



wwPDB EM Validation Summary Report ⓘ

Dec 4, 2024 – 01:19 PM EST

PDB ID : 9CGP
EMDB ID : EMD-45584
Title : RyR1 disease mutant Y523S with FKBP12.6, nanodisc and inhibitor dantrolene in the absence of calcium with refined P1 domain
Authors : Iyer, K.A.; Samsó, M.
Deposited on : 2024-06-30
Resolution : 3.34 Å (reported)
Based on initial model : 7T64

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.dev113
Mogul : 2022.3.0, CSD as543be (2022)
MolProbity : 4.02b-467
buster-report : 1.1.7 (2018)
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ : 1.9.13
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.40

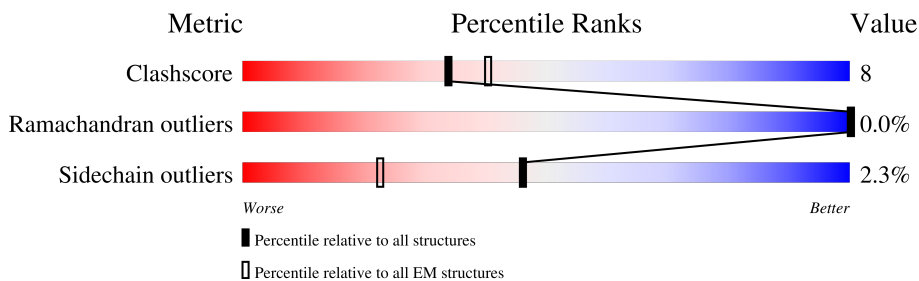
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 3.34 Å.

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



Metric	Whole archive (#Entries)	EM structures (#Entries)
Clashscore	210492	15764
Ramachandran outliers	207382	16835
Sidechain outliers	206894	16415

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	5037	8% (red), 68% (green), 16% (yellow), 15% (grey)
1	B	5037	8% (red), 69% (green), 15% (yellow), 15% (grey)
1	C	5037	8% (red), 68% (green), 16% (yellow), 15% (grey)
1	D	5037	8% (red), 68% (green), 16% (yellow), 15% (grey)
2	E	107	8% (red), 69% (green), 31% (yellow)
2	F	107	8% (red), 74% (green), 26% (yellow)
2	G	107	8% (red), 72% (green), 27% (yellow)
2	H	107	8% (red), 70% (green), 29% (yellow)

2 Entry composition [i](#)

There are 5 unique types of molecules in this entry. The entry contains 132860 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 Ryanodine receptor 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	4258	32374	20609	5541	6025	199	0	0
1	B	4258	32374	20609	5541	6025	199	0	0
1	C	4258	32374	20609	5541	6025	199	0	0
1	D	4258	32374	20609	5541	6025	199	0	0

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	523	SER	TYR	engineered mutation	UNP P11716
B	523	SER	TYR	engineered mutation	UNP P11716
C	523	SER	TYR	engineered mutation	UNP P11716
D	523	SER	TYR	engineered mutation	UNP P11716

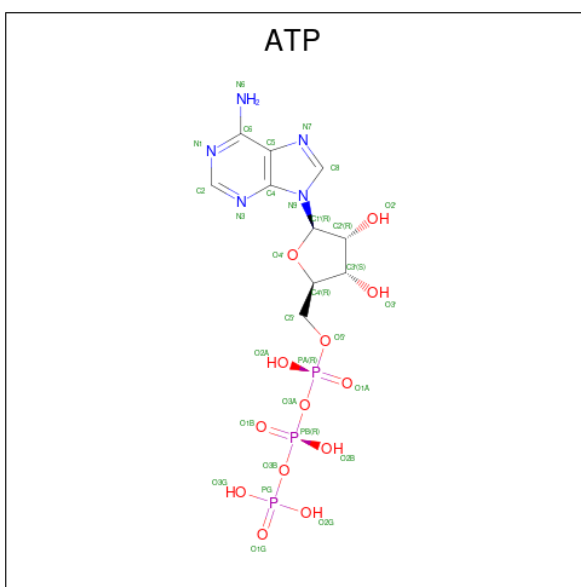
- Molecule 2 is a protein called Peptidyl-prolyl cis-trans isomerase FKBP1B.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	E	107	786	498	137	148	3	0	0
2	F	107	786	498	137	148	3	0	0
2	G	107	786	498	137	148	3	0	0
2	H	107	786	498	137	148	3	0	0

- Molecule 3 is ZINC ION (three-letter code: ZN) (formula: Zn) (labeled as "Ligand of Interest" by depositor).

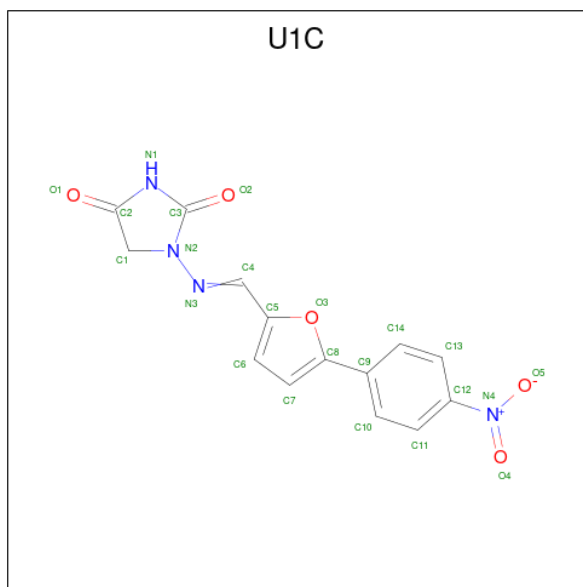
Mol	Chain	Residues	Atoms		AltConf
3	A	1	Total	Zn	0
			1	1	
3	B	1	Total	Zn	0
			1	1	
3	C	1	Total	Zn	0
			1	1	
3	D	1	Total	Zn	0
			1	1	

- Molecule 4 is ADENOSINE-5'-TRIPHOSPHATE (three-letter code: ATP) (formula: $C_{10}H_{16}N_5O_{13}P_3$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms					AltConf
4	A	1	Total	C	N	O	P	0
			31	10	5	13	3	
4	B	1	Total	C	N	O	P	0
			31	10	5	13	3	
4	C	1	Total	C	N	O	P	0
			31	10	5	13	3	
4	D	1	Total	C	N	O	P	0
			31	10	5	13	3	

- Molecule 5 is Dantrolene (three-letter code: U1C) (formula: $C_{14}H_{10}N_4O_5$) (labeled as "Ligand of Interest" by depositor).

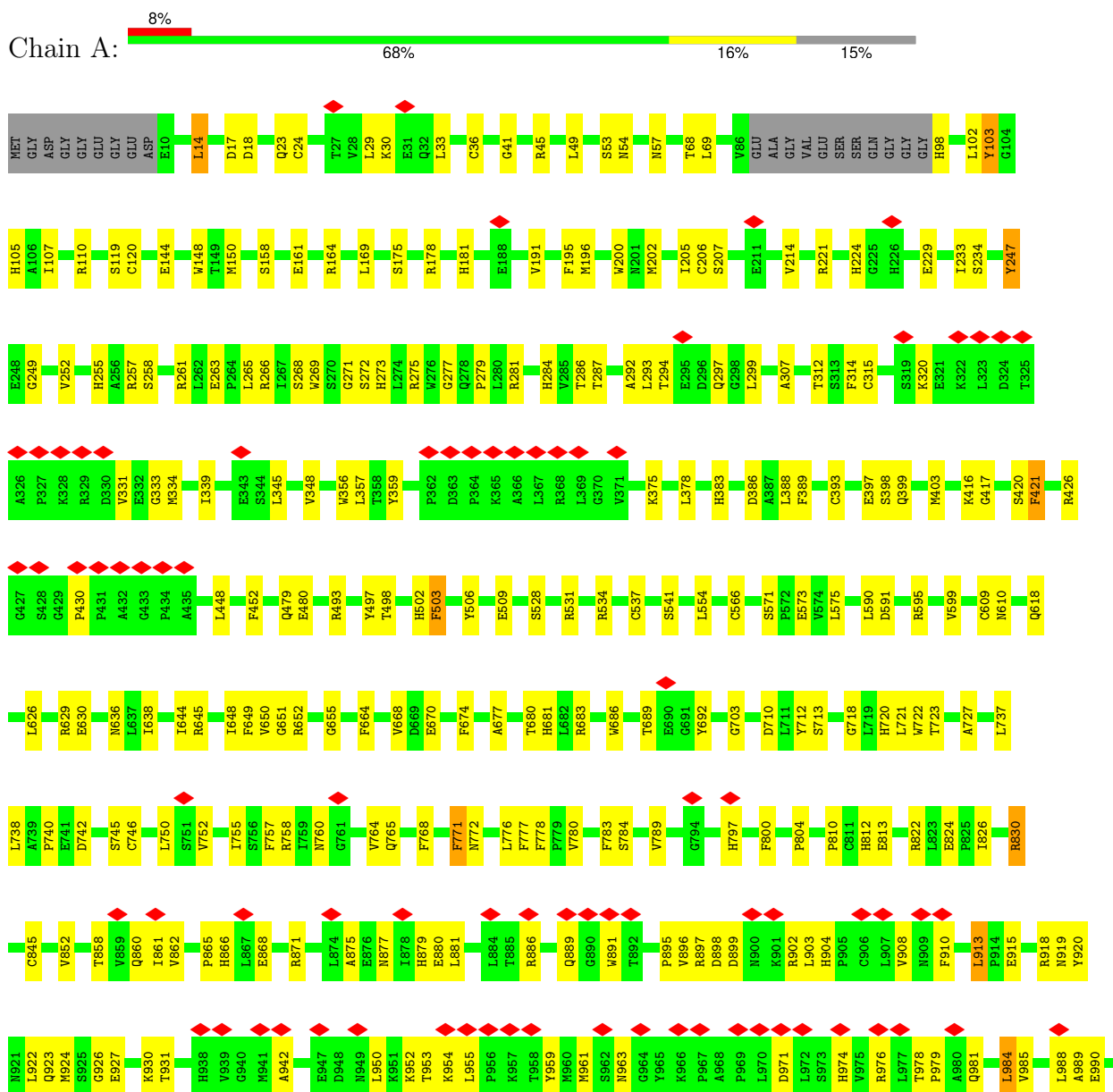


Mol	Chain	Residues	Atoms				AltConf
			Total	C	N	O	
5	A	1	Total	C	N	O	0
			23	14	4	5	
5	B	1	Total	C	N	O	0
			23	14	4	5	
5	C	1	Total	C	N	O	0
			23	14	4	5	
5	D	1	Total	C	N	O	0
			23	14	4	5	

3 Residue-property plots

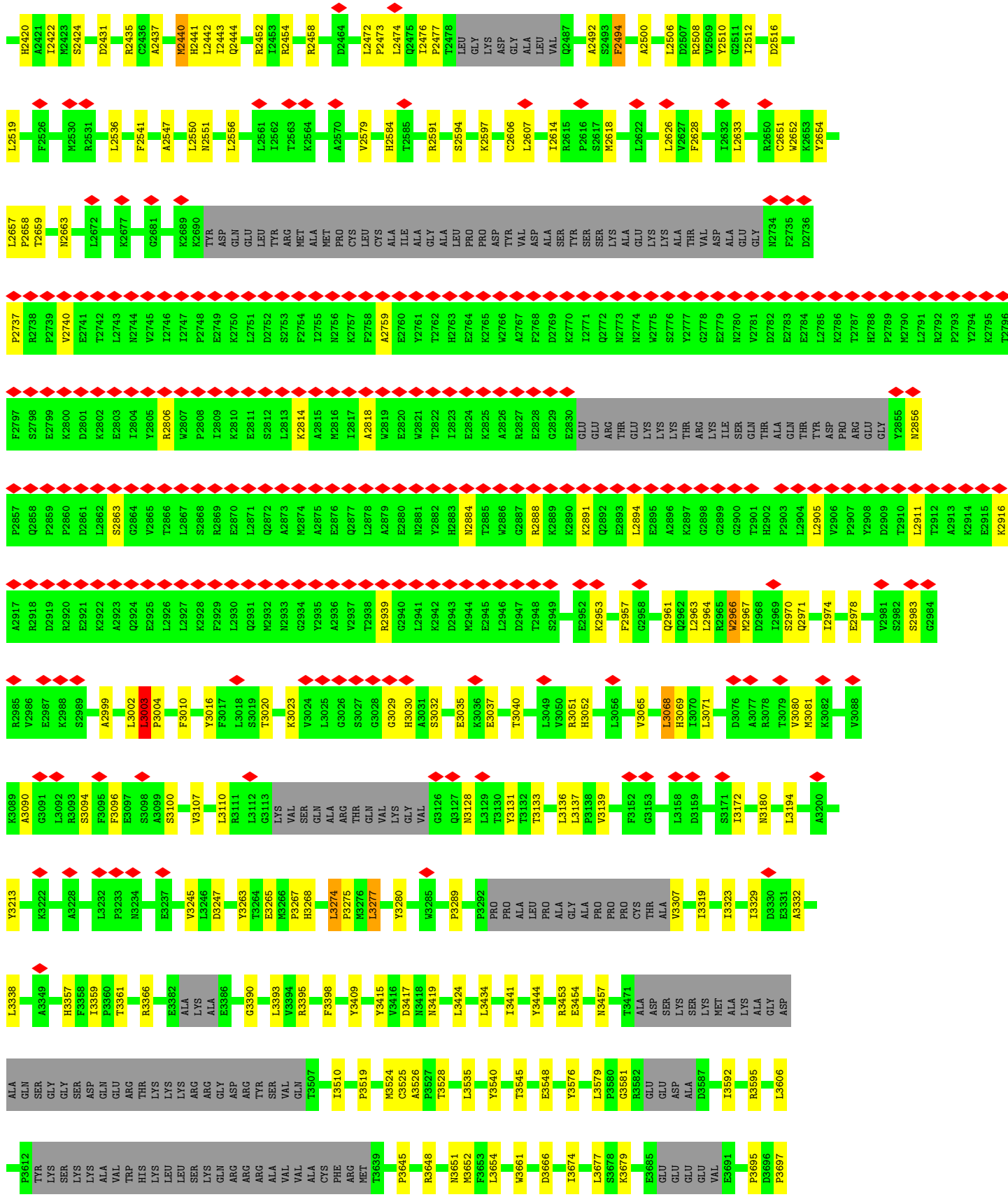
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion 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.

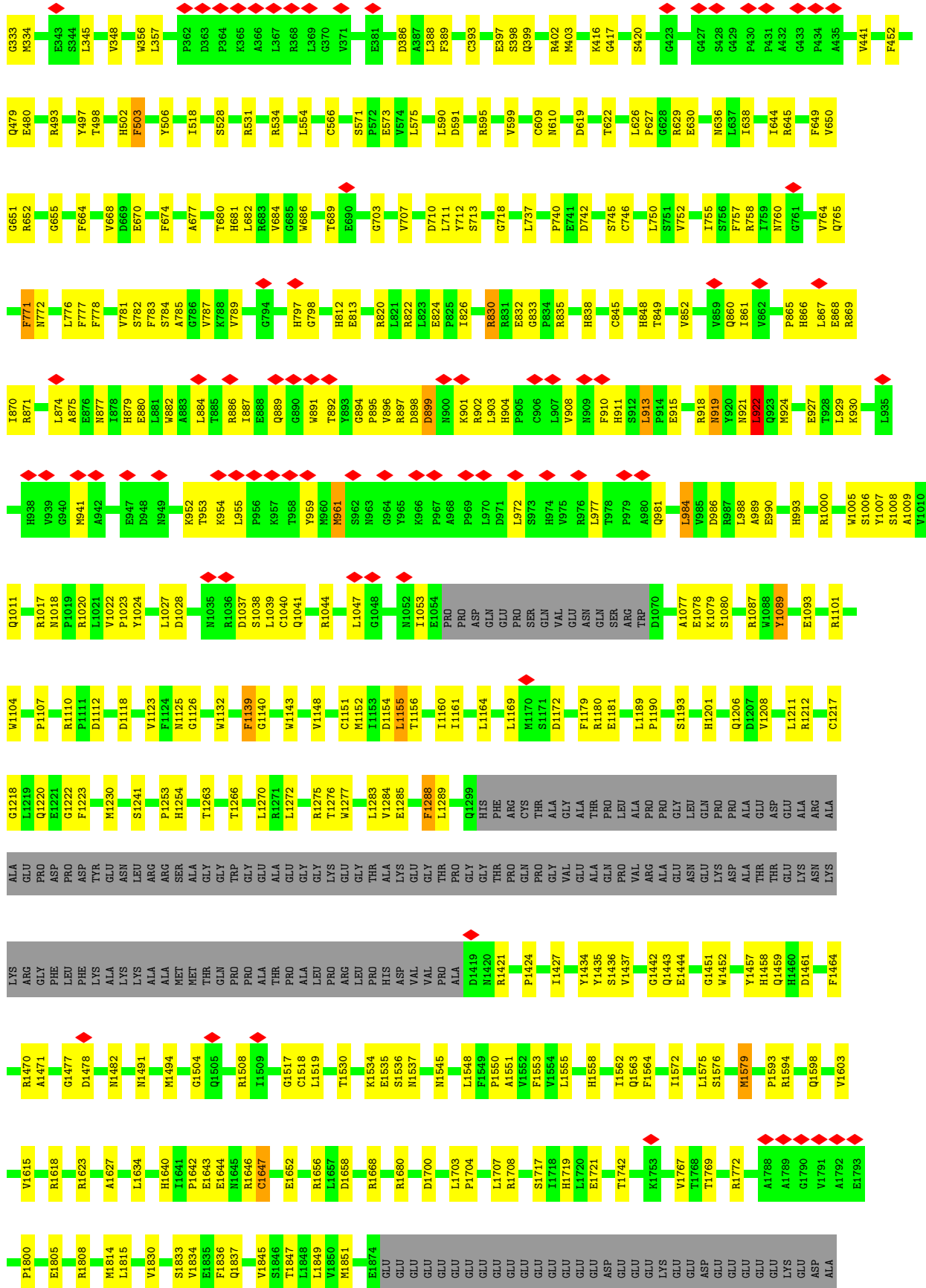
• Molecule 1: Ryanodine receptor 1

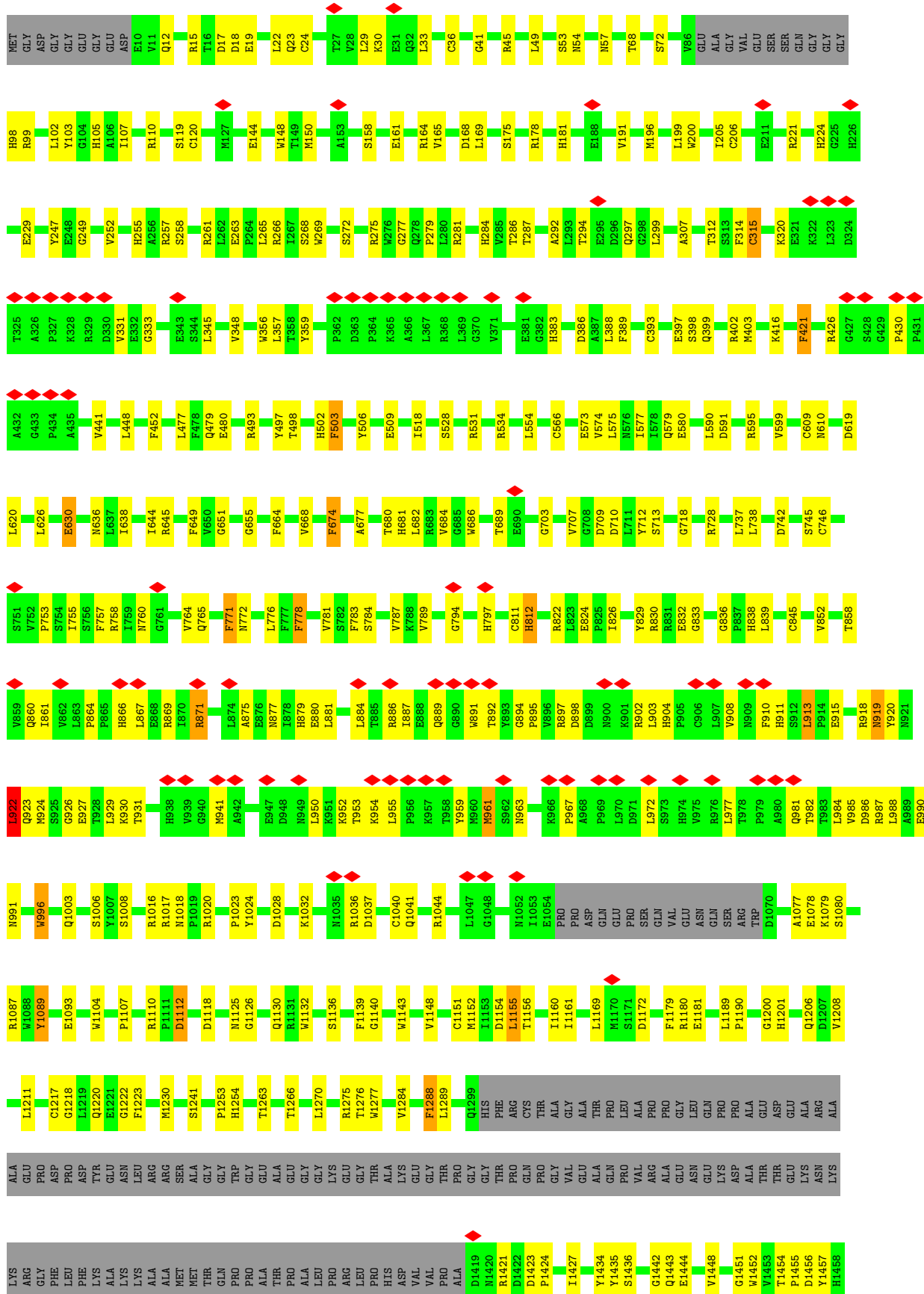


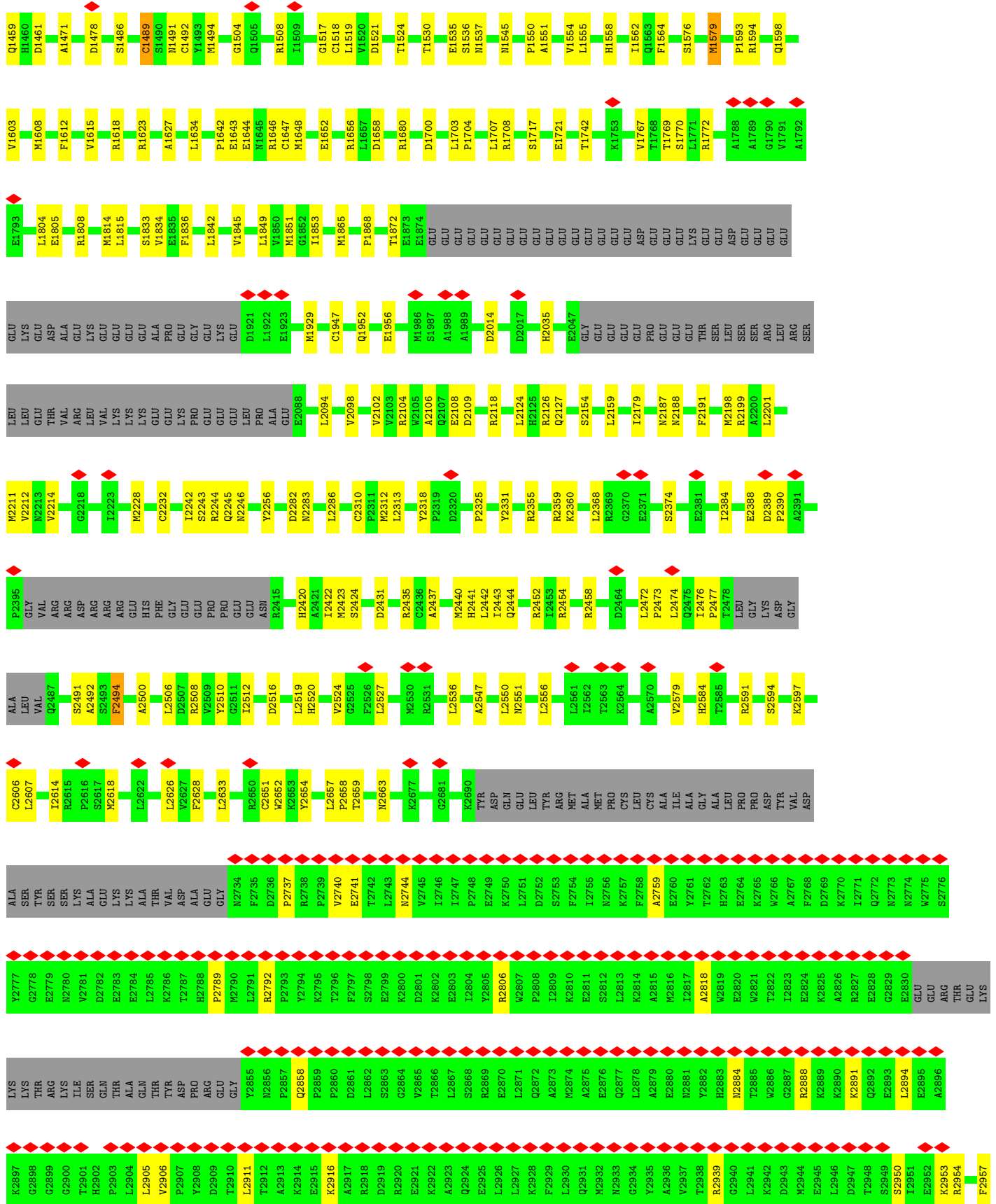
H993	E1093	E1921	TYR	LYS	N1482	V1615	M1814	GLU	SER	R2199	T2384	I2476	H2584
R1000	W1104	G1222	ASN	ALA	S1486	R1618	L1815	GLU	LEU	A2200	E2388	P2477	T2585
W1005	P1107	F1223	LEU	LYS	N1491	R1623	S1833	PRO	LEU	L2201	D2389	T2478	R2591
S1006	R1110	M1230	ARG	ALA	M1494	R1627	E1835	GLY	THR	M2211	F2390	L2479	S2594
A1009	P1111	M1241	SER	MET	M1494	A1627	F1836	GLU	ARG	M2214	A2391	A2477	K2597
V1010	D1112	P1253	ALA	THR	G1504	L1634	V1845	GLU	VAL	G2218	F2395	A2487	C2606
Q1011	D1118	H1254	GLY	PRO	Q1505	H1640	T1847	GLY	LYS	L2223	G1239	L2506	L2607
I1013	D1118	G1266	TRP	ALA	R1508	P1642	L1848	VAL	LYS	I2228	ARG	S2491	R2615
V1022	N1125	T1263	GLY	THR	I1509	E1643	V1850	GLU	GLY	M2228	ARG	A2492	P2616
P1023	G1126	T1266	ALA	THR	G1517	M1644	M1851	GLU	LYS	L2236	ARG	S2493	S2617
Y1024	W1132	L1270	GLY	ALA	C1518	M1645	M1865	PRO	PRO	L2266	ARG	F2494	M2618
L1027	F1139	R1275	GLY	LEU	L1519	C1647	P1868	GLU	GLY	I2242	HIS	D2497	L2622
D1028	G1140	T1276	GLY	ARG	D1521	E1652	P1872	LEU	LEU	S2243	PHE	A2500	L2626
K1032	W1143	W1277	THR	LEU	T1524	R1656	E1874	ALA	ALA	R2244	GLY	L2506	V2627
N1035	V1148	L1283	ALA	HIS	M1527	D1658	E1874	GLU	ALA	Q2245	GLU	R2508	L2628
R1036	C1151	V1284	LYS	ASP	M1527	M1678	E1874	GLU	ALA	M2250	PRO	V2509	L2633
L1039	M1152	F1288	GLY	VAL	T1530	N1678	E1874	GLU	E2088	Y2256	PRO	I2510	R2650
R1044	I1153	L1289	PRO	ALA	E1535	D1700	GLU	GLU	L2094	L2257	GLU	G2511	C2651
L1047	D1154	Q1299	GLY	ALA	S1536	L1703	M1420	GLU	V2098	L2258	ASN	L2415	R2652
G1048	L1155	PHE	THR	THR	M1537	P1704	N1421	GLU	V2102	V2275	H2420	H2420	C2653
N1052	T1156	ARG	PRO	PRO	N1545	P1704	D1422	GLU	V2103	D2282	R2421	R2421	Y2654
I1053	I1160	CYS	GLN	GLN	L1548	L1707	D1422	GLU	R2104	M2283	L2422	L2422	L2657
E1054	I1161	THR	PRO	PRO	F1549	R1708	E2018	GLU	E2108	L2286	S2424	S2424	T2659
PRO	M1170	ALA	ALA	ALA	A1551	S1717	C2021	GLU	R2118	C2310	D2431	D2431	N2663
ASP	D1172	THR	GLN	GLN	Y1434	E1721	P2022	GLU	L2124	M2311	R2435	R2435	L2672
GLN	F1179	ALA	VAL	VAL	Y1435	T1742	L2023	GLU	H2125	M2312	C2436	C2436	R2677
GLU	R1180	PRO	ALA	ALA	S1436	T1742	P2024	GLU	R2126	L2313	A2437	A2437	G2681
PRO	E1181	GLY	ALA	ALA	G1442	K1753	L2031	GLU	Y2128	Y2318	H2440	H2440	L2690
SER	L1189	LEU	GLY	GLY	V1561	V1767	H2035	GLU	V2149	P2319	L2441	L2441	TYR
GLN	P1190	ASP	ASN	ASN	I1562	T1769	E2047	GLY	E2150	L2325	L2442	L2442	ASP
VAL	H1201	THR	THR	THR	F1563	R1772	GLU	GLU	M2153	Y2331	Q2444	Q2444	GLN
GLN	Q1206	GLU	THR	THR	F1564	A1788	GLU	GLU	S2154	R2355	R2452	R2452	LEU
TRP	D1207	GLY	THR	THR	T1572	A1789	GLU	GLU	L2159	R2359	R2453	R2453	LEU
ALA	V1208	ALA	GLU	GLU	S1576	G1790	LYS	PRO	M2170	L2369	R2454	R2454	TYR
ALA	S1209	ALA	GLY	GLY	M1579	V1791	GLU	GLU	L2179	L2368	D2464	D2464	ARG
ALA	S1210	ALA	ASN	ASN	P1593	A1792	ASP	GLU	I2179	R2369	L2472	L2472	ARG
ALA	L1211	ALA	LYS	LYS	R1594	E1793	ALA	THR	M2188	G2370	P2473	P2473	MET
ALA	C1217	ALA	ARG	ARG	Q1598	E1805	LYS	SER	F2191	S2374	L2474	L2474	MET
ALA	L1218	PRO	GLY	GLY	V1603	R1808	GLU	SER	M2198	E2381	A2570	A2570	PRO
ALA	Q1220	ASP	PHE	PHE			GLU	ARG			V2579	V2579	PRO
								LEU					CYS
								ALA					ALA

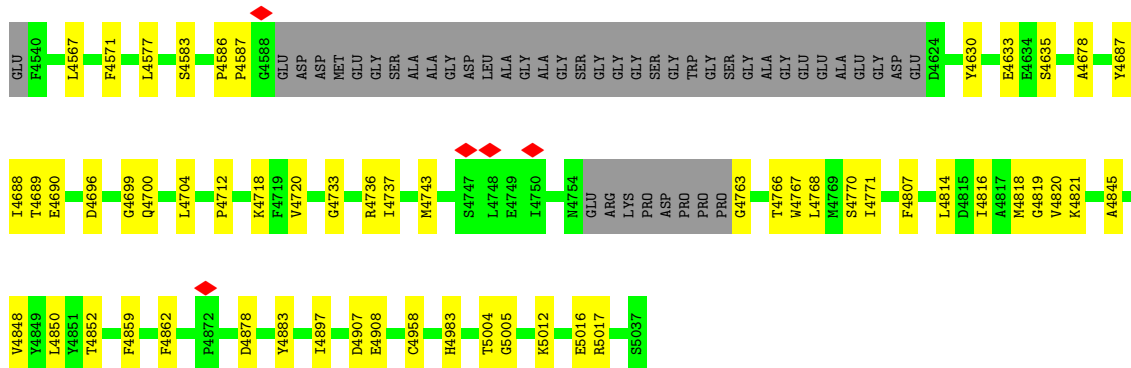
ILE	A2826	W2766	R2827	W2886	L2946	E3035	M3128	E3271	V3384	T3471	V3568	T3658	V3750	V3866	V3969	V4055	V4105	V4109	V4112	V4115
ALA	R2827	A2767	R2828	G2887	D2947	E3036	L3129	L3272	R3395	R3471	R3527	R3579	R3678	R3736	R3889	R3986	R4058	R4059	R4087	R4088
GLY	E2828	F2768	E2828	R2888	T2948	E3037	T3133	T3273	F3398	F3416	F3527	F3579	F3678	F3736	F3889	F3986	F4058	F4059	F4087	F4088
ALA	G2829	D2769	G2829	K2889	S2949	T3040	V3134	L3274	Y3409	Y3415	Y3416	Y3417	Y3418	Y3419	Y3420	Y3421	Y3422	Y3423	Y3424	Y3425
LEU	K2770	K2770	K2890	K2891	S2950	T3040	A3135	L3277	Y3409	Y3415	Y3416	Y3417	Y3418	Y3419	Y3420	Y3421	Y3422	Y3423	Y3424	Y3425
PRO	I2771	I2771	L2890	L2891	L2951	L3049	L3136	Y3280	Y3280	Y3280	Y3280	Y3280	Y3280	Y3280	Y3280	Y3280	Y3280	Y3280	Y3280	Y3280
ASP	Q2772	Q2772	GLU	GLU	GLU	L3049	L3136	Y3280	Y3280	Y3280	Y3280	Y3280	Y3280	Y3280	Y3280	Y3280	Y3280	Y3280	Y3280	Y3280
TYR	N2773	N2773	ARG	ARG	K2953	H3052	V3139	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285
VAL	N2774	N2774	THR	THR	R2954	H3052	L3140	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285
ASP	N2775	N2775	GLU	GLU	F2957	L3056	L3140	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285
SER	W2776	W2776	LYS	LYS	G2958	V3065	V3139	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285
TYR	S2777	S2777	LYS	LYS	Q2961	V3065	V3139	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285
SER	Y2777	Y2777	THR	THR	Q2962	L3068	V3139	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285
LYS	Z2778	Z2778	ARG	ARG	Q2963	H3069	L3140	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285
LYS	E2779	E2779	ILE	ILE	L2964	L3070	L3140	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285
ALA	N2780	N2780	GLU	GLU	L2964	L3070	L3140	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285
GLU	N2780	N2780	SER	SER	L2964	L3070	L3140	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285
LYS	V2781	V2781	GLN	GLN	W2966	L3071	D3159	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285
LYS	D2782	D2782	THR	THR	M2967	D3076	S3171	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285
ALA	E2783	E2783	ALA	ALA	D2968	A3077	I3172	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285
THR	D2784	D2784	GLN	GLN	L2969	R3078	L3175	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285
VAL	E2784	E2784	THR	THR	Q2970	A3077	L3175	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285
ASP	L2785	L2785	TYR	TYR	S2970	R3078	L3175	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285
ALA	K2786	K2786	PRO	PRO	Q2971	V3081	C3183	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285
GLU	T2787	T2787	ARG	ARG	I2974	H3081	L3194	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285
GLY	H2788	H2788	GLU	GLU	E2978	V3088	L3194	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285	W3285
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E2741	P2859	P2794	P2860	K2914	R2985	E3097	Y3213	A3332	A3332	A3332	A3332	A3332	A3332	A3332	A3332	A3332	A3332	A3332	A3332	A3332
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L2743	D2861	K2915	D2861	K2915	E2987	S3098	A3228	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334
N2744	L2862	T2796	L2862	K2916	E2987	S3098	A3228	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334
V2745	L2862	T2796	L2862	K2916	E2987	S3098	A3228	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334
I2746	L2864	S2798	L2864	K2916	E2987	S3098	A3228	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334
I2747	L2864	S2798	L2864	K2916	E2987	S3098	A3228	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334
P2748	L2866	E2799	L2866	K2916	E2987	S3098	A3228	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334
E2749	L2866	E2799	L2866	K2916	E2987	S3098	A3228	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334
K2750	L2866	E2799	L2866	K2916	E2987	S3098	A3228	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334
L2751	L2866	E2799	L2866	K2916	E2987	S3098	A3228	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334
D2752	L2866	E2799	L2866	K2916	E2987	S3098	A3228	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334
S2753	L2866	E2799	L2866	K2916	E2987	S3098	A3228	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334
F2754	L2866	E2799	L2866	K2916	E2987	S3098	A3228	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334
N2756	L2866	E2799	L2866	K2916	E2987	S3098	A3228	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334
K2757	L2866	E2799	L2866	K2916	E2987	S3098	A3228	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334
F2758	L2866	E2799	L2866	K2916	E2987	S3098	A3228	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334
A2759	L2866	E2799	L2866	K2916	E2987	S3098	A3228	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334
E2760	L2866	E2799	L2866	K2916	E2987	S3098	A3228	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334
Y2761	L2866	E2799	L2866	K2916	E2987	S3098	A3228	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334
T2762	L2866	E2799	L2866	K2916	E2987	S3098	A3228	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334
H2763	L2866	E2799	L2866	K2916	E2987	S3098	A3228	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334
E2764	L2866	E2799	L2866	K2916	E2987	S3098	A3228	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334
K2765	L2866	E2799	L2866	K2916	E2987	S3098	A3228	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334	W3334
W2766	A2767	F2768	D2769	K2770	I2771	Q2772	N2773	N2774	N2775	W2776	S2777	Y2777	Z2778	E2779	N2780	V2781	D2782	E2783	L2784	K2785
A2767	F2768	D2769	K2770	I2771	Q2772	N2773	N2774	N2775	W2776	S2777	Y2777	Z2778	E2779	N2780	V2781	D2782	E2783	L2784	K2785	T2786
F2768	D2769	K2770	I2771	Q2772	N2773	N2774	N2775	W2776	S2777	Y2777	Z2778	E2779	N2780	V2781	D2782	E2783	L2784	K2785	T2786	K2786
D2769	K2770	I2771	Q2772	N2773	N2774	N2775	W2776	S2777	Y2777	Z2778	E2779	N2780	V2781	D2782	E2783	L2784	K2785	T2786	K2786	K2787
K2770	I2771	Q2772	N2773	N2774	N2775	W2776	S2777	Y2777	Z2778	E2779	N2780	V2781	D2782	E2783	L2					



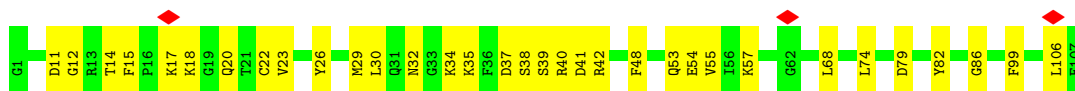








● Molecule 2: Peptidyl-prolyl cis-trans isomerase FKBP1B



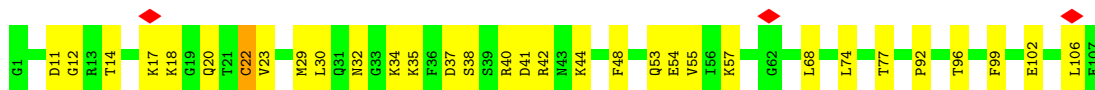
● Molecule 2: Peptidyl-prolyl cis-trans isomerase FKBP1B



● Molecule 2: Peptidyl-prolyl cis-trans isomerase FKBP1B



● Molecule 2: Peptidyl-prolyl cis-trans isomerase FKBP1B



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	249034	Depositor
Resolution determination method	OTHER	Depositor
CTF correction method	NONE	Depositor
Microscope	TFS KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	50	Depositor
Minimum defocus (nm)	1200	Depositor
Maximum defocus (nm)	2600	Depositor
Magnification	81000	Depositor
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	3.277	Depositor
Minimum map value	0.000	Depositor
Average map value	0.011	Depositor
Map value standard deviation	0.072	Depositor
Recommended contour level	0.32	Depositor
Map size (\AA)	501.12003, 501.12003, 501.12003	wwPDB
Map dimensions	464, 464, 464	wwPDB
Map angles ($^\circ$)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (\AA)	1.08, 1.08, 1.08	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: ZN, U1C, ATP

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	0.25	0/33082	0.48	3/45015 (0.0%)
1	B	0.24	0/33082	0.47	2/45015 (0.0%)
1	C	0.24	0/33082	0.48	4/45015 (0.0%)
1	D	0.25	0/33082	0.48	5/45015 (0.0%)
2	E	0.26	0/802	0.52	0/1086
2	F	0.27	0/802	0.54	0/1086
2	G	0.27	0/802	0.55	0/1086
2	H	0.26	0/802	0.52	0/1086
All	All	0.25	0/135536	0.48	14/184404 (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
1	A	0	1
1	B	0	1
1	C	0	1
1	D	0	1
All	All	0	4

There are no bond length outliers.

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

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	3003	LEU	CA-CB-CG	7.13	131.69	115.30
1	C	3003	LEU	CA-CB-CG	7.11	131.64	115.30
1	D	3003	LEU	CA-CB-CG	7.03	131.48	115.30
1	A	3003	LEU	CA-CB-CG	7.00	131.39	115.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C	922	LEU	CA-CB-CG	6.73	130.77	115.30

There are no chirality outliers.

All (4) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	626	LEU	Peptide
1	B	626	LEU	Peptide
1	C	626	LEU	Peptide
1	D	626	LEU	Peptide

5.2 Too-close contacts [i](#)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	32374	0	30869	505	0
1	B	32374	0	30869	488	0
1	C	32374	0	30869	498	0
1	D	32374	0	30869	514	0
2	E	786	0	766	22	0
2	F	786	0	766	20	0
2	G	786	0	766	21	0
2	H	786	0	766	26	0
3	A	1	0	0	0	0
3	B	1	0	0	0	0
3	C	1	0	0	0	0
3	D	1	0	0	0	0
4	A	31	0	12	0	0
4	B	31	0	12	0	0
4	C	31	0	12	0	0
4	D	31	0	12	0	0
5	A	23	0	0	0	0
5	B	23	0	0	0	0
5	C	23	0	0	0	0
5	D	23	0	0	0	0
All	All	132860	0	126588	2070	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 8.

The worst 5 of 2070 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)
1:D:830:ARG:HD3	1:D:1612:PHE:CE2	1.70	1.26
1:D:1454:THR:CG2	1:D:1456:ASP:OD1	2.09	0.99
1:D:830:ARG:CD	1:D:1612:PHE:CE2	2.45	0.99
1:D:1454:THR:HG23	1:D:1456:ASP:OD1	1.63	0.97
1:B:4763:GLY:N	1:B:4766:THR:HG1	1.62	0.95

There are no symmetry-related clashes.

5.3 Torsion angles [i](#)

5.3.1 Protein backbone [i](#)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	4214/5037 (84%)	3883 (92%)	329 (8%)	2 (0%)	100	100
1	B	4214/5037 (84%)	3873 (92%)	340 (8%)	1 (0%)	100	100
1	C	4214/5037 (84%)	3878 (92%)	334 (8%)	2 (0%)	100	100
1	D	4214/5037 (84%)	3886 (92%)	327 (8%)	1 (0%)	100	100
2	E	105/107 (98%)	90 (86%)	15 (14%)	0	100	100
2	F	105/107 (98%)	89 (85%)	16 (15%)	0	100	100
2	G	105/107 (98%)	89 (85%)	16 (15%)	0	100	100
2	H	105/107 (98%)	90 (86%)	15 (14%)	0	100	100
All	All	17276/20576 (84%)	15878 (92%)	1392 (8%)	6 (0%)	100	100

5 of 6 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	862	VAL

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Mol	Chain	Res	Type
1	C	899	ASP
1	A	1023	PRO
1	C	1023	PRO
1	D	1023	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	3334/4276 (78%)	3266 (98%)	68 (2%)	50	72
1	B	3334/4276 (78%)	3244 (97%)	90 (3%)	40	65
1	C	3334/4276 (78%)	3260 (98%)	74 (2%)	47	70
1	D	3334/4276 (78%)	3259 (98%)	75 (2%)	47	70
2	E	80/88 (91%)	78 (98%)	2 (2%)	42	67
2	F	80/88 (91%)	79 (99%)	1 (1%)	65	79
2	G	80/88 (91%)	79 (99%)	1 (1%)	65	79
2	H	80/88 (91%)	79 (99%)	1 (1%)	65	79
All	All	13656/17456 (78%)	13344 (98%)	312 (2%)	46	69

5 of 312 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	C	4807	PHE
1	D	3003	LEU
1	D	315	CYS
1	D	1143	TRP
1	D	4156	HIS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 69 such sidechains are listed below:

Mol	Chain	Res	Type
1	D	2005	GLN

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Mol	Chain	Res	Type
1	D	2176	ASN
1	D	3837	GLN
1	B	2112	GLN
1	B	2005	GLN

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 12 ligands modelled in this entry, 4 are monoatomic - leaving 8 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
5	U1C	C	5103	-	23,25,25	6.21	12 (52%)	26,35,35	3.18	9 (34%)
4	ATP	C	5102	-	28,33,33	0.63	0	34,52,52	0.59	1 (2%)
5	U1C	A	5103	-	23,25,25	6.21	12 (52%)	26,35,35	3.20	9 (34%)
4	ATP	D	5102	-	28,33,33	0.65	0	34,52,52	0.58	1 (2%)
5	U1C	B	5103	-	23,25,25	6.19	12 (52%)	26,35,35	3.20	9 (34%)
5	U1C	D	5103	-	23,25,25	6.20	12 (52%)	26,35,35	3.19	9 (34%)
4	ATP	A	5102	-	28,33,33	0.65	0	34,52,52	0.58	1 (2%)
4	ATP	B	5102	-	28,33,33	0.66	0	34,52,52	0.58	1 (2%)

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
5	U1C	C	5103	-	-	1/7/25/25	0/3/3/3
4	ATP	C	5102	-	-	9/18/38/38	0/3/3/3
5	U1C	A	5103	-	-	1/7/25/25	0/3/3/3
4	ATP	D	5102	-	-	9/18/38/38	0/3/3/3
5	U1C	B	5103	-	-	1/7/25/25	0/3/3/3
5	U1C	D	5103	-	-	1/7/25/25	0/3/3/3
4	ATP	A	5102	-	-	9/18/38/38	0/3/3/3
4	ATP	B	5102	-	-	9/18/38/38	0/3/3/3

The worst 5 of 48 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	C	5103	U1C	C1-N2	-18.77	1.32	1.45
5	A	5103	U1C	C1-N2	-18.76	1.32	1.45
5	D	5103	U1C	C1-N2	-18.64	1.32	1.45
5	B	5103	U1C	C1-N2	-18.59	1.32	1.45
5	B	5103	U1C	C1-C2	-10.54	1.39	1.51

The worst 5 of 40 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	C	5103	U1C	C2-C1-N2	8.41	106.93	101.45
5	B	5103	U1C	C2-C1-N2	8.40	106.92	101.45
5	A	5103	U1C	C2-C1-N2	8.38	106.91	101.45
5	D	5103	U1C	C2-C1-N2	8.37	106.90	101.45
5	B	5103	U1C	C1-N2-C3	-7.36	108.27	112.31

There are no chirality outliers.

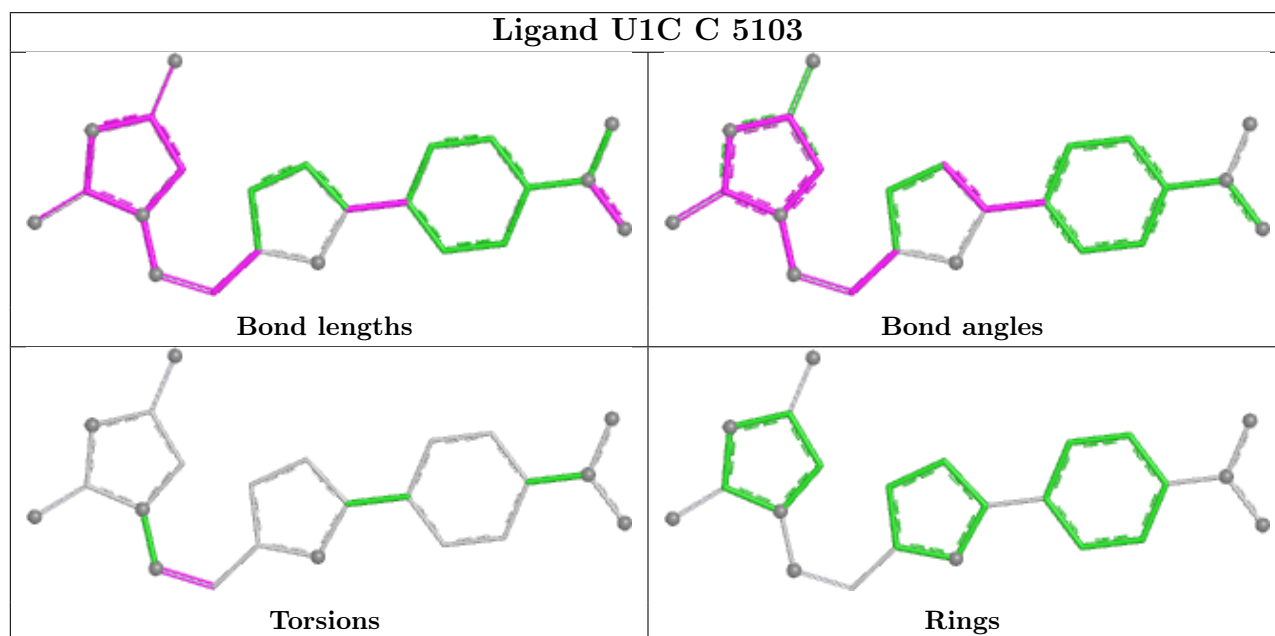
5 of 40 torsion outliers are listed below:

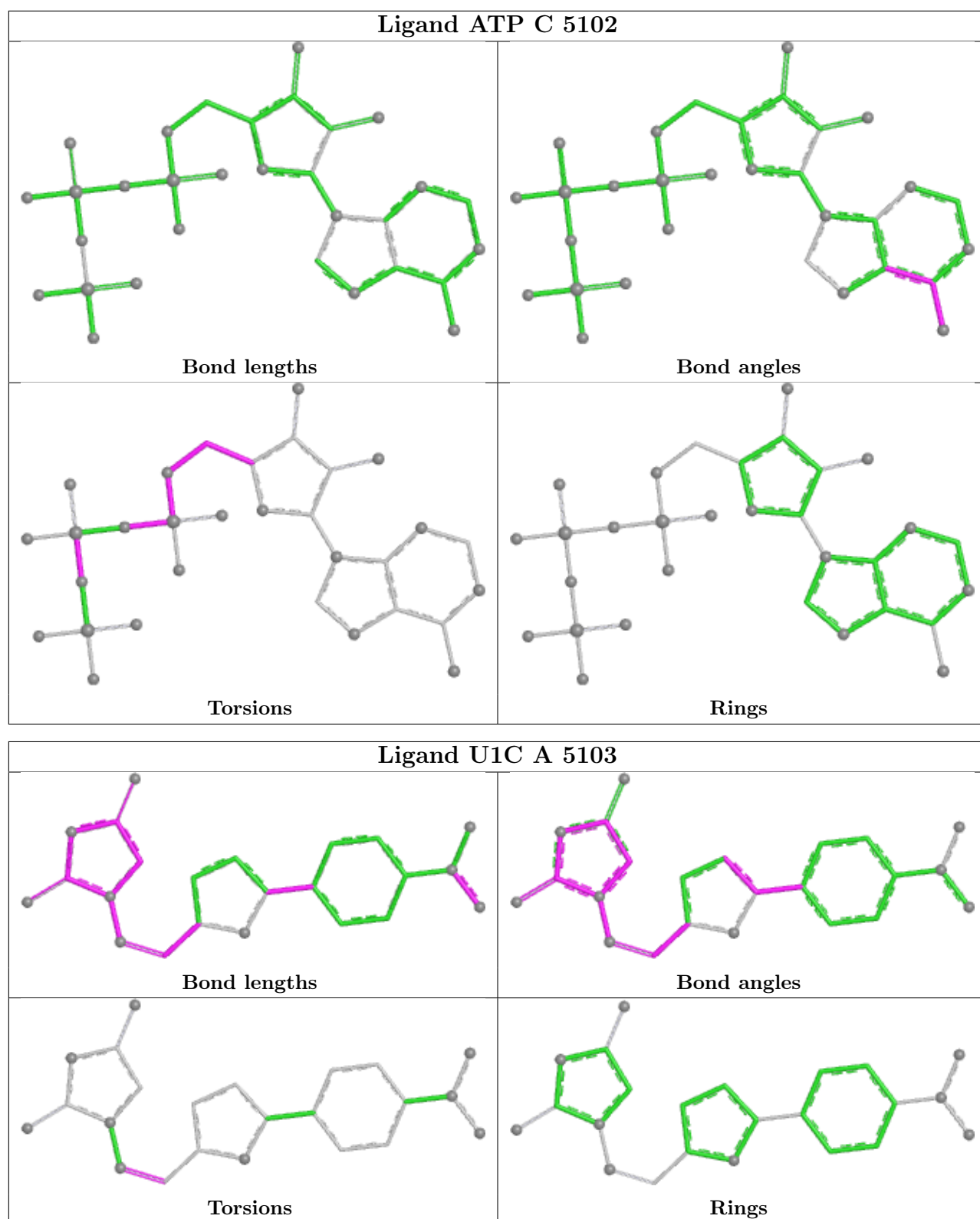
Mol	Chain	Res	Type	Atoms
4	A	5102	ATP	C5'-O5'-PA-O1A
4	A	5102	ATP	C5'-O5'-PA-O2A
4	A	5102	ATP	C5'-O5'-PA-O3A
4	A	5102	ATP	O4'-C4'-C5'-O5'
4	B	5102	ATP	C5'-O5'-PA-O1A

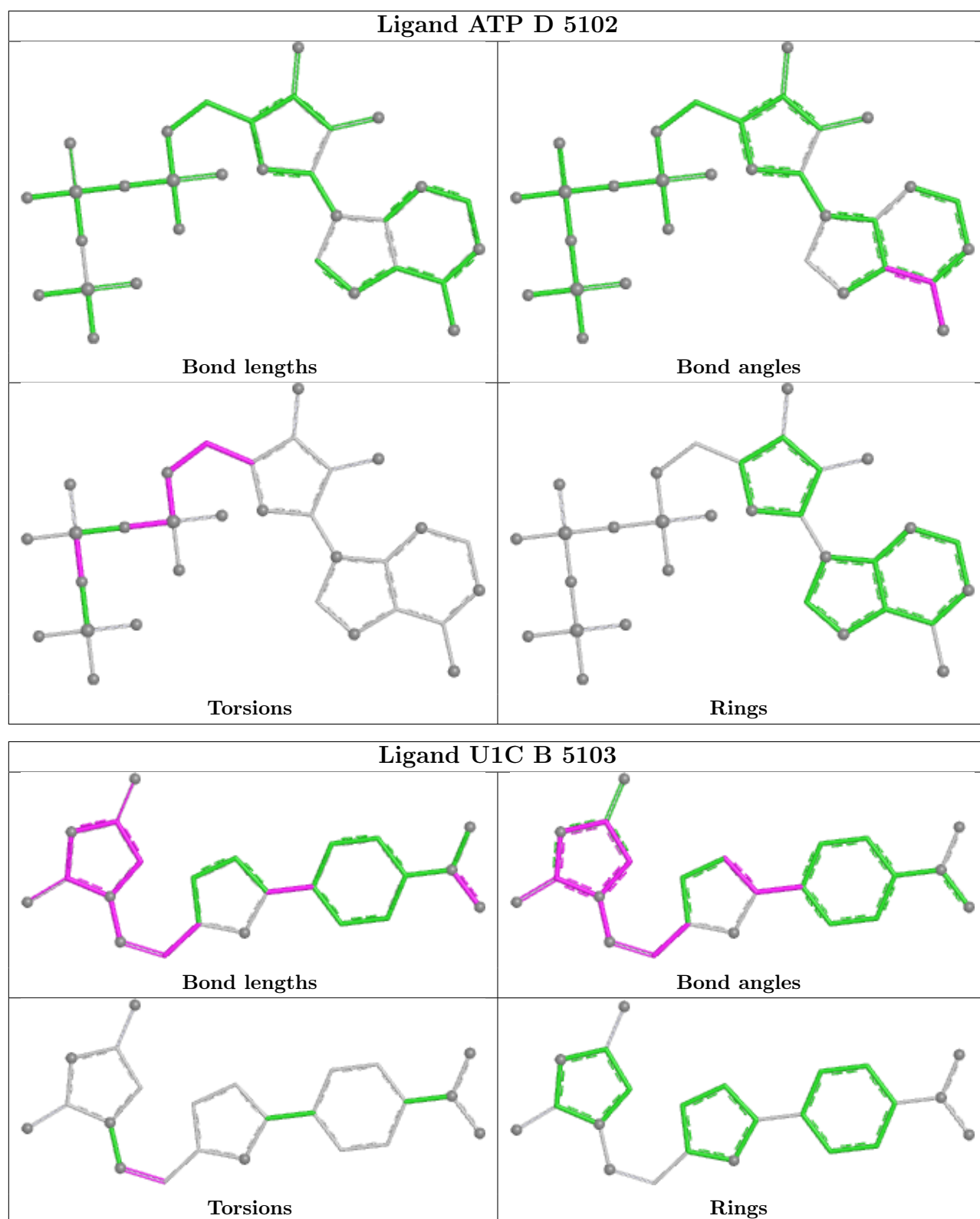
There are no ring outliers.

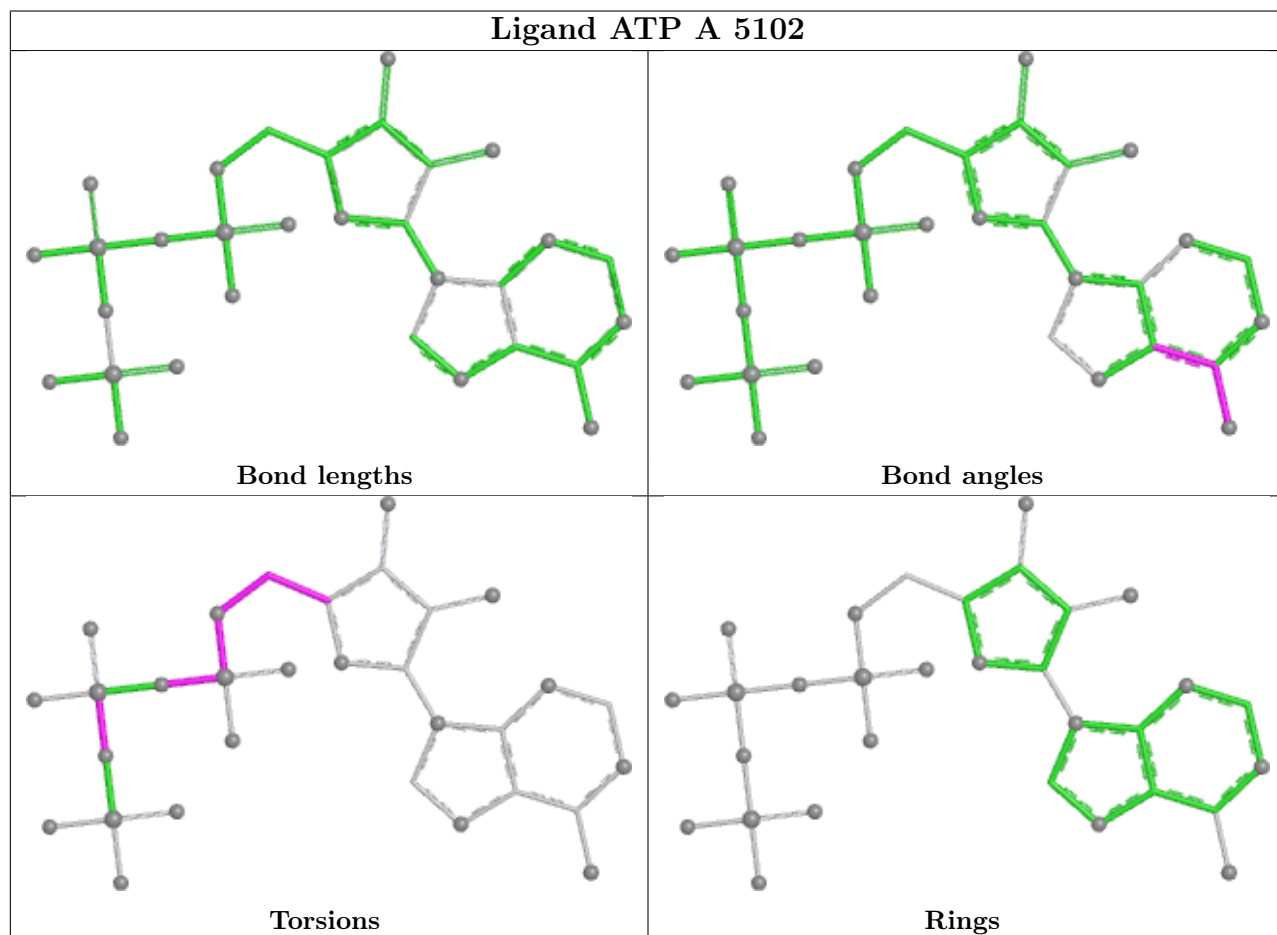
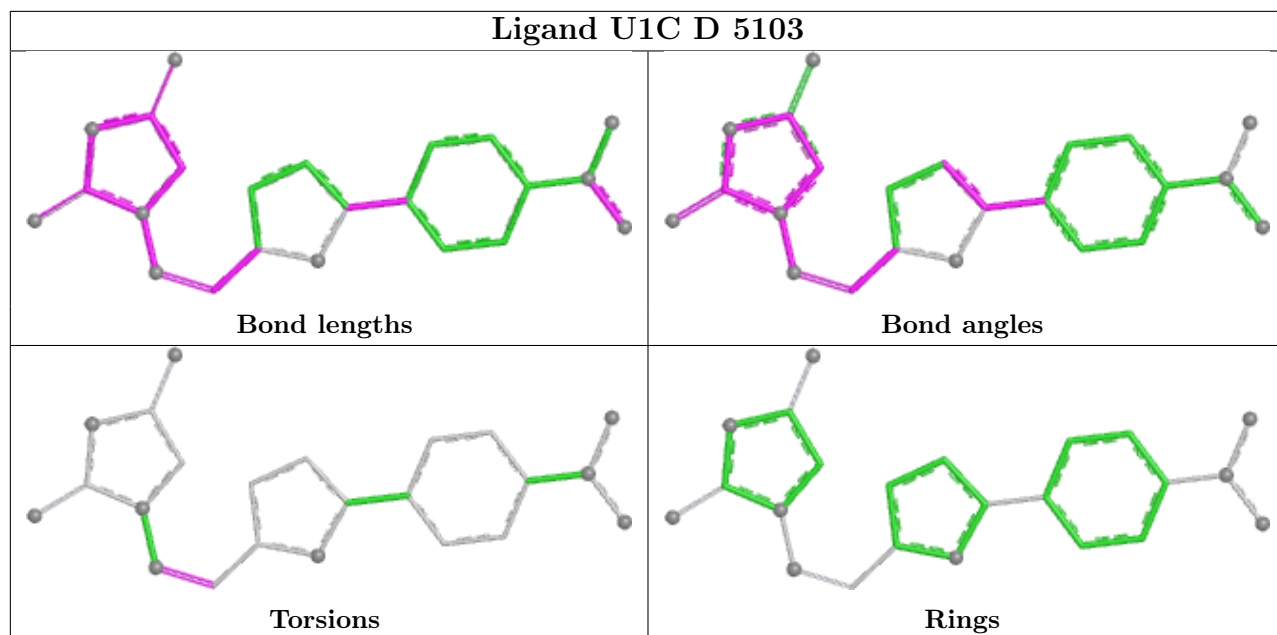
No monomer is involved in short contacts.

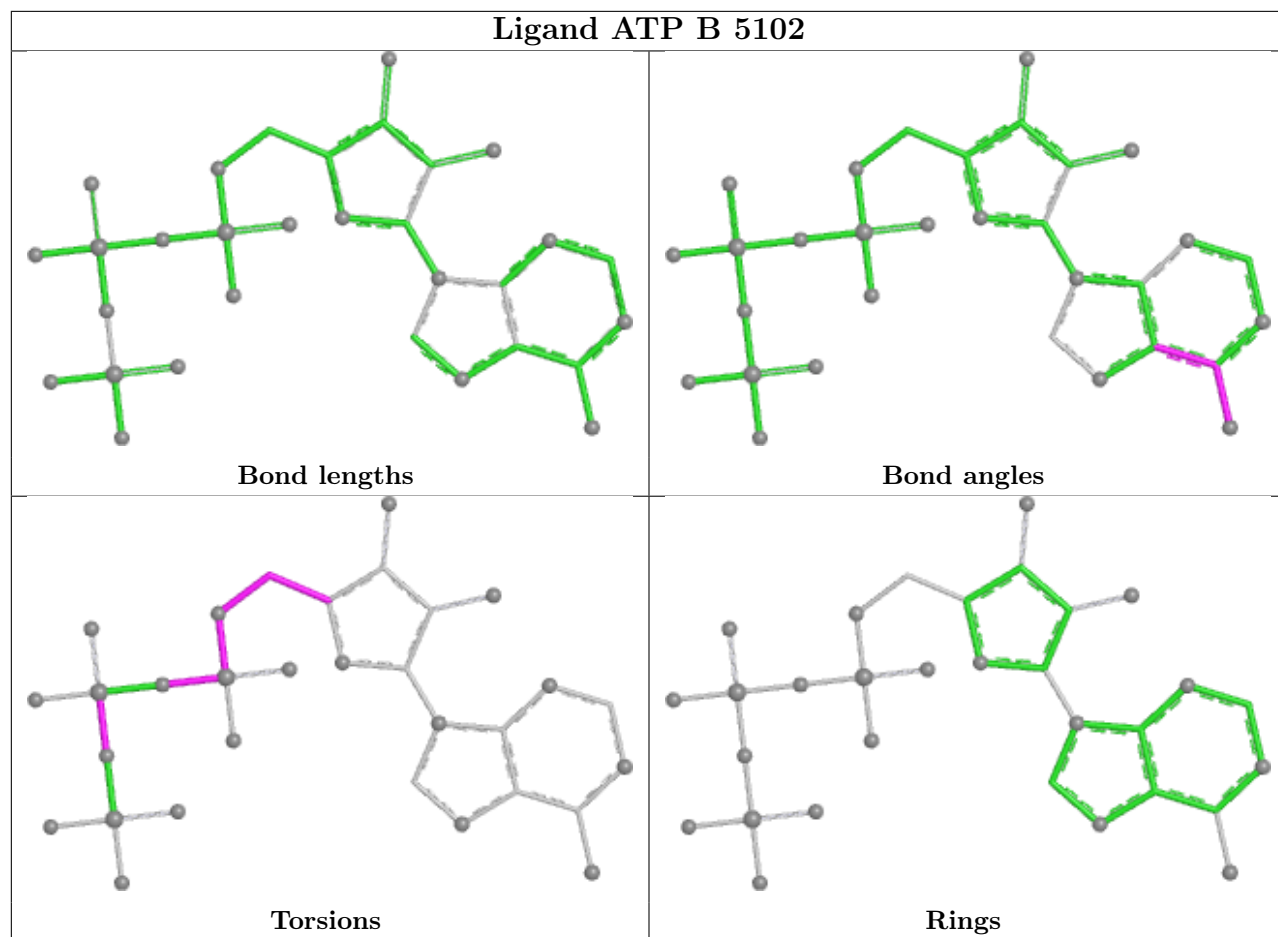
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. 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.

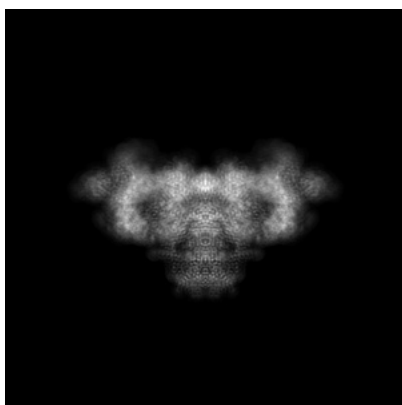
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-45584. These allow visual inspection of the internal detail of the map and identification of artifacts.

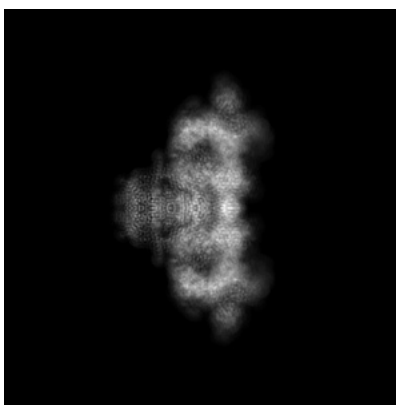
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections [i](#)

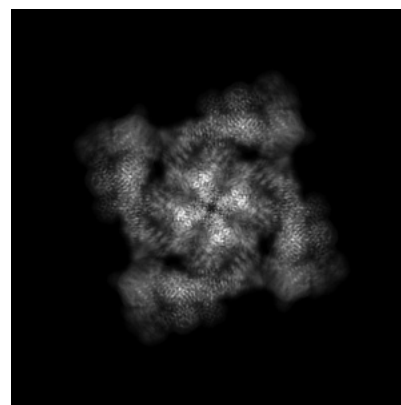
6.1.1 Primary map



X



Y

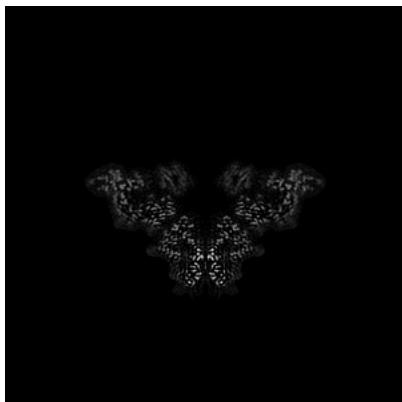


Z

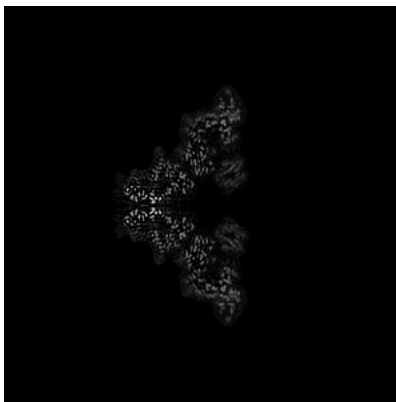
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

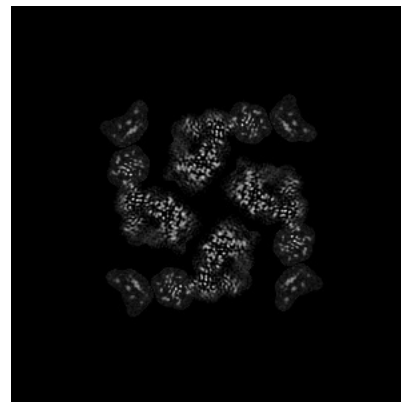
6.2.1 Primary map



X Index: 232



Y Index: 232

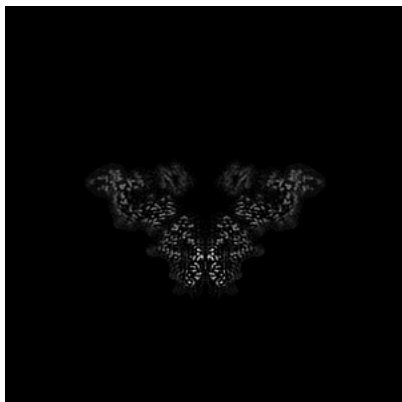


Z Index: 232

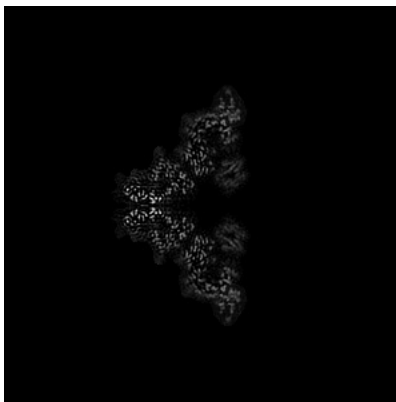
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [\(i\)](#)

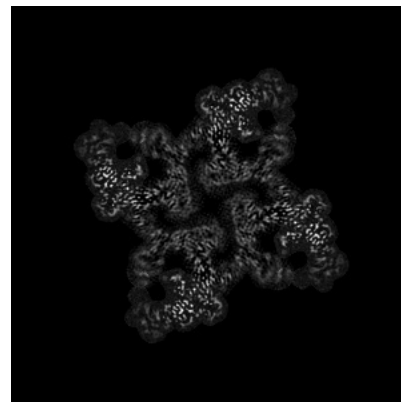
6.3.1 Primary map



X Index: 232



Y Index: 232

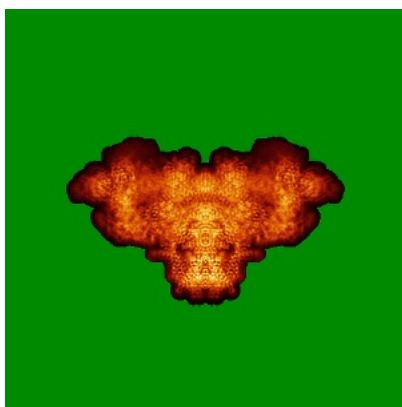


Z Index: 261

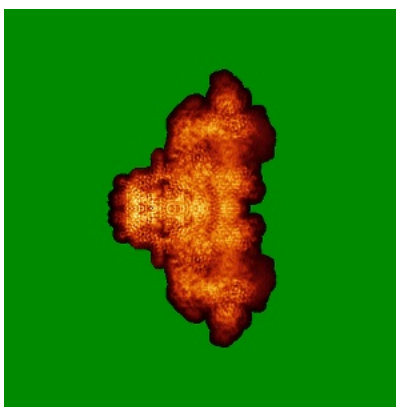
The images above show the largest variance slices of the map in three orthogonal directions.

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

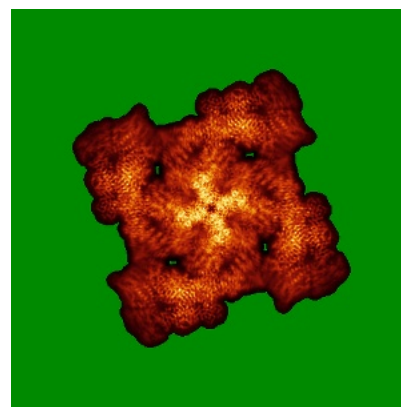
6.4.1 Primary map



X



Y

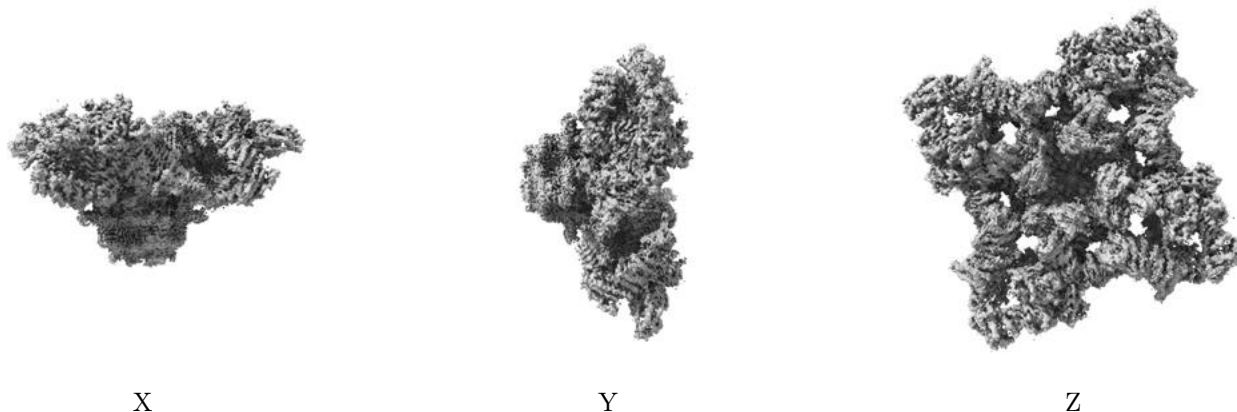


Z

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 0.32. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

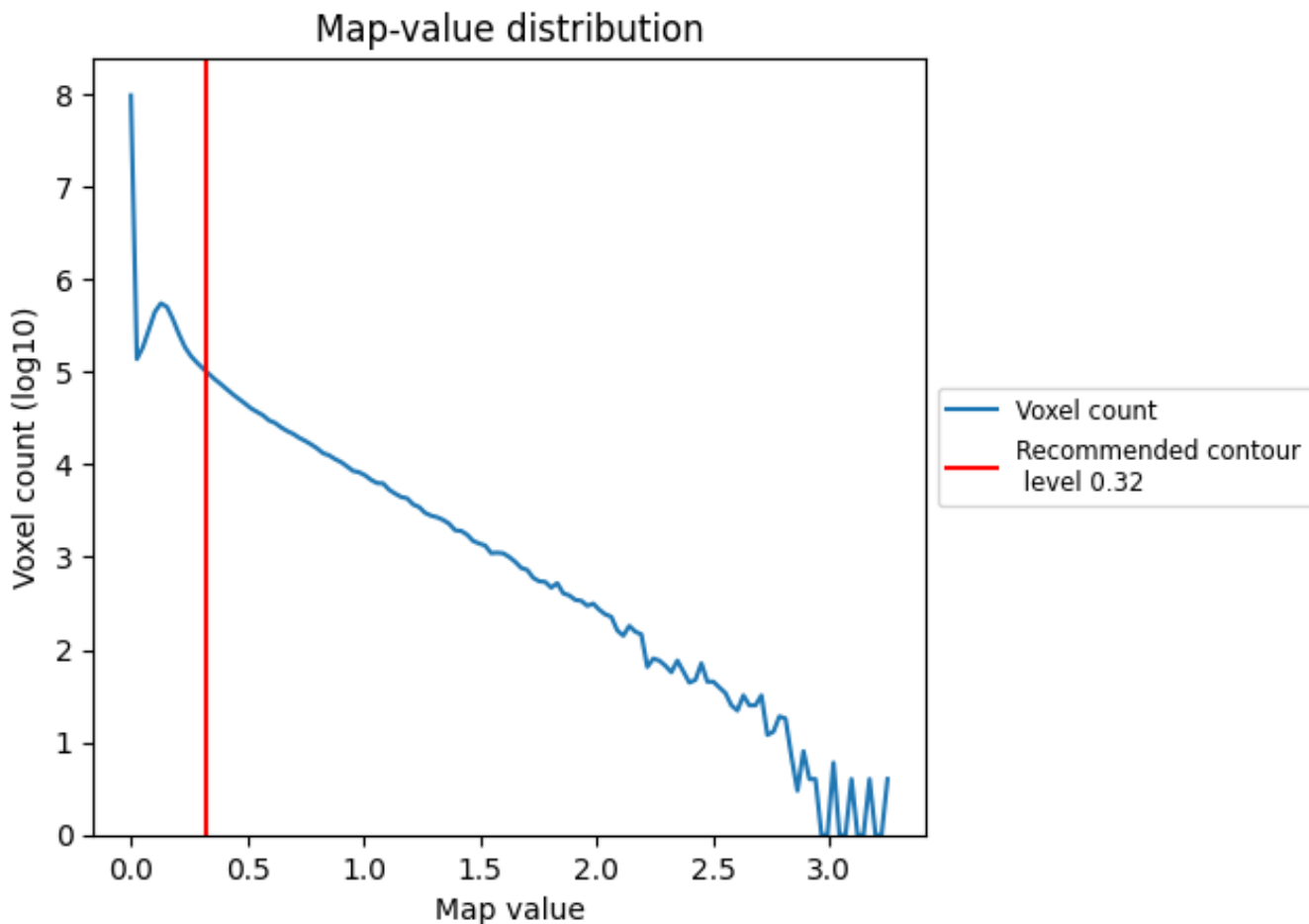
6.6 Mask visualisation [i](#)

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

7 Map analysis [i](#)

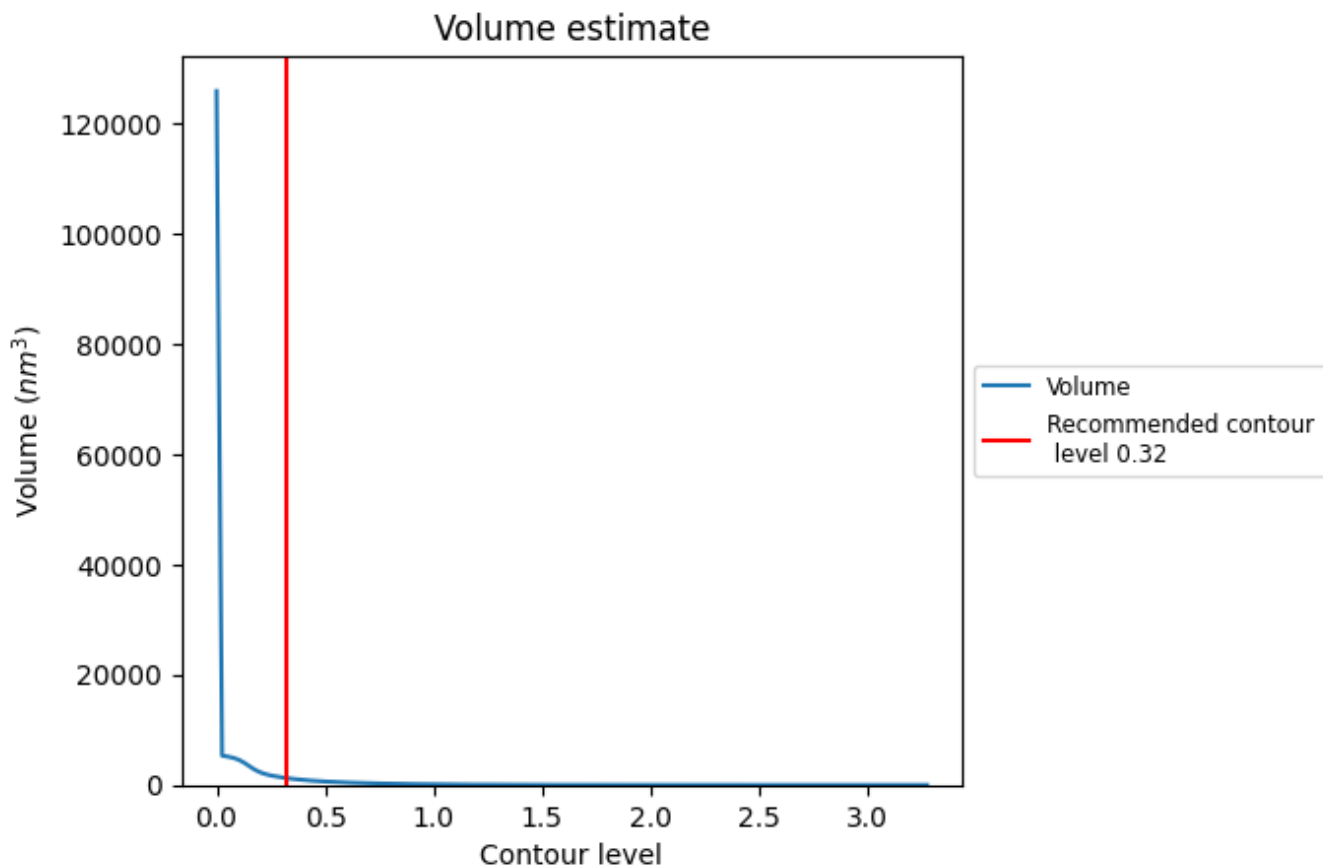
This section contains the results of statistical analysis of the map.

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.

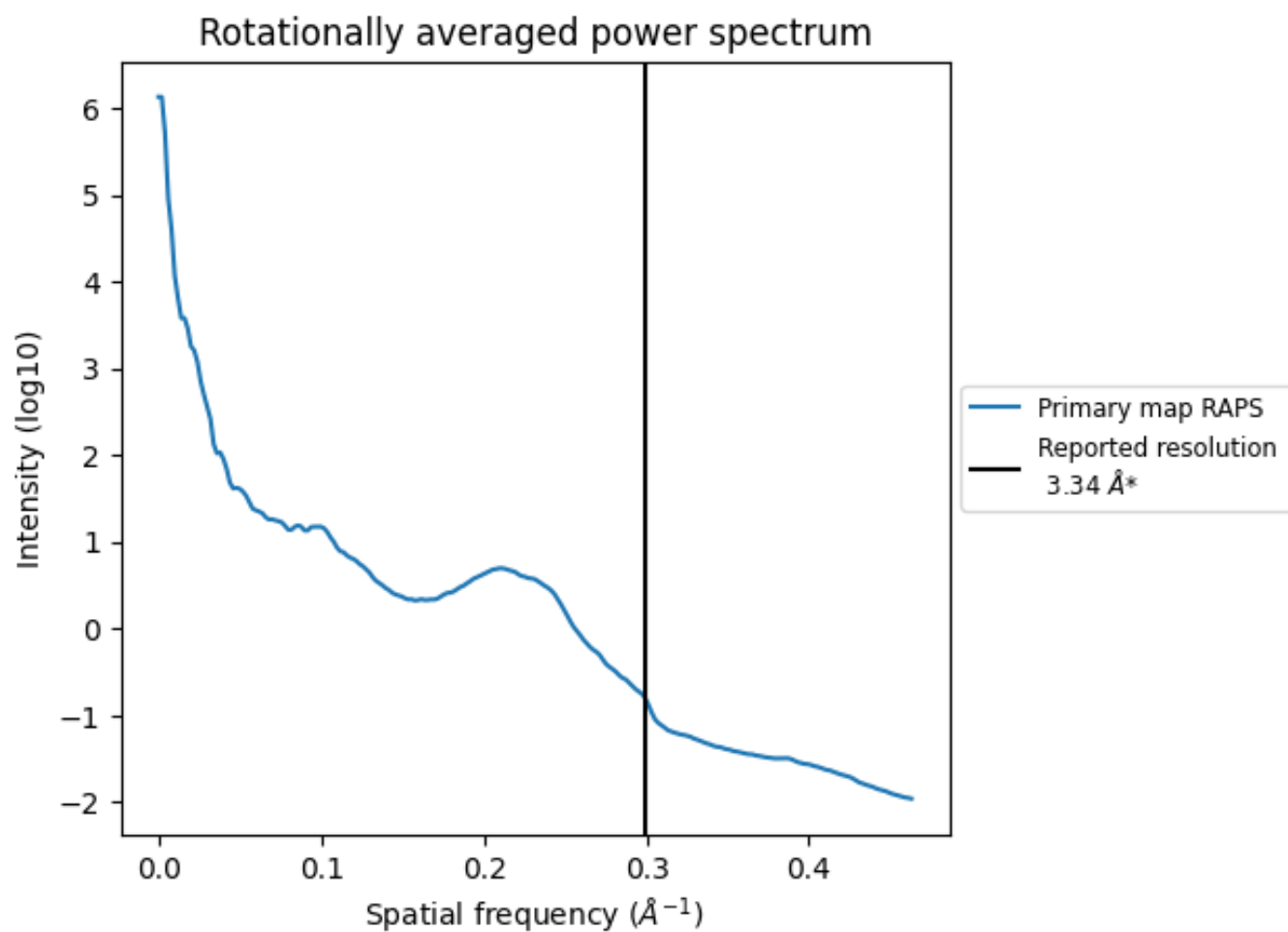
7.2 Volume estimate [\(i\)](#)



The volume at the recommended contour level is 1262 nm^3 ; this corresponds to an approximate mass of 1140 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 0.299 \AA^{-1}

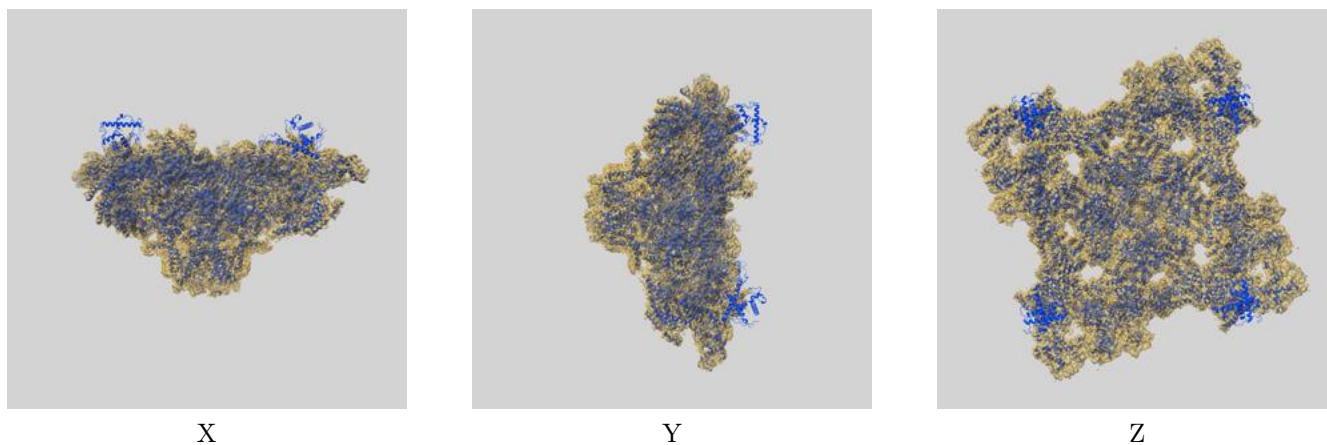
8 Fourier-Shell correlation

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

9 Map-model fit [i](#)

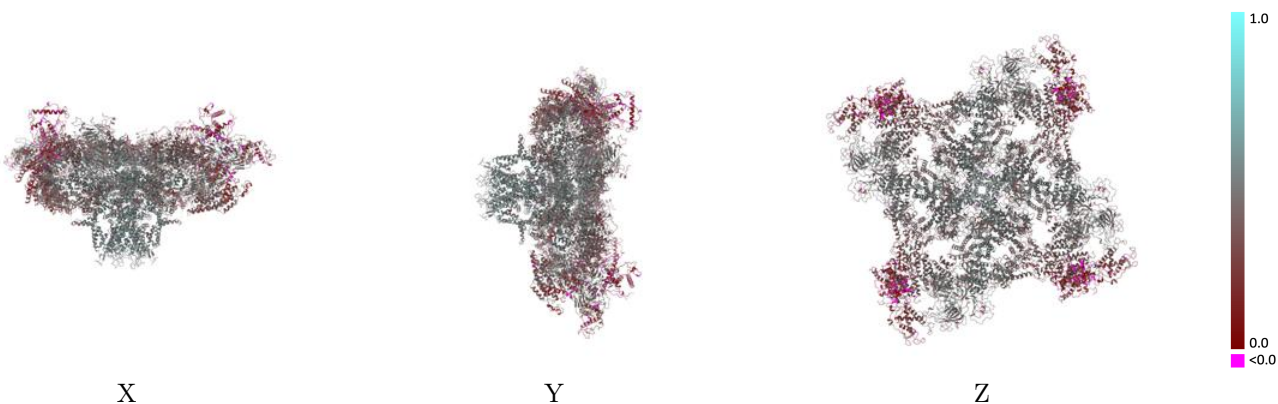
This section contains information regarding the fit between EMDB map EMD-45584 and PDB model 9CGP. Per-residue inclusion information can be found in section 3 on page 6.

9.1 Map-model overlay [i](#)



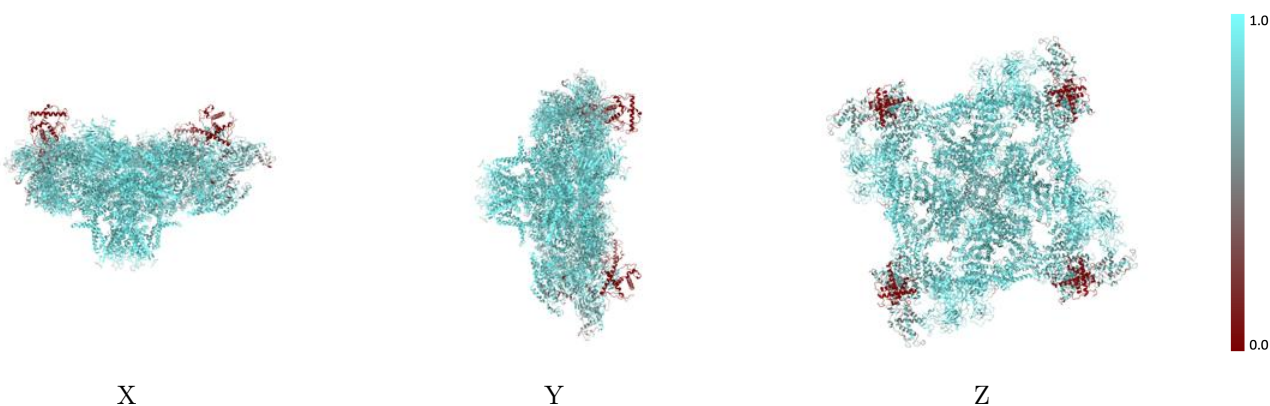
The images above show the 3D surface view of the map at the recommended contour level 0.32 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



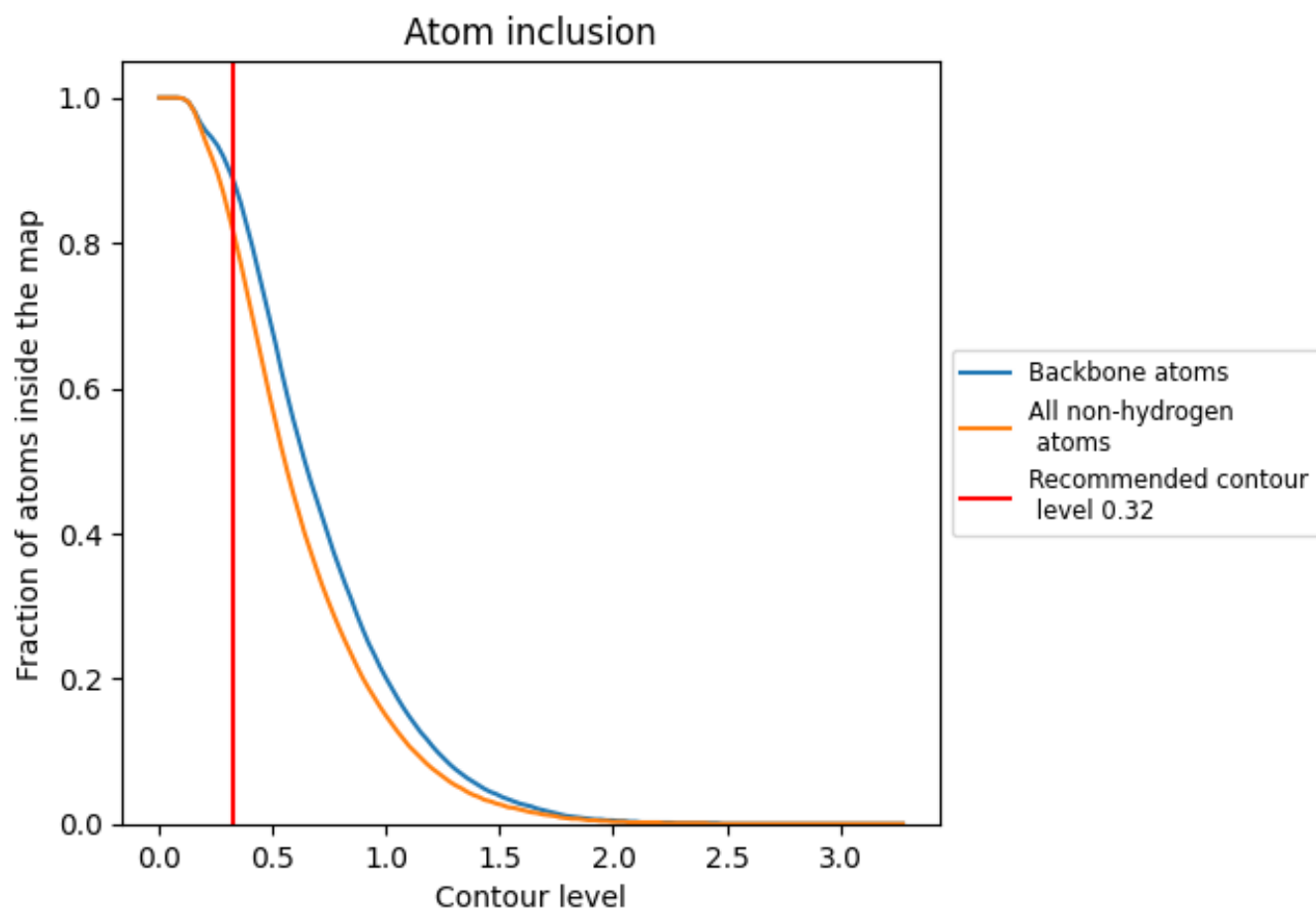
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.32).



















9.4 Atom inclusion [i](#)



At the recommended contour level, 89% of all backbone atoms, 82% 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 (0.32) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.8220	 0.4080
A	 0.8210	 0.4070
B	 0.8220	 0.4080
C	 0.8210	 0.4070
D	 0.8230	 0.4080
E	 0.8530	 0.4190
F	 0.8480	 0.4210
G	 0.8490	 0.4200
H	 0.8490	 0.4230

