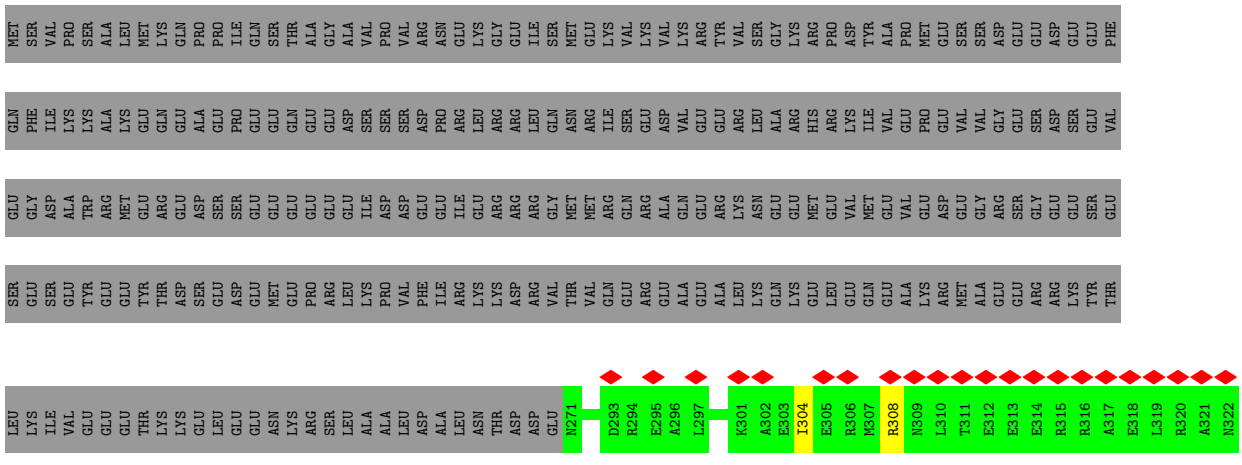
• Molecule 13: MINX M3 RNA

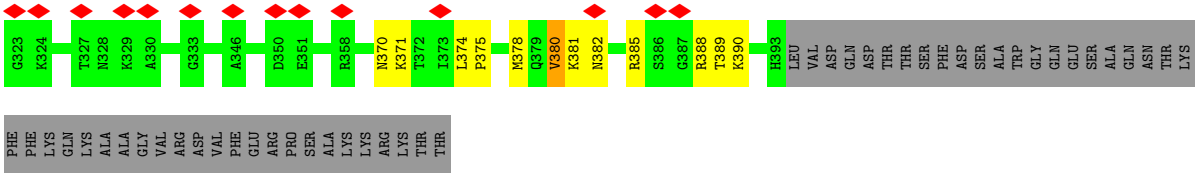
Chain Z:



• Molecule 14: Microfibrillar-associated protein 1

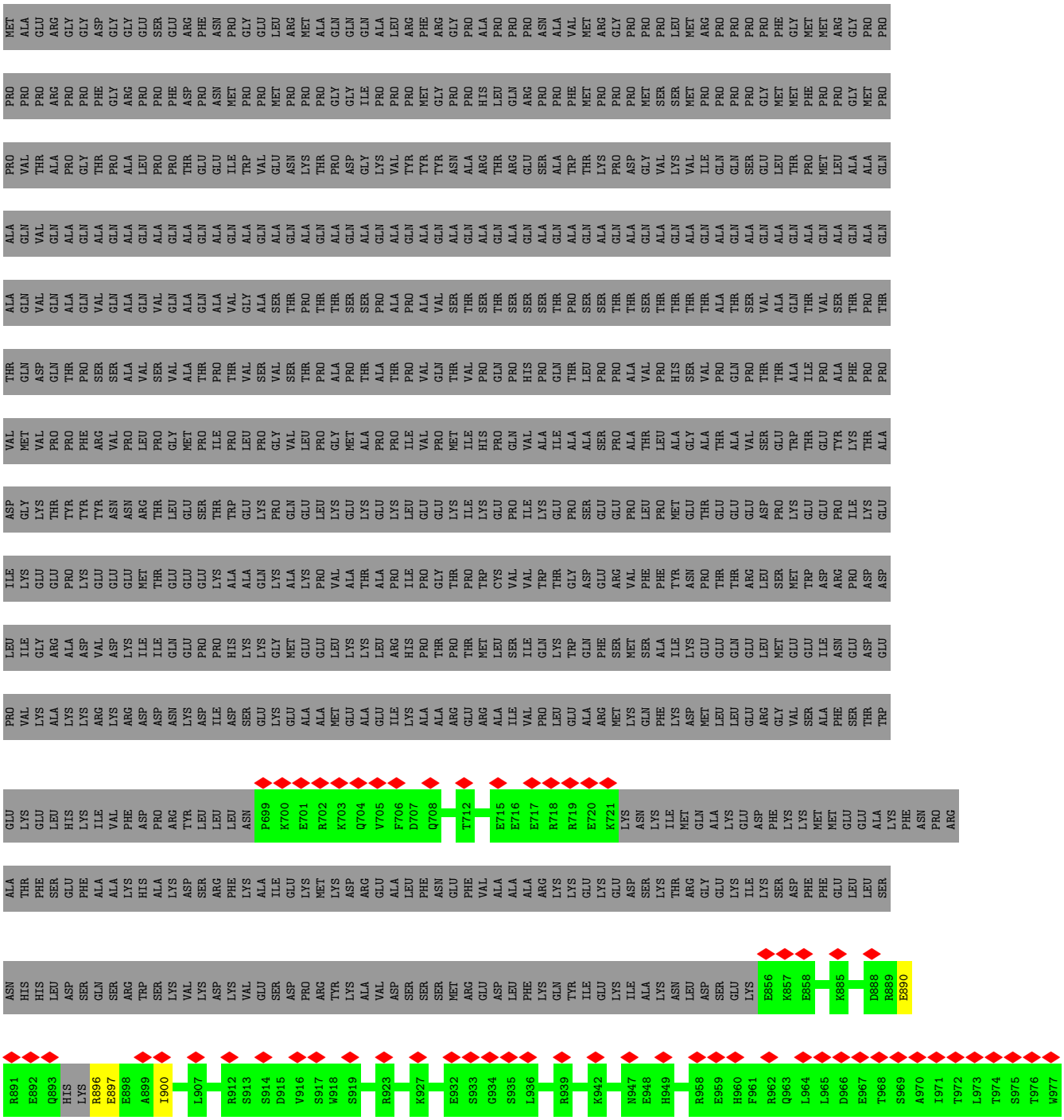
Chain K:

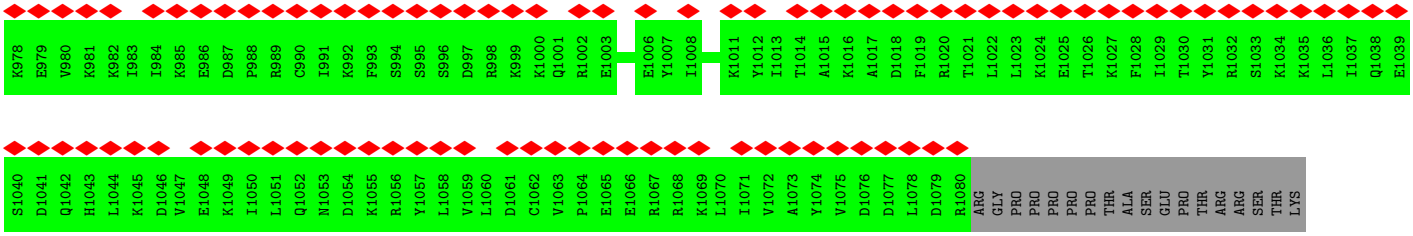




• Molecule 15: Transcription elongation regulator 1

Chain A4:




K978 E979 V980 K981 K982 I983 I984 K985 E986 D987 P988 R989 C990 I991 K992 F993 S994 S995 S996 D997 R998 K999 K1000 Q1001 R1002 E1003
E1006 Y1007 I1008
K1011 Y1012 I1013 T1014 A1015 K1016 A1017 D1018 F1019 R1020 T1021 L1022 L1023 K1024 E1025 T1026 K1027 F1028 I1029 T1030 Y1031 R1032 S1033 K1034 K1035 L1036 I1037 Q1038 E1039

S1040 D1041 Q1042 H1043 L1044 K1045 D1046 V1047 E1048 K1049 I1050 L1051 Q1052 N1053 D1054 K1055 R1056 Y1057 L1058 V1059 L1060 D1061 C1062 V1063 P1064 E1065 E1066 R1067 R1068 K1069 L1070 I1071 V1072 A1073 Y1074 V1075 D1076 D1077 L1078 D1079 R1080
ARG GLY PRO PRO PRO PRO PRO PRO THR ALA SER GLU PRO THR ARG ARG SER THR LYS

4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	84539	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 ($e^-/Å^2$)	2.25	Depositor
Minimum defocus (nm)	Not provided	
Maximum defocus (nm)	Not provided	
Magnification	Not provided	
Image detector	FEI FALCON III (4k x 4k)	Depositor
Maximum map value	0.131	Depositor
Minimum map value	-0.063	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.003	Depositor
Recommended contour level	0.034	Depositor
Map size (Å)	445.44, 445.44, 445.44	wwPDB
Map dimensions	384, 384, 384	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.16, 1.16, 1.16	Depositor

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: IHP, GTP, 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	Q	0.25	0/870	0.46	0/1208
2	I	0.28	0/1174	0.50	0/1616
3	A	0.27	0/10821	0.49	1/14985 (0.0%)
4	r	0.28	0/5232	0.51	2/7255 (0.0%)
5	N	0.22	0/296	0.35	0/410
6	q	0.27	0/533	0.51	0/727
7	R	0.21	0/44	0.28	0/60
8	5	0.30	0/1360	0.85	0/2113
9	6	0.24	0/1557	0.80	1/2423 (0.0%)
10	X	0.23	0/182	0.31	0/254
11	v	0.23	0/273	0.29	0/379
12	G	0.27	0/1616	0.50	0/2258
13	Z	0.20	0/696	0.71	0/1083
14	K	0.31	0/813	0.49	0/1106
15	A4	0.22	0/1235	0.33	0/1725
All	All	0.27	0/26702	0.55	4/37602 (0.0%)

There are no bond length outliers.

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	r	141	GLY	C-N-CA	-7.18	103.76	121.70
4	r	141	GLY	CA-C-O	-6.42	109.05	120.60
9	6	66	C	C6-N1-C2	-5.16	118.24	120.30
3	A	257	LEU	CA-CB-CG	5.07	126.95	115.30

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts (i)

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	Q	850	0	574	2	0
2	I	1151	0	915	3	0
3	A	10522	0	7599	48	0
4	r	5120	0	3785	0	0
5	N	295	0	149	2	0
6	q	523	0	472	0	0
7	R	45	0	17	0	0
8	5	1220	0	618	36	0
9	6	1392	0	705	11	0
10	X	182	0	85	0	0
11	v	275	0	138	0	0
12	G	1604	0	795	13	0
13	Z	622	0	315	27	0
14	K	799	0	609	11	0
15	A4	1235	0	539	2	0
16	A	36	0	6	0	0
17	r	32	0	10	0	0
18	r	1	0	0	0	0
All	All	25904	0	17331	133	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 4.

All (133) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
8:5:24:G:N1	8:5:57:G:N3	1.75	1.33
3:A:599:MET:HE3	13:Z:52:C:C2	1.74	1.22
8:5:24:G:C6	8:5:57:G:N3	2.05	1.22
3:A:599:MET:HE3	13:Z:52:C:N3	1.55	1.21
12:G:381:HIS:CB	12:G:382:PRO:HD3	1.73	1.17
8:5:24:G:C6	8:5:57:G:C2	2.35	1.15
8:5:24:G:N2	8:5:57:G:O2'	1.86	1.07
8:5:24:G:N1	8:5:57:G:C4	2.26	1.02
8:5:24:G:H22	8:5:57:G:C1'	1.74	1.00

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
8:5:24:G:H22	8:5:57:G:H1'	1.25	1.00
12:G:381:HIS:CB	12:G:382:PRO:CD	2.40	0.99
8:5:24:G:H22	8:5:57:G:C2'	1.76	0.98
8:5:19:A:C2	8:5:23:C:C5	2.51	0.98
3:A:599:MET:HE3	13:Z:52:C:O2	1.65	0.96
3:A:599:MET:CE	13:Z:52:C:C2	2.53	0.90
8:5:24:G:N2	8:5:57:G:H1'	1.88	0.88
8:5:24:G:C6	8:5:57:G:C4	2.60	0.88
3:A:599:MET:CE	13:Z:52:C:N3	2.36	0.87
8:5:24:G:H1	8:5:57:G:H1'	1.40	0.87
3:A:599:MET:CE	13:Z:52:C:O2	2.23	0.85
8:5:24:G:H1	8:5:57:G:C1'	1.91	0.83
8:5:24:G:C2	8:5:57:G:N3	2.46	0.83
13:Z:52:C:C5	14:K:389:THR:CB	2.65	0.79
8:5:24:G:N2	8:5:57:G:C2'	2.42	0.79
8:5:24:G:N1	8:5:57:G:H1'	1.99	0.77
9:6:43:A:H61	13:Z:62:A:H61	1.33	0.76
15:A4:890:GLU:O	15:A4:897:GLU:N	2.21	0.74
3:A:663:ARG:NH1	9:6:64:U:OP2	2.21	0.74
8:5:24:G:C5	8:5:57:G:C2	2.76	0.74
12:G:381:HIS:CB	12:G:388:ALA:H	2.00	0.73
9:6:59:G:O6	9:6:76:A:N1	2.22	0.73
8:5:24:G:C5	8:5:57:G:N2	2.57	0.73
3:A:824:PRO:O	3:A:933:ARG:NH1	2.22	0.72
9:6:34:G:OP2	9:6:34:G:N2	2.23	0.72
14:K:378:MET:HG2	14:K:381:LYS:HE3	1.72	0.70
3:A:964:ASP:O	3:A:1100:ARG:NH2	2.24	0.70
8:5:24:G:C2	8:5:57:G:H1'	2.26	0.70
3:A:584:HIS:O	3:A:588:LEU:N	2.26	0.69
3:A:663:ARG:NH2	9:6:65:G:O6	2.26	0.69
8:5:19:A:N3	8:5:23:C:C5	2.61	0.69
8:5:43:U:O2'	9:6:67:G:O6	2.09	0.67
3:A:658:ARG:NH2	9:6:66:C:OP2	2.27	0.67
12:G:195:LYS:N	12:G:490:ARG:O	2.27	0.67
3:A:419:ARG:NH1	8:5:25:C:OP1	2.27	0.66
3:A:474:ARG:NH1	8:5:15:C:OP2	2.28	0.66
13:Z:75:U:H2'	13:Z:76:A:H8	1.59	0.66
8:5:19:A:C2	8:5:23:C:H5	2.14	0.65
3:A:1127:GLY:O	3:A:1151:ARG:NH2	2.30	0.65
3:A:546:LEU:HD12	3:A:648:LEU:HD21	1.79	0.64
3:A:635:ARG:NH1	8:5:27:U:OP2	2.30	0.64

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:A:1628:ASP:N	3:A:1662:ILE:O	2.30	0.64
3:A:119:LEU:N	3:A:128:PHE:O	2.32	0.62
3:A:119:LEU:O	3:A:128:PHE:N	2.32	0.62
13:Z:77:G:H2'	13:Z:78:A:H8	1.64	0.62
8:5:19:A:N3	8:5:23:C:H5	1.96	0.61
8:5:24:G:O6	8:5:57:G:C4	2.52	0.61
12:G:195:LYS:O	12:G:490:ARG:N	2.34	0.61
13:Z:67:C:H2'	13:Z:68:U:C6	2.37	0.59
5:N:98:HIS:CD2	13:Z:67:C:H4'	2.38	0.59
13:Z:74:G:H3'	13:Z:75:U:H5'	1.83	0.59
12:G:380:LEU:O	12:G:421:VAL:CB	2.52	0.57
3:A:152:ARG:NH1	3:A:616:PHE:O	2.37	0.57
13:Z:55:A:H2'	13:Z:56:A:H8	1.68	0.57
13:Z:54:G:O2'	13:Z:55:A:H5"	2.03	0.56
13:Z:75:U:H2'	13:Z:76:A:C8	2.39	0.56
3:A:612:ILE:O	3:A:616:PHE:N	2.38	0.55
8:5:24:G:N2	8:5:57:G:C1'	2.51	0.55
8:5:47:A:O4'	14:K:388:ARG:NH1	2.39	0.55
3:A:1605:GLU:O	3:A:1634:SER:N	2.38	0.55
3:A:599:MET:HE2	13:Z:52:C:O2	2.07	0.55
13:Z:66:C:O2'	13:Z:67:C:H5'	2.07	0.54
12:G:438:LEU:O	12:G:447:PHE:N	2.39	0.54
13:Z:77:G:H2'	13:Z:78:A:C8	2.43	0.54
14:K:380:VAL:HG13	14:K:382:ASN:H	1.72	0.53
3:A:1623:ASN:OD1	3:A:1624:SER:N	2.42	0.53
3:A:613:TYR:O	3:A:617:ASN:N	2.40	0.53
2:I:29:ILE:HD11	2:I:71:LEU:CD1	2.38	0.52
14:K:371:LYS:HA	14:K:374:LEU:HD23	1.92	0.51
12:G:219:PHE:N	12:G:231:TRP:O	2.43	0.51
3:A:191:ILE:O	3:A:191:ILE:HG22	2.11	0.50
3:A:957:GLN:O	3:A:961:ASN:N	2.43	0.50
8:5:44:A:OP1	9:6:67:G:N1	2.44	0.50
13:Z:61:A:H2'	13:Z:62:A:O4'	2.11	0.50
12:G:379:VAL:CB	12:G:419:LEU:CB	2.90	0.50
3:A:193:LEU:N	3:A:208:TYR:OH	2.45	0.49
3:A:267:LYS:HE2	3:A:459:LEU:HD11	1.95	0.49
13:Z:56:A:O2'	13:Z:57:C:H5'	2.12	0.49
8:5:19:A:C2	8:5:23:C:C6	2.98	0.49
13:Z:53:C:O2'	13:Z:54:G:H5'	2.12	0.49
14:K:374:LEU:HB3	14:K:375:PRO:HD2	1.95	0.48
8:5:24:G:N1	8:5:57:G:C1'	2.64	0.48

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
13:Z:65:G:O2'	13:Z:66:C:H5'	2.14	0.48
3:A:382:GLU:O	3:A:384:VAL:N	2.46	0.47
3:A:692:ASP:O	3:A:696:MET:N	2.47	0.47
15:A4:896:ARG:O	15:A4:900:ILE:N	2.46	0.47
13:Z:70:G:C6	13:Z:71:C:H1'	2.50	0.47
3:A:897:GLU:O	3:A:908:VAL:N	2.45	0.47
3:A:1144:LYS:O	3:A:1148:ASN:ND2	2.47	0.47
3:A:1557:LEU:HD11	9:6:44:G:C4	2.50	0.46
14:K:380:VAL:O	14:K:385:ARG:HD3	2.15	0.46
8:5:24:G:C8	8:5:26:A:N6	2.83	0.46
12:G:382:PRO:HB2	12:G:383:ARG:H	1.58	0.46
1:Q:58:ARG:NH2	1:Q:62:ASP:OD1	2.47	0.46
3:A:802:THR:O	3:A:805:GLU:N	2.49	0.45
3:A:1267:LEU:O	3:A:1271:MET:N	2.46	0.45
2:I:106:TYR:O	2:I:110:THR:N	2.49	0.44
8:5:24:G:O6	8:5:57:G:C2	2.64	0.44
3:A:798:GLY:O	3:A:800:TYR:N	2.50	0.44
9:6:36:A:HO2'	9:6:38:G:H8	1.66	0.43
12:G:381:HIS:CB	12:G:388:ALA:HB3	2.49	0.43
13:Z:61:A:H2'	13:Z:62:A:C8	2.54	0.43
3:A:802:THR:O	3:A:806:ALA:N	2.46	0.43
13:Z:52:C:H5	14:K:389:THR:CB	2.26	0.43
3:A:652:LEU:O	3:A:656:LEU:HD23	2.19	0.42
9:6:8:C:N4	9:6:9:U:O2	2.53	0.42
3:A:249:LEU:HD23	3:A:249:LEU:O	2.20	0.42
14:K:374:LEU:HD12	14:K:378:MET:SD	2.59	0.42
2:I:64:ASN:OD1	2:I:65:ILE:N	2.52	0.42
3:A:105:ASN:ND2	3:A:129:VAL:HG11	2.34	0.42
3:A:101:LYS:O	3:A:105:ASN:N	2.53	0.42
3:A:446:SER:O	3:A:450:LEU:HD23	2.20	0.42
8:5:19:A:C4	8:5:23:C:H5	2.37	0.42
14:K:304:ILE:O	14:K:308:ARG:N	2.52	0.42
5:N:98:HIS:HD2	13:Z:67:C:H4'	1.85	0.42
1:Q:3:LYS:N	1:Q:26:ASP:OD1	2.53	0.41
12:G:379:VAL:CB	12:G:419:LEU:O	2.68	0.41
3:A:1722:SER:O	3:A:1726:ILE:HD12	2.19	0.41
12:G:379:VAL:CB	12:G:419:LEU:C	2.89	0.41
3:A:1571:ILE:HA	3:A:1574:ILE:HG22	2.02	0.41
3:A:974:ASN:O	3:A:1178:TYR:N	2.54	0.40
8:5:24:G:C4	8:5:57:G:N2	2.89	0.40
3:A:136:ILE:HG22	3:A:138:PRO:HD2	2.03	0.40

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
14:K:390:LYS:CG	14:K:390:LYS:O	2.70	0.40

There are no symmetry-related clashes.

5.3 Torsion angles (i)

5.3.1 Protein backbone (i)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	Q	136/144 (94%)	110 (81%)	26 (19%)	0	100	100
2	I	174/312 (56%)	152 (87%)	22 (13%)	0	100	100
3	A	1650/2335 (71%)	1408 (85%)	242 (15%)	0	100	100
4	r	842/972 (87%)	769 (91%)	73 (9%)	0	100	100
5	N	54/199 (27%)	53 (98%)	1 (2%)	0	100	100
6	q	71/73 (97%)	62 (87%)	9 (13%)	0	100	100
7	R	7/229 (3%)	7 (100%)	0	0	100	100
10	X	34/641 (5%)	33 (97%)	1 (3%)	0	100	100
11	v	51/536 (10%)	51 (100%)	0	0	100	100
12	G	318/514 (62%)	280 (88%)	36 (11%)	2 (1%)	25	63
14	K	121/439 (28%)	100 (83%)	20 (16%)	1 (1%)	19	57
15	A4	240/1077 (22%)	233 (97%)	7 (3%)	0	100	100
All	All	3698/7471 (50%)	3258 (88%)	437 (12%)	3 (0%)	54	84

All (3) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
12	G	381	HIS
12	G	382	PRO
14	K	380	VAL

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	Q	42/130 (32%)	42 (100%)	0	100	100
2	I	70/293 (24%)	70 (100%)	0	100	100
3	A	544/2108 (26%)	539 (99%)	5 (1%)	78	87
4	r	269/866 (31%)	267 (99%)	2 (1%)	84	90
5	N	5/181 (3%)	5 (100%)	0	100	100
6	q	43/66 (65%)	43 (100%)	0	100	100
10	X	1/554 (0%)	1 (100%)	0	100	100
12	G	13/441 (3%)	13 (100%)	0	100	100
14	K	44/395 (11%)	43 (98%)	1 (2%)	50	71
15	A4	3/938 (0%)	3 (100%)	0	100	100
All	All	1034/5972 (17%)	1026 (99%)	8 (1%)	82	89

All (8) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
3	A	86	ARG
3	A	240	ARG
3	A	727	LYS
3	A	1471	ARG
3	A	1562	MET
4	r	140	HIS
4	r	194	LYS
14	K	370	ASN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (2) such sidechains are listed below:

Mol	Chain	Res	Type
3	A	1241	HIS
5	N	98	HIS

5.3.3 RNA (i)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
13	Z	28/230 (12%)	9 (32%)	0
8	5	57/116 (49%)	20 (35%)	1 (1%)
9	6	63/106 (59%)	20 (31%)	0
All	All	148/452 (32%)	49 (33%)	1 (0%)

All (49) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
8	5	11	U
8	5	15	C
8	5	19	A
8	5	20	G
8	5	21	A
8	5	22	U
8	5	23	C
8	5	24	G
8	5	25	C
8	5	26	A
8	5	27	U
8	5	28	A
8	5	38	C
8	5	39	C
8	5	41	U
8	5	45	C
8	5	48	A
8	5	57	G
8	5	61	A
8	5	66	A
9	6	6	C
9	6	7	G
9	6	10	U
9	6	11	C
9	6	12	G
9	6	13	G
9	6	25	C
9	6	26	U
9	6	27	A
9	6	28	A
9	6	29	A
9	6	31	U
9	6	33	G

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
9	6	36	A
9	6	37	C
9	6	45	A
9	6	46	G
9	6	68	C
9	6	74	U
9	6	75	G
13	Z	51	U
13	Z	52	C
13	Z	53	C
13	Z	54	G
13	Z	55	A
13	Z	61	A
13	Z	63	G
13	Z	71	C
13	Z	75	U

All (1) RNA pucker outliers are listed below:

Mol	Chain	Res	Type
8	5	26	A

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

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

5.5 Carbohydrates (i)

There are no monosaccharides in this entry.

5.6 Ligand geometry (i)

Of 3 ligands modelled in this entry, 1 is 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	$\#\|Z\|>2$
17	GTP	r	1500	4,18	26,34,34	0.99	2 (7%)	32,54,54	0.84	1 (3%)
16	IHP	A	3001	-	36,36,36	1.44	6 (16%)	54,60,60	0.71	1 (1%)

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
17	GTP	r	1500	4,18	-	5/18/38/38	0/3/3/3
16	IHP	A	3001	-	-	10/30/54/54	0/1/1/1

All (8) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
16	A	3001	IHP	P2-O12	3.30	1.65	1.59
16	A	3001	IHP	P3-O13	3.06	1.65	1.59
16	A	3001	IHP	P4-O14	3.03	1.65	1.59
16	A	3001	IHP	P5-O15	3.03	1.65	1.59
16	A	3001	IHP	P1-O11	3.02	1.65	1.59
16	A	3001	IHP	P6-O16	2.86	1.64	1.59
17	r	1500	GTP	C5-C6	-2.50	1.42	1.47
17	r	1500	GTP	C8-N7	-2.06	1.31	1.35

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
16	A	3001	IHP	C5-C6-C1	2.33	115.51	110.41
17	r	1500	GTP	PA-O3A-PB	2.23	140.49	132.83

There are no chirality outliers.

All (15) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
16	A	3001	IHP	C1-C2-O12-P2
16	A	3001	IHP	C3-C2-O12-P2
16	A	3001	IHP	C1-O11-P1-O31
16	A	3001	IHP	C4-O14-P4-O24
17	r	1500	GTP	C5'-O5'-PA-O1A
16	A	3001	IHP	C1-O11-P1-O21

Continued on next page...

Continued from previous page...

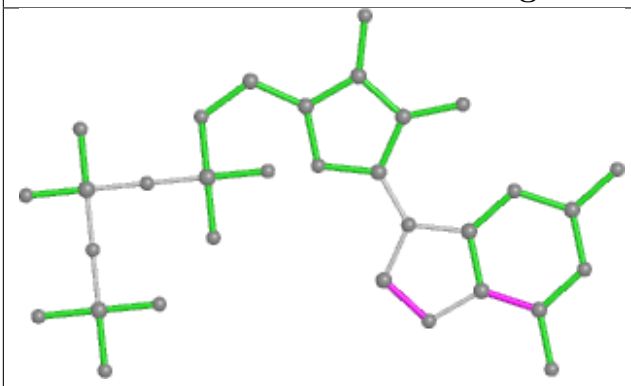
Mol	Chain	Res	Type	Atoms
17	r	1500	GTP	PB-O3B-PG-O2G
16	A	3001	IHP	C6-O16-P6-O36
16	A	3001	IHP	C6-O16-P6-O46
17	r	1500	GTP	C3'-C4'-C5'-O5'
17	r	1500	GTP	PB-O3A-PA-O2A
16	A	3001	IHP	C2-O12-P2-O22
16	A	3001	IHP	C3-O13-P3-O43
16	A	3001	IHP	C4-O14-P4-O34
17	r	1500	GTP	O4'-C4'-C5'-O5'

There are no ring outliers.

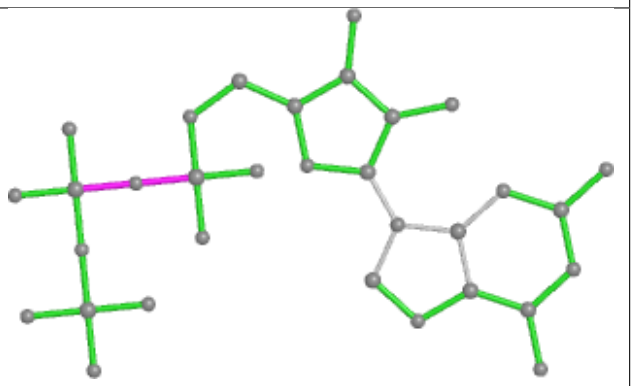
No monomer is involved in short contacts.

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 then 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.

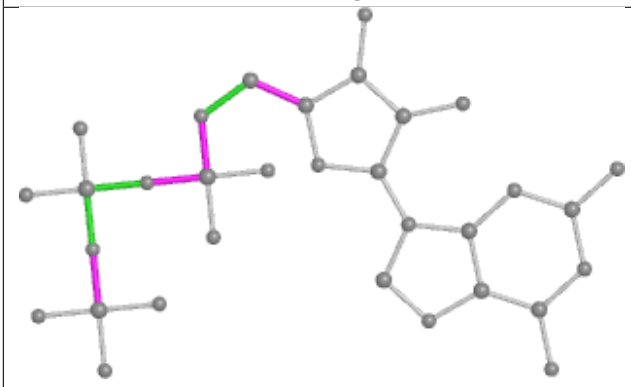
Ligand GTP r 1500



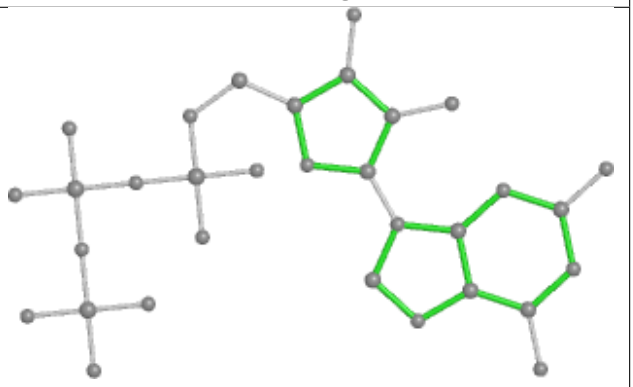
Bond lengths



Bond angles

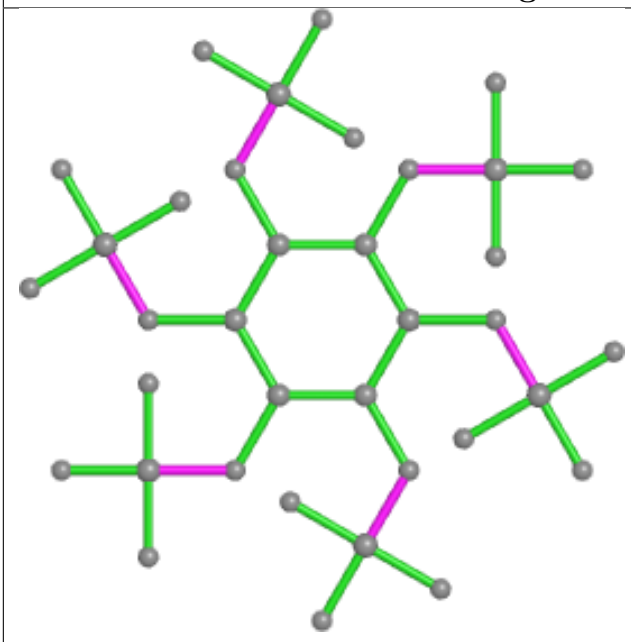


Torsions

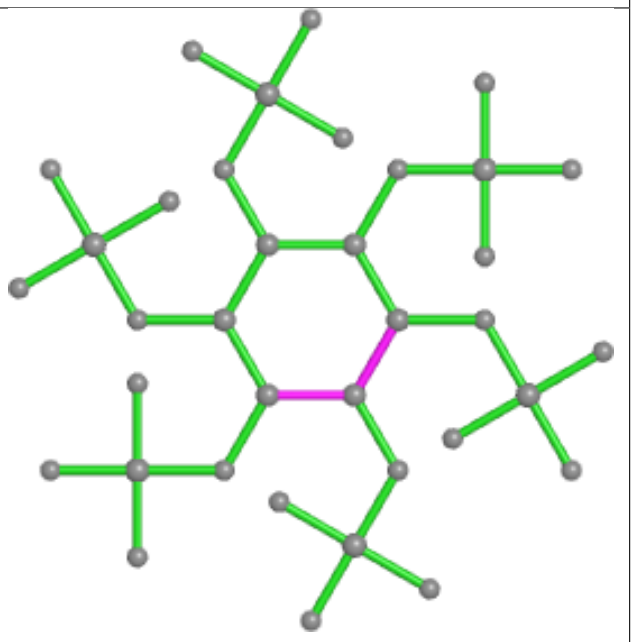


Rings

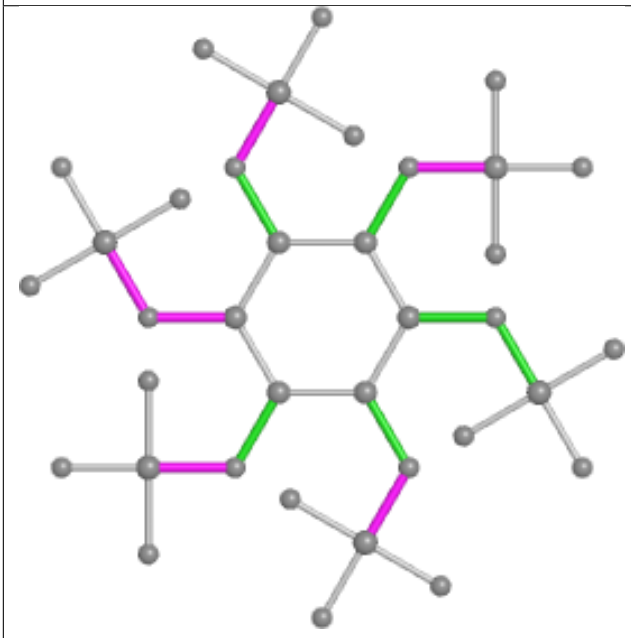
Ligand IHP A 3001



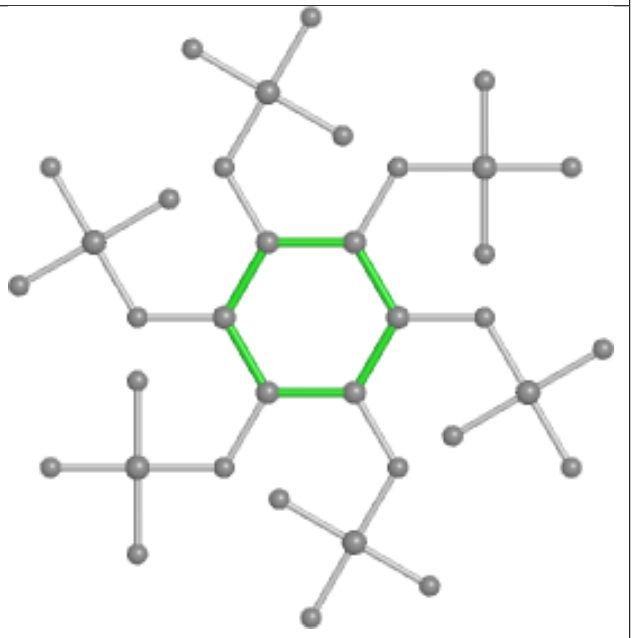
Bond lengths



Bond angles



Torsions



Rings

5.7 Other polymers

There are no such residues in this entry.

5.8 Polymer linkage issues

There are no chain breaks in this entry.

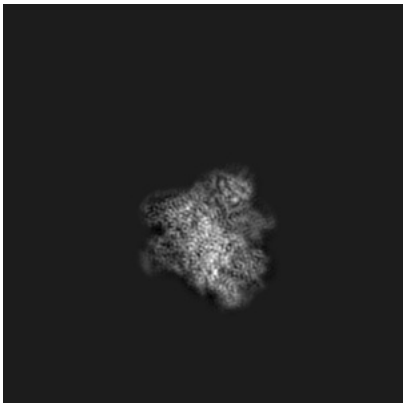
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-11694. These allow visual inspection of the internal detail of the map and identification of artifacts.

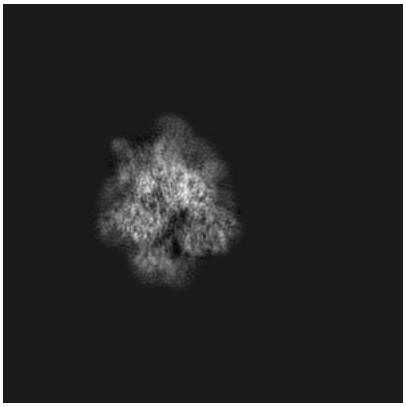
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections

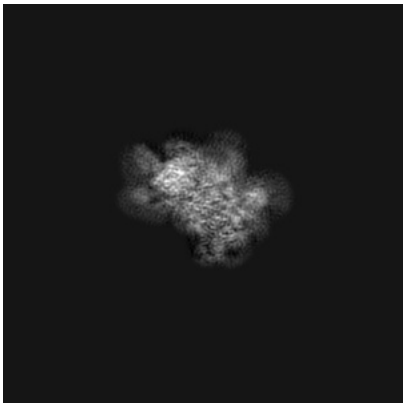
6.1.1 Primary map



X



Y

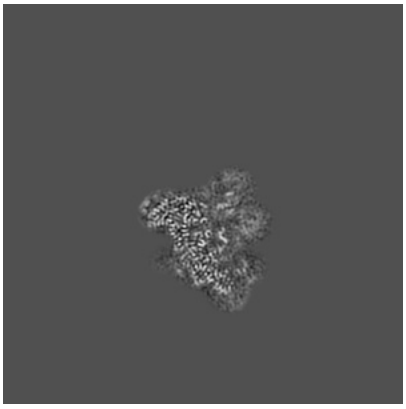


Z

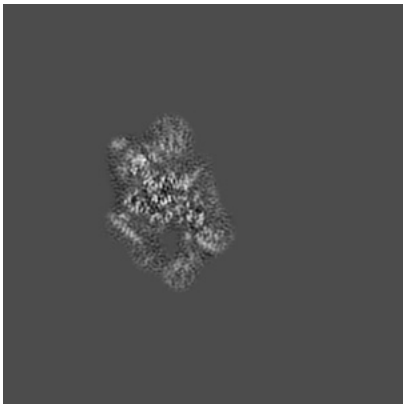
The images above show the map projected in three orthogonal directions.

6.2 Central slices

6.2.1 Primary map



X Index: 192



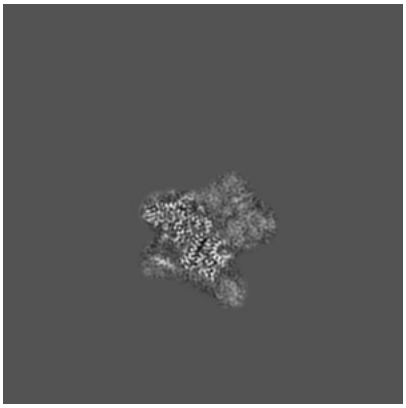
Y Index: 192

Z Index: 192

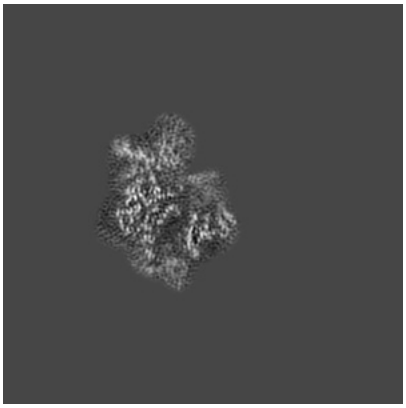
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

6.3.1 Primary map



X Index: 203



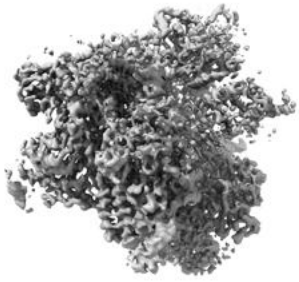
Y Index: 201

Z Index: 149

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



X

Y

Z

The images above show the 3D surface view of the map at the recommended contour level 0.034. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

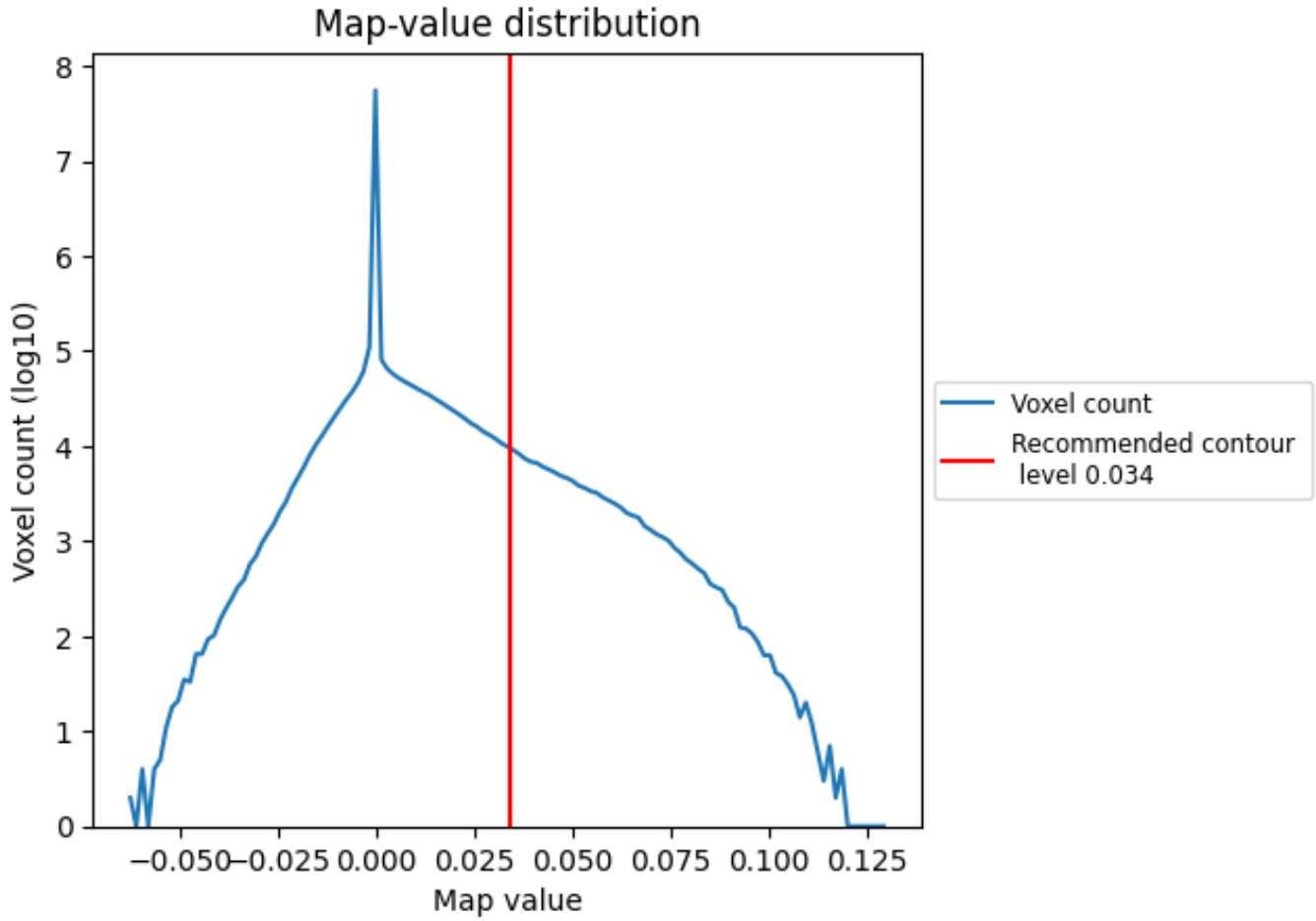
6.5 Mask visualisation (i)

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

7 Map analysis

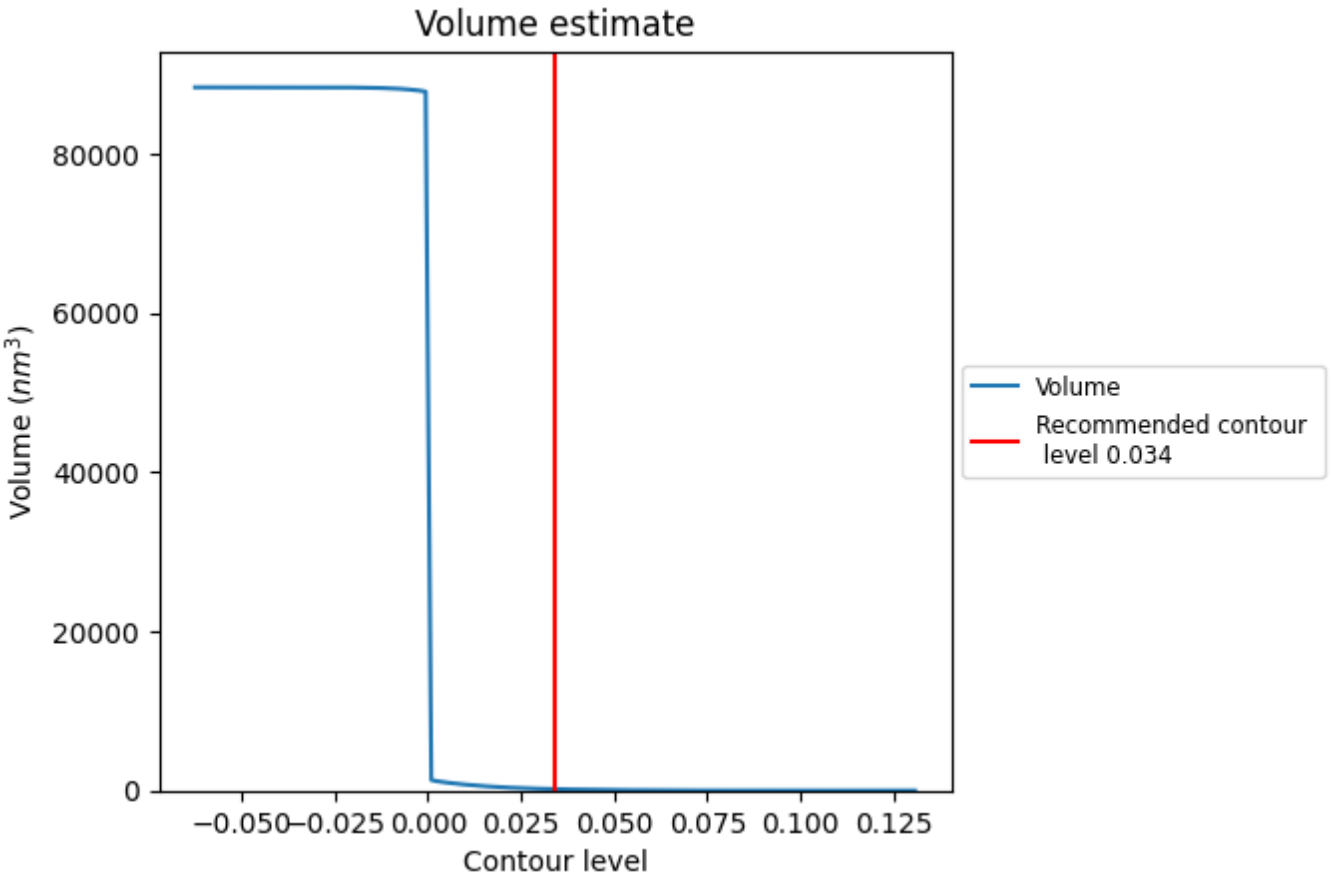
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution



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.

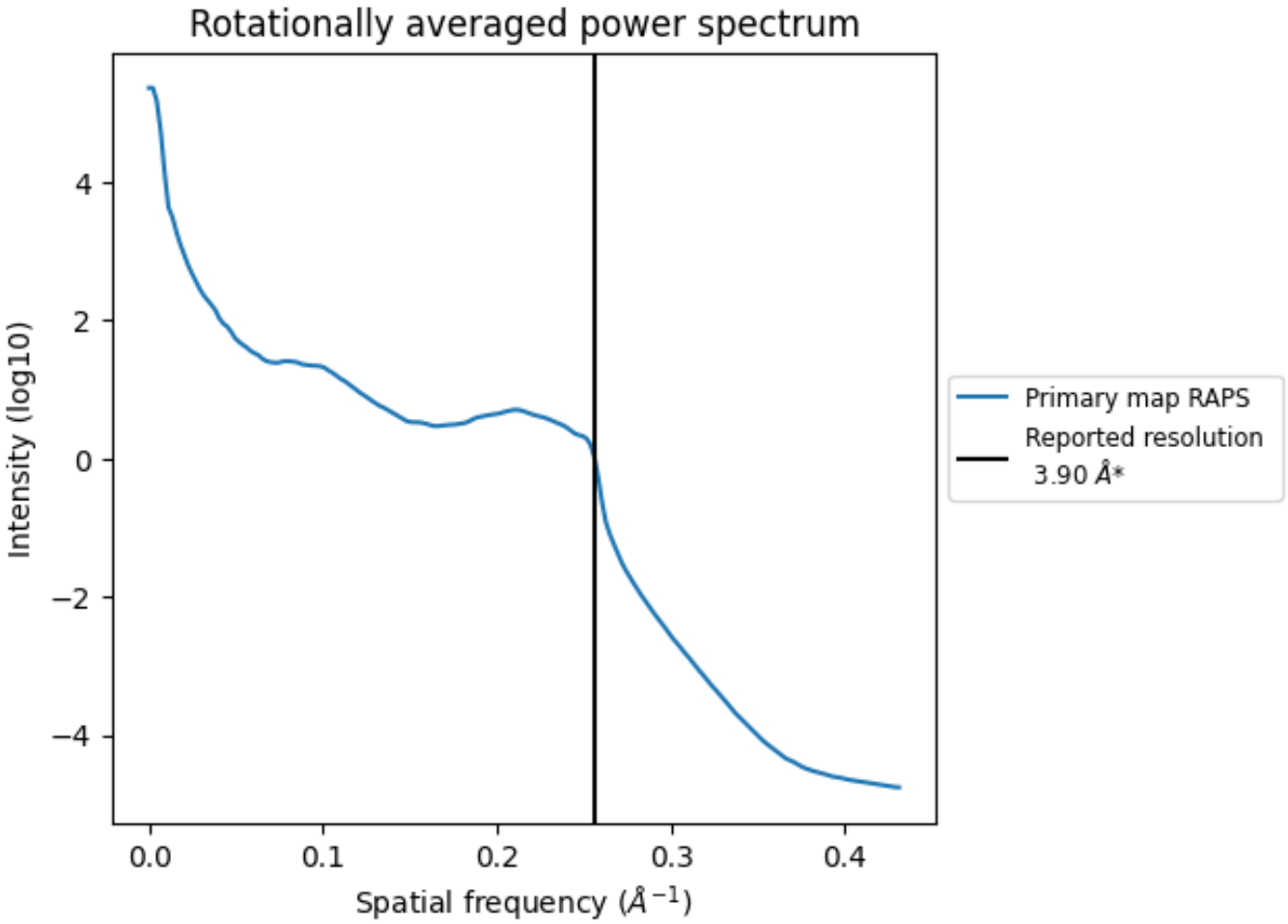
7.2 Volume estimate



The volume at the recommended contour level is 183 nm^3; this corresponds to an approximate mass of 165 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 0.256 $Å^{-1}$

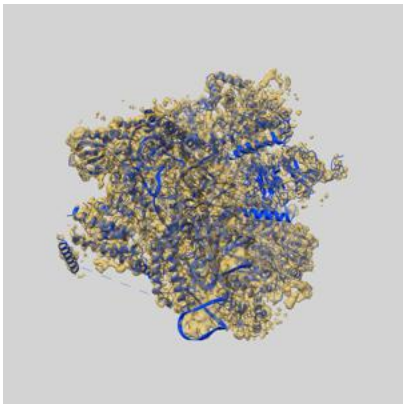
8 Fourier-Shell correlation

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

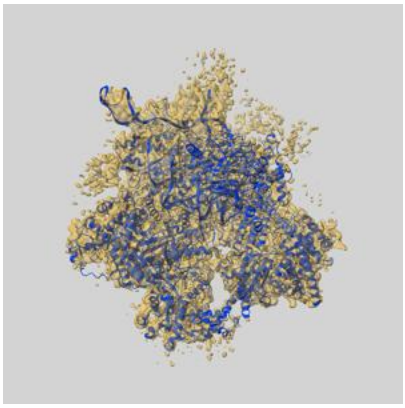
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-11694 and PDB model 7ABF. Per-residue inclusion information can be found in section 3 on page 8.

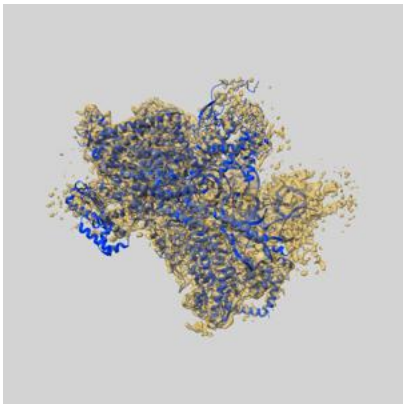
9.1 Map-model overlay



X



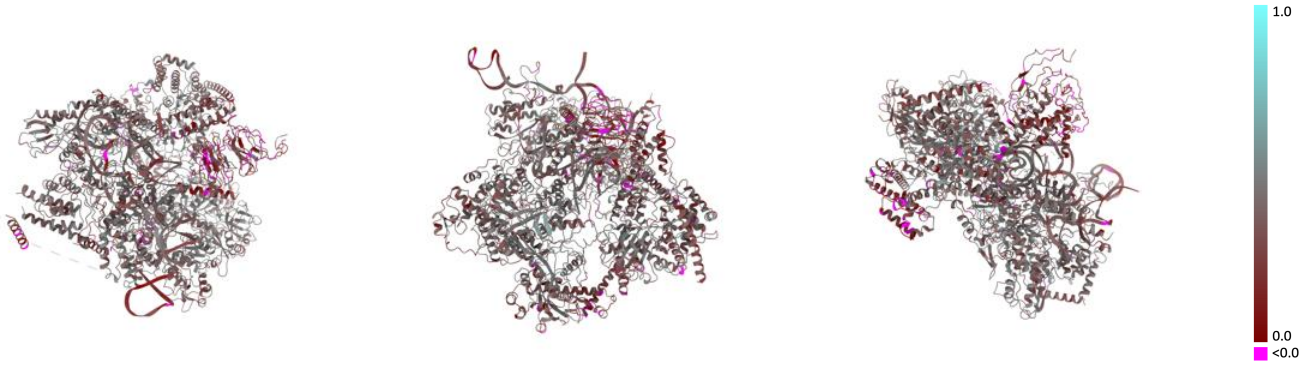
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.034 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.

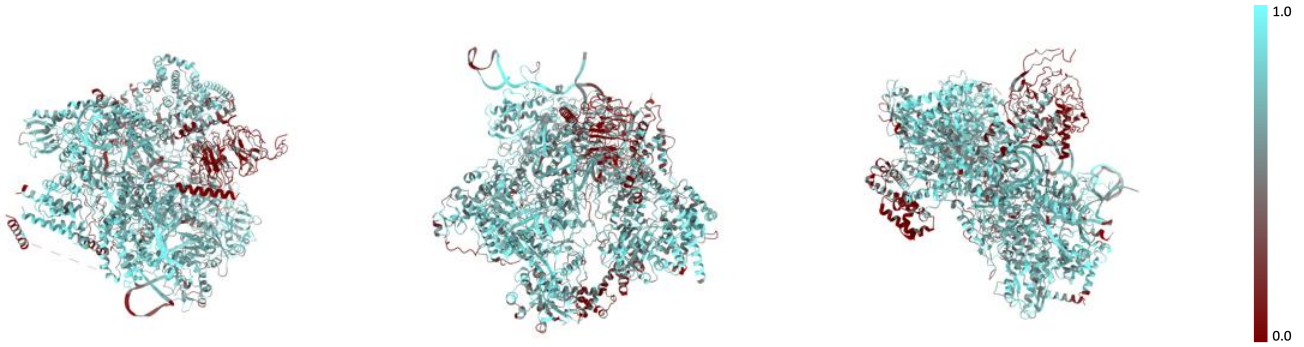
9.2 Q-score mapped to coordinate model (i)



X Y Z

The images above show the model with each residue coloured according 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.

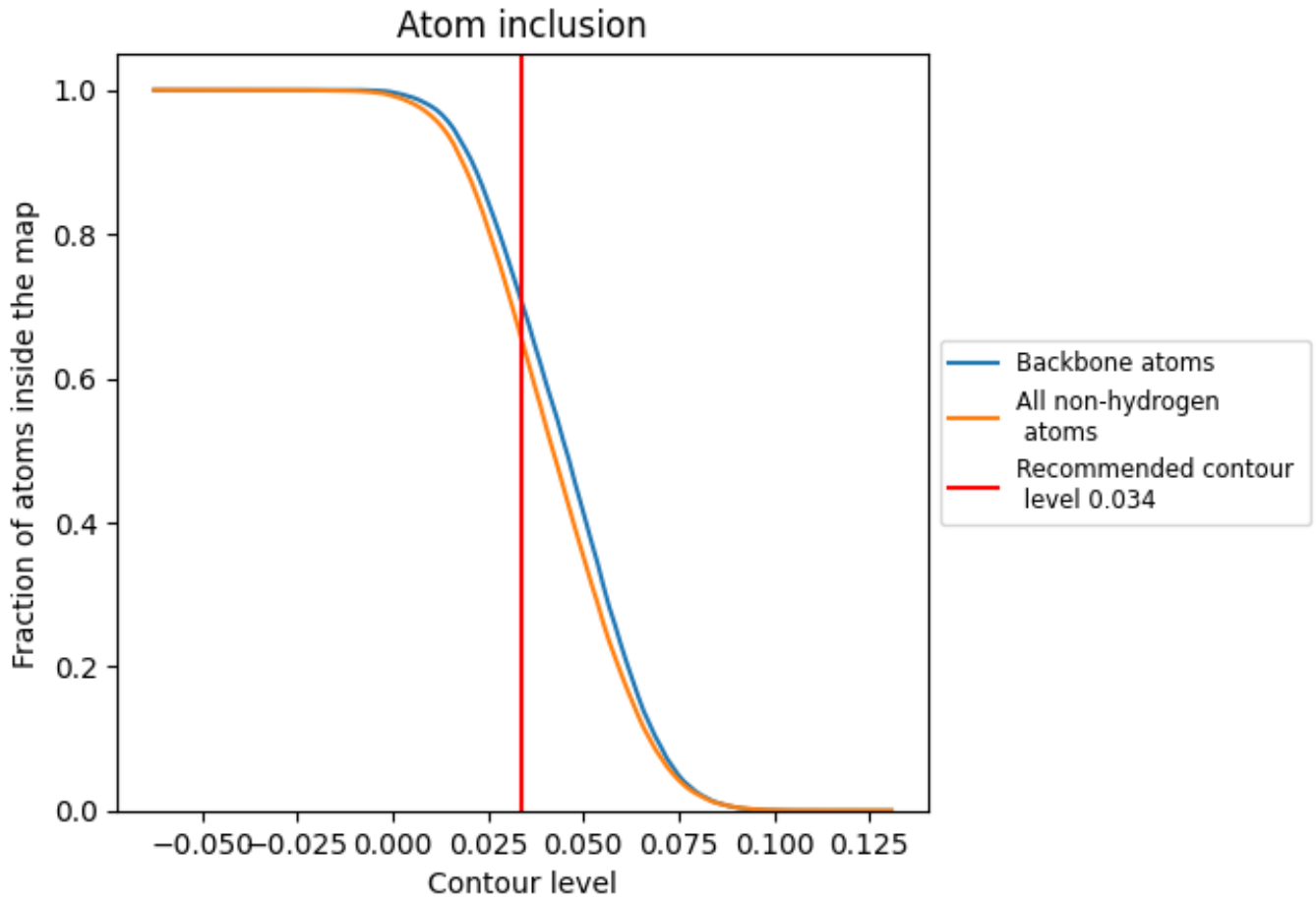
9.3 Atom inclusion mapped to coordinate model (i)



X Y Z

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 (0.034).

9.4 Atom inclusion (i)



At the recommended contour level, 70% of all backbone atoms, 65% 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 (0.034) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.6508	0.3740
5	0.8008	0.3930
6	0.6688	0.3050
A	0.6873	0.3950
A4	0.3854	0.2490
G	0.1802	0.2200
I	0.7234	0.3990
K	0.5906	0.3740
N	0.7525	0.4090
Q	0.7551	0.3810
R	0.1556	0.3850
X	0.6099	0.3690
Z	0.7524	0.3830
q	0.6718	0.4560
r	0.7193	0.4120
v	0.4655	0.2590