



wwPDB EM Validation Summary Report ⓘ

Nov 23, 2022 – 11:07 AM EST

PDB ID : 7T65
EMDB ID : EMD-25710
Title : Rabbit RyR1 disease mutant Y523S in complex with FKBP12.6 embedded in lipidic nanodisc in the open state
Authors : Iyer, K.A.; Hu, Y.; Murayama, T.; Samsó, M.
Deposited on : 2021-12-13
Resolution : 4.05 Å (reported)
Based on initial model : 6WOT

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.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

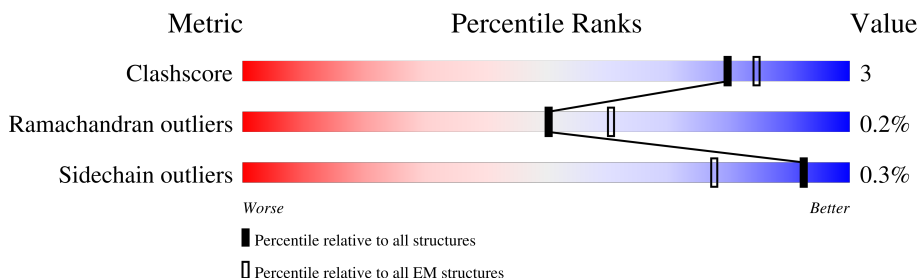
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 4.05 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	5037	
1	B	5037	
1	C	5037	
1	D	5037	
2	E	107	
2	F	107	
2	G	107	
2	H	107	

2 Entry composition [i](#)

There are 5 unique types of molecules in this entry. The entry contains 135328 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	4252	32981	20992	5666	6114	209	0	0
1	B	4252	32981	20992	5666	6114	209	0	0
1	C	4252	32981	20992	5666	6114	209	0	0
1	D	4252	32981	20992	5666	6114	209	0	0

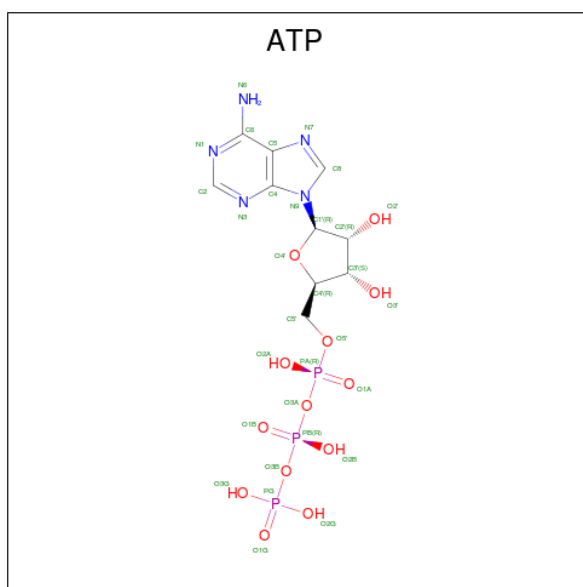
There are 4 discrepancies between the modelled and reference sequences:

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	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 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
			Total	C	N	O	P	
3	A	1	Total 31	C 10	N 5	O 13	P 3	0
3	B	1	Total 31	C 10	N 5	O 13	P 3	0
3	C	1	Total 31	C 10	N 5	O 13	P 3	0
3	D	1	Total 31	C 10	N 5	O 13	P 3	0

- Molecule 4 is CALCIUM ION (three-letter code: CA) (formula: Ca) (labeled as "Ligand of Interest" by depositor).

Mol	Chain	Residues	Atoms		AltConf
			Total	Ca	
4	A	1	Total 1	Ca 1	0
4	B	1	Total 1	Ca 1	0
4	C	1	Total 1	Ca 1	0
4	D	1	Total 1	Ca 1	0

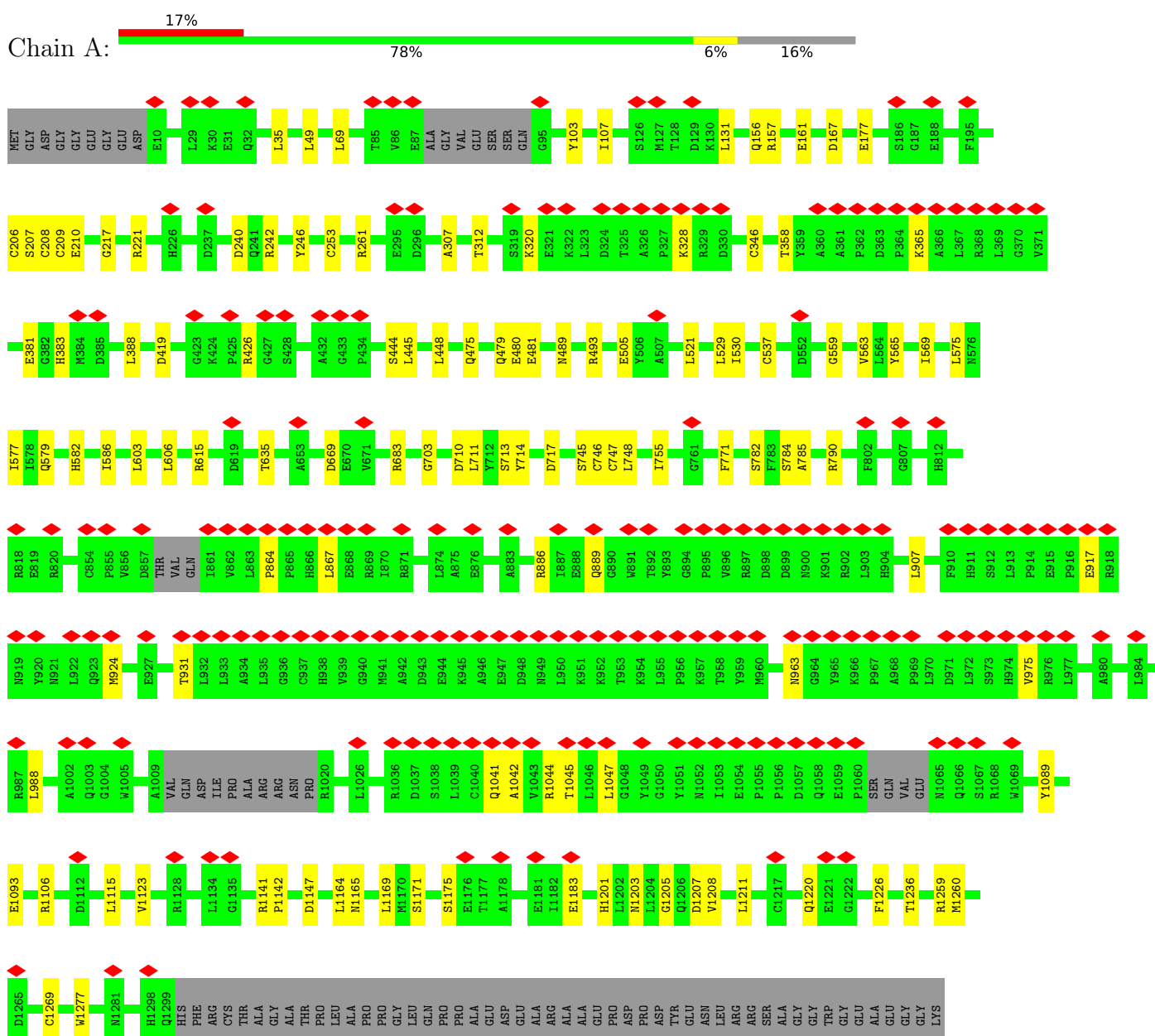
- Molecule 5 is ZINC ION (three-letter code: ZN) (formula: Zn) (labeled as "Ligand of Interest" by depositor).

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

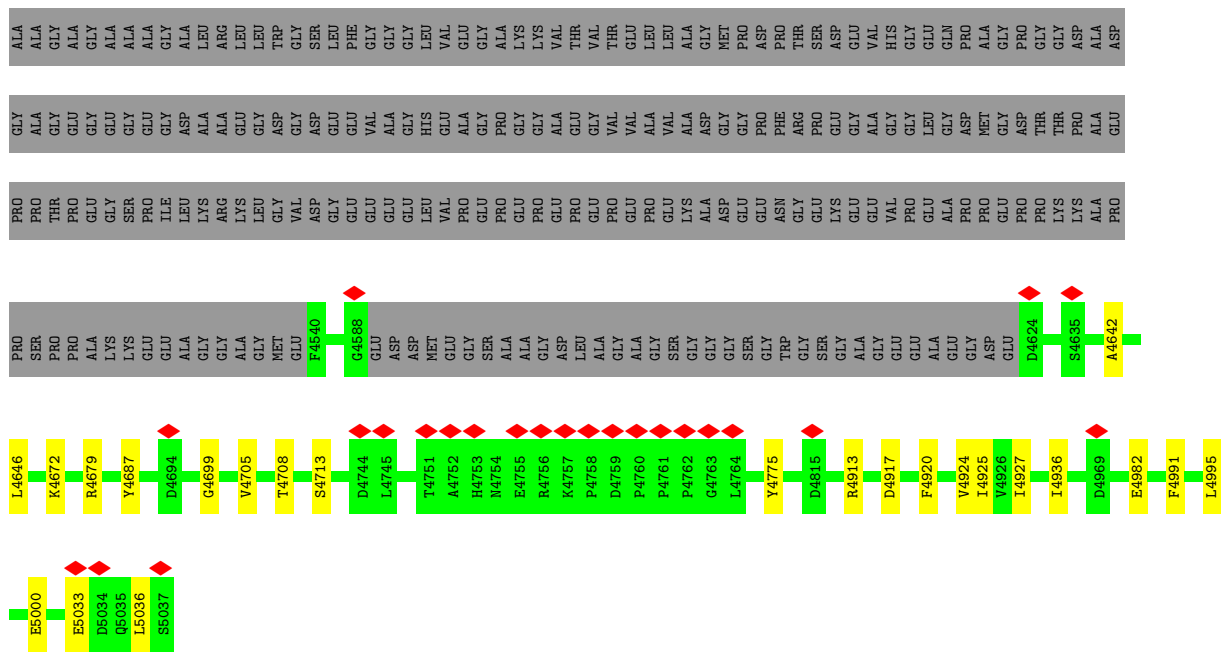
3 Residue-property plots

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.

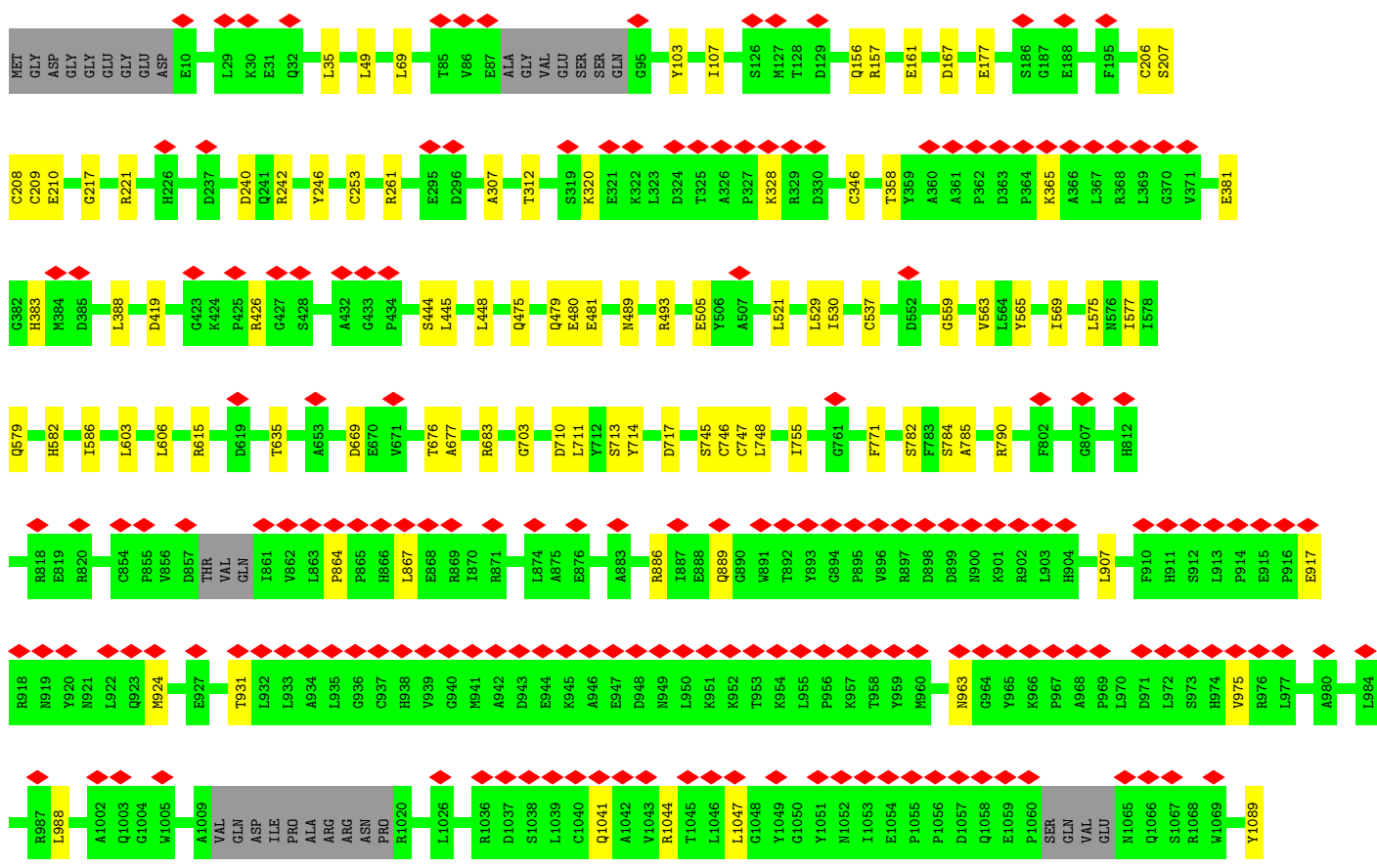
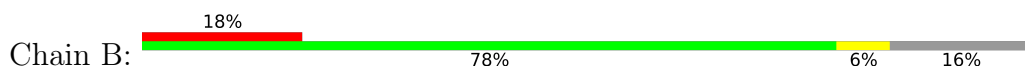
• Molecule 1: Ryanodine receptor 1

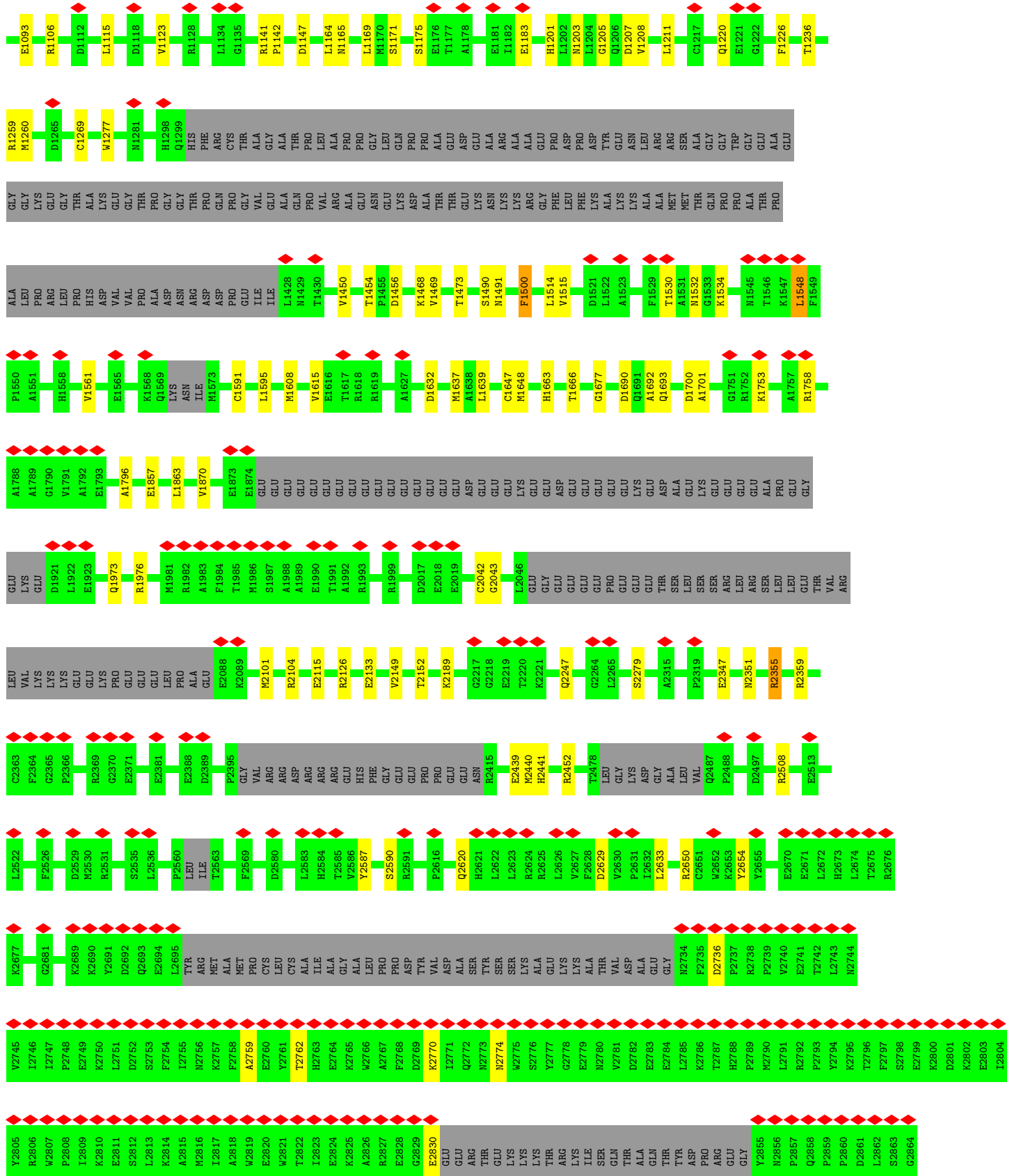


ALA	E4152	Q3869	E3682	L3579	ARG	A3429	H3357	P3293	A3228	D3159	LYS	I2995
ALA	P4155	H3870	Q3683	P3590	ARG	E433	F3358	ALA	ILE	Y3166	GLY	K2996
THR	H4156	D3877	E3684	G3581	GLY	E362	I3362	LEU	LEU	R3167	ALA	F2997
VAL	D4157	E3885	E3685	R3582	ASP	L3434	G3363	LEU	GLY	R3168	THR	F2998
ALA	P4158	E3886	E3686	T3583	TYR	R3435	R3364	PRO	LEU	L3169	ALA	A2999
GLY	R4159	E3887	E3687	E3584	SER	R3436	L3365	ALA	PRO	R3170	ALA	K3000
ALA	E4165	E3888	Q3506	D3585	VAL	M3437	R3366	GLY	N3234	C3170	THR	F3010
THR	F3889	E3689	T3507	A3586		E3440	K3367	P3301	S2235	S3171	THR	F3011
ALA	D3941	V3690	S3508	A3587		E3445	R3368	P3302	V2236	I3172	ALA	C3014
ARG	E3691	D3588	L3509	E3588		W3446	A3369	P3303	E3237	F3173	THR	F3017
ALA	N3963	E3692	I3510	P3589		K3447	G3370	C3304	E3238	S3174	ALA	T3020
ALA	T3966	H3734	T3513	E3590			K3371	T3305	M3240	G3176	ALA	T3021
ALA	A3981	L3735	L3514	K3591			E3375	V3307	P3241	T3177	ALA	F3022
ARG	W3986	E3736	K3515	I3592			E3376	T3308	D3242	T3178	ALA	A3022
ALA	W3986	E3737	K3516	R3595			E3377	S3309	I3243	R3179	ALA	K3023
ARG	K4002	G3738	M3517	W3596			Q3378	D3310	P2244	N3180	ALA	V3024
GLY	L4003	G3739	E3454	E3597			L3379	H3311	V2245	T3181	VAL	L3025
LEU	L4012	E3740	E3455	Q3597			R3380	L3512	L3246	Y3182	VAL	GLY
TYR	L4012	ASN	Q3456	E3598			L3381	N3313	D3247	VAL	SER	GLY
ARG	M4026	GLY	Q3461	E3610			GLU	S3314	R3248	GLU	GLY	GLY
SER	E4056	ALA	N3462	H3611			ALA	L3316	L3249	ALA	GLY	GLY
ARG	D4070	GLU	E3463	P3612			LYS	I3319	M3250	R3185	ARG	H3030
ARG	S4074	GLU	E3464	T3612			GLU	R3321	A3251	L3186	THR	A3031
ARG	D4079	GLU	N3465	Y3611			ALA	L3322	D3252	R3187	GLN	S3032
LEU	V4081	VAL	N3466	H3611			ALA	M3325	G3254	A3188	VAL	L3046
THR	R4085	THR	N3467	E3612			LYS	G3328	G3255	C3193	GLY	A3047
ALA	G4096	ARG	M3468	F3469			GLU	L3329	L3256	L3194	VAL	A3048
GLY	L4087	ARG	F3469	L3470			ALA	D3330	A3257	R3053	ALA	L3049
GLY	L4087	ARG	THR	THR			ALA	R3331	E3258	A3199	VAL	Y3050
ALA	Q4102	ALA	ALA	ALA			ALA	G3332	E3259	L3197	THR	R3053
LEU	F4103	VAL	LYS	LYS			LYS	W3334	S2259	A3198	GLY	V3054
LEU	T4104	VAL	TRP	HIS			LYS	M3335	G2260	A3199	VAL	V3055
ALA	G4105	ALA	ALA	ALA			LYS	K3336	Y3283	M3201	THR	L3056
LEU	D4118	ALA	ALA	ALA			LYS	R3337	THR	P3202	THR	F3057
LEU	E4119	ALA	LYS	LYS			LYS	L3338	GLU	V3203	ALA	A3135
TRP	N4120	ALA	ASP	ASP			LYS	A3339	H3268	A3204	THR	G3058
VAL	E4121	ALA	GLY	GLY			LYS	R3340	V3269	F3205	THR	T3059
ALA	MET	ALA	GLY	GLY			LYS	F3341	I3270	L3206	ALA	D3060
ALA	N4124	ALA	GLY	GLY			LYS	A3342	E3207	E3207	ALA	F3062
ARG	F4125	ALA	ASP	ASP			LYS	A3343	L3274	P3208	ALA	A3063
ALA	E4126	ALA	GLY	GLY			LYS	P3344	E3271	L3210	ALA	V3064
GLY	A4144	ALA	GLY	GLY			LYS	P3345	L3274	N3211	THR	V3065
ALA	T4148	ALA	THR	THR			LYS	I3345	L3277	E3212	THR	N3066
ALA		ALA	LYS	LYS			LYS	V3346	C3278	E3212	ALA	H3069
ALA		ALA	ASP	ASP			LYS	R3347	S3279	Y3213	ALA	I3070
ALA		ALA	GLN	GLN			LYS	V3347	N3214	N3214	ALA	R3073
GLY		ALA	GLY	GLY			LYS	R3348	L3281	A3215	ALA	S3074
GLY		ALA	GLY	GLY			LYS	R3349	R3282	C3216	ASP	L3075
ALA		ALA	GLY	GLY			LYS	A3349	W3284	V3218	ALA	L3075
ALA		ALA	LYS	LYS			LYS	R3350	G3288	Y3219	ALA	H3069
ALA		ALA	LYS	LYS			LYS	E3352	P3289	T3220	ALA	R3078
ALA		ALA	LYS	LYS			LYS	L3353	E3290	K3222	ALA	T3079
GLY		ALA	LYS	LYS			LYS	L3354	A3291	K3223	ALA	V3080
GLY		ALA	LYS	LYS			LYS	H3355	P3292	P3224	ALA	H3081
GLY		ALA	LYS	LYS			LYS	S3356	P3292	R3225	ALA	H3081

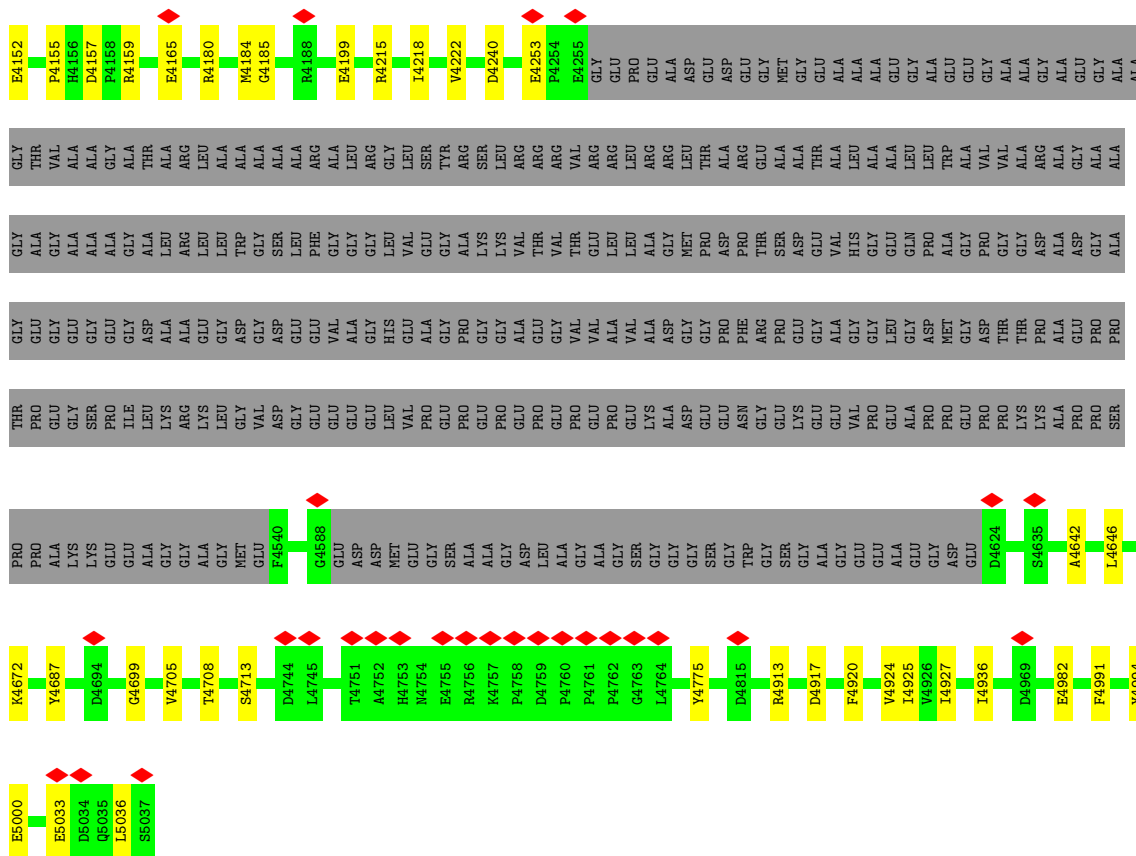


• Molecule 1: Ryanodine receptor 1

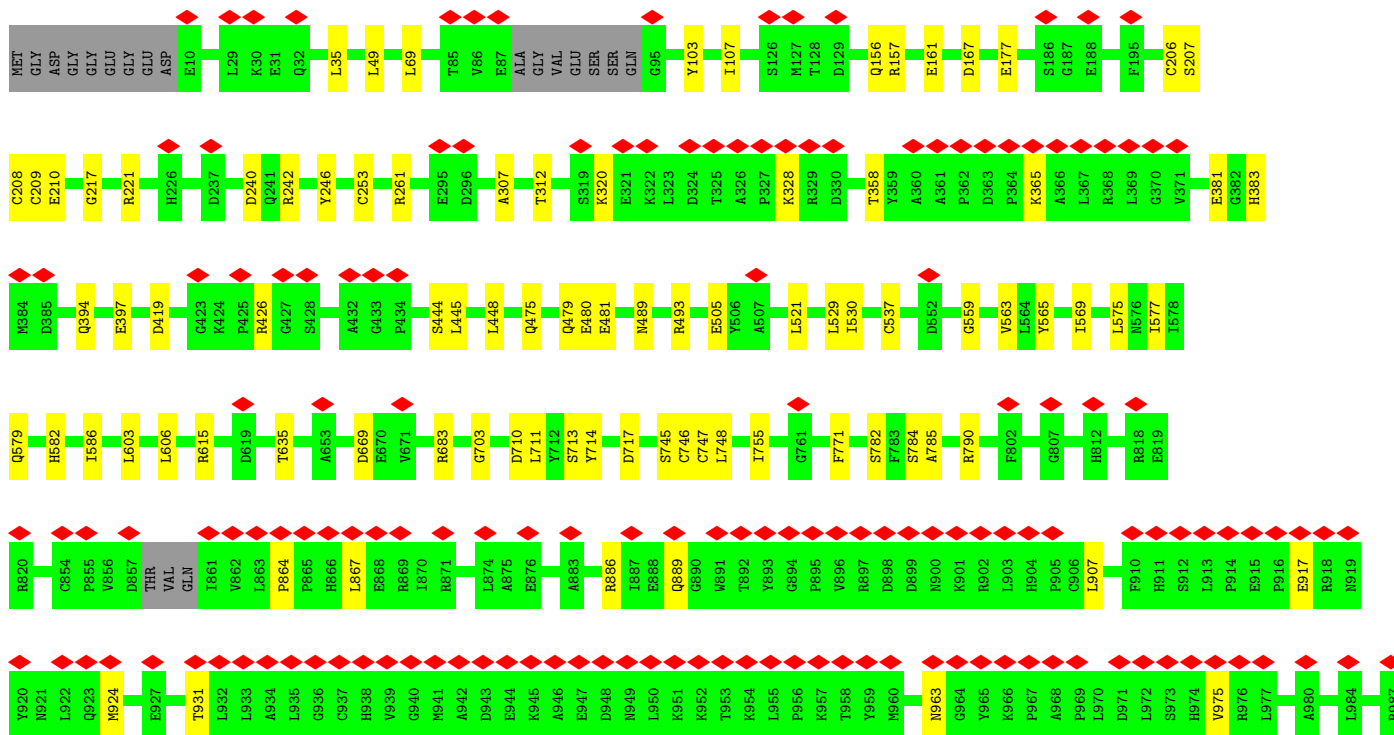
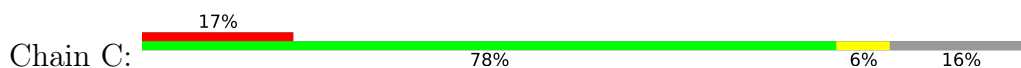


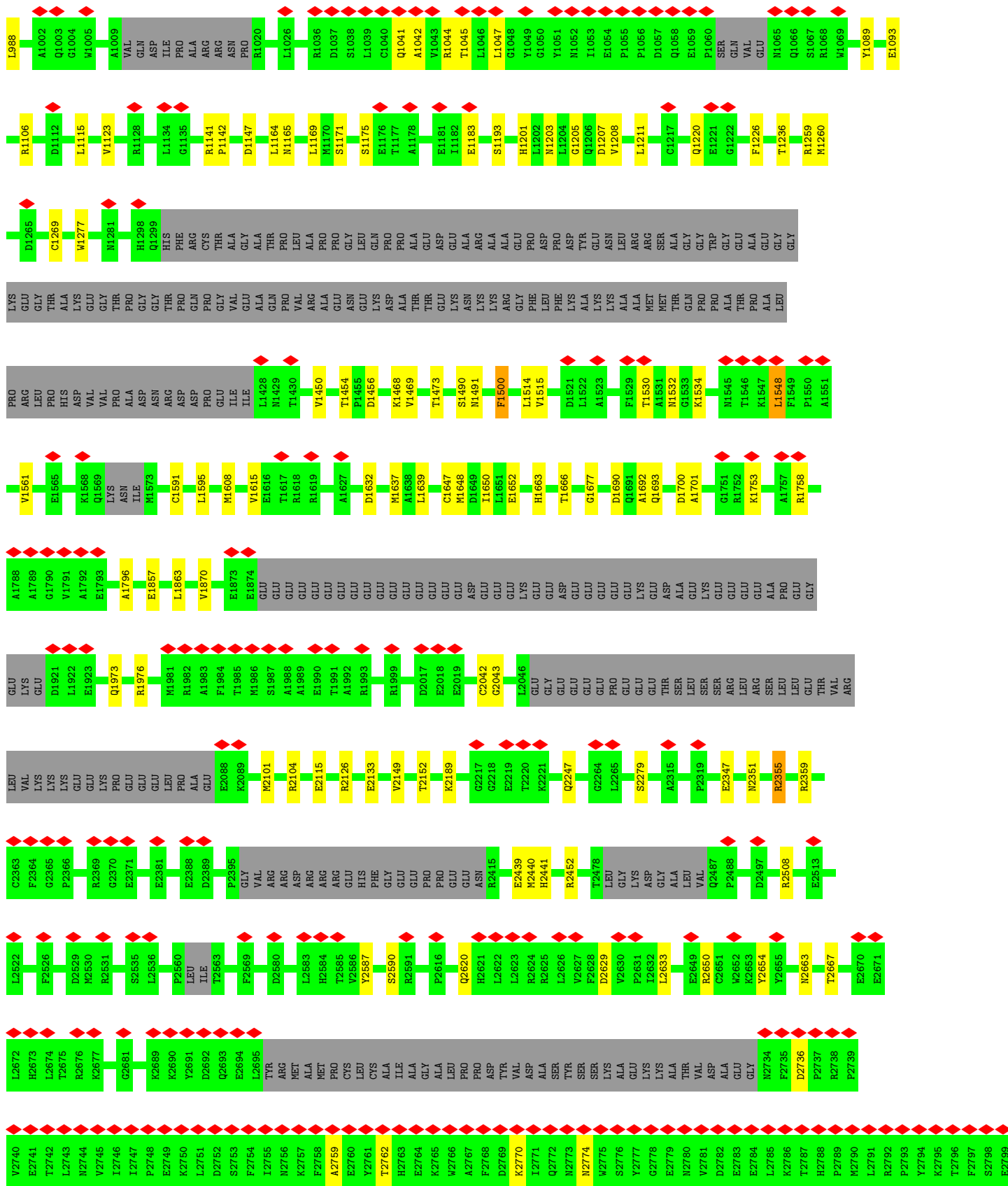


V2865	E2925	F2997	M5081	L3158	A3228	P3292	S3356	L3424	LYS	G3578	E3684	I3866
T2866	L2926	F2998	LYS	D3159	ILE	P3293	H3357	A3429	ARG	L3579	E3685	N3867
L2867	L2927	A2999	S0083	Y3166	LEU	ALA	F3358	E3433	ARG	P3580	E3686	R3868
S2868	L2928	K3000	G3084	R3167	GLY	PRO	I3362	L3434	ASP	G3581	E3687	Q3869
R2869	K2929	F2929	A3080	T3168	PRO	PRO	G3363	L3435	TYR	R3582	E3688	N3870
E2870	L2930	Q2931	R2093	C3170	ALA	ALA	R3364	R3436	SER	E3584	E3689	D3877
L2871	M2932	Q2931	E3101	S3171	G3300	G3300	R3365	M3437	VAL	D3585	E3691	R3886
Q2872	G2933	M2932	F3017	I3172	P3301	P3301	R3366	E3440	Q3506	A3586	E3692	D3941
A2873	G2934	G2934	T3020	Y3173	V3236	P3302	R3367	E3440	T3507	D3587	H3734	L3941
A2875	Y2935	Y2935	K3105	S3174	V3236	P3303	R3368	E3440	S3508	D3588	L3735	N3963
E2876	A2936	A2936	E3108	S3174	M3239	P3303	A3369	E3440	L3509	P3589	G3736	T3966
Q2877	V2937	V2937	E3108	L3175	C3240	C3304	G3370	E3440	I3510	E3590	E3736	A3961
L2878	V2937	V2937	E3109	G3176	P3241	T3305	K3371	E3440	T3513	K3591	E3737	A3961
A2879	T2938	T2938	N3109	T3177	D3242	V3307	E3375	F3451	L3514	L3592	G3738	N3961
E2880	R2939	R2939	L3110	T3178	L3243	S3308	E3376	K3452	K3515	R3595	G3739	M3986
E2881	G2940	G2940	R3111	K3179	P3244	D3310	F3377	R3453	K3516	Y3596	G3740	M3986
M2882	L3025	L3025	L3112	N3180	L3246	H3311	Q3378	E3454	M3517	V3597	ASN	K4002
Y2882	GLY	GLY	L3113	T3181	D3247	L3312	L3379	E3455	L3521	Q3597	GLY	L4003
H2883	GLY	GLY	VAL	Y3182	R3248	N3313	R3380	Q3456	L3522	E3598	GLU	L4012
H2884	GLY	GLY	SER	VAL	L3249	S3314	R3381	M3457	N3523	E3610	GLU	M4026
T2885	E2945	A3031	ALA	K3185	D3252	L3314	ALA	Q3461	D3531	H3611	GLU	E4056
W2886	E2945	A3031	ALA	L3186	R3253	N3314	ALA	N3462	L3535	P3612	GLU	D4070
W2886	E2946	A3031	ALA	R3187	G3254	S3314	ALA	I3463	L3535	LYS	V3749	D4070
G2887	D2947	D2947	THR	L3188	G3255	L3315	GLU	I3464	T3538	SER	E3750	E3750
R2888	T2948	T2948	GLN	P3188	L3256	L3315	ALA	N3465	R3539	LYS	Q3767	Q3767
K2889	S2949	S2949	VAL	A3189	E3257	L3321	ALA	N3466	R3540	LYS	R3772	R3772
K2890	S2950	S2950	LYS	A3189	A3257	I3322	E3388	M3467	Y3540	LYS	R3773	R3773
K2891	I2951	I2951	GLY	C3193	S3259	N3325	E3389	M3468	S3440	ALA	C3786	C3786
Q2892	E2952	E2952	V3125	L3194	G3260	G3325	G3390	F3469	L3542	VAL	I3802	I3802
E2893	K2953	K2953	G3126	L3197	E3260	G3325	G3390	L3470	L3544	TRP	S3803	S3803
L2894	R2954	R2954	Q3127	A3198	G3260	G3325	E3391	L3470	L3544	HIS	I3804	I3804
E2895	F2955	F2955	N3128	A3199	V3263	G3325	L3392	V3394	D3546	LEU	I3805	I3805
A2896	A2956	A2956	L3129	A3199	THR	G3325	L3393	R3395	E3547	LEU	N3806	N3806
K2897	A2956	A2956	T3130	A3200	THR	G3325	L3393	R3396	E3548	SER	G3807	G3807
K2897	F2959	F2959	T3133	M3201	THR	G3325	L3394	D3396	V3549	GLN	G3808	G3808
G2899	W2966	W2966	V3134	P3202	MET	G3325	V3394	SER	F3552	ALA	Q3813	Q3813
G2900	W2966	W2966	A3135	V3203	P3267	M3335	R3403	LYS	L3552	VAL	Q3814	Q3814
T2901	F2973	F2973	L3136	A3204	H2268	K3336	D3404	LYS	L3553	VAL	K3815	K3815
H2902	I2974	I2974	L3137	F3205	V3269	R3337	L3405	GLY	M3555	ALA	S3831	S3831
F2903	A2975	A2975	P3138	L3206	E3271	L3338	L3405	ASP	N3556	ALA	S3840	S3840
L2904	H2976	H2976	V3139	P3208	T3272	A3339	L3406	GLN	L3557	L3357	G3857	G3857
L2905	L2977	L2977	L3140	Q3209	L3274	V3340	L3407	ASP	H3558	L3559	M3857	M3857
V2906	E2978	E2978	T3141	Q3209	L3274	F3341	L3408	GLY	L3559	L3559	V3859	V3859
F2907	ALA	ALA	T3142	Q3209	L3274	F3341	L3408	GLY	H3559	L3559	N3860	N3860
V2908	VAL	VAL	Q3145	Q3209	L3274	F3341	L3408	GLY	H3559	L3559	E3861	E3861
V2908	SER	SER	Q3145	Q3209	L3274	F3341	L3408	GLY	H3559	L3559	D3862	D3862
D2909	SER	SER	Q3145	Q3209	L3274	F3341	L3408	GLY	H3559	L3559	G3863	G3863
T2910	GLY	GLY	Q3145	Q3209	L3274	F3341	L3408	GLY	H3559	L3559	T3864	T3864
L2911	ARG	ARG	Q3145	Q3209	L3274	F3341	L3408	GLY	H3559	L3559	V3865	V3865
T2912	VAL	VAL	Q3145	Q3209	L3274	F3341	L3408	GLY	H3559	L3559		
A2913	GLU	GLU	Q3145	Q3209	L3274	F3341	L3408	GLY	H3559	L3559		
K2914	LYS	LYS	Q3145	Q3209	L3274	F3341	L3408	GLY	H3559	L3559		
E2915	SER	SER	Q3145	Q3209	L3274	F3341	L3408	GLY	H3559	L3559		
K2916	PRO	PRO	Q3145	Q3209	L3274	F3341	L3408	GLY	H3559	L3559		
A2917	H2992	H2992	ASP	R3078	G3288	P3350	D3417	THR	Q3665	E3666		
R2918	E2992	E2992	ALA	R3078	G3288	P3350	D3417	THR	Q3665	E3666		
D2919	L2995	L2995	ASP	R3078	G3288	P3350	D3417	THR	Q3665	E3666		
R2920	K2996	K2996	LYS	V3080	E3291	L3354	H3355	LYS	L3575	R3577		
K2921			T3157	R3225	A3291	L3354	H3355	LYS	L3575	R3577		
A2923			T3157	R3225	A3291	L3354	H3355	LYS	L3575	R3577		
Q2924			T3157	R3225	A3291	L3354	H3355	LYS	L3575	R3577		

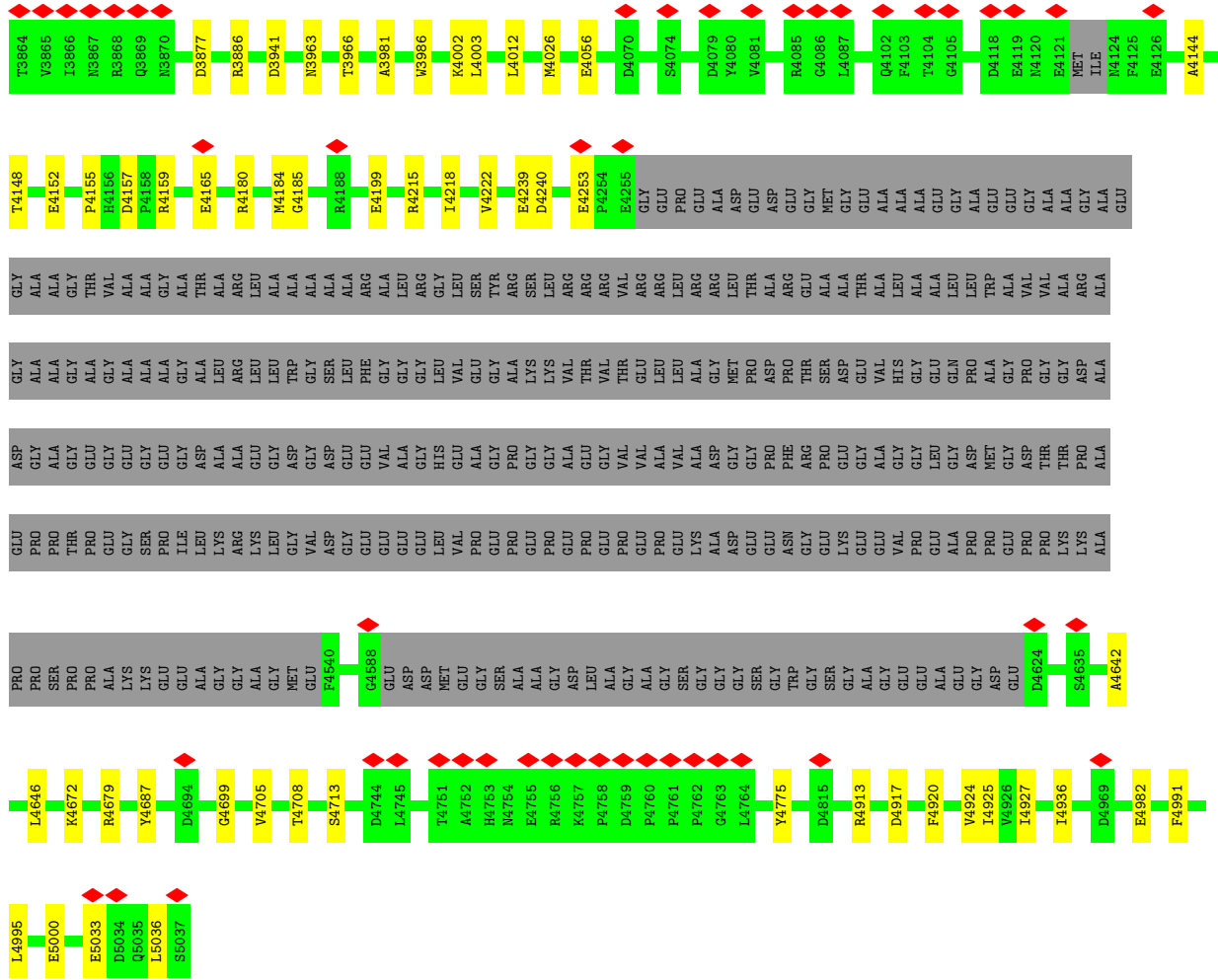


• Molecule 1: Ryanodine receptor 1

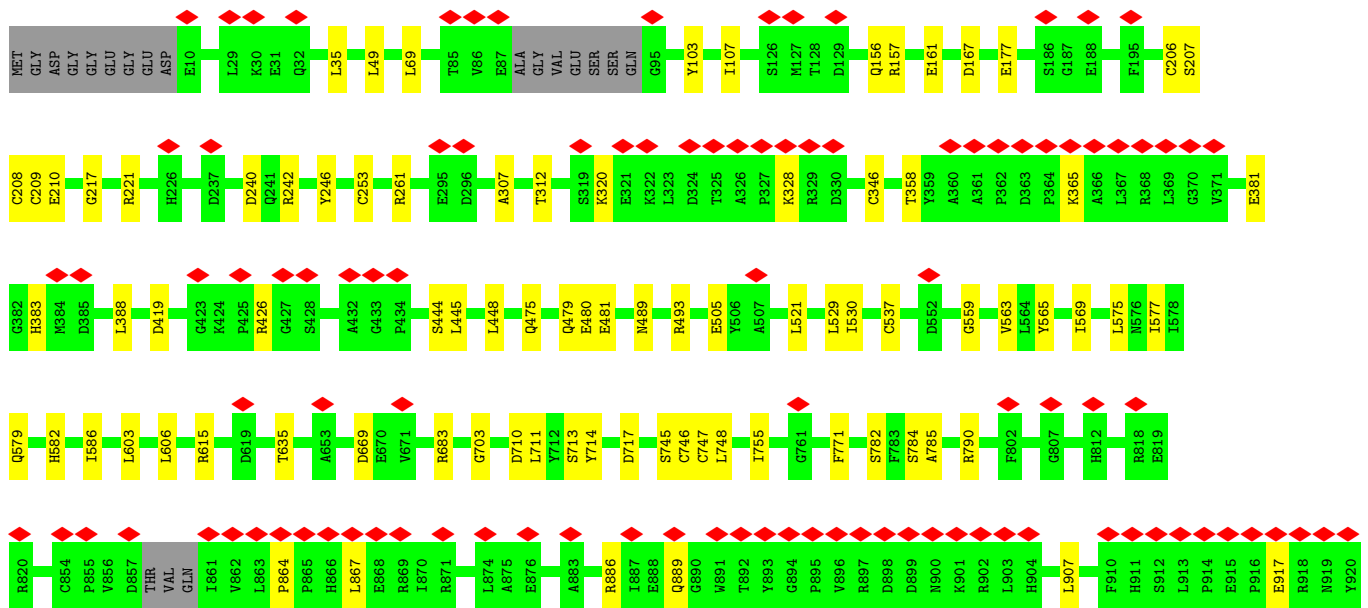
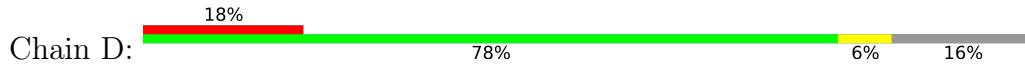


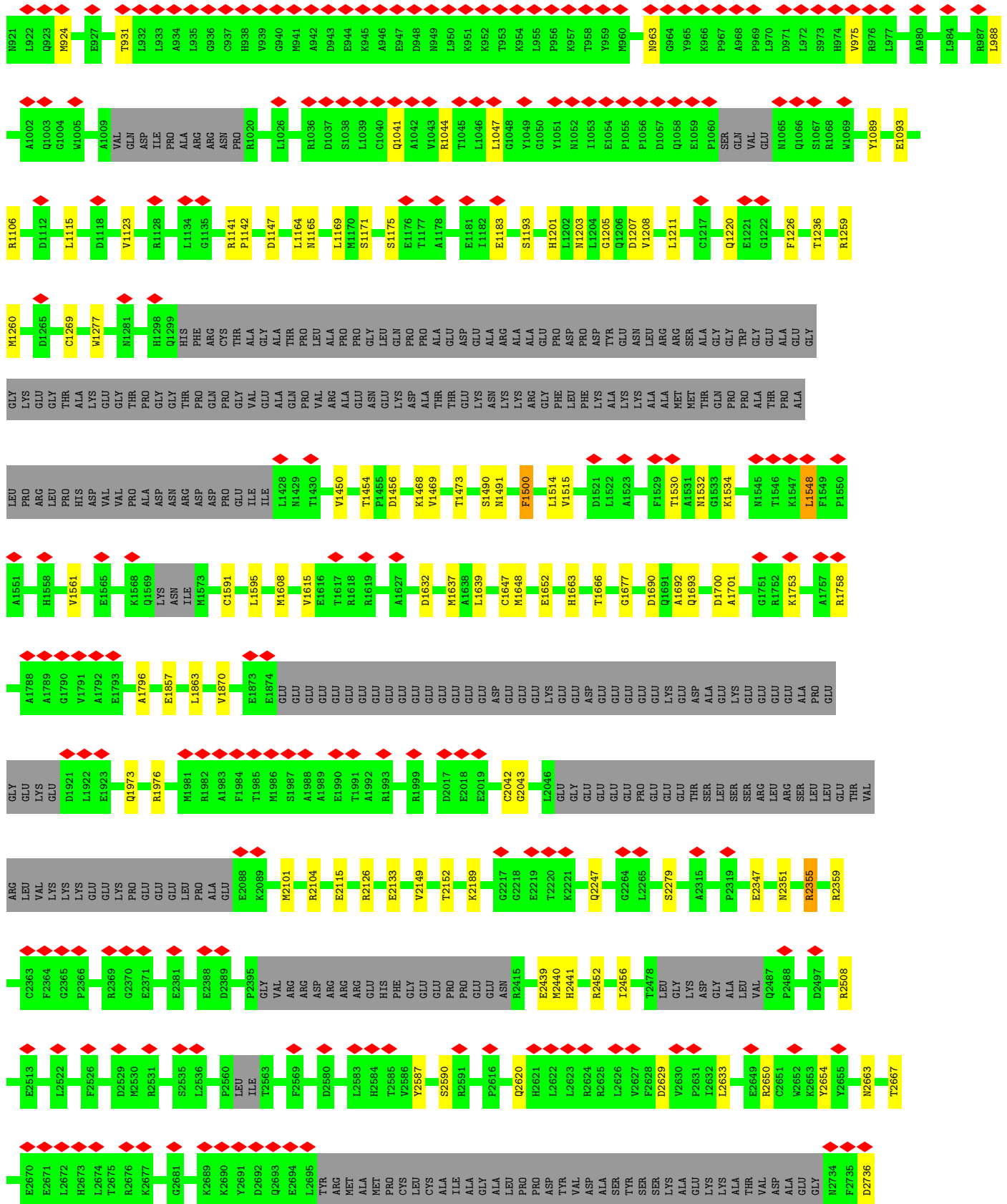


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THR	LYS	LYS	ARG	ARG	GLY	ASP	ARG	TYR	SER	VAL	Q3506	T3507	S3508	L3509	L3510	T3513	L3514	K3515	K3516	M3517	G3521	L3522	N3523	D3531	L3535	T3538	R3539	Y3540	A3541	L3542	K3543	D3544	T3545	D3546	E3547	E3548	V3549	F3552	L3553	Q3554	N3555	N3556	L3557	H3558	L3559	Q3560	G3561	K3562	V3563	E3564	G3565						
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H3667	K3679	E3682	Q3683	E3684	E3685	E3686	E3687	E3688	E3689	V3690	E3691	E3692	H3734	L3735	E3736	E3737	G3738	G3739	E3740	ASN	GLY	GLU	ALA	ALA	GLU	GLU	E3748	V3749	E3750	Q3767	T3772	R3773	C3786	I3802	S3803	L3804	N3806	K3815	S3831	S3840	G3857	M3858	V3859	N3860	E3861	D3862	G3863										

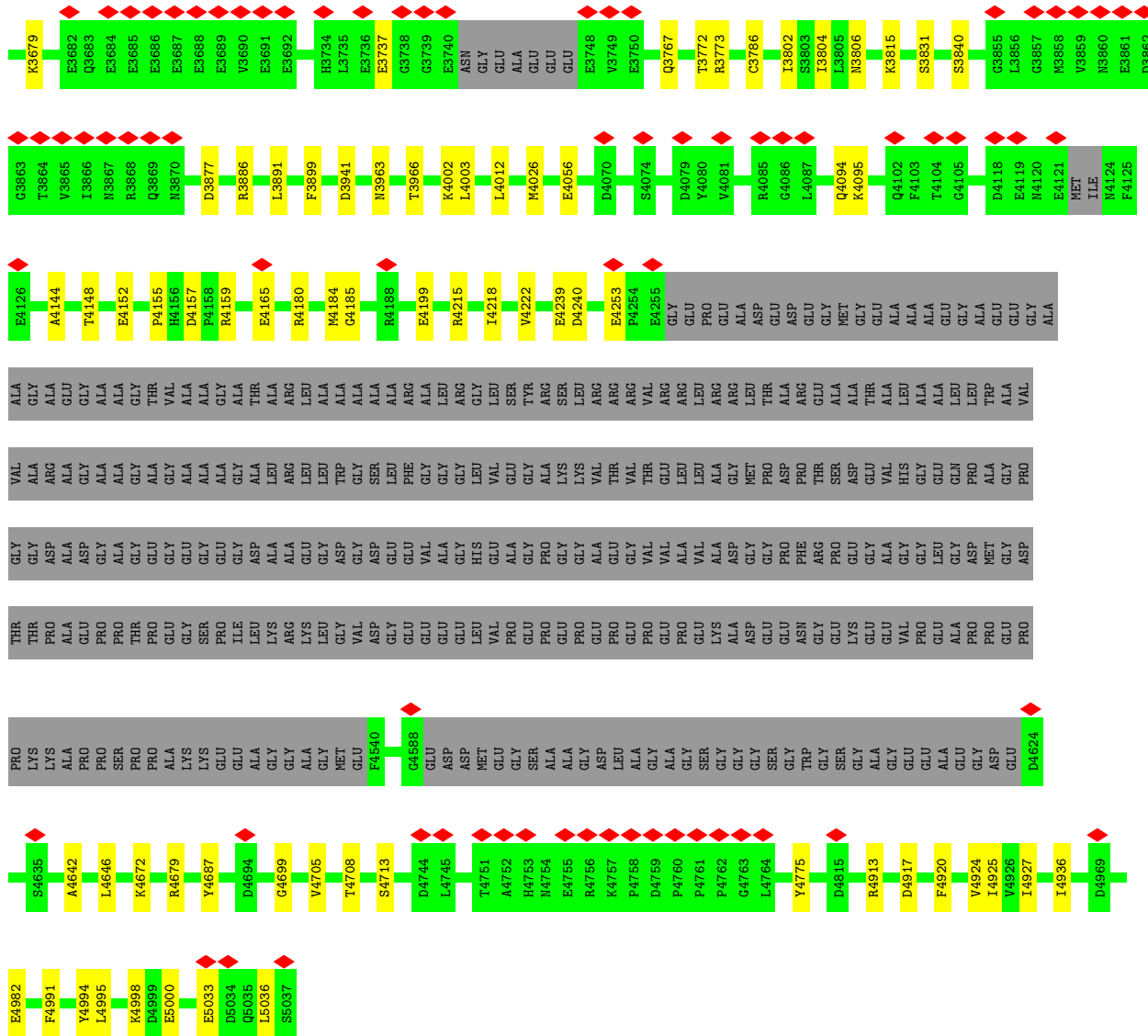


• Molecule 1: Ryanodine receptor 1

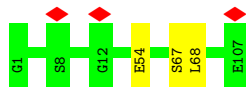




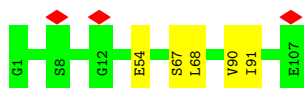
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F3152	G3153	D3154	D3155	V3156	I3157	L3158	D3159	Y3166	R3167	T3168	L3169	C3170	S3171	I3172	Y3173	S3174	L3175	G3176	T3177	L3178	K3179	N3180	T3181	Y3182	VAL	GLU	L3186	R3187	P3188	A3189	C3193	L3194	L3197	A3198	A3199	A3200	H3201	P3202	V3203	A3204	F3205	L3206	E3207	P3208	Q3209	L3210	N3211	E3212	Y3213	N3214	A3215	C3216	SER	V3218	Y3219									
T3220	T3221	K3222	S3223	P3224	R3225	A3228	ILE	LEU	GLY	LEU	PRO	N3234	S3235	V3236	E3237	E3238	K3239	C3240	P3241	D3242	I3243	F3244	V3245	L3246	D3247	R3248	L3249	D3252	I3253	G3254	G3255	L3256	A3257	E3258	S3259	G3260	Y3263	THR	GLU	MET	H3268	V3269	I3270	E3271	I3272	T3273	L3274	L3277	C3278	S3279	F3280	L3281	R3282	R3283										
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N3419	R3420	A3421	H3422	W3423	L3424	A3429	E3433	L3434	F3435	R3436	M3437	E3440	W3445	S3446	K3447	F3451	K3452	R3453	E3454	E3455	Q3456	N3457	Q3461	N3462	E3463	I3464	N3465	N3466	M3467	S3468	F3469	L3470	THR	ALA	ASP	LYS	SER	SER	SER	MET	ALA	VAL	VAL	ALA	CYS	ASP	ALA	GLN	SER	L3459	Q3560	G3561	K3562	V3563	E3564									
GLU	ARG	THR	LYS	LYS	LYS	ARG	GLY	ASP	ARG	TYR	SER	VAL	Q3506	T3507	S3508	L3509	I3510	T3513	L3514	K3515	K3516	M3517	G3521	L3522	N3523	D3531	L3535	T3538	R3539	Y3540	A3541	K3542	K3543	D3544	T3545	D3546	E3547	E3548	V3549	F3552	L3553	Q3554	N3555	N3556	L3557	H3558	L3559	Q3560	G3561	K3562	V3563	E3564												
G3565	L3575	V3576	R3577	G3578	L3579	P3580	G3581	R3582	E3583	E3584	D3585	A3586	P3587	D3588	F3589	E3590	K3591	I3592	R3595	V3596	Q3597	E3598	E3610	H3611	P3612	TYR	LYS	SER	LYS	LYS	ALA	VAL	TRP	LYS	HIS	LYS	LEU	LEU	SER	E3547	GLN	ARG	ARG	ALA	VAL	VAL	CYS	PHE	ARG	MET	T3639	E3665	D3666	H3667										



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

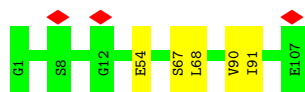


● Molecule 2: Peptidyl-prolyl cis-trans isomerase FKBP1B



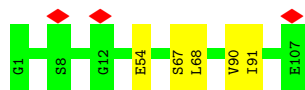
● Molecule 2: Peptidyl-prolyl cis-trans isomerase FKBP1B

Chain G:  95% 5%



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

Chain H:  95% 5%



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C4	Depositor
Number of particles used	84954	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 ($e^-/\text{\AA}^2$)	53.19	Depositor
Minimum defocus (nm)	700	Depositor
Maximum defocus (nm)	2500	Depositor
Magnification	81000	Depositor
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	0.769	Depositor
Minimum map value	-0.355	Depositor
Average map value	0.004	Depositor
Map value standard deviation	0.038	Depositor
Recommended contour level	0.176	Depositor
Map size (\AA)	463.54004, 463.54004, 463.54004	wwPDB
Map dimensions	430, 430, 430	wwPDB
Map angles ($^\circ$)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (\AA)	1.0780001, 1.0780001, 1.0780001	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, CA

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	0.35	0/33703	0.66	4/45746 (0.0%)
1	B	0.35	0/33703	0.66	4/45746 (0.0%)
1	C	0.35	1/33703 (0.0%)	0.66	4/45746 (0.0%)
1	D	0.35	1/33703 (0.0%)	0.66	4/45746 (0.0%)
2	E	0.34	0/834	0.70	0/1123
2	F	0.34	0/834	0.70	0/1123
2	G	0.34	0/834	0.70	0/1123
2	H	0.34	0/834	0.70	0/1123
All	All	0.35	2/138148 (0.0%)	0.66	16/187476 (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

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	C	1652	GLU	C-O	-5.06	1.13	1.23
1	D	1652	GLU	C-O	-5.03	1.13	1.23

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

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C	3056	LEU	CA-CB-CG	5.82	128.68	115.30
1	A	3056	LEU	CA-CB-CG	5.82	128.68	115.30
1	D	3056	LEU	CA-CB-CG	5.82	128.68	115.30
1	B	3056	LEU	CA-CB-CG	5.81	128.67	115.30
1	B	1548	LEU	CA-CB-CG	5.59	128.17	115.30

There are no chirality outliers.

All (4) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	4253	GLU	Peptide
1	B	4253	GLU	Peptide
1	C	4253	GLU	Peptide
1	D	4253	GLU	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	32981	0	31923	181	0
1	B	32981	0	31923	178	0
1	C	32981	0	31923	183	0
1	D	32981	0	31923	181	0
2	E	818	0	824	2	0
2	F	818	0	824	3	0
2	G	818	0	824	3	0
2	H	818	0	824	3	0
3	A	31	0	12	1	0
3	B	31	0	12	1	0
3	C	31	0	12	1	0
3	D	31	0	12	1	0
4	A	1	0	0	0	0
4	B	1	0	0	0	0
4	C	1	0	0	0	0
4	D	1	0	0	0	0
5	A	1	0	0	0	0
5	B	1	0	0	0	0
5	C	1	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
5	D	1	0	0	0	0
All	All	135328	0	131036	721	0

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

The worst 5 of 721 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:C:4913:ARG:NH1	1:C:4917:ASP:OD2	2.23	0.72
1:B:4913:ARG:NH1	1:B:4917:ASP:OD2	2.22	0.72
1:A:4913:ARG:NH1	1:A:4917:ASP:OD2	2.22	0.72
1:D:4913:ARG:NH1	1:D:4917:ASP:OD2	2.22	0.71
1:A:3540:TYR:OH	1:A:3597:GLN:OE1	2.11	0.69

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	4188/5037 (83%)	3792 (90%)	385 (9%)	11 (0%)	41	75
1	B	4188/5037 (83%)	3794 (91%)	384 (9%)	10 (0%)	47	80
1	C	4188/5037 (83%)	3794 (91%)	384 (9%)	10 (0%)	47	80
1	D	4188/5037 (83%)	3795 (91%)	383 (9%)	10 (0%)	47	80
2	E	105/107 (98%)	95 (90%)	10 (10%)	0	100	100
2	F	105/107 (98%)	95 (90%)	10 (10%)	0	100	100
2	G	105/107 (98%)	95 (90%)	10 (10%)	0	100	100
2	H	105/107 (98%)	95 (90%)	10 (10%)	0	100	100
All	All	17172/20576 (84%)	15555 (91%)	1576 (9%)	41 (0%)	50	80

5 of 41 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	1548	LEU
1	A	2956	ALA
1	B	1548	LEU
1	B	2956	ALA
1	C	1548	LEU

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	3479/4276 (81%)	3469 (100%)	10 (0%)	92	95
1	B	3479/4276 (81%)	3469 (100%)	10 (0%)	92	95
1	C	3479/4276 (81%)	3469 (100%)	10 (0%)	92	95
1	D	3479/4276 (81%)	3469 (100%)	10 (0%)	92	95
2	E	88/88 (100%)	88 (100%)	0	100	100
2	F	88/88 (100%)	88 (100%)	0	100	100
2	G	88/88 (100%)	88 (100%)	0	100	100
2	H	88/88 (100%)	88 (100%)	0	100	100
All	All	14268/17456 (82%)	14228 (100%)	40 (0%)	92	95

5 of 40 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	C	3679	LYS
1	D	3111	ARG
1	C	3773	ARG
1	D	1468	LYS
1	D	3595	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. There are no such sidechains identified.

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, 8 are monoatomic - leaving 4 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
3	ATP	D	5101	-	26,33,33	0.62	0	31,52,52	1.06	2 (6%)
3	ATP	A	5101	-	26,33,33	0.62	0	31,52,52	1.06	2 (6%)
3	ATP	B	5101	-	26,33,33	0.62	0	31,52,52	1.06	2 (6%)
3	ATP	C	5101	-	26,33,33	0.62	0	31,52,52	1.05	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
3	ATP	D	5101	-	-	6/18/38/38	0/3/3/3
3	ATP	A	5101	-	-	6/18/38/38	0/3/3/3
3	ATP	B	5101	-	-	6/18/38/38	0/3/3/3
3	ATP	C	5101	-	-	6/18/38/38	0/3/3/3

There are no bond length outliers.

The worst 5 of 8 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	B	5101	ATP	C5-C6-N6	2.23	123.75	120.35
3	D	5101	ATP	C5-C6-N6	2.22	123.73	120.35
3	A	5101	ATP	C5-C6-N6	2.22	123.72	120.35
3	C	5101	ATP	C5-C6-N6	2.20	123.69	120.35
3	A	5101	ATP	PB-O3B-PG	2.03	139.79	132.83

There are no chirality outliers.

5 of 24 torsion outliers are listed below:

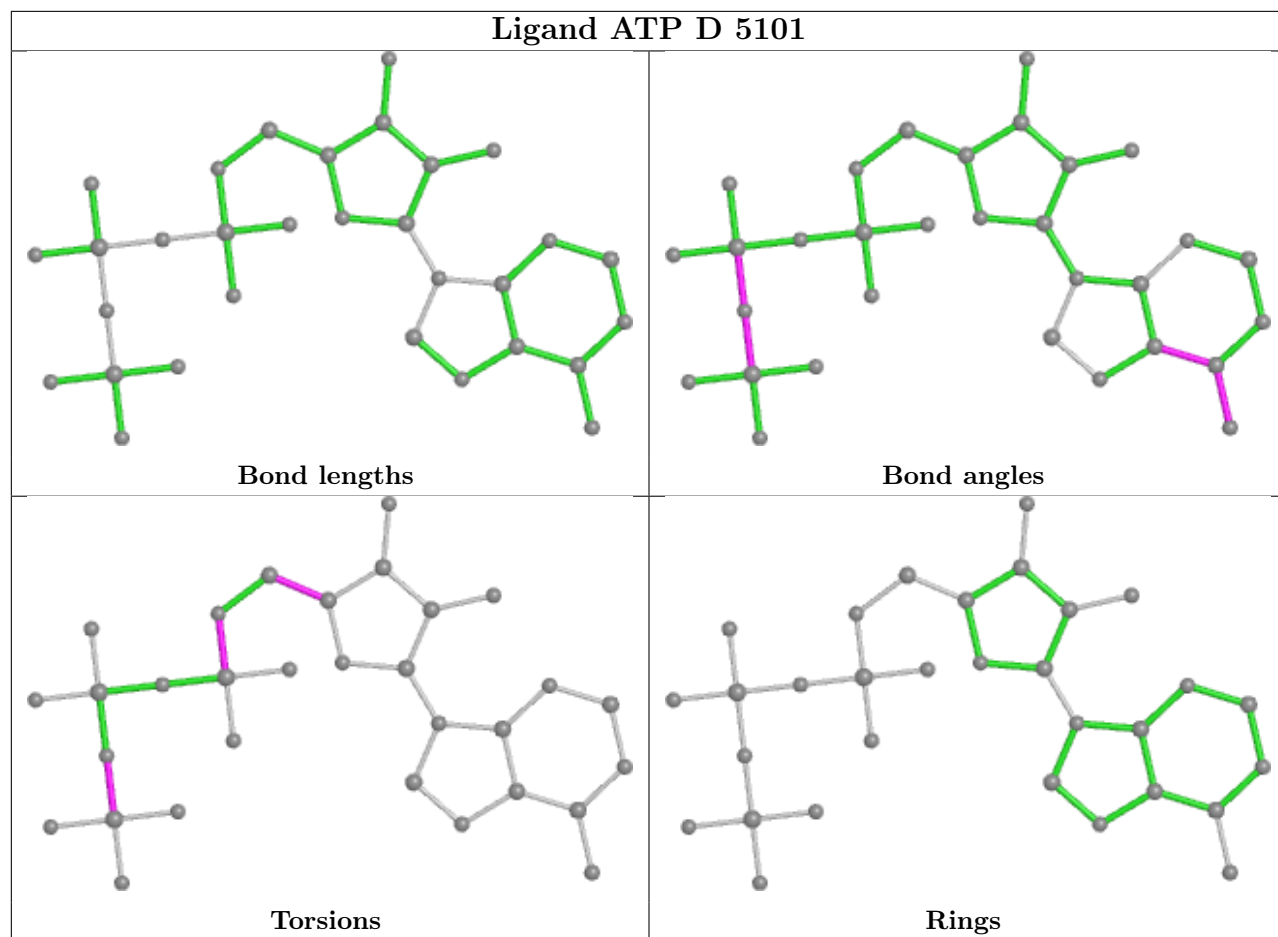
Mol	Chain	Res	Type	Atoms
3	A	5101	ATP	C5'-O5'-PA-O1A
3	A	5101	ATP	C5'-O5'-PA-O2A
3	A	5101	ATP	O4'-C4'-C5'-O5'
3	A	5101	ATP	C3'-C4'-C5'-O5'
3	B	5101	ATP	C5'-O5'-PA-O1A

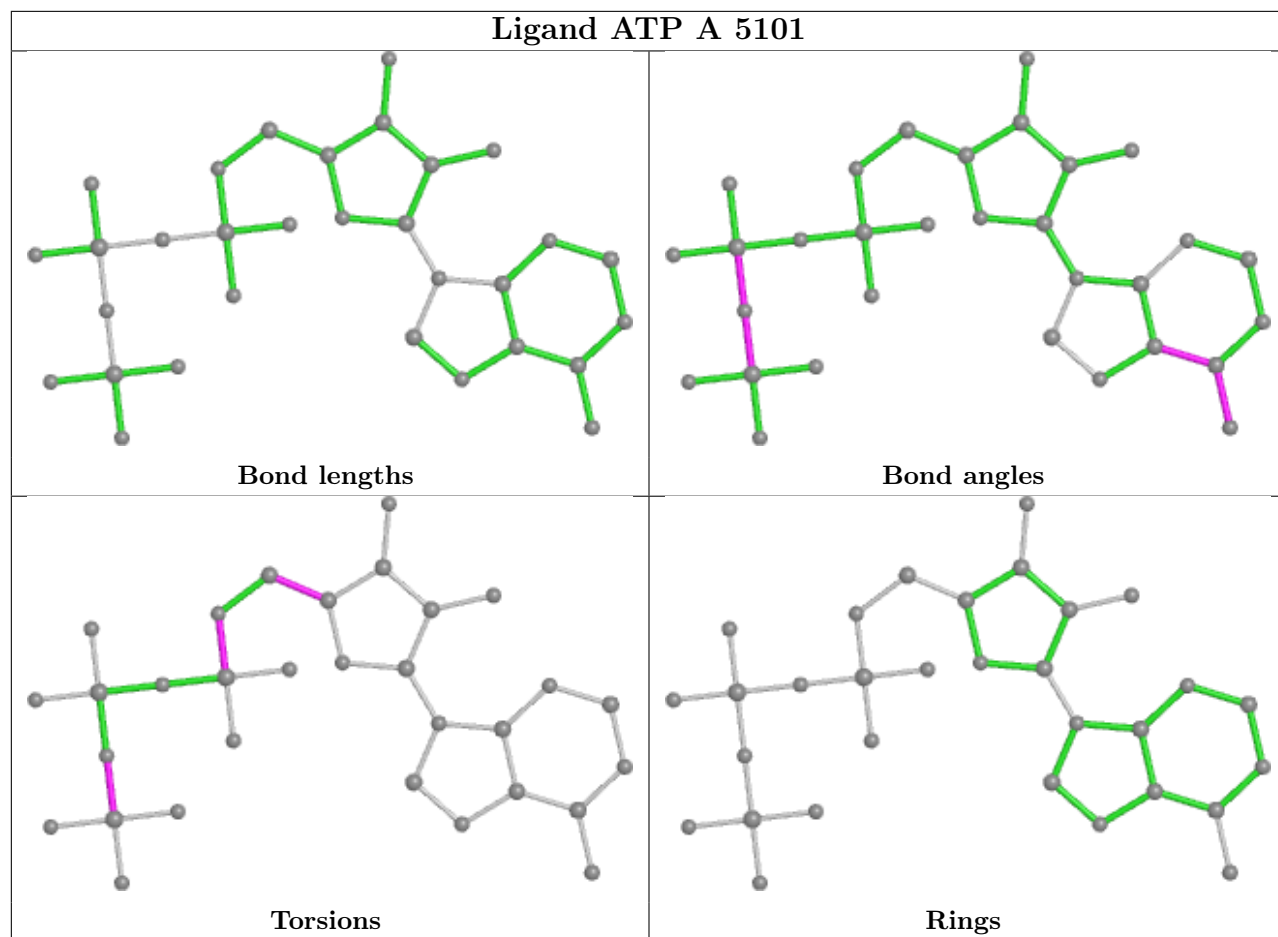
There are no ring outliers.

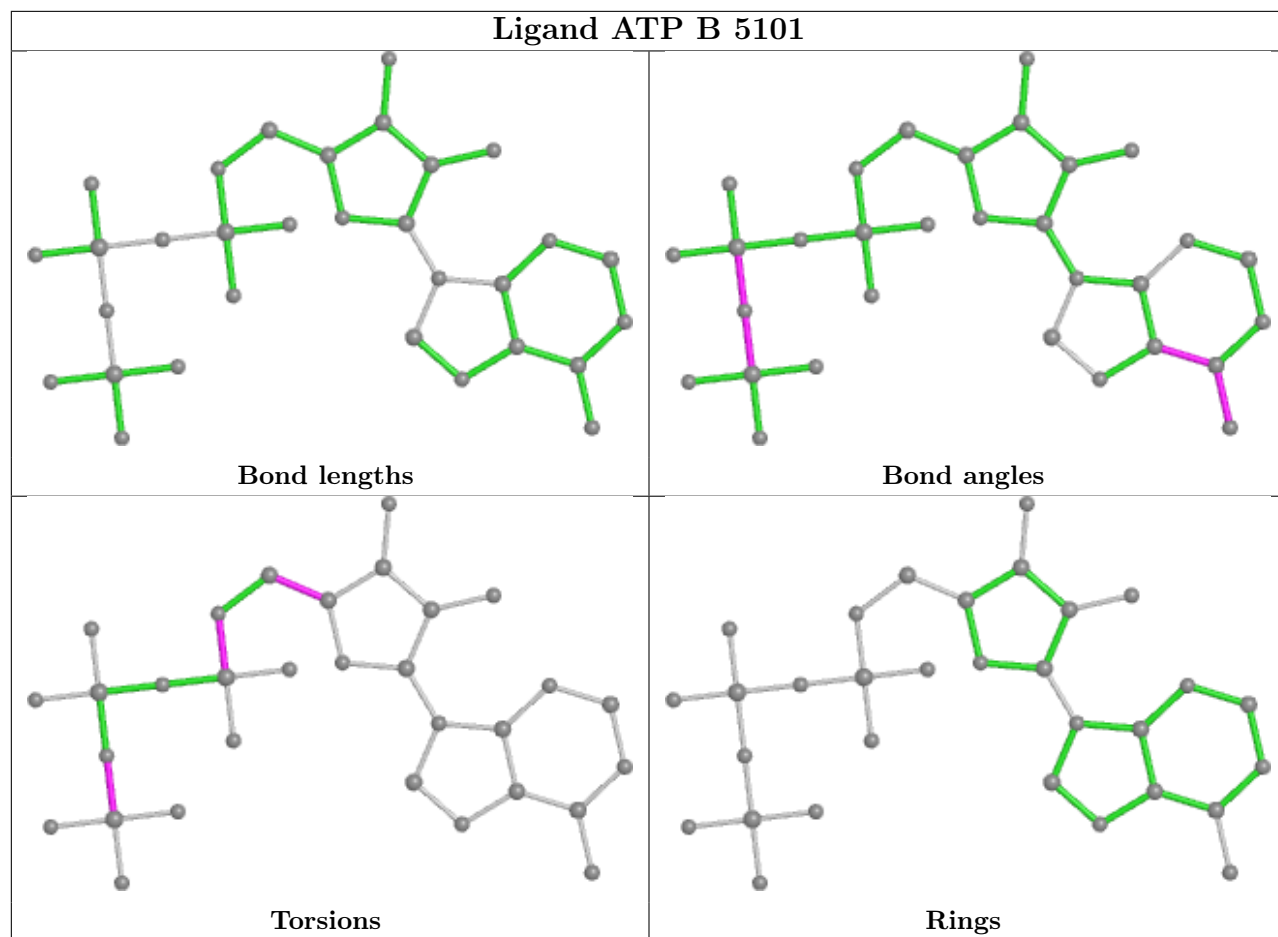
4 monomers are involved in 4 short contacts:

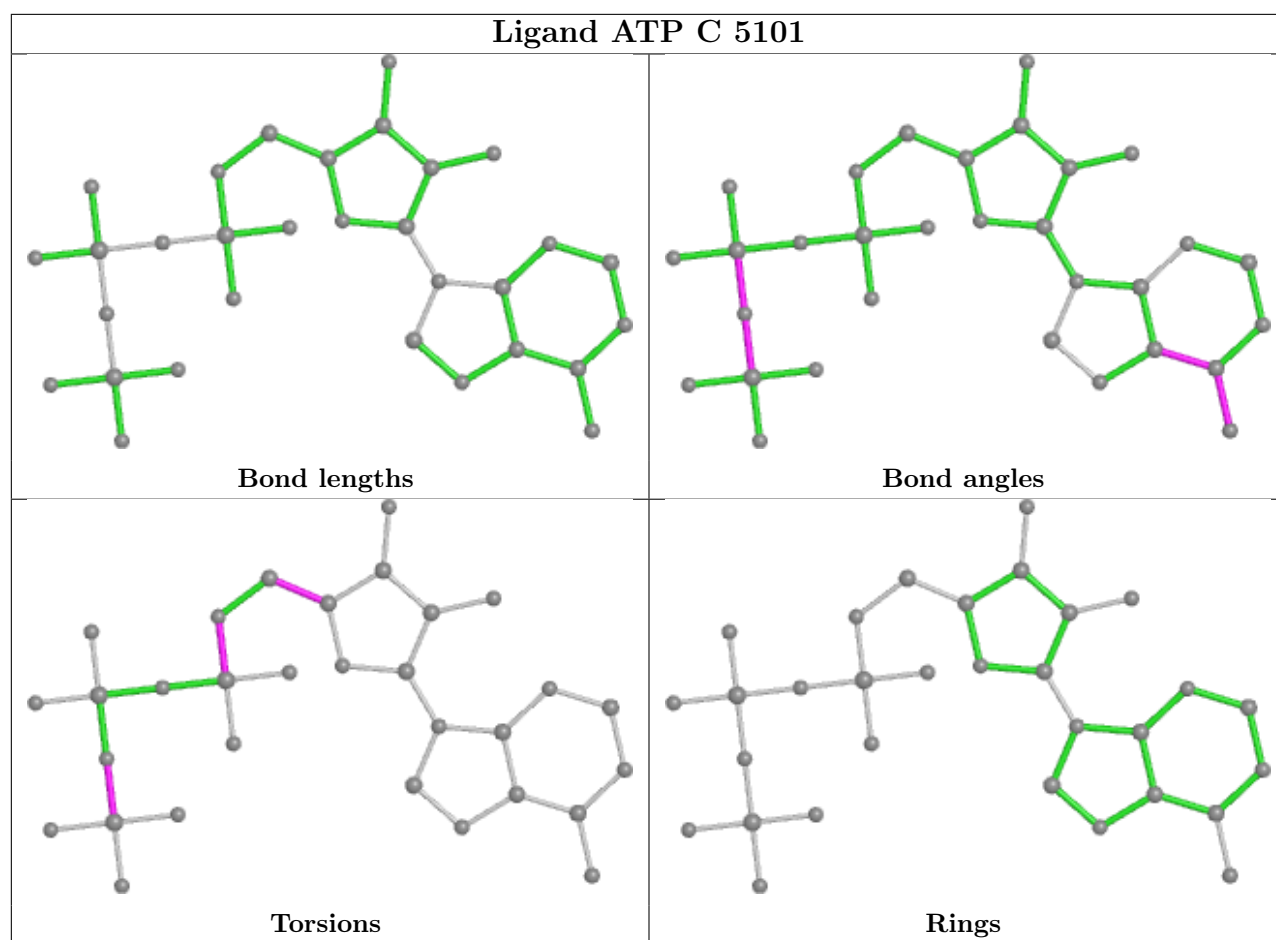
Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	D	5101	ATP	1	0
3	A	5101	ATP	1	0
3	B	5101	ATP	1	0
3	C	5101	ATP	1	0

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.

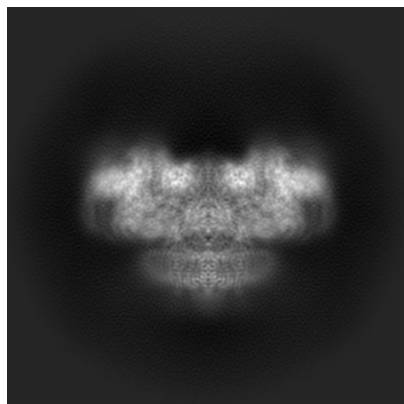
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-25710. These allow visual inspection of the internal detail of the map and identification of artifacts.

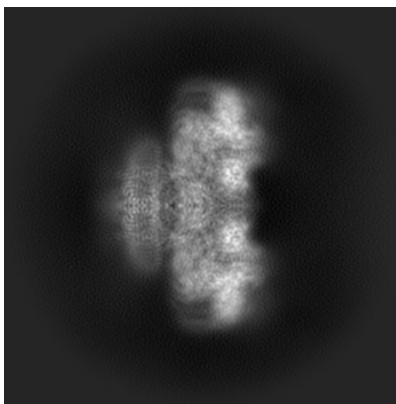
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

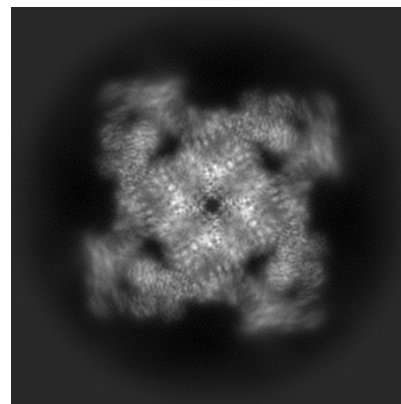
6.1.1 Primary map



X

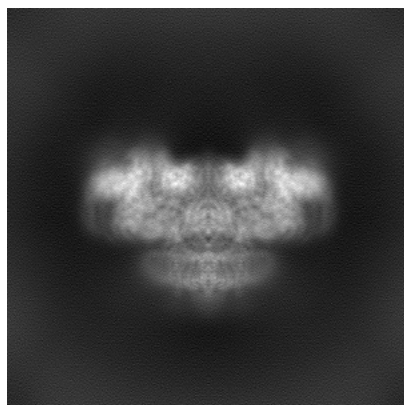


Y

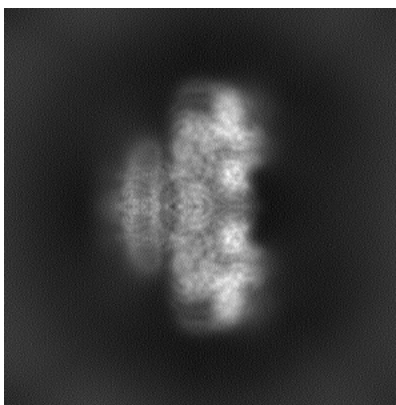


Z

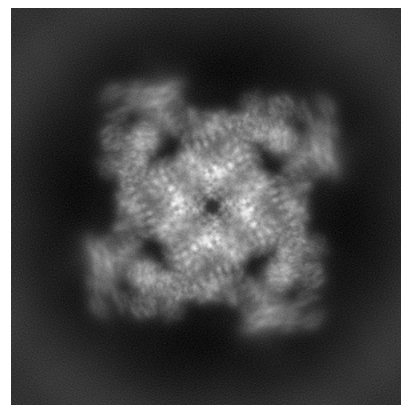
6.1.2 Raw map



X



Y

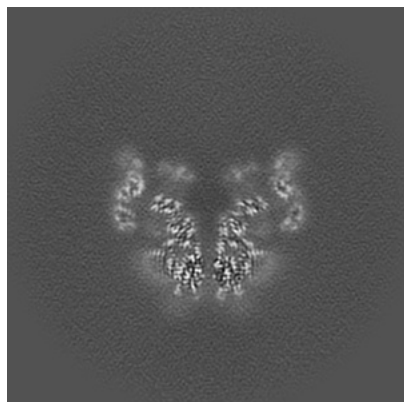


Z

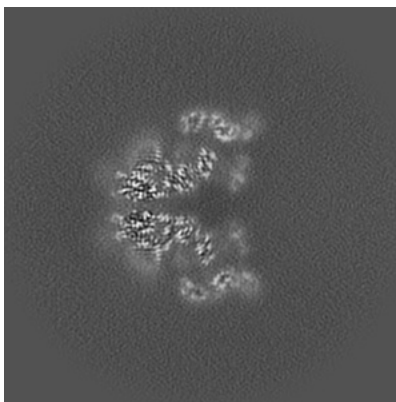
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

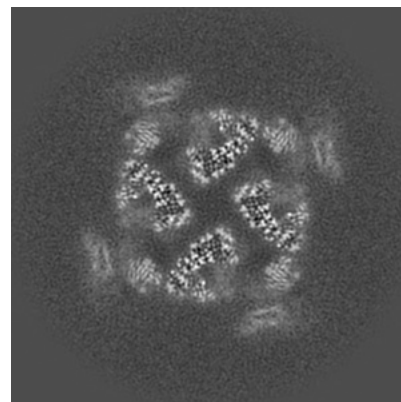
6.2.1 Primary map



X Index: 215

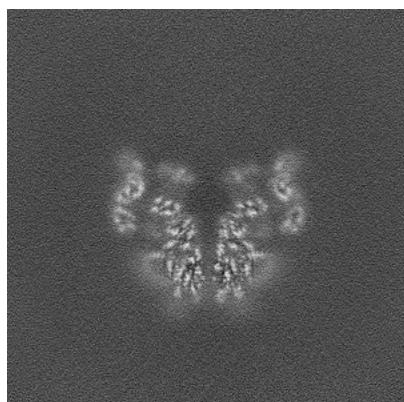


Y Index: 215

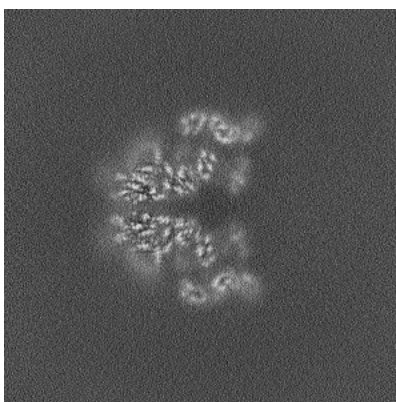


Z Index: 215

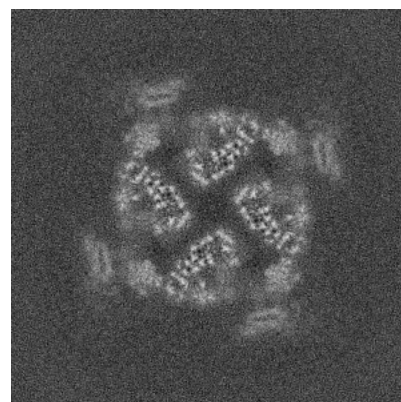
6.2.2 Raw map



X Index: 215



Y Index: 215

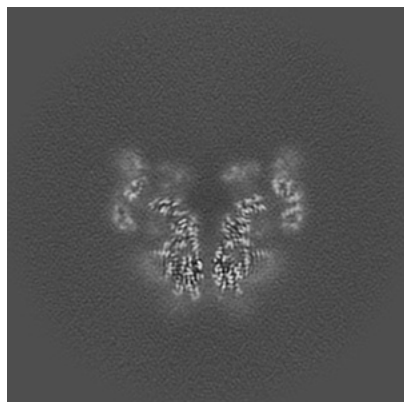


Z Index: 215

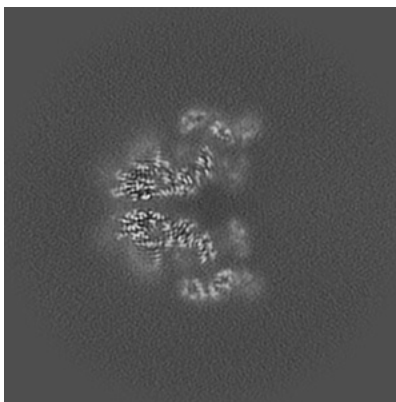
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

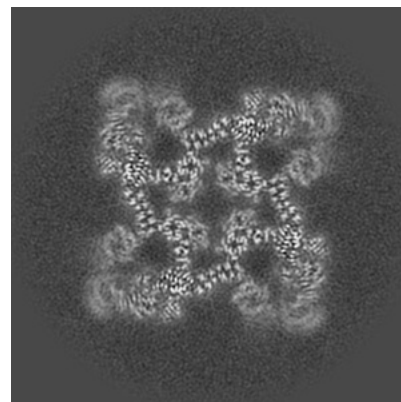
6.3.1 Primary map



X Index: 218

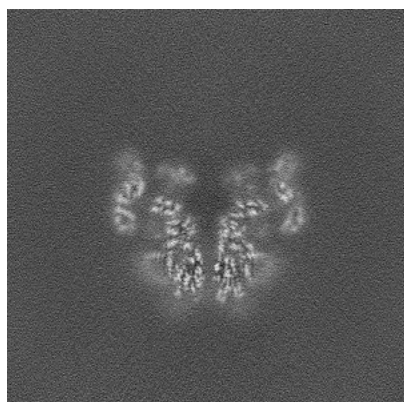


Y Index: 218

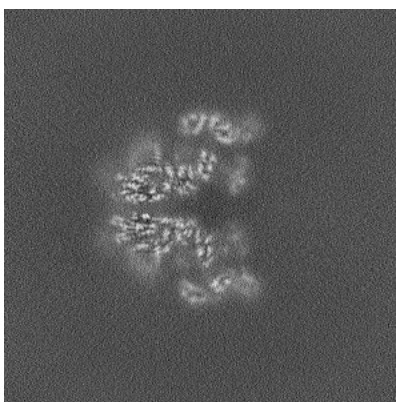


Z Index: 240

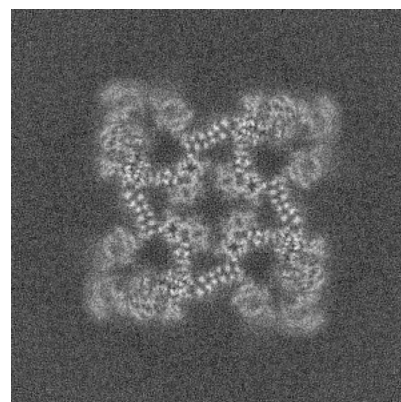
6.3.2 Raw map



X Index: 214



Y Index: 214

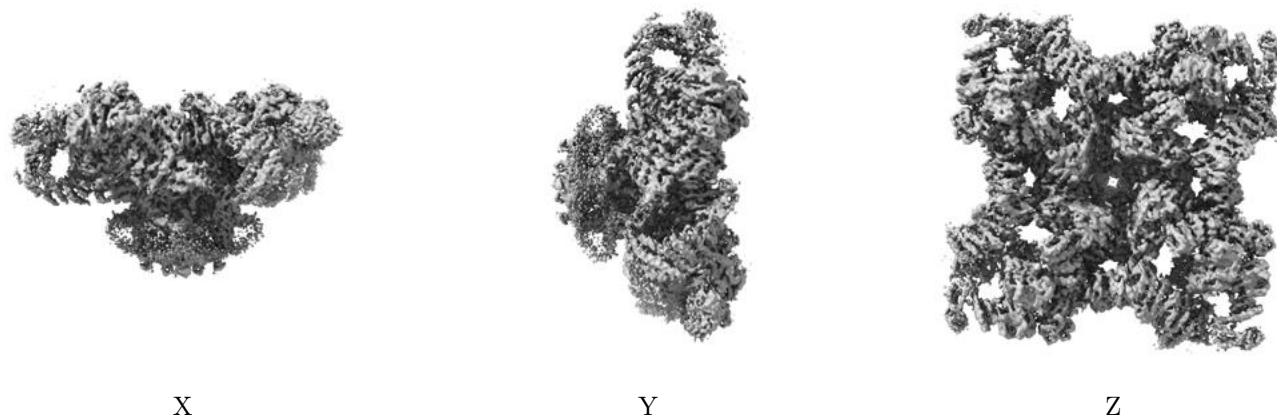


Z Index: 240

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

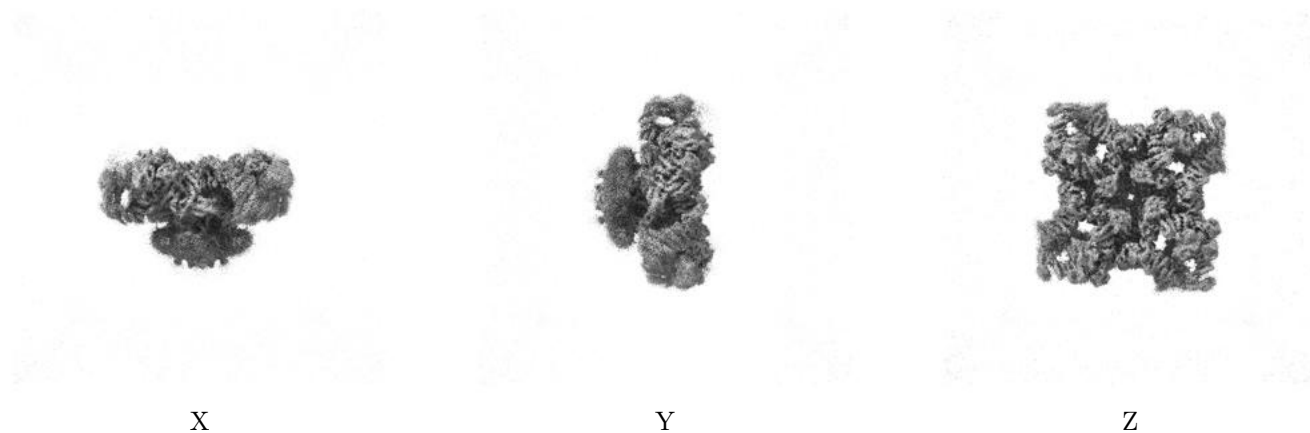
6.4 Orthogonal surface views [i](#)

6.4.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.176. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.4.2 Raw map



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

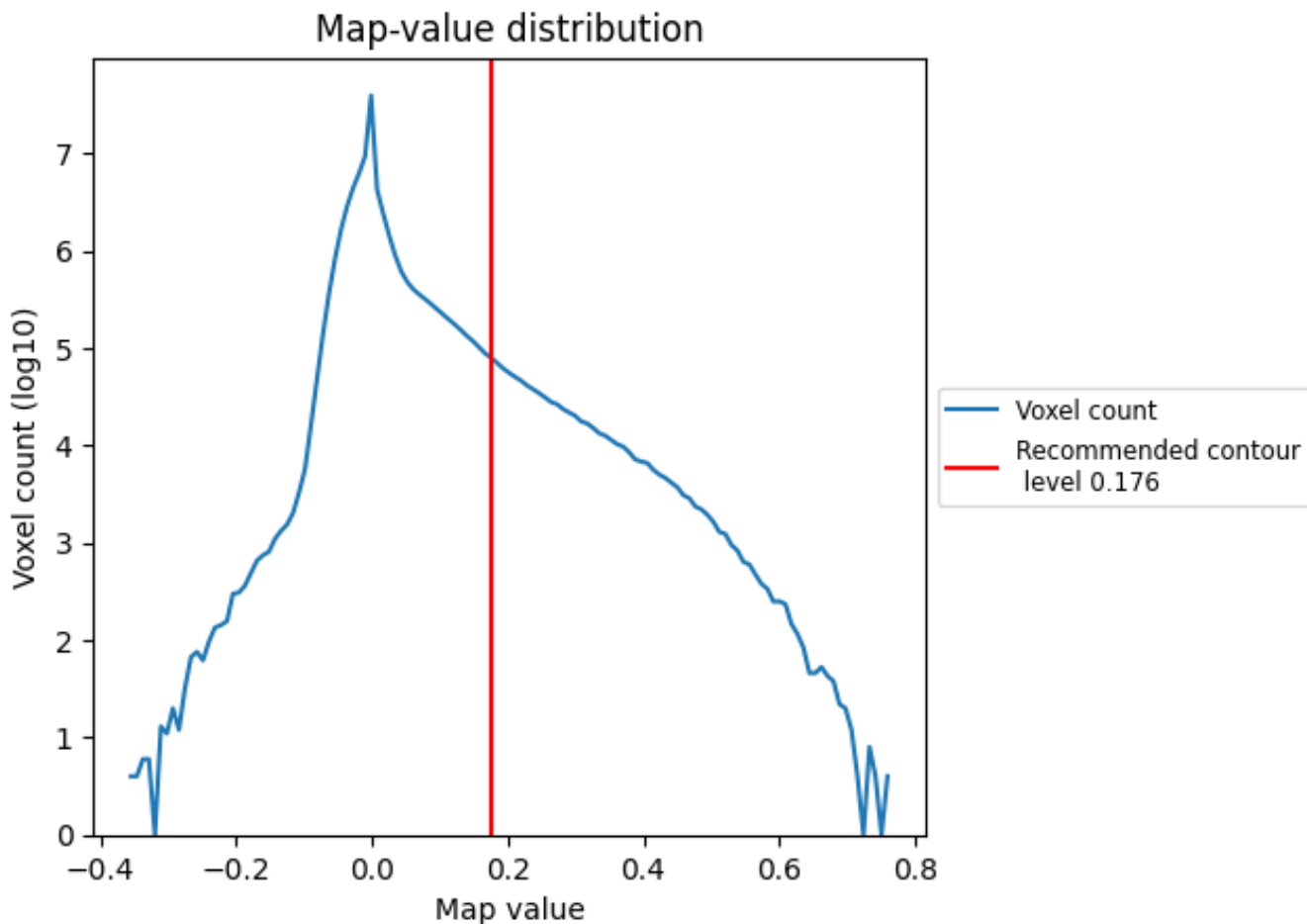
6.5 Mask visualisation [i](#)

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

7 Map analysis [i](#)

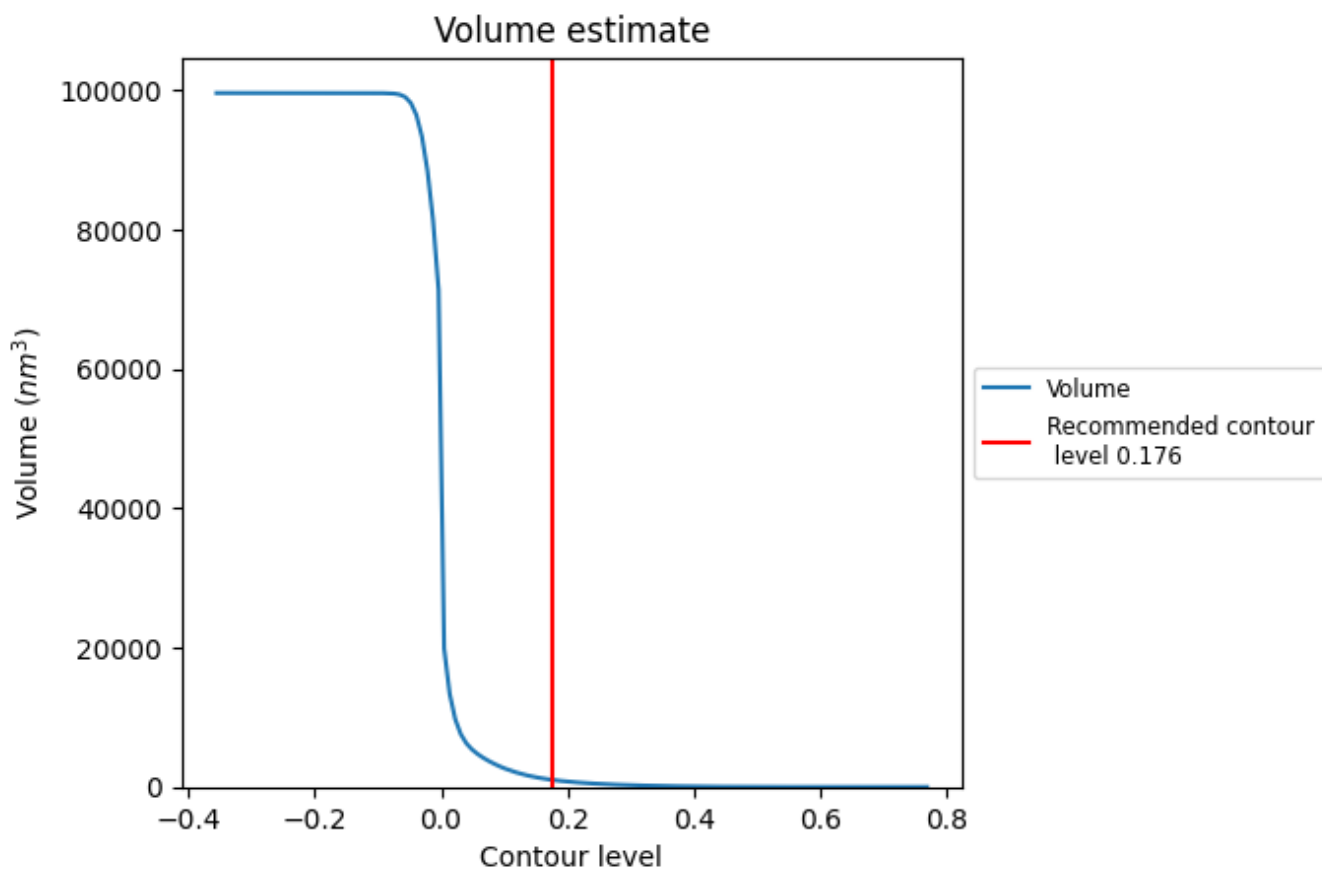
This section contains the results of statistical analysis of the map.

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.

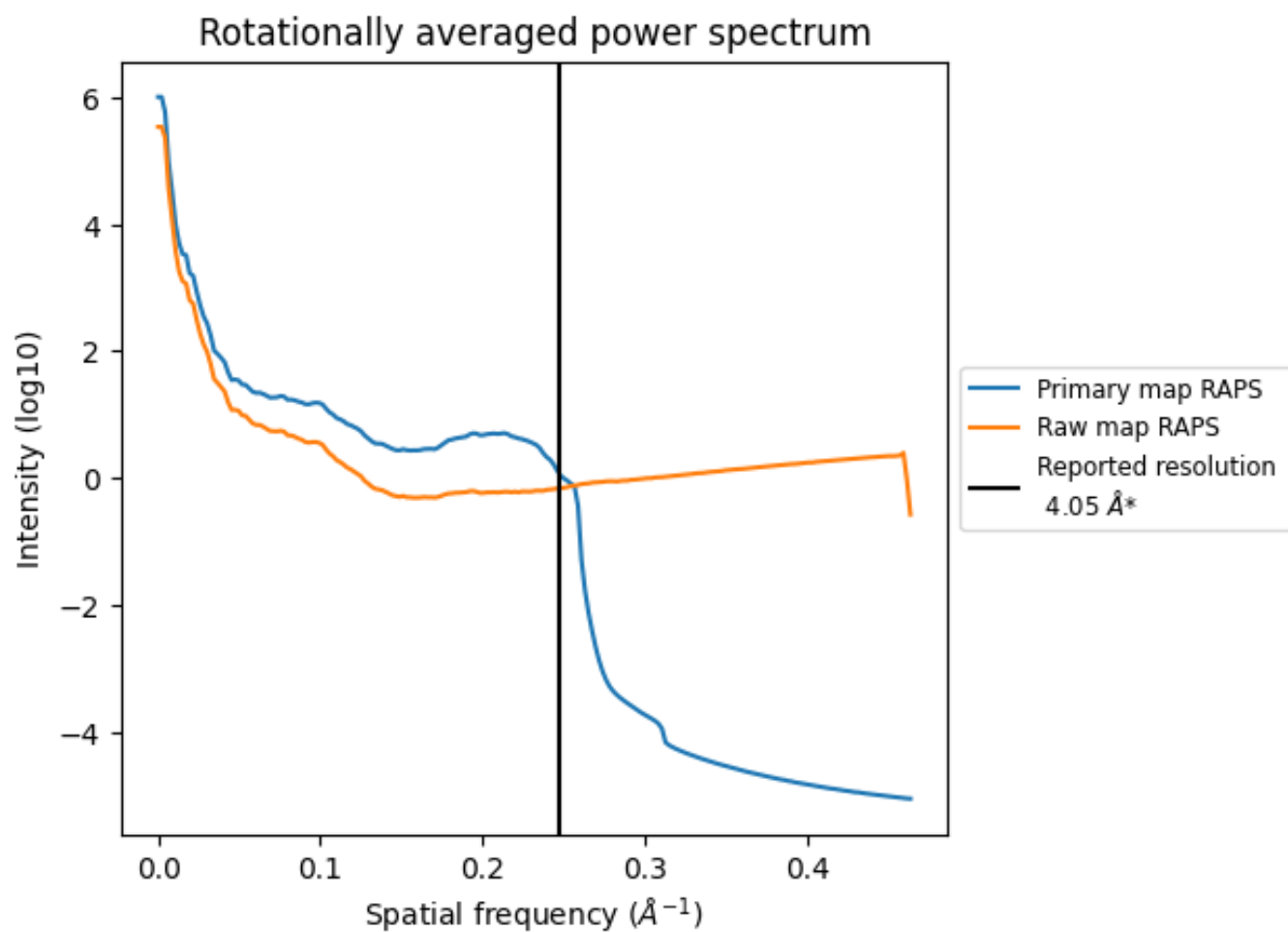
7.2 Volume estimate [\(i\)](#)



The volume at the recommended contour level is 1017 nm^3 ; this corresponds to an approximate mass of 918 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

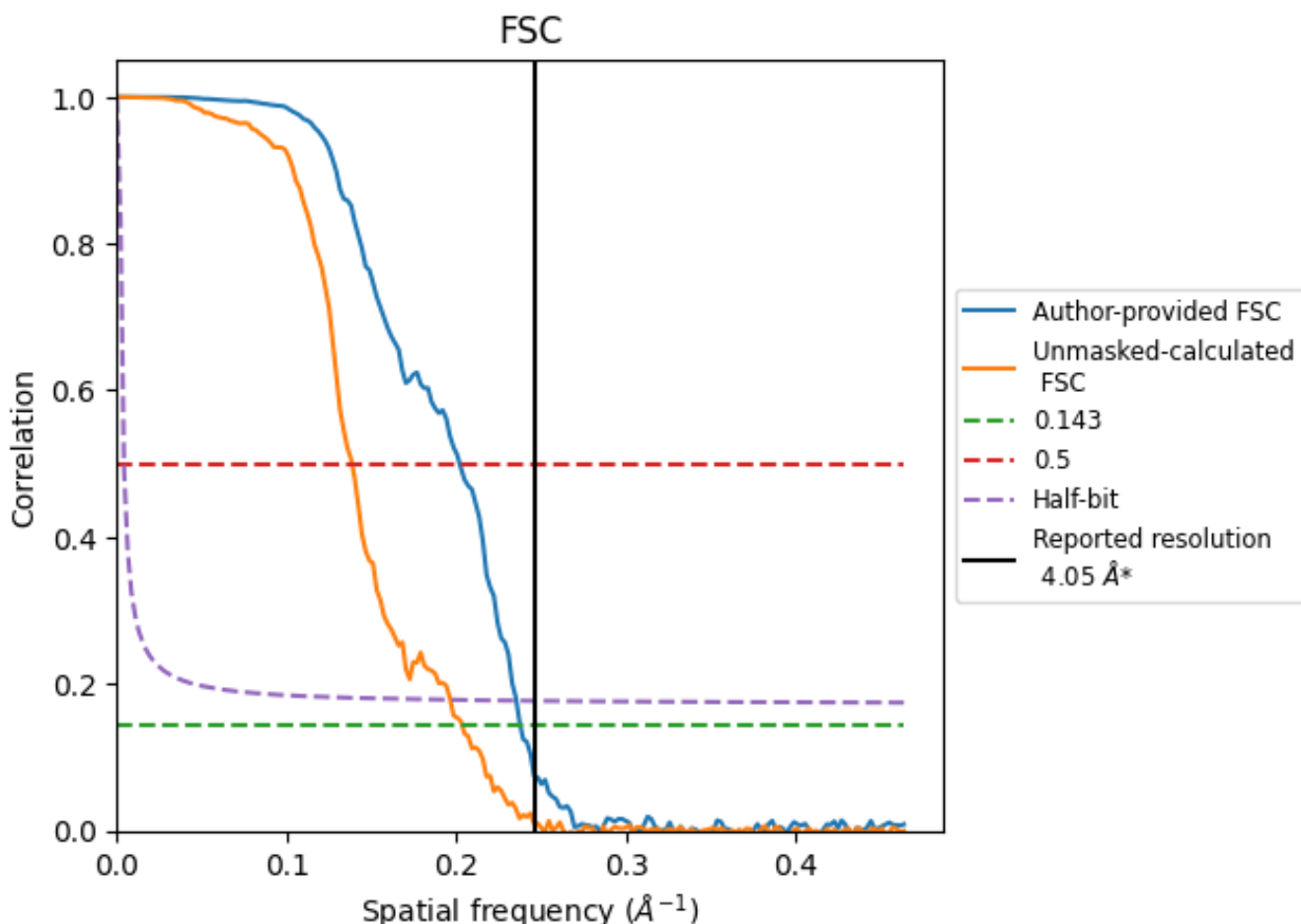


*Reported resolution corresponds to spatial frequency of 0.247 Å⁻¹

8 Fourier-Shell correlation [i](#)

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

8.1 FSC [i](#)



*Reported resolution corresponds to spatial frequency of 0.247\AA^{-1}

8.2 Resolution estimates

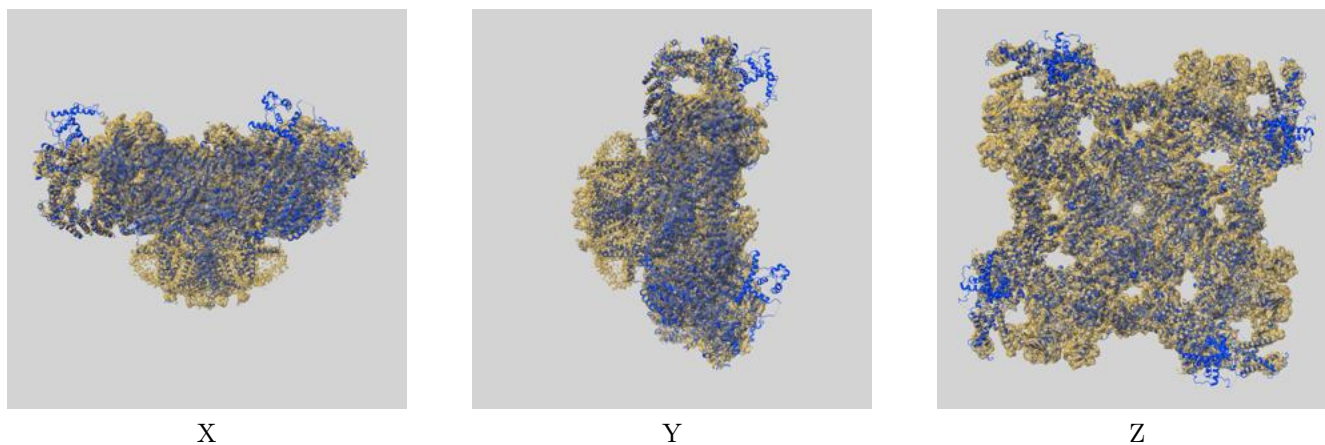
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	4.05	-	-
Author-provided FSC curve	4.21	4.95	4.25
Unmasked-calculated*	4.91	7.22	5.09

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 4.91 differs from the reported value 4.05 by more than 10 %

9 Map-model fit [i](#)

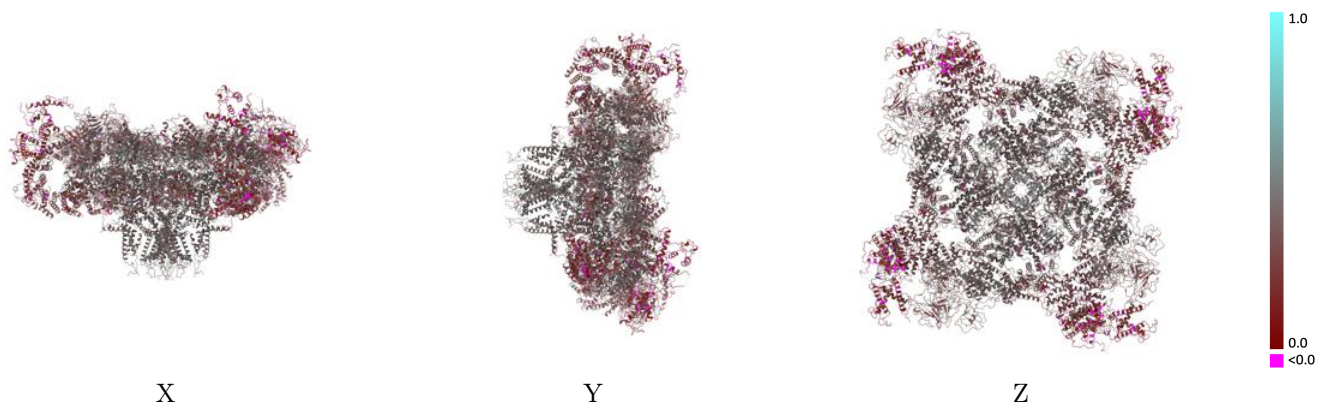
This section contains information regarding the fit between EMDB map EMD-25710 and PDB model 7T65. Per-residue inclusion information can be found in section 3 on page 6.

9.1 Map-model overlay [i](#)



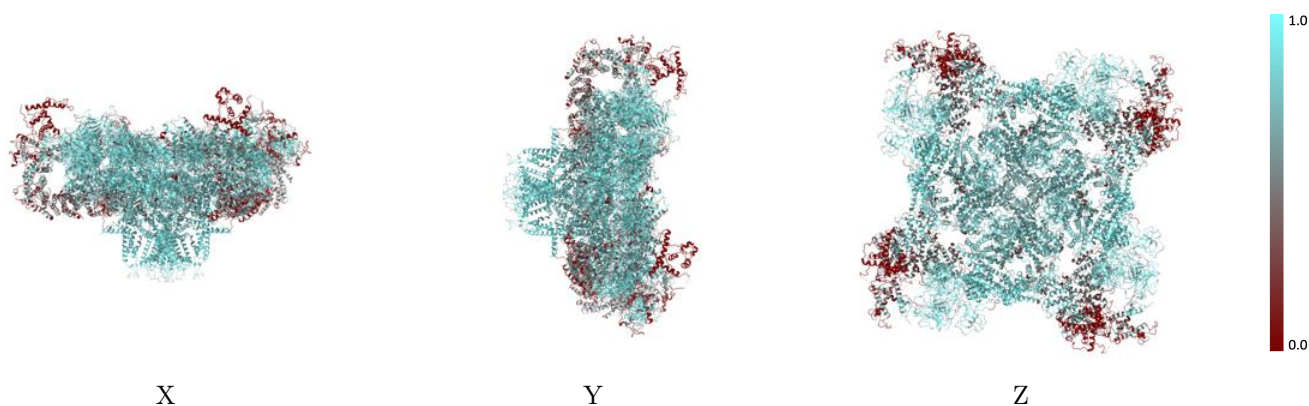
The images above show the 3D surface view of the map at the recommended contour level 0.176 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



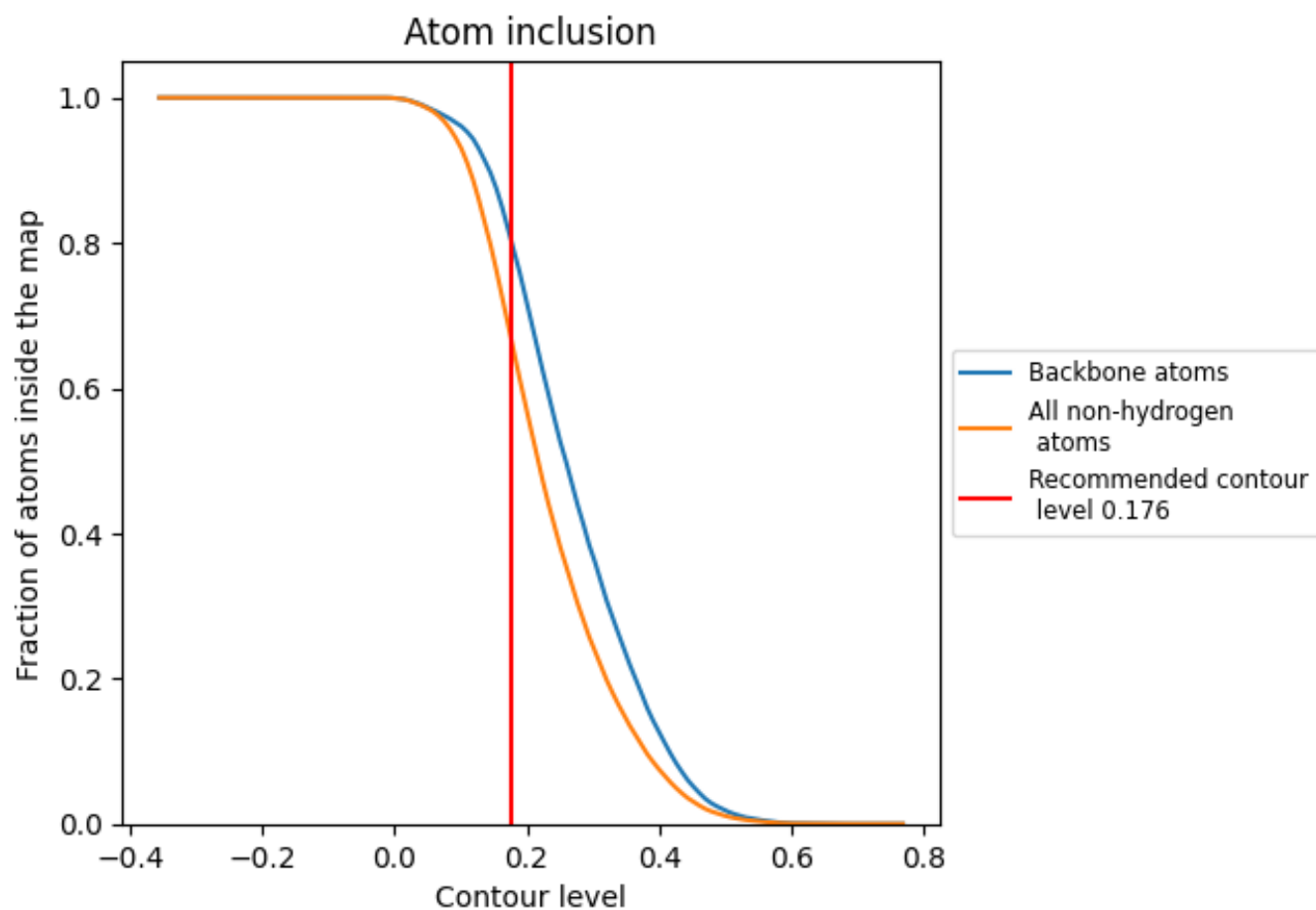
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.176).



















9.4 Atom inclusion [i](#)



At the recommended contour level, 81% of all backbone atoms, 67% of all non-hydrogen atoms, are inside the map.

9.5 Map-model fit summary [i](#)

The table lists the average atom inclusion at the recommended contour level (0.176) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.6681	 0.3480
A	 0.6654	 0.3460
B	 0.6654	 0.3470
C	 0.6650	 0.3460
D	 0.6652	 0.3460
E	 0.7841	 0.3990
F	 0.7841	 0.4000
G	 0.7866	 0.3980
H	 0.7854	 0.3970

