



wwPDB EM Validation Summary Report ⓘ

Nov 11, 2024 – 07:50 AM EST

PDB ID : 9C1F
EMDB ID : EMD-45117
Title : Mink RyR3 in open conformation bound to Ca²⁺/ATP/caffeine
Authors : Chen, Y.S.; Van Petegem, F.
Deposited on : 2024-05-29
Resolution : 3.22 Å (reported)
Based on initial model : 9C1E

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

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

A user guide is available at

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

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

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

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

EMDB validation analysis : 0.0.1.dev113
Mogul : 2022.3.0, CSD as543be (2022)
MolProbity : 4.02b-467
buster-report : 1.1.7 (2018)
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ : 1.9.13
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.39

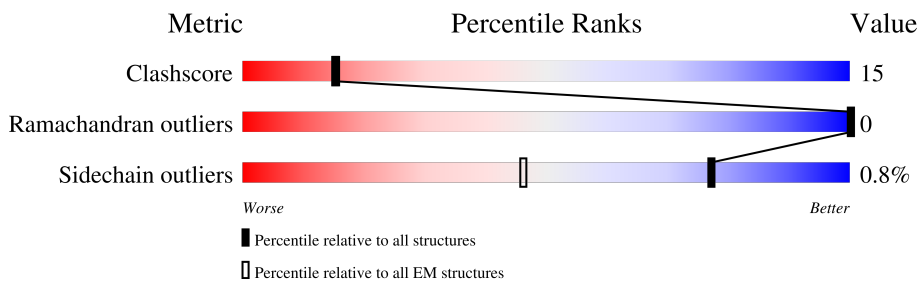
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 3.22 Å.

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



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

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

Mol	Chain	Length	Quality of chain
1	A	110	
1	C	110	
1	E	110	
1	G	110	
2	B	4859	
2	D	4859	
2	F	4859	
2	H	4859	

2 Entry composition i

There are 7 unique types of molecules in this entry. The entry contains 130508 atoms, of which 136 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 Peptidyl-prolyl cis-trans isomerase FKBP1B.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	108	815	515	145	151	4	0	0
1	C	108	815	515	145	151	4	0	0
1	E	108	815	515	145	151	4	0	0
1	G	108	815	515	145	151	4	0	0

There are 12 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-1	SER	-	expression tag	UNP P68106
A	0	ASN	-	expression tag	UNP P68106
A	1	ALA	-	expression tag	UNP P68106
C	-1	SER	-	expression tag	UNP P68106
C	0	ASN	-	expression tag	UNP P68106
C	1	ALA	-	expression tag	UNP P68106
E	-1	SER	-	expression tag	UNP P68106
E	0	ASN	-	expression tag	UNP P68106
E	1	ALA	-	expression tag	UNP P68106
G	-1	SER	-	expression tag	UNP P68106
G	0	ASN	-	expression tag	UNP P68106
G	1	ALA	-	expression tag	UNP P68106

- Molecule 2 is a protein called Ryanodine receptor 3.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	B	4076	31699	20288	5416	5789	206	0	0
2	D	4076	31699	20288	5416	5789	206	0	0
2	F	4076	31699	20288	5416	5789	206	0	0

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Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	H	4076	31699	20288	5416	5789	206	0	0

There are 12 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	733	LEU	GLN	conflict	UNP A0A8C7B9Y8
B	1078	TRP	ARG	conflict	UNP A0A8C7B9Y8
B	2075	ASP	ASN	conflict	UNP A0A8C7B9Y8
D	733	LEU	GLN	conflict	UNP A0A8C7B9Y8
D	1078	TRP	ARG	conflict	UNP A0A8C7B9Y8
D	2075	ASP	ASN	conflict	UNP A0A8C7B9Y8
F	733	LEU	GLN	conflict	UNP A0A8C7B9Y8
F	1078	TRP	ARG	conflict	UNP A0A8C7B9Y8
F	2075	ASP	ASN	conflict	UNP A0A8C7B9Y8
H	733	LEU	GLN	conflict	UNP A0A8C7B9Y8
H	1078	TRP	ARG	conflict	UNP A0A8C7B9Y8
H	2075	ASP	ASN	conflict	UNP A0A8C7B9Y8

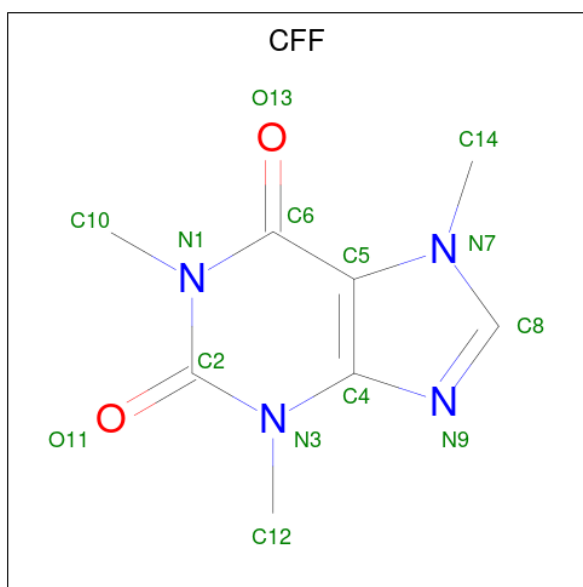
- Molecule 3 is ZINC ION (three-letter code: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		AltConf
3	B	1	Total 1	Zn 1	0
3	D	1	Total 1	Zn 1	0
3	F	1	Total 1	Zn 1	0
3	H	1	Total 1	Zn 1	0

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

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

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Mol	Chain	Residues	Atoms					AltConf
			Total	C	H	N	O	
6	B	1	24	8	10	4	2	0
6	D	1	24	8	10	4	2	0
6	F	1	24	8	10	4	2	0
6	H	1	24	8	10	4	2	0

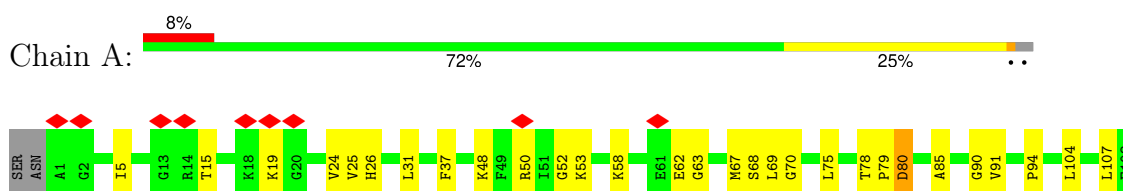
- Molecule 7 is CHLORIDE ION (three-letter code: CL) (formula: Cl) (labeled as "Ligand of Interest" by depositor).

Mol	Chain	Residues	Atoms		AltConf
			Total	Cl	
7	B	1	1	1	0
7	D	1	1	1	0
7	F	1	1	1	0
7	H	1	1	1	0

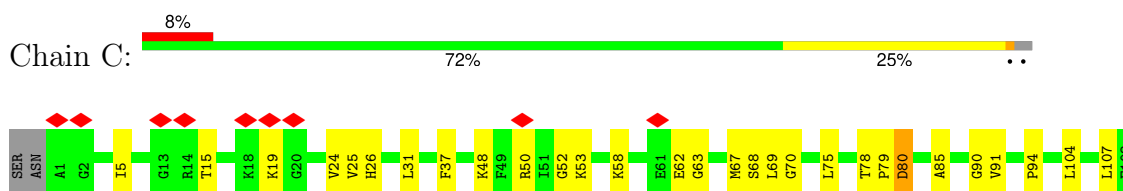
3 Residue-property plots [i](#)

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.

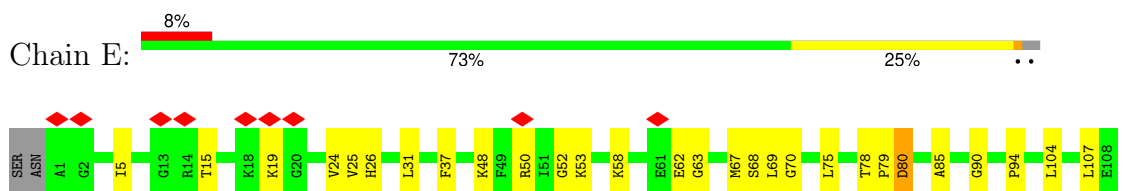
- Molecule 1: Peptidyl-prolyl cis-trans isomerase FKBP1B



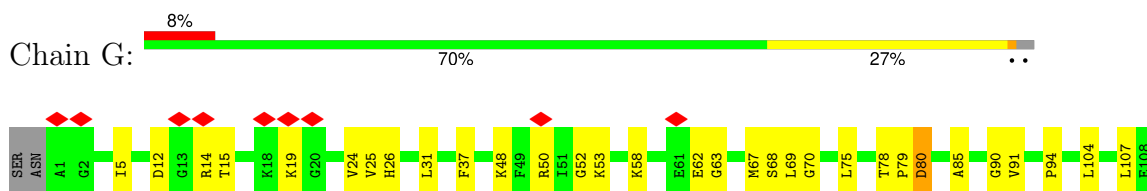
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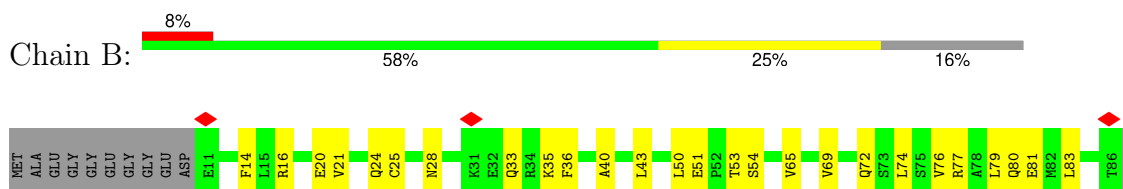
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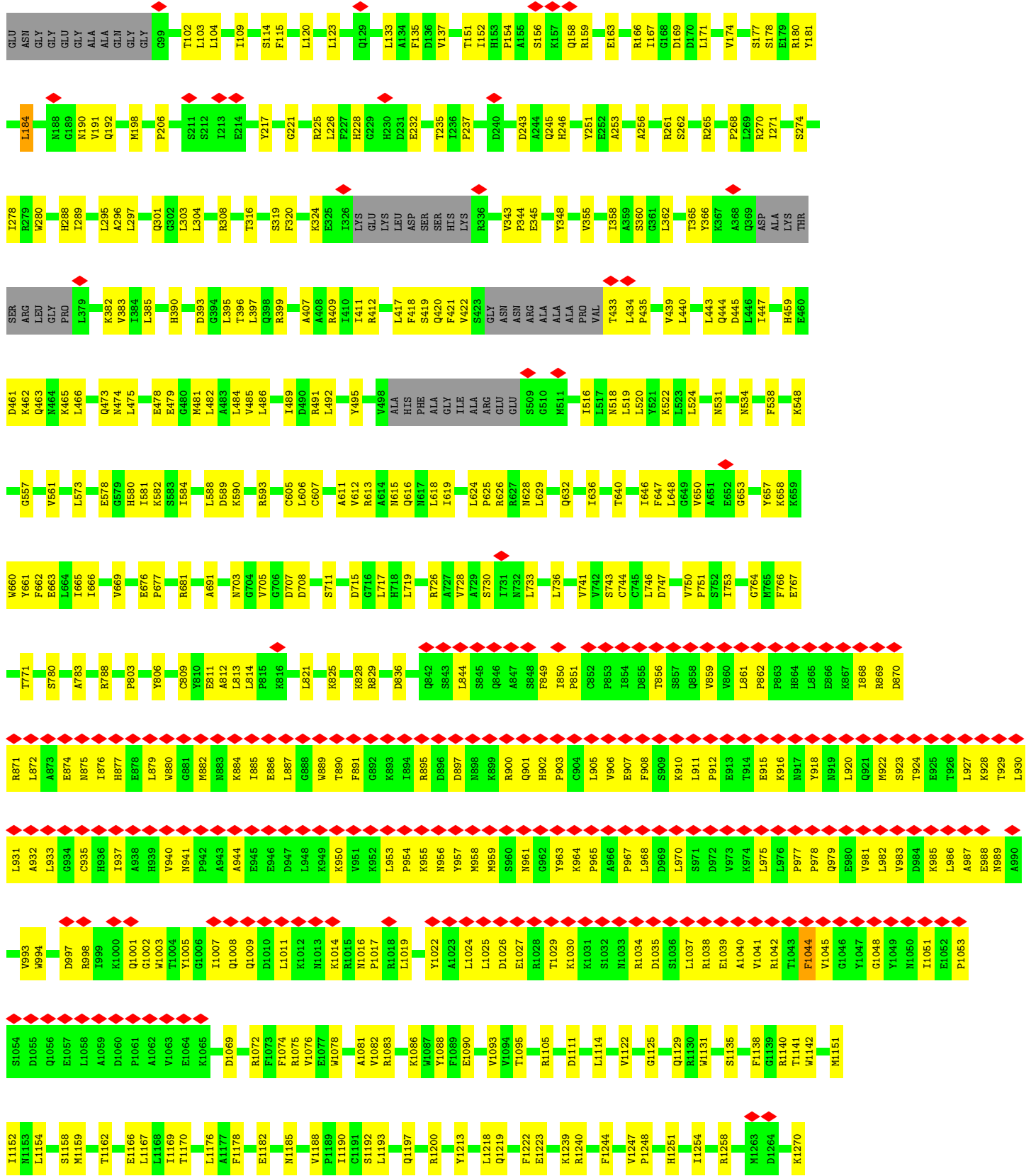


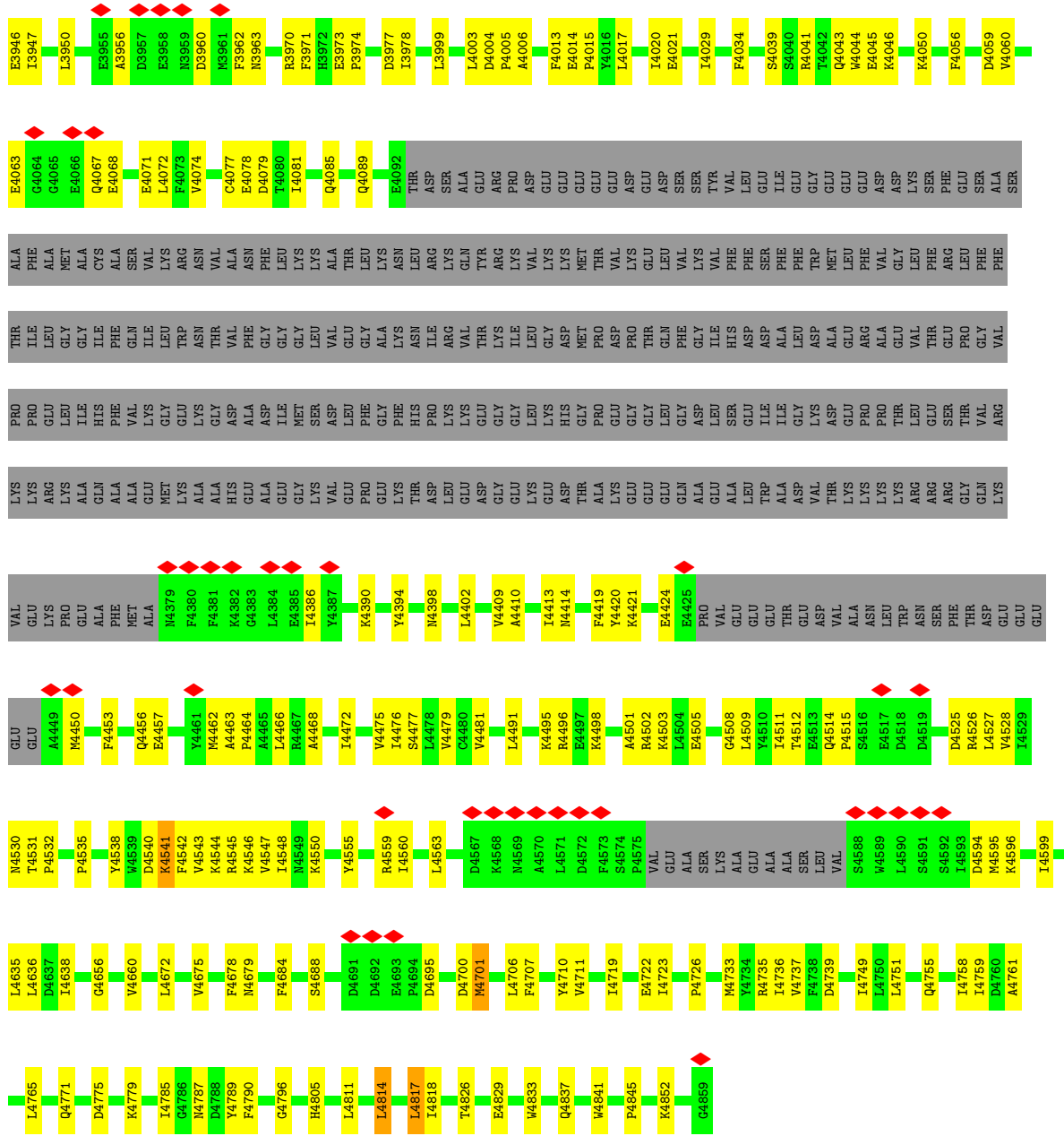
- Molecule 1: Peptidyl-prolyl cis-trans isomerase FKBP1B



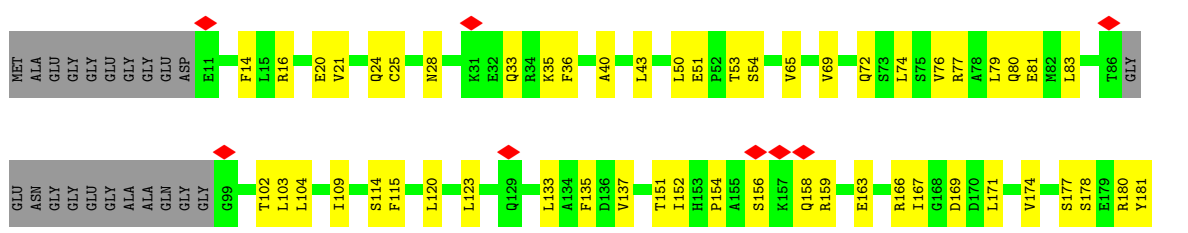
- Molecule 2: Ryanodine receptor 3

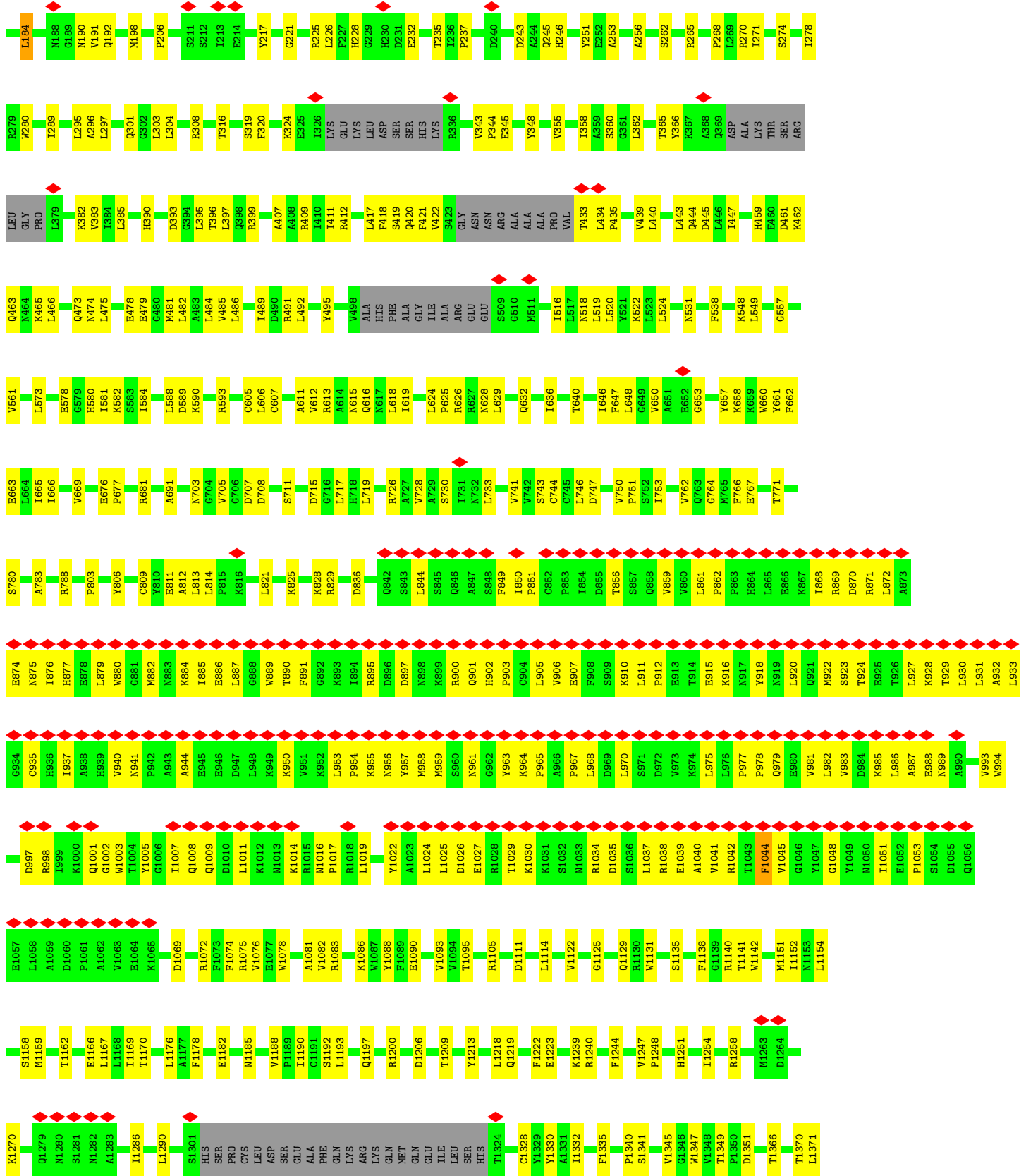


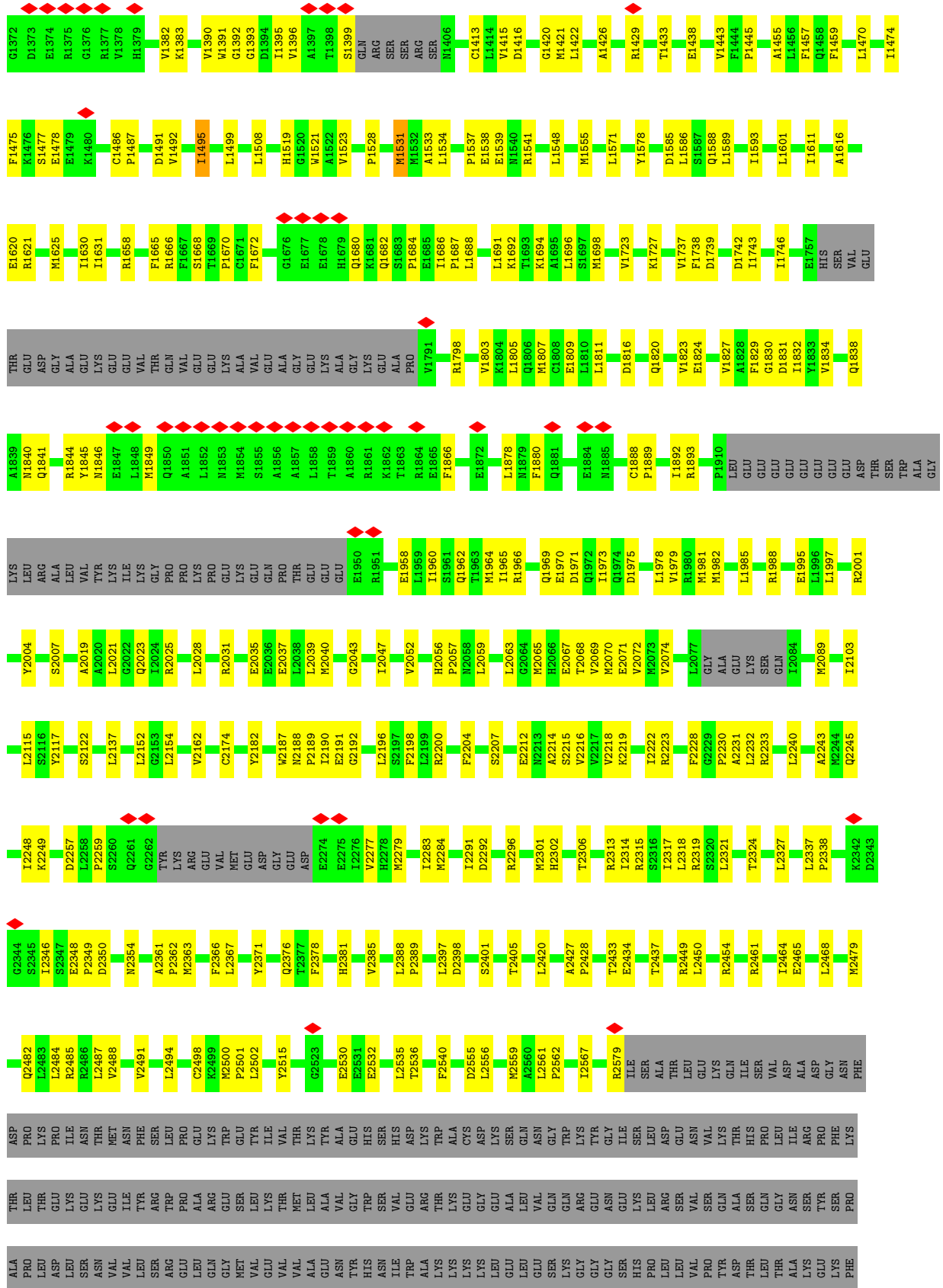


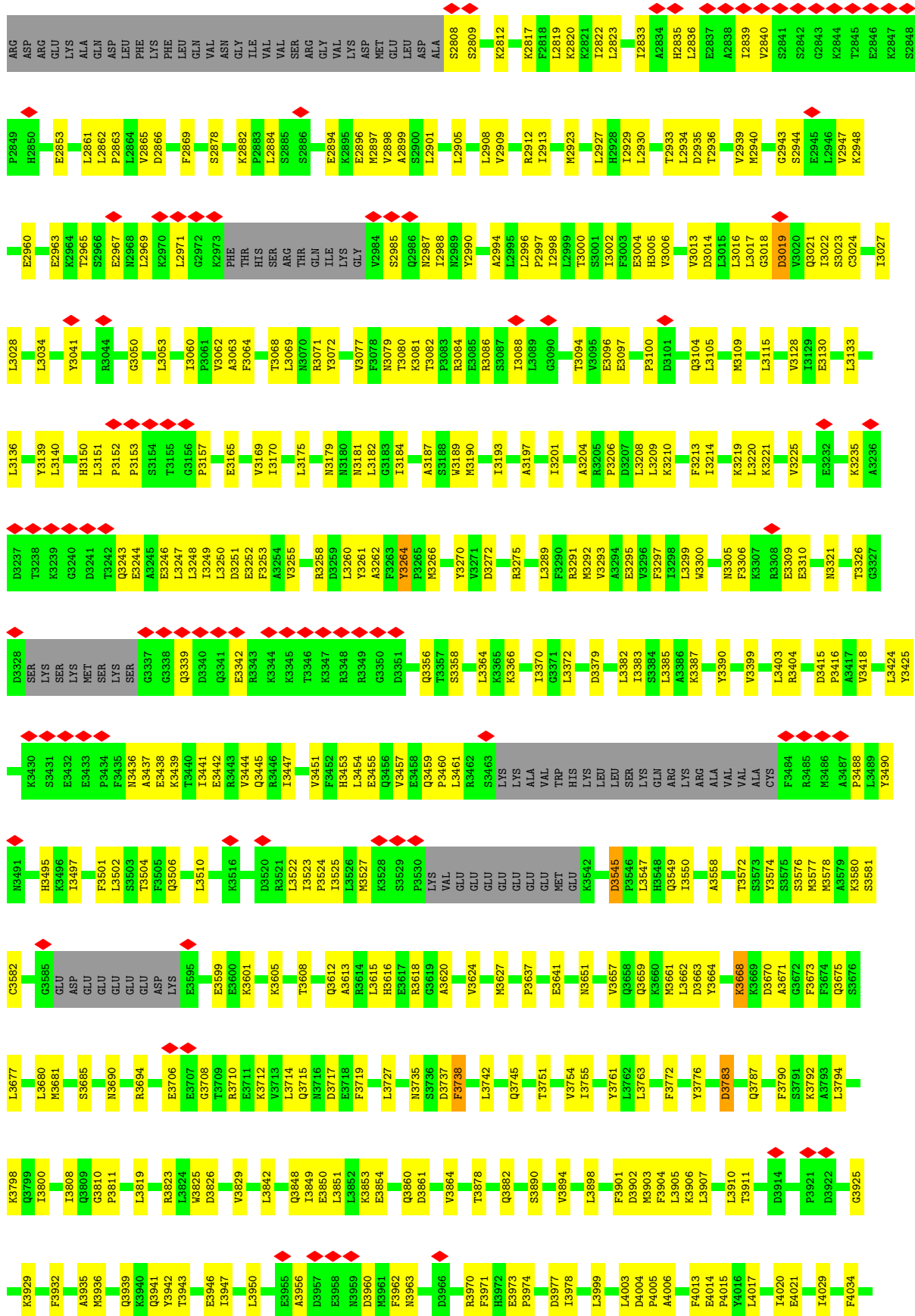


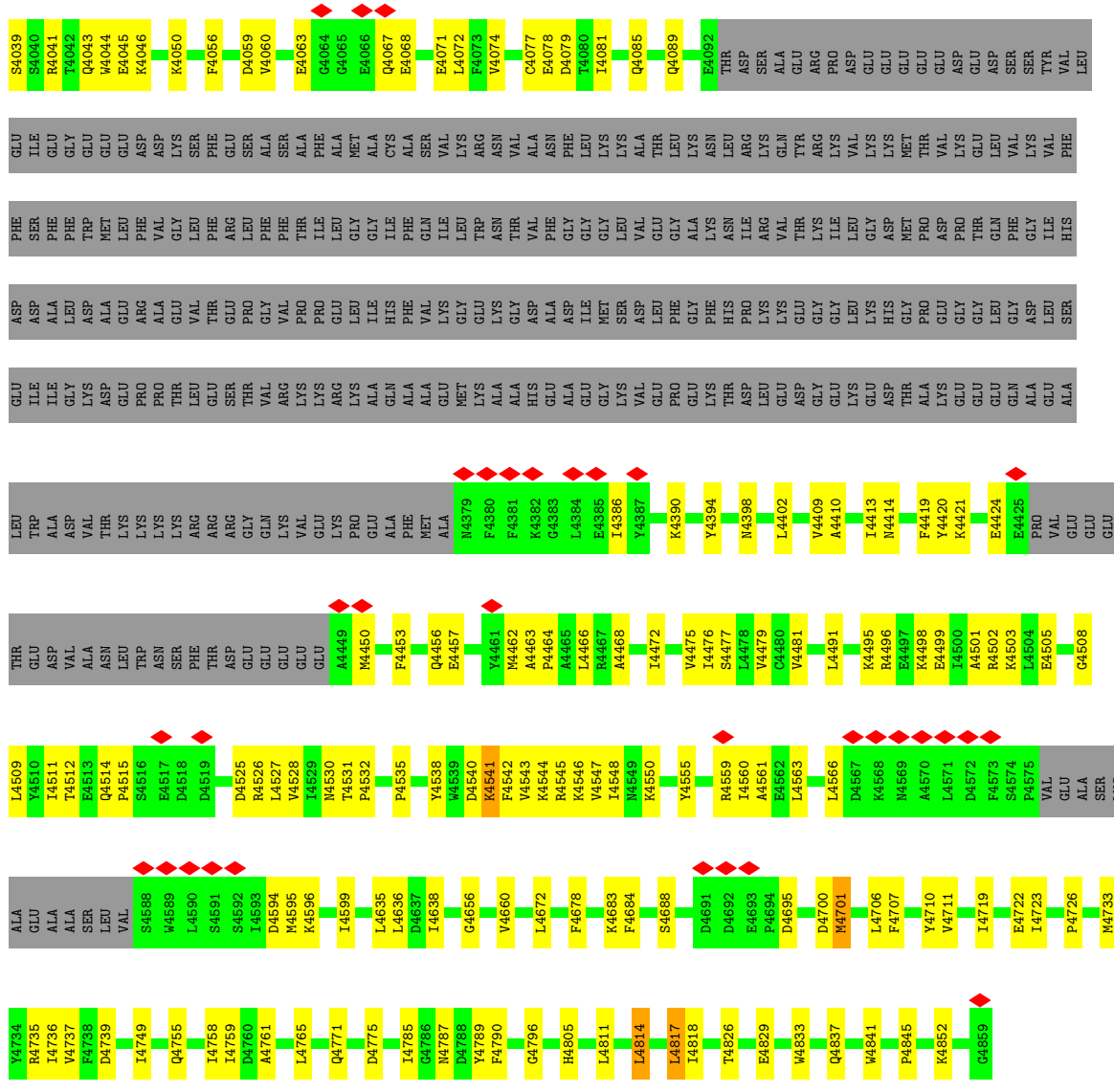
● Molecule 2: Ryanodine receptor 3



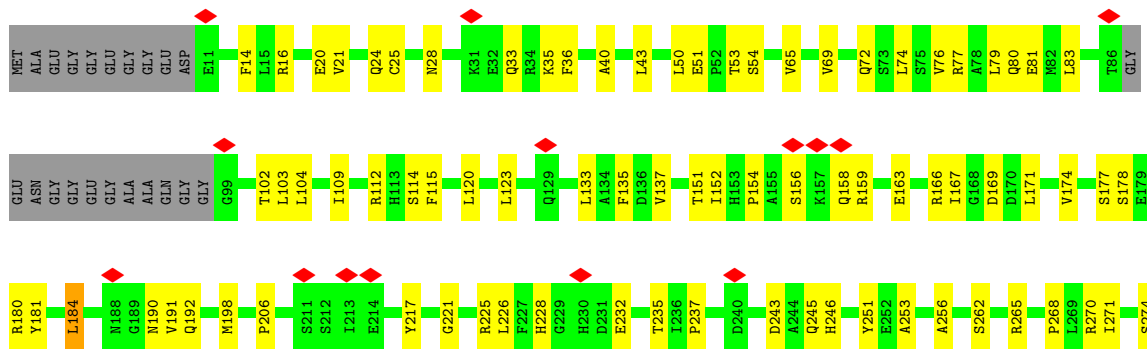




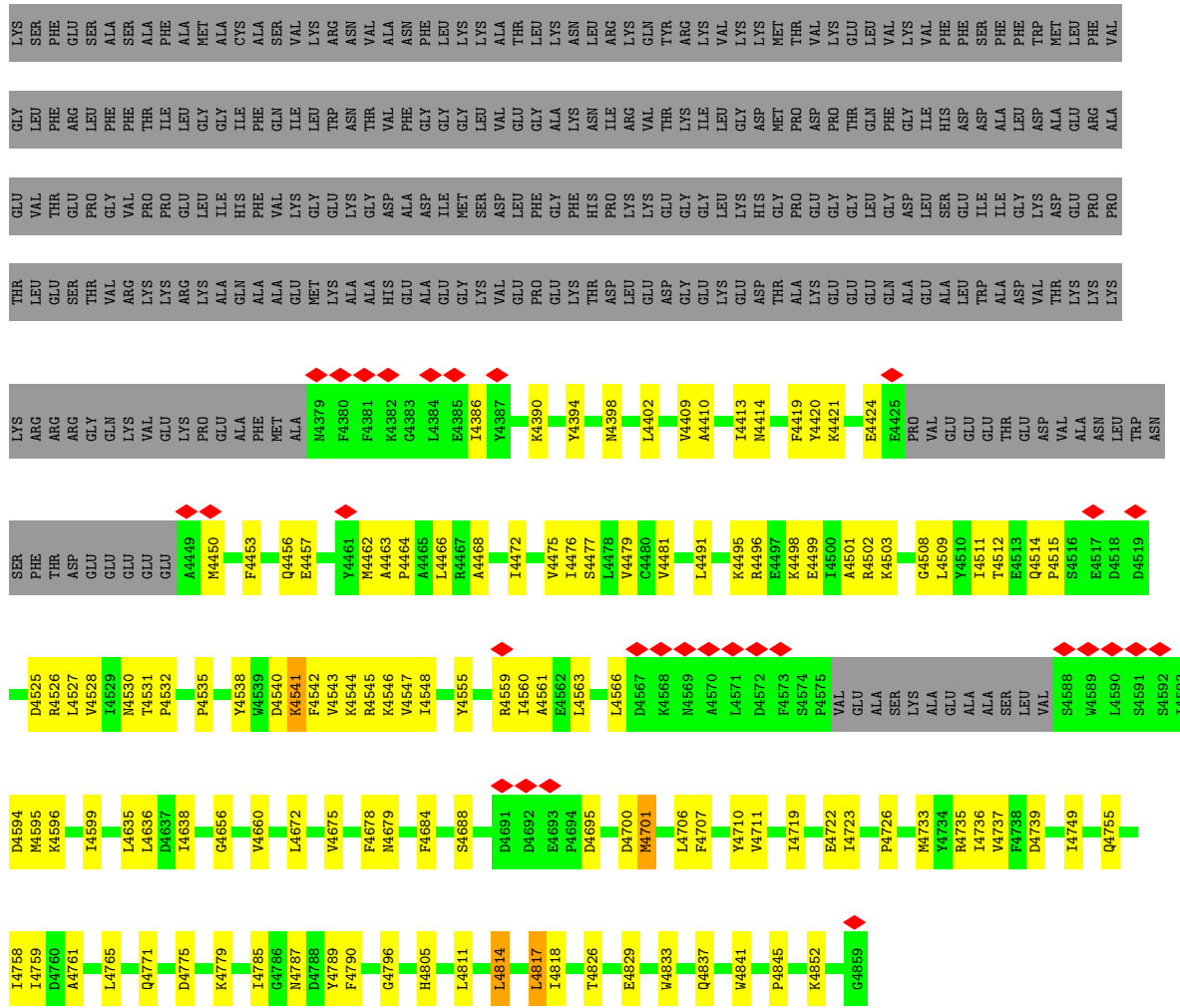




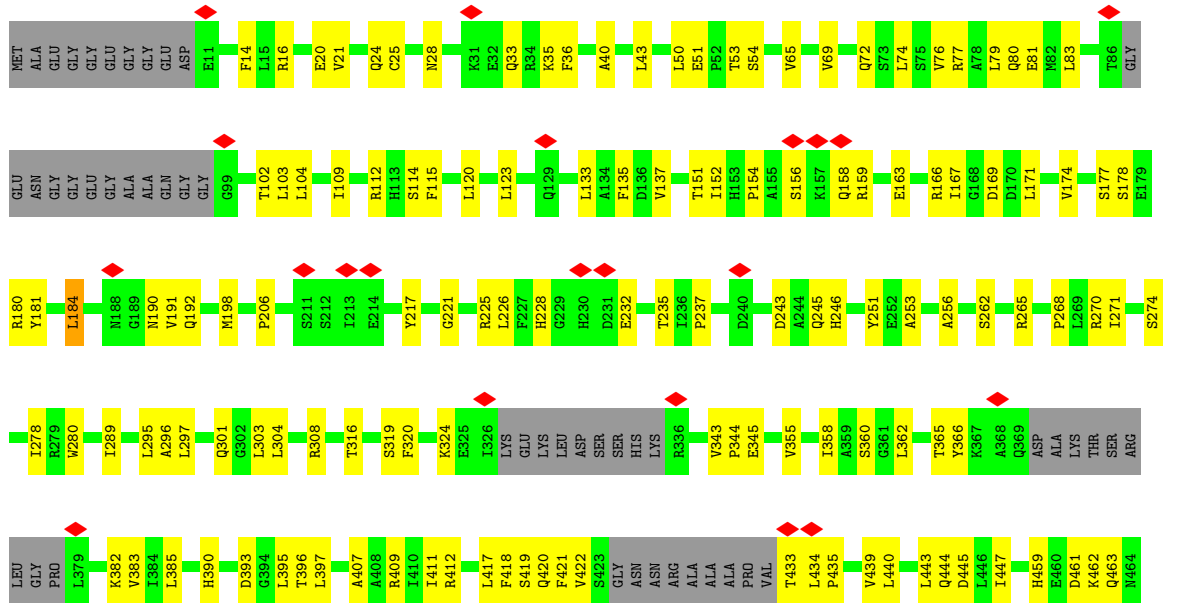
• Molecule 2: Ryanodine receptor 3

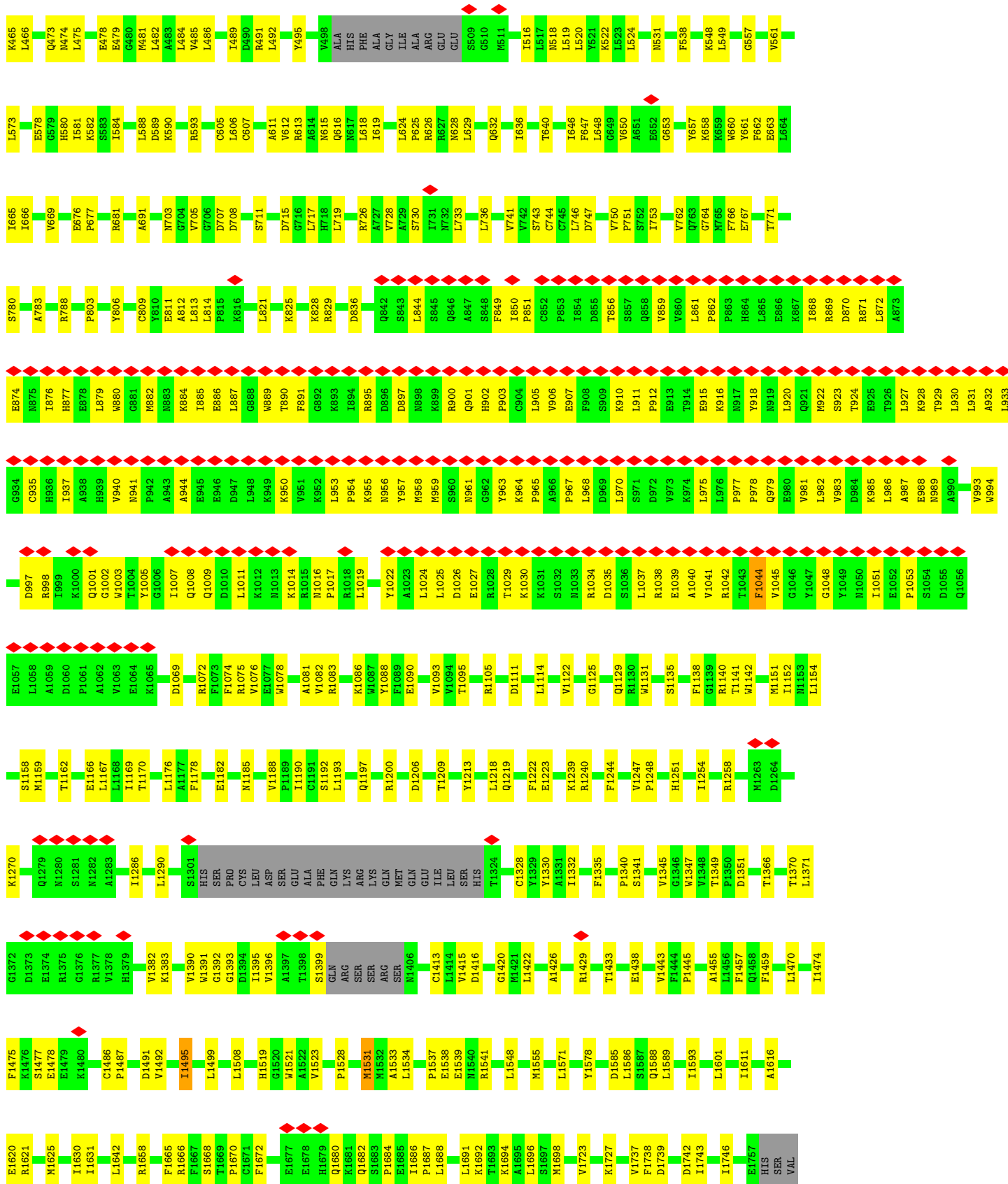


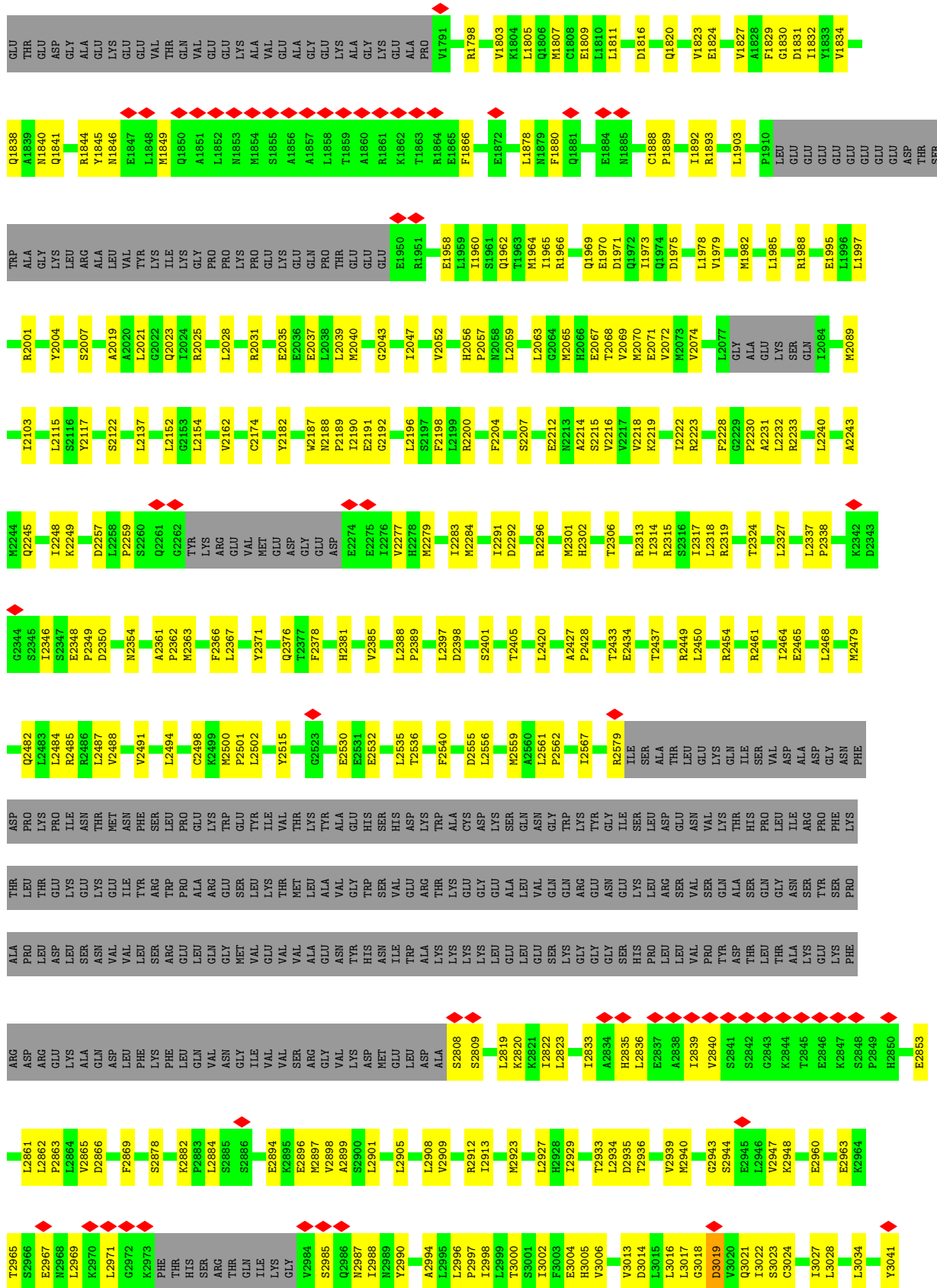
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R3823	L3824	W3825	D3826	V3829	L3842	Q3848	L3849	E3850	L3851	L3852	K3853	E3854	Q3860	D3861	V3864	T3878	Q3882	S3890	V3894	L3898	F3901	D3902	M3903	F3904	L3905	K3906	L3910	T3911	D3914	F3921	D3922	G3925	K3929	F3932	A3935	M3936	Q3939	K3940	R4041	Q4042	W4044	E4045	K4046													
Q3941	Y3942	T3943	E3946	I3947	L3950	L3951	F3952	A3955	D3957	E3958	N3959	M3961	F3962	N3963	D3966	R3970	F3971	H3972	E3973	P3974	D3977	I3978	L3999	L4003	D4004	P4005	A4006	F4013	E4014	P4015	Y4016	L4017	I4020	E4021	I4029	F4034	S4039	S4040	R4041	Q4042	W4044	E4045	K4046													
E3706	F3707	G3708	T3709	R3710	E3711	K3712	W3713	L3714	Q3715	N3716	D3717	E3718	F3719	L3727	N3735	S3736	D3737	F3738	L3742	Q3745	T3751	V3754	I3755	Y3761	L3762	L3763	F3772	Y3776	D3783	Q3787	F3790	S3793	K3792	A3793	L3794	K3798	Q3799	L3800	I3808	G3810	P3811	L3819														
E3506	L3510	K3516	D3520	R3521	L3522	P3523	L3525	L3526	M3527	K3528	E3529	P3530	VAL	GLU	GLU	GLU	GLU	GLU	GLU	GLU	TRP	HIS	LEU	D3545	F3546	L3547	H3548	Q3549	L3550	A3558	T3572	S3573	Y3574	S3575	G3576	F3577	M3578	A3579	K3580	S3581	C3582	G3585	GLU	ASP	GLU	GLU	GLU	GLU	GLU							
ASP	LYS	E3595	E3599	E3600	K3601	K3605	T3608	Q3612	A3613	R3614	L3615	H3616	E3617	M3618	A3620	V3624	M3627	P3637	E3641	N3651	V3657	Q3658	Q3659	K3660	M3661	L3662	Y3664	K3668	K3669	A3671	G3672	F3673	F3674	Q3675	S3676	L3677	L3680	M3681	S3685	N3690	R3694															
E4338	K4339	T3440	I3441	E4442	Q3445	R3446	I3447	V3451	F3452	H3453	L3454	E3455	Q3456	Q3457	E3458	Q3459	P3460	L3461	R3462	S3463	LYS	ALA	VAL	TRP	HIS	LEU	SER	LYS	GLN	ARG	LYS	ARG	ALA	VAL	VAL	ALA	CYS	F3484	R3485	M3486	A3487	P3488	L3489	Y3490	N3491	H3495	K3496	I3497	F3501	L3502	S3503	T3504				
SER	Q3337	Q3338	Q3339	Q3340	Q3341	E3342	K3343	K3344	K3345	K3346	K3347	K3348	K3349	Q3350	Q3351	Q3356	T3357	S3358	L3364	K3365	K3366	T3370	G3371	L3372	D3379	E3394	E3395	V3396	F3397	L3398	L3399	M3300	N3305	F3306	K3307	R3308	E3309	E3310	M3321	T3326	G3327	D3328	SER	LYS	SER	LYS	MET	SER	LYS	K3430	S3431	E3432	F3433	P3434	N3436	A3437
E3246	L3247	L3248	I3249	L3250	D3251	E3252	F3253	A3254	V3255	R3258	D3259	L3260	Y3261	A3262	F3263	Y3264	M3266	Y3270	V3271	D3272	R3275	L3289	F3290	K3291	M3292	V3293	E3295	V3296	F3297	L3298	L3299	M3300	N3305	F3306	K3307	R3308	E3309	E3310	M3321	T3326	G3327	D3328	SER	LYS	SER	LYS	MET	SER	LYS	K3430	S3431	E3432	F3433	P3434	N3436	A3437
S3154	T3155	G3156	P3157	W3158	C3159	E3165	V3169	I3170	L3175	N3179	N3180	N3181	L3182	G3183	I3184	A3187	S3188	N3189	M3190	T3193	A3197	I3201	A3204	R3205	P3206	D3207	L3208	L3209	K3210	F3213	I3214	K3219	L3220	K3221	V3225	E3232	A3236	D3237	T3238	K3239	G3240	D3241	T3242	Q3243	E3244											
L3053	I3060	P3061	V3062	A3063	F3064	T3068	L3069	N3070	R3071	Y3072	V3077	N3078	N3079	T3080	K3081	R3082	P3083	R3084	E3085	R3086	S3087	L3088	L3089	G3090	T3094	V3095	E3096	E3097	P3100	D3101	Q3104	L3105	M3109	L3115	V3128	T3129	E3130	L3136	Y3139	L3140	W3143	H3150	L3151	P3152	P3153											
L2969	K2970	L2971	P3061	K2972	K2973	THR	HIS	SER	ARG	THR	GLN	ILE	E2894	V2895	V2896	W2897	V2898	A2899	Q2986	N2987	I2988	N2989	Y2990	A2994	L2995	L2996	P2997	I2998	L2999	T3000	S3001	I3002	F3003	E3004	H3005	V3006	V3013	D3014	L3015	L3016	L3017	G3018	D3019	V3020	Q3021	L3022	S3023	C3024	I3027	L3028	L3034	Y3041	S2966	E2967	N2968	
V2865	D2866	F2869	S2878	K2882	F2883	L2884	S2885	S2886	E2894	V2895	V2896	W2897	V2898	A2899	Q2986	N2987	I2988	N2989	Y2990	A2994	L2995	L2996	P2997	I2998	L2999	T3000	S3001	I3002	F3003	E3004	H3005	V3006	V3013	D3014	L3015	L3016	L3017	G3018	D3019	V3020	Q3021	L3022	S3023	C3024	I3027	L3028	L3034	Y3041	S2966	E2967	N2968					



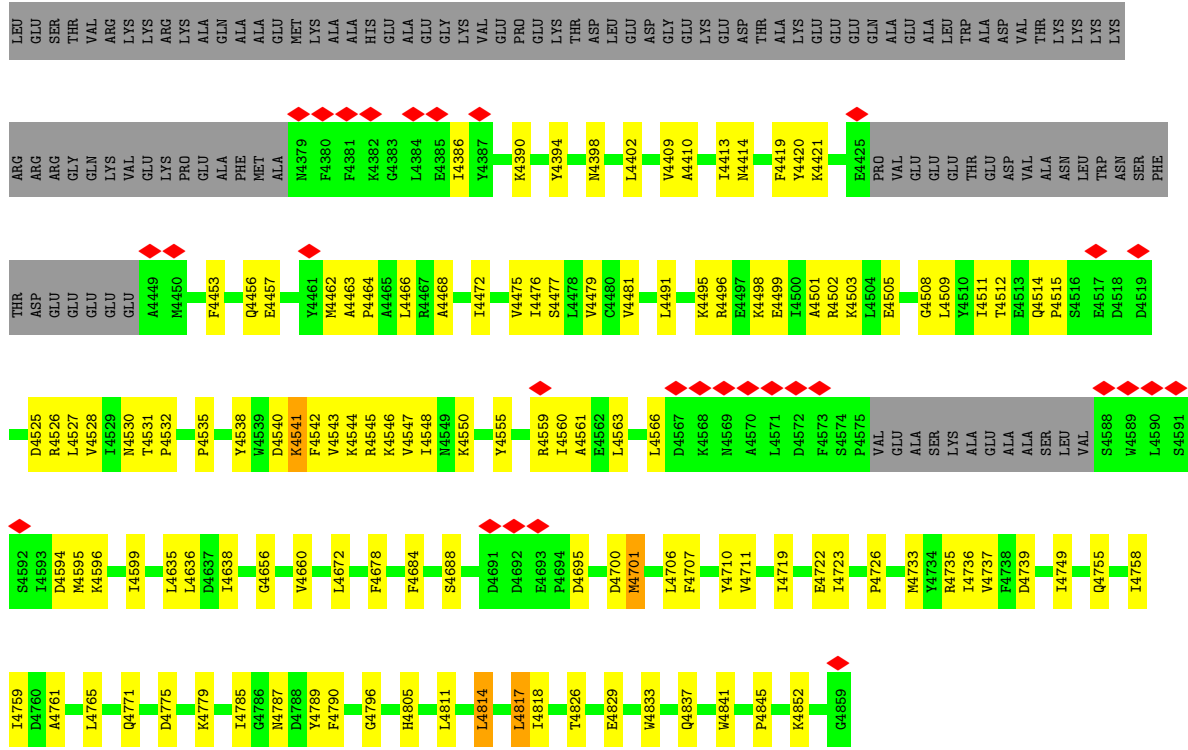
• Molecule 2: Ryanodine receptor 3







VAL	THR	GLU	LEU	SER	F4056	A3935	P3811	M3690	L3502	F3435	MET	T3242	H3150	R3044	
THR	PRO	GLU	PHE	PHE	D4059	M3936	L3819	GLU	S3503	N3436	SER	Q3243	L3151	R3044	
GLU	GLY	LEU	ARG	SER	V4060	Q3939	R3694	GLU	T3504	A3437	LYS	E3244	L3152	G3050	
VAL	VAL	PHE	PHE	ALA	G3941	R3823	L3824	LYS	Q3506	K3439	SER	A3245	P3153	L3053	
PRO	PRO	THR	THR	ALA	Y3942	R3825	H3826	ASP	L3510	T3440	G3337	E3246	S3154	L3060	
GLU	GLU	LEU	LEU	PHE	T3943	D3826	V3829	LYS	K3516	I3441	Q3339	L3247	T3155	I3060	
LEU	LEU	GLY	GLY	ALA	E3946	V3829	V3829	ASP	D3520	E3442	D3340	L3249	G3156	I3060	
ILE	ILE	GLY	ALA	ALA	R3710	K3601	K3601	GLU	K3521	Q3445	Q3341	L3250	P3157	V3061	
ALA	ALA	GLY	CYS	ALA	E3711	K3606	K3606	LYS	D3522	R3446	Q3342	L3248	H3158	A3063	
PHE	PHE	ILE	ILE	SER	V3712	V3605	V3605	VAL	R3521	I3447	R3343	F3253	C3159	F3064	
VAL	VAL	GLN	ALA	ALA	V3713	T3608	T3608	GLU	L3522	V3451	K3344	V3255	E3165	T3068	
VAL	GLY	LEU	VAL	VAL	L3714	Q3612	Q3612	GLU	L3523	F3452	K3345	R3258	V3169	T3068	
GLY	GLY	LEU	LYS	LYS	Q3715	E3850	E3850	GLU	P3524	H3453	T3346	R3258	L3070	L3069	
GLY	GLY	LEU	ARG	ARG	D3717	L3851	L3851	GLU	L3525	L3454	T3347	D3259	I3170	N3070	
GLY	GLY	LEU	ASN	ASN	E3718	L3852	L3852	GLU	L3527	E3455	K3347	L3260	L3176	R3071	
VAL	VAL	THR	THR	VAL	F3719	K3853	K3853	GLU	K3527	Q3456	R3348	Y3261	N3179	Y3072	
ALA	ALA	ASP	VAL	ALA	L3727	E3854	E3854	GLU	K3528	V3457	R3349	F3263	N3180	V3077	
ALA	ALA	ASP	ALA	ASN	M3735	Q3860	Q3860	GLU	S3529	Q3458	F3263	F3263	N3181	F3078	
ALA	ALA	ASP	ALA	PHE	S3736	D3861	D3861	GLU	P3530	P3460	R3263	P3263	L3182	N3079	
ALA	ALA	ASP	ALA	PHE	F3738	V3864	V3864	GLU	VAL	R3461	R3266	P3265	G3183	T3080	
ALA	ALA	ASP	ALA	THR	L3742	T3878	T3878	GLU	GLU	S3463	Y3270	M3266	I3184	K3081	
ALA	ALA	ASP	ALA	THR	Q3745	Q3882	Q3882	GLU	GLU	LYS	D3271	R3275	A3187	T3082	
ALA	ALA	ASP	ALA	THR	T3751	S3890	S3890	GLU	GLU	ALA	L3364	R3275	S3188	R3084	
ALA	ALA	ASP	ALA	THR	V3754	V3894	V3894	GLU	GLU	VAL	K3365	R3275	W3189	R3086	
ALA	ALA	ASP	ALA	THR	L3755	V3894	V3894	GLU	GLU	TRP	K3366	R3275	M3190	S3087	
ALA	ALA	ASP	ALA	THR	Y3761	L3898	L3898	GLU	GLU	HIS	T3370	L3289	I3183	I3088	
ALA	ALA	ASP	ALA	THR	L3762	F3900	F3900	GLU	GLU	LYS	G3371	F3290	G3090	L3089	
ALA	ALA	ASP	ALA	THR	L3763	F3901	F3901	GLU	GLU	LYS	L3372	R3291	G3090	G3090	
ALA	ALA	ASP	ALA	THR	F3772	M3902	M3902	GLU	GLU	ARG	D3379	A3294	T3094	T3094	
ALA	ALA	ASP	ALA	THR	Y3776	F3904	F3904	GLU	GLU	ARG	V3295	E3295	V3095	V3095	
ALA	ALA	ASP	ALA	THR	D3783	L3905	L3905	GLU	GLU	VAL	F3297	E3295	E3096	E3096	
ALA	ALA	ASP	ALA	THR	Q3787	L3907	L3907	GLU	GLU	VAL	V3297	F3297	E3097	E3097	
ALA	ALA	ASP	ALA	THR	F3790	M3903	M3903	GLU	GLU	VAL	V3298	F3297	P3100	P3100	
ALA	ALA	ASP	ALA	THR	G3672	F3673	F3673	GLU	GLU	VAL	L3299	L3299	D3101	D3101	
ALA	ALA	ASP	ALA	THR	F3673	Q3674	Q3674	GLU	GLU	VAL	W3300	W3300	L3208	L3101	L3101
ALA	ALA	ASP	ALA	THR	Q3674	L3675	L3675	GLU	GLU	VAL	N3305	L3209	L3208	Q3104	Q3104
ALA	ALA	ASP	ALA	THR	L3677	S3661	S3661	GLU	GLU	VAL	F3306	K3210	L3209	Q3104	Q3104
ALA	ALA	ASP	ALA	THR	L3680	L3681	L3681	GLU	GLU	VAL	R3307	K3210	L3209	L3105	L3105
ALA	ALA	ASP	ALA	THR	M3681	M3681	M3681	GLU	GLU	VAL	R3308	F3213	L3210	M3109	M3109
ALA	ALA	ASP	ALA	THR	S3685	S3685	S3685	GLU	GLU	VAL	L3403	K3219	L3220	L3115	L3115
ALA	ALA	ASP	ALA	THR	G3809	G3809	G3809	GLU	GLU	VAL	R3404	E3309	K3221	L3128	L3128
ALA	ALA	ASP	ALA	THR	G3810	G3810	G3810	GLU	GLU	VAL	D3415	E3310	K3221	I3129	I3129
ALA	ALA	ASP	ALA	THR				GLU	GLU	VAL	P3416	N3321	V3225	E3130	E3130
ALA	ALA	ASP	ALA	THR				GLU	GLU	VAL	A3417	T3326	E3232	E3136	E3136
ALA	ALA	ASP	ALA	THR				GLU	GLU	VAL	V3418	G3327	E3232	L3136	L3136
ALA	ALA	ASP	ALA	THR				GLU	GLU	VAL	L3424	D3328	A3236	Y3139	Y3139
ALA	ALA	ASP	ALA	THR				GLU	GLU	VAL	Y3425	SER	D3237	L3140	L3140
ALA	ALA	ASP	ALA	THR				GLU	GLU	VAL	K3430	LYS	T3238	W3143	W3143
ALA	ALA	ASP	ALA	THR				GLU	GLU	VAL	E3432	SER	K3239	K3240	K3240
ALA	ALA	ASP	ALA	THR				GLU	GLU	VAL	P3434	LYS	D3241	D3241	D3241



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C4	Depositor
Number of particles used	84690	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 ($e^-/\text{\AA}^2$)	50	Depositor
Minimum defocus (nm)	500	Depositor
Maximum defocus (nm)	2000	Depositor
Magnification	Not provided	
Image detector	FEI FALCON IV (4k x 4k)	Depositor
Maximum map value	0.693	Depositor
Minimum map value	0.000	Depositor
Average map value	0.002	Depositor
Map value standard deviation	0.015	Depositor
Recommended contour level	0.068	Depositor
Map size (Å)	478.72, 478.72, 478.72	wwPDB
Map dimensions	512, 512, 512	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.935, 0.935, 0.935	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: CL, CFF, 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	0.29	0/831	0.48	0/1120
1	C	0.29	0/831	0.48	0/1120
1	E	0.29	0/831	0.48	0/1120
1	G	0.29	0/831	0.48	0/1120
2	B	0.33	0/32381	0.46	0/43893
2	D	0.33	0/32381	0.46	0/43893
2	F	0.33	0/32381	0.46	0/43893
2	H	0.33	0/32381	0.46	0/43893
All	All	0.33	0/132848	0.46	0/180052

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

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	815	0	821	22	0
1	C	815	0	821	22	0
1	E	815	0	821	20	0
1	G	815	0	821	22	0
2	B	31699	0	31082	932	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	D	31699	0	31082	942	0
2	F	31699	0	31082	929	0
2	H	31699	0	31082	929	0
3	B	1	0	0	0	0
3	D	1	0	0	0	0
3	F	1	0	0	0	0
3	H	1	0	0	0	0
4	B	1	0	0	0	0
4	D	1	0	0	0	0
4	F	1	0	0	0	0
4	H	1	0	0	0	0
5	B	62	24	24	2	0
5	D	62	24	24	2	0
5	F	62	24	24	2	0
5	H	62	24	24	2	0
6	B	14	10	10	0	0
6	D	14	10	10	0	0
6	F	14	10	10	0	0
6	H	14	10	10	0	0
7	B	1	0	0	1	0
7	D	1	0	0	1	0
7	F	1	0	0	1	0
7	H	1	0	0	1	0
All	All	130372	136	127748	3762	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 3762 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)
2:B:983:VAL:HG22	2:B:1041:VAL:HG21	1.45	0.98
2:H:885:ILE:HG21	2:H:957:TYR:HA	1.45	0.98
2:H:983:VAL:HG22	2:H:1041:VAL:HG21	1.45	0.98
2:B:885:ILE:HG21	2:B:957:TYR:HA	1.45	0.98
2:F:983:VAL:HG22	2:F:1041:VAL:HG21	1.45	0.98

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	106/110 (96%)	100 (94%)	6 (6%)	0	100	100
1	C	106/110 (96%)	100 (94%)	6 (6%)	0	100	100
1	E	106/110 (96%)	100 (94%)	6 (6%)	0	100	100
1	G	106/110 (96%)	100 (94%)	6 (6%)	0	100	100
2	B	4034/4859 (83%)	3934 (98%)	100 (2%)	0	100	100
2	D	4034/4859 (83%)	3934 (98%)	100 (2%)	0	100	100
2	F	4034/4859 (83%)	3934 (98%)	100 (2%)	0	100	100
2	H	4034/4859 (83%)	3934 (98%)	100 (2%)	0	100	100
All	All	16560/19876 (83%)	16136 (97%)	424 (3%)	0	100	100

There are no Ramachandran outliers to report.

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	86/90 (96%)	84 (98%)	2 (2%)	45	70
1	C	86/90 (96%)	84 (98%)	2 (2%)	45	70
1	E	86/90 (96%)	84 (98%)	2 (2%)	45	70
1	G	86/90 (96%)	84 (98%)	2 (2%)	45	70
2	B	3370/4253 (79%)	3343 (99%)	27 (1%)	79	89
2	D	3370/4253 (79%)	3343 (99%)	27 (1%)	79	89

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
2	F	3370/4253 (79%)	3343 (99%)	27 (1%)	79	89
2	H	3370/4253 (79%)	3343 (99%)	27 (1%)	79	89
All	All	13824/17372 (80%)	13708 (99%)	116 (1%)	77	89

5 of 116 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
2	D	4817	LEU
2	H	3783	ASP
2	F	2301	MET
2	H	3772	PHE
2	H	2031	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 215 such sidechains are listed below:

Mol	Chain	Res	Type
2	F	199	GLN
2	F	2481	GLN
2	H	2987	ASN
2	F	401	GLN
2	F	941	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 oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 24 ligands modelled in this entry, 12 are monoatomic - leaving 12 for Mogul analysis.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
5	ATP	B	5303	-	28,33,33	0.67	0	34,52,52	0.97	2 (5%)
5	ATP	H	5305	-	28,33,33	0.66	0	34,52,52	0.97	2 (5%)
6	CFF	D	5304	-	8,15,15	1.05	0	8,23,23	2.61	2 (25%)
5	ATP	B	5305	-	28,33,33	0.66	0	34,52,52	0.97	2 (5%)
6	CFF	H	5304	-	8,15,15	1.05	0	8,23,23	2.61	2 (25%)
5	ATP	D	5305	-	28,33,33	0.66	0	34,52,52	0.97	2 (5%)
5	ATP	H	5303	-	28,33,33	0.67	0	34,52,52	0.97	2 (5%)
6	CFF	F	5304	-	8,15,15	1.05	0	8,23,23	2.61	2 (25%)
6	CFF	B	5304	-	8,15,15	1.05	0	8,23,23	2.61	2 (25%)
5	ATP	D	5303	-	28,33,33	0.67	0	34,52,52	0.97	2 (5%)
5	ATP	F	5303	-	28,33,33	0.67	0	34,52,52	0.97	2 (5%)
5	ATP	F	5305	-	28,33,33	0.66	0	34,52,52	0.97	2 (5%)

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
5	ATP	B	5303	-	-	6/18/38/38	0/3/3/3
5	ATP	H	5305	-	-	6/18/38/38	0/3/3/3
6	CFF	D	5304	-	-	-	0/2/2/2
5	ATP	B	5305	-	-	6/18/38/38	0/3/3/3
6	CFF	H	5304	-	-	-	0/2/2/2
5	ATP	D	5305	-	-	6/18/38/38	0/3/3/3
5	ATP	H	5303	-	-	6/18/38/38	0/3/3/3
6	CFF	F	5304	-	-	-	0/2/2/2
6	CFF	B	5304	-	-	-	0/2/2/2
5	ATP	D	5303	-	-	6/18/38/38	0/3/3/3
5	ATP	F	5303	-	-	6/18/38/38	0/3/3/3

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
5	ATP	F	5305	-	-	6/18/38/38	0/3/3/3

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(°)
6	B	5304	CFE	C5-C6-N1	-6.20	111.91	118.20
6	D	5304	CFE	C5-C6-N1	-6.20	111.91	118.20
6	F	5304	CFE	C5-C6-N1	-6.20	111.91	118.20
6	H	5304	CFE	C5-C6-N1	-6.20	111.91	118.20
6	B	5304	CFE	C4-C5-C6	3.57	122.67	119.96

There are no chirality outliers.

5 of 48 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
5	B	5305	ATP	C5'-O5'-PA-O1A
5	B	5305	ATP	C5'-O5'-PA-O3A
5	D	5305	ATP	C5'-O5'-PA-O1A
5	D	5305	ATP	C5'-O5'-PA-O3A
5	F	5305	ATP	C5'-O5'-PA-O1A

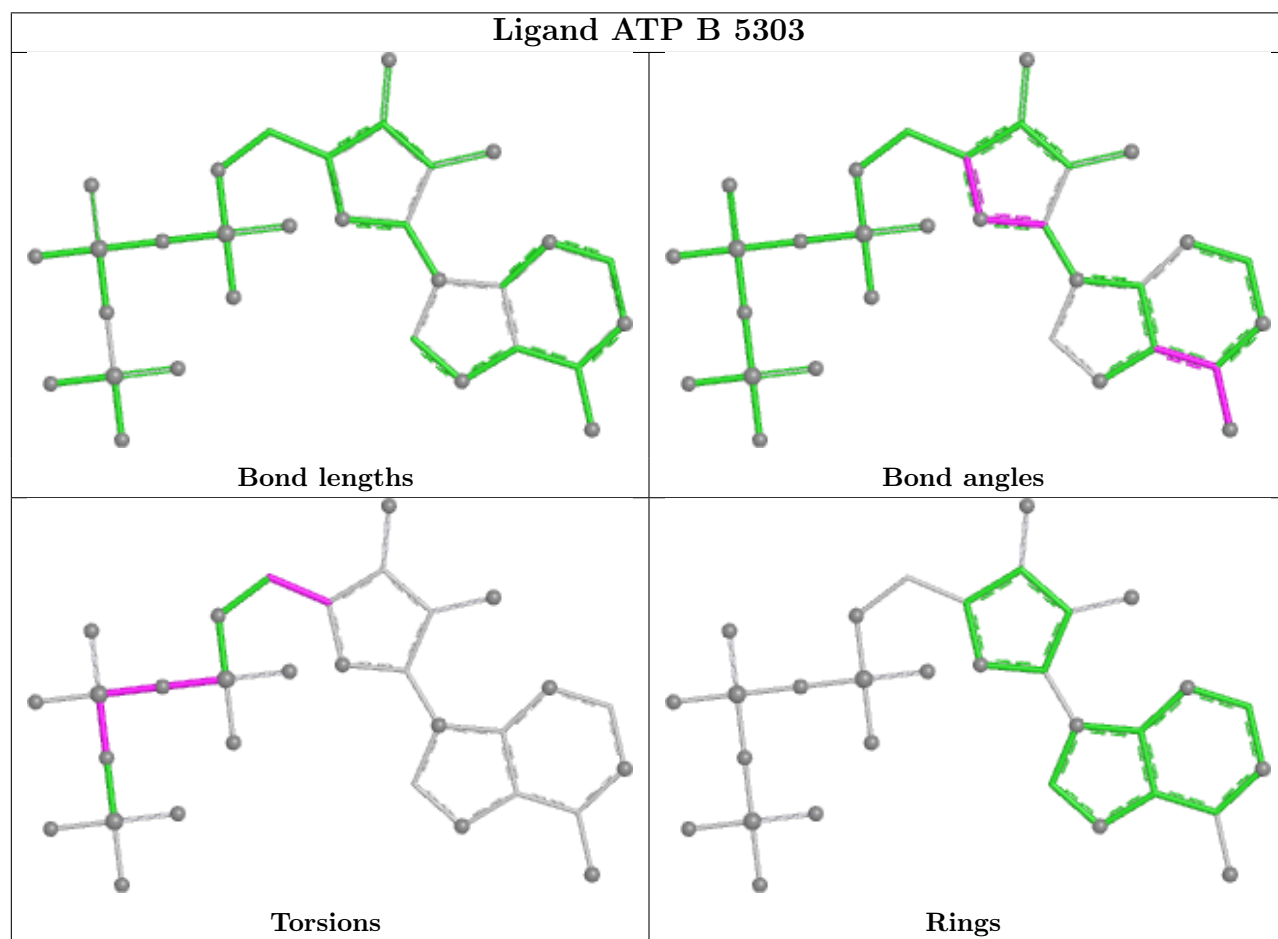
There are no ring outliers.

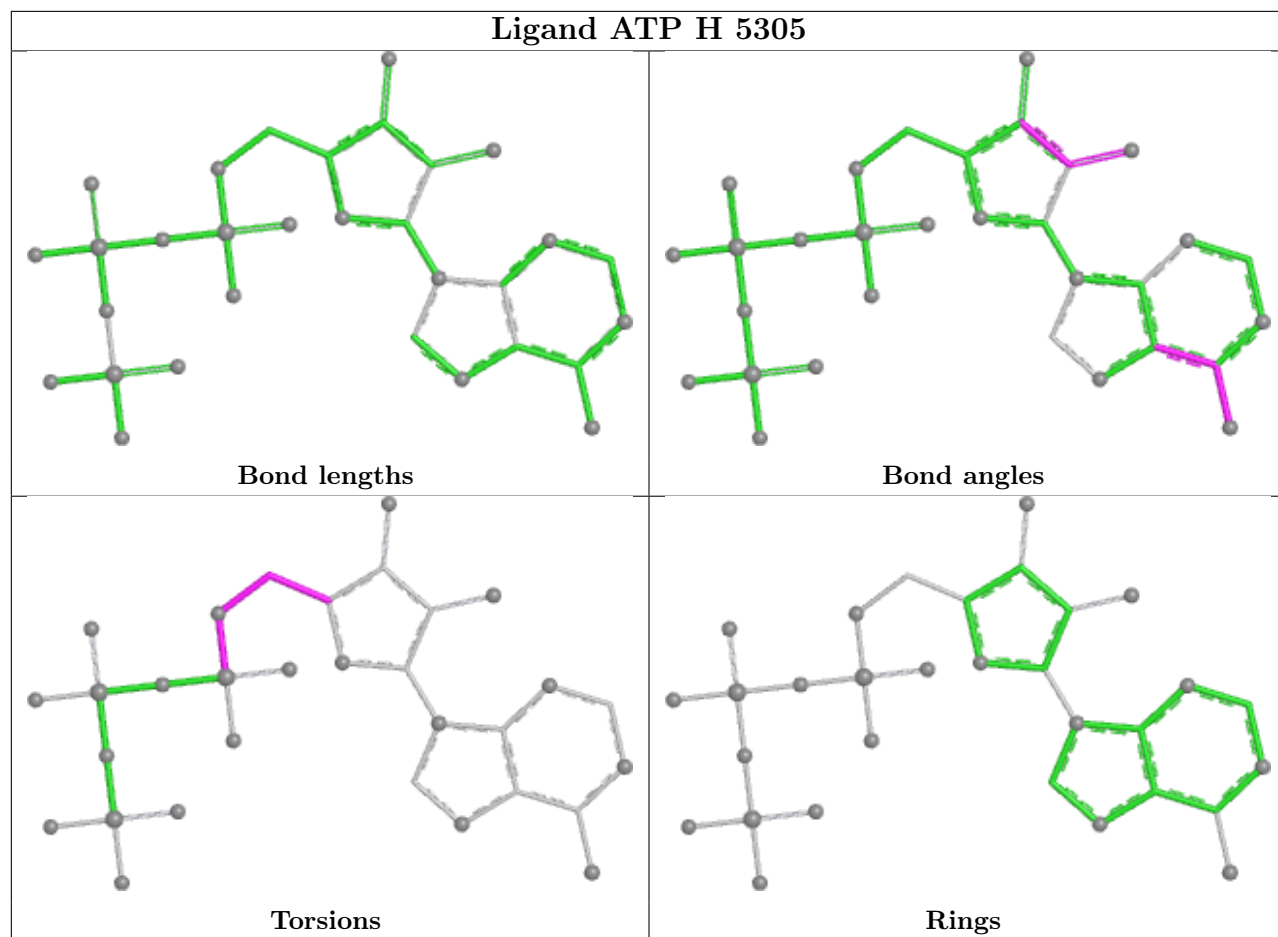
4 monomers are involved in 8 short contacts:

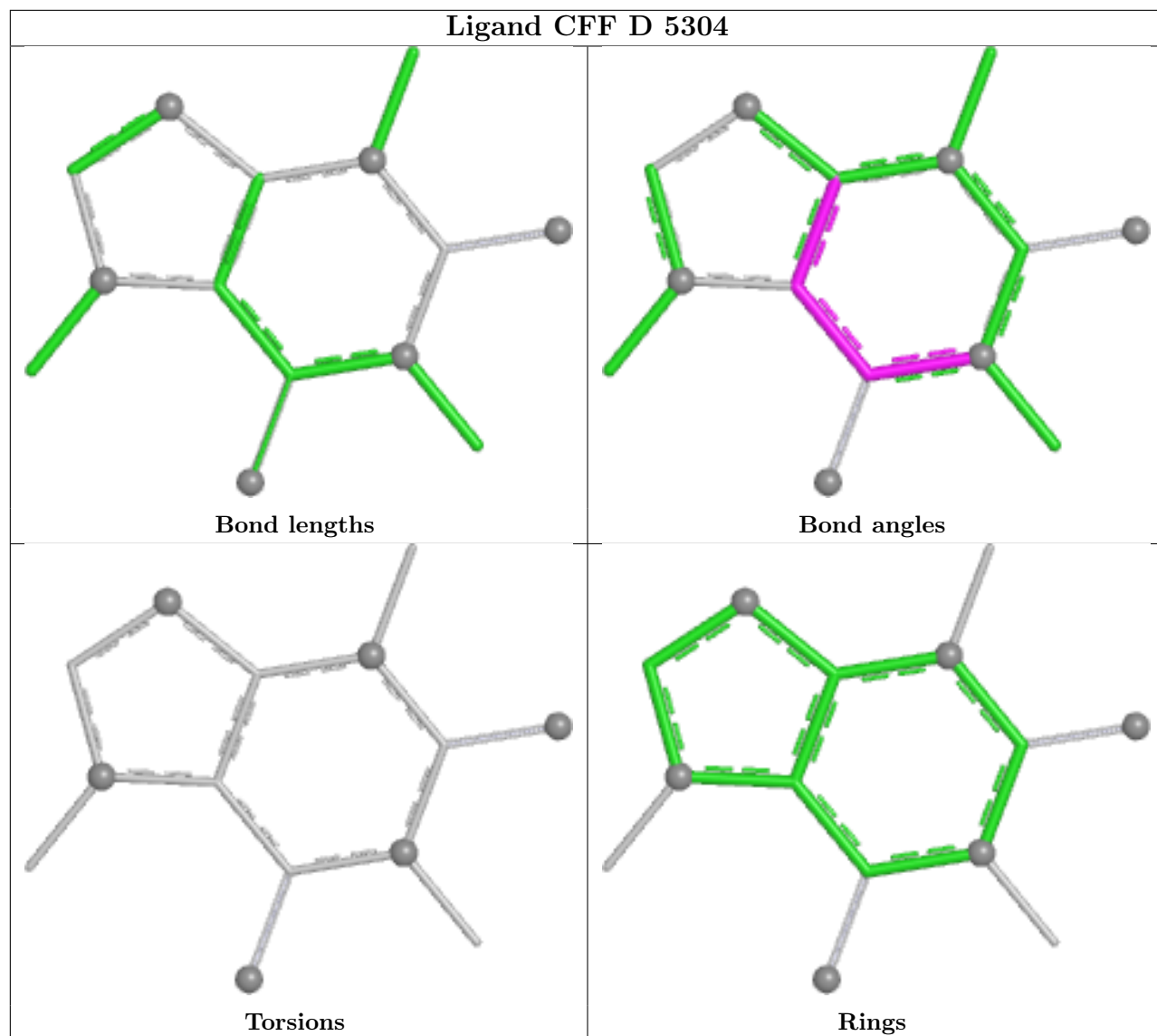
Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	H	5305	ATP	2	0
5	B	5305	ATP	2	0
5	D	5305	ATP	2	0
5	F	5305	ATP	2	0

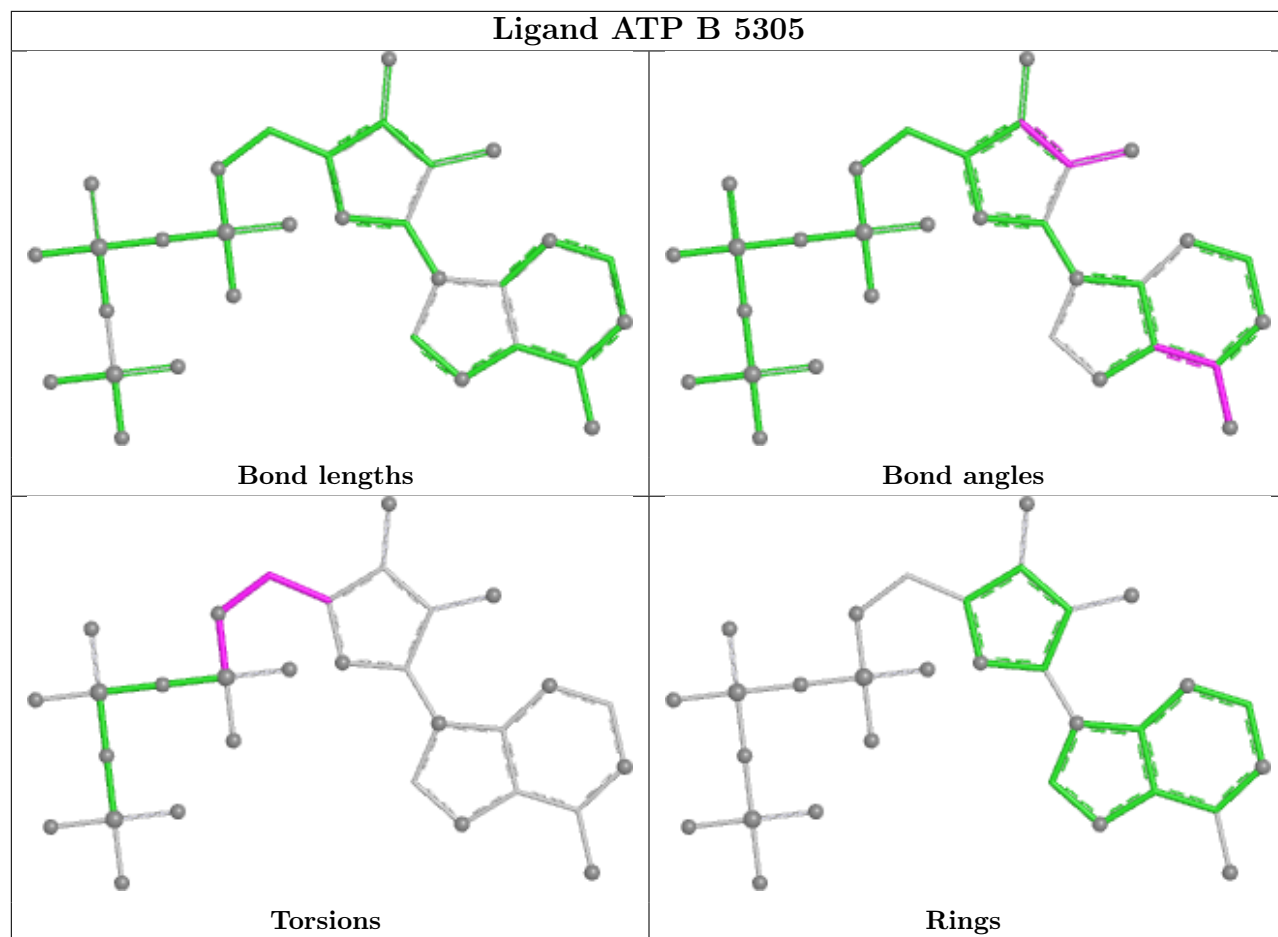
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included.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

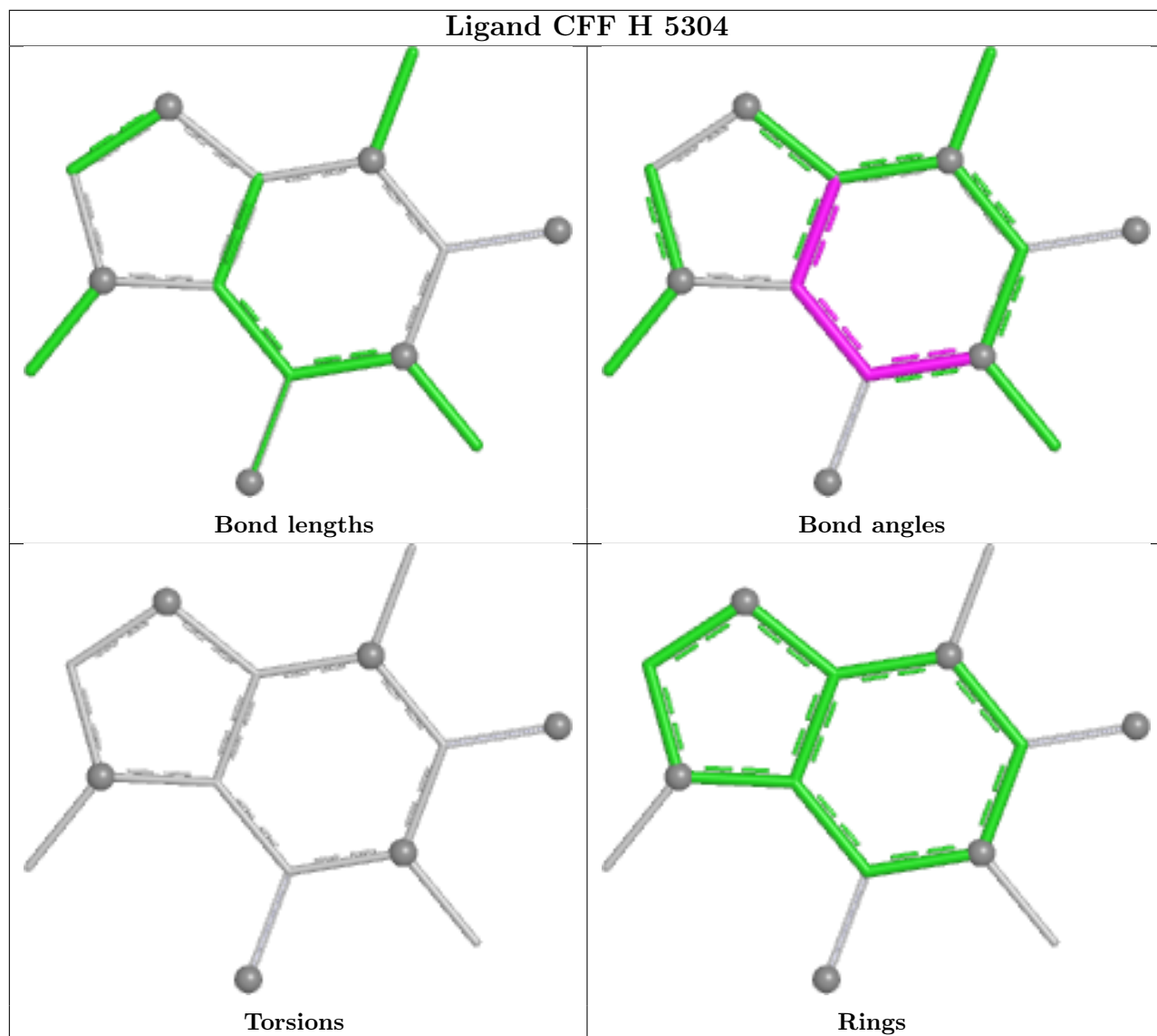
The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.

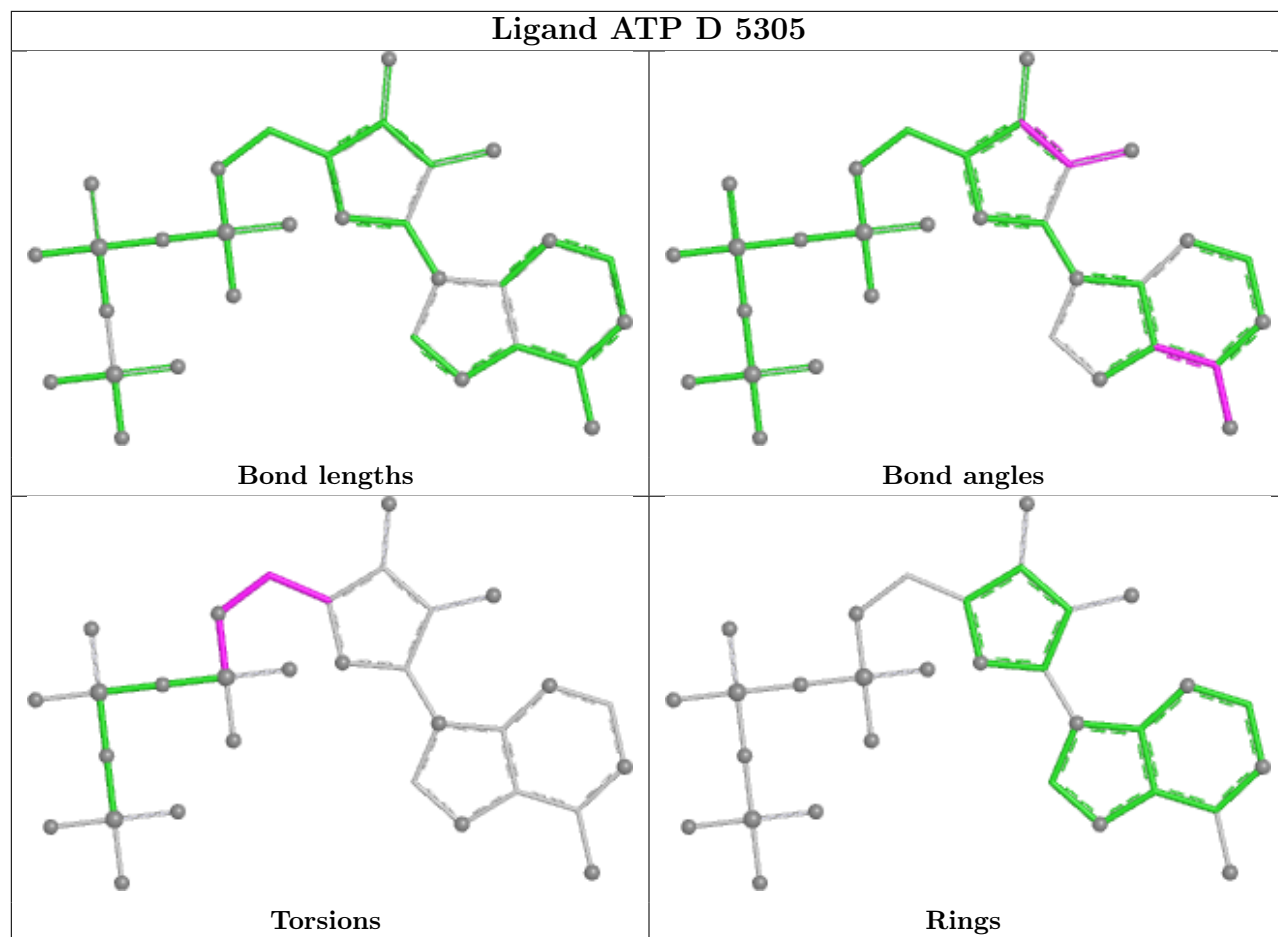


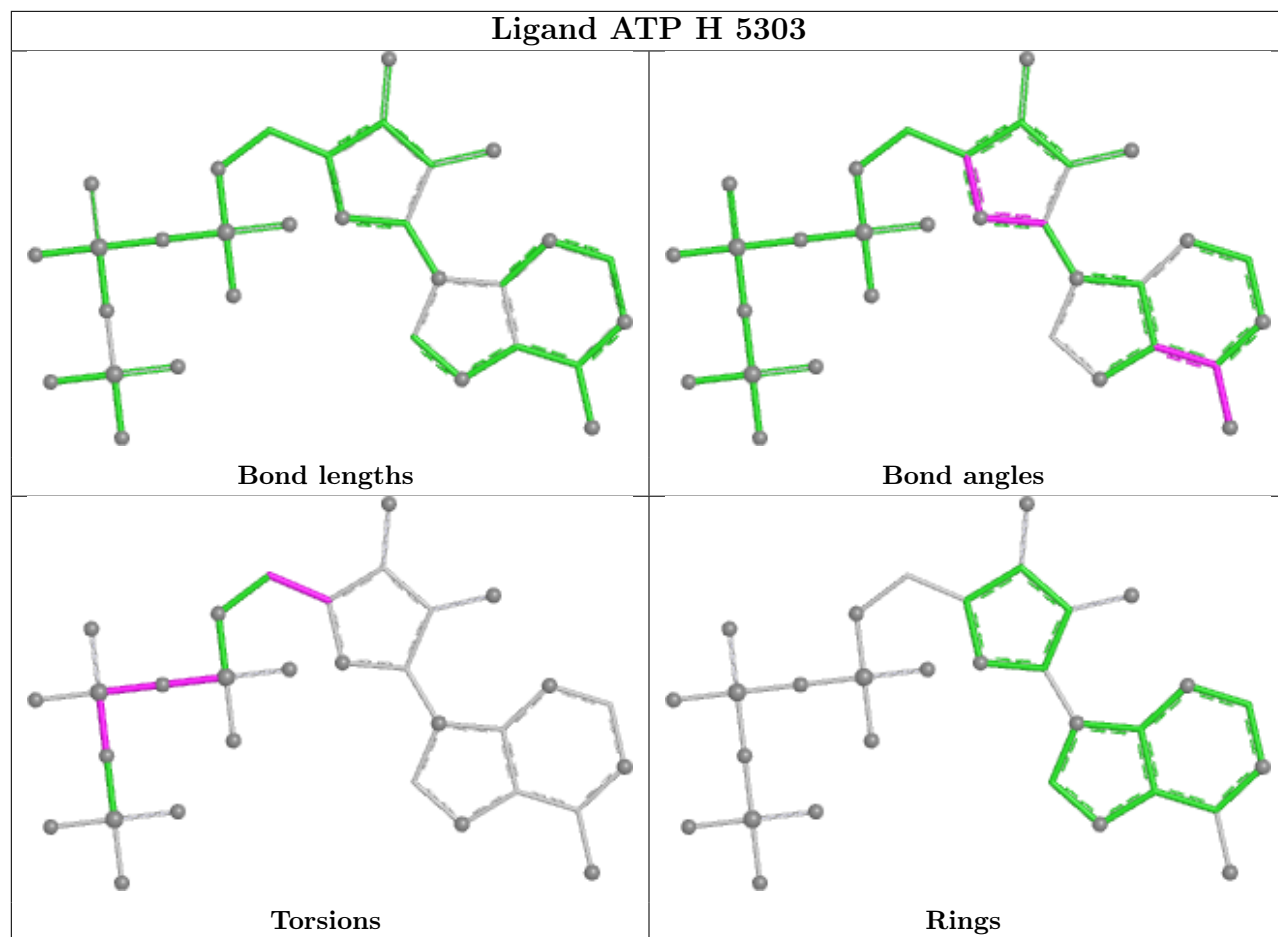


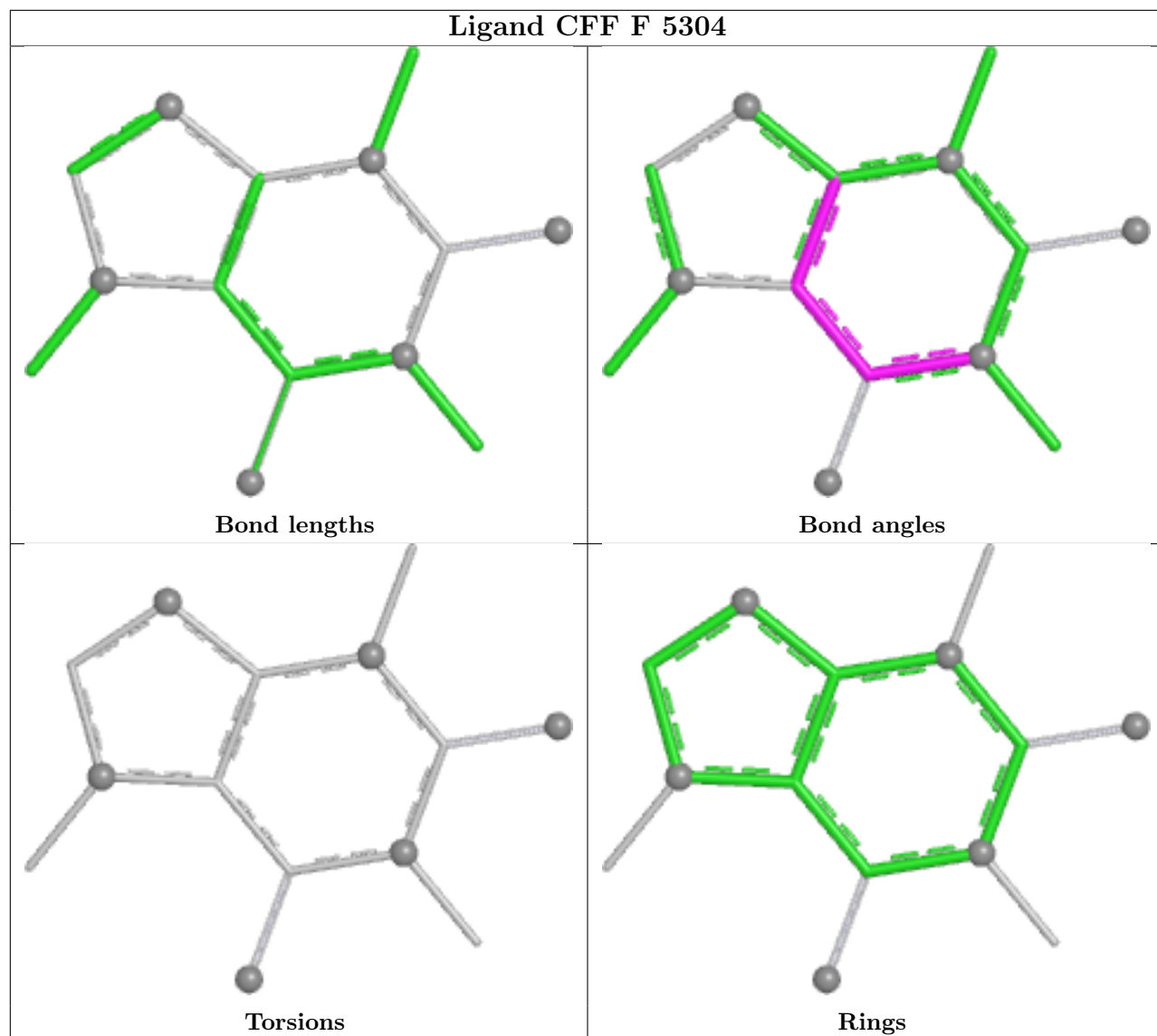


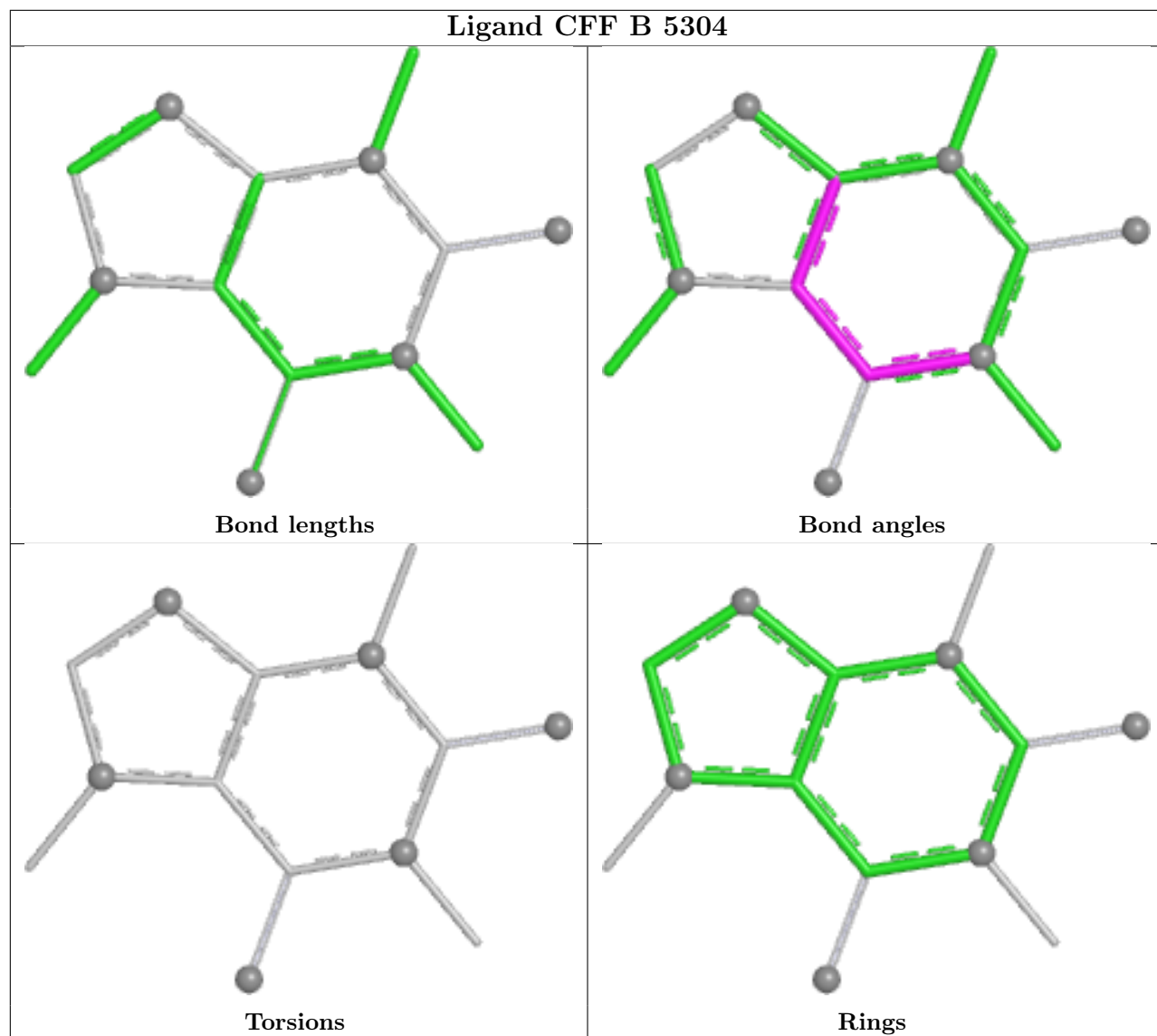


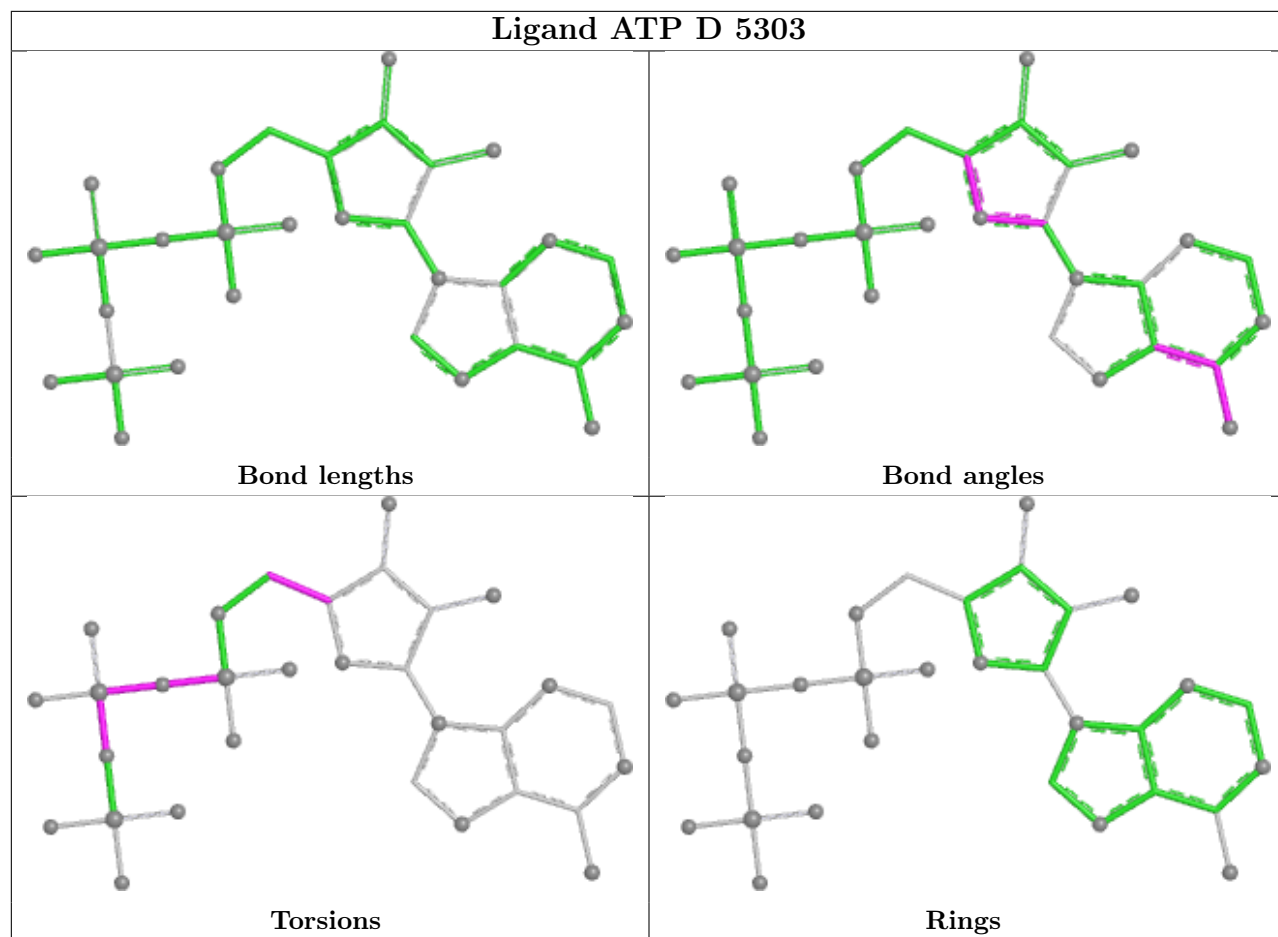


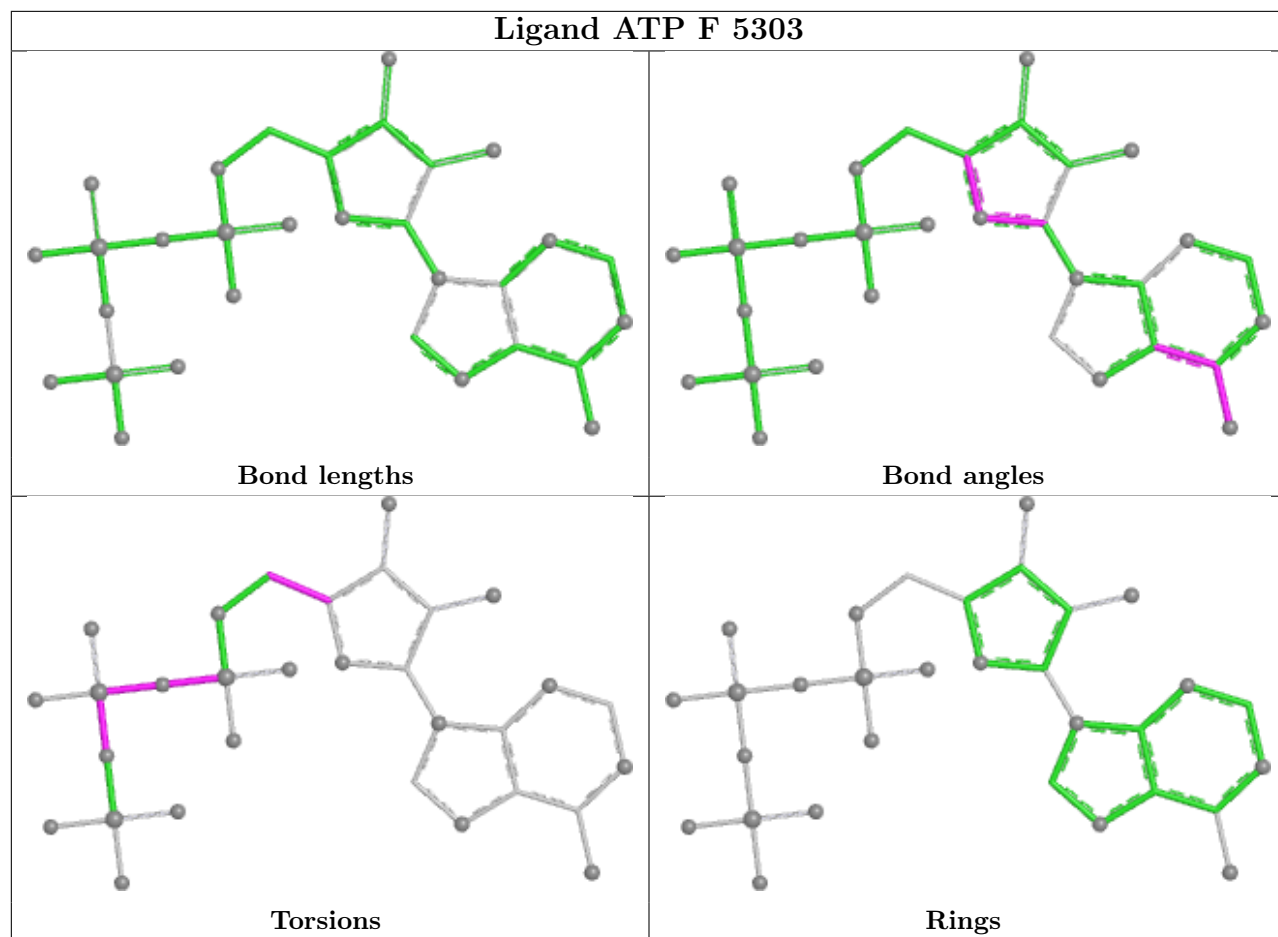


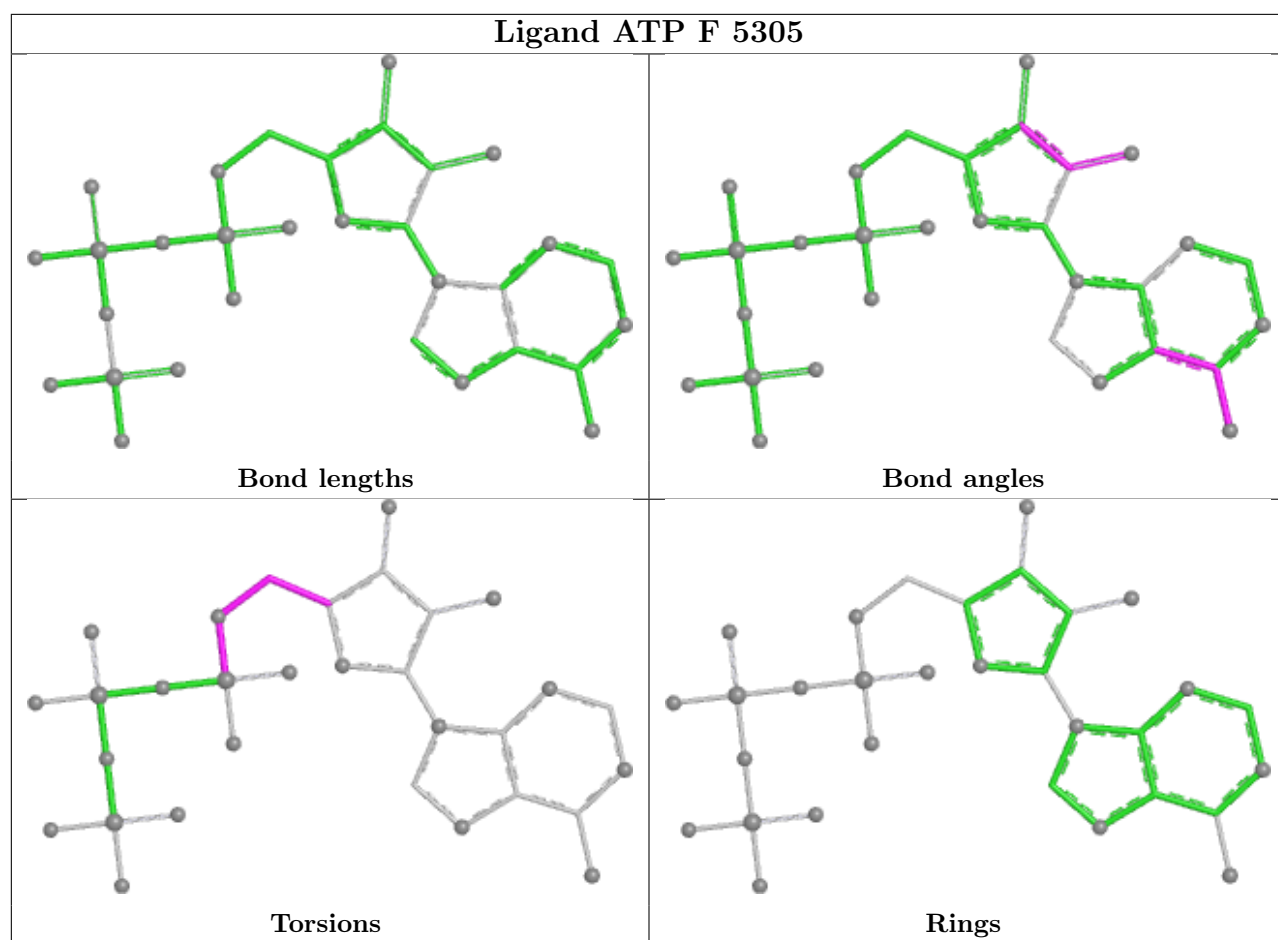












5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

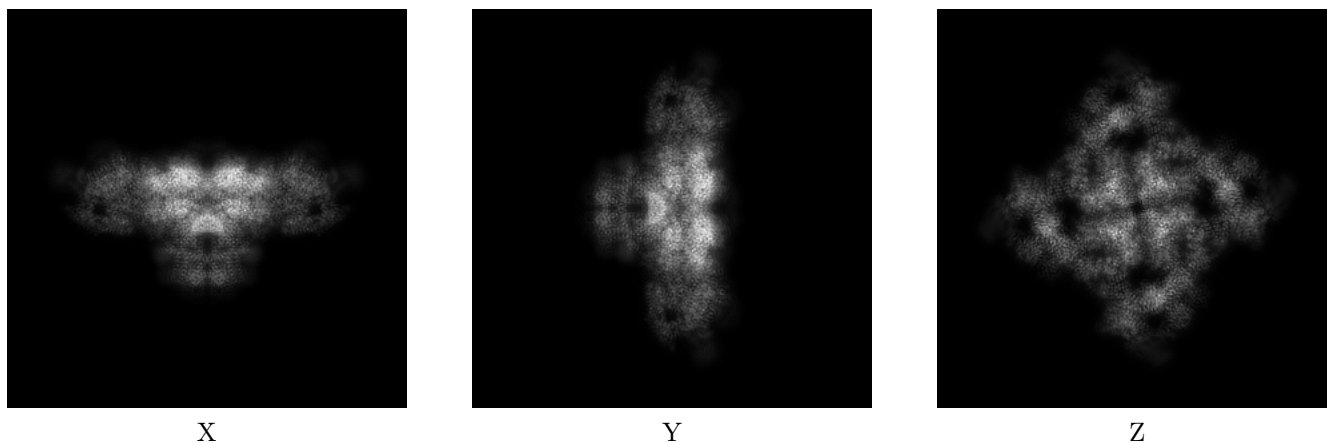
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-45117. 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](#)

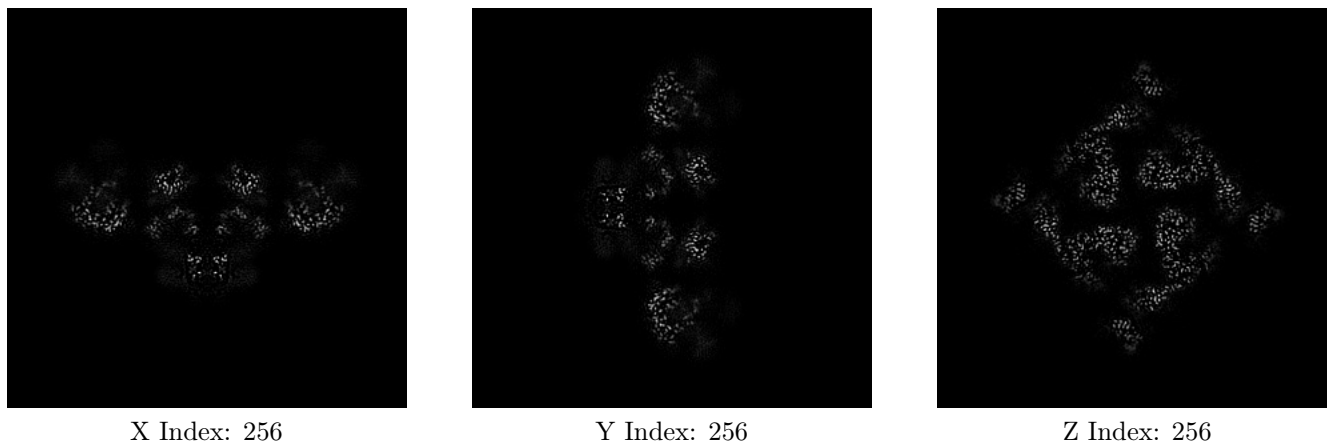
6.1.1 Primary map



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

6.2 Central slices [i](#)

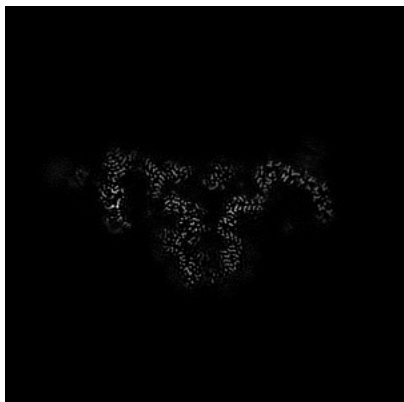
6.2.1 Primary map



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

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

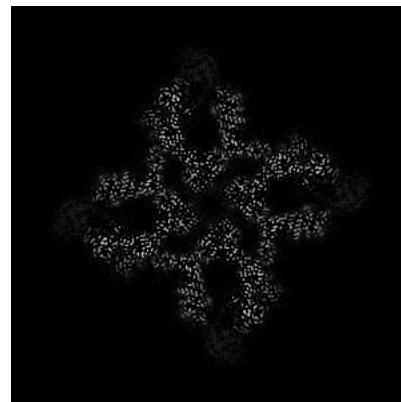
6.3.1 Primary map



X Index: 284



Y Index: 228

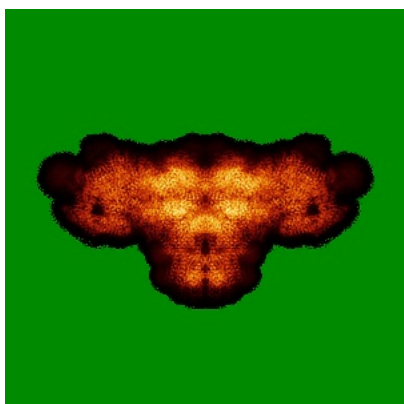


Z Index: 289

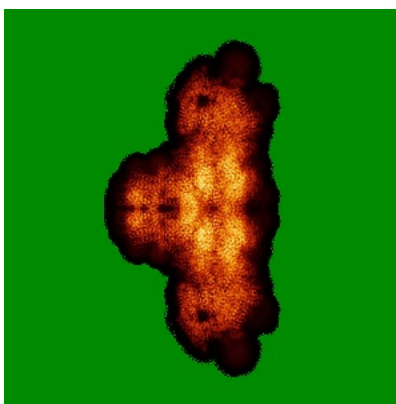
The images above show the largest variance slices of the map in three orthogonal directions.

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

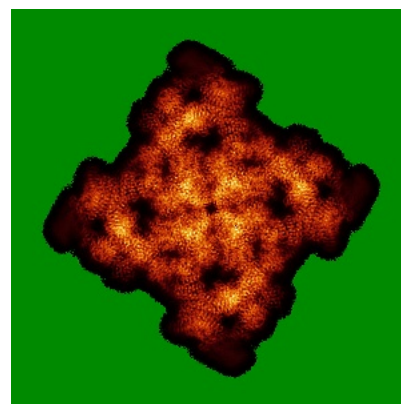
6.4.1 Primary map



X



Y

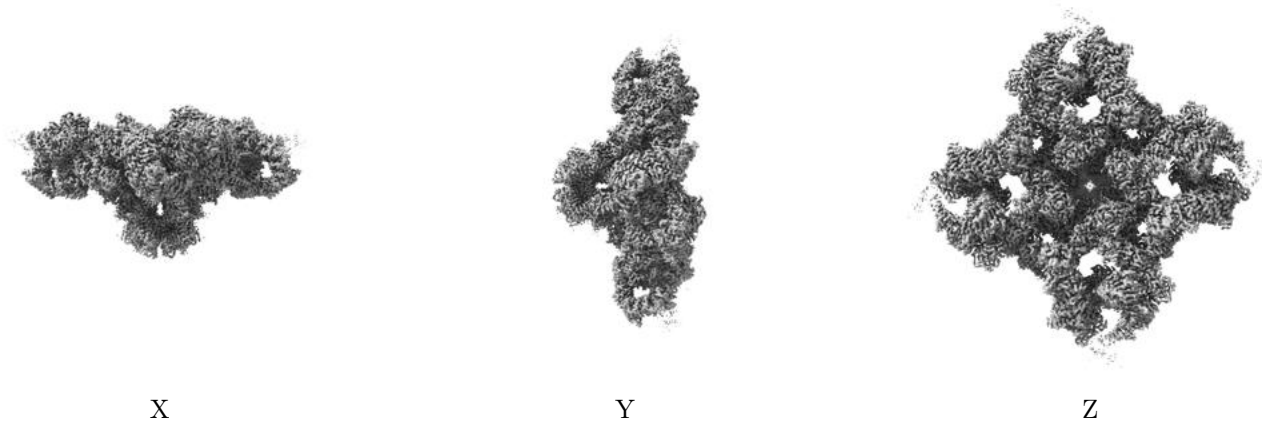


Z

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

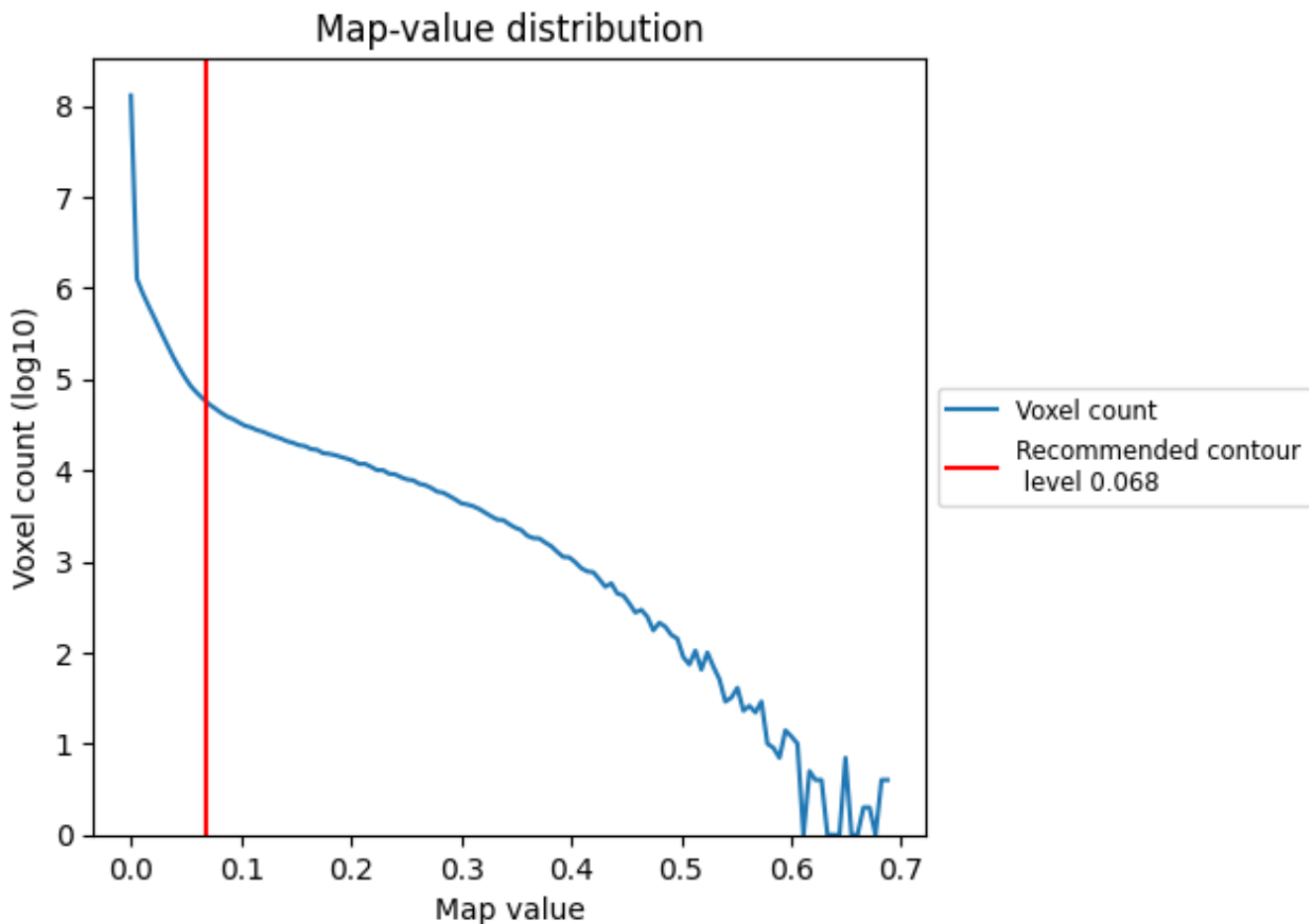
6.6 Mask visualisation [i](#)

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

7 Map analysis [i](#)

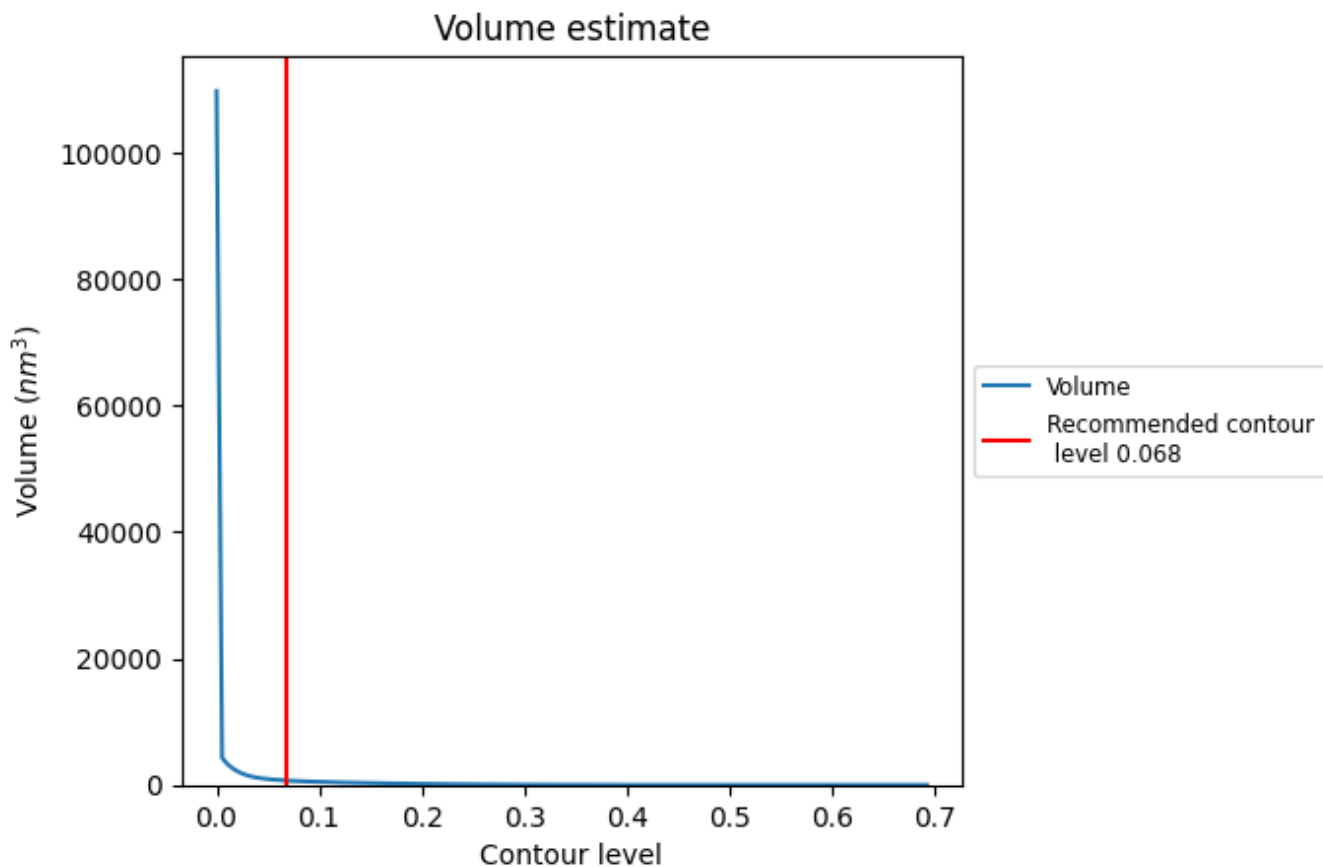
This section contains the results of statistical analysis of the map.

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.

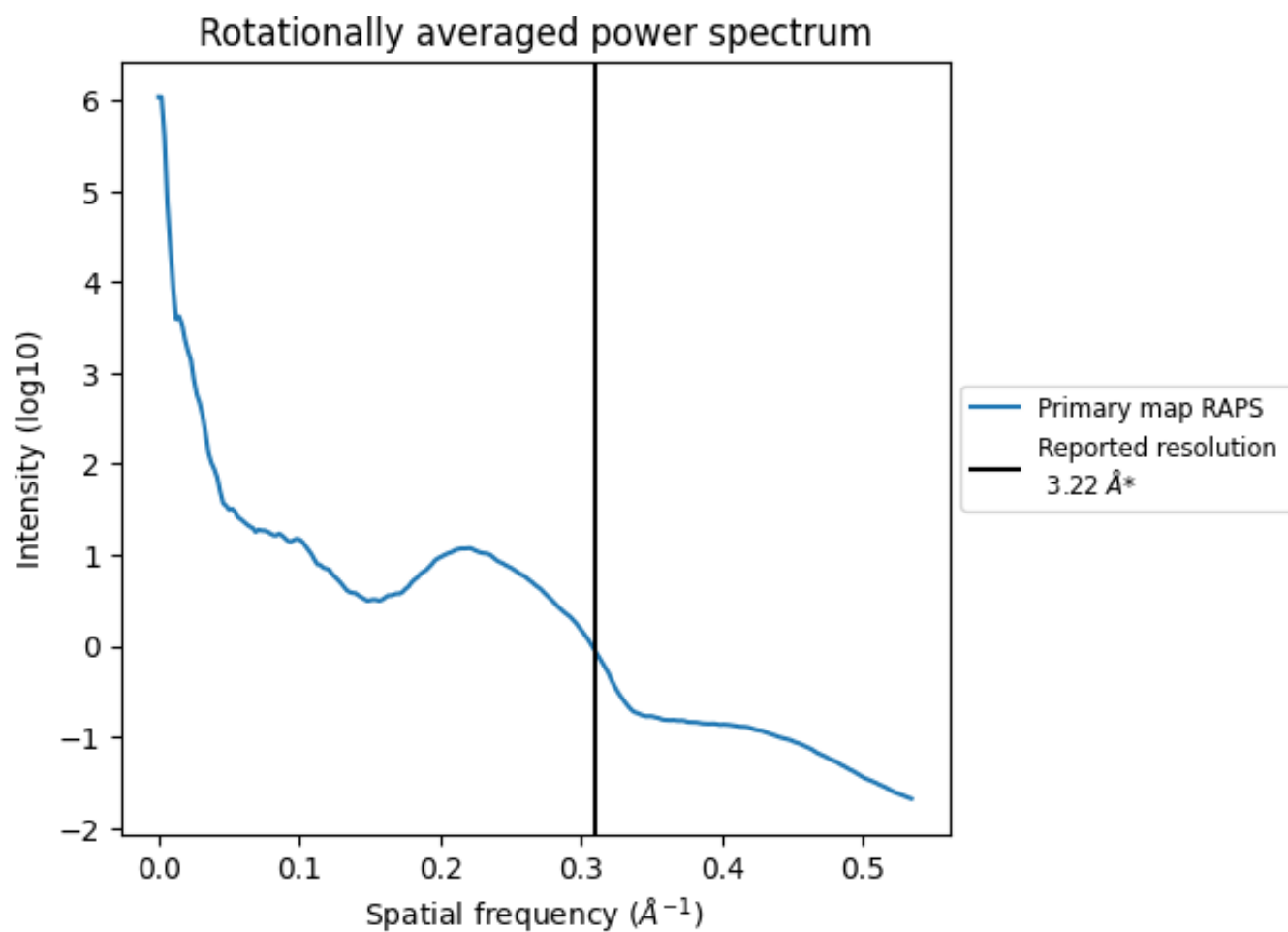
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 704 nm^3 ; this corresponds to an approximate mass of 636 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 0.311 Å⁻¹

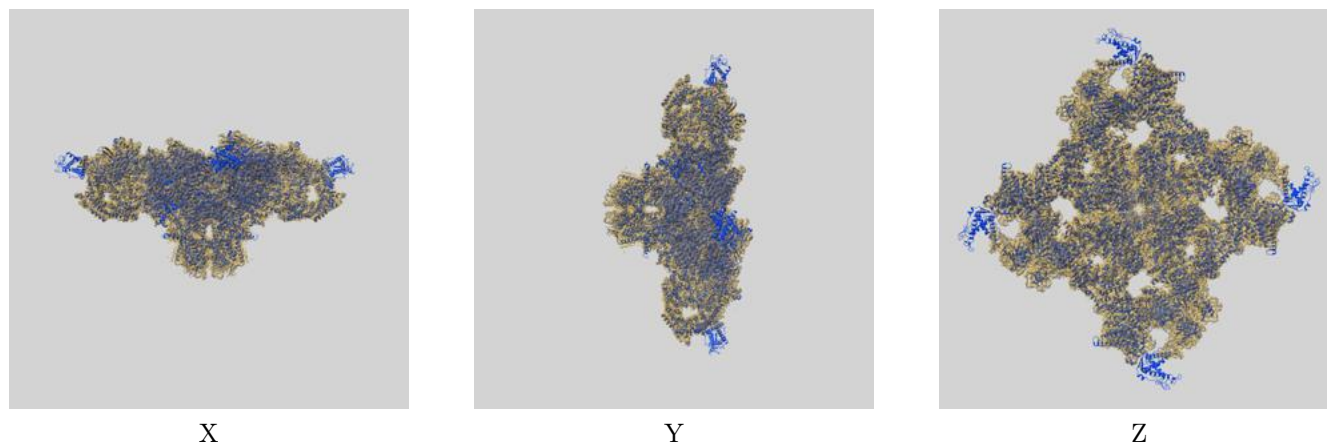
8 Fourier-Shell correlation

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

9 Map-model fit [i](#)

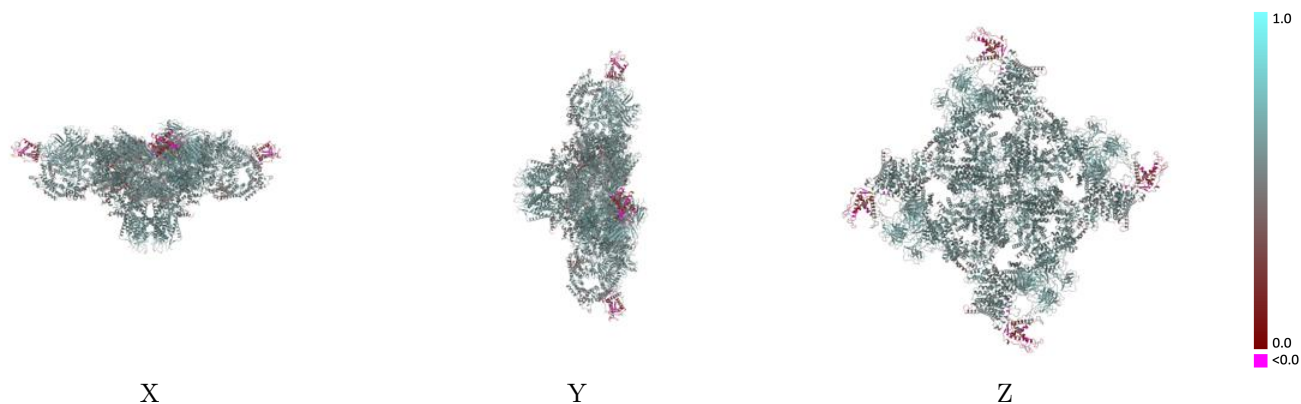
This section contains information regarding the fit between EMDB map EMD-45117 and PDB model 9C1F. Per-residue inclusion information can be found in section 3 on page 7.

9.1 Map-model overlay [i](#)



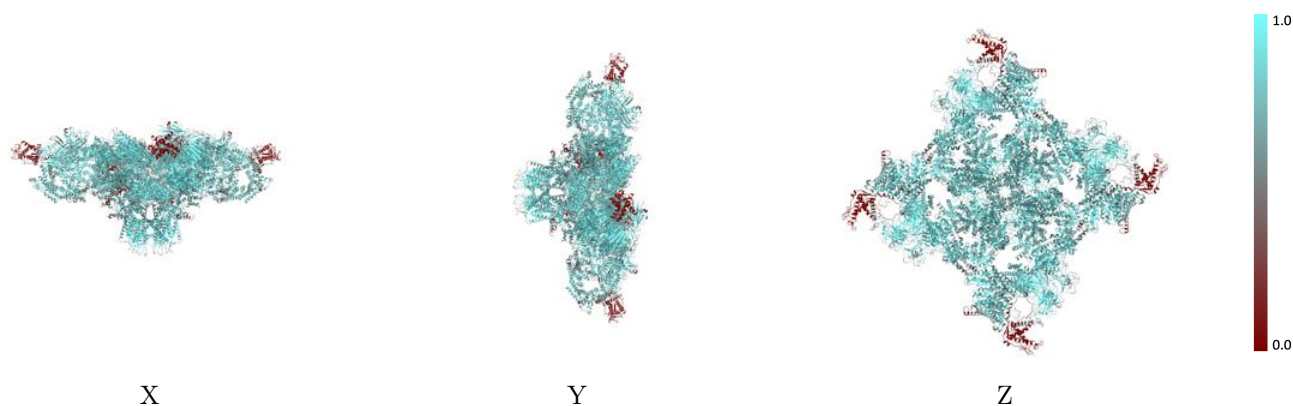
The images above show the 3D surface view of the map at the recommended contour level 0.068 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



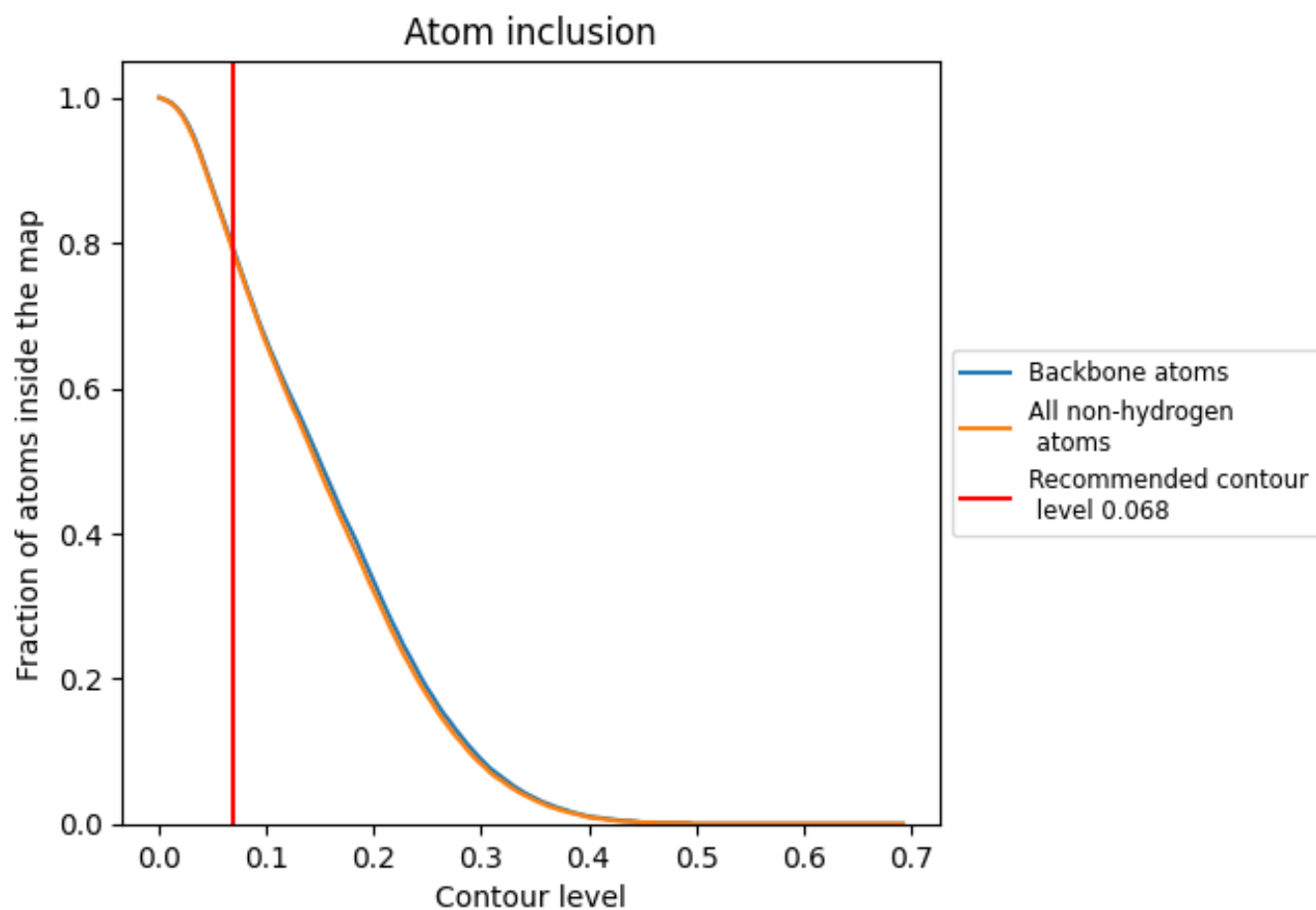
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.068).



















9.4 Atom inclusion [i](#)



At the recommended contour level, 80% of all backbone atoms, 79% 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 (0.068) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.7910	 0.5530
A	 0.7220	 0.5760
B	 0.7960	 0.5520
C	 0.7200	 0.5720
D	 0.7960	 0.5520
E	 0.7210	 0.5720
F	 0.7960	 0.5520
G	 0.7220	 0.5740
H	 0.7960	 0.5520

