



wwPDB EM Validation Summary Report ⓘ

Nov 5, 2024 – 10:09 AM EST

PDB ID : 9E1F
EMDB ID : EMD-47392
Title : Structure of RyR1 in the primed state in the presence of allopurinol
Authors : Miotto, M.C.; Marks, A.R.
Deposited on : 2024-10-21
Resolution : 3.03 Å (reported)
Based on initial model : 7TZC

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

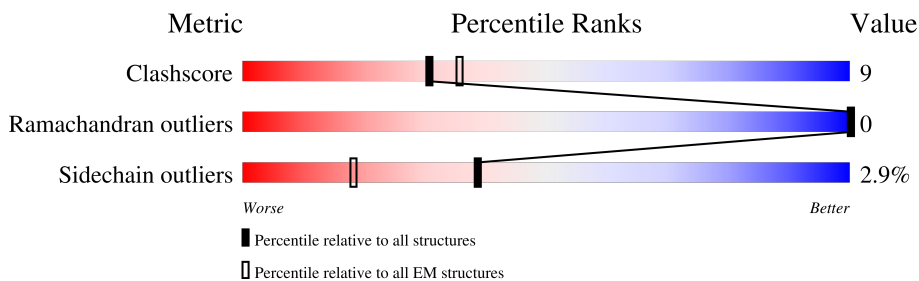
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 3.03 Å.

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



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

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

Mol	Chain	Length	Quality of chain
1	A	5037	
1	B	5037	
1	C	5037	
1	D	5037	
2	E	108	
2	F	108	
2	G	108	
2	H	108	

2 Entry composition

There are 7 unique types of molecules in this entry. The entry contains 144104 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.

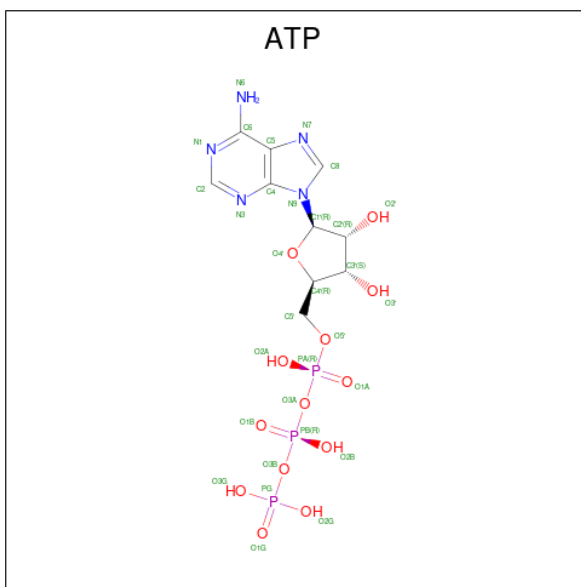
- Molecule 1 is a protein called Ryanodine receptor 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	4404	35150	22365	6063	6485	237	9	0
1	B	4404	35150	22365	6063	6485	237	9	0
1	D	4404	35150	22365	6063	6485	237	9	0
1	C	4404	35150	22365	6063	6485	237	9	0

- Molecule 2 is a protein called Peptidyl-prolyl cis-trans isomerase FKBP1A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	E	107	831	527	146	154	4	0	0
2	H	107	831	527	146	154	4	0	0
2	G	107	831	527	146	154	4	0	0
2	F	107	831	527	146	154	4	0	0

- Molecule 3 is ADENOSINE-5'-TRIPHOSPHATE (three-letter code: ATP) (formula: $C_{10}H_{16}N_5O_{13}P_3$).



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

- Molecule 4 is CALCIUM ION (three-letter code: CA) (formula: Ca).

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

- Molecule 5 is ZINC ION (three-letter code: ZN) (formula: Zn).

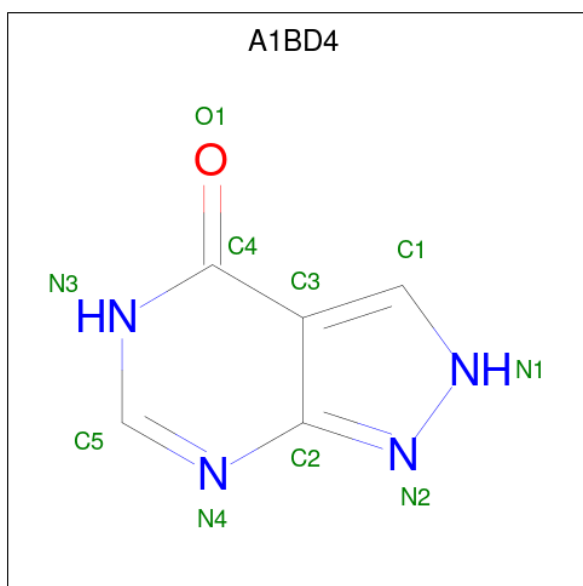
Mol	Chain	Residues	Atoms		AltConf
5	A	1	Total	Zn	0
			1	1	

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

- Molecule 6 is allopurinol (three-letter code: A1BD4) (formula: C₅H₄N₄O) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms				AltConf
6	A	1	Total	C	N	O	0
			10	5	4	1	
6	B	1	Total	C	N	O	0
			10	5	4	1	
6	D	1	Total	C	N	O	0
			10	5	4	1	
6	C	1	Total	C	N	O	0
			10	5	4	1	

- Molecule 7 is water.

Mol	Chain	Residues	Atoms		AltConf
7	A	2	Total	O	0
			2	2	
7	B	2	Total	O	0
			2	2	

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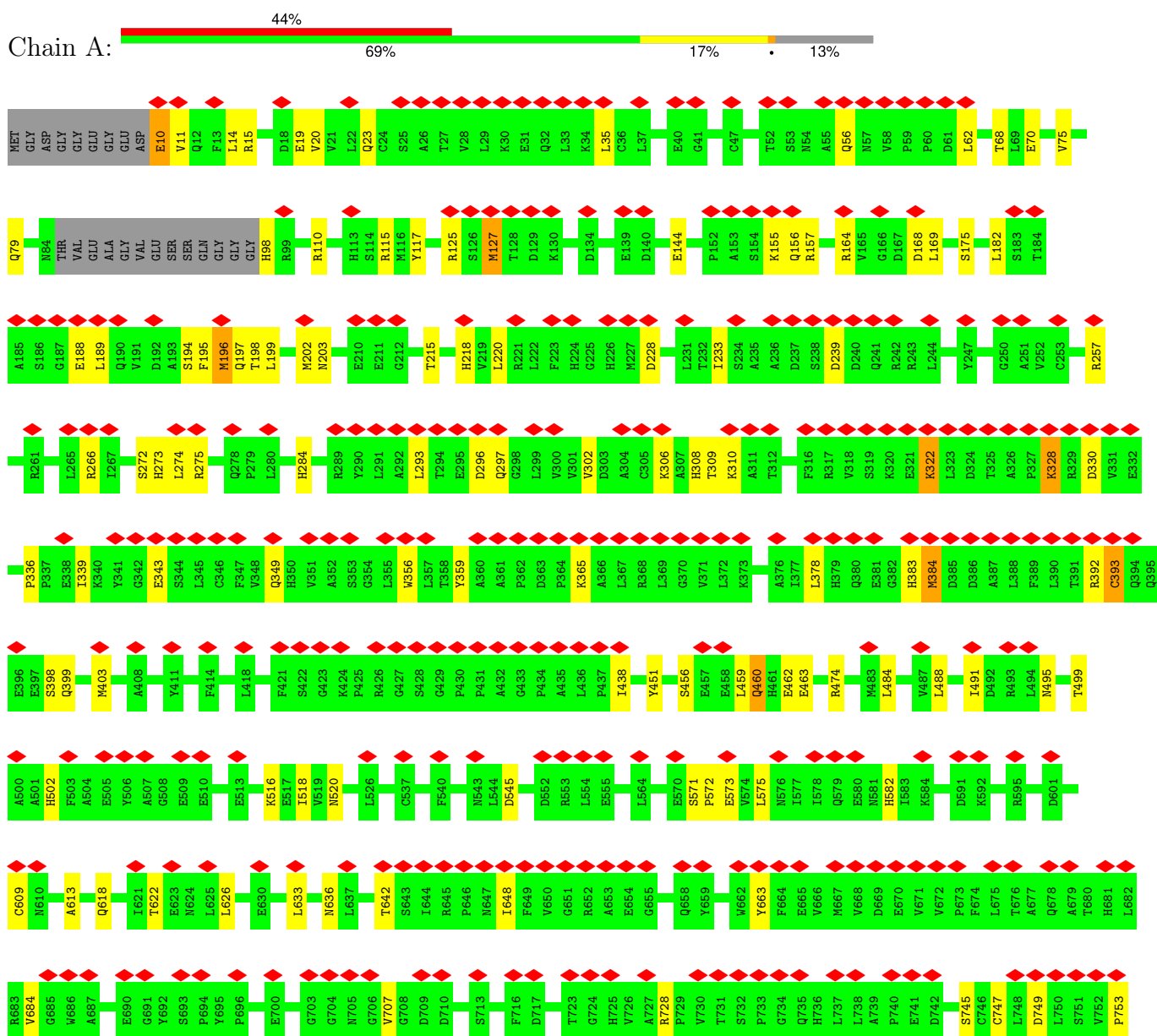
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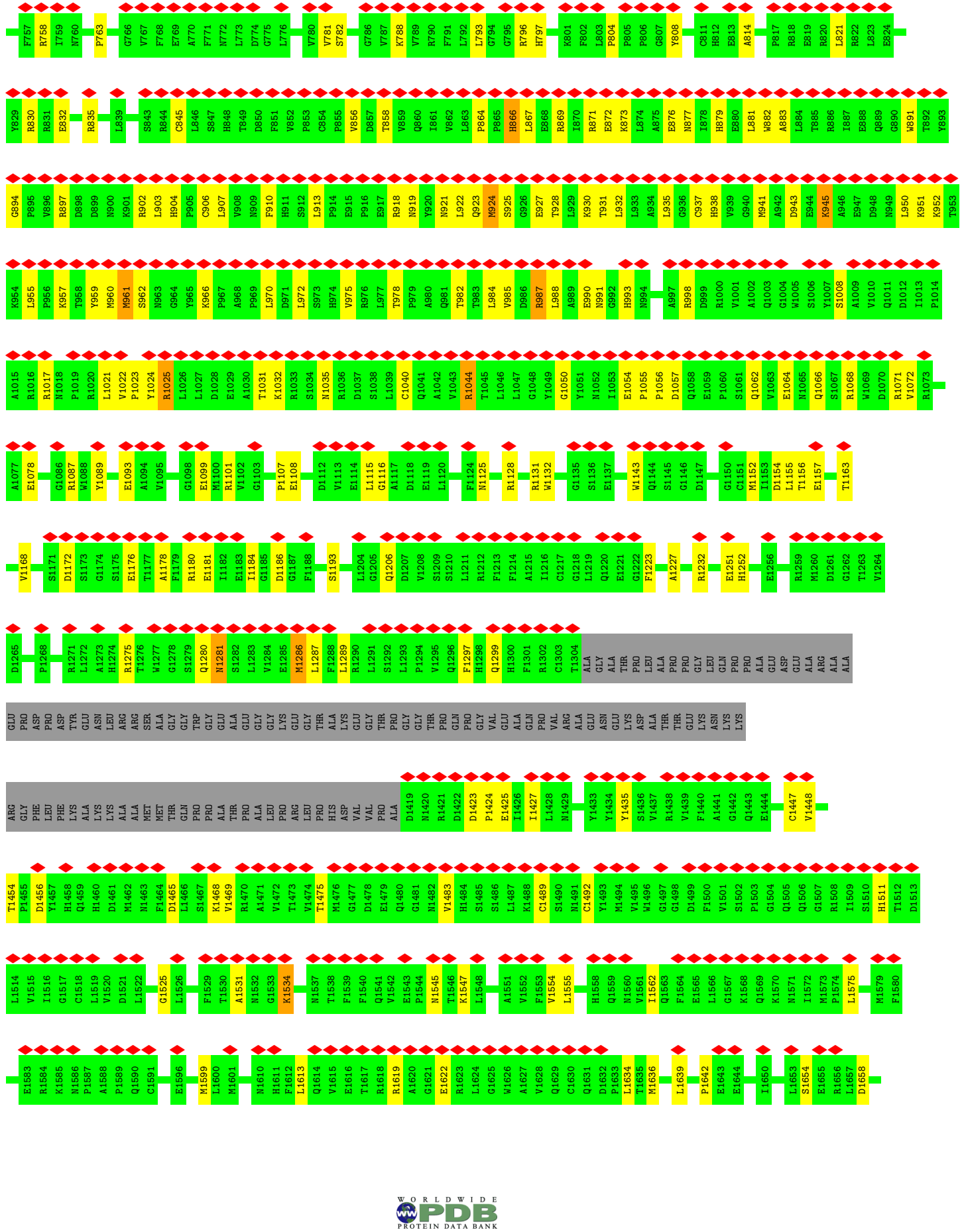
Mol	Chain	Residues	Atoms	AltConf
7	D	2	Total O 2 2	0
7	C	2	Total O 2 2	0

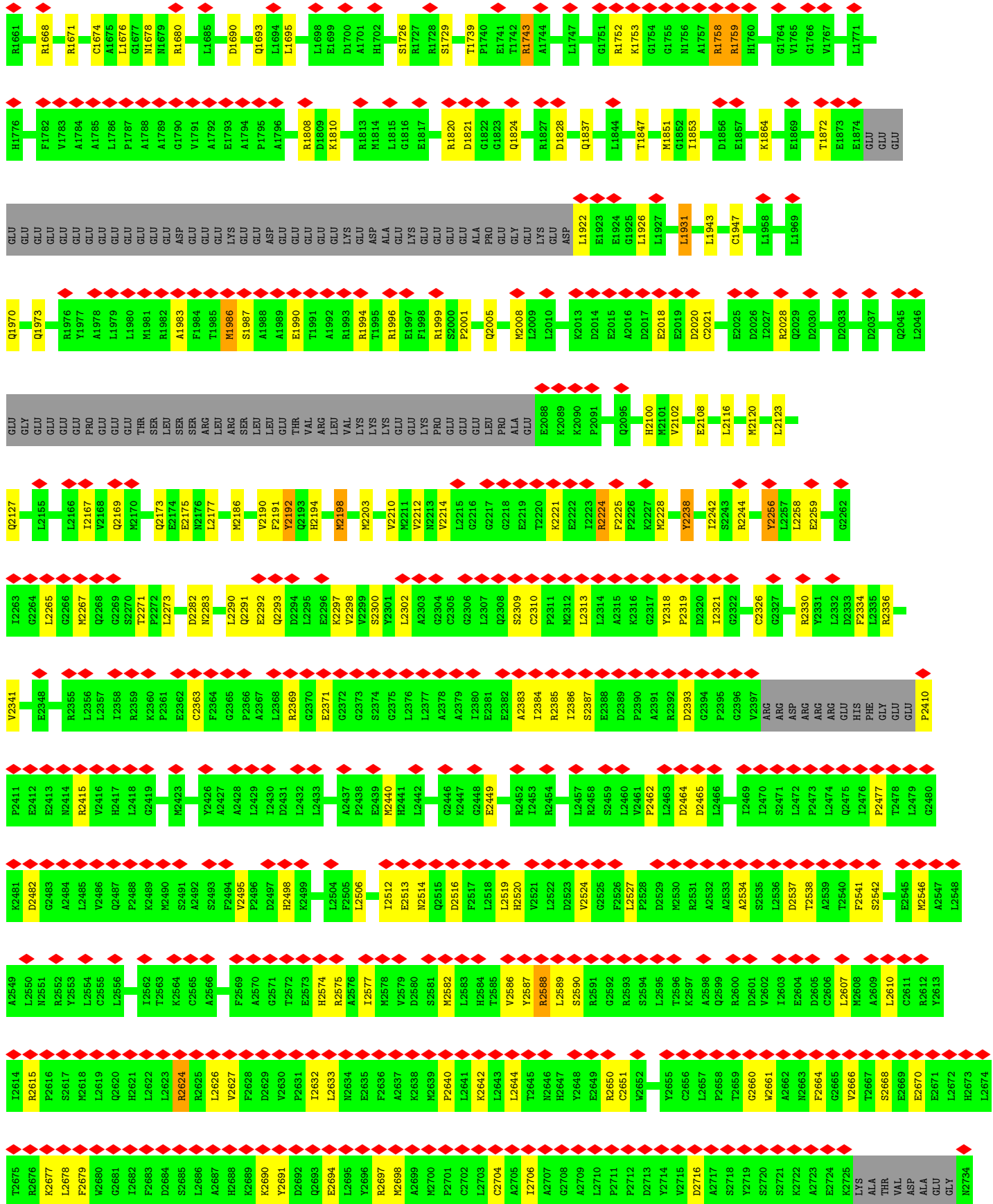
3 Residue-property plots [i](#)

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: Ryanodine receptor 1



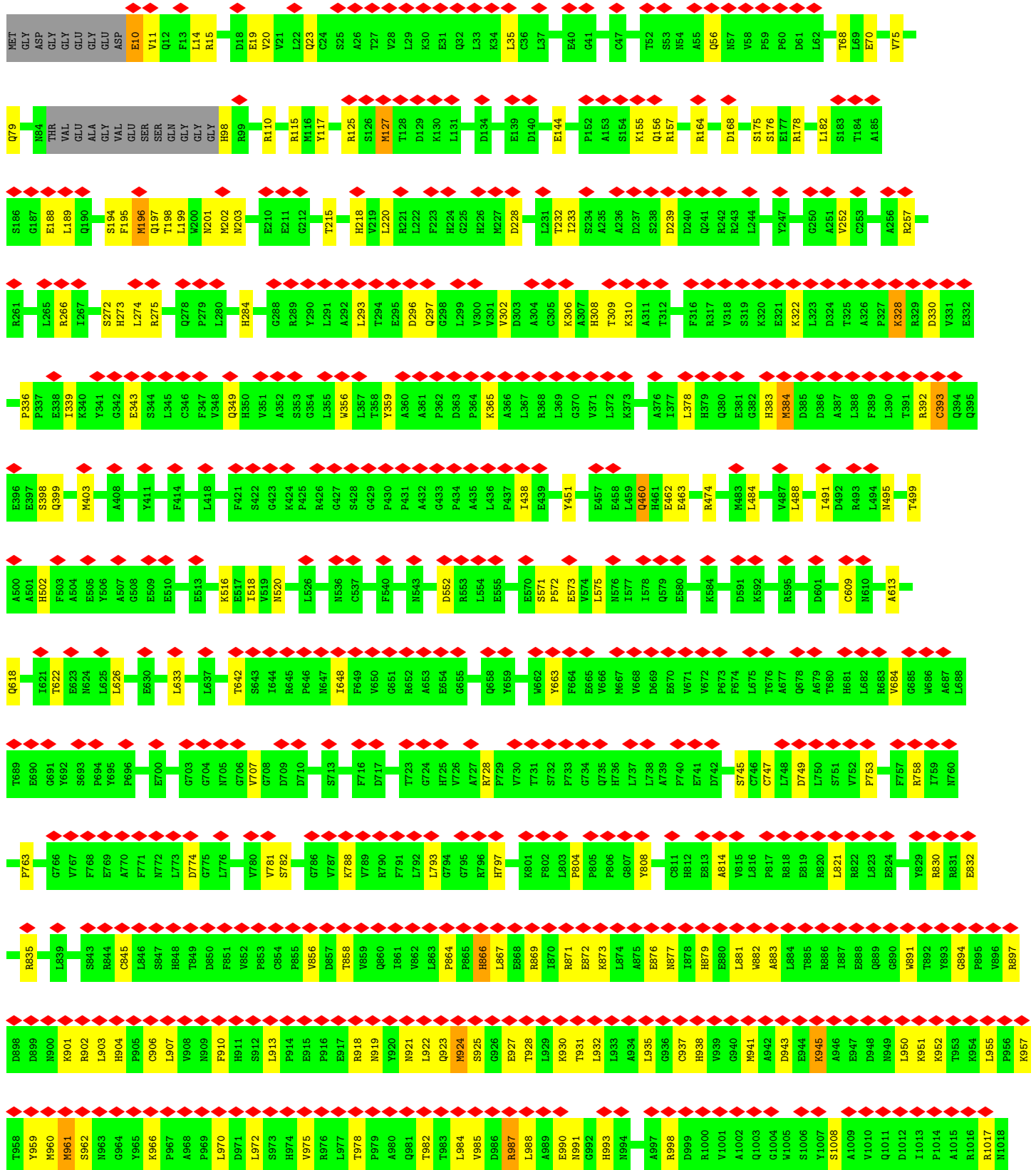


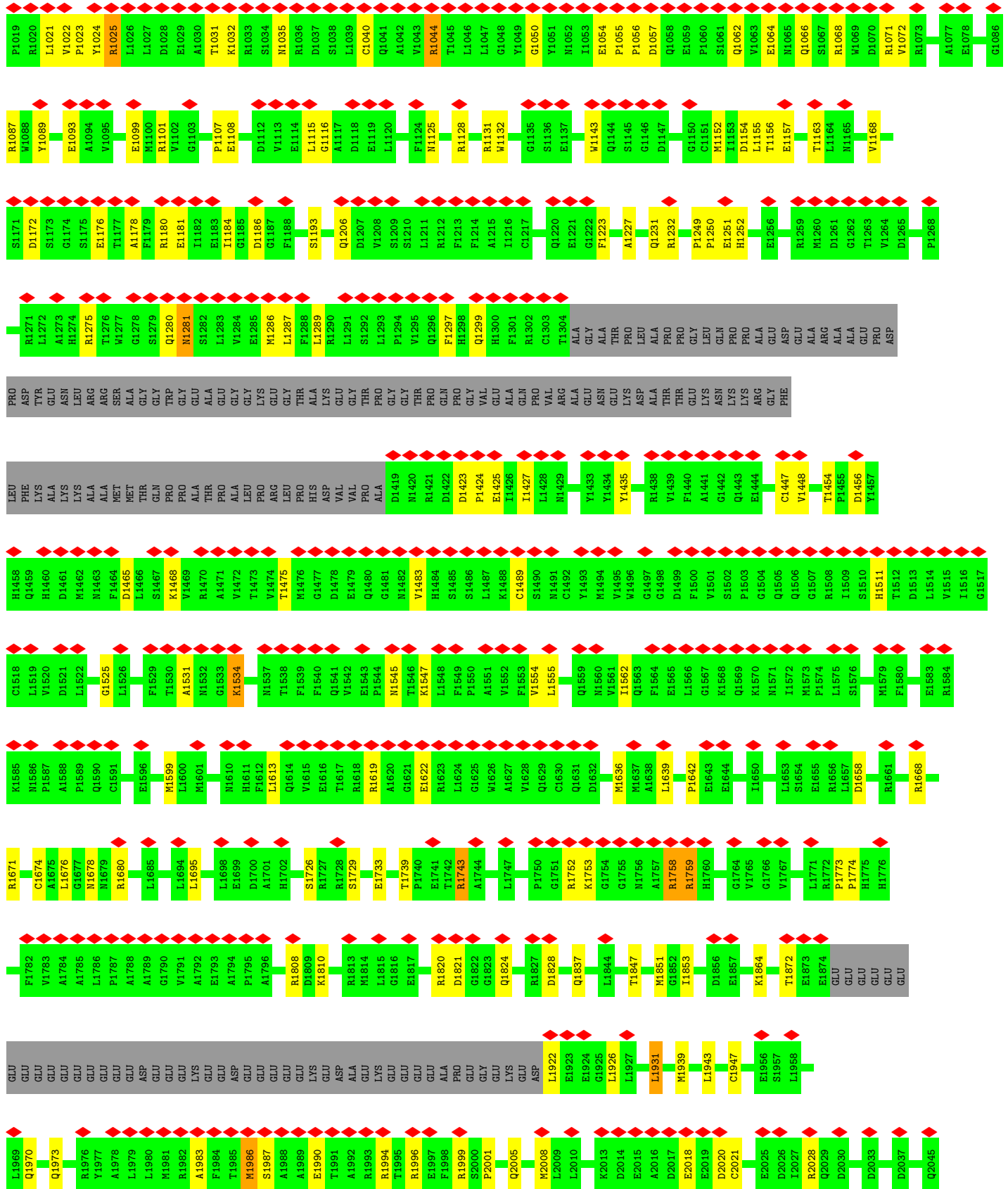


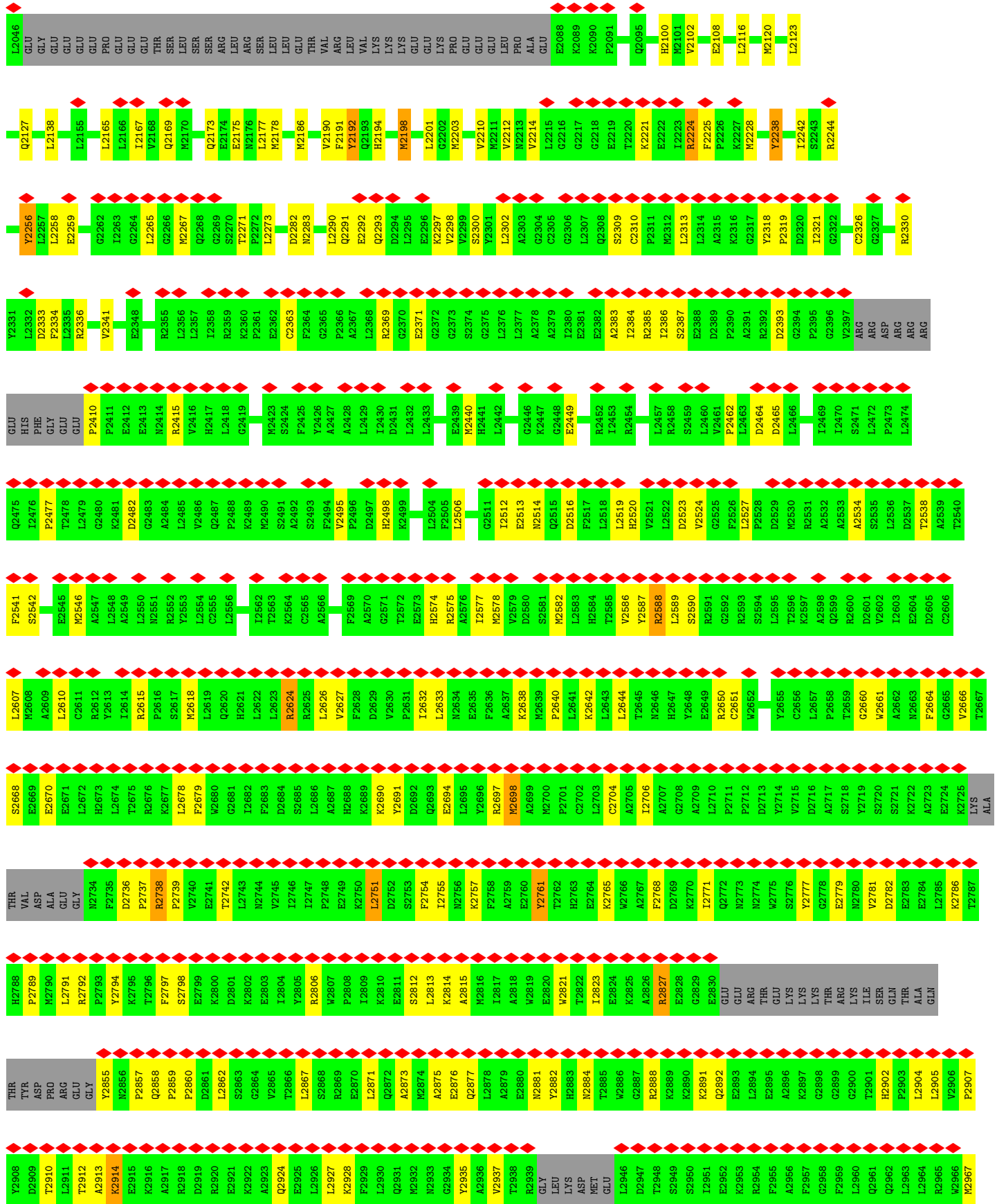
E3455	R3395	M3335	P3275	A3215	D3155	F3095	E3035	A2975	E2915	Y2855	K2795	F2735
D3456	D3396	K3336	M3276	C3216	V3156	F3096	K3036	H2976	K2916	M2856	T2796	D2736
N3457	E3397	R3337	M3277	S3217	L3157	F3097	E3037	L2977	A2917	P2857	T2797	D2737
F3458	F3398	L3338	C3278	V3218	L3158	S3098	M3038	E2978	R2918	Q2858	S2798	R2738
V3459	S3399	A3339	S3279	V3219	D3159	A3099	T3039	A2979	A2919	P2859	E2799	P2739
V3460	V3400	V3340	Y3280	T3220	D3160	S3100	T3040	V2980	R2920	K2860	K2800	V2740
Q3461	L3401	F3341	L3281	T3221	V3161	E3101	S3041	V2981	E2921	D2861	D2801	E2741
N3462	C3402	A3342	P3282	K3222	Q3162	D3102	L3042	S2982	K2922	L2862	K2802	T2742
E3463	R3403	Q3343	R3283	S3223	V3163	I3103	F3043	S2983	S2923	S2863	E2803	L2743
I3464	D3404	P3344	M3284	P3224	S3164	E3104	C3044	Q2984	Q2924	Q2864	I2804	N2744
N3465	L3405	I3345	W3285	R3225	C3165	K3105	K3045	R2985	E2925	V2865	Y2805	V2745
N3466	Y3406	V3346	E3286	E3226	Y3166	M3106	L3046	V2986	L2926	T2866	R2806	I2746
N3467	A3407	S3347	R3287	A3227	R3167	V3107	A3047	E2987	L2927	L2867	W2807	I2747
F3468	L3408	R3348	G3288	R3228	T3168	E3108	A3048	K2988	K2928	S2868	P2808	P2748
F3469	Y3409	A3349	P3289	T3229	L3169	M3109	L3049	S2989	F2929	S2869	I2809	E2749
L3470	P3410	R3350	E3290	L3230	C3170	L3110	V3050	P2990	L2930	E2870	K2810	K2750
T3471	L3411	P3351	A3291	G3231	S3171	R3111	H3051	H2991	Q2931	L2871	E2811	L2751
A3472	L3412	E3352	P3292	L3232	I3172	L3112	K3052	E2992	M2932	Q2872	S2812	D2752
D3473	I3413	L3353	P3293	P3233	Y3173	G3113	M2933	Q2993	M2933	A2873	L2813	S2753
S3474	R3414	L3354	P3294	N3234	S3174	K3114	V3054	E2994	Q2934	M2874	K2814	F2754
Y3415	Y3415	H3355	A3295	S3235	L3175	S3055	S2995	I2995	G2935	A2875	A2815	I2755
S3476	Y3416	S3356	L3296	V3236	G3176	M3116	L3056	K2996	A2936	E2876	M2816	N2756
K3477	D3417	H3357	P3297	E3237	T3177	S3117	F3057	F2997	V2937	Q2877	I2817	K2757
N3478	N3418	F3358	A3298	E3238	T3178	ALA	G3058	F2998	T2938	L2878	A2818	F2758
A3479	N3419	I3359	G3299	M3239	K3179	ARG	T3059	A2999	R2939	A2879	W2819	A2759
LYS	R3420	P3360	A3300	C3240	M3180	THR	D3060	K3000	GLY	E2880	E2820	E2760
ALA	A3421	T3361	P3301	P3241	T3181	VAL	A3061	I3001	LEU	M2881	W2821	Y2761
GLY	H3422	I3362	P3302	D3242	Y3182	K3123	P3062	L3002	ASP	Y2882	T2822	T2762
ASP	W3423	L3363	P3303	I3243	V3183	G3124	A3063	L3003	MET	H2883	I2823	H2763
ALA	L3424	G3364	C3304	P3244	E3184	V3125	V3064	P3004	GLU	M2884	E2824	E2764
SER	T3425	L3365	T3305	V3245	K3185	G3126	V3065	L3005	L2946	T2885	K2825	K2765
GLY	E3426	R3366	A3306	L3246	L3186	Q3127	N3066	I3006	D2947	W2886	K2826	W2766
GLY	P3427	K3367	V3307	D3247	R3187	L3129	C3067	N3007	T2948	E2887	A2827	W2767
SER	N3428	R3368	F3308	R3248	P3188	L3130	L3068	Y3009	S2950	R2888	E2828	F2768
GLN	A3429	A3369	S3309	L3249	A3189	T3130	H3069	F3010	S2951	K2889	G2829	D2769
GLU	N3430	G3370	D3310	M3250	L3190	Y3131	I3070	F3011	I2952	K2890	E2830	K2770
ARG	A3431	K3371	H3311	A3251	G3191	T3133	L3071	T3011	E2952	K2891	I2771	I2771
LYS	E3432	V3372	L3312	D3252	E3192	T3134	A3072	N3012	K2953	Q2892	GLU	Q2772
LYS	E3433	V3373	N3313	I3253	V3194	V3134	R3073	H3013	R2954	E2893	THR	R2773
LYS	L3434	A3374	S3314	G3254	A3195	A3135	S3074	C3014	F2955	L2894	GLU	N2774
LYS	F3435	E3375	L3315	G3255	L3196	L3136	L3075	L3015	A2956	E2895	GLU	W2775
R3499	R3436	E3376	L3316	L3256	R3196	L3137	D3076	F3016	F2957	E2896	LYS	W2776
G3500	M3437	E3377	G3317	A3257	L3197	P3138	A3077	F3017	G2958	K2897	THR	Y2777
D3501	V3438	E3378	N3318	E3258	L3199	V3139	R3078	L3018	F2959	Q2898	ARG	G2778
R3502	G3439	L3379	I3319	S3259	A3199	L3140	R3079	S3019	L2960	G2899	LYS	E2779
V3503	E3440	R3380	L3320	A3260	A3200	T3141	T3079	S3019	Q2961	Q2900	IIE	I2780
S3504	I3441	L3381	R3321	A3261	M3201	T3142	V3080	T3020	Q2962	T2901	GLN	W2781
V3505	F3442	E3382	I3322	R3262	P3202	L3143	K3082	A3022	L2963	H2902	THR	D2782
K3506	I3443	A3383	V3263	V3263	V3203	F3144	S3083	K3023	L2964	P2903	ALA	E2783
T3507	Y3444	K3384	T3264	A3204	Q3145	Q3145	G3084	V3024	R2965	L2904	GLN	E2784
S3508	W3445	A3385	E3265	E3265	H3146	H3146	P3085	L3025	W2966	L2905	THR	E2785
L3509	S3446	A3386	M3266	M3266	I3147	I3147	E3086	G3026	M2967	V2906	ASP	L2785
I3510	K3447	L3327	F3267	F3267	E3207	A3148	I3087	S3027	D2968	P2907	ARG	K2786
V3511	S3448	E3387	H3268	H3268	Q3149	Q3149	V3088	G3028	I2969	P2908	ARG	T2787
A3512	H3449	E3388	I3329	V3269	H3150	H3150	K3089	G3029	S2970	V2908	GLU	H2788
N3450	N3450	E3389	D3330	V3269	Q3209	Q3209	K3089	G3029	Q2971	D2909	GLU	P2789
F3451	F3451	G3390	L3270	L3270	L3210	L3210	A3090	H3030	Q2971	T2910	THR	H2790
R3452	R3452	E3391	E3271	E3271	N3211	N3211	G3091	A3031	E2972	L2911	THR	L2791
K3453	K3453	I3322	I3272	I3272	E3212	E3212	L3092	S3032	F2973	T2912	THR	R2792
E3454	E3454	L3393	T3273	T3273	Y3213	Y3213	R3093	N3033	I2974	A2913	GLY	F2793
		V3394	N3214	N3214	N3214	N3214	S3094	K3034		K2914		Y2794

R897	D898	D899	N900	K901	R902	L903	H904	P905	C906	L907	V908	N909	F910	H911	S912	L913	P914	E915	P916	E917	R918	N919	Y920	N921	L922	Q923	M924	S925	G926	E927	T928	L929	K930	T931	L932	L933	A934	L935	G936	C937	H938	V939	G940	M941	A942	D943	E944	K945	A946	E947	D948	N949	L950	K951	K952	T953	L955	P956																																
K957	T958	Y959	N960	M961	S962	N963	G964	K966	P967	A968	P969	D971	L972	S973	H974	V975	R976	L977	T978	P979	A980	G981	T982	T983	L984	V985	D986	R987	L988	A989	E990	N991	S992	H993	H994	A997	R998	D999	R1000	V1001	A1002	Q1003	G1004	W1005	S1006	Y1007	S1008	A1009	V1010	Q1011	D1012	I1013	P1014	A1015	R1016	R1017																																		
W1018	P1019	R1020	L1021	V1022	P1023	Y1024	R1025	L1026	L1027	D1028	A1029	A1030	T1031	K1032	R1033	S973	M1035	R1036	D1037	S1038	L1039	C1040	Q1041	A1042	V1043	R1044	T1045	L1046	L1047	G1048	Y1049	Y1051	N1052	S992	H993	P1055	P1056	D1057	Q1058	E1059	P1060	S1061	Q1062	V1063	E1064	W1065	M1066	Y1067	S1068	R1068	W1069	R1071	V1072	I1073	A1077	E1078																																		
G1086	R1087	W1088	Y1089	E1093	A1094	V1095	E1099	M1100	W1101	A1102	G1103	P1107	E1108	D1112	V1113	L1115	G1116	D1118	E1119	L1120	F1124	M1125	R1128	R1131	W1132	G1135	S1136	E1137	W1143	Q1144	S1145	G1146	D1147	G1150	G1151	M1152	L1154	L1155	T1156	E1157	G1158	G1159	M1162	T1163	R1068	W1069	R1071	V1072	I1073	A1077	E1078																																							
S1171	D1172	S1173	G1174	S1175	E1176	T1177	A1178	F1179	R1180	E1181	I1182	E1183	I1184	D1186	G1187	S1193	L1204	G1205	Q1206	D1207	V1208	S1209	S1210	L1211	R1212	F1213	F1214	A1215	I1216	C1217	Q1220	E1221	G1222	F1223	A1227	Q1231	R1232	E1251	H1252	E1256	R1259	M1260	L1261	G1262	T1263	V1264	D1265																																											
P1266	R1271	L1272	A1273	H1274	R1275	A1276	SER	A1277	G1278	Q1280	M1281	S1282	L1283	V1284	E1285	M1286	ARG	G1287	F1288	L1289	R1290	L1291	S1292	L1293	P1294	V1295	Q1296	F1297	H1298	Q1299	H1300	F1301	R1302	C1303	T1304	ALA	GLY	ALA	ASN	GLU	THR	PRO	LEU	ALA	ALA	PRO	GLY	ASN	GLN	LYS	ASP	ALA	THR	PRO	GLY	GLU	ALA	ASN	GLU	THR	PRO	LEU	ALA	ALA	PRO	GLY	ASP	ALA	THR	PRO	GLY	GLU	ALA	ASN	GLN	LYS	ARG	GLY	ASP	ALA	THR	PRO	GLY	GLU	ALA	ASN	GLN	LYS	ARG	GLY
PHE	LEU	PHE	LYS	ALA	GLN	LYS	ALA	ALA	MET	THR	GLN	PRO	PRO	ALA	THR	PRO	VAL	ASP	VAL	VAL	D1419	N1420	R1421	D1422	D1423	P1424	E1425	I1426	I1427	L1428	N1429	Y1433	Y1434	Y1435	R1436	V1439	F1440	A1441	G1442	Q1443	E1444	C1447	V1448	T1454	P1455	D1456																																												
Y1457	H1458	Q1459	H1460	L1461	M1462	N1463	F1464	L1465	L1466	S1467	K1468	V1469	R1470	A1471	V1472	T1473	V1474	M1475	M1476	F1477	D1478	E1479	Q1480	G1481	M1482	V1483	H1484	S1485	F1486	L1487	K1488	C1489	S1490	N1491	C1492	Y1493	M1494	V1495	W1496	G1497	G1498	D1499	F1500	V1501	S1502	F1503	G1504	Q1505	Q1506	G1507	R1508	I1509	S1510	H1511	T1512	D1513	L1514	V1515	I1516																															
G1517	C1518	L1519	V1520	D1521	L1522	G1525	L1526	F1529	T1530	A1531	M1532	G1533	K1534	M1537	T1538	F1539	F1540	Q1541	V1542	E1543	P1544	M1545	T1546	K1547	L1548	F1549	P1550	A1551	V1552	F1553	V1554	L1555	Q1559	N1560	V1561	I1562	Q1563	F1564	E1565	L1566	G1567	K1568	Q1569	G1570	M1571	I1572	M1573	P1574	L1575	S1576	M1579	F1580	E1583																																					
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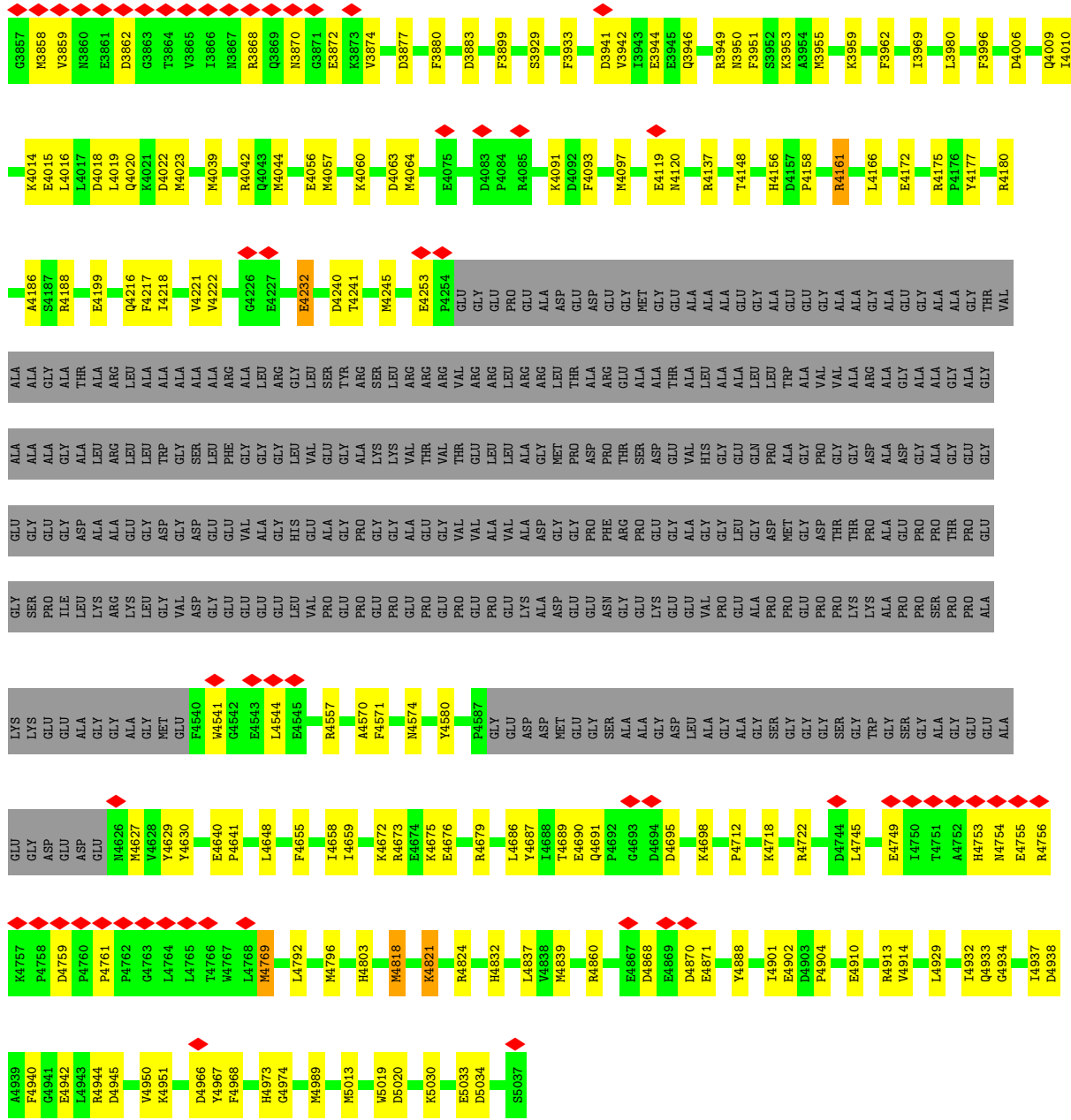
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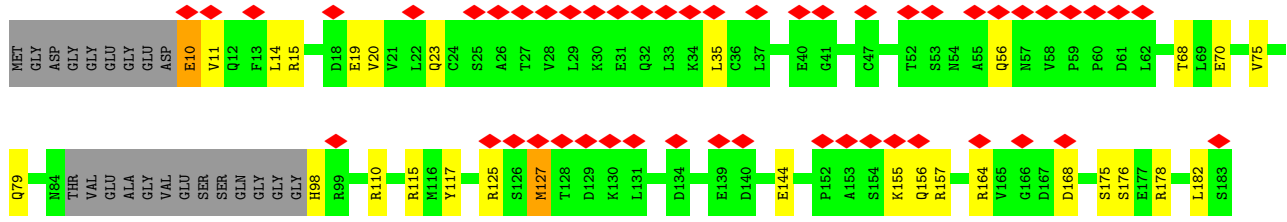
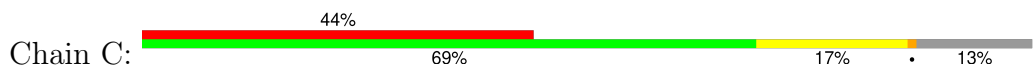


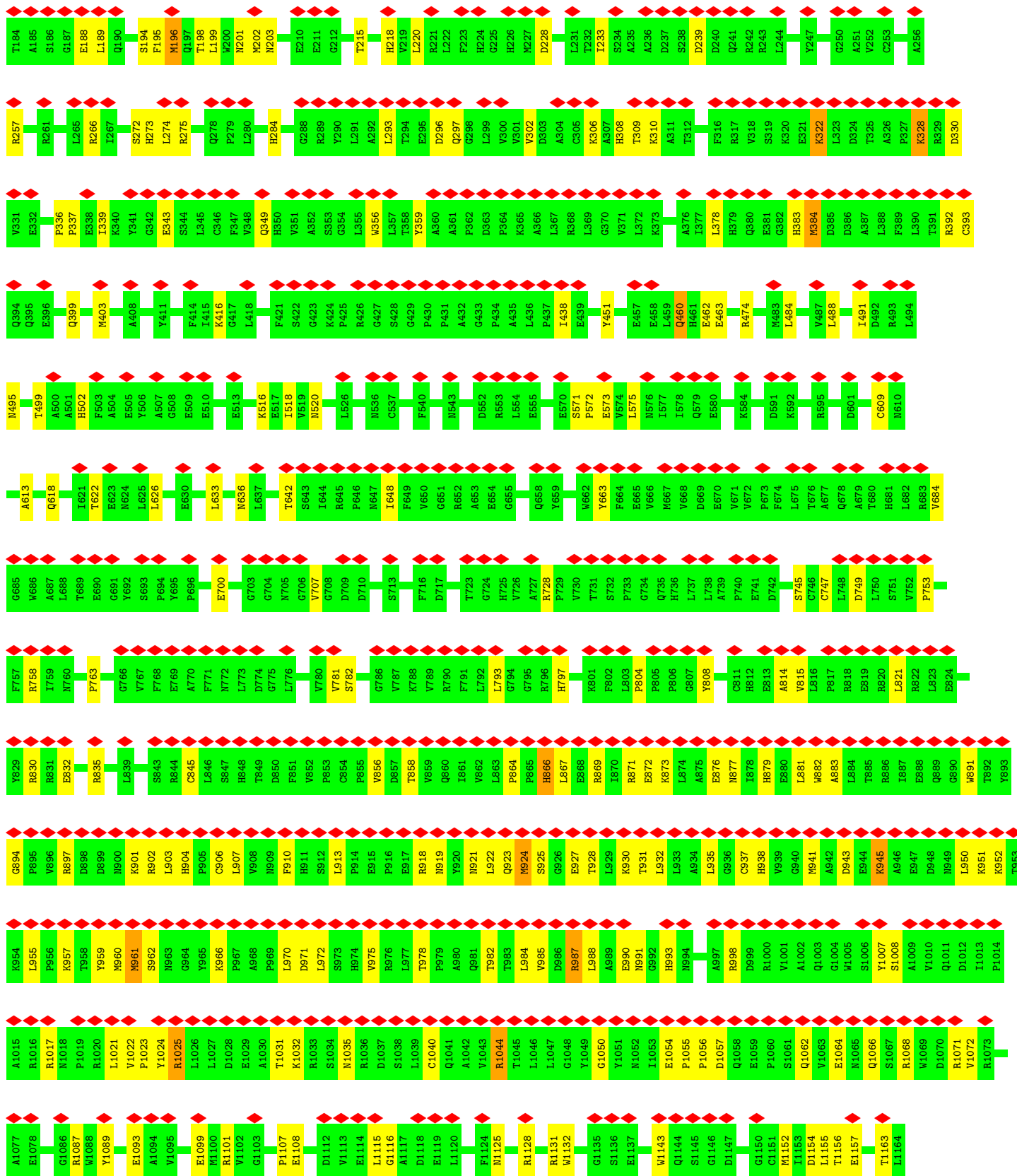


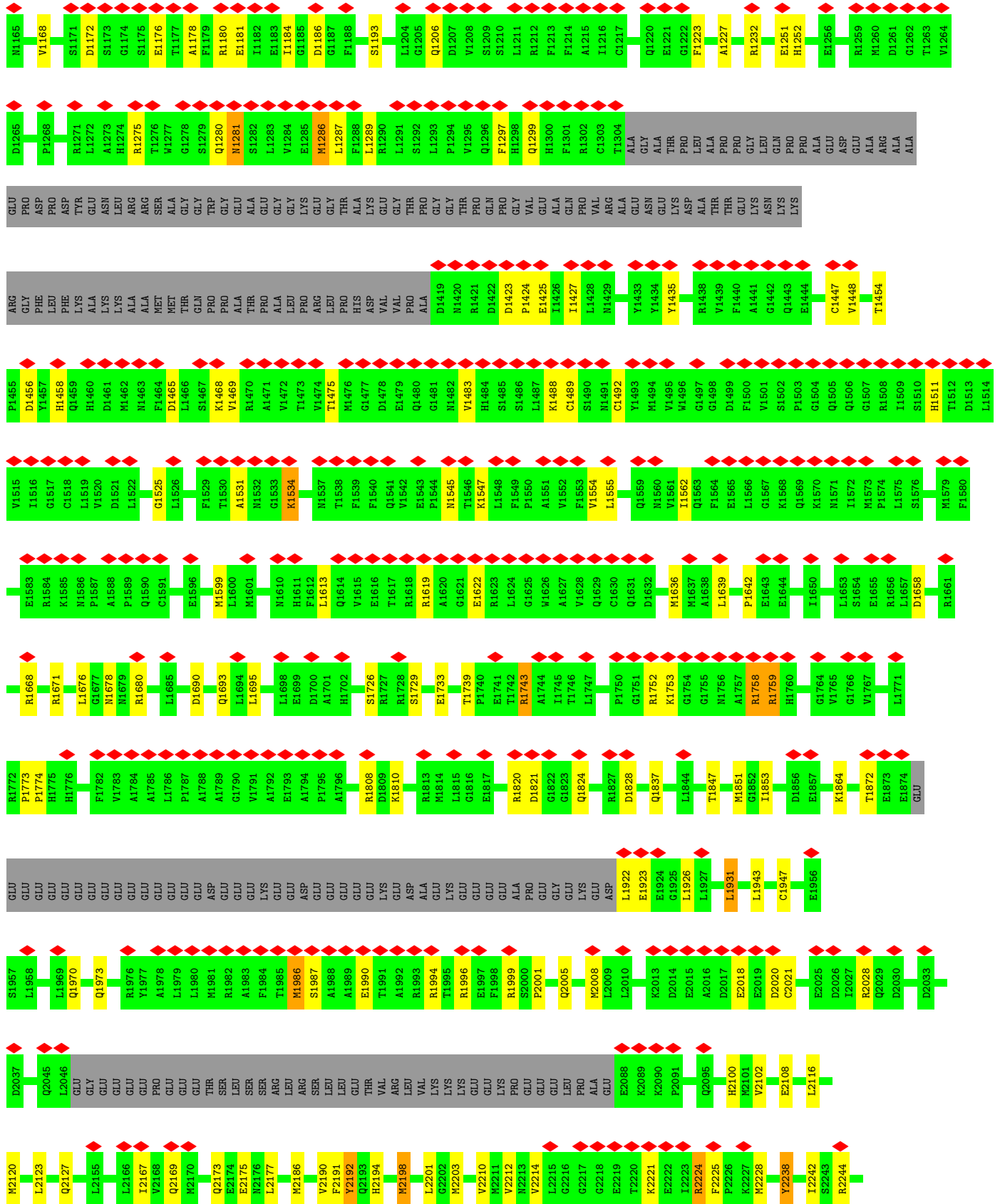
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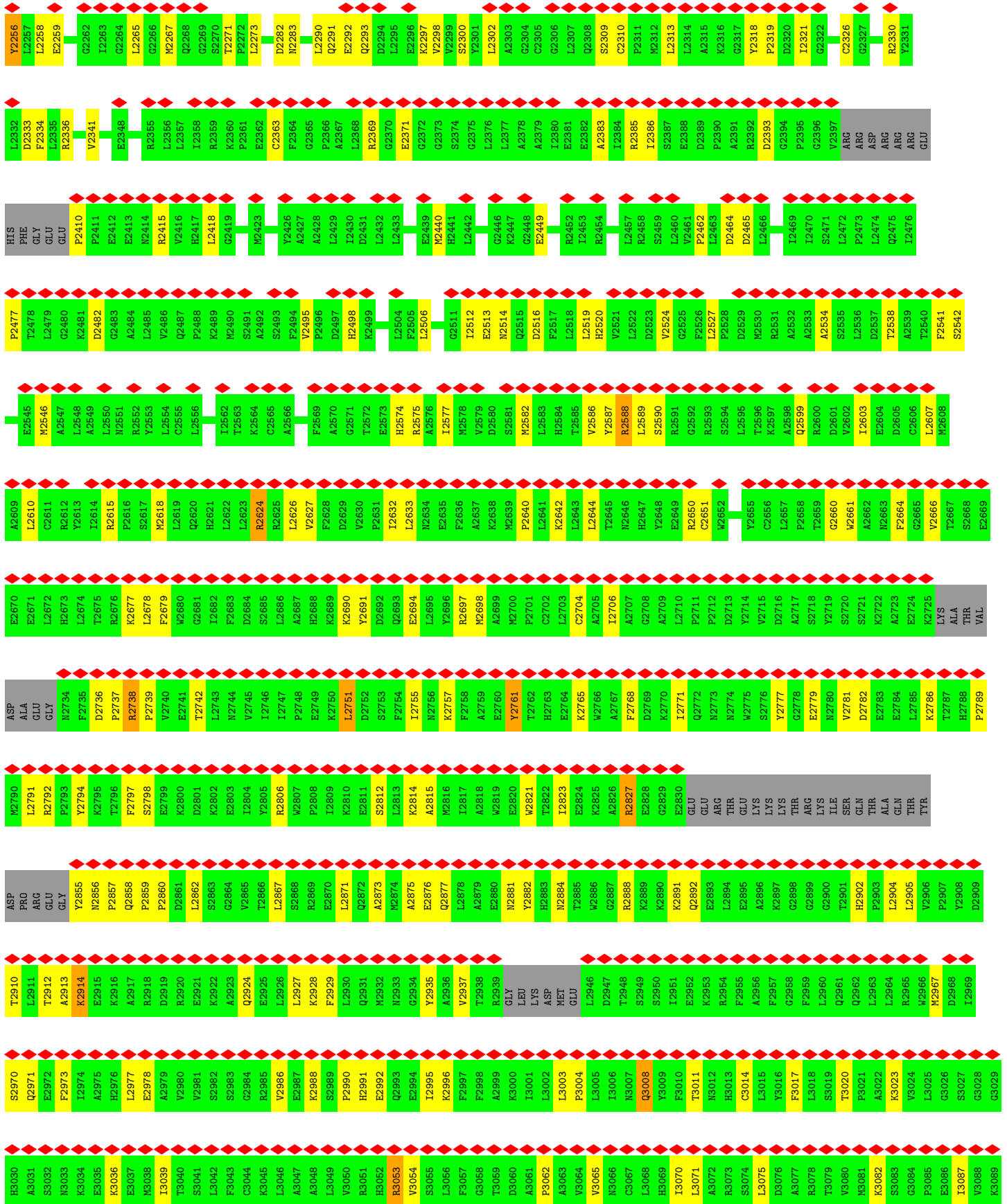


● Molecule 1: Ryanodine receptor 1

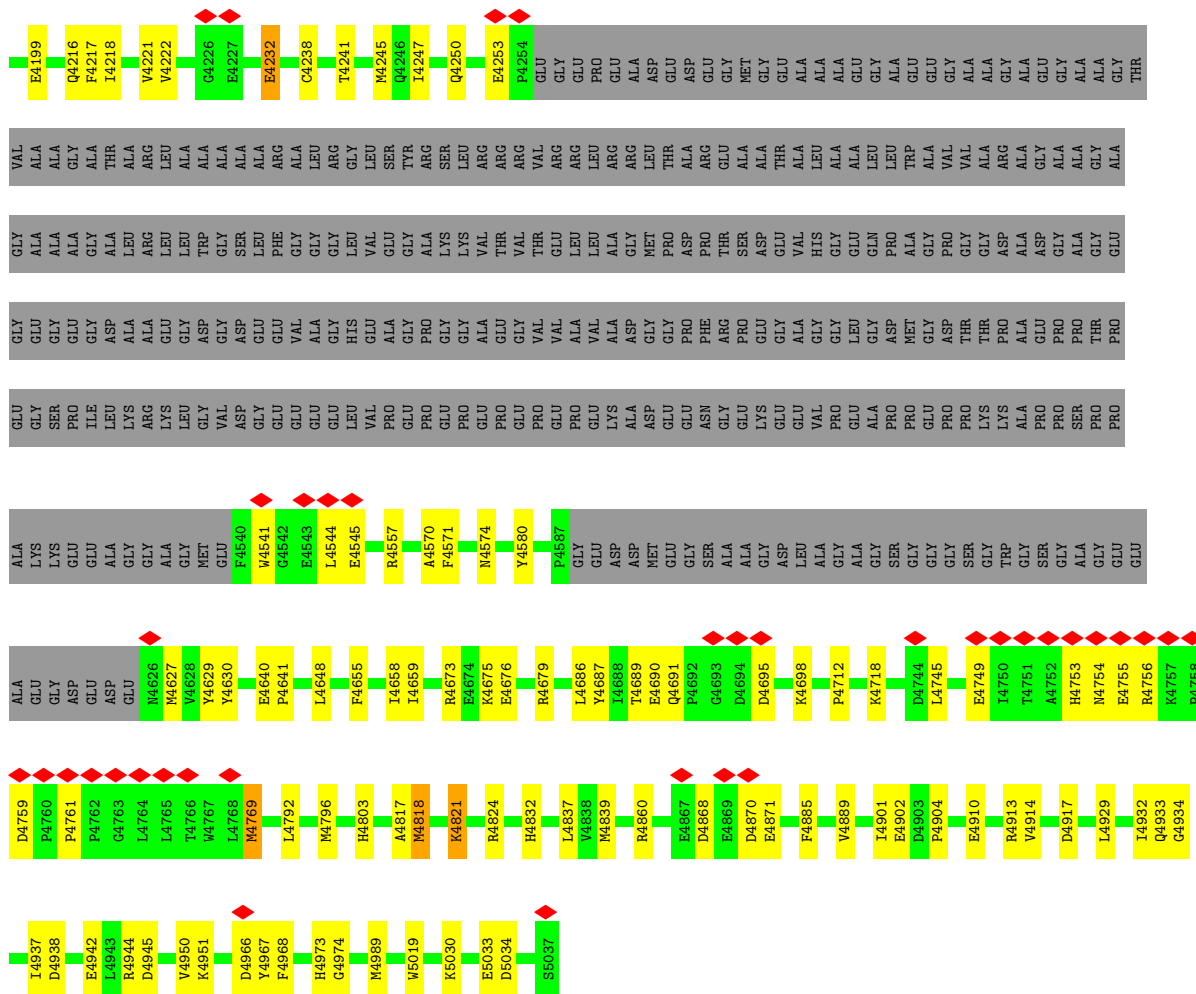




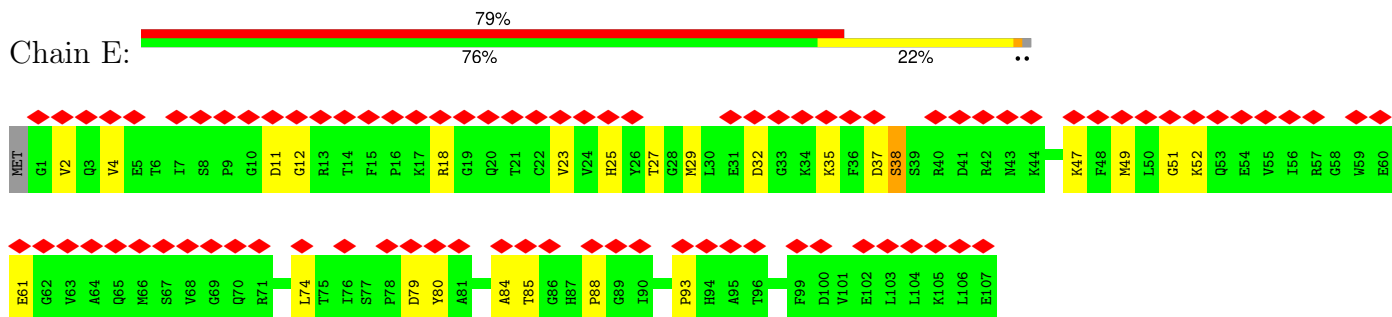




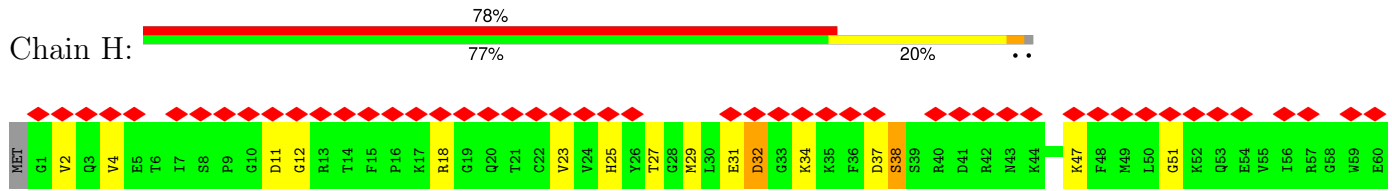
D4018	E3861	K3731	A3631	W3571	F3451	E3391	E3331	E3271	N3211	Q3151	A3090
L4019	D3862	H3734	V3632	Q3572	K4512	L3392	A3332	I3272	E3212	F3152	G3091
R4020	G3863	L3735	V3633	K3573	R4513	L3393	T3333	T3273	E3213	G3153	L3092
M4022	T3864	E3736	A3634	A3574	E4454	V3394	W3334	L3274	N3214	D3154	F3095
M4023	S3865	E3736	C3635	L3575	E4455	R3395	M3335	P3275	C3215	V3155	F3096
M4039	I3866	GLY	F3636	Y3576	N3457	D3396	K3336	M3276	A3216	D3157	E3097
R4042	N3867	GLY	R3637	R3577	R3458	R3397	R3337	L3277	S3217	I3157	S3098
R4043	R3868	GLU	O3638	G3578	F3458	F3398	L3338	C3278	V3218	L3158	A3099
M4044	Q3869	ASN	T3639	L3579	V3459	A3339	A3339	S3279	Y3219	D3159	S3100
E4056	N3870	GLU	P3640	P3520	V3460	S3399	V3340	Y3280	Y3220	D3160	E3101
R4060	G3871	ALA	L3642	G3521	Q3461	L3401	F3341	L3281	T3221	V3161	D3102
D4063	K3872	GLU	R3582	L3522	N3462	C3402	A3342	P3282	K3222	Q3162	I3103
M4064	N3873	GLU	N3643	N3523	E3463	R3403	Q3343	R3283	S3223	V3163	E3104
D3877	E3874	GLU	R3648	M3524	I3464	D3404	R3344	W3284	P3224	S3164	K3105
D3878	D3875	V3749	M3652	C3525	N3465	L3405	I3345	W3285	R3225	C3165	M3106
E3879	E3876	E3750	A3586	A3526	V3466	Y3406	V3346	E3286	E3226	Y3166	V3107
F3880	D3887	S3752	D3587	P3527	M3467	A3407	S3347	R3287	R3227	R3167	E3108
D3883	D3888	F3753	D3588	S3468	S3468	L3408	R3348	G3288	A3228	T3168	N3109
F3889	E3883	E3754	P3589	F3469	F3469	Y3409	A3349	P3289	I3229	L3169	L3110
S3929	K3872	E3755	E3590	Q3530	L3470	P3410	R3350	E3290	L3230	C3170	R3111
F3933	E3872	K3756	D3672	D3531	T3471	L3411	P3351	A3291	G3231	S3171	L3112
D3941	E3881	E3757	G3681	L3532	A3472	L3412	E3352	P3292	P3232	I3172	G3113
V3942	E3882	M3758	E3882	L3533	D3473	T3413	L3353	P3293	P3233	Y3173	K3114
Q3946	Q3683	R3761	Q3683	M3534	R3474	R3414	L3354	P3294	N3234	S3174	V3115
R3949	E3684	R3762	E3684	L3535	K3475	Y3415	H3355	A3295	S3235	L3175	S3116
F3951	E3685	Q3765	V3596	A3536	S3476	V3416	S3356	L3296	V3236	G3176	ALA
K3952	E3686	Q3766	Q3597	K3537	K3477	D3417	H3357	P3297	E3237	T3177	ALA
S3953	E3687	S3767	T3538	T3538	M3478	N3418	F3358	A3298	E3238	R3178	ARG
A3954	E3688	S3768	R3539	R3539	A3479	N3419	I3359	G3299	M3239	K3179	THR
M3955	E3689	H3771	Y3540	A3641	ALA	R3420	P3360	A3300	C3240	N3180	GLN
D3956	F3690	M3793	A3601	A3641	GLY	A3421	T3361	P3301	P3241	T3181	VAL
K3959	E3692	A3810	R3602	L3542	ASP	H3422	I3362	I3302	P3242	Y3182	K3123
F3962	I3969	K3815	L3603	K3543	ALA	W3423	G3363	P3303	I3243	V3183	G3124
L3980	L3969	D3822	H3605	D3544	GLN	L3424	R3364	C3304	P3244	E3184	V3125
F3996	L3969	K3823	L3606	T3545	SER	L3425	R3365	T3305	V3245	K3185	G3126
D4006	L3980	S3840	E3607	D3546	GLY	F3426	R3366	A3306	L3246	L3186	Q3127
I4010	L3980	D3822	Q3608	E3647	SER	P3427	K3367	V3307	D3247	R3187	R3128
K4014	L3980	K3841	T3609	E3648	ASP	R3428	R3368	T3308	R3248	P3188	L3129
E4015	L3980	L3842	E3610	V3649	GLU	A3429	A3369	S3309	L3249	A3189	T3130
R4188	L3980	L3842	H3611	R3550	THR	N3430	G3370	D3310	M3250	L3190	Y3131
S4187	L3980	L3842	F3552	F3551	LVS	A3431	K3371	H3311	A3251	G3191	T3132
R4188	L3980	L3842	L3553	L3553	LVS	E3433	V3372	L3312	D3252	E3192	T3133
E4016	L3980	L3842	Q3554	Q3554	R3498	L3434	V3373	N3313	I3253	C3193	V3134
L4017	L3980	L3842	N3555	N3555	R3499	S3314	A3374	S3314	G3254	L3194	A3135
L4017	L3980	L3842	M3556	M3556	G3500	E3376	E3376	L3315	G3255	A3195	L3136
L4017	L3980	L3842	L3557	L3557	D3501	M3437	E3377	G3317	L3256	A3196	L3137
L4017	L3980	L3842	H3558	H3558	R3502	V3438	Q3378	A3257	A3257	R3196	F3138
L4017	L3980	L3842	L3559	L3559	Y3503	G3439	L3379	I3319	E3258	A3198	L3140
L4017	L3980	L3842	Q3560	Q3560	S3504	E3440	R3380	L3320	S3259	A3199	T3141
L4017	L3980	L3842	G3561	G3561	V3505	L3441	L3381	R3321	A3261	M3201	T3142
L4017	L3980	L3842	K3562	K3562	Q3506	F3442	E3382	I3322	A3262	P3202	L3143
L4017	L3980	L3842	V3563	V3563	T3507	I3443	A3383	I3323	Y3263	V3203	F3144
L4017	L3980	L3842	E3564	E3564	S3508	V3444	K3384	V3324	T3264	A3204	Q3145
L4017	L3980	L3842	G3565	G3565	L3509	W3445	A3385	N3325	T3265	A3205	H3146
L4017	L3980	L3842	S3566	S3566	L3509	S3446	A3386	N3326	E3265	F3205	I3147
L4017	L3980	L3842	P3567	P3567	I3510	R3447	E3387	L3327	M3266	P3206	T3148
L4017	L3980	L3842	S3568	S3568	S3448	S3448	A3387	G3328	P3267	E3207	A3148
L4017	L3980	L3842	L3569	L3569	H3449	H3449	E3388	I3329	H3268	P3208	Q3149
L4017	L3980	L3842	R3570	R3570	H3450	H3450	E3389	D3330	V3269	Q3209	H3150

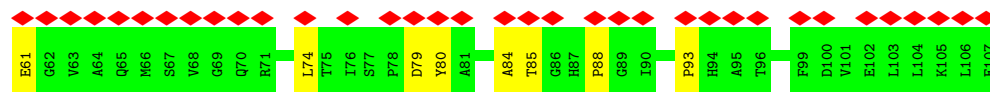


• Molecule 2: Peptidyl-prolyl cis-trans isomerase FKBP1A

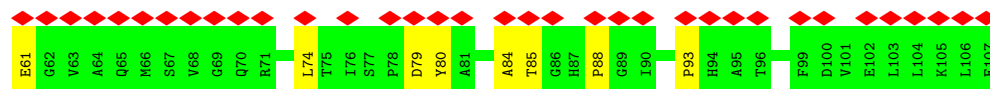
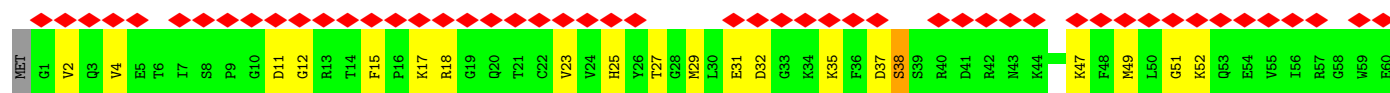
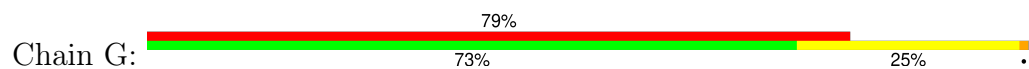


• Molecule 2: Peptidyl-prolyl cis-trans isomerase FKBP1A

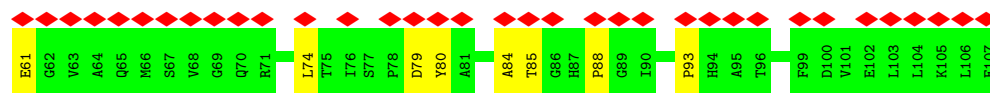
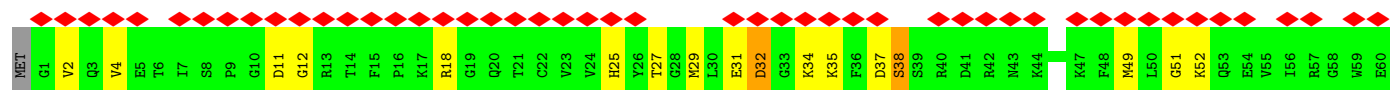
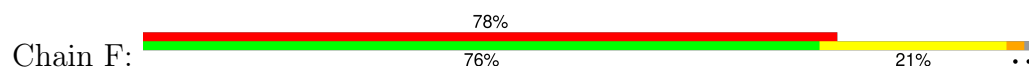




- Molecule 2: Peptidyl-prolyl cis-trans isomerase FKBP1A



- Molecule 2: Peptidyl-prolyl cis-trans isomerase FKBP1A



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	41370	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	TFS KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	58	Depositor
Minimum defocus (nm)	500	Depositor
Maximum defocus (nm)	1500	Depositor
Magnification	Not provided	
Image detector	GATAN K3 BIOQUANTUM (6k x 4k)	Depositor
Maximum map value	0.433	Depositor
Minimum map value	-0.213	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.016	Depositor
Recommended contour level	0.1	Depositor
Map size (\AA)	427.52, 427.52, 427.52	wwPDB
Map dimensions	512, 512, 512	wwPDB
Map angles ($^\circ$)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (\AA)	0.835, 0.835, 0.835	Depositor

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: ZN, CA, A1BD4, ATP

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 5$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
1	A	0.33	0/35977	0.52	3/48726 (0.0%)
1	B	0.33	0/35977	0.52	3/48726 (0.0%)
1	C	0.33	0/35977	0.52	3/48726 (0.0%)
1	D	0.33	0/35977	0.52	3/48726 (0.0%)
2	E	0.33	0/850	0.56	0/1146
2	F	0.33	0/850	0.57	0/1146
2	G	0.32	0/850	0.56	0/1146
2	H	0.32	0/850	0.57	0/1146
All	All	0.33	0/147308	0.52	12/199488 (0.0%)

There are no bond length outliers.

The worst 5 of 12 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	3603	LEU	CA-CB-CG	8.45	134.74	115.30
1	A	3603	LEU	CA-CB-CG	8.44	134.71	115.30
1	D	3603	LEU	CA-CB-CG	8.43	134.69	115.30
1	C	3603	LEU	CA-CB-CG	8.43	134.69	115.30
1	C	3393	LEU	CA-CB-CG	6.08	129.29	115.30

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts

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	35150	0	34797	623	0
1	B	35150	0	34797	614	0
1	C	35150	0	34797	617	0
1	D	35150	0	34797	616	0
2	E	831	0	831	12	0
2	F	831	0	831	13	0
2	G	831	0	831	13	0
2	H	831	0	831	12	0
3	A	31	0	12	0	0
3	B	31	0	12	0	0
3	C	31	0	12	0	0
3	D	31	0	12	0	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
5	D	1	0	0	0	0
6	A	10	0	0	0	0
6	B	10	0	0	0	0
6	C	10	0	0	0	0
6	D	10	0	0	0	0
7	A	2	0	0	0	0
7	B	2	0	0	0	0
7	C	2	0	0	0	0
7	D	2	0	0	0	0
All	All	144104	0	142560	2493	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 2493 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:A:4860:ARG:NH1	1:D:4630:TYR:OH	1.88	1.06
1:A:4630:TYR:OH	1:B:4860:ARG:NH1	1.92	1.01
1:B:4630:TYR:OH	1:C:4860:ARG:NH1	1.97	0.96
1:D:4860:ARG:NH1	1:C:4630:TYR:OH	1.97	0.95
1:D:2765:LYS:HZ3	1:D:2857:PRO:HB2	1.38	0.89

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	4385/5037 (87%)	4235 (97%)	150 (3%)	0	100	100
1	B	4385/5037 (87%)	4235 (97%)	150 (3%)	0	100	100
1	C	4385/5037 (87%)	4236 (97%)	149 (3%)	0	100	100
1	D	4385/5037 (87%)	4235 (97%)	150 (3%)	0	100	100
2	E	105/108 (97%)	104 (99%)	1 (1%)	0	100	100
2	F	105/108 (97%)	103 (98%)	2 (2%)	0	100	100
2	G	105/108 (97%)	104 (99%)	1 (1%)	0	100	100
2	H	105/108 (97%)	103 (98%)	2 (2%)	0	100	100
All	All	17960/20580 (87%)	17355 (97%)	605 (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	3836/4276 (90%)	3727 (97%)	109 (3%)	38	67
1	B	3836/4276 (90%)	3727 (97%)	109 (3%)	38	67
1	C	3836/4276 (90%)	3727 (97%)	109 (3%)	38	67
1	D	3836/4276 (90%)	3727 (97%)	109 (3%)	38	67

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
2	E	89/90 (99%)	84 (94%)	5 (6%)	17	46
2	F	89/90 (99%)	83 (93%)	6 (7%)	13	40
2	G	89/90 (99%)	83 (93%)	6 (7%)	13	40
2	H	89/90 (99%)	83 (93%)	6 (7%)	13	40
All	All	15700/17464 (90%)	15241 (97%)	459 (3%)	39	67

5 of 459 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	B	4627	MET
1	C	4091	LYS
1	D	2203	MET
1	C	3648	ARG
1	C	2256	TYR

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 25 such sidechains are listed below:

Mol	Chain	Res	Type
1	D	866	HIS
1	D	3461	GLN
1	C	4009	GLN
1	D	3214	ASN
1	D	4009	GLN

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 16 ligands modelled in this entry, 8 are monoatomic - leaving 8 for Mogul analysis.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
3	ATP	D	5301	-	28,33,33	0.66	0	34,52,52	0.74	2 (5%)
6	A1BD4	D	5304	-	9,11,11	1.18	1 (11%)	6,15,15	1.31	1 (16%)
3	ATP	B	5301	-	28,33,33	0.66	0	34,52,52	0.74	2 (5%)
6	A1BD4	B	5304	-	9,11,11	1.16	1 (11%)	6,15,15	1.32	1 (16%)
3	ATP	C	5301	-	28,33,33	0.66	0	34,52,52	0.75	2 (5%)
6	A1BD4	C	5304	-	9,11,11	1.18	1 (11%)	6,15,15	1.31	1 (16%)
3	ATP	A	5301	-	28,33,33	0.66	0	34,52,52	0.74	2 (5%)
6	A1BD4	A	5304	-	9,11,11	1.17	1 (11%)	6,15,15	1.33	1 (16%)

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	5301	-	-	3/18/38/38	0/3/3/3
6	A1BD4	D	5304	-	-	-	0/2/2/2
3	ATP	B	5301	-	-	3/18/38/38	0/3/3/3
6	A1BD4	B	5304	-	-	-	0/2/2/2
3	ATP	C	5301	-	-	3/18/38/38	0/3/3/3
6	A1BD4	C	5304	-	-	-	0/2/2/2
3	ATP	A	5301	-	-	3/18/38/38	0/3/3/3
6	A1BD4	A	5304	-	-	-	0/2/2/2

All (4) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
6	D	5304	A1BD4	C3-C4	-3.07	1.42	1.47

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
6	C	5304	A1BD4	C3-C4	-3.07	1.42	1.47
6	A	5304	A1BD4	C3-C4	-3.06	1.42	1.47
6	B	5304	A1BD4	C3-C4	-2.99	1.42	1.47

The worst 5 of 12 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	B	5301	ATP	C4'-O4'-C1'	-2.38	107.74	109.92
3	A	5301	ATP	C4'-O4'-C1'	-2.37	107.76	109.92
3	C	5301	ATP	C5-C6-N6	2.36	123.91	120.31
3	D	5301	ATP	C4'-O4'-C1'	-2.35	107.78	109.92
3	A	5301	ATP	C5-C6-N6	2.34	123.88	120.31

There are no chirality outliers.

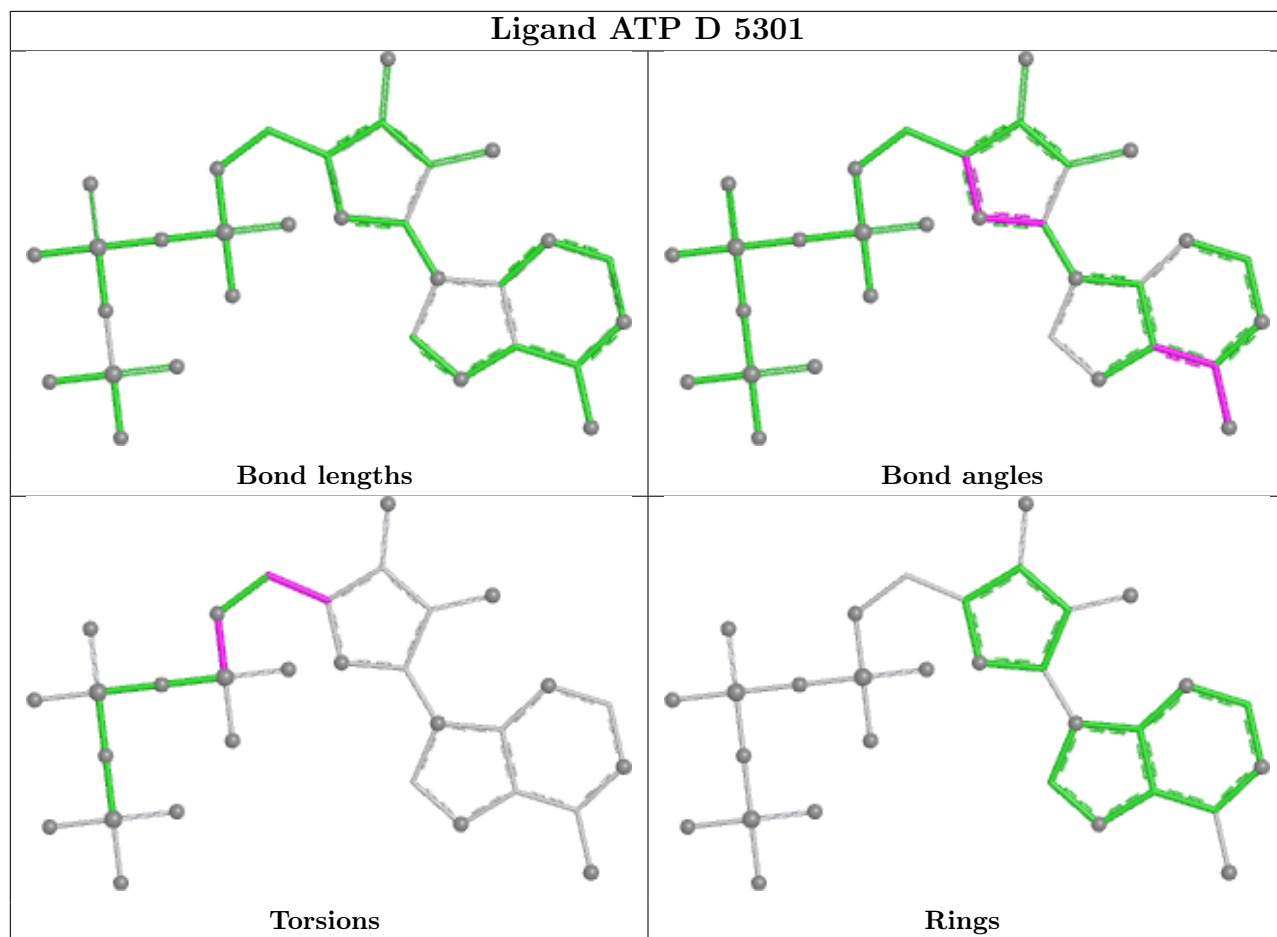
5 of 12 torsion outliers are listed below:

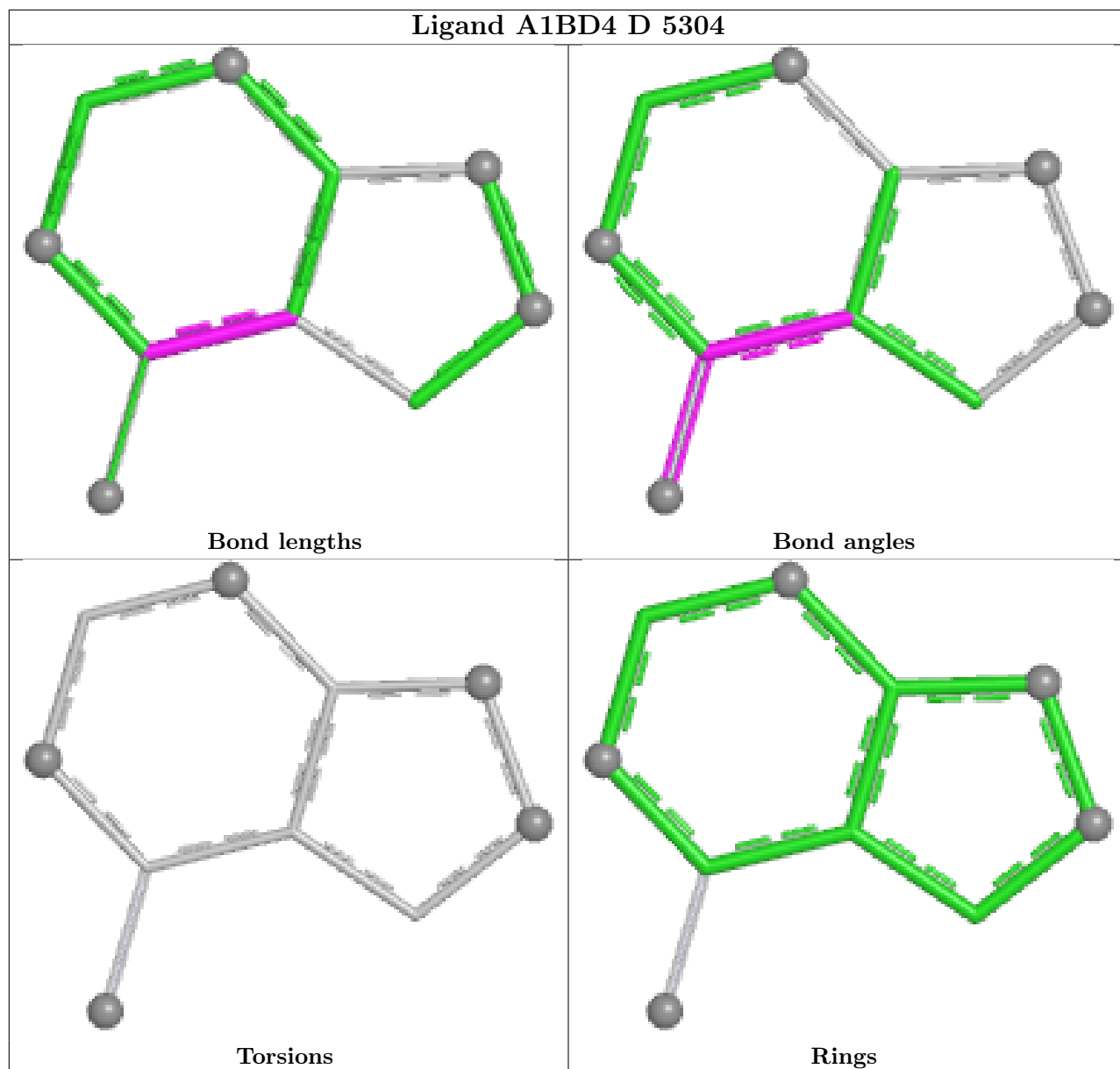
Mol	Chain	Res	Type	Atoms
3	A	5301	ATP	C5'-O5'-PA-O2A
3	A	5301	ATP	C5'-O5'-PA-O3A
3	B	5301	ATP	C5'-O5'-PA-O2A
3	B	5301	ATP	C5'-O5'-PA-O3A
3	D	5301	ATP	C5'-O5'-PA-O2A

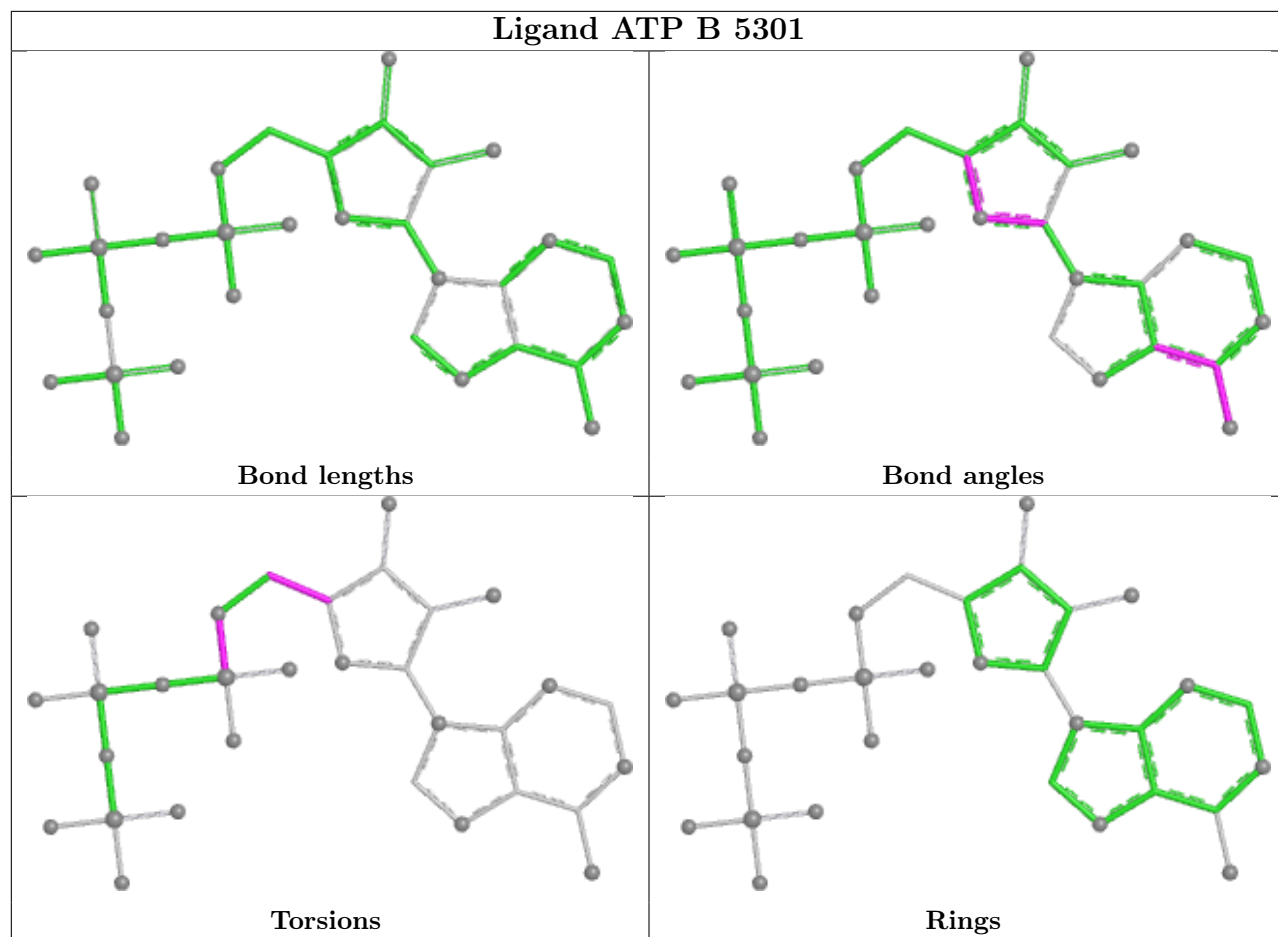
There are no ring outliers.

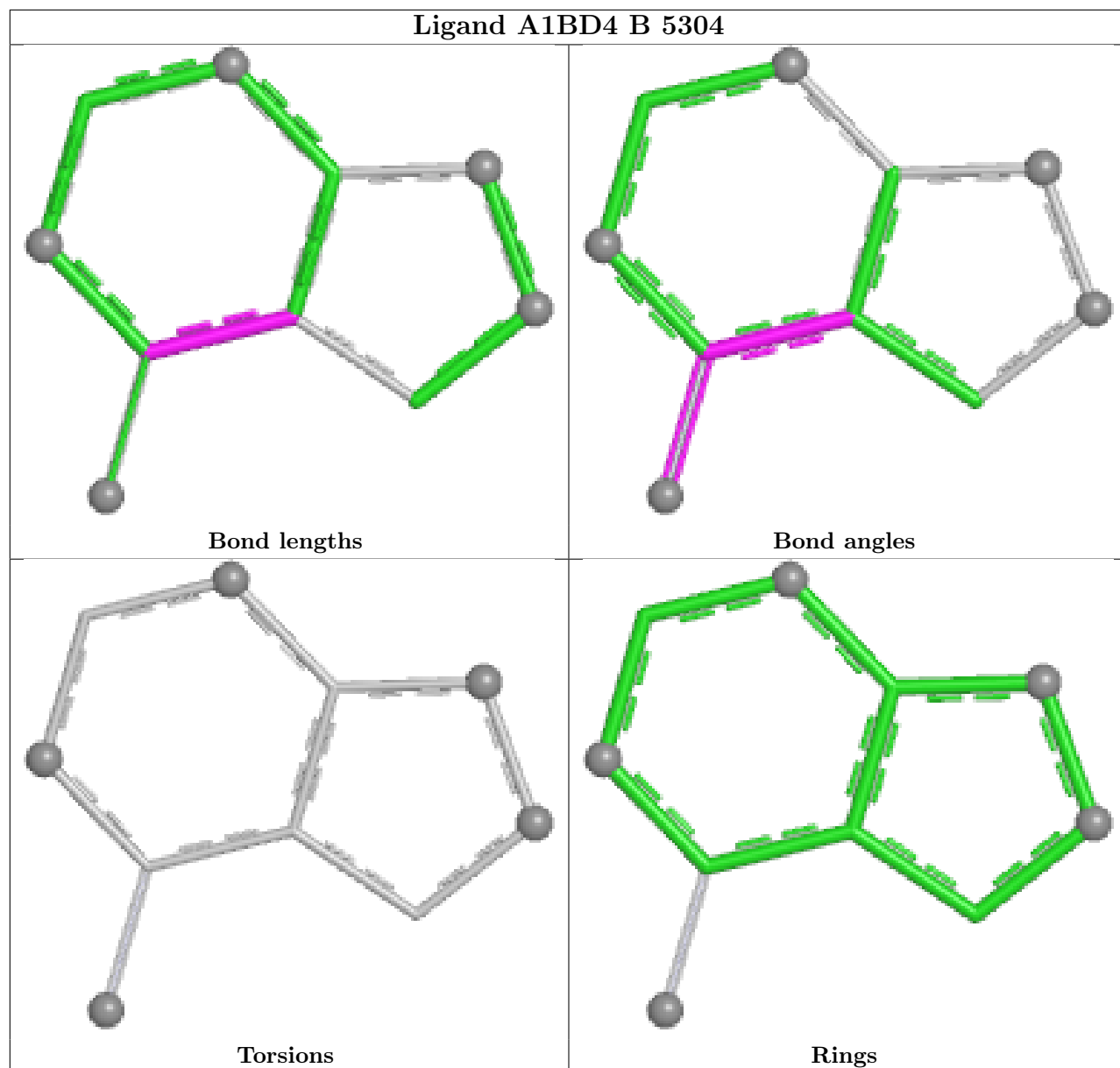
No monomer is involved in short contacts.

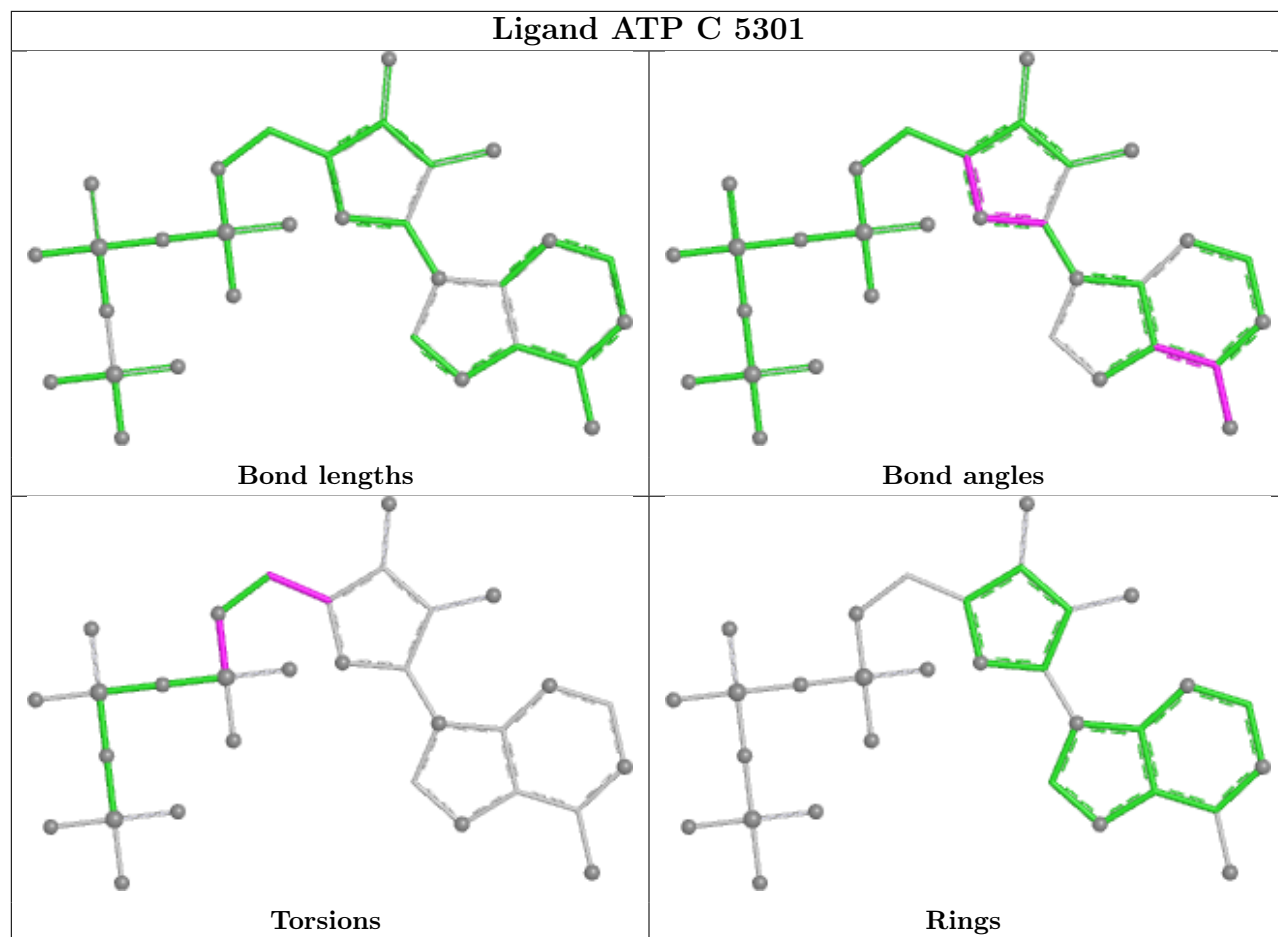
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.

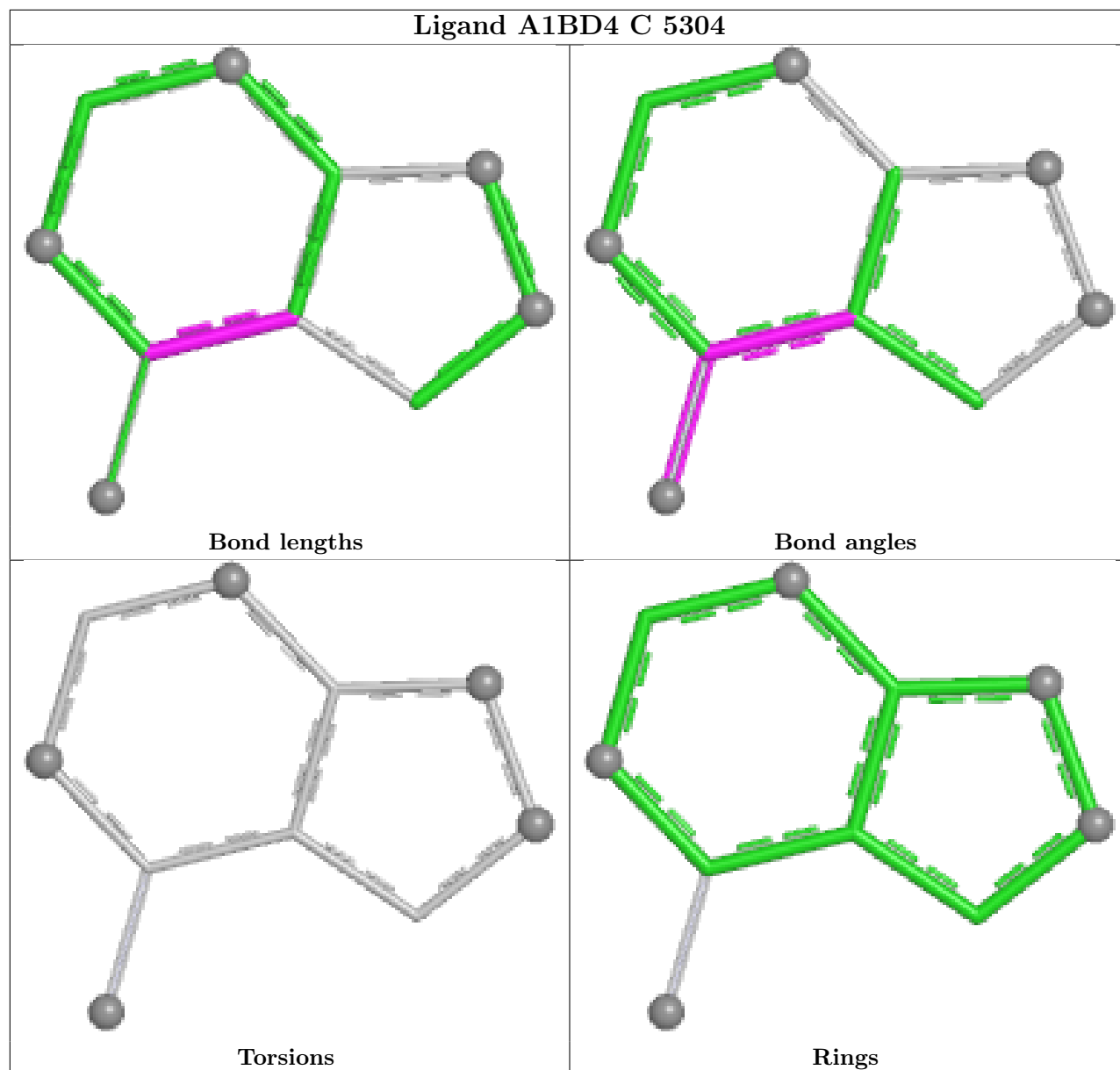


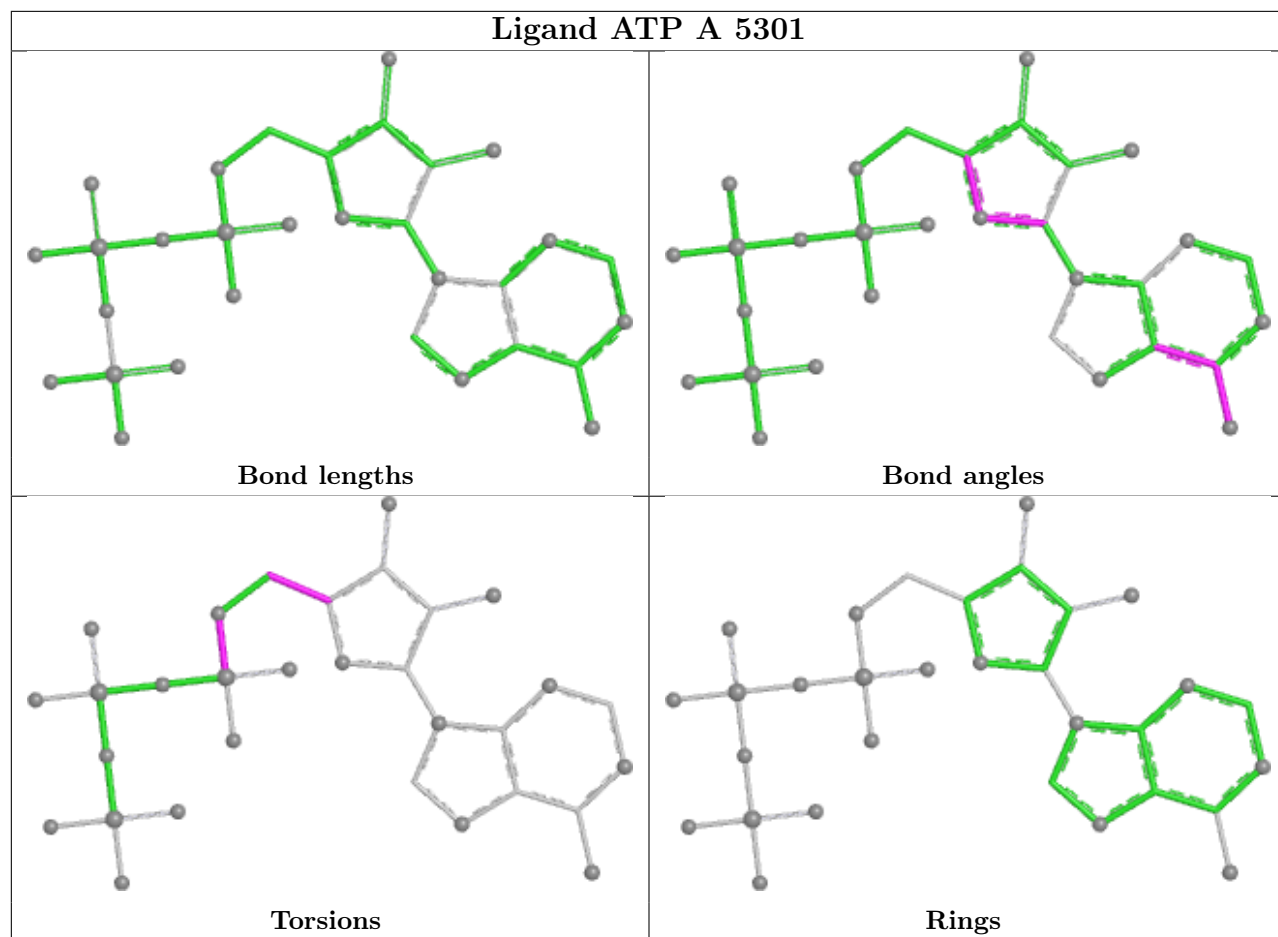


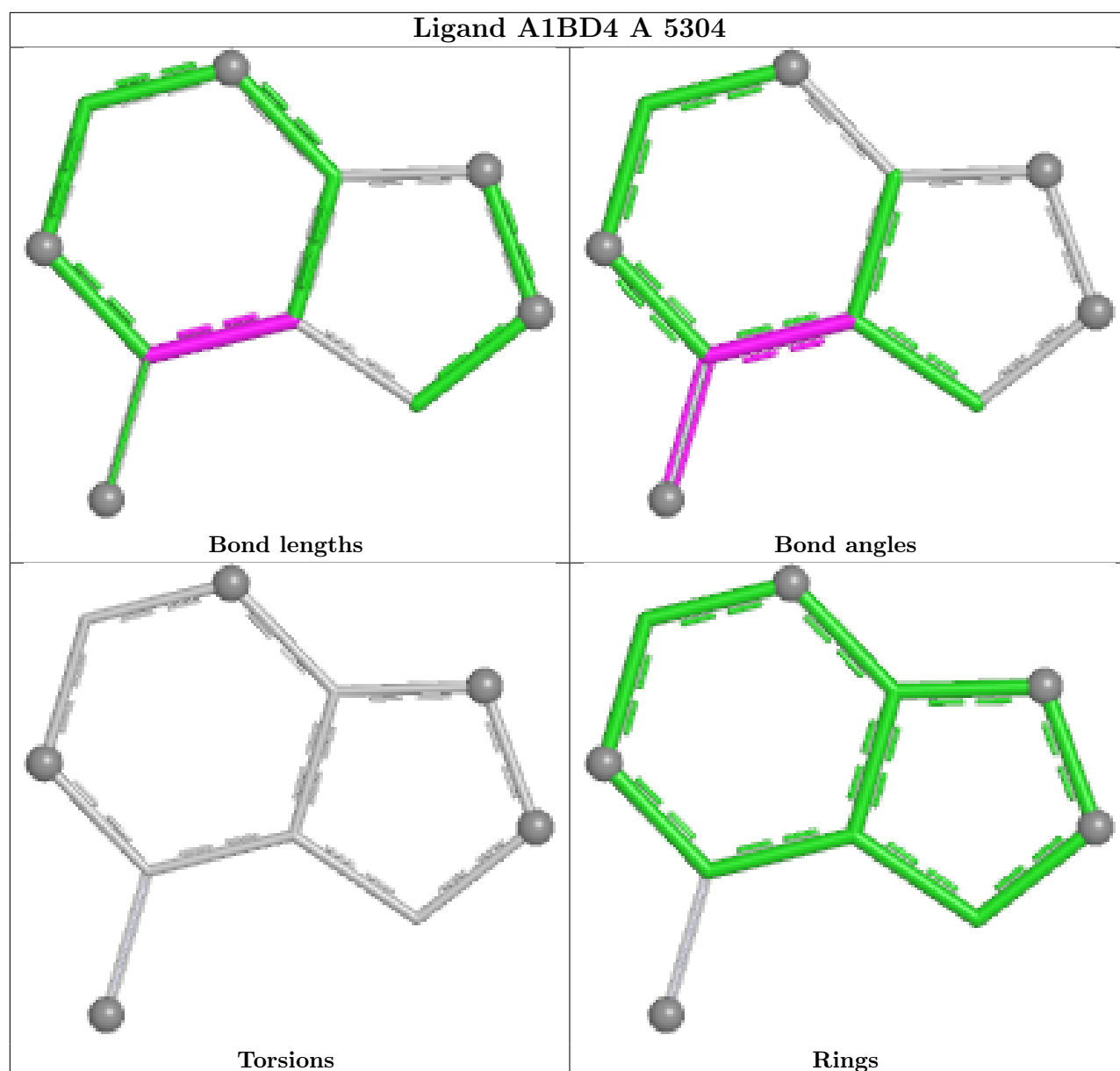












5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

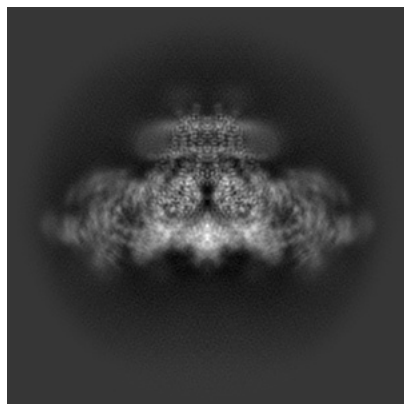
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-47392. These allow visual inspection of the internal detail of the map and identification of artifacts.

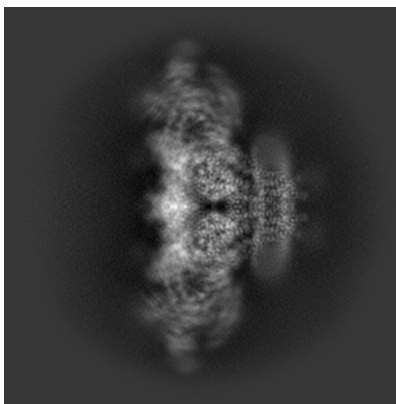
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

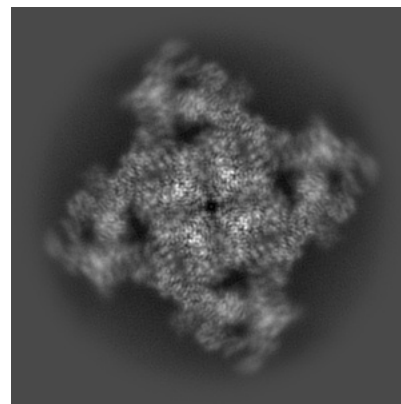
6.1.1 Primary map



X

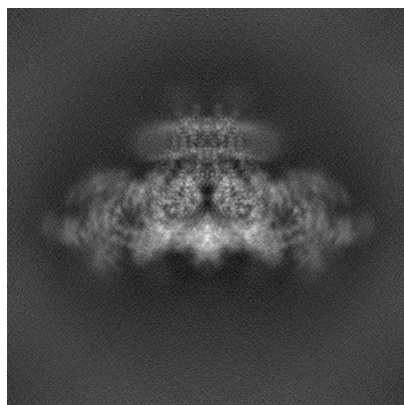


Y

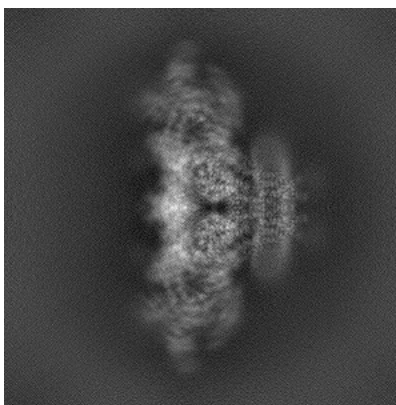


Z

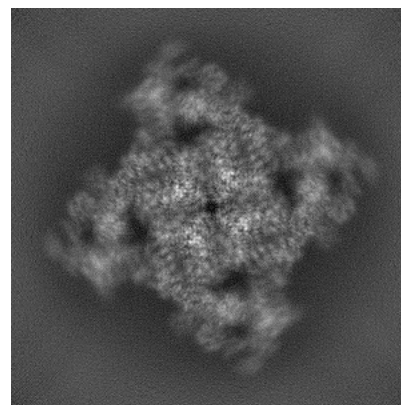
6.1.2 Raw map



X



Y

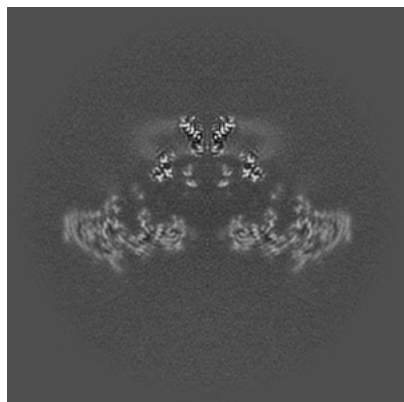


Z

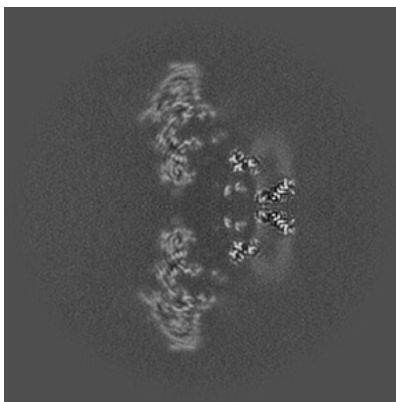
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

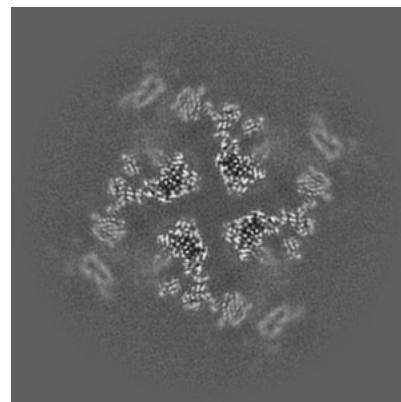
6.2.1 Primary map



X Index: 256

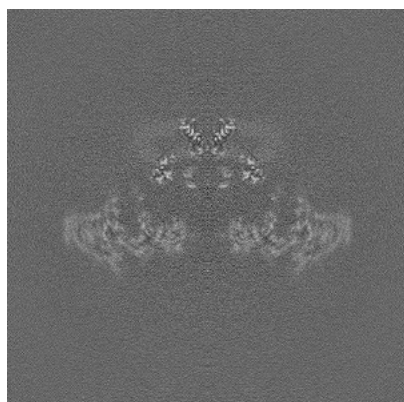


Y Index: 256

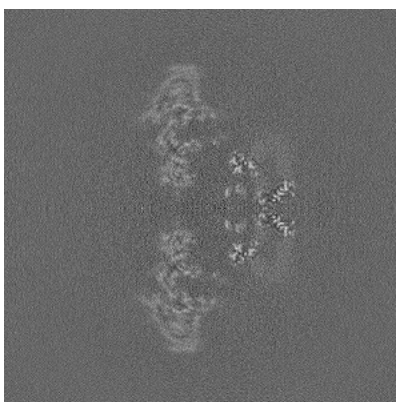


Z Index: 256

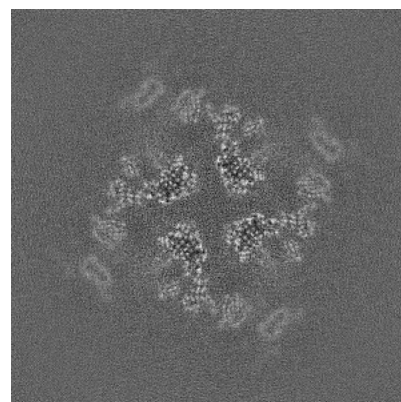
6.2.2 Raw map



X Index: 256



Y Index: 256

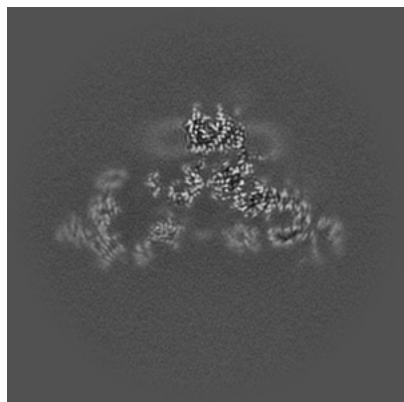


Z Index: 256

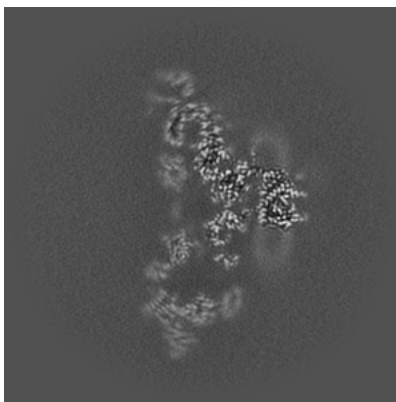
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

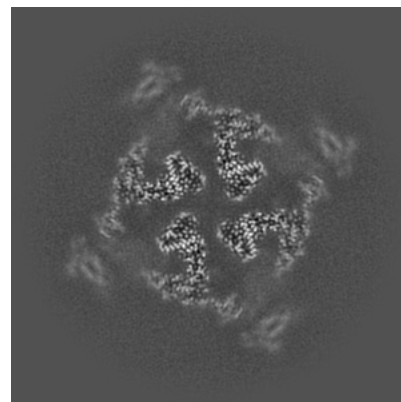
6.3.1 Primary map



X Index: 273

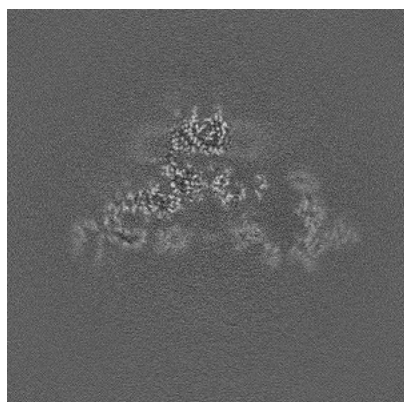


Y Index: 239

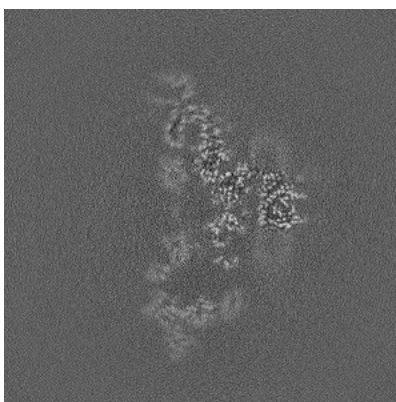


Z Index: 264

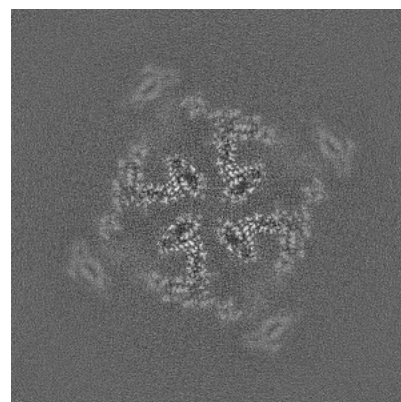
6.3.2 Raw map



X Index: 239



Y Index: 239

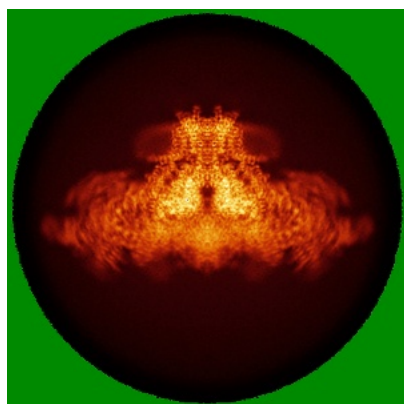


Z Index: 266

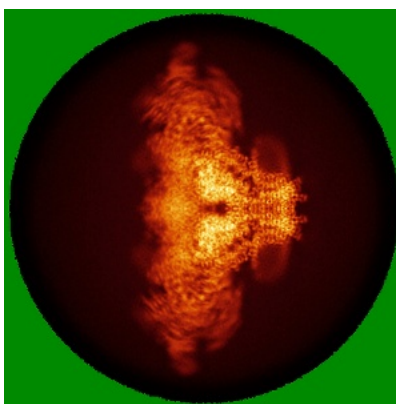
The images above show the largest variance slices of the map in three orthogonal directions.

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

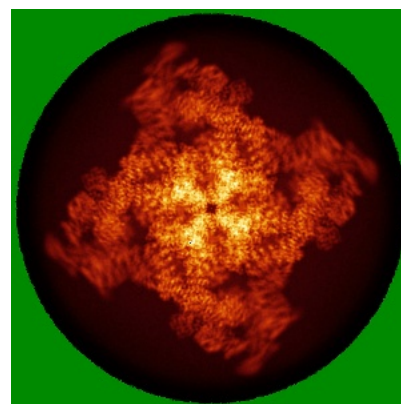
6.4.1 Primary map



X

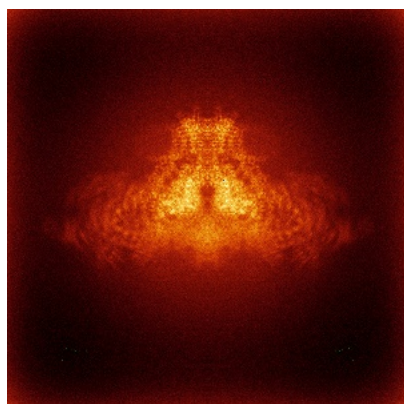


Y

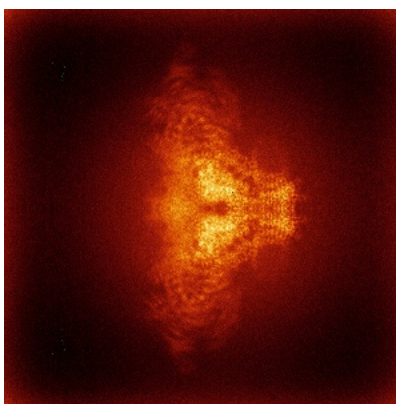


Z

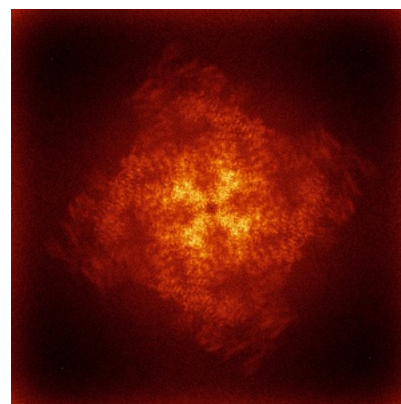
6.4.2 Raw map



X



Y

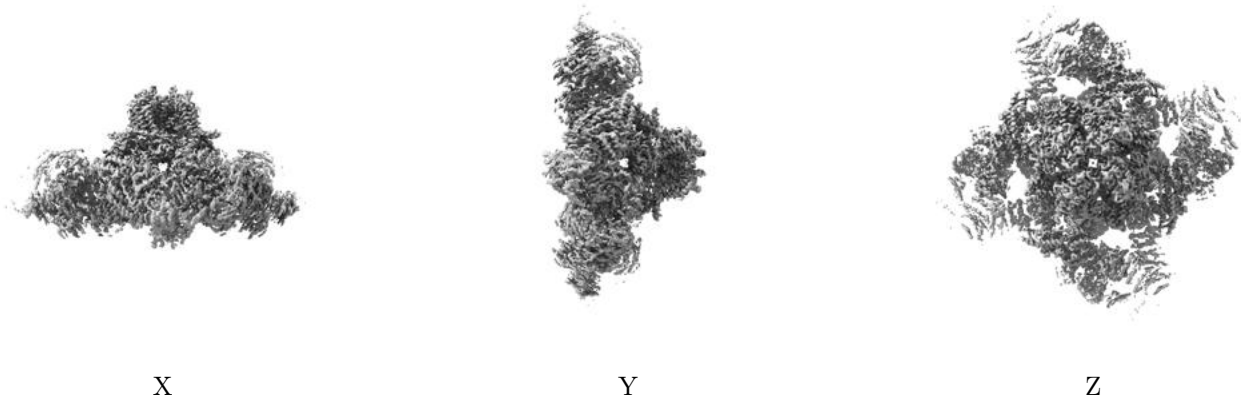


Z

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.

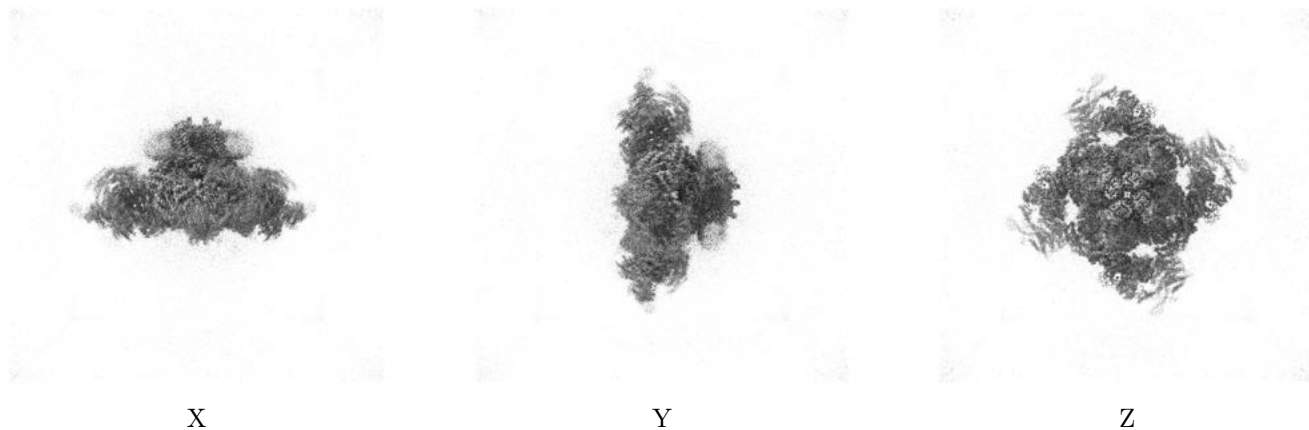
6.5 Orthogonal surface views [i](#)

6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.1. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.5.2 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.

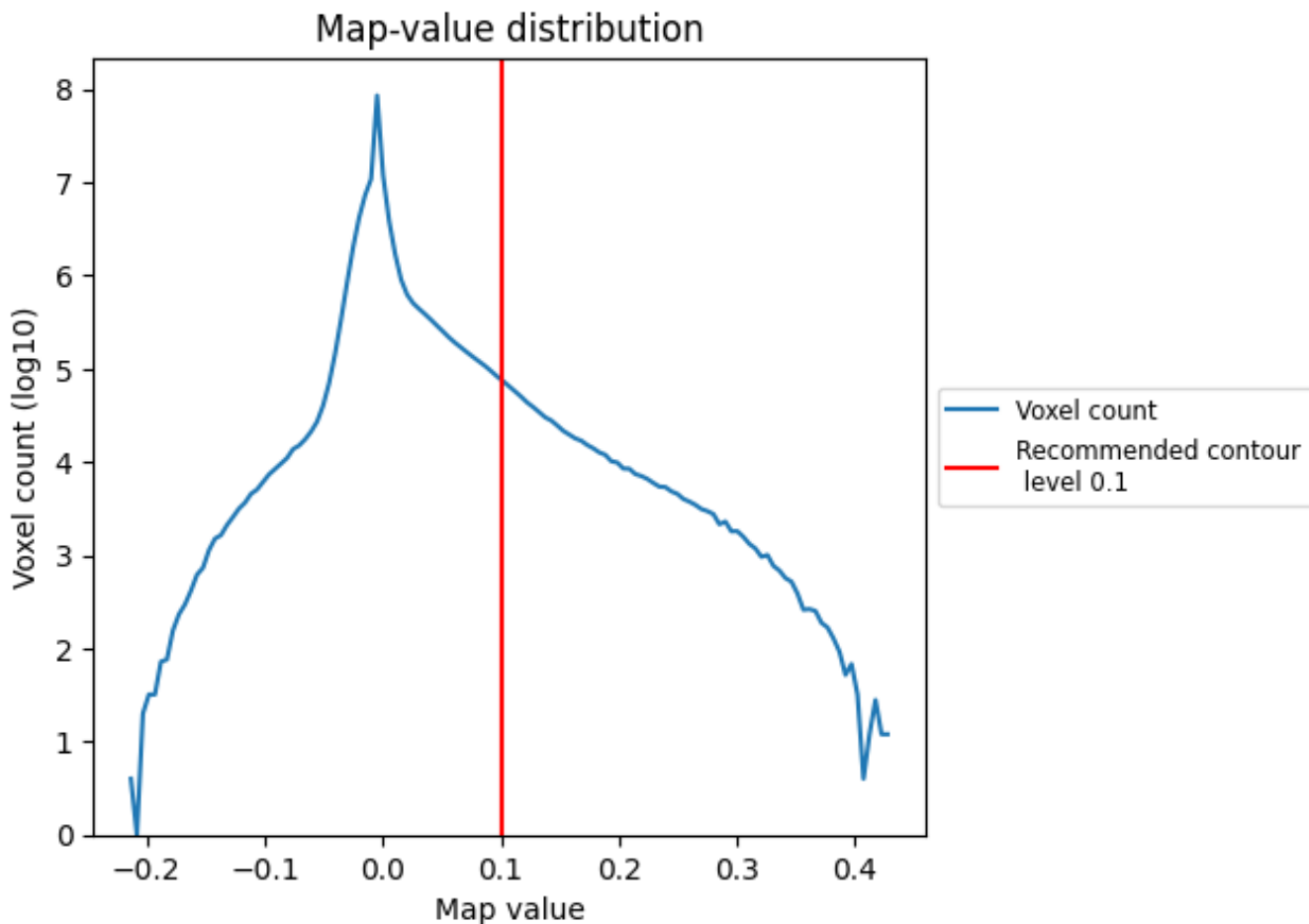
6.6 Mask visualisation [i](#)

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

7 Map analysis [i](#)

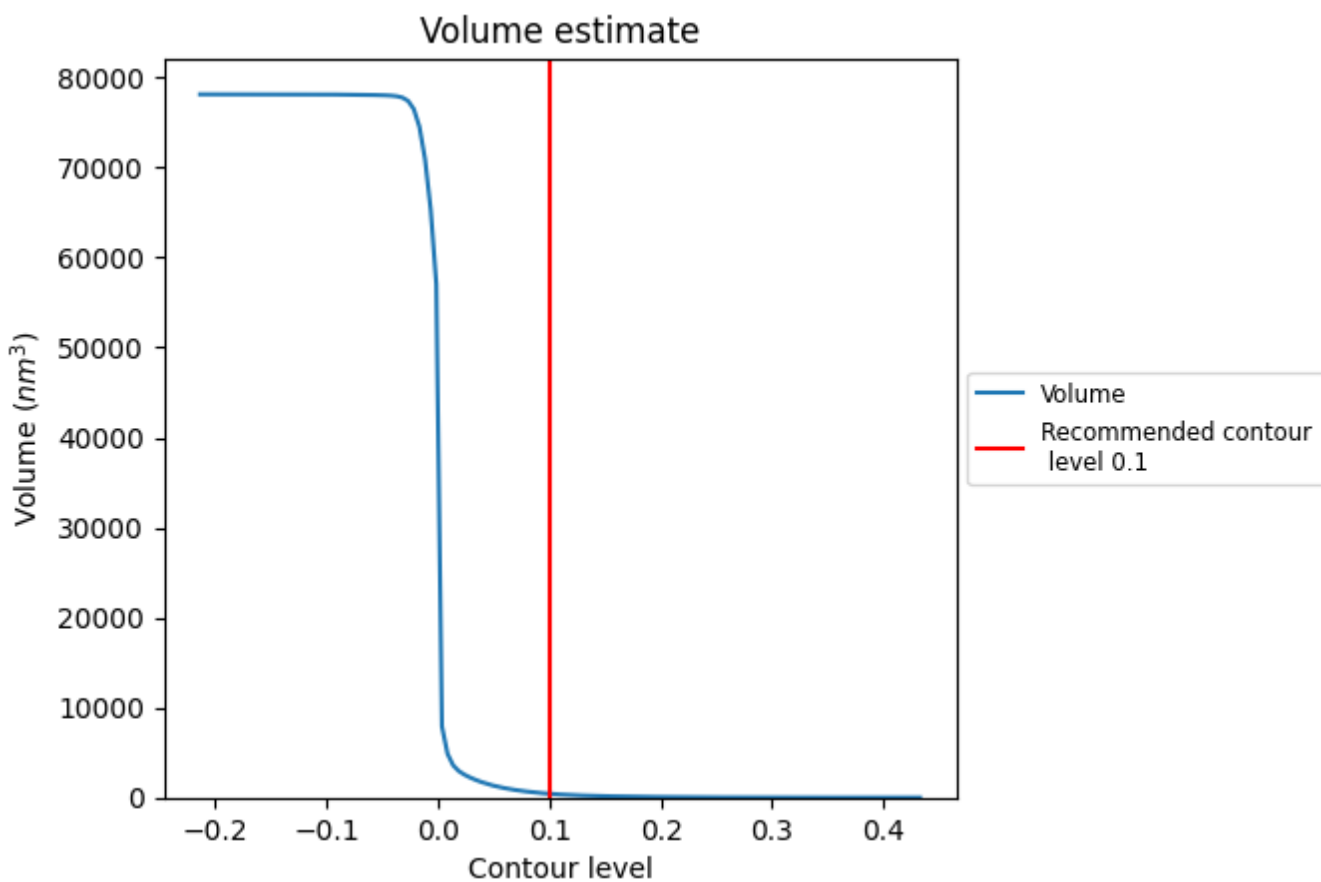
This section contains the results of statistical analysis of the map.

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.

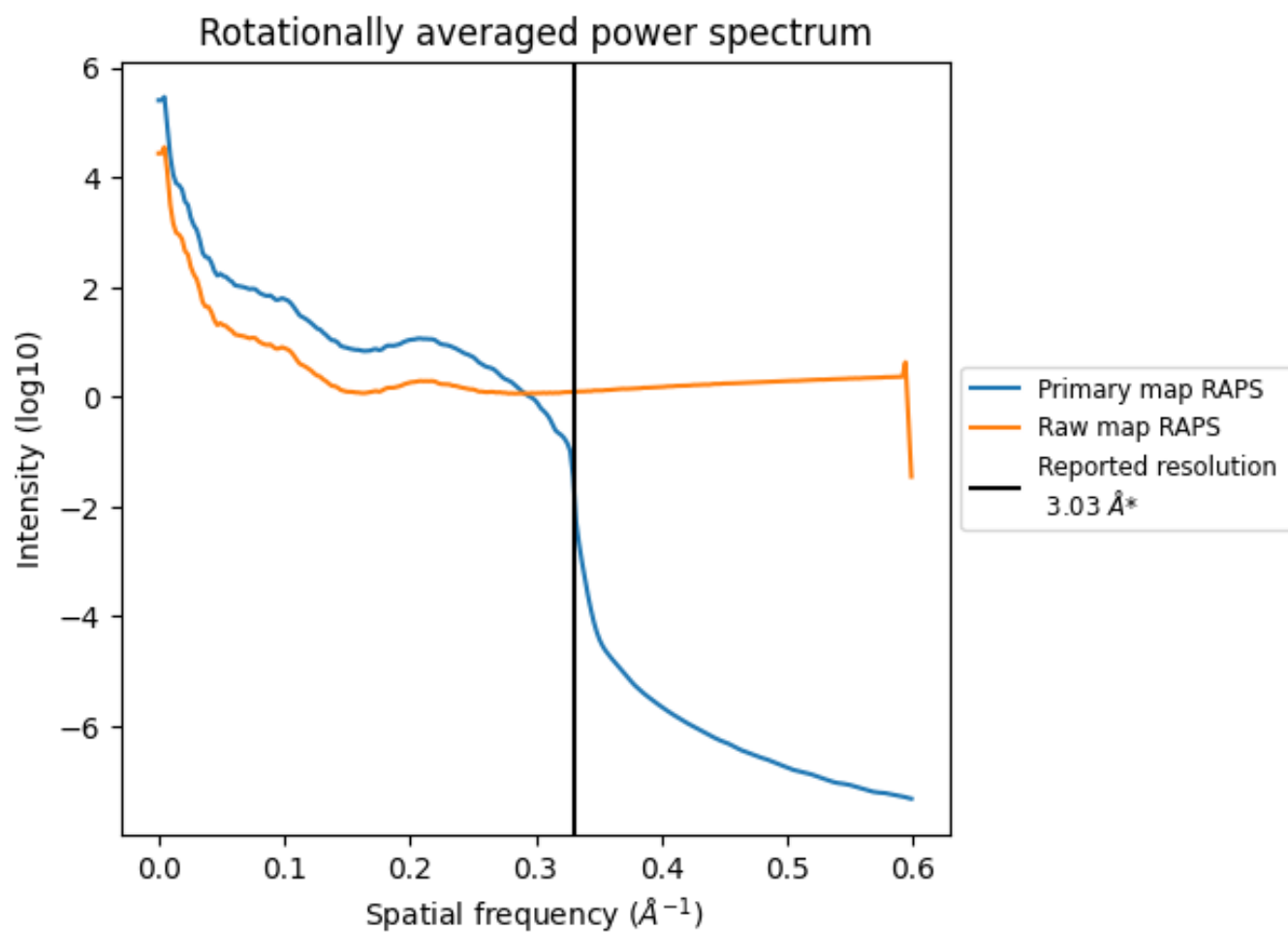
7.2 Volume estimate [\(i\)](#)



The volume at the recommended contour level is 424 nm³; this corresponds to an approximate mass of 383 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

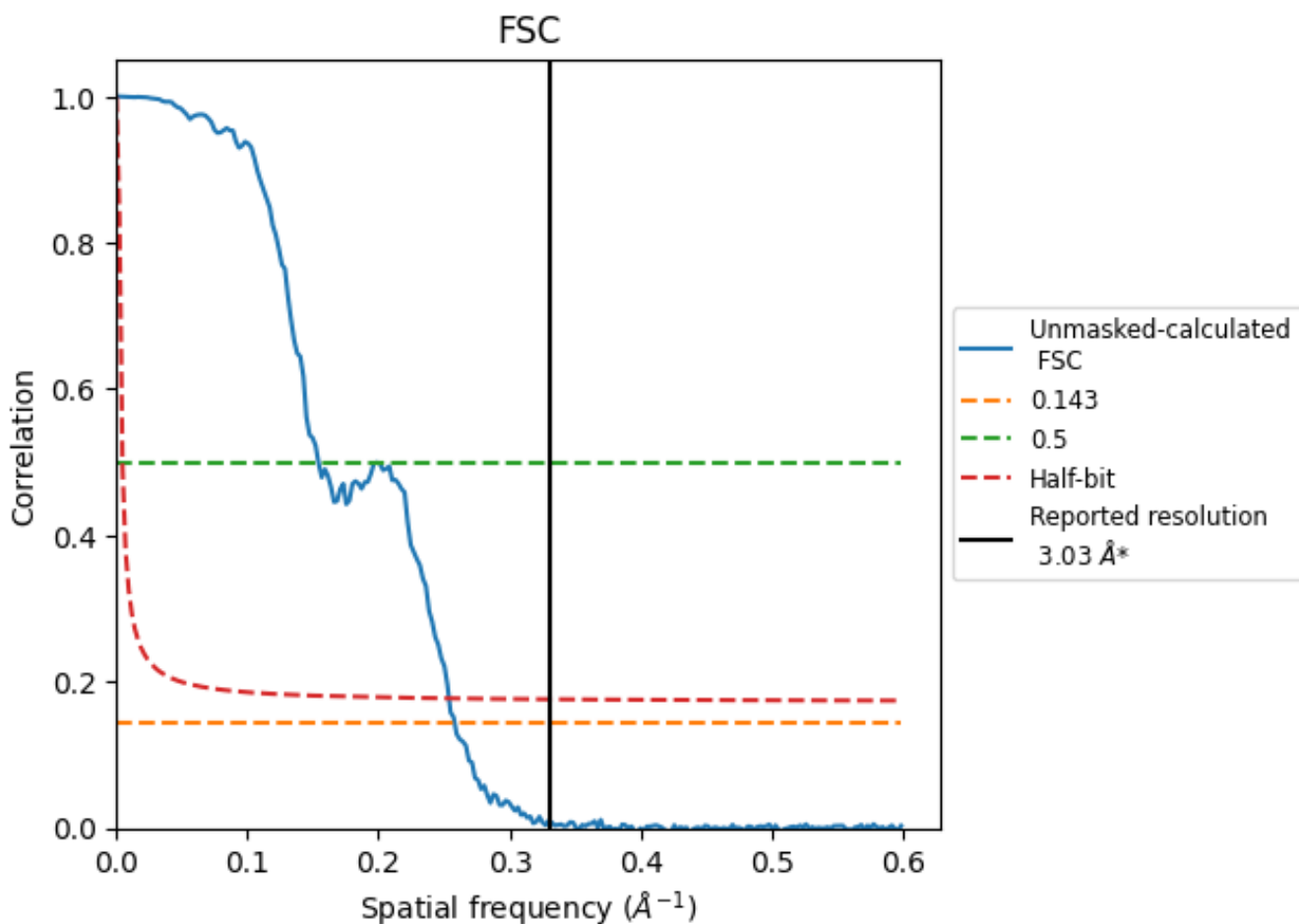


*Reported resolution corresponds to spatial frequency of 0.330 Å⁻¹

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 0.330 \AA^{-1}

8.2 Resolution estimates [i](#)

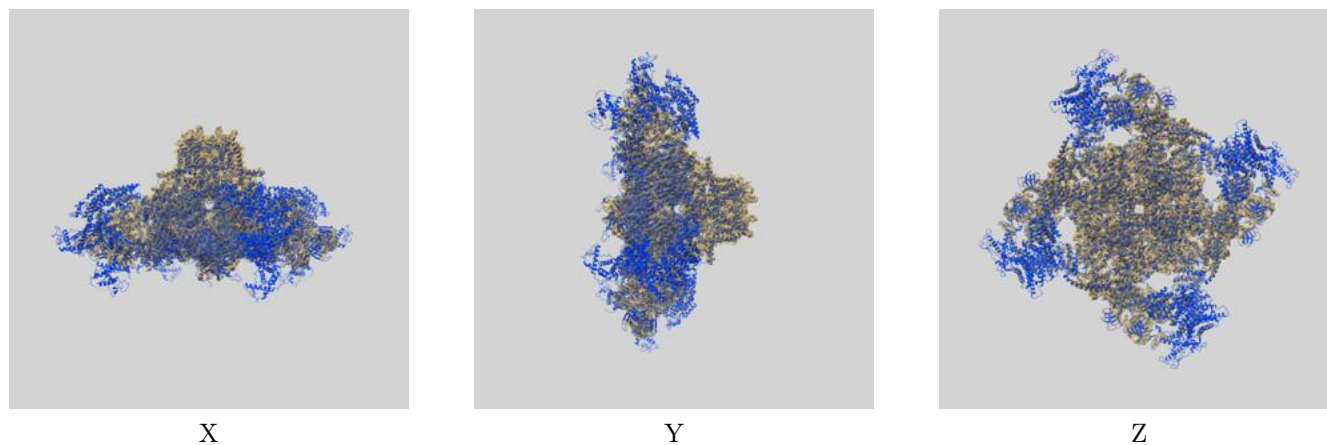
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.03	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	3.87	6.49	3.94

*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 3.87 differs from the reported value 3.03 by more than 10 %

9 Map-model fit [i](#)

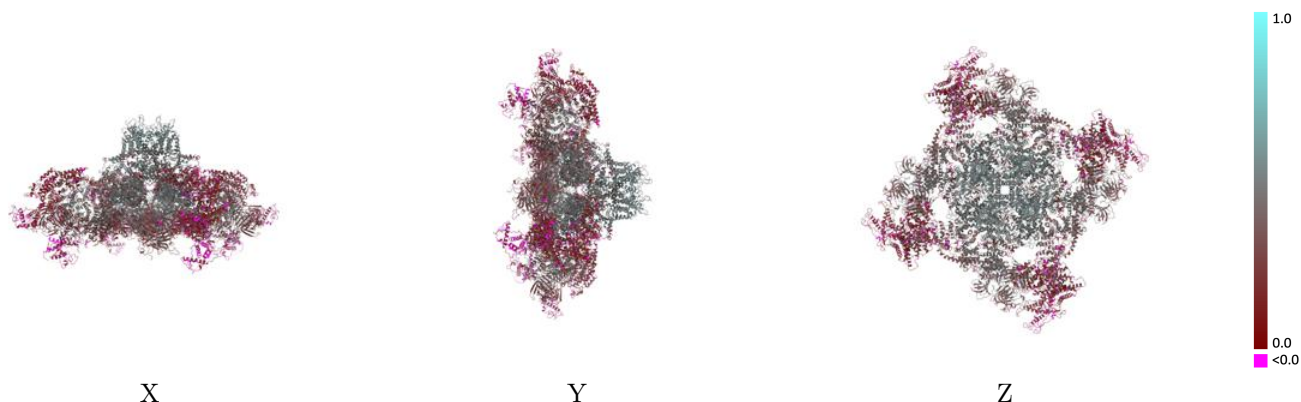
This section contains information regarding the fit between EMDB map EMD-47392 and PDB model 9E1F. Per-residue inclusion information can be found in section 3 on page 7.

9.1 Map-model overlay [i](#)



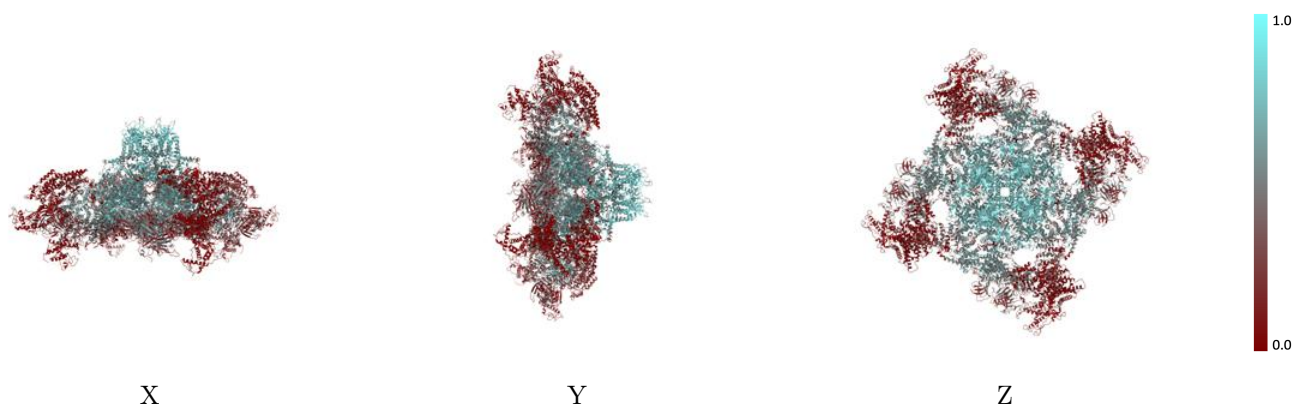
The images above show the 3D surface view of the map at the recommended contour level 0.1 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



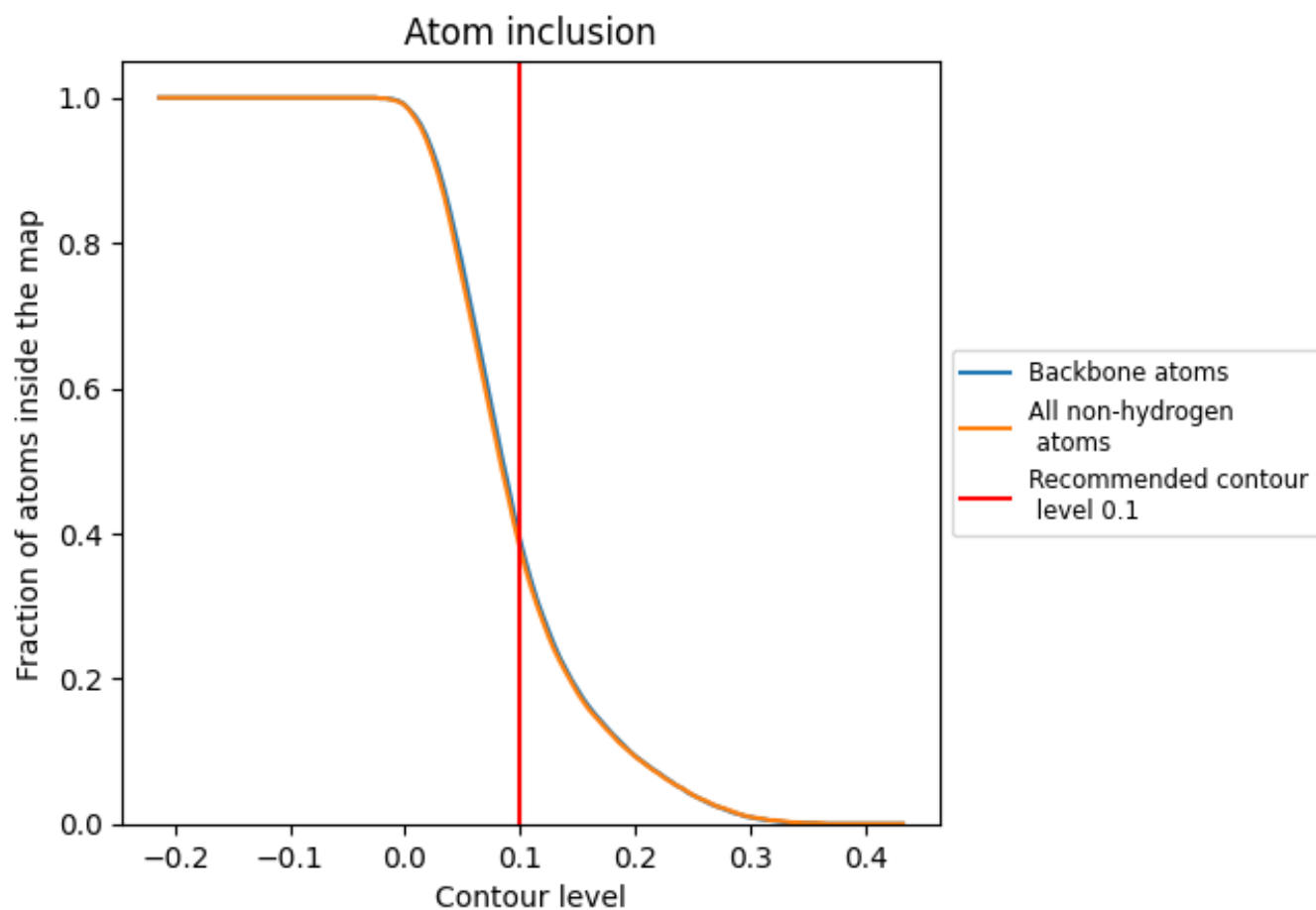
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.1).

9.4 Atom inclusion [i](#)



At the recommended contour level, 39% of all backbone atoms, 38% 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 (0.1) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.3790	0.3300
A	0.3890	0.3290
B	0.3890	0.3290
C	0.3890	0.3290
D	0.3890	0.3290
E	0.2370	0.3640
F	0.2380	0.3570
G	0.2380	0.3570
H	0.2400	0.3580

