



Full wwPDB EM Validation Report ⓘ

Nov 29, 2022 – 03:08 AM JST

PDB ID : 7W5B
EMDB ID : EMD-32321
Title : The cryo-EM structure of human C* complex
Authors : Zhan, X.; Lu, Y.; Shi, Y.
Deposited on : 2021-11-29
Resolution : 4.30 Å(reported)

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

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

A user guide is available at

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

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

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

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

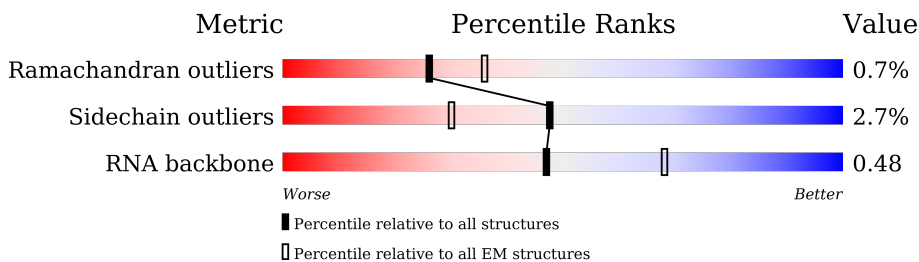
EMDB validation analysis : 0.0.1.dev43
Mogul : 1.8.5 (274361), CSD as541be (2020)
MolProbity : 4.02b-467
buster-report : 1.1.7 (2018)
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ : 1.9.9
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.31.3

1 Overall quality at a glance

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

The reported resolution of this entry is 4.30 Å.

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



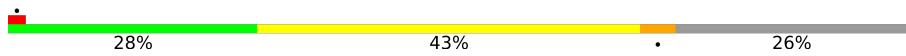





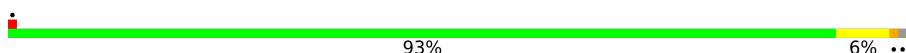
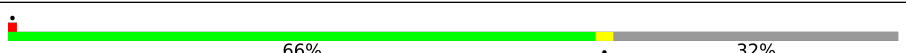
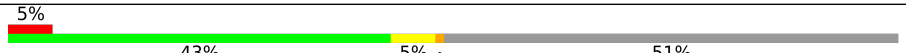
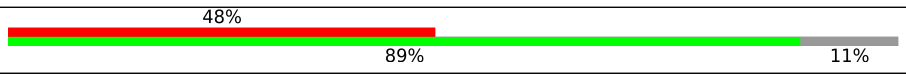
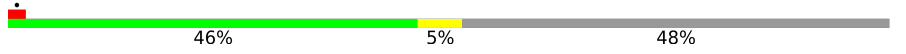
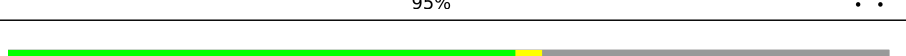

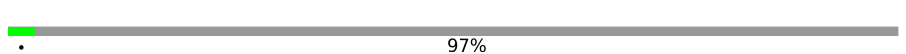

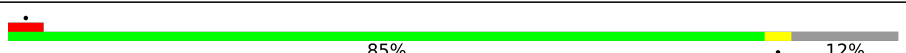
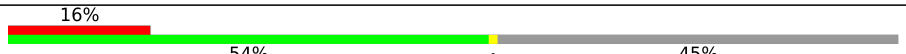
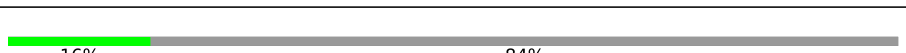
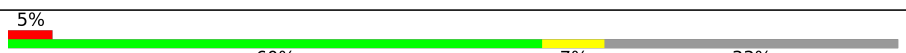




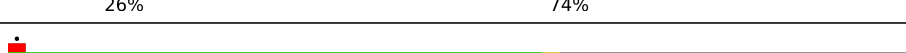
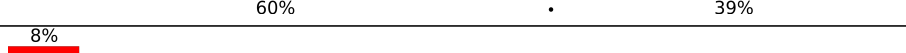
Metric	Whole archive (#Entries)	EM structures (#Entries)
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826
RNA backbone	4643	859

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

Mol	Chain	Length	Quality of chain
1	A	2335	
2	B	117	
3	C	972	
4	D	2136	
5	E	357	
6	F	107	
7	4	46	
8	G	174	




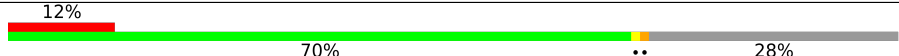
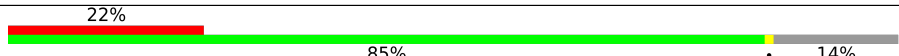
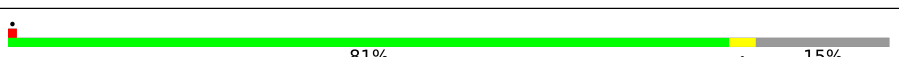
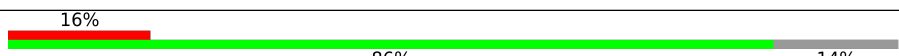
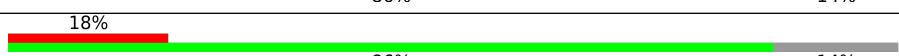
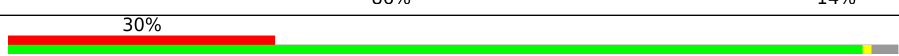
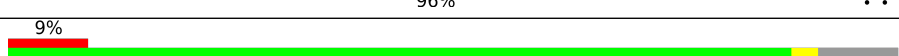

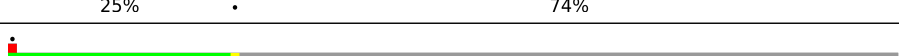

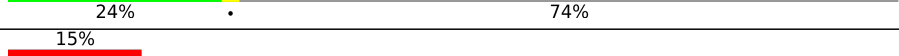




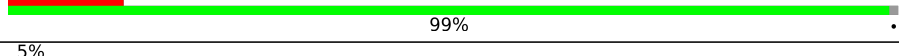
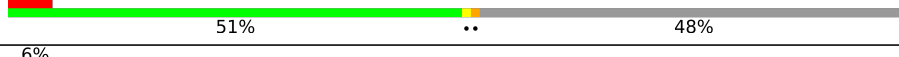
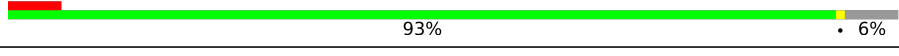
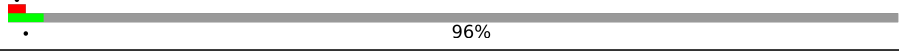
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Mol	Chain	Length	Quality of chain
9	H	188	
10	I	855	
11	J	848	
12	K	225	
13	L	802	
14	M	243	
15	N	144	
16	O	420	
17	P	229	
18	Q	1485	
19	R	536	
20	S	166	
21	T	514	
22	U	2752	
23	V	908	
24	W	579	
25	Y	1220	
26	Z	758	
27	2	184	
28	z	112	
29	b	240	
29	i	240	
30	y	301	
31	a	126	
31	h	126	

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Mol	Chain	Length	Quality of chain
32	c	119	 67% 31%
32	j	119	 67% 31%
33	d	118	 81% 18%
33	k	118	 70% 28%
34	f	86	 85% 14%
34	m	86	 81% 15%
35	e	92	 86% 14%
35	l	92	 86% 14%
36	g	76	 96%
36	n	76	 88% 9%
37	q	504	 25% 74%
37	r	504	 25% 74%
37	s	504	 24% 74%
37	t	504	 25% 74%
38	o	255	 57% 6% 36%
39	p	225	 39% 58%
40	1	586	 45% 54%
41	v	146	 99%
42	w	174	 51% 48%
43	u	411	 93% 6%
44	x	703	 96%
45	3	415	 93% 7%

2 Entry composition

There are 50 unique types of molecules in this entry. The entry contains 106538 atoms, of which 0 are hydrogens and 0 are deuteriums.

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

- Molecule 1 is a protein called Pre-mRNA-processing-splicing factor 8.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	2253	17748	11367	3144	3167	70	0	0

- Molecule 2 is a RNA chain called U5 snRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
2	B	84	1768	792	295	597	84	0	0

- Molecule 3 is a protein called 116 kDa U5 small nuclear ribonucleoprotein component.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	C	862	6787	4339	1136	1281	31	0	0

- Molecule 4 is a protein called U5 small nuclear ribonucleoprotein 200 kDa helicase.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
4	D	1722	8530	5086	1722	1722	0	0

- Molecule 5 is a protein called U5 small nuclear ribonucleoprotein 40 kDa protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	E	299	2338	1470	410	445	13	0	0

- Molecule 6 is a RNA chain called U6 snRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
6	F	97	2075	928	381	669	97	0	0

- Molecule 7 is a RNA chain called Pre-mRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
7	4	13	276	123	50	90	13	0	0

- Molecule 8 is a RNA chain called Pre-mRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
8	G	82	1510	666	210	552	82	0	0

- Molecule 9 is a RNA chain called U2 snRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
9	H	140	2966	1326	510	990	140	0	0

- Molecule 10 is a protein called Pre-mRNA-splicing factor SYF1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
10	I	618	3857	2389	722	735	11	0	0

- Molecule 11 is a protein called Crooked neck-like protein 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
11	J	569	3819	2379	718	716	6	0	0

- Molecule 12 is a protein called Pre-mRNA-splicing factor SPF27.

Mol	Chain	Residues	Atoms			AltConf	Trace	
			Total	C	N			O
12	K	155	772	462	155	155	0	0

- Molecule 13 is a protein called Cell division cycle 5-like protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
13	L	437	3015	1859	584	565	7	0	0

- Molecule 14 is a protein called Pre-mRNA-splicing factor SYF2.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
14	M	130	1098	684	204	208	2	0	0

- Molecule 15 is a protein called Protein BUD31 homolog.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
15	N	143	1184	746	217	209	12	0	0

- Molecule 16 is a protein called Pre-mRNA-splicing factor RBM22.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
16	O	285	2296	1442	408	426	20	0	0

- Molecule 17 is a protein called Spliceosome-associated protein CWC15 homolog.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
17	P	113	953	583	189	179	2	0	0

- Molecule 18 is a protein called RNA helicase aquarius.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O			
18	Q	1322	6562	3918	1322	1322		4	0

- Molecule 19 is a protein called SNW domain-containing protein 1.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	N	O	P	S		
19	R	280	2243	1401	411	416	2	13	0	0

- Molecule 20 is a protein called Peptidyl-prolyl cis-trans isomerase-like 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
20	S	159	1236	787	215	227	7	0	0

- Molecule 21 is a protein called Pleiotropic regulator 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
21	T	312	Total	C	N	O	S	0	0
			2454	1550	446	450	8		

- Molecule 22 is a protein called Serine/arginine repetitive matrix protein 2.

Mol	Chain	Residues	Atoms					AltConf	Trace
22	U	72	Total	C	N	O	S	0	0
			422	257	82	82	1		

- Molecule 23 is a protein called Pre-mRNA-splicing factor CWC22 homolog.

Mol	Chain	Residues	Atoms					AltConf	Trace
23	V	452	Total	C	N	O	S	0	0
			2632	1639	492	495	6		

- Molecule 24 is a protein called Pre-mRNA-processing factor 17.

Mol	Chain	Residues	Atoms					AltConf	Trace
24	W	509	Total	C	N	O	S	0	0
			4129	2628	715	762	24		

- Molecule 25 is a protein called ATP-dependent RNA helicase DHX8.

Mol	Chain	Residues	Atoms					AltConf	Trace
25	Y	667	Total	C	N	O	S	4	0
			3431	2057	680	693	1		

- Molecule 26 is a protein called Cactin.

Mol	Chain	Residues	Atoms					AltConf	Trace
26	Z	122	Total	C	N	O	S	0	0
			1084	712	197	173	2		

- Molecule 27 is a protein called PRKR-interacting protein 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
27	2	123	Total	C	N	O	S	0	0
			1013	635	193	180	5		

- Molecule 28 is a protein called Protein FAM32A.

Mol	Chain	Residues	Atoms					AltConf	Trace
28	z	60	Total	C	N	O	S	0	0
			496	306	96	92	2		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
29	b	102	Total	C	N	O	S	0	0
			786	492	148	139	7		
29	i	86	Total	C	N	O	S	0	0
			690	434	126	123	7		

- Molecule 30 is a protein called Peptidyl-prolyl cis-trans isomerase E.

Mol	Chain	Residues	Atoms				AltConf	Trace
30	y	79	Total	C	N	O	0	0
			390	232	79	79		

- Molecule 31 is a protein called Small nuclear ribonucleoprotein Sm D3.

Mol	Chain	Residues	Atoms					AltConf	Trace
31	a	77	Total	C	N	O	S	0	0
			609	381	108	115	5		
31	h	81	Total	C	N	O	S	0	0
			633	397	112	118	6		

- Molecule 32 is a protein called Small nuclear ribonucleoprotein Sm D1.

Mol	Chain	Residues	Atoms					AltConf	Trace
32	c	82	Total	C	N	O	S	0	0
			649	413	113	119	4		
32	j	82	Total	C	N	O	S	0	0
			649	413	113	119	4		

- Molecule 33 is a protein called Small nuclear ribonucleoprotein Sm D2.

Mol	Chain	Residues	Atoms					AltConf	Trace
33	d	97	Total	C	N	O	S	0	0
			776	488	143	140	5		
33	k	85	Total	C	N	O	S	0	0
			688	432	125	126	5		

- Molecule 34 is a protein called Small nuclear ribonucleoprotein F.

Mol	Chain	Residues	Atoms					AltConf	Trace
34	f	74	Total	C	N	O	S	0	0
			576	373	95	103	5		
34	m	73	Total	C	N	O	S	0	0
			566	367	93	101	5		

- Molecule 35 is a protein called Small nuclear ribonucleoprotein E.

Mol	Chain	Residues	Atoms					AltConf	Trace
35	e	79	Total	C	N	O	S	0	0
			652	412	116	119	5		
35	l	79	Total	C	N	O	S	0	0
			652	412	116	119	5		

- Molecule 36 is a protein called Small nuclear ribonucleoprotein G.

Mol	Chain	Residues	Atoms					AltConf	Trace
36	g	74	Total	C	N	O	S	0	0
			577	364	104	103	6		
36	n	69	Total	C	N	O	S	0	0
			542	345	97	94	6		

- Molecule 37 is a protein called Pre-mRNA-processing factor 19.

Mol	Chain	Residues	Atoms				AltConf	Trace
37	q	132	Total	C	N	O	0	0
			659	395	132	132		
37	r	131	Total	C	N	O	0	0
			654	392	131	131		
37	s	132	Total	C	N	O	0	0
			659	395	132	132		
37	t	131	Total	C	N	O	0	0
			654	392	131	131		

- Molecule 38 is a protein called U2 small nuclear ribonucleoprotein A'.

Mol	Chain	Residues	Atoms					AltConf	Trace
38	o	162	Total	C	N	O	S	0	0
			1282	820	219	240	3		

- Molecule 39 is a protein called U2 small nuclear ribonucleoprotein B'.

Mol	Chain	Residues	Atoms					AltConf	Trace
39	p	94	Total	C	N	O	S	0	0
			760	488	135	132	5		

- Molecule 40 is a protein called Pre-mRNA-splicing factor SLU7.

Mol	Chain	Residues	Atoms					AltConf	Trace
40	1	269	Total	C	N	O	S	0	0
			2209	1389	394	418	8		

- Molecule 41 is a protein called Protein mago nashi homolog.

Mol	Chain	Residues	Atoms				AltConf	Trace
41	v	144	Total	C	N	O	0	0
			711	423	144	144		

- Molecule 42 is a protein called RNA-binding protein 8A.

Mol	Chain	Residues	Atoms				AltConf	Trace
42	w	91	Total	C	N	O	0	0
			445	263	91	91		

- Molecule 43 is a protein called Eukaryotic initiation factor 4A-III.

Mol	Chain	Residues	Atoms				AltConf	Trace
43	u	386	Total	C	N	O	0	0
			1907	1135	386	386		

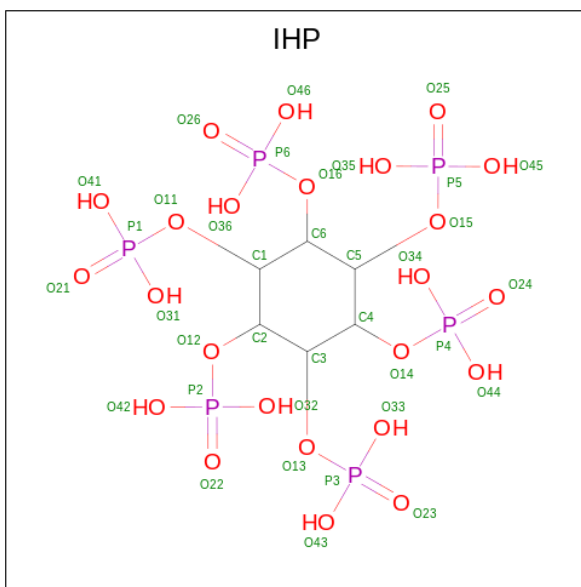
- Molecule 44 is a protein called Protein CASC3.

Mol	Chain	Residues	Atoms				AltConf	Trace
44	x	25	Total	C	N	O	0	0
			124	74	25	25		

- Molecule 45 is a protein called NF-kappa-B-activating protein.

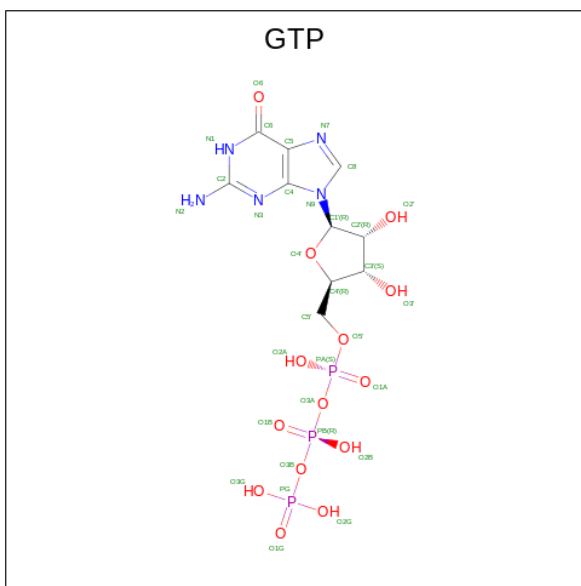
Mol	Chain	Residues	Atoms					AltConf	Trace
45	3	30	Total	C	N	O	S	0	0
			230	140	43	45	2		

- Molecule 46 is INOSITOL HEXAKISPHOSPHATE (three-letter code: IHP) (formula: C₆H₁₈O₂₄P₆) (labeled as "Ligand of Interest" by depositor).



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

- Molecule 47 is GUANOSINE-5'-TRIPHOSPHATE (three-letter code: GTP) (formula: $C_{10}H_{16}N_5O_{14}P_3$) (labeled as "Ligand of Interest" by depositor).



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

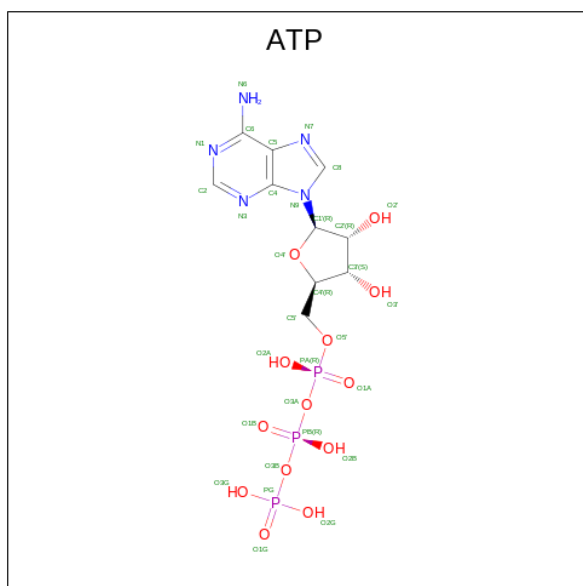
- Molecule 48 is MAGNESIUM ION (three-letter code: MG) (formula: Mg) (labeled as "Ligand of Interest" by depositor).

Mol	Chain	Residues	Atoms	AltConf
48	C	1	Total Mg 1 1	0
48	F	6	Total Mg 6 6	0
48	Q	2	Total Mg 2 2	0

- Molecule 49 is ZINC ION (three-letter code: ZN) (formula: Zn) (labeled as "Ligand of Interest" by depositor).

Mol	Chain	Residues	Atoms	AltConf
49	N	3	Total Zn 3 3	0
49	O	3	Total Zn 3 3	0
49	1	1	Total Zn 1 1	0

- Molecule 50 is ADENOSINE-5'-TRIPHOSPHATE (three-letter code: ATP) (formula: C₁₀H₁₆N₅O₁₃P₃) (labeled as "Ligand of Interest" by depositor).

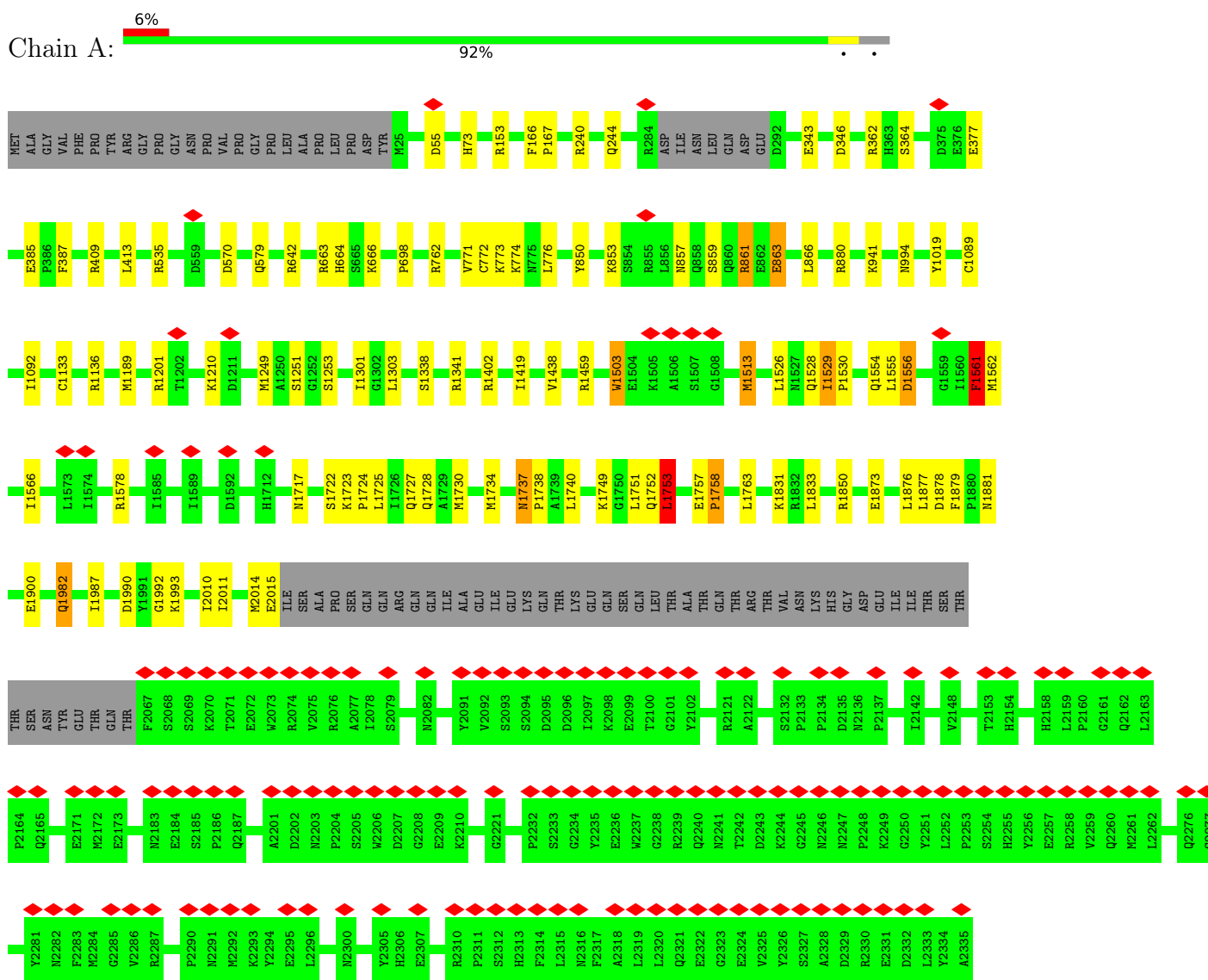


Mol	Chain	Residues	Atoms				AltConf	
			Total	C	N	O		P
50	Q	1	31	10	5	13	3	0

3 Residue-property plots

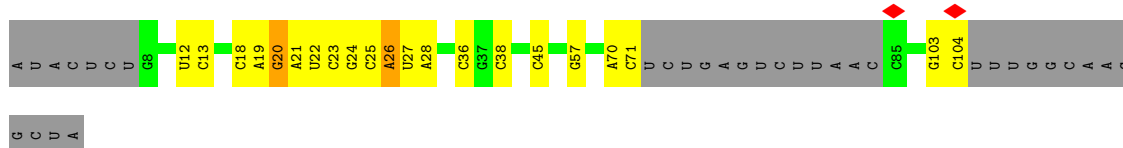
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion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

- Molecule 1: Pre-mRNA-processing-splicing factor 8

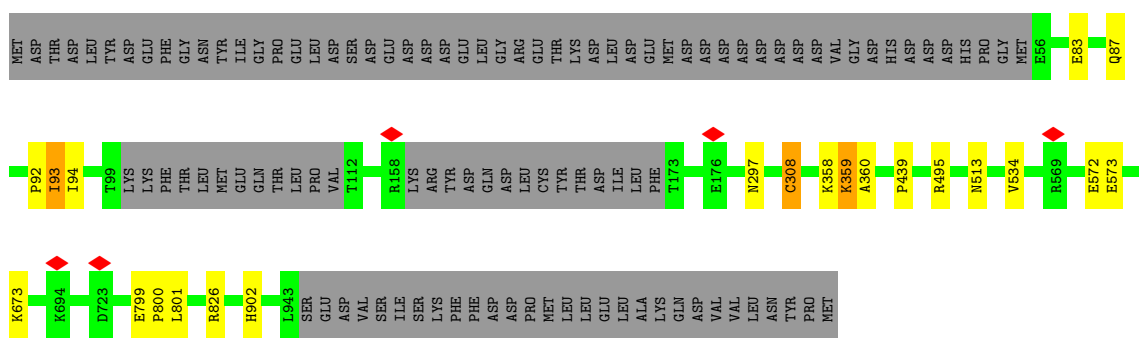
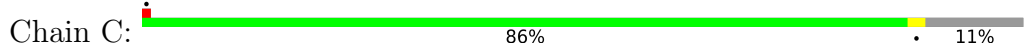


- Molecule 2: U5 snRNA

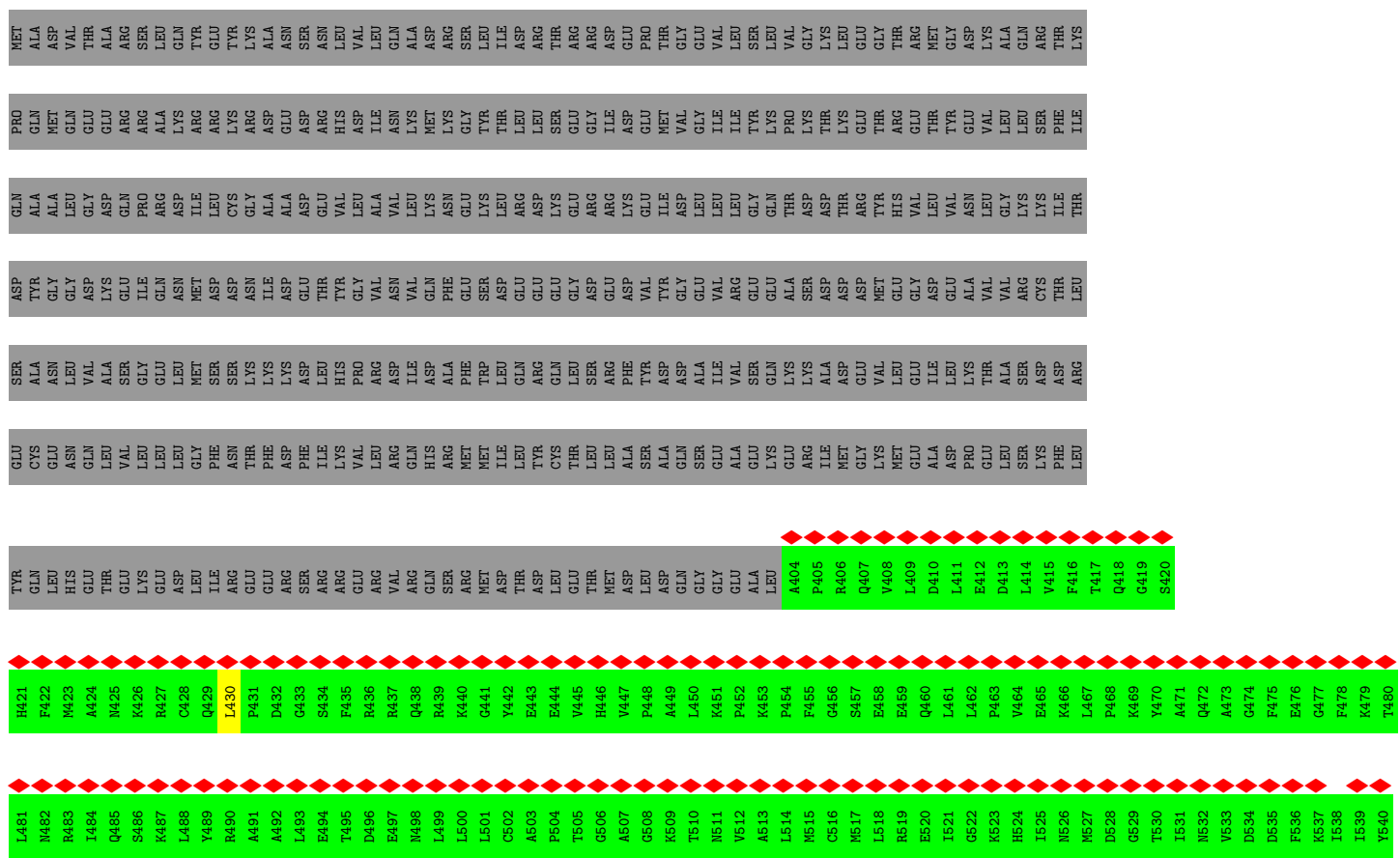




• Molecule 3: 116 kDa U5 small nuclear ribonucleoprotein component



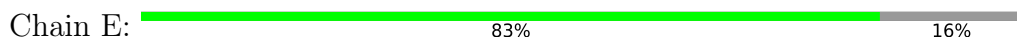
• Molecule 4: U5 small nuclear ribonucleoprotein 200 kDa helicase



I541	A642	P643	M644	R645	S646	L647	Q648	E649	E650	M651	S652	G653	S654	F655	G656	K657	R658	L659	A660	T661	Y662	G663	I664	T665	V666	A667	E668	L669	T670	G671	D672	H673	Q674	L675	C676	K677	E678	E679	I680	S681	A682	T683	S684	I685	I686	V687	C688	T689	P690	M693	D694	I695	G600	Y605	T606	Q607				
L608	V609	R610	L611	I612	E616	L619	L620	H621	D622	D623	R624	G625	P626	V627	L628	E629	V632	A633	R634	A635	I636	R637	M638	I639	E640	M641	T642	Q643	E644	D645	H646	R647	L648	I649	G650	L651	S652	A653	T654	L655	P656	M657	V658	R659	D660	V661	A662	T663	F664	L665	R666	V667	D668	P669	A670	K671				
G672	L673	F674	Y675	F676	D677	M678	S679	F680	R681	P682	V683	P684	L685	E686	Q687	T688	V689	V690	G691	I692	T693	E694	K695	K696	A697	I698	K699	R700	F701	Q702	I703	M704	N705	E706	I707	V708	G709	L710	K711	I712	M713	E714	H715	A716	G717	K718	N719	Q720	V721	L722	V723	F724	V725	H726	S727	K728	K729	E730	T731	
G732	K733	T734	A735	R736	A737	I738	R739	M740	M741	C742	L743	E744	K745	D746	T747	L748	G749	L750	L751	L752	R753	E754	G755	S756	A757	S758	K759	T759	E760	V761	L762	R763	H764	E765	A766	E767	Q768	C769	K770	N771	L772	E773	L774	K775	D776	L777	L778	P779	Y780	G781	F782	A783	I784	H785	H786	A787	G788	N789	T790	R791
V792	D793	R794	T795	L796	V797	E798	D799	L800	F801	A802	D803	K804	H805	I806	Q807	V808	L809	V810	S811	T812	A813	E814	T815	A816	M817	G818	V819	N820	L821	P822	A823	H824	T825	V826	I827	G830	T831	Q832	V833	Y834	S835	P836	E837	K838	G839	R840	N841	T842	E843	L844	G845	A846	L847	D848	I849	L850	L853			
G854	R855	A856	G857	R858	P859	Q860	Y861	D862	T863	K864	G865	E866	I868	L869	T870	S871	S872	H873	G874	E875	L876	Q877	Y878	Y879	L880	S881	L882	L883	M884	Q885	Q886	L887	P888	I889	E890	S891	Q892	M893	V894	S895	K896	L897	P898	D899	N900	L901	N902	V906	A913	K914	D915	L916	V917	N918	W919	L920				
G921	Y922	A923	Y924	L925	Y926	I927	A928	N929	L930	R931	S932	P933	T934	L935	Y936	Q937	R938	S939	H940	D941	D942	L943	K944	G945	D946	P947	L948	L949	D950	Q951	R952	R953	L954	D955	L956	H956	T959	A960	M961	L962	N963	L964	D965	K966	N967	R968	L969	V970	K971	Y972	D973	K974	K975	A976	I977	I978	G979	N978	F979	Q980
V981	T982	E983	L984	T987	Q988	Q989	T1000	Y1001	N1002	Q1003	L1004	L1005	K1006	P1007	T1008	L1009	S1010	E1011	I1012	E1013	L1014	F1015	R1016	V1017	L1020	S1021	S1022	K1025	N1026	I1027	T1028	N1029	R1030	E1031	E1032	E1033	K1034	L1035	E1036	L1037	Q1038	K1039	L1040	L1041	E1042	R1043	V1044	P1045	I1046	P1047	V1048	K1049	E1050	S1051	I1052	E1053				
E1054	P1055	S1056	A1057	K1058	N1059	M1060	V1061	L1062	F1066	L1070	K1071	L1072	E1073	G1074	F1075	A1076	L1077	M1078	D1080	M1081	V1082	Y1083	V1084	T1085	Q1086	S1087	M1092	R1093	A1094	I1095	F1096	E1097	I1098	V1099	L1100	W1104	A1105	D1109	K1110	T1111	L1112	M1113	C1115	K1116	D1119	W1123	Q1124	S1125	M1126											
R1133	K1134	L1135	P1136	E1137	V1138	V1139	V1140	K1141	K1142	L1143	E1144	K1145	K1146	N1147	F1148	P1149	F1150	E1151	R1152	L1153	Y1154	D1155	L1156	N1157	H1158	N1159	E1160	I1161	G1162	E1163	L1164	I1165	R1166	T1167	Q1168	K1169	M1170	G1171	K1172	T1173	Y1177	K1183	L1184	E1185	L1186	S1187	L1190	R1195	S1196	T1197	L1202	T1203	E1212							
K1213	G1215	W1222	E1226	D1227	V1228	D1229	S1230	E1231	E1237	K1242	E1249	H1250	L1251	I1252	T1253	F1259	E1260	P1261	L1262	P1263	R1269	V1270	S1277	C1278	E1279	T1280	Q1281	L1282	P1283	V1284	S1285	L1289	I1290	L1291	P1292	E1293	K1294	Y1295	P1296	P1297	P1298	T1299	E1300	L1301	L1302	D1303	L1304	Q1305	P1306											
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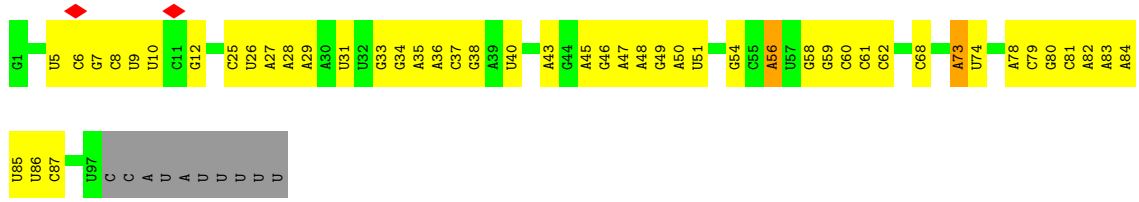
• Molecule 5: U5 small nuclear ribonucleoprotein 40 kDa protein



MET	ILE	GLU	GLN	GLN	LYS	ARG	LYS	GLY	PRO	GLU	LEU	LEU	PRO	LEU	VAL	PRO	VAL	LYS	ARG	GLN	ARG	HIS	GLU	GLU	LEU	LEU	LEU	GLY	ALA	ALA	GLY	GLY	GLN	GLN	GLN	GLN	ALA	ALA	THR	PRO	GLY	GLY	ALA	LEU	LEU	GLN	ALA	PRO	ARG	ARG	CYS	SER	SER	SER	LEU	LEU	GLN	ALA	P56	N192
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• Molecule 6: U6 snRNA

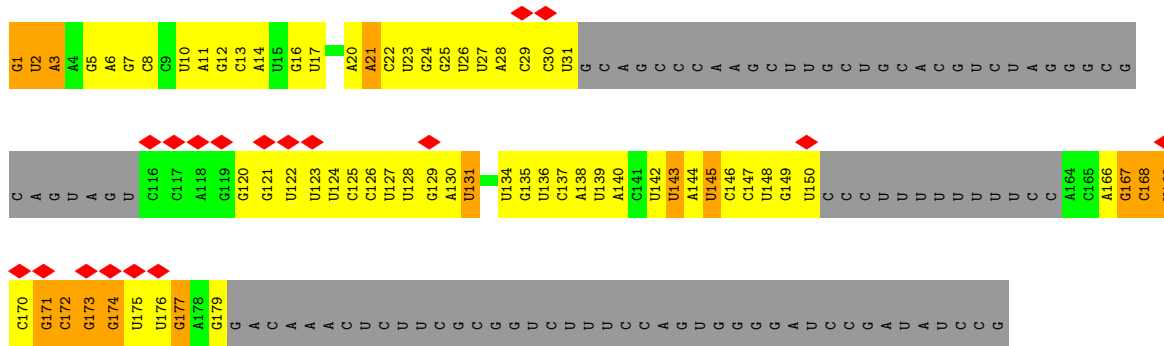
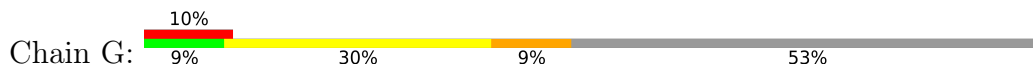




• Molecule 7: Pre-mRNA



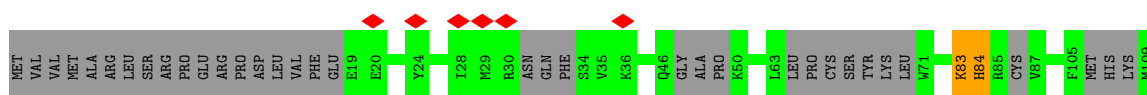
• Molecule 8: Pre-mRNA

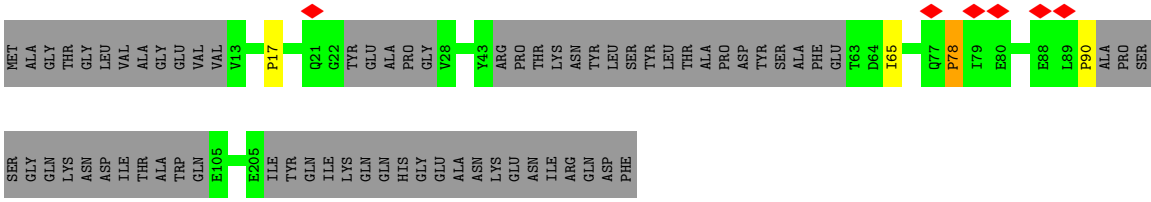


• Molecule 9: U2 snRNA

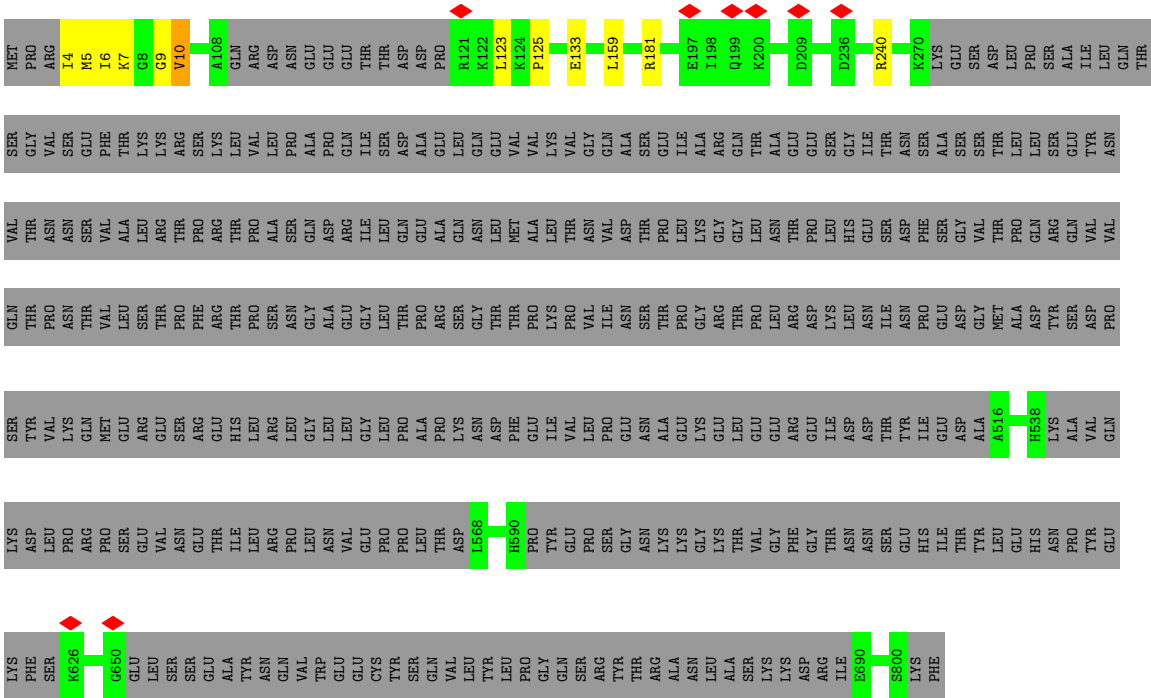


• Molecule 10: Pre-mRNA-splicing factor SYF1

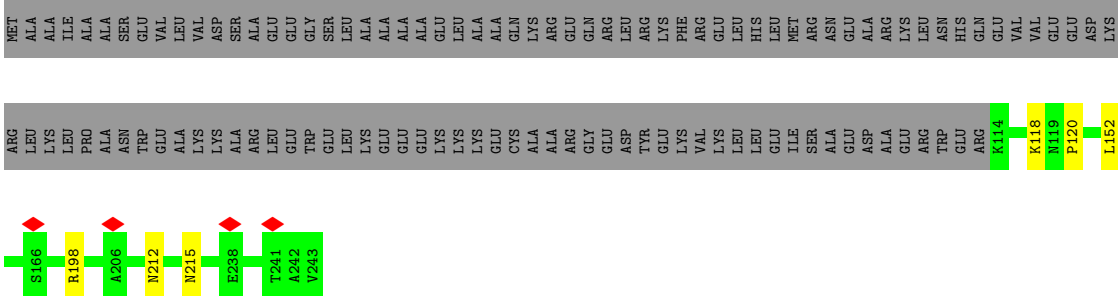




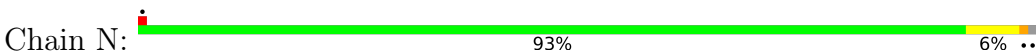
● Molecule 13: Cell division cycle 5-like protein

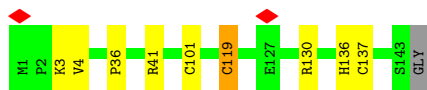


● Molecule 14: Pre-mRNA-splicing factor SYF2

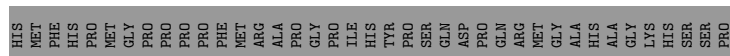
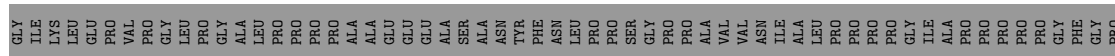


● Molecule 15: Protein BUD31 homolog

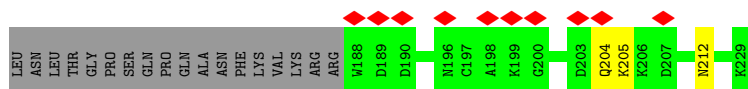
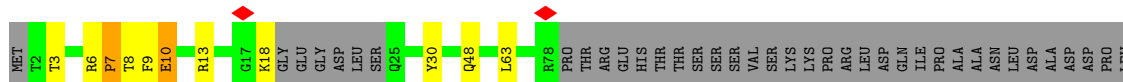
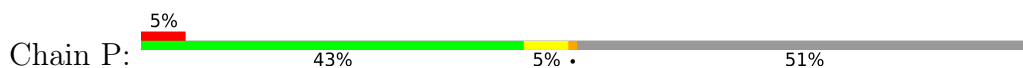




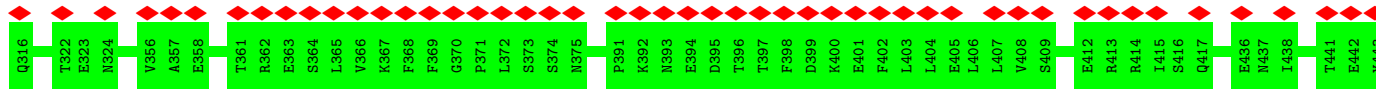
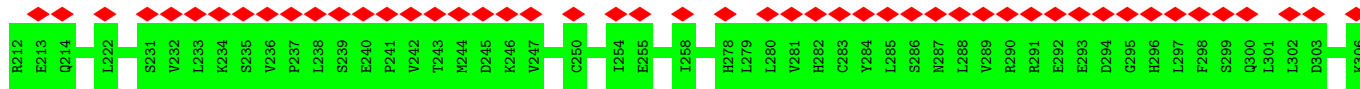
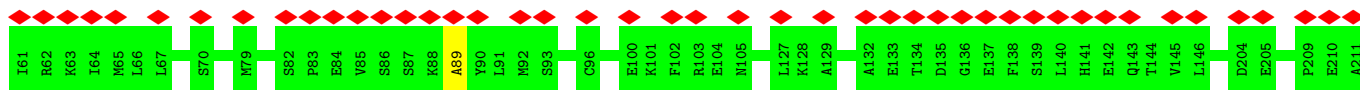
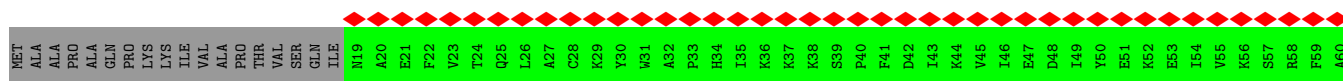
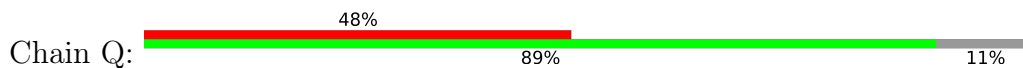
• Molecule 16: Pre-mRNA-splicing factor RBM22

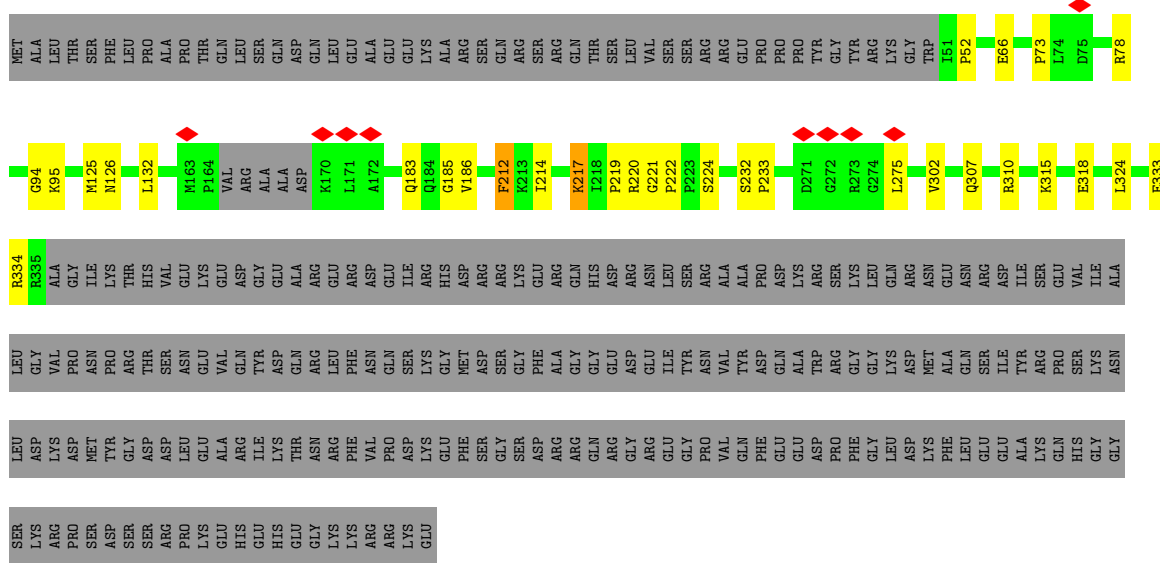


• Molecule 17: Spliceosome-associated protein CWC15 homolog

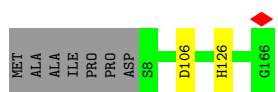


• Molecule 18: RNA helicase aquarius

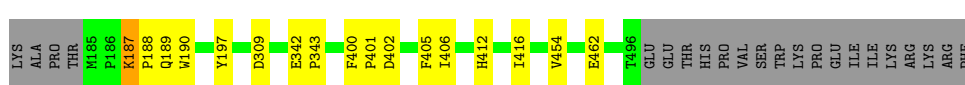
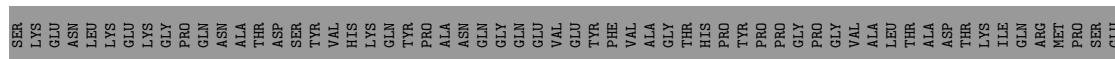
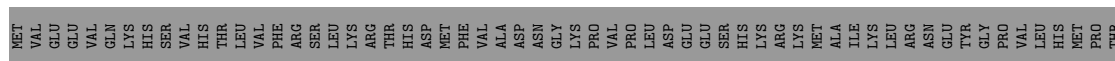




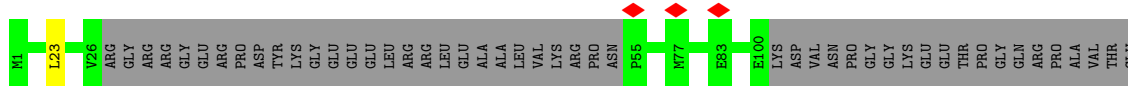
Molecule 20: Peptidyl-prolyl cis-trans isomerase-like 1



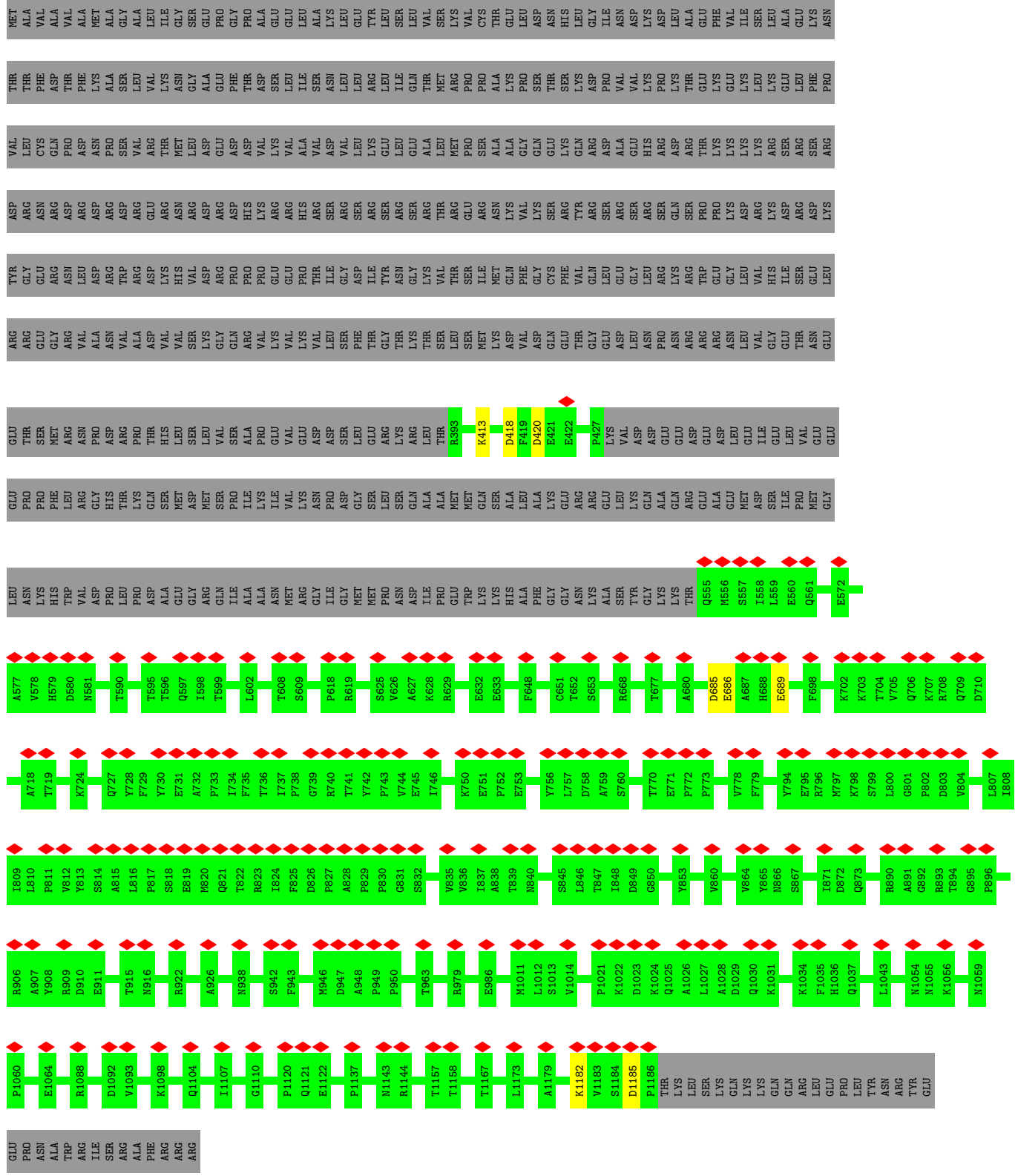
Molecule 21: Pleiotropic regulator 1



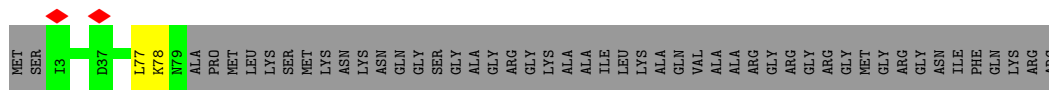
Molecule 22: Serine/arginine repetitive matrix protein 2



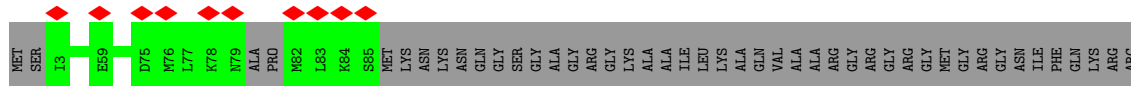
• Molecule 25: ATP-dependent RNA helicase DHX8



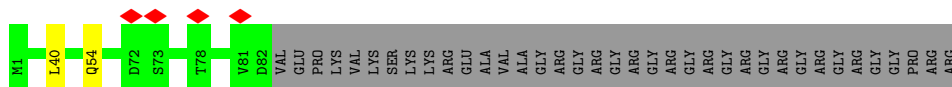
• Molecule 26: Cactin



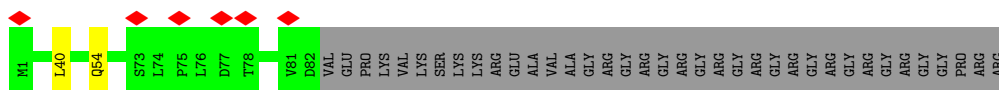
- Molecule 31: Small nuclear ribonucleoprotein Sm D3



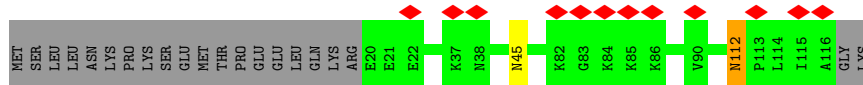
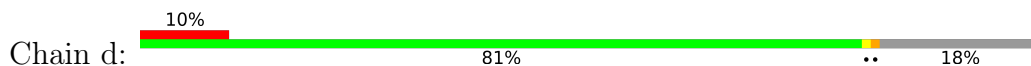
- Molecule 32: Small nuclear ribonucleoprotein Sm D1



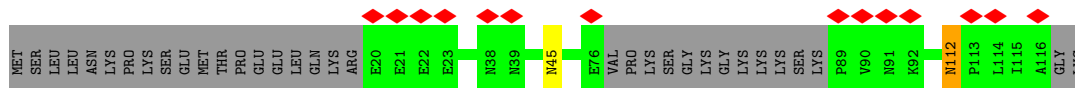
- Molecule 32: Small nuclear ribonucleoprotein Sm D1



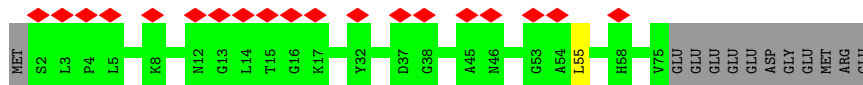
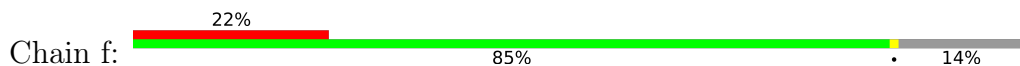
- Molecule 33: Small nuclear ribonucleoprotein Sm D2



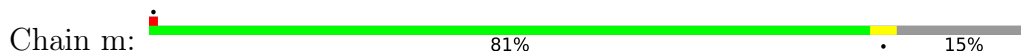
- Molecule 33: Small nuclear ribonucleoprotein Sm D2



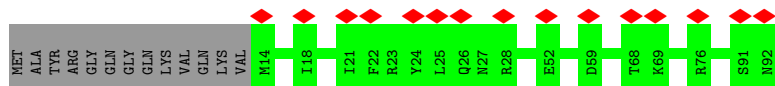
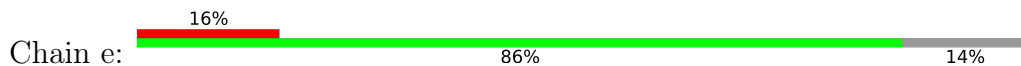
- Molecule 34: Small nuclear ribonucleoprotein F



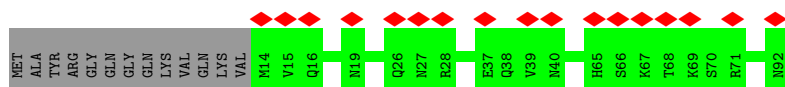
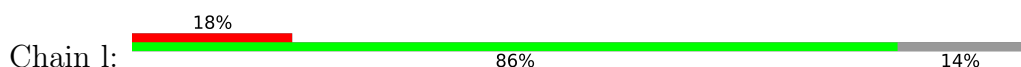
- Molecule 34: Small nuclear ribonucleoprotein F



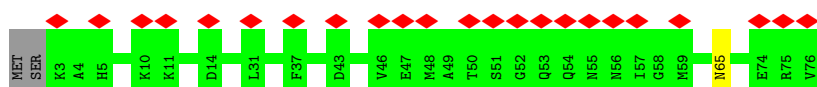
• Molecule 35: Small nuclear ribonucleoprotein E



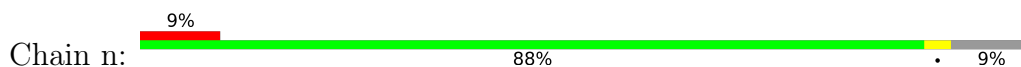
• Molecule 35: Small nuclear ribonucleoprotein E



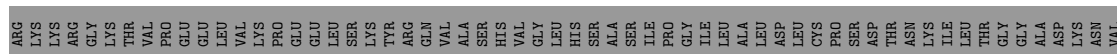
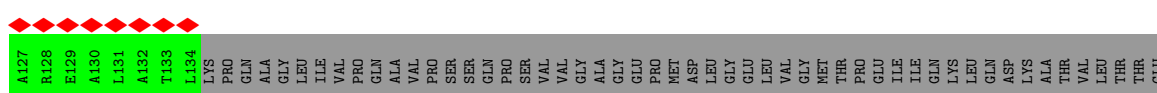
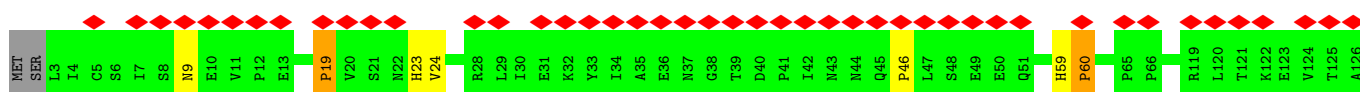
• Molecule 36: Small nuclear ribonucleoprotein G

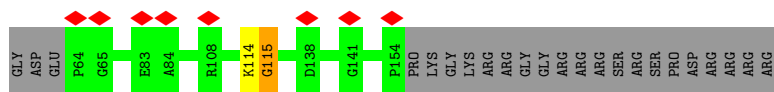


• Molecule 36: Small nuclear ribonucleoprotein G

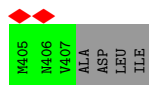
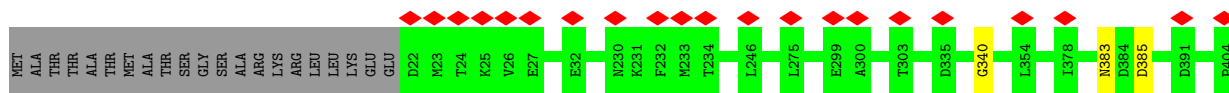
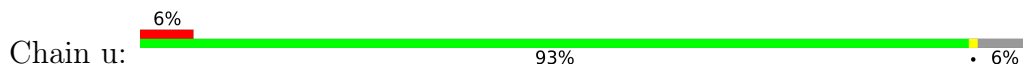


• Molecule 37: Pre-mRNA-processing factor 19

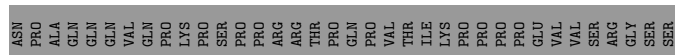
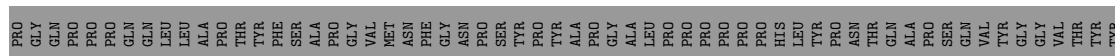
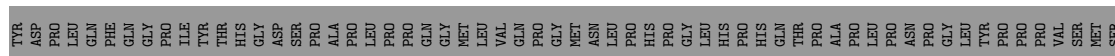
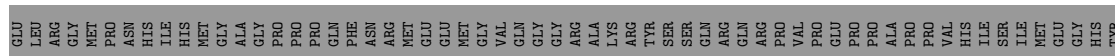
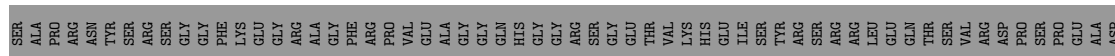
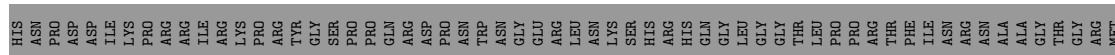
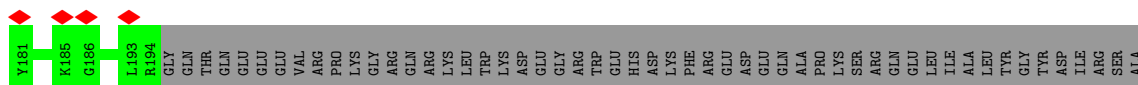
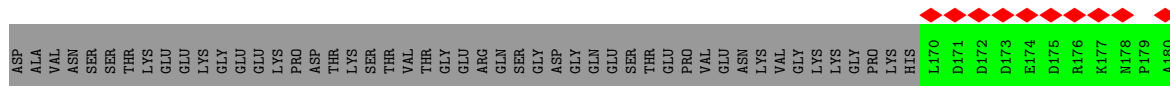




• Molecule 43: Eukaryotic initiation factor 4A-III



• Molecule 44: Protein CASC3



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	58374	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	NONE	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	50	Depositor
Minimum defocus (nm)	1200	Depositor
Maximum defocus (nm)	2500	Depositor
Magnification	Not provided	
Image detector	GATAN K2 SUMMIT (4k x 4k)	Depositor
Maximum map value	2.144	Depositor
Minimum map value	-1.098	Depositor
Average map value	0.014	Depositor
Map value standard deviation	0.086	Depositor
Recommended contour level	0.37	Depositor
Map size (\AA)	535.2, 535.2, 535.2	wwPDB
Map dimensions	400, 400, 400	wwPDB
Map angles ($^\circ$)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (\AA)	1.338, 1.338, 1.338	Depositor

5 Model quality i

5.1 Standard geometry i

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

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

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
1	A	0.73	8/18191 (0.0%)	0.78	17/24720 (0.1%)
2	B	0.61	1/1970 (0.1%)	0.84	4/3060 (0.1%)
3	C	0.57	0/6938	0.71	3/9428 (0.0%)
4	D	0.33	0/8529	0.59	0/11891
5	E	0.56	0/2392	0.66	0/3242
6	F	0.49	0/2323	0.78	2/3619 (0.1%)
7	4	1.34	0/307	1.53	7/476 (1.5%)
8	G	0.63	4/1674 (0.2%)	1.24	19/2594 (0.7%)
9	H	0.95	26/3305 (0.8%)	1.63	112/5130 (2.2%)
10	I	0.43	0/3884	0.86	10/5301 (0.2%)
11	J	0.56	0/3861	0.60	6/5241 (0.1%)
12	K	0.44	0/768	0.55	2/1067 (0.2%)
13	L	0.48	0/3046	0.63	2/4115 (0.0%)
14	M	0.54	0/1119	0.70	1/1497 (0.1%)
15	N	0.77	3/1210 (0.2%)	0.69	0/1622
16	O	0.60	1/2344 (0.0%)	0.70	4/3163 (0.1%)
17	P	0.66	0/967	0.87	3/1285 (0.2%)
18	Q	0.24	0/6565	0.45	0/9143
19	R	0.69	3/2262 (0.1%)	0.84	6/3031 (0.2%)
20	S	0.52	0/1268	0.64	1/1714 (0.1%)
21	T	0.81	0/2519	0.82	5/3433 (0.1%)
22	U	0.49	0/424	0.59	0/582
23	V	0.34	0/2642	0.56	1/3602 (0.0%)
24	W	0.45	0/4237	0.72	4/5723 (0.1%)
25	Y	0.52	0/3436	0.75	3/4774 (0.1%)
26	Z	0.32	0/1129	0.53	0/1525
27	2	0.47	0/1030	0.75	1/1371 (0.1%)
28	z	0.27	0/505	0.55	1/672 (0.1%)
29	b	0.55	0/797	0.81	0/1062
29	i	0.53	0/700	0.82	0/933
30	y	0.36	0/389	0.72	1/540 (0.2%)
31	a	0.47	0/616	0.72	1/830 (0.1%)

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
31	h	0.47	0/639	0.68	0/857
32	c	0.56	0/657	0.77	0/888
32	j	0.56	0/657	0.77	0/888
33	d	0.69	0/786	0.86	0/1053
33	k	0.69	0/696	0.86	0/935
34	f	0.82	0/588	0.84	0/795
34	m	0.83	0/578	0.88	0/783
35	e	0.62	0/660	0.83	0/886
35	l	0.61	0/660	0.84	0/886
36	g	0.53	0/584	0.78	0/779
36	n	0.53	0/548	0.83	0/729
37	q	0.35	0/658	0.63	3/919 (0.3%)
37	r	0.32	0/653	0.59	3/912 (0.3%)
37	s	0.34	0/658	0.65	3/919 (0.3%)
37	t	0.35	0/653	0.59	3/912 (0.3%)
38	o	0.59	0/1299	1.63	17/1761 (1.0%)
39	p	0.56	0/774	1.35	6/1035 (0.6%)
40	l	0.38	0/2262	0.56	0/3045
41	v	0.30	0/710	0.65	0/987
42	w	0.30	0/444	0.78	2/614 (0.3%)
43	u	0.32	0/1906	0.69	0/2653
44	x	0.34	0/123	0.70	0/170
45	3	0.32	0/232	0.48	0/307
All	All	0.57	46/108772 (0.0%)	0.80	253/150099 (0.2%)

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

Mol	Chain	#Chirality outliers	#Planarity outliers
1	A	0	19
3	C	0	9
4	D	0	1
5	E	0	1
10	I	0	6
11	J	0	5
15	N	0	4
16	O	0	1
17	P	0	3
19	R	0	7
21	T	0	3

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Mol	Chain	#Chirality outliers	#Planarity outliers
24	W	0	2
33	d	0	1
33	k	0	1
All	All	0	63

All (46) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	1724	PRO	N-CA	12.46	1.68	1.47
19	R	222	PRO	N-CA	12.17	1.68	1.47
8	G	21	A	O3'-P	-8.36	1.51	1.61
1	A	1529	ILE	C-N	7.75	1.49	1.34
9	H	142	C	C1'-N1	7.48	1.59	1.48
9	H	77	C	C1'-N1	7.46	1.59	1.48
8	G	145	U	O3'-P	-7.29	1.52	1.61
9	H	72	U	C1'-N1	7.01	1.59	1.48
9	H	55	U	C1'-N1	7.00	1.59	1.48
2	B	103	G	C1'-N9	-6.98	1.37	1.46
9	H	74	U	C1'-N1	6.95	1.59	1.48
9	H	54	U	C1'-N1	6.94	1.59	1.48
9	H	89	U	C1'-N1	6.93	1.59	1.48
9	H	92	U	C1'-N1	6.93	1.59	1.48
9	H	69	U	C1'-N1	6.92	1.59	1.48
9	H	60	U	C1'-N1	6.90	1.59	1.48
15	N	101	CYS	CB-SG	-6.88	1.70	1.82
9	H	58	U	C1'-N1	6.87	1.59	1.48
9	H	91	U	C1'-N1	6.85	1.59	1.48
9	H	150	U	C1'-N1	6.78	1.58	1.48
9	H	182	U	C1'-N1	6.75	1.58	1.48
9	H	73	C	C1'-N1	6.46	1.58	1.48
9	H	151	C	C1'-N1	6.46	1.58	1.48
9	H	67	C	C1'-N1	6.44	1.58	1.48
9	H	141	C	C1'-N1	6.43	1.58	1.48
9	H	184	C	C1'-N1	6.39	1.58	1.48
9	H	97	G	C1'-N9	-6.34	1.38	1.46
9	H	71	C	C1'-N1	6.33	1.58	1.48
9	H	70	C	C1'-N1	6.32	1.58	1.48
9	H	148	C	C1'-N1	6.32	1.58	1.48
9	H	84	C	C1'-N1	6.26	1.58	1.48
9	H	78	C	C1'-N1	6.26	1.58	1.48
8	G	168	C	O3'-P	6.16	1.68	1.61
1	A	863	GLU	CD-OE1	-6.04	1.19	1.25

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	776	LEU	C-O	-5.95	1.12	1.23
19	R	219	PRO	C-O	-5.86	1.11	1.23
1	A	863	GLU	CD-OE2	-5.85	1.19	1.25
8	G	3	A	O3'-P	-5.84	1.54	1.61
16	O	27	CYS	CB-SG	-5.65	1.72	1.81
1	A	771	VAL	C-O	-5.46	1.12	1.23
15	N	137	CYS	CB-SG	-5.39	1.73	1.81
15	N	119	CYS	CB-SG	-5.31	1.73	1.81
19	R	221	GLY	C-N	5.30	1.44	1.34
1	A	859	SER	CA-CB	-5.21	1.45	1.52
9	H	110	A	C1'-N9	-5.11	1.39	1.46
1	A	1438	VAL	CB-CG1	-5.10	1.42	1.52

All (253) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
38	o	55	ARG	NE-CZ-NH1	15.12	127.86	120.30
1	A	535	ARG	CB-CA-C	14.48	139.35	110.40
1	A	772	CYS	CA-CB-SG	-13.84	89.09	114.00
38	o	55	ARG	CD-NE-CZ	13.75	142.85	123.60
8	G	167	G	O4'-C1'-N9	-12.96	97.83	108.20
9	H	167	U	C5-C4-O4	11.87	133.02	125.90
8	G	177	G	N9-C1'-C2'	-11.45	99.12	114.00
38	o	55	ARG	NE-CZ-NH2	-11.38	114.61	120.30
38	o	75	ARG	NE-CZ-NH1	-11.23	114.68	120.30
7	4	-12	G	N9-C1'-C2'	-11.05	99.64	114.00
9	H	164	C	N1-C2-O2	-10.13	112.82	118.90
9	H	31	G	N9-C1'-C2'	-9.81	101.21	112.00
8	G	177	G	C4'-C3'-O3'	9.44	131.87	113.00
8	G	1	G	N9-C1'-C2'	-9.24	101.83	112.00
39	p	25	ARG	NE-CZ-NH1	9.17	124.88	120.30
6	F	56	A	O5'-P-OP1	-8.93	97.67	105.70
9	H	162	U	N3-C2-O2	-8.92	115.96	122.20
39	p	80	ARG	CD-NE-CZ	8.87	136.02	123.60
1	A	1561	PHE	CB-CA-C	-8.63	93.14	110.40
7	4	-6	C	C2-N1-C1'	8.50	128.15	118.80
2	B	20	G	N9-C1'-C2'	8.50	125.05	114.00
9	H	164	C	C5'-C4'-O4'	-8.34	99.09	109.10
8	G	3	A	N9-C1'-C2'	-8.32	102.85	112.00
9	H	169	C	P-O3'-C3'	8.22	129.57	119.70
1	A	861	ARG	CG-CD-NE	-8.20	94.59	111.80
10	I	84	HIS	O-C-N	-8.15	109.65	122.70

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
10	I	83	LYS	O-C-N	-8.15	109.66	122.70
10	I	311	MET	O-C-N	-8.13	109.69	122.70
10	I	310	LYS	O-C-N	-8.11	109.72	122.70
9	H	167	U	N3-C4-O4	-8.07	113.75	119.40
10	I	309	ALA	O-C-N	-8.04	109.84	122.70
9	H	166	G	O4'-C1'-N9	7.99	114.59	108.20
16	O	193	LEU	CA-CB-CG	7.88	133.43	115.30
8	G	1	G	C1'-C2'-O2'	-7.87	87.00	110.60
8	G	172	C	P-O3'-C3'	7.83	129.10	119.70
21	T	402	ASP	CB-CG-OD1	7.70	125.23	118.30
38	o	107	ASP	CB-CG-OD1	7.62	125.16	118.30
1	A	1850	ARG	N-CA-CB	7.60	124.28	110.60
9	H	164	C	P-O3'-C3'	7.52	128.73	119.70
9	H	167	U	N1-C2-O2	7.52	128.06	122.80
38	o	27	ARG	NE-CZ-NH2	-7.50	116.55	120.30
9	H	164	C	N3-C2-O2	7.49	127.14	121.90
1	A	663	ARG	CG-CD-NE	-7.38	96.29	111.80
1	A	1724	PRO	N-CA-C	-7.36	92.97	112.10
19	R	222	PRO	CA-N-CD	-7.32	101.25	111.50
9	H	69	U	OP2-P-O3'	7.29	121.25	105.20
9	H	114	A	OP2-P-O3'	7.27	121.19	105.20
8	G	169	U	N1-C1'-C2'	-7.26	104.01	112.00
9	H	148	C	OP2-P-O3'	7.24	121.13	105.20
9	H	73	C	OP2-P-O3'	7.24	121.13	105.20
9	H	70	C	OP2-P-O3'	7.23	121.11	105.20
9	H	59	A	OP2-P-O3'	7.23	121.11	105.20
9	H	113	G	OP2-P-O3'	7.23	121.10	105.20
9	H	183	G	OP2-P-O3'	7.23	121.10	105.20
9	H	77	C	OP2-P-O3'	7.22	121.09	105.20
9	H	88	A	OP2-P-O3'	7.21	121.07	105.20
9	H	57	A	OP2-P-O3'	7.21	121.06	105.20
9	H	55	U	OP2-P-O3'	7.21	121.05	105.20
9	H	82	G	OP2-P-O3'	7.21	121.05	105.20
9	H	141	C	OP2-P-O3'	7.21	121.05	105.20
9	H	72	U	OP2-P-O3'	7.21	121.05	105.20
9	H	71	C	OP2-P-O3'	7.20	121.05	105.20
9	H	149	A	OP2-P-O3'	7.20	121.05	105.20
9	H	91	U	OP2-P-O3'	7.20	121.04	105.20
9	H	181	G	OP2-P-O3'	7.20	121.04	105.20
9	H	182	U	OP2-P-O3'	7.20	121.04	105.20
9	H	92	U	OP2-P-O3'	7.20	121.03	105.20
9	H	54	U	OP2-P-O3'	7.20	121.03	105.20

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
9	H	68	G	OP2-P-O3'	7.20	121.03	105.20
9	H	81	G	OP2-P-O3'	7.20	121.03	105.20
9	H	78	C	OP2-P-O3'	7.19	121.02	105.20
9	H	180	G	OP2-P-O3'	7.19	121.01	105.20
9	H	79	G	OP2-P-O3'	7.18	121.00	105.20
9	H	58	U	OP2-P-O3'	7.18	120.99	105.20
9	H	84	C	OP2-P-O3'	7.17	120.98	105.20
9	H	89	U	OP2-P-O3'	7.17	120.98	105.20
9	H	90	A	OP2-P-O3'	7.17	120.98	105.20
9	H	74	U	OP2-P-O3'	7.17	120.97	105.20
9	H	150	U	OP2-P-O3'	7.17	120.96	105.20
9	H	67	C	OP2-P-O3'	7.16	120.96	105.20
9	H	93	A	OP2-P-O3'	7.16	120.95	105.20
9	H	56	A	OP2-P-O3'	7.15	120.93	105.20
9	H	83	A	OP2-P-O3'	7.14	120.90	105.20
9	H	168	A	P-O5'-C5'	-7.14	109.48	120.90
9	H	80	A	OP2-P-O3'	7.13	120.89	105.20
37	s	60	PRO	N-CA-CB	7.09	111.81	103.30
9	H	167	U	N3-C2-O2	-7.06	117.26	122.20
21	T	187	LYS	C-N-CD	-7.02	105.16	120.60
8	G	174	G	C4'-C3'-O3'	6.96	126.92	113.00
16	O	119	GLN	CB-CA-C	6.88	124.17	110.40
9	H	82	G	O3'-P-O5'	-6.86	90.97	104.00
9	H	183	G	O3'-P-O5'	-6.85	90.99	104.00
9	H	77	C	O3'-P-O5'	-6.82	91.03	104.00
9	H	68	G	O3'-P-O5'	-6.81	91.05	104.00
9	H	78	C	O3'-P-O5'	-6.81	91.05	104.00
9	H	141	C	O3'-P-O5'	-6.81	91.06	104.00
9	H	56	A	O3'-P-O5'	-6.81	91.06	104.00
9	H	113	G	O3'-P-O5'	-6.81	91.06	104.00
9	H	148	C	O3'-P-O5'	-6.81	91.07	104.00
9	H	59	A	O3'-P-O5'	-6.80	91.07	104.00
9	H	54	U	O3'-P-O5'	-6.80	91.09	104.00
9	H	180	G	O3'-P-O5'	-6.80	91.09	104.00
9	H	57	A	O3'-P-O5'	-6.79	91.10	104.00
9	H	182	U	O3'-P-O5'	-6.79	91.10	104.00
19	R	132	LEU	CA-CB-CG	6.79	130.91	115.30
9	H	72	U	O3'-P-O5'	-6.79	91.11	104.00
9	H	74	U	O3'-P-O5'	-6.79	91.11	104.00
9	H	73	C	O3'-P-O5'	-6.78	91.11	104.00
2	B	104	C	C2'-C3'-O3'	-6.78	94.58	109.50
9	H	91	U	O3'-P-O5'	-6.78	91.12	104.00

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
9	H	93	A	O3'-P-O5'	-6.78	91.12	104.00
9	H	150	U	O3'-P-O5'	-6.78	91.12	104.00
9	H	149	A	O3'-P-O5'	-6.78	91.13	104.00
9	H	81	G	O3'-P-O5'	-6.77	91.14	104.00
9	H	90	A	O3'-P-O5'	-6.77	91.14	104.00
9	H	181	G	O3'-P-O5'	-6.77	91.14	104.00
9	H	79	G	O3'-P-O5'	-6.77	91.14	104.00
9	H	55	U	O3'-P-O5'	-6.76	91.15	104.00
9	H	80	A	O3'-P-O5'	-6.76	91.15	104.00
9	H	84	C	O3'-P-O5'	-6.76	91.15	104.00
9	H	155	C	P-O3'-C3'	6.76	127.81	119.70
9	H	89	U	O3'-P-O5'	-6.76	91.16	104.00
9	H	92	U	O3'-P-O5'	-6.76	91.16	104.00
9	H	67	C	O3'-P-O5'	-6.75	91.19	104.00
9	H	69	U	O3'-P-O5'	-6.75	91.18	104.00
9	H	71	C	O3'-P-O5'	-6.74	91.19	104.00
9	H	58	U	O3'-P-O5'	-6.74	91.19	104.00
9	H	114	A	O3'-P-O5'	-6.74	91.19	104.00
38	o	23	GLU	OE1-CD-OE2	-6.74	115.21	123.30
9	H	83	A	O3'-P-O5'	-6.73	91.20	104.00
9	H	88	A	O3'-P-O5'	-6.73	91.21	104.00
9	H	70	C	O3'-P-O5'	-6.72	91.23	104.00
9	H	166	G	C8-N9-C4	-6.71	103.72	106.40
37	t	60	PRO	N-CA-CB	6.68	111.32	103.30
39	p	89	ASP	CB-CG-OD1	6.67	124.30	118.30
23	V	467	LEU	CA-CB-CG	6.64	130.58	115.30
8	G	174	G	N9-C1'-C2'	-6.63	104.70	112.00
37	q	46	PRO	N-CA-CB	6.60	111.22	103.30
37	s	46	PRO	N-CA-CB	6.58	111.19	103.30
1	A	343	GLU	N-CA-CB	-6.57	98.78	110.60
37	r	46	PRO	N-CA-CB	6.51	111.12	103.30
12	K	90	PRO	N-CA-CB	6.47	111.06	103.30
37	q	60	PRO	N-CA-CB	6.46	111.05	103.30
42	w	114	LYS	N-CA-C	-6.42	93.67	111.00
13	L	159	LEU	CA-CB-CG	6.40	130.02	115.30
9	H	165	A	O4'-C1'-N9	-6.37	103.11	108.20
8	G	131	U	C2'-C3'-O3'	-6.36	95.51	109.50
38	o	5	THR	N-CA-CB	-6.34	98.25	110.30
8	G	171	G	C2'-C3'-O3'	6.34	123.84	113.70
27	2	97	ASP	CA-C-N	-6.32	103.31	117.20
12	K	78	PRO	N-CA-CB	6.28	110.83	103.30
3	C	308	CYS	CA-CB-SG	6.26	125.27	114.00

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
9	H	166	G	N9-C4-C5	6.25	107.90	105.40
13	L	9	GLY	C-N-CA	6.24	137.29	121.70
8	G	21	A	O3'-P-O5'	6.13	115.66	104.00
7	4	-6	C	C6-N1-C1'	-6.11	113.46	120.80
38	o	78	ARG	NE-CZ-NH2	-6.10	117.25	120.30
9	H	166	G	N3-C4-C5	-6.04	125.58	128.60
38	o	132	ARG	CD-NE-CZ	6.01	132.02	123.60
16	O	193	LEU	CB-CG-CD2	-6.00	100.80	111.00
38	o	21	ASP	CB-CG-OD1	6.00	123.70	118.30
9	H	162	U	N1-C2-O2	6.00	127.00	122.80
11	J	220	LEU	CA-CB-CG	5.97	129.03	115.30
11	J	670	PRO	N-CA-CB	5.96	110.45	103.30
1	A	663	ARG	CB-CA-C	-5.96	98.49	110.40
21	T	401	PRO	C-N-CA	5.95	136.58	121.70
37	t	46	PRO	N-CA-CB	5.95	110.44	103.30
17	P	7	PRO	C-N-CA	5.94	136.55	121.70
11	J	637	PRO	N-CA-CB	5.92	110.40	103.30
39	p	25	ARG	CD-NE-CZ	5.91	131.88	123.60
9	H	172	C	P-O3'-C3'	5.89	126.77	119.70
10	I	458	LYS	O-C-N	5.88	132.11	122.70
38	o	27	ARG	CB-CA-C	-5.88	98.65	110.40
11	J	675	PRO	N-CA-CB	5.87	110.34	103.30
38	o	64	ARG	NE-CZ-NH1	5.87	123.23	120.30
9	H	168	A	C5'-C4'-C3'	-5.86	106.62	116.00
2	B	26	A	P-O5'-C5'	-5.85	111.53	120.90
11	J	604	PRO	N-CA-CB	5.85	110.33	103.30
10	I	459	ALA	O-C-N	5.84	132.05	122.70
8	G	21	A	P-O3'-C3'	-5.84	112.69	119.70
9	H	164	C	C5-C4-N4	-5.84	116.11	120.20
37	r	19	PRO	N-CA-CB	5.83	110.30	103.30
37	q	19	PRO	N-CA-CB	5.80	110.26	103.30
10	I	457	ARG	O-C-N	5.78	131.94	122.70
19	R	222	PRO	N-CA-C	-5.76	97.12	112.10
11	J	566	PRO	N-CA-CB	5.76	110.21	103.30
9	H	167	U	O3'-P-O5'	-5.73	93.12	104.00
19	R	217	LYS	CB-CA-C	-5.72	98.97	110.40
24	W	139	LEU	CA-CB-CG	5.69	128.38	115.30
9	H	156	U	P-O3'-C3'	-5.68	112.88	119.70
19	R	214	ILE	CG1-CB-CG2	-5.68	98.91	111.40
37	t	19	PRO	N-CA-CB	5.66	110.10	103.30
7	4	-12	G	C4'-C3'-O3'	5.64	124.28	113.00
17	P	10	GLU	CB-CA-C	5.64	121.67	110.40

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
38	o	75	ARG	NH1-CZ-NH2	5.62	125.59	119.40
1	A	1737	ASN	CB-CA-C	5.61	121.61	110.40
9	H	166	G	C6-N1-C2	-5.55	121.77	125.10
37	s	19	PRO	N-CA-CB	5.55	109.95	103.30
38	o	58	ASP	N-CA-CB	-5.55	100.61	110.60
8	G	2	U	N1-C1'-C2'	-5.54	105.91	112.00
24	W	532	LEU	CB-CG-CD1	-5.49	101.67	111.00
6	F	73	A	P-O3'-C3'	5.49	126.28	119.70
8	G	168	C	O5'-P-OP2	-5.46	100.78	105.70
37	r	60	PRO	N-CA-CB	5.45	109.84	103.30
2	B	20	G	O4'-C1'-N9	5.41	112.53	108.20
9	H	106	G	O5'-P-OP1	5.41	117.19	110.70
1	A	1556	ASP	CB-CA-C	-5.36	99.69	110.40
9	H	162	U	C2-N3-C4	-5.35	123.79	127.00
9	H	156	U	OP2-P-O3'	5.35	116.97	105.20
38	o	47	ILE	N-CA-CB	5.34	123.08	110.80
19	R	275	LEU	CA-CB-CG	5.32	127.53	115.30
20	S	106	ASP	CB-CG-OD1	5.31	123.08	118.30
9	H	157	G	O4'-C1'-N9	-5.30	103.96	108.20
30	y	47	ARG	CB-CA-C	-5.29	99.81	110.40
24	W	82	ASN	C-N-CD	-5.27	109.00	120.60
39	p	39	ASP	CB-CG-OD2	-5.26	113.56	118.30
21	T	309	ASP	O-C-N	5.26	131.12	122.70
1	A	1301	ILE	CG1-CB-CG2	-5.26	99.83	111.40
21	T	309	ASP	CB-CG-OD1	5.25	123.03	118.30
1	A	1982	GLN	CB-CA-C	-5.25	99.91	110.40
1	A	1459	ARG	NE-CZ-NH1	-5.24	117.68	120.30
1	A	1753	LEU	N-CA-CB	-5.24	99.92	110.40
7	4	-6	C	O4'-C1'-N1	5.24	112.39	108.20
9	H	157	G	P-O5'-C5'	-5.23	112.53	120.90
28	z	56	ASP	CB-CG-OD2	5.22	123.00	118.30
1	A	863	GLU	CB-CG-CD	-5.22	100.11	114.20
7	4	-6	C	N1-C2-O2	5.22	122.03	118.90
25	Y	685	ASP	C-N-CA	5.22	134.74	121.70
9	H	156	U	C4'-C3'-C2'	5.21	107.81	102.60
16	O	28	LEU	CB-CG-CD2	-5.20	102.16	111.00
42	w	115	GLY	N-CA-C	5.19	126.08	113.10
24	W	243	VAL	CG1-CB-CG2	-5.17	102.63	110.90
39	p	39	ASP	CB-CG-OD1	5.17	122.95	118.30
8	G	143	U	N1-C1'-C2'	-5.16	106.32	112.00
8	G	2	U	C3'-C2'-C1'	5.16	105.63	101.50
31	a	78	LYS	N-CA-CB	5.13	119.84	110.60

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	1303	LEU	CA-CB-CG	-5.13	103.49	115.30
25	Y	686	GLU	C-N-CA	5.12	134.49	121.70
9	H	160	A	P-O5'-C5'	-5.11	112.72	120.90
9	H	176	G	OP1-P-OP2	-5.11	111.94	119.60
10	I	697	PRO	C-N-CA	5.10	134.45	121.70
3	C	93	ILE	CG1-CB-CG2	-5.10	100.19	111.40
25	Y	689	GLU	N-CA-C	-5.08	97.28	111.00
9	H	170	C	N3-C4-C5	-5.08	119.87	121.90
8	G	173	G	O5'-P-OP2	-5.07	101.14	105.70
9	H	160	A	C4'-C3'-C2'	-5.06	97.54	102.60
10	I	698	ARG	N-CA-CB	5.06	119.71	110.60
9	H	170	C	O4'-C1'-C2'	-5.04	100.76	105.80
38	o	99	SER	N-CA-CB	-5.04	102.94	110.50
14	M	120	PRO	CB-CA-C	-5.03	99.41	112.00
3	C	359	LYS	CA-CB-CG	5.01	124.42	113.40
17	P	63	LEU	CB-CG-CD1	-5.01	102.49	111.00
7	4	-6	C	N3-C2-O2	-5.00	118.40	121.90

There are no chirality outliers.

All (63) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	1019	TYR	Peptide
1	A	1201	ARG	Peptide
1	A	1210	LYS	Peptide
1	A	1338	SER	Peptide
1	A	1503	TRP	Peptide
1	A	1513	MET	Mainchain
1	A	1561	PHE	Mainchain
1	A	166	PHE	Peptide
1	A	1717	ASN	Mainchain
1	A	1749	LYS	Mainchain
1	A	1753	LEU	Mainchain
1	A	2010	ILE	Mainchain
1	A	346	ASP	Peptide
1	A	377	GLU	Peptide
1	A	385	GLU	Peptide
1	A	55	ASP	Peptide
1	A	698	PRO	Peptide
1	A	73	HIS	Peptide
1	A	941	LYS	Peptide
3	C	308	CYS	Peptide

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Mol	Chain	Res	Type	Group
3	C	358	LYS	Peptide
3	C	360	ALA	Peptide
3	C	534	VAL	Peptide
3	C	799	GLU	Peptide
3	C	800	PRO	Peptide
3	C	902	HIS	Peptide
3	C	92	PRO	Peptide
3	C	93	ILE	Peptide
4	D	430	LEU	Peptide
5	E	192	ASN	Peptide
10	I	309	ALA	Mainchain
10	I	310	LYS	Mainchain
10	I	311	MET	Mainchain
10	I	693	GLN	Mainchain
10	I	83	LYS	Mainchain
10	I	84	HIS	Mainchain
11	J	205	LEU	Peptide
11	J	215	THR	Peptide
11	J	216	ASP	Peptide
11	J	240	THR	Peptide
11	J	241	VAL	Peptide
15	N	136	HIS	Peptide
15	N	3	LYS	Peptide
15	N	36	PRO	Peptide
15	N	4	VAL	Peptide
16	O	63	MET	Peptide
17	P	204	GLN	Peptide
17	P	30	TYR	Peptide
17	P	48	GLN	Peptide
19	R	125	MET	Peptide
19	R	126	ASN	Peptide
19	R	183	GLN	Peptide
19	R	185	GLY	Peptide
19	R	212	PHE	Peptide
19	R	66	GLU	Peptide
19	R	94	GLY	Peptide
21	T	342	GLU	Peptide
21	T	400	PHE	Peptide
21	T	405	PHE	Peptide
24	W	257	ILE	Peptide
24	W	518	PRO	Peptide
33	d	112	ASN	Peptide

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Mol	Chain	Res	Type	Group
33	k	112	ASN	Peptide

5.2 Too-close contacts [i](#)

Due to software issues we are unable to calculate clashes - this section is therefore empty.

5.3 Torsion angles [i](#)

5.3.1 Protein backbone [i](#)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	2247/2335 (96%)	2044 (91%)	191 (8%)	12 (0%)	29	68
3	C	856/972 (88%)	781 (91%)	71 (8%)	4 (0%)	29	68
4	D	1720/2136 (80%)	1632 (95%)	85 (5%)	3 (0%)	47	81
5	E	297/357 (83%)	275 (93%)	22 (7%)	0	100	100
10	I	576/855 (67%)	558 (97%)	14 (2%)	4 (1%)	22	62
11	J	530/848 (62%)	489 (92%)	33 (6%)	8 (2%)	10	46
12	K	147/225 (65%)	136 (92%)	8 (5%)	3 (2%)	7	40
13	L	425/802 (53%)	408 (96%)	15 (4%)	2 (0%)	29	68
14	M	128/243 (53%)	117 (91%)	11 (9%)	0	100	100
15	N	141/144 (98%)	124 (88%)	16 (11%)	1 (1%)	22	62
16	O	283/420 (67%)	259 (92%)	23 (8%)	1 (0%)	34	72
17	P	107/229 (47%)	89 (83%)	15 (14%)	3 (3%)	5	33
18	Q	1308/1485 (88%)	1280 (98%)	26 (2%)	2 (0%)	47	81
19	R	274/536 (51%)	247 (90%)	23 (8%)	4 (2%)	10	46
20	S	157/166 (95%)	148 (94%)	9 (6%)	0	100	100
21	T	310/514 (60%)	275 (89%)	29 (9%)	6 (2%)	8	41
22	U	68/2752 (2%)	60 (88%)	8 (12%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
23	V	444/908 (49%)	431 (97%)	12 (3%)	1 (0%)	47	81
24	W	507/579 (88%)	432 (85%)	69 (14%)	6 (1%)	13	50
25	Y	667/1220 (55%)	642 (96%)	23 (3%)	2 (0%)	41	76
26	Z	120/758 (16%)	107 (89%)	13 (11%)	0	100	100
27	2	121/184 (66%)	110 (91%)	7 (6%)	4 (3%)	4	30
28	z	58/112 (52%)	56 (97%)	2 (3%)	0	100	100
29	b	98/240 (41%)	93 (95%)	2 (2%)	3 (3%)	4	31
29	i	84/240 (35%)	82 (98%)	2 (2%)	0	100	100
30	y	77/301 (26%)	75 (97%)	2 (3%)	0	100	100
31	a	75/126 (60%)	74 (99%)	1 (1%)	0	100	100
31	h	77/126 (61%)	76 (99%)	1 (1%)	0	100	100
32	c	80/119 (67%)	77 (96%)	3 (4%)	0	100	100
32	j	80/119 (67%)	77 (96%)	3 (4%)	0	100	100
33	d	95/118 (80%)	91 (96%)	4 (4%)	0	100	100
33	k	81/118 (69%)	78 (96%)	3 (4%)	0	100	100
34	f	72/86 (84%)	68 (94%)	4 (6%)	0	100	100
34	m	71/86 (83%)	67 (94%)	3 (4%)	1 (1%)	11	47
35	e	77/92 (84%)	76 (99%)	1 (1%)	0	100	100
35	l	77/92 (84%)	76 (99%)	1 (1%)	0	100	100
36	g	72/76 (95%)	70 (97%)	2 (3%)	0	100	100
36	n	65/76 (86%)	63 (97%)	2 (3%)	0	100	100
37	q	130/504 (26%)	117 (90%)	7 (5%)	6 (5%)	2	24
37	r	129/504 (26%)	118 (92%)	9 (7%)	2 (2%)	9	45
37	s	130/504 (26%)	116 (89%)	6 (5%)	8 (6%)	1	19
37	t	129/504 (26%)	116 (90%)	9 (7%)	4 (3%)	4	31
38	o	160/255 (63%)	146 (91%)	12 (8%)	2 (1%)	12	48
39	p	92/225 (41%)	90 (98%)	2 (2%)	0	100	100
40	l	265/586 (45%)	246 (93%)	19 (7%)	0	100	100
41	v	142/146 (97%)	138 (97%)	4 (3%)	0	100	100
42	w	89/174 (51%)	87 (98%)	1 (1%)	1 (1%)	14	52
43	u	384/411 (93%)	372 (97%)	9 (2%)	3 (1%)	19	60

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
44	x	23/703 (3%)	22 (96%)	1 (4%)	0	100	100
45	3	28/415 (7%)	27 (96%)	1 (4%)	0	100	100
All	All	14373/25726 (56%)	13438 (94%)	839 (6%)	96 (1%)	26	62

All (96) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	1092	ILE
1	A	1831	LYS
1	A	1881	ASN
3	C	801	LEU
4	D	957	VAL
4	D	1584	ILE
10	I	698	ARG
11	J	217	GLU
11	J	241	VAL
12	K	78	PRO
13	L	10	VAL
13	L	125	PRO
17	P	8	THR
19	R	233	PRO
21	T	187	LYS
21	T	188	PRO
21	T	190	TRP
24	W	73	ASP
24	W	74	PRO
24	W	82	ASN
24	W	83	PRO
27	2	24	PRO
27	2	76	SER
37	q	24	VAL
37	q	59	HIS
37	q	60	PRO
37	s	9	ASN
37	s	55	ILE
37	s	60	PRO
37	s	66	PRO
37	s	71	ILE
37	t	9	ASN
37	t	69	THR
34	m	4	PRO

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Mol	Chain	Res	Type
43	u	383	ASN
1	A	1992	GLY
3	C	94	ILE
3	C	439	PRO
10	I	532	LYS
11	J	709	VAL
18	Q	530	ASN
21	T	406	ILE
25	Y	1185	ASP
37	q	9	ASN
37	q	19	PRO
38	o	160	LYS
42	w	115	GLY
43	u	340	GLY
43	u	385	ASP
1	A	167	PRO
1	A	1503	TRP
1	A	1513	MET
10	I	699	THR
11	J	188	GLN
11	J	205	LEU
17	P	6	ARG
19	R	52	PRO
23	V	597	PRO
24	W	258	PRO
27	2	32	LYS
27	2	72	ALA
37	q	23	HIS
37	r	9	ASN
37	s	24	VAL
37	t	67	SER
1	A	570	ASP
3	C	83	GLU
11	J	341	PRO
11	J	604	PRO
12	K	65	ILE
15	N	41	ARG
17	P	205	LYS
19	R	73	PRO
19	R	186	VAL
25	Y	1182	LYS
37	t	65	PRO

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Mol	Chain	Res	Type
38	o	32	PRO
1	A	364	SER
1	A	1530	PRO
18	Q	89	ALA
21	T	343	PRO
21	T	462	GLU
29	b	105	GLY
29	b	106	ILE
37	s	62	ARG
1	A	1758	PRO
10	I	372	ARG
11	J	216	ASP
16	O	20	PHE
29	b	115	PRO
1	A	1419	ILE
12	K	17	PRO
24	W	271	PRO
37	s	38	GLY
4	D	585	ILE
37	r	60	PRO

5.3.2 Protein sidechains [i](#)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	1775/2108 (84%)	1704 (96%)	71 (4%)	31	56
3	C	758/866 (88%)	749 (99%)	9 (1%)	71	84
5	E	256/300 (85%)	256 (100%)	0	100	100
10	I	199/749 (27%)	187 (94%)	12 (6%)	19	47
11	J	241/751 (32%)	239 (99%)	2 (1%)	81	89
13	L	218/709 (31%)	209 (96%)	9 (4%)	30	56
14	M	117/209 (56%)	112 (96%)	5 (4%)	29	55
15	N	130/130 (100%)	128 (98%)	2 (2%)	65	80

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
16	O	255/361 (71%)	254 (100%)	1 (0%)	91	94
17	P	101/203 (50%)	94 (93%)	7 (7%)	15	42
19	R	236/457 (52%)	223 (94%)	13 (6%)	21	49
20	S	129/134 (96%)	128 (99%)	1 (1%)	81	89
21	T	268/441 (61%)	263 (98%)	5 (2%)	57	75
22	U	21/2432 (1%)	20 (95%)	1 (5%)	25	52
23	V	98/838 (12%)	95 (97%)	3 (3%)	40	63
24	W	448/502 (89%)	439 (98%)	9 (2%)	55	73
25	Y	32/1085 (3%)	29 (91%)	3 (9%)	8	30
26	Z	110/655 (17%)	110 (100%)	0	100	100
27	2	106/157 (68%)	98 (92%)	8 (8%)	13	40
28	z	51/99 (52%)	50 (98%)	1 (2%)	55	73
29	b	83/177 (47%)	81 (98%)	2 (2%)	49	69
29	i	77/177 (44%)	75 (97%)	2 (3%)	46	67
31	a	68/101 (67%)	67 (98%)	1 (2%)	65	80
31	h	70/101 (69%)	70 (100%)	0	100	100
32	c	77/101 (76%)	75 (97%)	2 (3%)	46	67
32	j	77/101 (76%)	75 (97%)	2 (3%)	46	67
33	d	90/110 (82%)	88 (98%)	2 (2%)	52	71
33	k	80/110 (73%)	78 (98%)	2 (2%)	47	68
34	f	63/74 (85%)	62 (98%)	1 (2%)	62	79
34	m	61/74 (82%)	59 (97%)	2 (3%)	38	62
35	e	74/84 (88%)	74 (100%)	0	100	100
35	l	74/84 (88%)	74 (100%)	0	100	100
36	g	64/66 (97%)	63 (98%)	1 (2%)	62	79
36	n	60/66 (91%)	58 (97%)	2 (3%)	38	62
38	o	139/218 (64%)	135 (97%)	4 (3%)	42	64
39	p	82/195 (42%)	79 (96%)	3 (4%)	34	59
40	1	235/520 (45%)	231 (98%)	4 (2%)	60	78
45	3	25/366 (7%)	25 (100%)	0	100	100
All	All	7048/15911 (44%)	6856 (97%)	192 (3%)	48	66

All (192) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	153	ARG
1	A	240	ARG
1	A	244	GLN
1	A	362	ARG
1	A	387	PHE
1	A	409	ARG
1	A	413	LEU
1	A	579	GLN
1	A	642	ARG
1	A	664	HIS
1	A	666	LYS
1	A	762	ARG
1	A	773	LYS
1	A	774	LYS
1	A	850	TYR
1	A	853	LYS
1	A	857	ASN
1	A	861	ARG
1	A	863	GLU
1	A	866	LEU
1	A	880	ARG
1	A	994	ASN
1	A	1089	CYS
1	A	1133	CYS
1	A	1136	ARG
1	A	1189	MET
1	A	1249	MET
1	A	1251	SER
1	A	1253	SER
1	A	1341	ARG
1	A	1402	ARG
1	A	1526	LEU
1	A	1528	GLN
1	A	1529	ILE
1	A	1554	GLN
1	A	1555	LEU
1	A	1556	ASP
1	A	1561	PHE
1	A	1562	MET
1	A	1566	ILE
1	A	1578	ARG
1	A	1722	SER

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Mol	Chain	Res	Type
1	A	1723	LYS
1	A	1725	LEU
1	A	1727	GLN
1	A	1728	GLN
1	A	1730	MET
1	A	1734	MET
1	A	1737	ASN
1	A	1738	PRO
1	A	1740	LEU
1	A	1751	LEU
1	A	1752	GLN
1	A	1753	LEU
1	A	1757	GLU
1	A	1758	PRO
1	A	1763	LEU
1	A	1833	LEU
1	A	1873	GLU
1	A	1876	LEU
1	A	1877	LEU
1	A	1878	ASP
1	A	1879	PHE
1	A	1900	GLU
1	A	1982	GLN
1	A	1987	ILE
1	A	1990	ASP
1	A	1993	LYS
1	A	2011	ILE
1	A	2014	MET
1	A	2015	GLU
3	C	87	GLN
3	C	297	ASN
3	C	359	LYS
3	C	495	ARG
3	C	513	ASN
3	C	572	GLU
3	C	573	GLU
3	C	673	LYS
3	C	826	ARG
10	I	532	LYS
10	I	548	PHE
10	I	606	TRP
10	I	694	ILE

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Mol	Chain	Res	Type
10	I	698	ARG
10	I	699	THR
10	I	724	LEU
10	I	725	ARG
10	I	726	ILE
10	I	727	ARG
10	I	730	VAL
10	I	731	GLN
11	J	201	ARG
11	J	221	ASN
13	L	4	ILE
13	L	5	MET
13	L	6	ILE
13	L	7	LYS
13	L	10	VAL
13	L	123	LEU
13	L	133	GLU
13	L	181	ARG
13	L	240	ARG
14	M	118	LYS
14	M	152	LEU
14	M	198	ARG
14	M	212	ASN
14	M	215	ASN
15	N	119	CYS
15	N	130	ARG
16	O	222	ARG
17	P	3	THR
17	P	7	PRO
17	P	9	PHE
17	P	10	GLU
17	P	13	ARG
17	P	18	LYS
17	P	212	ASN
19	R	78	ARG
19	R	95	LYS
19	R	212	PHE
19	R	217	LYS
19	R	220	ARG
19	R	302	VAL
19	R	307	GLN
19	R	310	ARG

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Mol	Chain	Res	Type
19	R	315	LYS
19	R	318	GLU
19	R	324	LEU
19	R	333	GLU
19	R	334	ARG
20	S	126	HIS
21	T	189	GLN
21	T	197	TYR
21	T	412	HIS
21	T	416	ILE
21	T	454	VAL
22	U	23	LEU
23	V	458	THR
23	V	535	THR
23	V	597	PRO
24	W	129	ARG
24	W	182	LYS
24	W	200	VAL
24	W	243	VAL
24	W	322	ARG
24	W	492	ASN
24	W	495	ARG
24	W	500	LYS
24	W	529	ASN
25	Y	413	LYS
25	Y	418	ASP
25	Y	420	ASP
27	2	23	ILE
27	2	25	LYS
27	2	30	GLU
27	2	68	MET
27	2	102	LYS
27	2	134	LEU
27	2	136	GLU
27	2	137	LYS
28	z	79	LYS
29	b	13	ILE
29	b	58	GLN
31	a	77	LEU
32	c	40	LEU
32	c	54	GLN
33	d	45	ASN

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Mol	Chain	Res	Type
33	d	112	ASN
34	f	55	LEU
36	g	65	ASN
29	i	13	ILE
29	i	58	GLN
32	j	40	LEU
32	j	54	GLN
33	k	45	ASN
33	k	112	ASN
34	m	5	LEU
34	m	55	LEU
36	n	10	LYS
36	n	65	ASN
38	o	5	THR
38	o	55	ARG
38	o	114	SER
38	o	126	THR
39	p	17	LYS
39	p	46	MET
39	p	87	ASP
40	1	34	ARG
40	1	265	LEU
40	1	267	ILE
40	1	305	ASP

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (102) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	57	GLN
1	A	78	ASN
1	A	105	ASN
1	A	181	ASN
1	A	361	HIS
1	A	457	ASN
1	A	467	GLN
1	A	495	GLN
1	A	584	HIS
1	A	703	GLN
1	A	704	ASN
1	A	711	GLN
1	A	792	HIS
1	A	793	ASN

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Mol	Chain	Res	Type
1	A	834	HIS
1	A	994	ASN
1	A	1014	ASN
1	A	1124	ASN
1	A	1130	ASN
1	A	1148	ASN
1	A	1359	HIS
1	A	1460	HIS
1	A	1476	GLN
1	A	1487	HIS
1	A	1531	ASN
1	A	1599	GLN
1	A	1615	HIS
1	A	1717	ASN
1	A	1727	GLN
1	A	1766	GLN
1	A	1775	GLN
1	A	1816	GLN
1	A	1881	ASN
1	A	1944	HIS
1	A	1995	ASN
1	A	2004	GLN
3	C	60	HIS
3	C	137	HIS
3	C	208	HIS
3	C	210	ASN
3	C	245	HIS
3	C	297	ASN
3	C	451	HIS
3	C	513	ASN
5	E	101	ASN
5	E	253	ASN
10	I	601	GLN
11	J	212	GLN
11	J	221	ASN
11	J	331	GLN
11	J	347	HIS
13	L	186	GLN
13	L	266	HIS
14	M	212	ASN
15	N	37	HIS
15	N	54	HIS

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Mol	Chain	Res	Type
16	O	113	ASN
16	O	196	GLN
16	O	294	ASN
19	R	189	ASN
19	R	279	HIS
20	S	87	HIS
20	S	111	GLN
20	S	126	HIS
21	T	189	GLN
21	T	278	ASN
21	T	407	GLN
21	T	437	HIS
21	T	455	GLN
23	V	474	HIS
23	V	499	GLN
24	W	71	HIS
24	W	82	ASN
24	W	242	HIS
24	W	472	ASN
24	W	492	ASN
24	W	529	ASN
24	W	549	HIS
27	2	93	GLN
28	z	62	GLN
28	z	95	HIS
28	z	102	HIS
29	b	22	GLN
29	b	76	ASN
31	a	60	GLN
32	c	64	ASN
33	d	69	ASN
34	f	58	HIS
36	g	65	ASN
31	h	60	GLN
29	i	22	GLN
29	i	76	ASN
32	j	64	ASN
33	k	69	ASN
34	m	12	ASN
34	m	58	HIS
36	n	65	ASN
38	o	130	HIS

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Mol	Chain	Res	Type
39	p	7	HIS
40	1	85	GLN
40	1	154	HIS
40	1	156	GLN

5.3.3 RNA [i](#)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
2	B	82/117 (70%)	17 (20%)	4 (4%)
6	F	96/107 (89%)	45 (46%)	16 (16%)
7	4	13/46 (28%)	8 (61%)	3 (23%)
8	G	80/174 (45%)	63 (78%)	20 (25%)
9	H	133/188 (70%)	34 (25%)	10 (7%)
All	All	404/632 (63%)	167 (41%)	53 (13%)

All (167) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
2	B	12	U
2	B	13	C
2	B	19	A
2	B	20	G
2	B	21	A
2	B	22	U
2	B	23	C
2	B	24	G
2	B	25	C
2	B	26	A
2	B	28	A
2	B	36	C
2	B	38	C
2	B	45	C
2	B	57	G
2	B	70	A
2	B	71	C
6	F	6	C
6	F	7	G
6	F	8	C
6	F	9	U
6	F	10	U
6	F	12	G

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Mol	Chain	Res	Type
6	F	25	C
6	F	26	U
6	F	27	A
6	F	28	A
6	F	29	A
6	F	31	U
6	F	33	G
6	F	34	G
6	F	35	A
6	F	36	A
6	F	37	C
6	F	38	G
6	F	40	U
6	F	43	A
6	F	45	A
6	F	46	G
6	F	47	A
6	F	48	A
6	F	49	G
6	F	51	U
6	F	54	G
6	F	56	A
6	F	59	G
6	F	60	C
6	F	61	C
6	F	62	C
6	F	68	C
6	F	73	A
6	F	74	U
6	F	78	A
6	F	79	C
6	F	80	G
6	F	81	C
6	F	82	A
6	F	83	A
6	F	84	A
6	F	85	U
6	F	86	U
6	F	87	C
7	4	-12	G
7	4	-11	G
7	4	-10	C

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Mol	Chain	Res	Type
7	4	-9	C
7	4	-7	C
7	4	-6	C
7	4	-4	A
7	4	-1	G
8	G	2	U
8	G	3	A
8	G	5	G
8	G	6	A
8	G	7	G
8	G	8	C
8	G	10	U
8	G	11	A
8	G	12	G
8	G	13	C
8	G	14	A
8	G	17	U
8	G	21	A
8	G	22	C
8	G	23	U
8	G	24	G
8	G	25	G
8	G	26	U
8	G	27	U
8	G	28	A
8	G	29	C
8	G	30	C
8	G	31	U
8	G	120	G
8	G	121	G
8	G	122	U
8	G	123	U
8	G	124	U
8	G	125	C
8	G	126	C
8	G	127	U
8	G	128	U
8	G	129	G
8	G	130	A
8	G	131	U
8	G	134	U
8	G	135	G

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Mol	Chain	Res	Type
8	G	136	U
8	G	137	C
8	G	138	A
8	G	139	U
8	G	140	A
8	G	143	U
8	G	144	A
8	G	145	U
8	G	146	C
8	G	147	C
8	G	148	U
8	G	149	G
8	G	150	U
8	G	166	A
8	G	167	G
8	G	168	C
8	G	169	U
8	G	170	C
8	G	171	G
8	G	172	C
8	G	173	G
8	G	174	G
8	G	175	U
8	G	176	U
8	G	177	G
8	G	179	G
9	H	13	C
9	H	14	C
9	H	15	U
9	H	16	U
9	H	17	U
9	H	19	G
9	H	24	A
9	H	25	G
9	H	28	C
9	H	29	A
9	H	30	A
9	H	31	G
9	H	33	G
9	H	37	U
9	H	39	U
9	H	40	C

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Mol	Chain	Res	Type
9	H	41	U
9	H	42	G
9	H	43	U
9	H	112	G
9	H	143	A
9	H	147	G
9	H	152	G
9	H	153	A
9	H	154	C
9	H	156	U
9	H	157	G
9	H	164	C
9	H	165	A
9	H	168	A
9	H	169	C
9	H	177	A
9	H	178	A
9	H	179	C

All (53) RNA pucker outliers are listed below:

Mol	Chain	Res	Type
2	B	18	C
2	B	19	A
2	B	20	G
2	B	27	U
6	F	5	U
6	F	7	G
6	F	25	C
6	F	26	U
6	F	33	G
6	F	34	G
6	F	35	A
6	F	36	A
6	F	45	A
6	F	50	A
6	F	58	G
6	F	59	G
6	F	73	A
6	F	81	C
6	F	84	A
6	F	86	U

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Mol	Chain	Res	Type
7	4	-13	C
7	4	-12	G
7	4	-11	G
8	G	1	G
8	G	16	G
8	G	20	A
8	G	21	A
8	G	22	C
8	G	23	U
8	G	137	C
8	G	142	U
8	G	143	U
8	G	144	A
8	G	145	U
8	G	147	C
8	G	166	A
8	G	167	G
8	G	168	C
8	G	171	G
8	G	172	C
8	G	173	G
8	G	175	U
8	G	176	U
9	H	15	U
9	H	28	C
9	H	29	A
9	H	30	A
9	H	38	A
9	H	39	U
9	H	40	C
9	H	156	U
9	H	164	C
9	H	168	A

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

2 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
19	SEP	R	224	19	8,9,10	1.00	0	8,12,14	1.53	1 (12%)
19	SEP	R	232	19	8,9,10	1.56	1 (12%)	8,12,14	1.71	2 (25%)

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
19	SEP	R	224	19	-	0/5/8/10	-
19	SEP	R	232	19	-	1/5/8/10	-

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
19	R	232	SEP	P-O1P	3.40	1.61	1.50

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
19	R	232	SEP	P-OG-CB	-4.04	107.16	118.30
19	R	224	SEP	OG-CB-CA	-2.66	105.55	108.14
19	R	232	SEP	OG-CB-CA	2.37	110.45	108.14

There are no chirality outliers.

All (1) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
19	R	232	SEP	N-CA-CB-OG

There are no ring outliers.

No monomer is involved in short contacts.

5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

5.6 Ligand geometry

Of 19 ligands modelled in this entry, 16 are monoatomic - leaving 3 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
46	IHP	A	3000	-	36,36,36	0.72	0	54,60,60	1.05	0
47	GTP	C	1500	48	26,34,34	1.50	3 (11%)	32,54,54	1.95	7 (21%)
50	ATP	Q	1501	48	26,33,33	1.72	8 (30%)	31,52,52	1.85	10 (32%)

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
46	IHP	A	3000	-	-	3/30/54/54	0/1/1/1
47	GTP	C	1500	48	-	1/18/38/38	0/3/3/3
50	ATP	Q	1501	48	-	4/18/38/38	0/3/3/3

All (11) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
47	C	1500	GTP	C5-C6	-4.83	1.37	1.47
50	Q	1501	ATP	C2'-C1'	-3.59	1.48	1.53
50	Q	1501	ATP	C4-N3	3.40	1.40	1.35
50	Q	1501	ATP	C6-N6	3.34	1.46	1.34
50	Q	1501	ATP	C2'-C3'	-2.74	1.45	1.53
47	C	1500	GTP	C5-C4	-2.42	1.36	1.43
50	Q	1501	ATP	O2'-C2'	-2.25	1.37	1.43
47	C	1500	GTP	O4'-C4'	-2.25	1.40	1.45
50	Q	1501	ATP	C2-N3	2.18	1.35	1.32
50	Q	1501	ATP	C3'-C4'	-2.18	1.47	1.53
50	Q	1501	ATP	O3'-C3'	-2.16	1.37	1.43

All (17) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
47	C	1500	GTP	PA-O3A-PB	-5.64	113.48	132.83
50	Q	1501	ATP	PB-O3B-PG	-5.47	114.07	132.83
47	C	1500	GTP	PB-O3B-PG	-4.37	117.84	132.83
50	Q	1501	ATP	N3-C2-N1	-4.18	122.14	128.68
47	C	1500	GTP	C5-C6-N1	3.72	120.52	113.95
47	C	1500	GTP	C2-N1-C6	-3.47	118.71	125.10
47	C	1500	GTP	C3'-C2'-C1'	3.21	105.81	100.98
47	C	1500	GTP	C8-N7-C5	2.82	108.36	102.99
50	Q	1501	ATP	PA-O3A-PB	-2.62	123.85	132.83
50	Q	1501	ATP	C1'-N9-C4	-2.50	122.25	126.64
50	Q	1501	ATP	O2G-PG-O1G	-2.41	101.23	110.68
50	Q	1501	ATP	O2A-PA-O1A	-2.35	100.65	112.24
50	Q	1501	ATP	O2G-PG-O3B	2.25	112.17	104.64
47	C	1500	GTP	O6-C6-C5	-2.22	120.04	124.37
50	Q	1501	ATP	O2B-PB-O1B	-2.08	101.97	112.24
50	Q	1501	ATP	O5'-C5'-C4'	2.07	116.12	108.99
50	Q	1501	ATP	O3G-PG-O3B	2.05	111.50	104.64

There are no chirality outliers.

All (8) torsion outliers are listed below:

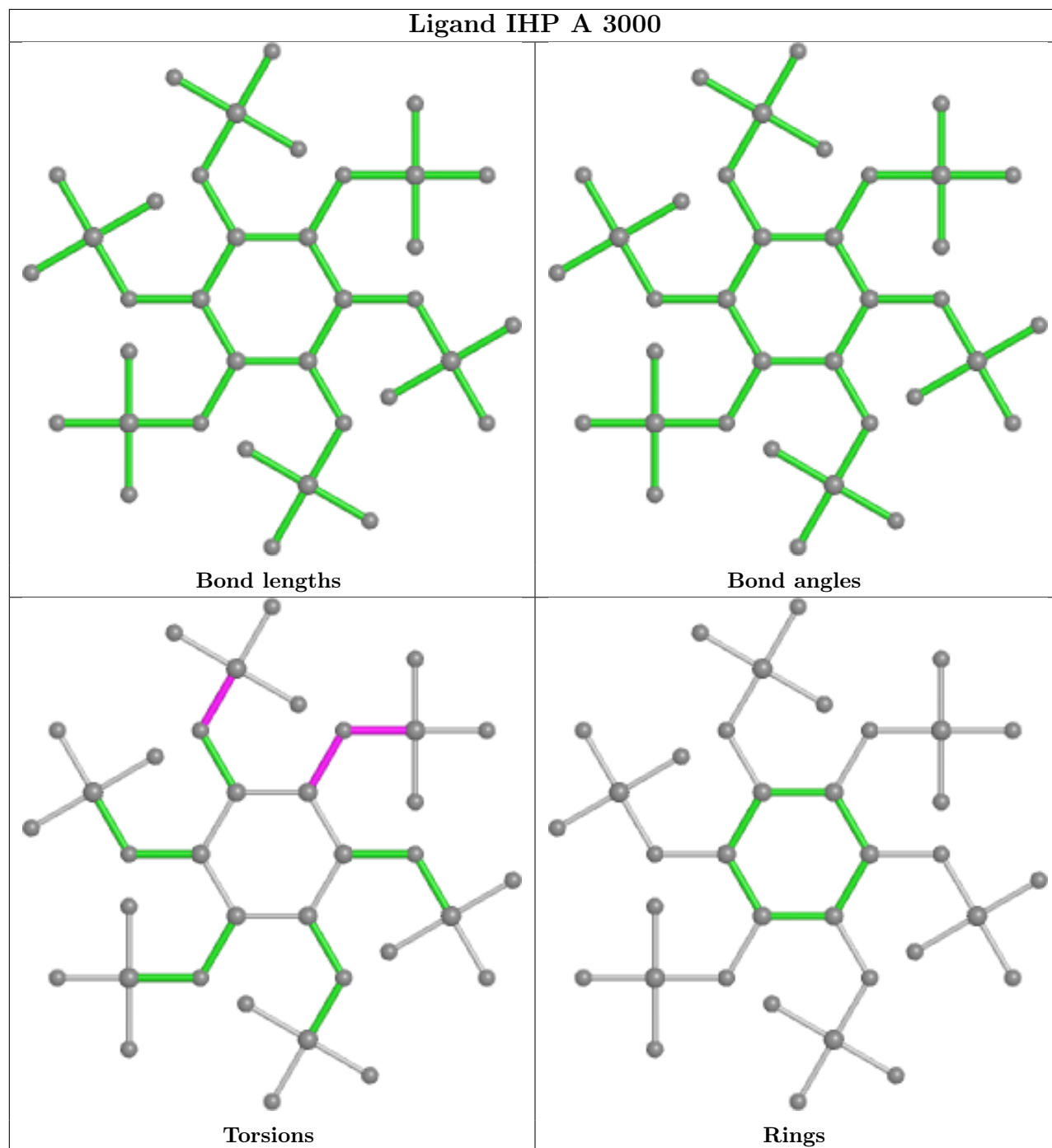
Mol	Chain	Res	Type	Atoms
46	A	3000	IHP	C3-O13-P3-O43
47	C	1500	GTP	O4'-C4'-C5'-O5'
50	Q	1501	ATP	C5'-O5'-PA-O1A
50	Q	1501	ATP	C5'-O5'-PA-O2A
46	A	3000	IHP	C3-C4-O14-P4
50	Q	1501	ATP	PB-O3A-PA-O2A
46	A	3000	IHP	C4-O14-P4-O44
50	Q	1501	ATP	C5'-O5'-PA-O3A

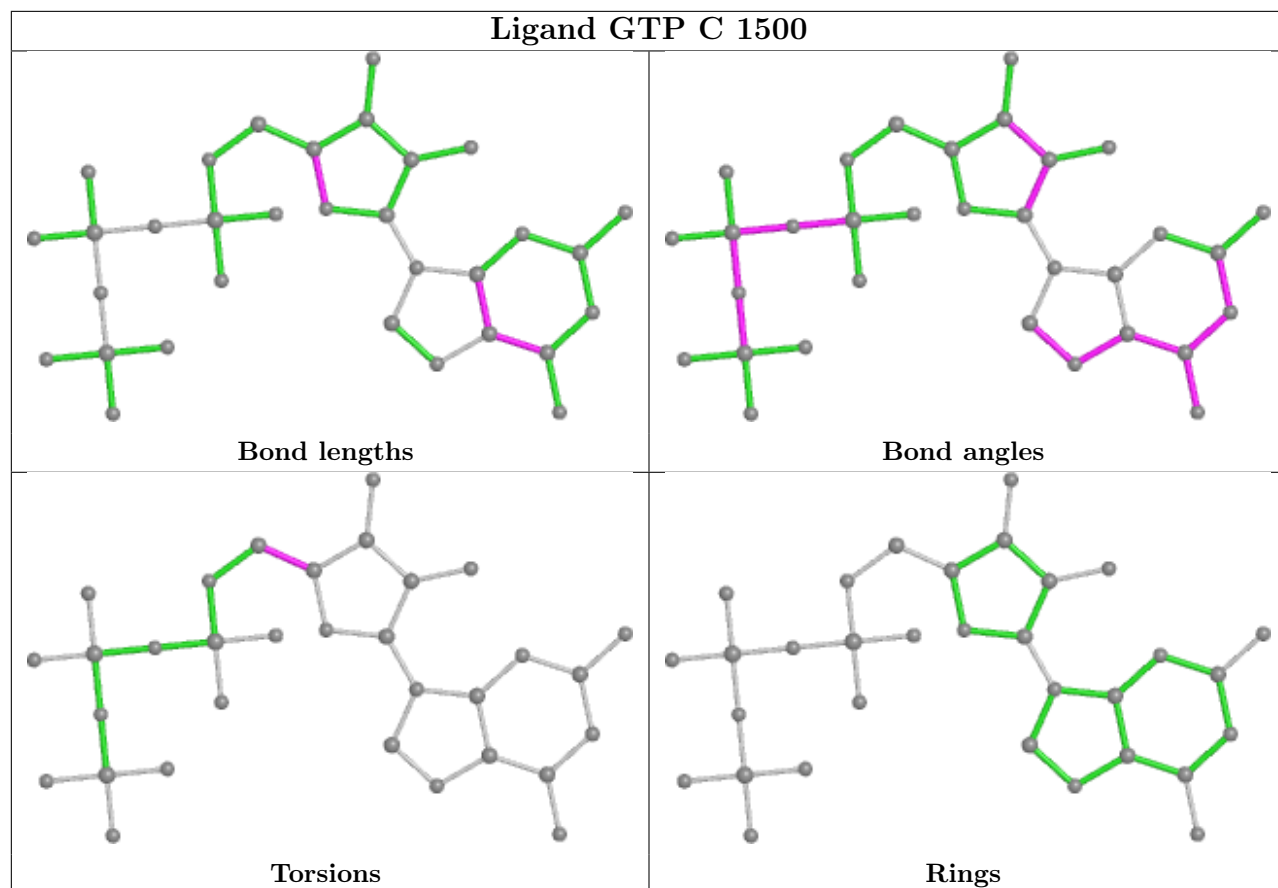
There are no ring outliers.

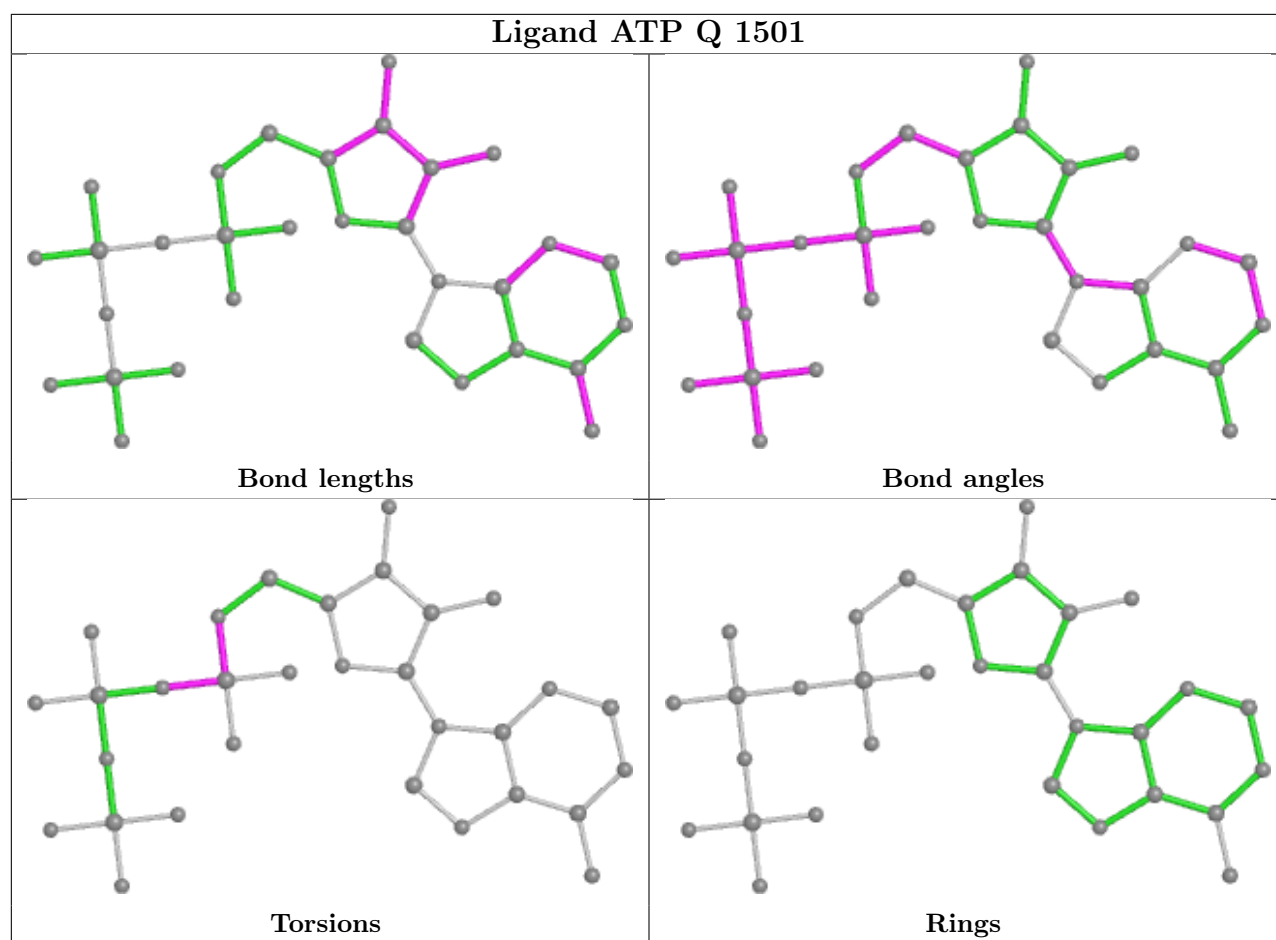
No monomer is involved in short contacts.

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and

any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.







5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

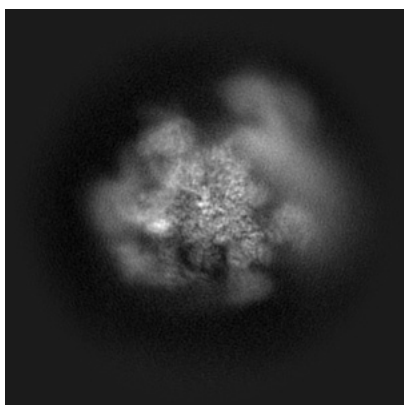
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-32321. These allow visual inspection of the internal detail of the map and identification of artifacts.

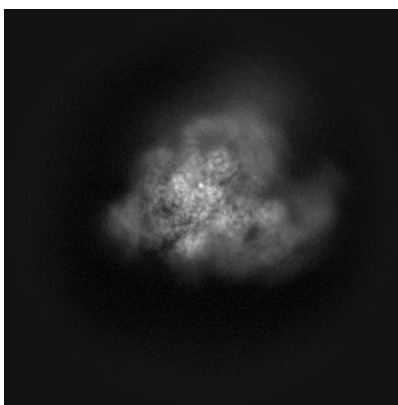
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections [i](#)

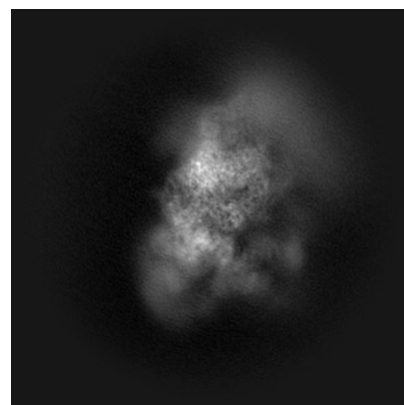
6.1.1 Primary map



X



Y

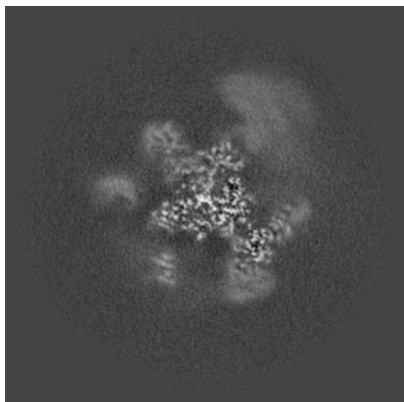


Z

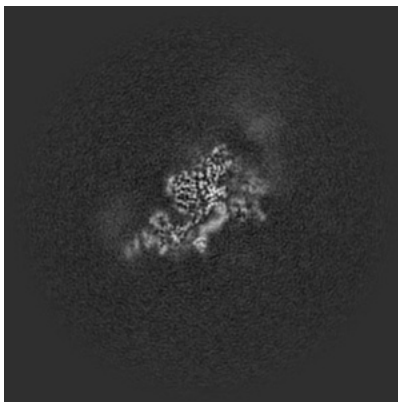
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

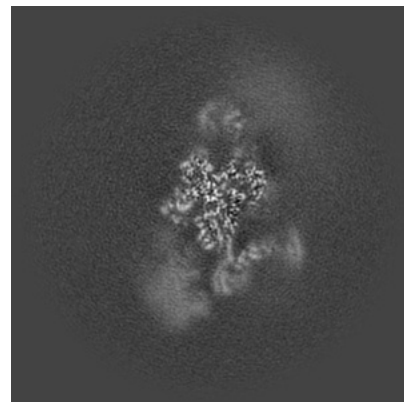
6.2.1 Primary map



X Index: 200



Y Index: 200

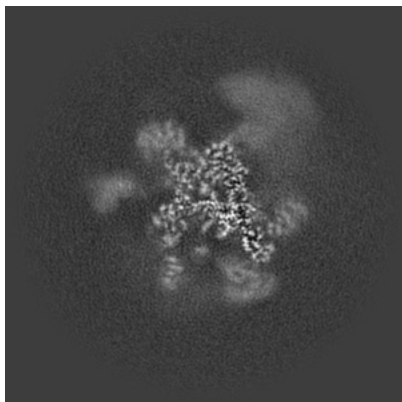


Z Index: 200

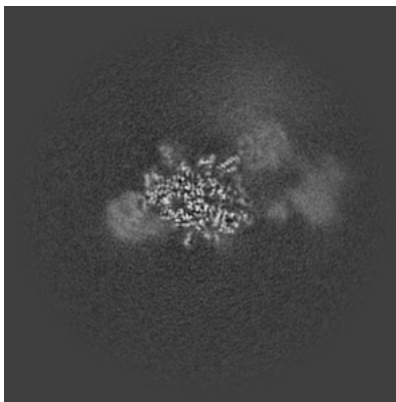
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

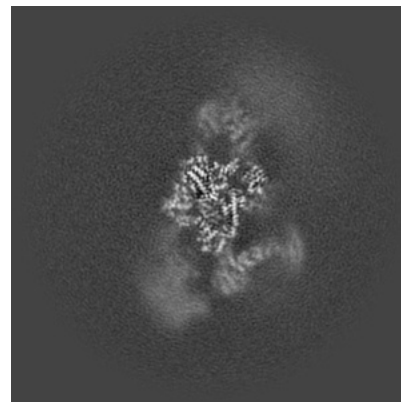
6.3.1 Primary map



X Index: 194



Y Index: 238

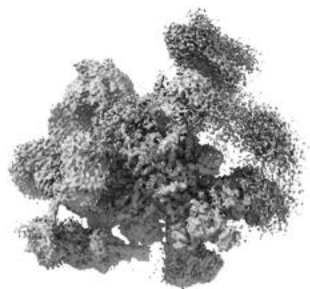


Z Index: 197

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

6.4 Orthogonal surface views [i](#)

6.4.1 Primary map



X



Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.37. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

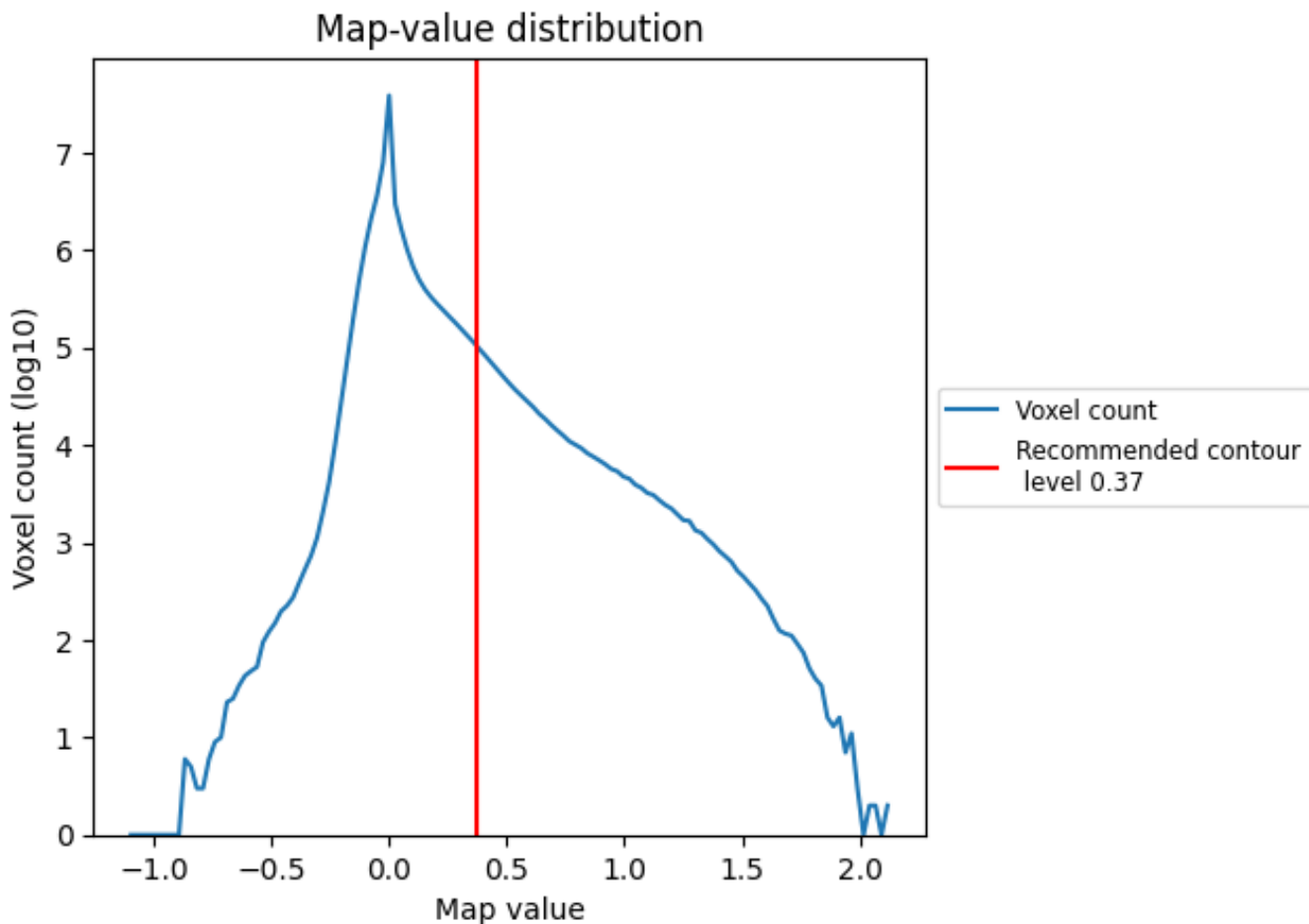
6.5 Mask visualisation

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

7 Map analysis [i](#)

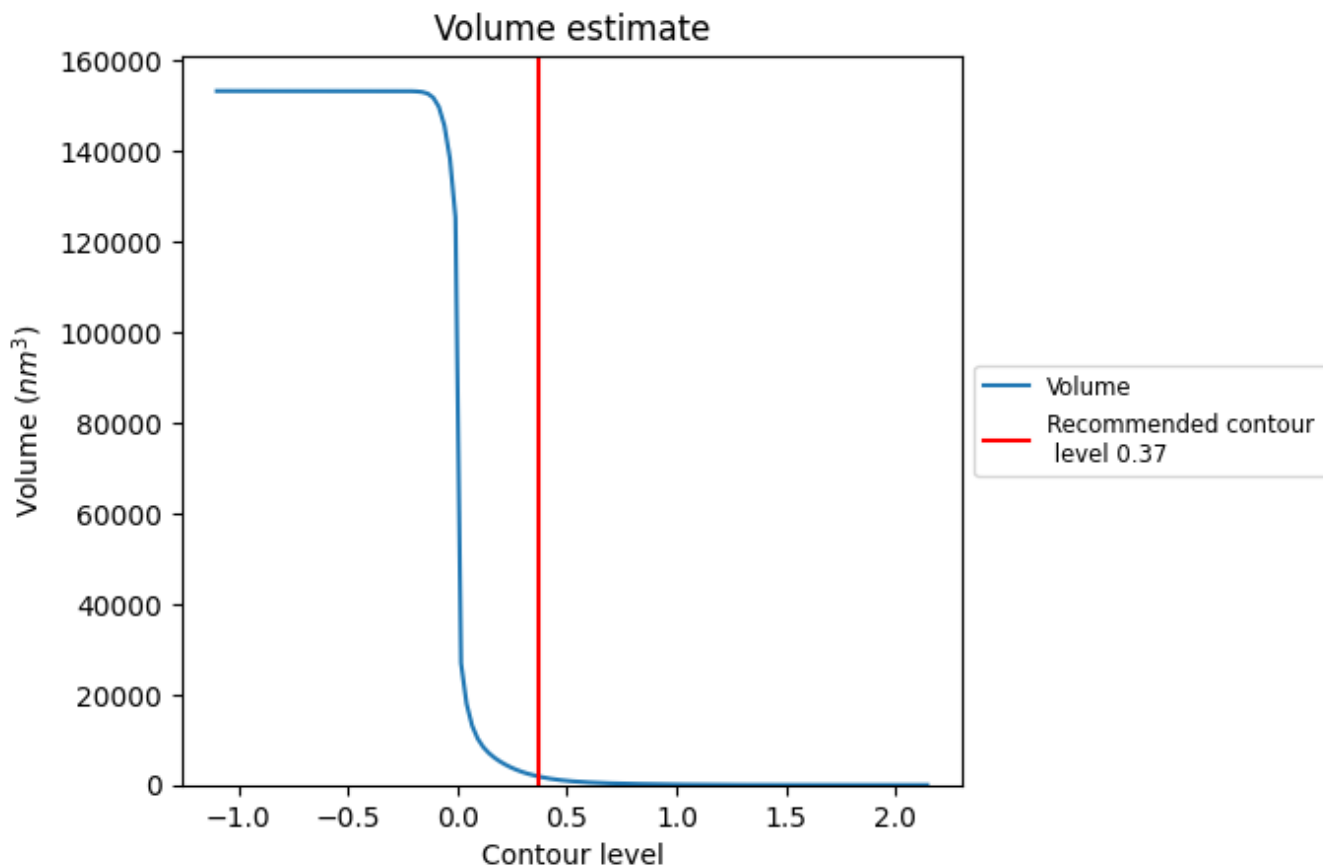
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution [i](#)



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

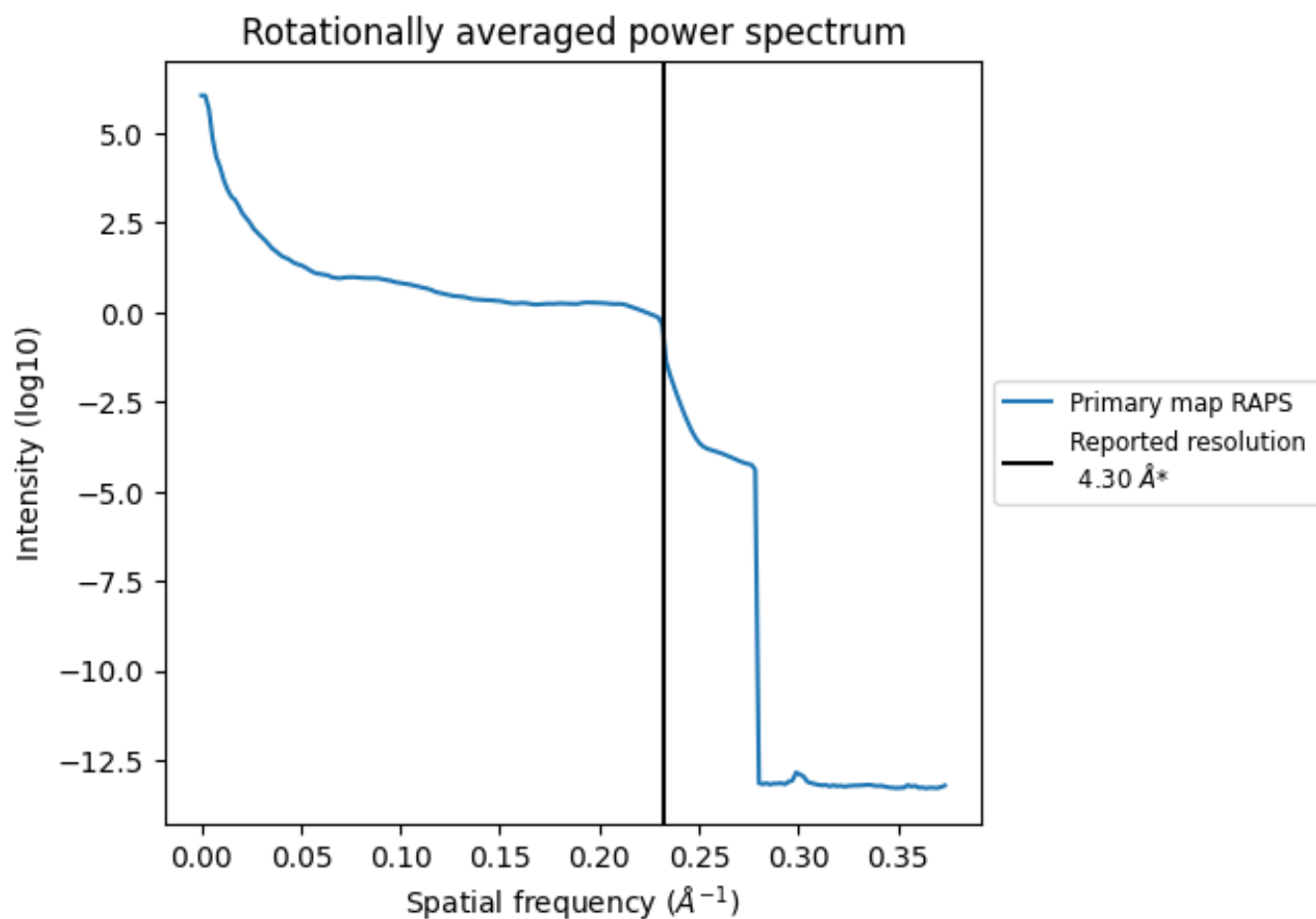
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 1869 nm^3 ; this corresponds to an approximate mass of 1688 kDa.

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

7.3 Rotationally averaged power spectrum [i](#)



*Reported resolution corresponds to spatial frequency of 0.233 Å⁻¹

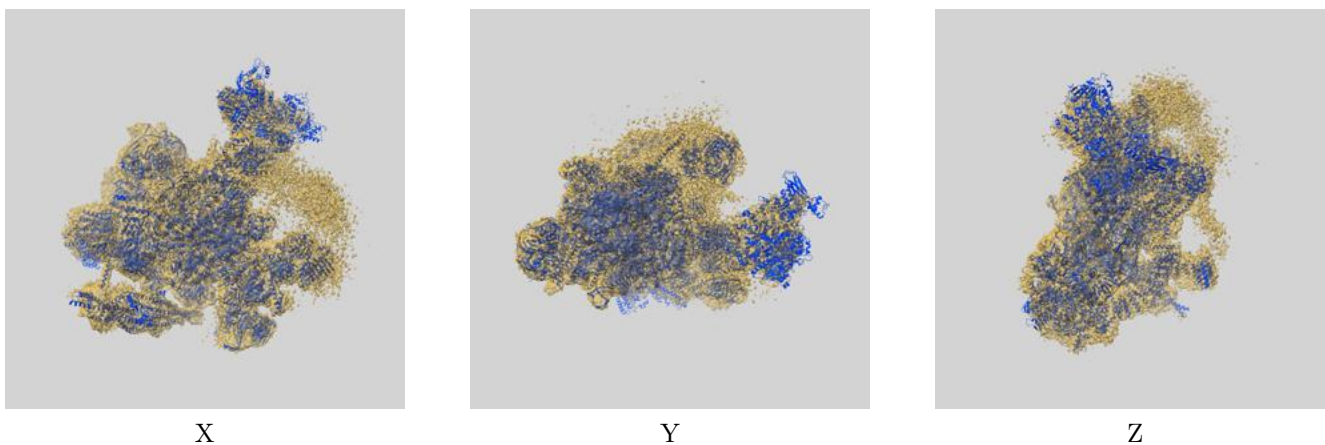
8 Fourier-Shell correlation

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

9 Map-model fit [i](#)

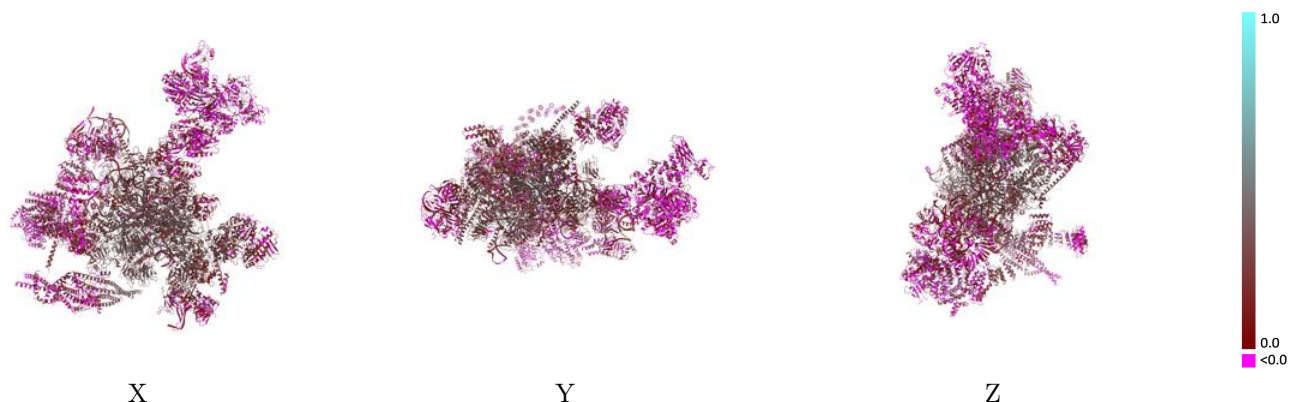
This section contains information regarding the fit between EMDB map EMD-32321 and PDB model 7W5B. Per-residue inclusion information can be found in section [3](#) on page [14](#).

9.1 Map-model overlay [i](#)



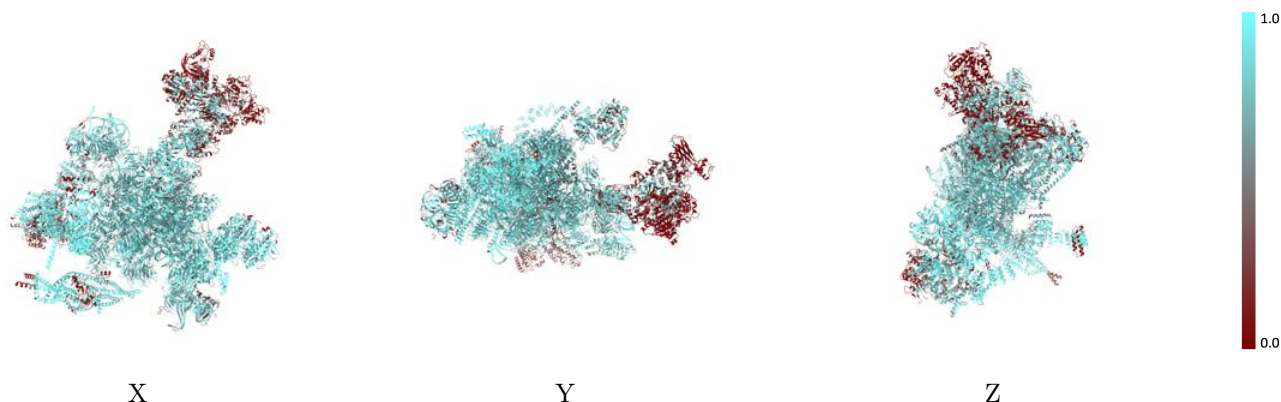
The images above show the 3D surface view of the map at the recommended contour level 0.37 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



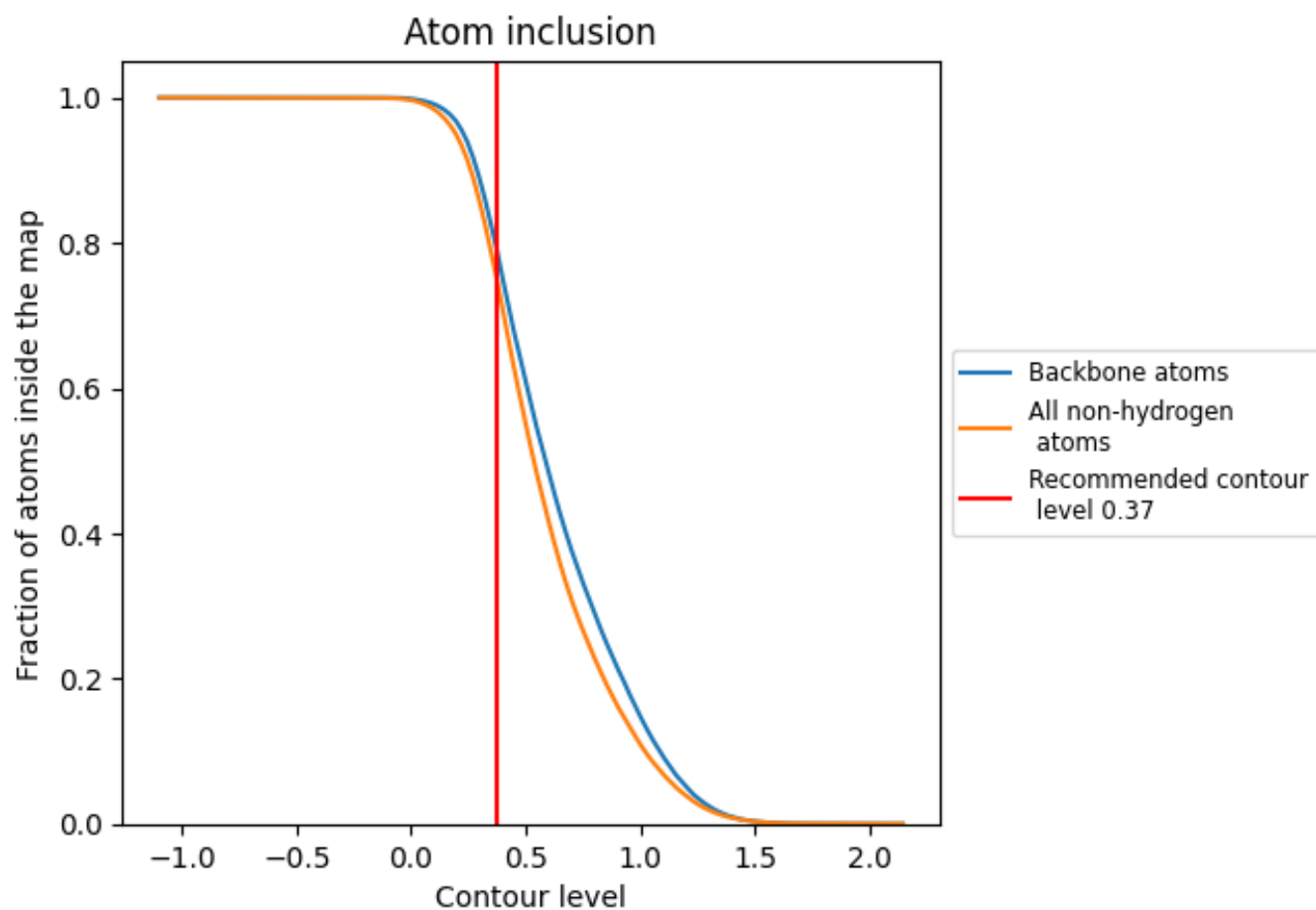
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.37).







































































9.4 Atom inclusion [i](#)



At the recommended contour level, 80% of all backbone atoms, 76% 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 (0.37) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.7555	 0.1920
1	 0.6776	 0.2120
2	 0.7949	 0.1810
3	 0.6742	 0.2640
4	 0.9855	 0.3870
A	 0.8193	 0.2900
B	 0.9440	 0.2580
C	 0.8620	 0.2950
D	 0.2744	 0.0240
E	 0.9104	 0.2900
F	 0.9606	 0.3000
G	 0.7623	 0.1640
H	 0.9123	 0.1490
I	 0.8922	 0.1500
J	 0.8428	 0.1950
K	 0.9521	 0.2010
L	 0.8501	 0.2470
M	 0.8045	 0.2660
N	 0.8741	 0.3000
O	 0.8589	 0.2530
P	 0.7426	 0.2680
Q	 0.4579	 0.0290
R	 0.8284	 0.3040
S	 0.8904	 0.2590
T	 0.9116	 0.3710
U	 0.9183	 0.2580
V	 0.8401	 0.2200
W	 0.8184	 0.2180
Y	 0.6649	 0.0970
Z	 0.8402	 0.2360
a	 0.7802	 0.1570
b	 0.7992	 0.1220
c	 0.8969	 0.0790
d	 0.7992	 0.0610
e	 0.7013	 0.0590



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Chain	Atom inclusion	Q-score
f	 0.7173	 0.0680
g	 0.5606	 0.0740
h	 0.7387	 0.0730
i	 0.6148	 0.0230
j	 0.8328	 0.0500
k	 0.7493	 0.0550
l	 0.6903	 0.0660
m	 0.9191	 0.1090
n	 0.7640	 0.0740
o	 0.8049	 0.0720
p	 0.8978	 0.0790
q	 0.6055	 0.0700
r	 0.9404	 0.1470
s	 0.4962	 0.1050
t	 0.4113	 0.0150
u	 0.9035	 0.2540
v	 0.7862	 0.1330
w	 0.8719	 0.1370
x	 0.4113	 0.0800
y	 0.8205	 0.0850
z	 0.5413	 0.1300