



wwPDB EM Validation Summary Report ⓘ

Nov 9, 2023 – 03:26 PM EST

PDB ID : 8UQ4
EMDB ID : EMD-42460
Title : Structure of human RyR2-S2808D in the subprimed state in the presence of H₂O₂/NOC-12/GSH
Authors : Miotto, M.C.; Marks, A.R.
Deposited on : 2023-10-23
Resolution : 3.64 Å (reported)
Based on initial model : 7UA5

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.dev70
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) : 2.36

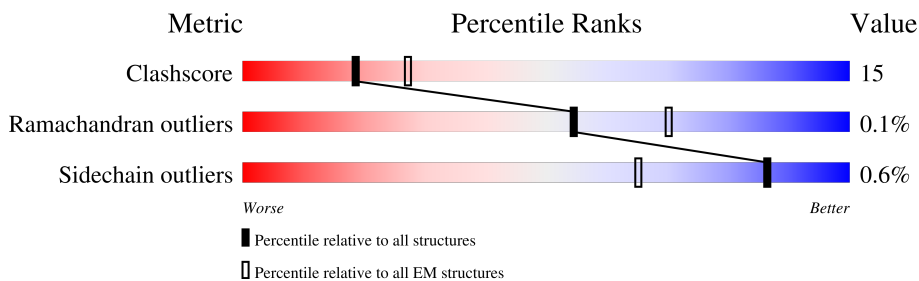
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 3.64 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	158937	4297
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826

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	4967	
1	B	4967	
1	C	4967	
1	D	4967	
2	E	108	
2	F	108	
2	G	108	
2	H	108	

2 Entry composition [i](#)

There are 4 unique types of molecules in this entry. The entry contains 138608 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 2.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	4224	33771	21516	5745	6280	230	2	0
1	B	4224	33771	21516	5745	6280	230	2	0
1	C	4224	33771	21516	5745	6280	230	2	0
1	D	4224	33771	21516	5745	6280	230	2	0

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	2808	ASP	SER	engineered mutation	UNP Q92736
B	2808	ASP	SER	engineered mutation	UNP Q92736
C	2808	ASP	SER	engineered mutation	UNP Q92736
D	2808	ASP	SER	engineered mutation	UNP Q92736

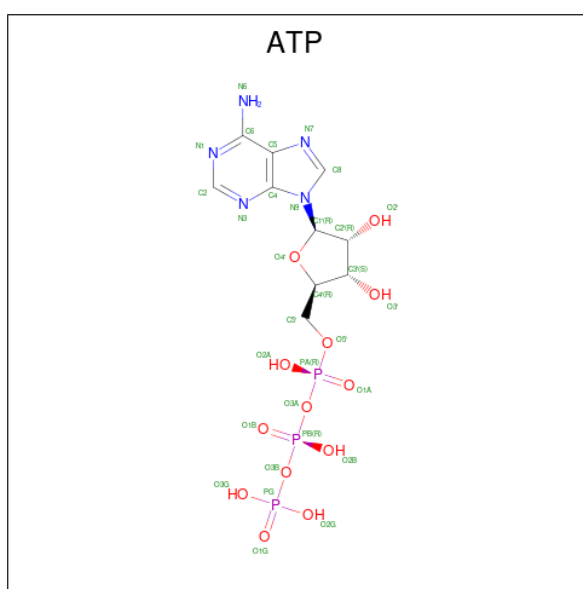
- Molecule 2 is a protein called Peptidyl-prolyl cis-trans isomerase FKBP1B.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	E	107	818	516	144	154	4	0	0
2	F	107	818	516	144	154	4	0	0
2	G	107	818	516	144	154	4	0	0
2	H	107	818	516	144	154	4	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	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	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	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	

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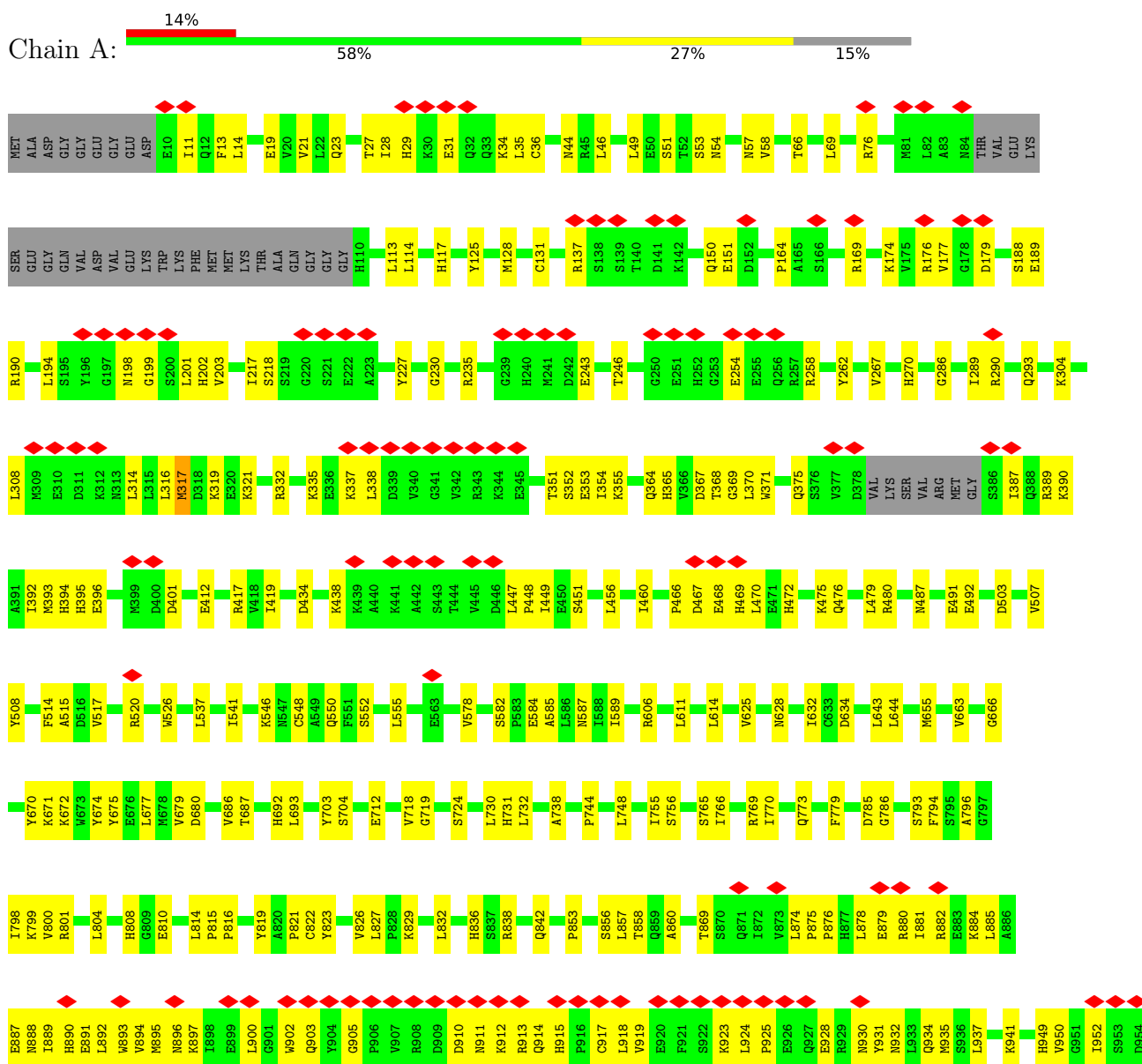
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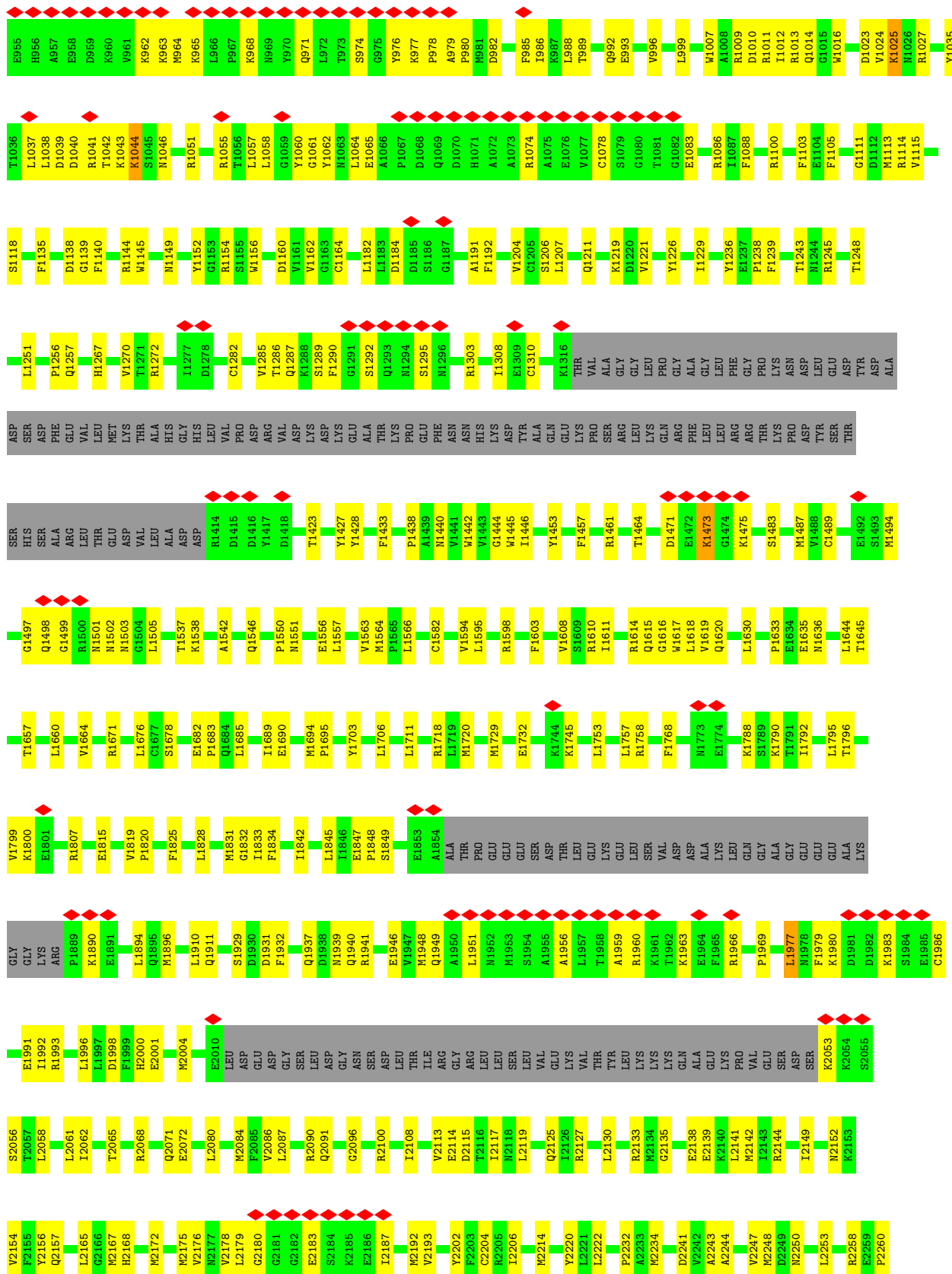
Mol	Chain	Residues	Atoms					AltConf
			Total	C	N	O	P	
4	D	1	31	10	5	13	3	0

3 Residue-property plots

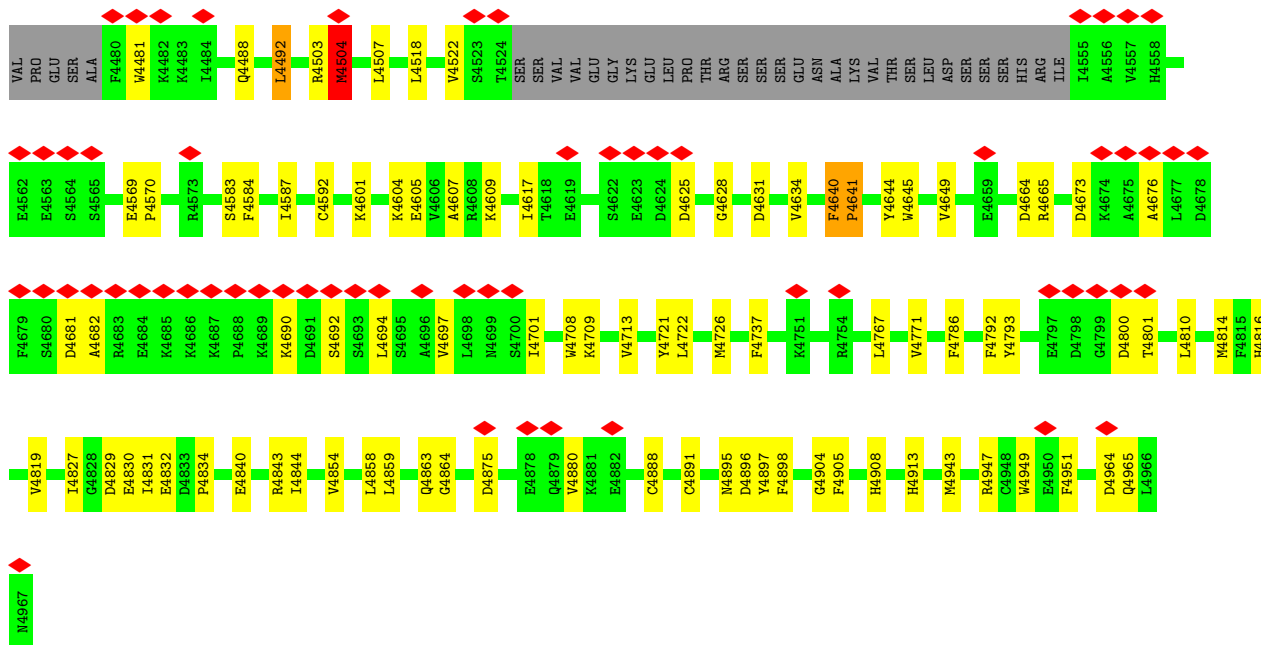
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion 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: Ryanodine receptor 2

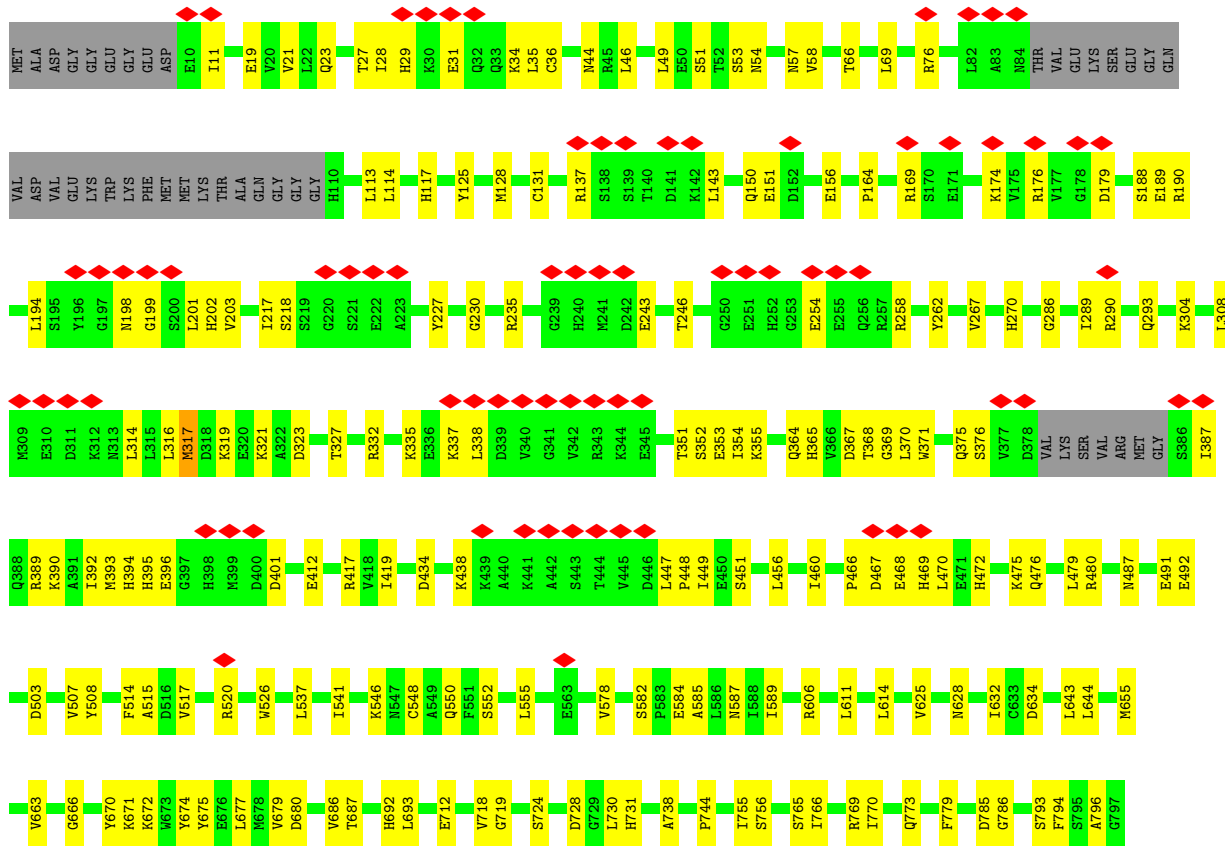


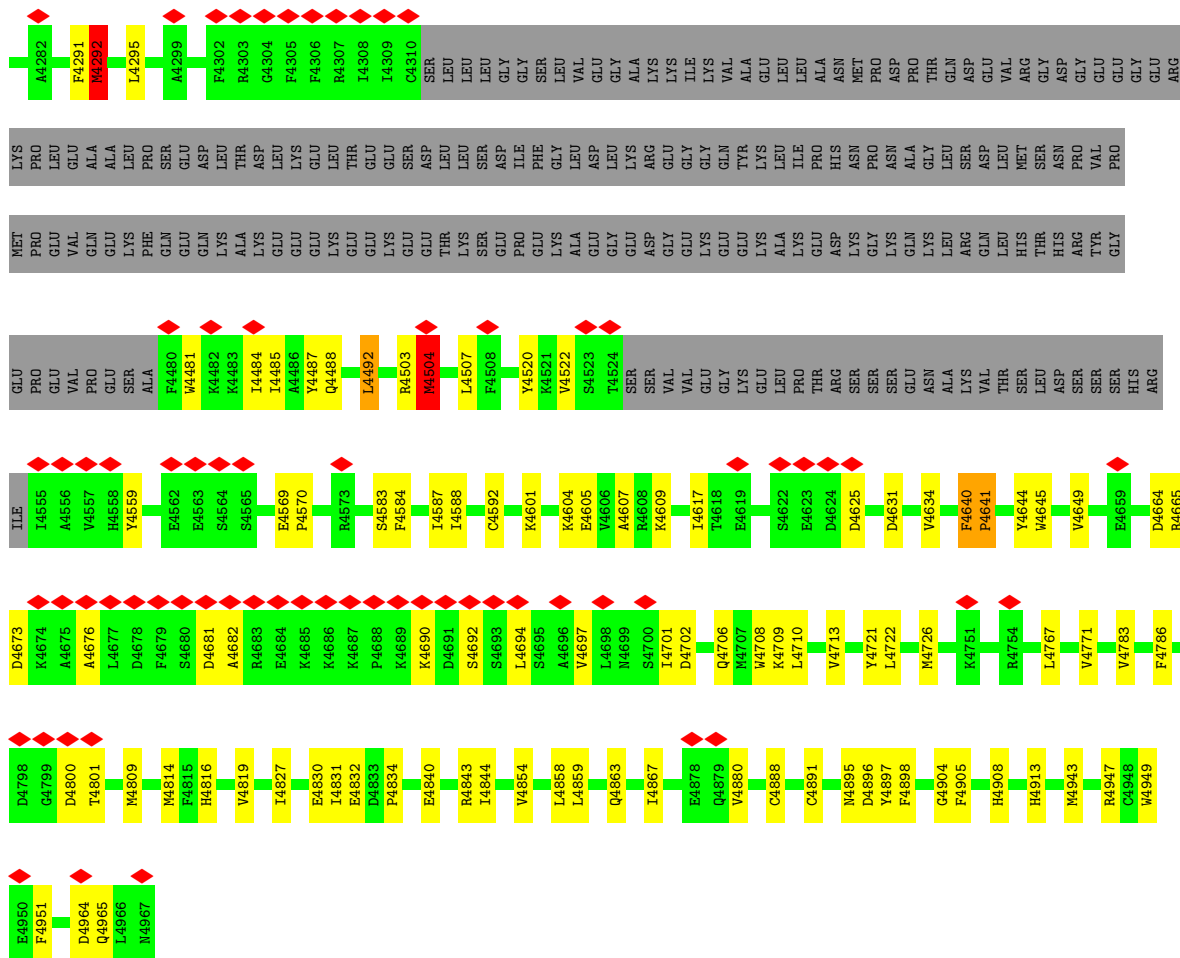


K264	K265	V266	V266	A2270	G2273	Q2278	V2281	W2290	H2291	F2292	G2295	E2296	R2297	F2301	L2302	R2303	F2304	F2307	R2322	R2326	R2327	G2332	R2336	G2337	E2338	I2353	R2359	D2360	S2363	P2364	ASN	SER	GLY	SER	SER	LYS	THR	THR	LEU	C2461	ASP	THR	THR	GLU	GLU	E2377	E2378												
D2379	D2380	H2383	F2391	R2401	C2402	A2403	M2406	H2407	L2408	I2409	K2413	G2414	E2415	A2416	I2417	R2418	I2419	R2420	L2423	R2424	S2425	L2426	I2427	D2431	G2434	V2435	I2436	S2437	I2438	Q2441	M2442	P2443	T2444	I2445	A2446	K2447	V2451	E2452	E2453	M2456	F2460	C2461	P2462	K2465	V2469	Y2553	R2554												
L2570	F2571	R2574	Y2575	Y2576	D2582	F2583	L2584	A2585	D2586	F2587	F2588	A2589	L2590	L2591	R2592	L2593	R2594	L2595	L2596	H2602	A2603	K2604	H2605	P2606	L2610	T2611	N2612	H2613	C2521	L2525	P2526	R2530	L2534	P2535	A2536	G2537	H2540	H2541	A2542	S2543	I2545	L2548	L2549	Y2553	R2554														
L2555	S2556	K2557	Q2565	R2566	I2569	E2570	L2580	R2581	P2582	S2583	M2584	H2585	Q2586	H2587	L2588	L2589	R2590	L2591	D2592	L2593	F2594	H2602	A2603	K2604	H2605	P2606	L2610	T2611	N2612	H2613	E2615	R2616	K2619	Y2620	Y2621	C2622	L2623	P2624	G2625	G2626	W2627	F2630	S2634	E2635	E2636	E2637	L2638	H2639	L2640	S2641									
R2642	K2643	L2644	F2645	W2646	G2647	L2648	F2649	D2650	A2651	L2652	K2655	K2656	Y2657	E2658	Q2659	L2660	L2661	F2662	K2663	L2664	A2665	L2666	P2667	C2668	L2669	S2670	A2671	A2673	G2674	L2675	L2676	P2677	P2678	D2679	M2681	E2682	S2683	M2684	Y2685	V2686	M2688	M2689	E2690	K2691	Q2692	S2693	S2694	M2695	E2696	L2696	S2697	E2698	G2699	F2701	N2700	N2702			
F2703	Q2704	P2705	V2706	D2707	T2708	S2709	N2710	T2711	T2712	L2713	P2714	E2715	K2716	L2717	E2718	Y2719	F2720	K2721	N2722	K2723	Y2724	A2725	H2726	E2727	S2728	H2729	D2730	K2731	N2732	K2736	L2737	A2738	N2739	L2742	V2743	G2744	E2745	L2746	Y2747	S2748	D2749	S2750	S2751	K2752	V2753	Q2754	P2755	L2756	L2757	K2758	P2759	N2760	K2761	L2762	L2763	S2764	E2765		
K2766	E2767	L2768	E2769	I2770	Y2771	R2772	N2773	L2779	H2782	L2783	A2784	W2785	N2787	R2788	I2789	E2790	T2791	R2792	K2793	E2794	S2797	N2798	Y2801	N2802	ARG	THR	ARG	ARG	ILE	ASP	GLN	THR	SER	GLN	VAL	VAL	ASP	ALA	ALA	HIS	G2820	Y2821	S2822	P2823	R2824	A2825	I2826	L2827	M2828	S2829	N2830	V2831	T2832	T2833					
L2833	S2834	R2835	D2836	L2837	H2838	A2839	M2840	A2841	E2842	M2843	M2844	A2845	E2846	Y2848	H2849	N2850	L2851	W2852	A2853	K2854	K2855	K2856	K2857	H2858	E2859	L2860	E2861	K2862	K2863	G2864	G2865	G2866	N2867	H2868	P2869	L2870	L2871	V2872	P2873	Y2874	D2875	L2877	T2878	A2879	K2880	E2881	K2882	A2883	K2884	D2885	R2886	E2887	K2888	A2889	Q2890	D2891	L2892		
L2893	K2894	F2895	L2896	Q2897	L2898	M2899	G2900	Y2901	A2902	V2903	S2904	R2905	G2906	F2907	K2908	D2909	L2910	E2911	L2912	D2913	T2914	P2915	S2916	L2917	E2918	K2919	R2920	F2921	A2922	S2923	S2924	F2925	L2926	L2929	I2930	A2936	Y2939	F2943	D2944	G2945	G2946	S2947	R2948	G2949	K2950	G2951	G3023	H3024	D3025	A3026	T3027	S3028	L2960	E2887	K2888	A2889	Q2890	D2891	L2892
K2965	V2966	V2967	L2968	P2969	L2970	G3037	Q3038	T3039	L3040	D3041	A3042	R3043	T3044	V3045	K3046	K3047	T3048	G3049	L3050	V3053	R3058	A3059	F3060	A3064	A3065	L3068	E3069	N3072	K2989	E3000	K3001	E3002	M3003	L3007	F3008	G3009	K3010	L3011	L3014	V3015	R3017	R3018	I3019	S3020	L3021	F3022	G3023	H3024	D3025	A3026	T3027	S3028	L2960	E2887	K2888	A2889	Q2890	D2891	L2892
L3029	V3030	H3034	L3035	L3036	L3037	Q3038	T3039	L3040	D3041	A3042	R3043	T3044	V3045	K3046	K3047	T3048	G3049	L3050	V3053	R3058	A3059	F3060	A3064	A3065	L3068	E3069	N3072	K2989	E3000	K3001	E3002	M3003	L3007	F3008	G3009	K3010	L3011	L3014	V3015	R3017	R3018	I3019	S3020	L3021	F3022	G3023	H3024	D3025	A3026	T3027	S3028	L2960	E2887	K2888	A2889	Q2890	D2891	L2892	
P3103	H3104	S3105	S3106	S3107	L3108	F3109	E3110	H3111	Q3114	F3117	G3118	E3119	D3120	I3121	I3122	L3123	E3124	D3125	V3126	Q3127	S3128	S3129	C3130	Y3131	R3132	I3133	L3134	T3135	S3136	L3137	Y3138	A3139	L3140	K3144	S3145	Q3077	Q3078	F3080	T3081	HIS	THR	ASN	GLN	PRO	K3088	G3089	V3090	T3091	Q3092	V3096	T3097	L3098	V3099	A3100	L3101	L3102	E3172		
T3173	H3174	L3175	D3176	K3177	H3178	H3179	I3180	Y3181	Y3184	N3185	L3186	K3187	S3188	E3191	R3192	A3193	A3194	L3195	L3196	L3197	F3198	T3199	N3200	V3201	R3202	I3203	V3204	I3208	P3209	S3210	L3211	E3212	K3213	L3214	M3215	E3216	E3217	L3218	V3219	E3220	L3226	R3227	T3228	Q3230	H3233	V3234	M3235	E3236	V3237	L3238	L3239	F3240	H3241						

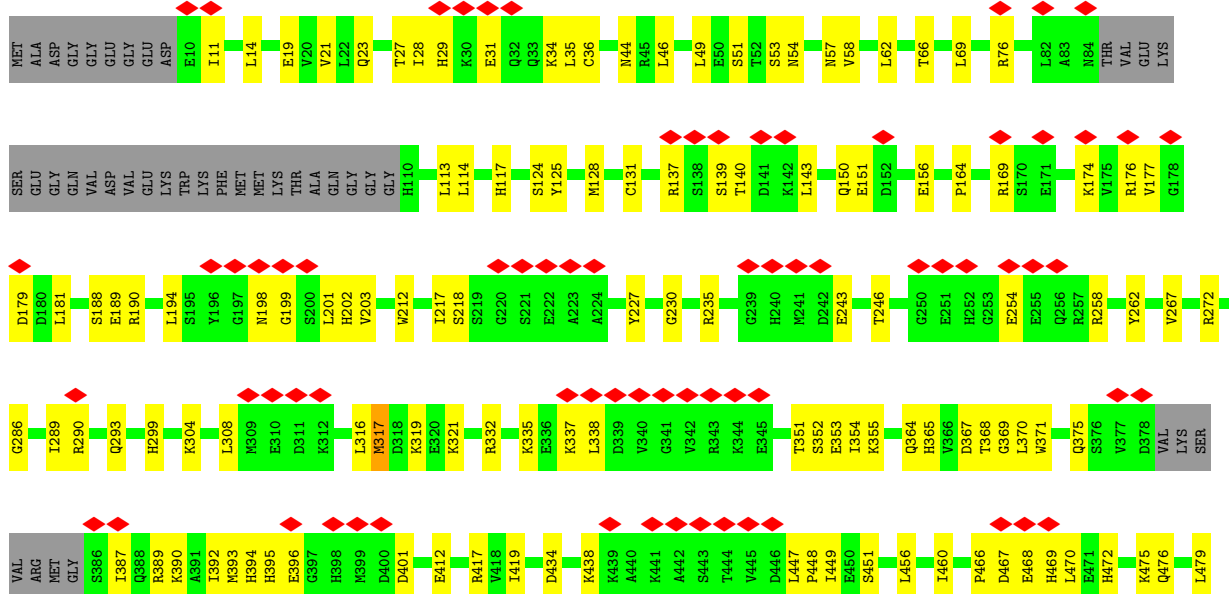


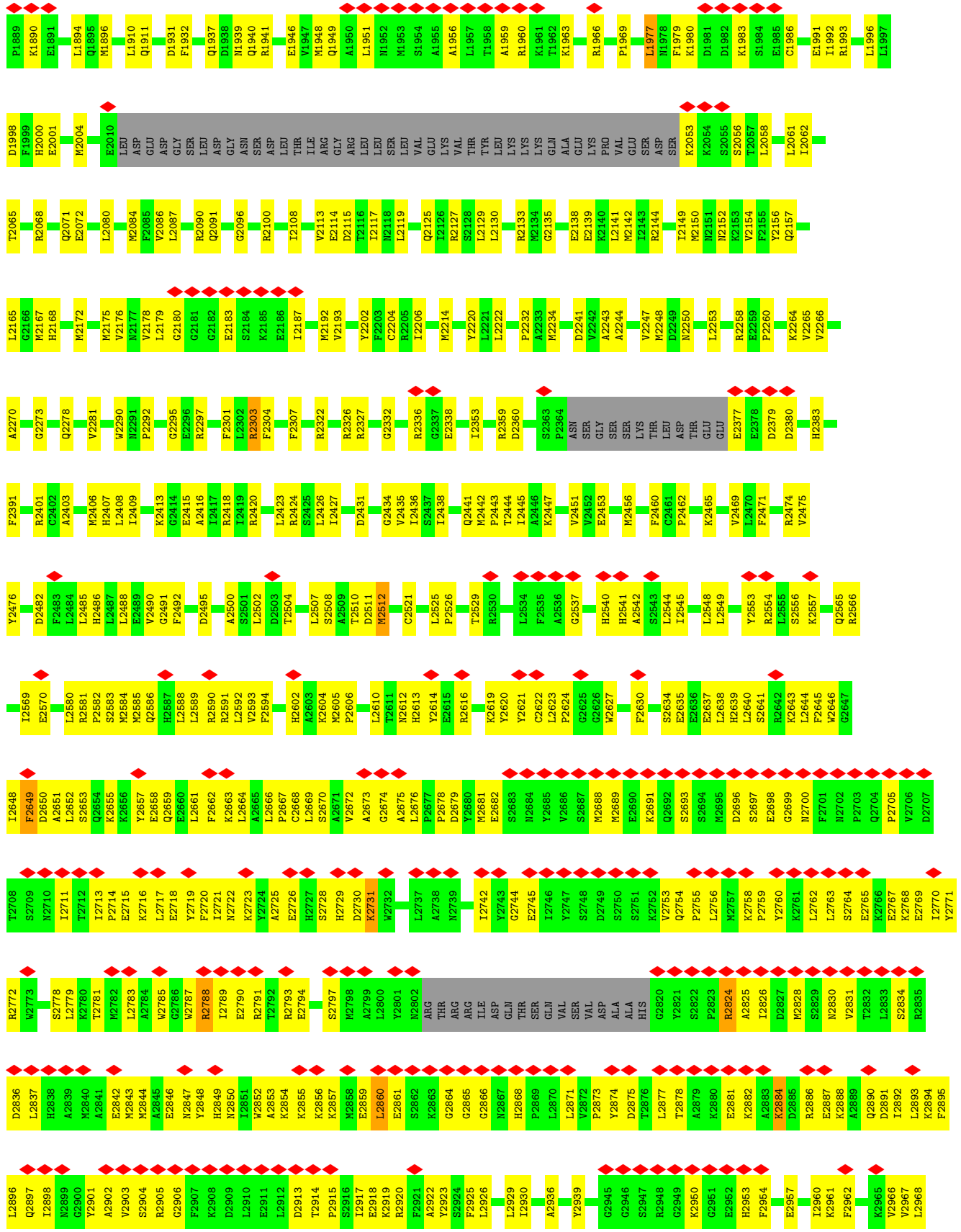
• Molecule 1: Ryanodine receptor 2

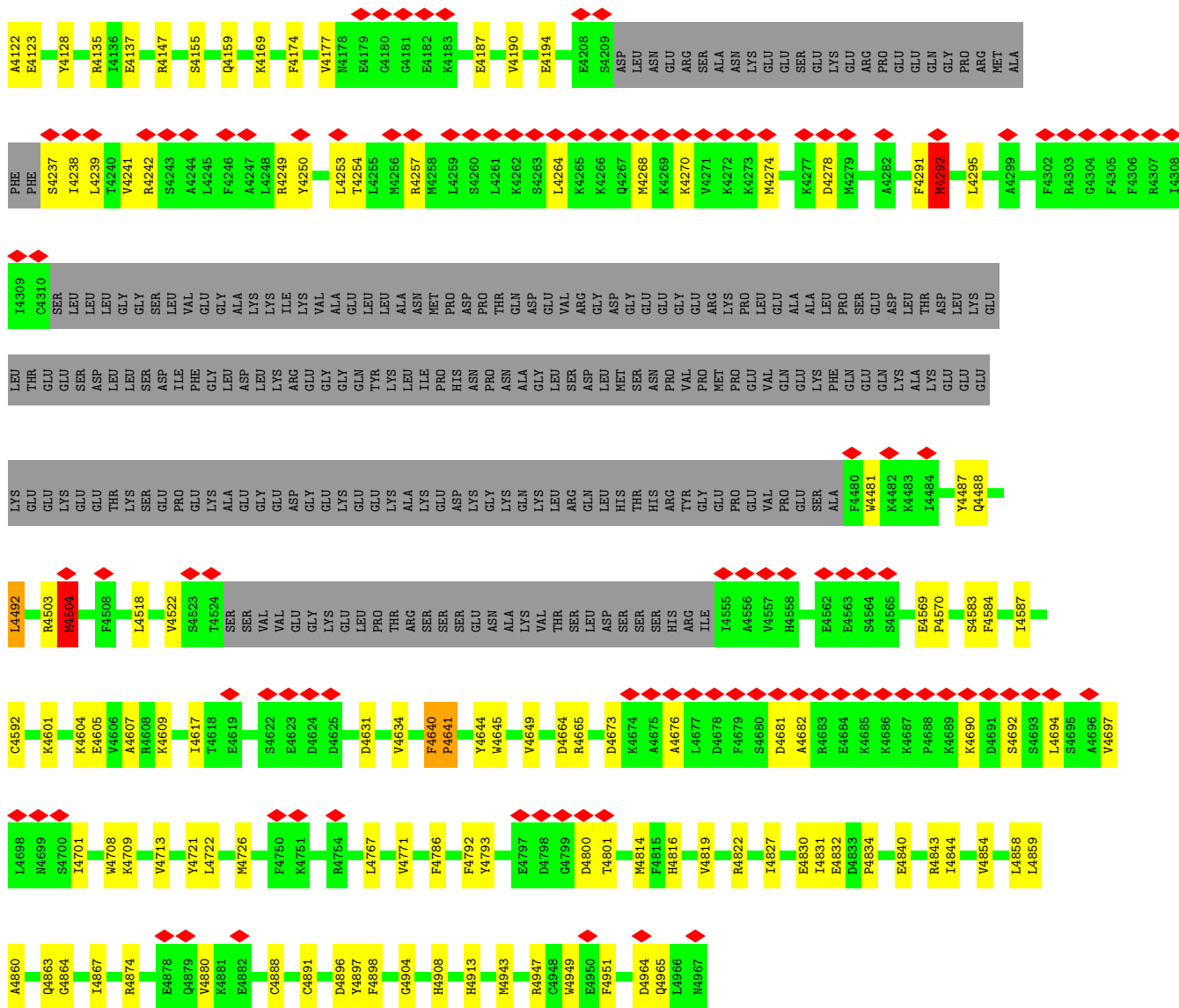




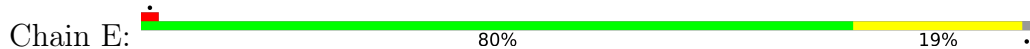
• Molecule 1: Ryanodine receptor 2



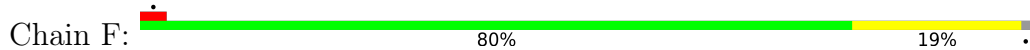




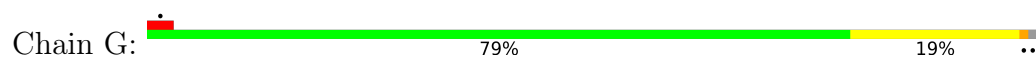
• Molecule 2: Peptidyl-prolyl cis-trans isomerase FKBP1B



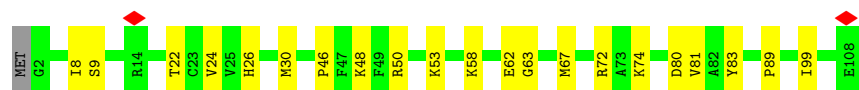
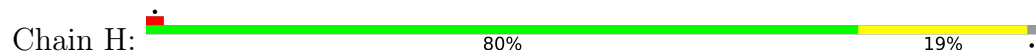
• Molecule 2: Peptidyl-prolyl cis-trans isomerase FKBP1B



• 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, C4	Depositor
Number of particles used	19753	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	58	Depositor
Minimum defocus (nm)	500	Depositor
Maximum defocus (nm)	1200	Depositor
Magnification	Not provided	
Image detector	GATAN K3 BIOQUANTUM (6k x 4k)	Depositor
Maximum map value	0.474	Depositor
Minimum map value	-0.018	Depositor
Average map value	0.010	Depositor
Map value standard deviation	0.024	Depositor
Recommended contour level	0.12	Depositor
Map size (Å)	424.96, 424.96, 424.96	wwPDB
Map dimensions	512, 512, 512	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.83, 0.83, 0.83	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, 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	0.27	0/34511	0.51	9/46614 (0.0%)
1	B	0.27	0/34511	0.51	9/46614 (0.0%)
1	C	0.27	0/34511	0.51	9/46614 (0.0%)
1	D	0.27	0/34511	0.51	9/46614 (0.0%)
2	E	0.29	0/834	0.51	0/1123
2	F	0.29	0/834	0.51	0/1123
2	G	0.29	0/834	0.51	0/1123
2	H	0.29	0/834	0.51	0/1123
All	All	0.27	0/141380	0.51	36/190948 (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	3
1	B	0	3
1	C	0	3
1	D	0	3
All	All	0	12

There are no bond length outliers.

The worst 5 of 36 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	4292	MET	CB-CG-SD	7.58	135.13	112.40
1	C	4292	MET	CB-CG-SD	7.57	135.12	112.40
1	D	4292	MET	CB-CG-SD	7.57	135.10	112.40
1	A	4292	MET	CB-CG-SD	7.55	135.05	112.40

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	4292	MET	CA-CB-CG	5.87	123.29	113.30

There are no chirality outliers.

5 of 12 planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	2988	ARG	Peptide
1	A	4504	MET	Peptide
1	A	4640	PHE	Peptide
1	B	2988	ARG	Peptide
1	B	4504	MET	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	33771	0	33455	1002	0
1	B	33771	0	33455	1005	0
1	C	33771	0	33455	992	0
1	D	33771	0	33455	992	0
2	E	818	0	821	20	0
2	F	818	0	821	18	0
2	G	818	0	821	19	0
2	H	818	0	821	19	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	62	0	24	4	0
4	B	62	0	24	4	0
4	C	62	0	24	4	0
4	D	62	0	24	4	0
All	All	138608	0	137200	4003	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 15.

The worst 5 of 4003 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:B:1611:ILE:HD11	1:B:1618:LEU:HB2	1.49	0.93
1:D:1611:ILE:HD11	1:D:1618:LEU:HB2	1.49	0.92
1:A:1611:ILE:HD11	1:A:1618:LEU:HB2	1.49	0.91
1:C:1611:ILE:HD11	1:C:1618:LEU:HB2	1.49	0.90
1:B:2905:ARG:HE	1:B:2906:GLY:H	1.22	0.88

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	4198/4967 (84%)	4054 (97%)	140 (3%)	4 (0%)	51	83
1	B	4198/4967 (84%)	4055 (97%)	139 (3%)	4 (0%)	51	83
1	C	4198/4967 (84%)	4053 (96%)	141 (3%)	4 (0%)	51	83
1	D	4198/4967 (84%)	4053 (96%)	141 (3%)	4 (0%)	51	83
2	E	105/108 (97%)	102 (97%)	3 (3%)	0	100	100
2	F	105/108 (97%)	102 (97%)	3 (3%)	0	100	100
2	G	105/108 (97%)	102 (97%)	3 (3%)	0	100	100
2	H	105/108 (97%)	102 (97%)	3 (3%)	0	100	100
All	All	17212/20300 (85%)	16623 (97%)	573 (3%)	16 (0%)	54	83

5 of 16 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	3927	PRO
1	A	4641	PRO
1	B	3927	PRO
1	B	4641	PRO

Continued on next page...

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Mol	Chain	Res	Type
1	C	3927	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	3708/4358 (85%)	3684 (99%)	24 (1%)	86	94
1	B	3708/4358 (85%)	3684 (99%)	24 (1%)	86	94
1	C	3708/4358 (85%)	3684 (99%)	24 (1%)	86	94
1	D	3708/4358 (85%)	3684 (99%)	24 (1%)	86	94
2	E	88/89 (99%)	88 (100%)	0	100	100
2	F	88/89 (99%)	88 (100%)	0	100	100
2	G	88/89 (99%)	87 (99%)	1 (1%)	73	87
2	H	88/89 (99%)	88 (100%)	0	100	100
All	All	15184/17788 (85%)	15087 (99%)	97 (1%)	86	94

5 of 97 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	C	2731	LYS
1	C	4504	MET
1	C	2824	ARG
1	C	3328	LYS
1	D	1044	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 49 such sidechains are listed below:

Mol	Chain	Res	Type
1	C	2849	HIS
1	C	4863	GLN
1	C	2868	HIS
1	C	3179	ASN

Continued on next page...

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Mol	Chain	Res	Type
1	D	477	ASN

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 monosaccharides 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
4	ATP	A	5003	-	26,33,33	0.60	0	31,52,52	0.73	2 (6%)
4	ATP	B	5002	-	26,33,33	0.62	0	31,52,52	0.79	2 (6%)
4	ATP	C	5002	-	26,33,33	0.63	0	31,52,52	0.79	2 (6%)
4	ATP	D	5003	-	26,33,33	0.61	0	31,52,52	0.73	2 (6%)
4	ATP	C	5003	-	26,33,33	0.60	0	31,52,52	0.73	2 (6%)
4	ATP	B	5003	-	26,33,33	0.60	0	31,52,52	0.73	2 (6%)
4	ATP	D	5002	-	26,33,33	0.62	0	31,52,52	0.79	2 (6%)
4	ATP	A	5002	-	26,33,33	0.62	0	31,52,52	0.79	2 (6%)

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
4	ATP	A	5003	-	-	3/18/38/38	0/3/3/3
4	ATP	B	5002	-	-	10/18/38/38	0/3/3/3
4	ATP	C	5002	-	-	9/18/38/38	0/3/3/3
4	ATP	D	5003	-	-	3/18/38/38	0/3/3/3
4	ATP	C	5003	-	-	3/18/38/38	0/3/3/3
4	ATP	B	5003	-	-	3/18/38/38	0/3/3/3
4	ATP	D	5002	-	-	10/18/38/38	0/3/3/3
4	ATP	A	5002	-	-	10/18/38/38	0/3/3/3

There are no bond length outliers.

The worst 5 of 16 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	A	5003	ATP	C5-C6-N6	2.29	123.84	120.35
4	B	5003	ATP	C5-C6-N6	2.28	123.81	120.35
4	D	5003	ATP	C5-C6-N6	2.28	123.81	120.35
4	C	5002	ATP	C5-C6-N6	2.27	123.81	120.35
4	D	5002	ATP	C5-C6-N6	2.26	123.79	120.35

There are no chirality outliers.

5 of 51 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	A	5002	ATP	PB-O3B-PG-O3G
4	A	5002	ATP	C5'-O5'-PA-O1A
4	A	5002	ATP	C5'-O5'-PA-O2A
4	A	5002	ATP	C5'-O5'-PA-O3A
4	B	5002	ATP	PB-O3B-PG-O3G

There are no ring outliers.

8 monomers are involved in 16 short contacts:

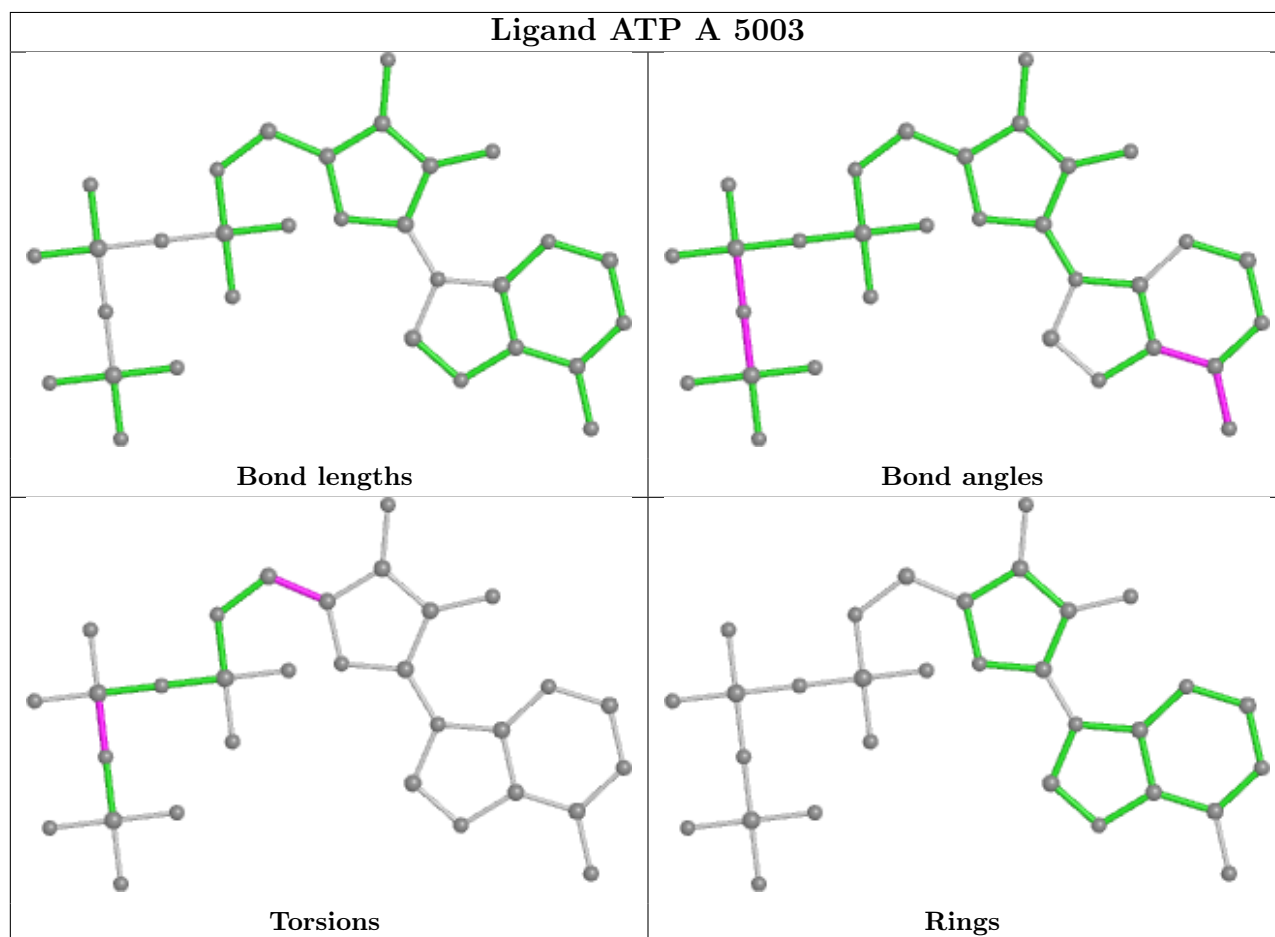
Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	A	5003	ATP	3	0
4	B	5002	ATP	1	0
4	C	5002	ATP	1	0
4	D	5003	ATP	3	0

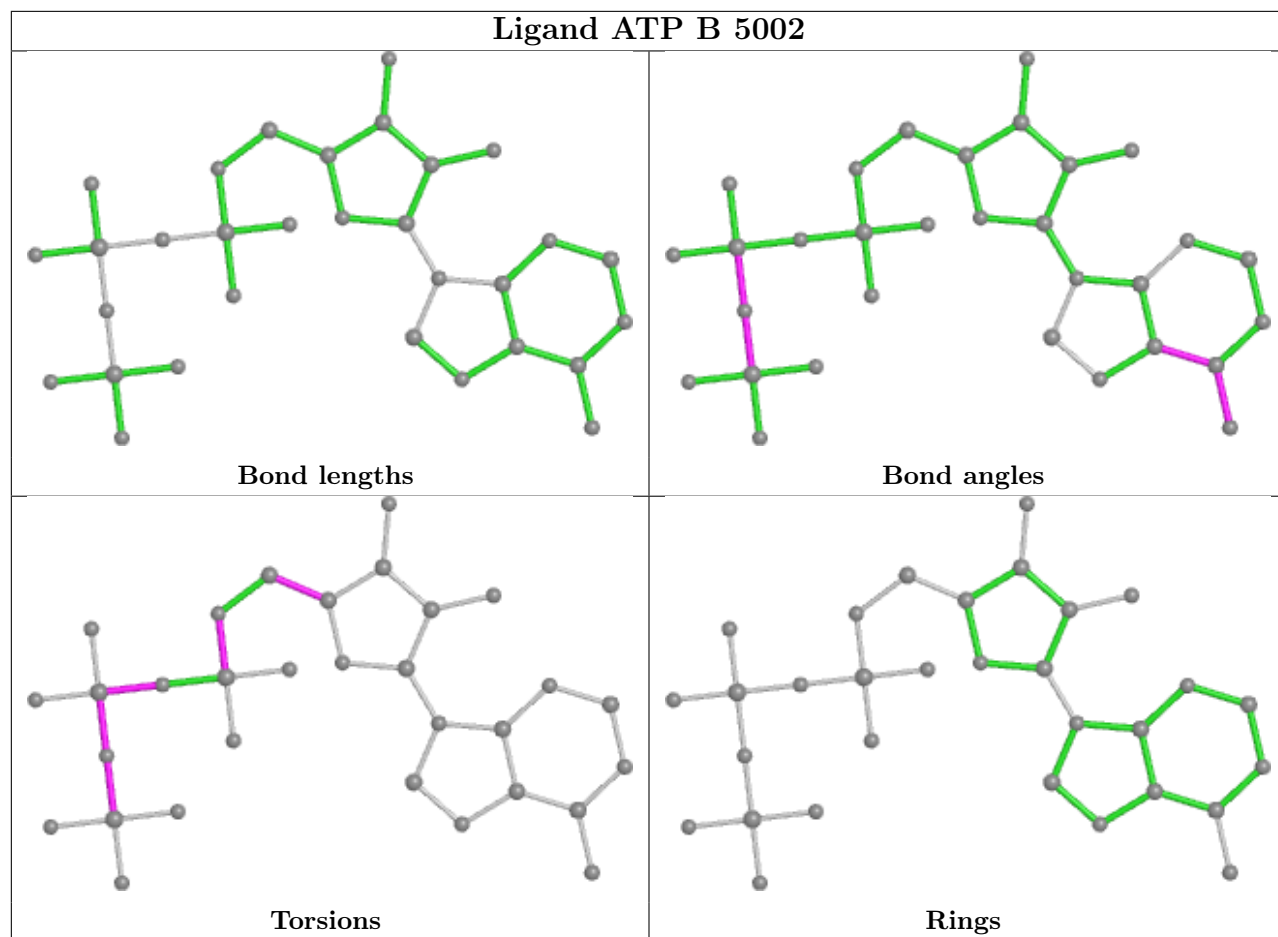
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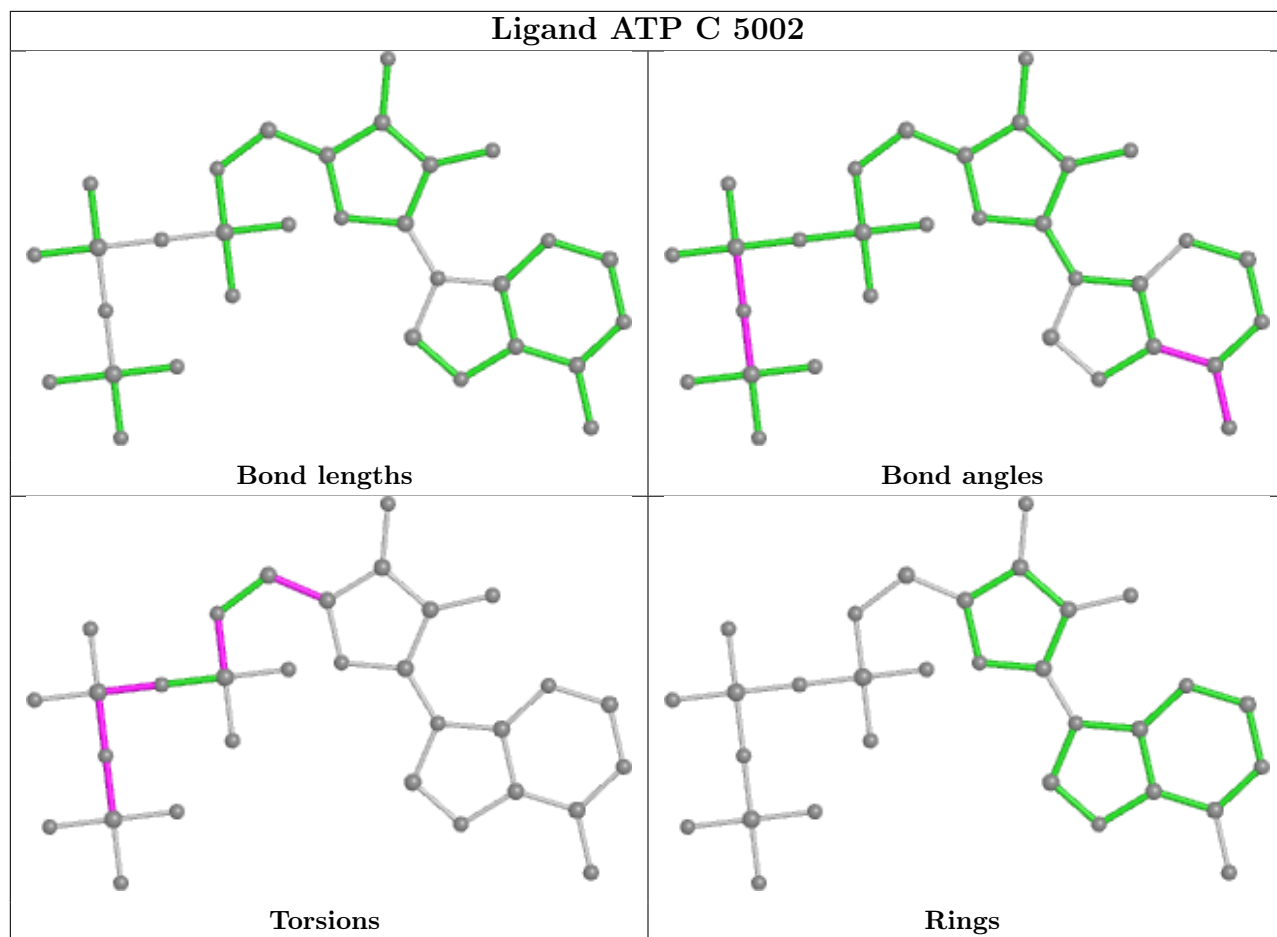
Continued from previous page...

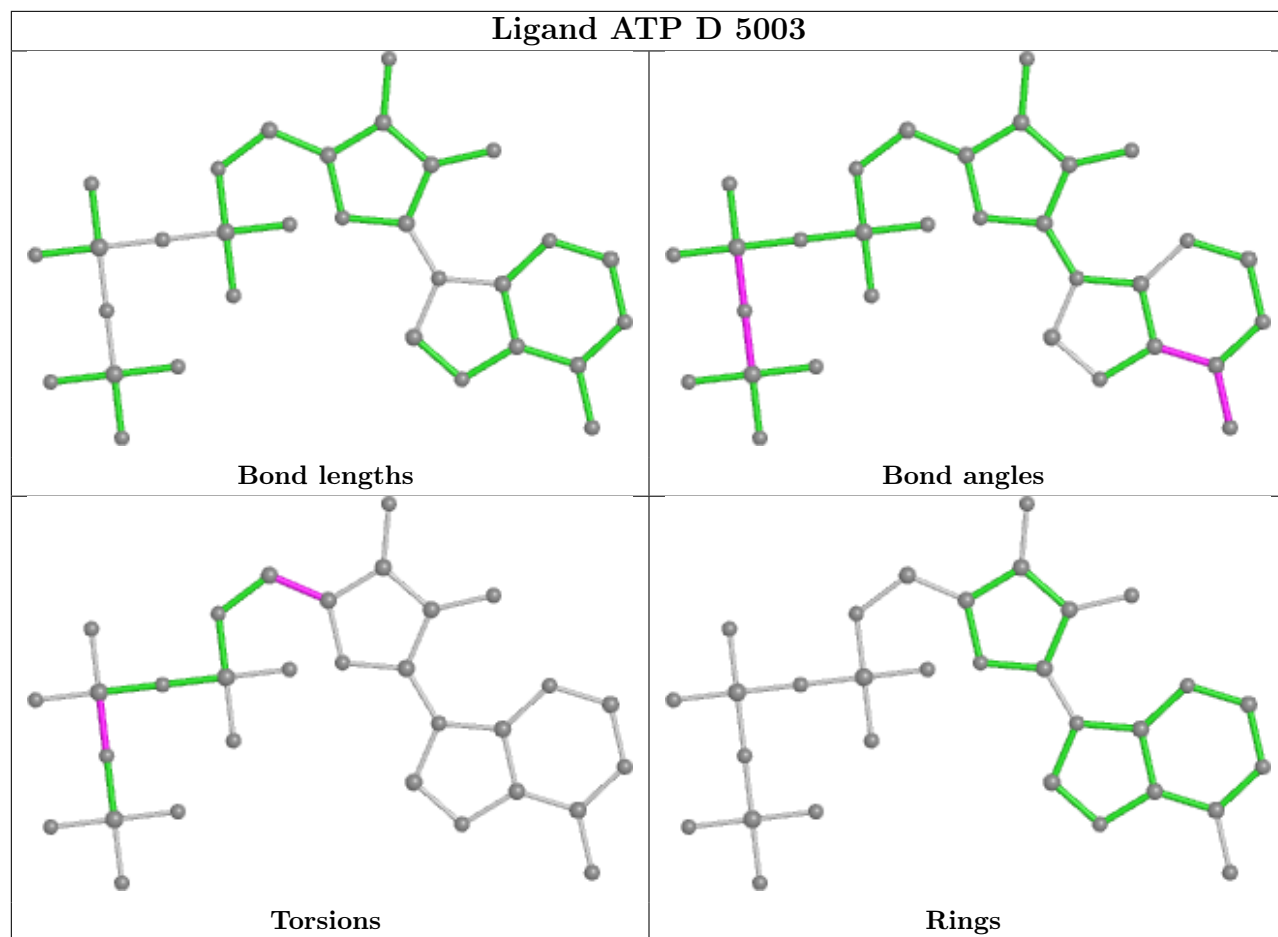
Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	C	5003	ATP	3	0
4	B	5003	ATP	3	0
4	D	5002	ATP	1	0
4	A	5002	ATP	1	0

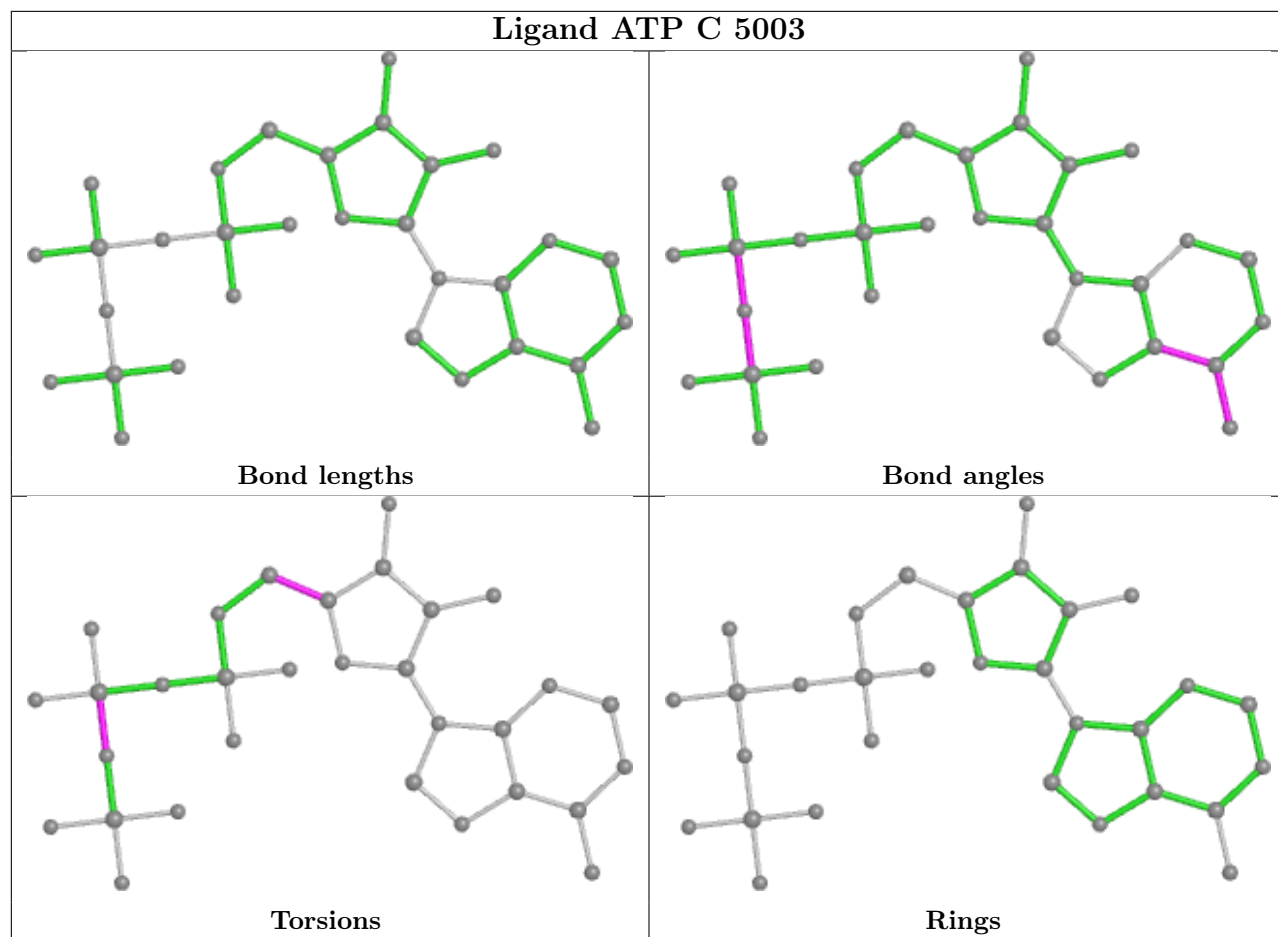
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included.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

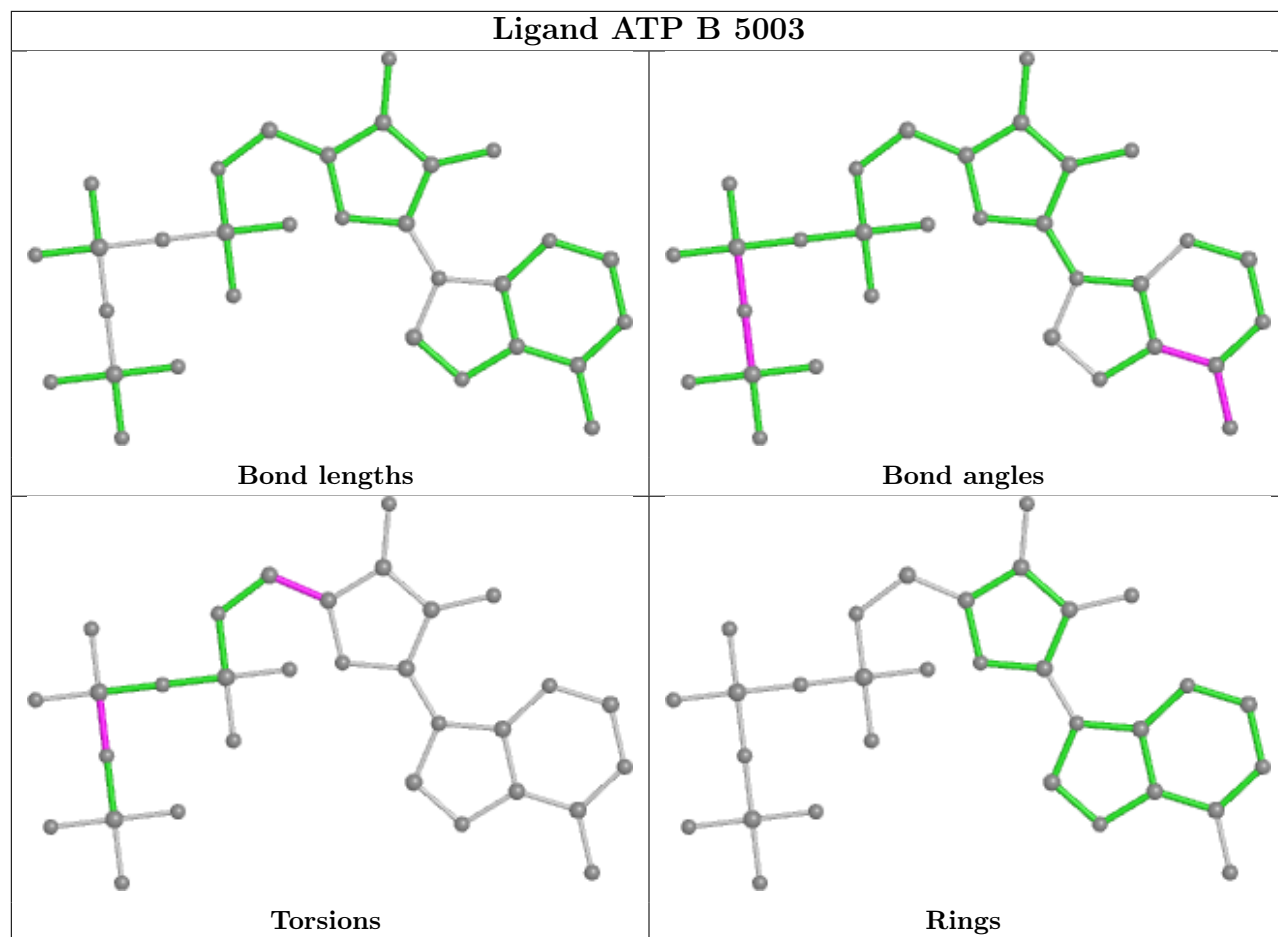


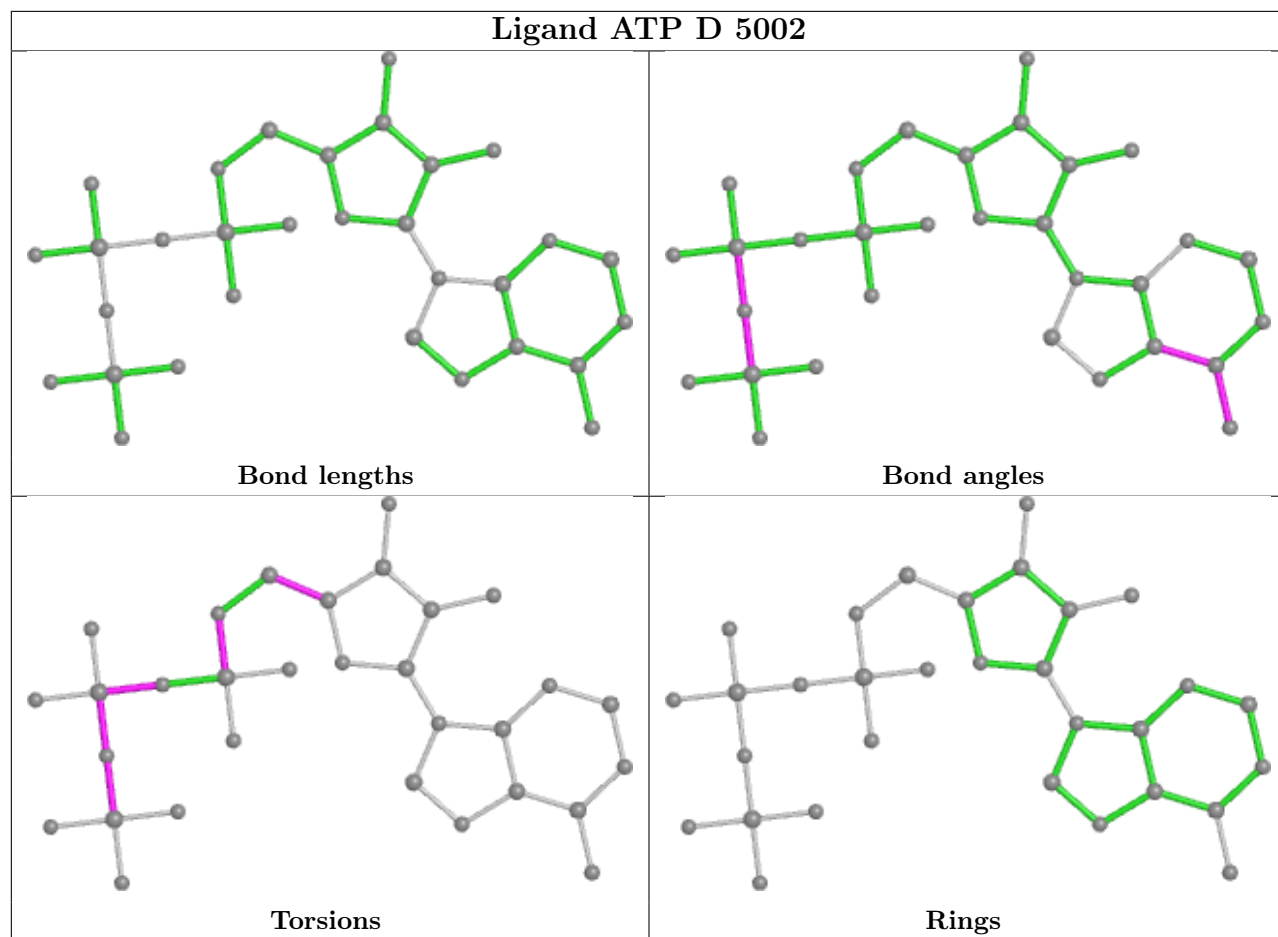


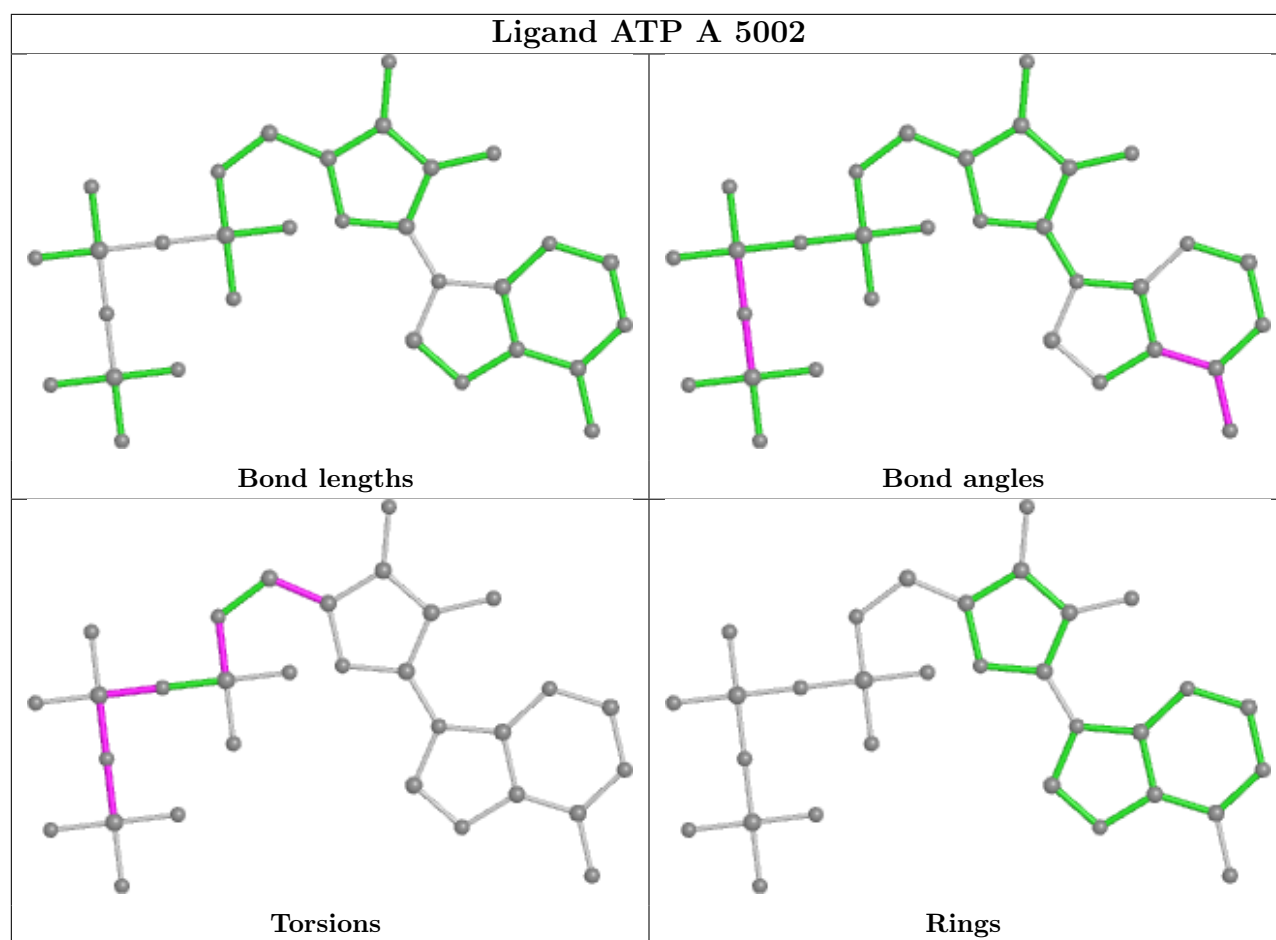












5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

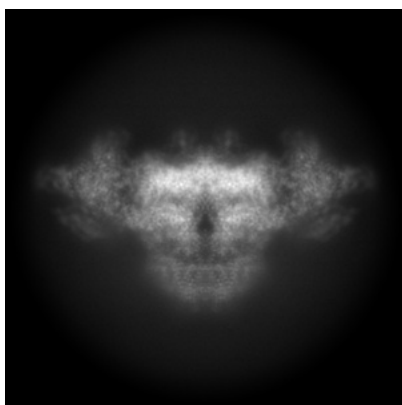
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-42460. These allow visual inspection of the internal detail of the map and identification of artifacts.

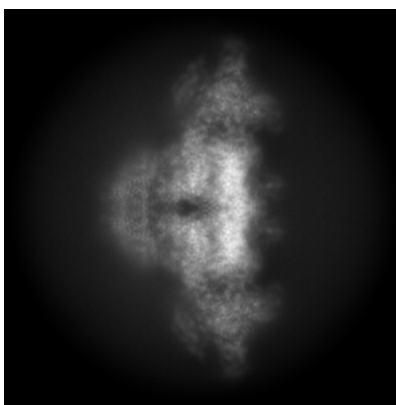
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections [i](#)

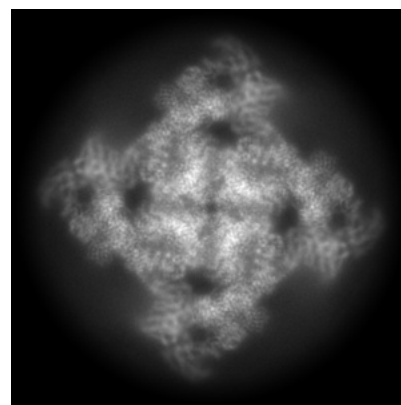
6.1.1 Primary map



X



Y

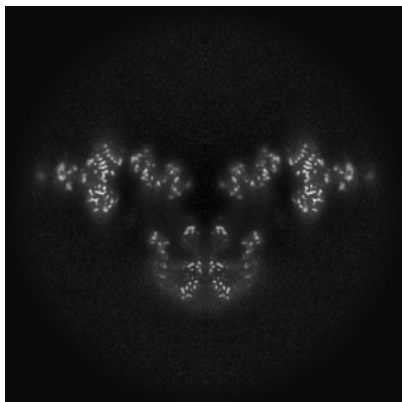


Z

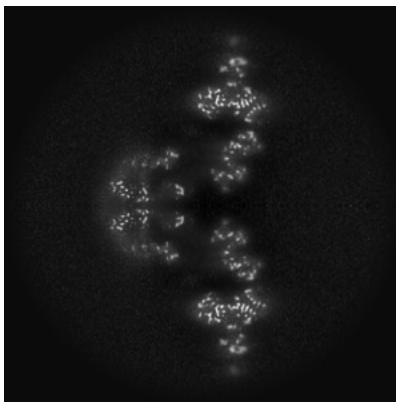
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

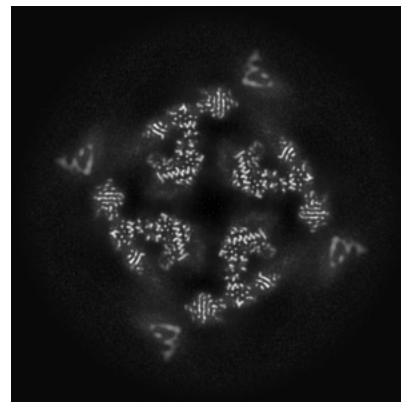
6.2.1 Primary map



X Index: 256



Y Index: 256

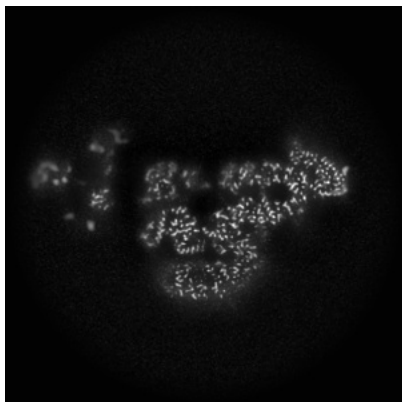


Z Index: 256

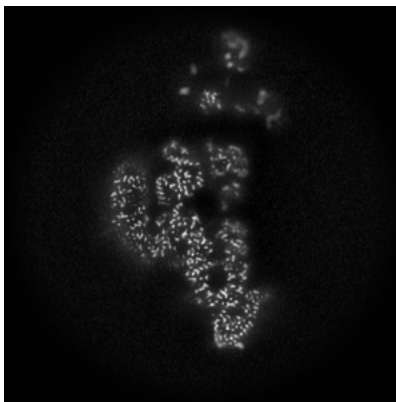
The images above show central slices of the map in three orthogonal directions.

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

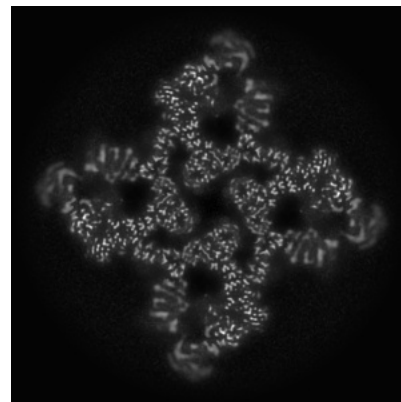
6.3.1 Primary map



X Index: 233



Y Index: 233



Z Index: 290

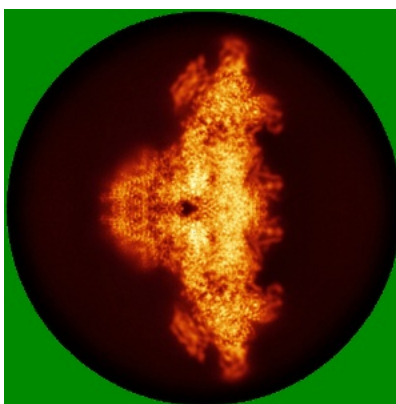
The images above show the largest variance slices of the map in three orthogonal directions.

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

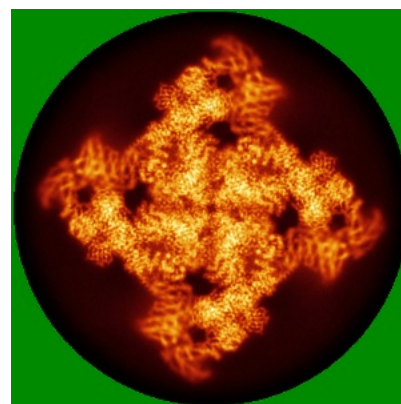
6.4.1 Primary map



X



Y

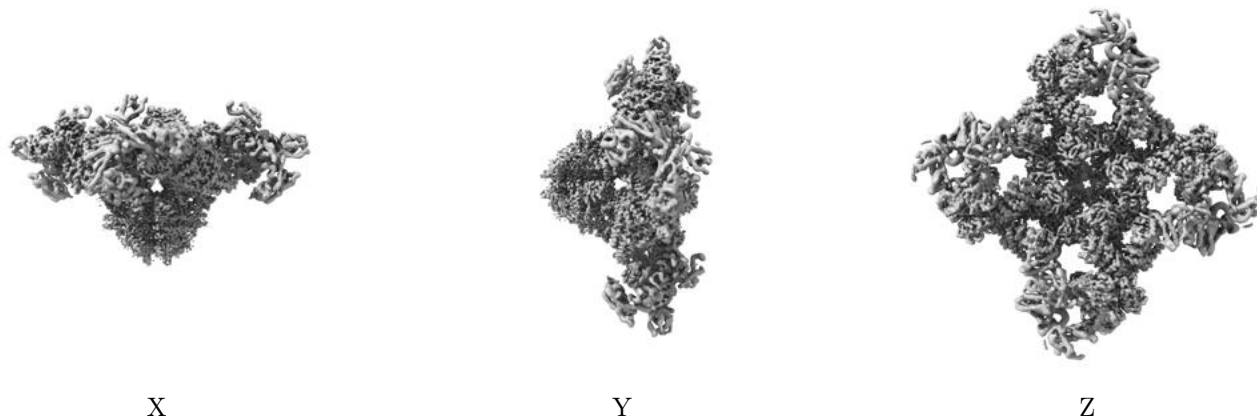


Z

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

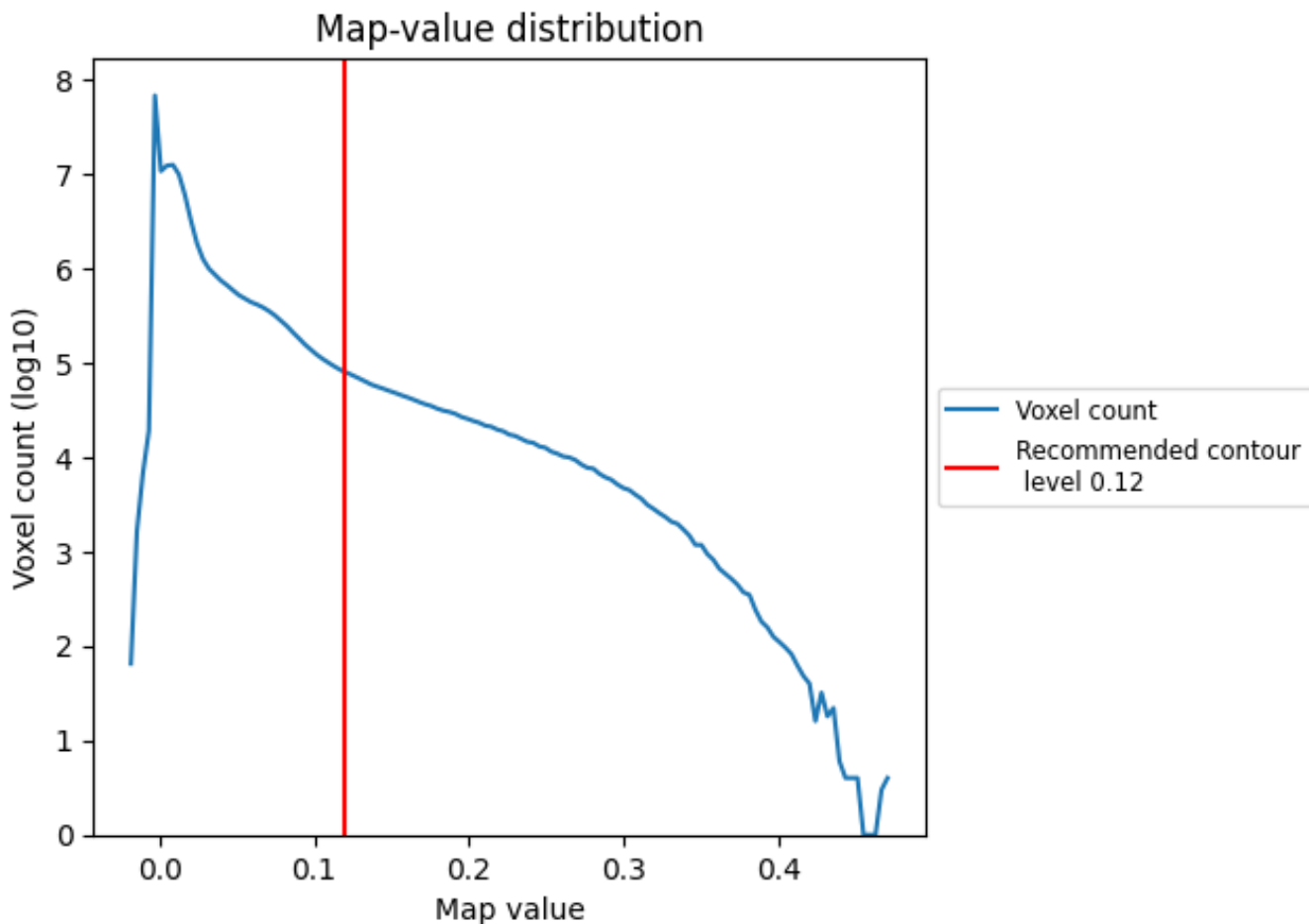
6.6 Mask visualisation [i](#)

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

7 Map analysis [i](#)

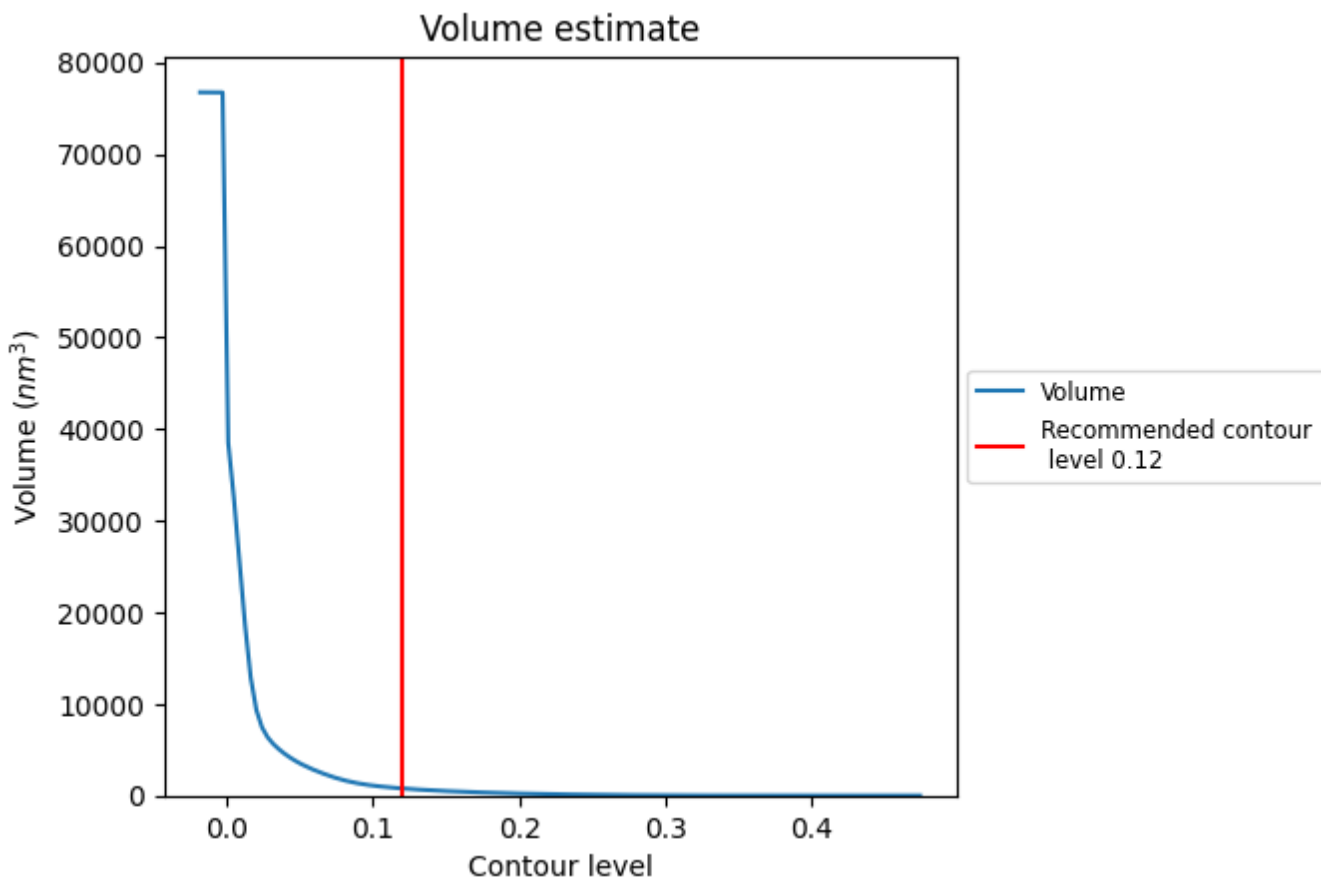
This section contains the results of statistical analysis of the map.

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.

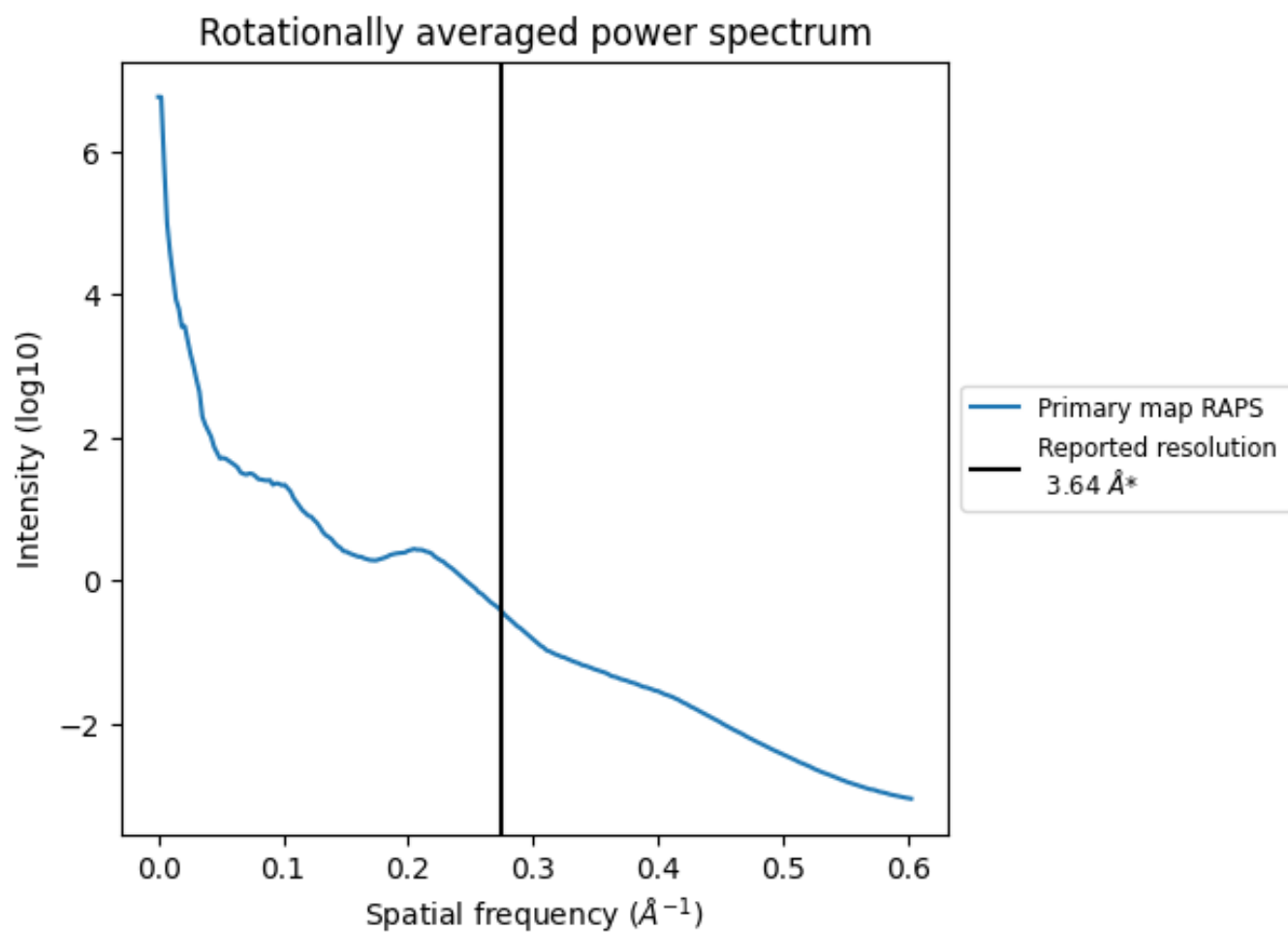
7.2 Volume estimate [\(i\)](#)



The volume at the recommended contour level is 778 nm³; this corresponds to an approximate mass of 703 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 0.275 Å⁻¹

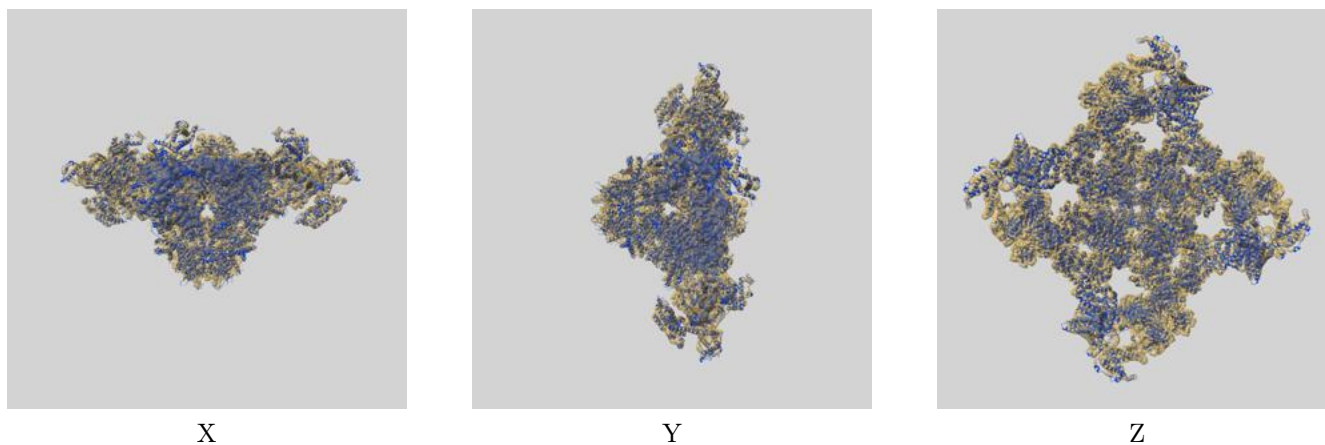
8 Fourier-Shell correlation

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

9 Map-model fit [i](#)

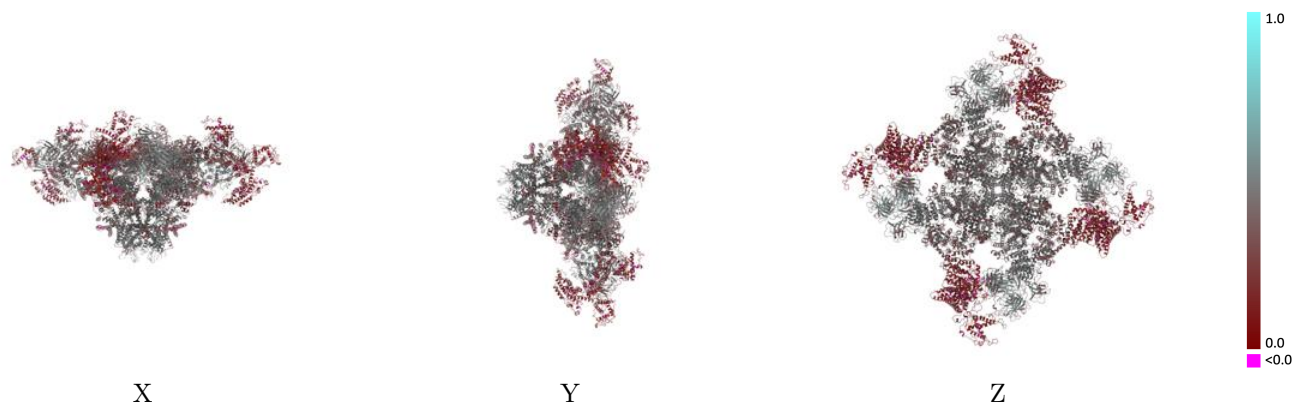
This section contains information regarding the fit between EMDB map EMD-42460 and PDB model 8UQ4. Per-residue inclusion information can be found in section 3 on page 6.

9.1 Map-model overlay [i](#)



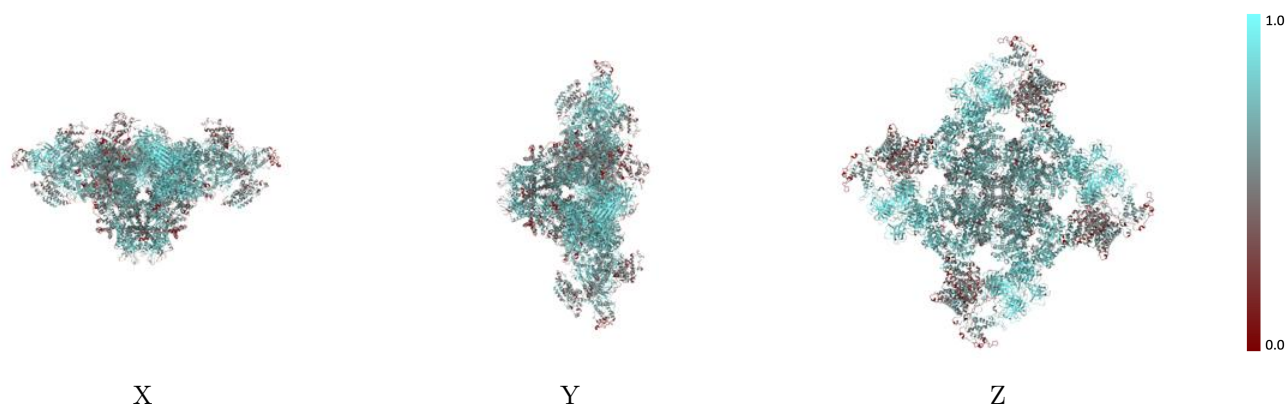
The images above show the 3D surface view of the map at the recommended contour level 0.12 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



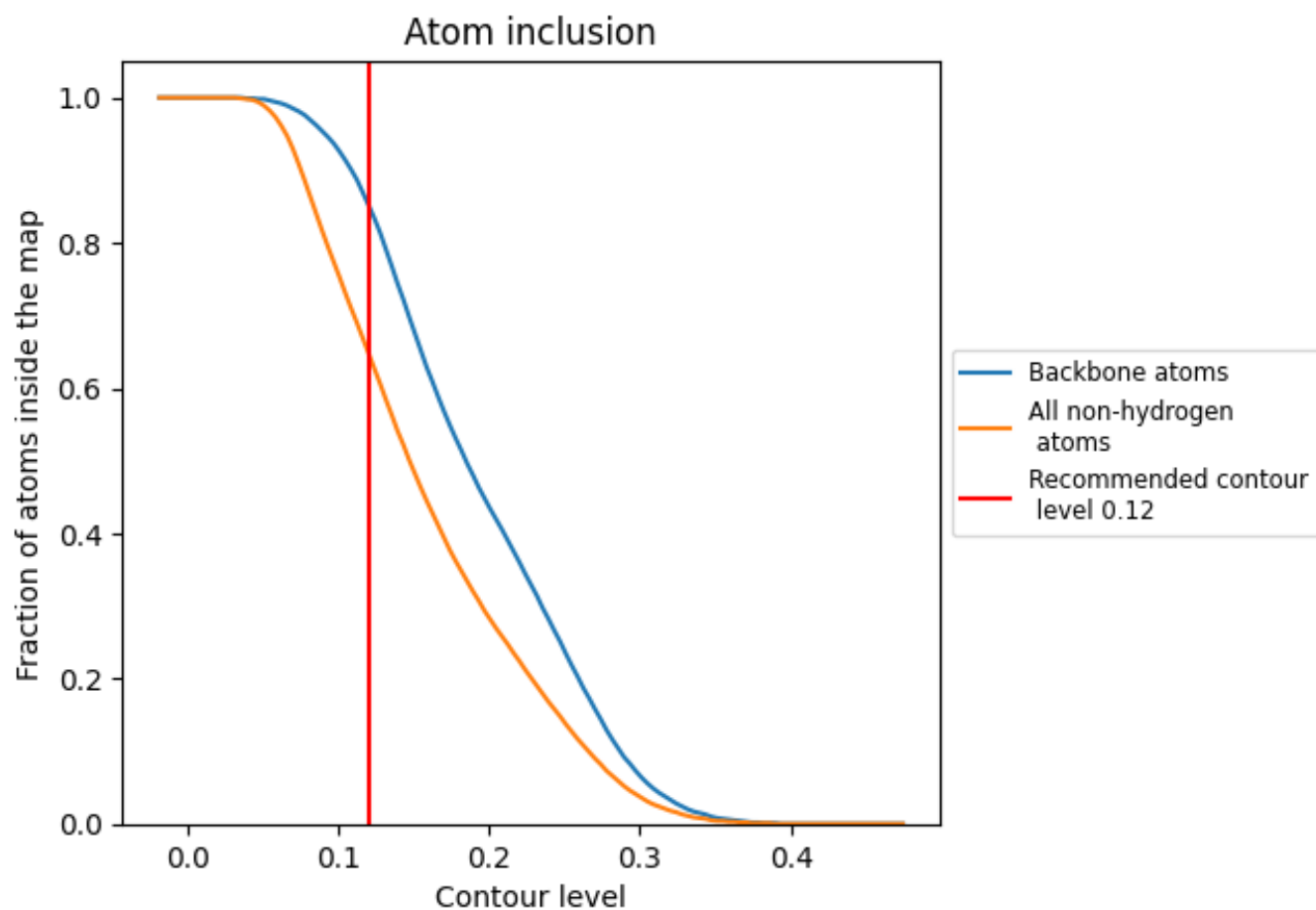
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.12).



















9.4 Atom inclusion [i](#)



At the recommended contour level, 85% of all backbone atoms, 65% 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 (0.12) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.6480	 0.3650
A	 0.6440	 0.3620
B	 0.6450	 0.3630
C	 0.6450	 0.3630
D	 0.6450	 0.3630
E	 0.7900	 0.4640
F	 0.7960	 0.4670
G	 0.7990	 0.4680
H	 0.7930	 0.4670

