wwPDB X-ray Structure Validation Summary Report (i)

Dec 15, 2024 – 08:16 AM EST

PDB ID	:	4V4S
Title	:	Crystal structure of the whole ribosomal complex.
Authors	:	Petry, S.; Brodersen, D.E.; Murphy IV, F.V.; Dunham, C.M.; Selmer, M.; Tarry, M.J.; Kelley, A.C.; Ramakrishnan, V.
Deposited on	:	2005-10-12
Resolution	:	6.76 Å(reported)

This is a wwPDB X-ray Structure 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/XrayValidationReportHelp
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:

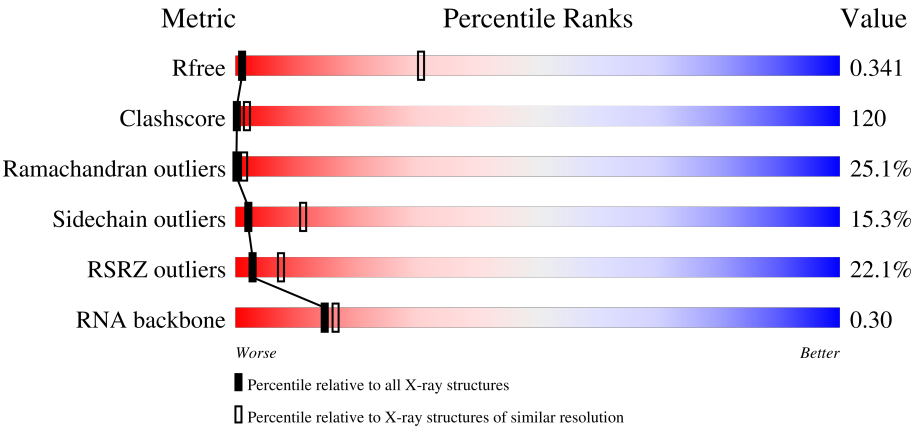
MolProbity	:	4.02b-467
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	1.21
EDS	:	3.0
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4	:	9.0.004 (Gargrove)
Density-Fitness	:	1.0.11
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.40

1 Overall quality at a glance (i)

The following experimental techniques were used to determine the structure:
X-RAY DIFFRACTION

The reported resolution of this entry is 6.76 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)	Similar resolution (#Entries, resolution range(Å))
R_{free}	164625	1105 (9.50-4.00)
Clashscore	180529	1145 (9.50-4.00)
Ramachandran outliers	177936	1012 (9.50-4.00)
Sidechain outliers	177891	1033 (9.50-3.96)
RSRZ outliers	164620	1100 (9.50-4.00)
RNA backbone	3690	1000 (9.50-3.02)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower 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 electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	AA	1522	6% 25% 42% 24% 9%
2	AV	76	11% 16% 59% 22% .
3	AW	76	9% 29% 47% 16% 8%
4	AX	18	67% 61% 33% 6%

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Mol	Chain	Length	Quality of chain
5	AB	256	14% 44% 39% 7% 9%
6	AC	239	22% 48% 29% 8% 14%
7	AD	209	38% 36% 52% 11%
8	AE	162	22% 48% 35% 10% 7%
9	AF	101	24% 66% 29%
10	AG	156	25% 60% 35%
11	AH	138	17% 38% 47% 14%
12	AI	128	30% 50% 41% 7%
13	AJ	105	28% 42% 40% 11% 7%
14	AK	129	10% 50% 40% 8%
15	AL	135	30% 39% 45% 7% 8%
16	AM	126	33% 50% 40% 9%
17	AN	61	20% 34% 56% 8%
18	AO	89	35% 63% 29% 7%
19	AP	88	43% 44% 35% 13% 6%
20	AQ	105	32% 40% 51% 7%
21	AR	88	19% 41% 33% 9% 17%
22	AS	93	29% 39% 43% 14%
23	AT	106	43% 49% 38% 7% 7%
24	AU	27	48% 30% 52% 7% 11%
25	AY	365	75% 98%
26	BB	123	4% 28% 45% 24%
27	BA	2916	8% 11% 34% 38% 13%
28	BD	173	35% 44% 46% 9%
29	BE	338	24% 30% 20% 43%

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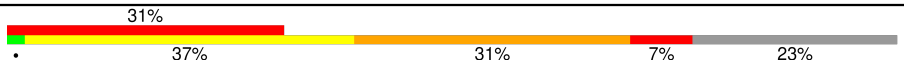
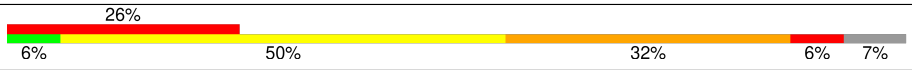
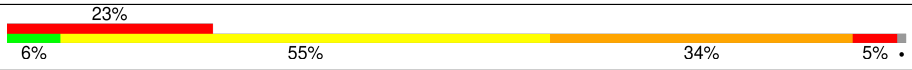
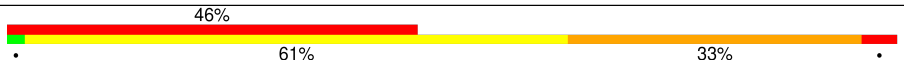
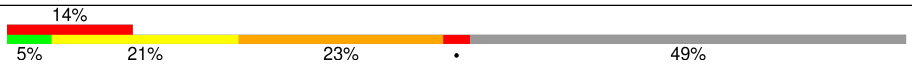
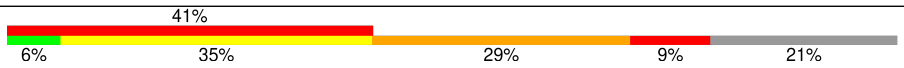
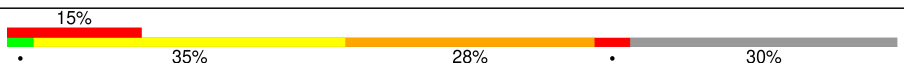
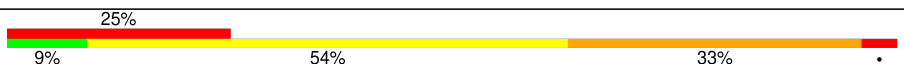
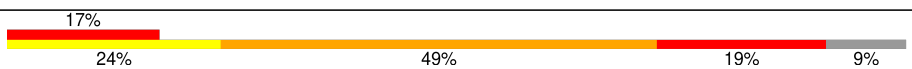
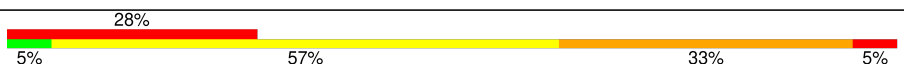
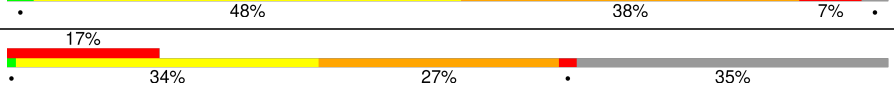
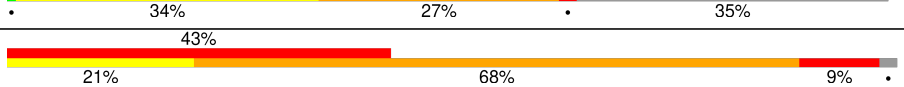
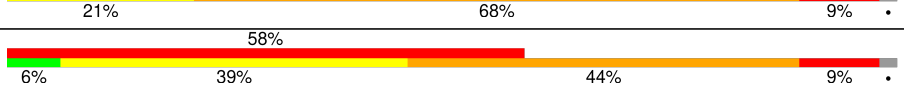
Mol	Chain	Length	Quality of chain
30	BF	246	
31	BG	176	
32	BH	177	
33	BI	149	
34	BN	145	
35	BO	122	
36	BP	164	
37	BQ	138	
38	BS	186	
39	BT	66	
40	BW	113	
41	BX	84	
42	BY	119	
43	BZ	253	
44	BR	118	
45	BU	118	
46	BV	100	
47	B2	70	
48	B3	60	
49	B0	91	
50	B4	73	
51	B5	60	
52	B6	82	
53	B7	47	
54	B8	64	

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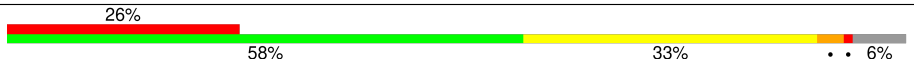
Mol	Chain	Length	Quality of chain
55	B9	36	
56	BK	141	

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
3	YYG	AW	37	X	-	X	-

2 Entry composition (i)

There are 56 unique types of molecules in this entry. The entry contains 142811 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, the ZeroOcc column contains the number of atoms modelled with zero occupancy, 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					ZeroOcc	AltConf	Trace
			Total	C	N	O	P			
1	AA	1515	32551	14490	6022	10525	1514	0	0	0

There are 3 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
AA	416	G	-	insertion	GB 155076
AA	905	U	-	insertion	GB 155076
AA	1395	C	-	insertion	GB 155076

- Molecule 2 is a RNA chain called P-site tRNA (Phe).

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	P			
2	AV	76	1622	725	293	529	75	0	0	0

- Molecule 3 is a RNA chain called E-site tRNA (Phe).

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	P			
3	AW	76	1638	736	294	533	75	0	0	0

- Molecule 4 is a RNA chain called 5'-D(*AP*UP*GP*UP*UP*CP*UP*AP*GP*AP*UP*AP*CP*AP*AP*UP*AP*AP*U)-3'.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	P			
4	AX	17	136	56	19	44	17	0	0	11

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

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
5	AB	234	Total	C	N	O	S	0	0	0
			1900	1213	341	341	5			

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

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
6	AC	206	Total	C	N	O	S	0	0	0
			1612	1016	314	281	1			

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

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
7	AD	208	Total	C	N	O	S	0	0	0
			1703	1066	339	291	7			

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

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
8	AE	150	Total	C	N	O	S	0	0	0
			1146	724	217	201	4			

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

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
9	AF	101	Total	C	N	O	S	0	0	0
			843	531	155	154	3			

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

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
10	AG	155	Total	C	N	O	S	0	0	0
			1257	781	252	218	6			

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

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
11	AH	138	Total	C	N	O	S	0	0	0
			1116	705	215	193	3			

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

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
12	AI	127	Total	C	N	O	0	0	0
			1011	639	198	174			

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

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
13	AJ	98	Total	C	N	O	S	0	0	0
			794	499	156	138	1			

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

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
14	AK	119	Total	C	N	O	S	0	0	0
			885	549	168	165	3			

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

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
15	AL	124	Total	C	N	O	S	0	0	0
			970	611	195	163	1			

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

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
16	AM	125	Total	C	N	O	S	0	0	0
			997	617	207	171	2			

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

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
17	AN	60	Total	C	N	O	S	0	0	0
			492	312	104	72	4			

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

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
18	AO	88	Total	C	N	O	S	0	0	0
			734	459	147	126	2			

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

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
19	AP	83	Total	C	N	O	S	0	0	0
			700	443	139	117	1			

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

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
20	AQ	104	Total	C	N	O	S	0	0	0
			857	547	161	147	2			

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

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
21	AR	73	Total	C	N	O	0	0	0
			597	380	118	99			

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

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
22	AS	80	Total	C	N	O	S	0	0	0
			647	414	119	112	2			

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

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
23	AT	99	Total	C	N	O	S	0	0	0
			762	469	162	129	2			

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

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
24	AU	24	Total	C	N	O	0	0	0
			208	128	50	30			

- Molecule 25 is a protein called Peptide chain release factor 2.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf	Trace
25	AY	365	Total	C	0	0	365
			365	365			

- Molecule 26 is a RNA chain called 5S ribosomal RNA.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
26	BB	123	Total	C	N	O	P	0	0	0
			2637	1175	488	852	122			

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
BB	-1	A	-	insertion	GB 48271

- Molecule 27 is a RNA chain called 23S ribosomal RNA.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
27	BA	2814	Total	C	N	O	P	0	0	0
			60599	26974	11331	19482	2812			

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
BA	493	G	-	insertion	GB 48268

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

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
28	BD	173	Total	C	N	O	S	0	0	0
			1308	820	246	236	6			

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

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
29	BE	191	Total	C	N	O	S	0	0	0
			1507	940	290	273	4			

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

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
30	BF	189	Total	C	N	O	S	0	0	0
			1430	872	255	302	1			

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

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
31	BG	122	Total	C	N	O	S	0	0	0
			957	597	176	180	4			

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

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
32	BH	164	Total	C	N	O	S	0	0	0
			1251	787	225	237	2			

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

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
33	BI	148	Total	C	N	O	S	0	0	0
			1145	727	205	212	1			

- Molecule 34 is a protein called 50S ribosomal protein L13.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
34	BN	117	Total	C	N	O	S	0	0	0
			917	570	164	180	3			

- Molecule 35 is a protein called 50S ribosomal protein L14.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
35	BO	122	Total	C	N	O	S	0	0	0
			937	585	180	169	3			

- Molecule 36 is a protein called 50S ribosomal protein L15.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
36	BP	84	Total	C	N	O	0	0	0
			639	391	109	139			

- Molecule 37 is a protein called 50S ribosomal protein L16.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
37	BQ	138	Total	C	N	O	S	0	0	0
			1081	678	208	192	3			

- Molecule 38 is a protein called 50S ribosomal protein L18.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
38	BS	113	Total	C	N	O	S	0	0	0
			866	536	165	164	1			

- Molecule 39 is a protein called 50S ribosomal protein L19.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
39	BT	52	Total	C	N	O	S	0	0	0
			406	242	74	85	5			

- Molecule 40 is a protein called 50S ribosomal protein L22.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
40	BW	108	Total	C	N	O	0	0	0
			860	542	169	149			

- Molecule 41 is a protein called 50S ribosomal protein L23.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
41	BX	76	Total	C	N	O	S	0	0	0
			602	366	102	131	3			

- Molecule 42 is a protein called 50S ribosomal protein 24.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
42	BY	110	Total	C	N	O	0	0	0
			879	531	166	182			

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

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
43	BZ	177	Total	C	N	O	S	0	0	0
			1360	859	238	257	6			

- Molecule 44 is a protein called 50S ribosomal protein L17.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
44	BR	105	Total	C	N	O	0	0	0
			855	536	174	145			

- Molecule 45 is a protein called 50S ribosomal protein L20.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
45	BU	117	Total	C	N	O	S	0	0	0
			978	608	210	159	1			

- Molecule 46 is a protein called 50S ribosomal protein L21.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
46	BV	100	Total	C	N	O	S	0	0	0
			787	495	146	145	1			

- Molecule 47 is a protein called 50S ribosomal protein L29.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
47	B2	64	Total	C	N	O	S	0	0	0
			494	301	93	99	1			

- Molecule 48 is a protein called 50S ribosomal protein L30.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
48	B3	60	Total	C	N	O	S	0	0	0
			477	303	91	82	1			

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

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
49	B0	86	Total	C	N	O	S	0	0	0
			641	402	124	114	1			

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

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
50	B4	73	Total	C	N	O	S	0	0	0
			604	382	110	108	4			

- Molecule 51 is a protein called 50S ribosomal protein L32.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
51	B5	58	Total	C	N	O	S	0	0	0
			457	281	94	77	5			

- Molecule 52 is a protein called 50S ribosomal protein L33.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
52	B6	53	Total	C	N	O	S	0	0	0
			431	274	80	76	1			

- Molecule 53 is a protein called 50S ribosomal protein L34.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
53	B7	46	Total	C	N	O	S	0	0	0
			383	230	91	60	2			

- Molecule 54 is a protein called 50S ribosomal protein L35.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
54	B8	63	Total	C	N	O	S	0	0	0
			496	312	101	78	5			

- Molecule 55 is a protein called 50S ribosomal protein L36.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
55	B9	35	Total	C	N	O	S	0	0	0
			285	172	64	45	4			

- Molecule 56 is a protein called 50S ribosomal protein L11.

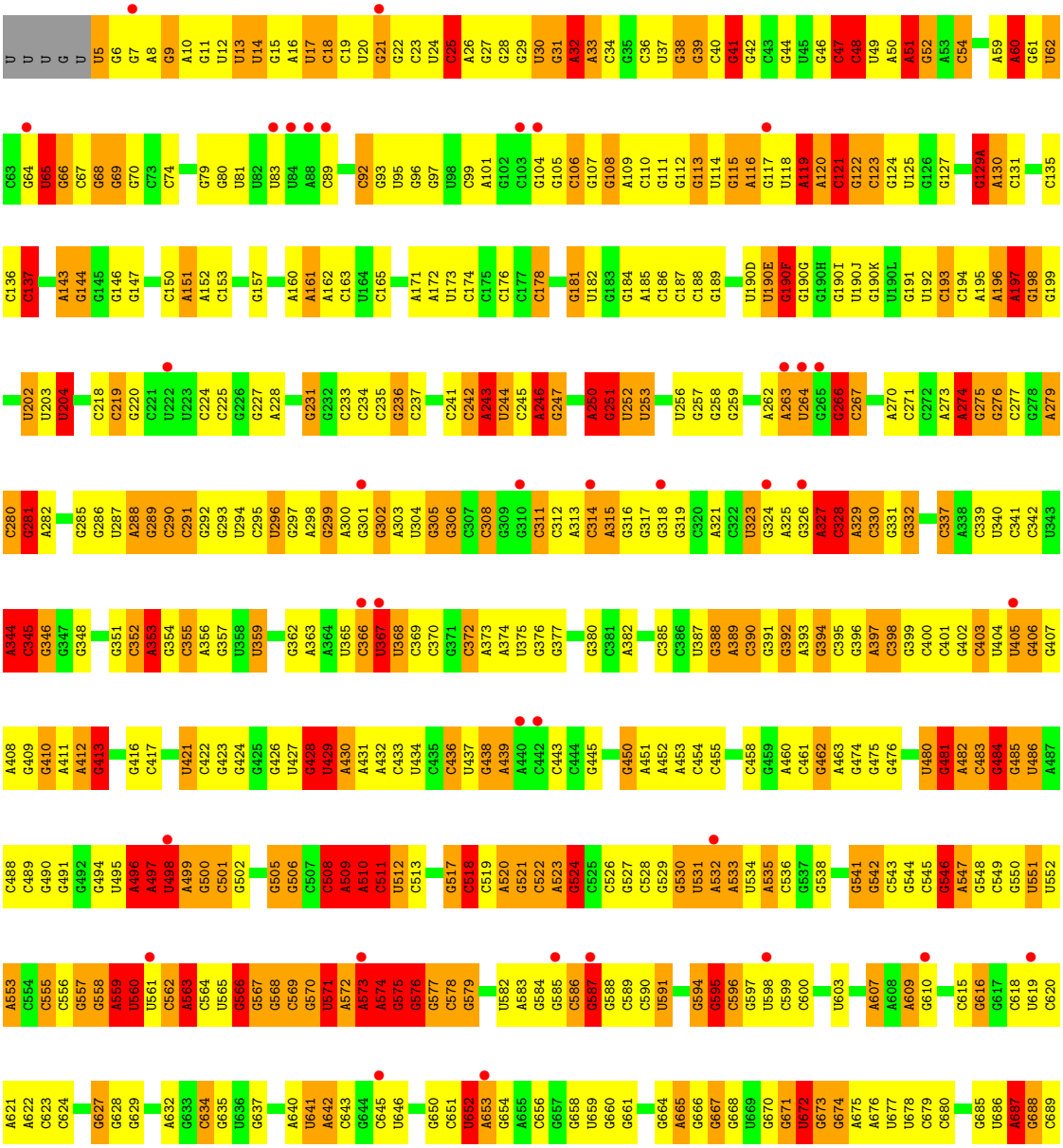
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
56	BK	133	Total	C	N	O	S	0	0	0
			999	642	169	182	6			

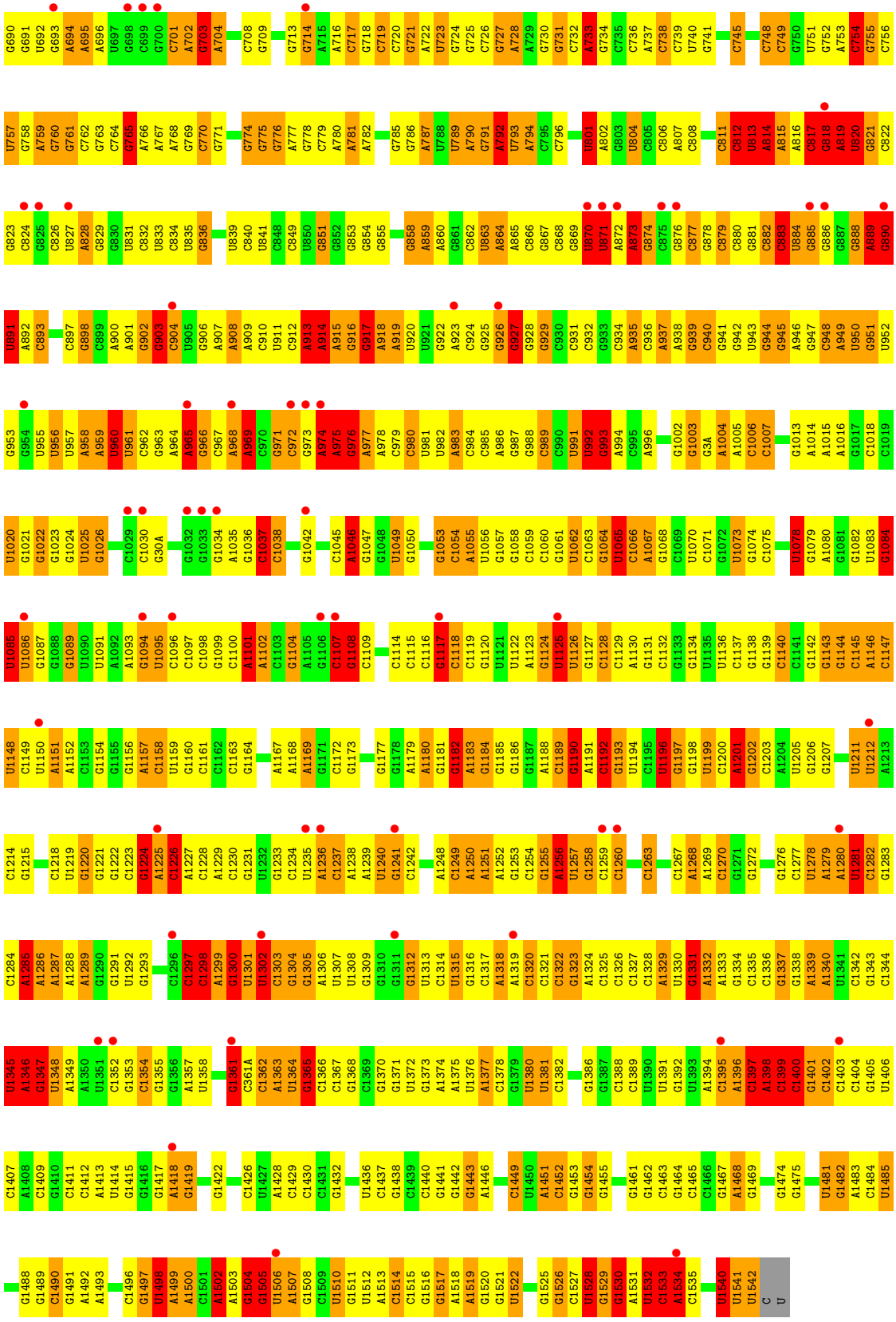
3 Residue-property plots (i)

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 electron 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 dot above a residue indicates a poor fit to the electron density (RSRZ > 2). 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

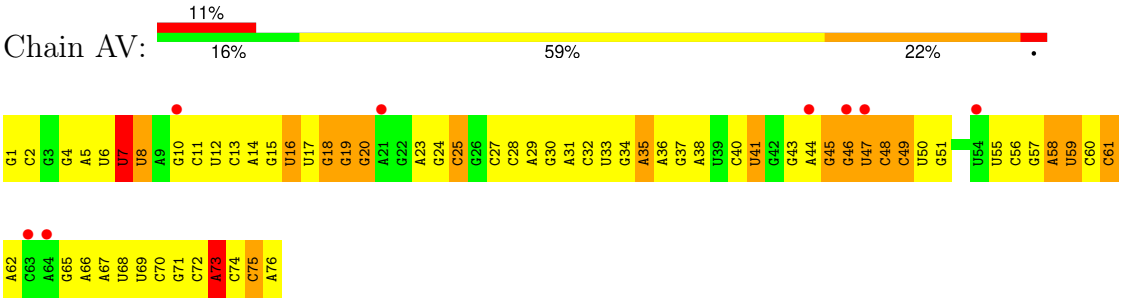
Chain AA: 6% 25% 42% 24% 9%





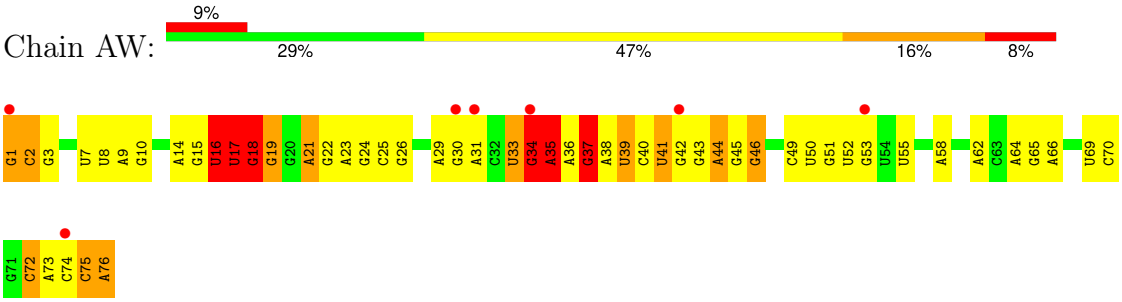
• Molecule 2: P-site tRNA (Phe)

Chain AV:



• Molecule 3: E-site tRNA (Phe)

Chain AW:

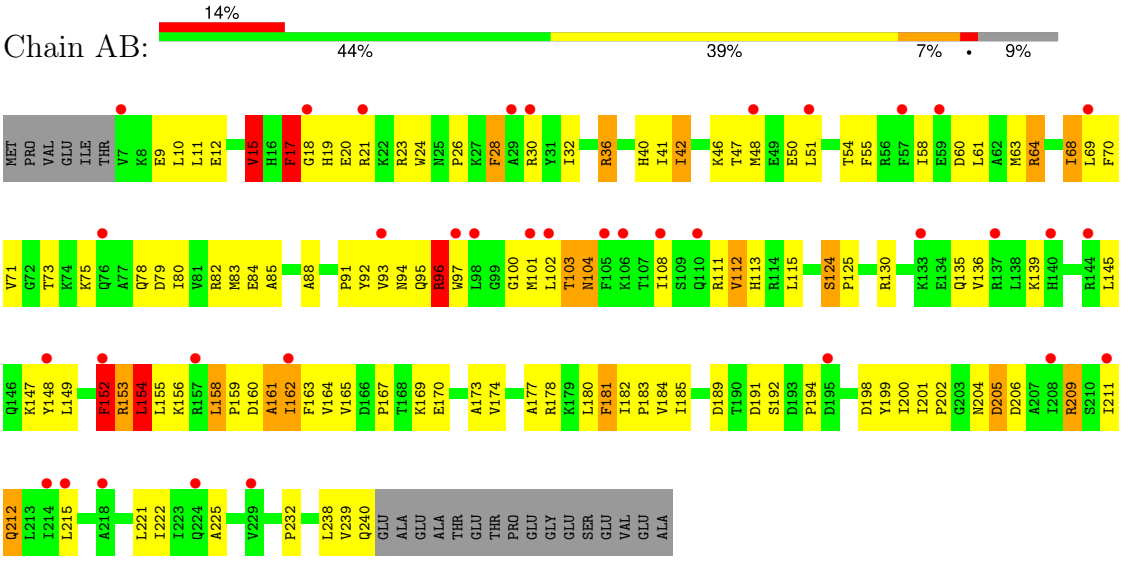


• Molecule 4: 5'-D(*AP*UP*GP*UP*UP*CP*UP*AP*GP*AP*UP*AP*CP*AP*AP*UP*AP*AP*U)-3'

Chain AX:

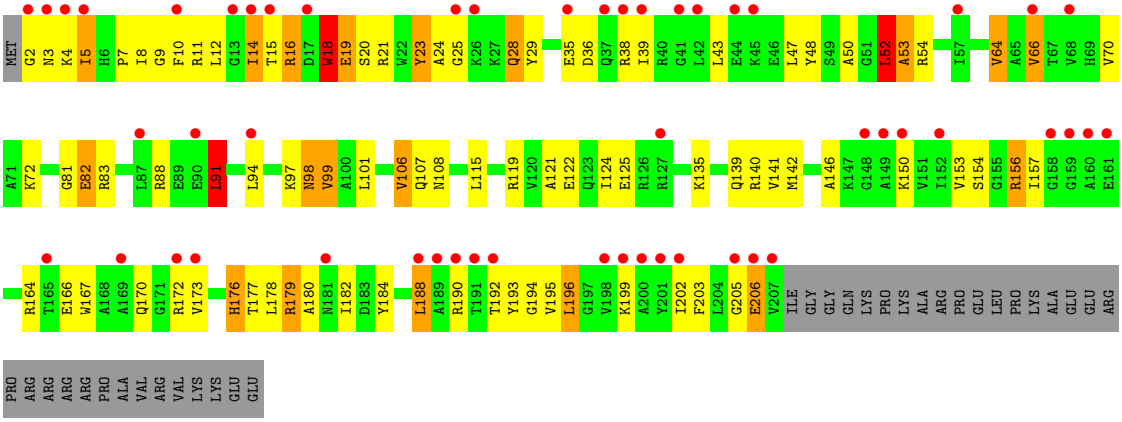
• Molecule 5: 30S ribosomal protein S2

Chain AB:



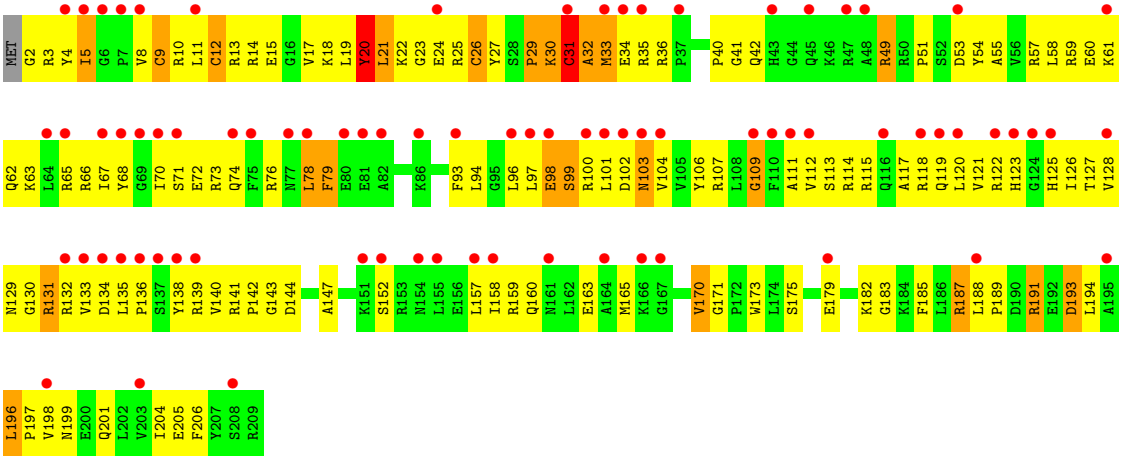
• Molecule 6: 30S ribosomal protein S3

Chain AC:



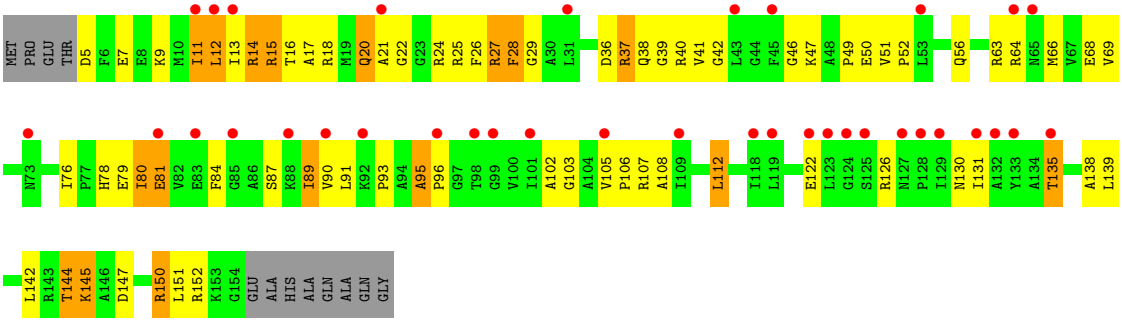
• Molecule 7: 30S ribosomal protein S4

Chain AD:



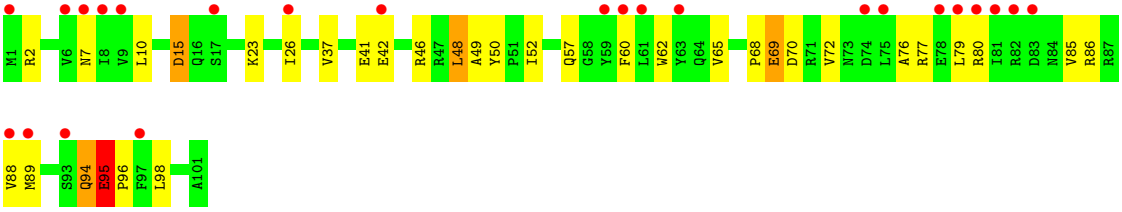
• Molecule 8: 30S ribosomal protein S5

Chain AE:

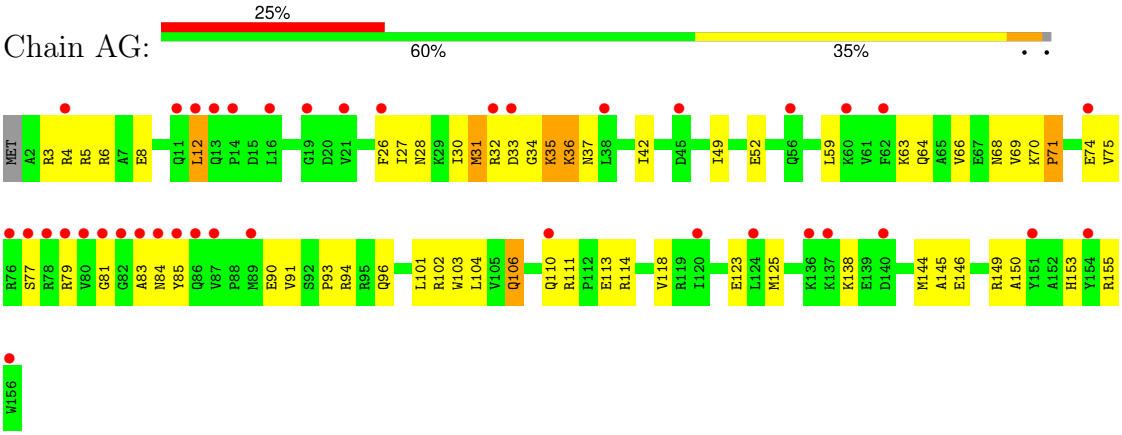


• Molecule 9: 30S ribosomal protein S6

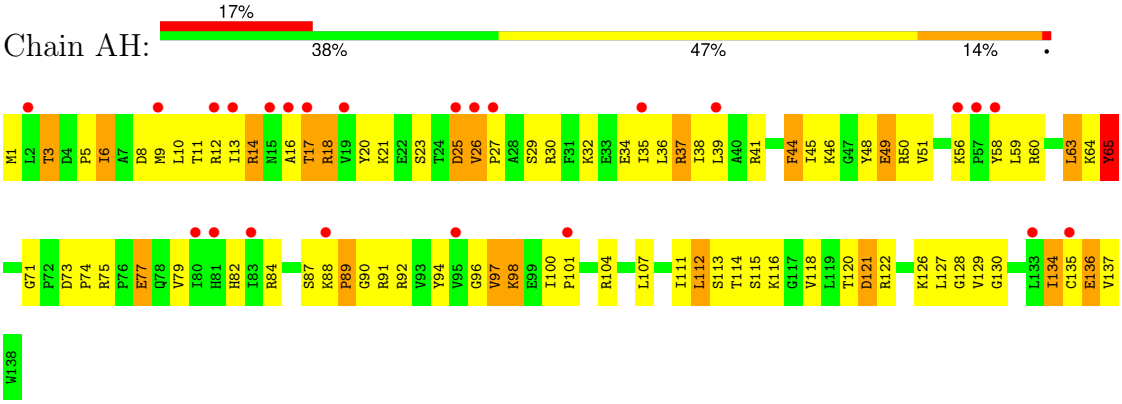
Chain AF:



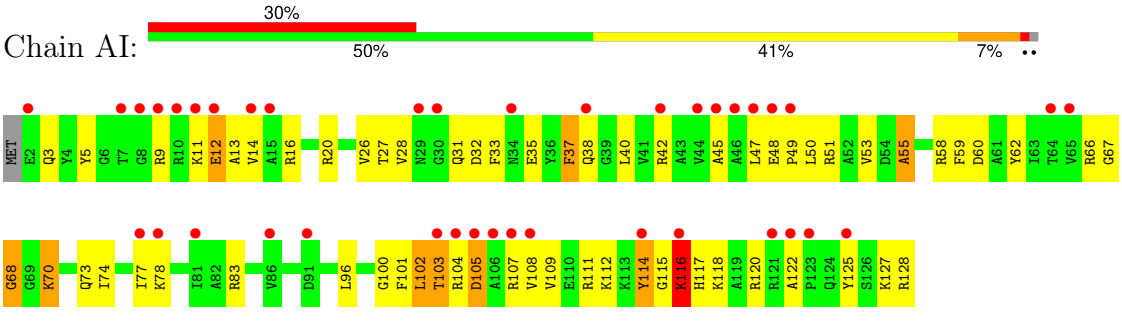
• Molecule 10: 30S ribosomal protein S7



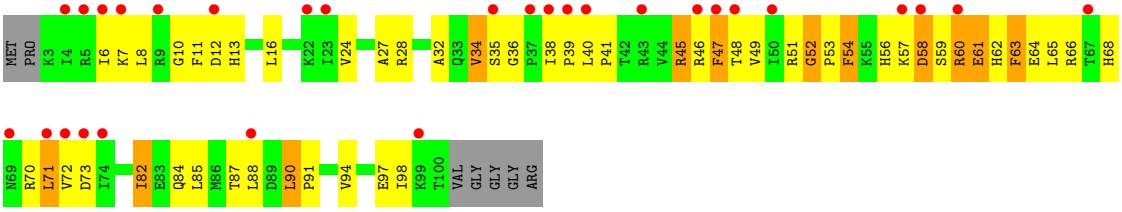
• Molecule 11: 30S ribosomal protein S8



• Molecule 12: 30S ribosomal protein S9

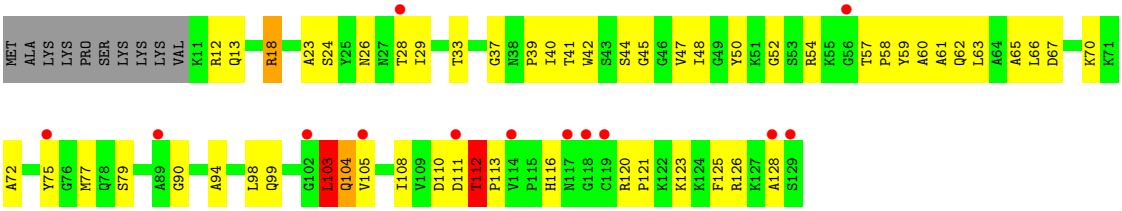


• Molecule 13: 30S ribosomal protein S10



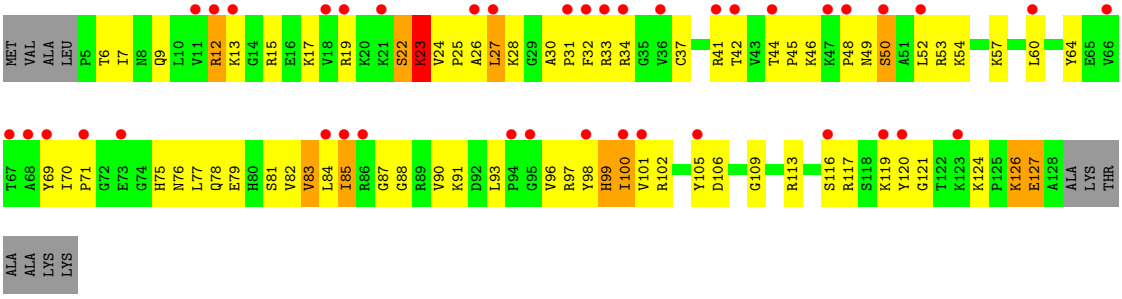
• Molecule 14: 30S ribosomal protein S11

Chain AK:



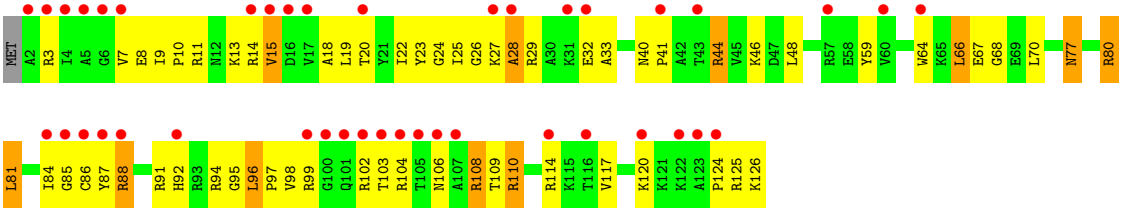
• Molecule 15: 30S ribosomal protein S12

Chain AL:



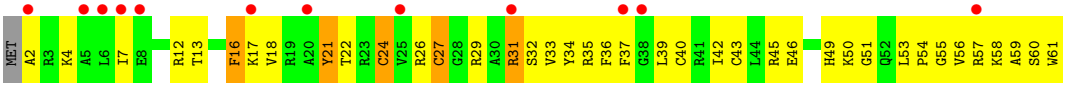
• Molecule 16: 30S ribosomal protein S13

Chain AM:



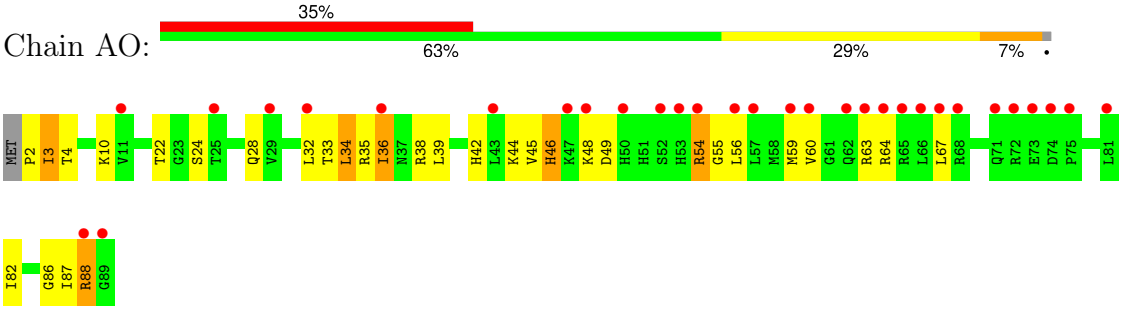
• Molecule 17: 30S ribosomal protein S14

Chain AN:



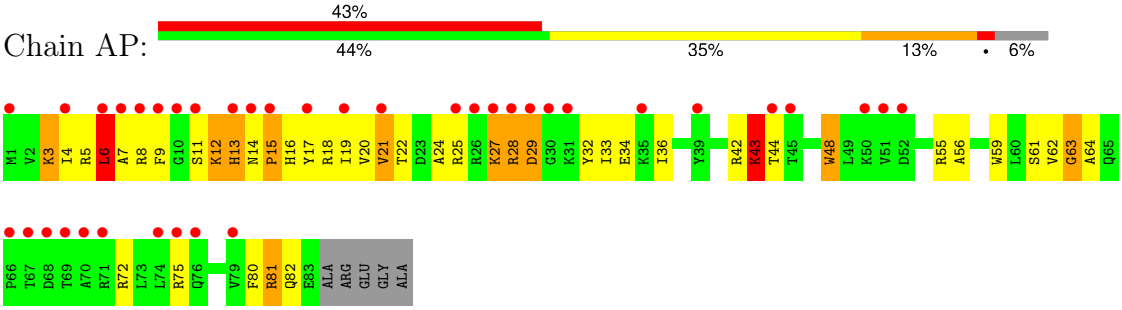
• Molecule 18: 30S ribosomal protein S15

Chain AO:



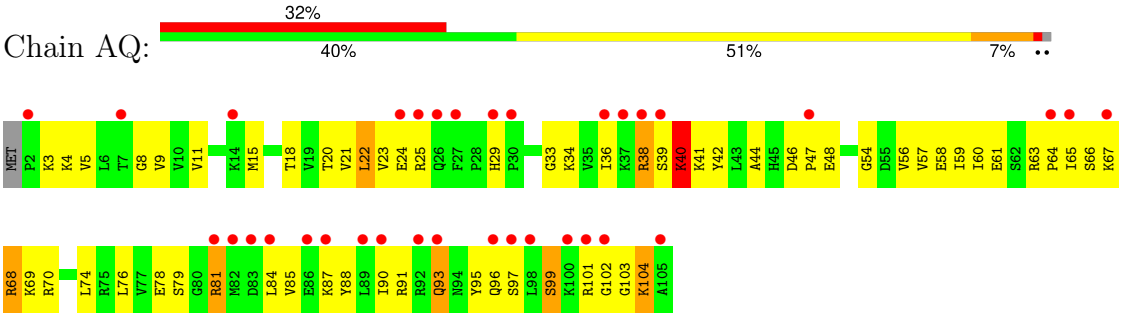
• Molecule 19: 30S ribosomal protein S16

Chain AP:



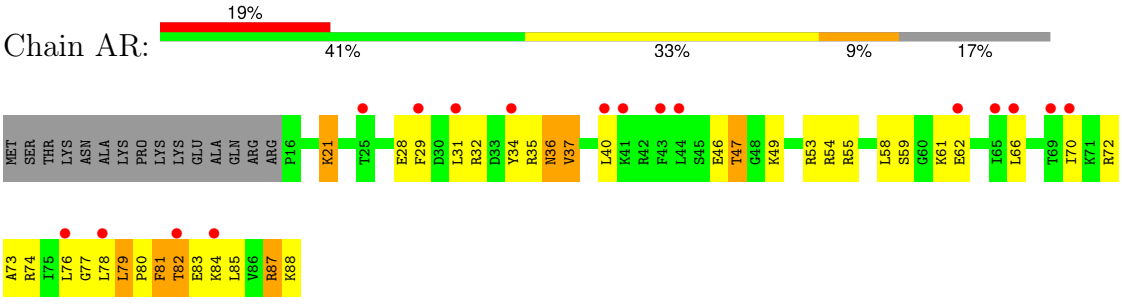
• Molecule 20: 30S ribosomal protein S17

Chain AQ:



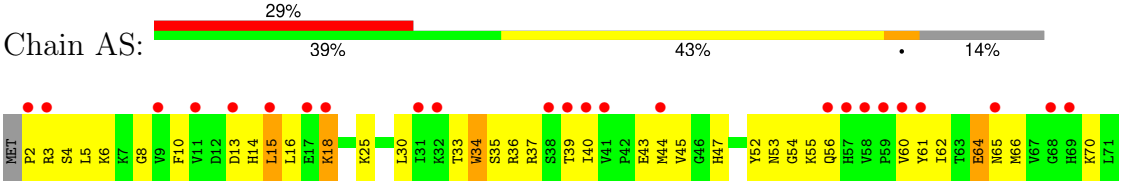
• Molecule 21: 30S ribosomal protein S18

Chain AR:



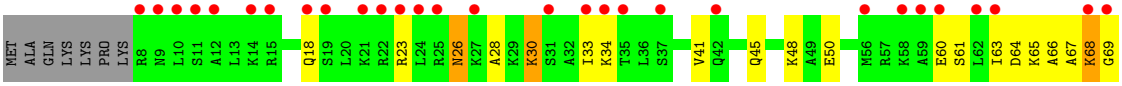
• Molecule 22: 30S ribosomal protein S19

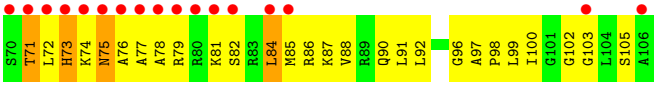
Chain AS:



• Molecule 23: 30S ribosomal protein S20

Chain AT:



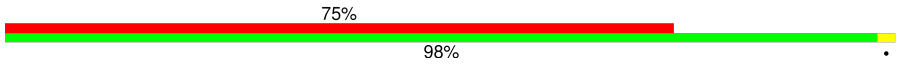


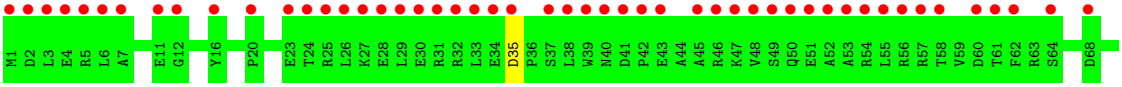
• Molecule 24: 30S ribosomal protein Thx

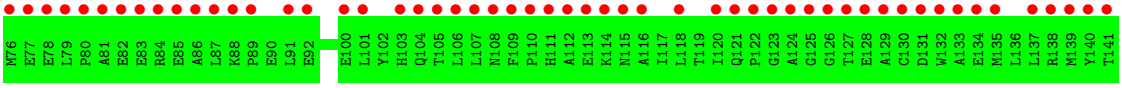
Chain AU:

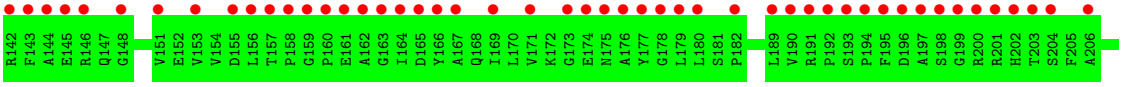
• Molecule 25: Peptide chain release factor 2

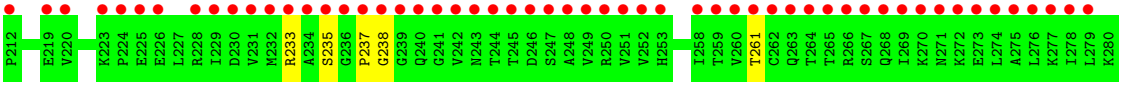
Chain AY:

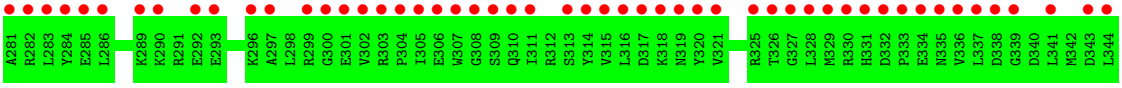


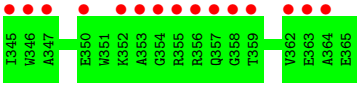






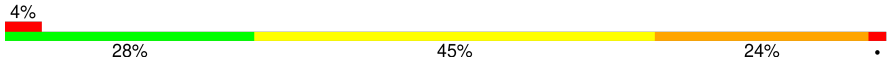


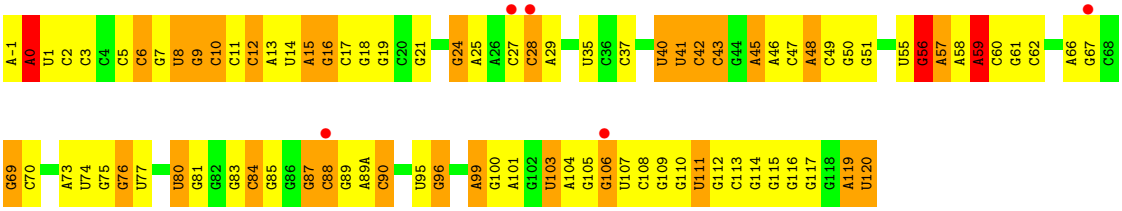




• Molecule 26: 5S ribosomal RNA

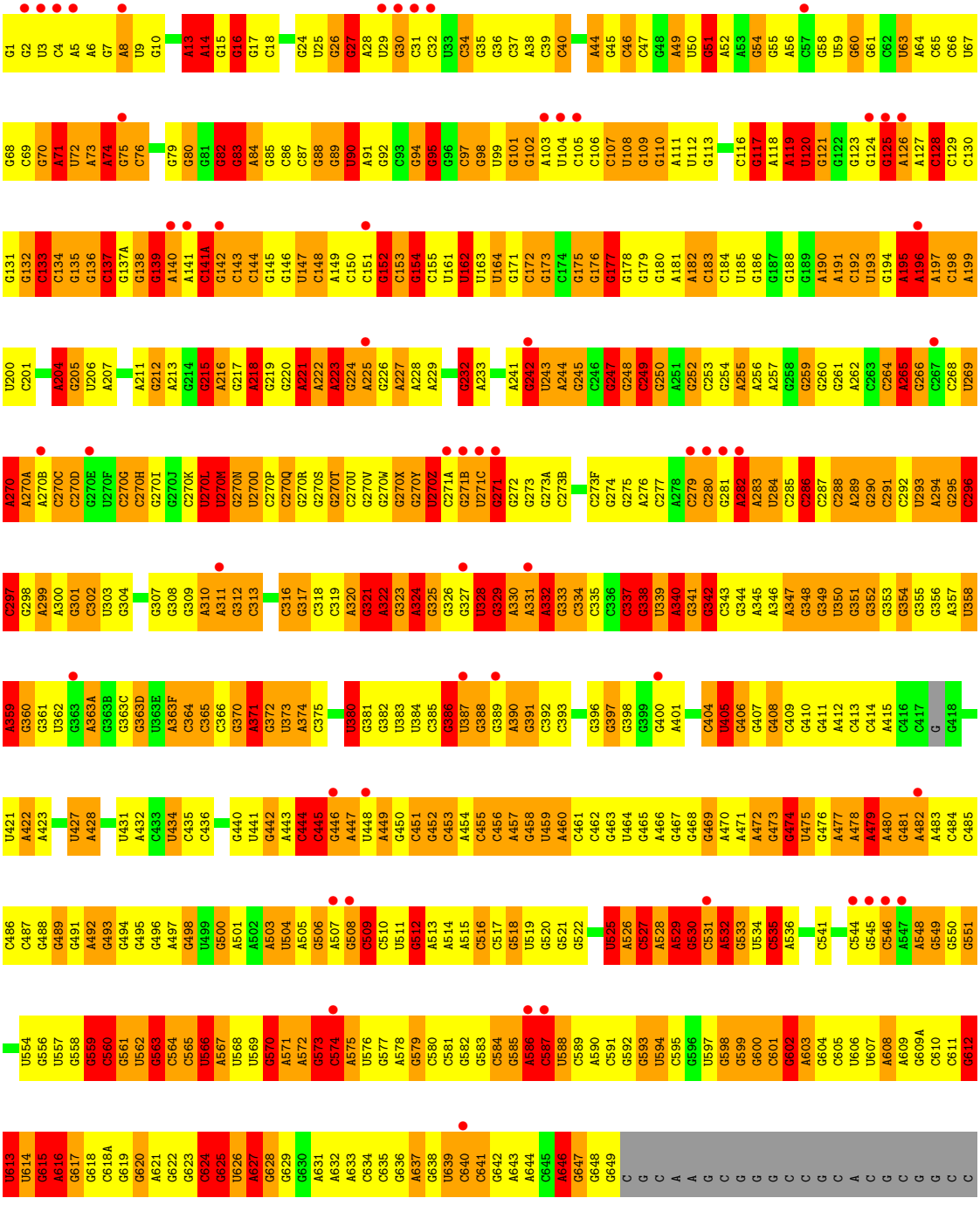
Chain BB:

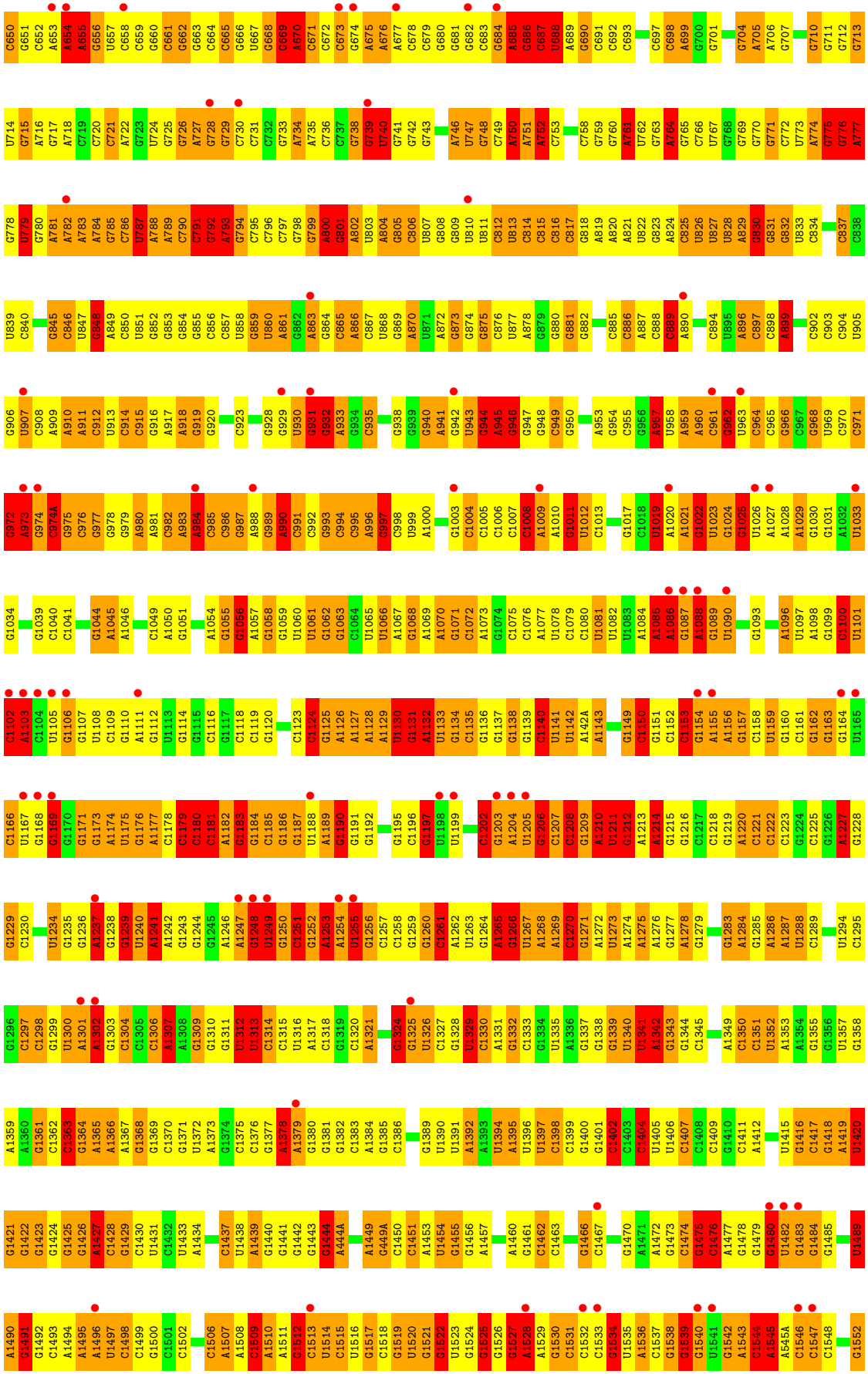


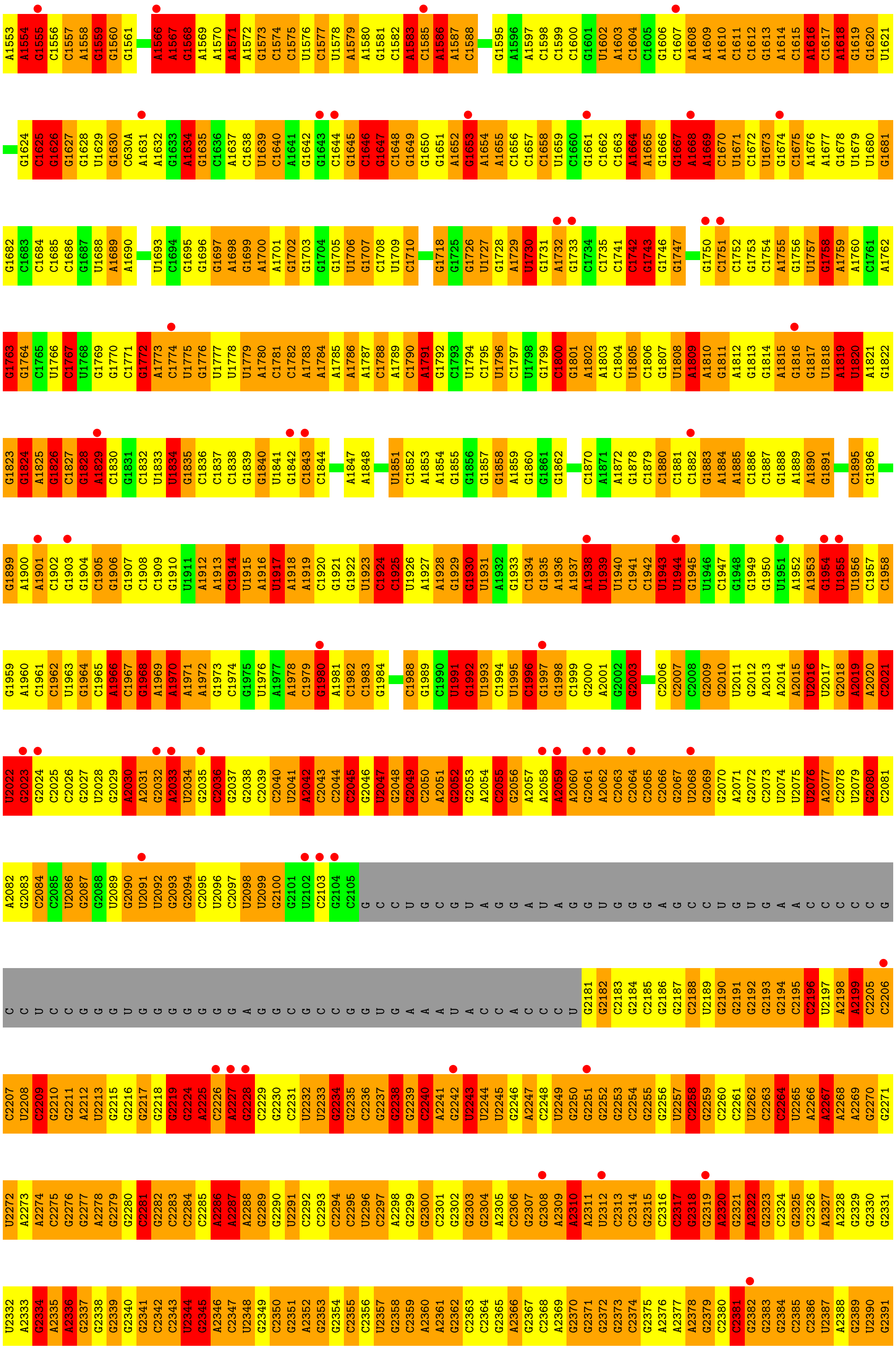


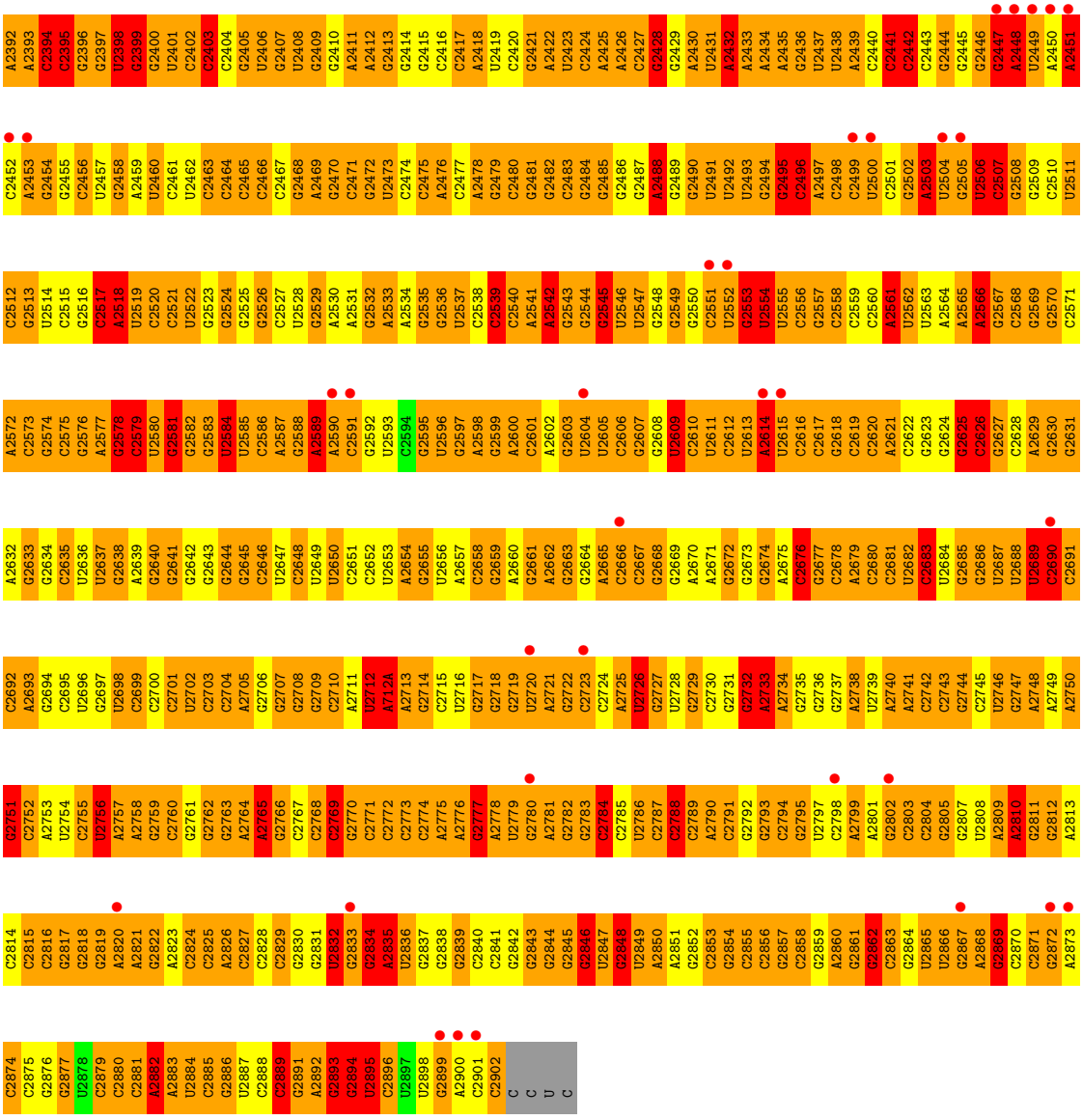
• Molecule 27: 23S ribosomal RNA

Chain BA:

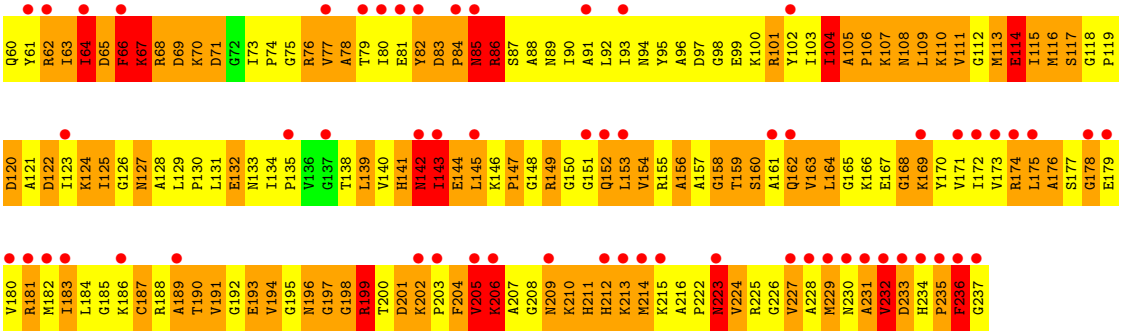





A1553 A1554 G1555 C1556 C1557 A1558 G1559 G1560 G1561 A1566 A1567 G1568 A1569 A1570 A1571 A1572 G1573 C1574 C1575 U1576 C1577 U1578 A1579 A1580 G1581 C1582 A1583 C1585 A1586 A1587 C1588 G1595 A1596 A1597 C1598 C1599 C1600 G1601 U1602 A1603 C1604 C1605 G1606 C1607 A1608 A1609 A1610 C1611 C1612 G1613 A1614 C1615 A1616 C1617 A1618 G1619 G1620 U1621
G1624 C1625 G1626 G1627 G1628 U1629 G1630 C630A A1631 A1632 G1633 A1634 G1635 C1636 A1637 C1638 U1639 C1640 A1641 G1642 G1643 C1644 G1645 C1646 G1647 C1648 G1649 G1650 G1651 A1652 G1653 A1654 A1655 C1656 C1657 C1658 U1659 C1660 G1661 C1662 C1663 A1664 A1665 G1666 G1667 A1668 A1669 C1670 U1671 C1672 U1673 G1674 C1675 A1676 A1677 G1678 U1679 U1680 G1681
G1682 C1683 C1684 C1685 C1686 G1687 U1688 A1689 A1690 U1693 C1694 G1695 G1696 G1697 A1698 G1699 A1700 A1701 G1702 G1703 G1704 G1705 U1706 G1707 C1708 U1709 C1710 U1718 G1725 G1726 U1727 G1728 A1729 U1730 G1731 A1732 G1733 C1734 C1735 C1741 C1742 G1743 G1746 G1747 G1750 C1751 C1752 G1753 C1754 A1755 G1756 U1757 G1758 A1759 A1760 C1761 A1762
G1763 G1764 C1765 U1766 C1767 U1768 G1769 G1770 C1771 G1772 A1773 C1774 U1775 G1776 U1777 U1778 U1779 A1780 C1781 C1782 A1783 A1784 A1785 A1786 A1787 C1788 A1789 C1790 A1791 G1792 C1793 U1794 C1795 U1796 C1797 U1798 G1799 C1800 G1801 A1802 A1803 C1804 U1805 C1806 G1807 U1808 A1809 A1810 G1811 A1812 G1813 G1814 A1815 G1816 G1817 U1818 A1819 U1820 A1821 G1822
G1823 G1824 A1825 G1826 C1827 G1828 A1829 C1830 G1831 C1832 U1833 U1834 G1835 C1836 C1837 C1838 G1839 G1840 U1841 G1842 C1843 C1844 A1847 A1848 U1851 C1852 A1853 A1854 G1855 G1856 G1857 G1858 A1859 G1860 G1861 G1862 C1870 A1871 A1872 G1878 C1879 C1880 C1881 C1882 G1883 A1884 A1885 C1886 C1887 G1888 A1889 A1890 G1891 C1895 G1896
G1899 A1900 A1901 C1902 G1903 G1904 C1905 G1906 G1907 C1908 C1909 G1910 U1911 A1912 A1913 C1914 U1915 A1916 U1917 A1918 A1919 C1920 G1921 G1922 U1923 C1924 C1925 U1926 A1927 A1928 G1929 G1930 U1931 A1932 G1933 C1934 G1935 A1936 A1937 A1938 U1939 U1940 C1941 C1942 U1943 U1944 G1945 U1946 C1947 G1948 G1949 G1950 U1951 A1952 A1953 G1954 U1955 U1956 C1957 C1958
G1959 A1960 C1961 C1962 U1963 G1964 C1965 A1966 C1967 G1968 A1969 A1970 A1971 A1972 G1973 C1974 G1975 U1976 A1977 A1978 C1979 G1980 A1981 C1982 C1983 G1984 C1988 G1989 C1990 U1991 U1992 U1993 C1994 U1995 C1996 G1997 G1998 C1999 G2000 A2001 G2002 G2003 C2006 C2007 C2008 G2009 G2010 U2011 G2012 A2013 A2014 A2015 U2016 U2017 G2018 A2019 A2020 C2021
U2022 G2023 G2024 C2025 C2026 G2027 U2028 G2029 A2030 A2031 G2032 A2033 U2034 G2035 C2036 G2037 G2038 C2039 C2040 U2041 A2042 C2043 C2044 C2045 G2046 U2047 G2048 G2049 C2050 A2051 G2052 G2053 A2054 C2055 G2056 A2057 A2058 A2059 A2060 G2061 A2062 C2063 C2064 C2065 C2066 G2067 U2068 G2069 G2070 A2071 G2072 C2073 U2074 U2075 U2076 A2077 C2078 U2079 G2080 C2081
A2082 G2083 C2084 C2085 U2086 G2087 G2088 U2089 G2090 U2091 U2092 G2093 G2094 C2095 U2096 C2097 U2098 U2099 G2100 G2101 U2102 C2103 G2104 C2105 G C C U G C G U A G G A U A G G U G G G A G C C U G U G A A C C C C C G
C C U C C G G G U G G G G G G G A G G C G C C G G U G A A A U A C C A C C C U G2181 G2182 C2183 G2184 C2185 G2186 C2187 C2188 U2189 G2190 G2191 G2192 G2193 G2194 C2195 C2196 U2197 A2198 A2199 C2205 C2206
C2207 U2208 C2209 G2210 G2211 A2212 U2213 G2215 G2216 G2217 G2218 G2219 G2224 A2225 C2226 A2227 G2228 C2229 G2230 C2231 U2232 U2233 G2234 G2235 C2236 G2237 G2238 G2239 C2240 A2241 G2242 U2243 U2244 U2245 G2246 A2247 C2248 U2249 G2250 G2251 G2252 G2253 C2254 G2255 G2256 U2257 C2258 G2259 C2260 C2261 U2262 C2263 C2264 U2265 A2266 A2267 A2268 A2269 G2270 G2271
U2272 A2273 A2274 C2275 G2276 G2277 A2278 G2279 G2280 C2281 G2282 C2283 C2284 C2285 A2286 A2287 A2288 G2289 G2290 U2291 C2292 C2293 C2294 C2295 U2296 C2297 A2298 G2299 G2300 C2301 G2302 G2303 G2304 A2305 C2306 G2307 G2308 A2309 A2310 A2311 U2312 C2313 C2314 G2315 C2316 C2317 G2318 G2319 A2320 G2321 A2322 G2323 C2324 G2325 C2326 A2327 A2328 G2329 G2330 G2331
U2332 A2333 G2334 A2335 A2336 G2337 G2338 G2339 G2340 G2341 C2342 C2343 U2344 G2345 A2346 C2347 U2348 G2349 C2350 G2351 A2352 G2353 C2354 C2355 C2356 U2357 G2358 C2359 G2360 A2361 G2362 C2363 C2364 G2365 A2366 C2367 C2368 A2369 G2370 G2371 C2372 G2373 C2374 G2375 A2376 A2377 A2378 G2379 C2380 C2381 G2382 G2383 G2384 C2385 C2386 U2387 A2388 G2389 U2390 G2391

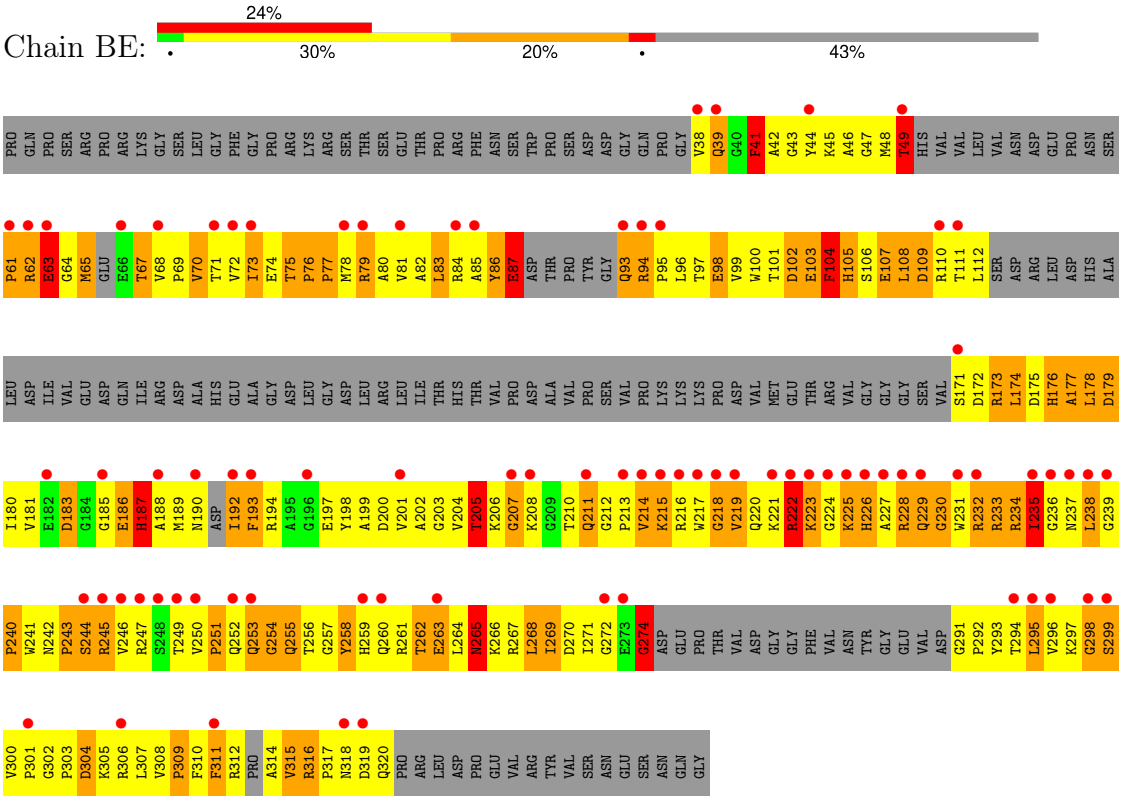


• Molecule 28: 50S ribosomal protein L2



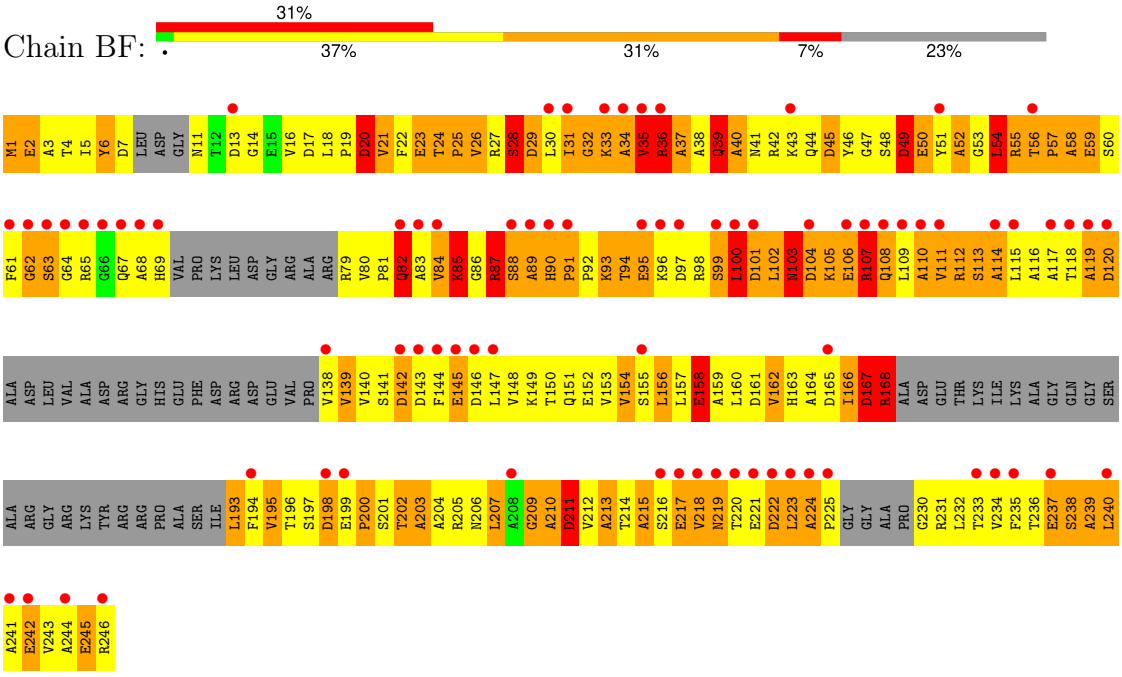
• Molecule 29: 50S ribosomal protein L3

Chain BE:



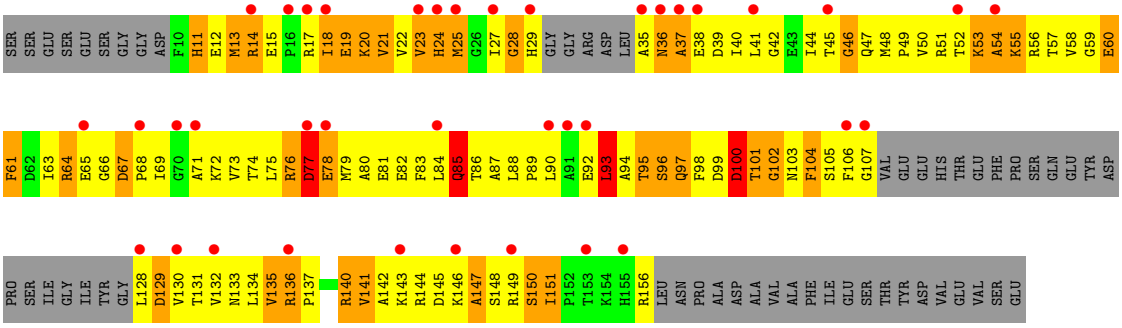
• Molecule 30: 50S ribosomal protein L4

Chain BF:



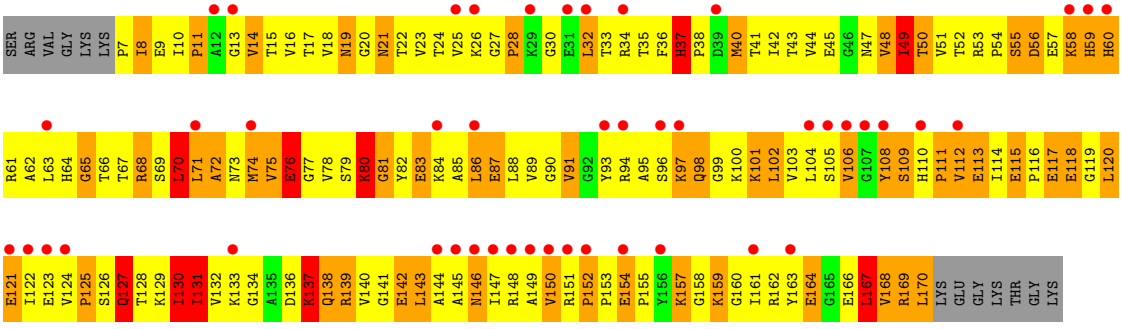
• Molecule 31: 50S ribosomal protein L5

Chain BG:



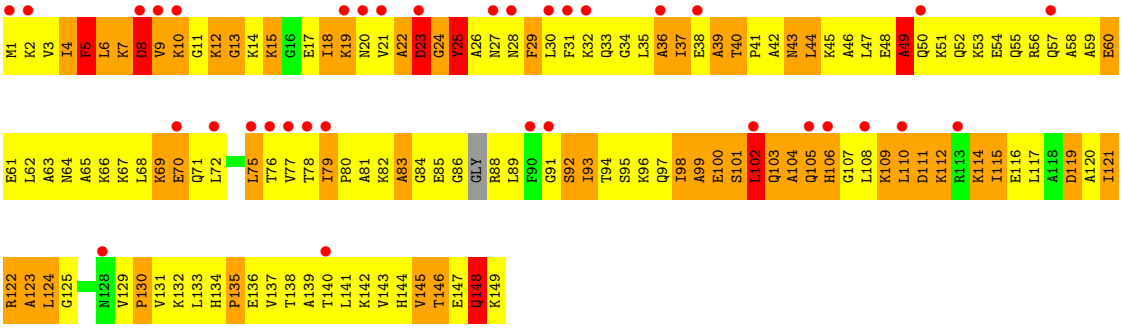
• Molecule 32: 50S ribosomal protein L6

Chain BH:



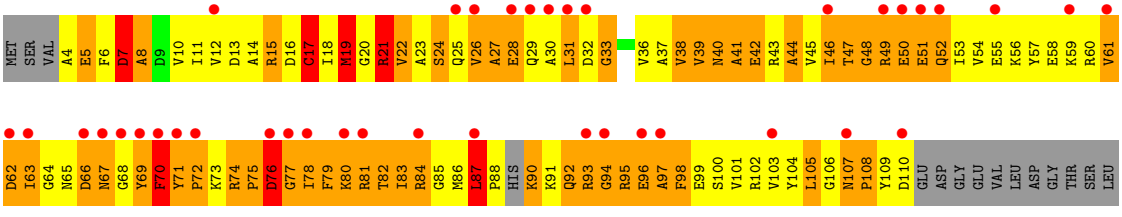
• Molecule 33: 50S ribosomal protein L9

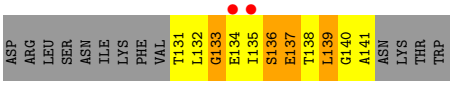
Chain BI:



• Molecule 34: 50S ribosomal protein L13

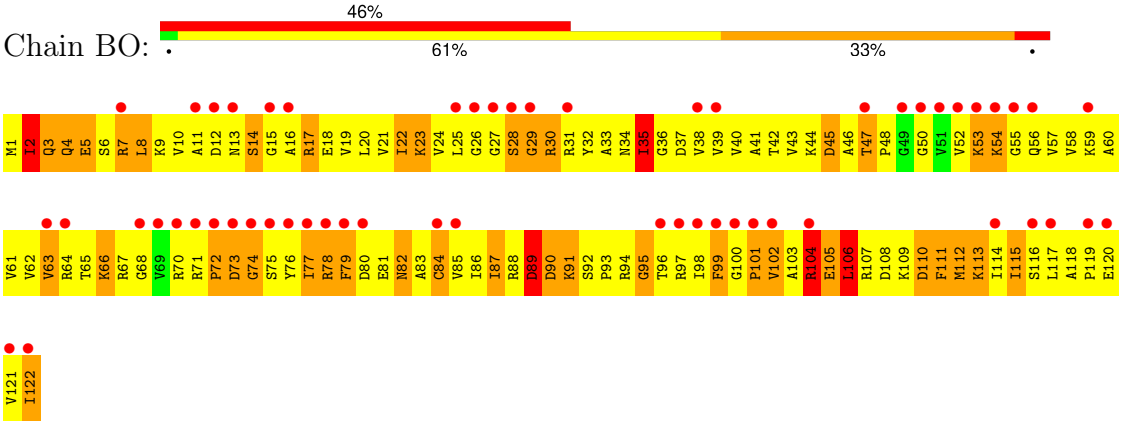
Chain BN:





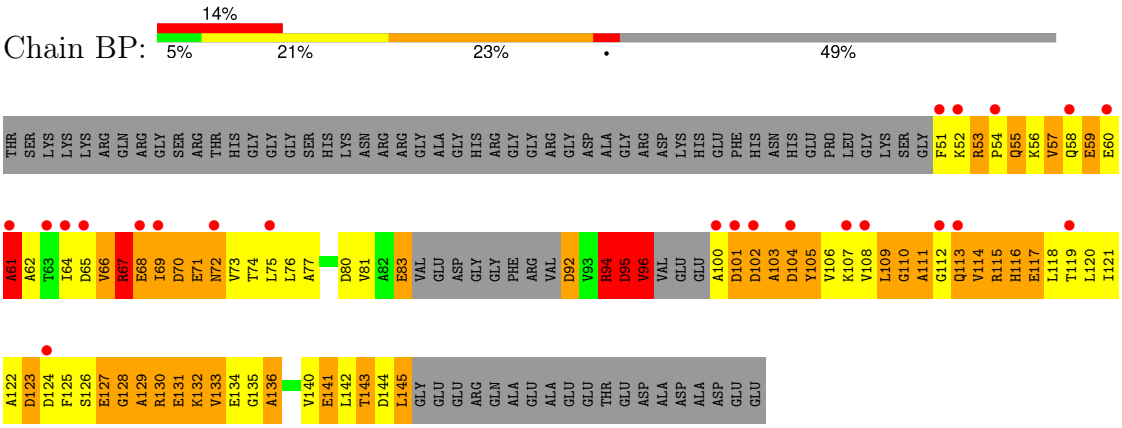
• Molecule 35: 50S ribosomal protein L14

Chain BO:



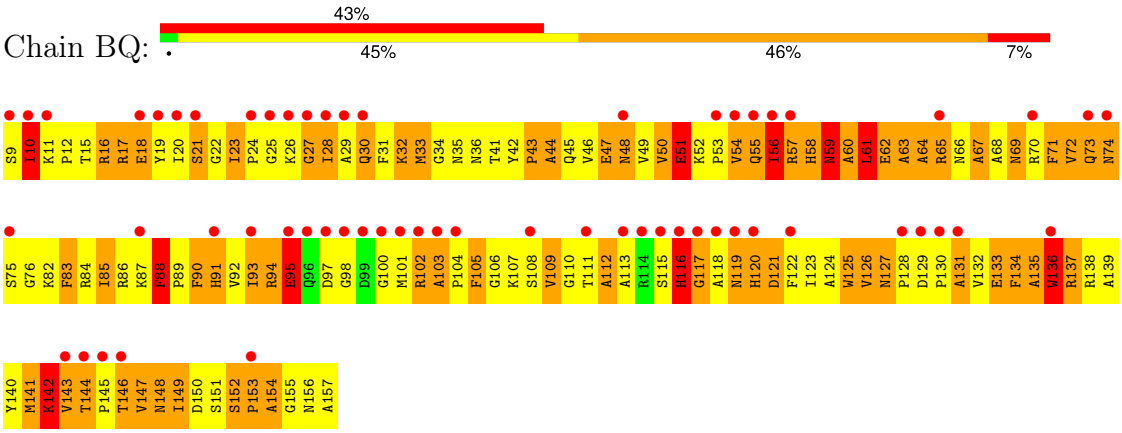
• Molecule 36: 50S ribosomal protein L15

Chain BP:



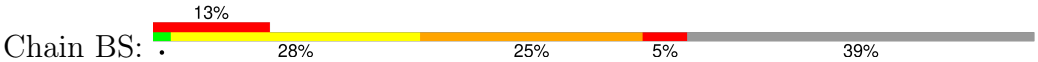
• Molecule 37: 50S ribosomal protein L16

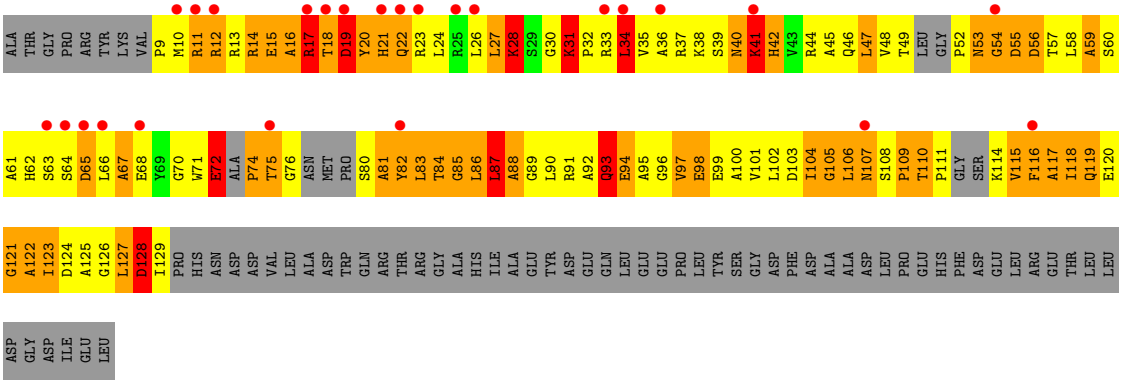
Chain BQ:



• Molecule 38: 50S ribosomal protein L18

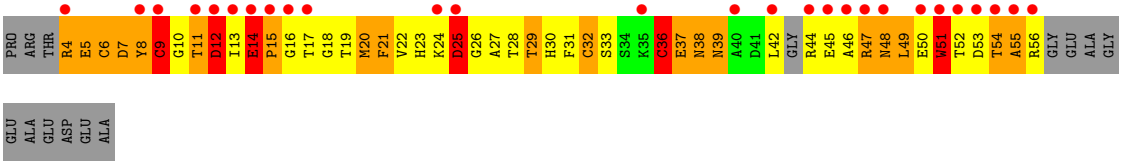
Chain BS:





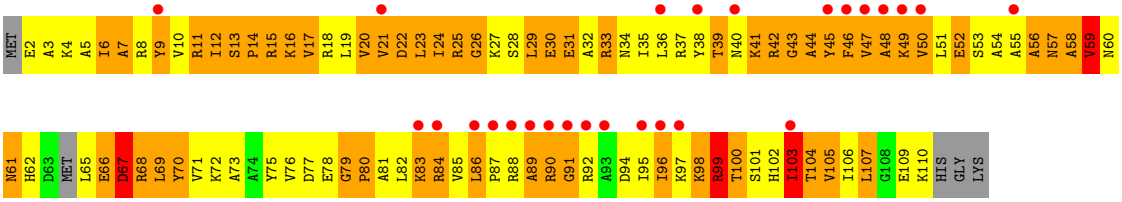
• Molecule 39: 50S ribosomal protein L19

Chain BT:



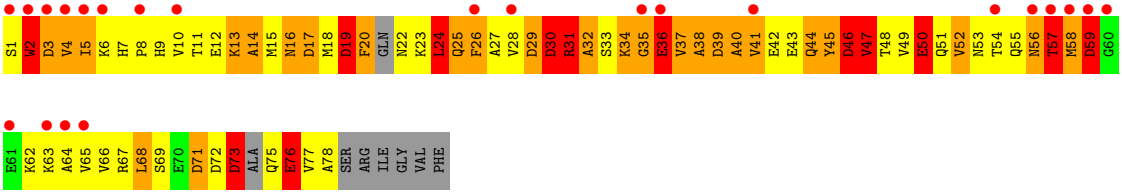
• Molecule 40: 50S ribosomal protein L22

Chain BW:



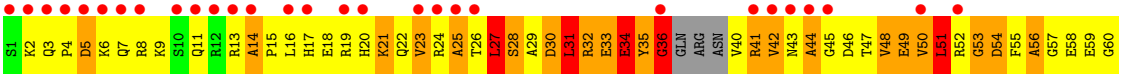
• Molecule 41: 50S ribosomal protein L23

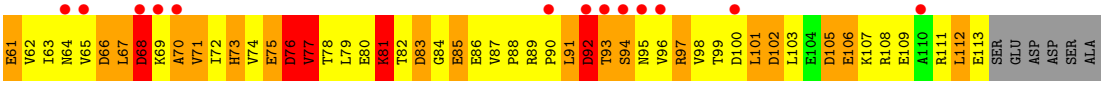
Chain BX:



• Molecule 42: 50S ribosomal protein 24

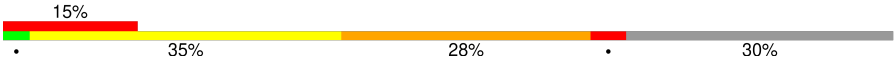
Chain BY:

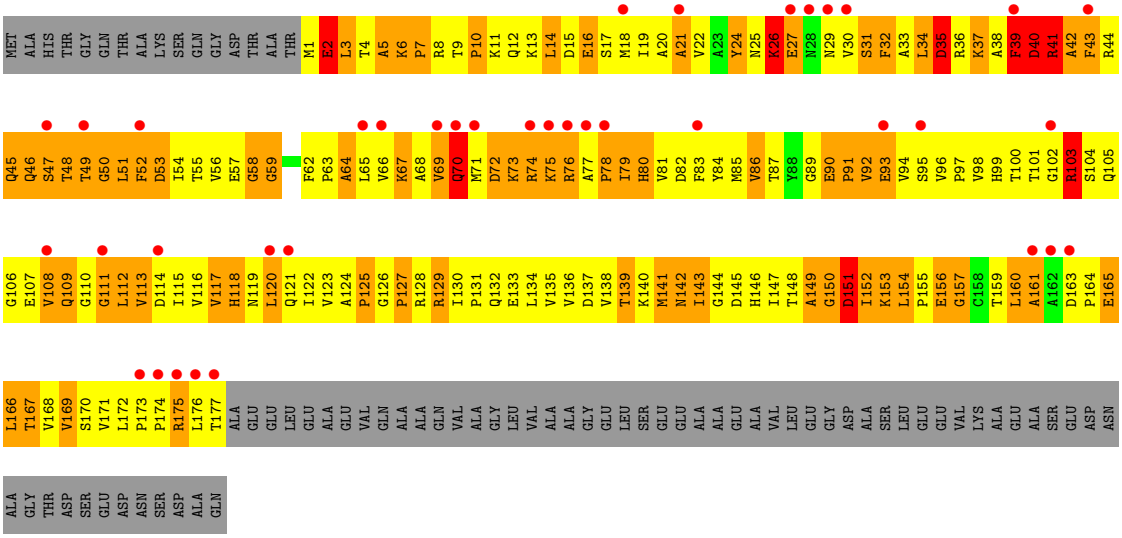




• Molecule 43: 50S ribosomal protein CTC

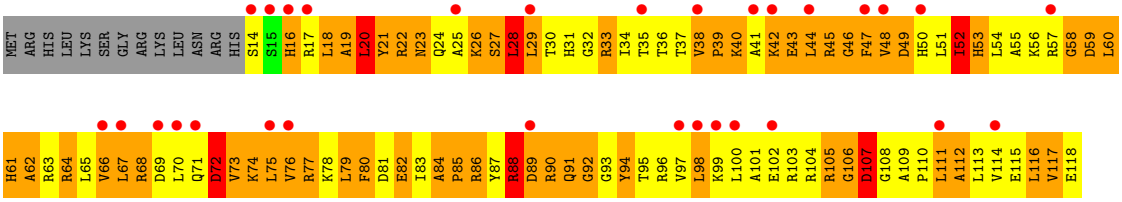
Chain BZ:





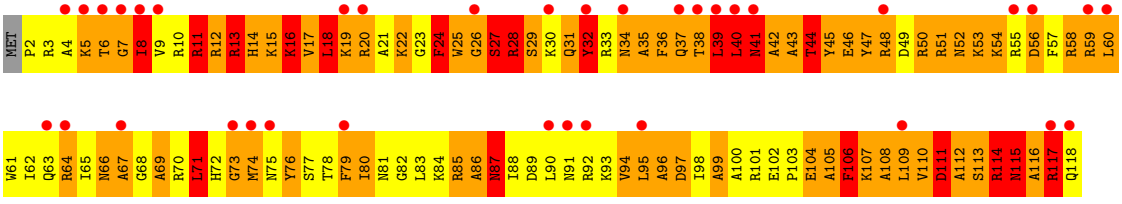
• Molecule 44: 50S ribosomal protein L17

Chain BR:



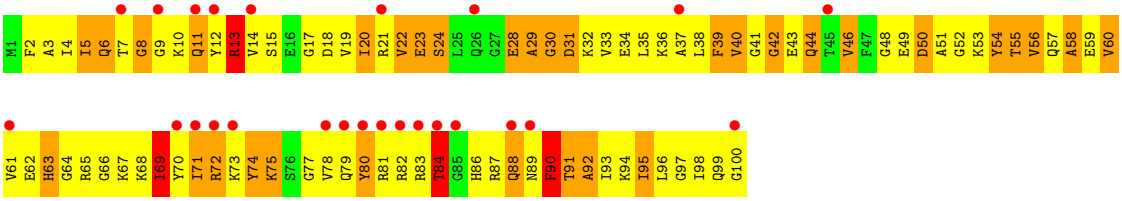
• Molecule 45: 50S ribosomal protein L20

Chain BU:



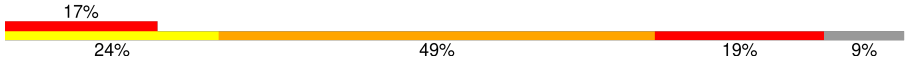
• Molecule 46: 50S ribosomal protein L21

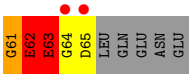
Chain BV:



• Molecule 47: 50S ribosomal protein L29

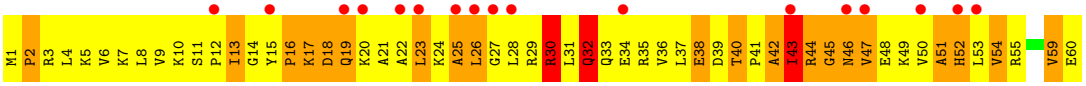
Chain B2:





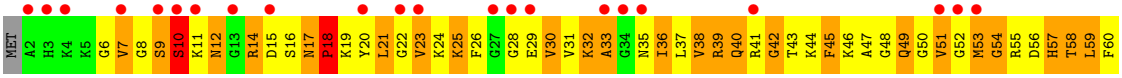
• Molecule 48: 50S ribosomal protein L30

Chain B3:



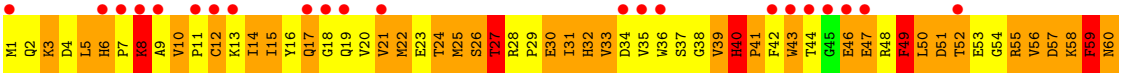
• Molecule 49: 50S ribosomal protein L27

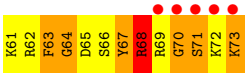
Chain B0:



• Molecule 50: 50S ribosomal protein L31

Chain B4:



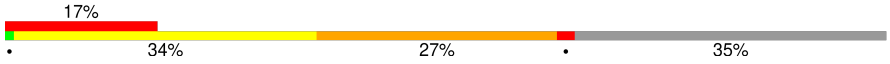


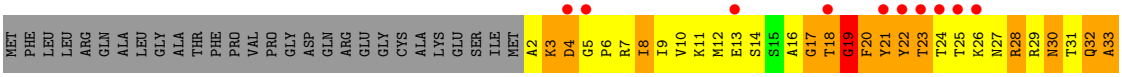
• Molecule 51: 50S ribosomal protein L32

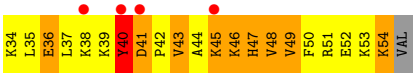
Chain B5:

• Molecule 52: 50S ribosomal protein L33

Chain B6:

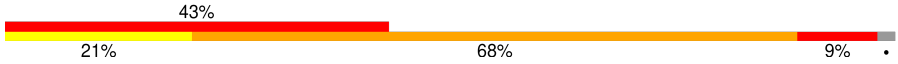


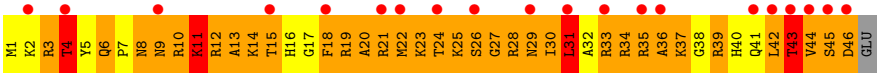




• Molecule 53: 50S ribosomal protein L34

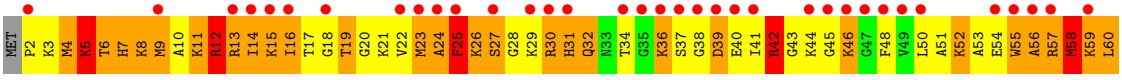
Chain B7:





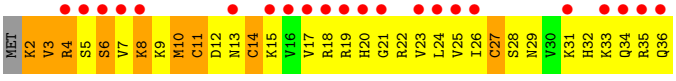
• Molecule 54: 50S ribosomal protein L35

Chain B8:



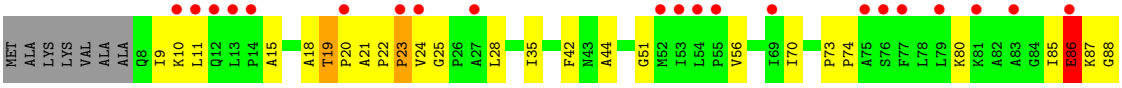
• Molecule 55: 50S ribosomal protein L36

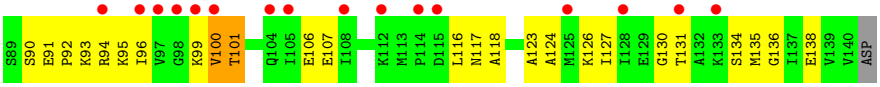
Chain B9:



• Molecule 56: 50S ribosomal protein L11

Chain BK:





4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 43 21 2	Depositor
Cell constants a, b, c, α, β, γ	520.21Å 520.21Å 365.90Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	43.35 – 6.76 43.35 – 6.76	Depositor EDS
% Data completeness (in resolution range)	96.2 (43.35-6.76) 95.7 (43.35-6.76)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	0.19	Depositor
$< I/\sigma(I) >$ [1]	1.11 (at 6.14Å)	Xtriage
Refinement program	CNS	Depositor
R, R_{free}	0.341 , 0.356 0.327 , 0.341	Depositor DCC
R_{free} test set	4221 reflections (5.02%)	wwPDB-VP
Wilson B-factor (Å^2)	233.6	Xtriage
Anisotropy	0.105	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.13 , 145.8	EDS
L-test for twinning[2]	$< \|L\| > = 0.37$, $< L^2 > = 0.20$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.87	EDS
Total number of atoms	142811	wwPDB-VP
Average B, all atoms (Å^2)	306.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.50% of the height of the origin peak. No significant pseudotranslation is detected.*

[1] Intensities estimated from amplitudes.

[2] Theoretical values of $< |L| >$, $< L^2 >$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: PSU, YYG

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	1.34	66/36411 (0.2%)	1.47	428/56769 (0.8%)
2	AV	1.58	5/1814 (0.3%)	1.08	11/2827 (0.4%)
3	AW	1.77	16/1737 (0.9%)	1.68	30/2690 (1.1%)
4	AX	0.18	0/139	0.66	0/213
5	AB	0.61	2/1935 (0.1%)	0.61	0/2609
6	AC	0.43	1/1636 (0.1%)	1.10	6/2205 (0.3%)
7	AD	0.79	5/1733 (0.3%)	1.09	11/2318 (0.5%)
8	AE	0.92	1/1162 (0.1%)	0.63	2/1564 (0.1%)
9	AF	0.35	0/856	0.54	0/1154
10	AG	0.33	0/1276	0.76	3/1709 (0.2%)
11	AH	0.41	0/1136	0.66	0/1527
12	AI	0.34	0/1029	0.54	0/1378
13	AJ	0.35	0/807	0.56	0/1085
14	AK	0.64	1/900 (0.1%)	0.56	0/1213
15	AL	0.99	1/986 (0.1%)	0.70	1/1320 (0.1%)
16	AM	0.35	0/1006	0.56	0/1341
17	AN	0.49	0/501	0.64	1/664 (0.2%)
18	AO	0.32	0/745	0.54	0/992
19	AP	0.40	0/716	0.59	1/963 (0.1%)
20	AQ	1.20	3/870 (0.3%)	1.54	6/1159 (0.5%)
21	AR	0.40	0/603	0.70	0/799
22	AS	0.34	0/661	0.53	0/890
23	AT	0.31	0/764	0.57	1/1006 (0.1%)
24	AU	0.34	0/212	0.49	0/277
26	BB	0.79	2/2950 (0.1%)	1.32	17/4602 (0.4%)
27	BA	1.31	147/67834 (0.2%)	1.47	923/105806 (0.9%)
28	BD	0.41	1/1328 (0.1%)	0.65	2/1783 (0.1%)
29	BE	0.67	4/1540 (0.3%)	1.08	8/2078 (0.4%)
30	BF	0.72	3/1444 (0.2%)	0.84	2/1954 (0.1%)
31	BG	0.25	0/971	0.46	0/1304
32	BH	0.45	1/1272 (0.1%)	0.60	3/1721 (0.2%)
33	BI	0.40	1/1156 (0.1%)	0.52	0/1544

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	#|Z| >5	RMSZ	#|Z| >5
34	BN	0.35	0/927	0.55	0/1245
35	BO	0.32	0/946	0.57	0/1269
36	BP	1.44	3/643 (0.5%)	1.31	5/870 (0.6%)
37	BQ	0.32	0/1106	0.52	0/1490
38	BS	1.20	3/877 (0.3%)	0.70	2/1179 (0.2%)
39	BT	0.39	0/412	0.70	0/554
40	BW	0.95	3/869 (0.3%)	0.96	6/1166 (0.5%)
41	BX	0.48	1/608 (0.2%)	1.04	3/820 (0.4%)
42	BY	0.25	0/887	0.83	3/1195 (0.3%)
43	BZ	0.31	1/1385 (0.1%)	0.46	0/1883
44	BR	0.30	0/867	0.49	0/1162
45	BU	0.56	1/994 (0.1%)	0.69	3/1323 (0.2%)
46	BV	0.69	1/796 (0.1%)	0.92	3/1058 (0.3%)
47	B2	0.37	0/497	1.00	2/668 (0.3%)
48	B3	0.31	0/482	0.50	0/646
49	B0	0.40	1/649 (0.2%)	0.82	3/860 (0.3%)
50	B4	1.31	2/620 (0.3%)	0.61	0/831
51	B5	0.38	0/469	1.08	3/629 (0.5%)
52	B6	0.32	0/438	0.55	1/583 (0.2%)
53	B7	0.38	0/387	0.64	0/509
54	B8	0.87	1/503 (0.2%)	0.95	6/657 (0.9%)
55	B9	0.33	0/286	0.59	0/375
56	BK	0.94	1/1010 (0.1%)	0.70	3/1349 (0.2%)
All	All	1.16	278/154788 (0.2%)	1.32	1499/231785 (0.6%)

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
3	AW	1	5
6	AC	0	1
14	AK	0	1
20	AQ	0	1
28	BD	0	1
29	BE	0	3
30	BF	0	4
32	BH	0	1
33	BI	0	1
36	BP	0	1
41	BX	0	1

Continued on next page...

Continued from previous page...

Mol	Chain	#Chirality outliers	#Planarity outliers
42	BY	0	1
47	B2	0	1
49	B0	0	1
51	B5	0	1
All	All	1	24

The worst 5 of 278 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	AA	1037	C	O3'-P	-82.19	0.62	1.61
1	AA	1255	G	O3'-P	-72.80	0.73	1.61
27	BA	2199	A	O3'-P	-71.10	0.75	1.61
27	BA	14	A	O3'-P	-50.73	1.00	1.61
27	BA	1924	C	O3'-P	-48.85	1.02	1.61

The worst 5 of 1499 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
27	BA	712(A)	A	P-O3'-C3'	-43.34	67.69	119.70
27	BA	2199	A	O3'-P-O5'	-43.06	22.18	104.00
27	BA	2454	G	P-O3'-C3'	-28.75	85.20	119.70
29	BE	49	THR	O-C-N	-27.49	68.88	121.10
3	AW	33	U	P-O3'-C3'	27.30	152.45	119.70

All (1) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
3	AW	37	YYG	C15

5 of 24 planarity outliers are listed below:

Mol	Chain	Res	Type	Group
3	AW	16	U	Sidechain
3	AW	17	U	Sidechain
3	AW	18	G	Sidechain
3	AW	19	G	Sidechain
3	AW	62	A	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	32551	0	16464	2039	4
2	AV	1622	0	819	182	0
3	AW	1638	0	835	197	0
4	AX	136	0	63	22	0
5	AB	1900	0	1950	92	0
6	AC	1612	0	1675	113	0
7	AD	1703	0	1760	288	0
8	AE	1146	0	1206	59	0
9	AF	843	0	857	49	0
10	AG	1257	0	1295	98	0
11	AH	1116	0	1177	99	0
12	AI	1011	0	1040	89	0
13	AJ	794	0	840	105	0
14	AK	885	0	904	55	0
15	AL	970	0	1056	74	0
16	AM	997	0	1070	186	0
17	AN	492	0	529	95	0
18	AO	734	0	771	30	0
19	AP	700	0	720	78	0
20	AQ	857	0	928	53	0
21	AR	597	0	668	52	0
22	AS	647	0	672	215	0
23	AT	762	0	859	33	0
24	AU	208	0	221	75	0
25	AY	365	0	0	14	0
26	BB	2637	0	1338	187	1
27	BA	60599	0	30523	10801	127
28	BD	1308	0	1346	1071	0
29	BE	1507	0	1475	1137	4
30	BF	1430	0	1357	1068	0
31	BG	957	0	950	687	0
32	BH	1251	0	1291	749	0
33	BI	1145	0	1224	627	4
34	BN	917	0	896	761	0
35	BO	937	0	992	621	0
36	BP	639	0	606	487	0
37	BQ	1081	0	1047	934	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
38	BS	866	0	868	691	0
39	BT	406	0	359	164	0
40	BW	860	0	909	568	0
41	BX	602	0	559	448	0
42	BY	879	0	859	751	0
43	BZ	1360	0	1377	897	0
44	BR	855	0	904	561	0
45	BU	978	0	1001	880	0
46	BV	787	0	784	643	0
47	B2	494	0	504	396	0
48	B3	477	0	528	441	0
49	B0	641	0	658	517	0
50	B4	604	0	586	493	0
51	B5	457	0	455	288	0
52	B6	431	0	454	288	0
53	B7	383	0	411	393	0
54	B8	496	0	539	359	0
55	B9	285	0	312	150	0
56	BK	999	0	1065	119	0
All	All	142811	0	94556	28254	136

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 120.

The worst 5 of 28254 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)
51:B5:33:CYS:SG	51:B5:36:CYS:HB2	1.24	1.69
27:BA:2470:G:C2	27:BA:2471:C:C5	1.81	1.69
27:BA:2712:U:C6	27:BA:712(A):A:C8	1.76	1.68
53:B7:30:ILE:HA	53:B7:33:ARG:CD	1.21	1.67
27:BA:2580:U:C6	27:BA:2581:G:C8	1.82	1.66

The worst 5 of 136 symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
27:BA:6:A:O4'	27:BA:2902:C:C1'[8_554]	0.64	1.56
27:BA:6:A:C4'	27:BA:2902:C:O2'[8_554]	0.74	1.46
27:BA:6:A:C4'	27:BA:2902:C:C2'[8_554]	0.77	1.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
27:BA:5:A:N7	27:BA:2901:C:N1[8_554]	0.83	1.37
27:BA:6:A:O4'	27:BA:2902:C:C2'[8_554]	0.90	1.30

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 X-ray entries followed by that with respect to entries of similar resolution.

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	AB	232/256 (91%)	183 (79%)	34 (15%)	15 (6%)	1 12
6	AC	204/239 (85%)	165 (81%)	23 (11%)	16 (8%)	1 10
7	AD	206/209 (99%)	156 (76%)	33 (16%)	17 (8%)	0 9
8	AE	148/162 (91%)	115 (78%)	29 (20%)	4 (3%)	4 25
9	AF	99/101 (98%)	85 (86%)	10 (10%)	4 (4%)	2 18
10	AG	153/156 (98%)	131 (86%)	18 (12%)	4 (3%)	4 26
11	AH	136/138 (99%)	101 (74%)	25 (18%)	10 (7%)	1 10
12	AI	125/128 (98%)	87 (70%)	30 (24%)	8 (6%)	1 13
13	AJ	96/105 (91%)	73 (76%)	14 (15%)	9 (9%)	0 8
14	AK	117/129 (91%)	88 (75%)	22 (19%)	7 (6%)	1 13
15	AL	122/135 (90%)	92 (75%)	13 (11%)	17 (14%)	0 3
16	AM	119/126 (94%)	95 (80%)	19 (16%)	5 (4%)	2 17
17	AN	58/61 (95%)	42 (72%)	12 (21%)	4 (7%)	1 11
18	AO	86/89 (97%)	76 (88%)	9 (10%)	1 (1%)	11 45
19	AP	81/88 (92%)	64 (79%)	10 (12%)	7 (9%)	0 9
20	AQ	102/105 (97%)	78 (76%)	18 (18%)	6 (6%)	1 13
21	AR	71/88 (81%)	54 (76%)	11 (16%)	6 (8%)	0 9
22	AS	78/93 (84%)	60 (77%)	15 (19%)	3 (4%)	2 19
23	AT	97/106 (92%)	79 (81%)	12 (12%)	6 (6%)	1 13

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
24	AU	22/27 (82%)	17 (77%)	3 (14%)	2 (9%)	0	8
28	BD	169/173 (98%)	60 (36%)	34 (20%)	75 (44%)	0	0
29	BE	183/338 (54%)	90 (49%)	34 (19%)	59 (32%)	0	0
30	BF	179/246 (73%)	51 (28%)	47 (26%)	81 (45%)	0	0
31	BG	116/176 (66%)	46 (40%)	31 (27%)	39 (34%)	0	0
32	BH	162/177 (92%)	74 (46%)	39 (24%)	49 (30%)	0	0
33	BI	144/149 (97%)	71 (49%)	29 (20%)	44 (31%)	0	0
34	BN	111/145 (77%)	34 (31%)	20 (18%)	57 (51%)	0	0
35	BO	120/122 (98%)	61 (51%)	27 (22%)	32 (27%)	0	0
36	BP	82/164 (50%)	29 (35%)	19 (23%)	34 (42%)	0	0
37	BQ	130/138 (94%)	38 (29%)	35 (27%)	57 (44%)	0	0
38	BS	105/186 (56%)	36 (34%)	20 (19%)	49 (47%)	0	0
39	BT	48/66 (73%)	17 (35%)	13 (27%)	18 (38%)	0	0
40	BW	104/113 (92%)	41 (39%)	16 (15%)	47 (45%)	0	0
41	BX	72/84 (86%)	26 (36%)	18 (25%)	28 (39%)	0	0
42	BY	108/119 (91%)	49 (45%)	20 (18%)	39 (36%)	0	0
43	BZ	175/253 (69%)	53 (30%)	52 (30%)	70 (40%)	0	0
44	BR	103/118 (87%)	35 (34%)	20 (19%)	48 (47%)	0	0
45	BU	115/118 (98%)	22 (19%)	23 (20%)	70 (61%)	0	0
46	BV	96/100 (96%)	39 (41%)	25 (26%)	32 (33%)	0	0
47	B2	62/70 (89%)	8 (13%)	9 (14%)	45 (73%)	0	0
48	B3	58/60 (97%)	24 (41%)	13 (22%)	21 (36%)	0	0
49	B0	84/91 (92%)	33 (39%)	17 (20%)	34 (40%)	0	0
50	B4	71/73 (97%)	21 (30%)	16 (22%)	34 (48%)	0	0
51	B5	56/60 (93%)	16 (29%)	17 (30%)	23 (41%)	0	0
52	B6	51/82 (62%)	21 (41%)	9 (18%)	21 (41%)	0	0
53	B7	44/47 (94%)	4 (9%)	7 (16%)	33 (75%)	0	0
54	B8	61/64 (95%)	22 (36%)	9 (15%)	30 (49%)	0	0
55	B9	33/36 (92%)	14 (42%)	9 (27%)	10 (30%)	0	0
56	BK	124/141 (88%)	92 (74%)	26 (21%)	6 (5%)	2	16
All	All	5318/6250 (85%)	2968 (56%)	1014 (19%)	1336 (25%)	0	1

5 of 1336 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
5	AB	24	TRP
5	AB	104	ASN
5	AB	153	ARG
5	AB	154	LEU
5	AB	161	ALA

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 X-ray entries followed by that with respect to entries of similar resolution.

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	AB	202/220 (92%)	173 (86%)	29 (14%)	2 12
6	AC	160/188 (85%)	146 (91%)	14 (9%)	8 25
7	AD	180/181 (99%)	162 (90%)	18 (10%)	6 20
8	AE	115/123 (94%)	94 (82%)	21 (18%)	1 8
9	AF	90/90 (100%)	83 (92%)	7 (8%)	10 29
10	AG	126/127 (99%)	116 (92%)	10 (8%)	10 29
11	AH	119/119 (100%)	91 (76%)	28 (24%)	0 4
12	AI	98/99 (99%)	90 (92%)	8 (8%)	9 28
13	AJ	88/92 (96%)	77 (88%)	11 (12%)	3 15
14	AK	90/99 (91%)	85 (94%)	5 (6%)	17 38
15	AL	104/111 (94%)	93 (89%)	11 (11%)	5 19
16	AM	100/101 (99%)	87 (87%)	13 (13%)	3 14
17	AN	49/50 (98%)	43 (88%)	6 (12%)	4 15
18	AO	79/80 (99%)	70 (89%)	9 (11%)	4 16
19	AP	72/74 (97%)	62 (86%)	10 (14%)	3 13
20	AQ	96/97 (99%)	87 (91%)	9 (9%)	7 23
21	AR	64/77 (83%)	57 (89%)	7 (11%)	5 18
22	AS	71/80 (89%)	64 (90%)	7 (10%)	6 21
23	AT	76/82 (93%)	68 (90%)	8 (10%)	5 19

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
24	AU	19/22 (86%)	19 (100%)	0	100 100
28	BD	135/135 (100%)	99 (73%)	36 (27%)	0 3
29	BE	156/284 (55%)	128 (82%)	28 (18%)	1 8
30	BF	152/193 (79%)	124 (82%)	28 (18%)	1 8
31	BG	102/147 (69%)	93 (91%)	9 (9%)	8 25
32	BH	137/147 (93%)	111 (81%)	26 (19%)	1 7
33	BI	119/119 (100%)	98 (82%)	21 (18%)	1 8
34	BN	95/121 (78%)	80 (84%)	15 (16%)	2 10
35	BO	101/101 (100%)	81 (80%)	20 (20%)	1 7
36	BP	67/126 (53%)	56 (84%)	11 (16%)	2 10
37	BQ	110/110 (100%)	83 (76%)	27 (24%)	0 3
38	BS	89/149 (60%)	73 (82%)	16 (18%)	1 8
39	BT	44/52 (85%)	30 (68%)	14 (32%)	0 2
40	BW	88/92 (96%)	74 (84%)	14 (16%)	2 10
41	BX	67/73 (92%)	44 (66%)	23 (34%)	0 1
42	BY	97/105 (92%)	80 (82%)	17 (18%)	1 8
43	BZ	151/203 (74%)	130 (86%)	21 (14%)	3 13
44	BR	89/101 (88%)	71 (80%)	18 (20%)	1 6
45	BU	96/97 (99%)	68 (71%)	28 (29%)	0 2
46	BV	79/79 (100%)	69 (87%)	10 (13%)	3 14
47	B2	51/56 (91%)	37 (72%)	14 (28%)	0 2
48	B3	52/52 (100%)	47 (90%)	5 (10%)	7 22
49	B0	64/67 (96%)	57 (89%)	7 (11%)	5 18
50	B4	66/66 (100%)	54 (82%)	12 (18%)	1 8
51	B5	51/53 (96%)	43 (84%)	8 (16%)	2 11
52	B6	46/69 (67%)	39 (85%)	7 (15%)	2 11
53	B7	39/40 (98%)	31 (80%)	8 (20%)	1 6
54	B8	50/51 (98%)	39 (78%)	11 (22%)	1 5
55	B9	34/35 (97%)	30 (88%)	4 (12%)	4 16
56	BK	108/113 (96%)	105 (97%)	3 (3%)	38 57
All	All	4533/5148 (88%)	3841 (85%)	692 (15%)	2 11

5 of 692 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
38	BS	87	LEU
44	BR	107	ASP
39	BT	25	ASP
38	BS	83	LEU
42	BY	31	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 131 such sidechains are listed below:

Mol	Chain	Res	Type
46	BV	86	HIS
48	B3	52	HIS
55	B9	29	ASN
23	AT	73	HIS
23	AT	26	ASN

5.3.3 RNA (i)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
1	AA	1496/1522 (98%)	518 (34%)	159 (10%)
2	AV	75/76 (98%)	17 (22%)	2 (2%)
26	BB	122/123 (99%)	44 (36%)	3 (2%)
27	BA	2779/2916 (95%)	1485 (53%)	361 (12%)
3	AW	68/76 (89%)	13 (19%)	4 (5%)
4	AX	5/18 (27%)	0	0
All	All	4545/4731 (96%)	2077 (45%)	529 (11%)

5 of 2077 RNA backbone outliers are listed below:

Mol	Chain	Res	Type
1	AA	6	G
1	AA	7	G
1	AA	8	A
1	AA	9	G
1	AA	12	U

5 of 529 RNA pucker outliers are listed below:

Mol	Chain	Res	Type
27	BA	2481	G

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Mol	Chain	Res	Type
27	BA	2555	U
27	BA	2472	G
27	BA	2849	U
27	BA	265	A

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

3 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	$\#\|Z\| > 2$
3	PSU	AW	39	3	18,21,22	0.73	1 (5%)	21,30,33	0.72	0
3	PSU	AW	55	3	18,21,22	0.72	0	21,30,33	0.91	1 (4%)
3	YYG	AW	37	3	30,42,43	0.96	1 (3%)	32,62,65	2.77	10 (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
3	PSU	AW	39	3	-	0/7/25/26	0/2/2/2
3	PSU	AW	55	3	-	0/7/25/26	0/2/2/2
3	YYG	AW	37	3	1/1/8/9	7/20/42/43	0/3/4/4

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	AW	37	YYG	C8-N7	-2.30	1.31	1.34
3	AW	39	PSU	C6-N1	-2.01	1.33	1.36

The worst 5 of 11 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	AW	37	YYG	C11-C12-N1	8.62	111.39	106.53
3	AW	37	YYG	C24-O23-C21	6.49	123.15	115.63
3	AW	37	YYG	C3-N3-C4	5.83	125.57	116.76
3	AW	37	YYG	O23-C21-N20	4.57	118.46	110.77
3	AW	37	YYG	C4-N3-C2	-3.87	111.86	122.30

All (1) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
3	AW	37	YYG	C15

5 of 7 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	AW	37	YYG	C12-C13-C14-C15
3	AW	37	YYG	C15-C16-O18-C19
3	AW	37	YYG	O17-C16-O18-C19
3	AW	37	YYG	C13-C14-C15-C16
3	AW	37	YYG	C13-C14-C15-N20

There are no ring outliers.

2 monomers are involved in 37 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	AW	39	PSU	2	0
3	AW	37	YYG	35	0

5.5 Carbohydrates (i)

There are no oligosaccharides in this entry.

5.6 Ligand geometry (i)

There are no ligands in this entry.

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
27	BA	118
1	AA	67
3	AW	9
56	BK	6
2	AV	5
37	BQ	3
28	BD	2
16	AM	2
46	BV	2
50	B4	2
38	BS	2
5	AB	2
40	BW	2
7	AD	2
30	BF	2
20	AQ	2
8	AE	1
36	BP	1
54	B8	1
26	BB	1
43	BZ	1
49	B0	1
6	AC	1
33	BI	1
32	BH	1
14	AK	1
45	BU	1
15	AL	1

The worst 5 of 240 chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	BK	70:ILE	C	71:LYS	N	5.81
1	BK	71:LYS	C	72:THR	N	5.77
1	AW	73:A	O3'	74:C	P	5.46
1	BK	73:PRO	C	74:PRO	N	5.30
1	BK	72:THR	C	73:PRO	N	5.11

6 Fit of model and data

6.1 Protein, DNA and RNA chains

In the following table, the column labelled '#RSRZ> 2' contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95^{th} percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled 'Q< 0.9' lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å^2)	Q<0.9
1	AA	1515/1522 (99%)	0.45	96 (6%) 27 27	208, 348, 400, 400	0
2	AV	76/76 (100%)	0.87	8 (10%) 13 16	208, 360, 393, 393	0
3	AW	73/76 (96%)	0.92	7 (9%) 15 17	342, 400, 400, 400	0
4	AX	17/18 (94%)	5.64	12 (70%) 0 1	399, 399, 399, 399	0
5	AB	234/256 (91%)	0.90	36 (15%) 6 11	400, 400, 400, 400	0
6	AC	206/239 (86%)	1.29	52 (25%) 2 6	398, 400, 400, 400	0
7	AD	208/209 (99%)	1.94	79 (37%) 1 4	311, 385, 400, 400	0
8	AE	150/162 (92%)	1.08	36 (24%) 2 7	335, 400, 400, 400	0
9	AF	101/101 (100%)	1.38	24 (23%) 2 7	400, 400, 400, 400	0
10	AG	155/156 (99%)	1.35	39 (25%) 2 6	376, 395, 395, 395	0
11	AH	138/138 (100%)	1.09	24 (17%) 5 9	389, 389, 389, 389	0
12	AI	127/128 (99%)	1.63	39 (30%) 1 5	400, 400, 400, 400	0
13	AJ	98/105 (93%)	1.66	29 (29%) 1 5	399, 399, 399, 399	0
14	AK	119/129 (92%)	0.49	13 (10%) 12 16	250, 250, 400, 400	0
15	AL	124/135 (91%)	1.69	40 (32%) 1 5	383, 383, 397, 397	0
16	AM	125/126 (99%)	1.90	41 (32%) 1 5	400, 400, 400, 400	0
17	AN	60/61 (98%)	1.08	12 (20%) 3 8	398, 398, 398, 398	0
18	AO	88/89 (98%)	2.04	31 (35%) 1 5	392, 392, 392, 392	0
19	AP	83/88 (94%)	2.23	38 (45%) 1 3	394, 394, 394, 394	0
20	AQ	104/105 (99%)	1.43	34 (32%) 1 5	397, 397, 400, 400	0
21	AR	73/88 (82%)	1.30	17 (23%) 2 7	400, 400, 400, 400	0
22	AS	80/93 (86%)	1.84	27 (33%) 1 5	395, 395, 395, 395	0
23	AT	99/106 (93%)	2.26	46 (46%) 0 3	400, 400, 400, 400	0
24	AU	24/27 (88%)	2.52	13 (54%) 0 3	400, 400, 400, 400	0

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Mol	Chain	Analysed	<RSRZ>	#RSRZ>2			OWAB(Å^2)	Q<0.9
25	AY	365/365 (100%)	5.87	275 (75%)	0	1	340, 396, 400, 400	0
26	BB	123/123 (100%)	0.22	5 (4%)	42	35	242, 265, 342, 342	0
27	BA	2814/2916 (96%)	0.51	221 (7%)	20	21	67, 222, 387, 400	0
28	BD	173/173 (100%)	1.99	60 (34%)	1	5	398, 398, 400, 400	0
29	BE	191/338 (56%)	2.07	81 (42%)	1	3	388, 400, 400, 400	0
30	BF	189/246 (76%)	2.30	77 (40%)	1	4	398, 398, 399, 399	0
31	BG	122/176 (69%)	1.47	38 (31%)	1	5	400, 400, 400, 400	0
32	BH	164/177 (92%)	1.52	46 (28%)	2	6	399, 399, 400, 400	0
33	BI	148/149 (99%)	1.27	35 (23%)	2	7	400, 400, 400, 400	0
34	BN	117/145 (80%)	2.06	41 (35%)	1	5	388, 388, 388, 388	0
35	BO	122/122 (100%)	2.17	56 (45%)	1	3	400, 400, 400, 400	0
36	BP	84/164 (51%)	1.22	23 (27%)	2	6	400, 400, 400, 400	0
37	BQ	138/138 (100%)	2.38	59 (42%)	1	3	391, 391, 391, 391	0
38	BS	113/186 (60%)	1.43	25 (22%)	3	7	275, 370, 400, 400	0
39	BT	52/66 (78%)	2.35	27 (51%)	0	3	400, 400, 400, 400	0
40	BW	108/113 (95%)	1.27	26 (24%)	2	7	275, 277, 400, 400	0
41	BX	76/84 (90%)	1.65	23 (30%)	1	5	400, 400, 400, 400	0
42	BY	110/119 (92%)	2.29	42 (38%)	1	4	400, 400, 400, 400	0
43	BZ	177/253 (69%)	1.11	38 (21%)	3	8	376, 376, 379, 379	0
44	BR	105/118 (88%)	1.26	30 (28%)	1	5	345, 345, 345, 345	0
45	BU	117/118 (99%)	1.61	36 (30%)	1	5	356, 356, 392, 392	0
46	BV	100/100 (100%)	1.12	25 (25%)	2	7	385, 385, 400, 400	0
47	B2	64/70 (91%)	0.98	12 (18%)	4	9	287, 287, 287, 287	0
48	B3	60/60 (100%)	1.62	17 (28%)	1	6	343, 343, 343, 343	0
49	B0	86/91 (94%)	1.57	26 (30%)	1	5	400, 400, 400, 400	0
50	B4	73/73 (100%)	1.95	27 (36%)	1	4	400, 400, 400, 400	0
51	B5	58/60 (96%)	1.87	18 (31%)	1	5	400, 400, 400, 400	0
52	B6	53/82 (64%)	1.36	14 (26%)	2	6	400, 400, 400, 400	0
53	B7	46/47 (97%)	2.15	20 (43%)	1	3	400, 400, 400, 400	0
54	B8	63/64 (98%)	2.47	37 (58%)	0	2	400, 400, 400, 400	0
55	B9	35/36 (97%)	3.10	22 (62%)	0	2	400, 400, 400, 400	0

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Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å^2)	Q<0.9
56	BK	133/141 (94%)	1.74	37 (27%) 2 6	397, 400, 400, 400	0
All	All	10456/11346 (92%)	1.28	2312 (22%) 3 7	67, 388, 400, 400	0

The worst 5 of 2312 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
25	AY	243	ASN	28.2
4	AX	114	U	25.4
25	AY	304	PRO	24.8
25	AY	4	GLU	24.1
25	AY	198	SER	22.0

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

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
3	YYG	AW	37	39/40	0.44	0.23	400,400,400,400	0
3	PSU	AW	39	20/21	0.49	0.19	400,400,400,400	0
3	PSU	AW	55	20/21	0.51	0.11	400,400,400,400	0

6.3 Carbohydrates (i)

There are no monosaccharides in this entry.

6.4 Ligands (i)

There are no ligands in this entry.

6.5 Other polymers (i)

There are no such residues in this entry.