wwPDB EM Validation Summary Report (i)

Dec 7, 2022 – 09:32 AM JST

PDB ID	:	5J8V
EMDB ID	:	EMD-8073
Title	:	Structure of rabbit ryanodine receptor RyR1 open state activated by calcium ion
Authors	:	Wang, X.; Wei, R.; Yin, C.; Sun, F.
Deposited on	:	2016-04-08
Resolution	:	4.90 Å(reported)
Based on initial model	:	3J8H

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 (i) 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 (i)) were used in the production of this report:

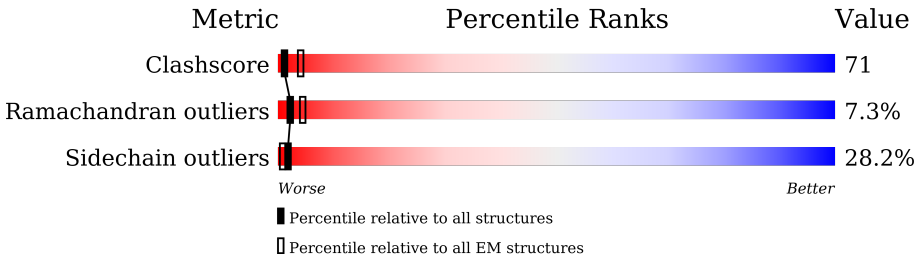
EMDB validation analysis	:	0.0.1.dev43
MolProbity	:	4.02b-467
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ	:	1.9.9
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.31.3

1 Overall quality at a glance (i)

The following experimental techniques were used to determine the structure:
ELECTRON MICROSCOPY

The reported resolution of this entry is 4.90 Å.

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



Metric	Whole archive (#Entries)	EM structures (#Entries)
Clashscore	158937	4297
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the bar indicate the fraction of residues that contain outliers for >=3, 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions <=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	8% 41% 21% 6% · 31%
1	B	5037	8% 41% 21% 6% · 31%
1	C	5037	8% 41% 21% 6% · 31%
1	D	5037	8% 41% 21% 6% · 31%

2 Entry composition (i)

There is only 1 type of molecule in this entry. The entry contains 73616 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.

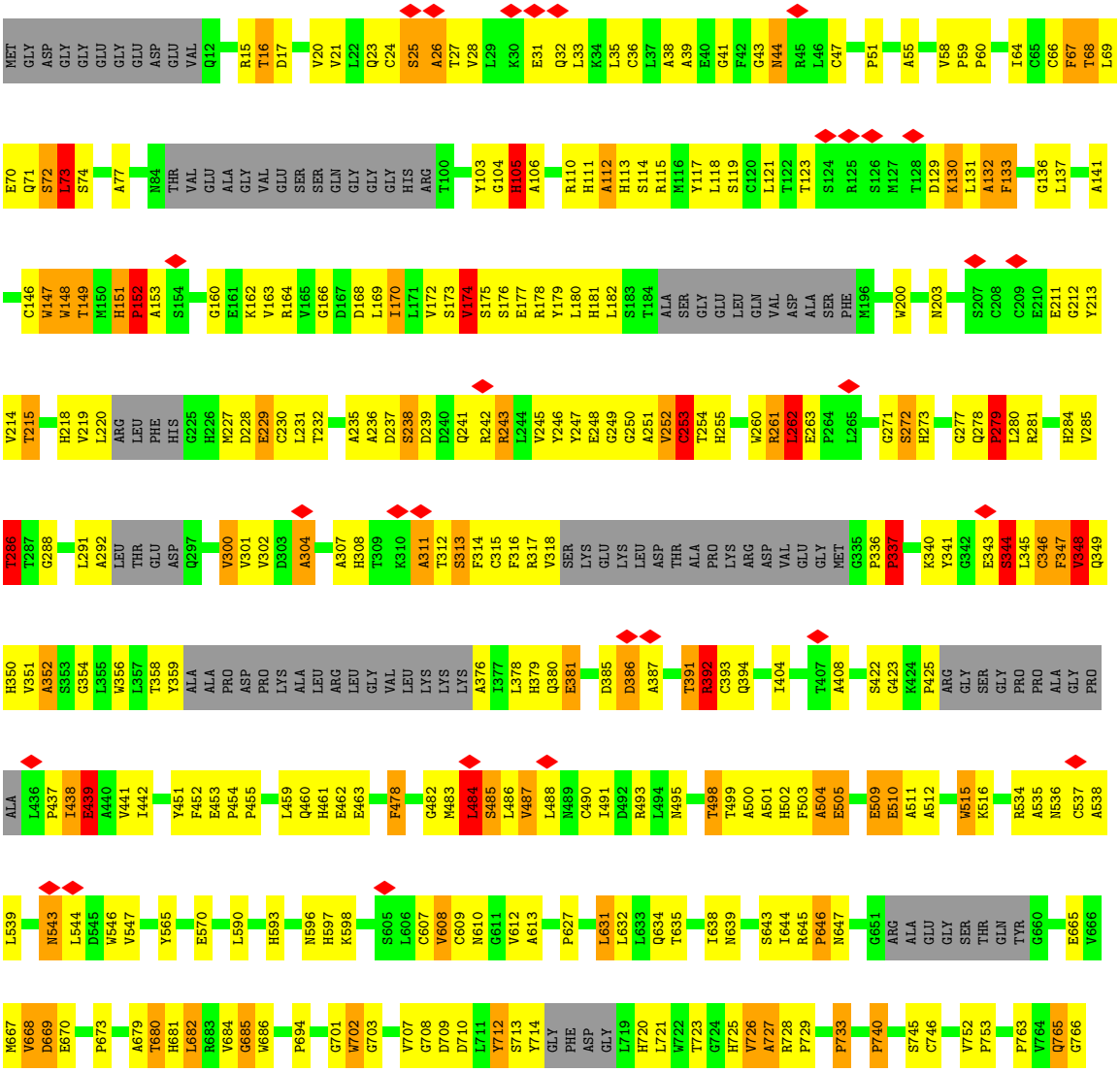
Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	3453	Total	C	N	O	S	0	0
			18404	11343	3553	3501	7		
1	B	3453	Total	C	N	O	S	0	0
			18404	11343	3553	3501	7		
1	C	3453	Total	C	N	O	S	0	0
			18404	11343	3553	3501	7		
1	D	3453	Total	C	N	O	S	0	0
			18404	11343	3553	3501	7		

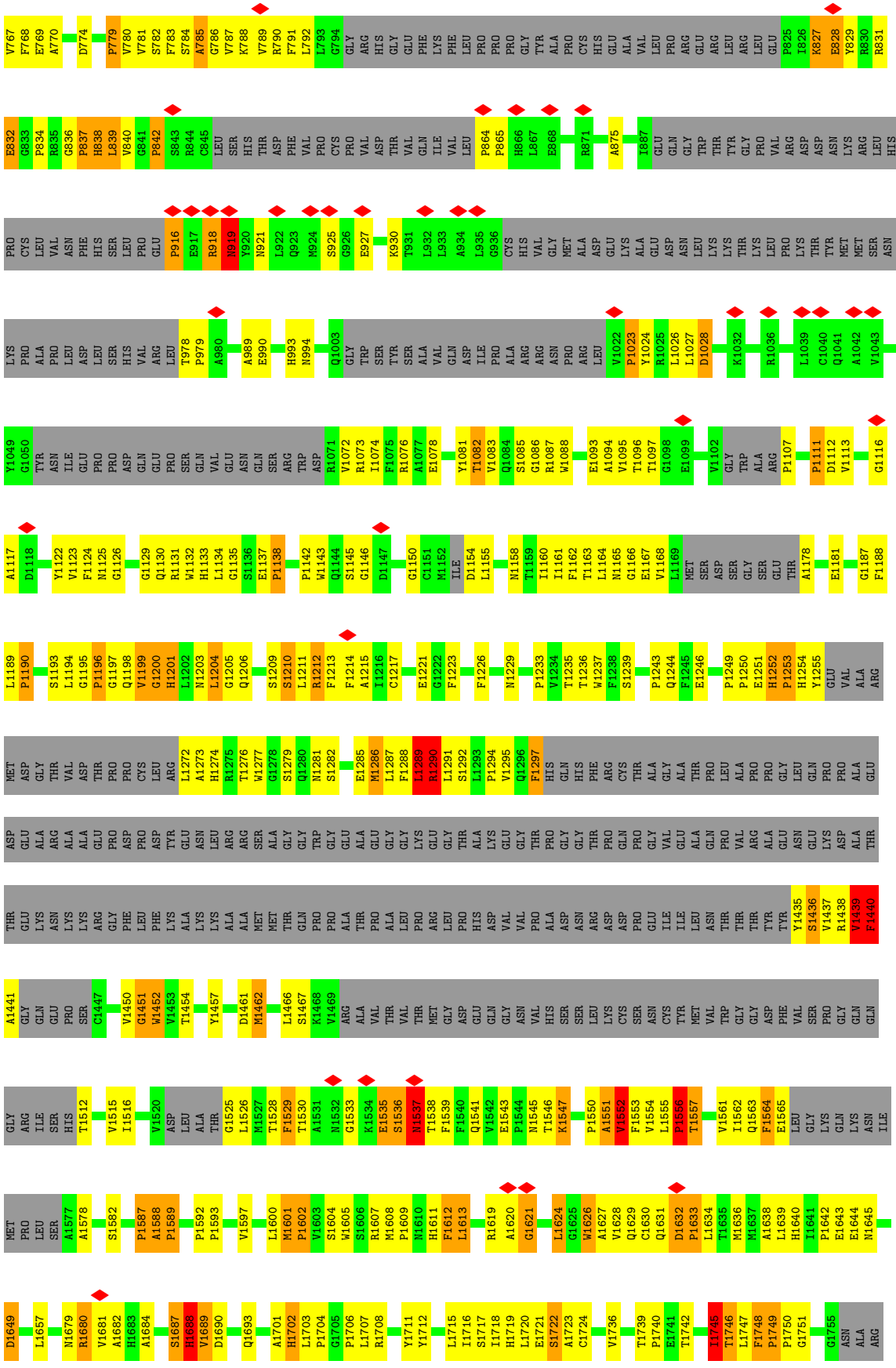
3 Residue-property plots (i)

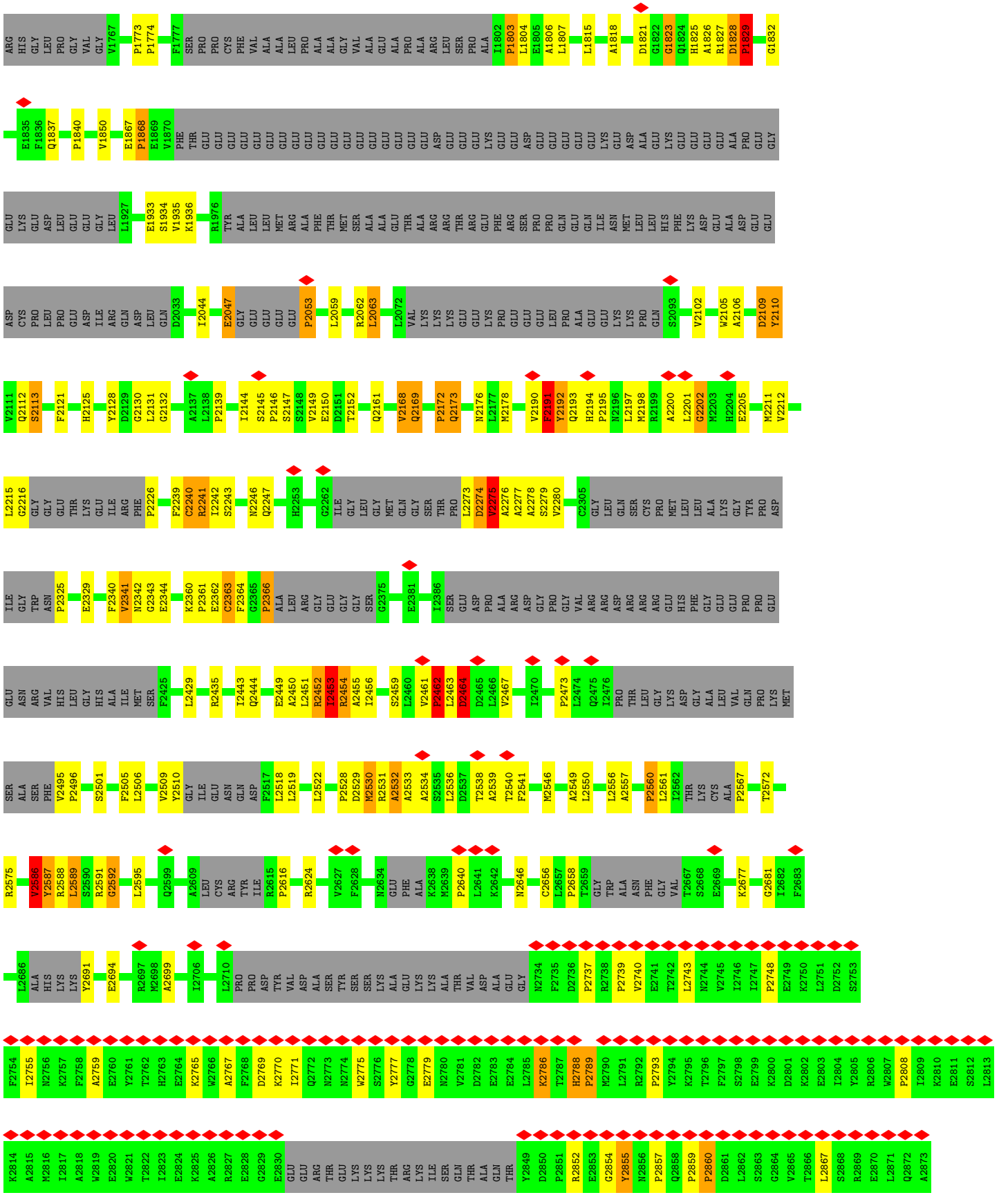
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion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

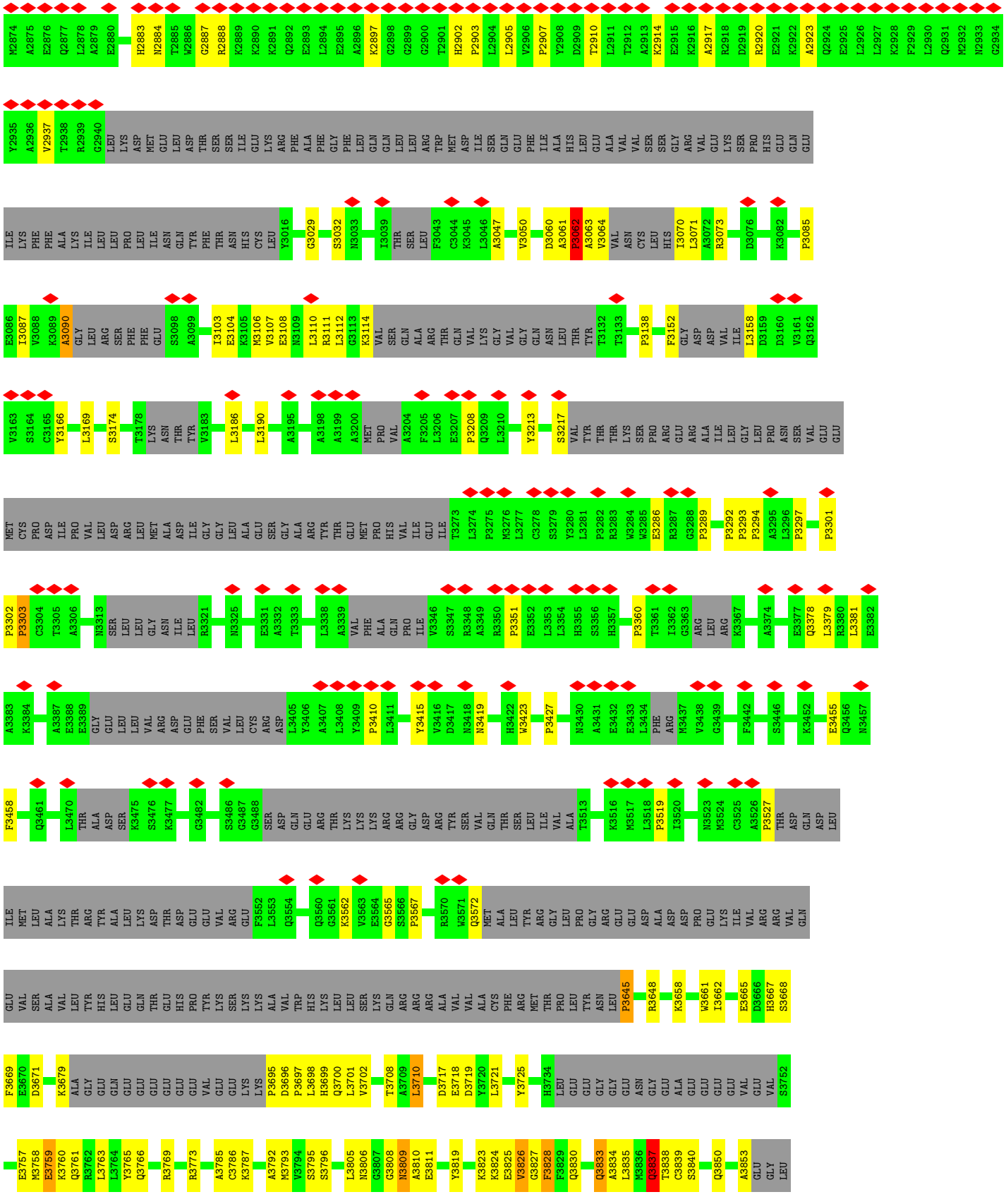
- Molecule 1: Ryanodine receptor 1

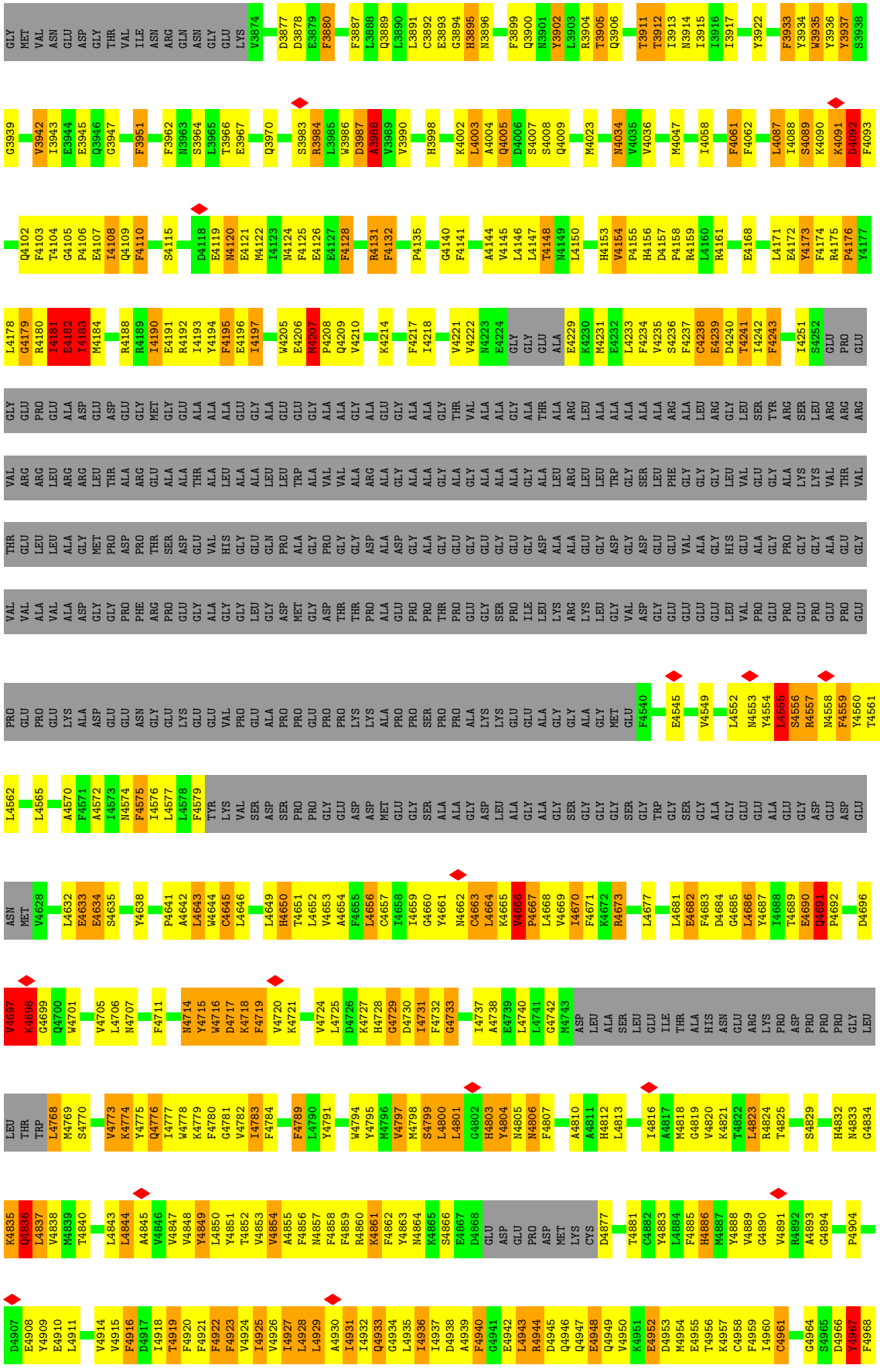
Chain A:

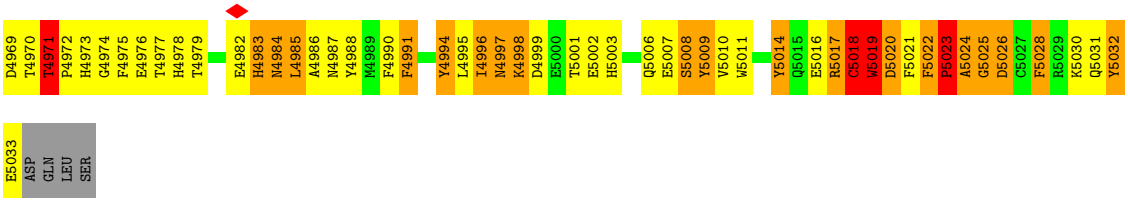






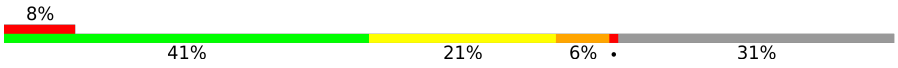

M2874 A2875 E2876 Q2877 L2878 A2879 E2880
H2883 N2884 T2885 W2886 G2887 R2888 K2889 K2890 K2891 Q2892 E2893 L2894 E2895 A2896 K2897 G2898 G2899 G2900 T2901 H2902 P2903 L2904 L2905 V2906 P2907 Y2908 D2909 T2910 L2911 T2912 A2913 K2914 E2915 K2916 A2917 R2918 D2919 R2920 E2921 K2922 A2923 Q2924 E2925 L2926 L2927 K2928 F2929 L2930 Q2931 M2932 N2933 G2934
Y2935 A2936 V2937 T2938 R2939 G2940
LEU LYS ASP MET GLU LEU ASP THR SER SER ILE GLU LYS ARG PHE ALA PHE GLY PHE LEU GLN GLN LEU LEU LEU ARG TRP MET ASP ILE SER GLN GLU PHE ILE ALA HIS LEU GLU ALA VAL VAL SER SER GLY ARG VAL GLU LYS SER PRO HIS GLU GLN GLU
ILE LYS PHE PHE ALA LYS ILE LEU LEU LEU PRO LEU ILE ASN GLN TYR PHE THR ASN HIS CYS LEU
Y3016 G3029 S3032 N3033 I3039 THR SER LEU F3043 C3044 K3045 L3046 A3047 V3050 D3060 A3061 P3062 A3063 V3064 VAL ASN CYS LEU HIS I3070 L3071 A3072 R3073 D3076 K3082 P3085
E3086 I3087 V3088 K3089 A3090 GLY LEU ARG SER PHE PHE GLU S3098 A3099 I3103 E3104 K3105 M3106 V3107 E3108 N3109 L3110 R3111 L3112 G3113 K3114 VAL SER GLN ALA ARG THR GLN VAL LYS GLY VAL GLY GLN ASN LEU THR TYR T3132 T3133 P3138 F3152 GLY ASP ASP VAL ILE L3158 D3159 D3160 V3161 Q3162
V3163 S3164 C3165 Y3166 L3169 S3174 T3178 LYS ASN THR TYR V3183 L3186 L3190 A3195 A3198 A3199 A3200 MET PRO VAL A3204 F3205 L3206 E3207 P3208 Q3209 L3210 Y3213 S3217 VAL TYR THR THR LYS SER PRO ARG GLU ARG ALA ILE LEU GLY LEU PRO ASN SER VAL GLU GLU
MET CYS PRO ASP ILE PRO VAL LEU ASP ARG LEU MET ALA ASP ILE GLY GLY LEU ALA GLU SER GLY ALA ARG TYR THR GLU MET PRO HIS VAL ILE GLU ILE T3273 L3274 P3275 M3276 L3277 C3278 S3279 Y3280 L3281 P3282 R3283 W3284 W3285 E3286 R3287 G3288 P3289 P3292 P3293 P3294 A3295 L3296 P3297 P3301
P3302 P3303 C3304 T3305 A3306 N3313 SER LEU LEU LEU GLY ASN ILE LEU R3321 N3325 E3331 A3332 T3333 L3338 A3339 VAL PHE ALA GLN PRO ILE V3346 S3347 R3348 A3349 R3350 P3351 E3352 L3353 L3354 H3355 S3356 H3357 P3360 T3361 I3362 G3363 ARG LEU ARG K3367 A3374 E3377 Q3378 L3379 R3380 L3381 E3382
A3383 K3384 A3387 E3388 E3389 GLY GLU LEU LEU LEU VAL ARG ASP GLU PHE SER VAL LEU CYS ARG ASP L3405 Y3406 A3407 L3408 Y3409 P3410 L3411 Y3415 V3416 D3417 N3418 N3419 H3422 W3423 P3427 N3430 A3431 E3432 E3433 L3434 PHE ARG M3437 V3438 G3439 F3442 S3446 K3452 E3455 Q3456 N3457
F3458 Q3461 L3470 THR ALA ASP SER K3475 S3476 K3477 G3482 S3486 G3487 G3488 SER ASP GLN GLU ARG THR LYS LYS LYS ARG ARG GLY ASP ARG TYR SER VAL LEU GLN THR SER LEU ILE VAL ALA T3513 K3516 M3517 L3518 P3519 I3520 N3523 M3524 C3525 A3526 P3527 THR ASP GLN ASP LEU
ILE MET LEU ALA LYS THR ARG TYR ALA LEU LYS ASP THR ASP GLU GLU VAL ARG GLU F3552 L3553 Q3554 Q3560 G3561 K3562 V3563 E3564 G3565 S3566 P3567 R3570 W3571 Q3572 MET ALA LEU TYR ARG GLY LEU PRO GLY ARG GLU GLU ASP ALA ASP ASP PRO GLU LYS ILE VAL ARG ARG VAL GLN
GLU VAL SER ALA VAL LEU TYR HIS LEU GLU GLN THR GLU HIS PRO TYR LYS SER LYS LYS ALA VAL TRP HIS LYS LEU LEU LEU SER LYS GLN ARG ARG ARG ALA VAL VAL ALA CYS PHE ARG MET THR PRO LEU TYR ASN LEU P3645 R3648 K3658 W3661 I3662 E3665 D3666 H3667 S3668
F3669 E3670 D3671 K3679 ALA GLY GLU GLN GLU GLU GLU GLU GLU GLU GLU GLU VAL GLU GLU LYS LYS P3695 D3696 P3697 L3698 H3699 Q3700 L3701 V3702 T3708 A3709 L3710 D3717 E3718 D3719 Y3720 L3721 Y3725 H3734 LEU GLU GLU GLY GLY GLU ASN GLY GLU ALA GLU GLU GLU GLU VAL GLU VAL S3752
E3757 M3758 E3759 K3760 Q3761 R3762 L3763 L3764 Y3765 Q3766 R3769 R3773 A3785 C3786 K3787 A3792 M3793 V3794 S3795 S3796 L3805 N3806 G3807 G3808 N3809 A3810 E3811 Y3819 K3823 K3824 E3825 V3826 G3827 F3828 F3829 Q3830 Q3833 A3834 L3835 M3836 Q3837 T3838 C3839 S3840 Q3850 A3853 GLU GLY LEU

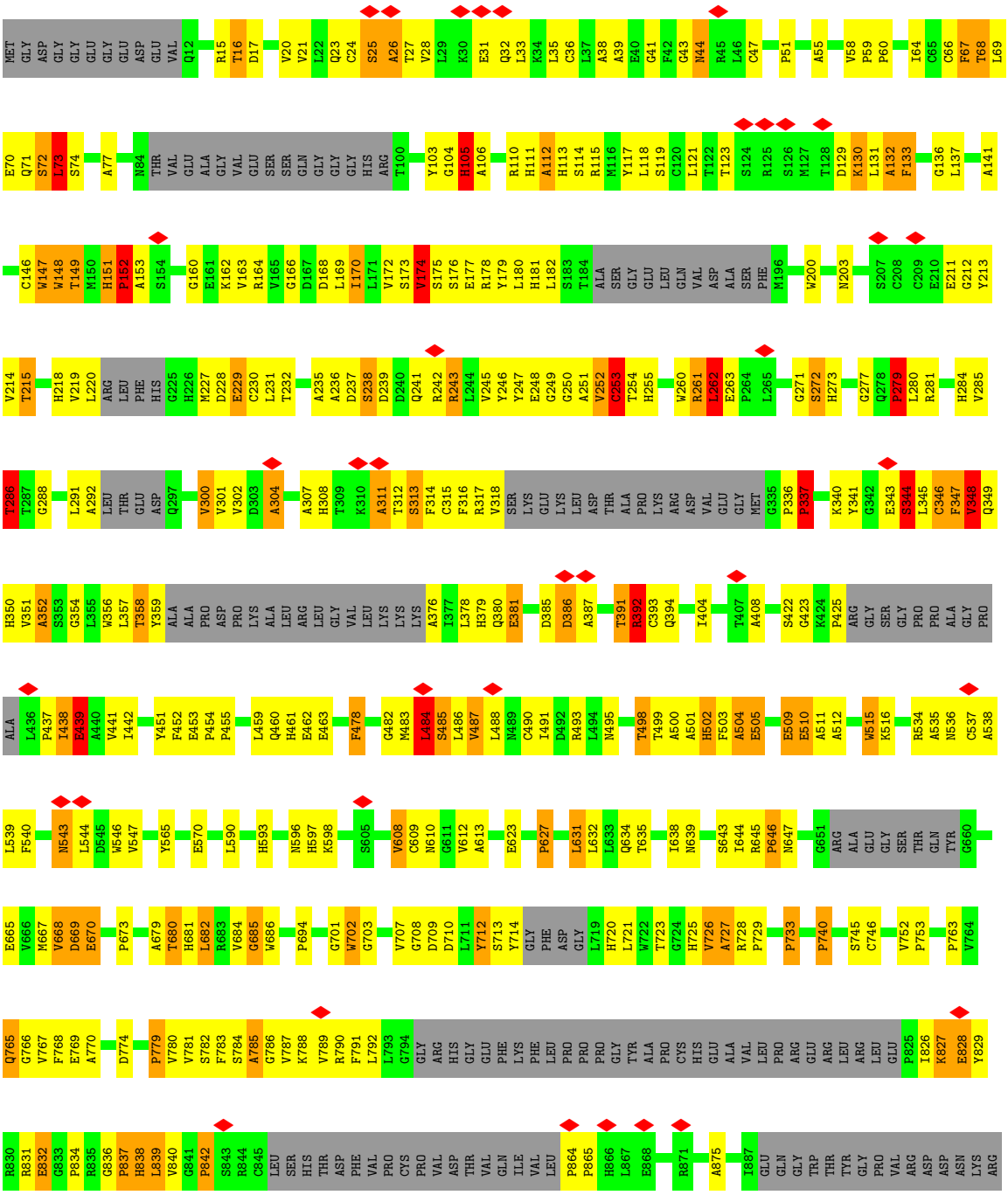


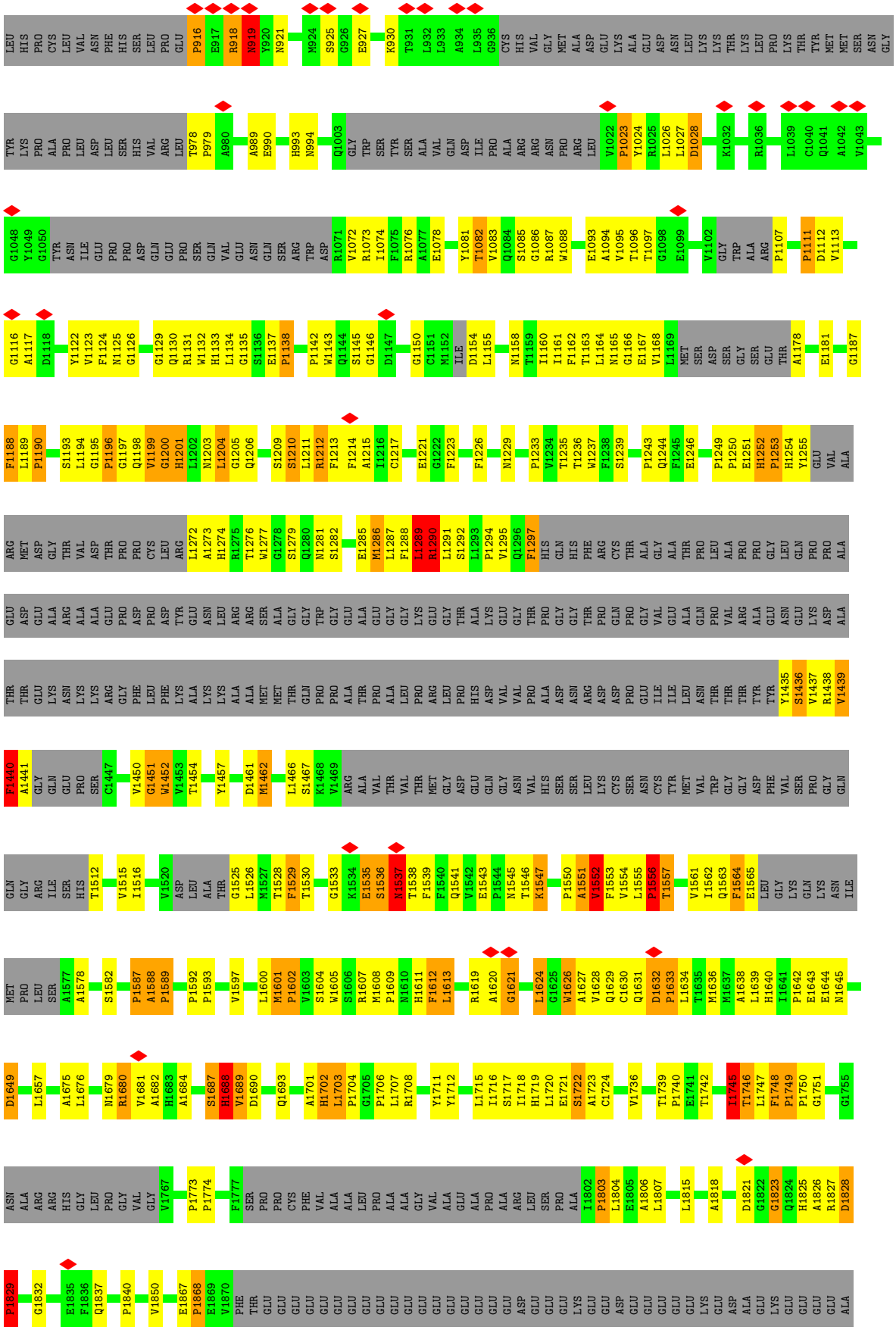


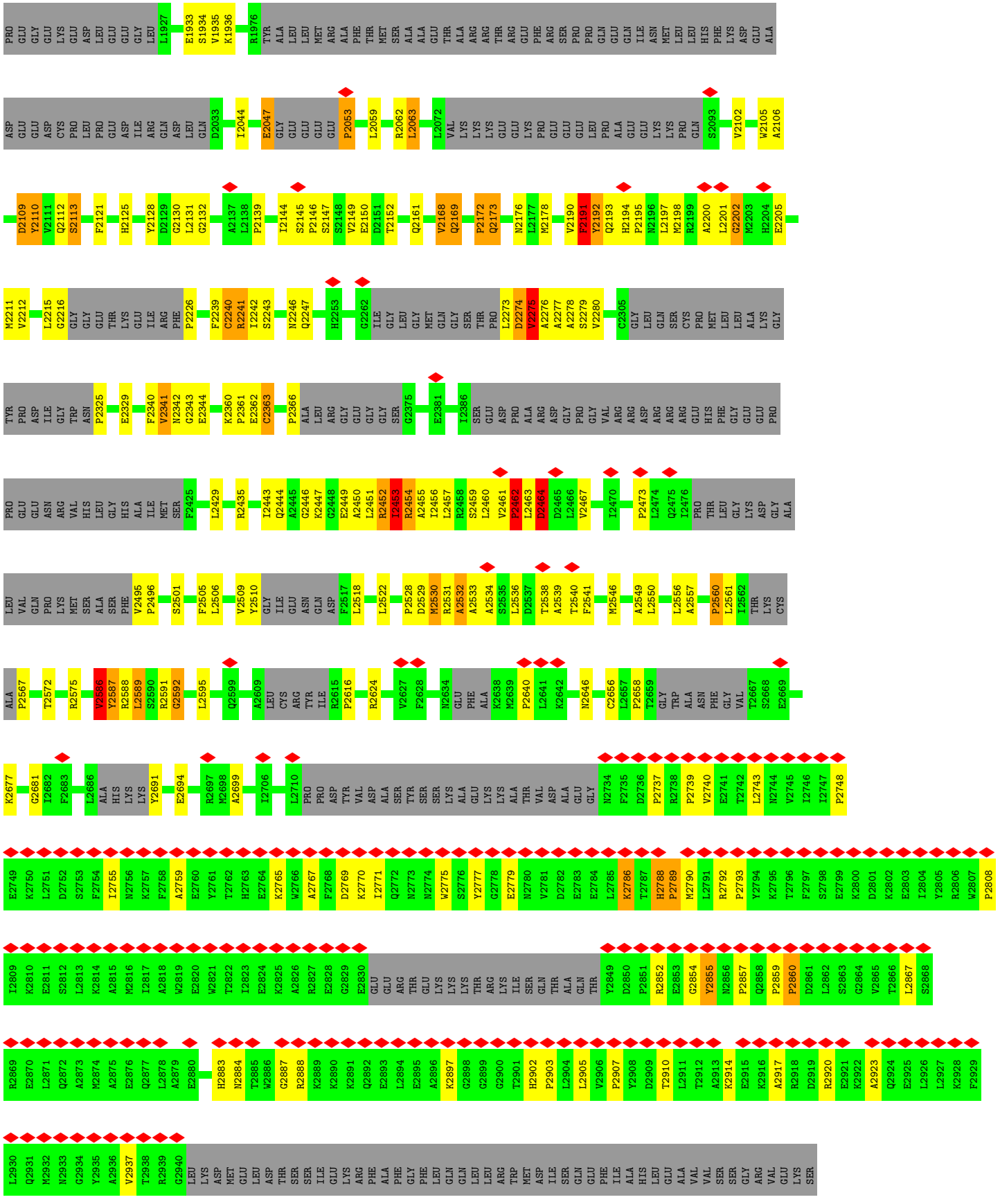
• Molecule 1: Ryanodine receptor 1

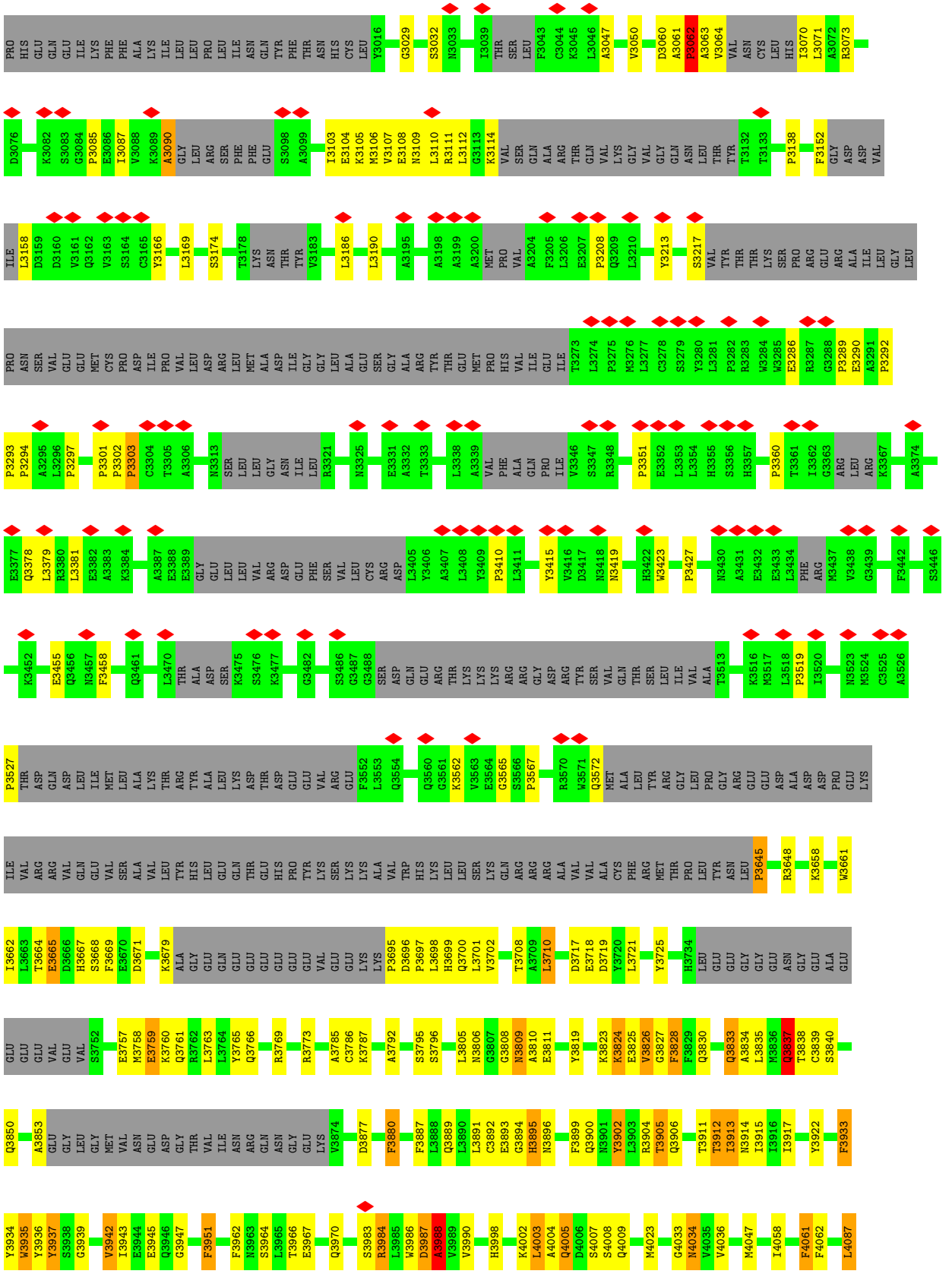
Chain B:

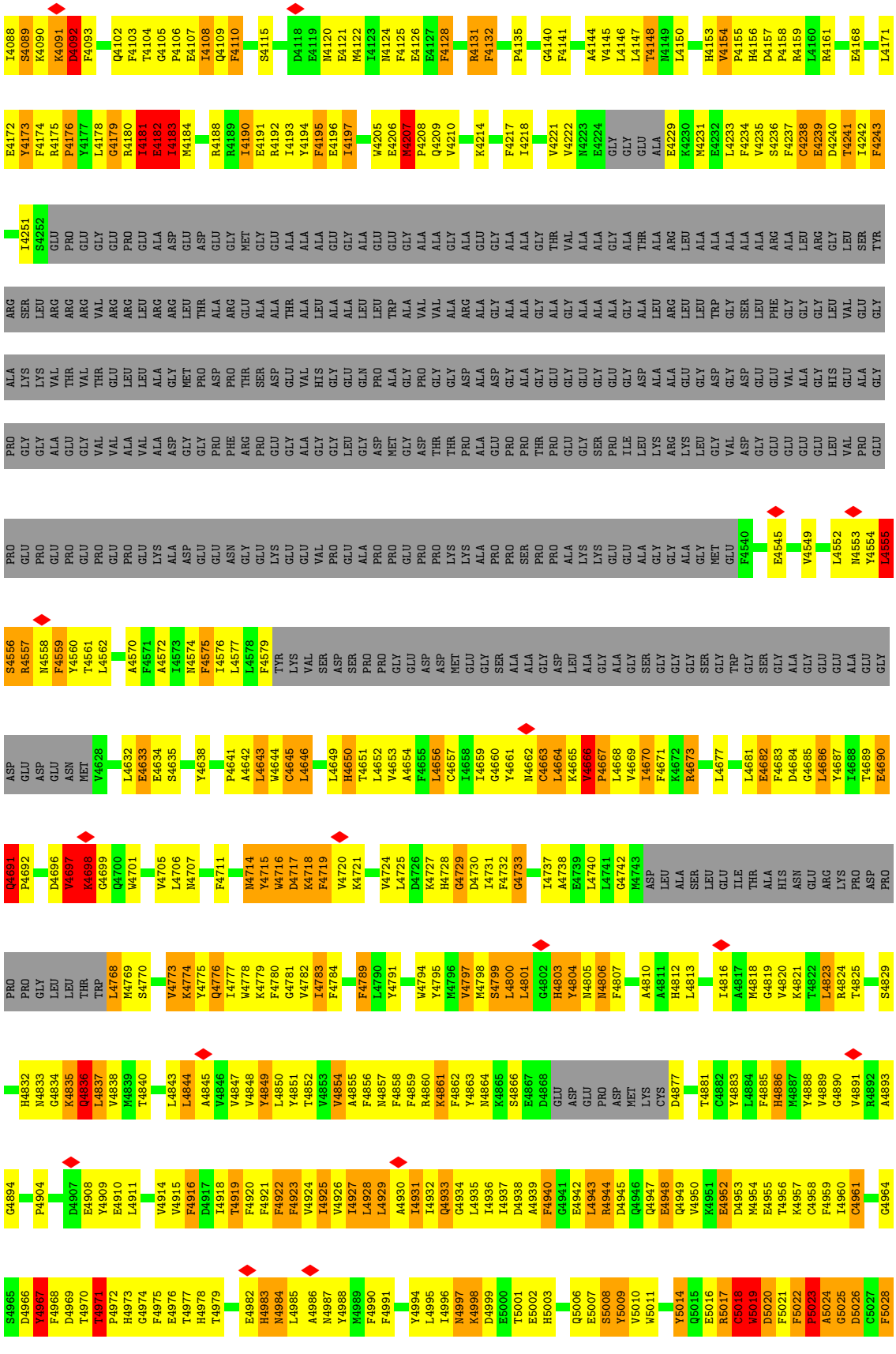






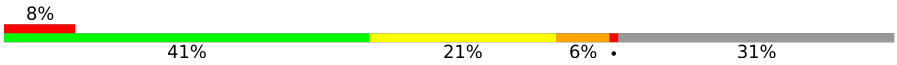

PRO GLU GLU GLY GLU LYS GLU ASP LEU GLU GLU GLY LEU L1927 E1933 S1934 V1935 K1936 R1976 TYR ALA LEU LEU MET ARG ALA PHE THR MET SER ALA ALA GLU THR ALA ARG ARG THR ARG GLU PHE ARG SER PRO PRO GLN GLU GLN ILE ASN MET LEU LEU LEU HIS PHE LYS ASP GLU ALA
ASP GLU GLU ASP CYS PRO LEU PRO GLU ASP ILE ARG GLN ASP LEU GLN D2033 T2044 E2047 GLY GLU GLU GLU GLU P2053 L2059 R2062 L2063 L2072 VAL LYS LYS LYS GLU GLU LYS PRO GLU GLU GLU LEU PRO ALA GLU GLU LYS LYS PRO GLN S2093 V2102 W2105 A2106
D2109 Y2110 V2111 Q2112 S2113 F2121 H2125 Y2128 D2129 G2130 L2131 G2132 A2137 L2138 P2139 I2144 S2145 P2146 S2147 S2148 V2149 E2150 D2151 T2152 Q2161 V2168 Q2169 P2172 Q2173 N2176 L2177 M2178 V2190 F2191 Y2192 Q2193 H2194 P2195 N2196 L2197 M2198 R2199 A2200 L2201 G2202 M2203 H2204 E2205
M2211 V2212 L2215 G2216 GLY GLY GLU THR LYS GLU ILE ARG PHE P2226 F2239 C2240 R2241 I2242 S2243 N2246 Q2247 H2253 G2262 ILE GLY LEU GLY MET GLN GLY SER THR PRO L2273 D2274 V2275 A2276 A2277 A2278 S2279 V2280 C2305 GLY LEU GLN SER CYS PRO MET LEU LEU ALA LYS GLY
TYR PRO ASP ILE GLY TRP ASN P2325 E2329 F2340 V2341 N2342 G2343 E2344 K2360 P2361 E2362 C2363 P2366 ALA LEU ARG GLY GLU GLY GLY SER G2375 E2381 I2386 SER GLU ASP PRO ALA ARG ASP GLY PRO GLY VAL ARG ARG ASP ARG ARG ARG GLU HIS PHE GLY GLU GLU PRO
PRO GLU GLU ASN ARG VAL HIS LEU GLY HIS ALA ILE MET SER F2425 L2429 R2435 I2443 Q2444 A2445 G2446 K2447 G2448 E2449 A2450 L2451 R2452 I2453 R2454 A2455 I2456 L2457 R2458 S2459 L2460 V2461 P2462 L2463 D2464 D2465 L2466 V2467 I2470 P2473 L2474 Q2475 I2476 PRO THR LEU GLY LYS ASP GLY ALA
LEU VAL GLN PRO LYS MET SER ALA SER PHE V2495 P2496 S2501 F2505 L2506 V2509 Y2510 GLY ILE GLU ASN GLN ASP F2517 L2518 L2522 P2528 D2529 M2530 R2531 A2532 A2533 A2534 S2535 L2536 D2537 T2538 A2539 T2540 F2541 M2546 A2549 L2550 L2556 A2557 P2560 L2561 I2562 THR LYS CYS
ALA P2567 T2572 R2575 V2586 Y2587 R2588 L2589 S2590 R2591 G2592 L2595 Q2599 A2609 LEU CYS ARG TYR ILE R2615 P2616 R2624 V2627 F2628 N2634 GLU PHE ALA K2638 M2639 P2640 L2641 K2642 N2646 C2656 L2657 P2658 T2659 GLY TRP ALA ASN PHE GLY VAL T2667 S2668 E2669
K2677 G2681 I2682 F2683 L2686 ALA HIS LYS LYS Y2691 E2694 R2697 M2698 A2699 I2706 L2710 PRO PRO ASP TYR VAL ASP ALA SER TYR SER SER LYS ALA GLU LYS LYS ALA THR VAL ASP ALA GLU GLY N2734 F2735 D2736 P2737 R2738 P2739 V2740 E2741 T2742 L2743 N2744 V2745 I2746 I2747 P2748
E2749 K2750 L2751 D2752 S2753 F2754 I2755 N2756 K2757 F2758 A2759 E2760 Y2761 T2762 H2763 E2764 K2765 W2766 A2767 F2768 D2769 K2770 I2771 Q2772 N2773 N2774 W2775 S2776 Y2777 G2778 E2779 N2780 V2781 D2782 E2783 E2784 L2785 K2786 T2787 H2788 P2789 M2790 L2791 R2792 P2793 Y2794 K2795 T2796 F2797 S2798 E2799 K2800 D2801 K2802 E2803 I2804 Y2805 R2806 W2807 P2808
I2809 K2810 E2811 S2812 L2813 K2814 A2815 M2816 I2817 A2818 W2819 E2820 W2821 T2822 I2823 E2824 K2825 A2826 R2827 E2828 G2829 E2830 GLU GLU ARG THR GLU LYS LYS LYS THR ARG LYS ILE SER GLN THR ALA GLN THR Y2849 D2850 P2851 R2852 E2853 G2854 Y2855 N2856 P2857 Q2858 P2859 P2860 D2861 L2862 S2863 G2864 V2865 T2866 L2867 S2868
R2869 E2870 L2871 Q2872 A2873 M2874 A2875 E2876 Q2877 L2878 A2879 E2880 H2883 N2884 T2885 W2886 G2887 R2888 K2889 K2890 K2891 Q2892 E2893 L2894 E2895 A2896 K2897 G2898 G2899 G2900 T2901 H2902 P2903 L2904 L2905 V2906 P2907 Y2908 D2909 T2910 L2911 T2912 A2913 K2914 E2915 K2916 A2917 R2918 D2919 R2920 E2921 K2922 A2923 Q2924 E2925 L2926 L2927 K2928 F2929
L2930 Q2931 M2932 N2933 G2934 Y2935 A2936 V2937 T2938 R2939 G2940 LEU LYS ASP MET GLU LEU ASP THR SER SER ILE GLU LYS ARG PHE ALA PHE GLY PHE LEU GLN GLN LEU LEU ARG TRP MET ASP ILE SER GLN GLU PHE ILE ALA HIS LEU GLU ALA VAL VAL SER SER GLY ARG VAL GLU LYS SER

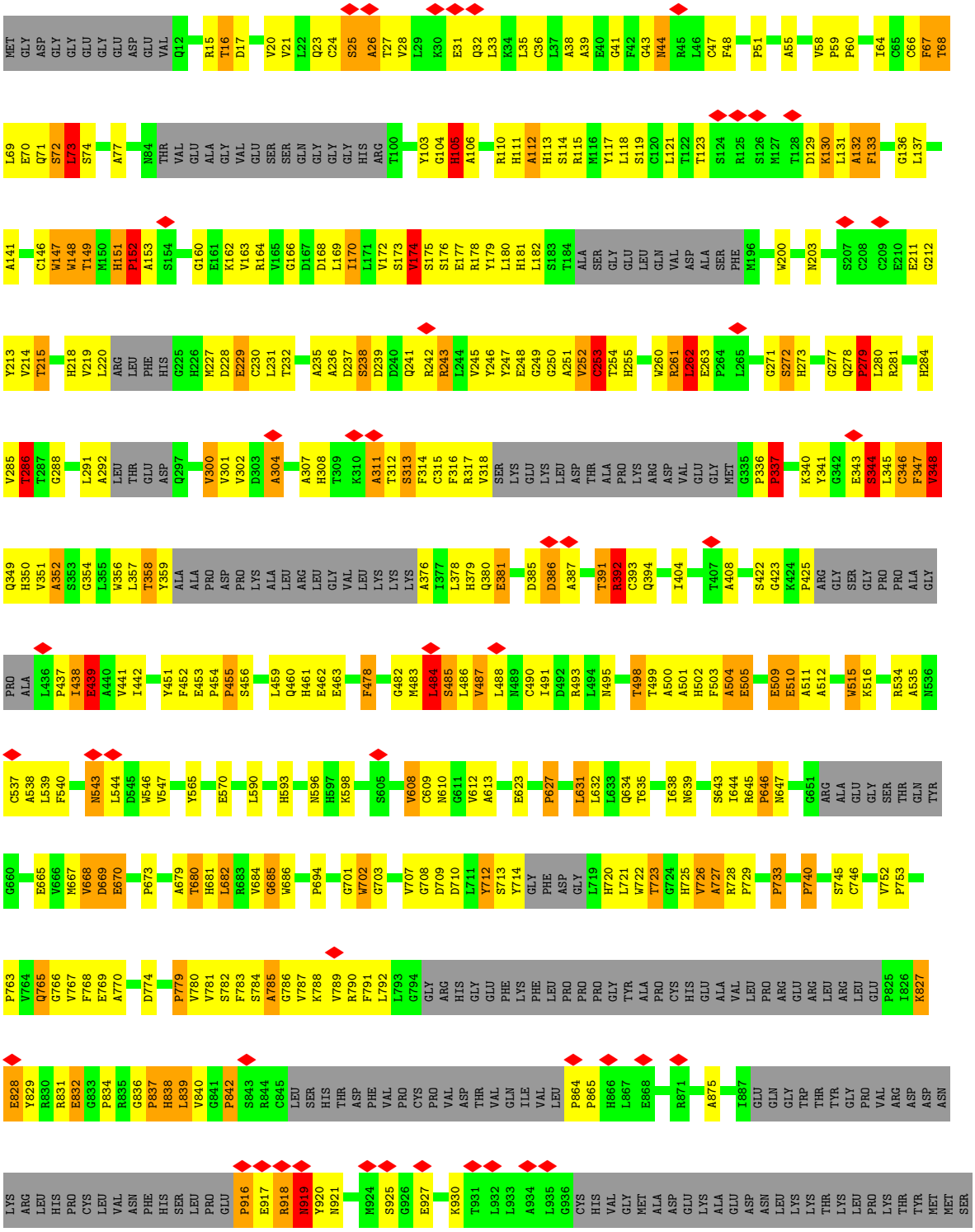


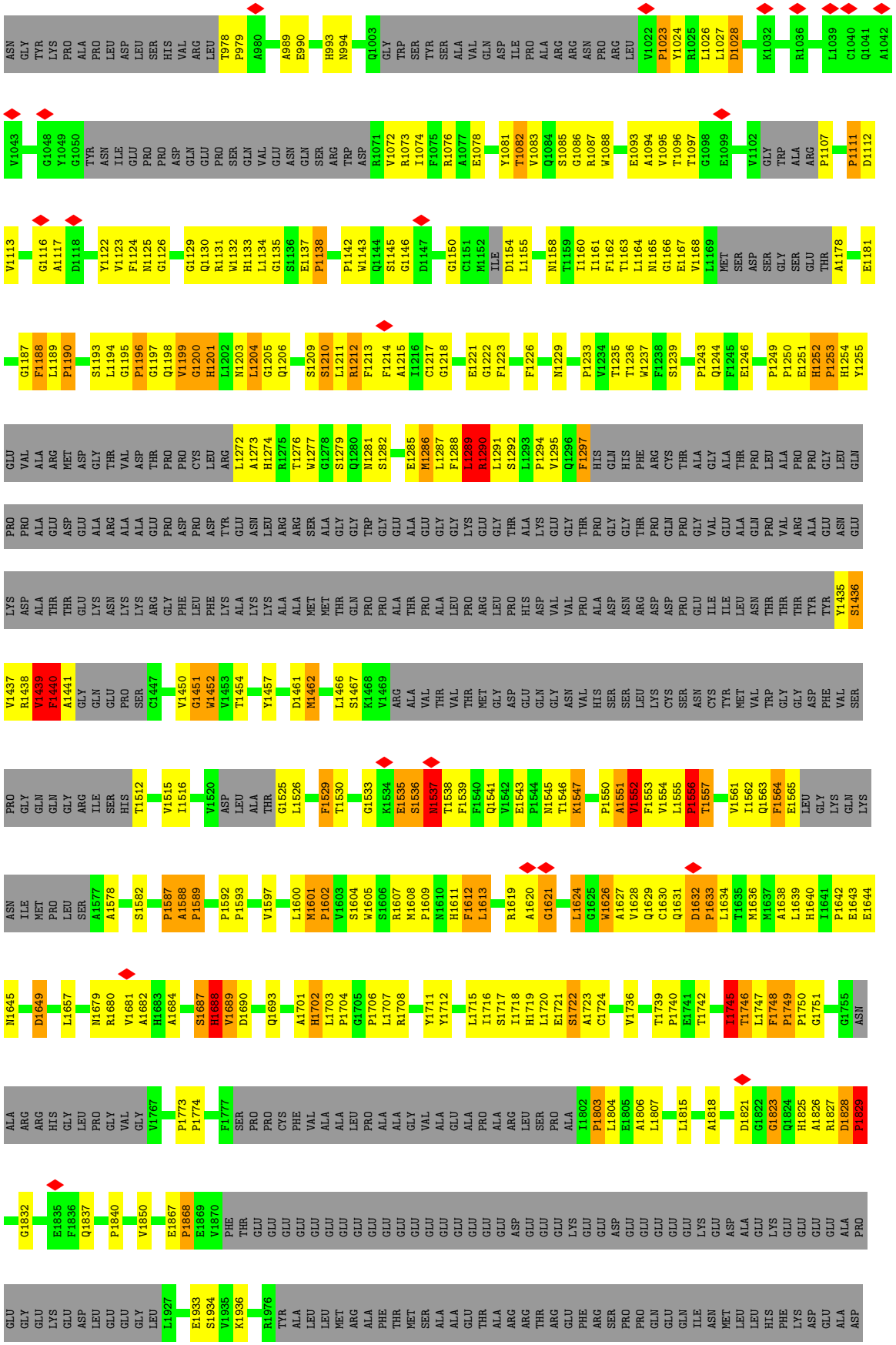


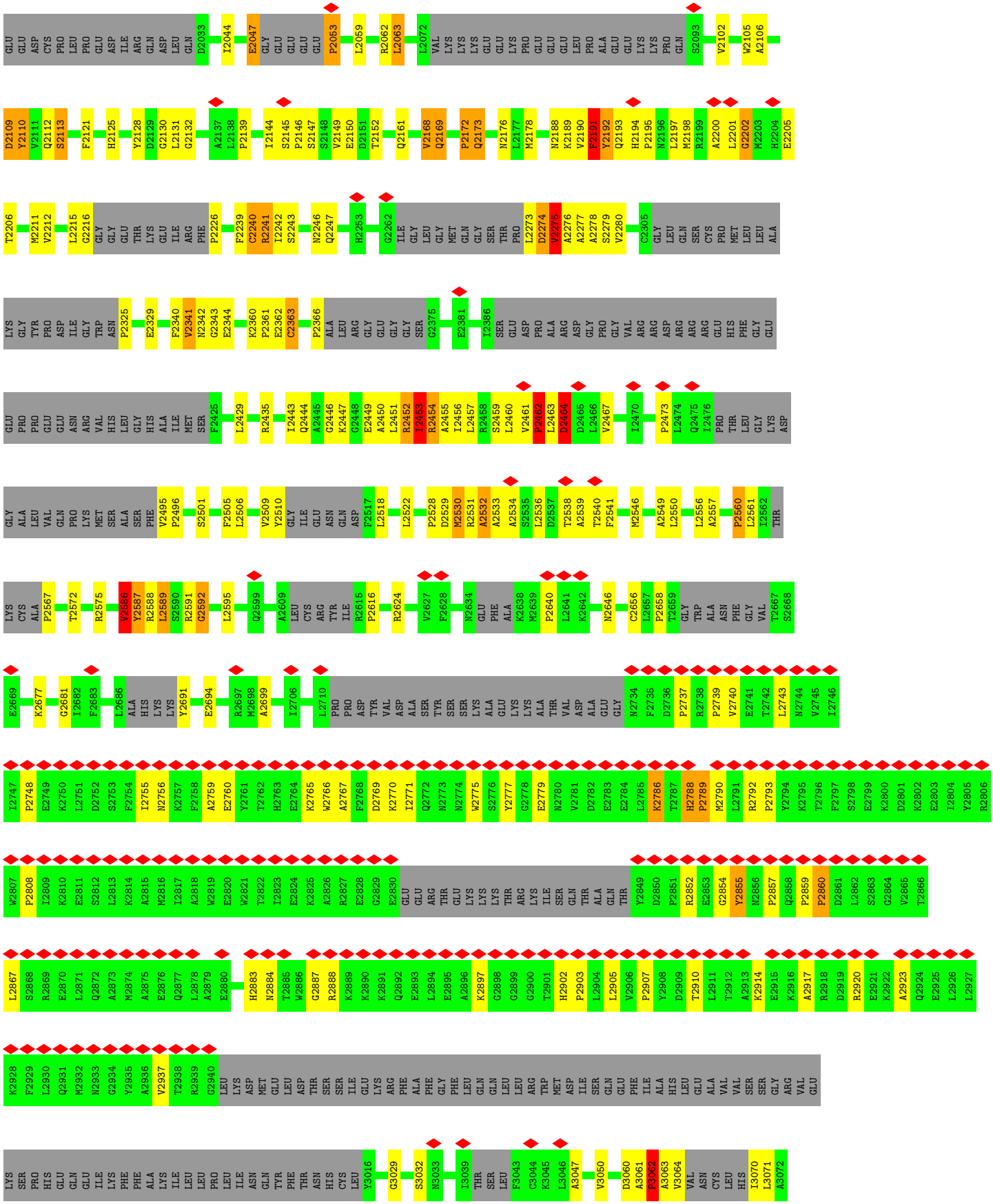
• Molecule 1: Ryanodine receptor 1

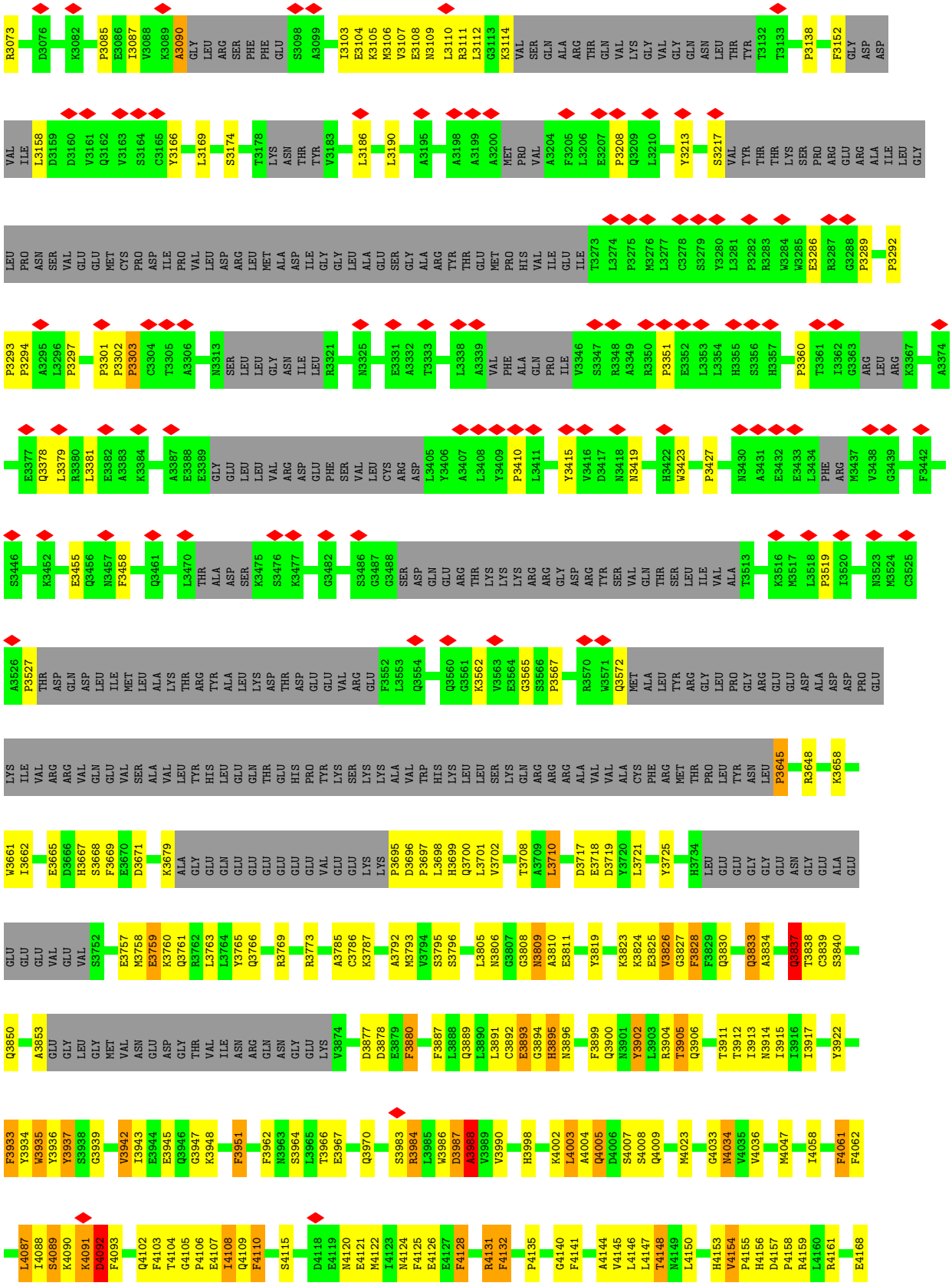
Chain C:

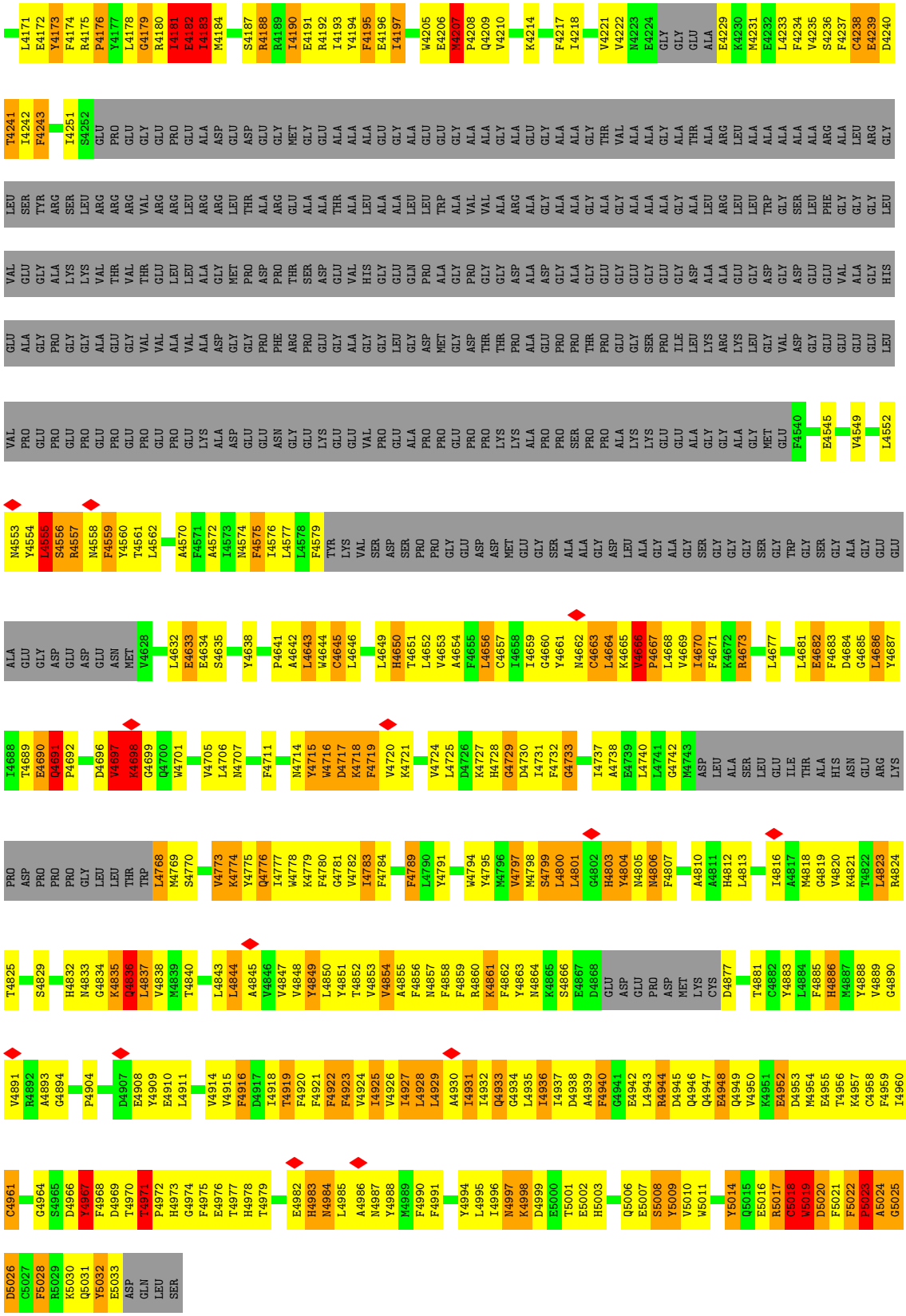








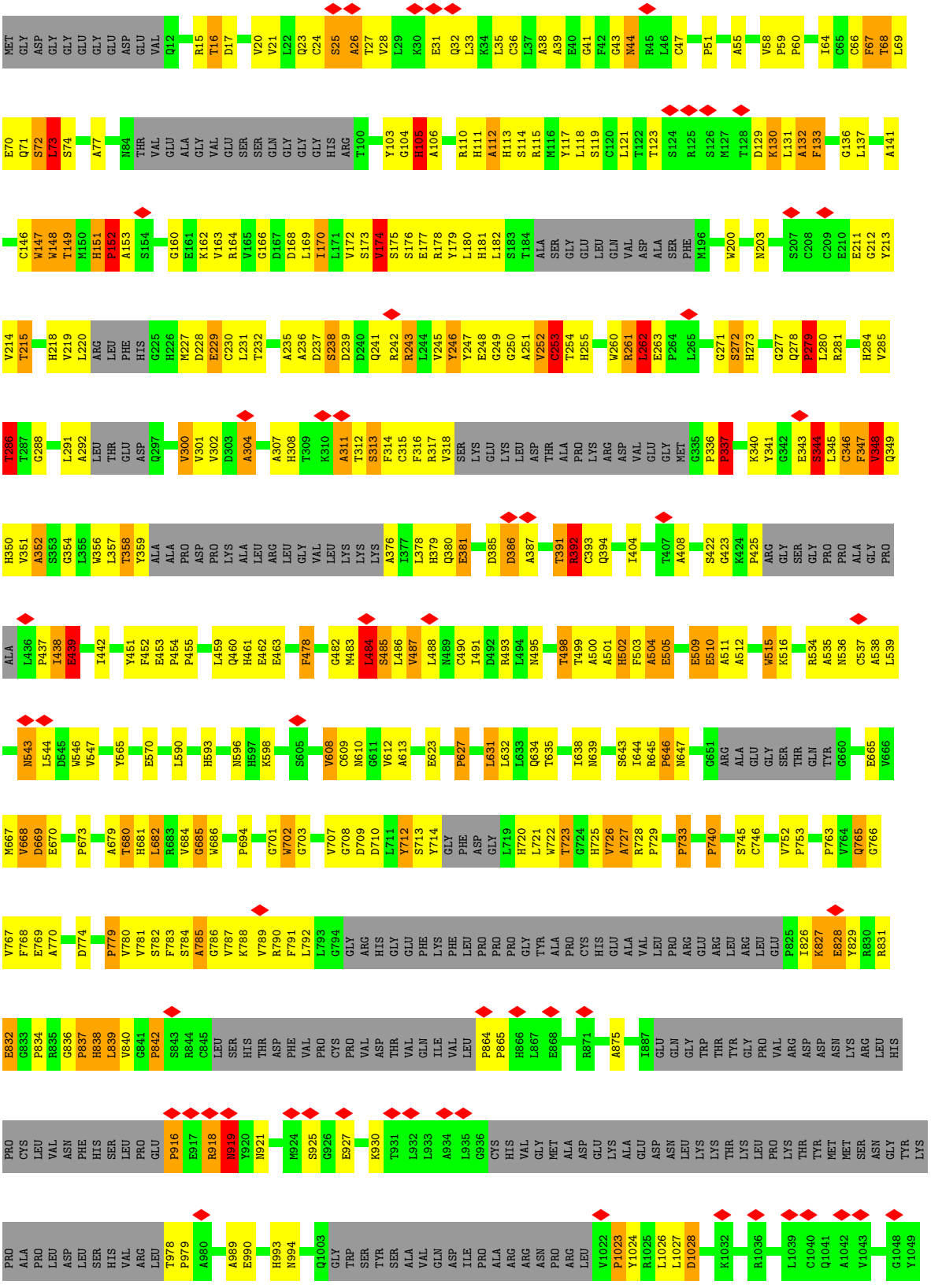


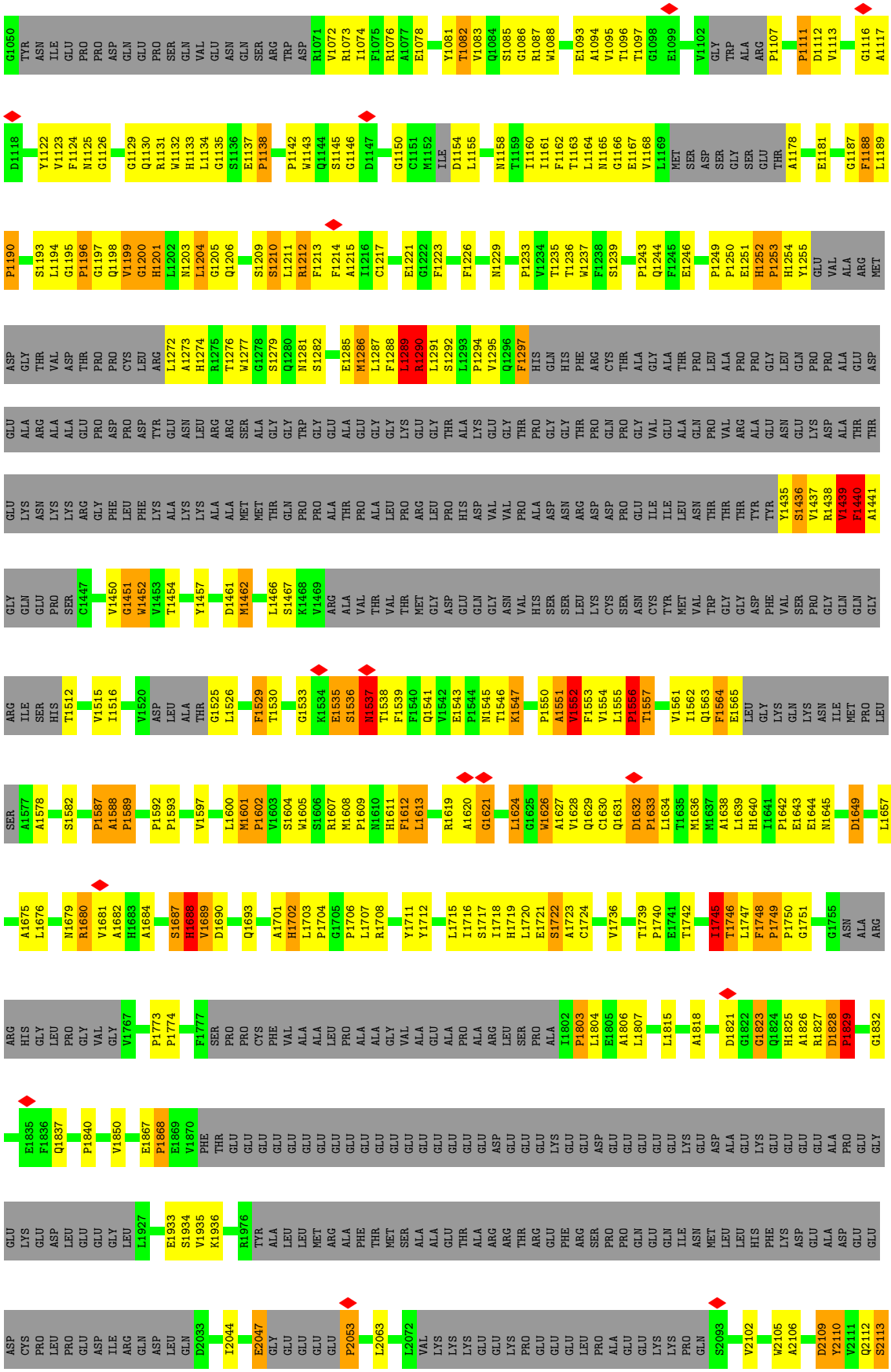


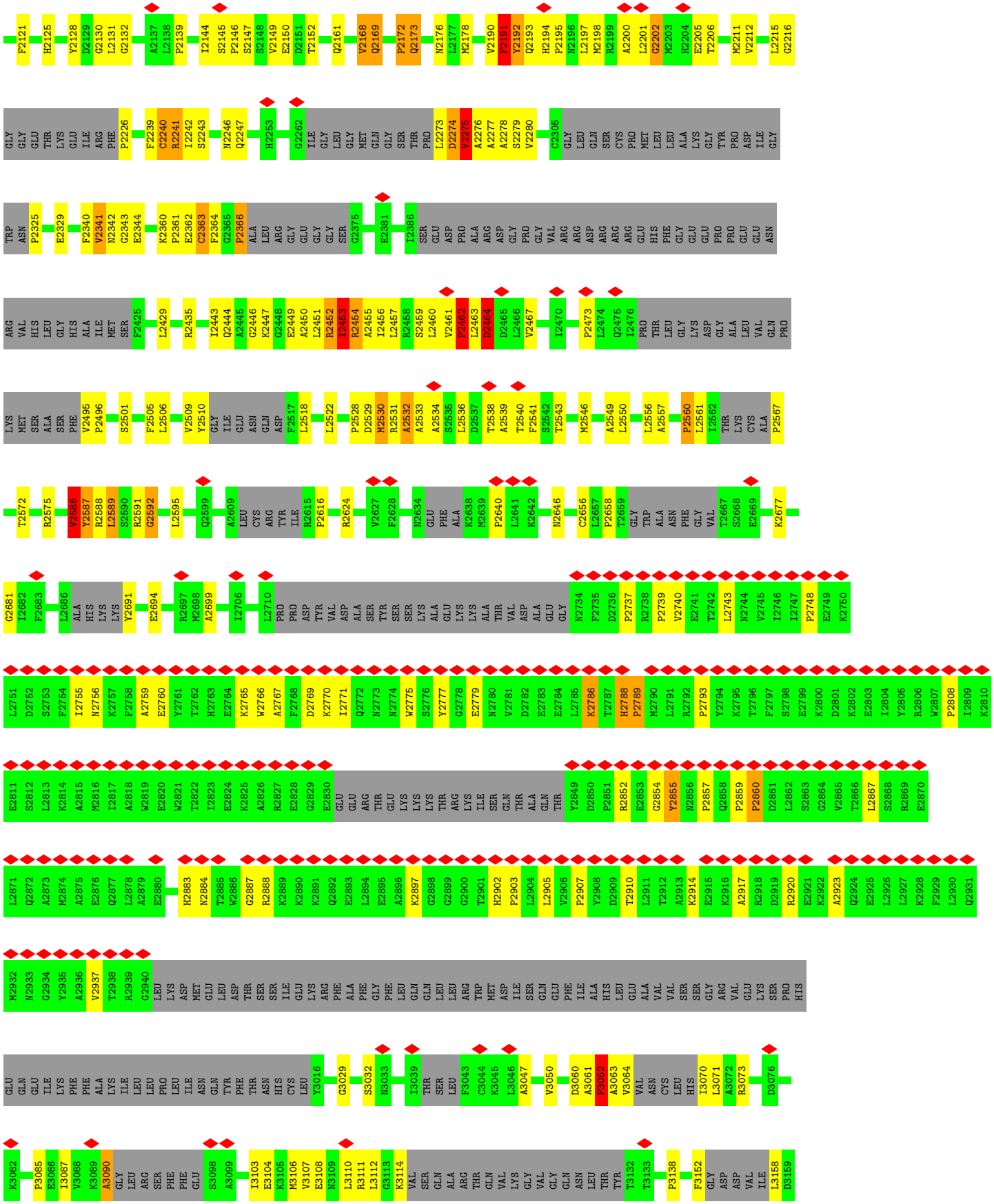
• Molecule 1: Ryanodine receptor 1

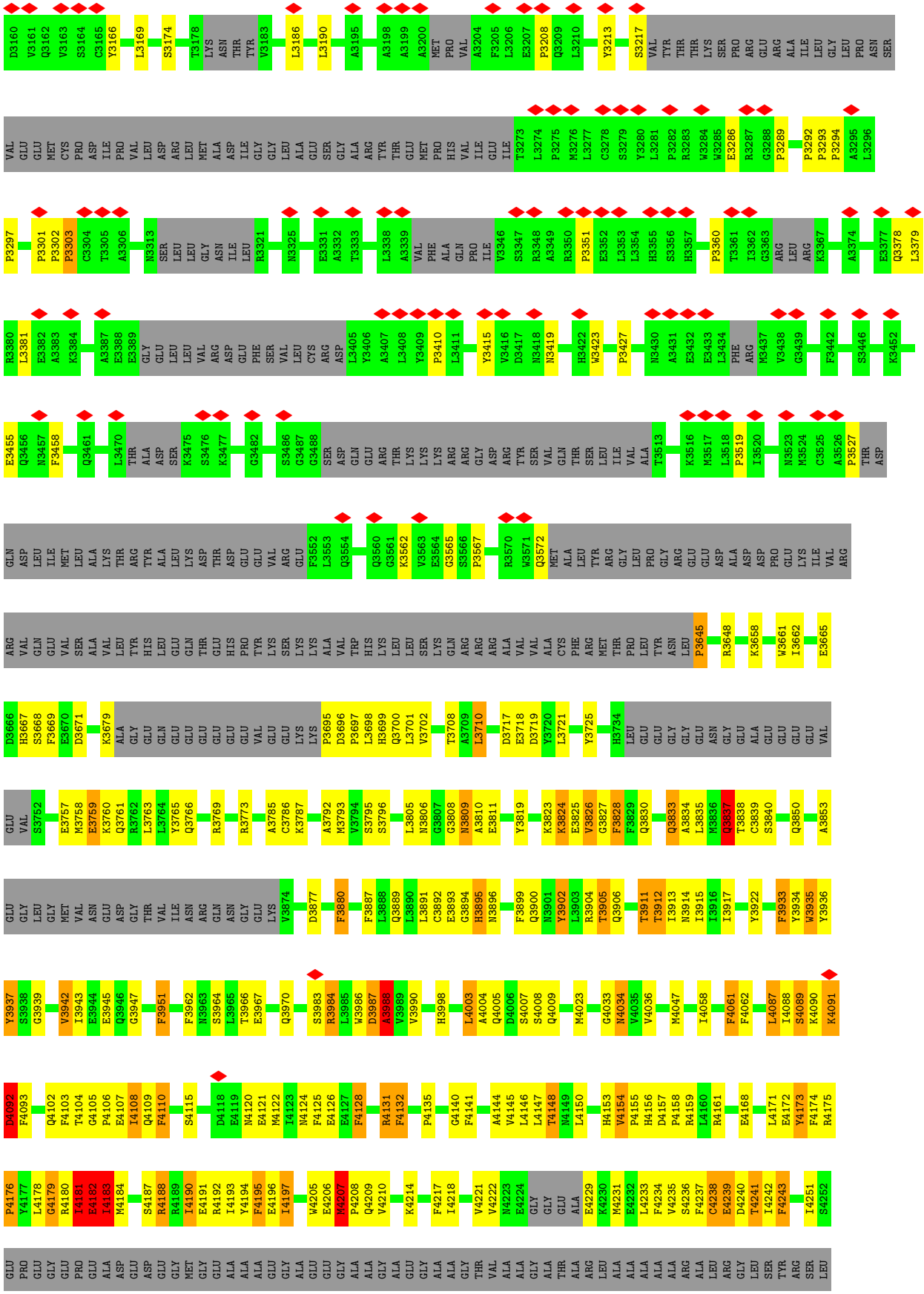
Chain D:

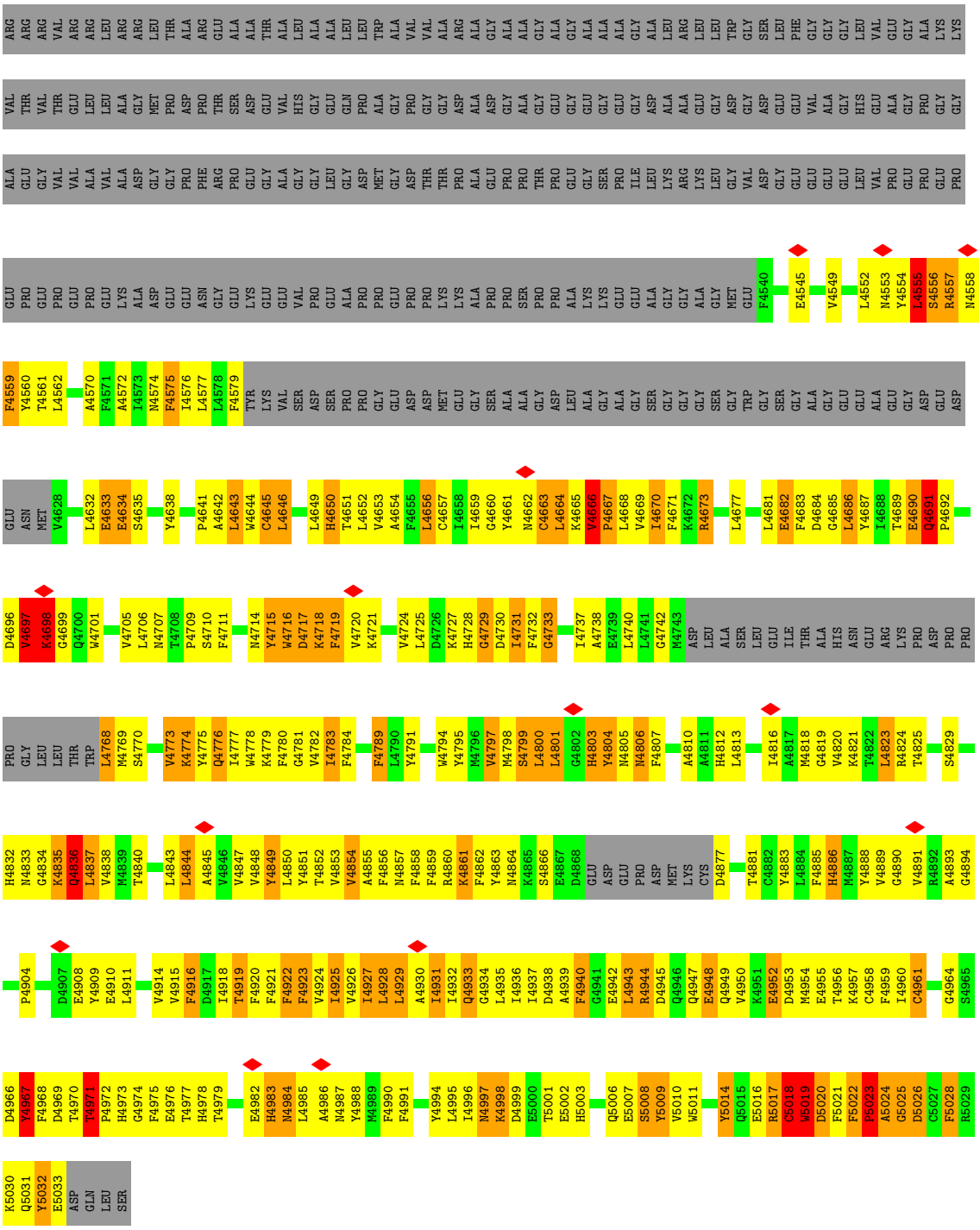

8%
41%
21%
6%
31%


MET GLY ASP GLY GLY GLU GLY GLU ASP GLU VAL Q12 R15 T16 D17 V20 V21 L22 Q23 C24 S25 A26 T27 V28 L29 K30 E31 Q32 L33 K34 L35 C36 L37 A38 A39 E40 G41 F42 G43 N44 R45 L46 C47 P51 A55 V58 P59 P60 I64 G65 C66 F67 T68 L69
E70 Q71 S72 L73 S74 A77 N84 THR VAL GLU ALA GLY VAL GLU SER SER GLN GLY GLY GLY HIS ARG T100 Y103 G104 H105 A106 R110 H111 A112 H113 S114 R115 M116 Y117 L118 S119 C120 L121 T122 T123 S124 R125 S126 M127 T128 D129 K130 L131 A132 F133 G136 L137 A141
C146 W147 W148 T149 M150 H151 P152 A153 S154 G160 E161 K162 V163 R164 V165 G166 D167 D168 L169 I170 L171 V172 S173 V174 S175 S176 E177 R178 Y179 L180 H181 L182 S183 T184 ALA SER GLY GLU LEU GLN VAL ASP ALA SER PHE M196 W200 N203 S207 C208 C209 E210 E211 G212 Y213
V214 T215 H218 V219 L220 ARG LEU PHE HIS G225 H226 M227 D228 E229 C230 L231 T232 A235 A236 D237 S238 D239 D240 Q241 R242 R243 L244 V245 Y246 Y247 E248 G249 G250 A251 V252 C253 T254 H255 W260 R261 L262 E263 P264 L265 G271 S272 H273 G277 G278 P279 L280 R281 H284 V285
T286 T287 G288 L291 A292 LEU THR GLU ASP Q297 V300 V301 V302 D303 A304 A307 H308 T309 K310 A311 T312 S313 F314 C315 F316 R317 V318 SER LYS GLU LYS LEU ASP THR ALA PRO LYS ARG ASP VAL GLU GLY MET G335 P336 P337 K340 Y341 G342 E343 S344 L345 C346 F347 V348 Q349
H350 V351 A352 S353 G354 L355 W356 L357 T358 Y359 ALA ALA PRO ASP PRO LYS ALA LEU ARG LEU GLY VAL LEU LYS LYS LYS A376 I377 L378 H379 Q380 E381 D385 D386 A387 T391 R392 C393 Q394 I404 T407 A408 S422 G423 K424 P425 ARG GLY SER GLY PRO PRO ALA GLY PRO
ALA L436 P437 I438 E439 I442 Y451 F452 E453 P454 P455 L459 Q460 H461 E462 E463 F478 G482 M483 L484 S485 L486 V487 L488 N489 C490 I491 D492 R493 L494 N495 T498 T499 A500 A501 H502 F503 A504 E505 E509 E510 A511 A512 W515 K516 R534 A535 N536 C537 A538 L539
N543 L544 D545 W546 V547 Y565 E570 L590 H593 N596 H597 K598 S605 V608 C609 N610 G611 V612 A613 E623 P627 L631 L632 L633 Q634 T635 I638 N639 S643 I644 R645 P646 N647 G651 ARG ALA GLU GLY SER THR GLN TYR G660 E665 V666
M667 V668 D669 E670 P673 A679 T680 H681 L682 R683 V684 G685 W686 P694 G701 W702 G703 V707 G708 D709 D710 L711 Y712 S713 Y714 GLY PHE ASP GLY L719 H720 L721 W722 T723 G724 H725 V726 A727 R728 P729 P733 P740 S745 C746 V752 P753 P763 V764 Q765 G766
V767 F768 E769 A770 D774 P779 V780 V781 S782 F783 S784 A785 G786 V787 K788 V789 R790 F791 L792 L793 G794 GLY ARG HIS GLY GLU PHE LYS PHE LEU PRO PRO PRO GLY TYR ALA PRO CYS HIS GLU ALA VAL LEU PRO ARG GLU ARG LEU ARG LEU GLU P825 I826 K827 E828 Y829 R830 R831
E832 G833 P834 R835 G836 P837 H838 L839 V840 G841 P842 S843 R844 C845 LEU SER HIS THR ASP PHE VAL PRO CYS PRO VAL ASP THR VAL GLN ILE VAL LEU P864 P865 H866 L867 E868 R871 A875 I887 GLU GLN GLY TRP THR TYR GLY PRO VAL ARG ASP ASP ASN LYS ARG LEU HIS
PRO CYS LEU VAL ASN PHE HIS SER LEU PRO GLU P916 E917 R918 N919 Y920 N921 M924 S925 G926 E927 K930 T931 L932 L933 A934 L935 G936 CYS HIS VAL GLY MET ALA ASP GLU LYS ALA GLU ASP ASN LEU LYS LYS THR LYS LEU PRO LYS THR TYR MET MET SER ASN GLY TYR LYS
PRO ALA PRO LEU ASP LEU SER HIS VAL ARG LEU T978 P979 A980 A989 E990 H993 N994 Q1003 GLY TRP SER TYR SER ALA VAL GLN ASP ILE PRO ALA ARG ARG ASN PRO ARG LEU V1022 P1023 Y1024 R1025 L1026 L1027 D1028 K1032 R1036 L1039 C1040 Q1041 A1042 V1043 G1048 Y1049









4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C4	Depositor
Number of particles used	41743	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	NONE	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/Å^2$)	48	Depositor
Minimum defocus (nm)	1300	Depositor
Maximum defocus (nm)	5400	Depositor
Magnification	100286	Depositor
Image detector	FEI FALCON II (4k x 4k)	Depositor
Maximum map value	0.532	Depositor
Minimum map value	-0.339	Depositor
Average map value	0.001	Depositor
Map value standard deviation	0.014	Depositor
Recommended contour level	0.0967	Depositor
Map size (Å)	547.232, 547.232, 547.232	wwPDB
Map dimensions	392, 392, 392	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.396, 1.396, 1.396	Depositor

5 Model quality (i)

5.1 Standard geometry (i)

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	1.17	51/18508 (0.3%)	1.21	262/25601 (1.0%)
1	B	1.17	51/18508 (0.3%)	1.21	262/25601 (1.0%)
1	C	1.17	51/18508 (0.3%)	1.21	262/25601 (1.0%)
1	D	1.17	51/18508 (0.3%)	1.21	262/25601 (1.0%)
All	All	1.17	204/74032 (0.3%)	1.21	1048/102404 (1.0%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand.A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	A	1	3
1	B	1	3
1	C	1	3
1	D	1	3
All	All	4	12

The worst 5 of 204 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	4859	PHE	CA-CB	-43.48	0.58	1.53
1	B	4859	PHE	CA-CB	-43.48	0.58	1.53
1	C	4859	PHE	CA-CB	-43.48	0.58	1.53
1	D	4859	PHE	CA-CB	-43.48	0.58	1.53
1	A	4691	GLN	CA-CB	-40.95	0.63	1.53

The worst 5 of 1048 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	2047	GLU	N-CA-CB	-38.23	41.78	110.60
1	C	2047	GLU	N-CA-CB	-38.23	41.78	110.60
1	D	2047	GLU	N-CA-CB	-38.23	41.78	110.60

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	B	2047	GLU	N-CA-CB	-38.22	41.80	110.60
1	A	4168	GLU	N-CA-CB	-30.53	55.64	110.60

All (4) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
1	A	4691	GLN	CA
1	B	4691	GLN	CA
1	C	4691	GLN	CA
1	D	4691	GLN	CA

5 of 12 planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	2192	TYR	Mainchain
1	A	2586	VAL	Peptide
1	A	4091	LYS	Peptide
1	B	2192	TYR	Mainchain
1	B	2586	VAL	Peptide

5.2 Too-close contacts (i)

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	18404	0	9770	2060	0
1	B	18404	0	9770	2067	0
1	C	18404	0	9770	2068	0
1	D	18404	0	9770	2069	0
All	All	73616	0	39080	8025	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 71.

The worst 5 of 8025 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:D:4978:HIS:HE2	1:D:4983:HIS:CD2	1.11	1.67
1:A:4235:VAL:HG21	1:A:5019:TRP:CZ3	1.15	1.67
1:C:4115:SER:HA	1:C:4128:PHE:CZ	1.23	1.66
1:A:4978:HIS:HE2	1:A:4983:HIS:CD2	1.11	1.66
1:B:4978:HIS:HE2	1:B:4983:HIS:CD2	1.11	1.65

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	3311/5037 (66%)	2865 (86%)	203 (6%)	243 (7%)	1	15
1	B	3311/5037 (66%)	2865 (86%)	204 (6%)	242 (7%)	1	15
1	C	3311/5037 (66%)	2865 (86%)	203 (6%)	243 (7%)	1	15
1	D	3311/5037 (66%)	2864 (86%)	205 (6%)	242 (7%)	1	15
All	All	13244/20148 (66%)	11459 (86%)	815 (6%)	970 (7%)	2	15

5 of 970 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	16	THR
1	A	25	SER
1	A	26	ALA
1	A	44	ASN
1	A	67	PHE

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	317/4276 (7%)	225 (71%)	92 (29%)	0	3
1	B	317/4276 (7%)	229 (72%)	88 (28%)	0	3
1	C	317/4276 (7%)	229 (72%)	88 (28%)	0	3
1	D	317/4276 (7%)	228 (72%)	89 (28%)	0	3
All	All	1268/17104 (7%)	911 (72%)	357 (28%)	2	3

5 of 357 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	C	4799	SER
1	D	4061	PHE
1	C	4849	TYR
1	C	4997	ASN
1	D	4561	THR

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 44 such sidechains are listed below:

Mol	Chain	Res	Type
1	C	4803	HIS
1	D	3833	GLN
1	C	4806	ASN
1	C	5031	GLN
1	D	4650	HIS

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)

There are no ligands in this entry.

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.

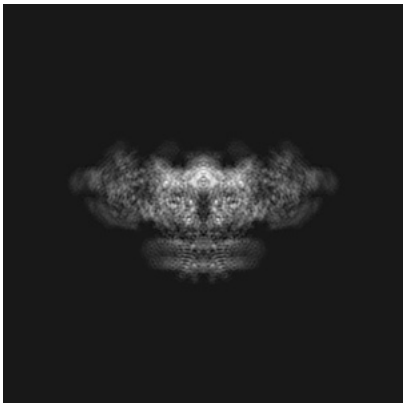
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-8073. These allow visual inspection of the internal detail of the map and identification of artifacts.

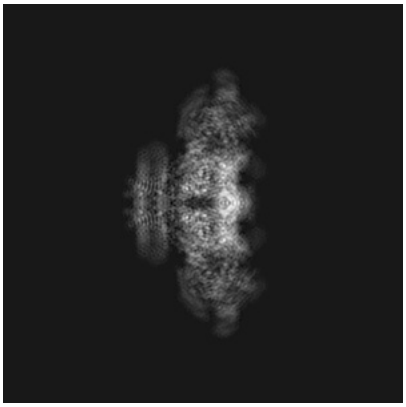
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections

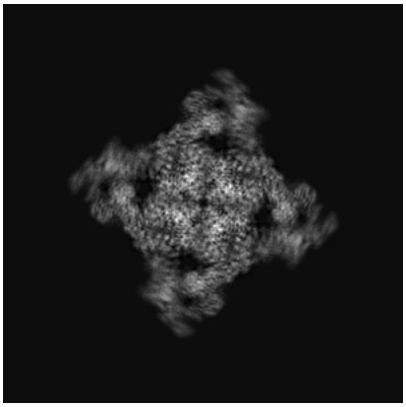
6.1.1 Primary map



X



Y



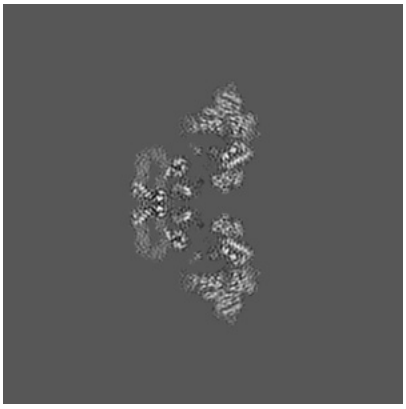
Z

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

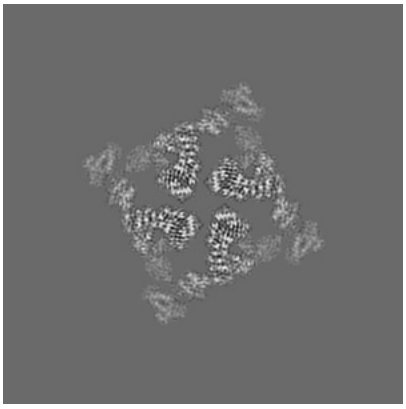
6.2 Central slices

6.2.1 Primary map

X Index: 196



Y Index: 196

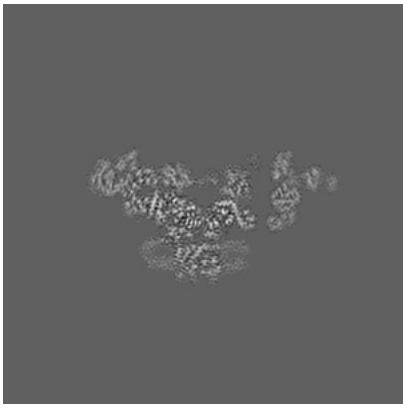


Z Index: 196

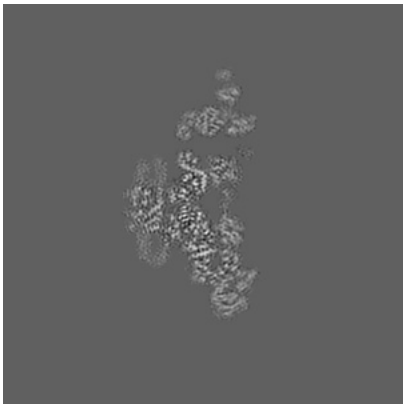
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

6.3.1 Primary map



X Index: 208



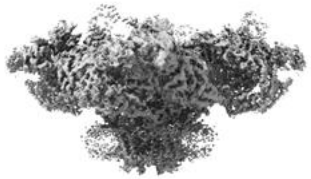
Y Index: 184

Z Index: 215

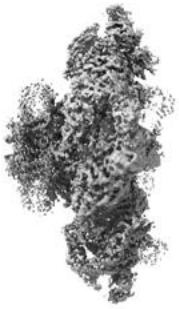
The images above show the largest variance slices of the map in three orthogonal directions.

6.4 Orthogonal surface views (i)

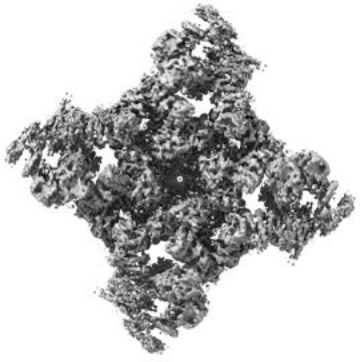
6.4.1 Primary map



X



Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.0967. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

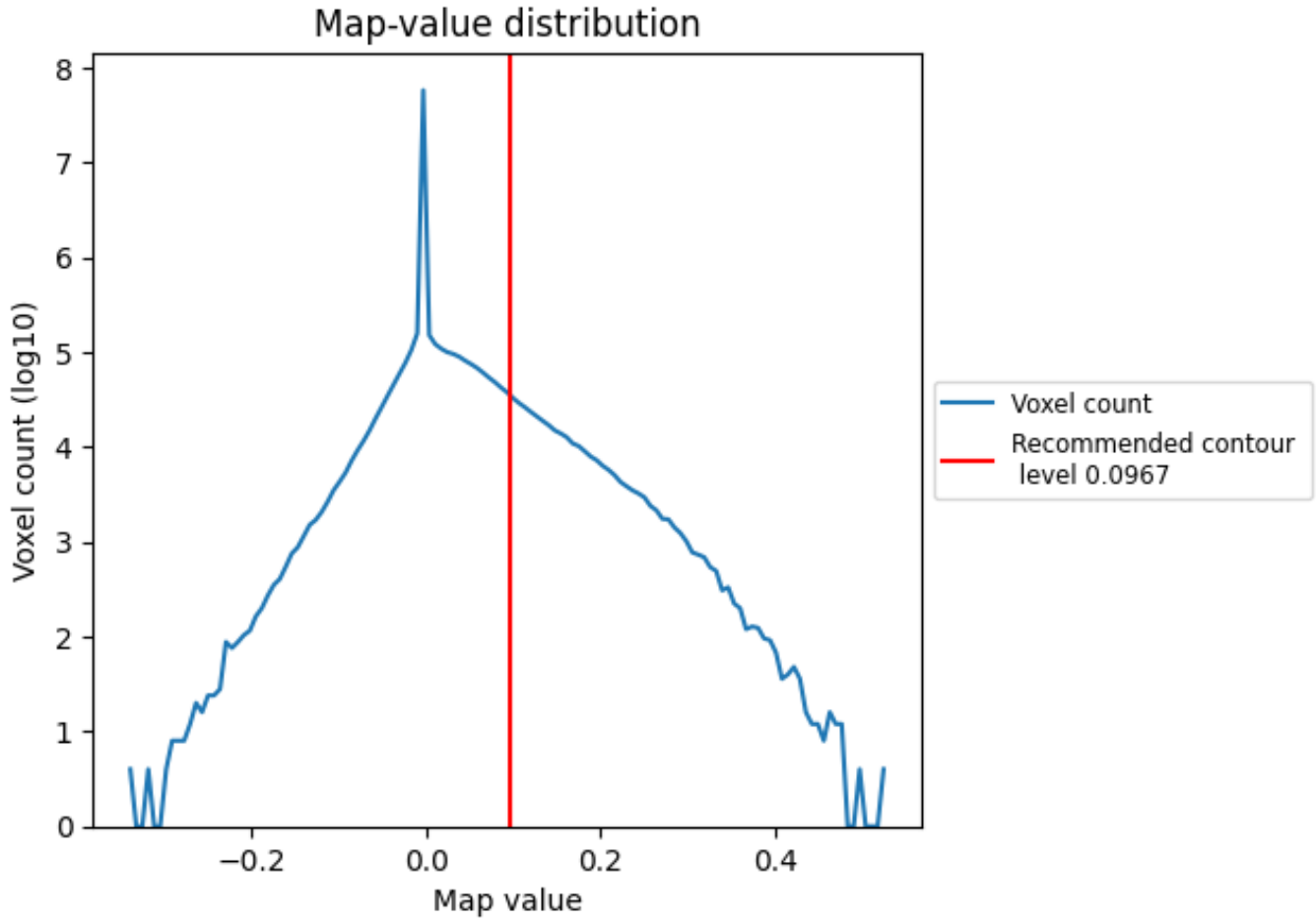
6.5 Mask visualisation (i)

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

7 Map analysis

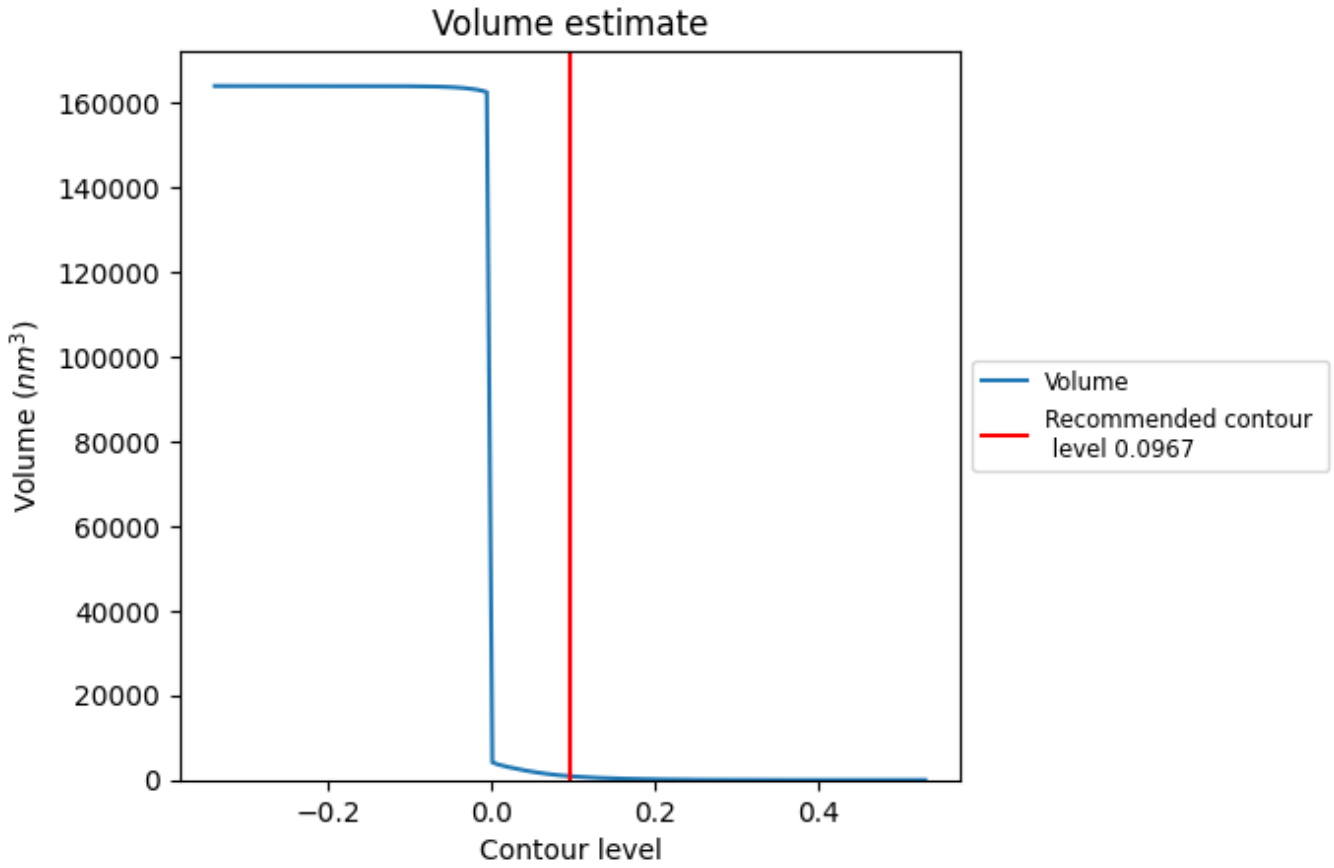
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution



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.

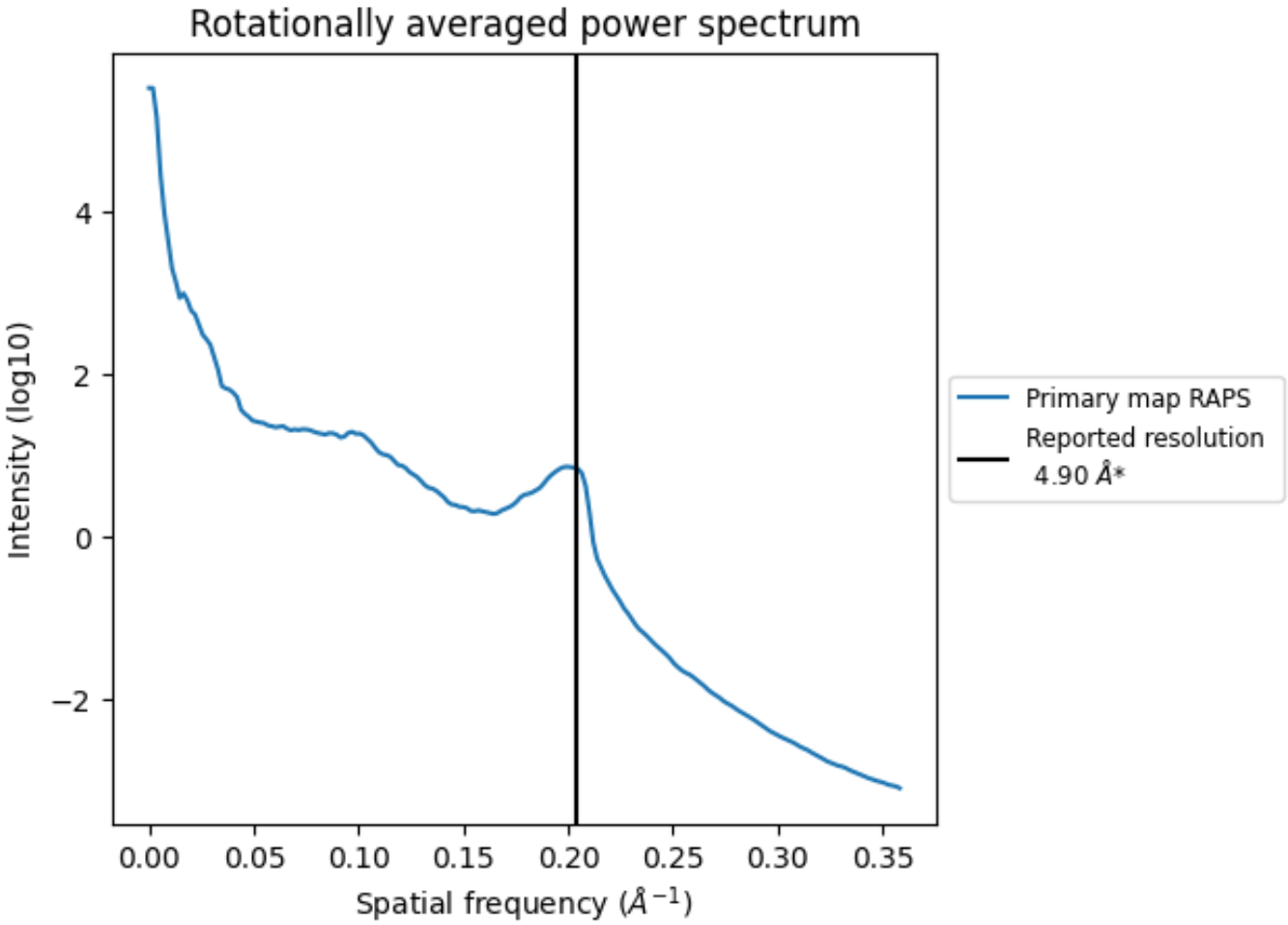
7.2 Volume estimate



The volume at the recommended contour level is 885 nm^3; this corresponds to an approximate mass of 799 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 0.204 Å^{-1}

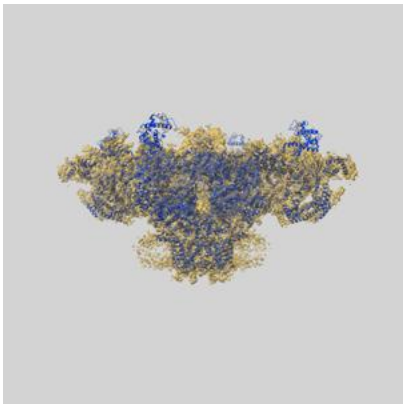
8 Fourier-Shell correlation (i)

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

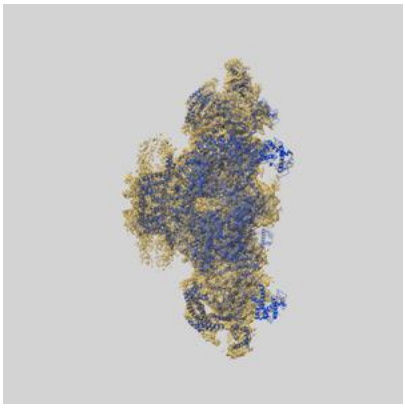
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-8073 and PDB model 5J8V. Per-residue inclusion information can be found in section 3 on page 4.

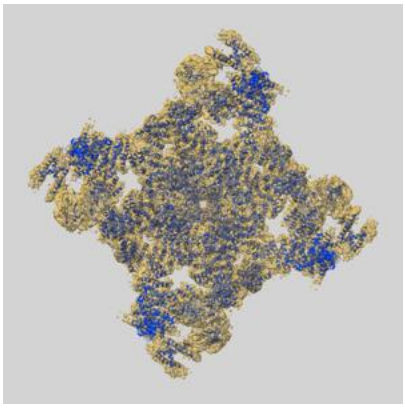
9.1 Map-model overlay



X



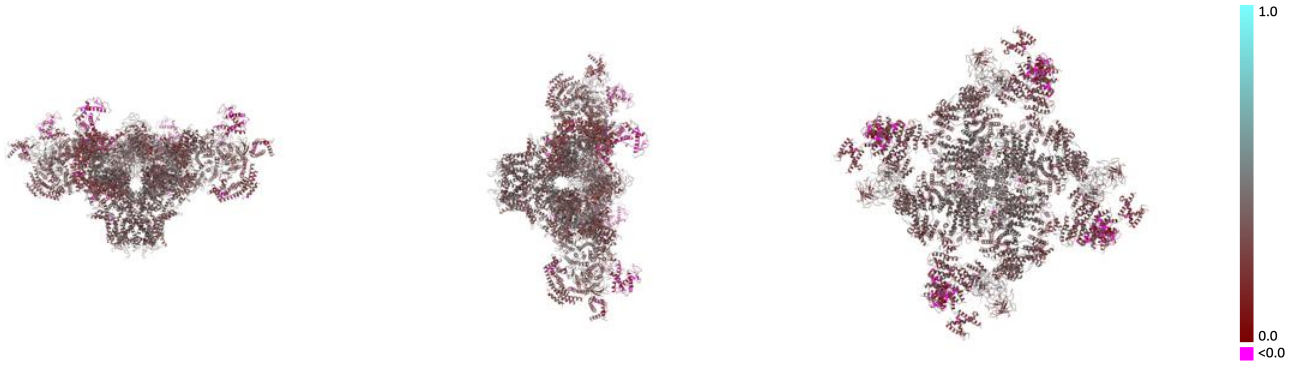
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.0967 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.

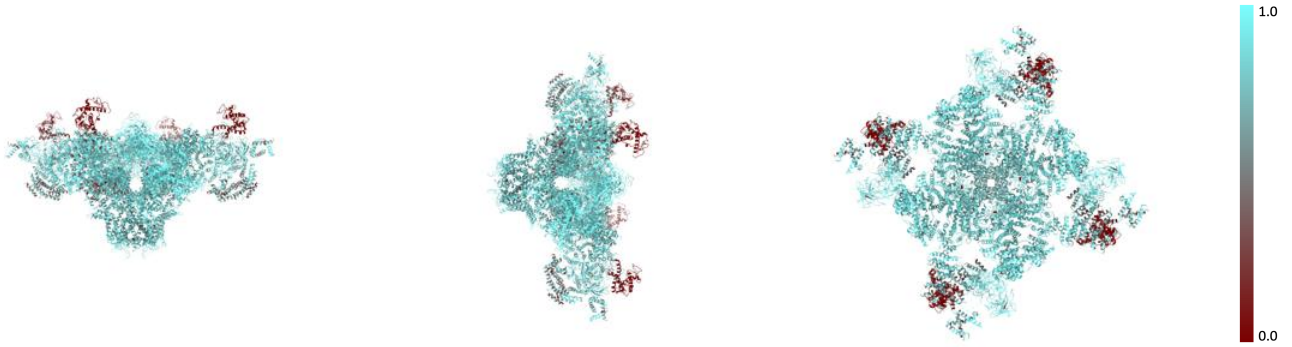
9.2 Q-score mapped to coordinate model



X Y Z

The images above show the model with each residue coloured according 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.

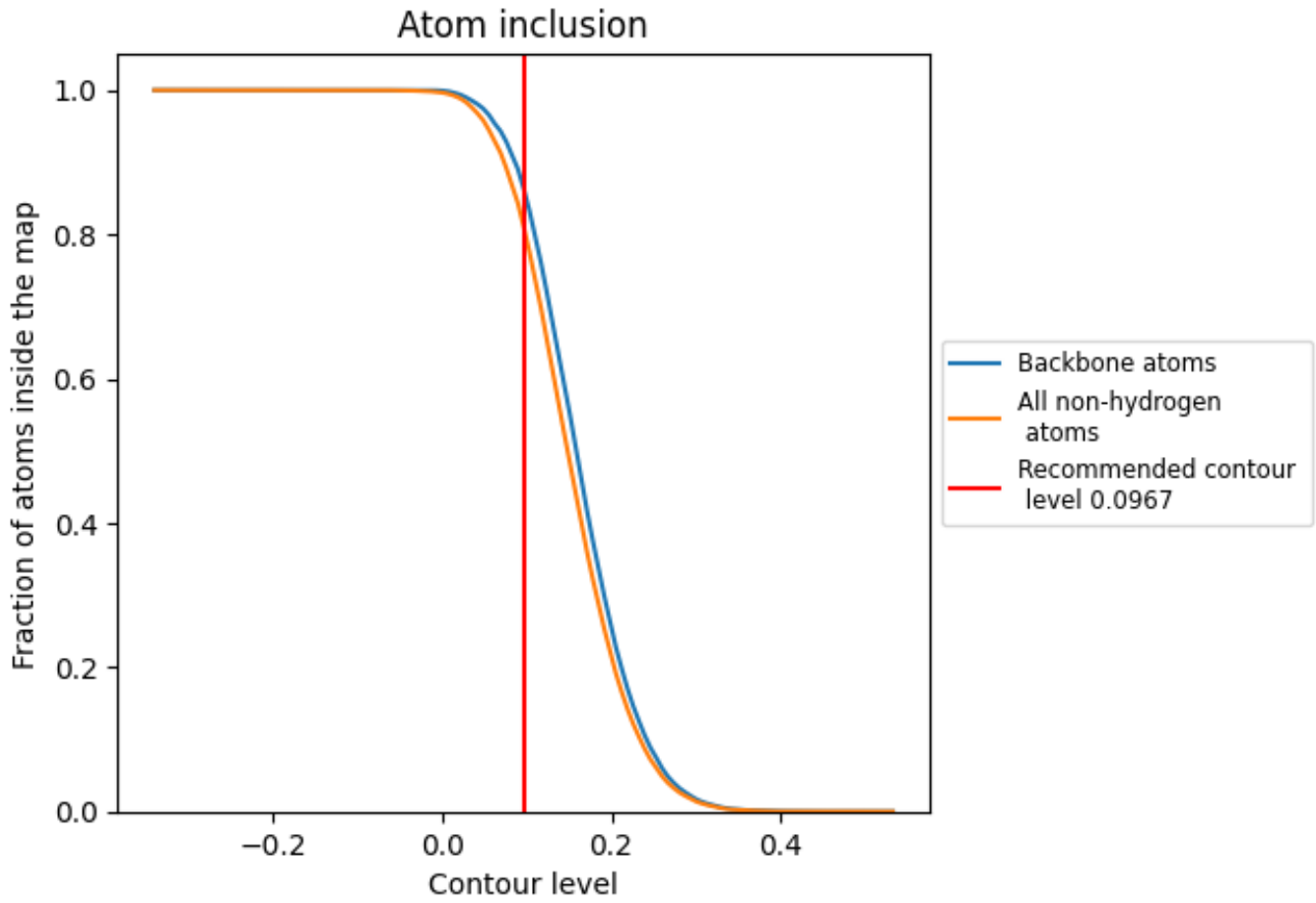
9.3 Atom inclusion mapped to coordinate model



X Y Z

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 (0.0967).

9.4 Atom inclusion (i)



At the recommended contour level, 86% of all backbone atoms, 81% 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 (0.0967) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.8096	0.3470
A	0.8093	0.3470
B	0.8098	0.3470
C	0.8099	0.3470
D	0.8093	0.3470