



# wwPDB EM Validation Summary Report ⓘ

Mar 11, 2024 – 01:18 AM EDT

PDB ID : 6PV6  
EMDB ID : EMD-20486  
Title : Functional Pathways of Biomolecules Retrieved from Single-particle Snapshots  
Authors : Dashti, A.; des Georges, A.; Frank, J.; Ourmazd, A.  
Deposited on : 2019-07-19  
Resolution : 4.50 Å (reported)  
Based on initial model : 5TB4

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

We welcome your comments at [validation@mail.wwpdb.org](mailto: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>.

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

EMDB validation analysis : 0.0.1.dev70  
MolProbity : 4.02b-467  
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)  
MapQ : 1.9.13  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.36

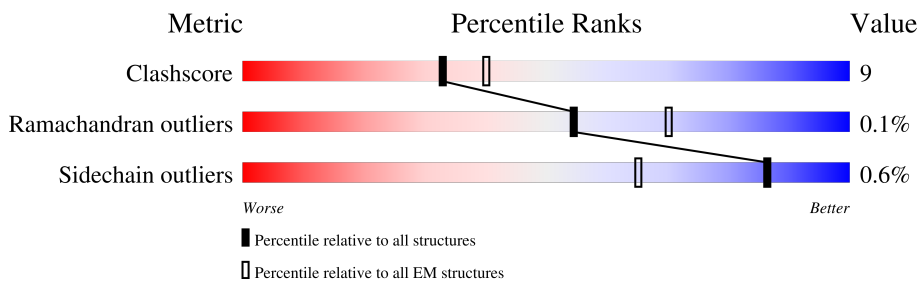
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*ELECTRON MICROSCOPY*

The reported resolution of this entry is 4.50 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  $\geq 3$ , 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	B	4687	
1	E	4687	
1	G	4687	
1	I	4687	
2	A	108	
2	F	108	
2	H	108	
2	J	108	

## 2 Entry composition [i](#)

There are 4 unique types of molecules in this entry. The entry contains 120756 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	B	4168	29369	18608	5202	5402	157	0	0
1	E	4168	29369	18608	5202	5402	157	0	0
1	I	4168	29369	18608	5202	5402	157	0	0
1	G	4168	29369	18608	5202	5402	157	0	0

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

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

- Molecule 3 is ZINC ION (three-letter code: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		AltConf
3	B	1	Total	Zn	0
			1	1	
3	E	1	Total	Zn	0
			1	1	
3	I	1	Total	Zn	0
			1	1	
3	G	1	Total	Zn	0
			1	1	

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

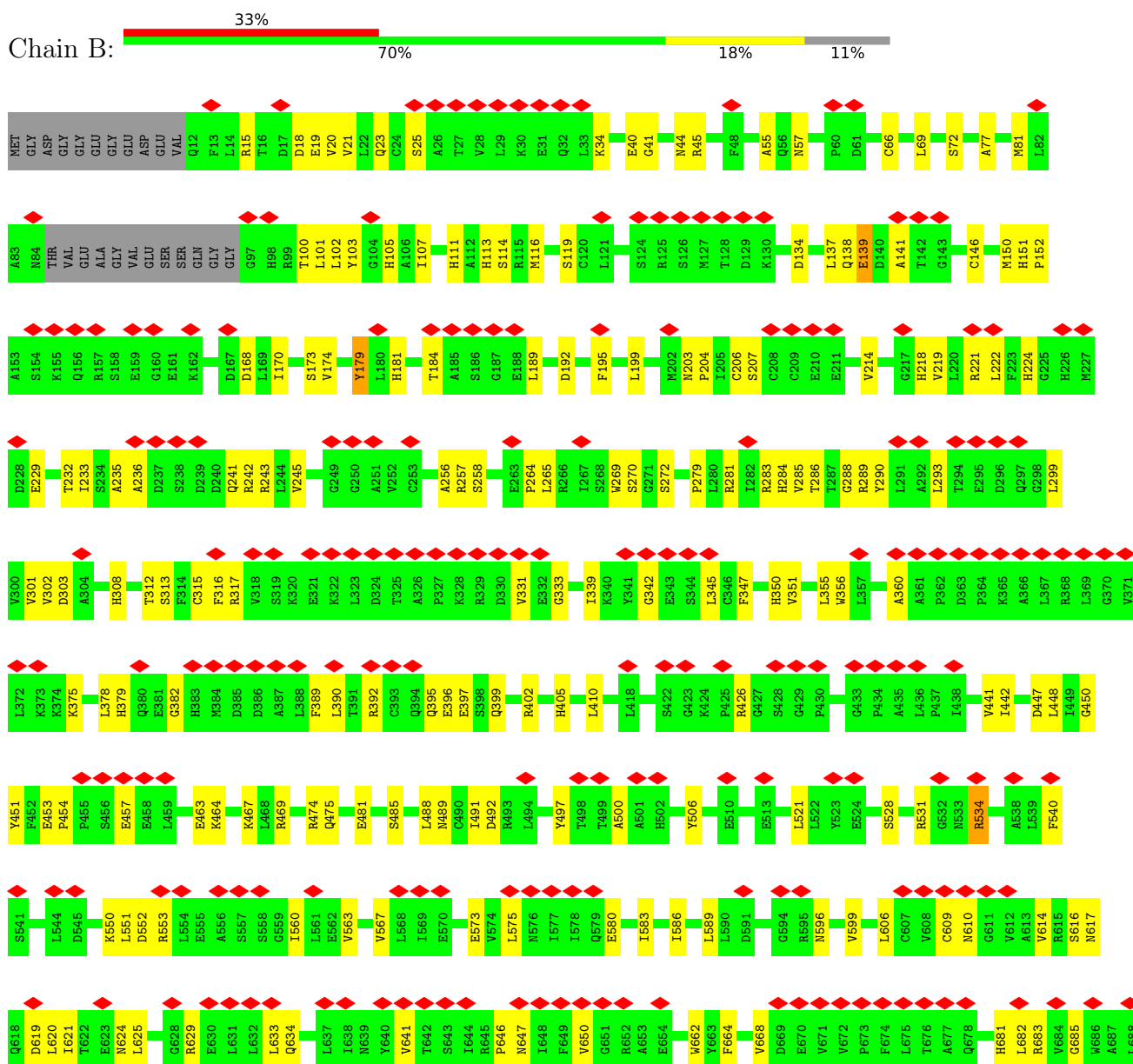
Interest" by depositor).

<b>Mol</b>	<b>Chain</b>	<b>Residues</b>	<b>Atoms</b>		<b>AltConf</b>
4	B	1	Total 1	Ca 1	0
4	E	1	Total 1	Ca 1	0
4	I	1	Total 1	Ca 1	0
4	G	1	Total 1	Ca 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



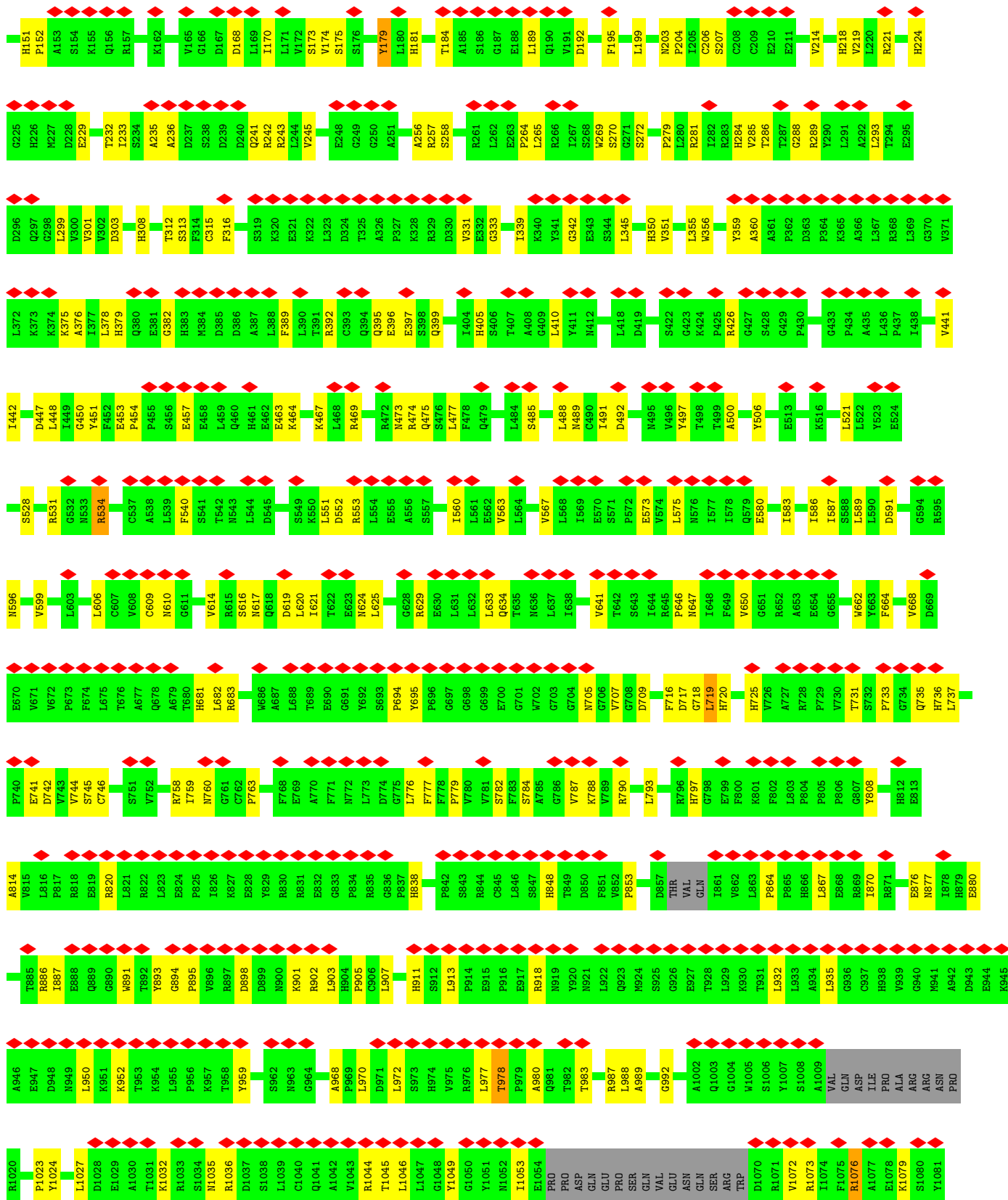




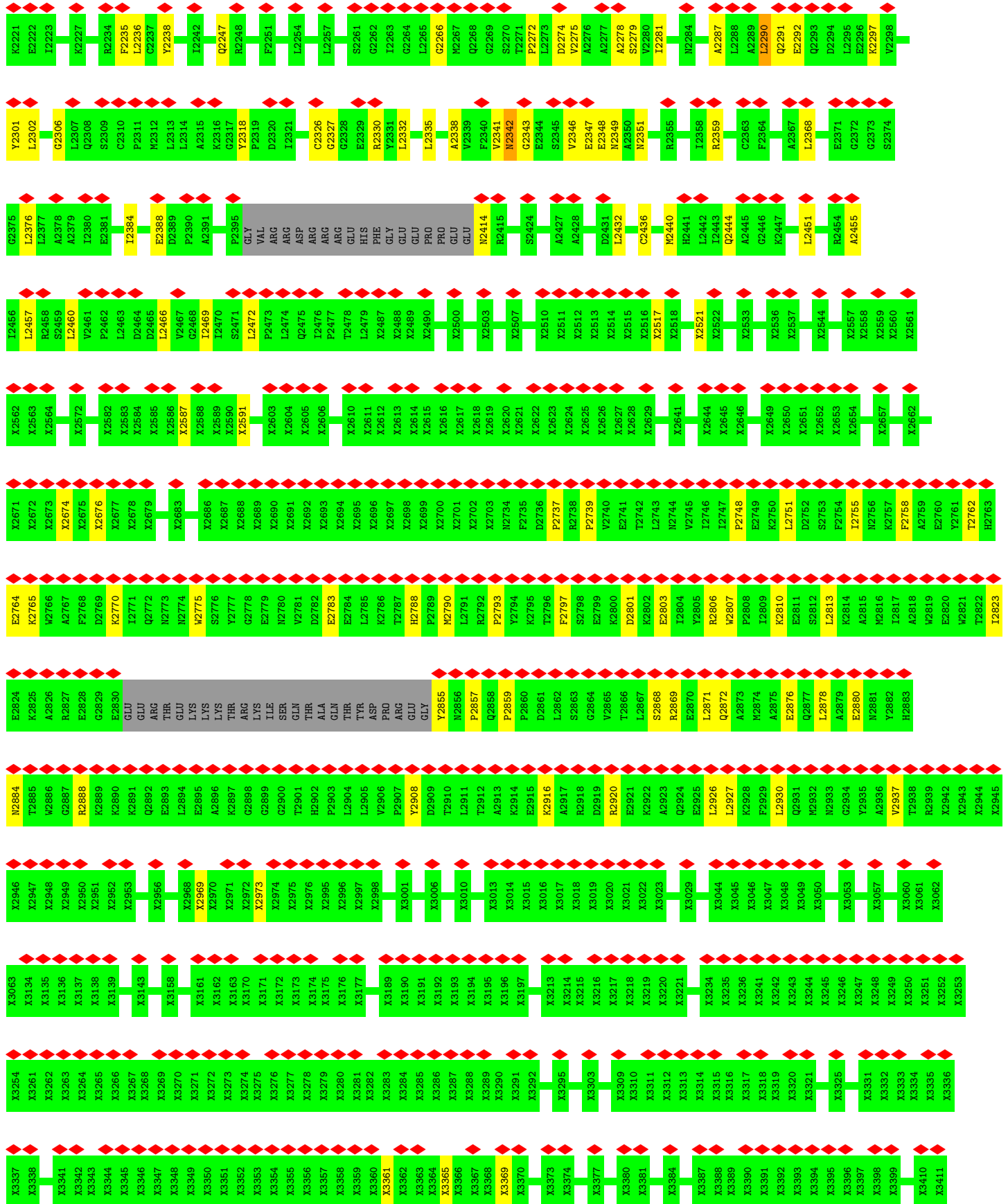
R4137	V4072	R3963	G3871	L3780	X3583	X3285	X3163	X2973	H2902
D4138	C4073	G5972	E3872	Q3781	X3584	X3286	X3170	X2974	P2903
R4142	S4074	P3972	K3873	S3784	X3585	X3287	X3171	X2975	L2904
V4145	A4075	C3973	A3785	C3786	X3586	X3288	X3172	X2976	L2905
L4146	E4076	R3976	V3876	K3787	X3587	X3289	X3173	X2977	V2906
L4147	Q4078	H3982	A3876	G3788	X3588	X3290	X3174	X2978	P2907
L4150	D4079	H3982	D3877	T3711	X3589	X3291	X3175	X2979	Y2908
S4151	Y4080	K3986	E3789	E3712	X3590	X3292	X3176	X2980	D2909
E4152	V4081	V3986	E3878	K3714	X3606	X3293	X3179	X3003	T2910
P4155	T4082	V5990	E3879	S3715	X3607	X3294	X3186	X3006	T2911
H4156	P4084	L3993	F3887	K3716	X3608	X3295	X3189	X3013	T2912
R4159	R4085	H3994	L3888	L3716	X3609	X3296	X3190	X3014	A2913
L4164	R4088	V3995	Q3889	D3717	X3610	X3297	X3191	X3015	R2914
S4169	I4089	F3996	L3890	E3718	X3611	X3298	X3192	X3016	E2915
E4172	K4090	A3997	L3891	D3719	X3612	X3299	X3193	X3017	A2917
Y4173	K4091	E3998	Y3720	Y3725	X3613	X3300	X3194	X3018	R2919
F4174	Q4094	N3896	Y3725	A3730	L3641	X3301	X3195	X3019	R2920
R4175	K4095	N3897	A3730	H3734	Y3642	X3302	X3196	X3020	E2921
R4180	K4096	D3898	H3734	L3735	P3645	X3303	X3197	X3021	A2922
L4181	K4097	F3899	L3735	E3736	T3646	X3304	X3198	X3022	Q2924
E4182	S4007	Q3900	E3736	E3737	C3649	X3305	X3199	X3023	E2925
R4188	S4008	N3901	E3737	Q3738	S3650	X3306	X3200	X3024	L2926
R4192	Q4009	Y3902	Q3738	G3739	X3653	X3307	X3201	X3025	R2928
L4193	L4010	Q3906	G3739	E3740	X3654	X3308	X3202	X3026	F2929
Y4194	D4022	T3912	E3740	E3741	X3655	X3309	X3203	X3027	L2930
T4200	M4023	Y3922	E3741	GLY	X3656	X3310	X3204	X3028	Q2931
M4201	V4024	Y3922	E3742	ALA	X3657	X3311	X3205	X3029	R2932
Q4204	V4025	L3926	E3743	L3842	X3658	X3312	X3206	X3030	H2933
R4215	L4027	Q3927	E3744	V3661	X3659	X3313	X3207	X3031	Q2934
I4218	L4028	E3928	E3745	GLU	X3660	X3314	X3208	X3032	E2935
E4224	L4028	S3929	E3746	GLU	X3661	X3315	X3209	X3033	L2936
Q4225	L4028	S3930	E3747	ALA	X3662	X3316	X3210	X3034	R2937
E4227	L4028	S3931	E3748	GLU	X3663	X3317	X3211	X3035	T2938
A4228	L4028	D3932	E3749	GLU	X3664	X3318	X3212	X3036	X2942
E4232	L4028	W3935	E3750	GLU	X3665	X3319	X3213	X3037	X2943
S4236	L4028	Y3936	E3751	GLU	X3666	X3320	X3214	X3038	X2944
D4240	L4028	Y3937	E3752	F3669	X3667	X3321	X3215	X3039	X2945
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		G3939	E3754	K3679	X3669	X3323	X3217	X3041	X2947
		K3940	E3755	A3680	X3670	X3324	X3218	X3042	X2948
		D3941	E3756	E3681	X3671	X3325	X3219	X3043	X2949
		E3945	K3756	E3682	X3672	X3326	X3220	X3044	X2950
		Q3946	E3757	E3683	X3673	X3327	X3221	X3045	X2951
		R3949	M3758	E3684	X3674	X3328	X3222	X3046	X2952
		N3950	E3759	E3685	X3675	X3329	X3223	X3047	X2953
		F3951	E3760	E3686	X3676	X3330	X3224	X3048	X2954
		K3959	K3761	E3687	X3677	X3331	X3225	X3049	X2955
		Q3960	R3762	E3688	X3678	X3332	X3226	X3050	X2956
			L3770	E3689	X3679	X3333	X3227	X3051	K2959
			H3771	E3690	X3680	X3334	X3228	X3052	X2965
			T3772	E3691	X3681	X3335	X3229	X3053	X2968
			R3773	E3692	X3682	X3336	X3230	X3054	X2968
			A3776	E3693	X3683	X3337	X3231	X3055	X2968
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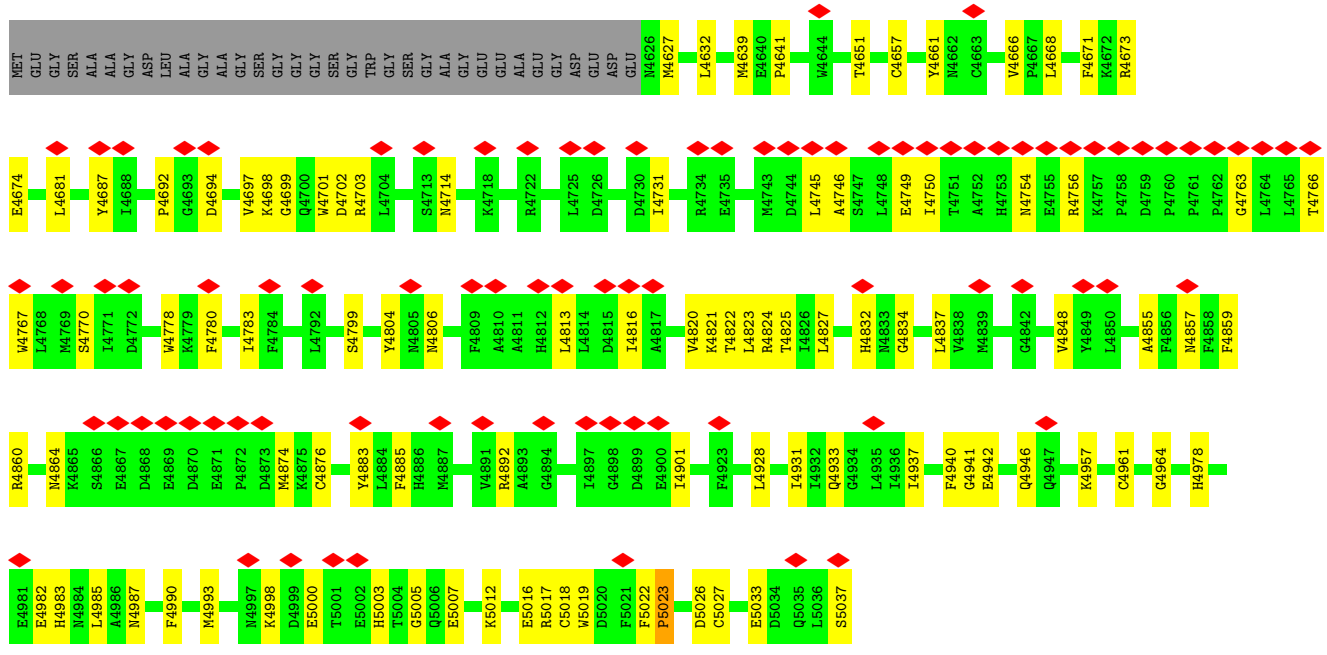




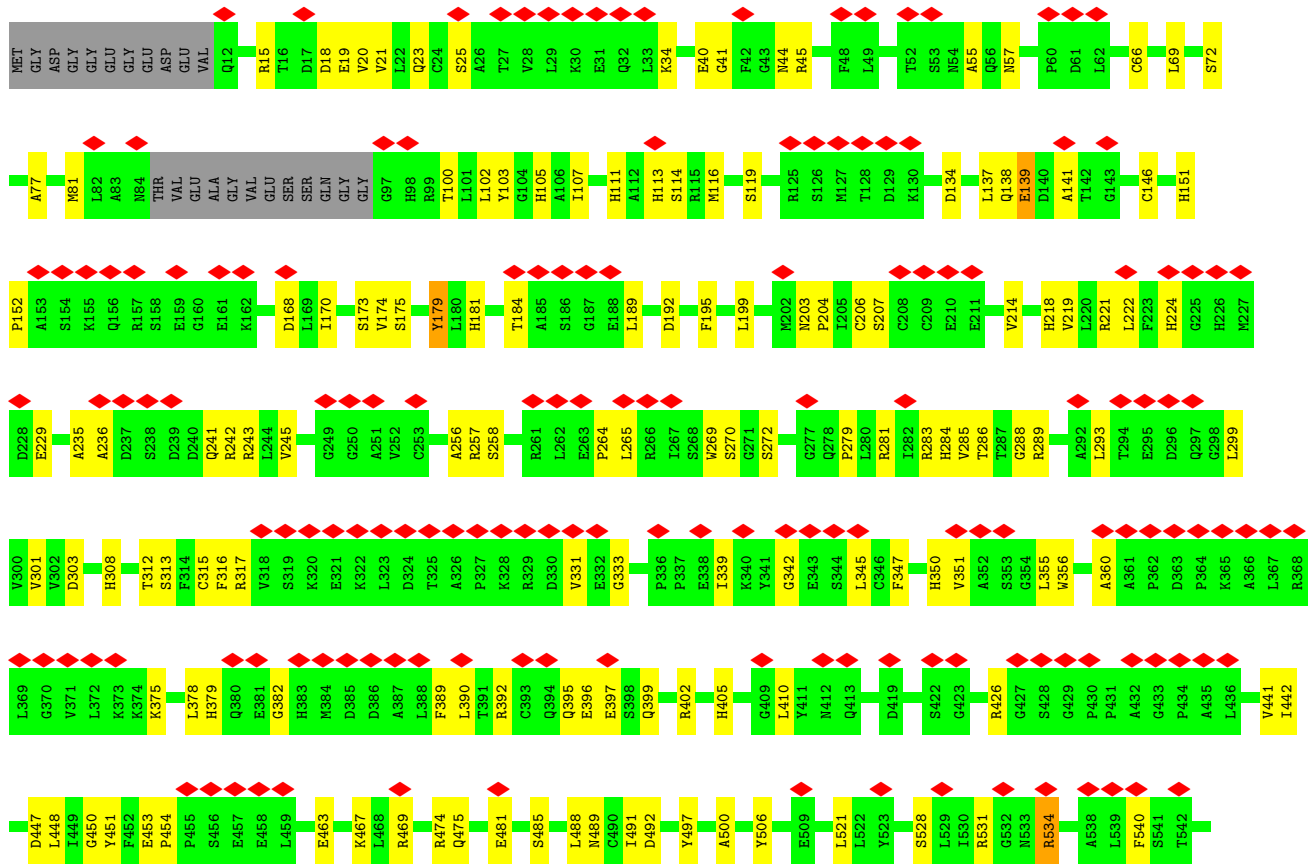


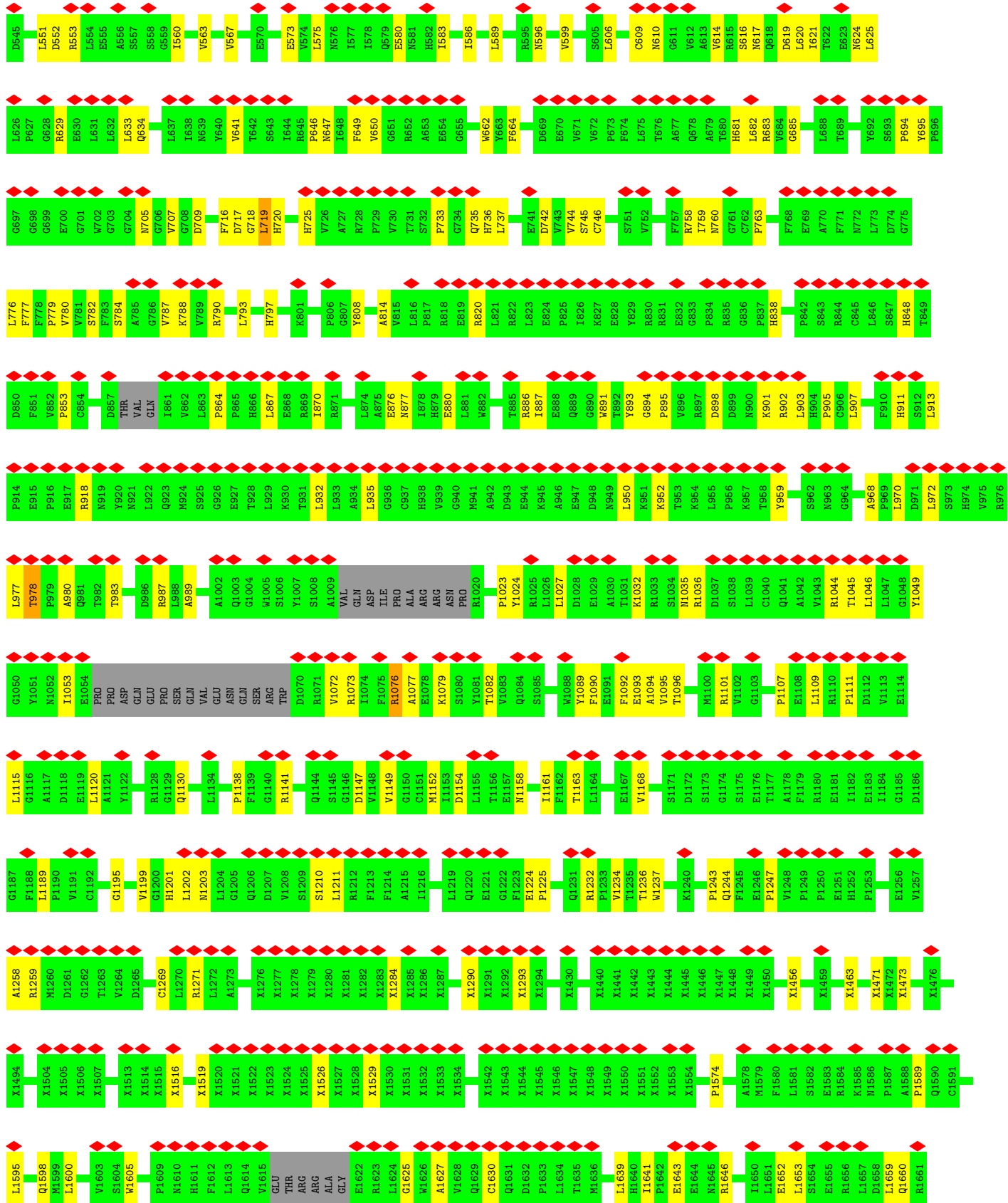


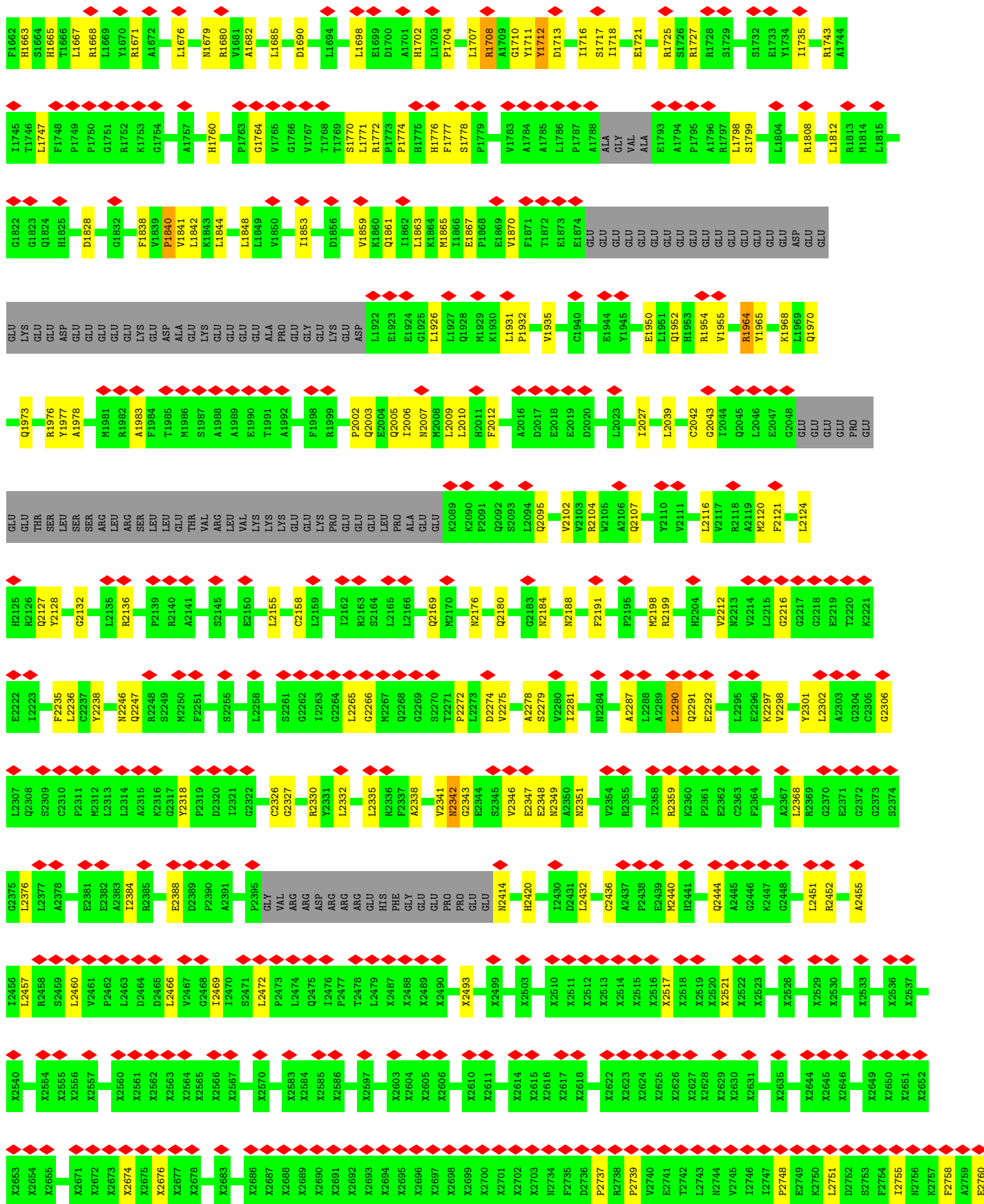




● Molecule 1: Ryanodine receptor 1

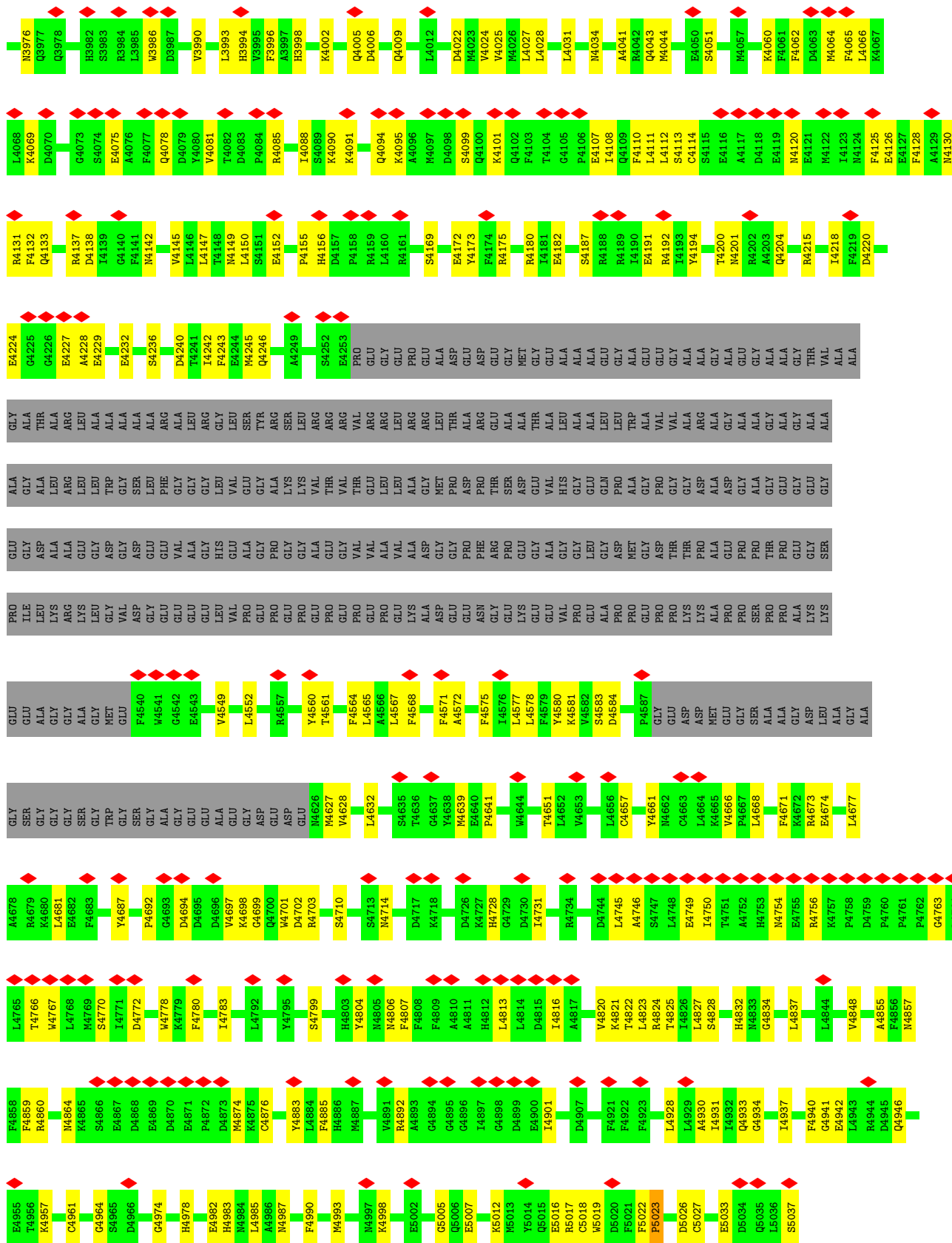








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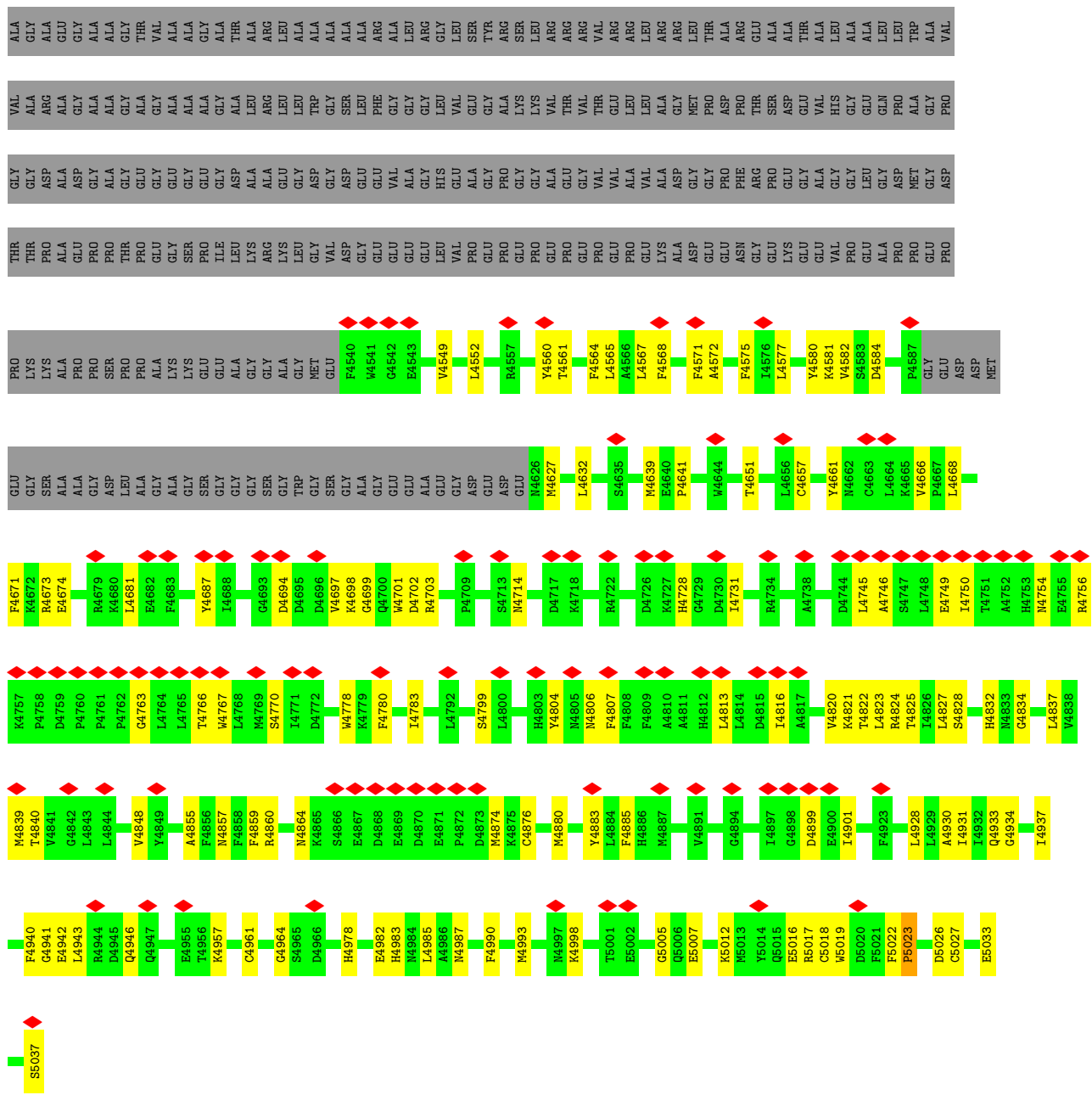
• Molecule 1: Ryanodine receptor 1



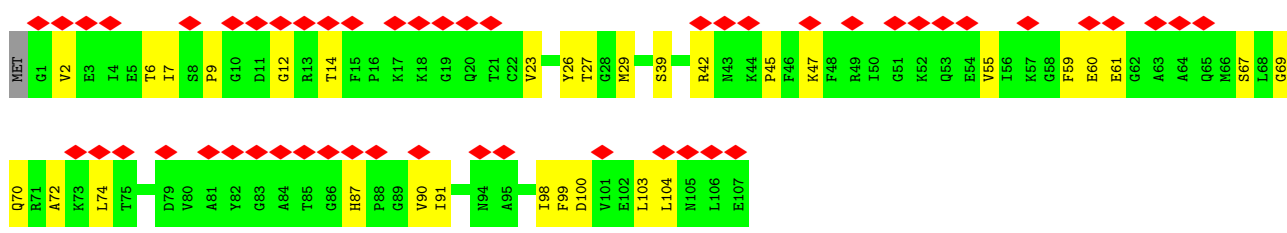


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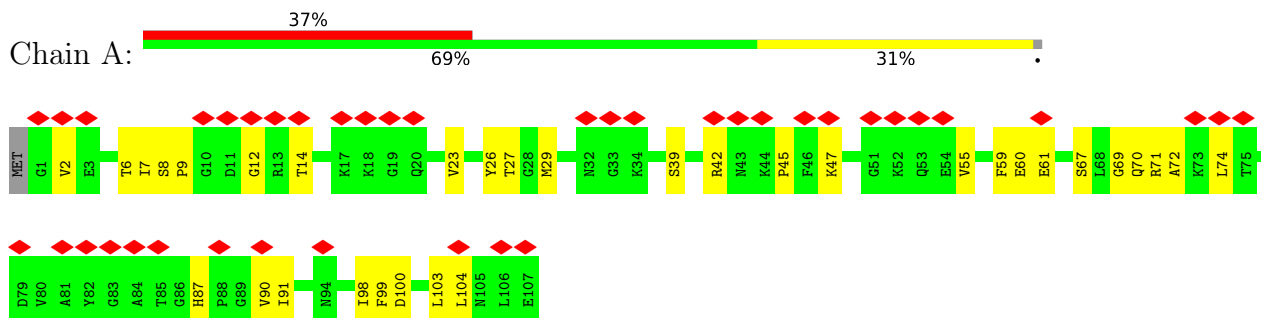
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E4206	M4124	D4063	C3972	Q8889	D3818	K3658	X3552	X3397	X3318	X3220	X3046
R4215	F4125	M4064	F3973	L3890	Y3819	A3660	X3556	X3398	X3319	X3221	X3047
R4219	E4126	F4065	N3976	L3891	L3820	K3661	X3560	X3411	X3320	X3222	X3048
F4219	E4127	L4066	C3892	C3892	K3821	E3737	X3562	X3412	X3321	X3223	X3049
D4220	F4128	K4067	E3893	E3893	D3822	G3738	X3566	X3413	X3322	X3224	X3050
E4224	M4129	L4068	N3896	N3896	F3829	N3741	X3568	X3414	X3330	X3225	X3053
G4225	K4069	R4069	D3898	D3898	R3829	G3739	X3569	X3415	X3333	X3226	X3060
G4226	D4070	I4071	N3897	N3897	Q3830	E3740	X3570	X3419	X3334	X3227	X3061
G4227	I4072	V4072	S3931	S3931	GLU	GLU	X3571	X3423	X3335	X3228	X3062
A4228	G4073	A4073	I3832	I3832	ALA	ALA	X3572	X3424	X3336	X3229	X3063
E4229	D3987	D3987	Q3833	Q3833	GLU	GLU	X3576	X3425	X3337	X3230	X3134
E4232	V3990	V3990	M3836	M3836	E3747	E3747	X3577	X3426	X3338	X3231	X3135
S4236	G3991	G3991	Q3837	Q3837	E3748	E3748	X3581	X3427	X3339	X3232	X3136
D4240	L3993	L3993	S3840	S3840	V3749	V3749	X3582	X3428	X3340	X3233	X3137
F4243	H3995	H3995	Y3841	Y3841	E3750	E3750	X3583	X3429	X3341	X3234	X3138
A4244	F3997	F3997	L3842	L3842	V3751	V3751	X3584	X3430	X3342	X3235	X3139
M4245	A3997	A3997	D3843	D3843	S3752	S3752	X3585	X3431	X3343	X3236	X3140
S4151	H3998	H3998	L3844	L3844	F3753	F3753	X3586	X3432	X3344	X3237	X3141
E4152	M4001	M4001	L3845	L3845	E3755	E3755	X3587	X3433	X3345	X3238	X3142
P4155	K4002	K4002	M3845	M3845	K3756	K3756	X3588	X3434	X3346	X3239	X3143
M4156	Q4005	Q4005	E3848	E3848	E3685	E3685	X3589	X3435	X3347	X3240	X3158
M4157	D4006	D4006	Q3927	Q3927	E3686	E3686	X3590	X3436	X3348	X3241	X3161
P4158	S4007	S4007	E3928	E3928	E3687	E3687	X3591	X3461	X3349	X3242	X3162
R4159	D4008	D4008	N3851	N3851	E3688	E3688	X3592	X3462	X3350	X3243	X3163
L4160	S4009	S4009	K3852	K3852	E3689	E3689	X3593	X3463	X3351	X3244	X3170
R4161	Q4009	Q4009	A3853	A3853	E3690	E3690	X3594	X3464	X3352	X3245	X3171
E4165	L4019	L4019	E3854	E3854	V3690	V3690	X3595	X3465	X3353	X3246	X3172
S4169	D4022	D4022	Q3955	Q3955	E3691	E3691	X3596	X3466	X3354	X3247	X3173
E4172	M4023	M4023	Y3936	Y3936	E3692	E3692	X3597	X3467	X3355	X3248	X3174
F4173	V4024	V4024	Y3937	Y3937	E3693	E3693	X3598	X3468	X3356	X3249	X3175
R4175	M4026	M4026	S3938	S3938	E3694	E3694	X3599	X3469	X3357	X3250	X3176
R4180	V4025	V4025	G3939	G3939	E3695	E3695	X3600	X3470	X3358	X3251	X3177
I4181	M4027	M4027	Q3940	Q3940	E3696	E3696	X3605	X3471	X3359	X3252	X3189
E4182	L4027	L4027	D3941	D3941	E3697	E3697	X3606	X3472	X3360	X3253	X3190
S4187	L4028	L4028	V3942	V3942	E3698	E3698	X3607	X3473	X3361	X3254	X3191
E4172	L4031	L4031	Y3945	Y3945	E3699	E3699	X3608	X3474	X3362	X3255	X3192
F4173	Q4102	Q4102	Q3946	Q3946	E3700	E3700	X3609	X3475	X3363	X3256	X3193
R4175	F4103	F4103	E3945	E3945	L3710	L3710	X3610	X3476	X3364	X3257	X3194
R4180	T4104	T4104	Q3946	Q3946	E3712	E3712	X3611	X3477	X3365	X3258	X3195
I4181	G4105	G4105	R3949	R3949	E3713	E3713	X3612	X3478	X3366	X3259	X3196
E4182	P4106	P4106	N3950	N3950	S3714	S3714	X3613	X3479	X3367	X3260	X3197
S4187	Q4107	Q4107	F3951	F3951	K3715	K3715	X3614	X3501	X3368	X3261	X3200
R4188	I4108	I4108	M3955	M3955	L3716	L3716	X3615	X3502	X3369	X3262	X3213
E4191	Q4109	Q4109	K3955	K3955	L3717	L3717	X3616	X3503	X3370	X3263	X3214
R4192	F4110	F4110	Q3959	Q3959	L3718	L3718	X3617	X3504	X3371	X3264	X3215
I4193	L4111	L4111	K3959	K3959	E3719	E3719	X3618	X3505	X3372	X3265	
Y4194	S4113	S4113	V3961	V3961	D3719	D3719	X3619	X3506	X3373	X3266	
	C4115	C4115	F3962	F3962	Y3720	Y3720	X3620	X3507	X3374	X3267	
	E4116	E4116			L3641	L3641	X3621	X3508	X3375	X3268	
	A4117	A4117			Y3642	Y3642	X3622	X3509	X3376	X3269	
	D4118	D4118			N3643	N3643	X3623	X3510	X3377	X3270	
	E4119	E4119			T3646	T3646	X3624	X3511	X3378	X3271	
					H3647	H3647	X3625	X3512	X3379	X3272	
					R3648	R3648	X3626	X3513	X3380	X3273	
							X3627	X3514	X3381	X3274	
							X3628	X3515	X3382	X3275	
							X3629	X3516	X3383	X3276	
							X3630	X3517	X3384	X3277	
							X3631	X3518	X3385	X3278	
							X3632	X3519	X3386	X3279	
							X3633	X3520	X3387	X3280	
							X3634	X3521	X3388	X3281	
							X3635	X3522	X3389	X3282	
							X3636	X3523	X3390	X3283	
							X3637	X3524	X3391	X3284	
							X3638	X3525	X3392	X3285	
							X3639	X3526	X3393	X3286	
							X3640	X3527	X3394	X3287	
							X3641	X3528	X3395	X3288	
							X3642	X3529	X3396	X3289	
							X3643	X3530	X3397	X3290	
							X3644	X3531	X3398	X3291	
							X3645	X3532	X3399	X3292	
							X3646	X3533	X3400	X3293	
							X3647	X3534	X3401	X3294	
							X3648	X3535	X3402	X3295	
							X3649	X3536	X3403	X3296	
							X3650	X3537	X3404	X3297	
							X3651	X3538	X3405	X3298	
							X3652	X3539	X3406	X3299	
							X3653	X3540	X3407	X3300	
							X3654	X3541	X3408	X3301	
							X3655	X3542	X3409	X3302	
							X3656	X3543	X3410	X3303	
							X3657	X3544	X3411	X3304	
							X3658	X3545	X3412	X3305	
							X3659	X3546	X3413	X3306	
							X3660	X3547	X3414	X3307	
							X3661	X3548	X3415	X3308	
							X3662	X3549	X3416	X3309	
							X3663	X3550	X3417	X3310	
							X3664	X3551	X3418	X3311	
							X3665	X3552	X3419	X3312	
							X3666	X3553	X3420	X3313	
							X3667	X3554	X3421	X3314	
							X3668	X3555	X3422	X3315	
							X3669	X3556	X3423	X3316	
							X3670	X3557	X3424	X3317	
							X3671	X3558	X3425	X3318	
							X3672	X3559	X3426	X3319	
							X3673	X3560	X3427	X3320	
							X3674	X3561	X3428	X3321	
							X3675	X3562	X3429	X3322	
							X3676	X3563	X3430	X3323	
							X3677	X3564	X3431	X3324	
							X3678	X3565	X3432	X3325	
							X3679	X3566	X3433	X3326	
							X3680	X3567	X3434	X3327	
							X3681	X3568	X3435	X3328	
							X3682	X3569	X3436	X3329	
							X3683	X3570	X3437	X3330	
							X3684	X3571	X3438	X3331	
							X3685	X3572	X3439	X3332	
							X3686	X3573	X3440	X3333	
							X3687	X3574	X3441	X3334	
							X3688	X3575	X3442	X3335	
							X3689	X3576	X3443	X3336	
							X3690	X3577	X3444	X3337	
							X3691	X3578	X3445	X3338	
							X3692	X3579	X3446	X3339	
							X3693	X3580	X3447	X3340	
							X3694	X3581	X3448	X3341	
							X3695	X3582	X3449	X3342	
							X3696	X3583	X3450	X3343	
							X3697	X3584	X3451	X3344	
							X3698	X3585	X3452	X3345	
							X3699	X3586	X3453	X3346	
							X3700	X3587	X3454	X3347	
							X3701	X3588	X3455	X3348	
							X3702	X3589	X3456	X3349	
							X3703	X3590	X3457	X3350	
							X3704	X3591	X3458	X3351	
							X3705	X3592	X3459	X3352	
							X				



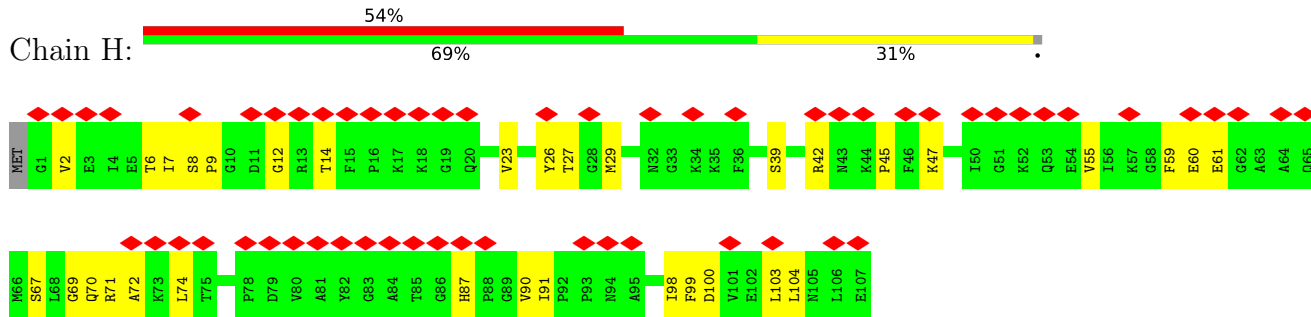
• Molecule 2: Peptidyl-prolyl cis-trans isomerase FKBP1B



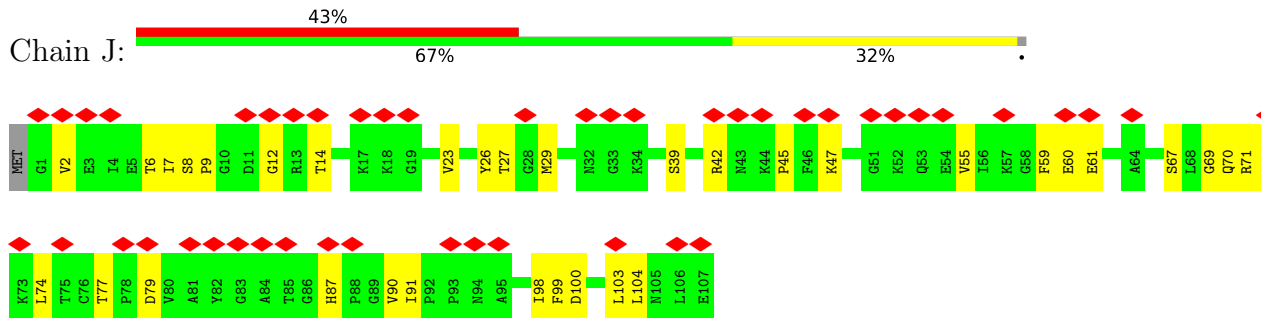
• Molecule 2: Peptidyl-prolyl cis-trans isomerase FKBP1B



● 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	791956	Depositor
Resolution determination method	OTHER	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI POLARA 300	Depositor
Voltage (kV)	300	Depositor
Electron dose ( $e^-/\text{\AA}^2$ )	50	Depositor
Minimum defocus (nm)	Not provided	
Maximum defocus (nm)	Not provided	
Magnification	Not provided	
Image detector	GATAN K2 SUMMIT (4k x 4k)	Depositor
Maximum map value	0.535	Depositor
Minimum map value	-0.203	Depositor
Average map value	0.001	Depositor
Map value standard deviation	0.026	Depositor
Recommended contour level	0.166	Depositor
Map size ( $\text{\AA}$ )	502.0, 502.0, 502.0	wwPDB
Map dimensions	400, 400, 400	wwPDB
Map angles ( $^\circ$ )	90.0, 90.0, 90.0	wwPDB
Pixel spacing ( $\text{\AA}$ )	1.255, 1.255, 1.255	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, 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	B	0.35	0/25428	0.59	6/34534 (0.0%)
1	E	0.35	0/25428	0.59	6/34534 (0.0%)
1	G	0.35	0/25428	0.59	6/34534 (0.0%)
1	I	0.35	0/25428	0.59	6/34534 (0.0%)
2	A	0.35	0/834	0.61	0/1123
2	F	0.35	0/834	0.61	0/1123
2	H	0.35	0/834	0.61	0/1123
2	J	0.35	0/834	0.61	0/1123
All	All	0.35	0/105048	0.59	24/142628 (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	B	0	22
1	E	0	22
1	G	0	22
1	I	0	22
All	All	0	88

There are no bond length outliers.

The worst 5 of 24 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	E	1667	LEU	CA-CB-CG	6.67	130.64	115.30
1	B	1667	LEU	CA-CB-CG	6.66	130.62	115.30
1	G	1667	LEU	CA-CB-CG	6.64	130.56	115.30
1	I	1667	LEU	CA-CB-CG	6.62	130.53	115.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	977	LEU	CA-CB-CG	5.60	128.18	115.30

There are no chirality outliers.

5 of 88 planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	B	139	GLU	Peptide
1	B	179	TYR	Peptide
1	B	552	ASP	Peptide
1	B	694	PRO	Peptide
1	B	808	TYR	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	B	29369	0	24717	498	0
1	E	29369	0	24716	494	0
1	G	29369	0	24717	506	0
1	I	29369	0	24717	497	0
2	A	818	0	824	19	0
2	F	818	0	824	19	0
2	H	818	0	824	19	0
2	J	818	0	824	20	0
3	B	1	0	0	0	0
3	E	1	0	0	0	0
3	G	1	0	0	0	0
3	I	1	0	0	0	0
4	B	1	0	0	0	0
4	E	1	0	0	0	0
4	G	1	0	0	0	0
4	I	1	0	0	0	0
All	All	120756	0	102163	2047	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 9.

The worst 5 of 2047 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:G:2318:TYR:HH	1:G:2414:ASN:N	1.80	0.79
1:I:2318:TYR:HH	1:I:2414:ASN:N	1.80	0.79
1:E:2318:TYR:HH	1:E:2414:ASN:N	1.81	0.79
1:B:2318:TYR:HH	1:B:2414:ASN:N	1.81	0.79
1:E:179:TYR:OH	1:G:2359:ARG:NH1	2.18	0.76

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	B	3235/4687 (69%)	2875 (89%)	355 (11%)	5 (0%)	47	81
1	E	3235/4687 (69%)	2874 (89%)	356 (11%)	5 (0%)	47	81
1	G	3235/4687 (69%)	2876 (89%)	354 (11%)	5 (0%)	47	81
1	I	3235/4687 (69%)	2876 (89%)	354 (11%)	5 (0%)	47	81
2	A	105/108 (97%)	94 (90%)	11 (10%)	0	100	100
2	F	105/108 (97%)	94 (90%)	11 (10%)	0	100	100
2	H	105/108 (97%)	94 (90%)	11 (10%)	0	100	100
2	J	105/108 (97%)	94 (90%)	11 (10%)	0	100	100
All	All	13360/19180 (70%)	11877 (89%)	1463 (11%)	20 (0%)	54	85

5 of 20 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	1708	ARG
1	E	1708	ARG
1	I	1708	ARG
1	G	1708	ARG

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Mol	Chain	Res	Type
1	B	1932	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	B	2493/3209 (78%)	2478 (99%)	15 (1%)	86	92
1	E	2493/3209 (78%)	2478 (99%)	15 (1%)	86	92
1	G	2493/3209 (78%)	2478 (99%)	15 (1%)	86	92
1	I	2493/3209 (78%)	2478 (99%)	15 (1%)	86	92
2	A	88/89 (99%)	88 (100%)	0	100	100
2	F	88/89 (99%)	88 (100%)	0	100	100
2	H	88/89 (99%)	88 (100%)	0	100	100
2	J	88/89 (99%)	88 (100%)	0	100	100
All	All	10324/13192 (78%)	10264 (99%)	60 (1%)	86	92

5 of 60 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	E	4137	ARG
1	G	4034	ASN
1	I	1964	ARG
1	G	3896	ASN
1	G	4985	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 165 such sidechains are listed below:

Mol	Chain	Res	Type
1	I	4102	GLN
1	G	1973	GLN
1	I	4156	HIS
1	G	405	HIS

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Mol	Chain	Res	Type
1	G	3946	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 monosaccharides in this entry.

## 5.6 Ligand geometry [i](#)

Of 8 ligands modelled in this entry, 8 are monoatomic - leaving 0 for Mogul analysis.

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

## 5.7 Other polymers [i](#)

There are no such residues in this entry.

## 5.8 Polymer linkage issues [i](#)

The following chains have linkage breaks:

Mol	Chain	Number of breaks
1	E	12
1	B	12

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Mol	Chain	Number of breaks
1	I	12
1	G	12

The worst 5 of 48 chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	E	3613:UNK	C	3639:THR	N	45.91
1	B	3613:UNK	C	3639:THR	N	45.70
1	I	3613:UNK	C	3639:THR	N	45.65
1	G	3613:UNK	C	3639:THR	N	45.46
1	I	3163:UNK	C	3170:UNK	N	16.67

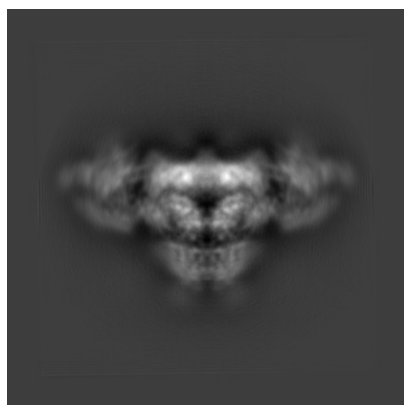
## 6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-20486. These allow visual inspection of the internal detail of the map and identification of artifacts.

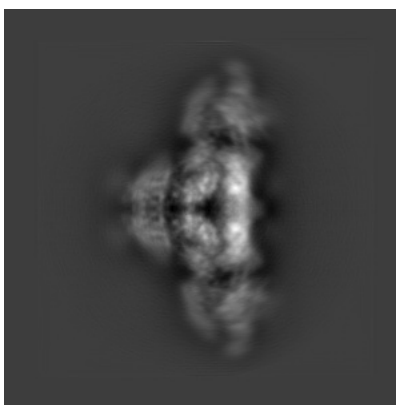
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

### 6.1 Orthogonal projections [i](#)

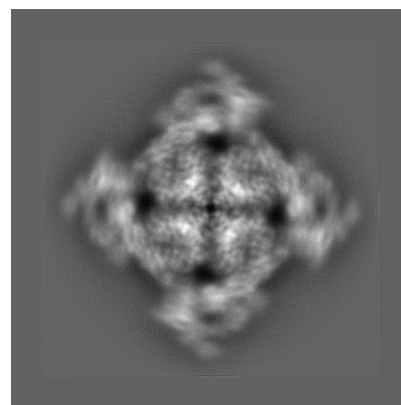
#### 6.1.1 Primary map



X



Y

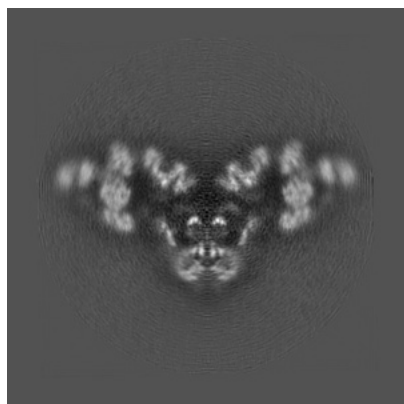


Z

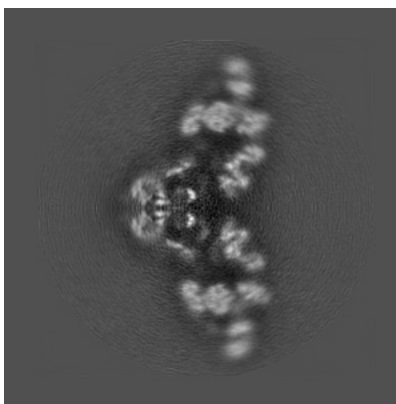
The images above show the map projected in three orthogonal directions.

### 6.2 Central slices [i](#)

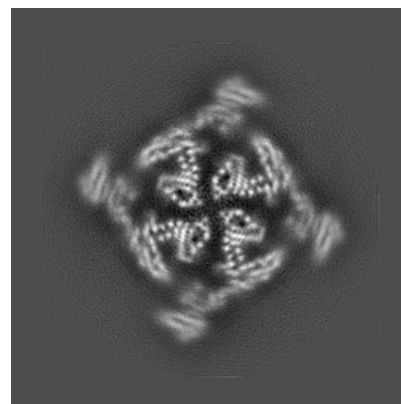
#### 6.2.1 Primary map



X Index: 200



Y Index: 200



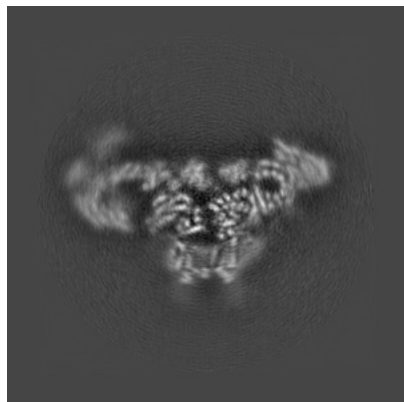
Z Index: 200



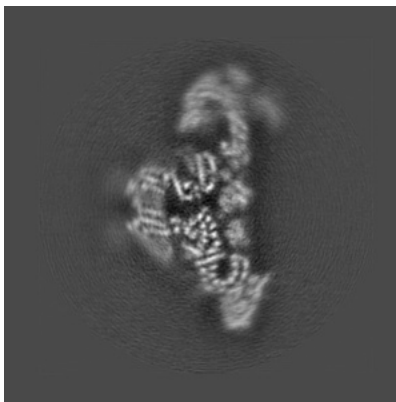
The images above show central slices of the map in three orthogonal directions.

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

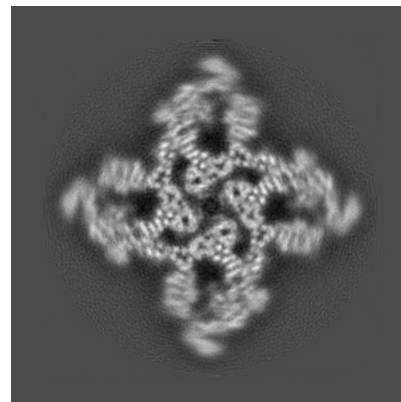
### 6.3.1 Primary map



X Index: 179



Y Index: 177



Z Index: 231

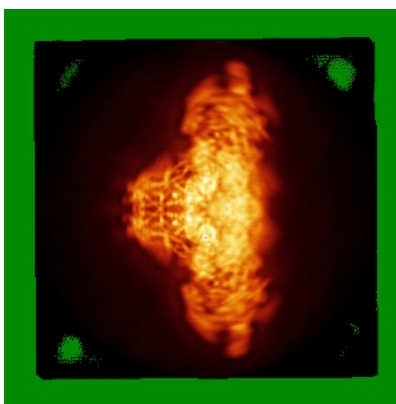
The images above show the largest variance slices of the map in three orthogonal directions.

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

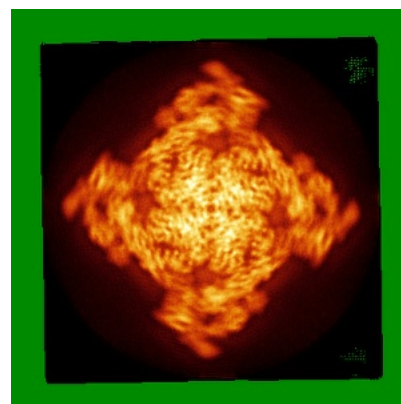
### 6.4.1 Primary map



X



Y

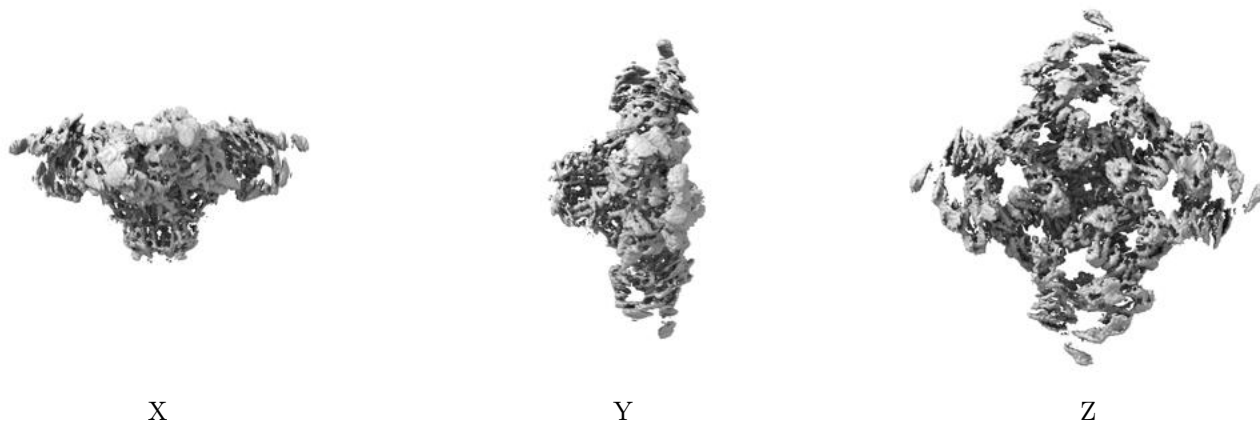


Z

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

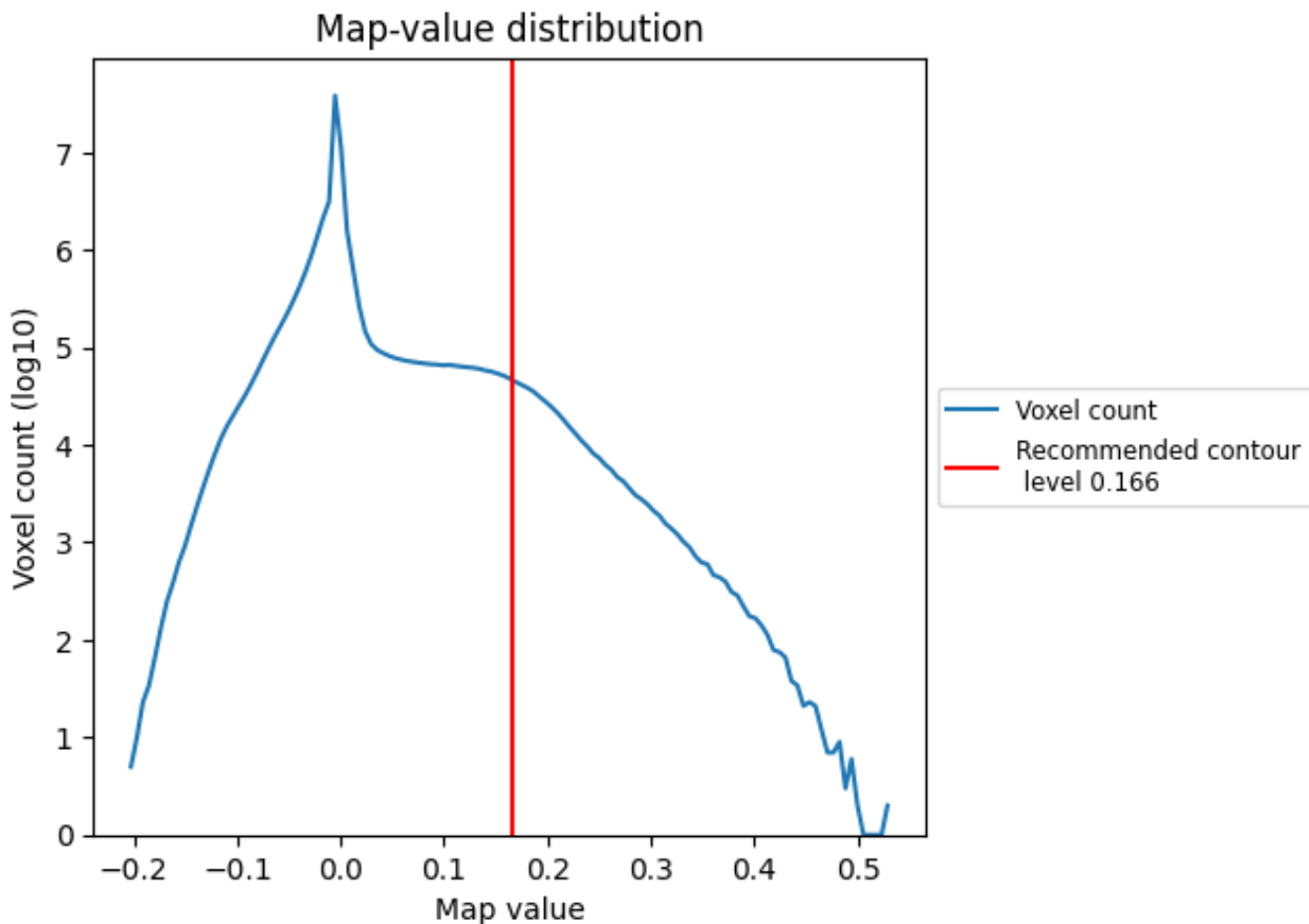
## 6.6 Mask visualisation [i](#)

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

## 7 Map analysis [i](#)

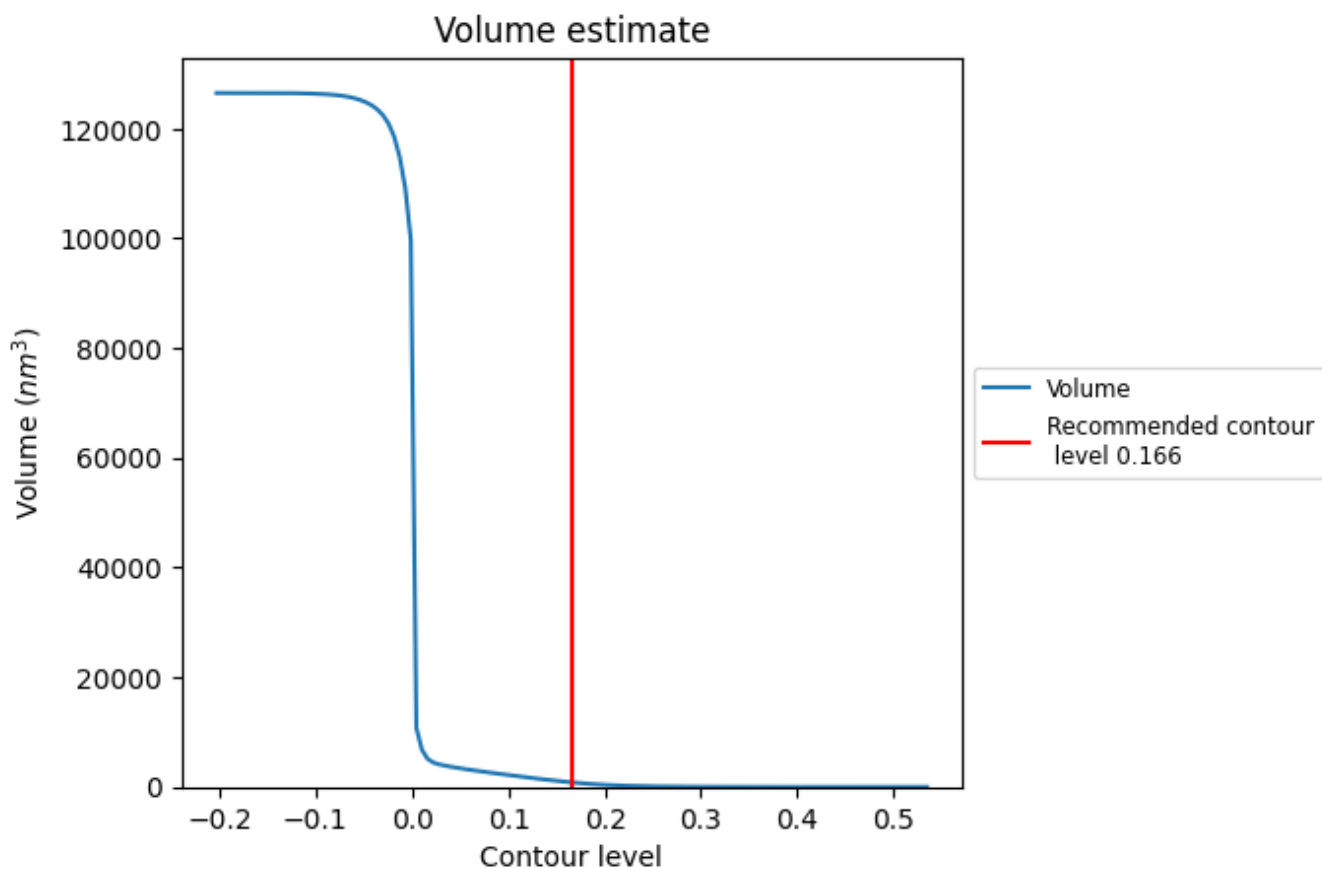
This section contains the results of statistical analysis of the map.

### 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.

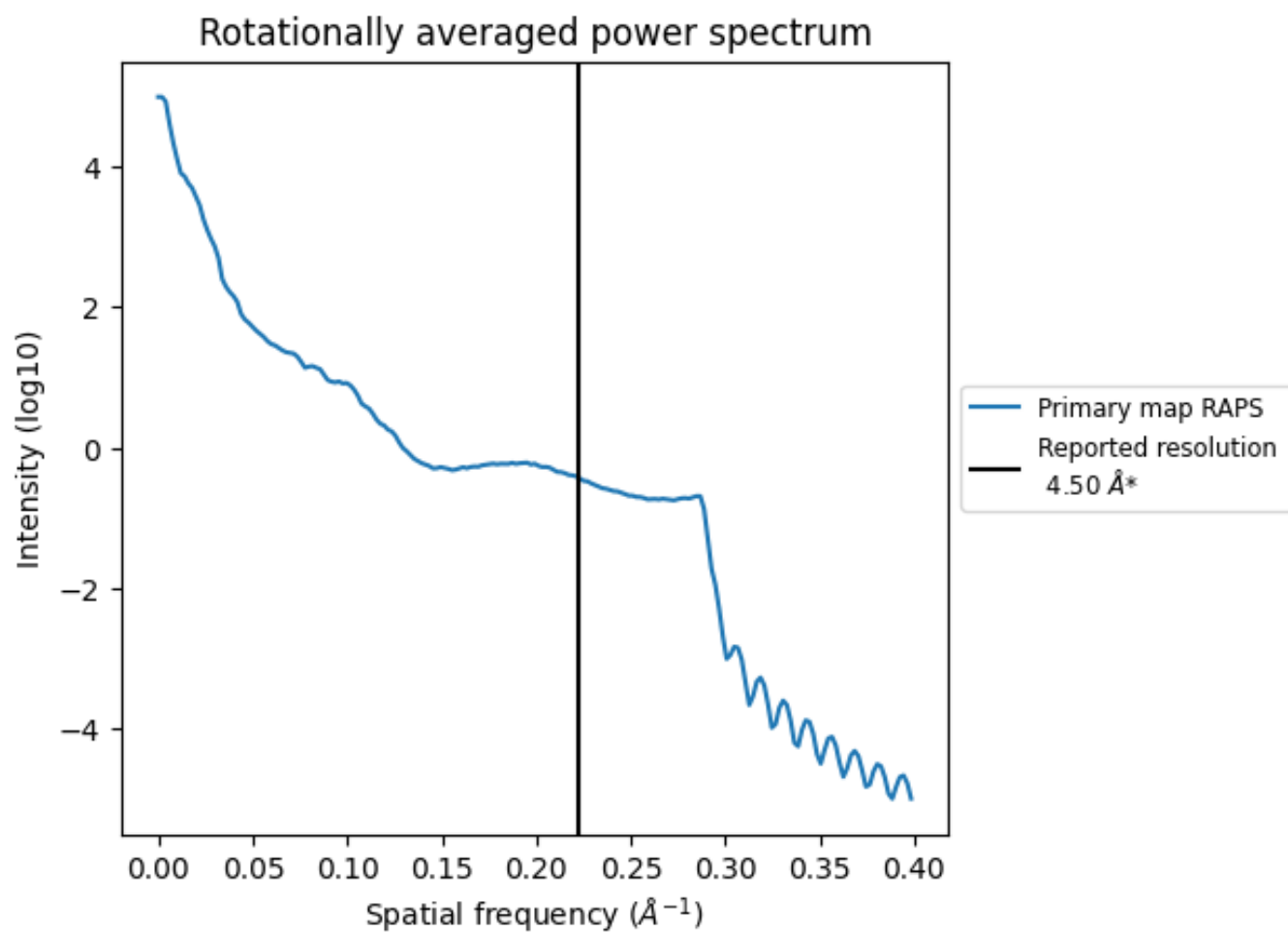
## 7.2 Volume estimate [i](#)



The volume at the recommended contour level is 830 nm<sup>3</sup>; this corresponds to an approximate mass of 750 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  $0.222 \text{\AA}^{-1}$

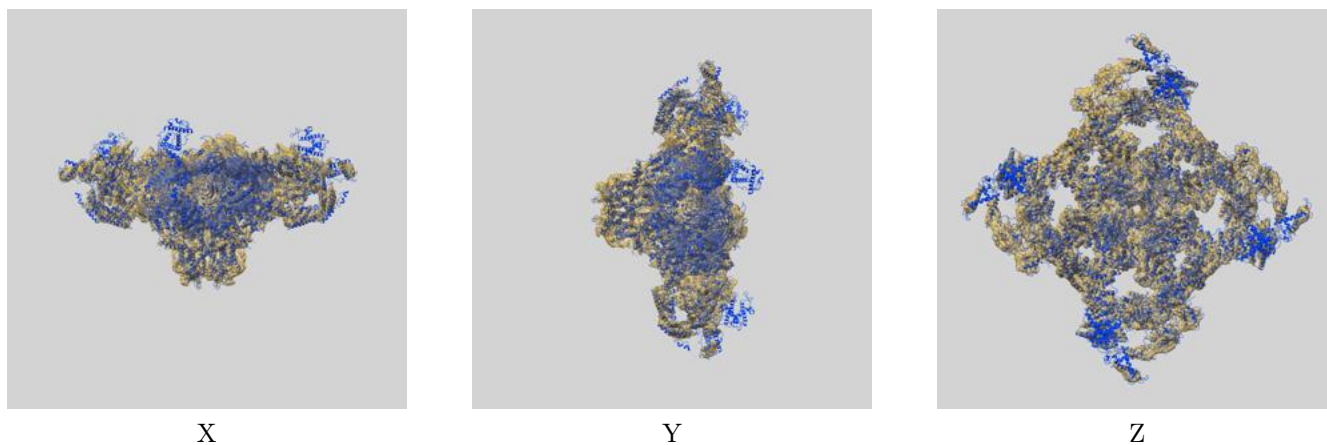
## 8 Fourier-Shell correlation

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

## 9 Map-model fit [i](#)

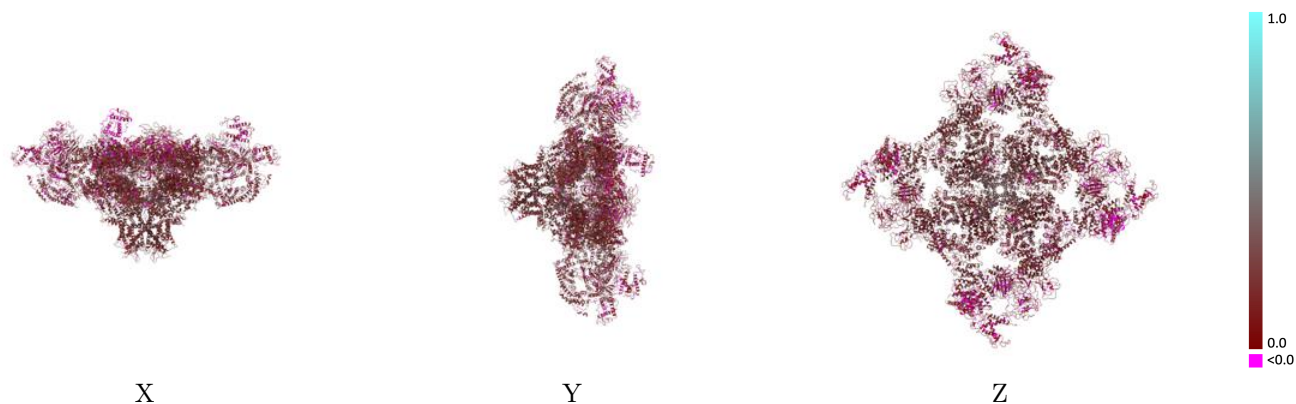
This section contains information regarding the fit between EMDB map EMD-20486 and PDB model 6PV6. Per-residue inclusion information can be found in section 3 on page 5.

### 9.1 Map-model overlay [i](#)



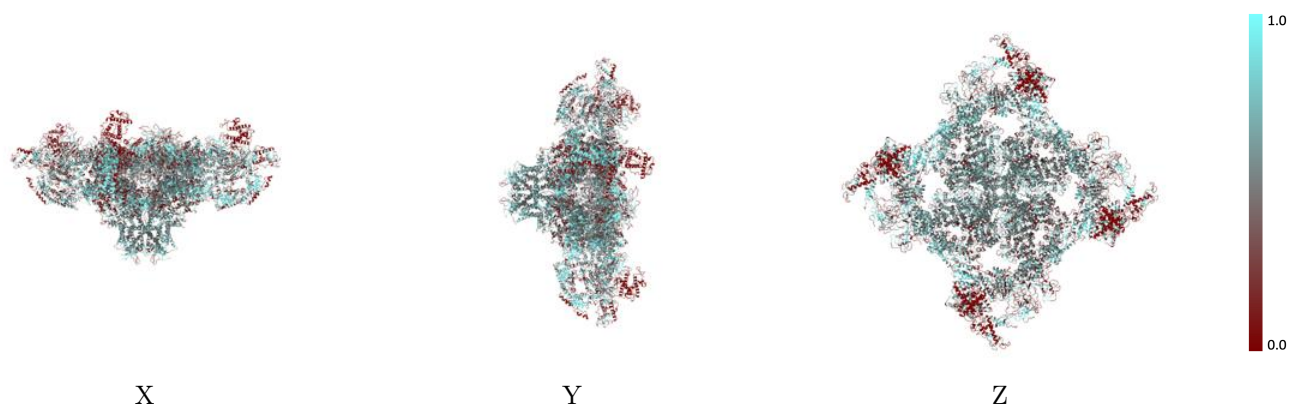
The images above show the 3D surface view of the map at the recommended contour level 0.166 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

## 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.

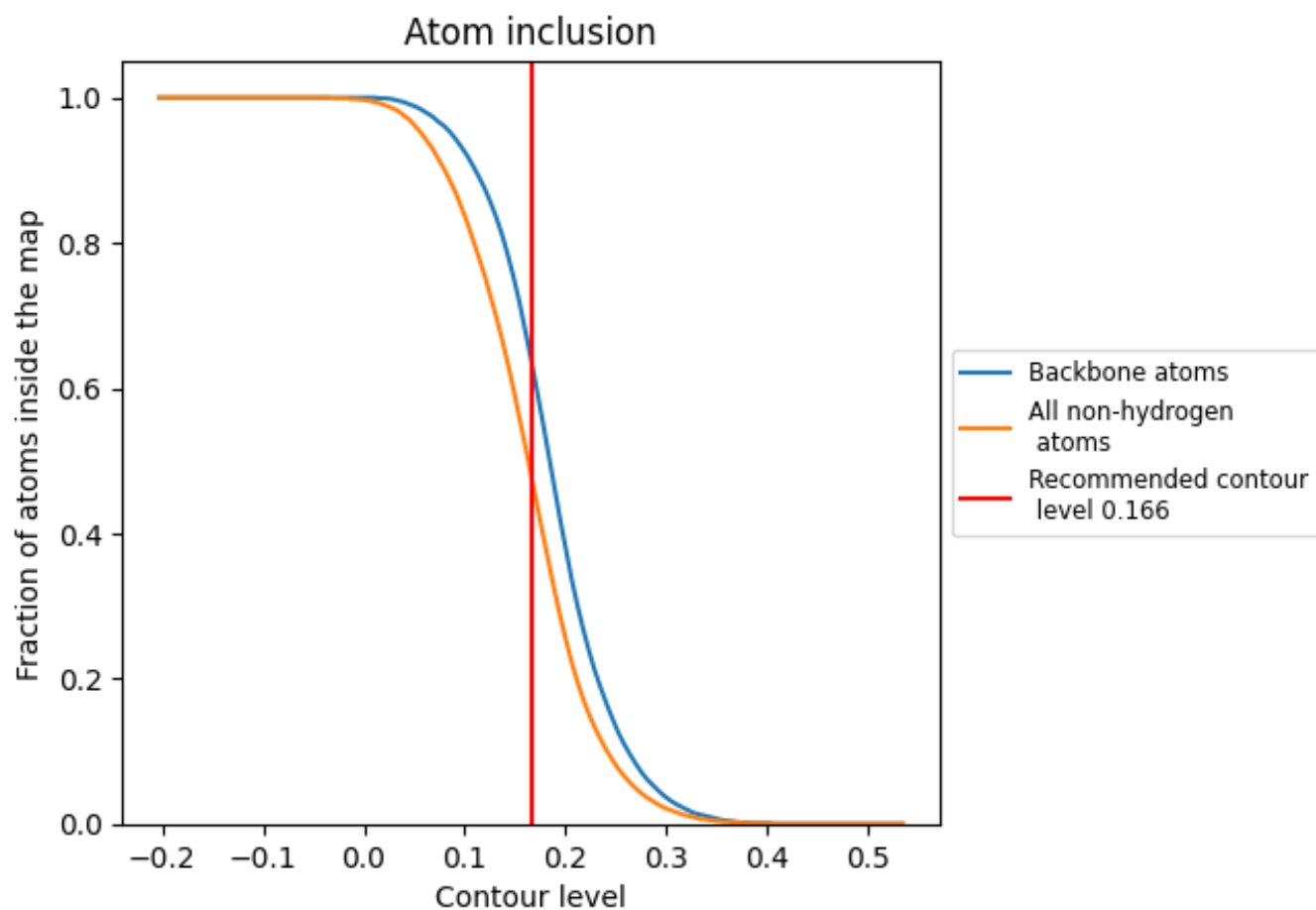
## 9.3 Atom inclusion mapped to coordinate model [i](#)



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 (0.166).





















## 9.4 Atom inclusion [i](#)



At the recommended contour level, 64% of all backbone atoms, 48% 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 (0.166) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.4790	 0.1800
A	 0.4850	 0.1850
B	 0.4970	 0.1950
E	 0.4770	 0.1780
F	 0.4270	 0.1320
G	 0.4620	 0.1660
H	 0.4110	 0.1400
I	 0.4840	 0.1860
J	 0.4700	 0.1810

