wwPDB EM Validation Summary Report

Jan 30, 2023 – 03:52 PM EST

PDB ID	:	4V6R
EMDB ID	:	EMD-5362
Title	:	Structural characterization of mRNA-tRNA translocation intermediates (class 6 of the six classes)
Authors	:	Agirrezabala, X.; Liao, H.; Schreiner, E.; Fu, J.; Ortiz-Meoz, R.F.; Schulten, K.; Green, R.; Frank, J.
Deposited on	:	2011-12-08
Resolution	:	11.50 Å(reported)
Based on initial model	:	2I2U

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 (i) 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 (i)) were used in the production of this report:

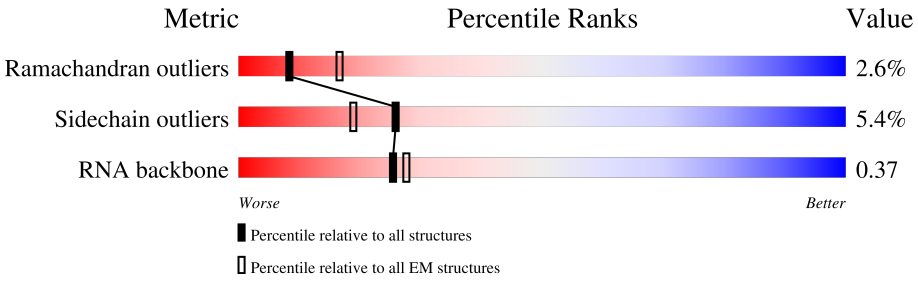
EMDB validation analysis	:	0.0.1.dev43
Mogul	:	1.8.5 (274361), CSD as541be (2020)
MolProbity	:	4.02b-467
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ	:	1.9.9
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.32.1

1 Overall quality at a glance (i)

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

The reported resolution of this entry is 11.50 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 <=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	AA	1542	32% 53% 14%
2	AB	76	29% 53% 18%
3	AC	47	9% 17% 45% 38%
4	AD	77	43% 51% 6%
5	AE	240	76% 21%
6	AF	232	78% 21%
7	AG	205	77% 20%
8	AH	166	79% 20%

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Mol	Chain	Length	Quality of chain
9	AI	135	74% 24%
10	AJ	178	79% 17%
11	AK	129	85% 13%
12	AL	129	74% 24%
13	AM	103	71% 26%
14	AN	128	80% 17%
15	AO	123	73% 20% 6%
16	AP	117	79% 18%
17	AQ	100	66% 30%
18	AR	88	72% 25%
19	AS	82	79% 16% 5%
20	AT	83	76% 17% 7%
21	AU	74	68% 24% 7%
22	AV	91	75% 19% 7%
23	AW	86	84% 13%
24	AX	70	61% 31% 7%
25	BA	120	38% 51% 11%
26	BB	2904	33% 55% 12%
27	BC	234	84% 14%
28	BD	272	74% 22%
29	BE	209	77% 20%
30	BF	201	74% 20% 5%
31	BG	178	70% 26%
32	BH	176	79% 16% 5%
33	BI	149	6% 78% 20%

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Mol	Chain	Length	Quality of chain
34	BJ	164	12% 80% 20%
35	BK	141	81% 18%
36	BL	142	76% 20%
37	BM	123	68% 29%
38	BN	144	80% 18%
39	BO	136	74% 23%
40	BP	127	75% 22%
41	BQ	117	80% 17%
42	BR	114	76% 18% 5%
43	BS	117	71% 26%
44	BT	103	77% 19%
45	BU	110	75% 24%
46	BV	100	78% 19%
47	BW	103	79% 19%
48	BX	94	80% 16%
49	BY	84	74% 20%
50	BZ	77	81% 17%
51	B0	63	75% 24%
52	B1	58	76% 21%
53	B2	70	73% 19% 7%
54	B3	56	71% 21% 7%
55	B4	54	83% 13%
56	B5	46	65% 30%
57	B6	64	80% 19%
58	B7	38	71% 29%

2 Entry composition (i)

There are 60 unique types of molecules in this entry. The entry contains 152351 atoms, of which 0 are hydrogens and 0 are deuteriums.

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

- Molecule 1 is a RNA chain called 16S ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
1	AA	1542	33089	14767	6064	10717	1541	0	0

- Molecule 2 is a RNA chain called A site tRNA.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	N	O	P	S		
2	AB	76	1627	731	287	532	75	2	0	0

- Molecule 3 is a RNA chain called mRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
3	AC	47	993	445	167	335	46	0	0

- Molecule 4 is a RNA chain called P site tRNA.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	N	O	P	S		
4	AD	77	1641	734	297	533	76	1	0	0

- Molecule 5 is a protein called 30S ribosomal protein S2.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	AE	240	1872	1180	332	352	8	0	0

- Molecule 6 is a protein called 30S ribosomal protein S3.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
6	AF	232	1822	1149	346	323	4	0	0

- Molecule 7 is a protein called 30S ribosomal protein S4.

Mol	Chain	Residues	Atoms					AltConf	Trace
7	AG	205	Total	C	N	O	S	0	0
			1643	1026	315	298	4		

- Molecule 8 is a protein called 30S ribosomal protein S5.

Mol	Chain	Residues	Atoms					AltConf	Trace
8	AH	166	Total	C	N	O	S	0	0
			1225	761	232	226	6		

- Molecule 9 is a protein called 30S ribosomal protein S6.

Mol	Chain	Residues	Atoms					AltConf	Trace
9	AI	135	Total	C	N	O	S	0	0
			1101	677	198	219	7		

- Molecule 10 is a protein called 30S ribosomal protein S7.

Mol	Chain	Residues	Atoms					AltConf	Trace
10	AJ	178	Total	C	N	O	S	0	0
			1400	874	269	253	4		

- Molecule 11 is a protein called 30S ribosomal protein S8.

Mol	Chain	Residues	Atoms					AltConf	Trace
11	AK	129	Total	C	N	O	S	0	0
			979	616	173	184	6		

- Molecule 12 is a protein called 30S ribosomal protein S9.

Mol	Chain	Residues	Atoms					AltConf	Trace
12	AL	129	Total	C	N	O	S	0	0
			1036	642	208	183	3		

- Molecule 13 is a protein called 30S ribosomal protein S10.

Mol	Chain	Residues	Atoms					AltConf	Trace
13	AM	103	Total	C	N	O	S	0	0
			825	514	158	151	2		

- Molecule 14 is a protein called 30S ribosomal protein S11.

Mol	Chain	Residues	Atoms					AltConf	Trace
14	AN	128	Total	C	N	O	S	0	0
			965	595	196	171	3		

- Molecule 15 is a protein called 30S ribosomal protein S12.

Mol	Chain	Residues	Atoms					AltConf	Trace
15	AO	123	Total	C	N	O	S	0	0
			955	590	196	165	4		

- Molecule 16 is a protein called 30S ribosomal protein S13.

Mol	Chain	Residues	Atoms					AltConf	Trace
16	AP	117	Total	C	N	O	S	0	0
			910	564	183	160	3		

- Molecule 17 is a protein called 30S ribosomal protein S14.

Mol	Chain	Residues	Atoms					AltConf	Trace
17	AQ	100	Total	C	N	O	S	0	0
			805	499	164	139	3		

- Molecule 18 is a protein called 30S ribosomal protein S15.

Mol	Chain	Residues	Atoms					AltConf	Trace
18	AR	88	Total	C	N	O	S	0	0
			716	440	146	129	1		

- Molecule 19 is a protein called 30S ribosomal protein S16.

Mol	Chain	Residues	Atoms					AltConf	Trace
19	AS	82	Total	C	N	O	S	0	0
			649	406	128	114	1		

- Molecule 20 is a protein called 30S ribosomal protein S17.

Mol	Chain	Residues	Atoms					AltConf	Trace
20	AT	83	Total	C	N	O	S	0	0
			672	425	124	120	3		

- Molecule 21 is a protein called 30S ribosomal protein S18.

Mol	Chain	Residues	Atoms					AltConf	Trace
21	AU	74	Total	C	N	O	S	0	0
			626	395	123	107	1		

- Molecule 22 is a protein called 30S ribosomal protein S19.

Mol	Chain	Residues	Atoms					AltConf	Trace
22	AV	91	Total	C	N	O	S	0	0
			727	464	139	122	2		

- Molecule 23 is a protein called 30S ribosomal protein S20.

Mol	Chain	Residues	Atoms					AltConf	Trace
23	AW	86	Total	C	N	O	S	0	0
			670	414	138	115	3		

- Molecule 24 is a protein called 30S ribosomal protein S21.

Mol	Chain	Residues	Atoms					AltConf	Trace
24	AX	70	Total	C	N	O	S	0	0
			590	366	125	98	1		

- Molecule 25 is a RNA chain called 5S ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
25	BA	120	Total	C	N	O	P	0	0
			2566	1144	468	835	119		

- Molecule 26 is a RNA chain called 23S ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
26	BB	2904	Total	C	N	O	P	0	0
			62351	27824	11469	20155	2903		

- Molecule 27 is a protein called 50S ribosomal protein L1.

Mol	Chain	Residues	Atoms					AltConf	Trace
27	BC	234	Total	C	N	O	S	0	0
			1733	1081	315	330	7		

- Molecule 28 is a protein called 50S ribosomal protein L2.

Mol	Chain	Residues	Atoms					AltConf	Trace
28	BD	272	Total	C	N	O	S	0	0
			2092	1294	425	366	7		

- Molecule 29 is a protein called 50S ribosomal protein L3.

Mol	Chain	Residues	Atoms					AltConf	Trace
29	BE	209	Total	C	N	O	S	0	0
			1565	979	288	294	4		

- Molecule 30 is a protein called 50S ribosomal protein L4.

Mol	Chain	Residues	Atoms					AltConf	Trace
30	BF	201	Total	C	N	O	S	0	0
			1552	974	283	290	5		

- Molecule 31 is a protein called 50S ribosomal protein L5.

Mol	Chain	Residues	Atoms					AltConf	Trace
31	BG	178	Total	C	N	O	S	0	0
			1420	905	251	258	6		

- Molecule 32 is a protein called 50S ribosomal protein L6.

Mol	Chain	Residues	Atoms					AltConf	Trace
32	BH	176	Total	C	N	O	S	0	0
			1323	832	243	246	2		

- Molecule 33 is a protein called 50S ribosomal protein L9.

Mol	Chain	Residues	Atoms					AltConf	Trace
33	BI	149	Total	C	N	O	S	0	0
			1111	699	197	214	1		

- Molecule 34 is a protein called 50S ribosomal protein L10.

Mol	Chain	Residues	Atoms					AltConf	Trace
34	BJ	164	Total	C	N	O	S	0	0
			1233	776	220	231	6		

- Molecule 35 is a protein called 50S ribosomal protein L11.

Mol	Chain	Residues	Atoms					AltConf	Trace
35	BK	141	Total	C	N	O	S	0	0
			1032	651	179	196	6		

- Molecule 36 is a protein called 50S ribosomal protein L13.

Mol	Chain	Residues	Atoms					AltConf	Trace
36	BL	142	Total	C	N	O	S	0	0
			1129	714	212	199	4		

- Molecule 37 is a protein called 50S ribosomal protein L14.

Mol	Chain	Residues	Atoms					AltConf	Trace
37	BM	123	Total	C	N	O	S	0	0
			947	593	181	167	6		

- Molecule 38 is a protein called 50S ribosomal protein L15.

Mol	Chain	Residues	Atoms					AltConf	Trace
38	BN	144	Total	C	N	O	S	0	0
			1053	654	207	190	2		

- Molecule 39 is a protein called 50S ribosomal protein L16.

Mol	Chain	Residues	Atoms					AltConf	Trace
39	BO	136	Total	C	N	O	S	0	0
			1074	686	205	177	6		

- Molecule 40 is a protein called 50S ribosomal protein L17.

Mol	Chain	Residues	Atoms					AltConf	Trace
40	BP	127	Total	C	N	O	S	0	0
			1008	621	204	178	5		

- Molecule 41 is a protein called 50S ribosomal protein L18.

Mol	Chain	Residues	Atoms					AltConf	Trace
41	BQ	117	Total	C	N	O	S	0	0
			900	557	179	163	1		

- Molecule 42 is a protein called 50S ribosomal protein L19.

Mol	Chain	Residues	Atoms					AltConf	Trace
42	BR	114	Total	C	N	O	S	0	0
			917	574	179	163	1		

- Molecule 43 is a protein called 50S ribosomal protein L20.

Mol	Chain	Residues	Atoms				AltConf	Trace
43	BS	117	Total	C	N	O	0	0
			947	604	192	151		

- Molecule 44 is a protein called 50S ribosomal protein L21.

Mol	Chain	Residues	Atoms					AltConf	Trace
44	BT	103	Total	C	N	O	S	0	0
			816	516	153	145	2		

- Molecule 45 is a protein called 50S ribosomal protein L22.

Mol	Chain	Residues	Atoms					AltConf	Trace
45	BU	110	Total	C	N	O	S	0	0
			857	532	166	156	3		

- Molecule 46 is a protein called 50S ribosomal protein L23.

Mol	Chain	Residues	Atoms					AltConf	Trace
46	BV	100	Total	C	N	O	S	0	0
			787	496	146	143	2		

- Molecule 47 is a protein called 50S ribosomal protein L24.

Mol	Chain	Residues	Atoms				AltConf	Trace
47	BW	103	Total	C	N	O	0	0
			789	498	148	143		

- Molecule 48 is a protein called 50S ribosomal protein L25.

Mol	Chain	Residues	Atoms					AltConf	Trace
48	BX	94	Total	C	N	O	S	0	0
			753	479	137	134	3		

- Molecule 49 is a protein called 50S ribosomal protein L27.

Mol	Chain	Residues	Atoms					AltConf	Trace
49	BY	84	Total	C	N	O	S	0	0
			634	391	129	113	1		

- Molecule 50 is a protein called 50S ribosomal protein L28.

Mol	Chain	Residues	Atoms					AltConf	Trace
50	BZ	77	Total	C	N	O	S	0	0
			625	388	129	106	2		

- Molecule 51 is a protein called 50S ribosomal protein L29.

Mol	Chain	Residues	Atoms					AltConf	Trace
51	B0	63	Total	C	N	O	S	0	0
			509	313	99	95	2		

- Molecule 52 is a protein called 50S ribosomal protein L30.

Mol	Chain	Residues	Atoms					AltConf	Trace
52	B1	58	Total	C	N	O	S	0	0
			449	281	87	79	2		

- Molecule 53 is a protein called 50S ribosomal protein L31.

Mol	Chain	Residues	Atoms					AltConf	Trace
53	B2	70	Total	C	N	O	S	0	0
			549	339	104	100	6		

- Molecule 54 is a protein called 50S ribosomal protein L32.

Mol	Chain	Residues	Atoms					AltConf	Trace
54	B3	56	Total	C	N	O	S	0	0
			444	269	94	80	1		

- Molecule 55 is a protein called 50S ribosomal protein L33.

Mol	Chain	Residues	Atoms				AltConf	Trace
55	B4	54	Total	C	N	O	0	0
			441	284	81	76		

- Molecule 56 is a protein called 50S ribosomal protein L34.

Mol	Chain	Residues	Atoms					AltConf	Trace
56	B5	46	Total	C	N	O	S	0	0
			377	228	90	57	2		

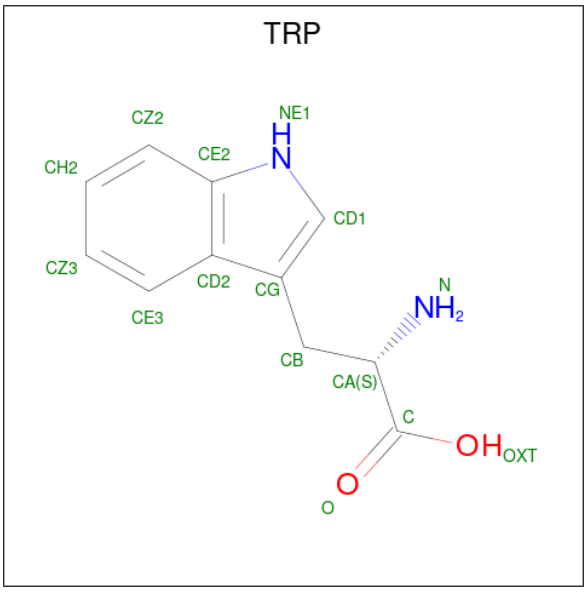
- Molecule 57 is a protein called 50S ribosomal protein L35.

Mol	Chain	Residues	Atoms					AltConf	Trace
57	B6	64	Total	C	N	O	S	0	0
			504	323	105	74	2		

- Molecule 58 is a protein called 50S ribosomal protein L36.

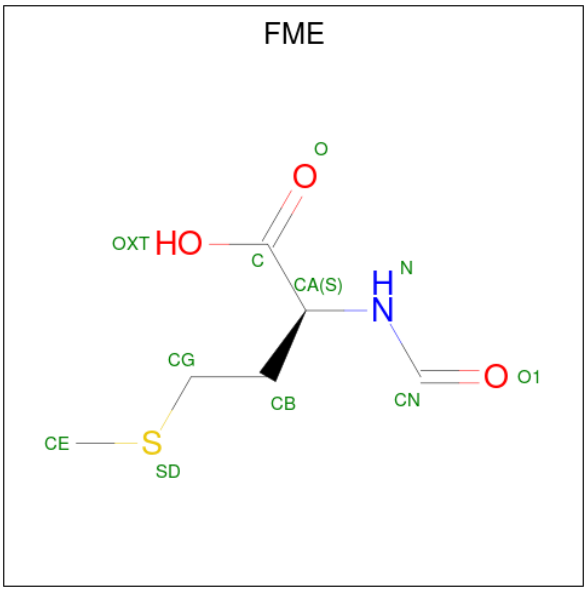
Mol	Chain	Residues	Atoms					AltConf	Trace
58	B7	38	Total	C	N	O	S	0	0
			302	185	65	48	4		

- Molecule 59 is TRYPTOPHAN (three-letter code: TRP) (formula: $C_{11}H_{12}N_2O_2$).



Mol	Chain	Residues	Atoms				AltConf
59	AB	1	Total	C	N	O	0
			14	11	2	1	

- Molecule 60 is N-FORMYLMETHIONINE (three-letter code: FME) (formula: $C_6H_{11}NO_3S$).



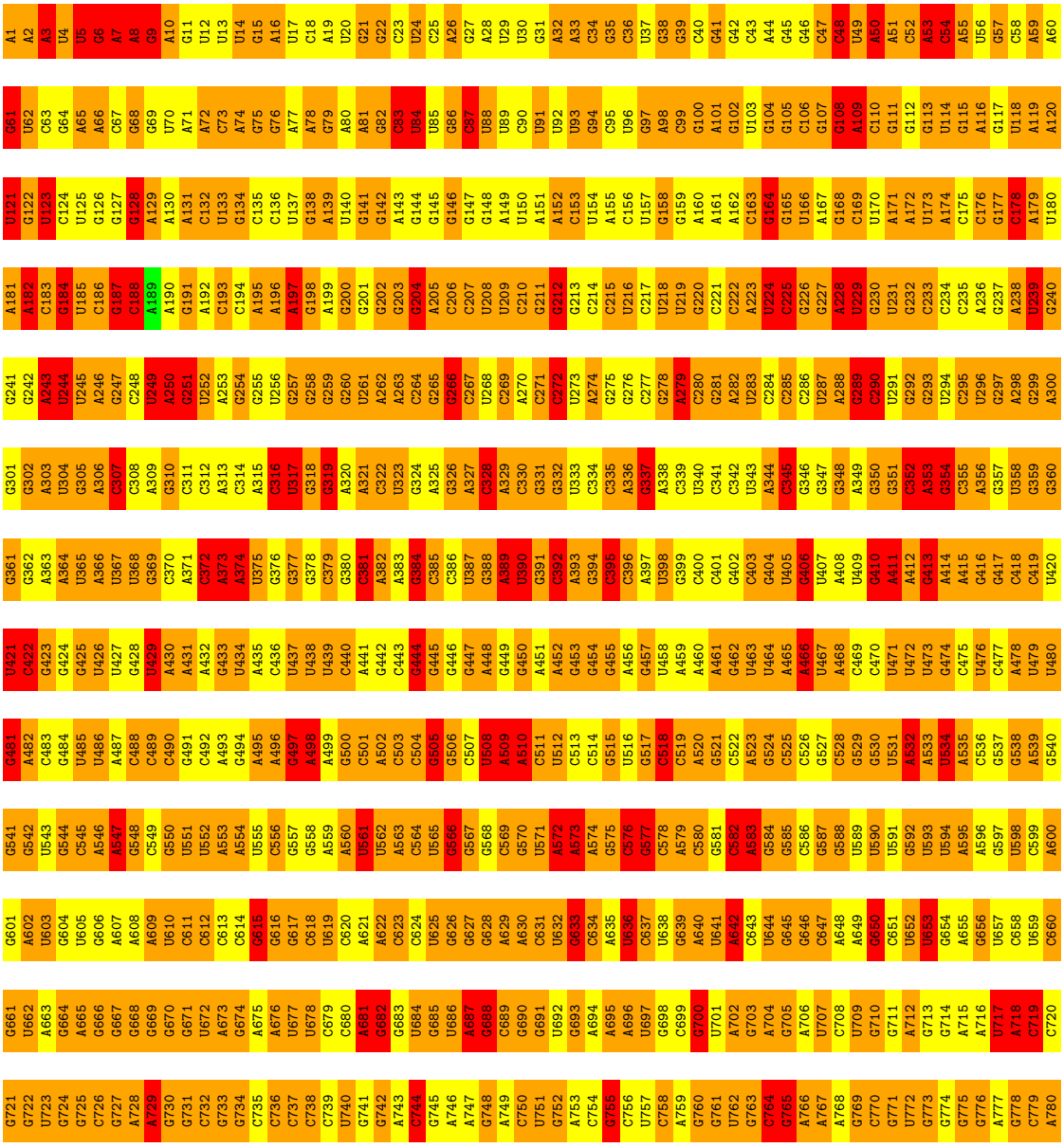
Mol	Chain	Residues	Atoms					AltConf
60	BB	1	Total	C	N	O	S	0
			10	6	1	2	1	

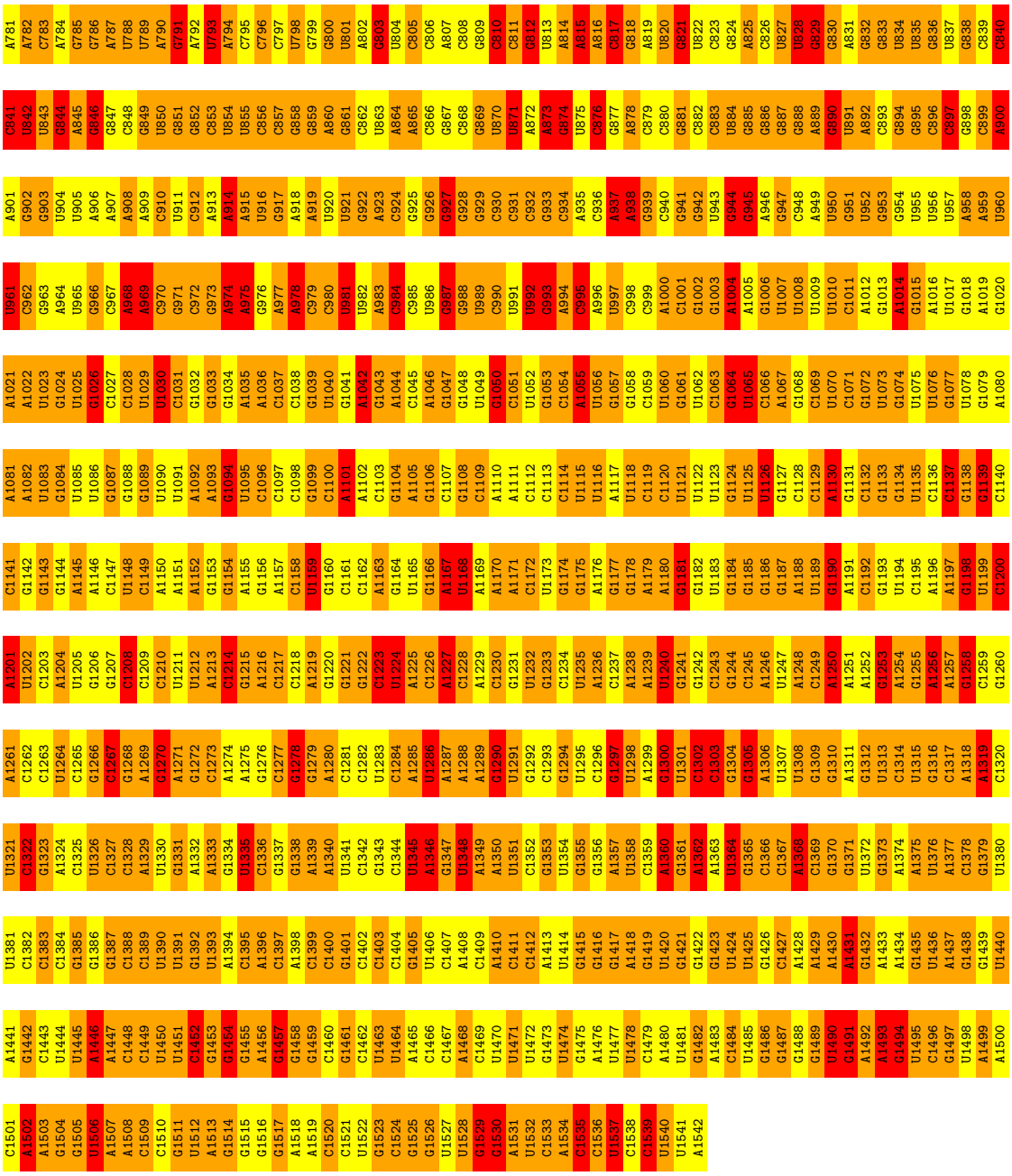
3 Residue-property plots (i)

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: 16S ribosomal RNA

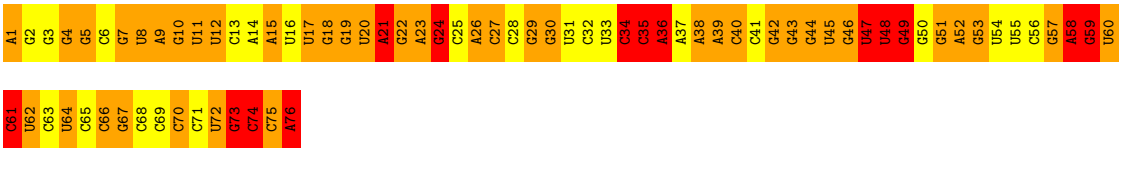
Chain AA: 32% 53% 14%





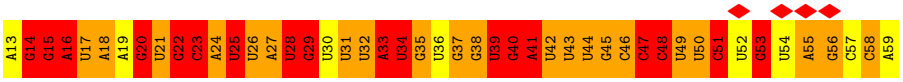
• Molecule 2: A site tRNA

Chain AB:



• Molecule 3: mRNA

Chain AC:

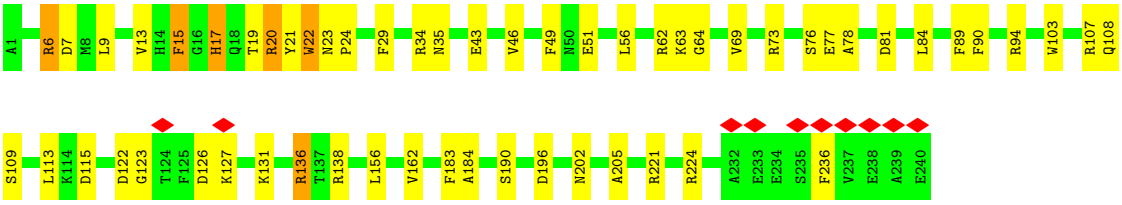


• Molecule 4: P site tRNA

Chain AD:

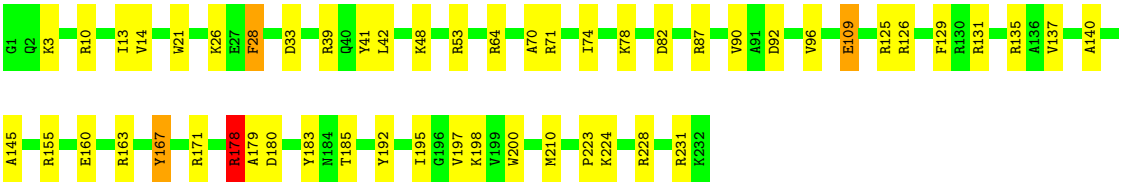
• Molecule 5: 30S ribosomal protein S2

Chain AE:



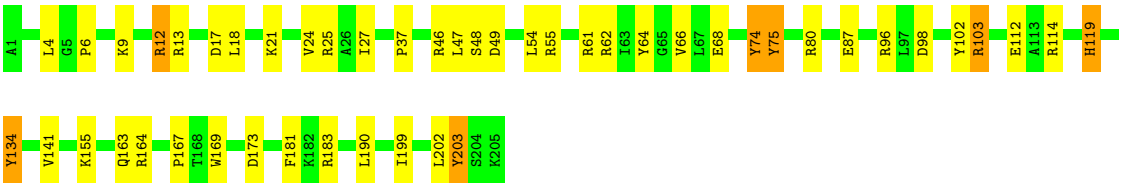
• Molecule 6: 30S ribosomal protein S3

Chain AF:



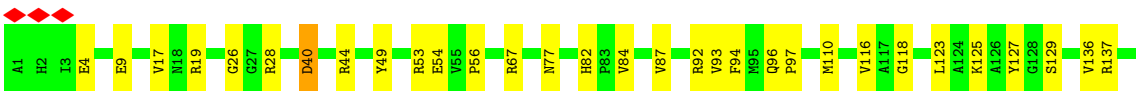
• Molecule 7: 30S ribosomal protein S4

Chain AG:



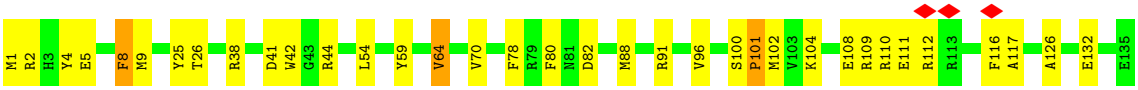
• Molecule 8: 30S ribosomal protein S5

Chain AH:



• Molecule 9: 30S ribosomal protein S6

Chain AI:

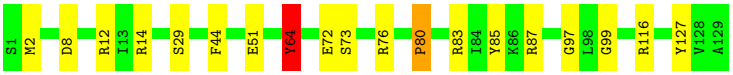


• Molecule 10: 30S ribosomal protein S7

Chain AJ:

• Molecule 11: 30S ribosomal protein S8

Chain AK:

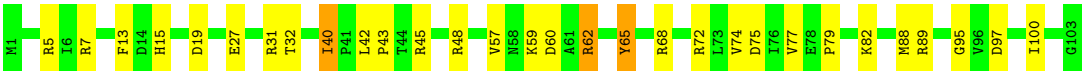


• Molecule 12: 30S ribosomal protein S9

Chain AL:

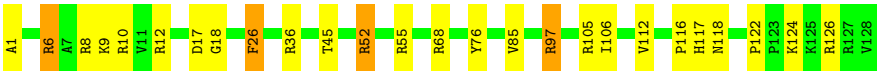
• Molecule 13: 30S ribosomal protein S10

Chain AM:



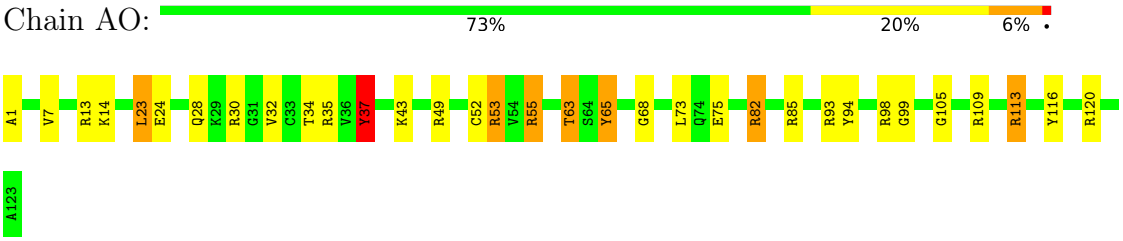
• Molecule 14: 30S ribosomal protein S11

Chain AN:



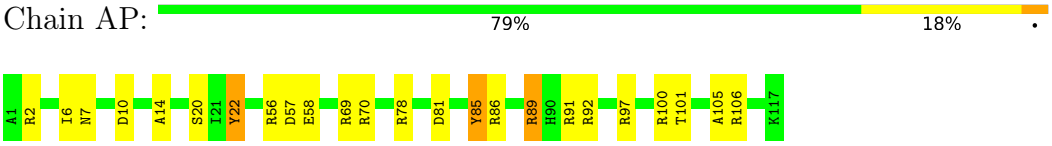
• Molecule 15: 30S ribosomal protein S12

Chain AO:



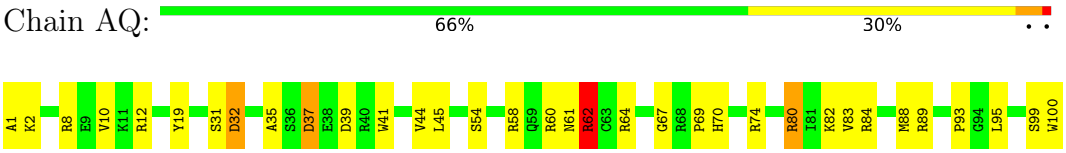
• Molecule 16: 30S ribosomal protein S13

Chain AP:



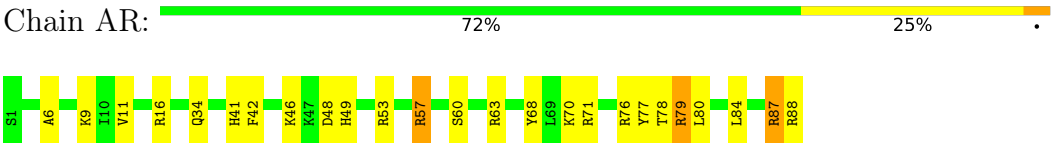
• Molecule 17: 30S ribosomal protein S14

Chain AQ:



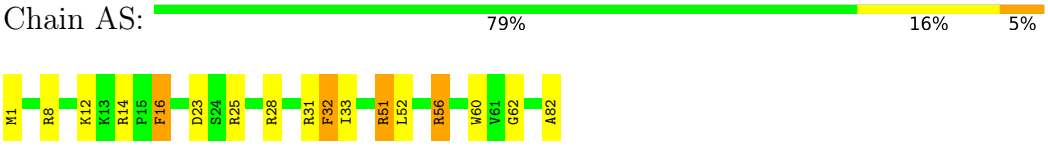
• Molecule 18: 30S ribosomal protein S15

Chain AR:



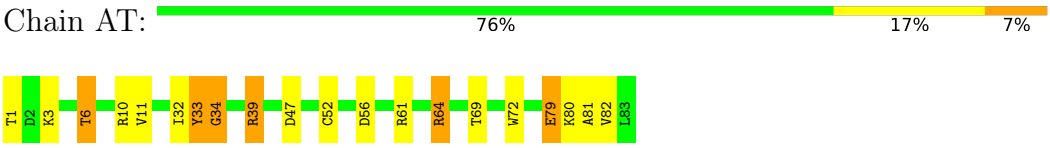
• Molecule 19: 30S ribosomal protein S16

Chain AS:



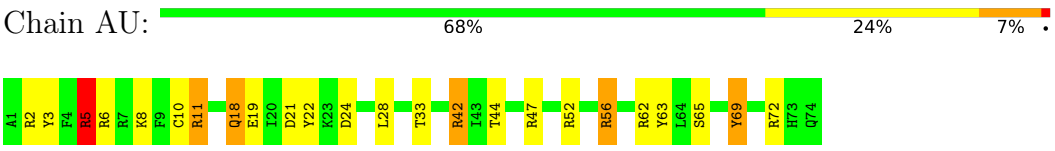
• Molecule 20: 30S ribosomal protein S17

Chain AT:



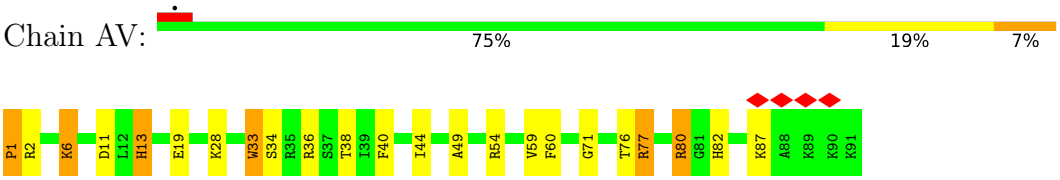
• Molecule 21: 30S ribosomal protein S18

Chain AU:



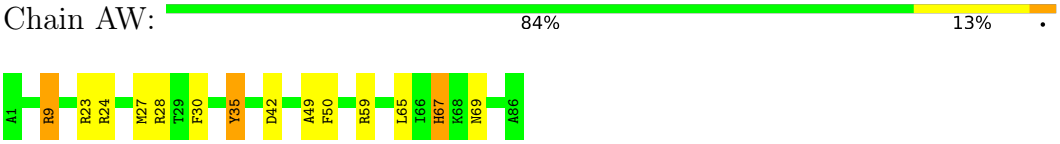
• Molecule 22: 30S ribosomal protein S19

Chain AV:



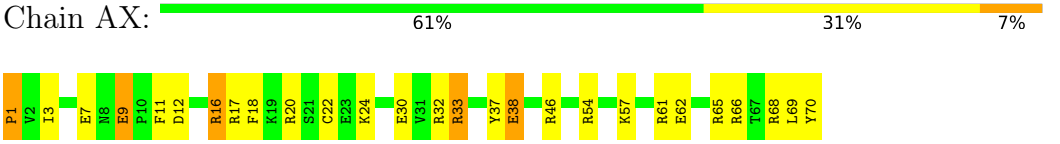
• Molecule 23: 30S ribosomal protein S20

Chain AW:



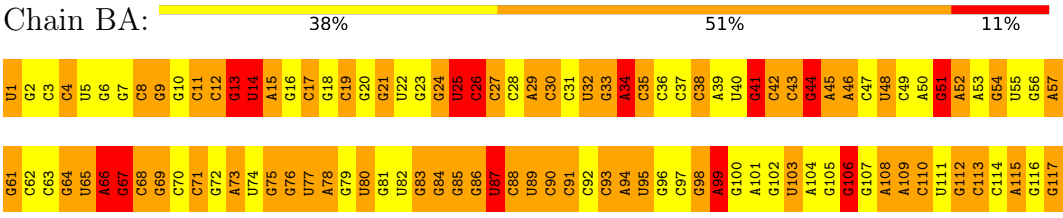
• Molecule 24: 30S ribosomal protein S21

Chain AX:



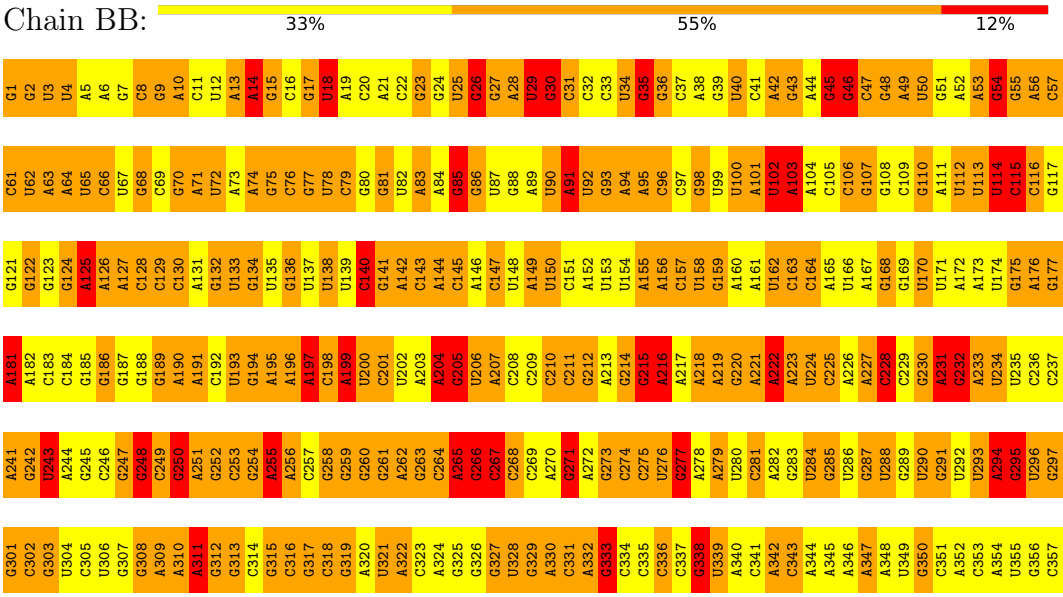
• Molecule 25: 5S ribosomal RNA

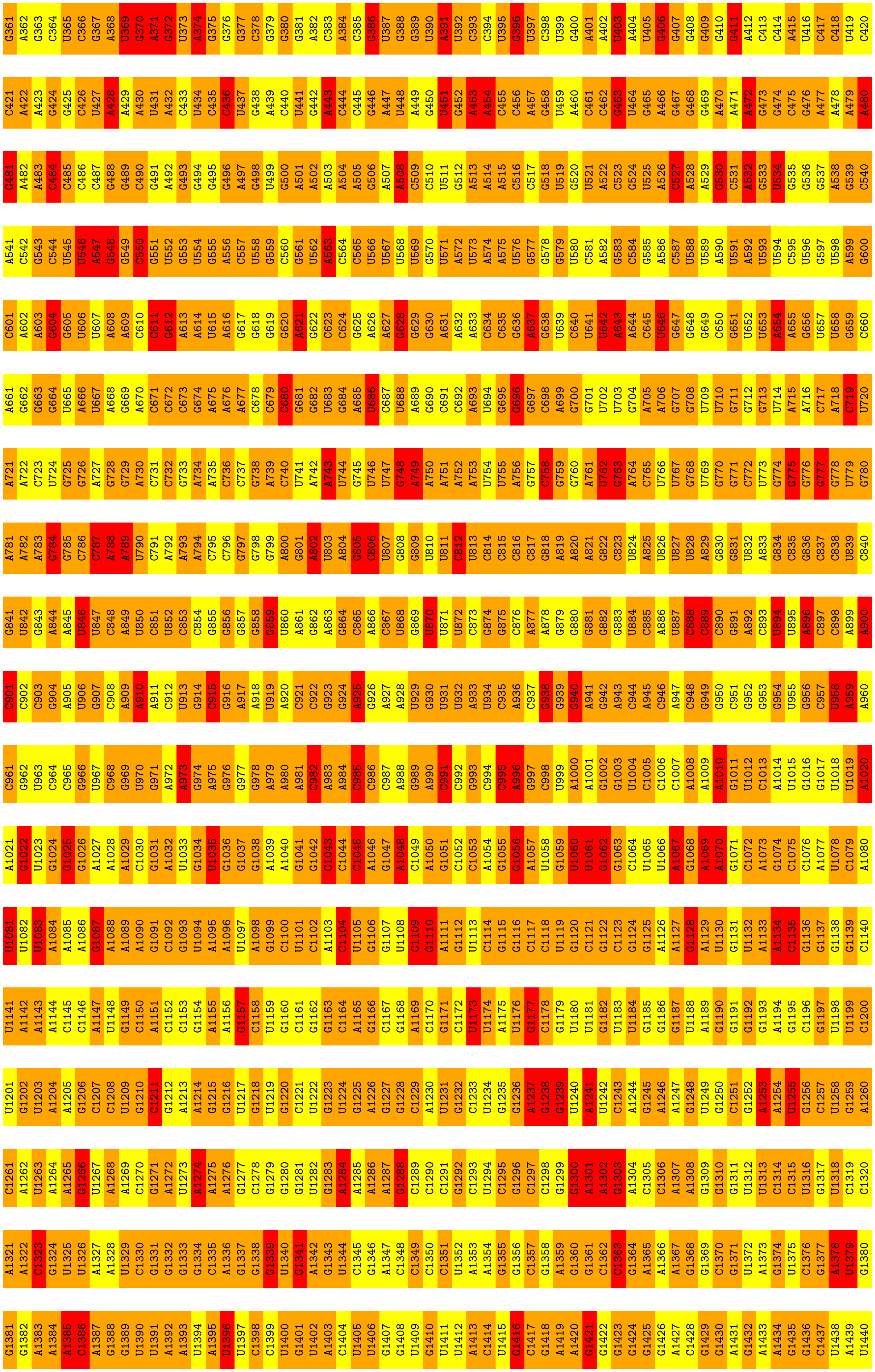
Chain BA:

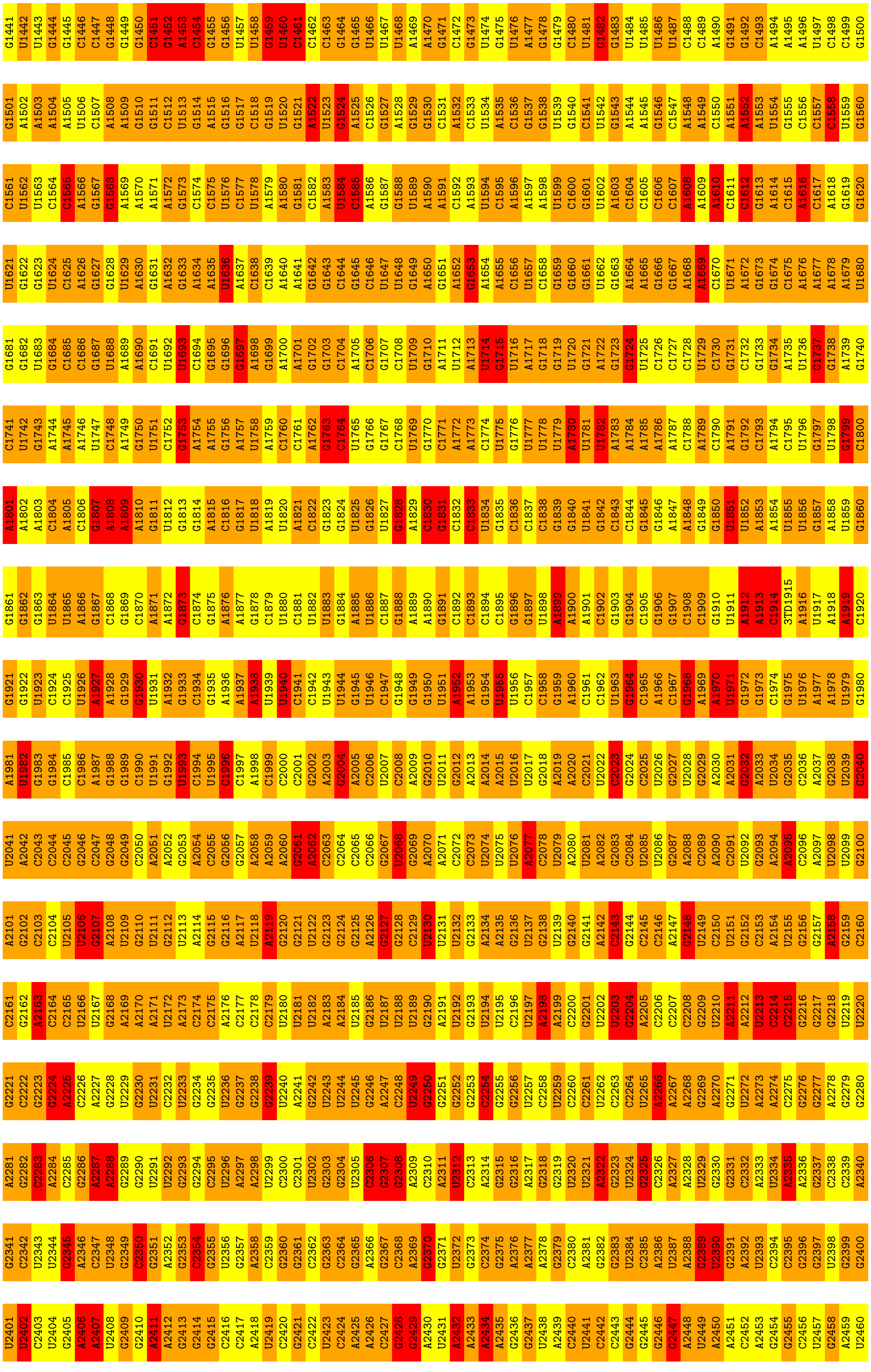


• Molecule 26: 23S ribosomal RNA

Chain BB:



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C1561 U1562 U1563 C1564 C1565 A1566 G1567 G1568 A1569 A1570 A1571 A1572 G1573 C1574 C1575 U1576 C1577 U1578 A1579 A1580 G1581 C1582 A1583 U1584 C1585 A1586 G1587 G1588 U1589 A1590 A1591 C1592 A1593 U1594 C1595 A1596 A1597 A1598 U1599 C1600 G1601 U1602 A1603 C1604 C1605 C1606 C1607 A1608 A1609 A1610 C1611 C1612 G1613 A1614 C1615 A1616 C1617 A1618 G1619 G1620
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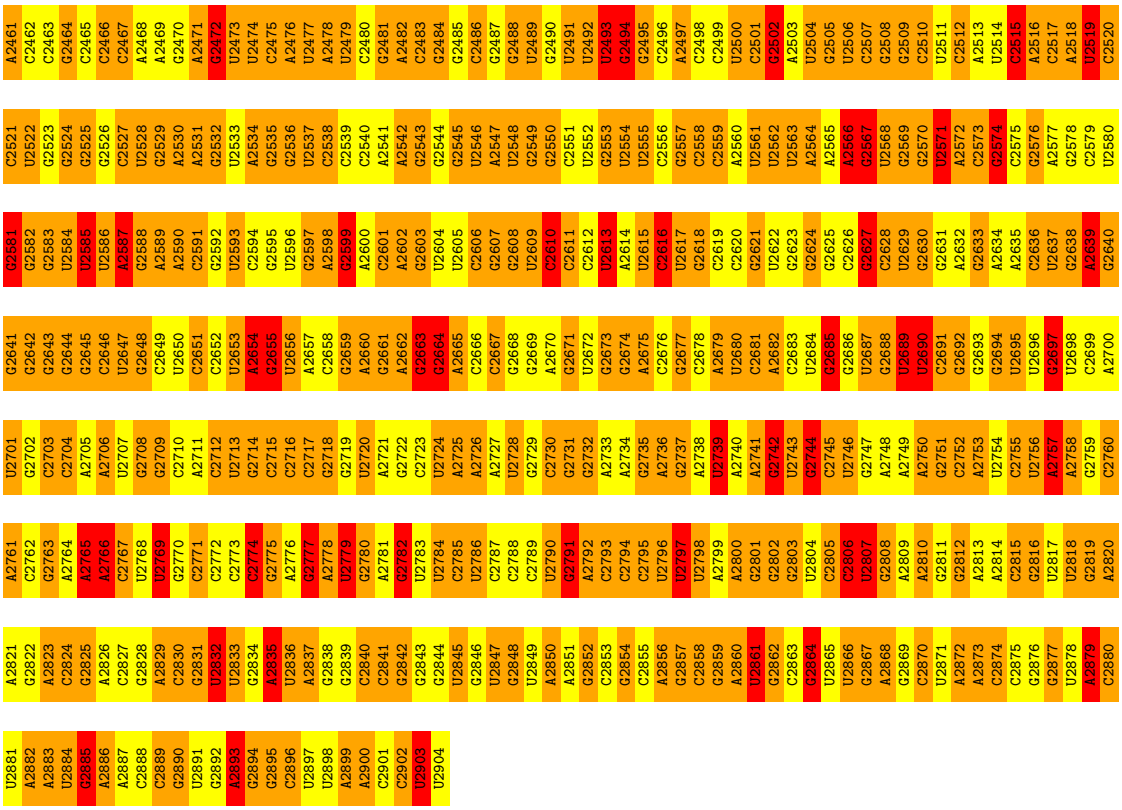
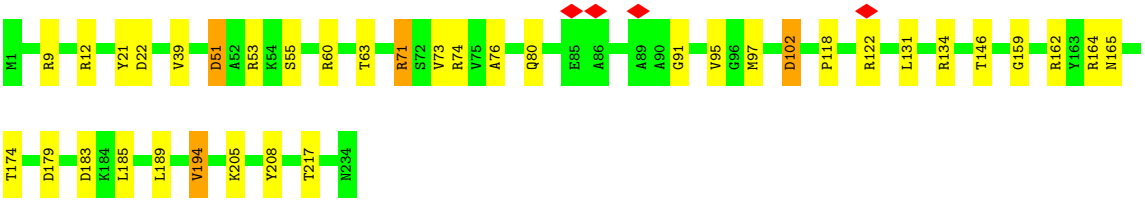


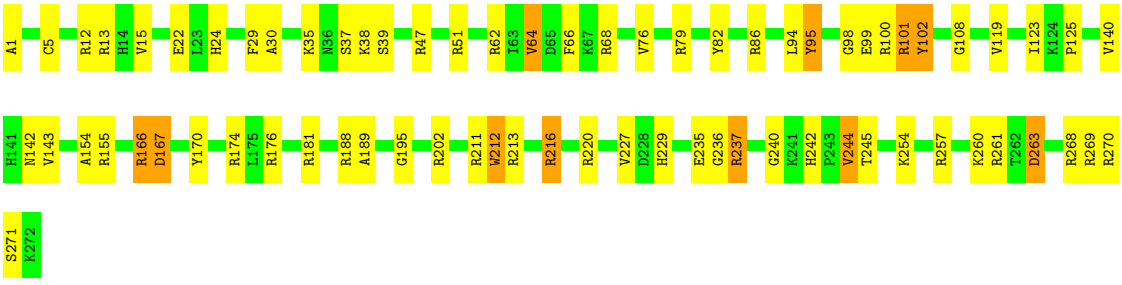
• Molecule 27: 50S ribosomal protein L1

Chain BC:



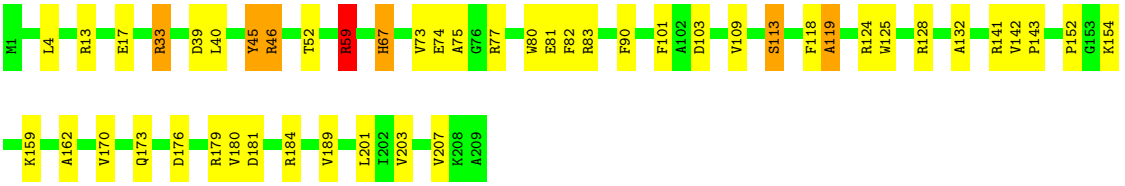
• Molecule 28: 50S ribosomal protein L2

Chain BD:



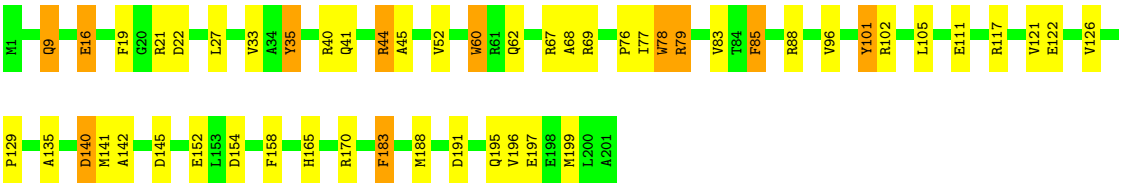
• Molecule 29: 50S ribosomal protein L3

Chain BE:



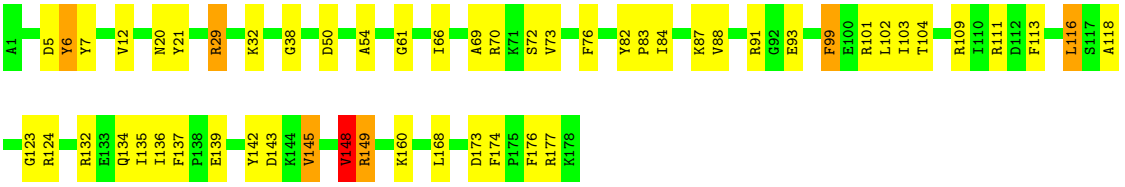
• Molecule 30: 50S ribosomal protein L4

Chain BF:



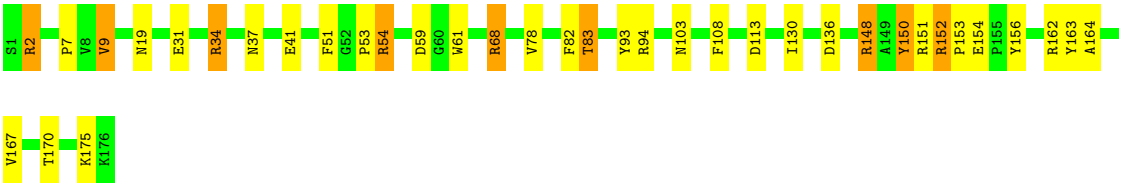
• Molecule 31: 50S ribosomal protein L5

Chain BG:



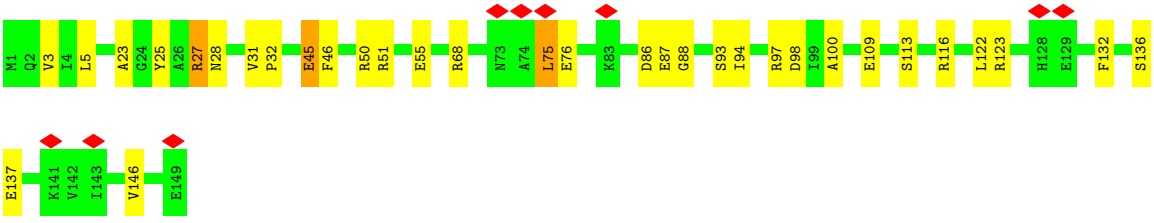
• Molecule 32: 50S ribosomal protein L6

Chain BH:



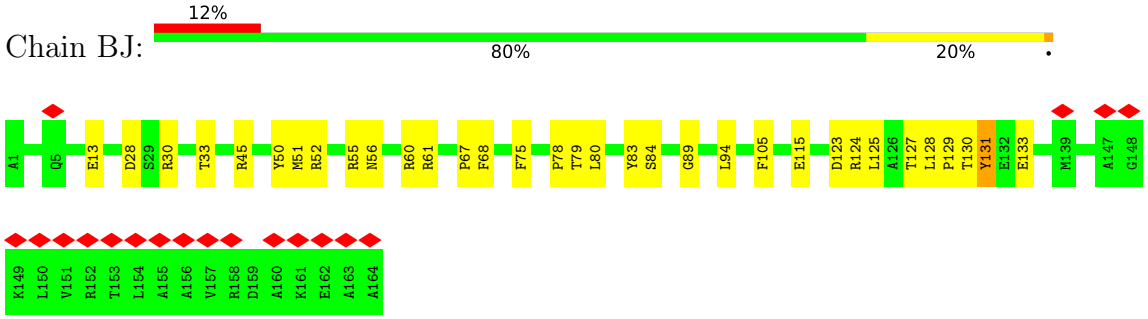
• Molecule 33: 50S ribosomal protein L9

Chain BI:



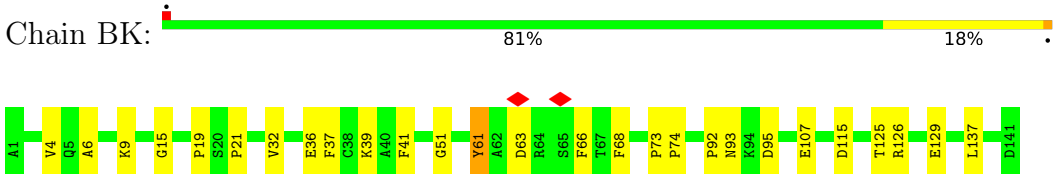
• Molecule 34: 50S ribosomal protein L10

Chain BJ:



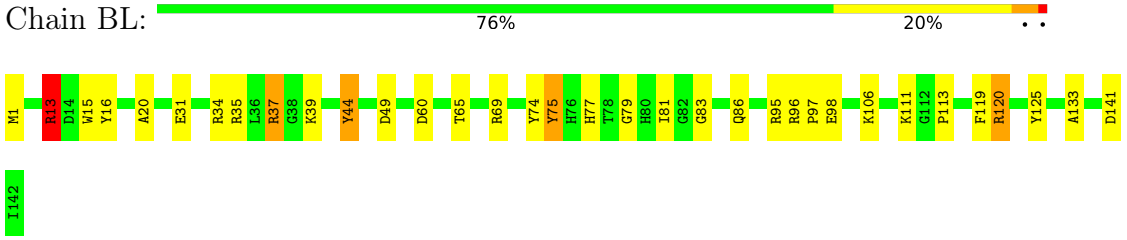
• Molecule 35: 50S ribosomal protein L11

Chain BK:



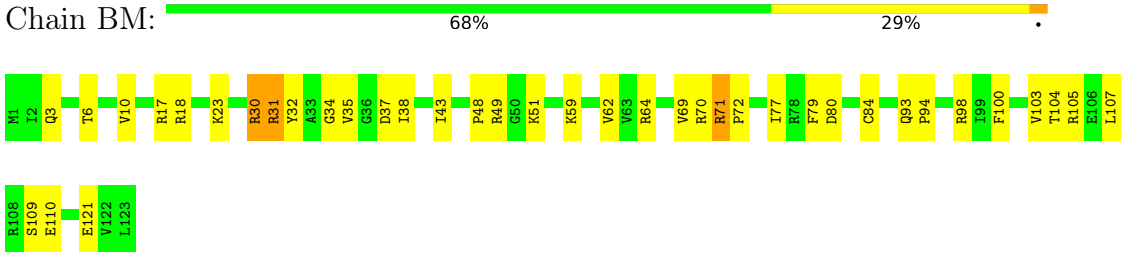
• Molecule 36: 50S ribosomal protein L13

Chain BL:



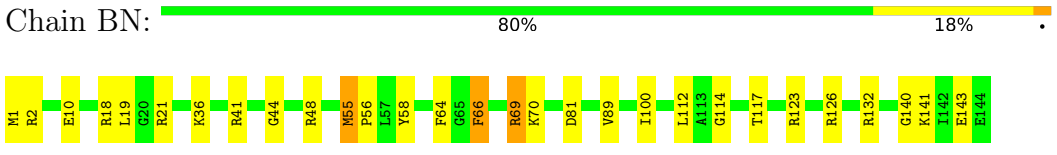
• Molecule 37: 50S ribosomal protein L14

Chain BM:



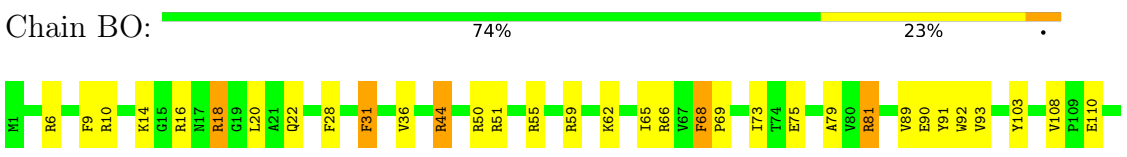
• Molecule 38: 50S ribosomal protein L15

Chain BN:



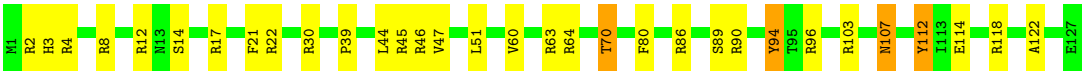
• Molecule 39: 50S ribosomal protein L16

Chain BO:



• Molecule 40: 50S ribosomal protein L17

Chain BP:

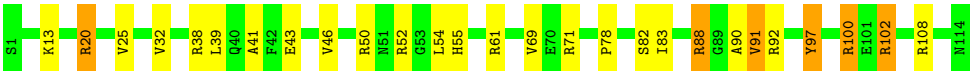


• Molecule 41: 50S ribosomal protein L18

Chain BQ:

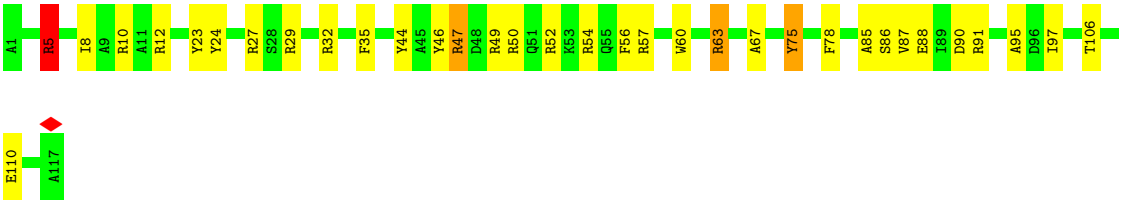
• Molecule 42: 50S ribosomal protein L19

Chain BR:



• Molecule 43: 50S ribosomal protein L20

Chain BS:

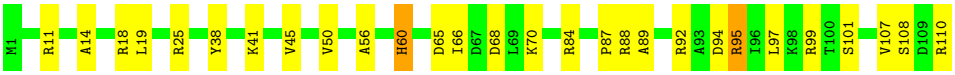


• Molecule 44: 50S ribosomal protein L21

Chain BT:

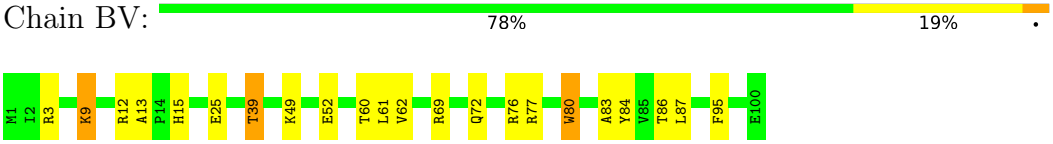
• Molecule 45: 50S ribosomal protein L22

Chain BU:



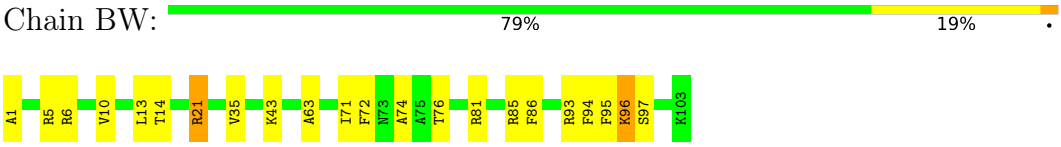
• Molecule 46: 50S ribosomal protein L23

Chain BV:



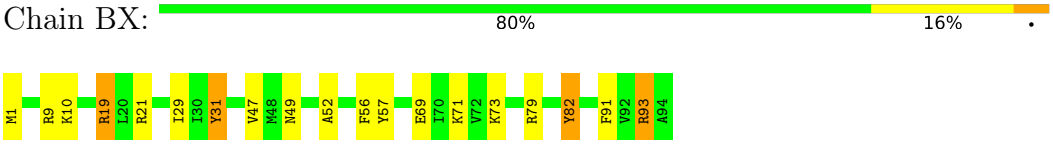
• Molecule 47: 50S ribosomal protein L24

Chain BW:



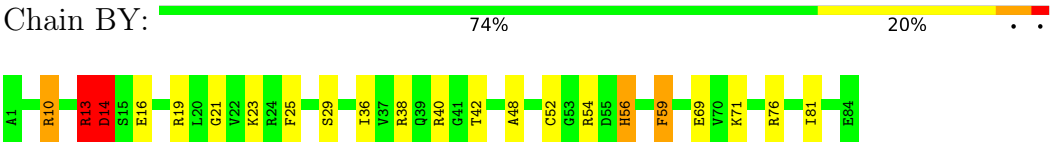
• Molecule 48: 50S ribosomal protein L25

Chain BX:



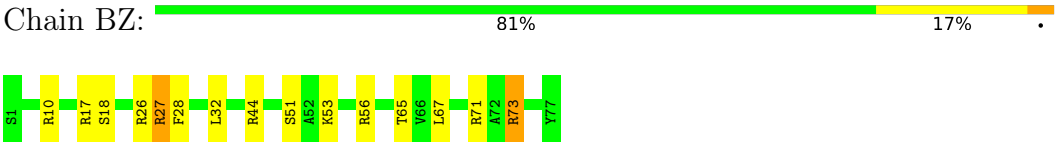
• Molecule 49: 50S ribosomal protein L27

Chain BY:



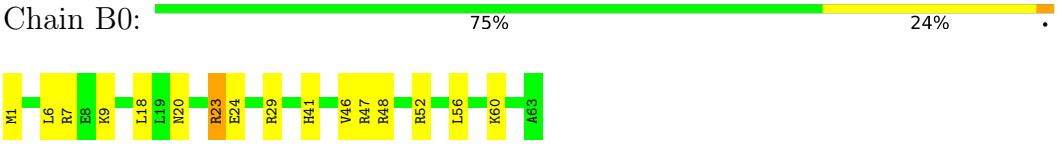
• Molecule 50: 50S ribosomal protein L28

Chain BZ:



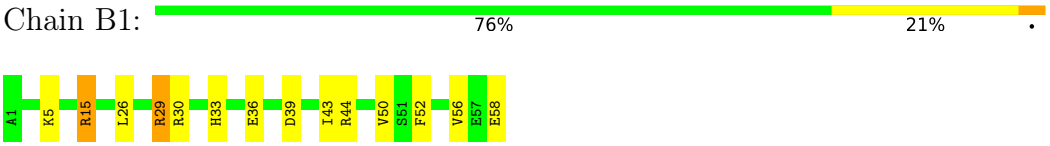
• Molecule 51: 50S ribosomal protein L29

Chain B0:



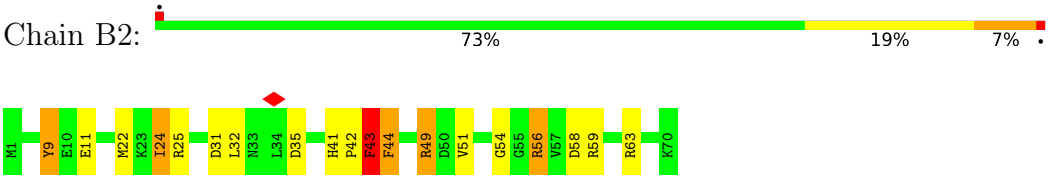
• Molecule 52: 50S ribosomal protein L30

Chain B1:



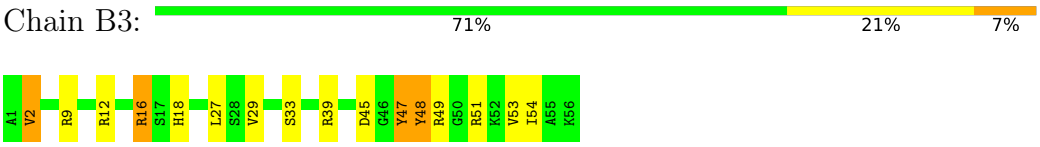
• Molecule 53: 50S ribosomal protein L31

Chain B2:



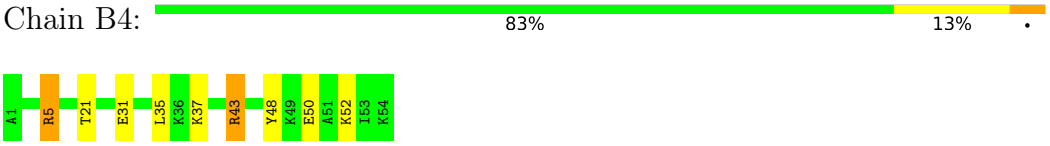
• Molecule 54: 50S ribosomal protein L32

Chain B3:



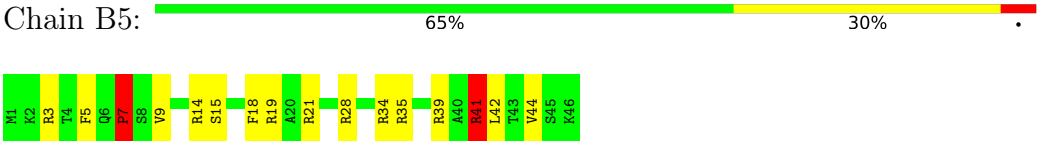
• Molecule 55: 50S ribosomal protein L33

Chain B4:



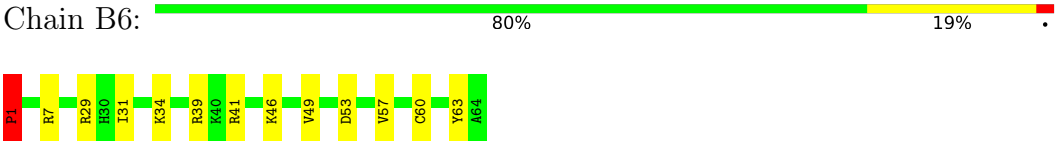
• Molecule 56: 50S ribosomal protein L34

Chain B5:



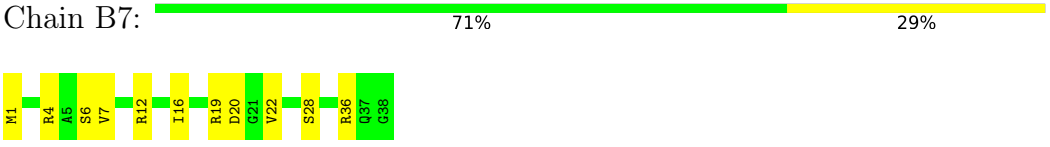
• Molecule 57: 50S ribosomal protein L35

Chain B6:



• Molecule 58: 50S ribosomal protein L36

Chain B7:



4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	37000	Depositor
Resolution determination method	FSC 0.5 CUT-OFF	Depositor
CTF correction method	Volumes were CTF-corrected in defocus groups	Depositor
Microscope	FEI TECNAI F30	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/Å^2$)	25	Depositor
Minimum defocus (nm)	1200	Depositor
Maximum defocus (nm)	4000	Depositor
Magnification	58269	Depositor
Image detector	TVIPS TEMCAM-F415 (4k x 4k)	Depositor
Maximum map value	1.575	Depositor
Minimum map value	-0.492	Depositor
Average map value	0.029	Depositor
Map value standard deviation	0.204	Depositor
Recommended contour level	0.1	Depositor
Map size (Å)	375.0, 375.0, 375.0	wwPDB
Map dimensions	250, 250, 250	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.5, 1.5, 1.5	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: OMC, PSU, 4OC, OMG, 4SU, CH, 1MG, 2MA, H2U, 5MU, UR3, 5MC, 2MG, MIA, 6MZ, OMU, 7MG, MA6, FME, 3TD

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	AA	3.08	3895/36769 (10.6%)	3.56	8470/57354 (14.8%)
2	AB	3.15	171/1600 (10.7%)	3.56	384/2492 (15.4%)
3	AC	3.09	117/1108 (10.6%)	3.61	256/1724 (14.8%)
4	AD	3.09	193/1721 (11.2%)	3.54	391/2683 (14.6%)
5	AE	1.51	6/1904 (0.3%)	1.92	45/2565 (1.8%)
6	AF	1.52	7/1852 (0.4%)	1.92	47/2490 (1.9%)
7	AG	1.49	7/1665 (0.4%)	2.08	46/2227 (2.1%)
8	AH	1.51	6/1239 (0.5%)	1.87	24/1664 (1.4%)
9	AI	1.55	6/1121 (0.5%)	1.91	29/1509 (1.9%)
10	AJ	1.47	2/1422 (0.1%)	2.07	39/1908 (2.0%)
11	AK	1.53	8/989 (0.8%)	1.89	16/1326 (1.2%)
12	AL	1.52	4/1048 (0.4%)	2.03	33/1394 (2.4%)
13	AM	1.50	5/835 (0.6%)	2.00	23/1127 (2.0%)
14	AN	1.54	6/982 (0.6%)	1.99	24/1323 (1.8%)
15	AO	1.52	4/969 (0.4%)	2.06	33/1300 (2.5%)
16	AP	1.57	5/919 (0.5%)	2.09	26/1226 (2.1%)
17	AQ	1.60	8/817 (1.0%)	1.99	27/1088 (2.5%)
18	AR	1.44	0/724	2.09	30/966 (3.1%)
19	AS	1.53	4/659 (0.6%)	1.92	13/884 (1.5%)
20	AT	1.56	2/681 (0.3%)	1.83	18/913 (2.0%)
21	AU	1.59	7/637 (1.1%)	2.19	20/851 (2.4%)
22	AV	1.48	2/744 (0.3%)	1.98	20/995 (2.0%)
23	AW	1.46	1/676 (0.1%)	1.88	14/895 (1.6%)
24	AX	1.61	4/598 (0.7%)	2.21	25/792 (3.2%)
25	BA	3.02	293/2869 (10.2%)	3.44	610/4474 (13.6%)
26	BB	3.09	7348/69257 (10.6%)	3.54	15639/108040 (14.5%)
27	BC	1.46	3/1748 (0.2%)	1.85	33/2355 (1.4%)
28	BD	1.51	10/2131 (0.5%)	2.03	68/2863 (2.4%)
29	BE	1.54	3/1586 (0.2%)	2.03	41/2134 (1.9%)
30	BF	1.53	6/1571 (0.4%)	1.97	51/2113 (2.4%)
31	BG	1.58	11/1444 (0.8%)	1.94	33/1937 (1.7%)

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	#|Z| >5	RMSZ	#|Z| >5
32	BH	1.50	7/1343 (0.5%)	1.89	33/1816 (1.8%)
33	BI	1.50	8/1122 (0.7%)	1.93	22/1515 (1.5%)
34	BJ	1.52	4/1247 (0.3%)	1.95	29/1679 (1.7%)
35	BK	1.45	4/1046 (0.4%)	1.81	17/1410 (1.2%)
36	BL	1.53	5/1152 (0.4%)	1.98	24/1551 (1.5%)
37	BM	1.53	3/956 (0.3%)	1.99	28/1279 (2.2%)
38	BN	1.53	4/1062 (0.4%)	1.93	21/1413 (1.5%)
39	BO	1.53	6/1093 (0.5%)	1.96	31/1460 (2.1%)
40	BP	1.53	3/1021 (0.3%)	2.11	37/1364 (2.7%)
41	BQ	1.60	4/910 (0.4%)	1.96	26/1219 (2.1%)
42	BR	1.53	1/929 (0.1%)	2.18	29/1242 (2.3%)
43	BS	1.57	5/960 (0.5%)	2.38	37/1278 (2.9%)
44	BT	1.58	2/829 (0.2%)	2.03	21/1107 (1.9%)
45	BU	1.43	4/864 (0.5%)	2.00	28/1156 (2.4%)
46	BV	1.52	3/794 (0.4%)	1.92	14/1060 (1.3%)
47	BW	1.46	1/797 (0.1%)	2.06	20/1062 (1.9%)
48	BX	1.48	1/766 (0.1%)	1.93	16/1025 (1.6%)
49	BY	1.49	4/642 (0.6%)	2.00	16/848 (1.9%)
50	BZ	1.50	0/635	1.84	17/848 (2.0%)
51	B0	1.43	1/510 (0.2%)	2.02	13/677 (1.9%)
52	B1	1.54	1/453 (0.2%)	1.96	12/605 (2.0%)
53	B2	1.58	4/559 (0.7%)	1.92	13/745 (1.7%)
54	B3	1.55	2/450 (0.4%)	2.05	10/599 (1.7%)
55	B4	1.41	0/448	1.83	6/594 (1.0%)
56	B5	1.50	1/380 (0.3%)	2.36	22/498 (4.4%)
57	B6	1.43	0/513	1.79	11/676 (1.6%)
58	B7	1.44	1/303 (0.3%)	2.17	7/397 (1.8%)
All	All	2.70	12223/164069 (7.4%)	3.19	27088/244735 (11.1%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand.A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	AA	0	910
2	AB	0	43
3	AC	0	30
4	AD	0	37
5	AE	0	1
6	AF	0	3
7	AG	0	9

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Mol	Chain	#Chirality outliers	#Planarity outliers
8	AH	0	2
9	AI	0	5
10	AJ	0	6
11	AK	0	2
12	AL	0	3
13	AM	0	2
14	AN	0	4
15	AO	0	9
16	AP	0	4
17	AQ	0	1
18	AR	0	3
19	AS	0	3
20	AT	0	2
21	AU	0	5
22	AV	0	3
23	AW	0	2
24	AX	0	4
25	BA	0	65
26	BB	0	1685
27	BC	0	1
28	BD	0	10
29	BE	0	8
30	BF	0	6
31	BG	0	7
32	BH	0	6
33	BI	0	3
34	BJ	0	4
35	BK	0	5
36	BL	0	8
37	BM	0	4
38	BN	0	2
39	BO	0	4
40	BP	0	2
41	BQ	0	2
42	BR	0	5
43	BS	0	6
44	BT	0	3
45	BU	0	1
46	BV	0	2
47	BW	0	1
48	BX	0	5
49	BY	0	4

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Mol	Chain	#Chirality outliers	#Planarity outliers
50	BZ	0	1
51	B0	0	1
53	B2	0	5
54	B3	0	4
55	B4	0	3
56	B5	0	2
57	B6	0	1
All	All	0	2959

The worst 5 of 12223 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
26	BB	2448	A	N3-C4	21.86	1.48	1.34
1	AA	451	A	N3-C4	17.17	1.45	1.34
26	BB	492	A	N7-C5	-16.23	1.29	1.39
26	BB	2241	A	N3-C4	15.98	1.44	1.34
26	BB	833	A	N7-C5	-15.82	1.29	1.39

The worst 5 of 27088 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
7	AG	164	ARG	NE-CZ-NH2	-25.71	107.44	120.30
7	AG	164	ARG	NE-CZ-NH1	23.24	131.92	120.30
7	AG	114	ARG	NE-CZ-NH2	-22.43	109.08	120.30
26	BB	1929	G	C2-N3-C4	22.14	122.97	111.90
26	BB	2512	C	N3-C4-C5	-21.97	113.11	121.90

There are no chirality outliers.

5 of 2959 planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	AA	1	A	Sidechain
1	AA	2	A	Sidechain
1	AA	3	A	Sidechain
1	AA	5	U	Sidechain
1	AA	6	G	Sidechain

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	AA	33089	0	16599	0	0
2	AB	1627	0	841	0	0
3	AC	993	0	498	0	0
4	AD	1641	0	839	0	0
5	AE	1872	0	1885	0	0
6	AF	1822	0	1913	0	0
7	AG	1643	0	1710	0	0
8	AH	1225	0	1273	0	0
9	AI	1101	0	1050	0	0
10	AJ	1400	0	1449	0	0
11	AK	979	0	1034	0	0
12	AL	1036	0	1084	0	0
13	AM	825	0	865	0	0
14	AN	965	0	997	0	0
15	AO	955	0	1019	0	0
16	AP	910	0	981	0	0
17	AQ	805	0	847	0	0
18	AR	716	0	742	0	0
19	AS	649	0	666	0	0
20	AT	672	0	716	0	0
21	AU	626	0	651	0	0
22	AV	727	0	769	0	0
23	AW	670	0	722	0	0
24	AX	590	0	631	0	0
25	BA	2566	0	1294	0	0
26	BB	62351	0	31277	0	0
27	BC	1733	0	1824	0	0
28	BD	2092	0	2170	0	0
29	BE	1565	0	1616	0	0
30	BF	1552	0	1619	0	0
31	BG	1420	0	1460	0	0
32	BH	1323	0	1374	0	0
33	BI	1111	0	1148	0	0
34	BJ	1233	0	1283	0	0
35	BK	1032	0	1088	0	0
36	BL	1129	0	1162	0	0
37	BM	947	0	1023	0	0
38	BN	1053	0	1129	0	0
39	BO	1074	0	1157	0	0
40	BP	1008	0	1045	0	0
41	BQ	900	0	935	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
42	BR	917	0	965	0	0
43	BS	947	0	1022	0	0
44	BT	816	0	839	0	0
45	BU	857	0	922	0	0
46	BV	787	0	846	0	0
47	BW	789	0	847	0	0
48	BX	753	0	780	0	0
49	BY	634	0	656	0	0
50	BZ	625	0	655	0	0
51	B0	509	0	543	0	0
52	B1	449	0	491	0	0
53	B2	549	0	552	0	0
54	B3	444	0	461	0	0
55	B4	441	0	485	0	0
56	B5	377	0	418	0	0
57	B6	504	0	574	0	0
58	B7	302	0	343	0	0
59	AB	14	0	9	0	0
60	BB	10	0	10	0	0
All	All	152351	0	103803	0	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). Clashscore could not be calculated for this entry.

There are no clashes within the asymmetric unit.

There are no symmetry-related clashes.

5.3 Torsion angles (i)

5.3.1 Protein backbone (i)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
5	AE	238/240 (99%)	219 (92%)	10 (4%)	9 (4%)	3 24
6	AF	230/232 (99%)	215 (94%)	10 (4%)	5 (2%)	6 35

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
7	AG	203/205 (99%)	187 (92%)	13 (6%)	3 (2%)	10	46
8	AH	164/166 (99%)	151 (92%)	11 (7%)	2 (1%)	13	50
9	AI	133/135 (98%)	122 (92%)	10 (8%)	1 (1%)	19	60
10	AJ	176/178 (99%)	164 (93%)	10 (6%)	2 (1%)	14	52
11	AK	127/129 (98%)	119 (94%)	7 (6%)	1 (1%)	19	60
12	AL	127/129 (98%)	114 (90%)	10 (8%)	3 (2%)	6	33
13	AM	101/103 (98%)	92 (91%)	4 (4%)	5 (5%)	2	20
14	AN	126/128 (98%)	111 (88%)	13 (10%)	2 (2%)	9	44
15	AO	121/123 (98%)	105 (87%)	13 (11%)	3 (2%)	5	32
16	AP	115/117 (98%)	109 (95%)	4 (4%)	2 (2%)	9	42
17	AQ	98/100 (98%)	85 (87%)	6 (6%)	7 (7%)	1	14
18	AR	86/88 (98%)	80 (93%)	5 (6%)	1 (1%)	13	50
19	AS	80/82 (98%)	77 (96%)	3 (4%)	0	100	100
20	AT	81/83 (98%)	72 (89%)	7 (9%)	2 (2%)	5	32
21	AU	72/74 (97%)	61 (85%)	7 (10%)	4 (6%)	2	19
22	AV	89/91 (98%)	82 (92%)	6 (7%)	1 (1%)	14	52
23	AW	84/86 (98%)	79 (94%)	4 (5%)	1 (1%)	13	50
24	AX	68/70 (97%)	61 (90%)	4 (6%)	3 (4%)	2	22
27	BC	232/234 (99%)	215 (93%)	13 (6%)	4 (2%)	9	42
28	BD	270/272 (99%)	238 (88%)	23 (8%)	9 (3%)	4	26
29	BE	207/209 (99%)	173 (84%)	27 (13%)	7 (3%)	3	26
30	BF	199/201 (99%)	173 (87%)	17 (8%)	9 (4%)	2	22
31	BG	176/178 (99%)	152 (86%)	13 (7%)	11 (6%)	1	17
32	BH	174/176 (99%)	158 (91%)	13 (8%)	3 (2%)	9	42
33	BI	147/149 (99%)	131 (89%)	11 (8%)	5 (3%)	3	26
34	BJ	162/164 (99%)	157 (97%)	4 (2%)	1 (1%)	25	66
35	BK	139/141 (99%)	133 (96%)	5 (4%)	1 (1%)	22	63
36	BL	140/142 (99%)	119 (85%)	14 (10%)	7 (5%)	2	20
37	BM	121/123 (98%)	109 (90%)	9 (7%)	3 (2%)	5	32
38	BN	142/144 (99%)	126 (89%)	13 (9%)	3 (2%)	7	36
39	BO	134/136 (98%)	122 (91%)	10 (8%)	2 (2%)	10	46

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
40	BP	125/127 (98%)	116 (93%)	8 (6%)	1 (1%)	19 60
41	BQ	115/117 (98%)	109 (95%)	6 (5%)	0	100 100
42	BR	112/114 (98%)	97 (87%)	12 (11%)	3 (3%)	5 31
43	BS	115/117 (98%)	107 (93%)	5 (4%)	3 (3%)	5 31
44	BT	101/103 (98%)	89 (88%)	7 (7%)	5 (5%)	2 20
45	BU	108/110 (98%)	99 (92%)	6 (6%)	3 (3%)	5 30
46	BV	98/100 (98%)	75 (76%)	19 (19%)	4 (4%)	3 23
47	BW	101/103 (98%)	89 (88%)	10 (10%)	2 (2%)	7 38
48	BX	92/94 (98%)	86 (94%)	5 (5%)	1 (1%)	14 52
49	BY	82/84 (98%)	65 (79%)	12 (15%)	5 (6%)	1 17
50	BZ	75/77 (97%)	67 (89%)	5 (7%)	3 (4%)	3 23
51	B0	61/63 (97%)	56 (92%)	3 (5%)	2 (3%)	4 26
52	B1	56/58 (97%)	54 (96%)	2 (4%)	0	100 100
53	B2	68/70 (97%)	63 (93%)	4 (6%)	1 (2%)	10 46
54	B3	54/56 (96%)	48 (89%)	3 (6%)	3 (6%)	2 19
55	B4	52/54 (96%)	49 (94%)	1 (2%)	2 (4%)	3 24
56	B5	44/46 (96%)	40 (91%)	2 (4%)	2 (4%)	2 22
57	B6	62/64 (97%)	58 (94%)	3 (5%)	1 (2%)	9 44
58	B7	36/38 (95%)	29 (81%)	5 (14%)	2 (6%)	2 19
All	All	6319/6423 (98%)	5707 (90%)	447 (7%)	165 (3%)	8 31

5 of 165 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
8	AH	77	ASN
13	AM	57	VAL
17	AQ	2	LYS
17	AQ	61	ASN
17	AQ	70	HIS

5.3.2 Protein sidechains (i)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
5	AE	198/198 (100%)	186 (94%)	12 (6%)	18	44
6	AF	189/189 (100%)	180 (95%)	9 (5%)	25	51
7	AG	172/172 (100%)	166 (96%)	6 (4%)	36	59
8	AH	125/125 (100%)	116 (93%)	9 (7%)	14	39
9	AI	116/116 (100%)	109 (94%)	7 (6%)	19	44
10	AJ	146/146 (100%)	138 (94%)	8 (6%)	21	47
11	AK	104/104 (100%)	100 (96%)	4 (4%)	33	57
12	AL	106/106 (100%)	102 (96%)	4 (4%)	33	57
13	AM	90/90 (100%)	84 (93%)	6 (7%)	16	41
14	AN	98/98 (100%)	95 (97%)	3 (3%)	40	62
15	AO	103/103 (100%)	98 (95%)	5 (5%)	25	50
16	AP	95/95 (100%)	94 (99%)	1 (1%)	73	84
17	AQ	83/83 (100%)	79 (95%)	4 (5%)	25	51
18	AR	76/76 (100%)	74 (97%)	2 (3%)	46	66
19	AS	65/65 (100%)	60 (92%)	5 (8%)	13	37
20	AT	77/77 (100%)	71 (92%)	6 (8%)	12	36
21	AU	64/64 (100%)	60 (94%)	4 (6%)	18	43
22	AV	78/78 (100%)	70 (90%)	8 (10%)	7	25
23	AW	65/65 (100%)	62 (95%)	3 (5%)	27	52
24	AX	60/60 (100%)	57 (95%)	3 (5%)	24	49
27	BC	181/181 (100%)	173 (96%)	8 (4%)	28	53
28	BD	217/217 (100%)	210 (97%)	7 (3%)	39	61
29	BE	164/164 (100%)	153 (93%)	11 (7%)	16	41
30	BF	165/165 (100%)	157 (95%)	8 (5%)	25	51
31	BG	149/149 (100%)	141 (95%)	8 (5%)	22	47
32	BH	137/137 (100%)	129 (94%)	8 (6%)	20	45
33	BI	114/114 (100%)	107 (94%)	7 (6%)	18	44
34	BJ	122/122 (100%)	115 (94%)	7 (6%)	20	45
35	BK	109/109 (100%)	106 (97%)	3 (3%)	43	65
36	BL	116/116 (100%)	111 (96%)	5 (4%)	29	53

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
37	BM	104/104 (100%)	96 (92%)	8 (8%)	13 37
38	BN	103/103 (100%)	96 (93%)	7 (7%)	16 41
39	BO	109/109 (100%)	102 (94%)	7 (6%)	17 42
40	BP	103/103 (100%)	98 (95%)	5 (5%)	25 50
41	BQ	87/87 (100%)	84 (97%)	3 (3%)	37 60
42	BR	99/99 (100%)	94 (95%)	5 (5%)	24 48
43	BS	89/89 (100%)	88 (99%)	1 (1%)	73 84
44	BT	84/84 (100%)	79 (94%)	5 (6%)	19 44
45	BU	93/93 (100%)	90 (97%)	3 (3%)	39 61
46	BV	84/84 (100%)	77 (92%)	7 (8%)	11 34
47	BW	84/84 (100%)	79 (94%)	5 (6%)	19 44
48	BX	78/78 (100%)	73 (94%)	5 (6%)	17 42
49	BY	62/62 (100%)	57 (92%)	5 (8%)	11 35
50	BZ	67/67 (100%)	66 (98%)	1 (2%)	65 80
51	B0	55/55 (100%)	50 (91%)	5 (9%)	9 29
52	B1	48/48 (100%)	43 (90%)	5 (10%)	7 24
53	B2	62/62 (100%)	55 (89%)	7 (11%)	6 21
54	B3	47/47 (100%)	44 (94%)	3 (6%)	17 42
55	B4	48/48 (100%)	47 (98%)	1 (2%)	53 72
56	B5	38/38 (100%)	35 (92%)	3 (8%)	12 35
57	B6	51/51 (100%)	46 (90%)	5 (10%)	8 26
58	B7	34/34 (100%)	32 (94%)	2 (6%)	19 45
All	All	5213/5213 (100%)	4934 (95%)	279 (5%)	26 47

5 of 279 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
46	BV	87	LEU
48	BX	10	LYS
53	B2	31	ASP
22	AV	13	HIS
21	AU	65	SER

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. There are no such sidechains identified.

5.3.3 RNA (i)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
1	AA	1538/1542 (99%)	300 (19%)	101 (6%)
2	AB	74/76 (97%)	24 (32%)	7 (9%)
25	BA	119/120 (99%)	17 (14%)	10 (8%)
26	BB	2898/2904 (99%)	525 (18%)	177 (6%)
3	AC	46/47 (97%)	23 (50%)	12 (26%)
4	AD	76/77 (98%)	10 (13%)	5 (6%)
All	All	4751/4766 (99%)	899 (18%)	312 (6%)

5 of 899 RNA backbone outliers are listed below:

Mol	Chain	Res	Type
1	AA	3	A
1	AA	4	U
1	AA	5	U
1	AA	6	G
1	AA	7	A

5 of 312 RNA pucker outliers are listed below:

Mol	Chain	Res	Type
26	BB	1567	G
26	BB	2434	A
26	BB	1697	G
26	BB	2068	U
26	BB	2756	U

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

49 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	$\#\|Z\| > 2$
26	OMC	BB	2498	26	19,22,23	1.28	3 (15%)	26,31,34	1.09	2 (7%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\|>2$	Counts	RMSZ	$\#\|Z\|>2$
4	OMC	AD	33	4	19,22,23	1.09	1 (5%)	26,31,34	1.81	9 (34%)
26	2MG	BB	1835	26	18,26,27	1.98	7 (38%)	16,38,41	0.93	0
1	5MC	AA	967	1	18,22,23	1.40	3 (16%)	26,32,35	1.84	9 (34%)
26	PSU	BB	746	26	18,21,22	1.79	5 (27%)	22,30,33	1.57	5 (22%)
4	PSU	AD	56	4	18,21,22	1.90	3 (16%)	22,30,33	2.16	6 (27%)
2	5MU	AB	54	2	19,22,23	1.70	5 (26%)	28,32,35	1.84	7 (25%)
26	7MG	BB	2069	26	22,26,27	4.18	3 (13%)	29,39,42	1.70	5 (17%)
26	5MU	BB	747	26	19,22,23	1.93	7 (36%)	28,32,35	1.95	6 (21%)
26	CH	BB	2575	26	16,21,22	1.54	3 (18%)	20,30,33	1.56	4 (20%)
1	7MG	AA	527	1	22,26,27	6.42	5 (22%)	29,39,42	1.86	5 (17%)
2	H2U	AB	17	2	18,21,22	1.36	1 (5%)	21,30,33	1.90	4 (19%)
26	3TD	BB	1915	26	18,22,23	1.52	3 (16%)	22,32,35	1.86	5 (22%)
26	PSU	BB	1917	26	18,21,22	2.06	8 (44%)	22,30,33	2.52	8 (36%)
26	H2U	BB	2449	26	18,21,22	1.32	1 (5%)	21,30,33	1.51	3 (14%)
2	MIA	AB	37	2	24,31,32	2.06	8 (33%)	26,44,47	2.93	7 (26%)
26	2MA	BB	2503	26	17,25,26	1.42	5 (29%)	17,37,40	1.61	5 (29%)
26	PSU	BB	2504	26	18,21,22	2.01	6 (33%)	22,30,33	2.02	7 (31%)
26	PSU	BB	1911	26	18,21,22	1.92	4 (22%)	22,30,33	1.24	3 (13%)
26	PSU	BB	2580	26	18,21,22	1.45	3 (16%)	22,30,33	1.40	3 (13%)
2	H2U	AB	16	2	18,21,22	1.57	5 (27%)	21,30,33	1.22	3 (14%)
4	5MU	AD	55	4	19,22,23	1.67	5 (26%)	28,32,35	1.45	4 (14%)
2	4SU	AB	8	2	18,21,22	1.67	3 (16%)	26,30,33	1.57	5 (19%)
26	OMU	BB	2552	26	19,22,23	1.22	1 (5%)	26,31,34	2.06	11 (42%)
26	5MU	BB	1939	26	19,22,23	1.72	3 (15%)	28,32,35	1.80	4 (14%)
1	PSU	AA	516	1	18,21,22	1.97	5 (27%)	22,30,33	1.33	3 (13%)
26	OMG	BB	2251	26	18,26,27	1.77	5 (27%)	19,38,41	1.50	6 (31%)
1	4OC	AA	1402	1	20,23,24	1.58	6 (30%)	26,32,35	1.86	10 (38%)
26	1MG	BB	745	26	18,26,27	1.82	5 (27%)	19,39,42	2.43	4 (21%)
26	2MG	BB	2445	26	18,26,27	1.23	3 (16%)	16,38,41	1.48	2 (12%)
2	PSU	AB	55	2	18,21,22	1.31	1 (5%)	22,30,33	1.75	7 (31%)
26	6MZ	BB	2030	26	18,25,26	1.75	5 (27%)	16,36,39	2.35	5 (31%)
1	2MG	AA	966	1	18,26,27	1.66	6 (33%)	16,38,41	2.07	4 (25%)
1	UR3	AA	1498	1	19,22,23	1.04	1 (5%)	26,32,35	1.39	4 (15%)
26	5MC	BB	1962	26	18,22,23	1.57	3 (16%)	26,32,35	1.99	6 (23%)
26	6MZ	BB	1618	26	18,25,26	2.11	6 (33%)	16,36,39	1.56	3 (18%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\|>2$	Counts	RMSZ	$\#\|Z\|>2$
1	MA6	AA	1518	1	19,26,27	1.80	4 (21%)	18,38,41	2.43	4 (22%)
26	PSU	BB	2605	26	18,21,22	1.57	4 (22%)	22,30,33	1.30	2 (9%)
2	OMC	AB	32	2	19,22,23	1.32	3 (15%)	26,31,34	1.90	6 (23%)
1	2MG	AA	1516	1	18,26,27	1.26	1 (5%)	16,38,41	1.69	3 (18%)
1	5MC	AA	1407	1	18,22,23	1.35	2 (11%)	26,32,35	2.11	9 (34%)
2	7MG	AB	46	2	22,26,27	5.65	7 (31%)	29,39,42	1.80	2 (6%)
1	MA6	AA	1519	1	19,26,27	2.13	8 (42%)	18,38,41	1.62	3 (16%)
26	PSU	BB	955	26	18,21,22	1.36	2 (11%)	22,30,33	1.92	6 (27%)
1	2MG	AA	1207	1	18,26,27	2.11	6 (33%)	16,38,41	1.71	4 (25%)
4	H2U	AD	21	4	18,21,22	1.75	4 (22%)	21,30,33	1.90	5 (23%)
2	H2U	AB	20	2	18,21,22	1.27	2 (11%)	21,30,33	1.31	2 (9%)
4	4SU	AD	8	4	18,21,22	1.95	3 (16%)	26,30,33	2.36	9 (34%)
26	PSU	BB	2457	26	18,21,22	1.56	4 (22%)	22,30,33	2.10	7 (31%)

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
26	OMC	BB	2498	26	-	0/9/27/28	0/2/2/2
4	OMC	AD	33	4	-	0/9/27/28	0/2/2/2
26	2MG	BB	1835	26	-	1/5/27/28	0/3/3/3
1	5MC	AA	967	1	-	3/7/25/26	0/2/2/2
26	PSU	BB	746	26	-	4/7/25/26	0/2/2/2
4	PSU	AD	56	4	-	1/7/25/26	0/2/2/2
2	5MU	AB	54	2	-	0/7/25/26	0/2/2/2
26	7MG	BB	2069	26	-	0/7/37/38	0/3/3/3
26	5MU	BB	747	26	-	0/7/25/26	0/2/2/2
26	CH	BB	2575	26	-	0/5/25/26	0/2/2/2
1	7MG	AA	527	1	-	1/7/37/38	0/3/3/3
2	H2U	AB	17	2	-	0/7/38/39	0/2/2/2
26	3TD	BB	1915	26	-	1/7/25/26	0/2/2/2
26	PSU	BB	1917	26	-	2/7/25/26	0/2/2/2
26	H2U	BB	2449	26	-	0/7/38/39	0/2/2/2
2	MIA	AB	37	2	-	1/11/33/34	0/3/3/3
26	2MA	BB	2503	26	-	0/3/25/26	0/3/3/3
26	PSU	BB	2504	26	-	0/7/25/26	0/2/2/2
26	PSU	BB	1911	26	-	2/7/25/26	0/2/2/2

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
26	PSU	BB	2580	26	-	1/7/25/26	0/2/2/2
2	H2U	AB	16	2	-	0/7/38/39	0/2/2/2
4	5MU	AD	55	4	-	0/7/25/26	0/2/2/2
2	4SU	AB	8	2	-	6/7/25/26	0/2/2/2
26	OMU	BB	2552	26	-	1/9/27/28	0/2/2/2
26	5MU	BB	1939	26	-	0/7/25/26	0/2/2/2
1	PSU	AA	516	1	-	0/7/25/26	0/2/2/2
26	OMG	BB	2251	26	-	0/5/27/28	0/3/3/3
1	4OC	AA	1402	1	-	0/9/29/30	0/2/2/2
26	1MG	BB	745	26	-	0/3/25/26	0/3/3/3
26	2MG	BB	2445	26	-	0/5/27/28	0/3/3/3
2	PSU	AB	55	2	-	4/7/25/26	0/2/2/2
26	6MZ	BB	2030	26	-	0/5/27/28	0/3/3/3
1	2MG	AA	966	1	-	1/5/27/28	0/3/3/3
1	UR3	AA	1498	1	-	0/7/25/26	0/2/2/2
26	5MC	BB	1962	26	-	2/7/25/26	0/2/2/2
26	6MZ	BB	1618	26	-	0/5/27/28	0/3/3/3
1	MA6	AA	1518	1	-	0/7/29/30	0/3/3/3
26	PSU	BB	2605	26	-	1/7/25/26	0/2/2/2
2	OMC	AB	32	2	-	2/9/27/28	0/2/2/2
1	2MG	AA	1516	1	-	0/5/27/28	0/3/3/3
1	5MC	AA	1407	1	-	0/7/25/26	0/2/2/2
2	7MG	AB	46	2	-	2/7/37/38	0/3/3/3
1	MA6	AA	1519	1	-	0/7/29/30	0/3/3/3
26	PSU	BB	955	26	-	0/7/25/26	0/2/2/2
1	2MG	AA	1207	1	-	0/5/27/28	0/3/3/3
4	H2U	AD	21	4	-	3/7/38/39	0/2/2/2
2	H2U	AB	20	2	-	0/7/38/39	0/2/2/2
4	4SU	AD	8	4	-	0/7/25/26	0/2/2/2
26	PSU	BB	2457	26	-	0/7/25/26	0/2/2/2

The worst 5 of 197 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	AA	527	7MG	C8-N9	-29.36	1.29	1.46
2	AB	46	7MG	C8-N9	-25.16	1.31	1.46
26	BB	2069	7MG	C8-N9	-18.65	1.35	1.46
4	AD	8	4SU	C5-C4	-6.73	1.33	1.42
2	AB	37	MIA	C2-S10	5.60	1.80	1.75

The worst 5 of 246 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	AB	37	MIA	C11-S10-C2	11.77	111.06	102.27
26	BB	745	1MG	C2-N1-C6	8.17	127.59	120.95
1	AA	1518	MA6	N1-C6-N6	7.81	125.28	117.06
2	AB	46	7MG	N9-C8-N7	7.64	114.30	103.38
1	AA	527	7MG	N9-C8-N7	7.06	113.48	103.38

There are no chirality outliers.

5 of 39 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	AB	8	4SU	C2'-C1'-N1-C6
2	AB	32	OMC	O4'-C1'-N1-C2
2	AB	32	OMC	O4'-C1'-N1-C6
2	AB	37	MIA	C12-C13-C14-C16
2	AB	55	PSU	C2'-C1'-C5-C4

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)

2 ligands 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	$\#\|Z\| > 2$
60	FME	BB	3001	59	8,9,10	1.03	0	7,9,11	2.50	3 (42%)
59	TRP	AB	101	2,60	14,15,16	1.66	3 (21%)	13,20,22	1.34	3 (23%)

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
60	FME	BB	3001	59	-	2/7/9/11	-
59	TRP	AB	101	2,60	-	0/5/6/8	0/2/2/2

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
59	AB	101	TRP	OXT-C	-4.73	1.22	1.42
59	AB	101	TRP	CE3-CD2	-2.20	1.37	1.42
59	AB	101	TRP	CH2-CZ2	2.20	1.41	1.36

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

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
60	BB	3001	FME	CA-N-CN	4.83	130.26	122.82
59	AB	101	TRP	CZ3-CH2-CZ2	-2.37	117.12	120.44
60	BB	3001	FME	O1-CN-N	-2.35	119.08	125.27
59	AB	101	TRP	OXT-C-CA	2.22	120.29	111.52
60	BB	3001	FME	CG-CB-CA	-2.18	106.89	112.95

There are no chirality outliers.

All (2) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
60	BB	3001	FME	O1-CN-N-CA
60	BB	3001	FME	N-CA-CB-CG

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)

The following chains have linkage breaks:

Mol	Chain	Number of breaks
1	AA	1

All chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	AA	1457:G	O3'	1458:G	P	1.77

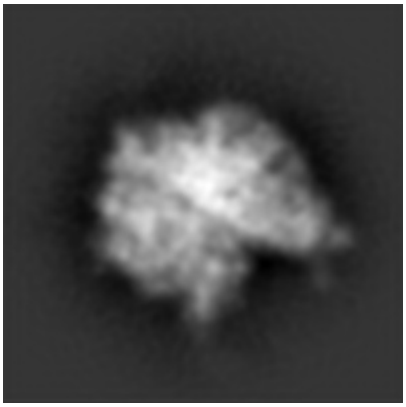
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-5362. These allow visual inspection of the internal detail of the map and identification of artifacts.

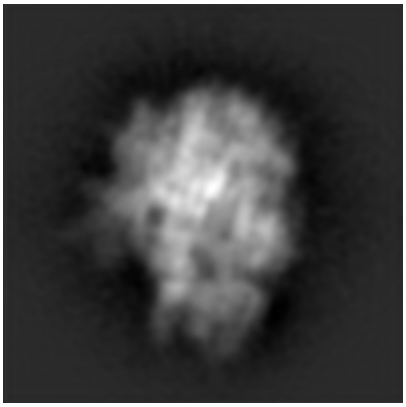
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections

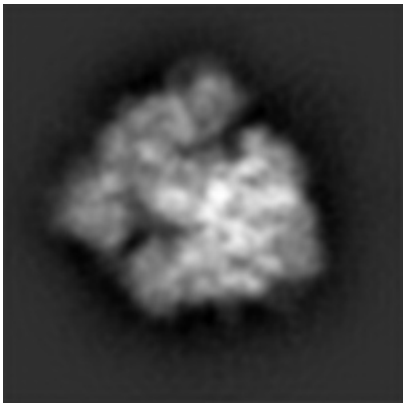
6.1.1 Primary map



X



Y

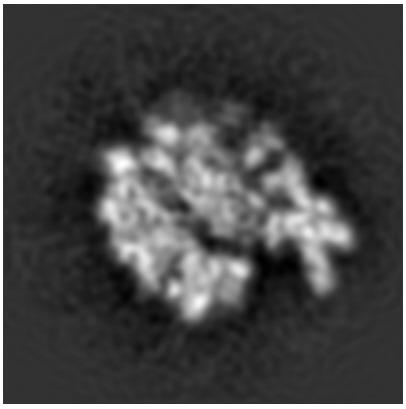


Z

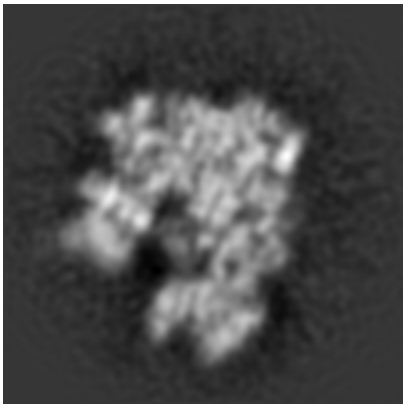
The images above show the map projected in three orthogonal directions.

6.2 Central slices

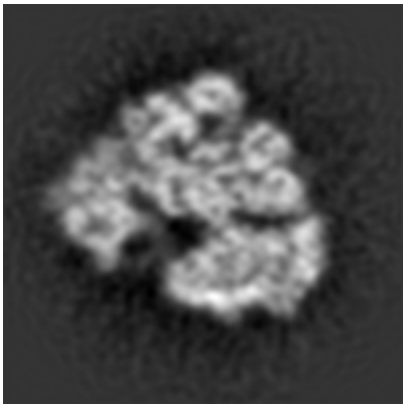
6.2.1 Primary map



X Index: 125



Y Index: 125

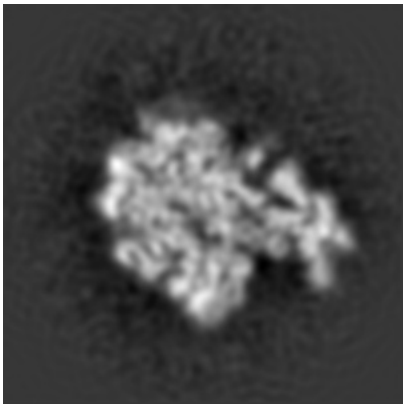


Z Index: 125

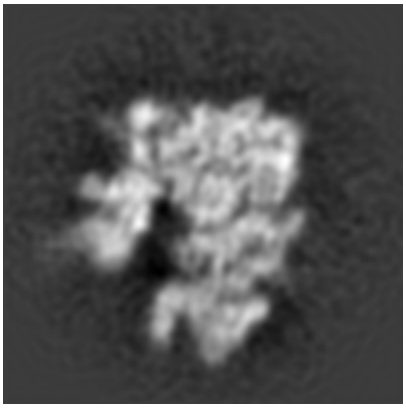
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

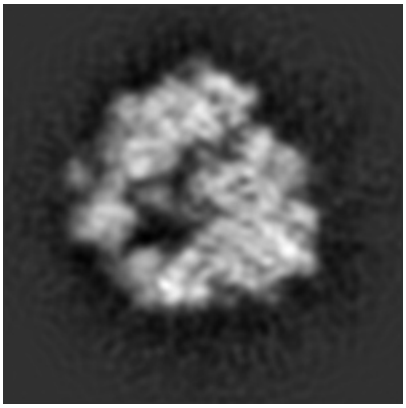
6.3.1 Primary map



X Index: 130



Y Index: 130

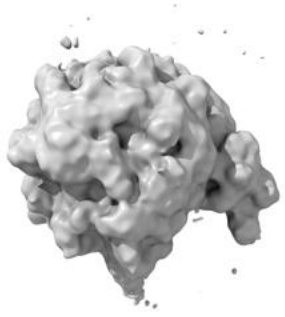


Z Index: 114

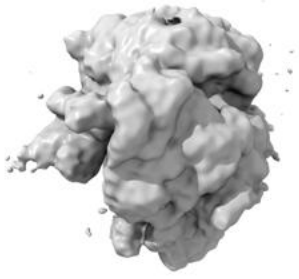
The images above show the largest variance slices of the map in three orthogonal directions.

6.4 Orthogonal surface views (i)

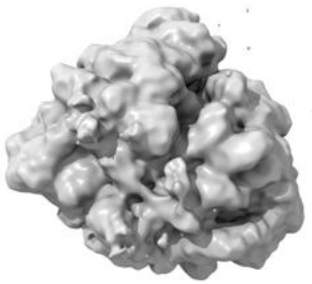
6.4.1 Primary map



X



Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.1. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

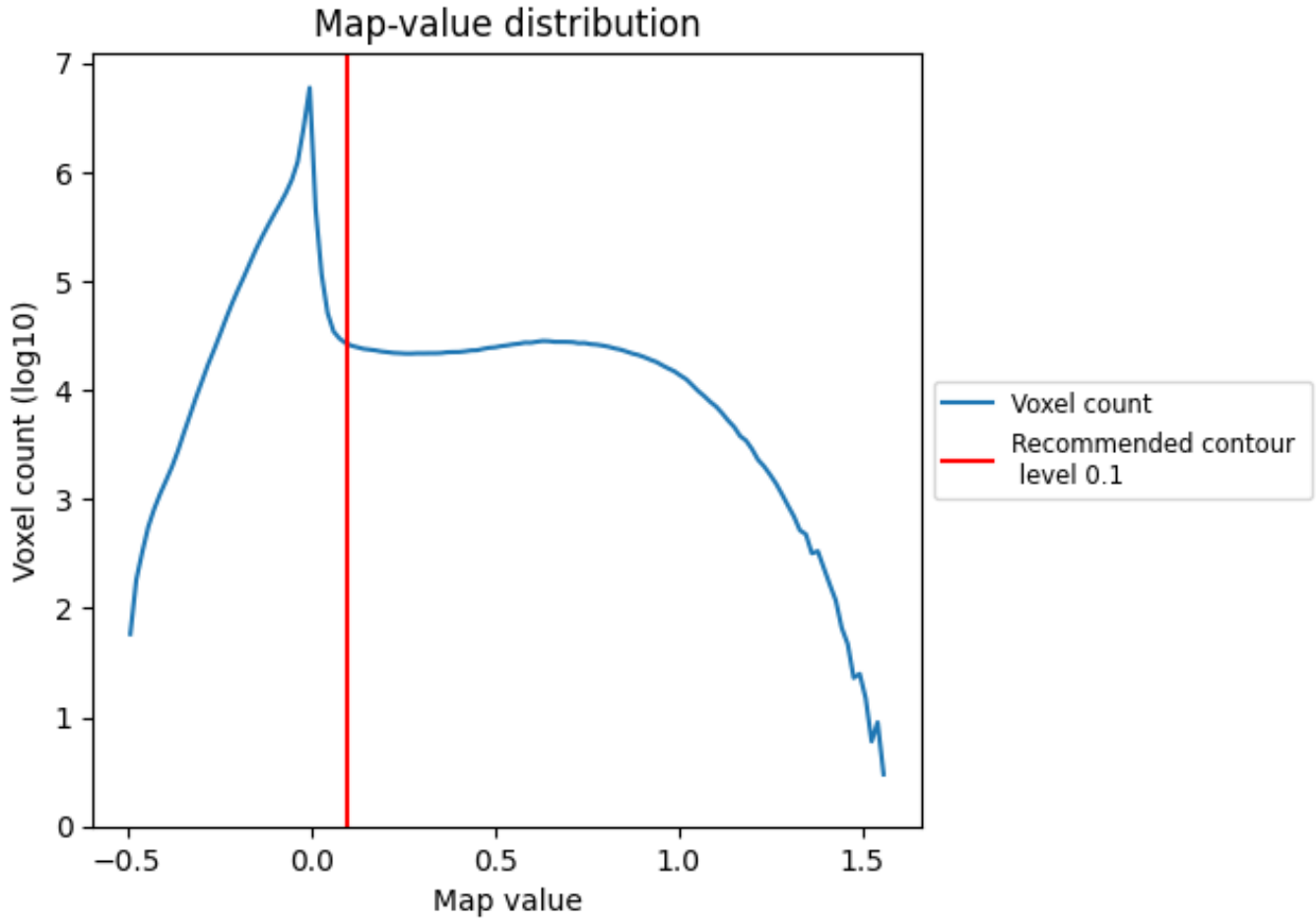
6.5 Mask visualisation (i)

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

7 Map analysis

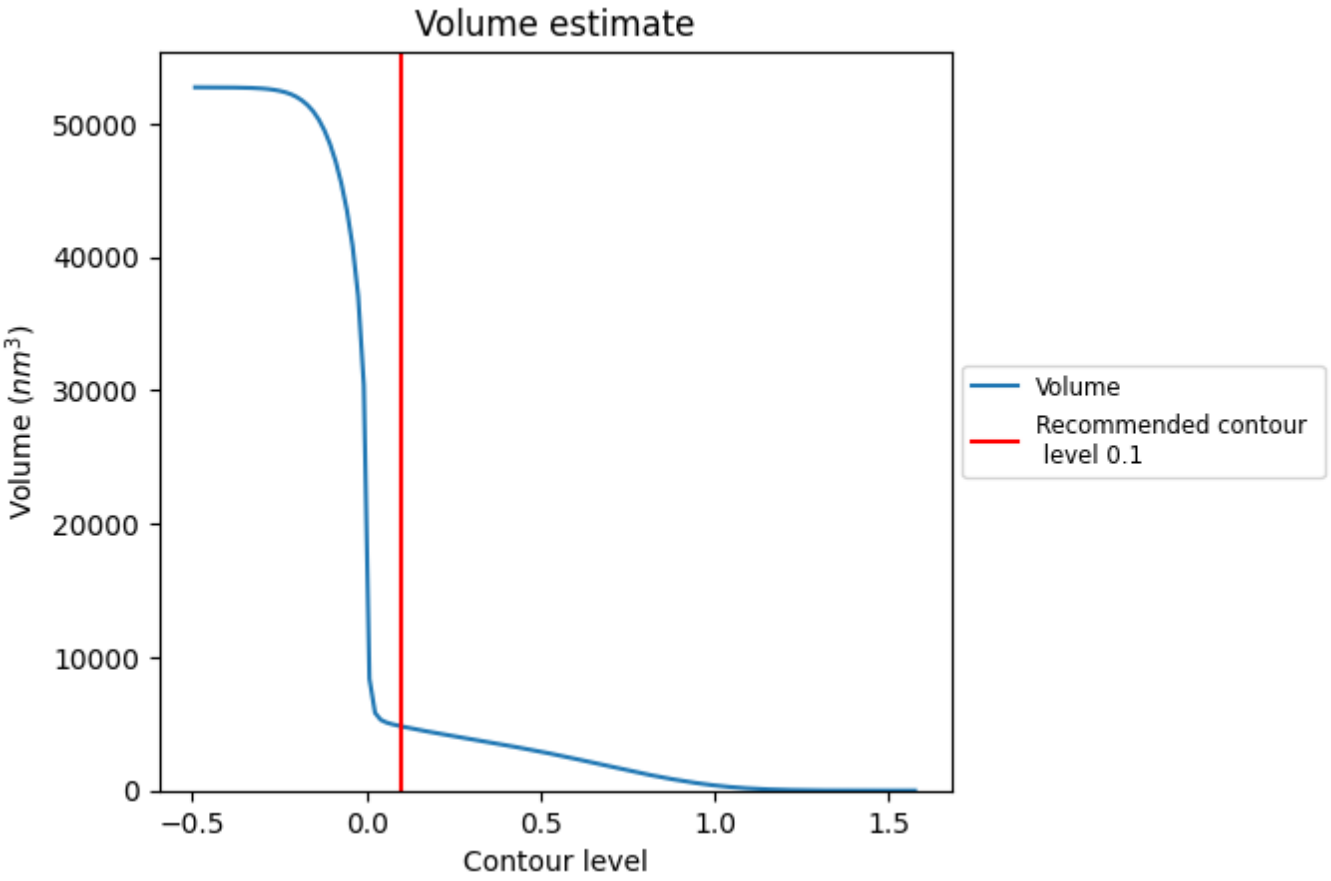
This section contains the results of statistical analysis of the map.

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.

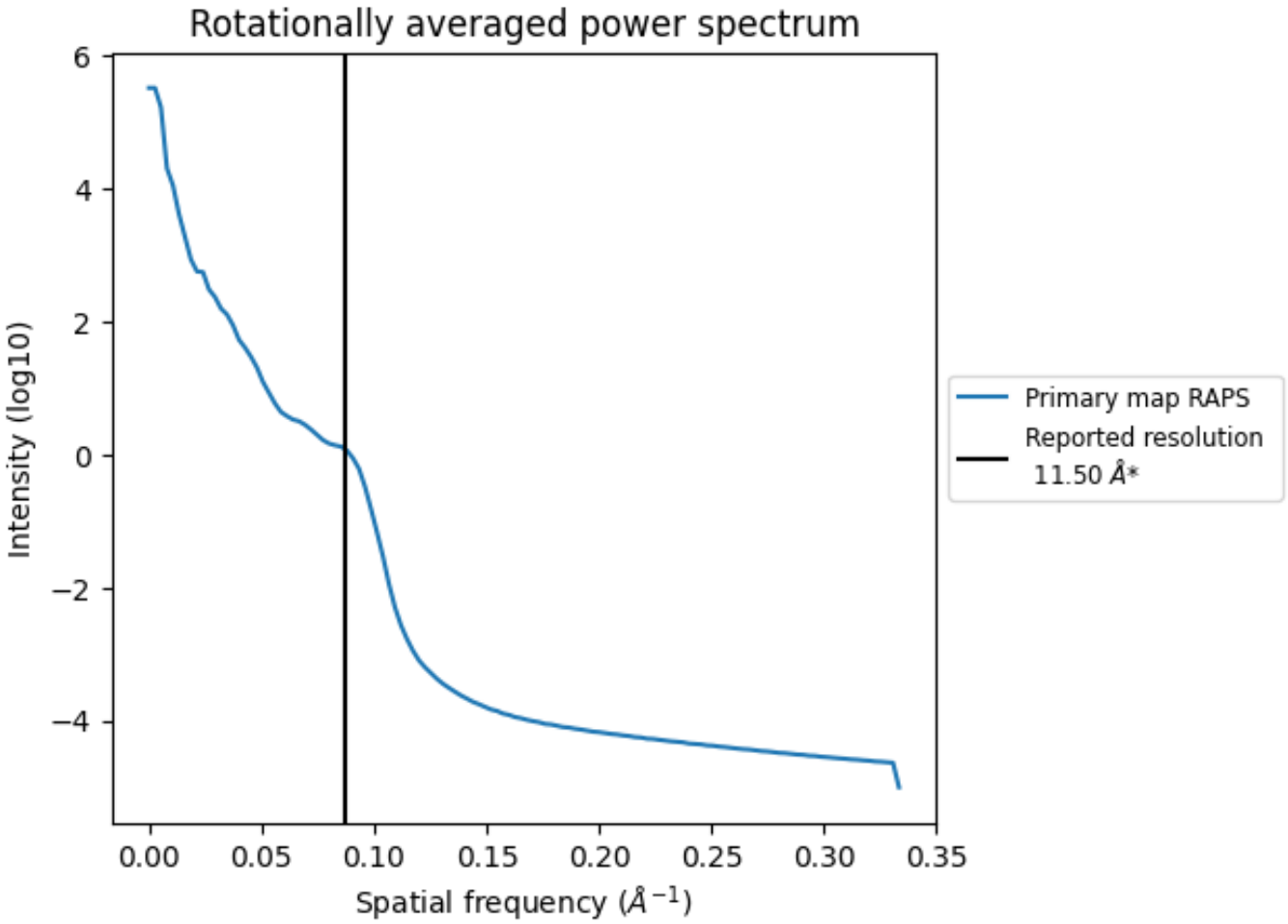
7.2 Volume estimate (i)



The volume at the recommended contour level is 4817 nm^3; this corresponds to an approximate mass of 4352 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 0.087 Å^{-1}

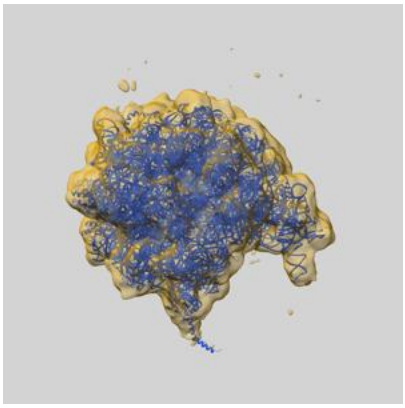
8 Fourier-Shell correlation

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

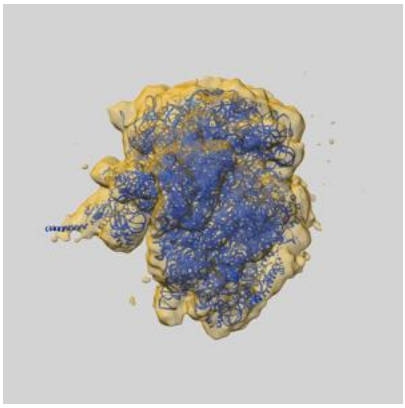
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-5362 and PDB model 4V6R. Per-residue inclusion information can be found in section 3 on page 15.

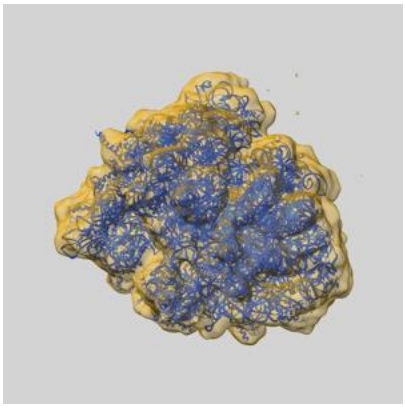
9.1 Map-model overlay



X



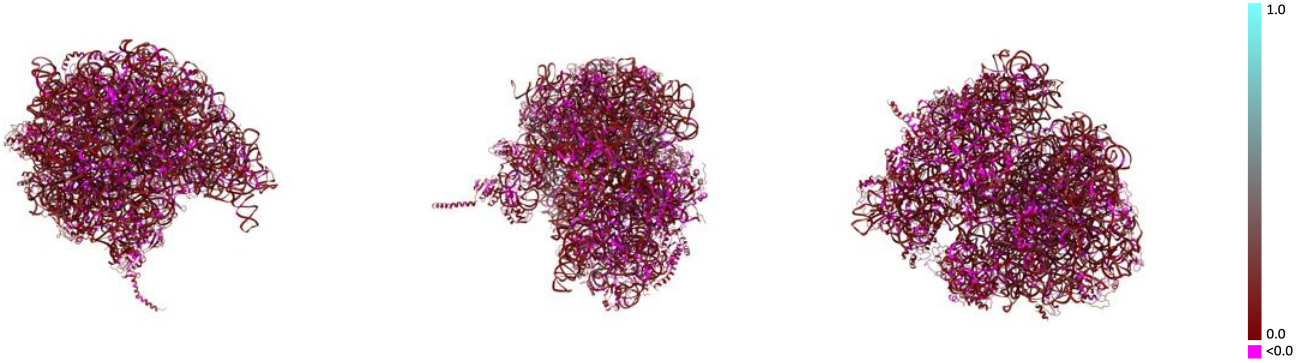
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.1 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.

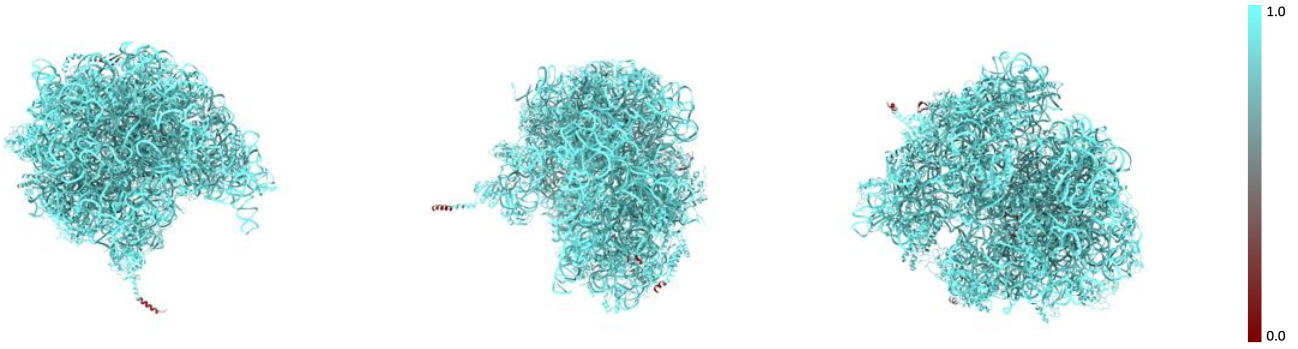
9.2 Q-score mapped to coordinate model (i)



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.

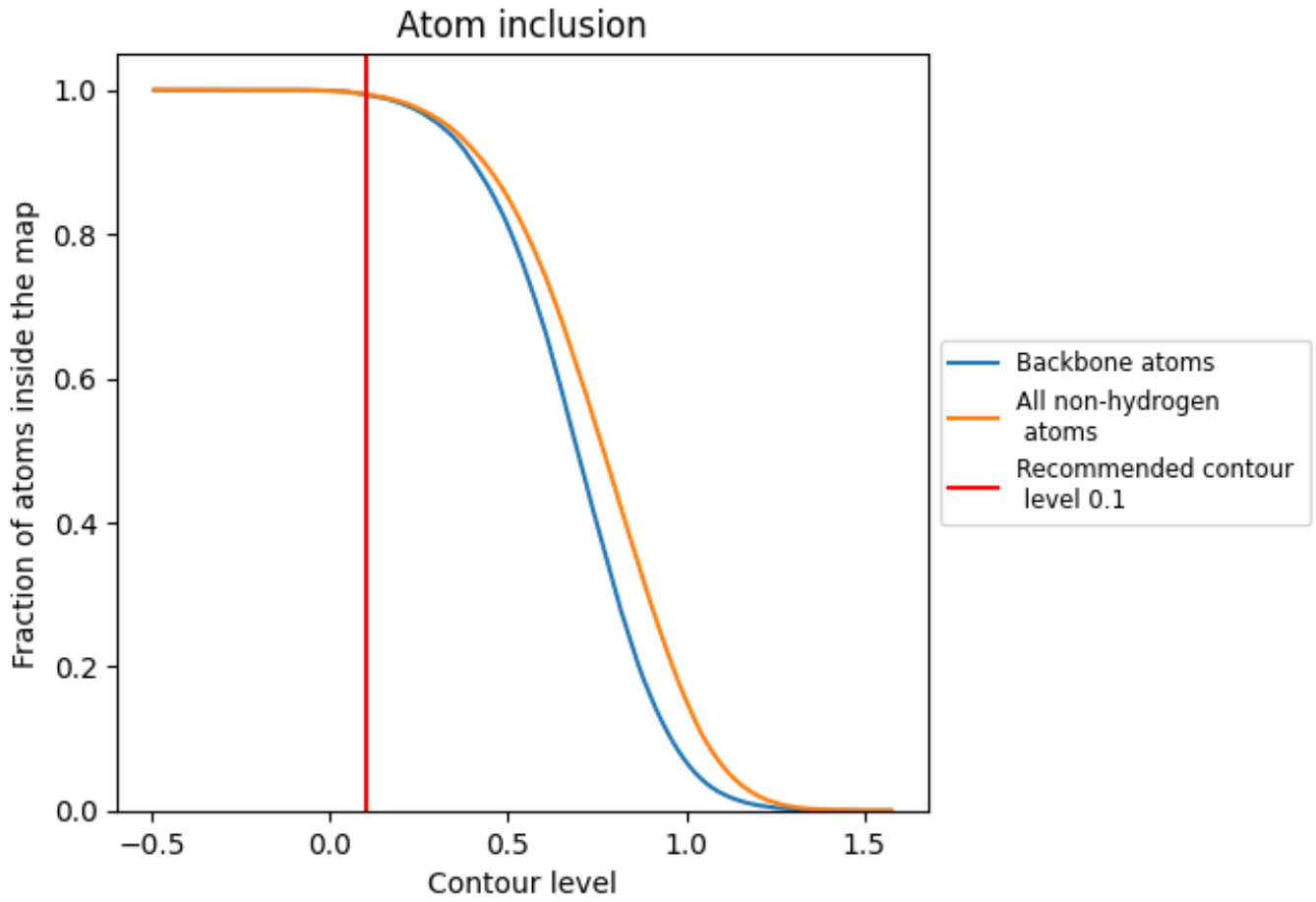
9.3 Atom inclusion mapped to coordinate model (i)



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 (0.1).

9.4 Atom inclusion (i)



At the recommended contour level, 99% of all backbone atoms, 99% 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 (0.1) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.9943	0.0730
AA	0.9994	0.0890
AB	0.9640	0.0680
AC	0.8953	0.0140
AD	0.9890	0.0900
AE	0.9457	0.0440
AF	0.9977	0.0620
AG	1.0000	0.0410
AH	0.9792	0.0420
AI	0.9767	0.0440
AJ	0.9926	0.0580
AK	0.9958	0.0360
AL	0.9839	0.0480
AM	1.0000	0.0190
AN	0.9957	0.0410
AO	0.9848	0.0310
AP	0.9852	0.0460
AQ	0.9961	0.0380
AR	1.0000	0.0560
AS	1.0000	0.0230
AT	1.0000	0.0420
AU	1.0000	0.0380
AV	0.9606	0.0280
AW	1.0000	0.0430
AX	1.0000	0.0360
B0	1.0000	0.0200
B1	0.9977	0.0540
B2	0.9665	0.0250
B3	1.0000	0.0320
B4	1.0000	0.0530
B5	1.0000	-0.0070
B6	1.0000	-0.0070
B7	1.0000	0.0400
BA	1.0000	0.0990
BB	0.9996	0.0910

Continued on next page...

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Chain	Atom inclusion	Q-score
BC	0.9690	0.0360
BD	1.0000	0.0220
BE	0.9974	0.0200
BF	0.9987	0.0620
BG	0.9949	0.0600
BH	0.9946	0.0250
BI	0.9097	0.0260
BJ	0.8814	0.0570
BK	0.9746	0.0420
BL	1.0000	0.0300
BM	0.9913	0.0580
BN	1.0000	0.0250
BO	1.0000	0.0420
BP	1.0000	0.0240
BQ	0.9931	0.0530
BR	0.9899	0.0190
BS	0.9945	0.0210
BT	1.0000	0.0630
BU	0.9988	0.0110
BV	0.9961	0.0250
BW	0.9987	0.0530
BX	0.9986	0.0620
BY	0.9951	0.0290
BZ	1.0000	0.0290