



wwPDB EM Validation Summary Report ⓘ

Jun 26, 2026 – 04:40 AM EDT

PDB ID : 9N2B / pdb_00009n2b
EMDB ID : EMD-48830
Title : Impacts of ribosomal RNA sequence variation on gene expression and phenotype: Cryo-EM structure of the rrsB ribosome (BBB-70S)
Authors : Welfer, G.A.; Brady, R.A.; Natchiar, S.K.; Watson, Z.L.; Rundlet, E.J.; Alejo, J.L.; Singh, A.P.; Mishra, N.K.; Altman, R.B.; Blanchard, S.C.
Deposited on : 2025-01-28
Resolution : 2.20 Å (reported)
Based on initial model : 7N1P

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

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

A user guide is available at

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

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

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

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

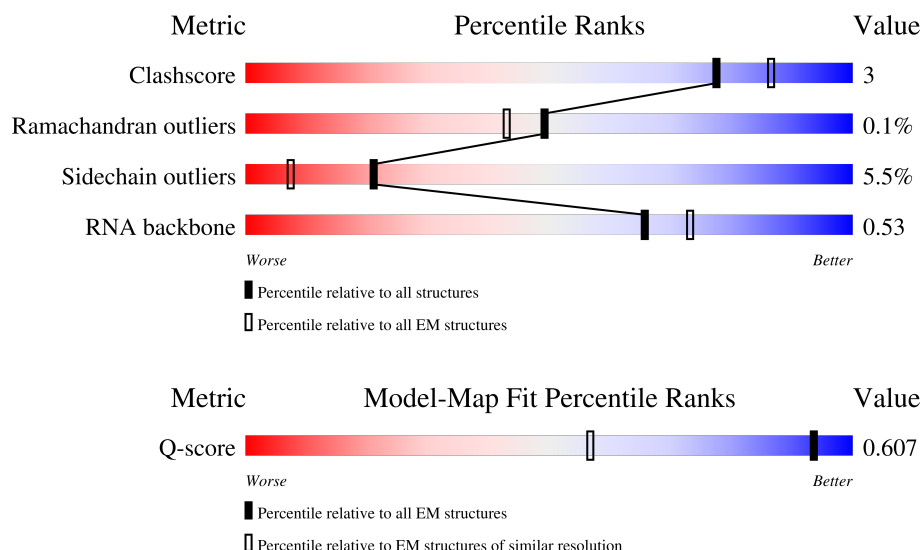
EMDB validation analysis : 0.0.1.dev132
Mogul : 2022.3.0, CSD as543be (2022)
MolProbity : 4-5-2 with Phenix2.0
Buster-report : wwPDB partial adaption of 1.1.7 (2018)
Percentile statistics : 20250101.v01 (using entries in the PDB archive January 1st 2025)
EM percentile statistics : 202505.v01 (Using data in the EMDB archive up until May 2025)
MapQ : 1.9.13
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.49

1 Overall quality at a glance

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

The reported resolution of this entry is 2.20 Å.

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



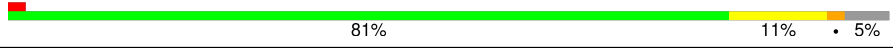
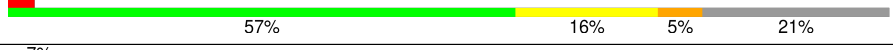
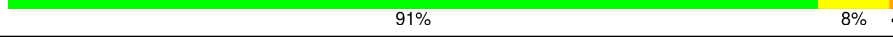
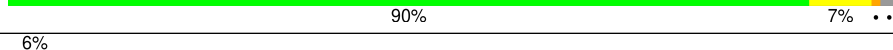
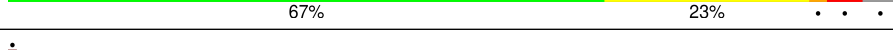
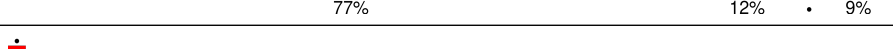
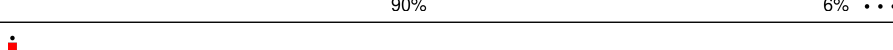
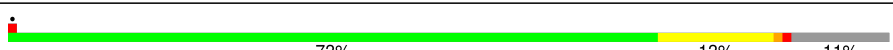
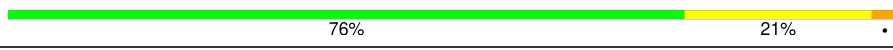
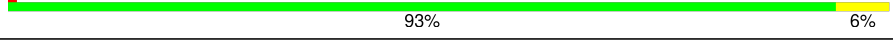
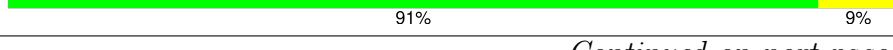
Metric	Whole archive (#Entries)	EM structures (#Entries)	Similar EM resolution (#Entries, resolution range(Å))
Clashscore	229148	23984	-
Ramachandran outliers	224038	23583	-
Sidechain outliers	223484	23102	-
RNA backbone	8273	3508	-
Q-score	-	25397	3184 (1.71 - 2.70)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions $\leq 5\%$. The upper red bar (where present) indicates the fraction of residues that have poor fit to the EM map (all-atom inclusion $< 40\%$). The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	16	1542	
2	SB	241	

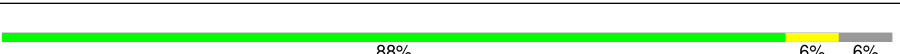
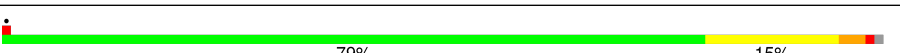
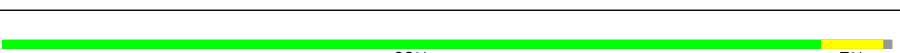
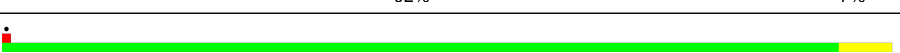
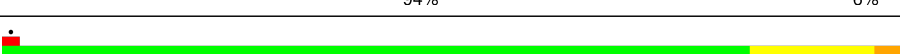
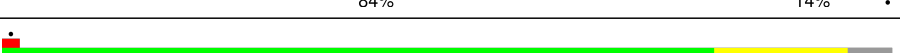
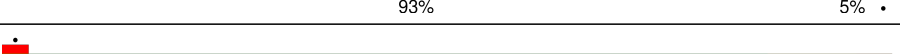
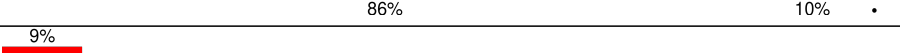
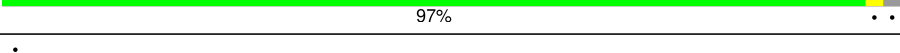
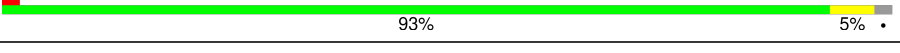
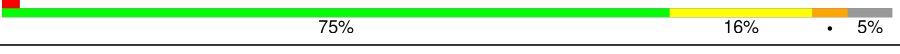
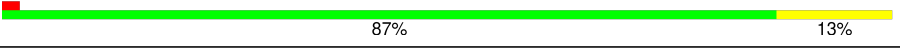
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Mol	Chain	Length	Quality of chain
3	SC	233	
4	SD	206	
5	SE	167	
6	SF	135	
7	SG	179	
8	SH	130	
9	SI	130	
10	SJ	103	
11	SK	129	
12	SL	124	
13	SM	118	
14	SN	101	
15	SO	89	
16	SP	82	
17	SQ	84	
18	SR	75	
19	SS	91	
20	ST	87	
21	SU	71	
22	mR	60	
23	23	2904	
24	5	120	
25	LB	273	
26	LC	209	
27	LD	201	

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Mol	Chain	Length	Quality of chain
28	LE	179	
29	LF	177	
30	LI	149	
31	LM	142	
32	LN	123	
33	LO	144	
34	LP	136	
35	LQ	127	
36	LR	117	
37	LS	115	
38	LT	118	
39	LU	103	
40	LV	110	
41	LW	100	
42	LX	104	
43	LY	94	
44	La	85	
45	Lb	78	
46	Lc	63	
47	Ld	59	
48	Le	70	
49	Lf	57	
50	Lg	55	
51	Lh	46	
52	Li	65	

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Mol	Chain	Length	Quality of chain
53	Lj	38	68% 24% 8%
54	Pt	77	77% 19%

2 Entry composition

There are 61 unique types of molecules in this entry. The entry contains 142763 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 (rRNA) from the rrnB operon.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	16	1542	Total	C	N	O	P	0	0
			33092	14767	6064	10719	1542		

- Molecule 2 is a protein called 30S ribosomal protein S2.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	SB	229	Total	C	N	O	S	0	0
			1787	1129	320	330	8		

- Molecule 3 is a protein called 30S ribosomal protein S3.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	SC	212	Total	C	N	O	S	0	0
			1658	1049	311	294	4		

- Molecule 4 is a protein called 30S ribosomal protein S4.

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

- Molecule 5 is a protein called 30S ribosomal protein S5.

Mol	Chain	Residues	Atoms					AltConf	Trace
5	SE	158	Total	C	N	O	S	0	0
			1166	725	220	215	6		

- Molecule 6 is a protein called 30S ribosomal protein S6.

Mol	Chain	Residues	Atoms					AltConf	Trace
6	SF	106	Total	C	N	O	S	0	0
			862	545	156	154	7		

- Molecule 7 is a protein called 30S ribosomal protein S7.

Mol	Chain	Residues	Atoms					AltConf	Trace
7	SG	155	Total	C	N	O	S	1	0
			1236	772	240	220	4		

- Molecule 8 is a protein called 30S ribosomal protein S8.

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

- Molecule 9 is a protein called 30S ribosomal protein S9.

Mol	Chain	Residues	Atoms					AltConf	Trace
9	SI	127	Total	C	N	O	S	0	0
			1021	634	206	178	3		

- Molecule 10 is a protein called 30S ribosomal protein S10.

Mol	Chain	Residues	Atoms					AltConf	Trace
10	SJ	99	Total	C	N	O	S	0	0
			795	498	152	144	1		

- Molecule 11 is a protein called Small ribosomal subunit protein uS11.

Mol	Chain	Residues	Atoms					AltConf	Trace
11	SK	118	Total	C	N	O	S	1	0
			895	551	178	163	3		

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
SK	119	IAS	ASN	conflict	UNP P0A7R9

- Molecule 12 is a protein called Small ribosomal subunit protein uS12.

Mol	Chain	Residues	Atoms					AltConf	Trace
12	SL	123	Total	C	N	O	S	0	0
			957	591	196	165	5		

- Molecule 13 is a protein called 30S ribosomal protein S13.

Mol	Chain	Residues	Atoms					AltConf	Trace
13	SM	115	Total	C	N	O	S	0	0
			891	552	179	157	3		

- Molecule 14 is a protein called 30S ribosomal protein S14.

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

- Molecule 15 is a protein called 30S ribosomal protein S15.

Mol	Chain	Residues	Atoms					AltConf	Trace
15	SO	88	Total	C	N	O	S	0	0
			713	439	144	129	1		

- Molecule 16 is a protein called 30S ribosomal protein S16.

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

- Molecule 17 is a protein called 30S ribosomal protein S17.

Mol	Chain	Residues	Atoms					AltConf	Trace
17	SQ	80	Total	C	N	O	S	0	0
			648	411	121	113	3		

- Molecule 18 is a protein called 30S ribosomal protein S18.

Mol	Chain	Residues	Atoms					AltConf	Trace
18	SR	67	Total	C	N	O	S	0	0
			555	351	106	97	1		

- Molecule 19 is a protein called Small ribosomal subunit protein uS19.

Mol	Chain	Residues	Atoms					AltConf	Trace
19	SS	83	Total	C	N	O	S	0	0
			663	424	126	111	2		

- Molecule 20 is a protein called 30S ribosomal protein S20.

Mol	Chain	Residues	Atoms					AltConf	Trace
20	ST	86	Total	C	N	O	S	0	0
			669	414	138	114	3		

- Molecule 21 is a protein called 30S ribosomal protein S21.

Mol	Chain	Residues	Atoms					AltConf	Trace
21	SU	70	Total	C	N	O	S	0	0
			589	366	125	97	1		

- Molecule 22 is a RNA chain called Synthetic messenger RNA (mRNA) 60 bp in length.

Mol	Chain	Residues	Atoms					AltConf	Trace
22	mR	28	Total	C	N	O	P	1	0
			621	278	113	201	29		

- Molecule 23 is a RNA chain called 23S ribosomal RNA (rRNA) from the rrnB operon.

Mol	Chain	Residues	Atoms					AltConf	Trace
23	23	2767	Total	C	N	O	P	0	0
			59424	26515	10941	19201	2767		

- Molecule 24 is a RNA chain called 5S ribosomal RNA (rRNA) from the B operon.

Mol	Chain	Residues	Atoms					AltConf	Trace
24	5	120	Total	C	N	O	P	0	0
			2572	1145	470	837	120		

- Molecule 25 is a protein called 50S ribosomal protein L2.

Mol	Chain	Residues	Atoms					AltConf	Trace
25	LB	271	Total	C	N	O	S	0	0
			2082	1288	423	364	7		

- Molecule 26 is a protein called 50S ribosomal protein L3.

Mol	Chain	Residues	Atoms					AltConf	Trace
26	LC	209	Total	C	N	O	S	0	0
			1564	979	288	293	4		

- Molecule 27 is a protein called Large ribosomal subunit protein uL4.

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

- Molecule 28 is a protein called 50S ribosomal protein L5.

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

- Molecule 29 is a protein called 50S ribosomal protein L6.

Mol	Chain	Residues	Atoms					AltConf	Trace
29	LF	175	Total	C	N	O	S	0	0
			1313	826	241	244	2		

- Molecule 30 is a protein called 50S ribosomal protein L9.

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

- Molecule 31 is a protein called 50S ribosomal protein L13.

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

- Molecule 32 is a protein called 50S ribosomal protein L14.

Mol	Chain	Residues	Atoms					AltConf	Trace
32	LN	123	Total	C	N	O	S	0	0
			946	593	181	166	6		

- Molecule 33 is a protein called 50S ribosomal protein L15.

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

- Molecule 34 is a protein called 50S ribosomal protein L16.

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

- Molecule 35 is a protein called 50S ribosomal protein L17.

Mol	Chain	Residues	Atoms					AltConf	Trace
35	LQ	120	Total	C	N	O	S	0	0
			960	593	196	166	5		

- Molecule 36 is a protein called 50S ribosomal protein L18.

Mol	Chain	Residues	Atoms				AltConf	Trace
36	LR	116	Total	C	N	O	0	0
			892	552	178	162		

- Molecule 37 is a protein called 50S ribosomal protein L19.

Mol	Chain	Residues	Atoms					AltConf	Trace
37	LS	114	Total	C	N	O	S	0	0
			916	574	179	162	1		

- Molecule 38 is a protein called 50S ribosomal protein L20.

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

- Molecule 39 is a protein called 50S ribosomal protein L21.

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

- Molecule 40 is a protein called Large ribosomal subunit protein uL22.

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

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

Mol	Chain	Residues	Atoms					AltConf	Trace
41	LW	95	Total	C	N	O	S	0	0
			757	479	141	135	2		

- Molecule 42 is a protein called 50S ribosomal protein L24.

Mol	Chain	Residues	Atoms					AltConf	Trace
42	LX	102	Total	C	N	O		0	0
			779	492	146	141			

- Molecule 43 is a protein called 50S ribosomal protein L25.

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

- Molecule 44 is a protein called 50S ribosomal protein L27.

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

- Molecule 45 is a protein called 50S ribosomal protein L28.

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

- Molecule 46 is a protein called 50S ribosomal protein L29.

Mol	Chain	Residues	Atoms					AltConf	Trace
46	Lc	62	Total	C	N	O	S	0	0
			501	308	98	94	1		

- Molecule 47 is a protein called 50S ribosomal protein L30.

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

- Molecule 48 is a protein called 50S ribosomal protein L31.

Mol	Chain	Residues	Atoms					AltConf	Trace
48	Le	68	Total	C	N	O	S	0	0
			533	330	101	96	6		

- Molecule 49 is a protein called 50S ribosomal protein L32.

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

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

Mol	Chain	Residues	Atoms					AltConf	Trace
50	Lg	52	Total	C	N	O	S	0	0
			426	275	78	73			

- Molecule 51 is a protein called 50S ribosomal protein L34.

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

- Molecule 52 is a protein called 50S ribosomal protein L35.

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

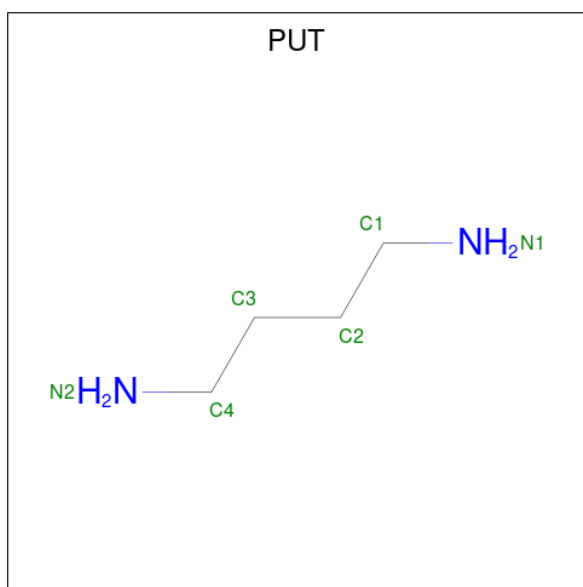
- Molecule 53 is a protein called 50S ribosomal protein L36.

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

- Molecule 54 is a RNA chain called N-formyl-methionine initiator tRNA (fMet-tRNA^{fMet}).

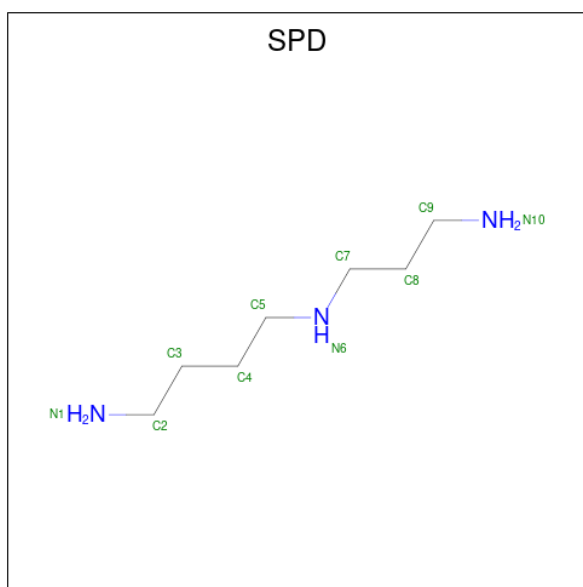
Mol	Chain	Residues	Atoms						AltConf	Trace
54	Pt	77	Total	C	N	O	P	S	0	0
			1646	734	298	536	77	1		

- Molecule 55 is 1,4-DIAMINOBTANE (CCD ID: PUT) (formula: C₄H₁₂N₂) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms			AltConf
55	16	1	Total	C	N	0
			6	4	2	
55	23	1	Total	C	N	0
			6	4	2	
55	23	1	Total	C	N	0
			6	4	2	
55	23	1	Total	C	N	0
			6	4	2	
55	23	1	Total	C	N	0
			6	4	2	
55	23	1	Total	C	N	0
			6	4	2	
55	23	1	Total	C	N	0
			6	4	2	
55	23	1	Total	C	N	0
			6	4	2	

- Molecule 56 is SPERMIDINE (CCD ID: SPD) (formula: C₇H₁₉N₃) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms			AltConf
56	16	1	Total	C	N	0
			10	7	3	
56	23	1	Total	C	N	0
			10	7	3	
56	23	1	Total	C	N	0
			10	7	3	
56	23	1	Total	C	N	0
			10	7	3	
56	23	1	Total	C	N	0
			10	7	3	

- Molecule 57 is MAGNESIUM ION (CCD ID: MG) (formula: Mg) (labeled as "Ligand of Interest" by depositor).

Mol	Chain	Residues	Atoms		AltConf
57	16	75	Total	Mg	0
			75	75	
57	mR	3	Total	Mg	0
			3	3	
57	23	185	Total	Mg	0
			185	185	
57	5	6	Total	Mg	0
			6	6	
57	LB	2	Total	Mg	0
			2	2	
57	LC	1	Total	Mg	0
			1	1	

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Mol	Chain	Residues	Atoms		AltConf
57	LD	1	Total 1	Mg 1	0
57	Lf	1	Total 1	Mg 1	0
57	Pt	2	Total 2	Mg 2	0

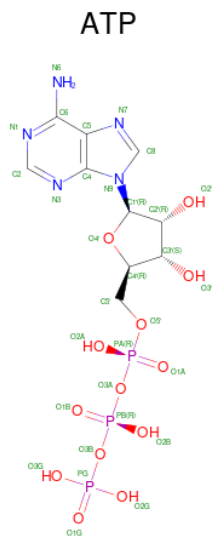
- Molecule 58 is POTASSIUM ION (CCD ID: K) (formula: K) (labeled as "Ligand of Interest" by depositor).

Mol	Chain	Residues	Atoms		AltConf
58	16	8	Total 8	K 8	0
58	23	46	Total 46	K 46	0
58	LB	1	Total 1	K 1	0
58	LX	1	Total 1	K 1	0

- Molecule 59 is ZINC ION (CCD ID: ZN) (formula: Zn) (labeled as "Ligand of Interest" by depositor).

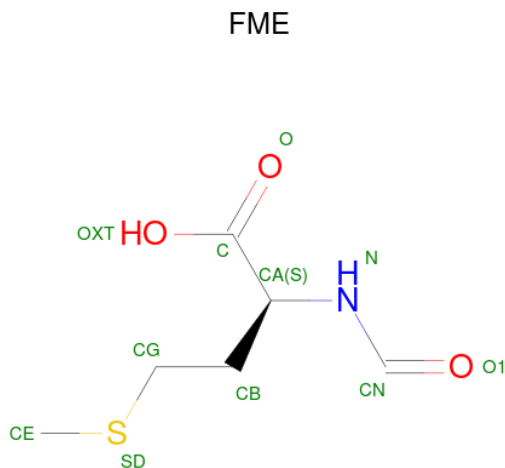
Mol	Chain	Residues	Atoms		AltConf
59	SB	1	Total 1	Zn 1	0
59	Le	1	Total 1	Zn 1	0
59	Lj	1	Total 1	Zn 1	0

- Molecule 60 is ADENOSINE-5'-TRIPHOSPHATE (CCD ID: ATP) (formula: C₁₀H₁₆N₅O₁₃P₃) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms					AltConf
60	23	1	Total 31	C 10	N 5	O 13	P 3	0
60	23	1	Total 31	C 10	N 5	O 13	P 3	0

- Molecule 61 is N-FORMYLMETHIONINE (CCD ID: FME) (formula: $\text{C}_6\text{H}_{11}\text{NO}_3\text{S}$) (labeled as "Ligand of Interest" by depositor).

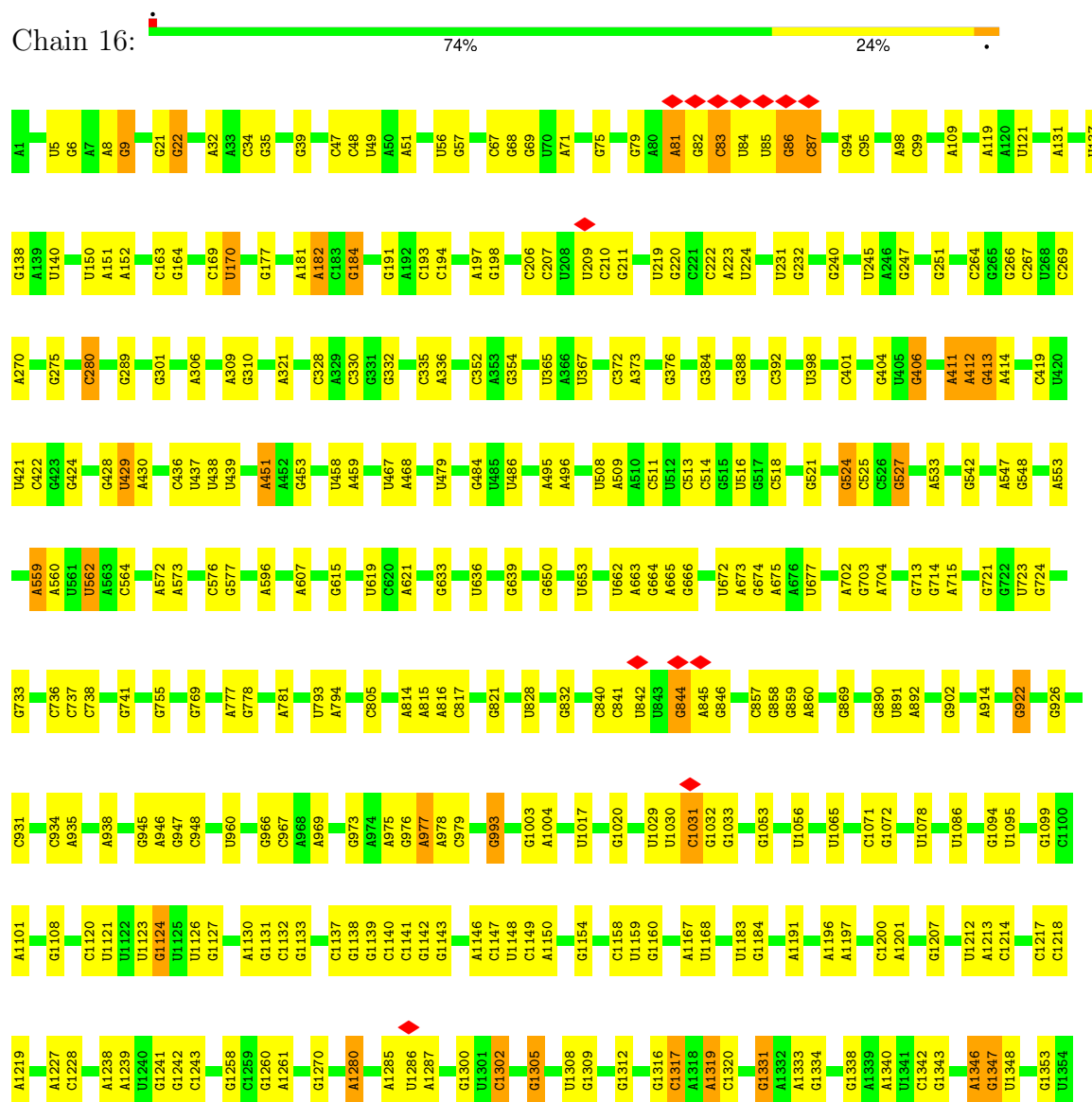


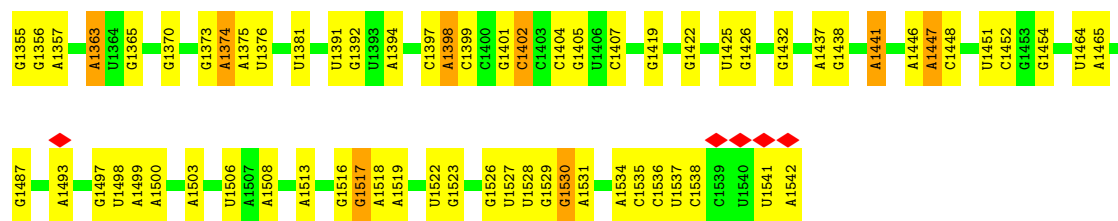
Mol	Chain	Residues	Atoms					AltConf
61	Pt	1	Total	C	N	O	S	0
			10	6	1	2	1	

3 Residue-property plots

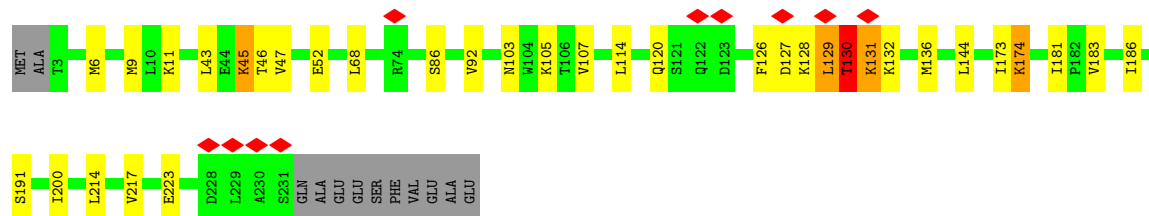
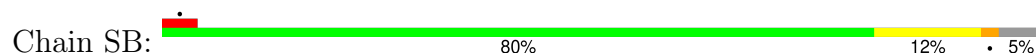
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion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

- Molecule 1: 16S ribosomal RNA (rRNA) from the rrnB operon

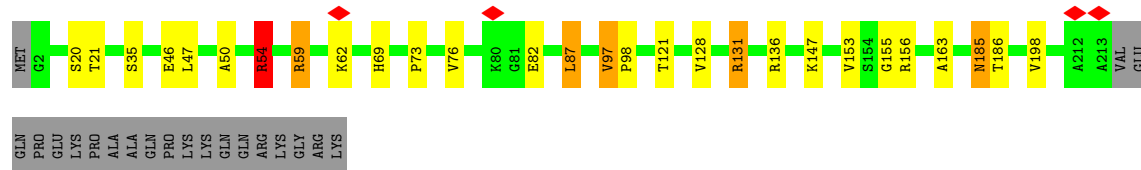
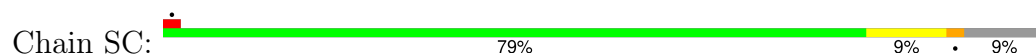




• Molecule 2: 30S ribosomal protein S2



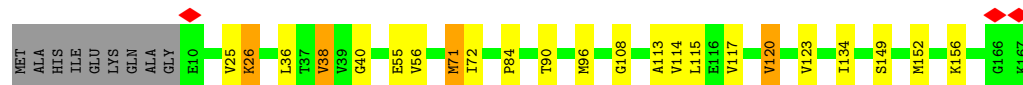
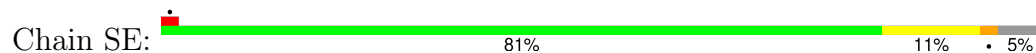
• Molecule 3: 30S ribosomal protein S3



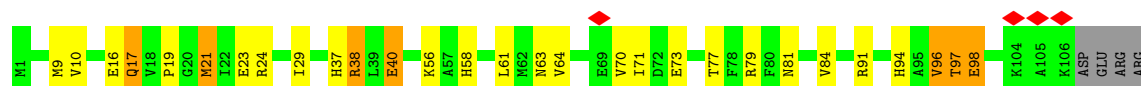
• Molecule 4: 30S ribosomal protein S4



• Molecule 5: 30S ribosomal protein S5



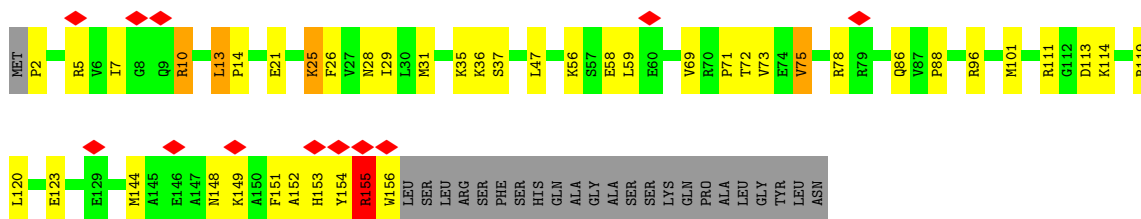
• Molecule 6: 30S ribosomal protein S6



GLU
ARG
ARG
ASP
ASP
PHE
ALA
ALA
GLU
THR
ALA
ASP
ASP
ALA
ALA
ALA
GLY
ASP
SER
SER
GLU
GLU
GLU
GLU
GLU

• Molecule 7: 30S ribosomal protein S7

Chain SG: 7% 62% 22% 13%



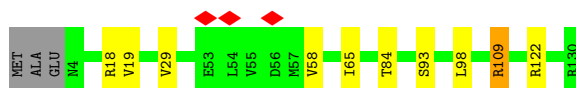
• Molecule 8: 30S ribosomal protein S8

Chain SH: 91% 8%



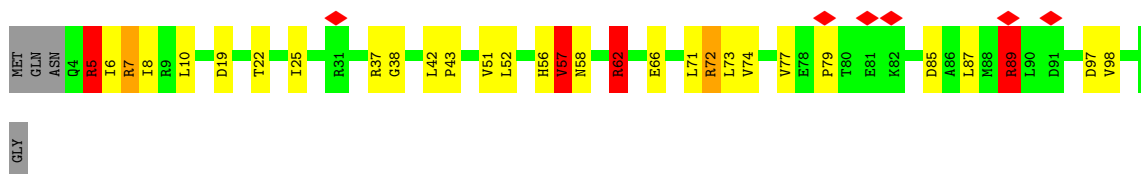
• Molecule 9: 30S ribosomal protein S9

Chain SI: 90% 7%



• Molecule 10: 30S ribosomal protein S10

Chain SJ: 6% 67% 23%



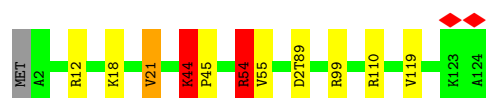
• Molecule 11: Small ribosomal subunit protein uS11

Chain SK: 77% 12% 9%

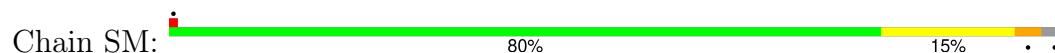


• Molecule 12: Small ribosomal subunit protein uS12

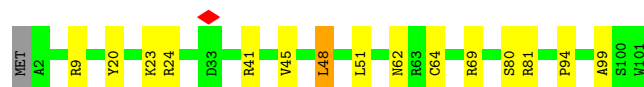
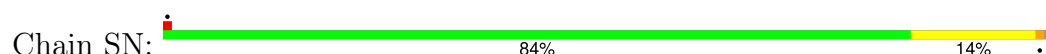
Chain SL: 90% 6%



- Molecule 13: 30S ribosomal protein S13



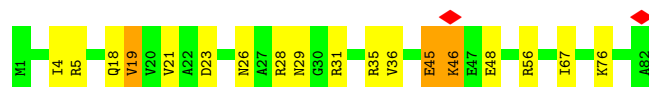
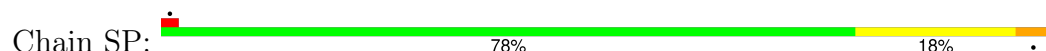
- Molecule 14: 30S ribosomal protein S14



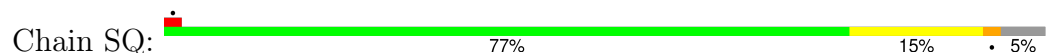
- Molecule 15: 30S ribosomal protein S15



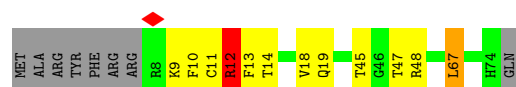
- Molecule 16: 30S ribosomal protein S16



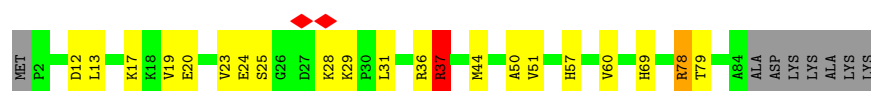
- Molecule 17: 30S ribosomal protein S17



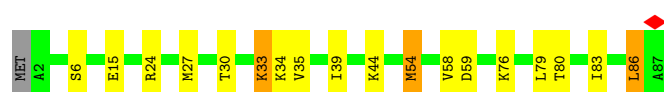
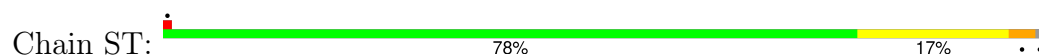
- Molecule 18: 30S ribosomal protein S18



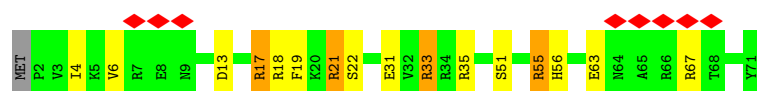
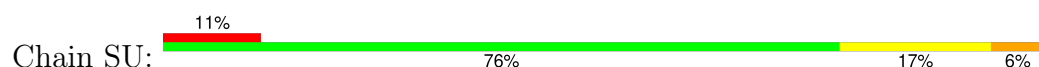
- Molecule 19: Small ribosomal subunit protein uS19



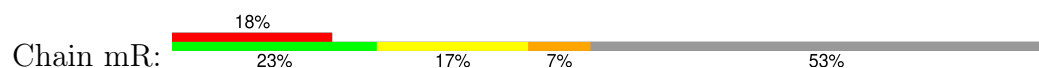
- Molecule 20: 30S ribosomal protein S20



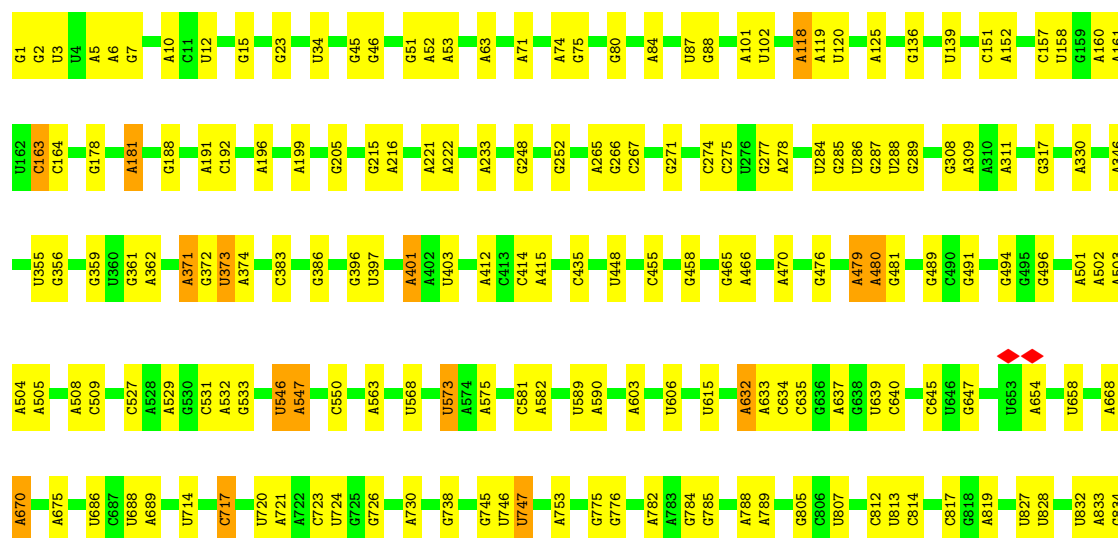
- Molecule 21: 30S ribosomal protein S21



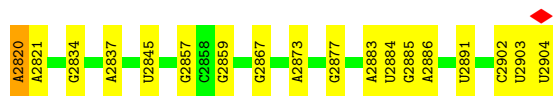
- Molecule 22: Synthetic messenger RNA (mRNA) 60 bp in length



- Molecule 23: 23S ribosomal RNA (rRNA) from the rrnB operon



G2663	G2532	U2419	A2278	G2069	A1913	A1773	U1578	U1379	U1199	C	G962	U839
G2668	A2547	C2422	G2279	G2087	C1914	A1782	A1583	A1383	G1206	A	G974	A845
G2685	C2551	U2429	C2283	A2088	3D1915	U1791	U1584	A1386	G1225	U	A983	U846
G2686	U2552	G2424	A2287	G2093	A1919	G1792	C1585	A1387	A1226	U	A984	U847
U2689	G2553	A2425	A2288	G2094	G1929	G1793	A1586	A1397	G1227	A	C985	C948
U2690	U2554	G2428	U2291	A2095	G1930	C1794	A1603	A1393	G1236	A	U850	A849
C2709	C2555	U2429	U2292	G2096	A1937	G1795	C1607	A1394	G1237	G	G989	U851
G2710	U2556	A2430	U2293	A2101	A1938	G1796	A1608	A1395	G1238	A	C995	U852
A2711	C2557	G2435	U2305	G2102	U1939	U1797	A1609	A1403	A1244	A	A996	G857
G2714	U2562	U2441	C2306	C	U1955	G1798	A1610	G1416	G1245	C	A1000	G858
G2715	A2563	G2442	G2307	U	U1956	G1799	G1613	G1417	A1247	C	G989	G859
G2716	A2564	U2443	G2308	U	C1957	A1801	A1618	G1418	U1249	U	A1009	G869
G2717	G2565	G2444	U2319	A	C1958	A1802	A1619	A1419	G1252	A	U1012	G882
G2718	C2566	U2445	U2320	U	U1963	A1803	U1636	A1420	A1253	A	C1013	G883
A2726	U2567	G2446	A2321	G	U1964	A1808	A1637	C1428	G1256	G	A1014	U884
G2732	U2568	U2447	G2322	U	C1967	A1809	U1647	G1432	A1262	U	G1026	G888
G2733	G2569	A2448	G2323	A	U1971	A1810	U1648	A1433	G1270	C	A1027	C889
U2739	G2570	U2449	U2324	U	G1972	G1811	G1666	A1434	A1271	C	A1028	C990
G2744	C2571	G2450	A2325	G	U1991	U1818	G1667	G1435	A1272	U	A1029	G991
A2748	G2572	U2451	U2326	U	U1992	A1819	U1674	G1436	G1278	C	G1030	U894
G2751	U2573	U2452	A2327	U	U1993	A1820	C1675	C1437	G1279	U	A1046	U895
U2756	A2574	G2453	G2328	G	C1997	G1821	U1680	A1452	C1296	C	G1047	A896
A2757	U2575	U2454	U2329	U	U2022	G1822	U1689	G1453	C1297	U	U1033	C997
C2762	U2576	G2455	G2330	A	C2023	A1823	G1699	A1470	G1300	C	C1052	G907
A2778	G2577	U2456	G2331	U	G2029	A1824	G1721	G1482	A1301	A	A	A910
U2779	U2578	A2457	A2332	C	A2031	A1825	A1722	C1483	A1321	G	G	A911
G2780	C2579	G2458	C2333	U	G2032	A1826	G1723	A1493	U1326	U	A	G914
A2781	U2580	U2459	U2334	U	A2033	A1827	G1724	A1494	A1327	G	U	A917
C2788	U2581	U2460	U2335	G	G2038	G1828	U1729	U1497	A1328	U	U	U919
G2793	G2582	G2461	A2336	A	U2039	G1829	C1730	A1509	U1329	G	G	G923
U2797	U2583	A2462	G2337	U	G2040	G1830	C1731	A1515	G1332	C	A	G930
U2798	C2584	U2463	U2338	U	C2043	A1831	G1732	G1524	G1338	U	U	U931
A2799	U2585	G2464	G2339	G	U2047	A1832	U1736	A1535	U1352	A	A	U932
G2800	U2586	U2465	U2340	A	G2049	G1833	G1737	C1536	G1360	G	A	A933
U2804	C2587	A2466	A2341	U	C2055	U1880	A1738	A1537	A1365	U	A	U934
C2805	U2588	U2467	U2342	C	G2056	C1881	A1744	G1538	A1378	C	C	A941
A2809	G2589	G2468	G2343	A	U2060	U1882	A1745	U1566	G1388	U	A	C946
U2818	U2590	U2469	U2344	G	A2062	G1883	G1763	G1567	G1374	C	C	U855
G2819	C2591	A2470	A2345	U	A2062	G1884	C1764	G1568	A1378	U	U	C961



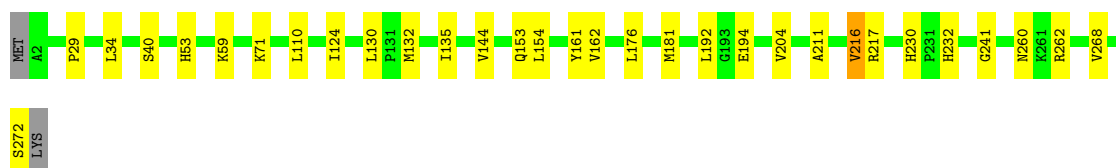
- Molecule 24: 5S ribosomal RNA (rRNA) from the B operon

Chain 5: 76% 21%



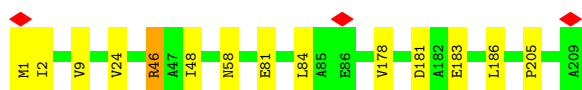
- Molecule 25: 50S ribosomal protein L2

Chain LB: 88% 11%



- Molecule 26: 50S ribosomal protein L3

Chain LC: 93% 6%



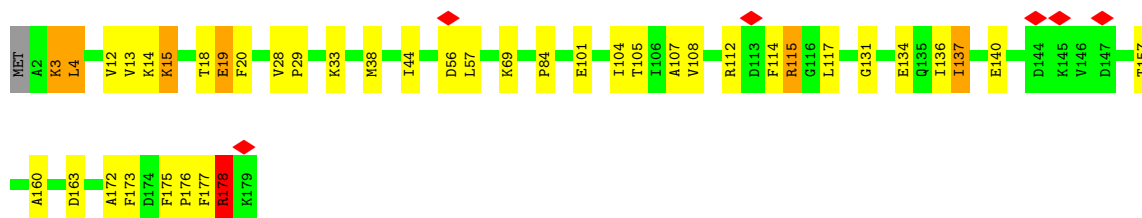
- Molecule 27: Large ribosomal subunit protein uL4

Chain LD: 91% 9%



- Molecule 28: 50S ribosomal protein L5

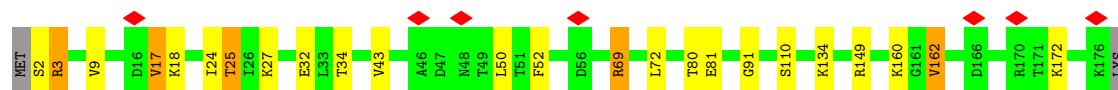
Chain LE: 77% 19%



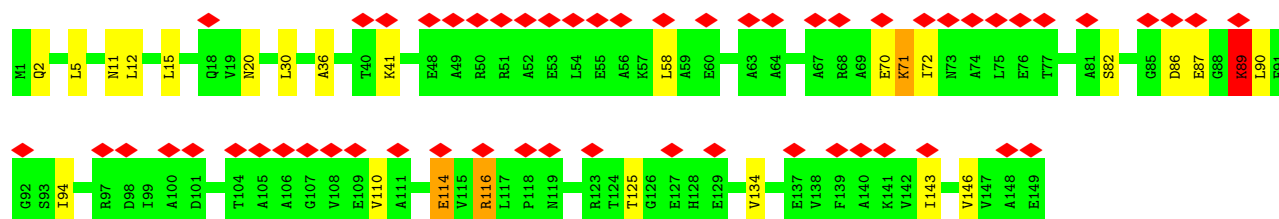
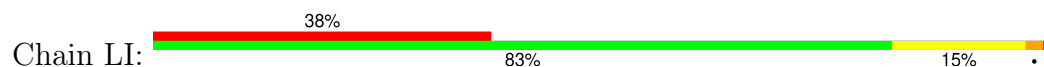
- Molecule 29: 50S ribosomal protein L6

Chain LF: 85% 11%

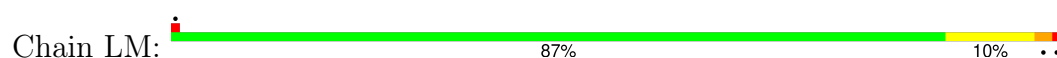




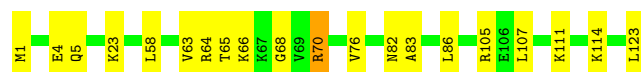
- Molecule 30: 50S ribosomal protein L9



- Molecule 31: 50S ribosomal protein L13



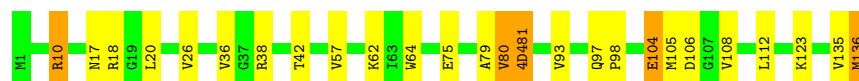
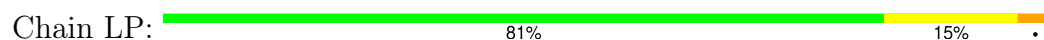
- Molecule 32: 50S ribosomal protein L14



- Molecule 33: 50S ribosomal protein L15



- Molecule 34: 50S ribosomal protein L16

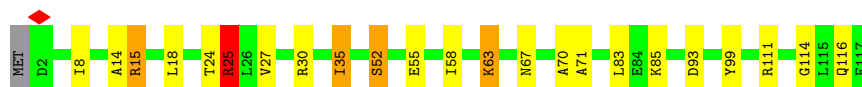
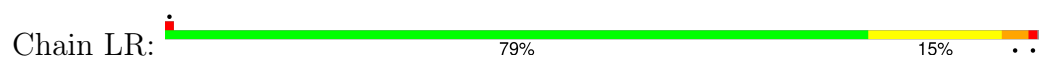


- Molecule 35: 50S ribosomal protein L17

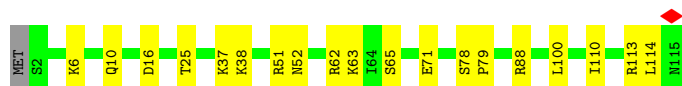
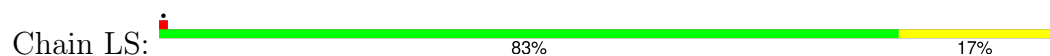




- Molecule 36: 50S ribosomal protein L18



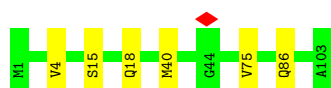
- Molecule 37: 50S ribosomal protein L19



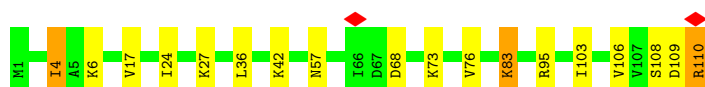
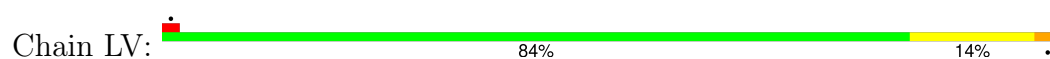
- Molecule 38: 50S ribosomal protein L20



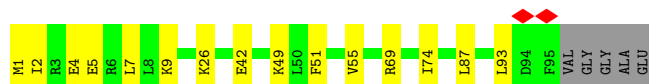
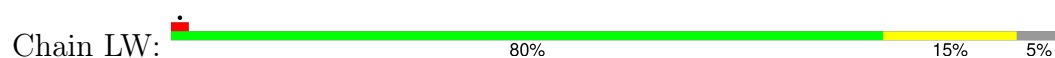
- Molecule 39: 50S ribosomal protein L21



- Molecule 40: Large ribosomal subunit protein uL22



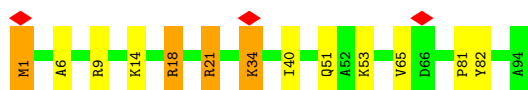
- Molecule 41: 50S ribosomal protein L23



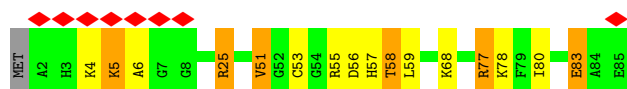
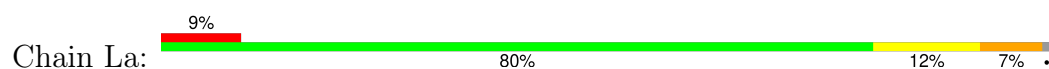
- Molecule 42: 50S ribosomal protein L24



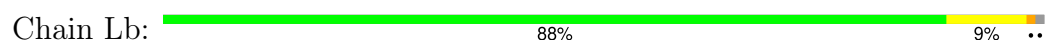
- Molecule 43: 50S ribosomal protein L25



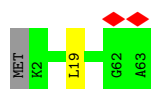
- Molecule 44: 50S ribosomal protein L27



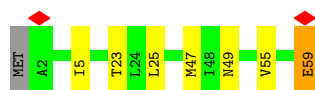
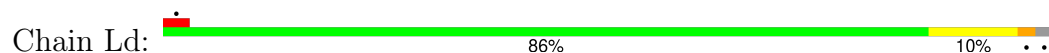
- Molecule 45: 50S ribosomal protein L28



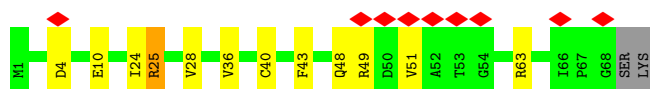
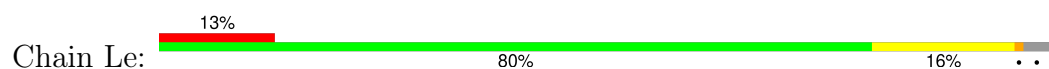
- Molecule 46: 50S ribosomal protein L29



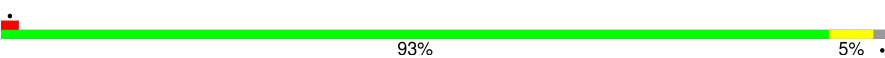
- Molecule 47: 50S ribosomal protein L30

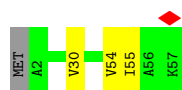


- Molecule 48: 50S ribosomal protein L31



- Molecule 49: 50S ribosomal protein L32

Chain Lf:  93% 5%



- Molecule 50: 50S ribosomal protein L33

Chain Lg:  75% 16% 5%



- Molecule 51: 50S ribosomal protein L34

Chain Lh:  87% 13%



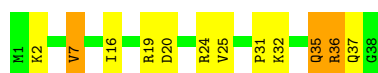
- Molecule 52: 50S ribosomal protein L35

Chain Li:  89% 8%



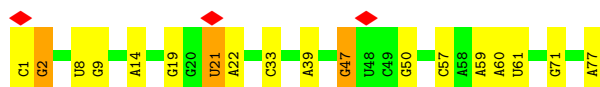
- Molecule 53: 50S ribosomal protein L36

Chain Lj:  68% 24% 8%



- Molecule 54: N-formyl-methionine initiator tRNA (fMet-tRNA^{fMet})

Chain Pt:  77% 19%



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	555112	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	TFS KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	1.45	Depositor
Minimum defocus (nm)	300	Depositor
Maximum defocus (nm)	1500	Depositor
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	0.092	Depositor
Minimum map value	-0.036	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.004	Depositor
Recommended contour level	0.008	Depositor
Map size ($\text{\AA}$)	339.19998, 339.19998, 339.19998	wwPDB
Map dimensions	320, 320, 320	wwPDB
Map angles ($^\circ$)	90.0, 90.0, 90.0	wwPDB
Pixel spacing ($\text{\AA}$)	1.06, 1.06, 1.06	Depositor

5 Model quality ⓘ

5.1 Standard geometry ⓘ

Bond lengths and bond angles in the following residue types are not validated in this section: 5MU, H2U, OMU, MA6, ATP, 5MC, FME, SPD, 4D4, 2MA, OMC, 4OC, PUT, UR3, ZN, MG, 2MG, IAS, G7M, 1MG, D2T, 4SU, 3TD, OMG, 6MZ, K, PSU

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	16	0.34	1/36772 (0.0%)	0.51	0/57358
2	SB	0.43	0/1818	0.78	2/2450 (0.1%)
3	SC	0.40	0/1685	0.70	0/2270
4	SD	0.46	0/1665	0.74	0/2227
5	SE	0.46	0/1179	0.80	1/1584 (0.1%)
6	SF	0.57	1/881 (0.1%)	0.89	2/1189 (0.2%)
7	SG	0.54	0/1257	0.85	1/1686 (0.1%)
8	SH	0.29	0/989	0.60	0/1326
9	SI	0.38	0/1033	0.70	0/1375
10	SJ	0.55	0/805	0.92	1/1089 (0.1%)
11	SK	0.44	0/902	0.64	1/1215 (0.1%)
12	SL	0.38	0/960	0.71	0/1286
13	SM	0.51	0/900	0.81	0/1204
14	SN	0.35	0/817	0.59	0/1088
15	SO	0.39	0/721	0.64	0/964
16	SP	0.46	0/659	0.74	0/884
17	SQ	0.34	0/657	0.66	0/881
18	SR	0.45	0/564	0.77	1/756 (0.1%)
19	SS	0.42	0/680	0.68	0/915
20	ST	0.52	0/675	0.78	0/895
21	SU	0.40	0/597	0.66	0/792
22	mR	0.47	0/695	0.58	0/1081
23	23	0.33	1/66023 (0.0%)	0.51	2/102992 (0.0%)
24	5	0.36	0/2876	0.50	0/4483
25	LB	0.32	0/2121	0.60	0/2852
26	LC	0.37	0/1585	0.65	0/2134
27	LD	0.29	0/1571	0.59	0/2113
28	LE	0.54	2/1444 (0.1%)	0.81	1/1937 (0.1%)
29	LF	0.40	0/1333	0.68	0/1805
30	LI	0.40	0/1122	0.76	1/1515 (0.1%)
31	LM	0.39	0/1152	0.63	0/1551

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
32	LN	0.38	0/955	0.68	0/1279
33	LO	0.31	0/1062	0.59	0/1413
34	LP	0.47	0/1080	0.75	0/1443
35	LQ	0.35	0/973	0.69	0/1301
36	LR	0.54	2/902 (0.2%)	0.80	0/1209
37	LS	0.39	0/928	0.64	0/1242
38	LT	0.33	0/960	0.62	0/1278
39	LU	0.32	0/829	0.57	0/1107
40	LV	0.32	0/864	0.65	1/1156 (0.1%)
41	LW	0.38	0/764	0.63	0/1021
42	LX	0.34	0/787	0.59	0/1051
43	LY	0.35	0/766	0.65	0/1025
44	La	0.51	0/642	0.79	0/848
45	Lb	0.47	0/635	0.76	0/848
46	Lc	0.21	0/502	0.44	0/667
47	Ld	0.44	0/453	0.72	0/605
48	Le	0.39	0/543	0.74	0/726
49	Lf	0.26	0/450	0.53	0/599
50	Lg	0.31	0/433	0.65	0/576
51	Lh	0.41	0/380	0.55	0/498
52	Li	0.47	0/513	0.74	0/676
53	Lj	0.60	1/303 (0.3%)	0.71	0/397
54	Pt	0.44	2/1744 (0.1%)	0.56	0/2716
All	All	0.36	10/153606 (0.0%)	0.57	14/229578 (0.0%)

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	SC	0	4
6	SF	0	3
7	SG	0	2
8	SH	0	1
9	SI	0	1
10	SJ	0	4
11	SK	0	2
12	SL	0	1
13	SM	0	2
14	SN	0	2
16	SP	0	1

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Mol	Chain	#Chirality outliers	#Planarity outliers
18	SR	0	2
19	SS	0	2
20	ST	0	1
21	SU	0	4
26	LC	0	1
28	LE	0	2
29	LF	0	2
30	LI	0	1
31	LM	0	2
32	LN	0	1
34	LP	0	1
35	LQ	0	2
36	LR	0	2
37	LS	0	2
38	LT	0	1
40	LV	0	1
43	LY	0	3
44	La	0	2
45	Lb	0	1
48	Le	0	2
51	Lh	0	1
52	Li	0	1
53	Lj	0	1
All	All	0	61

The worst 5 of 10 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
28	LE	178	ARG	C-N	8.06	1.44	1.33
28	LE	177	PHE	C-N	7.37	1.44	1.33
36	LR	14	ALA	C-N	-6.17	1.25	1.33
6	SF	40	GLU	C-N	6.10	1.42	1.33
53	Lj	35	GLN	C-N	5.72	1.41	1.33

The worst 5 of 14 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	SB	130	THR	N-CA-C	-7.71	103.77	113.02
7	SG	69	VAL	N-CA-C	-6.63	107.03	113.53
11	SK	74	VAL	N-CA-C	-6.17	107.24	113.47
10	SJ	89	ARG	N-CA-C	-6.10	106.16	113.97
6	SF	17	GLN	CA-C-N	-6.04	115.50	120.33

There are no chirality outliers.

5 of 61 planarity outliers are listed below:

Mol	Chain	Res	Type	Group
3	SC	131	ARG	Sidechain
3	SC	136	ARG	Sidechain
3	SC	54	ARG	Sidechain
3	SC	59	ARG	Sidechain
6	SF	24	ARG	Sidechain

5.2 Too-close contacts

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	16	33092	0	16675	144	0
2	SB	1787	0	1812	20	0
3	SC	1658	0	1732	13	0
4	SD	1643	0	1707	16	0
5	SE	1166	0	1212	14	0
6	SF	862	0	864	14	0
7	SG	1236	0	1290	20	0
8	SH	979	0	1031	5	0
9	SI	1021	0	1070	5	0
10	SJ	795	0	836	17	0
11	SK	895	0	905	8	0
12	SL	957	0	1017	6	0
13	SM	891	0	952	9	0
14	SN	805	0	844	9	0
15	SO	713	0	734	3	0
16	SP	649	0	666	11	0
17	SQ	648	0	691	8	0
18	SR	555	0	578	5	0
19	SS	663	0	688	8	0
20	ST	669	0	719	13	0
21	SU	589	0	629	6	0
22	mR	621	0	312	10	0
23	23	59424	0	29905	170	0
24	5	2572	0	1301	9	0
25	LB	2082	0	2153	20	0
26	LC	1564	0	1616	5	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
27	LD	1552	0	1619	10	0
28	LE	1420	0	1457	27	0
29	LF	1313	0	1358	10	0
30	LI	1111	0	1148	14	0
31	LM	1129	0	1162	13	0
32	LN	946	0	1023	9	0
33	LO	1053	0	1128	6	0
34	LP	1074	0	1154	17	0
35	LQ	960	0	1000	3	0
36	LR	892	0	923	9	0
37	LS	916	0	962	9	0
38	LT	947	0	1019	4	0
39	LU	816	0	839	2	0
40	LV	857	0	922	9	0
41	LW	757	0	820	7	0
42	LX	779	0	830	3	0
43	LY	753	0	780	7	0
44	La	634	0	653	12	0
45	Lb	625	0	652	4	0
46	Lc	501	0	531	1	0
47	Ld	449	0	488	3	0
48	Le	533	0	530	3	0
49	Lf	444	0	458	1	0
50	Lg	426	0	464	7	0
51	Lh	377	0	418	2	0
52	Li	504	0	572	4	0
53	Lj	302	0	340	9	0
54	Pt	1646	0	843	2	0
55	16	6	0	12	0	0
55	23	48	0	96	0	0
56	16	10	0	19	0	0
56	23	40	0	76	0	0
57	16	75	0	0	0	0
57	23	185	0	0	0	0
57	5	6	0	0	0	0
57	LB	2	0	0	0	0
57	LC	1	0	0	0	0
57	LD	1	0	0	0	0
57	Lf	1	0	0	0	0
57	Pt	2	0	0	0	0
57	mR	3	0	0	0	0
58	16	8	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
58	23	46	0	0	0	0
58	LB	1	0	0	0	0
58	LX	1	0	0	0	0
59	Le	1	0	0	0	0
59	Lj	1	0	0	0	0
59	SB	1	0	0	0	0
60	23	62	0	24	0	0
61	Pt	10	0	10	0	0
All	All	142763	0	96269	691	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 3.

The worst 5 of 691 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)
23:23:2494:G:O2'	34:LP:79:ALA:HA	1.71	0.88
53:Lj:7:VAL:HG22	53:Lj:35:GLN:HG3	1.56	0.87
1:16:1402:4OC:H5	1:16:1500:A:H61	1.44	0.82
1:16:9:G:H5'	5:SE:108:GLY:HA3	1.62	0.81
1:16:406:G:H21	4:SD:116:GLN:HE22	1.30	0.80

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	
2	SB	227/241 (94%)	216 (95%)	11 (5%)	0	100	100
3	SC	210/233 (90%)	202 (96%)	8 (4%)	0	100	100
4	SD	203/206 (98%)	202 (100%)	1 (0%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
5	SE	156/167 (93%)	153 (98%)	3 (2%)	0	100	100
6	SF	104/135 (77%)	103 (99%)	1 (1%)	0	100	100
7	SG	154/179 (86%)	149 (97%)	5 (3%)	0	100	100
8	SH	127/130 (98%)	123 (97%)	4 (3%)	0	100	100
9	SI	125/130 (96%)	115 (92%)	10 (8%)	0	100	100
10	SJ	97/103 (94%)	91 (94%)	4 (4%)	2 (2%)	5	3
11	SK	115/129 (89%)	109 (95%)	6 (5%)	0	100	100
12	SL	120/124 (97%)	117 (98%)	2 (2%)	1 (1%)	16	16
13	SM	113/118 (96%)	105 (93%)	8 (7%)	0	100	100
14	SN	98/101 (97%)	98 (100%)	0	0	100	100
15	SO	86/89 (97%)	84 (98%)	2 (2%)	0	100	100
16	SP	80/82 (98%)	76 (95%)	3 (4%)	1 (1%)	9	8
17	SQ	78/84 (93%)	76 (97%)	2 (3%)	0	100	100
18	SR	65/75 (87%)	62 (95%)	3 (5%)	0	100	100
19	SS	81/91 (89%)	80 (99%)	1 (1%)	0	100	100
20	ST	84/87 (97%)	83 (99%)	1 (1%)	0	100	100
21	SU	68/71 (96%)	68 (100%)	0	0	100	100
25	LB	269/273 (98%)	263 (98%)	6 (2%)	0	100	100
26	LC	207/209 (99%)	201 (97%)	6 (3%)	0	100	100
27	LD	199/201 (99%)	197 (99%)	2 (1%)	0	100	100
28	LE	176/179 (98%)	167 (95%)	9 (5%)	0	100	100
29	LF	173/177 (98%)	163 (94%)	10 (6%)	0	100	100
30	LI	147/149 (99%)	128 (87%)	18 (12%)	1 (1%)	18	19
31	LM	140/142 (99%)	138 (99%)	2 (1%)	0	100	100
32	LN	121/123 (98%)	120 (99%)	1 (1%)	0	100	100
33	LO	142/144 (99%)	138 (97%)	4 (3%)	0	100	100
34	LP	133/136 (98%)	128 (96%)	5 (4%)	0	100	100
35	LQ	118/127 (93%)	114 (97%)	4 (3%)	0	100	100
36	LR	114/117 (97%)	107 (94%)	7 (6%)	0	100	100
37	LS	112/115 (97%)	107 (96%)	5 (4%)	0	100	100
38	LT	115/118 (98%)	114 (99%)	1 (1%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
39	LU	101/103 (98%)	96 (95%)	5 (5%)	0	100	100
40	LV	108/110 (98%)	105 (97%)	3 (3%)	0	100	100
41	LW	93/100 (93%)	91 (98%)	2 (2%)	0	100	100
42	LX	100/104 (96%)	98 (98%)	2 (2%)	0	100	100
43	LY	92/94 (98%)	92 (100%)	0	0	100	100
44	La	82/85 (96%)	78 (95%)	4 (5%)	0	100	100
45	Lb	75/78 (96%)	74 (99%)	1 (1%)	0	100	100
46	Lc	60/63 (95%)	60 (100%)	0	0	100	100
47	Ld	56/59 (95%)	52 (93%)	4 (7%)	0	100	100
48	Le	66/70 (94%)	60 (91%)	6 (9%)	0	100	100
49	Lf	54/57 (95%)	52 (96%)	2 (4%)	0	100	100
50	Lg	50/55 (91%)	48 (96%)	2 (4%)	0	100	100
51	Lh	44/46 (96%)	43 (98%)	1 (2%)	0	100	100
52	Li	62/65 (95%)	60 (97%)	2 (3%)	0	100	100
53	Lj	36/38 (95%)	34 (94%)	2 (6%)	0	100	100
All	All	5636/5912 (95%)	5440 (96%)	191 (3%)	5 (0%)	49	57

All (5) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
10	SJ	38	GLY
10	SJ	57	VAL
30	LI	89	LYS
12	SL	44	LYS
16	SP	48	GLU

5.3.2 Protein sidechains ⓘ

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
2	SB	190/199 (96%)	177 (93%)	13 (7%)	14	17
3	SC	172/190 (90%)	162 (94%)	10 (6%)	18	22
4	SD	172/173 (99%)	164 (95%)	8 (5%)	23	31
5	SE	120/126 (95%)	114 (95%)	6 (5%)	22	28
6	SF	92/116 (79%)	83 (90%)	9 (10%)	7	8
7	SG	129/147 (88%)	114 (88%)	15 (12%)	5	5
8	SH	104/105 (99%)	100 (96%)	4 (4%)	29	40
9	SI	105/107 (98%)	102 (97%)	3 (3%)	37	51
10	SJ	87/90 (97%)	77 (88%)	10 (12%)	5	5
11	SK	91/98 (93%)	86 (94%)	5 (6%)	19	24
12	SL	102/103 (99%)	96 (94%)	6 (6%)	18	22
13	SM	93/96 (97%)	84 (90%)	9 (10%)	8	8
14	SN	83/84 (99%)	80 (96%)	3 (4%)	31	42
15	SO	76/77 (99%)	74 (97%)	2 (3%)	40	55
16	SP	65/65 (100%)	59 (91%)	6 (9%)	8	9
17	SQ	74/78 (95%)	69 (93%)	5 (7%)	14	17
18	SR	58/65 (89%)	54 (93%)	4 (7%)	14	16
19	SS	72/78 (92%)	60 (83%)	12 (17%)	2	2
20	ST	65/66 (98%)	58 (89%)	7 (11%)	6	6
21	SU	60/61 (98%)	54 (90%)	6 (10%)	7	7
25	LB	216/218 (99%)	212 (98%)	4 (2%)	50	66
26	LC	164/164 (100%)	159 (97%)	5 (3%)	36	49
27	LD	165/165 (100%)	161 (98%)	4 (2%)	43	58
28	LE	149/150 (99%)	139 (93%)	10 (7%)	15	17
29	LF	136/138 (99%)	128 (94%)	8 (6%)	18	22
30	LI	114/114 (100%)	107 (94%)	7 (6%)	17	20
31	LM	116/116 (100%)	112 (97%)	4 (3%)	32	44
32	LN	104/104 (100%)	99 (95%)	5 (5%)	23	30
33	LO	103/103 (100%)	100 (97%)	3 (3%)	37	51
34	LP	108/108 (100%)	100 (93%)	8 (7%)	13	14
35	LQ	100/103 (97%)	99 (99%)	1 (1%)	68	81
36	LR	86/87 (99%)	77 (90%)	9 (10%)	6	6

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
37	LS	99/100 (99%)	98 (99%)	1 (1%)	68	81
38	LT	89/90 (99%)	89 (100%)	0	100	100
39	LU	84/84 (100%)	82 (98%)	2 (2%)	43	58
40	LV	93/93 (100%)	87 (94%)	6 (6%)	15	18
41	LW	82/84 (98%)	80 (98%)	2 (2%)	43	58
42	LX	83/85 (98%)	82 (99%)	1 (1%)	63	78
43	LY	78/78 (100%)	73 (94%)	5 (6%)	16	19
44	La	62/63 (98%)	55 (89%)	7 (11%)	5	5
45	Lb	67/68 (98%)	64 (96%)	3 (4%)	24	33
46	Lc	54/55 (98%)	54 (100%)	0	100	100
47	Ld	48/49 (98%)	45 (94%)	3 (6%)	16	19
48	Le	60/62 (97%)	52 (87%)	8 (13%)	4	3
49	Lf	47/48 (98%)	46 (98%)	1 (2%)	47	63
50	Lg	47/49 (96%)	45 (96%)	2 (4%)	26	35
51	Lh	38/38 (100%)	37 (97%)	1 (3%)	40	55
52	Li	51/52 (98%)	50 (98%)	1 (2%)	48	64
53	Lj	34/34 (100%)	30 (88%)	4 (12%)	5	5
All	All	4687/4826 (97%)	4429 (94%)	258 (6%)	21	24

5 of 258 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
44	La	56	ASP
47	Ld	49	ASN
13	SM	101	ARG
13	SM	42	ASP
48	Le	24	ILE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 116 such sidechains are listed below:

Mol	Chain	Res	Type
28	LE	63	GLN
49	Lf	6	ASN
32	LN	88	ASN
49	Lf	4	GLN

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Mol	Chain	Res	Type
44	La	76	ASN

5.3.3 RNA ⓘ

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
1	16	1541/1542 (99%)	241 (15%)	4 (0%)
22	mR	26/60 (43%)	12 (46%)	0
23	23	2764/2904 (95%)	409 (14%)	11 (0%)
24	5	119/120 (99%)	18 (15%)	0
54	Pt	76/77 (98%)	13 (17%)	0
All	All	4526/4703 (96%)	693 (15%)	15 (0%)

5 of 693 RNA backbone outliers are listed below:

Mol	Chain	Res	Type
1	16	5	U
1	16	6	G
1	16	9	G
1	16	22	G
1	16	32	A

5 of 15 RNA pucker outliers are listed below:

Mol	Chain	Res	Type
23	23	827	U
23	23	2689	U
23	23	858	G
23	23	2756	U
23	23	2324	U

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

40 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
1	2MG	16	1516	1	23,26,27	1.24	4 (17%)	33,38,41	2.19	7 (21%)
1	2MG	16	966	1	23,26,27	1.26	4 (17%)	33,38,41	2.14	6 (18%)
23	PSU	23	2457	23	18,21,22	1.39	3 (16%)	21,30,33	2.17	4 (19%)
23	OMG	23	2251	54,23	23,26,27	1.22	3 (13%)	32,38,41	2.05	7 (21%)
1	MA6	16	1518	1	23,26,27	1.55	5 (21%)	33,38,41	2.22	10 (30%)
1	5MC	16	967	1	19,22,23	1.57	3 (15%)	26,32,35	1.12	2 (7%)
12	D2T	SL	89	12	8,9,10	7.08	2 (25%)	6,11,13	2.60	3 (50%)
23	OMC	23	2498	23,57	19,22,23	0.83	0	25,31,34	1.05	1 (4%)
1	4OC	16	1402	1,57	20,23,24	0.78	0	25,32,35	2.08	7 (28%)
23	6MZ	23	2030	23	22,25,26	1.49	5 (22%)	29,36,39	2.46	11 (37%)
54	4SU	Pt	8	54	18,21,22	1.87	5 (27%)	25,30,33	2.30	5 (20%)
23	2MG	23	1835	23	23,26,27	1.27	4 (17%)	33,38,41	2.35	7 (21%)
34	4D4	LP	81	34	9,11,12	2.03	2 (22%)	7,13,15	1.78	3 (42%)
23	PSU	23	955	23	18,21,22	1.44	4 (22%)	21,30,33	2.06	3 (14%)
23	PSU	23	2504	23,58	18,21,22	1.57	4 (22%)	21,30,33	2.15	4 (19%)
1	2MG	16	1207	1	23,26,27	1.26	4 (17%)	33,38,41	2.21	6 (18%)
23	5MU	23	747	23	19,22,23	1.41	5 (26%)	27,32,35	2.19	9 (33%)
23	G7M	23	2069	23	23,26,27	0.68	1 (4%)	34,39,42	0.63	1 (2%)
23	PSU	23	2604	23	18,21,22	1.68	5 (27%)	21,30,33	2.24	5 (23%)
1	5MC	16	1407	1	19,22,23	1.54	3 (15%)	26,32,35	1.20	3 (11%)
54	G7M	Pt	47	54	23,26,27	0.72	1 (4%)	34,39,42	0.62	1 (2%)
1	PSU	16	516	1,57	18,21,22	1.36	3 (16%)	21,30,33	2.06	4 (19%)
23	2MG	23	2445	23	23,26,27	1.25	3 (13%)	33,38,41	2.27	7 (21%)
1	G7M	16	527	1	23,26,27	0.71	1 (4%)	34,39,42	0.68	1 (2%)
23	PSU	23	2605	23	18,21,22	1.52	5 (27%)	21,30,33	2.31	4 (19%)
23	PSU	23	746	23,57	18,21,22	1.41	3 (16%)	21,30,33	2.04	4 (19%)
1	MA6	16	1519	1	23,26,27	1.54	5 (21%)	33,38,41	2.20	10 (30%)
54	OMC	Pt	33	54	19,22,23	0.86	0	25,31,34	1.33	3 (12%)
11	IAS	SK	119	11	6,7,8	1.34	1 (16%)	3,8,10	0.65	0
23	5MU	23	1939	23,58	19,22,23	1.54	4 (21%)	27,32,35	2.34	6 (22%)
23	PSU	23	2580	23	18,21,22	1.39	3 (16%)	21,30,33	2.12	4 (19%)
23	OMU	23	2552	23	19,22,23	1.22	3 (15%)	25,31,34	1.80	6 (24%)
1	UR3	16	1498	1	19,22,23	0.94	0	26,32,35	1.70	4 (15%)
23	H2U	23	2449	23	18,21,22	1.09	3 (16%)	19,30,33	0.94	1 (5%)
23	2MA	23	2503	23,57,58	22,25,26	1.50	4 (18%)	32,37,40	2.38	8 (25%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
23	6MZ	23	1618	23	22,25,26	1.46	4 (18%)	29,36,39	2.21	10 (34%)
23	3TD	23	1915	23	19,22,23	1.22	2 (10%)	23,32,35	2.07	3 (13%)
23	5MC	23	1962	23,58	19,22,23	1.66	3 (15%)	26,32,35	1.08	2 (7%)
23	1MG	23	745	23	23,26,27	1.19	3 (13%)	33,39,42	1.74	5 (15%)
54	H2U	Pt	21	54	18,21,22	0.96	2 (11%)	19,30,33	0.71	0

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
1	2MG	16	1516	1	-	0/9/27/28	0/3/3/3
1	2MG	16	966	1	-	0/9/27/28	0/3/3/3
23	PSU	23	2457	23	-	0/7/25/26	0/2/2/2
23	OMG	23	2251	54,23	-	1/9/27/28	0/3/3/3
1	MA6	16	1518	1	-	0/11/29/30	0/3/3/3
1	5MC	16	967	1	-	0/7/25/26	0/2/2/2
12	D2T	SL	89	12	-	4/7/12/14	-
23	OMC	23	2498	23,57	-	0/9/27/28	0/2/2/2
1	4OC	16	1402	1,57	-	2/9/29/30	0/2/2/2
23	6MZ	23	2030	23	-	2/9/27/28	0/3/3/3
54	4SU	Pt	8	54	-	0/7/25/26	0/2/2/2
23	2MG	23	1835	23	-	0/9/27/28	0/3/3/3
34	4D4	LP	81	34	-	3/11/12/14	-
23	PSU	23	955	23	-	0/7/25/26	0/2/2/2
23	PSU	23	2504	23,58	-	2/7/25/26	0/2/2/2
1	2MG	16	1207	1	-	0/9/27/28	0/3/3/3
23	5MU	23	747	23	-	1/7/25/26	0/2/2/2
23	G7M	23	2069	23	-	1/7/25/26	0/3/3/3
23	PSU	23	2604	23	-	2/7/25/26	0/2/2/2
1	5MC	16	1407	1	-	0/7/25/26	0/2/2/2
54	G7M	Pt	47	54	-	2/7/25/26	0/3/3/3
1	PSU	16	516	1,57	-	0/7/25/26	0/2/2/2
23	2MG	23	2445	23	-	2/9/27/28	0/3/3/3
1	G7M	16	527	1	-	3/7/25/26	0/3/3/3
23	PSU	23	2605	23	-	0/7/25/26	0/2/2/2
23	PSU	23	746	23,57	-	2/7/25/26	0/2/2/2
1	MA6	16	1519	1	-	4/11/29/30	0/3/3/3

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
54	OMC	Pt	33	54	-	0/9/27/28	0/2/2/2
11	IAS	SK	119	11	-	0/7/7/8	-
23	5MU	23	1939	23,58	-	0/7/25/26	0/2/2/2
23	PSU	23	2580	23	-	0/7/25/26	0/2/2/2
23	OMU	23	2552	23	-	0/9/27/28	0/2/2/2
1	UR3	16	1498	1	-	0/7/25/26	0/2/2/2
23	H2U	23	2449	23	-	0/7/38/39	0/2/2/2
23	2MA	23	2503	23,57,58	-	2/7/25/26	0/3/3/3
23	6MZ	23	1618	23	-	2/9/27/28	0/3/3/3
23	3TD	23	1915	23	-	2/7/25/26	0/2/2/2
23	5MC	23	1962	23,58	-	0/7/25/26	0/2/2/2
23	1MG	23	745	23	-	0/7/25/26	0/3/3/3
54	H2U	Pt	21	54	-	2/7/38/39	0/2/2/2

The worst 5 of 119 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
12	SL	89	D2T	CB-CA	-19.05	1.48	1.54
23	23	1962	5MC	C5-C4	6.12	1.48	1.44
1	16	967	5MC	C5-C4	5.71	1.48	1.44
1	16	1407	5MC	C5-C4	5.47	1.48	1.44
54	Pt	8	4SU	C4-S4	-5.11	1.59	1.68

The worst 5 of 187 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
23	23	2503	2MA	C5-C4-N3	-8.44	118.29	127.18
23	23	1835	2MG	C2-N3-C4	7.95	121.95	112.00
23	23	2445	2MG	C2-N3-C4	7.65	121.58	112.00
1	16	1207	2MG	C2-N3-C4	7.35	121.19	112.00
23	23	2605	PSU	N1-C2-N3	7.18	122.74	115.17

There are no chirality outliers.

5 of 39 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
1	16	1402	4OC	O4'-C1'-N1-C2
1	16	1402	4OC	O4'-C1'-N1-C6
1	16	1519	MA6	O4'-C4'-C5'-O5'
12	SL	89	D2T	CA-CB-CG-OD1
12	SL	89	D2T	CA-CB-CG-OD2

There are no ring outliers.

7 monomers are involved in 10 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
1	16	1402	4OC	1	0
23	23	2030	6MZ	1	0
34	LP	81	4D4	3	0
23	23	2604	PSU	1	0
23	23	1939	5MU	2	0
23	23	2503	2MA	1	0
23	23	1915	3TD	2	0

5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 352 ligands modelled in this entry, 335 are monoatomic - leaving 17 for Mogul analysis.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\# Z > 2$	Counts	RMSZ	$\# Z > 2$
61	FME	Pt	101	54	8,9,10	0.59	0	8,9,11	1.14	1 (12%)
55	PUT	23	3004	-	5,5,5	0.13	0	4,4,4	0.22	0
56	SPD	16	1602	-	9,9,9	0.16	0	8,8,8	0.20	0
56	SPD	23	3012	-	9,9,9	0.24	0	8,8,8	0.30	0
56	SPD	23	3013	-	9,9,9	0.27	0	8,8,8	0.28	0
60	ATP	23	3001	-	32,33,33	0.33	0	48,52,52	0.34	0
55	PUT	16	1601	-	5,5,5	0.13	0	4,4,4	0.23	0
55	PUT	23	3006	-	5,5,5	0.11	0	4,4,4	0.20	0
55	PUT	23	3003	-	5,5,5	0.14	0	4,4,4	0.15	0
55	PUT	23	3008	-	5,5,5	0.14	0	4,4,4	0.20	0
56	SPD	23	3014	-	9,9,9	0.26	0	8,8,8	0.20	0
55	PUT	23	3009	-	5,5,5	0.11	0	4,4,4	0.17	0
55	PUT	23	3010	-	5,5,5	0.14	0	4,4,4	0.19	0
60	ATP	23	3002	-	32,33,33	0.27	0	48,52,52	0.36	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
55	PUT	23	3007	-	5,5,5	0.10	0	4,4,4	0.28	0
55	PUT	23	3005	-	5,5,5	0.18	0	4,4,4	0.24	0
56	SPD	23	3011	-	9,9,9	0.27	0	8,8,8	0.27	0

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
61	FME	Pt	101	54	-	4/7/9/11	-
55	PUT	23	3004	-	-	1/3/3/3	-
56	SPD	16	1602	-	-	3/7/7/7	-
56	SPD	23	3012	-	-	2/7/7/7	-
56	SPD	23	3013	-	-	2/7/7/7	-
60	ATP	23	3001	-	-	4/22/38/38	0/3/3/3
55	PUT	16	1601	-	-	2/3/3/3	-
55	PUT	23	3006	-	-	2/3/3/3	-
55	PUT	23	3003	-	-	1/3/3/3	-
55	PUT	23	3008	-	-	0/3/3/3	-
56	SPD	23	3014	-	-	2/7/7/7	-
55	PUT	23	3009	-	-	1/3/3/3	-
55	PUT	23	3010	-	-	1/3/3/3	-
60	ATP	23	3002	-	-	3/22/38/38	0/3/3/3
55	PUT	23	3007	-	-	1/3/3/3	-
55	PUT	23	3005	-	-	1/3/3/3	-
56	SPD	23	3011	-	-	2/7/7/7	-

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
61	Pt	101	FME	O-C-CA	-2.85	117.43	124.77

There are no chirality outliers.

5 of 32 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
60	23	3001	ATP	PB-O3B-PG-O2G

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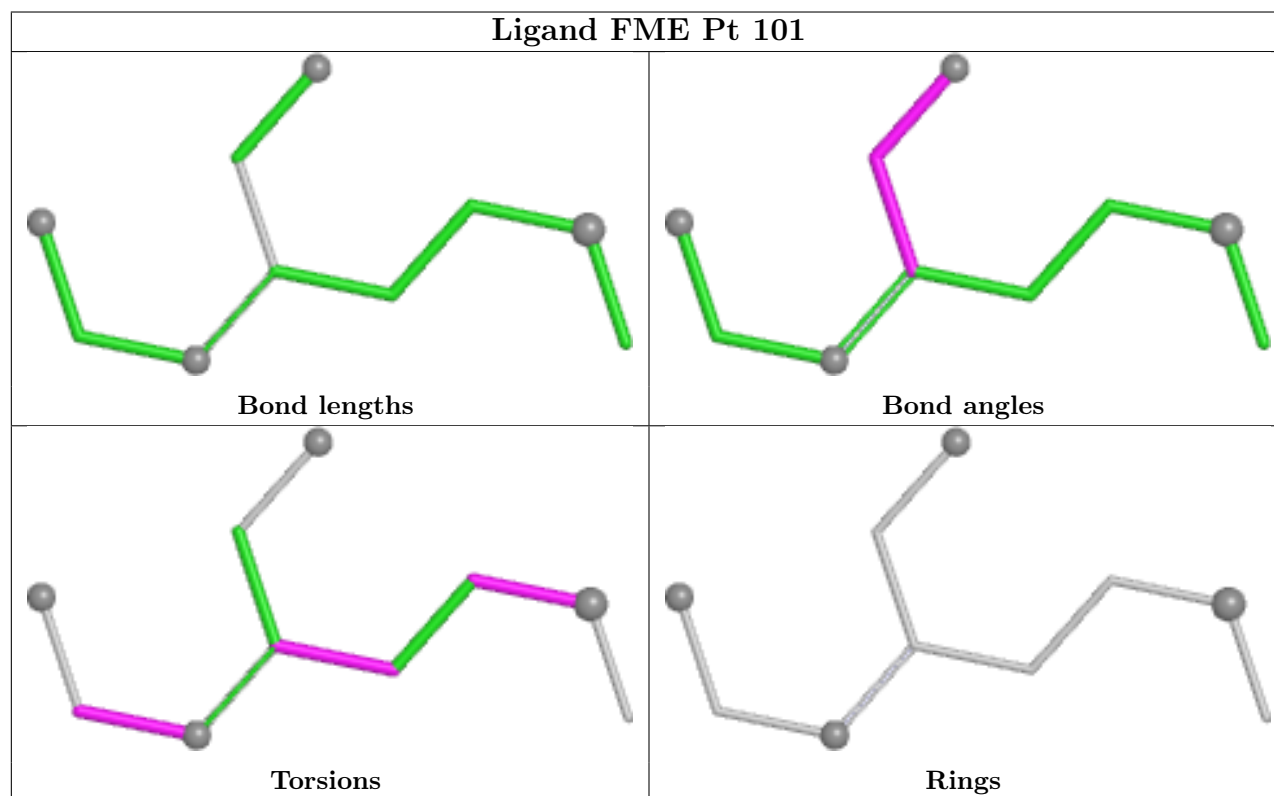
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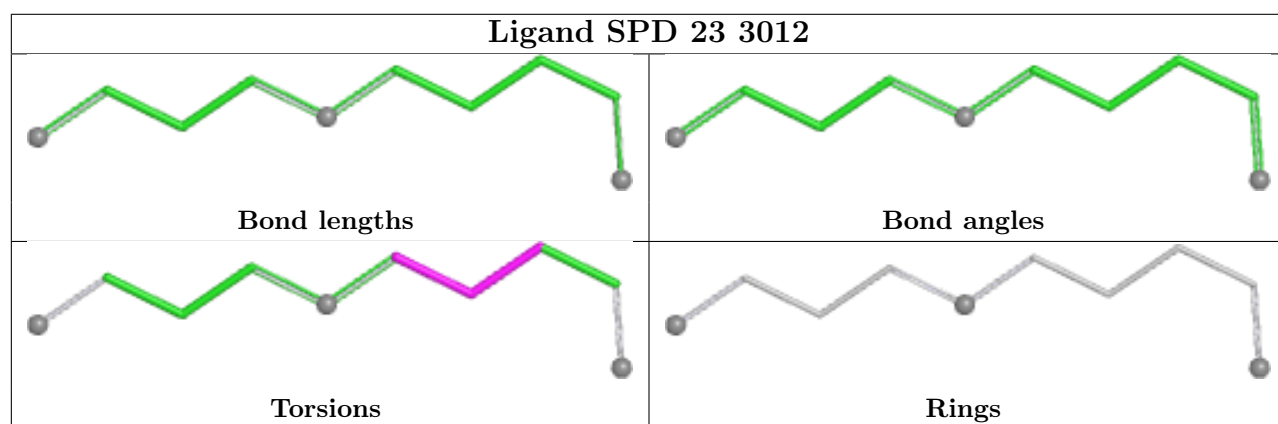
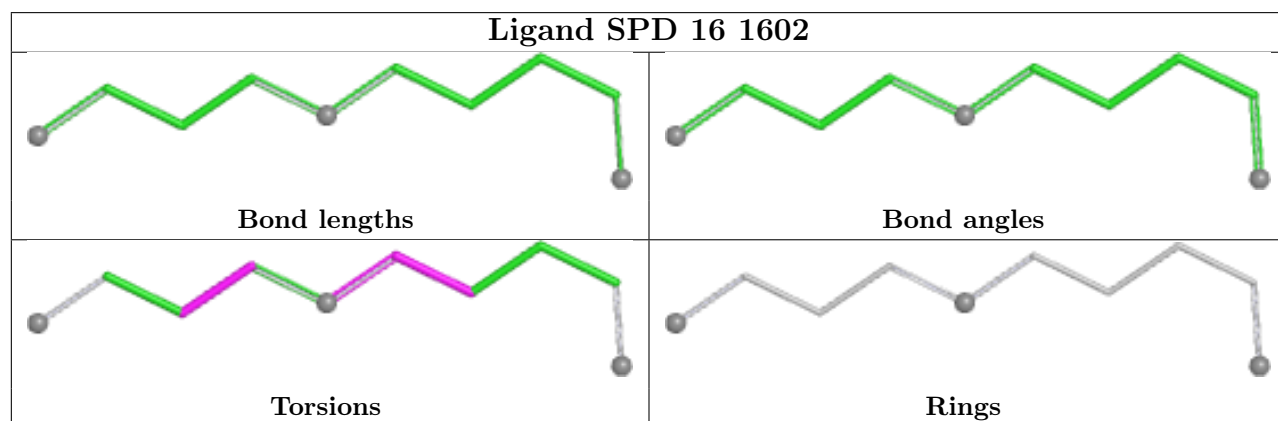
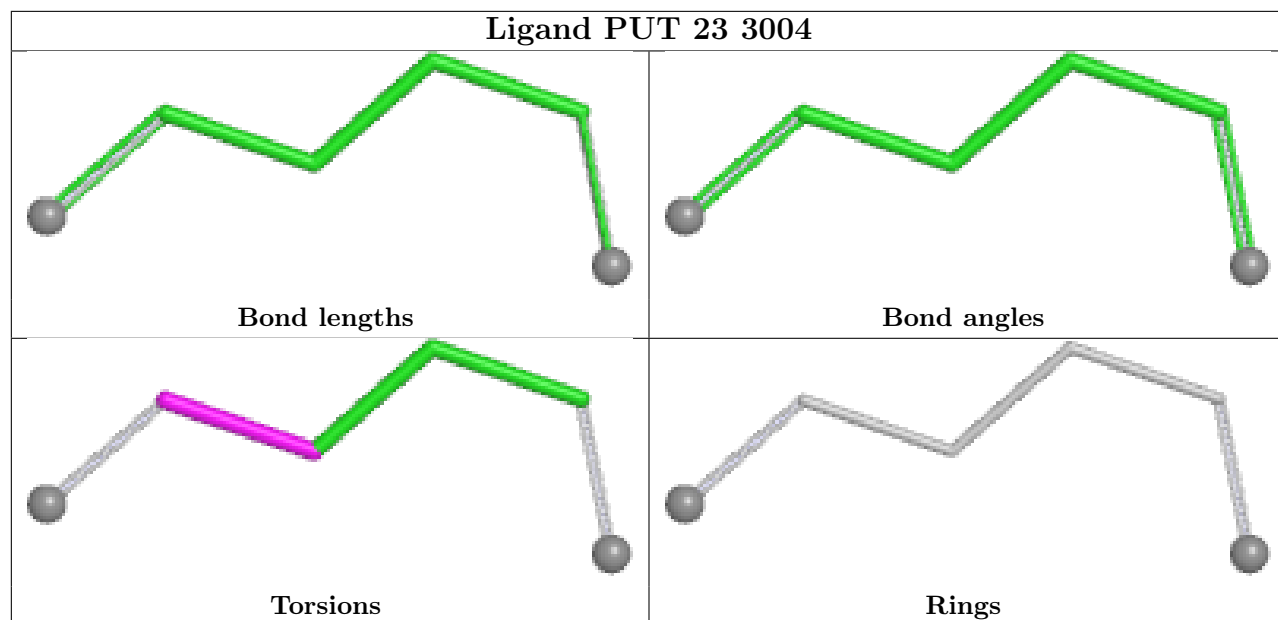
Mol	Chain	Res	Type	Atoms
61	Pt	101	FME	O1-CN-N-CA
61	Pt	101	FME	N-CA-CB-CG
56	16	1602	SPD	N6-C7-C8-C9
55	23	3005	PUT	C1-C2-C3-C4

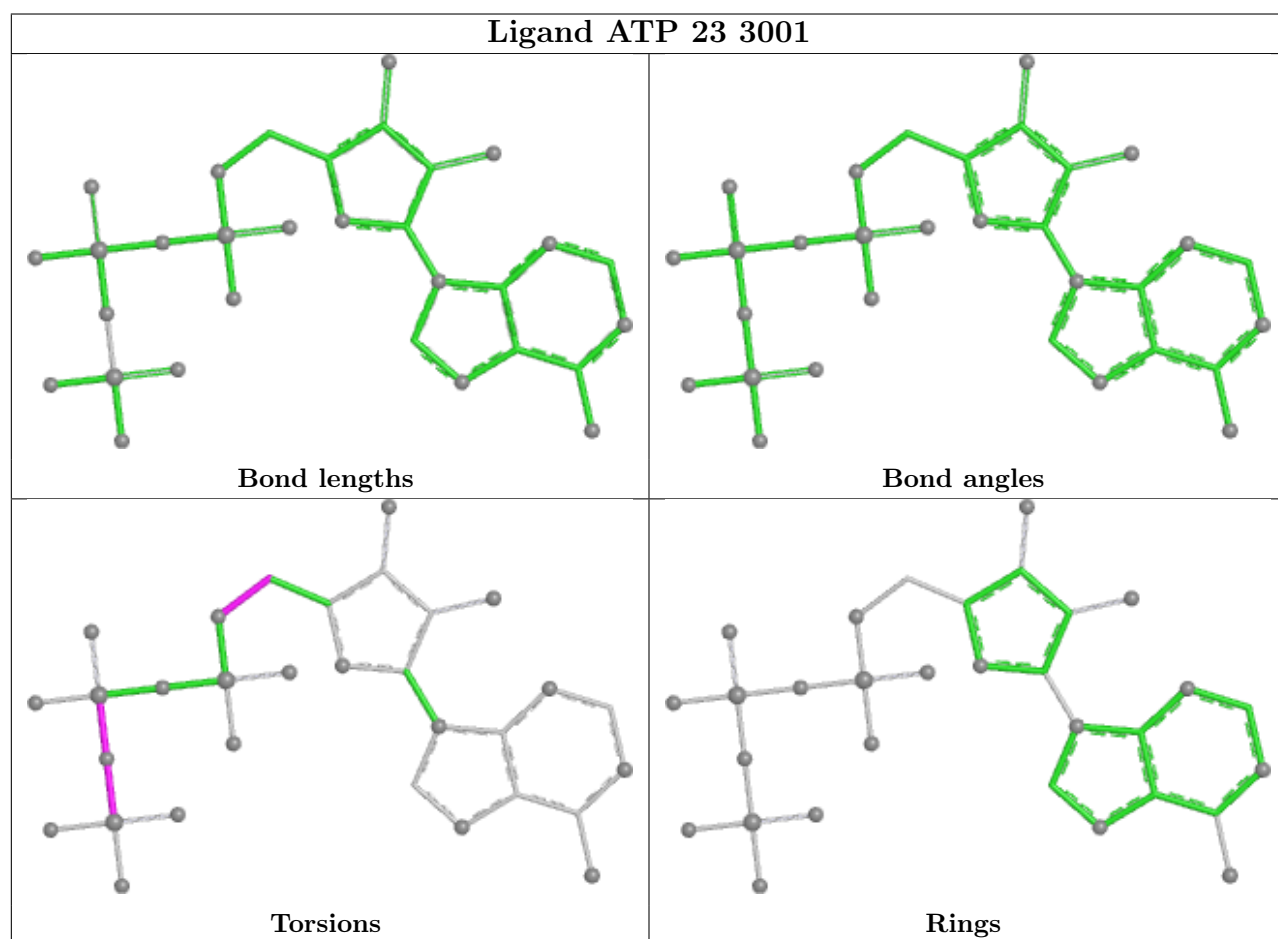
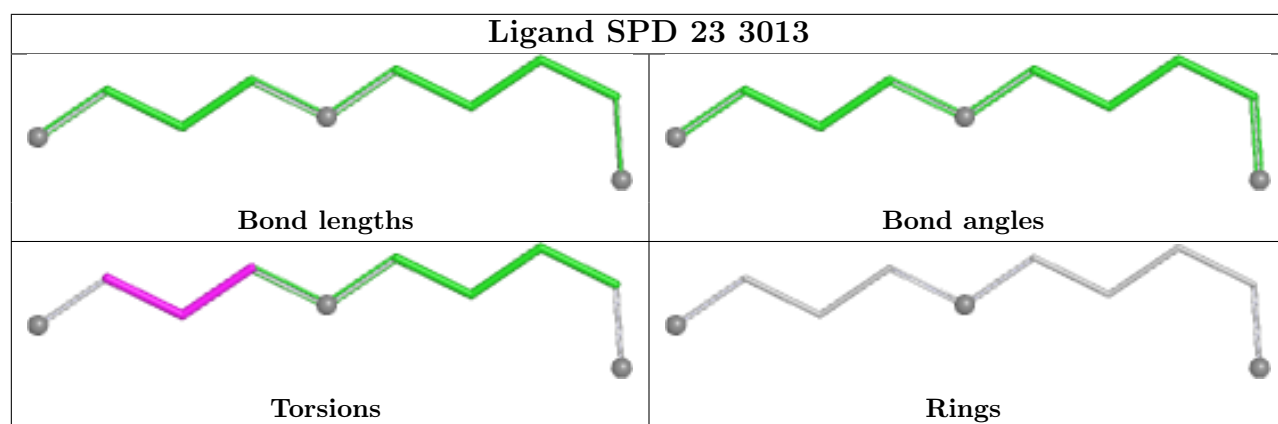
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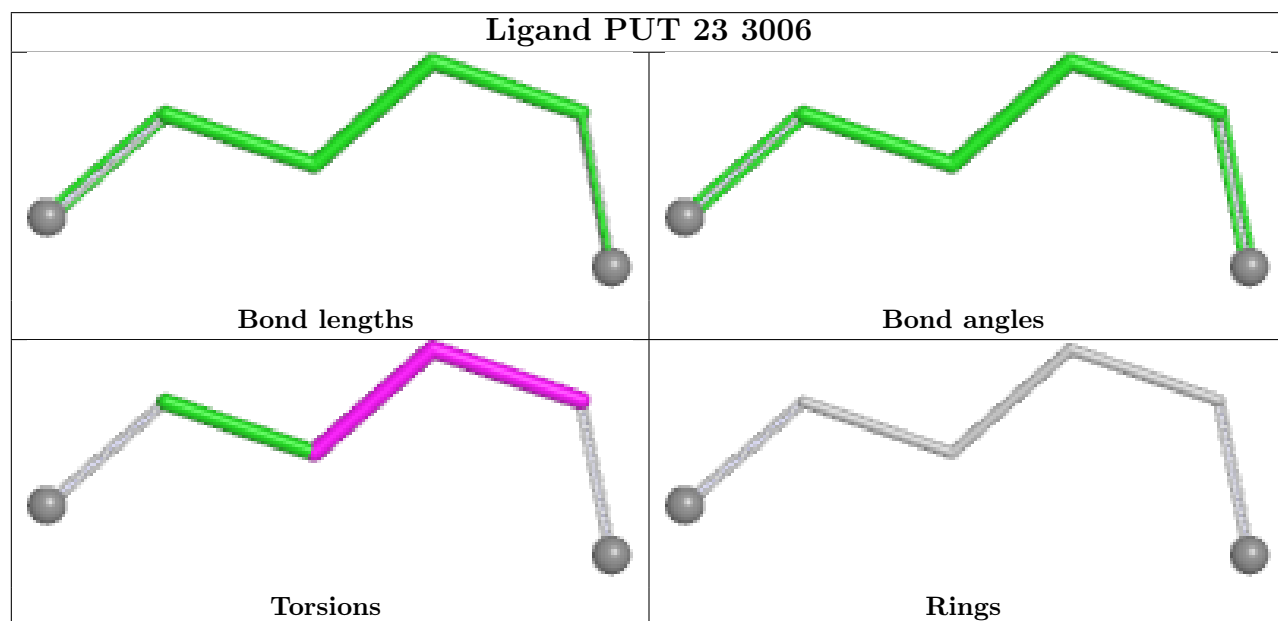
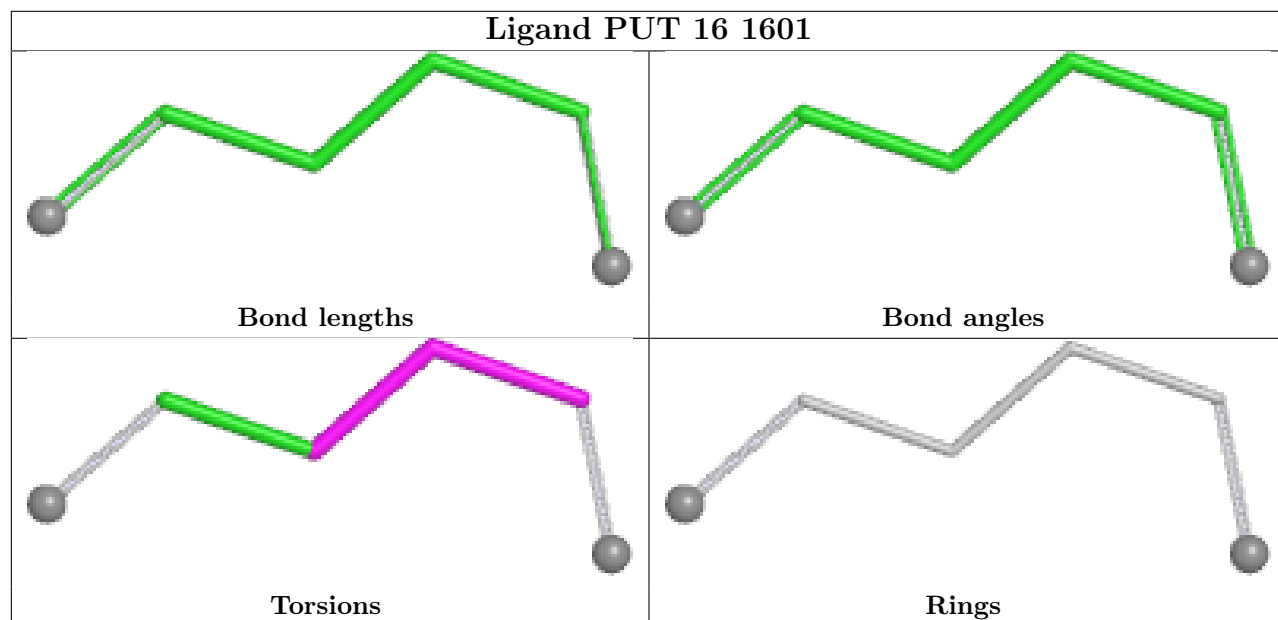
No monomer is involved in short contacts.

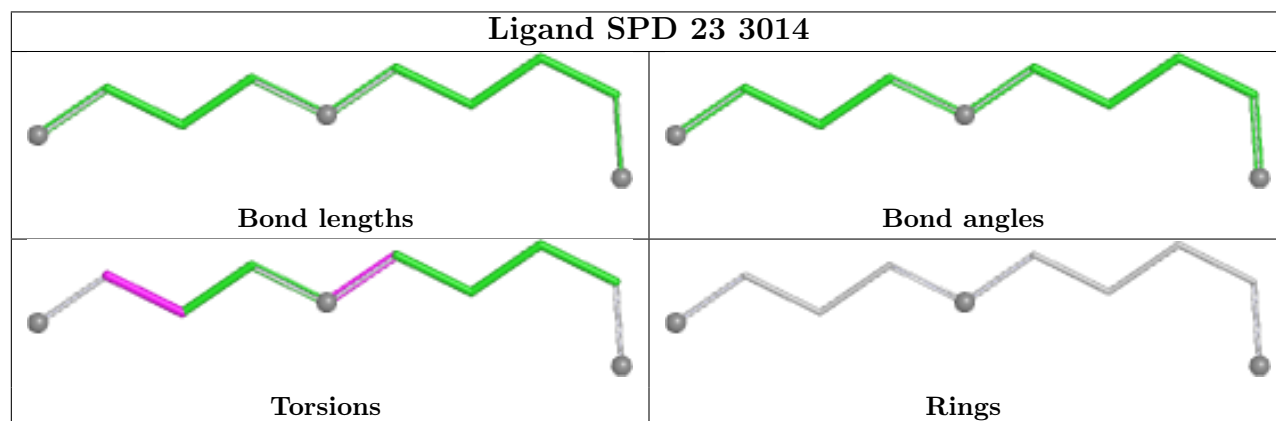
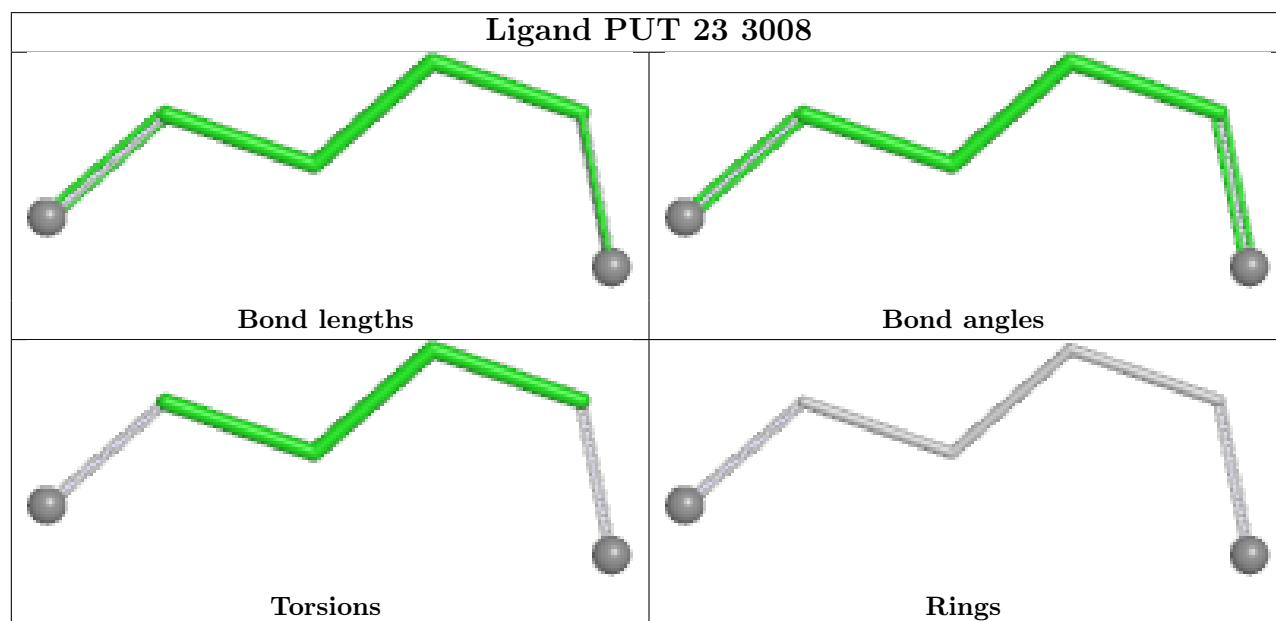
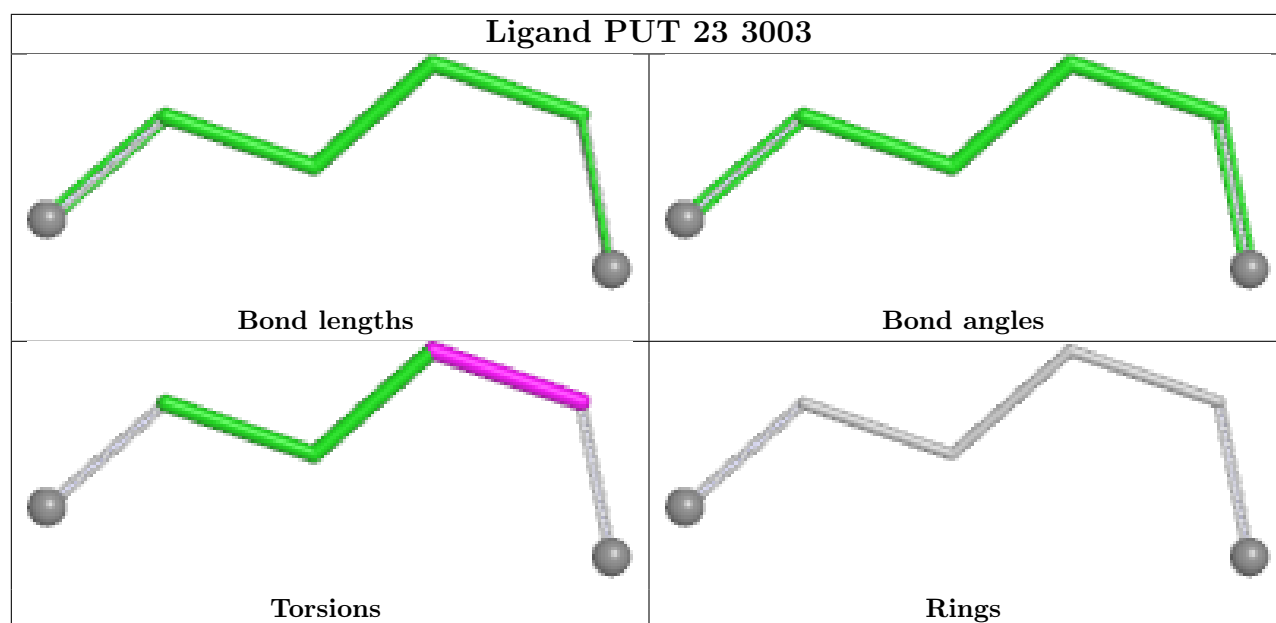
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included.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

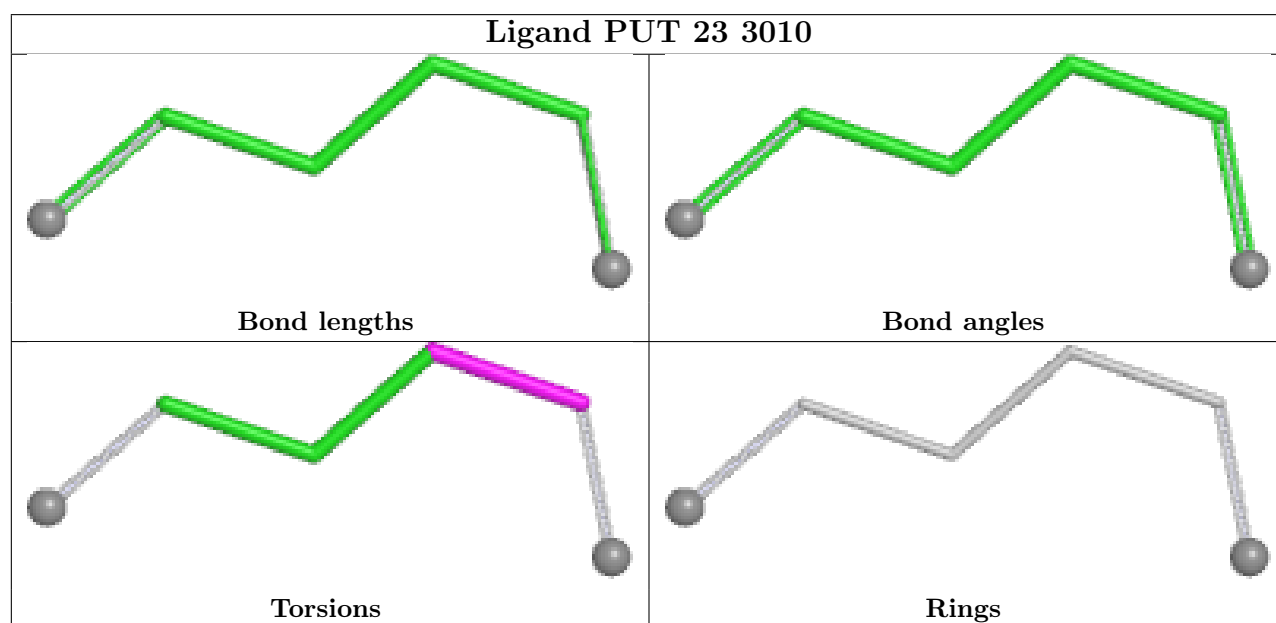
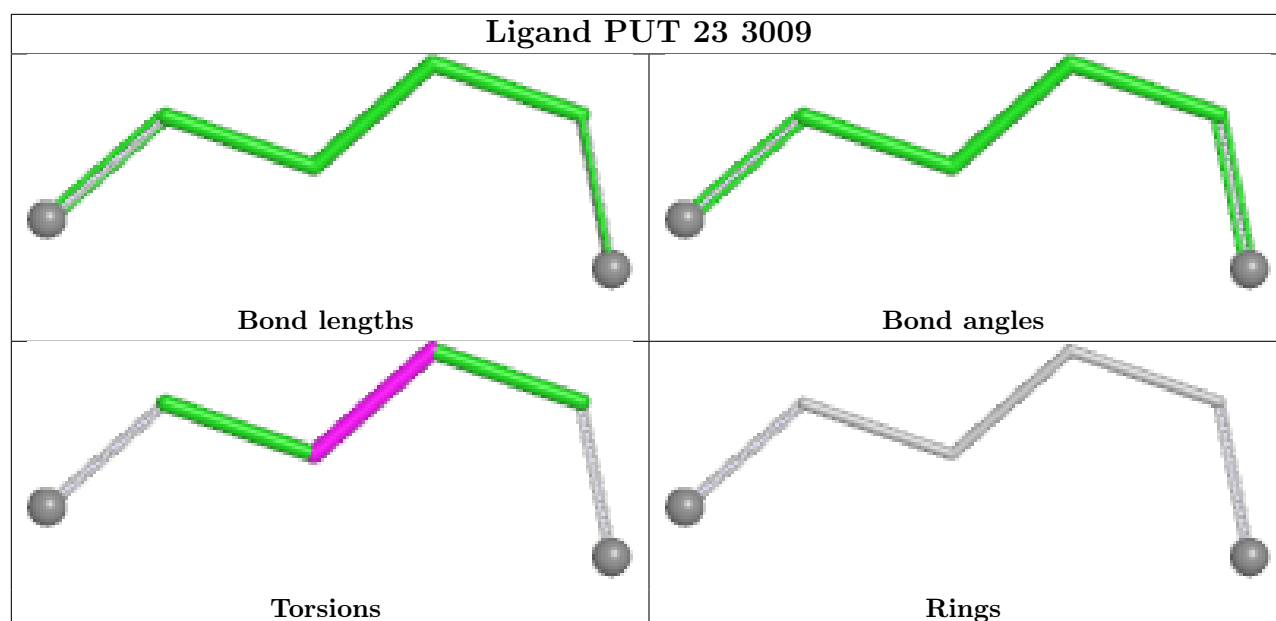


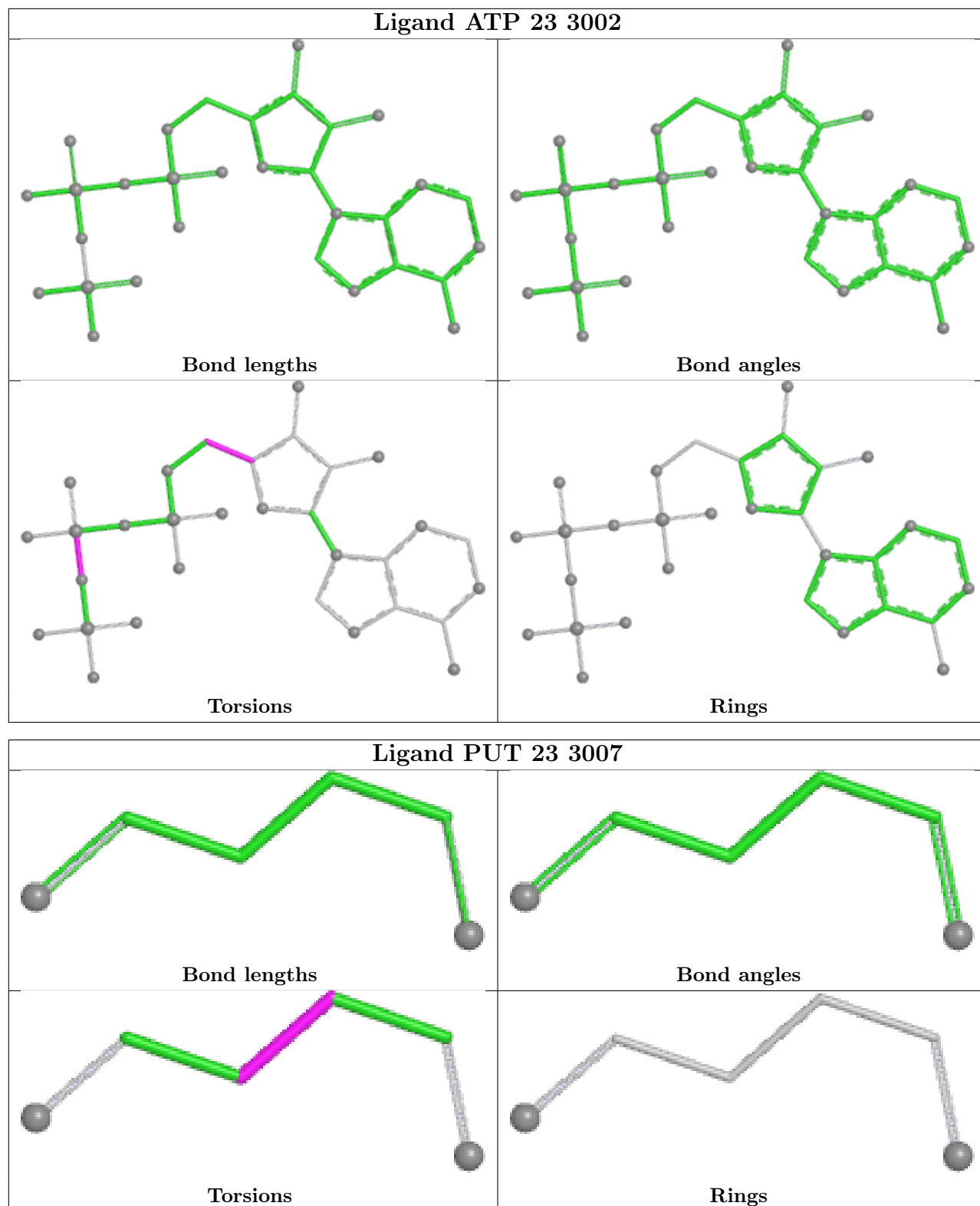


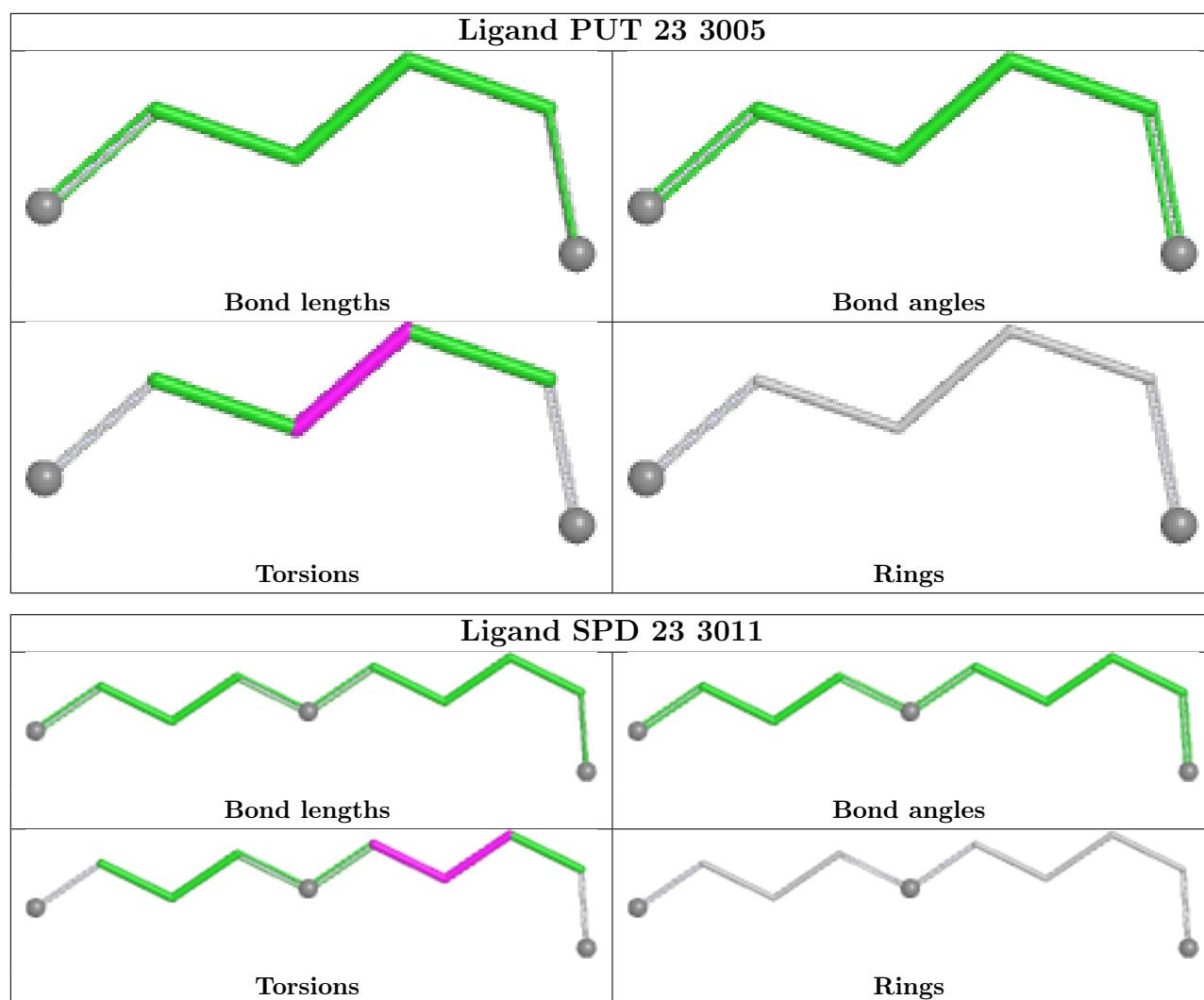












5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

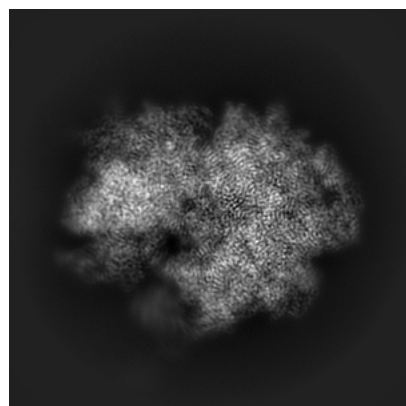
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-48830. These allow visual inspection of the internal detail of the map and identification of artifacts.

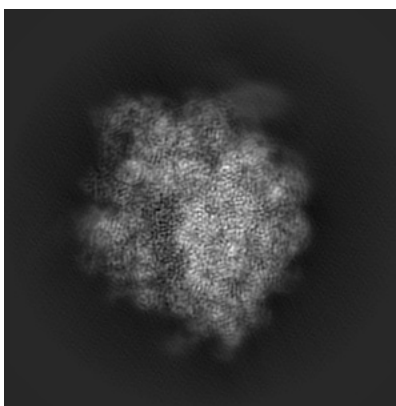
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

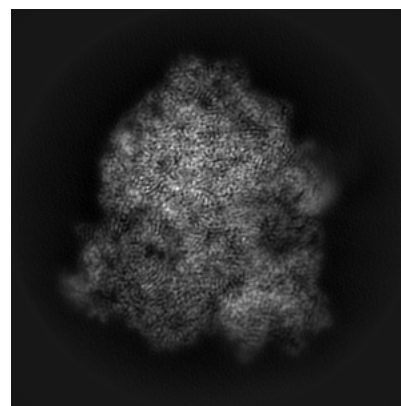
6.1.1 Primary map



X

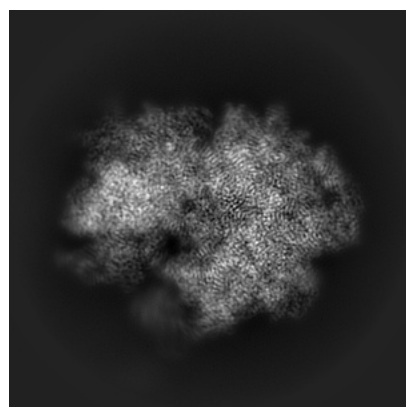


Y

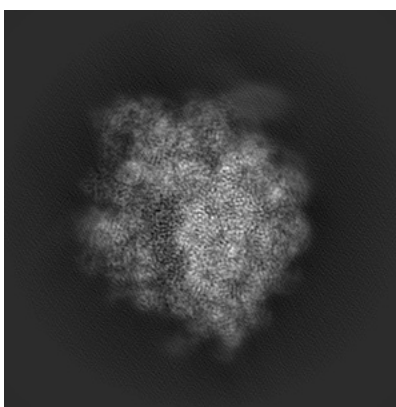


Z

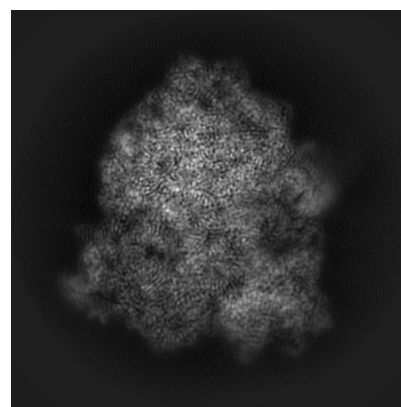
6.1.2 Raw map



X



Y

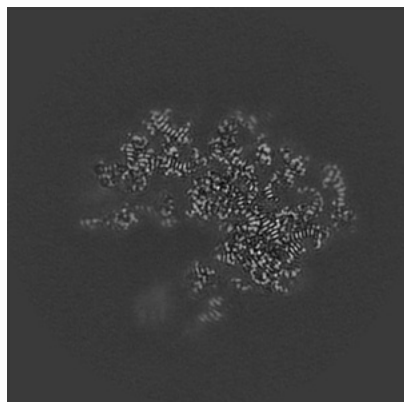


Z

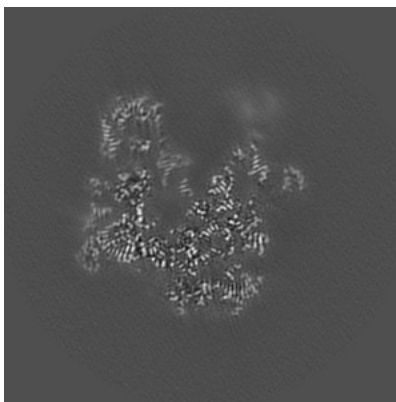
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

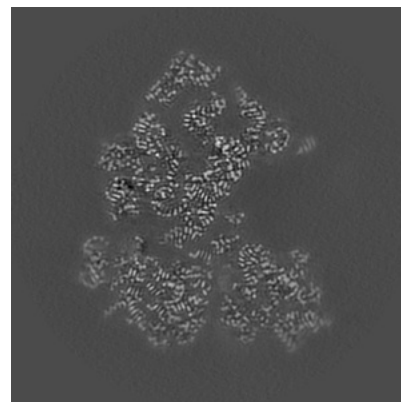
6.2.1 Primary map



X Index: 160

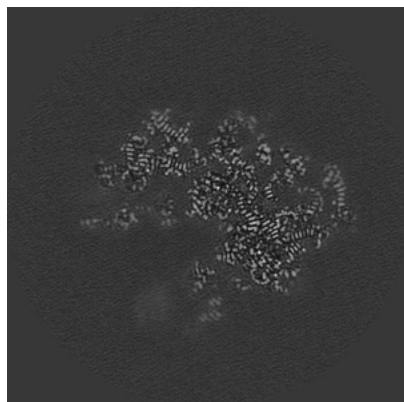


Y Index: 160

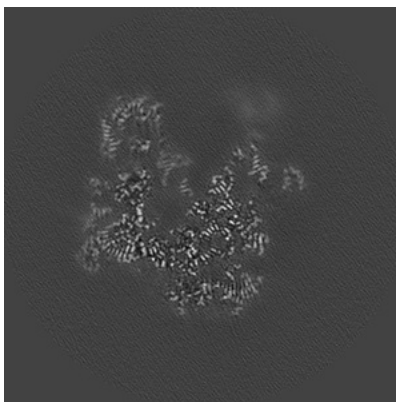


Z Index: 160

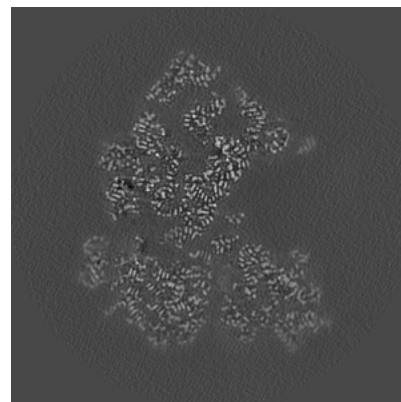
6.2.2 Raw map



X Index: 160



Y Index: 160

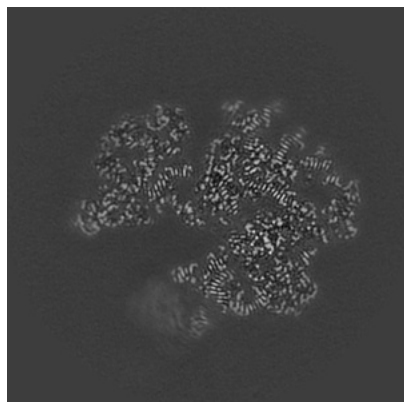


Z Index: 160

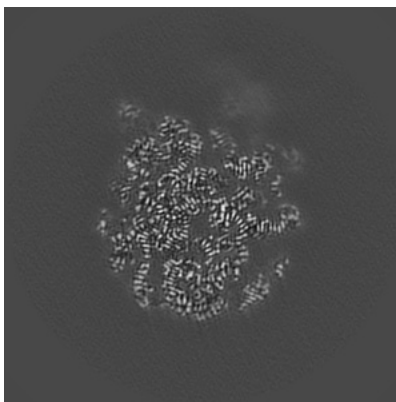
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

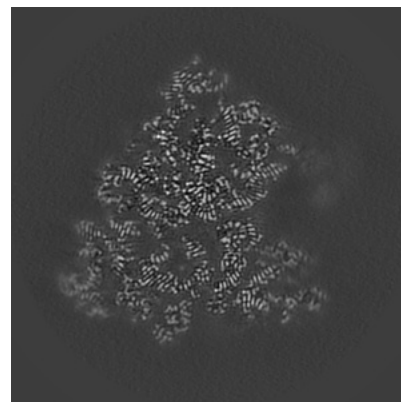
6.3.1 Primary map



X Index: 147

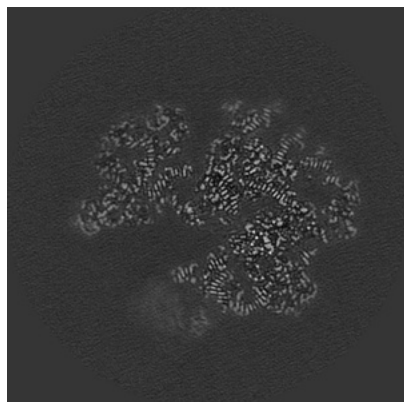


Y Index: 195

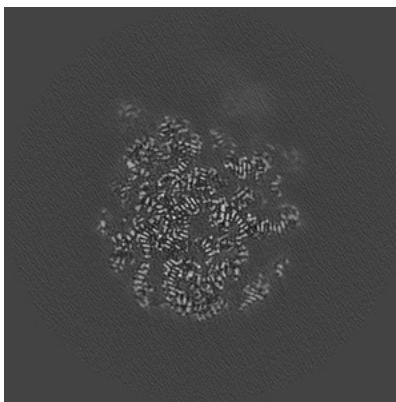


Z Index: 179

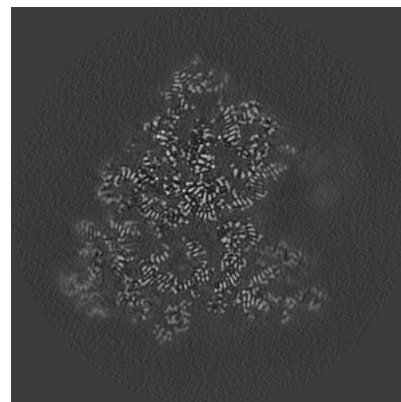
6.3.2 Raw map



X Index: 147



Y Index: 195

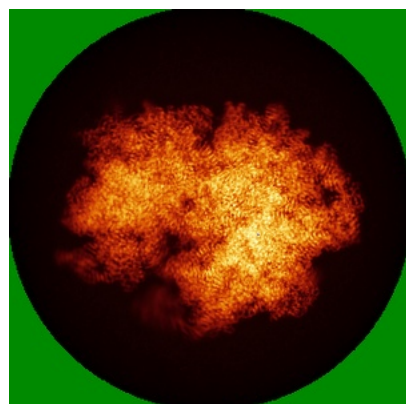


Z Index: 179

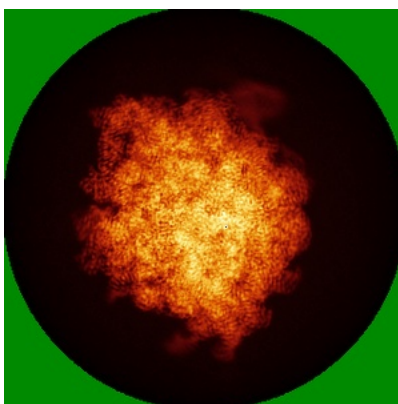
The images above show the largest variance slices of the map in three orthogonal directions.

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

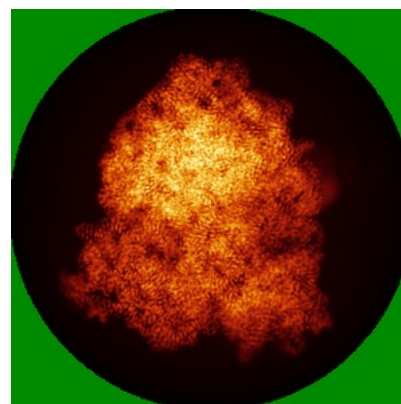
6.4.1 Primary map



X

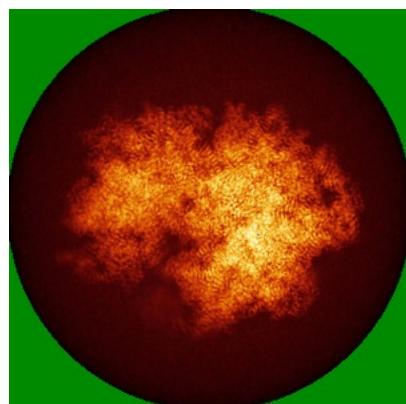


Y

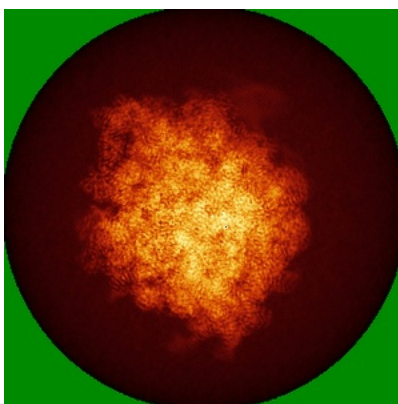


Z

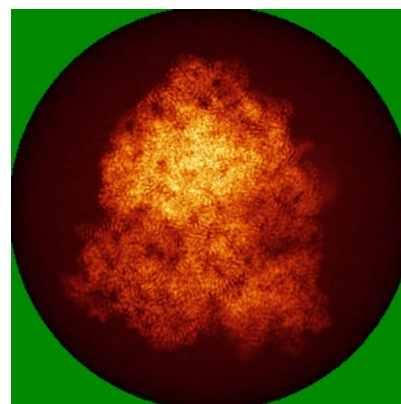
6.4.2 Raw map



X



Y

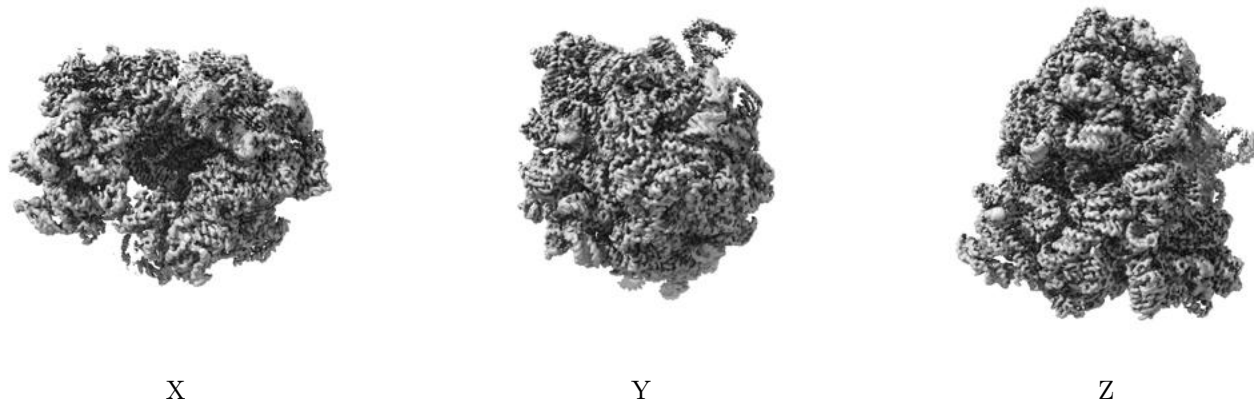


Z

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

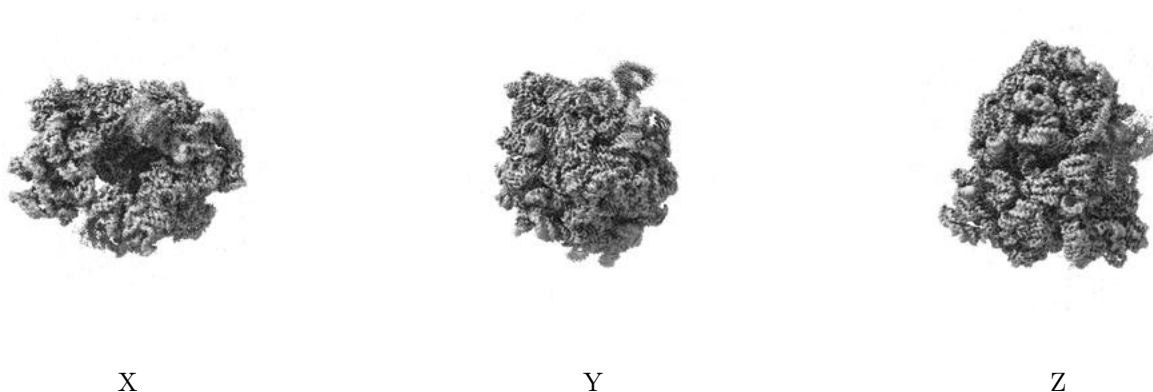
6.5 Orthogonal surface views [i](#)

6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.008. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.5.2 Raw map



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

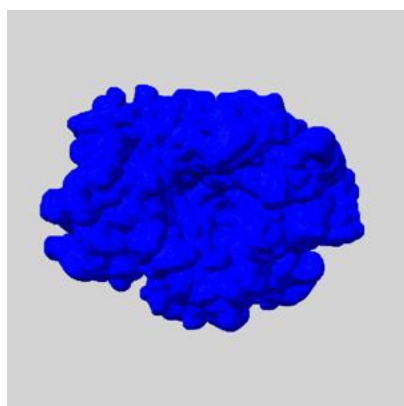
6.6 Mask visualisation [i](#)

This section shows the 3D surface view of the primary map at 50% transparency overlaid with the specified mask at 0% transparency

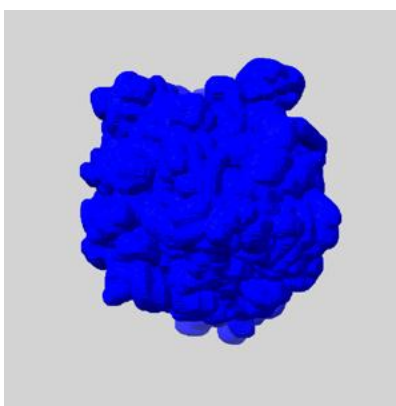
A mask typically either:

- Encompasses the whole structure
- Separates out a domain, a functional unit, a monomer or an area of interest from a larger structure

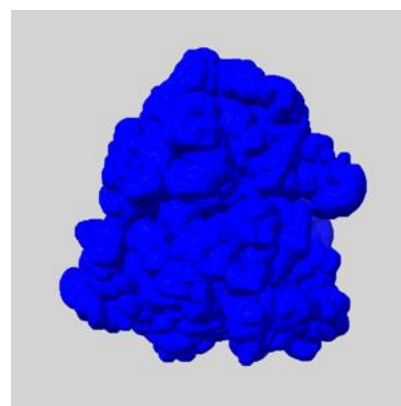
6.6.1 emd_48830_msk_1.map [i](#)



X



Y

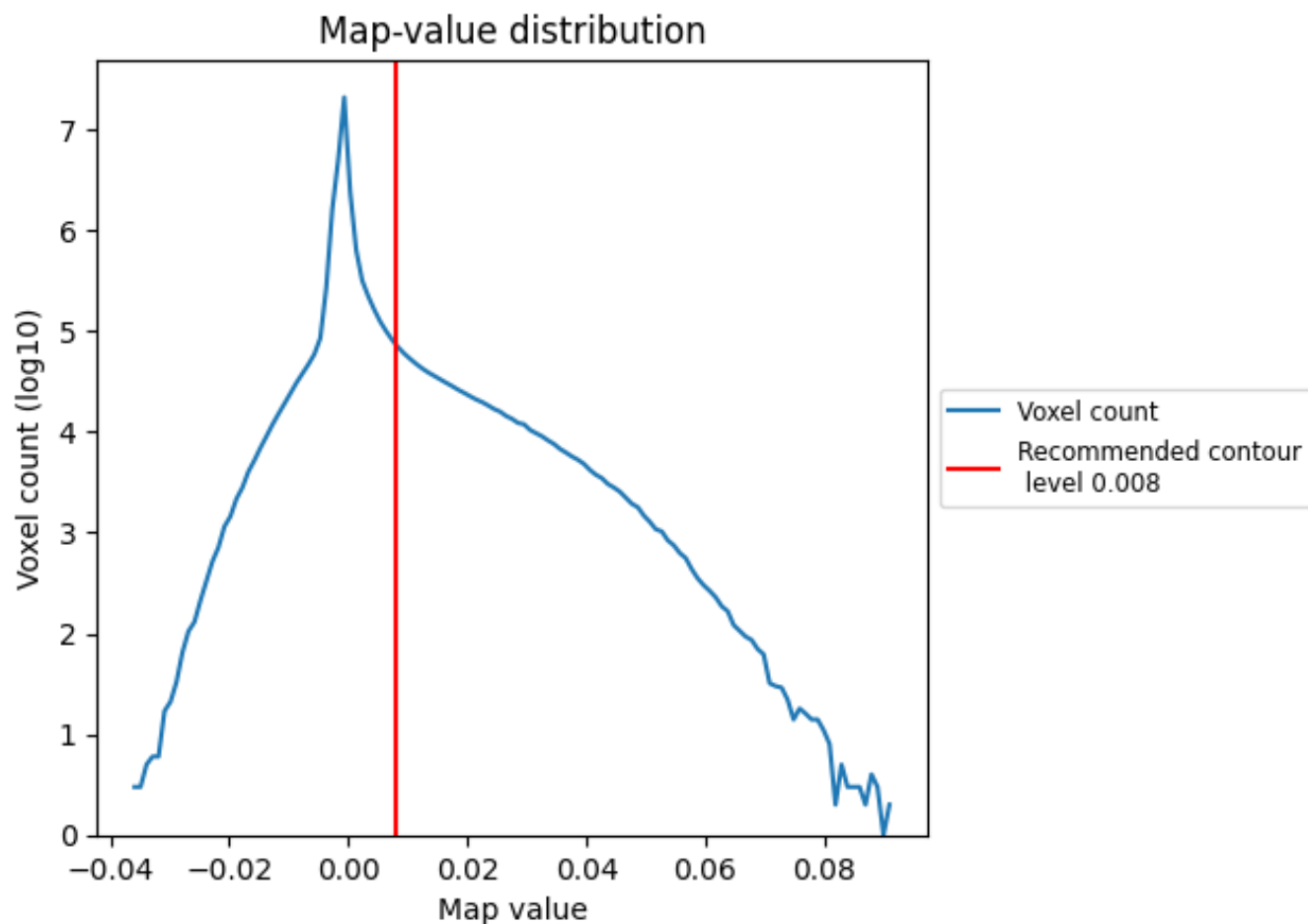


Z

7 Map analysis [i](#)

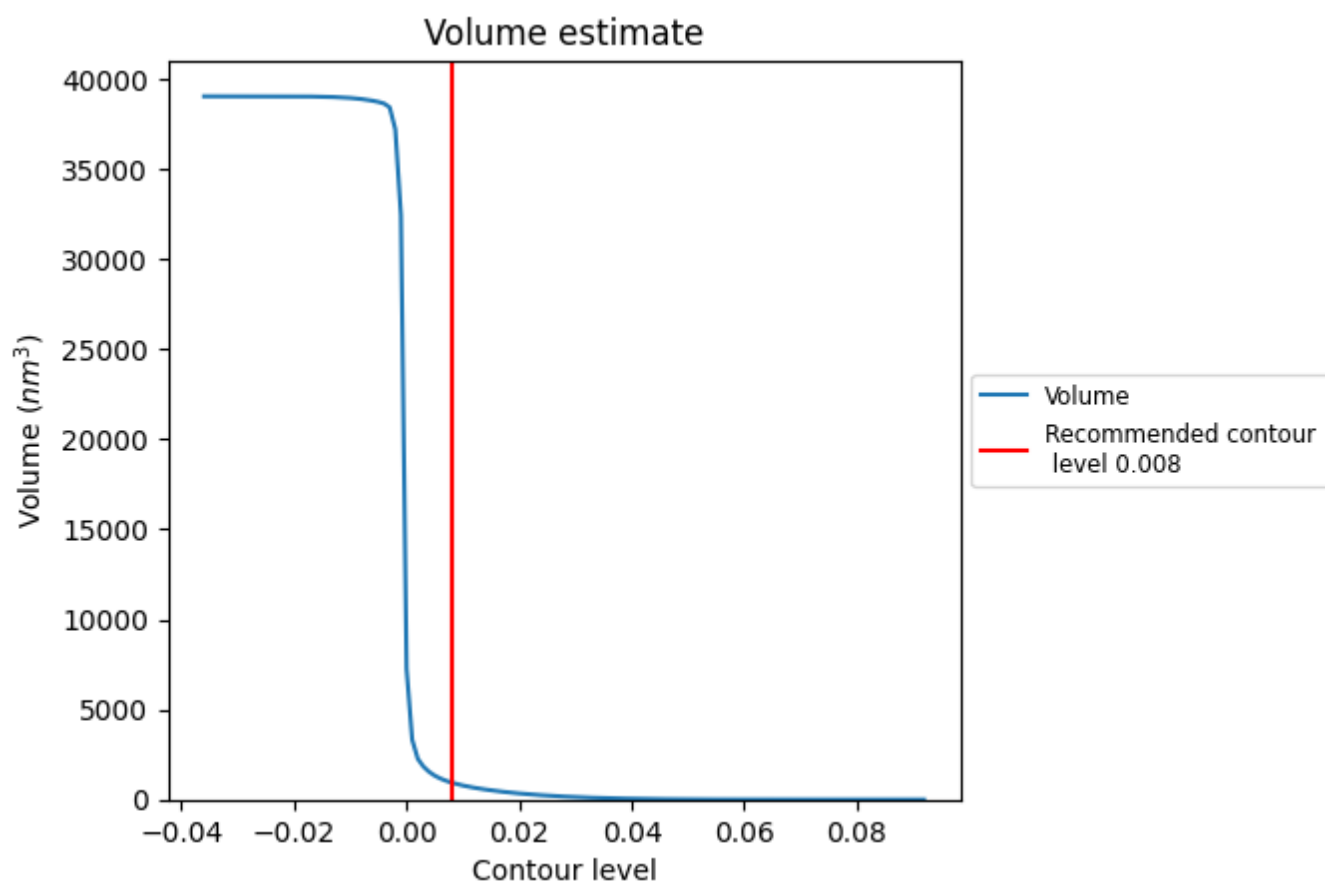
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution [i](#)



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

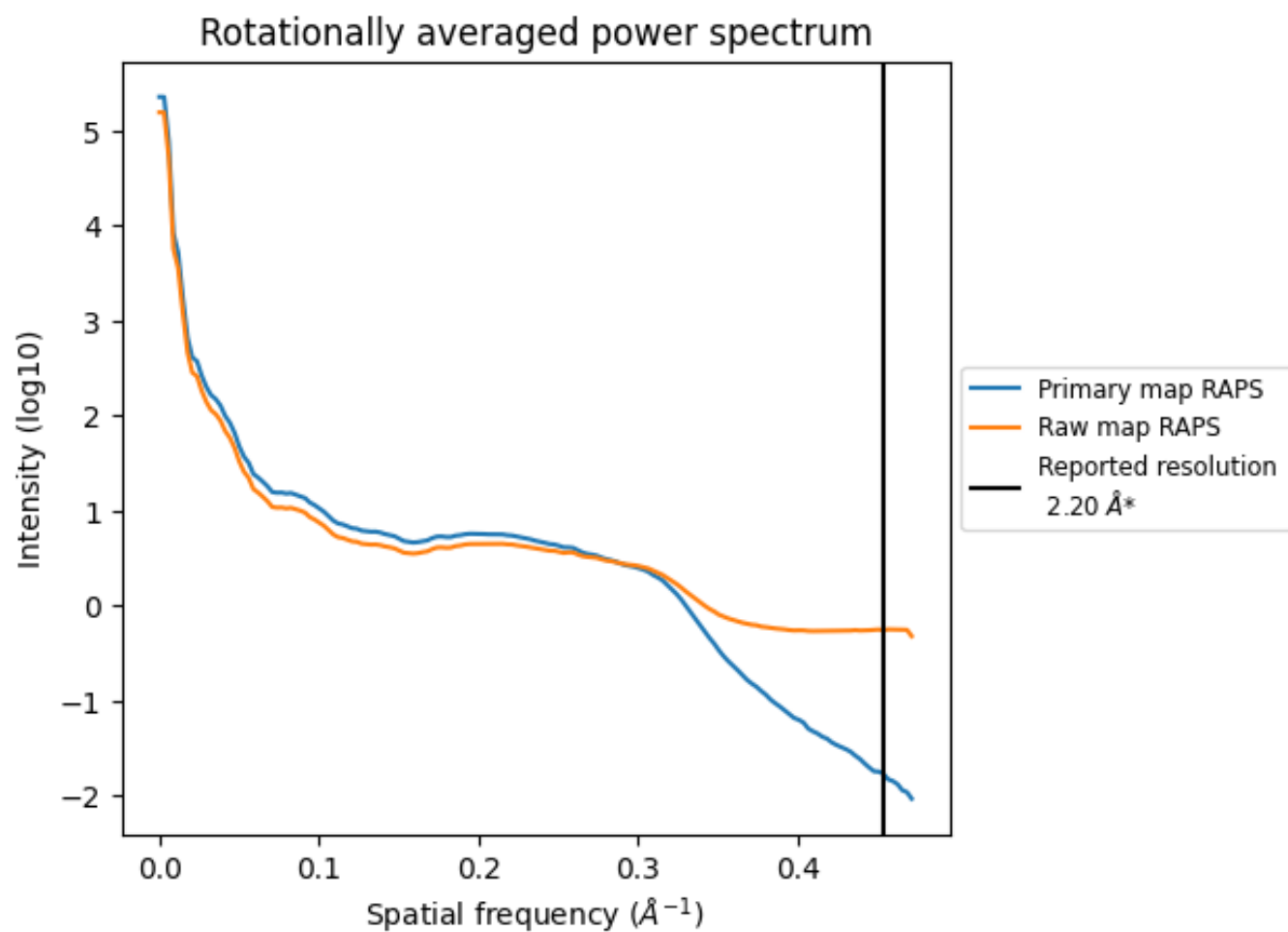
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 945 nm³; this corresponds to an approximate mass of 854 kDa.

The volume estimate graph shows how the enclosed volume varies with the contour level. The recommended contour level is shown as a vertical line and the intersection between the line and the curve gives the volume of the enclosed surface at the given level.

7.3 Rotationally averaged power spectrum ⓘ

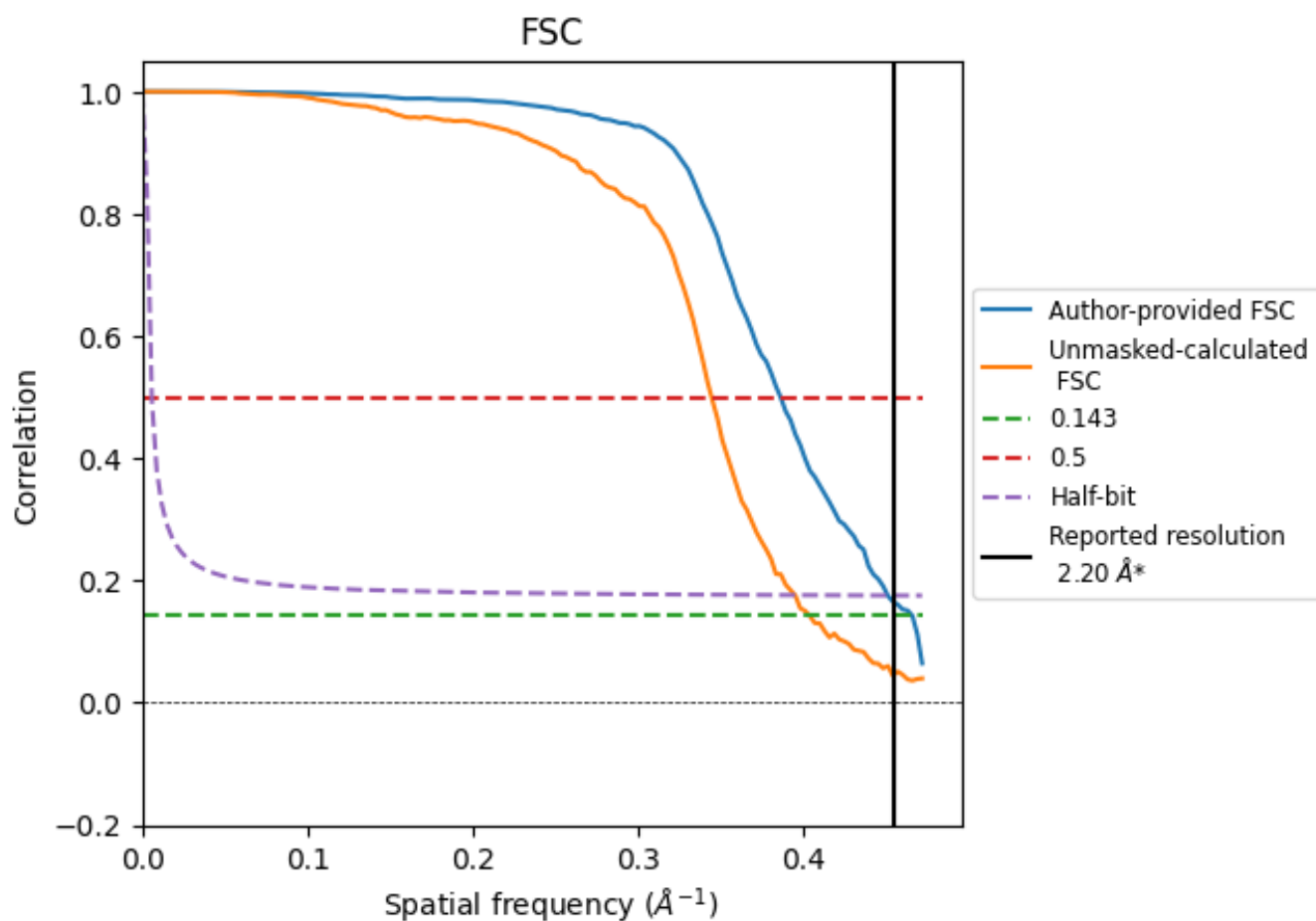


*Reported resolution corresponds to spatial frequency of 0.455 Å⁻¹

8 Fourier-Shell correlation [i](#)

Fourier-Shell Correlation (FSC) is the most commonly used method to estimate the resolution of single-particle and subtomogram-averaged maps. The shape of the curve depends on the imposed symmetry, mask and whether or not the two 3D reconstructions used were processed from a common reference. The reported resolution is shown as a black line. A curve is displayed for the half-bit criterion in addition to lines showing the 0.143 gold standard cut-off and 0.5 cut-off.

8.1 FSC [i](#)



*Reported resolution corresponds to spatial frequency of $0.455 \text{ \AA}^{-1}$

8.2 Resolution estimates [i](#)

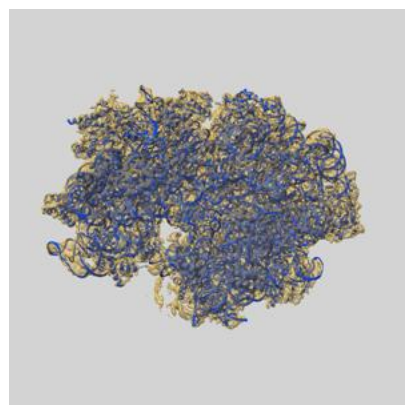
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	2.20	-	-
Author-provided FSC curve	2.15	2.59	2.22
Unmasked-calculated*	2.48	2.90	2.53

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 2.48 differs from the reported value 2.2 by more than 10 %

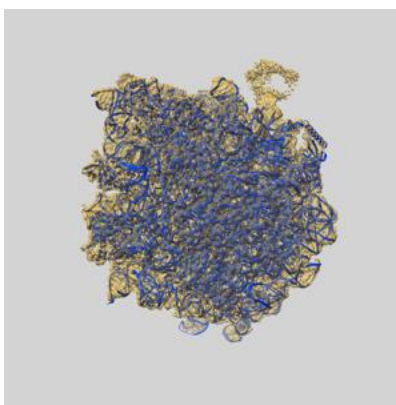
9 Map-model fit [i](#)

This section contains information regarding the fit between EMDB map EMD-48830 and PDB model 9N2B. Per-residue inclusion information can be found in [section 3](#) on [page 18](#).

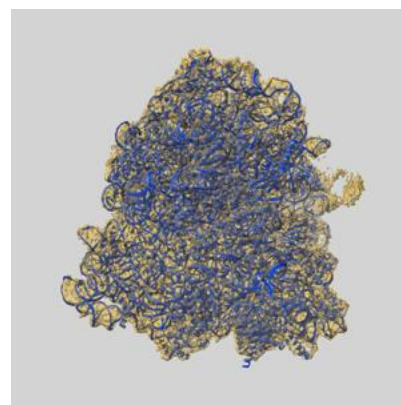
9.1 Map-model overlay [i](#)



X



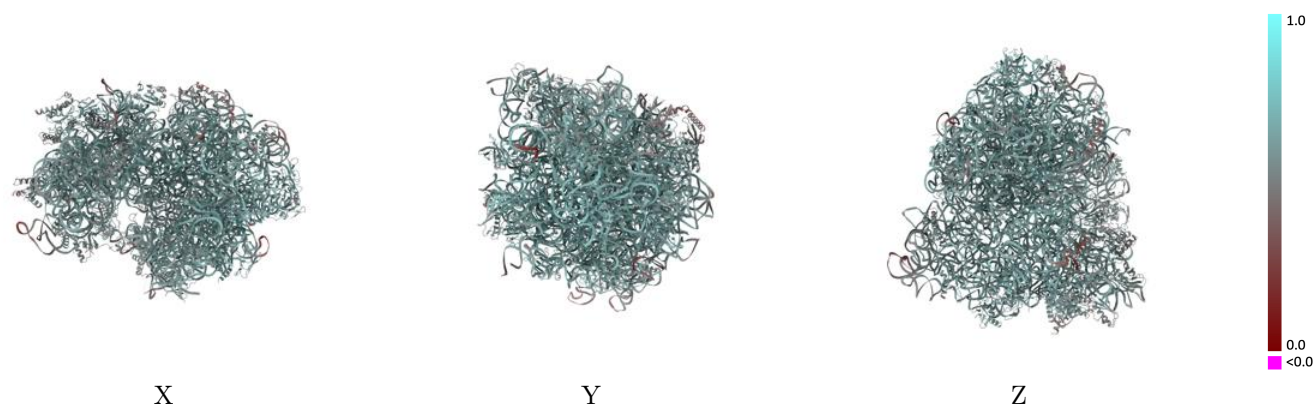
Y



Z

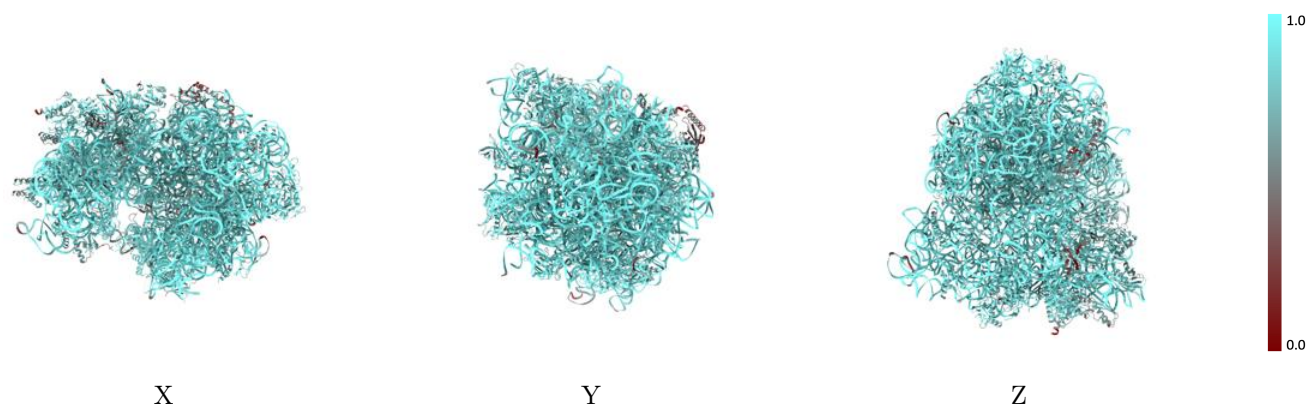
The images above show the 3D surface view of the map at the recommended contour level 0.008 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



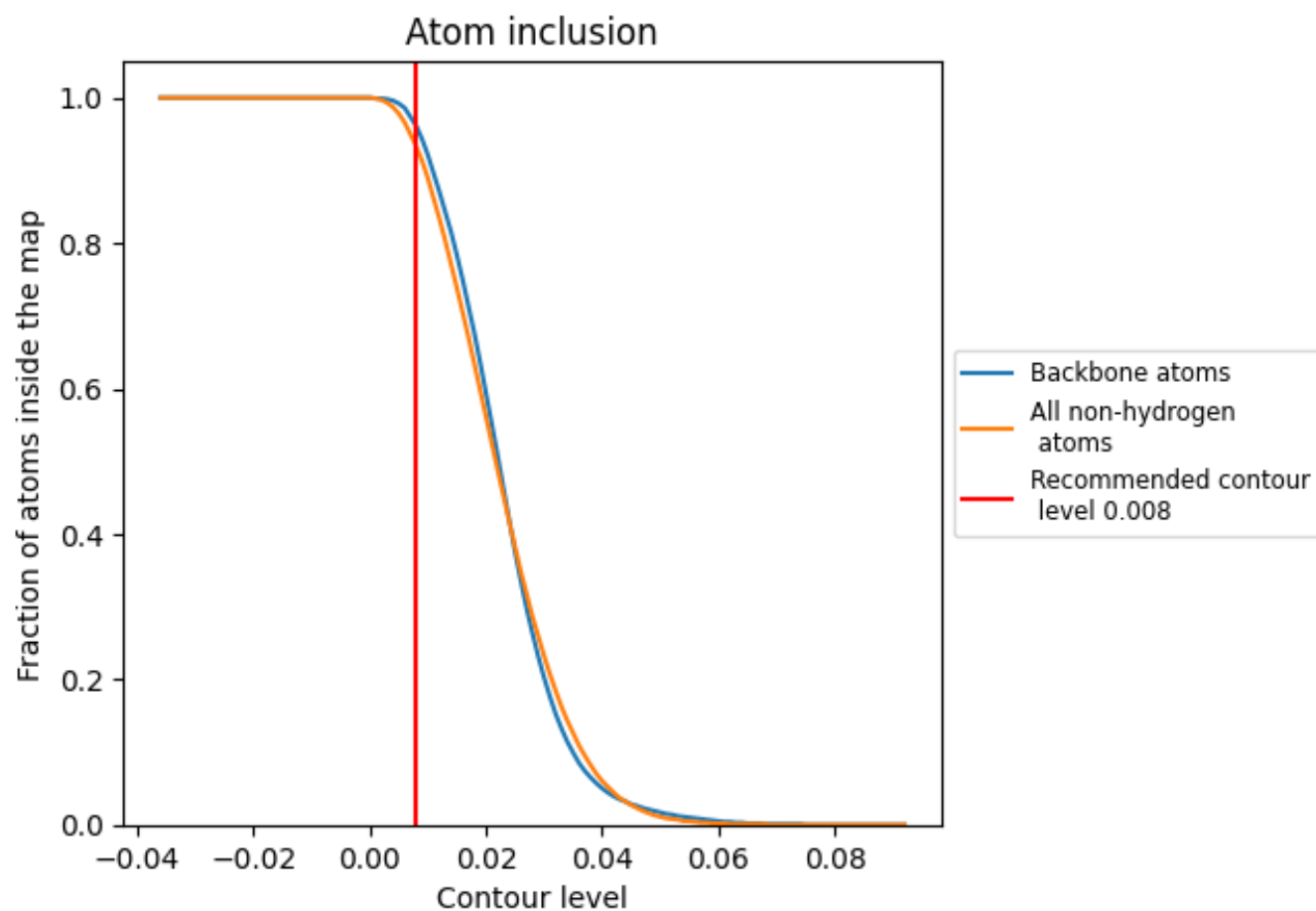
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions at which atoms can be resolved. Low Q-score values may therefore be expected for many entries.

9.3 Atom inclusion mapped to coordinate model [i](#)



The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.008).

9.4 Atom inclusion [i](#)



At the recommended contour level, 96% of all backbone atoms, 93% 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 (0.008) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.9340	 0.6070
16	 0.9630	 0.5960
23	 0.9770	 0.6260
5	 0.9650	 0.5850
LB	 0.9530	 0.6530
LC	 0.9210	 0.6250
LD	 0.8940	 0.6120
LE	 0.7840	 0.5360
LF	 0.8020	 0.5540
LI	 0.4980	 0.4780
LM	 0.9320	 0.6330
LN	 0.9170	 0.6300
LO	 0.9140	 0.6190
LP	 0.9230	 0.6350
LQ	 0.9390	 0.6240
LR	 0.8710	 0.5640
LS	 0.8890	 0.6140
LT	 0.9620	 0.6540
LU	 0.9070	 0.6250
LV	 0.9100	 0.6240
LW	 0.8680	 0.6150
LX	 0.8850	 0.6130
LY	 0.8600	 0.5930
La	 0.8460	 0.6120
Lb	 0.9320	 0.6280
Lc	 0.8590	 0.5920
Ld	 0.8860	 0.6110
Le	 0.6830	 0.5140
Lf	 0.9070	 0.6320
Lg	 0.8590	 0.5930
Lh	 0.9410	 0.6660
Li	 0.9290	 0.6400
Lj	 0.9520	 0.6280
Pt	 0.8910	 0.5800
SB	 0.7910	 0.5600



Continued on next page...

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Chain	Atom inclusion	Q-score
SC	 0.8480	 0.5890
SD	 0.8610	 0.5940
SE	 0.9060	 0.6200
SF	 0.8230	 0.5690
SG	 0.7270	 0.5300
SH	 0.8970	 0.6170
SI	 0.8350	 0.5620
SJ	 0.7570	 0.5320
SK	 0.8550	 0.5810
SL	 0.9090	 0.6270
SM	 0.8300	 0.5670
SN	 0.8610	 0.5870
SO	 0.8900	 0.6070
SP	 0.8660	 0.5830
SQ	 0.8340	 0.5920
SR	 0.8550	 0.5990
SS	 0.8250	 0.5680
ST	 0.8500	 0.5670
SU	 0.7320	 0.5430
mR	 0.5680	 0.4780