



## Full wwPDB EM Validation Report ⓘ

Oct 5, 2024 – 10:54 AM EDT

PDB ID : 5T9S  
EMDB ID : EMD-8375  
Title : Structure of rabbit RyR1 (Ca<sup>2+</sup>-only dataset, class 4)  
Authors : Clarke, O.B.; des Georges, A.; Zalk, R.; Marks, A.R.; Hendrickson, W.A.;  
Frank, J.  
Deposited on : 2016-09-09  
Resolution : 4.20 Å(reported)

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

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

A user guide is available at

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

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

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

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

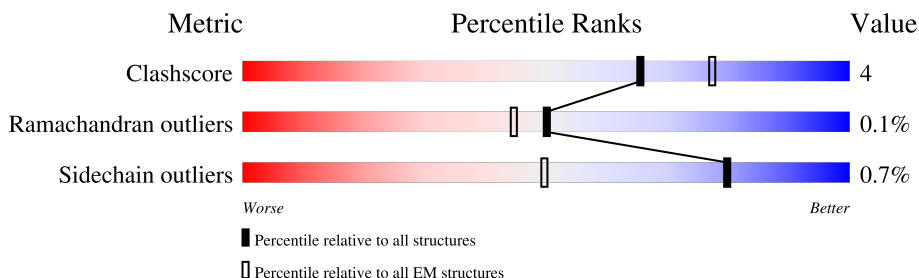
EMDB validation analysis : 0.0.1.dev113  
MolProbity : 4.02b-467  
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)  
MapQ : 1.9.13  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 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 4.20 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  $\geq 3$ , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions  $\leq 5\%$ . The upper red bar (where present) indicates the fraction of residues that have poor fit to the EM map (all-atom inclusion  $< 40\%$ ). The numeric value is given above the bar.

| Mol | Chain | Length | Quality of chain |
|-----|-------|--------|------------------|
| 1   | A     | 108    |                  |
| 1   | F     | 108    |                  |
| 1   | H     | 108    |                  |
| 1   | J     | 108    |                  |
| 2   | B     | 4676   |                  |
| 2   | E     | 4676   |                  |
| 2   | G     | 4676   |                  |
| 2   | I     | 4676   |                  |

## 2 Entry composition i

There are 4 unique types of molecules in this entry. The entry contains 120756 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, the AltConf column contains the number of residues with at least one atom in alternate conformation and the Trace column contains the number of residues modelled with at most 2 atoms.

- Molecule 1 is a protein called Peptidyl-prolyl cis-trans isomerase FKBP1B.

| Mol | Chain | Residues | Atoms        |          |          |          |        | AltConf | Trace |
|-----|-------|----------|--------------|----------|----------|----------|--------|---------|-------|
|     |       |          | Total        | C        | N        | O        | S      |         |       |
| 1   | F     | 107      | Total<br>818 | C<br>516 | N<br>144 | O<br>154 | S<br>4 | 0       | 0     |
| 1   | A     | 107      | Total<br>818 | C<br>516 | N<br>144 | O<br>154 | S<br>4 | 0       | 0     |
| 1   | H     | 107      | Total<br>818 | C<br>516 | N<br>144 | O<br>154 | S<br>4 | 0       | 0     |
| 1   | J     | 107      | Total<br>818 | C<br>516 | N<br>144 | O<br>154 | S<br>4 | 0       | 0     |

- Molecule 2 is a protein called Ryanodine receptor 1.

| Mol | Chain | Residues | Atoms          |            |           |           |          | AltConf | Trace |
|-----|-------|----------|----------------|------------|-----------|-----------|----------|---------|-------|
|     |       |          | Total          | C          | N         | O         | S        |         |       |
| 2   | B     | 4168     | Total<br>29369 | C<br>18608 | N<br>5202 | O<br>5402 | S<br>157 | 0       | 0     |
| 2   | E     | 4168     | Total<br>29369 | C<br>18608 | N<br>5202 | O<br>5402 | S<br>157 | 0       | 0     |
| 2   | I     | 4168     | Total<br>29369 | C<br>18608 | N<br>5202 | O<br>5402 | S<br>157 | 0       | 0     |
| 2   | G     | 4168     | Total<br>29369 | C<br>18608 | N<br>5202 | O<br>5402 | S<br>157 | 0       | 0     |

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

| Mol | Chain | Residues | Atoms      |         | AltConf |
|-----|-------|----------|------------|---------|---------|
| 3   | B     | 1        | Total<br>1 | Zn<br>1 | 0       |
| 3   | E     | 1        | Total<br>1 | Zn<br>1 | 0       |
| 3   | I     | 1        | Total<br>1 | Zn<br>1 | 0       |
| 3   | G     | 1        | Total<br>1 | Zn<br>1 | 0       |

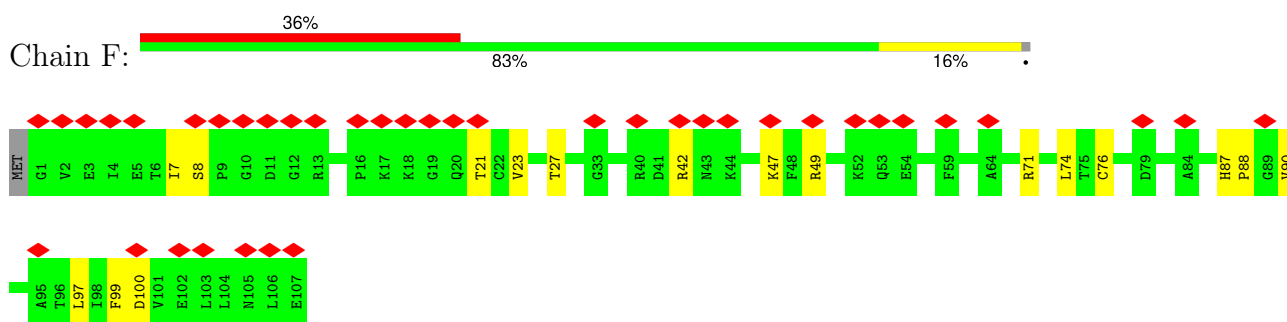
- Molecule 4 is CALCIUM ION (three-letter code: CA) (formula: Ca).

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

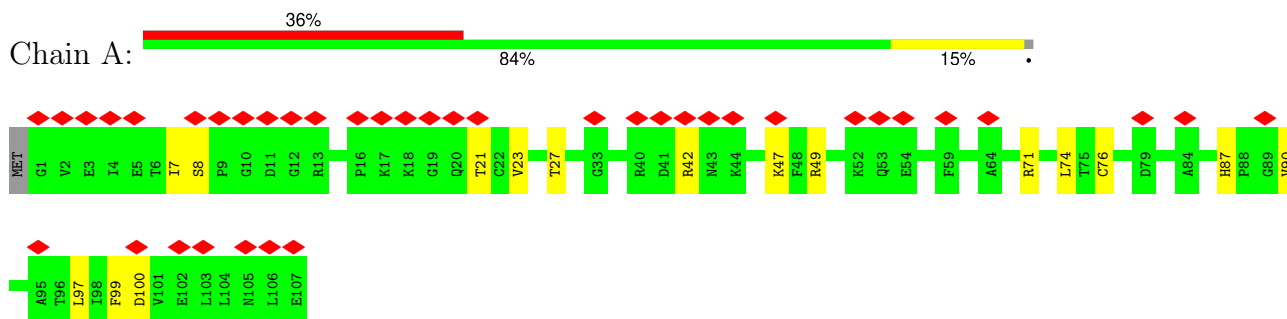
### 3 Residue-property plots [i](#)

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.

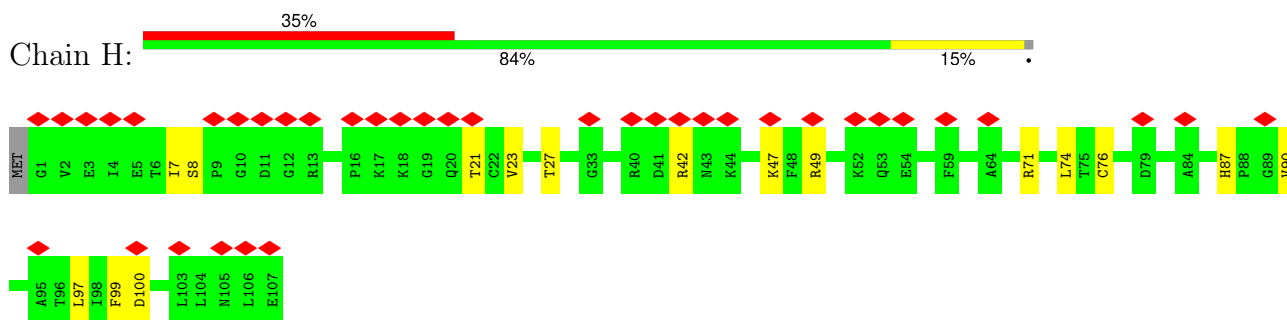
- Molecule 1: Peptidyl-prolyl cis-trans isomerase FKBP1B



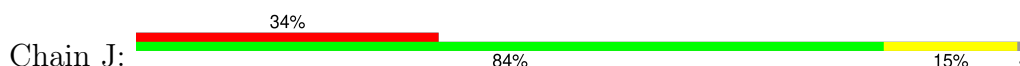
- Molecule 1: Peptidyl-prolyl cis-trans isomerase FKBP1B

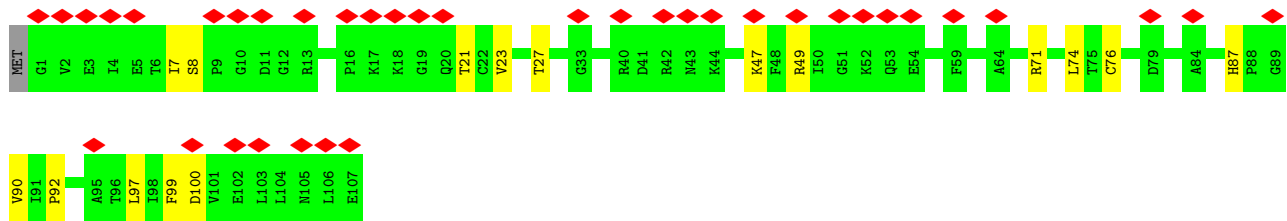


- Molecule 1: Peptidyl-prolyl cis-trans isomerase FKBP1B

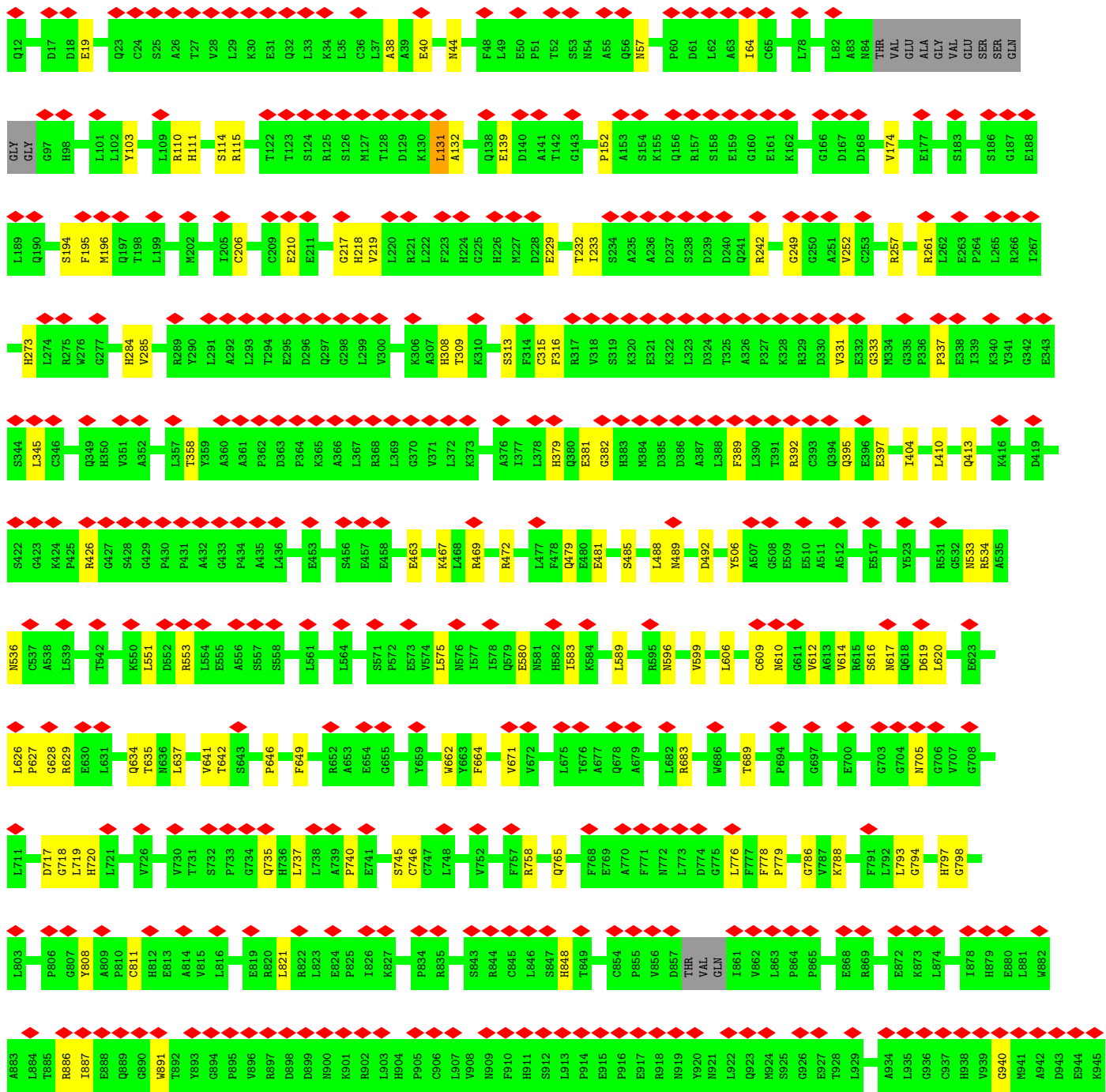
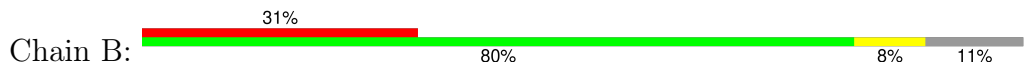


- Molecule 1: Peptidyl-prolyl cis-trans isomerase FKBP1B





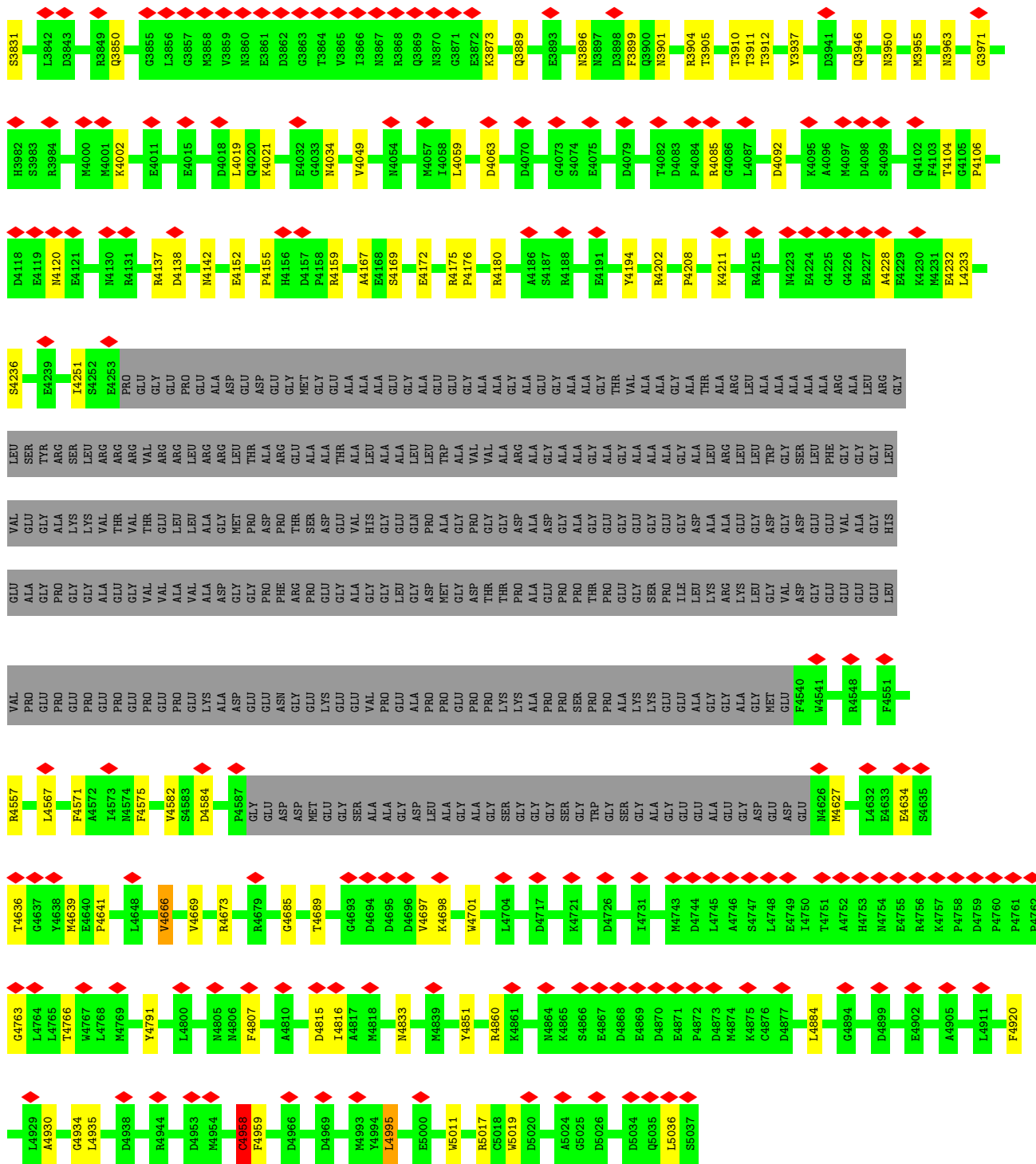
• Molecule 2: Ryanodine receptor 1



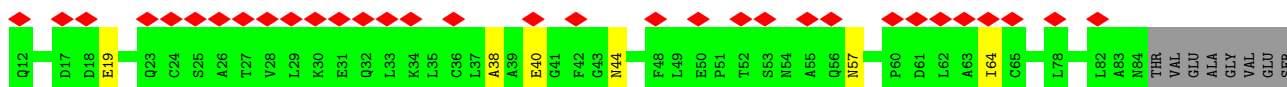
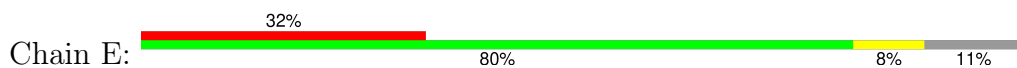


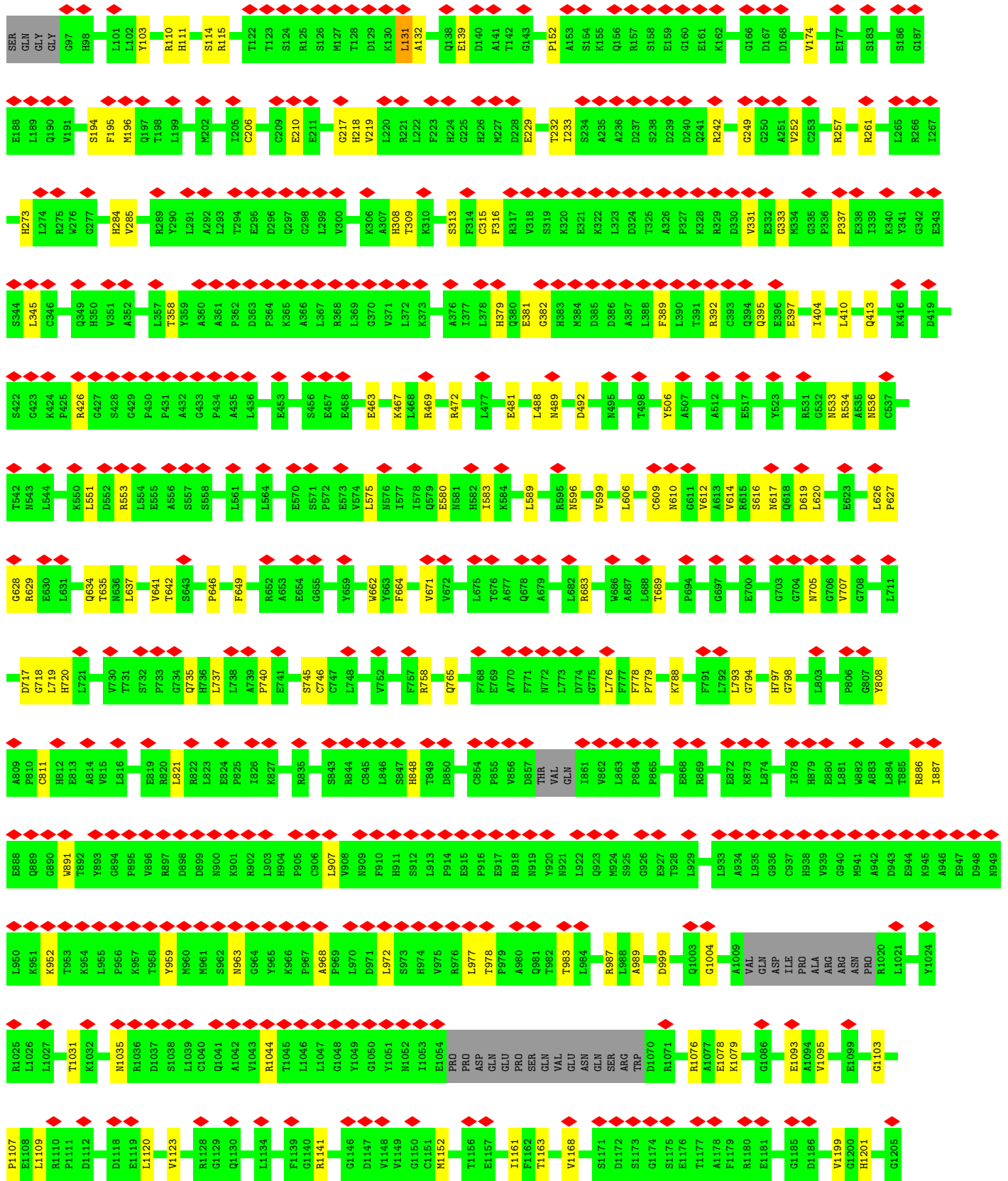
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----|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----|
| E3691 | E3692 | E3693 | F3711 | E3712 | K3713 | S3714 | K3715 | L3716 | D3717 | E3718 | D3719 | K3720 | E3737 | G3738 | G3739 | E3740 | K3741 | GLU | ALA | GLU | E3747 | E3748 | V3749 | E3750 | V3751 | S3752 | F3753 | E3754 | R3773 | H3778 | V3779 | D3780 | S3784 | E3787 | L3805 | N3806 | G3807 | K3816 | L3817 | D3822 | E3825 | V3826 | G3827 | K3559 | K3560 | K3561 | K3562 | K3563 | K3564 | K3565 | K3566 | K3567 | K3568 | K3577 | K3580 | K3581 | K3582 | K3583 | K3584 | K3585 | K3586 | K3587 | K3591 | K3592 | K3609 | K3610 | K3611 | K3612 | K3613 | T3639 | N3643 | L3644 | P3645 | F3653 | I3662 | E3665 | D3666 | H3667 | S3668 | F3669 | D3676 | K3679 | A3680 | G3681 | E3682 | K3683 | E3684 | E3685 | E3686 | E3687 | E3688 | E3689 | F2395 | GLY | VAL | ARG | ARG | ASP | ARG | ARG | ARG | ARG | GLU | HIS | PHE | GLY | GLU | PRO | PRO | GLU | N2414 | N2415 | G2434 | R2435 | P2438 | E2439 | H2440 | H2441 | K2447 | G2448 | E2449 | R2452 | I2453 | L2457 | R2458 | S2459 | L2460 | L2463 | D2464 | D2465 | L2466 | I2469 | L2472 | P2473 | L2474 | Q2475 | T2478 | L2479 | X2487 | X2488 | X2493 | X2499 | X2513 | X2514 | X2517 | X2521 | X2531 | X2532 | X2533 | X2534 | X2535 | X2536 | X2537 | X2538 | X2562 | X2563 | X2564 | X2565 | X2580 | X2581 | X2582 | X2583 | X2584 | X2585 | X2586 | X2596 | X2602 | X2613 | X2614 | X2618 | X2619 | X2620 | X2623 | X2624 | X2625 | X2626 | X2627 | X2628 | X2629 | X2650 | X2651 | X2654 | X2671 | X2672 | X2673 | X2674 | X2675 | X2676 | D2769 | K2770 | X2675 | X2676 | X2677 | X2680 | X2686 | X2687 | X2688 | X2689 | X2690 | X2691 | X2692 | X2693 | X2696 | X2697 | X2698 | X2699 | X2700 | X2701 | X2702 | X2703 | N2734 | F2735 | D2736 | P2737 | R2738 | P2739 | V2740 | E2741 | T2742 | L2743 | N2744 | V2745 | L2746 | L2747 | P2748 | E2749 | K2750 | L2751 | D2752 | S2753 | F2754 | L2755 | N2756 | K2757 | F2758 | A2759 | E2760 | X2761 | T2762 | H2763 | E2764 | N2765 | N2766 | A2767 | F2768 | D2769 | K2770 | L2771 | Q2772 | N2773 | N2774 | S2775 | W2776 | Y2777 | G2778 | E2779 | N2780 | V2781 | D2782 | E2783 | E2784 | L2785 | K2786 | T2787 | H2788 | P2789 | N2790 | L2791 | R2792 | P2793 | Y2794 | K2795 | D2796 | F2797 | S2798 | E2799 | K2800 | K2802 | E2803 | L2804 | Y2805 | R2806 | W2807 | P2808 | L2809 | K2810 | E2811 | S2812 | L2813 | K2814 | A2815 | N2816 | L2817 | A2818 | W2819 | E2820 | W2821 | T2822 | I2823 | E2824 | K2825 | A2826 | R2827 | E2828 | G2829 | E2830 | Y2855 | N2856 | P2857 | Q2858 | P2859 | P2860 | D2861 | L2862 | S2863 | G2864 | V2865 | L2866 | L2867 | S2868 | R2869 | E2870 | L2871 | Q2872 | A2873 | M2874 | A2875 | E2876 | Q2877 | L2878 | A2879 | E2880 | N2881 | Y2882 | H2883 | N2884 | T2885 | W2886 | G2887 | R2888 | K2889 | K2890 | K2891 | Q2892 | L2894 | E2895 | E2896 | E2897 | E2898 | E2899 | E2900 | T2901 | H2902 | P2903 | E2904 | L2905 | V2906 | Y2907 | D2909 | T2910 | L2911 | T2912 | A2913 | K2914 | E2915 | X3026 | A2917 | R2918 | D2919 | E2921 | K2922 | A2923 | Q2924 | E2925 | L2926 | L2927 | K2928 | F2929 | L2930 | Q2931 | M2932 | N2933 | G2934 | Y2935 | A2936 | W2937 | T2938 | R2939 | X3061 | X3062 | X3063 | X3134 | X3135 | X3136 | X3137 | X3138 | X3139 | X3142 | X3143 | X3144 | X3148 | X3149 | X3153 | X3158 | X3159 | X3160 | X3161 | X3162 | X3163 | X3170 | X3171 | X3172 | X3173 | X3174 | X3175 | X3176 | X3177 | X3178 | X3179 | X3190 | X3191 | X3192 | X3193 | X3194 | X3195 | X3196 | X3205 | X3213 | X3214 | X3215 | X3216 | X3217 | X3218 | X3219 | X3220 | X3221 | X3222 | X3223 | X3224 | X3229 | X3230 | X3233 | X3234 | X3235 | X3236 | X3241 | X3242 | X3245 | X3246 | X3247 | X3250 | X3251 | X3252 | X3253 | X3254 | X3261 | X3262 | X3263 | X3264 | X3265 | X3266 | X3267 | X3268 | X3269 | X3270 | X3271 | X3272 | X3275 | X3276 | X3277 | X3278 | X3281 | X3282 | X3283 | X3284 | X3285 | X3286 | X3287 | X3290 | X3291 | X3292 | X3293 | X3294 | X3295 | X3296 | X3297 | X3298 | X3299 | X3300 | X3301 | X3309 | X3313 | X3314 | X3315 | X3320 | X3323 | X3331 | X3332 | X3333 | X3334 | X3335 | X3336 | X3337 | X3338 | X3339 | X3340 | X3341 | X3342 | X3346 | X3347 | X3348 | X3349 | X3352 | X3353 | X3354 | X3355 | X3356 | X3357 | X3358 | X3359 | X3360 | X3361 | X3362 | X3363 | X3364 | X3365 | X3366 | X3369 | X3379 | X3380 | X3381 | X3382 | X3383 | X3384 | X3385 | X3386 | X3387 | X3388 | X3389 | X3390 | X3391 | X3392 | X3393 | X3394 | X3395 | X3396 | X3397 | X3398 | X3399 | X3400 | X3403 | X3404 | X3409 | X3412 | X3413 | X3417 | X3425 | X3426 | X3427 | X3432 | X3433 | X3434 | X3435 | X3436 | X3452 | X3453 | X3454 | X3455 | X3456 | X3457 | X3464 | X3465 | X3466 | X3467 | X3468 | X3511 | X3512 | X3513 | X3514 | X3515 | X3516 | X3522 | X3529 | X3530 | X3531 | X3532 | X3533 | X3534 | X3539 | X3540 | X3541 | X3542 | X3543 | X3547 | X3548 | X3549 | X3550 | X3556 | X3557 | X3558 | K3559 | K3560 | K3561 | K3562 | K3563 | K3564 | K3565 | K3566 | K3567 | K3568 | K3577 | K3580 | K3581 | K3582 | K3583 | K3584 | K3585 | K3586 | K3587 | K3591 | K3592 | K3609 | K3610 | K3611 | K3612 | K3613 | T3639 | N3643 | L3644 | P3645 | F3653 | I3662 | E3665 | D3666 | H3667 | S3668 | F3669 | D3676 | K3679 | A3680 | G3681 | E3682 | K3683 | E3684 | E3685 | E3686 | E3687 | E3688 | E3689 | F2395 | GLY | VAL | ARG | ARG | ASP | ARG | ARG | ARG | ARG | GLU | HIS | PHE | GLY | GLU | PRO | PRO | GLU | N2414 | N2415 | G2434 | R2435 | P2438 | E2439 | H2440 | H2441 | K2447 | G2448 | E2449 | R2452 | I2453 | L2457 | R2458 | S2459 | L2460 | L2463 | D2464 | D2465 | L2466 | I2469 | L2472 | P2473 | L2474 | Q2475 | T2478 | L2479 | X2487 | X2488 | X2493 | X2499 | X2513 | X2514 | X2517 | X2521 | X2531 | X2532 | X2533 | X2534 | X2535 | X2536 | X2537 | X2538 | X2562 | X2563 | X2564 | X2565 | X2580 | X2581 | X2582 | X2583 | X2584 | X2585 | X2586 | X2596 | X2602 | X2613 | X2614 | X2618 | X2619 | X2620 | X2623 | X2624 | X2625 | X2626 | X2627 | X2628 | X2629 | X2650 | X2651 | X2654 | X2671 | X2672 | X2673 | E2764 | N2765 | N2766 | A2767 | F2768 | D2769 | K2770 | L2771 | Q2772 | N2773 | N2774 | S2775 | W2776 | Y2777 | G2778 | E2779 | 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X3341 | X3342 | X3346 | X3347 | X3348 | X3349 | X3352 | X3353 | X3354 | X3355 | X3356 | X3357 | X3358 | X3359 | X3360 | X3361 | X3362 | X3363 | X3364 | X3365 | X3366 | X3369 | X3379 | X3380 | X3381 | X3382 | X3383 | X3384 | X3385 | X3386 | X3387 | X3388 | X3389 | X3390 | X3391 | X3392 | X3393 | X3394 | X3395 | X3396 | X3397 | X3398 | X3399 | X3400 | X3403 | X3404 | X3409 | X3412 | X3413 | X3417 | X3425 | X3426 | X3427 | X3432 | X3433 | X3434 | X3435 | X3436 | X3452 | X3453 | X3454 | X3455 | X3456 | X3457 | X3464 | X3465 | X3466 | X3467 | X3468 | X3511 | X3512 | X3513 | X3514 | X3515 | X3516 | X3522 | X3529 | X3530 | X3531 | X3532 | X3533 | X3534 | X3539 | X3540 | X3541 | X3542 | X3543 | X3547 | X3548 | X3549 | X3550 | X3556 | X3557 | X3558 | K3559 | K3560 | K3561 | K3562 | K3563 | K3564 | K3565 | K3566 | K3567 | K3568 | K3577 | K3580 | K3581 | K3582 | K3583 | K3584 | K3585 | K3586 | K3587 | K3591 | K3592 | K3609 | K3610 | K3611 | K3612 | K3613 | T3639 | N3643 | L3644 | P3645 | F3653 | 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D2782 | E2783 | E2784 | L2785 | K2786 | T2787 | H2788 | P2789 | N2790 | L2791 | R2792 | P2793 | Y2794 | K2795 | D2796 | F2797 | S2798 | E2799 | K2800 | K2802 | E2803 | L2804 | Y2805 | R2806 | W2807 | P2808 | L2809 | K2810 | E2811 | S2812 | L2813 | K2814 | A2815 | N2816 | L2817 | A2818 | W2819 | E2820 | W2821 | T2822 | I2823 | E2824 | K2825 | A2826 | R2827 | E2828 | G2829 | E2830 | Y2855 | N2856 | P2857 | Q2858 | P2859 | P2860 | D2861 | L2862 | S2863 | G2864 | V2865 | L2866 | L2867 | S2868 | R2869 | E2870 | L2871 | Q2872 | A2873 | M2874 | A2875 | E2876 | Q2877 | L2878 | A2879 | E2880 | N2881 | Y2882 | H2883 | N2884 | T2885 | W2886 | G2887 | R2888 | K2889 | K2890 | K2891 | Q2892 | L2894 | E2895 | E2896 | E2897 | E2898 | E2899 | E2900 | T2901 | H2902 | P2903 | E2904 | L2905 | V2906 | Y2907 | D2909 | T2910 | L2911 | T2912 | A2 |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-----|-----|-----|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------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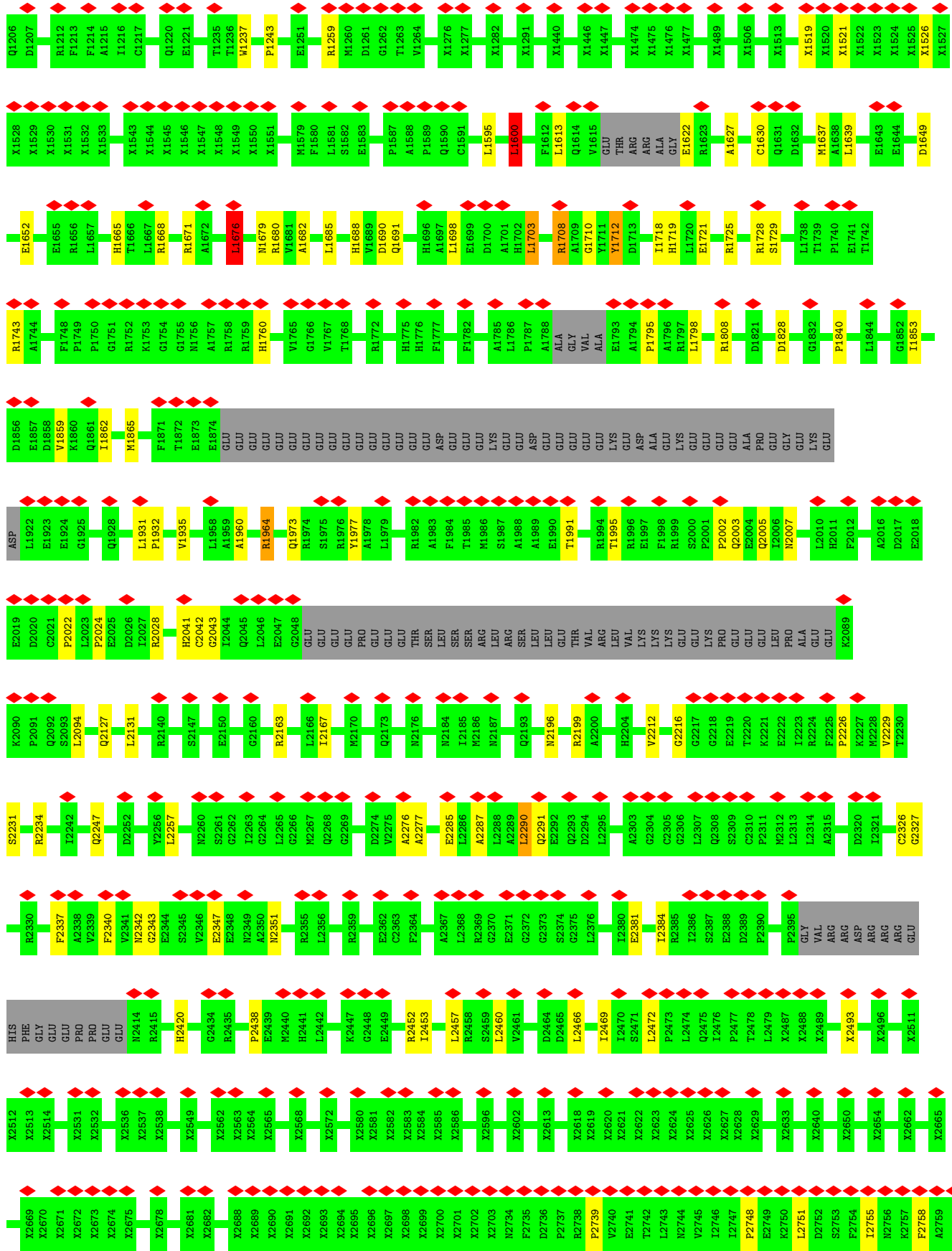




• Molecule 2: Ryanodine receptor 1

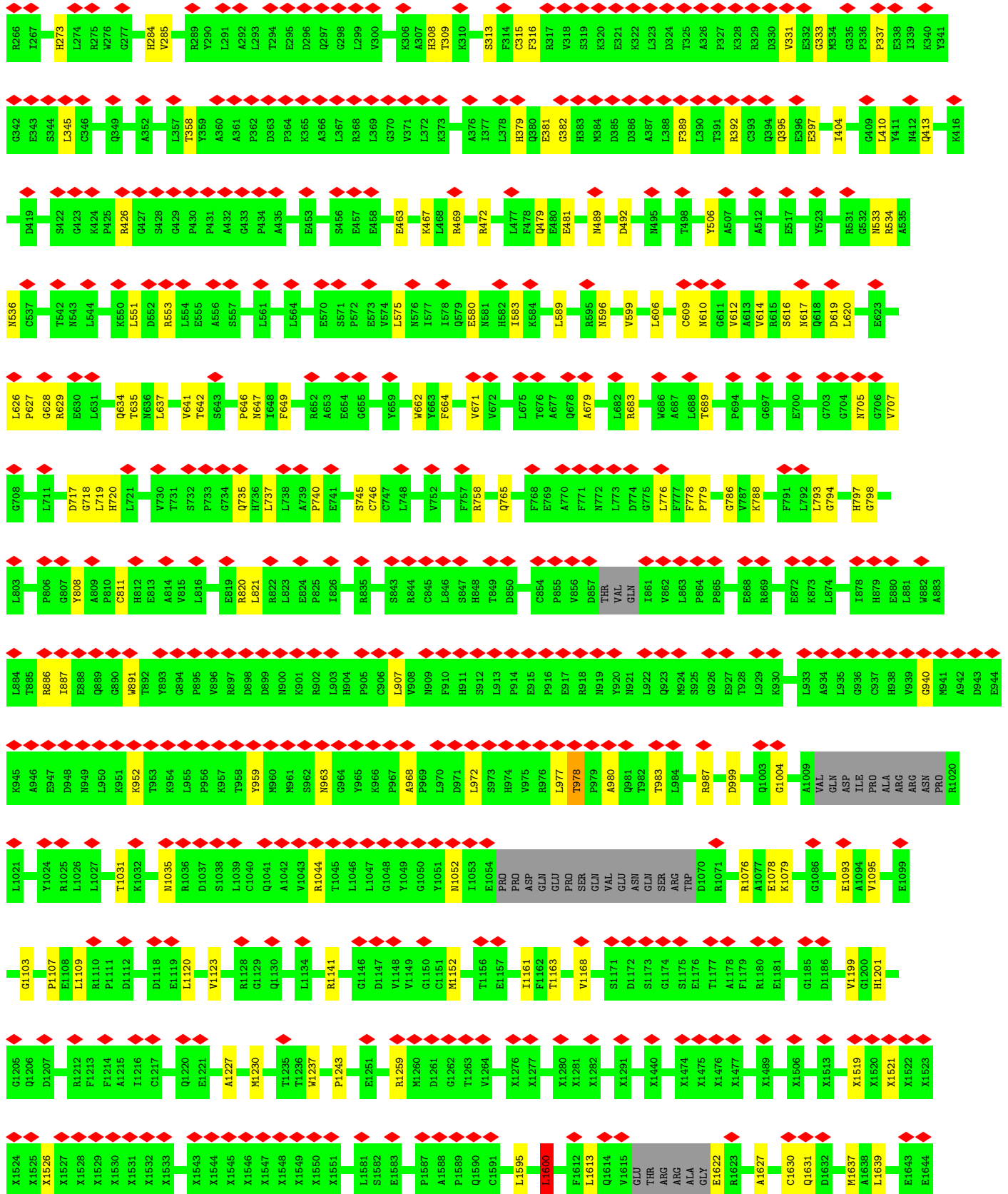


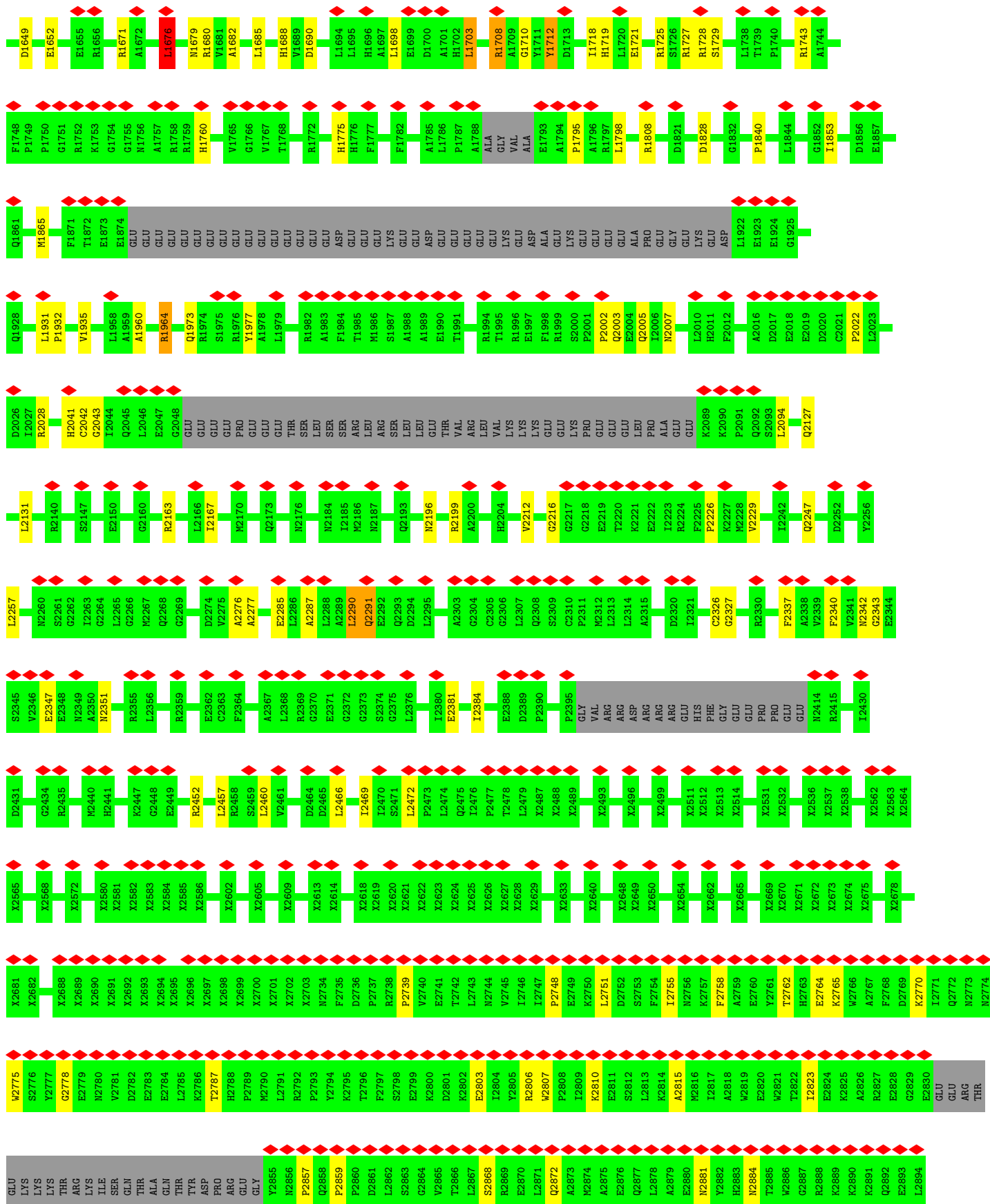




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   |       |       |       |       |     |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       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| E2764 | E2824 | N2884 | X2946 | X3047 | X3207 | X3280 | X3359 | X3436 | X3561 | X3679 | N3806 | N3950 | E2765 | K2924 | T2885 | X3048 | X3208 | X3281 | X3360 | X3437 | X3562 | A3680 | G3807 | E2766 | A2826 | W2886 | X3049 | X3209 | X3282 | X3361 | X3438 | X3563 | G3681 | G3681 | M3816 | M3955 | A2767 | X2948 | G2887 | X3050 | X3210 | X3283 | X3362 | X3439 | X3564 | E3682 | E3682 | L3817 | G3971 | D2768 | X2949 | R2888 | X3051 | X3211 | X3284 | X3363 | X3440 | X3565 | Q3683 | Q3683 | D3822 | G3971 | D2769 | X2950 | K2889 | X3052 | X3212 | X3285 | X3364 | X3441 | X3566 | E3684 | E3684 | E3825 | R3984 | K2770 | X2951 | K2890 | X3053 | X3213 | X3286 | X3365 | X3442 | X3567 | E3685 | E3685 | E3826 | R3984 | I2771 | X2952 | E2890 | X3054 | X3214 | X3287 | X3366 | X3443 | X3568 | E3686 | E3686 | V3826 | M4000 | Q2772 | X2957 | GLU | X3055 | X3215 | X3288 | X3367 | X3444 | X3569 | E3687 | E3687 | M4001 | M4001 | W2773 | X2961 | ARG | X3056 | X3216 | X3289 | X3368 | X3445 | X3570 | E3688 | 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|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-----|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-----|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-----|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-----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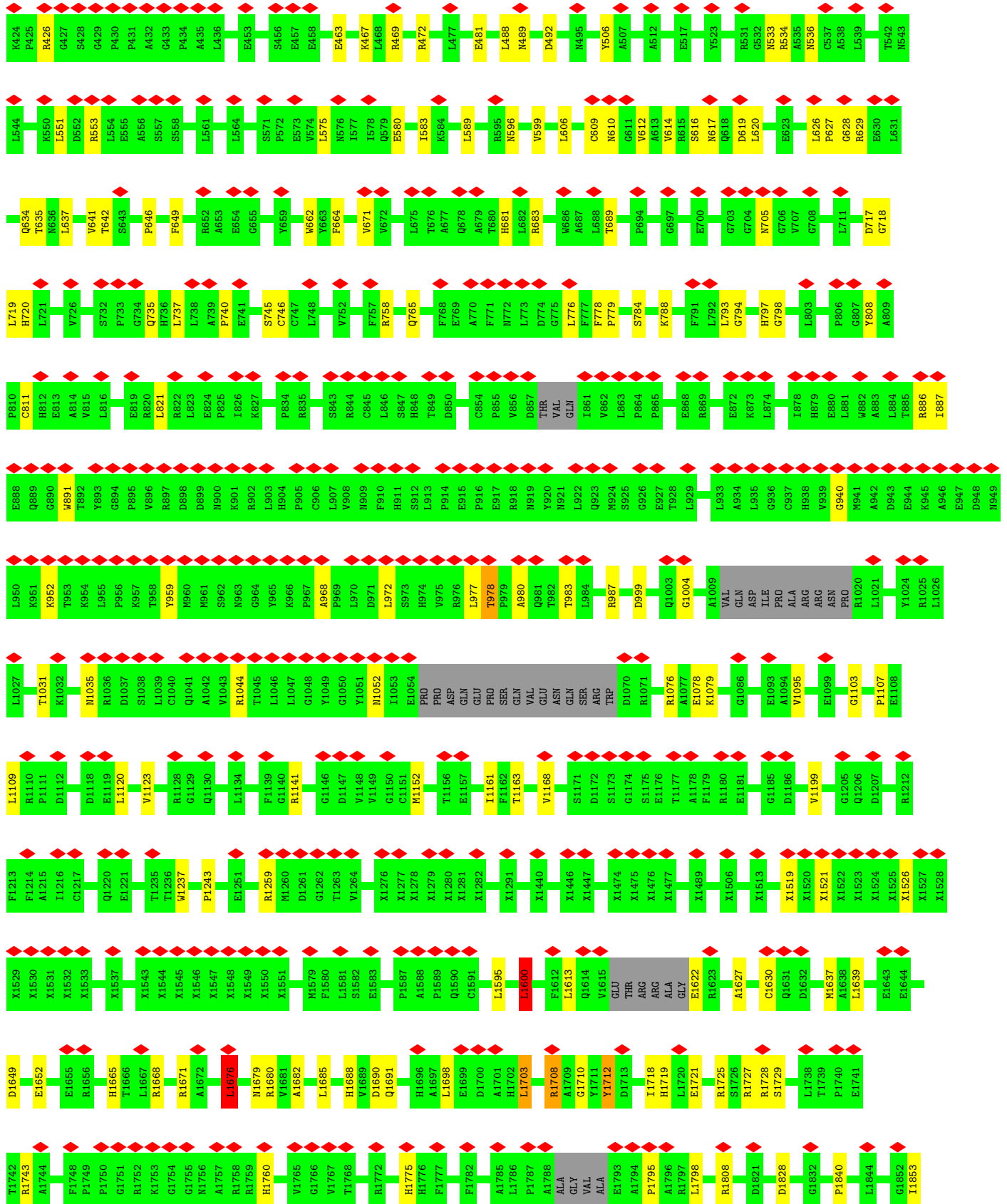




|       |       |       |       |       |       |       |       |       |       |       |       |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| I4251 | E2895 | X3220 | X3294 | X3372 | X3453 | X3574 | E3689 | E3825 | D3987 | M4130 | T4251 |
| S4252 | A2896 | X3221 | X3295 | X3373 | X3454 | X3577 | V3690 | V3926 | M4000 | R4131 | S4252 |
| E4253 | R2897 | X3222 | X3296 | X3374 | X3457 | X3578 | E3691 | E3692 | K4002 | M4001 | PRO   |
| PRO   | G2898 | X3223 | X3301 | X3378 | X3463 | X3580 | E3692 | E3693 | E4011 | M4002 | GLY   |
| GLY   | G2899 | X3224 | X3306 | X3381 | X3464 | X3581 | E3693 | E3694 | E4015 | D4138 | GLU   |
| GLY   | G2900 | X3225 | X3307 | X3382 | X3467 | X3582 | T3711 | E3712 | L3842 | M4142 | ALA   |
| PRO   | G2901 | X3229 | X3308 | X3383 | X3468 | X3583 | E3711 | E3713 | D3843 | E4152 | ALA   |
| ALA   | T2901 | X3230 | X3309 | X3384 | X3468 | X3584 | E3712 | E3714 | Q3850 | E4155 | GLU   |
| ALA   | H2902 | X3231 | X3310 | X3385 | X3468 | X3585 | S3714 | S3714 | G3855 | P4155 | GLU   |
| ASP   | H2903 | X3232 | X3311 | X3386 | X3468 | X3585 | K3714 | K3714 | L3856 | L4018 | ASP   |
| GLU   | L2904 | X3233 | X3312 | X3387 | X3468 | X3586 | L3715 | L3715 | L3856 | L4019 | GLU   |
| GLU   | L2905 | X3234 | X3313 | X3388 | X3468 | X3586 | D3716 | D3716 | Q4020 | L4157 | GLY   |
| GLU   | L2906 | X3235 | X3314 | X3389 | X3468 | X3587 | L3717 | L3717 | K4021 | Q4020 | GLY   |
| GLU   | V2907 | X3236 | X3315 | X3390 | X3468 | X3588 | E3718 | E3718 | E4021 | K4021 | GLY   |
| GLU   | Y2908 | X3237 | X3318 | X3391 | X3468 | X3589 | E3719 | E3719 | E4032 | E4022 | GLY   |
| ALA   | D2909 | X3238 | X3321 | X3392 | X3468 | X3592 | D3719 | D3719 | G4033 | E4032 | ALA   |
| ALA   | T2910 | X3239 | X3322 | X3393 | X3468 | X3593 | E3720 | E3720 | E4168 | G4033 | ALA   |
| ALA   | L2911 | X3241 | X3325 | X3394 | X3468 | X3593 | E3737 | E3737 | M4034 | E4168 | ALA   |
| ALA   | L2912 | X3242 | X3326 | X3395 | X3468 | X3594 | G3738 | G3738 | Y4049 | S4169 | ALA   |
| ALA   | T2911 | X3243 | X3327 | X3396 | X3468 | X3594 | G3739 | G3739 | E4172 | E4172 | GLY   |
| ALA   | L2912 | X3244 | X3328 | X3397 | X3468 | X3597 | E3740 | E3740 | M4054 | E4172 | ALA   |
| ALA   | A2913 | X3245 | X3329 | X3398 | X3468 | X3597 | G3739 | G3739 | P4176 | R4175 | ALA   |
| ALA   | R2914 | X3246 | X3330 | X3399 | X3468 | X3597 | E3740 | E3740 | M4057 | P4176 | GLU   |
| ALA   | R2915 | X3247 | X3331 | X3400 | X3468 | X3597 | N3741 | N3741 | L4058 | M4057 | GLY   |
| ALA   | E2916 | X3248 | X3332 | X3401 | X3468 | X3597 | GLY   | GLY   | L4059 | L4058 | GLY   |
| ALA   | A2917 | X3249 | X3333 | X3402 | X3468 | X3597 | ALA   | ALA   | L4059 | L4058 | GLY   |
| ALA   | R2918 | X3250 | X3334 | X3403 | X3468 | X3597 | GLU   | GLU   | L4059 | L4058 | GLY   |
| ALA   | R2919 | X3251 | X3335 | X3404 | X3468 | X3597 | GLU   | GLU   | L4059 | L4058 | GLY   |
| ALA   | D2920 | X3252 | X3336 | X3405 | X3468 | X3597 | GLU   | GLU   | L4059 | L4058 | GLY   |
| ALA   | E2921 | X3253 | X3337 | X3406 | X3468 | X3597 | GLU   | GLU   | L4059 | L4058 | GLY   |
| ALA   | R2922 | X3254 | X3338 | X3407 | X3468 | X3597 | GLU   | GLU   | L4059 | L4058 | GLY   |
| ALA   | A2923 | X3255 | X3339 | X3408 | X3468 | X3597 | GLU   | GLU   | L4059 | L4058 | GLY   |
| ALA   | Q2924 | X3256 | X3340 | X3409 | X3468 | X3597 | GLU   | GLU   | L4059 | L4058 | GLY   |
| ALA   | E2925 | X3257 | X3341 | X3410 | X3468 | X3597 | GLU   | GLU   | L4059 | L4058 | GLY   |
| ALA   | L2926 | X3258 | X3342 | X3411 | X3468 | X3597 | GLU   | GLU   | L4059 | L4058 | GLY   |
| ALA   | L2927 | X3259 | X3343 | X3412 | X3468 | X3597 | GLU   | GLU   | L4059 | L4058 | GLY   |
| ALA   | R2928 | X3260 | X3344 | X3413 | X3468 | X3597 | GLU   | GLU   | L4059 | L4058 | GLY   |
| ALA   | F2929 | X3261 | X3345 | X3414 | X3468 | X3597 | GLU   | GLU   | L4059 | L4058 | GLY   |
| ALA   | L2930 | X3262 | X3346 | X3415 | X3468 | X3597 | GLU   | GLU   | L4059 | L4058 | GLY   |
| ALA   | Q2931 | X3263 | X3347 | X3416 | X3468 | X3597 | GLU   | GLU   | L4059 | L4058 | GLY   |
| ALA   | H2932 | X3264 | X3348 | X3417 | X3468 | X3597 | GLU   | GLU   | L4059 | L4058 | GLY   |
| ALA   | H2933 | X3265 | X3349 | X3418 | X3468 | X3597 | GLU   | GLU   | L4059 | L4058 | GLY   |
| ALA   | G2934 | X3266 | X3350 | X3419 | X3468 | X3597 | GLU   | GLU   | L4059 | L4058 | GLY   |
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| ALA   | T2938 | X3270 | X3354 | X3423 | X3468 | X3597 | GLU   | GLU   | L4059 | L4058 | GLY   |
| ALA   | R2939 | X3271 | X3355 | X3424 | X3468 | X3597 | GLU   | GLU   | L4059 | L4058 | GLY   |
| ALA   | H2940 | X3272 | X3356 | X3425 | X3468 | X3597 | GLU   | GLU   | L4059 | L4058 | GLY   |
| ALA   | H2941 | X3273 | X3357 | X3426 | X3468 | X3597 | GLU   | GLU   | L4059 | L4058 | GLY   |
| ALA   | X2942 | X3274 | X3358 | X3427 | X3468 | X3597 | GLU   | GLU   | L4059 | L4058 | GLY   |
| ALA   | X2943 | X3275 | X3359 | X3428 | X3468 | X3597 | GLU   | GLU   | L4059 | L4058 | GLY   |
| ALA   | X2944 | X3276 | X3360 | X3429 | X3468 | X3597 | GLU   | GLU   | L4059 | L4058 | GLY   |
| ALA   | X2945 | X3277 | X3361 | X3430 | X3468 | X3597 | GLU   | GLU   | L4059 | L4058 | GLY   |
| ALA   | X2946 | X3278 | X3362 | X3431 | X3468 | X3597 | GLU   | GLU   | L4059 | L4058 | GLY   |
| ALA   | X2947 | X3279 | X3363 | X3432 | X3468 | X3597 | GLU   | GLU   | L4059 | L4058 | GLY   |
| ALA   | X2948 | X3280 | X3364 | X3433 | X3468 | X3597 | GLU   | GLU   | L4059 | L4058 | GLY   |
| ALA   | X2949 | X3281 | X3365 | X3434 | X3468 | X3597 | GLU   | GLU   | L4059 | L4058 | GLY   |
| ALA   | X2950 | X3282 | X3366 | X3435 | X3468 | X3597 | GLU   | GLU   | L4059 | L4058 | GLY   |
| ALA   | X2951 | X3283 | X3367 | X3436 | X3468 | X3597 | GLU   | GLU   | L4059 | L4058 | GLY   |
| ALA   | X2952 | X3284 | X3368 | X3437 | X3468 | X3597 | GLU   | GLU   | L4059 | L4058 | GLY   |
| ALA   | X2953 | X3285 | X3369 | X3438 | X3468 | X3597 | GLU   | GLU   | L4059 | L4058 | GLY   |
| ALA   | X2954 | X3286 | X3370 | X3439 | X3468 | X3597 | GLU   | GLU   | L4059 | L4058 | GLY   |
| ALA   | X2955 | X3287 | X3371 | X3440 | X3468 | X3597 | GLU   | GLU   | L4059 | L4058 | GLY   |
| ALA   | X2956 | X3288 | X3372 | X3441 | X3468 | X3597 | GLU   | GLU   | L4059 | L4058 | GLY   |
| ALA   | X2957 | X3289 | X3373 | X3442 | X3468 | X3597 | GLU   | GLU   | L4059 | L4058 | GLY   |
| ALA   | X2958 | X3290 | X3374 | X3443 | X3468 | X3597 | GLU   | GLU   | L4059 | L4058 | GLY   |
| ALA   | X2959 | X3291 | X3375 | X3444 | X3468 | X3597 | GLU   | GLU   | L4059 | L4058 | GLY   |
| ALA   | X2960 | X3292 | X3376 | X3445 | X3468 | X3597 | GLU   | GLU   | L4059 | L4058 | GLY   |
| ALA   | X2961 | X3293 | X3377 | X3446 | X3468 | X3597 | GLU   | GLU   | L4059 | L4058 | GLY   |
| ALA   | X2962 | X3294 | X3378 | X3447 | X3468 | X3597 | GLU   | GLU   | L4059 | L4058 | GLY   |
| ALA   | X2963 | X3295 | X3379 | X3448 | X3468 | X3597 | GLU   | GLU   | L4059 | L4058 | GLY   |
| ALA   | X2964 | X3296 | X3380 | X3449 | X3468 | X3597 | GLU   | GLU   | L4059 | L4058 | GLY   |
| ALA   | X2965 | X3297 | X3381 | X3450 | X3468 | X3597 | GLU   | GLU   | L4059 | L4058 | GLY   |
| ALA   | X2966 | X3298 | X3382 | X3451 | X3468 | X3597 | GLU   | GLU   | L4059 | L4058 | GLY   |
| ALA   | X2967 | X3299 | X3383 | X3452 | X3468 | X3597 | GLU   | GLU   | L4059 | L4058 | GLY   |
| ALA   | X2968 | X3300 | X3384 | X3453 | X3468 | X3597 | GLU   | GLU   | L4059 | L4058 | GLY   |
| ALA   | X3001 | X3001 | X3385 | X3454 | X3468 | X3597 | GLU   | GLU   | L4059 | L4058 | GLY   |
| ALA   | X3006 | X3006 | X3386 | X3455 | X3468 | X3597 | GLU   | GLU   | L4059 | L4058 | GLY   |
| ALA   | X3013 | X3013 | X3387 | X3456 | X3468 | X3597 | GLU   | GLU   | L4059 | L4058 | GLY   |
| ALA   | X3016 | X3016 | X3388 | X3457 | X3468 | X3597 | GLU   | GLU   | L4059 | L4058 | GLY   |
| ALA   | X3017 | X3017 | X3389 | X3458 | X3468 | X3597 | GLU   | GLU   | L4059 | L4058 | GLY   |
| ALA   | X3018 | X3018 | X3390 | X3459 | X3468 | X3597 | GLU   | GLU   | L4059 | L4058 | GLY   |
| ALA   | X3019 | X3019 | X3391 | X3460 | X3468 | X3597 | GLU   | GLU   | L4059 | L4058 | GLY   |
| ALA   | X3020 | X3020 | X3392 | X3461 | X3468 | X3597 | GLU   | GLU   | L4059 | L4058 | GLY   |
| ALA   | X3021 | X3021 | X3393 | X3462 | X3468 | X3597 | GLU   | GLU   | L4059 | L4058 | GLY   |
| ALA   | X3022 | X3022 | X3394 | X3463 | X3468 | X3597 | GLU   | GLU   | L4059 | L4058 | GLY   |
| ALA   | X3023 | X3023 | X3395 | X3464 | X3468 | X3597 | GLU   | GLU   | L4059 | L4058 | GLY   |
| ALA   | X3026 | X3026 | X3396 | X3465 | X3468 | X3597 | GLU   | GLU   | L4059 | L4058 | GLY   |
| ALA   | X3027 | X3027 | X3397 | X3466 | X3468 | X3597 | GLU   | GLU   | L4059 | L4058 | GLY   |
| ALA   | X3032 | X3032 | X3398 | X3467 | X3468 | X3597 | GLU   | GLU   | L4059 | L4058 | GLY   |
| ALA   | X3035 | X3035 | X3399 | X3468 | X3468 | X3597 | GLU   | GLU   | L4059 | L4058 | GLY   |
| ALA   | X3036 | X3036 | X3400 | X3469 | X3468 | X3597 | GLU   | GLU   | L4059 | L4058 | GLY   |
| ALA   | X3040 | X3040 | X3401 | X3470 | X3468 | X3597 | GLU   | GLU   | L4059 | L4058 | GLY   |
| ALA   | X3041 | X3041 | X3402 | X3471 | X3468 | X3597 | GLU   | GLU   | L4059 | L4058 | GLY   |
| ALA   | X3042 | X3042 | X3403 | X3472 | X3468 | X3597 | GLU   | GLU   | L4059 | L4058 | GLY   |
| ALA   | X3043 | X3043 | X3404 | X3473 | X3468 | X3597 | GLU   | GLU   | L4059 | L4058 | GLY   |
| ALA   | X3044 | X3044 | X3405 | X3474 | X3468 | X3597 | GLU   | GLU   | L4059 | L4058 | GLY   |
| ALA   | X3045 | X3045 | X3406 | X3475 | X3468 | X3597 | GLU   | GLU   | L4059 | L4058 | GLY   |
| ALA   | X3046 | X3046 | X3407 | X3476 | X3468 | X3597 | GLU   | GLU   | L4059 | L4058 | GLY   |
| ALA   | X3047 | X3047 | X3408 | X3477 | X3468 | X3597 | GLU   | GLU   | L4059 | L4058 | GLY   |
| ALA   | X3048 | X3048 | X3409 | X3478 | X3468 | X3597 | GLU   | GLU   | L4059 | L4058 | GLY   |
| ALA   | X3051 | X3051 | X3410 | X3479 | X3468 | X3597 | GLU   | GLU   | L4059 | L4058 | GLY   |
| ALA   | X3052 | X3052 | X3411 | X3480 | X3468 | X3597 | GLU   | GLU   | L4059 | L4058 | GLY   |
| ALA   | X3053 | X3053 | X3412 | X3481 | X3468 | X3597 | GLU   | GLU   | L4059 | L4058 | GLY   |
| ALA   | X3054 | X3054 | X3413 | X3482 | X3468 | X3597 | GLU   | GLU   | L4059 | L4058 | GLY   |
| ALA   | X3055 | X3055 | X3414 | X3483 | X3468 | X3597 | GLU   | GLU   | L4059 | L4058 | GLY   |
| ALA   | X3056 | X3056 | X3415 | X3484 | X3468 | X3597 | GLU   | GLU   | L4059 | L4058 | GLY   |
| ALA   | X3057 | X3057 | X3416 | X3485 | X3468 | X3597 | GLU   | GLU   | L4059 | L4058 | GLY   |
| ALA   | X3058 | X3058 | X3417 | X3486 | X3468 | X3597 | GLU   | GLU   | L4059 | L4058 | GLY   |
| ALA   | X3059 | X3059 | X3418 | X3487 | X3468 | X3597 | GLU   | GLU   | L4059 | L4058 | GLY   |
| ALA   | X3061 | X3061 | X3419 | X3488 | X3468 | X3597 | GLU   | GLU   | L4059 | L4058 | GLY   |
| ALA   | X3062 | X3062 | X3420 | X3489 | X3468 | X3597 | GLU   | GLU   | L4059 | L4058 | GLY   |
| ALA   | X3063 | X3063 | X3421 | X3490 | X3468 | X3597 | GLU   | GLU   | L4059 | L4058 | GLY   |
| ALA   | X3134 | X3134 | X3422 | X3491 | X3468 | X3597 | GLU   | GLU   | L4059 | L4058 | GLY   |
| ALA   | X3135 | X3135 | X3423 | X3492 | X3468 | X3597 | GLU   | GLU   | L4059 | L4058 | GLY   |
| ALA   | X3136 | X3136 | X3424 | X3493 |       |       |       |       |       |       |       |













## 4 Experimental information

| Property                             | Value                                   | Source    |
|--------------------------------------|---|-----------|
| EM reconstruction method             | SINGLE PARTICLE                         | Depositor |
| Imposed symmetry                     | POINT, Not provided                     |           |
| Number of particles used             | 55564                                   | Depositor |
| Resolution determination method      | FSC 0.143 CUT-OFF                       | Depositor |
| CTF correction method                | PHASE FLIPPING AND AMPLITUDE CORRECTION | Depositor |
| Microscope                           | FEI POLARA 300                          | Depositor |
| Voltage (kV)                         | 300                                     | Depositor |
| Electron dose ( $e^-/\text{\AA}^2$ ) | 50                                      | Depositor |
| Minimum defocus (nm)                 | Not provided                            |           |
| Maximum defocus (nm)                 | Not provided                            |           |
| Magnification                        | Not provided                            |           |
| Image detector                       | GATAN K2 SUMMIT (4k x 4k)               | Depositor |
| Maximum map value                    | 0.141                                   | Depositor |
| Minimum map value                    | -0.064                                  | Depositor |
| Average map value                    | 0.000                                   | Depositor |
| Map value standard deviation         | 0.007                                   | Depositor |
| Recommended contour level            | 0.04                                    | Depositor |
| Map size (Å)                         | 502.0, 502.0, 502.0                     | wwPDB     |
| Map dimensions                       | 400, 400, 400                           | wwPDB     |
| Map angles (°)                       | 90.0, 90.0, 90.0                        | wwPDB     |
| Pixel spacing (Å)                    | 1.255, 1.255, 1.255                     | 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

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     | 0.31         | 0/834       | 0.51        | 0/1123           |
| 1   | F     | 0.31         | 0/834       | 0.51        | 0/1123           |
| 1   | H     | 0.30         | 0/834       | 0.51        | 0/1123           |
| 1   | J     | 0.31         | 0/834       | 0.51        | 0/1123           |
| 2   | B     | 0.30         | 0/25428     | 0.54        | 6/34534 (0.0%)   |
| 2   | E     | 0.30         | 0/25428     | 0.54        | 6/34534 (0.0%)   |
| 2   | G     | 0.30         | 0/25428     | 0.54        | 6/34534 (0.0%)   |
| 2   | I     | 0.30         | 0/25428     | 0.54        | 6/34534 (0.0%)   |
| All | All   | 0.30         | 0/105048    | 0.54        | 24/142628 (0.0%) |

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

| Mol | Chain | #Chirality outliers | #Planarity outliers |
|-----|-------|---------------------|---------------------|
| 1   | A     | 0                   | 1                   |
| 1   | F     | 0                   | 1                   |
| 1   | H     | 0                   | 1                   |
| 1   | J     | 0                   | 1                   |
| 2   | B     | 0                   | 16                  |
| 2   | E     | 0                   | 16                  |
| 2   | G     | 0                   | 16                  |
| 2   | I     | 0                   | 16                  |
| All | All   | 0                   | 68                  |

There are no bond length outliers.

All (24) bond angle outliers are listed below:

| Mol | Chain | Res  | Type | Atoms    | Z    | Observed(°) | Ideal(°) |
|-----|-------|------|------|----------|------|-------------|----------|
| 2   | G     | 131  | LEU  | CA-CB-CG | 8.13 | 134.00      | 115.30   |
| 2   | E     | 131  | LEU  | CA-CB-CG | 8.11 | 133.96      | 115.30   |
| 2   | I     | 131  | LEU  | CA-CB-CG | 8.11 | 133.96      | 115.30   |
| 2   | B     | 131  | LEU  | CA-CB-CG | 8.10 | 133.94      | 115.30   |
| 2   | E     | 1600 | LEU  | CA-CB-CG | 7.05 | 131.51      | 115.30   |
| 2   | B     | 1600 | LEU  | CA-CB-CG | 7.03 | 131.48      | 115.30   |
| 2   | G     | 1600 | LEU  | CA-CB-CG | 7.03 | 131.47      | 115.30   |
| 2   | I     | 1600 | LEU  | CA-CB-CG | 7.01 | 131.43      | 115.30   |
| 2   | E     | 1676 | LEU  | CA-CB-CG | 6.33 | 129.86      | 115.30   |
| 2   | I     | 1676 | LEU  | CA-CB-CG | 6.33 | 129.85      | 115.30   |
| 2   | B     | 1676 | LEU  | CA-CB-CG | 6.32 | 129.84      | 115.30   |
| 2   | G     | 1676 | LEU  | CA-CB-CG | 6.32 | 129.84      | 115.30   |
| 2   | B     | 2290 | LEU  | CA-CB-CG | 6.11 | 129.35      | 115.30   |
| 2   | I     | 2290 | LEU  | CA-CB-CG | 6.10 | 129.34      | 115.30   |
| 2   | E     | 2290 | LEU  | CA-CB-CG | 6.10 | 129.33      | 115.30   |
| 2   | G     | 2290 | LEU  | CA-CB-CG | 6.09 | 129.31      | 115.30   |
| 2   | G     | 977  | LEU  | CA-CB-CG | 5.68 | 128.38      | 115.30   |
| 2   | I     | 977  | LEU  | CA-CB-CG | 5.68 | 128.36      | 115.30   |
| 2   | E     | 977  | LEU  | CA-CB-CG | 5.67 | 128.35      | 115.30   |
| 2   | B     | 977  | LEU  | CA-CB-CG | 5.66 | 128.32      | 115.30   |
| 2   | E     | 4639 | MET  | C-N-CA   | 5.07 | 134.38      | 121.70   |
| 2   | G     | 4639 | MET  | C-N-CA   | 5.07 | 134.37      | 121.70   |
| 2   | I     | 4639 | MET  | C-N-CA   | 5.06 | 134.36      | 121.70   |
| 2   | B     | 4639 | MET  | C-N-CA   | 5.04 | 134.31      | 121.70   |

There are no chirality outliers.

All (68) planarity outliers are listed below:

| Mol | Chain | Res  | Type | Group   |
|-----|-------|------|------|---------|
| 1   | A     | 8    | SER  | Peptide |
| 2   | B     | 139  | GLU  | Peptide |
| 2   | B     | 1676 | LEU  | Peptide |
| 2   | B     | 1690 | ASP  | Peptide |
| 2   | B     | 1712 | TYR  | Peptide |
| 2   | B     | 1795 | PRO  | Peptide |
| 2   | B     | 1828 | ASP  | Peptide |
| 2   | B     | 2291 | GLN  | Peptide |
| 2   | B     | 2342 | ASN  | Peptide |
| 2   | B     | 2343 | GLY  | Peptide |
| 2   | B     | 2472 | LEU  | Peptide |
| 2   | B     | 2807 | TRP  | Peptide |
| 2   | B     | 3971 | GLY  | Peptide |
| 2   | B     | 4666 | VAL  | Peptide |

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| <b>Mol</b> | <b>Chain</b> | <b>Res</b> | <b>Type</b> | <b>Group</b> |
|------------|--------------|------------|-------------|--------------|
| 2          | B            | 4807       | PHE         | Peptide      |
| 2          | B            | 4958       | CYS         | Peptide      |
| 2          | B            | 808        | TYR         | Peptide      |
| 2          | E            | 139        | GLU         | Peptide      |
| 2          | E            | 1676       | LEU         | Peptide      |
| 2          | E            | 1690       | ASP         | Peptide      |
| 2          | E            | 1712       | TYR         | Peptide      |
| 2          | E            | 1795       | PRO         | Peptide      |
| 2          | E            | 1828       | ASP         | Peptide      |
| 2          | E            | 2291       | GLN         | Peptide      |
| 2          | E            | 2342       | ASN         | Peptide      |
| 2          | E            | 2343       | GLY         | Peptide      |
| 2          | E            | 2472       | LEU         | Peptide      |
| 2          | E            | 2807       | TRP         | Peptide      |
| 2          | E            | 3971       | GLY         | Peptide      |
| 2          | E            | 4666       | VAL         | Peptide      |
| 2          | E            | 4807       | PHE         | Peptide      |
| 2          | E            | 4958       | CYS         | Peptide      |
| 2          | E            | 808        | TYR         | Peptide      |
| 1          | F            | 8          | SER         | Peptide      |
| 2          | G            | 139        | GLU         | Peptide      |
| 2          | G            | 1676       | LEU         | Peptide      |
| 2          | G            | 1690       | ASP         | Peptide      |
| 2          | G            | 1712       | TYR         | Peptide      |
| 2          | G            | 1795       | PRO         | Peptide      |
| 2          | G            | 1828       | ASP         | Peptide      |
| 2          | G            | 2291       | GLN         | Peptide      |
| 2          | G            | 2342       | ASN         | Peptide      |
| 2          | G            | 2343       | GLY         | Peptide      |
| 2          | G            | 2472       | LEU         | Peptide      |
| 2          | G            | 2807       | TRP         | Peptide      |
| 2          | G            | 3971       | GLY         | Peptide      |
| 2          | G            | 4666       | VAL         | Peptide      |
| 2          | G            | 4807       | PHE         | Peptide      |
| 2          | G            | 4958       | CYS         | Peptide      |
| 2          | G            | 808        | TYR         | Peptide      |
| 1          | H            | 8          | SER         | Peptide      |
| 2          | I            | 139        | GLU         | Peptide      |
| 2          | I            | 1676       | LEU         | Peptide      |
| 2          | I            | 1690       | ASP         | Peptide      |
| 2          | I            | 1712       | TYR         | Peptide      |
| 2          | I            | 1795       | PRO         | Peptide      |

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| Mol | Chain | Res  | Type | Group   |
|-----|-------|------|------|---------|
| 2   | I     | 1828 | ASP  | Peptide |
| 2   | I     | 2291 | GLN  | Peptide |
| 2   | I     | 2342 | ASN  | Peptide |
| 2   | I     | 2343 | GLY  | Peptide |
| 2   | I     | 2472 | LEU  | Peptide |
| 2   | I     | 2807 | TRP  | Peptide |
| 2   | I     | 3971 | GLY  | Peptide |
| 2   | I     | 4666 | VAL  | Peptide |
| 2   | I     | 4807 | PHE  | Peptide |
| 2   | I     | 4958 | CYS  | Peptide |
| 2   | I     | 808  | TYR  | Peptide |
| 1   | J     | 8    | SER  | 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     | 818    | 0        | 824      | 8       | 0            |
| 1   | F     | 818    | 0        | 824      | 9       | 0            |
| 1   | H     | 818    | 0        | 824      | 8       | 0            |
| 1   | J     | 818    | 0        | 824      | 9       | 0            |
| 2   | B     | 29369  | 0        | 24721    | 212     | 0            |
| 2   | E     | 29369  | 0        | 24721    | 206     | 0            |
| 2   | G     | 29369  | 0        | 24719    | 205     | 0            |
| 2   | I     | 29369  | 0        | 24721    | 208     | 0            |
| 3   | B     | 1      | 0        | 0        | 0       | 0            |
| 3   | E     | 1      | 0        | 0        | 0       | 0            |
| 3   | G     | 1      | 0        | 0        | 0       | 0            |
| 3   | I     | 1      | 0        | 0        | 0       | 0            |
| 4   | B     | 1      | 0        | 0        | 0       | 0            |
| 4   | E     | 1      | 0        | 0        | 0       | 0            |
| 4   | G     | 1      | 0        | 0        | 0       | 0            |
| 4   | I     | 1      | 0        | 0        | 0       | 0            |
| All | All   | 120756 | 0        | 102178   | 849     | 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 4.

All (849) 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:426:ARG:HB2   | 2:B:506:TYR:HA    | 1.78                     | 0.66              |
| 2:I:426:ARG:HB2   | 2:I:506:TYR:HA    | 1.78                     | 0.66              |
| 2:G:426:ARG:HB2   | 2:G:506:TYR:HA    | 1.78                     | 0.66              |
| 2:E:426:ARG:HB2   | 2:E:506:TYR:HA    | 1.78                     | 0.65              |
| 2:B:4860:ARG:HD2  | 2:E:4582:VAL:HG11 | 1.77                     | 0.64              |
| 2:B:2748:PRO:HD2  | 2:B:2751:LEU:HD12 | 1.80                     | 0.64              |
| 2:I:2748:PRO:HD2  | 2:I:2751:LEU:HD12 | 1.80                     | 0.63              |
| 2:E:2748:PRO:HD2  | 2:E:2751:LEU:HD12 | 1.80                     | 0.63              |
| 2:B:174:VAL:O     | 2:E:2452:ARG:NH1  | 2.31                     | 0.63              |
| 2:B:2452:ARG:NH1  | 2:I:174:VAL:O     | 2.31                     | 0.63              |
| 2:E:627:PRO:O     | 2:E:629:ARG:NH1   | 2.32                     | 0.63              |
| 2:I:627:PRO:O     | 2:I:629:ARG:NH1   | 2.32                     | 0.63              |
| 2:B:627:PRO:O     | 2:B:629:ARG:NH1   | 2.32                     | 0.62              |
| 2:G:627:PRO:O     | 2:G:629:ARG:NH1   | 2.32                     | 0.62              |
| 2:G:2748:PRO:HD2  | 2:G:2751:LEU:HD12 | 1.80                     | 0.62              |
| 2:B:2764:GLU:HG3  | 2:B:2857:PRO:HB2  | 1.82                     | 0.62              |
| 2:E:2764:GLU:HG3  | 2:E:2857:PRO:HB2  | 1.82                     | 0.62              |
| 2:B:1671:ARG:NH2  | 2:B:1710:GLY:O    | 2.33                     | 0.62              |
| 2:B:1721:GLU:OE2  | 2:B:1725:ARG:NH2  | 2.30                     | 0.61              |
| 2:I:1671:ARG:NH2  | 2:I:1710:GLY:O    | 2.33                     | 0.61              |
| 2:G:1671:ARG:NH2  | 2:G:1710:GLY:O    | 2.33                     | 0.61              |
| 2:E:641:VAL:HG21  | 2:E:705:ASN:HA    | 1.82                     | 0.61              |
| 2:I:641:VAL:HG21  | 2:I:705:ASN:HA    | 1.82                     | 0.61              |
| 2:E:4049:VAL:HG21 | 2:E:4159:ARG:HD2  | 1.83                     | 0.61              |
| 2:B:671:VAL:HG22  | 2:B:740:PRO:HG3   | 1.83                     | 0.61              |
| 1:J:76:CYS:HB2    | 1:J:97:LEU:HB2    | 1.83                     | 0.61              |
| 2:B:4049:VAL:HG21 | 2:B:4159:ARG:HD2  | 1.83                     | 0.61              |
| 2:I:671:VAL:HG22  | 2:I:740:PRO:HG3   | 1.83                     | 0.61              |
| 2:E:1671:ARG:NH2  | 2:E:1710:GLY:O    | 2.33                     | 0.61              |
| 2:G:4049:VAL:HG21 | 2:G:4159:ARG:HD2  | 1.83                     | 0.61              |
| 2:I:4049:VAL:HG21 | 2:I:4159:ARG:HD2  | 1.83                     | 0.60              |
| 2:E:1721:GLU:OE2  | 2:E:1725:ARG:NH2  | 2.30                     | 0.60              |
| 1:H:76:CYS:HB2    | 1:H:97:LEU:HB2    | 1.83                     | 0.60              |
| 2:B:641:VAL:HG21  | 2:B:705:ASN:HA    | 1.82                     | 0.60              |
| 2:G:641:VAL:HG21  | 2:G:705:ASN:HA    | 1.82                     | 0.60              |
| 2:G:1703:LEU:HB3  | 2:G:1708:ARG:HH21 | 1.67                     | 0.60              |
| 2:E:379:HIS:HD2   | 2:E:382:GLY:H     | 1.49                     | 0.60              |
| 2:I:2764:GLU:HG3  | 2:I:2857:PRO:HB2  | 1.82                     | 0.60              |
| 2:E:4251:ILE:O    | 2:E:4557:ARG:NH1  | 2.35                     | 0.60              |
| 2:I:2755:ILE:HD13 | 2:I:2810:LYS:HG2  | 1.84                     | 0.60              |
| 2:G:4251:ILE:O    | 2:G:4557:ARG:NH1  | 2.35                     | 0.60              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 2:E:671:VAL:HG22  | 2:E:740:PRO:HG3   | 1.83                     | 0.60              |
| 2:B:1703:LEU:HB3  | 2:B:1708:ARG:HH21 | 1.67                     | 0.59              |
| 2:E:111:HIS:HD2   | 2:E:114:SER:H     | 1.48                     | 0.59              |
| 2:E:788:LYS:HG2   | 2:E:1630:CYS:H    | 1.66                     | 0.59              |
| 2:I:4582:VAL:HG11 | 2:G:4860:ARG:HD2  | 1.83                     | 0.59              |
| 2:G:1721:GLU:OE2  | 2:G:1725:ARG:NH2  | 2.30                     | 0.59              |
| 2:G:2764:GLU:HG3  | 2:G:2857:PRO:HB2  | 1.82                     | 0.59              |
| 2:B:111:HIS:HD2   | 2:B:114:SER:H     | 1.48                     | 0.59              |
| 2:B:2755:ILE:HD13 | 2:B:2810:LYS:HG2  | 1.84                     | 0.59              |
| 2:E:1703:LEU:HB3  | 2:E:1708:ARG:HH21 | 1.67                     | 0.59              |
| 2:B:379:HIS:HD2   | 2:B:382:GLY:H     | 1.49                     | 0.59              |
| 2:B:1079:LYS:NZ   | 2:B:1107:PRO:O    | 2.36                     | 0.59              |
| 2:G:788:LYS:HG2   | 2:G:1630:CYS:H    | 1.66                     | 0.59              |
| 1:F:76:CYS:HB2    | 1:F:97:LEU:HB2    | 1.83                     | 0.59              |
| 2:E:646:PRO:HD2   | 2:E:779:PRO:HB2   | 1.85                     | 0.59              |
| 2:G:671:VAL:HG22  | 2:G:740:PRO:HG3   | 1.83                     | 0.59              |
| 1:A:76:CYS:HB2    | 1:A:97:LEU:HB2    | 1.83                     | 0.59              |
| 2:E:2755:ILE:HD13 | 2:E:2810:LYS:HG2  | 1.84                     | 0.59              |
| 2:I:788:LYS:HG2   | 2:I:1630:CYS:H    | 1.66                     | 0.59              |
| 2:G:1079:LYS:NZ   | 2:G:1107:PRO:O    | 2.36                     | 0.59              |
| 2:B:4251:ILE:O    | 2:B:4557:ARG:NH1  | 2.35                     | 0.59              |
| 2:E:609:CYS:SG    | 2:E:610:ASN:N     | 2.76                     | 0.59              |
| 2:I:1079:LYS:NZ   | 2:I:1107:PRO:O    | 2.36                     | 0.59              |
| 2:G:2755:ILE:HD13 | 2:G:2810:LYS:HG2  | 1.84                     | 0.59              |
| 2:B:614:VAL:HG22  | 2:B:616:SER:H     | 1.68                     | 0.59              |
| 2:G:4104:THR:HG22 | 2:G:4106:PRO:HD2  | 1.85                     | 0.59              |
| 2:B:4104:THR:HG22 | 2:B:4106:PRO:HD2  | 1.85                     | 0.59              |
| 2:B:788:LYS:HG2   | 2:B:1630:CYS:H    | 1.66                     | 0.59              |
| 2:B:3937:TYR:O    | 2:B:4002:LYS:NZ   | 2.36                     | 0.59              |
| 2:G:646:PRO:HD2   | 2:G:779:PRO:HB2   | 1.85                     | 0.59              |
| 2:B:646:PRO:HD2   | 2:B:779:PRO:HB2   | 1.85                     | 0.58              |
| 2:E:1079:LYS:NZ   | 2:E:1107:PRO:O    | 2.36                     | 0.58              |
| 2:I:4104:THR:HG22 | 2:I:4106:PRO:HD2  | 1.85                     | 0.58              |
| 2:I:4251:ILE:O    | 2:I:4557:ARG:NH1  | 2.35                     | 0.58              |
| 2:E:4791:TYR:OH   | 2:E:4815:ASP:O    | 2.22                     | 0.58              |
| 2:G:379:HIS:HD2   | 2:G:382:GLY:H     | 1.49                     | 0.58              |
| 2:E:4104:THR:HG22 | 2:E:4106:PRO:HD2  | 1.85                     | 0.58              |
| 2:I:1703:LEU:HB3  | 2:I:1708:ARG:HH21 | 1.67                     | 0.58              |
| 2:G:4791:TYR:OH   | 2:G:4815:ASP:O    | 2.22                     | 0.58              |
| 2:E:614:VAL:HG22  | 2:E:616:SER:H     | 1.68                     | 0.58              |
| 2:I:3955:MET:HG3  | 2:I:4019:LEU:HD22 | 1.86                     | 0.58              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 2:I:4233:LEU:HA   | 2:I:4236:SER:HB3  | 1.86                     | 0.58              |
| 2:G:111:HIS:HD2   | 2:G:114:SER:H     | 1.49                     | 0.58              |
| 2:B:3955:MET:HG3  | 2:B:4019:LEU:HD22 | 1.86                     | 0.58              |
| 2:E:3955:MET:HG3  | 2:E:4019:LEU:HD22 | 1.86                     | 0.58              |
| 2:I:2803:GLU:OE2  | 2:I:2806:ARG:NH1  | 2.37                     | 0.58              |
| 2:G:609:CYS:SG    | 2:G:610:ASN:N     | 2.76                     | 0.58              |
| 2:G:3955:MET:HG3  | 2:G:4019:LEU:HD22 | 1.86                     | 0.58              |
| 2:B:609:CYS:SG    | 2:B:610:ASN:N     | 2.76                     | 0.58              |
| 2:B:4791:TYR:OH   | 2:B:4815:ASP:O    | 2.22                     | 0.58              |
| 2:E:635:THR:HB    | 2:E:1639:LEU:HD23 | 1.86                     | 0.58              |
| 2:I:614:VAL:HG22  | 2:I:616:SER:H     | 1.68                     | 0.58              |
| 2:I:4791:TYR:OH   | 2:I:4815:ASP:O    | 2.22                     | 0.58              |
| 2:G:2803:GLU:OE2  | 2:G:2806:ARG:NH1  | 2.37                     | 0.58              |
| 2:E:3937:TYR:O    | 2:E:4002:LYS:NZ   | 2.36                     | 0.58              |
| 2:I:111:HIS:HD2   | 2:I:114:SER:H     | 1.48                     | 0.58              |
| 2:I:646:PRO:HD2   | 2:I:779:PRO:HB2   | 1.85                     | 0.58              |
| 2:I:2739:PRO:HB3  | 2:I:2884:ASN:HB3  | 1.85                     | 0.58              |
| 2:B:2739:PRO:HB3  | 2:B:2884:ASN:HB3  | 1.85                     | 0.58              |
| 2:B:2803:GLU:OE2  | 2:B:2806:ARG:NH1  | 2.37                     | 0.58              |
| 2:I:379:HIS:HD2   | 2:I:382:GLY:H     | 1.49                     | 0.58              |
| 2:B:635:THR:HB    | 2:B:1639:LEU:HD23 | 1.86                     | 0.57              |
| 2:G:4233:LEU:HA   | 2:G:4236:SER:HB3  | 1.86                     | 0.57              |
| 2:E:2022:PRO:O    | 2:E:2028:ARG:NH2  | 2.35                     | 0.57              |
| 2:E:2803:GLU:OE2  | 2:E:2806:ARG:NH1  | 2.37                     | 0.57              |
| 2:I:609:CYS:SG    | 2:I:610:ASN:N     | 2.76                     | 0.57              |
| 2:I:2022:PRO:O    | 2:I:2028:ARG:NH2  | 2.35                     | 0.57              |
| 1:H:87:HIS:HD2    | 1:H:90:VAL:HB     | 1.70                     | 0.57              |
| 2:E:1519:UNK:HA   | 2:E:1526:UNK:HA   | 1.87                     | 0.57              |
| 2:G:635:THR:HB    | 2:G:1639:LEU:HD23 | 1.86                     | 0.57              |
| 2:G:3937:TYR:O    | 2:G:4002:LYS:NZ   | 2.36                     | 0.57              |
| 2:G:4232:GLU:OE2  | 2:G:5017:ARG:NH1  | 2.38                     | 0.57              |
| 2:I:3937:TYR:O    | 2:I:4002:LYS:NZ   | 2.36                     | 0.57              |
| 2:E:472:ARG:NH2   | 2:E:3712:GLU:OE2  | 2.38                     | 0.57              |
| 2:I:2452:ARG:NH1  | 2:G:174:VAL:O     | 2.38                     | 0.57              |
| 1:A:87:HIS:HD2    | 1:A:90:VAL:HB     | 1.70                     | 0.57              |
| 1:J:87:HIS:HD2    | 1:J:90:VAL:HB     | 1.70                     | 0.57              |
| 2:E:4232:GLU:OE2  | 2:E:5017:ARG:NH1  | 2.38                     | 0.57              |
| 2:I:1721:GLU:OE2  | 2:I:1725:ARG:NH2  | 2.30                     | 0.57              |
| 2:G:463:GLU:OE2   | 2:G:467:LYS:NZ    | 2.38                     | 0.57              |
| 2:B:2131:LEU:HD23 | 2:B:3662:ILE:HB   | 1.87                     | 0.57              |
| 2:E:2739:PRO:HB3  | 2:E:2884:ASN:HB3  | 1.85                     | 0.57              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 2:I:472:ARG:NH2   | 2:I:3712:GLU:OE2  | 2.38                     | 0.57              |
| 2:G:2131:LEU:HD23 | 2:G:3662:ILE:HB   | 1.87                     | 0.57              |
| 1:F:87:HIS:HD2    | 1:F:90:VAL:HB     | 1.70                     | 0.56              |
| 2:E:463:GLU:OE2   | 2:E:467:LYS:NZ    | 2.38                     | 0.56              |
| 2:E:2131:LEU:HD23 | 2:E:3662:ILE:HB   | 1.87                     | 0.56              |
| 2:G:2739:PRO:HB3  | 2:G:2884:ASN:HB3  | 1.85                     | 0.56              |
| 2:E:4233:LEU:HA   | 2:E:4236:SER:HB3  | 1.86                     | 0.56              |
| 2:G:19:GLU:HB2    | 2:G:206:CYS:HB3   | 1.87                     | 0.56              |
| 2:B:463:GLU:OE2   | 2:B:467:LYS:NZ    | 2.38                     | 0.56              |
| 2:B:4232:GLU:OE2  | 2:B:5017:ARG:NH1  | 2.38                     | 0.56              |
| 2:B:4233:LEU:HA   | 2:B:4236:SER:HB3  | 1.86                     | 0.56              |
| 2:I:635:THR:HB    | 2:I:1639:LEU:HD23 | 1.86                     | 0.56              |
| 2:G:472:ARG:NH2   | 2:G:3712:GLU:OE2  | 2.38                     | 0.56              |
| 2:G:614:VAL:HG22  | 2:G:616:SER:H     | 1.68                     | 0.56              |
| 2:E:19:GLU:HB2    | 2:E:206:CYS:HB3   | 1.87                     | 0.56              |
| 2:E:174:VAL:O     | 2:G:2452:ARG:NH1  | 2.39                     | 0.56              |
| 2:E:626:LEU:HG    | 2:E:628:GLY:H     | 1.70                     | 0.56              |
| 2:B:1109:LEU:HA   | 2:B:1120:LEU:HD21 | 1.88                     | 0.56              |
| 2:I:4232:GLU:OE2  | 2:I:5017:ARG:NH1  | 2.38                     | 0.56              |
| 2:B:472:ARG:NH2   | 2:B:3712:GLU:OE2  | 2.38                     | 0.56              |
| 2:B:2022:PRO:O    | 2:B:2028:ARG:NH2  | 2.35                     | 0.56              |
| 2:I:1109:LEU:HA   | 2:I:1120:LEU:HD21 | 1.88                     | 0.56              |
| 2:G:1109:LEU:HA   | 2:G:1120:LEU:HD21 | 1.88                     | 0.56              |
| 2:E:217:GLY:O     | 2:E:261:ARG:NH1   | 2.39                     | 0.56              |
| 2:E:1109:LEU:HA   | 2:E:1120:LEU:HD21 | 1.88                     | 0.56              |
| 2:I:4176:PRO:O    | 2:I:4202:ARG:NH1  | 2.39                     | 0.56              |
| 2:G:626:LEU:HG    | 2:G:628:GLY:H     | 1.70                     | 0.56              |
| 2:B:217:GLY:O     | 2:B:261:ARG:NH1   | 2.39                     | 0.56              |
| 2:B:2003:GLN:O    | 2:B:2007:ASN:ND2  | 2.39                     | 0.56              |
| 2:I:463:GLU:OE2   | 2:I:467:LYS:NZ    | 2.38                     | 0.56              |
| 2:B:1519:UNK:HA   | 2:B:1526:UNK:HA   | 1.89                     | 0.55              |
| 2:G:4176:PRO:O    | 2:G:4202:ARG:NH1  | 2.39                     | 0.55              |
| 2:B:2042:CYS:SG   | 2:B:2043:GLY:N    | 2.78                     | 0.55              |
| 2:E:1743:ARG:O    | 2:E:1964:ARG:NH2  | 2.40                     | 0.55              |
| 2:I:2131:LEU:HD23 | 2:I:3662:ILE:HB   | 1.87                     | 0.55              |
| 2:G:1519:UNK:HA   | 2:G:1526:UNK:HA   | 1.87                     | 0.55              |
| 2:G:2003:GLN:O    | 2:G:2007:ASN:ND2  | 2.39                     | 0.55              |
| 2:B:309:THR:O     | 2:B:313:SER:OG    | 2.24                     | 0.55              |
| 2:E:4176:PRO:O    | 2:E:4202:ARG:NH1  | 2.39                     | 0.55              |
| 2:I:626:LEU:HG    | 2:I:628:GLY:H     | 1.70                     | 0.55              |
| 2:I:2003:GLN:O    | 2:I:2007:ASN:ND2  | 2.39                     | 0.55              |

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| Atom-1            | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|------------------|--------------------------|-------------------|
| 2:E:345:LEU:HD23  | 2:E:389:PHE:HB3  | 1.89                     | 0.55              |
| 2:I:2042:CYS:SG   | 2:I:2043:GLY:N   | 2.78                     | 0.55              |
| 2:G:217:GLY:O     | 2:G:261:ARG:NH1  | 2.39                     | 0.55              |
| 2:G:2022:PRO:O    | 2:G:2028:ARG:NH2 | 2.35                     | 0.55              |
| 2:B:626:LEU:HG    | 2:B:628:GLY:H    | 1.70                     | 0.55              |
| 2:B:19:GLU:HB2    | 2:B:206:CYS:HB3  | 1.87                     | 0.55              |
| 2:I:19:GLU:HB2    | 2:I:206:CYS:HB3  | 1.87                     | 0.55              |
| 2:I:217:GLY:O     | 2:I:261:ARG:NH1  | 2.39                     | 0.55              |
| 2:I:1743:ARG:O    | 2:I:1964:ARG:NH2 | 2.40                     | 0.55              |
| 2:G:132:ALA:HA    | 2:G:194:SER:HB2  | 1.88                     | 0.55              |
| 2:G:345:LEU:HD23  | 2:G:389:PHE:HB3  | 1.89                     | 0.55              |
| 2:B:4152:GLU:OE2  | 2:B:4180:ARG:NH1 | 2.40                     | 0.55              |
| 2:E:2003:GLN:O    | 2:E:2007:ASN:ND2 | 2.39                     | 0.55              |
| 2:E:4673:ARG:HH22 | 2:E:4698:LYS:HB2 | 1.72                     | 0.55              |
| 2:I:309:THR:O     | 2:I:313:SER:OG   | 2.24                     | 0.55              |
| 2:G:309:THR:O     | 2:G:313:SER:OG   | 2.24                     | 0.55              |
| 2:G:1743:ARG:O    | 2:G:1964:ARG:NH2 | 2.40                     | 0.55              |
| 2:G:4152:GLU:OE2  | 2:G:4180:ARG:NH1 | 2.40                     | 0.55              |
| 2:B:4176:PRO:O    | 2:B:4202:ARG:NH1 | 2.39                     | 0.54              |
| 2:E:132:ALA:HA    | 2:E:194:SER:HB2  | 1.88                     | 0.54              |
| 2:I:345:LEU:HD23  | 2:I:389:PHE:HB3  | 1.89                     | 0.54              |
| 2:I:132:ALA:HA    | 2:I:194:SER:HB2  | 1.88                     | 0.54              |
| 2:B:1743:ARG:O    | 2:B:1964:ARG:NH2 | 2.40                     | 0.54              |
| 2:E:57:ASN:HD22   | 2:E:308:HIS:HB2  | 1.73                     | 0.54              |
| 2:E:2042:CYS:SG   | 2:E:2043:GLY:N   | 2.78                     | 0.54              |
| 2:I:1519:UNK:HA   | 2:I:1526:UNK:HA  | 1.89                     | 0.54              |
| 2:G:4673:ARG:HH22 | 2:G:4698:LYS:HB2 | 1.72                     | 0.54              |
| 2:B:345:LEU:HD23  | 2:B:389:PHE:HB3  | 1.89                     | 0.54              |
| 2:B:575:LEU:HD22  | 2:B:609:CYS:HB3  | 1.90                     | 0.54              |
| 2:B:4673:ARG:HH22 | 2:B:4698:LYS:HB2 | 1.72                     | 0.54              |
| 2:I:4673:ARG:HH22 | 2:I:4698:LYS:HB2 | 1.72                     | 0.54              |
| 2:G:717:ASP:OD1   | 2:G:720:HIS:ND1  | 2.41                     | 0.54              |
| 2:B:132:ALA:HA    | 2:B:194:SER:HB2  | 1.88                     | 0.54              |
| 2:E:309:THR:O     | 2:E:313:SER:OG   | 2.24                     | 0.54              |
| 2:I:575:LEU:HD22  | 2:I:609:CYS:HB3  | 1.90                     | 0.54              |
| 2:E:4152:GLU:OE2  | 2:E:4180:ARG:NH1 | 2.40                     | 0.54              |
| 2:I:2770:LYS:HB3  | 2:I:2775:TRP:HB2 | 1.91                     | 0.53              |
| 2:E:533:ASN:ND2   | 2:E:536:ASN:OD1  | 2.40                     | 0.53              |
| 2:I:4152:GLU:OE2  | 2:I:4180:ARG:NH1 | 2.40                     | 0.53              |
| 2:G:57:ASN:HD22   | 2:G:308:HIS:HB2  | 1.73                     | 0.53              |
| 2:B:57:ASN:HD22   | 2:B:308:HIS:HB2  | 1.73                     | 0.53              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 2:E:717:ASP:OD1   | 2:E:720:HIS:ND1   | 2.41                     | 0.53              |
| 2:B:2326:CYS:SG   | 2:B:2327:GLY:N    | 2.82                     | 0.53              |
| 2:I:717:ASP:OD1   | 2:I:720:HIS:ND1   | 2.41                     | 0.53              |
| 2:I:952:LYS:HB3   | 2:I:968:ALA:HB1   | 1.91                     | 0.53              |
| 2:G:2770:LYS:HB3  | 2:G:2775:TRP:HB2  | 1.91                     | 0.53              |
| 2:I:2326:CYS:SG   | 2:I:2327:GLY:N    | 2.82                     | 0.53              |
| 2:B:717:ASP:OD1   | 2:B:720:HIS:ND1   | 2.41                     | 0.53              |
| 2:G:952:LYS:HB3   | 2:G:968:ALA:HB1   | 1.91                     | 0.53              |
| 2:G:3850:GLN:HB3  | 2:G:3873:LYS:HD3  | 1.91                     | 0.53              |
| 2:E:575:LEU:HD22  | 2:E:609:CYS:HB3   | 1.90                     | 0.53              |
| 2:E:1679:ASN:ND2  | 2:E:1798:LEU:O    | 2.42                     | 0.53              |
| 2:E:2326:CYS:SG   | 2:E:2327:GLY:N    | 2.82                     | 0.53              |
| 2:G:575:LEU:HD22  | 2:G:609:CYS:HB3   | 1.90                     | 0.53              |
| 2:G:2326:CYS:SG   | 2:G:2327:GLY:N    | 2.82                     | 0.53              |
| 2:I:1679:ASN:ND2  | 2:I:1798:LEU:O    | 2.42                     | 0.53              |
| 2:G:886:ARG:HB3   | 2:G:891:TRP:HB2   | 1.91                     | 0.52              |
| 2:B:1679:ASN:ND2  | 2:B:1798:LEU:O    | 2.42                     | 0.52              |
| 2:B:1931:LEU:HB3  | 2:B:1935:VAL:HB   | 1.92                     | 0.52              |
| 2:B:3850:GLN:HB3  | 2:B:3873:LYS:HD3  | 1.91                     | 0.52              |
| 2:E:3850:GLN:HB3  | 2:E:3873:LYS:HD3  | 1.91                     | 0.52              |
| 2:I:1931:LEU:HB3  | 2:I:1935:VAL:HB   | 1.92                     | 0.52              |
| 2:I:3850:GLN:HB3  | 2:I:3873:LYS:HD3  | 1.91                     | 0.52              |
| 2:G:1931:LEU:HB3  | 2:G:1935:VAL:HB   | 1.92                     | 0.52              |
| 2:G:2042:CYS:SG   | 2:G:2043:GLY:N    | 2.78                     | 0.52              |
| 2:G:4958:CYS:SG   | 2:G:4959:PHE:N    | 2.82                     | 0.52              |
| 2:B:886:ARG:HB3   | 2:B:891:TRP:HB2   | 1.92                     | 0.52              |
| 2:B:2196:ASN:OD1  | 2:B:2199:ARG:NH1  | 2.34                     | 0.52              |
| 2:I:1973:GLN:O    | 2:I:1977:TYR:N    | 2.43                     | 0.52              |
| 2:G:219:VAL:HG13  | 2:G:285:VAL:HG21  | 1.92                     | 0.52              |
| 2:G:1679:ASN:ND2  | 2:G:1798:LEU:O    | 2.42                     | 0.52              |
| 1:A:74:LEU:HB2    | 1:A:99:PHE:HB2    | 1.91                     | 0.52              |
| 2:E:745:SER:HB2   | 2:E:758:ARG:HB3   | 1.92                     | 0.52              |
| 2:E:1931:LEU:HB3  | 2:E:1935:VAL:HB   | 1.91                     | 0.52              |
| 2:G:745:SER:HB2   | 2:G:758:ARG:HB3   | 1.92                     | 0.52              |
| 2:B:2770:LYS:HB3  | 2:B:2775:TRP:HB2  | 1.91                     | 0.52              |
| 2:B:4567:LEU:HD12 | 2:B:4816:ILE:HD12 | 1.92                     | 0.52              |
| 2:E:886:ARG:HB3   | 2:E:891:TRP:HB2   | 1.91                     | 0.52              |
| 2:I:886:ARG:HB3   | 2:I:891:TRP:HB2   | 1.91                     | 0.52              |
| 2:B:1973:GLN:O    | 2:B:1977:TYR:N    | 2.43                     | 0.52              |
| 2:B:4958:CYS:SG   | 2:B:4959:PHE:N    | 2.82                     | 0.52              |
| 2:E:2770:LYS:HB3  | 2:E:2775:TRP:HB2  | 1.91                     | 0.52              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 2:I:57:ASN:HD22   | 2:I:308:HIS:HB2   | 1.73                     | 0.52              |
| 2:I:219:VAL:HG13  | 2:I:285:VAL:HG21  | 1.92                     | 0.52              |
| 1:F:74:LEU:HB2    | 1:F:99:PHE:HB2    | 1.91                     | 0.52              |
| 2:B:952:LYS:HB3   | 2:B:968:ALA:HB1   | 1.91                     | 0.52              |
| 2:E:395:GLN:HG3   | 2:E:397:GLU:H     | 1.75                     | 0.52              |
| 2:B:1729:SER:HB3  | 2:B:2163:ARG:HH11 | 1.75                     | 0.52              |
| 2:B:4884:LEU:HD11 | 2:I:4914:VAL:HG21 | 1.92                     | 0.52              |
| 1:A:42:ARG:HG2    | 2:B:1691:GLN:HG2  | 1.91                     | 0.52              |
| 2:B:2226:PRO:HA   | 2:B:2229:VAL:HG12 | 1.92                     | 0.52              |
| 2:I:1729:SER:HB3  | 2:I:2163:ARG:HH11 | 1.75                     | 0.52              |
| 1:J:74:LEU:HB2    | 1:J:99:PHE:HB2    | 1.91                     | 0.52              |
| 2:B:3817:LEU:HD13 | 2:B:3899:PHE:HD1  | 1.75                     | 0.52              |
| 2:E:315:CYS:SG    | 2:E:316:PHE:N     | 2.83                     | 0.52              |
| 2:E:4958:CYS:SG   | 2:E:4959:PHE:N    | 2.82                     | 0.52              |
| 2:B:745:SER:HB2   | 2:B:758:ARG:HB3   | 1.92                     | 0.51              |
| 2:E:219:VAL:HG13  | 2:E:285:VAL:HG21  | 1.92                     | 0.51              |
| 2:E:4860:ARG:HD2  | 2:G:4582:VAL:HG11 | 1.91                     | 0.51              |
| 2:I:395:GLN:HG3   | 2:I:397:GLU:H     | 1.75                     | 0.51              |
| 2:G:315:CYS:SG    | 2:G:316:PHE:N     | 2.83                     | 0.51              |
| 2:G:2751:LEU:HD11 | 2:G:2823:ILE:HG21 | 1.93                     | 0.51              |
| 2:I:3817:LEU:HD13 | 2:I:3899:PHE:HD1  | 1.75                     | 0.51              |
| 2:B:315:CYS:SG    | 2:B:316:PHE:N     | 2.83                     | 0.51              |
| 2:B:395:GLN:HG3   | 2:B:397:GLU:H     | 1.75                     | 0.51              |
| 2:E:952:LYS:HB3   | 2:E:968:ALA:HB1   | 1.91                     | 0.51              |
| 2:E:3817:LEU:HD13 | 2:E:3899:PHE:HD1  | 1.75                     | 0.51              |
| 2:I:315:CYS:SG    | 2:I:316:PHE:N     | 2.83                     | 0.51              |
| 2:I:745:SER:HB2   | 2:I:758:ARG:HB3   | 1.92                     | 0.51              |
| 2:E:765:GLN:NE2   | 2:E:1521:UNK:O    | 2.43                     | 0.51              |
| 2:I:4567:LEU:HD12 | 2:I:4816:ILE:HD12 | 1.92                     | 0.51              |
| 2:G:1973:GLN:O    | 2:G:1977:TYR:N    | 2.43                     | 0.51              |
| 2:G:395:GLN:HG3   | 2:G:397:GLU:H     | 1.75                     | 0.51              |
| 2:G:2226:PRO:HA   | 2:G:2229:VAL:HG12 | 1.92                     | 0.51              |
| 1:H:74:LEU:HB2    | 1:H:99:PHE:HB2    | 1.91                     | 0.51              |
| 2:E:2751:LEU:HD11 | 2:E:2823:ILE:HG21 | 1.92                     | 0.51              |
| 2:B:219:VAL:HG13  | 2:B:285:VAL:HG21  | 1.92                     | 0.51              |
| 2:G:3817:LEU:HD13 | 2:G:3899:PHE:HD1  | 1.75                     | 0.51              |
| 2:B:1960:ALA:O    | 2:B:1964:ARG:NE   | 2.43                     | 0.51              |
| 2:I:2226:PRO:HA   | 2:I:2229:VAL:HG12 | 1.92                     | 0.51              |
| 2:B:2247:GLN:NE2  | 2:B:2285:GLU:OE2  | 2.44                     | 0.51              |
| 2:E:4172:GLU:HA   | 2:E:4175:ARG:HE   | 1.76                     | 0.51              |
| 2:I:972:LEU:O     | 2:I:1044:ARG:NH2  | 2.44                     | 0.51              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 2:B:2751:LEU:HD11 | 2:B:2823:ILE:HG21 | 1.92                     | 0.51              |
| 2:E:2247:GLN:NE2  | 2:E:2285:GLU:OE2  | 2.44                     | 0.51              |
| 2:E:4567:LEU:HD12 | 2:E:4816:ILE:HD12 | 1.92                     | 0.51              |
| 2:G:972:LEU:O     | 2:G:1044:ARG:NH2  | 2.44                     | 0.51              |
| 2:G:2247:GLN:NE2  | 2:G:2285:GLU:OE2  | 2.44                     | 0.51              |
| 2:G:3781:GLN:HA   | 2:G:3784:SER:HB3  | 1.93                     | 0.51              |
| 2:E:972:LEU:O     | 2:E:1044:ARG:NH2  | 2.44                     | 0.50              |
| 2:E:2226:PRO:HA   | 2:E:2229:VAL:HG12 | 1.92                     | 0.50              |
| 2:E:2908:TYR:OH   | 2:E:2920:ARG:NE   | 2.44                     | 0.50              |
| 2:E:3781:GLN:HA   | 2:E:3784:SER:HB3  | 1.93                     | 0.50              |
| 2:I:2247:GLN:NE2  | 2:I:2285:GLU:OE2  | 2.44                     | 0.50              |
| 2:G:4567:LEU:HD12 | 2:G:4816:ILE:HD12 | 1.92                     | 0.50              |
| 2:E:1973:GLN:O    | 2:E:1977:TYR:N    | 2.43                     | 0.50              |
| 2:I:4958:CYS:SG   | 2:I:4959:PHE:N    | 2.82                     | 0.50              |
| 2:G:1960:ALA:O    | 2:G:1964:ARG:NE   | 2.43                     | 0.50              |
| 2:B:972:LEU:O     | 2:B:1044:ARG:NH2  | 2.44                     | 0.50              |
| 2:E:2287:ALA:HA   | 2:E:2290:LEU:HD13 | 1.94                     | 0.50              |
| 2:I:533:ASN:ND2   | 2:I:536:ASN:OD1   | 2.40                     | 0.50              |
| 2:B:2287:ALA:HA   | 2:B:2290:LEU:HD13 | 1.94                     | 0.50              |
| 2:I:40:GLU:HB3    | 2:I:44:ASN:HB3    | 1.94                     | 0.50              |
| 2:G:4172:GLU:HA   | 2:G:4175:ARG:HE   | 1.76                     | 0.50              |
| 2:B:533:ASN:ND2   | 2:B:536:ASN:OD1   | 2.40                     | 0.50              |
| 2:B:1622:GLU:N    | 2:B:1627:ALA:O    | 2.45                     | 0.50              |
| 2:B:4172:GLU:HA   | 2:B:4175:ARG:HE   | 1.76                     | 0.50              |
| 2:I:2277:ALA:HB1  | 2:I:2337:PHE:HD2  | 1.76                     | 0.50              |
| 2:G:2277:ALA:HB1  | 2:G:2337:PHE:HD2  | 1.76                     | 0.50              |
| 2:B:40:GLU:HB3    | 2:B:44:ASN:HB3    | 1.94                     | 0.50              |
| 2:E:1729:SER:HB3  | 2:E:2163:ARG:HH11 | 1.75                     | 0.50              |
| 2:E:1960:ALA:O    | 2:E:1964:ARG:NE   | 2.43                     | 0.50              |
| 2:I:2287:ALA:HA   | 2:I:2290:LEU:HD13 | 1.94                     | 0.50              |
| 2:I:3781:GLN:HA   | 2:I:3784:SER:HB3  | 1.93                     | 0.50              |
| 2:G:3780:LEU:HD11 | 2:G:3816:MET:HG3  | 1.94                     | 0.50              |
| 2:B:2277:ALA:HB1  | 2:B:2337:PHE:HD2  | 1.76                     | 0.50              |
| 2:B:2466:LEU:HA   | 2:B:2469:ILE:HD12 | 1.94                     | 0.50              |
| 2:E:1685:LEU:HA   | 2:E:1688:HIS:HD2  | 1.77                     | 0.50              |
| 2:G:1729:SER:HB3  | 2:G:2163:ARG:HH11 | 1.75                     | 0.50              |
| 2:G:1808:ARG:HD3  | 2:G:1853:ILE:HG22 | 1.94                     | 0.50              |
| 2:B:689:THR:H     | 2:B:778:PHE:HE2   | 1.60                     | 0.50              |
| 2:B:1685:LEU:HA   | 2:B:1688:HIS:HD2  | 1.77                     | 0.50              |
| 2:E:40:GLU:HB3    | 2:E:44:ASN:HB3    | 1.94                     | 0.50              |
| 2:E:689:THR:H     | 2:E:778:PHE:HE2   | 1.60                     | 0.49              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 2:I:689:THR:H     | 2:I:778:PHE:HE2   | 1.60                     | 0.49              |
| 2:G:4584:ASP:HA   | 2:G:4627:MET:HA   | 1.94                     | 0.49              |
| 2:B:410:LEU:HD12  | 2:B:413:GLN:HE21  | 1.77                     | 0.49              |
| 2:E:38:ALA:HB1    | 2:E:64:ILE:HG13   | 1.94                     | 0.49              |
| 2:E:3780:LEU:HD11 | 2:E:3816:MET:HG3  | 1.93                     | 0.49              |
| 2:I:1685:LEU:HA   | 2:I:1688:HIS:HD2  | 1.77                     | 0.49              |
| 2:I:2751:LEU:HD11 | 2:I:2823:ILE:HG21 | 1.92                     | 0.49              |
| 2:I:3780:LEU:HD11 | 2:I:3816:MET:HG3  | 1.94                     | 0.49              |
| 2:G:689:THR:H     | 2:G:778:PHE:HE2   | 1.60                     | 0.49              |
| 2:I:2466:LEU:HA   | 2:I:2469:ILE:HD12 | 1.94                     | 0.49              |
| 2:G:551:LEU:HD21  | 2:G:589:LEU:HD13  | 1.95                     | 0.49              |
| 2:B:3780:LEU:HD11 | 2:B:3816:MET:HG3  | 1.93                     | 0.49              |
| 2:E:1259:ARG:NH2  | 2:E:1595:LEU:O    | 2.46                     | 0.49              |
| 2:E:2277:ALA:HB1  | 2:E:2337:PHE:HD2  | 1.76                     | 0.49              |
| 2:G:606:LEU:O     | 2:G:617:ASN:ND2   | 2.45                     | 0.49              |
| 2:G:2347:GLU:O    | 2:G:2351:ASN:N    | 2.45                     | 0.49              |
| 2:B:2347:GLU:O    | 2:B:2351:ASN:N    | 2.45                     | 0.49              |
| 2:E:1095:VAL:HB   | 2:E:1199:VAL:HG23 | 1.94                     | 0.49              |
| 2:E:2466:LEU:HA   | 2:E:2469:ILE:HD12 | 1.94                     | 0.49              |
| 2:I:2347:GLU:O    | 2:I:2351:ASN:N    | 2.45                     | 0.49              |
| 2:G:38:ALA:HB1    | 2:G:64:ILE:HG13   | 1.95                     | 0.49              |
| 2:G:40:GLU:HB3    | 2:G:44:ASN:HB3    | 1.94                     | 0.49              |
| 2:G:1095:VAL:HB   | 2:G:1199:VAL:HG23 | 1.94                     | 0.49              |
| 2:G:4251:ILE:HD12 | 2:G:4557:ARG:HA   | 1.94                     | 0.49              |
| 2:B:331:VAL:HG12  | 2:B:333:GLY:H     | 1.77                     | 0.49              |
| 2:B:551:LEU:HD21  | 2:B:589:LEU:HD13  | 1.95                     | 0.49              |
| 2:B:1808:ARG:HD3  | 2:B:1853:ILE:HG22 | 1.94                     | 0.49              |
| 2:B:4251:ILE:HD12 | 2:B:4557:ARG:HA   | 1.94                     | 0.49              |
| 2:B:4584:ASP:HA   | 2:B:4627:MET:HA   | 1.94                     | 0.49              |
| 2:E:2347:GLU:O    | 2:E:2351:ASN:N    | 2.45                     | 0.49              |
| 2:E:4138:ASP:OD1  | 2:E:4138:ASP:N    | 2.46                     | 0.49              |
| 2:I:210:GLU:HG3   | 2:I:337:PRO:HG3   | 1.93                     | 0.49              |
| 2:I:1622:GLU:N    | 2:I:1627:ALA:O    | 2.45                     | 0.49              |
| 2:G:410:LEU:HD12  | 2:G:413:GLN:HE21  | 1.77                     | 0.49              |
| 2:G:4138:ASP:OD1  | 2:G:4138:ASP:N    | 2.46                     | 0.49              |
| 2:B:38:ALA:HB1    | 2:B:64:ILE:HG13   | 1.95                     | 0.49              |
| 2:B:195:PHE:HB3   | 2:B:196:MET:HG2   | 1.95                     | 0.49              |
| 2:B:210:GLU:HG3   | 2:B:337:PRO:HG3   | 1.94                     | 0.49              |
| 2:B:233:ILE:HD11  | 2:B:242:ARG:HH21  | 1.77                     | 0.49              |
| 2:B:1259:ARG:NH2  | 2:B:1595:LEU:O    | 2.46                     | 0.49              |
| 2:B:3781:GLN:HA   | 2:B:3784:SER:HB3  | 1.93                     | 0.49              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 2:I:229:GLU:HA    | 2:I:249:GLY:HA2   | 1.95                     | 0.49              |
| 2:I:4138:ASP:OD1  | 2:I:4138:ASP:N    | 2.46                     | 0.49              |
| 2:G:765:GLN:NE2   | 2:G:1521:UNK:O    | 2.46                     | 0.49              |
| 2:G:2287:ALA:HA   | 2:G:2290:LEU:HD13 | 1.94                     | 0.49              |
| 2:G:2466:LEU:HA   | 2:G:2469:ILE:HD12 | 1.94                     | 0.49              |
| 2:E:2002:PRO:HA   | 2:E:2005:GLN:HB3  | 1.95                     | 0.49              |
| 2:E:2257:LEU:HD11 | 2:E:2276:ALA:HB2  | 1.95                     | 0.49              |
| 2:I:606:LEU:O     | 2:I:617:ASN:ND2   | 2.46                     | 0.49              |
| 2:G:229:GLU:HA    | 2:G:249:GLY:HA2   | 1.95                     | 0.49              |
| 2:G:1622:GLU:N    | 2:G:1627:ALA:O    | 2.45                     | 0.49              |
| 2:G:1685:LEU:HA   | 2:G:1688:HIS:HD2  | 1.77                     | 0.49              |
| 2:B:229:GLU:HA    | 2:B:249:GLY:HA2   | 1.95                     | 0.48              |
| 2:E:410:LEU:HD12  | 2:E:413:GLN:HE21  | 1.77                     | 0.48              |
| 2:E:606:LEU:O     | 2:E:617:ASN:ND2   | 2.45                     | 0.48              |
| 2:E:1808:ARG:HD3  | 2:E:1853:ILE:HG22 | 1.94                     | 0.48              |
| 2:E:4251:ILE:HD12 | 2:E:4557:ARG:HA   | 1.94                     | 0.48              |
| 2:I:765:GLN:NE2   | 2:I:1521:UNK:O    | 2.46                     | 0.48              |
| 2:I:4172:GLU:HA   | 2:I:4175:ARG:HE   | 1.76                     | 0.48              |
| 2:G:111:HIS:CD2   | 2:G:114:SER:H     | 2.29                     | 0.48              |
| 2:G:1259:ARG:NH2  | 2:G:1595:LEU:O    | 2.46                     | 0.48              |
| 2:B:103:TYR:HB3   | 2:B:152:PRO:HD3   | 1.95                     | 0.48              |
| 2:E:551:LEU:HD21  | 2:E:589:LEU:HD13  | 1.95                     | 0.48              |
| 2:B:111:HIS:CD2   | 2:B:114:SER:H     | 2.29                     | 0.48              |
| 2:B:1095:VAL:HB   | 2:B:1199:VAL:HG23 | 1.94                     | 0.48              |
| 2:I:103:TYR:HB3   | 2:I:152:PRO:HD3   | 1.95                     | 0.48              |
| 2:I:233:ILE:HD11  | 2:I:242:ARG:HH21  | 1.77                     | 0.48              |
| 2:I:2002:PRO:HA   | 2:I:2005:GLN:HB3  | 1.95                     | 0.48              |
| 2:G:2257:LEU:HD11 | 2:G:2276:ALA:HB2  | 1.95                     | 0.48              |
| 2:B:606:LEU:O     | 2:B:617:ASN:ND2   | 2.45                     | 0.48              |
| 2:B:664:PHE:HB2   | 2:B:746:CYS:HB2   | 1.96                     | 0.48              |
| 2:E:233:ILE:HD11  | 2:E:242:ARG:HH21  | 1.77                     | 0.48              |
| 2:I:38:ALA:HB1    | 2:I:64:ILE:HG13   | 1.94                     | 0.48              |
| 2:I:719:LEU:HD22  | 2:I:735:GLN:HG2   | 1.95                     | 0.48              |
| 2:I:1808:ARG:HD3  | 2:I:1853:ILE:HG22 | 1.94                     | 0.48              |
| 2:I:1960:ALA:O    | 2:I:1964:ARG:NE   | 2.43                     | 0.48              |
| 2:G:210:GLU:HG3   | 2:G:337:PRO:HG3   | 1.94                     | 0.48              |
| 2:G:719:LEU:HD22  | 2:G:735:GLN:HG2   | 1.95                     | 0.48              |
| 2:B:2002:PRO:HA   | 2:B:2005:GLN:HB3  | 1.95                     | 0.48              |
| 2:E:195:PHE:HB3   | 2:E:196:MET:HG2   | 1.95                     | 0.48              |
| 2:E:229:GLU:HA    | 2:E:249:GLY:HA2   | 1.95                     | 0.48              |
| 2:I:111:HIS:CD2   | 2:I:114:SER:H     | 2.29                     | 0.48              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 2:I:257:ARG:O     | 2:I:284:HIS:NE2   | 2.36                     | 0.48              |
| 2:I:410:LEU:HD12  | 2:I:413:GLN:HE21  | 1.77                     | 0.48              |
| 2:G:331:VAL:HG12  | 2:G:333:GLY:H     | 1.77                     | 0.48              |
| 1:H:42:ARG:HG2    | 2:G:1691:GLN:HG2  | 1.95                     | 0.48              |
| 2:E:331:VAL:HG12  | 2:E:333:GLY:H     | 1.77                     | 0.48              |
| 2:E:664:PHE:HB2   | 2:E:746:CYS:HB2   | 1.96                     | 0.48              |
| 2:E:1622:GLU:N    | 2:E:1627:ALA:O    | 2.45                     | 0.48              |
| 2:E:4584:ASP:HA   | 2:E:4627:MET:HA   | 1.94                     | 0.48              |
| 2:I:4584:ASP:HA   | 2:I:4627:MET:HA   | 1.94                     | 0.48              |
| 2:G:2908:TYR:OH   | 2:G:2920:ARG:NE   | 2.44                     | 0.48              |
| 2:B:580:GLU:HG3   | 2:B:620:LEU:HD22  | 1.96                     | 0.48              |
| 2:E:210:GLU:HG3   | 2:E:337:PRO:HG3   | 1.94                     | 0.48              |
| 2:E:580:GLU:HG3   | 2:E:620:LEU:HD22  | 1.96                     | 0.48              |
| 2:I:551:LEU:HD21  | 2:I:589:LEU:HD13  | 1.95                     | 0.48              |
| 2:I:1259:ARG:NH2  | 2:I:1595:LEU:O    | 2.46                     | 0.48              |
| 2:I:4228:ALA:O    | 2:I:4232:GLU:N    | 2.46                     | 0.48              |
| 2:E:793:LEU:HD12  | 2:E:797:HIS:HB2   | 1.96                     | 0.48              |
| 2:I:331:VAL:HG12  | 2:I:333:GLY:H     | 1.77                     | 0.48              |
| 2:I:1718:ILE:HG13 | 2:I:1719:HIS:CD2  | 2.49                     | 0.48              |
| 2:I:4251:ILE:HD12 | 2:I:4557:ARG:HA   | 1.94                     | 0.48              |
| 2:G:195:PHE:HB3   | 2:G:196:MET:HG2   | 1.95                     | 0.48              |
| 2:B:719:LEU:HD22  | 2:B:735:GLN:HG2   | 1.95                     | 0.48              |
| 2:E:1152:MET:HB2  | 2:E:1161:ILE:HB   | 1.96                     | 0.48              |
| 2:G:103:TYR:HB3   | 2:G:152:PRO:HD3   | 1.95                     | 0.48              |
| 2:G:233:ILE:HD11  | 2:G:242:ARG:HH21  | 1.77                     | 0.48              |
| 2:E:103:TYR:HB3   | 2:E:152:PRO:HD3   | 1.95                     | 0.48              |
| 2:E:111:HIS:CD2   | 2:E:114:SER:H     | 2.29                     | 0.48              |
| 2:G:1718:ILE:HG13 | 2:G:1719:HIS:CD2  | 2.49                     | 0.48              |
| 2:G:2002:PRO:HA   | 2:G:2005:GLN:HB3  | 1.95                     | 0.48              |
| 2:B:257:ARG:O     | 2:B:284:HIS:NE2   | 2.36                     | 0.47              |
| 2:I:642:THR:HG23  | 2:I:1613:LEU:HD12 | 1.96                     | 0.47              |
| 2:B:642:THR:HG23  | 2:B:1613:LEU:HD12 | 1.96                     | 0.47              |
| 2:E:719:LEU:HD22  | 2:E:735:GLN:HG2   | 1.95                     | 0.47              |
| 2:I:793:LEU:HD12  | 2:I:797:HIS:HB2   | 1.96                     | 0.47              |
| 2:G:4063:ASP:OD1  | 2:G:4169:SER:OG   | 2.30                     | 0.47              |
| 2:E:1718:ILE:HG13 | 2:E:1719:HIS:CD2  | 2.49                     | 0.47              |
| 2:I:195:PHE:HB3   | 2:I:196:MET:HG2   | 1.95                     | 0.47              |
| 2:I:1095:VAL:HB   | 2:I:1199:VAL:HG23 | 1.94                     | 0.47              |
| 2:G:649:PHE:HB3   | 2:G:776:LEU:HD13  | 1.97                     | 0.47              |
| 2:B:649:PHE:HB3   | 2:B:776:LEU:HD13  | 1.97                     | 0.47              |
| 2:B:3901:ASN:OD1  | 2:B:3904:ARG:NH1  | 2.46                     | 0.47              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 2:E:649:PHE:HB3   | 2:E:776:LEU:HD13  | 1.97                     | 0.47              |
| 2:I:1152:MET:HB2  | 2:I:1161:ILE:HB   | 1.96                     | 0.47              |
| 2:I:1679:ASN:HA   | 2:I:1682:ALA:HB3  | 1.97                     | 0.47              |
| 2:I:2196:ASN:OD1  | 2:I:2199:ARG:NH1  | 2.34                     | 0.47              |
| 2:E:3901:ASN:OD1  | 2:E:3904:ARG:NH1  | 2.46                     | 0.47              |
| 2:G:1679:ASN:HA   | 2:G:1682:ALA:HB3  | 1.97                     | 0.47              |
| 2:B:793:LEU:HD12  | 2:B:797:HIS:HB2   | 1.96                     | 0.47              |
| 2:B:2257:LEU:HD11 | 2:B:2276:ALA:HB2  | 1.95                     | 0.47              |
| 2:E:718:GLY:HA3   | 2:E:737:LEU:HA    | 1.96                     | 0.47              |
| 2:E:1679:ASN:HA   | 2:E:1682:ALA:HB3  | 1.97                     | 0.47              |
| 2:I:580:GLU:HG3   | 2:I:620:LEU:HD22  | 1.96                     | 0.47              |
| 2:B:1679:ASN:HA   | 2:B:1682:ALA:HB3  | 1.97                     | 0.47              |
| 2:B:2927:LEU:HD23 | 2:B:2930:LEU:HD12 | 1.96                     | 0.47              |
| 2:E:2927:LEU:HD23 | 2:E:2930:LEU:HD12 | 1.96                     | 0.47              |
| 2:I:232:THR:HB    | 2:I:252:VAL:HG11  | 1.96                     | 0.47              |
| 2:I:649:PHE:HB3   | 2:I:776:LEU:HD13  | 1.97                     | 0.47              |
| 2:I:664:PHE:HB2   | 2:I:746:CYS:HB2   | 1.96                     | 0.47              |
| 2:I:718:GLY:HA3   | 2:I:737:LEU:HA    | 1.96                     | 0.47              |
| 2:G:580:GLU:HG3   | 2:G:620:LEU:HD22  | 1.96                     | 0.47              |
| 2:G:4228:ALA:O    | 2:G:4232:GLU:N    | 2.46                     | 0.47              |
| 2:E:232:THR:HB    | 2:E:252:VAL:HG11  | 1.96                     | 0.47              |
| 2:I:2257:LEU:HD11 | 2:I:2276:ALA:HB2  | 1.95                     | 0.47              |
| 2:G:232:THR:HB    | 2:G:252:VAL:HG11  | 1.96                     | 0.47              |
| 2:G:533:ASN:ND2   | 2:G:536:ASN:OD1   | 2.40                     | 0.47              |
| 2:G:2758:PHE:O    | 2:G:2762:THR:N    | 2.45                     | 0.47              |
| 2:B:718:GLY:HA3   | 2:B:737:LEU:HA    | 1.96                     | 0.47              |
| 2:B:1718:ILE:HG13 | 2:B:1719:HIS:CD2  | 2.49                     | 0.47              |
| 2:B:4228:ALA:O    | 2:B:4232:GLU:N    | 2.46                     | 0.47              |
| 2:G:793:LEU:HD12  | 2:G:797:HIS:HB2   | 1.96                     | 0.47              |
| 2:B:404:ILE:HG21  | 2:B:481:GLU:HG3   | 1.97                     | 0.47              |
| 2:E:1725:ARG:HA   | 2:E:1728:ARG:HG2  | 1.97                     | 0.47              |
| 2:I:580:GLU:HG2   | 2:I:583:ILE:HD11  | 1.97                     | 0.47              |
| 2:G:664:PHE:HB2   | 2:G:746:CYS:HB2   | 1.96                     | 0.47              |
| 2:G:718:GLY:HA3   | 2:G:737:LEU:HA    | 1.96                     | 0.47              |
| 1:F:7:ILE:HB      | 1:F:71:ARG:HB3    | 1.97                     | 0.46              |
| 2:B:232:THR:HB    | 2:B:252:VAL:HG11  | 1.96                     | 0.46              |
| 2:B:1152:MET:HB2  | 2:B:1161:ILE:HB   | 1.96                     | 0.46              |
| 2:B:1243:PRO:HB2  | 2:B:1600:LEU:HD22 | 1.97                     | 0.46              |
| 2:E:2196:ASN:OD1  | 2:E:2199:ARG:NH1  | 2.34                     | 0.46              |
| 2:E:4571:PHE:O    | 2:E:4575:PHE:N    | 2.48                     | 0.46              |
| 2:B:4138:ASP:OD1  | 2:B:4138:ASP:N    | 2.46                     | 0.46              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 2:E:642:THR:HG23  | 2:E:1613:LEU:HD12 | 1.96                     | 0.46              |
| 2:I:404:ILE:HG21  | 2:I:481:GLU:HG3   | 1.97                     | 0.46              |
| 2:I:637:LEU:HD23  | 2:I:1637:MET:HB3  | 1.97                     | 0.46              |
| 2:I:4063:ASP:OD1  | 2:I:4169:SER:OG   | 2.29                     | 0.46              |
| 2:G:1152:MET:HB2  | 2:G:1161:ILE:HB   | 1.96                     | 0.46              |
| 2:E:110:ARG:HH21  | 2:E:115:ARG:HB3   | 1.81                     | 0.46              |
| 2:I:2908:TYR:OH   | 2:I:2920:ARG:NE   | 2.44                     | 0.46              |
| 2:I:1725:ARG:HA   | 2:I:1728:ARG:HG2  | 1.97                     | 0.46              |
| 2:G:637:LEU:HD23  | 2:G:1637:MET:HB3  | 1.97                     | 0.46              |
| 2:B:2868:SER:O    | 2:B:2872:GLN:N    | 2.47                     | 0.46              |
| 2:B:4571:PHE:O    | 2:B:4575:PHE:N    | 2.48                     | 0.46              |
| 2:G:110:ARG:HH21  | 2:G:115:ARG:HB3   | 1.81                     | 0.46              |
| 2:G:3905:THR:HA   | 2:G:3912:THR:HG23 | 1.97                     | 0.46              |
| 2:B:580:GLU:HG2   | 2:B:583:ILE:HD11  | 1.97                     | 0.46              |
| 2:I:358:THR:HG21  | 2:I:382:GLY:HA2   | 1.98                     | 0.46              |
| 2:I:3905:THR:HA   | 2:I:3912:THR:HG23 | 1.97                     | 0.46              |
| 2:E:358:THR:HG21  | 2:E:382:GLY:HA2   | 1.98                     | 0.46              |
| 2:I:1103:GLY:HA3  | 2:I:1123:VAL:HA   | 1.98                     | 0.46              |
| 2:B:110:ARG:HH21  | 2:B:115:ARG:HB3   | 1.81                     | 0.46              |
| 2:B:2908:TYR:OH   | 2:B:2920:ARG:NE   | 2.44                     | 0.46              |
| 2:E:3905:THR:HA   | 2:E:3912:THR:HG23 | 1.97                     | 0.46              |
| 2:I:110:ARG:HH21  | 2:I:115:ARG:HB3   | 1.81                     | 0.46              |
| 2:G:4571:PHE:O    | 2:G:4575:PHE:N    | 2.48                     | 0.46              |
| 2:B:485:SER:O     | 2:B:489:ASN:N     | 2.42                     | 0.46              |
| 2:I:1243:PRO:HB2  | 2:I:1600:LEU:HD22 | 1.97                     | 0.46              |
| 2:G:642:THR:HG23  | 2:G:1613:LEU:HD12 | 1.96                     | 0.46              |
| 2:G:662:TRP:HZ3   | 2:G:811:CYS:HA    | 1.81                     | 0.46              |
| 1:J:7:ILE:HB      | 1:J:71:ARG:HB3    | 1.97                     | 0.45              |
| 2:E:662:TRP:HZ3   | 2:E:811:CYS:HA    | 1.81                     | 0.45              |
| 2:E:4152:GLU:OE1  | 2:E:4194:TYR:OH   | 2.34                     | 0.45              |
| 2:I:619:ASP:OD1   | 2:I:1680:ARG:NH1  | 2.41                     | 0.45              |
| 2:G:358:THR:HG21  | 2:G:382:GLY:HA2   | 1.98                     | 0.45              |
| 2:G:404:ILE:HG21  | 2:G:481:GLU:HG3   | 1.97                     | 0.45              |
| 2:G:469:ARG:HH21  | 2:G:3712:GLU:HB3  | 1.81                     | 0.45              |
| 2:E:1103:GLY:HA3  | 2:E:1123:VAL:HA   | 1.98                     | 0.45              |
| 2:E:4697:VAL:O    | 2:E:4701:TRP:N    | 2.49                     | 0.45              |
| 2:I:2927:LEU:HD23 | 2:I:2930:LEU:HD12 | 1.96                     | 0.45              |
| 2:I:3910:THR:HG23 | 2:I:3911:THR:HG23 | 1.98                     | 0.45              |
| 2:G:2196:ASN:OD1  | 2:G:2199:ARG:NH1  | 2.34                     | 0.45              |
| 2:G:2927:LEU:HD23 | 2:G:2930:LEU:HD12 | 1.96                     | 0.45              |
| 2:B:358:THR:HG21  | 2:B:382:GLY:HA2   | 1.98                     | 0.45              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 2:B:637:LEU:HD23  | 2:B:1637:MET:HB3  | 1.97                     | 0.45              |
| 2:B:1725:ARG:HA   | 2:B:1728:ARG:HG2  | 1.97                     | 0.45              |
| 2:E:4914:VAL:HG21 | 2:G:4884:LEU:HD11 | 1.98                     | 0.45              |
| 2:B:3910:THR:HG23 | 2:B:3911:THR:HG23 | 1.98                     | 0.45              |
| 2:E:404:ILE:HG21  | 2:E:481:GLU:HG3   | 1.97                     | 0.45              |
| 2:E:999:ASP:O     | 2:E:1004:GLY:N    | 2.50                     | 0.45              |
| 2:I:4571:PHE:O    | 2:I:4575:PHE:N    | 2.48                     | 0.45              |
| 2:G:1725:ARG:HA   | 2:G:1728:ARG:HG2  | 1.97                     | 0.45              |
| 2:B:1103:GLY:HA3  | 2:B:1123:VAL:HA   | 1.98                     | 0.45              |
| 2:E:637:LEU:HD23  | 2:E:1637:MET:HB3  | 1.97                     | 0.45              |
| 2:E:1243:PRO:HB2  | 2:E:1600:LEU:HD22 | 1.97                     | 0.45              |
| 2:I:2758:PHE:O    | 2:I:2762:THR:N    | 2.45                     | 0.45              |
| 2:B:2131:LEU:HB3  | 2:B:3662:ILE:HD13 | 1.99                     | 0.45              |
| 2:E:469:ARG:HH21  | 2:E:3712:GLU:HB3  | 1.81                     | 0.45              |
| 2:E:2765:LYS:HA   | 2:E:2859:PRO:HG3  | 1.99                     | 0.45              |
| 2:I:469:ARG:HH21  | 2:I:3712:GLU:HB3  | 1.81                     | 0.45              |
| 2:I:999:ASP:O     | 2:I:1004:GLY:N    | 2.50                     | 0.45              |
| 2:I:2868:SER:O    | 2:I:2872:GLN:N    | 2.47                     | 0.45              |
| 2:I:3901:ASN:OD1  | 2:I:3904:ARG:NH1  | 2.46                     | 0.45              |
| 2:I:4152:GLU:OE1  | 2:I:4194:TYR:OH   | 2.34                     | 0.45              |
| 1:H:7:ILE:HB      | 1:H:71:ARG:HB3    | 1.97                     | 0.45              |
| 2:B:3905:THR:HA   | 2:B:3912:THR:HG23 | 1.97                     | 0.45              |
| 2:I:2131:LEU:HB3  | 2:I:3662:ILE:HD13 | 1.99                     | 0.45              |
| 1:H:23:VAL:HG22   | 1:H:47:LYS:HG2    | 1.99                     | 0.45              |
| 2:B:887:ILE:HG21  | 2:B:959:TYR:HA    | 1.99                     | 0.45              |
| 2:B:4152:GLU:OE1  | 2:B:4194:TYR:OH   | 2.34                     | 0.45              |
| 2:E:488:LEU:O     | 2:E:492:ASP:N     | 2.45                     | 0.45              |
| 2:E:580:GLU:HG2   | 2:E:583:ILE:HD11  | 1.97                     | 0.45              |
| 2:E:1031:THR:O    | 2:E:1035:ASN:N    | 2.46                     | 0.45              |
| 2:G:999:ASP:O     | 2:G:1004:GLY:N    | 2.50                     | 0.45              |
| 2:G:2765:LYS:HA   | 2:G:2859:PRO:HG3  | 1.99                     | 0.45              |
| 1:F:23:VAL:HG22   | 1:F:47:LYS:HG2    | 1.99                     | 0.45              |
| 1:A:7:ILE:HB      | 1:A:71:ARG:HB3    | 1.97                     | 0.45              |
| 2:B:469:ARG:HH21  | 2:B:3712:GLU:HB3  | 1.81                     | 0.45              |
| 2:B:1269:CYS:HA   | 2:B:1473:UNK:HA   | 1.99                     | 0.45              |
| 2:I:662:TRP:HZ3   | 2:I:811:CYS:HA    | 1.81                     | 0.45              |
| 2:I:887:ILE:HG21  | 2:I:959:TYR:HA    | 1.99                     | 0.45              |
| 2:B:999:ASP:O     | 2:B:1004:GLY:N    | 2.50                     | 0.45              |
| 2:B:1865:MET:SD   | 2:B:1865:MET:N    | 2.90                     | 0.45              |
| 2:E:4763:GLY:O    | 2:E:4766:THR:OG1  | 2.34                     | 0.45              |
| 2:G:3901:ASN:OD1  | 2:G:3904:ARG:NH1  | 2.46                     | 0.45              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 2:B:1031:THR:O    | 2:B:1035:ASN:N    | 2.46                     | 0.44              |
| 2:E:1865:MET:SD   | 2:E:1865:MET:N    | 2.90                     | 0.44              |
| 2:E:3910:THR:HG23 | 2:E:3911:THR:HG23 | 1.98                     | 0.44              |
| 2:B:2457:LEU:HD23 | 2:B:2460:LEU:HD12 | 1.98                     | 0.44              |
| 2:B:2758:PHE:O    | 2:B:2762:THR:N    | 2.46                     | 0.44              |
| 2:E:4063:ASP:OD1  | 2:E:4169:SER:OG   | 2.29                     | 0.44              |
| 2:G:683:ARG:HG2   | 2:G:717:ASP:HB3   | 2.00                     | 0.44              |
| 2:G:2868:SER:O    | 2:G:2872:GLN:N    | 2.47                     | 0.44              |
| 2:B:683:ARG:HG2   | 2:B:717:ASP:HB3   | 2.00                     | 0.44              |
| 2:E:257:ARG:O     | 2:E:284:HIS:NE2   | 2.36                     | 0.44              |
| 2:I:2457:LEU:HD23 | 2:I:2460:LEU:HD12 | 1.98                     | 0.44              |
| 2:I:4155:PRO:HD2  | 2:I:5036:LEU:HD23 | 2.00                     | 0.44              |
| 2:G:1243:PRO:HB2  | 2:G:1600:LEU:HD22 | 1.97                     | 0.44              |
| 2:G:3910:THR:HG23 | 2:G:3911:THR:HG23 | 1.98                     | 0.44              |
| 2:B:662:TRP:HZ3   | 2:B:811:CYS:HA    | 1.81                     | 0.44              |
| 2:B:1163:THR:HA   | 2:B:1168:VAL:HA   | 2.00                     | 0.44              |
| 2:B:4582:VAL:HG11 | 2:I:4860:ARG:HD2  | 1.98                     | 0.44              |
| 2:I:2765:LYS:HA   | 2:I:2859:PRO:HG3  | 1.99                     | 0.44              |
| 2:G:580:GLU:HG2   | 2:G:583:ILE:HD11  | 1.97                     | 0.44              |
| 2:G:1103:GLY:HA3  | 2:G:1123:VAL:HA   | 1.98                     | 0.44              |
| 2:E:2457:LEU:HD23 | 2:E:2460:LEU:HD12 | 1.98                     | 0.44              |
| 2:I:1865:MET:SD   | 2:I:1865:MET:N    | 2.90                     | 0.44              |
| 1:H:21:THR:HA     | 1:H:49:ARG:HA     | 2.00                     | 0.44              |
| 2:B:1093:GLU:OE1  | 2:B:1201:HIS:NE2  | 2.42                     | 0.44              |
| 2:E:629:ARG:HD3   | 2:E:634:GLN:HG2   | 2.00                     | 0.44              |
| 2:E:1163:THR:HA   | 2:E:1168:VAL:HA   | 2.00                     | 0.44              |
| 2:G:4155:PRO:HD2  | 2:G:5036:LEU:HD23 | 2.00                     | 0.44              |
| 2:E:4228:ALA:O    | 2:E:4232:GLU:N    | 2.46                     | 0.44              |
| 2:I:4697:VAL:O    | 2:I:4701:TRP:N    | 2.49                     | 0.44              |
| 2:G:488:LEU:O     | 2:G:492:ASP:N     | 2.45                     | 0.44              |
| 2:G:4763:GLY:O    | 2:G:4766:THR:OG1  | 2.34                     | 0.44              |
| 2:B:2337:PHE:HA   | 2:B:2340:PHE:HB2  | 2.00                     | 0.44              |
| 2:B:2765:LYS:HA   | 2:B:2859:PRO:HG3  | 1.99                     | 0.44              |
| 2:E:619:ASP:OD1   | 2:E:1680:ARG:NH1  | 2.41                     | 0.44              |
| 2:I:683:ARG:HG2   | 2:I:717:ASP:HB3   | 2.00                     | 0.44              |
| 2:I:4059:LEU:HD11 | 2:I:4167:ALA:HB2  | 2.00                     | 0.44              |
| 2:G:629:ARG:HD3   | 2:G:634:GLN:HG2   | 2.00                     | 0.44              |
| 2:G:887:ILE:HG21  | 2:G:959:TYR:HA    | 1.99                     | 0.44              |
| 2:G:1163:THR:HA   | 2:G:1168:VAL:HA   | 2.00                     | 0.44              |
| 2:G:2337:PHE:HA   | 2:G:2340:PHE:HB2  | 2.00                     | 0.44              |
| 2:G:4152:GLU:OE1  | 2:G:4194:TYR:OH   | 2.34                     | 0.44              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 1:F:21:THR:HA     | 1:F:49:ARG:HA     | 2.00                     | 0.44              |
| 2:E:2131:LEU:HB3  | 2:E:3662:ILE:HD13 | 1.99                     | 0.44              |
| 2:E:4930:ALA:O    | 2:E:4934:GLY:N    | 2.51                     | 0.44              |
| 2:G:1865:MET:SD   | 2:G:1865:MET:N    | 2.90                     | 0.44              |
| 2:G:4208:PRO:HA   | 2:G:4211:LYS:HB3  | 2.00                     | 0.44              |
| 2:G:4697:VAL:O    | 2:G:4701:TRP:N    | 2.49                     | 0.44              |
| 1:J:21:THR:HA     | 1:J:49:ARG:HA     | 2.00                     | 0.43              |
| 2:E:683:ARG:HG2   | 2:E:717:ASP:HB3   | 2.00                     | 0.43              |
| 2:E:1093:GLU:OE1  | 2:E:1201:HIS:NE2  | 2.42                     | 0.43              |
| 2:B:488:LEU:O     | 2:B:492:ASP:N     | 2.45                     | 0.43              |
| 2:E:2420:HIS:ND1  | 2:E:2493:UNK:O    | 2.50                     | 0.43              |
| 2:I:1163:THR:HA   | 2:I:1168:VAL:HA   | 2.00                     | 0.43              |
| 2:I:4930:ALA:O    | 2:I:4934:GLY:N    | 2.51                     | 0.43              |
| 2:G:4930:ALA:O    | 2:G:4934:GLY:N    | 2.51                     | 0.43              |
| 1:A:23:VAL:HG22   | 1:A:47:LYS:HG2    | 1.99                     | 0.43              |
| 2:B:765:GLN:NE2   | 2:B:1521:UNK:O    | 2.51                     | 0.43              |
| 2:E:887:ILE:HG21  | 2:E:959:TYR:HA    | 1.99                     | 0.43              |
| 2:E:2337:PHE:HA   | 2:E:2340:PHE:HB2  | 2.00                     | 0.43              |
| 2:I:2337:PHE:HA   | 2:I:2340:PHE:HB2  | 2.00                     | 0.43              |
| 2:B:629:ARG:HD3   | 2:B:634:GLN:HG2   | 2.00                     | 0.43              |
| 2:B:4063:ASP:OD1  | 2:B:4169:SER:OG   | 2.29                     | 0.43              |
| 2:E:1760:HIS:CE1  | 2:E:2041:HIS:HA   | 2.54                     | 0.43              |
| 2:G:3787:LYS:HB2  | 2:G:3831:SER:HA   | 2.01                     | 0.43              |
| 2:E:4155:PRO:HD2  | 2:E:5036:LEU:HD23 | 2.00                     | 0.43              |
| 2:I:1760:HIS:CE1  | 2:I:2041:HIS:HA   | 2.54                     | 0.43              |
| 2:G:2131:LEU:HB3  | 2:G:3662:ILE:HD13 | 1.99                     | 0.43              |
| 2:G:2457:LEU:HD23 | 2:G:2460:LEU:HD12 | 1.98                     | 0.43              |
| 1:J:23:VAL:HG22   | 1:J:47:LYS:HG2    | 1.99                     | 0.43              |
| 2:B:4155:PRO:HD2  | 2:B:5036:LEU:HD23 | 2.00                     | 0.43              |
| 2:I:1093:GLU:OE1  | 2:I:1201:HIS:NE2  | 2.42                     | 0.43              |
| 2:I:3787:LYS:HB2  | 2:I:3831:SER:HA   | 2.01                     | 0.43              |
| 2:G:619:ASP:OD1   | 2:G:1680:ARG:NH1  | 2.41                     | 0.43              |
| 2:B:1760:HIS:CE1  | 2:B:2041:HIS:HA   | 2.54                     | 0.43              |
| 2:E:2024:PRO:O    | 2:E:2028:ARG:NE   | 2.48                     | 0.43              |
| 2:I:4208:PRO:HA   | 2:I:4211:LYS:HB3  | 2.00                     | 0.43              |
| 2:I:4763:GLY:O    | 2:I:4766:THR:OG1  | 2.34                     | 0.43              |
| 2:B:4833:ASN:HB3  | 2:B:4935:LEU:HD23 | 2.01                     | 0.43              |
| 2:I:629:ARG:HD3   | 2:I:634:GLN:HG2   | 2.00                     | 0.43              |
| 2:G:1649:ASP:HB3  | 2:G:1652:GLU:HG2  | 2.01                     | 0.43              |
| 2:G:4232:GLU:OE1  | 2:G:5019:TRP:NE1  | 2.52                     | 0.43              |
| 1:A:21:THR:HA     | 1:A:49:ARG:HA     | 2.00                     | 0.43              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 2:B:4208:PRO:HA   | 2:B:4211:LYS:HB3  | 2.00                     | 0.43              |
| 2:E:907:LEU:O     | 2:E:963:ASN:ND2   | 2.38                     | 0.43              |
| 2:E:4833:ASN:HB3  | 2:E:4935:LEU:HD23 | 2.01                     | 0.43              |
| 2:I:4995:LEU:HD11 | 2:I:5011:TRP:HB2  | 2.01                     | 0.43              |
| 2:G:983:THR:O     | 2:G:987:ARG:N     | 2.51                     | 0.43              |
| 2:B:4930:ALA:O    | 2:B:4934:GLY:N    | 2.51                     | 0.43              |
| 2:E:4232:GLU:OE1  | 2:E:5019:TRP:NE1  | 2.52                     | 0.43              |
| 2:I:647:ASN:ND2   | 2:I:820:ARG:O     | 2.43                     | 0.43              |
| 2:G:4833:ASN:HB3  | 2:G:4935:LEU:HD23 | 2.01                     | 0.43              |
| 2:E:2381:GLU:HA   | 2:E:2384:ILE:HD12 | 2.01                     | 0.42              |
| 2:I:1649:ASP:HB3  | 2:I:1652:GLU:HG2  | 2.01                     | 0.42              |
| 2:I:3772:THR:OG1  | 2:I:3815:LYS:NZ   | 2.36                     | 0.42              |
| 2:G:4059:LEU:HD11 | 2:G:4167:ALA:HB2  | 2.00                     | 0.42              |
| 2:B:1649:ASP:HB3  | 2:B:1652:GLU:HG2  | 2.01                     | 0.42              |
| 2:B:4995:LEU:HD11 | 2:B:5011:TRP:HB2  | 2.01                     | 0.42              |
| 2:E:2758:PHE:O    | 2:E:2762:THR:N    | 2.45                     | 0.42              |
| 2:E:4851:TYR:HD2  | 2:E:4920:PHE:HD1  | 1.68                     | 0.42              |
| 2:E:1649:ASP:HB3  | 2:E:1652:GLU:HG2  | 2.01                     | 0.42              |
| 2:I:907:LEU:O     | 2:I:963:ASN:ND2   | 2.38                     | 0.42              |
| 2:I:983:THR:O     | 2:I:987:ARG:N     | 2.51                     | 0.42              |
| 2:I:2778:GLY:HA3  | 2:I:2787:THR:HB   | 2.02                     | 0.42              |
| 2:I:4092:ASP:OD1  | 2:I:4092:ASP:N    | 2.53                     | 0.42              |
| 2:G:1760:HIS:CE1  | 2:G:2041:HIS:HA   | 2.54                     | 0.42              |
| 2:B:4697:VAL:O    | 2:B:4701:TRP:N    | 2.49                     | 0.42              |
| 2:E:4059:LEU:HD11 | 2:E:4167:ALA:HB2  | 2.00                     | 0.42              |
| 2:G:2420:HIS:ND1  | 2:G:2493:UNK:O    | 2.49                     | 0.42              |
| 2:I:4833:ASN:HB3  | 2:I:4935:LEU:HD23 | 2.01                     | 0.42              |
| 2:G:218:HIS:HB3   | 2:G:392:ARG:HD3   | 2.02                     | 0.42              |
| 2:G:4851:TYR:HD2  | 2:G:4920:PHE:HD1  | 1.67                     | 0.42              |
| 2:B:218:HIS:HB3   | 2:B:392:ARG:HD3   | 2.02                     | 0.42              |
| 2:E:3946:GLN:OE1  | 2:E:3950:ASN:ND2  | 2.53                     | 0.42              |
| 2:I:379:HIS:CD2   | 2:I:381:GLU:H     | 2.38                     | 0.42              |
| 2:I:2381:GLU:HA   | 2:I:2384:ILE:HD12 | 2.01                     | 0.42              |
| 2:G:4092:ASP:N    | 2:G:4092:ASP:OD1  | 2.53                     | 0.42              |
| 1:J:71:ARG:HH22   | 2:I:679:ALA:HB2   | 1.85                     | 0.42              |
| 2:E:983:THR:O     | 2:E:987:ARG:N     | 2.51                     | 0.42              |
| 2:I:683:ARG:NH1   | 2:I:707:VAL:O     | 2.45                     | 0.42              |
| 2:G:379:HIS:CD2   | 2:G:381:GLU:H     | 2.38                     | 0.42              |
| 2:G:2815:ALA:HB3  | 2:G:2881:ASN:HD21 | 1.85                     | 0.42              |
| 2:G:3946:GLN:OE1  | 2:G:3950:ASN:ND2  | 2.53                     | 0.42              |
| 2:B:2381:GLU:HA   | 2:B:2384:ILE:HD12 | 2.01                     | 0.42              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 2:B:3362:UNK:O    | 2:B:3366:UNK:N    | 2.53                     | 0.42              |
| 2:B:3946:GLN:OE1  | 2:B:3950:ASN:ND2  | 2.53                     | 0.42              |
| 2:B:4092:ASP:OD1  | 2:B:4092:ASP:N    | 2.53                     | 0.42              |
| 2:B:4763:GLY:O    | 2:B:4766:THR:OG1  | 2.34                     | 0.42              |
| 2:E:1698:LEU:N    | 2:E:1712:TYR:OH   | 2.53                     | 0.42              |
| 2:I:3946:GLN:OE1  | 2:I:3950:ASN:ND2  | 2.53                     | 0.42              |
| 2:I:4666:VAL:HG23 | 2:I:4669:VAL:HB   | 2.02                     | 0.42              |
| 2:B:4059:LEU:HD11 | 2:B:4167:ALA:HB2  | 2.00                     | 0.42              |
| 2:B:4851:TYR:HD2  | 2:B:4920:PHE:HD1  | 1.68                     | 0.42              |
| 2:E:3787:LYS:HB2  | 2:E:3831:SER:HA   | 2.01                     | 0.42              |
| 2:E:4092:ASP:N    | 2:E:4092:ASP:OD1  | 2.53                     | 0.42              |
| 2:E:4208:PRO:HA   | 2:E:4211:LYS:HB3  | 2.00                     | 0.42              |
| 2:I:218:HIS:HB3   | 2:I:392:ARG:HD3   | 2.02                     | 0.42              |
| 2:G:257:ARG:O     | 2:G:284:HIS:NE2   | 2.36                     | 0.42              |
| 2:G:1031:THR:O    | 2:G:1035:ASN:N    | 2.46                     | 0.42              |
| 2:B:978:THR:HB    | 2:B:980:ALA:H     | 1.85                     | 0.42              |
| 2:E:4685:GLY:HA3  | 2:E:4689:THR:HB   | 2.02                     | 0.42              |
| 2:I:4851:TYR:HD2  | 2:I:4920:PHE:HD1  | 1.68                     | 0.42              |
| 2:G:2778:GLY:HA3  | 2:G:2787:THR:HB   | 2.02                     | 0.42              |
| 2:B:4021:LYS:HG3  | 2:B:4142:ASN:HD22 | 1.85                     | 0.41              |
| 2:B:4666:VAL:HG23 | 2:B:4669:VAL:HB   | 2.02                     | 0.41              |
| 2:E:1078:GLU:HG3  | 2:E:1237:TRP:HE1  | 1.85                     | 0.41              |
| 2:E:4021:LYS:HG3  | 2:E:4142:ASN:HD22 | 1.85                     | 0.41              |
| 2:G:940:GLY:O     | 2:G:1052:ASN:N    | 2.53                     | 0.41              |
| 2:G:4685:GLY:HA3  | 2:G:4689:THR:HB   | 2.02                     | 0.41              |
| 2:B:379:HIS:CD2   | 2:B:381:GLU:H     | 2.38                     | 0.41              |
| 2:B:596:ASN:HB3   | 2:B:599:VAL:HG22  | 2.03                     | 0.41              |
| 2:B:3787:LYS:HB2  | 2:B:3831:SER:HA   | 2.01                     | 0.41              |
| 2:E:218:HIS:HB3   | 2:E:392:ARG:HD3   | 2.02                     | 0.41              |
| 2:E:4995:LEU:HD11 | 2:E:5011:TRP:HB2  | 2.01                     | 0.41              |
| 2:I:1078:GLU:HG3  | 2:I:1237:TRP:HE1  | 1.85                     | 0.41              |
| 2:I:4232:GLU:OE1  | 2:I:5019:TRP:NE1  | 2.52                     | 0.41              |
| 2:G:596:ASN:HB3   | 2:G:599:VAL:HG22  | 2.03                     | 0.41              |
| 2:G:978:THR:HB    | 2:G:980:ALA:H     | 1.85                     | 0.41              |
| 2:G:2381:GLU:HA   | 2:G:2384:ILE:HD12 | 2.01                     | 0.41              |
| 2:G:4634:GLU:HG3  | 2:G:4636:THR:H    | 1.86                     | 0.41              |
| 2:G:4995:LEU:HD11 | 2:G:5011:TRP:HB2  | 2.01                     | 0.41              |
| 2:E:2778:GLY:HA3  | 2:E:2787:THR:HB   | 2.02                     | 0.41              |
| 2:E:2815:ALA:HB3  | 2:E:2881:ASN:HD21 | 1.85                     | 0.41              |
| 2:E:4634:GLU:HG3  | 2:E:4636:THR:H    | 1.85                     | 0.41              |
| 2:B:612:VAL:HG12  | 2:B:2167:ILE:HA   | 2.03                     | 0.41              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 2:E:379:HIS:CD2   | 2:E:381:GLU:H     | 2.38                     | 0.41              |
| 2:I:612:VAL:HG12  | 2:I:2167:ILE:HA   | 2.03                     | 0.41              |
| 2:I:1227:ALA:HB1  | 2:I:1230:MET:HG3  | 2.02                     | 0.41              |
| 2:I:1698:LEU:N    | 2:I:1712:TYR:OH   | 2.53                     | 0.41              |
| 2:G:273:HIS:CE1   | 2:G:337:PRO:HB3   | 2.56                     | 0.41              |
| 2:G:612:VAL:HG12  | 2:G:2167:ILE:HA   | 2.02                     | 0.41              |
| 1:F:87:HIS:HA     | 1:F:88:PRO:HD3    | 1.93                     | 0.41              |
| 2:B:273:HIS:CE1   | 2:B:337:PRO:HB3   | 2.56                     | 0.41              |
| 2:B:619:ASP:OD1   | 2:B:1680:ARG:NH1  | 2.41                     | 0.41              |
| 2:B:940:GLY:O     | 2:B:1052:ASN:N    | 2.53                     | 0.41              |
| 2:B:1078:GLU:HG3  | 2:B:1237:TRP:HE1  | 1.85                     | 0.41              |
| 2:B:1641:ILE:HA   | 2:B:1642:PRO:HD3  | 1.92                     | 0.41              |
| 2:B:4232:GLU:OE1  | 2:B:5019:TRP:NE1  | 2.52                     | 0.41              |
| 2:E:273:HIS:CE1   | 2:E:337:PRO:HB3   | 2.56                     | 0.41              |
| 2:E:2868:SER:O    | 2:E:2872:GLN:N    | 2.47                     | 0.41              |
| 2:I:273:HIS:CE1   | 2:I:337:PRO:HB3   | 2.56                     | 0.41              |
| 2:I:978:THR:HB    | 2:I:980:ALA:H     | 1.85                     | 0.41              |
| 2:I:1031:THR:O    | 2:I:1035:ASN:N    | 2.46                     | 0.41              |
| 1:F:42:ARG:HG2    | 2:E:1691:GLN:HG2  | 2.03                     | 0.41              |
| 2:B:793:LEU:HD22  | 2:B:821:LEU:HD13  | 2.03                     | 0.41              |
| 2:B:989:ALA:O     | 2:B:1035:ASN:ND2  | 2.53                     | 0.41              |
| 2:B:1698:LEU:N    | 2:B:1712:TYR:OH   | 2.53                     | 0.41              |
| 2:B:3365:UNK:O    | 2:B:3369:UNK:N    | 2.54                     | 0.41              |
| 2:E:596:ASN:HB3   | 2:E:599:VAL:HG22  | 2.03                     | 0.41              |
| 2:E:4577:LEU:HG   | 2:E:4580:TYR:HE2  | 1.86                     | 0.41              |
| 2:I:793:LEU:HD22  | 2:I:821:LEU:HD13  | 2.03                     | 0.41              |
| 2:I:4685:GLY:HA3  | 2:I:4689:THR:HB   | 2.02                     | 0.41              |
| 2:G:2094:LEU:HD23 | 2:G:2127:GLN:HE22 | 1.86                     | 0.41              |
| 2:B:786:GLY:HA2   | 2:B:1631:GLN:HA   | 2.03                     | 0.41              |
| 2:B:4634:GLU:HG3  | 2:B:4636:THR:H    | 1.86                     | 0.41              |
| 2:B:4685:GLY:HA3  | 2:B:4689:THR:HB   | 2.02                     | 0.41              |
| 2:E:489:ASN:HA    | 2:E:492:ASP:HB2   | 2.03                     | 0.41              |
| 2:E:683:ARG:NH1   | 2:E:707:VAL:O     | 2.45                     | 0.41              |
| 2:G:793:LEU:HD22  | 2:G:821:LEU:HD13  | 2.03                     | 0.41              |
| 2:G:3362:UNK:O    | 2:G:3366:UNK:N    | 2.54                     | 0.41              |
| 2:B:1227:ALA:HB1  | 2:B:1230:MET:HG3  | 2.02                     | 0.41              |
| 2:E:2212:VAL:O    | 2:E:2216:GLY:N    | 2.48                     | 0.41              |
| 2:E:3362:UNK:O    | 2:E:3366:UNK:N    | 2.54                     | 0.41              |
| 2:E:4666:VAL:HG23 | 2:E:4669:VAL:HB   | 2.02                     | 0.41              |
| 2:I:786:GLY:HA2   | 2:I:1631:GLN:HA   | 2.03                     | 0.41              |
| 2:I:940:GLY:O     | 2:I:1052:ASN:N    | 2.53                     | 0.41              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 2:I:2815:ALA:HB3  | 2:I:2881:ASN:HD21 | 1.85                     | 0.41              |
| 2:I:3362:UNK:O    | 2:I:3366:UNK:N    | 2.54                     | 0.41              |
| 2:I:4577:LEU:HG   | 2:I:4580:TYR:HE2  | 1.86                     | 0.41              |
| 2:I:4634:GLU:HG3  | 2:I:4636:THR:H    | 1.85                     | 0.41              |
| 2:G:489:ASN:HA    | 2:G:492:ASP:HB2   | 2.03                     | 0.41              |
| 2:G:1665:HIS:HA   | 2:G:1668:ARG:HG2  | 2.03                     | 0.41              |
| 2:G:1698:LEU:N    | 2:G:1712:TYR:OH   | 2.53                     | 0.41              |
| 1:F:27:THR:HB     | 1:F:100:ASP:HB3   | 2.03                     | 0.41              |
| 2:B:2024:PRO:O    | 2:B:2028:ARG:NE   | 2.48                     | 0.41              |
| 2:B:2815:ALA:HB3  | 2:B:2881:ASN:HD21 | 1.85                     | 0.41              |
| 2:E:612:VAL:HG12  | 2:E:2167:ILE:HA   | 2.03                     | 0.41              |
| 2:E:989:ALA:O     | 2:E:1035:ASN:ND2  | 2.53                     | 0.41              |
| 2:E:1991:THR:O    | 2:E:1995:THR:OG1  | 2.32                     | 0.41              |
| 2:I:479:GLN:HE21  | 2:I:536:ASN:ND2   | 2.19                     | 0.41              |
| 2:I:596:ASN:HB3   | 2:I:599:VAL:HG22  | 2.03                     | 0.41              |
| 2:I:4884:LEU:HD11 | 2:G:4914:VAL:HG21 | 2.03                     | 0.41              |
| 2:G:2290:LEU:HG   | 2:G:2291:GLN:H    | 1.86                     | 0.41              |
| 2:G:2466:LEU:HD23 | 2:G:2469:ILE:HD12 | 2.02                     | 0.41              |
| 1:J:27:THR:HB     | 1:J:100:ASP:HB3   | 2.03                     | 0.41              |
| 2:E:776:LEU:HG    | 2:E:848:HIS:HA    | 2.03                     | 0.41              |
| 2:E:793:LEU:HD22  | 2:E:821:LEU:HD13  | 2.03                     | 0.41              |
| 2:E:794:GLY:H     | 2:E:798:GLY:HA3   | 1.86                     | 0.41              |
| 2:E:1665:HIS:HA   | 2:E:1668:ARG:HG2  | 2.03                     | 0.41              |
| 2:I:2290:LEU:HG   | 2:I:2291:GLN:H    | 1.86                     | 0.41              |
| 2:I:4021:LYS:HG3  | 2:I:4142:ASN:HD22 | 1.86                     | 0.41              |
| 1:H:27:THR:HB     | 1:H:100:ASP:HB3   | 2.03                     | 0.40              |
| 2:B:2231:SER:HA   | 2:B:2234:ARG:HG2  | 2.03                     | 0.40              |
| 2:B:2778:GLY:HA3  | 2:B:2787:THR:HB   | 2.02                     | 0.40              |
| 2:E:2094:LEU:HD23 | 2:E:2127:GLN:HE22 | 1.86                     | 0.40              |
| 2:E:2438:PRO:HB3  | 2:E:2453:ILE:HB   | 2.03                     | 0.40              |
| 2:E:2823:ILE:HG12 | 2:E:2937:VAL:HG22 | 2.04                     | 0.40              |
| 2:I:1595:LEU:HD23 | 2:I:1595:LEU:HA   | 1.97                     | 0.40              |
| 2:I:1727:ARG:HH21 | 2:I:1775:HIS:CE1  | 2.40                     | 0.40              |
| 2:G:1727:ARG:HH21 | 2:G:1775:HIS:CE1  | 2.39                     | 0.40              |
| 2:G:4577:LEU:HG   | 2:G:4580:TYR:HE2  | 1.86                     | 0.40              |
| 2:G:4666:VAL:HG23 | 2:G:4669:VAL:HB   | 2.02                     | 0.40              |
| 1:A:27:THR:HB     | 1:A:100:ASP:HB3   | 2.03                     | 0.40              |
| 2:B:489:ASN:HA    | 2:B:492:ASP:HB2   | 2.03                     | 0.40              |
| 2:B:1105:ALA:HB1  | 2:B:1109:LEU:HD21 | 2.03                     | 0.40              |
| 2:B:1727:ARG:HH21 | 2:B:1775:HIS:CE1  | 2.40                     | 0.40              |
| 2:E:1859:VAL:HA   | 2:E:1862:ILE:HG12 | 2.04                     | 0.40              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 2:G:794:GLY:H     | 2:G:798:GLY:HA3   | 1.86                     | 0.40              |
| 2:G:3842:LEU:O    | 2:G:3929:SER:OG   | 2.40                     | 0.40              |
| 2:G:4021:LYS:HG3  | 2:G:4142:ASN:HD22 | 1.86                     | 0.40              |
| 2:B:479:GLN:HE21  | 2:B:536:ASN:ND2   | 2.19                     | 0.40              |
| 2:B:794:GLY:H     | 2:B:798:GLY:HA3   | 1.86                     | 0.40              |
| 2:B:1665:HIS:HA   | 2:B:1668:ARG:HG2  | 2.03                     | 0.40              |
| 2:B:2212:VAL:O    | 2:B:2216:GLY:N    | 2.48                     | 0.40              |
| 2:B:2466:LEU:HD23 | 2:B:2469:ILE:HD12 | 2.02                     | 0.40              |
| 2:B:3889:GLN:HE22 | 2:B:3963:ASN:HB3  | 1.86                     | 0.40              |
| 2:E:2231:SER:HA   | 2:E:2234:ARG:HG2  | 2.03                     | 0.40              |
| 2:I:489:ASN:HA    | 2:I:492:ASP:HB2   | 2.03                     | 0.40              |
| 2:I:2094:LEU:HD23 | 2:I:2127:GLN:HE22 | 1.86                     | 0.40              |
| 2:I:2212:VAL:O    | 2:I:2216:GLY:N    | 2.48                     | 0.40              |
| 2:G:4680:LYS:HD3  | 2:G:4686:LEU:HD22 | 2.03                     | 0.40              |
| 2:B:776:LEU:HG    | 2:B:848:HIS:HA    | 2.03                     | 0.40              |
| 2:B:2438:PRO:HB3  | 2:B:2453:ILE:HB   | 2.03                     | 0.40              |
| 2:E:3365:UNK:O    | 2:E:3369:UNK:N    | 2.55                     | 0.40              |
| 2:I:2823:ILE:HG12 | 2:I:2937:VAL:HG22 | 2.03                     | 0.40              |
| 2:I:3365:UNK:O    | 2:I:3369:UNK:N    | 2.55                     | 0.40              |
| 2:G:681:HIS:HB3   | 2:G:784:SER:HB3   | 2.04                     | 0.40              |
| 2:G:1078:GLU:HG3  | 2:G:1237:TRP:HE1  | 1.85                     | 0.40              |
| 2:G:2231:SER:HA   | 2:G:2234:ARG:HG2  | 2.03                     | 0.40              |
| 2:G:3889:GLN:HE22 | 2:G:3963:ASN:HB3  | 1.86                     | 0.40              |
| 1:J:92:PRO:HD3    | 2:I:627:PRO:HB2   | 2.03                     | 0.40              |
| 2:B:2290:LEU:HG   | 2:B:2291:GLN:H    | 1.86                     | 0.40              |
| 2:B:2517:UNK:O    | 2:B:2521:UNK:N    | 2.55                     | 0.40              |
| 2:B:2823:ILE:HG12 | 2:B:2937:VAL:HG22 | 2.04                     | 0.40              |
| 2:I:794:GLY:H     | 2:I:798:GLY:HA3   | 1.86                     | 0.40              |
| 2:G:3365:UNK:O    | 2:G:3369:UNK:N    | 2.54                     | 0.40              |

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     | 105/108 (97%)     | 95 (90%)    | 10 (10%)   | 0        | 100         | 100 |
| 1   | F     | 105/108 (97%)     | 95 (90%)    | 10 (10%)   | 0        | 100         | 100 |
| 1   | H     | 105/108 (97%)     | 95 (90%)    | 10 (10%)   | 0        | 100         | 100 |
| 1   | J     | 105/108 (97%)     | 95 (90%)    | 10 (10%)   | 0        | 100         | 100 |
| 2   | B     | 3235/4676 (69%)   | 2894 (90%)  | 336 (10%)  | 5 (0%)   | 44          | 77  |
| 2   | E     | 3235/4676 (69%)   | 2896 (90%)  | 334 (10%)  | 5 (0%)   | 44          | 77  |
| 2   | G     | 3235/4676 (69%)   | 2894 (90%)  | 336 (10%)  | 5 (0%)   | 44          | 77  |
| 2   | I     | 3235/4676 (69%)   | 2895 (90%)  | 335 (10%)  | 5 (0%)   | 44          | 77  |
| All | All   | 13360/19136 (70%) | 11959 (90%) | 1381 (10%) | 20 (0%)  | 50          | 82  |

All (20) Ramachandran outliers are listed below:

| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 2   | B     | 1708 | ARG  |
| 2   | E     | 1708 | ARG  |
| 2   | I     | 1708 | ARG  |
| 2   | G     | 1708 | ARG  |
| 2   | B     | 1932 | PRO  |
| 2   | E     | 1932 | PRO  |
| 2   | I     | 1932 | PRO  |
| 2   | G     | 1932 | PRO  |
| 2   | B     | 1840 | PRO  |
| 2   | B     | 4641 | PRO  |
| 2   | B     | 4958 | CYS  |
| 2   | E     | 1840 | PRO  |
| 2   | E     | 4641 | PRO  |
| 2   | E     | 4958 | CYS  |
| 2   | I     | 1840 | PRO  |
| 2   | I     | 4641 | PRO  |
| 2   | I     | 4958 | CYS  |
| 2   | G     | 1840 | PRO  |
| 2   | G     | 4641 | PRO  |
| 2   | G     | 4958 | CYS  |

### 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     | 88/89 (99%)       | 88 (100%)   | 0        | 100         | 100 |
| 1   | F     | 88/89 (99%)       | 88 (100%)   | 0        | 100         | 100 |
| 1   | H     | 88/89 (99%)       | 88 (100%)   | 0        | 100         | 100 |
| 1   | J     | 88/89 (99%)       | 88 (100%)   | 0        | 100         | 100 |
| 2   | B     | 2493/3202 (78%)   | 2475 (99%)  | 18 (1%)  | 81          | 86  |
| 2   | E     | 2493/3202 (78%)   | 2475 (99%)  | 18 (1%)  | 81          | 86  |
| 2   | G     | 2493/3202 (78%)   | 2475 (99%)  | 18 (1%)  | 81          | 86  |
| 2   | I     | 2493/3202 (78%)   | 2475 (99%)  | 18 (1%)  | 81          | 86  |
| All | All   | 10324/13164 (78%) | 10252 (99%) | 72 (1%)  | 80          | 86  |

All (72) residues with a non-rotameric sidechain are listed below:

| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 2   | B     | 131  | LEU  |
| 2   | B     | 534  | ARG  |
| 2   | B     | 553  | ARG  |
| 2   | B     | 978  | THR  |
| 2   | B     | 1076 | ARG  |
| 2   | B     | 1141 | ARG  |
| 2   | B     | 1600 | LEU  |
| 2   | B     | 1676 | LEU  |
| 2   | B     | 1703 | LEU  |
| 2   | B     | 1964 | ARG  |
| 2   | B     | 3787 | LYS  |
| 2   | B     | 3805 | LEU  |
| 2   | B     | 3896 | ASN  |
| 2   | B     | 4034 | ASN  |
| 2   | B     | 4085 | ARG  |
| 2   | B     | 4120 | ASN  |
| 2   | B     | 4137 | ARG  |
| 2   | B     | 4995 | LEU  |
| 2   | E     | 131  | LEU  |
| 2   | E     | 534  | ARG  |
| 2   | E     | 553  | ARG  |
| 2   | E     | 978  | THR  |
| 2   | E     | 1076 | ARG  |
| 2   | E     | 1141 | ARG  |

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| <b>Mol</b> | <b>Chain</b> | <b>Res</b> | <b>Type</b> |
|------------|--------------|------------|-------------|
| 2          | E            | 1600       | LEU         |
| 2          | E            | 1676       | LEU         |
| 2          | E            | 1703       | LEU         |
| 2          | E            | 1964       | ARG         |
| 2          | E            | 3787       | LYS         |
| 2          | E            | 3805       | LEU         |
| 2          | E            | 3896       | ASN         |
| 2          | E            | 4034       | ASN         |
| 2          | E            | 4085       | ARG         |
| 2          | E            | 4120       | ASN         |
| 2          | E            | 4137       | ARG         |
| 2          | E            | 4995       | LEU         |
| 2          | I            | 131        | LEU         |
| 2          | I            | 534        | ARG         |
| 2          | I            | 553        | ARG         |
| 2          | I            | 978        | THR         |
| 2          | I            | 1076       | ARG         |
| 2          | I            | 1141       | ARG         |
| 2          | I            | 1600       | LEU         |
| 2          | I            | 1676       | LEU         |
| 2          | I            | 1703       | LEU         |
| 2          | I            | 1964       | ARG         |
| 2          | I            | 3787       | LYS         |
| 2          | I            | 3805       | LEU         |
| 2          | I            | 3896       | ASN         |
| 2          | I            | 4034       | ASN         |
| 2          | I            | 4085       | ARG         |
| 2          | I            | 4120       | ASN         |
| 2          | I            | 4137       | ARG         |
| 2          | I            | 4995       | LEU         |
| 2          | G            | 131        | LEU         |
| 2          | G            | 534        | ARG         |
| 2          | G            | 553        | ARG         |
| 2          | G            | 978        | THR         |
| 2          | G            | 1076       | ARG         |
| 2          | G            | 1141       | ARG         |
| 2          | G            | 1600       | LEU         |
| 2          | G            | 1676       | LEU         |
| 2          | G            | 1703       | LEU         |
| 2          | G            | 1964       | ARG         |
| 2          | G            | 3787       | LYS         |
| 2          | G            | 3805       | LEU         |

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| <b>Mol</b> | <b>Chain</b> | <b>Res</b> | <b>Type</b> |
|------------|--------------|------------|-------------|
| 2          | G            | 3896       | ASN         |
| 2          | G            | 4034       | ASN         |
| 2          | G            | 4085       | ARG         |
| 2          | G            | 4120       | ASN         |
| 2          | G            | 4137       | ARG         |
| 2          | G            | 4995       | LEU         |

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (120) such sidechains are listed below:

| <b>Mol</b> | <b>Chain</b> | <b>Res</b> | <b>Type</b> |
|------------|--------------|------------|-------------|
| 1          | F            | 87         | HIS         |
| 1          | A            | 87         | HIS         |
| 1          | H            | 87         | HIS         |
| 1          | J            | 87         | HIS         |
| 2          | B            | 23         | GLN         |
| 2          | B            | 57         | ASN         |
| 2          | B            | 111        | HIS         |
| 2          | B            | 113        | HIS         |
| 2          | B            | 203        | ASN         |
| 2          | B            | 224        | HIS         |
| 2          | B            | 273        | HIS         |
| 2          | B            | 379        | HIS         |
| 2          | B            | 405        | HIS         |
| 2          | B            | 413        | GLN         |
| 2          | B            | 479        | GLN         |
| 2          | B            | 765        | GLN         |
| 2          | B            | 1158       | ASN         |
| 2          | B            | 1719       | HIS         |
| 2          | B            | 1760       | HIS         |
| 2          | B            | 1775       | HIS         |
| 2          | B            | 2005       | GLN         |
| 2          | B            | 2127       | GLN         |
| 2          | B            | 3896       | ASN         |
| 2          | B            | 3946       | GLN         |
| 2          | B            | 3950       | ASN         |
| 2          | B            | 3994       | HIS         |
| 2          | B            | 4034       | ASN         |
| 2          | B            | 4054       | ASN         |
| 2          | B            | 4120       | ASN         |
| 2          | B            | 4142       | ASN         |
| 2          | B            | 4553       | ASN         |
| 2          | B            | 4984       | ASN         |

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| <b>Mol</b> | <b>Chain</b> | <b>Res</b> | <b>Type</b> |
|------------|--------------|------------|-------------|
| 2          | E            | 23         | GLN         |
| 2          | E            | 57         | ASN         |
| 2          | E            | 111        | HIS         |
| 2          | E            | 113        | HIS         |
| 2          | E            | 203        | ASN         |
| 2          | E            | 224        | HIS         |
| 2          | E            | 273        | HIS         |
| 2          | E            | 379        | HIS         |
| 2          | E            | 405        | HIS         |
| 2          | E            | 413        | GLN         |
| 2          | E            | 479        | GLN         |
| 2          | E            | 765        | GLN         |
| 2          | E            | 1158       | ASN         |
| 2          | E            | 1719       | HIS         |
| 2          | E            | 1760       | HIS         |
| 2          | E            | 1775       | HIS         |
| 2          | E            | 2005       | GLN         |
| 2          | E            | 2127       | GLN         |
| 2          | E            | 3889       | GLN         |
| 2          | E            | 3896       | ASN         |
| 2          | E            | 3946       | GLN         |
| 2          | E            | 3950       | ASN         |
| 2          | E            | 3960       | GLN         |
| 2          | E            | 3994       | HIS         |
| 2          | E            | 4034       | ASN         |
| 2          | E            | 4054       | ASN         |
| 2          | E            | 4120       | ASN         |
| 2          | E            | 4142       | ASN         |
| 2          | E            | 4553       | ASN         |
| 2          | E            | 4984       | ASN         |
| 2          | I            | 23         | GLN         |
| 2          | I            | 57         | ASN         |
| 2          | I            | 111        | HIS         |
| 2          | I            | 113        | HIS         |
| 2          | I            | 203        | ASN         |
| 2          | I            | 224        | HIS         |
| 2          | I            | 273        | HIS         |
| 2          | I            | 379        | HIS         |
| 2          | I            | 405        | HIS         |
| 2          | I            | 413        | GLN         |
| 2          | I            | 479        | GLN         |
| 2          | I            | 765        | GLN         |

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| <b>Mol</b> | <b>Chain</b> | <b>Res</b> | <b>Type</b> |
|------------|--------------|------------|-------------|
| 2          | I            | 1158       | ASN         |
| 2          | I            | 1719       | HIS         |
| 2          | I            | 1760       | HIS         |
| 2          | I            | 1775       | HIS         |
| 2          | I            | 2005       | GLN         |
| 2          | I            | 2127       | GLN         |
| 2          | I            | 3781       | GLN         |
| 2          | I            | 3896       | ASN         |
| 2          | I            | 3946       | GLN         |
| 2          | I            | 3950       | ASN         |
| 2          | I            | 3994       | HIS         |
| 2          | I            | 4034       | ASN         |
| 2          | I            | 4054       | ASN         |
| 2          | I            | 4120       | ASN         |
| 2          | I            | 4142       | ASN         |
| 2          | I            | 4553       | ASN         |
| 2          | I            | 4984       | ASN         |
| 2          | G            | 23         | GLN         |
| 2          | G            | 57         | ASN         |
| 2          | G            | 111        | HIS         |
| 2          | G            | 113        | HIS         |
| 2          | G            | 203        | ASN         |
| 2          | G            | 224        | HIS         |
| 2          | G            | 273        | HIS         |
| 2          | G            | 379        | HIS         |
| 2          | G            | 405        | HIS         |
| 2          | G            | 413        | GLN         |
| 2          | G            | 479        | GLN         |
| 2          | G            | 765        | GLN         |
| 2          | G            | 1158       | ASN         |
| 2          | G            | 1719       | HIS         |
| 2          | G            | 1760       | HIS         |
| 2          | G            | 1775       | HIS         |
| 2          | G            | 2005       | GLN         |
| 2          | G            | 2127       | GLN         |
| 2          | G            | 3781       | GLN         |
| 2          | G            | 3896       | ASN         |
| 2          | G            | 3946       | GLN         |
| 2          | G            | 3950       | ASN         |
| 2          | G            | 3994       | HIS         |
| 2          | G            | 4034       | ASN         |
| 2          | G            | 4054       | ASN         |

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| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 2   | G     | 4120 | ASN  |
| 2   | G     | 4142 | ASN  |
| 2   | G     | 4553 | ASN  |
| 2   | G     | 4984 | 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 8 ligands modelled in this entry, 8 are monoatomic - leaving 0 for Mogul analysis.

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

### 5.7 Other polymers [i](#)

There are no such residues in this entry.

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

The following chains have linkage breaks:

| Mol | Chain | Number of breaks |
|-----|-------|------------------|
| 2   | B     | 12               |
| 2   | G     | 12               |
| 2   | I     | 12               |
| 2   | E     | 12               |

All chain breaks are listed below:

| Model | Chain | Residue-1 | Atom-1 | Residue-2 | Atom-2 | Distance (Å) |
|-------|-------|-----------|--------|-----------|--------|--------------|
| 1     | B     | 3613:UNK  | C      | 3639:THR  | N      | 44.23        |
| 1     | G     | 3613:UNK  | C      | 3639:THR  | N      | 43.95        |
| 1     | I     | 3613:UNK  | C      | 3639:THR  | N      | 43.88        |
| 1     | E     | 3613:UNK  | C      | 3639:THR  | N      | 43.84        |
| 1     | E     | 3163:UNK  | C      | 3170:UNK  | N      | 16.60        |
| 1     | I     | 3163:UNK  | C      | 3170:UNK  | N      | 16.60        |
| 1     | G     | 3163:UNK  | C      | 3170:UNK  | N      | 16.59        |
| 1     | B     | 3163:UNK  | C      | 3170:UNK  | N      | 16.55        |
| 1     | B     | 3468:UNK  | C      | 3511:UNK  | N      | 15.45        |
| 1     | G     | 3468:UNK  | C      | 3511:UNK  | N      | 15.42        |
| 1     | E     | 3468:UNK  | C      | 3511:UNK  | N      | 15.40        |
| 1     | I     | 3468:UNK  | C      | 3511:UNK  | N      | 15.40        |
| 1     | B     | 3063:UNK  | C      | 3134:UNK  | N      | 14.93        |
| 1     | E     | 3063:UNK  | C      | 3134:UNK  | N      | 14.90        |
| 1     | I     | 3063:UNK  | C      | 3134:UNK  | N      | 14.90        |
| 1     | G     | 3063:UNK  | C      | 3134:UNK  | N      | 14.90        |
| 1     | I     | 2703:UNK  | C      | 2734:ASN  | N      | 14.22        |
| 1     | E     | 2703:UNK  | C      | 2734:ASN  | N      | 14.16        |
| 1     | G     | 2703:UNK  | C      | 2734:ASN  | N      | 14.10        |
| 1     | B     | 2703:UNK  | C      | 2734:ASN  | N      | 13.86        |
| 1     | E     | 3236:UNK  | C      | 3241:UNK  | N      | 13.47        |
| 1     | I     | 3236:UNK  | C      | 3241:UNK  | N      | 13.47        |
| 1     | B     | 3236:UNK  | C      | 3241:UNK  | N      | 13.46        |
| 1     | G     | 3236:UNK  | C      | 3241:UNK  | N      | 13.46        |
| 1     | I     | 1564:UNK  | C      | 1573:MET  | N      | 12.78        |
| 1     | G     | 1564:UNK  | C      | 1573:MET  | N      | 12.68        |
| 1     | E     | 1564:UNK  | C      | 1573:MET  | N      | 12.67        |
| 1     | B     | 1564:UNK  | C      | 1573:MET  | N      | 12.65        |
| 1     | B     | 2976:UNK  | C      | 2995:UNK  | N      | 12.08        |
| 1     | E     | 2976:UNK  | C      | 2995:UNK  | N      | 12.07        |
| 1     | I     | 2976:UNK  | C      | 2995:UNK  | N      | 12.07        |
| 1     | G     | 2976:UNK  | C      | 2995:UNK  | N      | 12.07        |
| 1     | E     | 3254:UNK  | C      | 3261:UNK  | N      | 8.41         |
| 1     | I     | 3254:UNK  | C      | 3261:UNK  | N      | 8.41         |
| 1     | G     | 3254:UNK  | C      | 3261:UNK  | N      | 8.40         |
| 1     | B     | 3254:UNK  | C      | 3261:UNK  | N      | 8.34         |

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| Model | Chain | Residue-1 | Atom-1 | Residue-2 | Atom-2 | Distance (Å) |
|-------|-------|-----------|--------|-----------|--------|--------------|
| 1     | I     | 1297:UNK  | C      | 1430:UNK  | N      | 5.95         |
| 1     | B     | 1297:UNK  | C      | 1430:UNK  | N      | 5.94         |
| 1     | E     | 1297:UNK  | C      | 1430:UNK  | N      | 5.94         |
| 1     | G     | 1297:UNK  | C      | 1430:UNK  | N      | 5.94         |
| 1     | B     | 2479:LEU  | C      | 2487:UNK  | N      | 3.52         |
| 1     | B     | 2939:ARG  | C      | 2942:UNK  | N      | 3.51         |
| 1     | E     | 2939:ARG  | C      | 2942:UNK  | N      | 3.44         |
| 1     | I     | 2939:ARG  | C      | 2942:UNK  | N      | 3.43         |
| 1     | G     | 2939:ARG  | C      | 2942:UNK  | N      | 3.41         |
| 1     | G     | 2479:LEU  | C      | 2487:UNK  | N      | 3.26         |
| 1     | E     | 2479:LEU  | C      | 2487:UNK  | N      | 3.22         |
| 1     | I     | 2479:LEU  | C      | 2487:UNK  | N      | 3.21         |



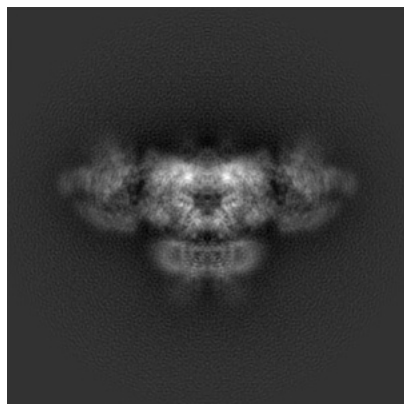
## 6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-8375. These allow visual inspection of the internal detail of the map and identification of artifacts.

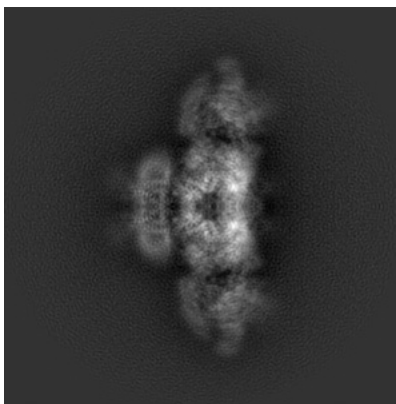
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

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

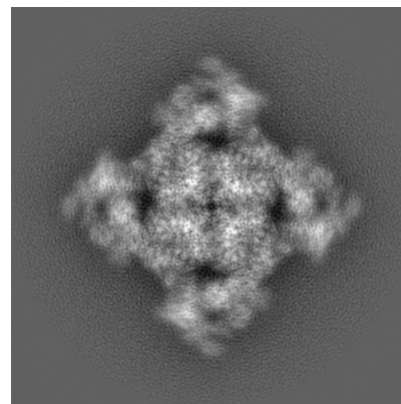
#### 6.1.1 Primary map



X

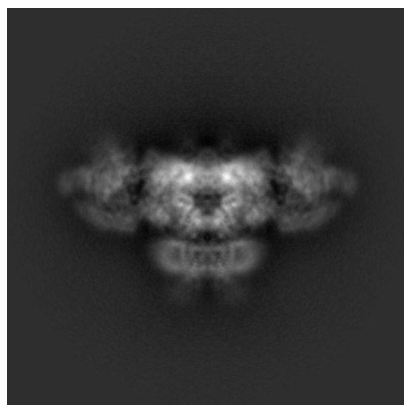


Y

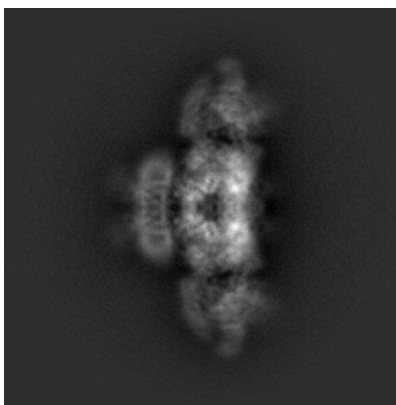


Z

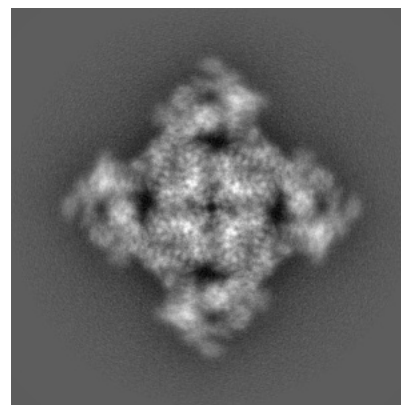
#### 6.1.2 Raw map



X



Y

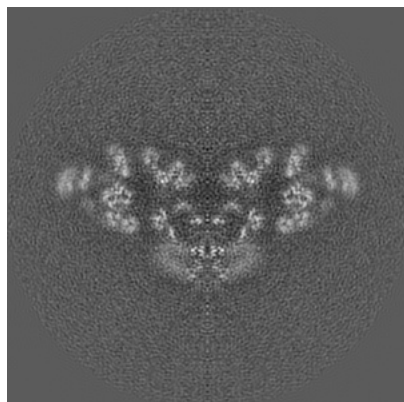


Z

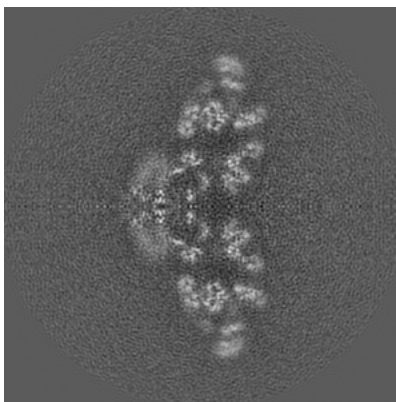
The images above show the map projected in three orthogonal directions.

## 6.2 Central slices [i](#)

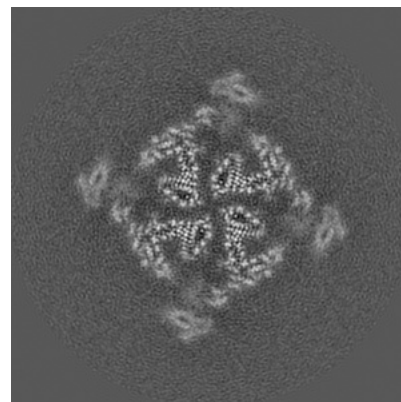
### 6.2.1 Primary map



X Index: 200

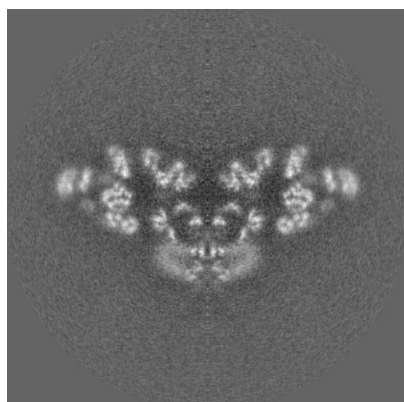


Y Index: 200

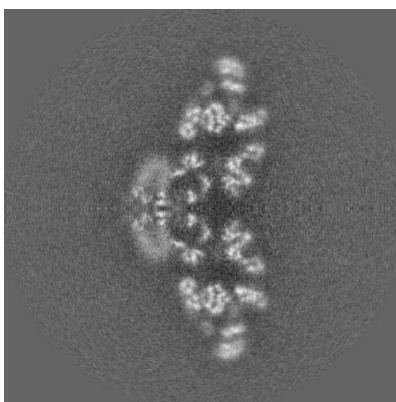


Z Index: 200

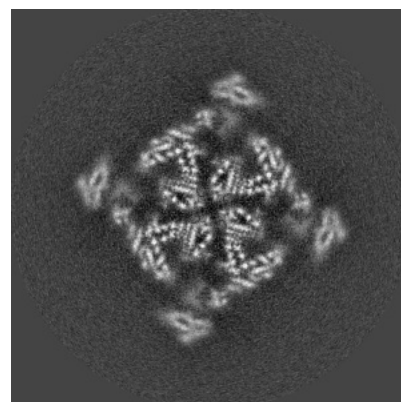
### 6.2.2 Raw map



X Index: 200



Y Index: 200

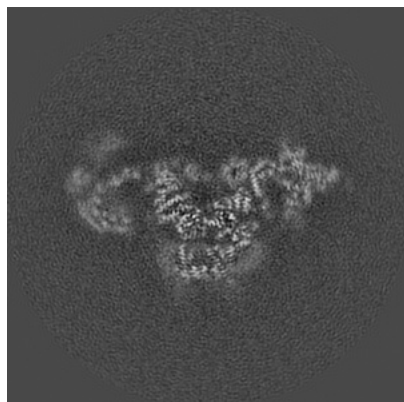


Z Index: 200

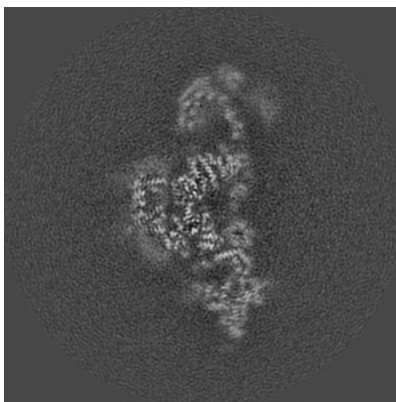
The images above show central slices of the map in three orthogonal directions.

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

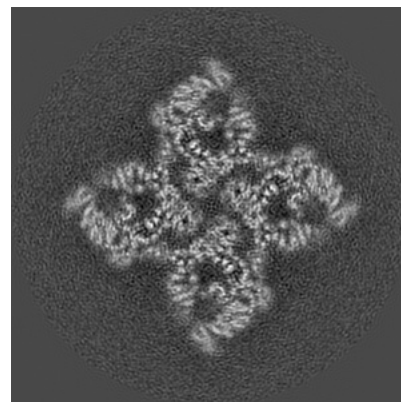
### 6.3.1 Primary map



X Index: 184

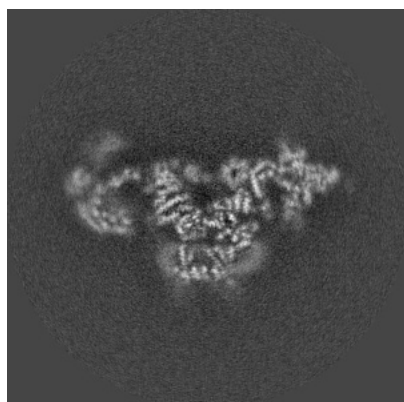


Y Index: 184

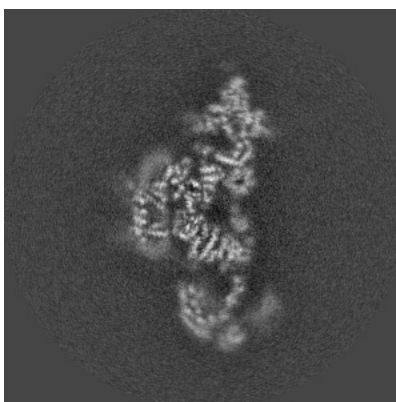


Z Index: 233

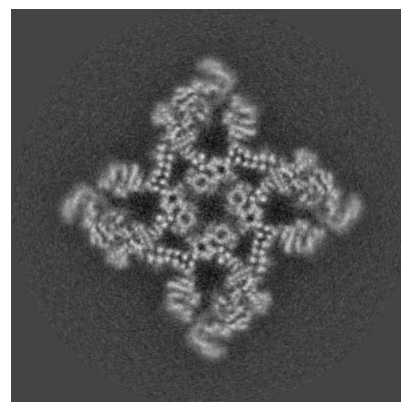
### 6.3.2 Raw map



X Index: 184



Y Index: 216

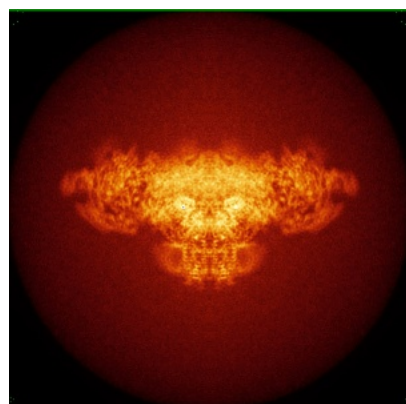


Z Index: 228

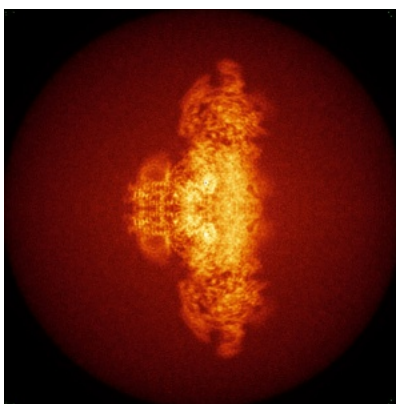
The images above show the largest variance slices of the map in three orthogonal directions.

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

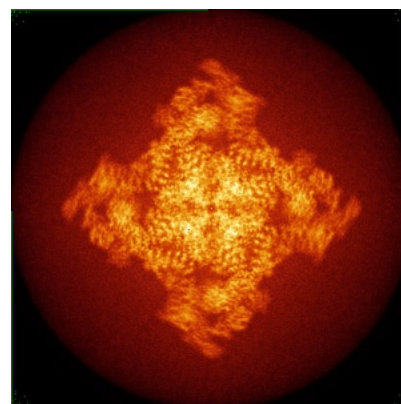
### 6.4.1 Primary map



X



Y

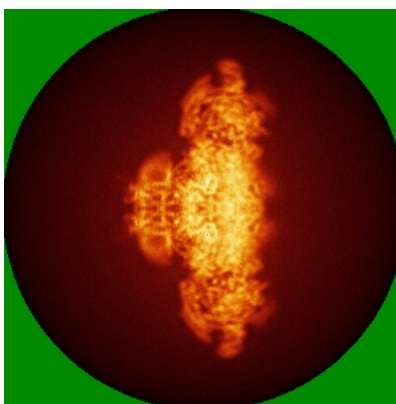


Z

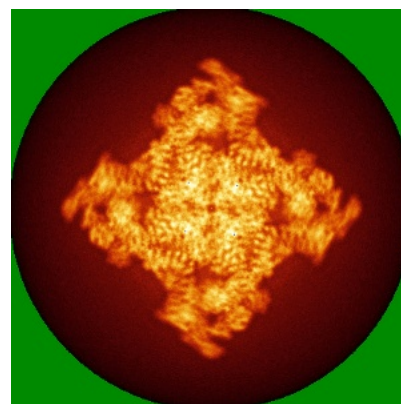
### 6.4.2 Raw map



X



Y

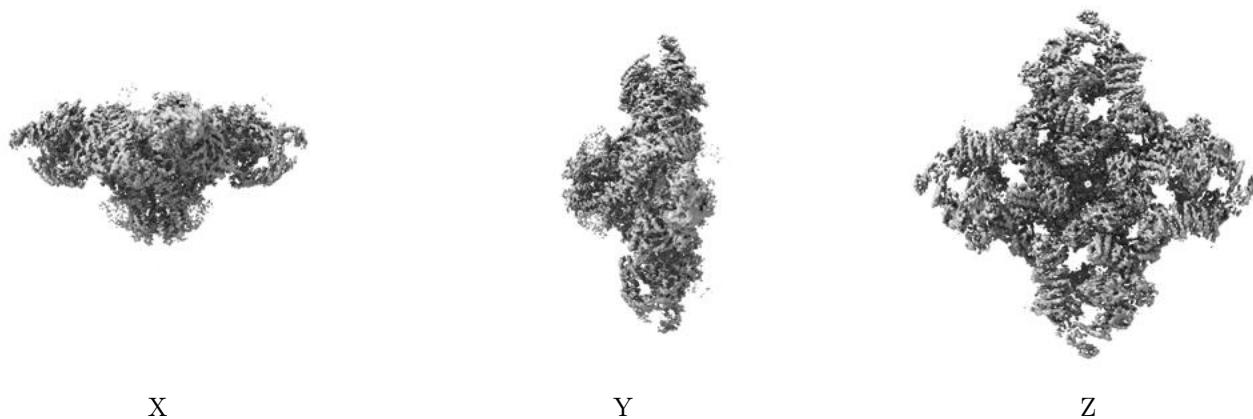


Z

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 0.04. 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.

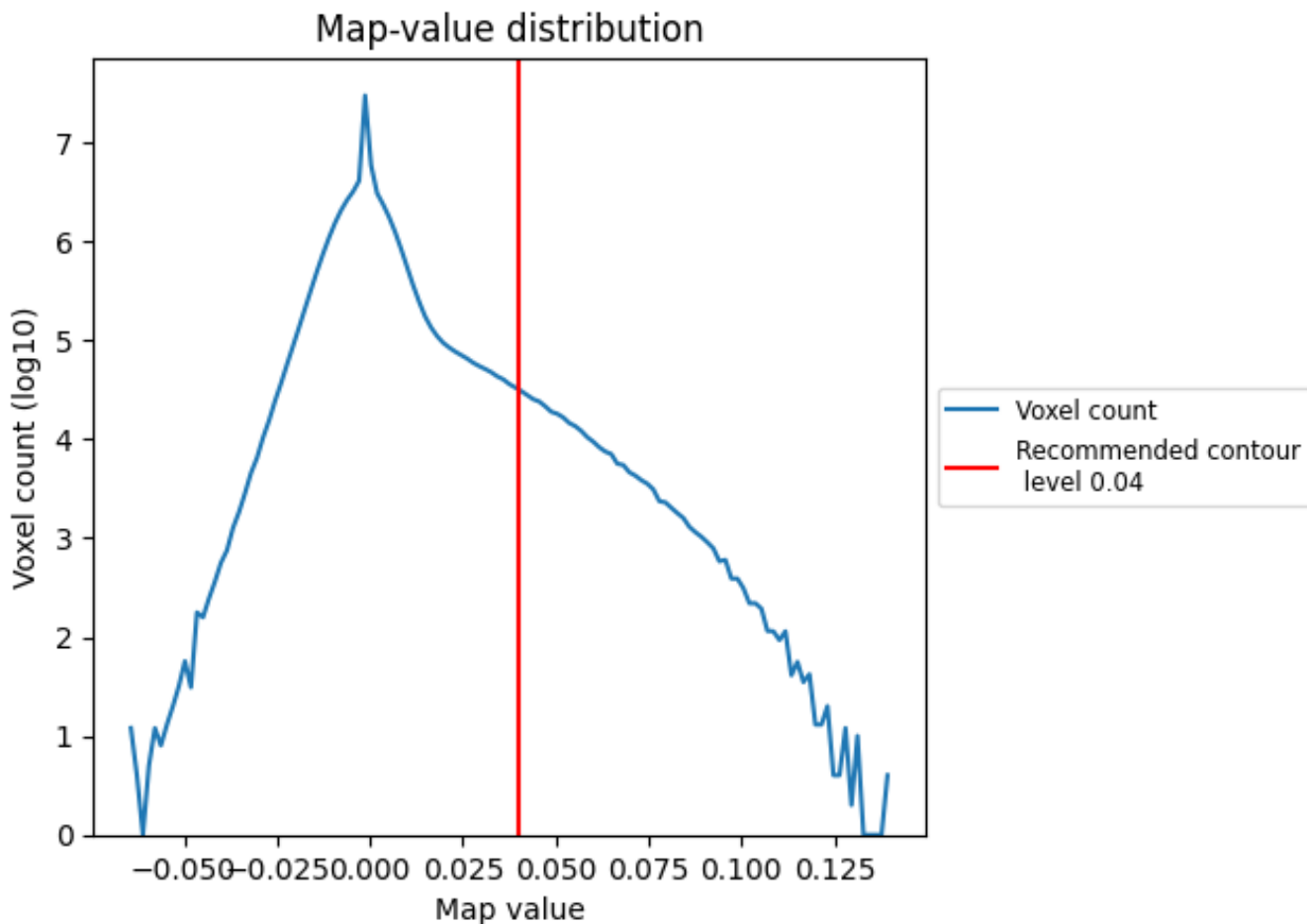
## 6.6 Mask visualisation [i](#)

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

## 7 Map analysis [i](#)

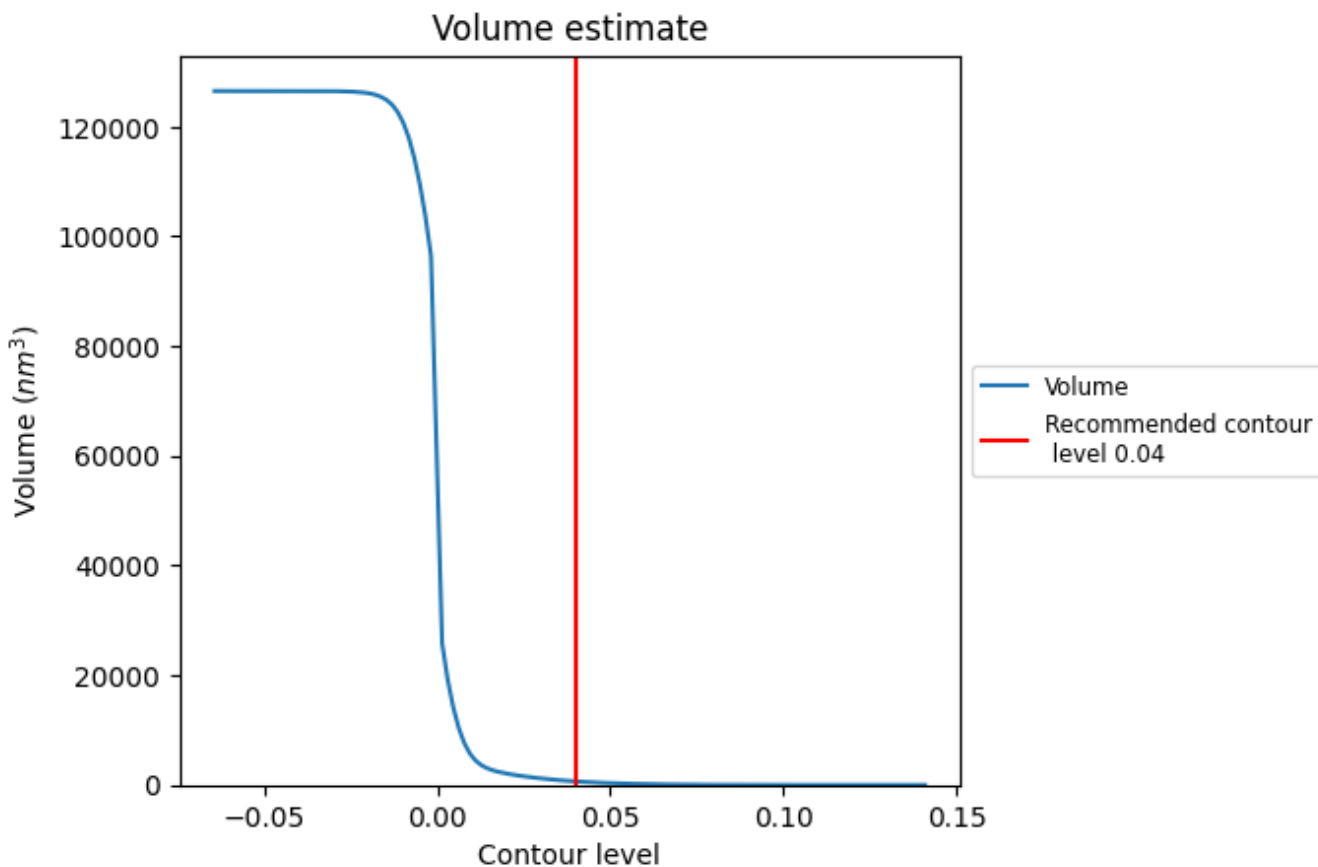
This section contains the results of statistical analysis of the map.

### 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.

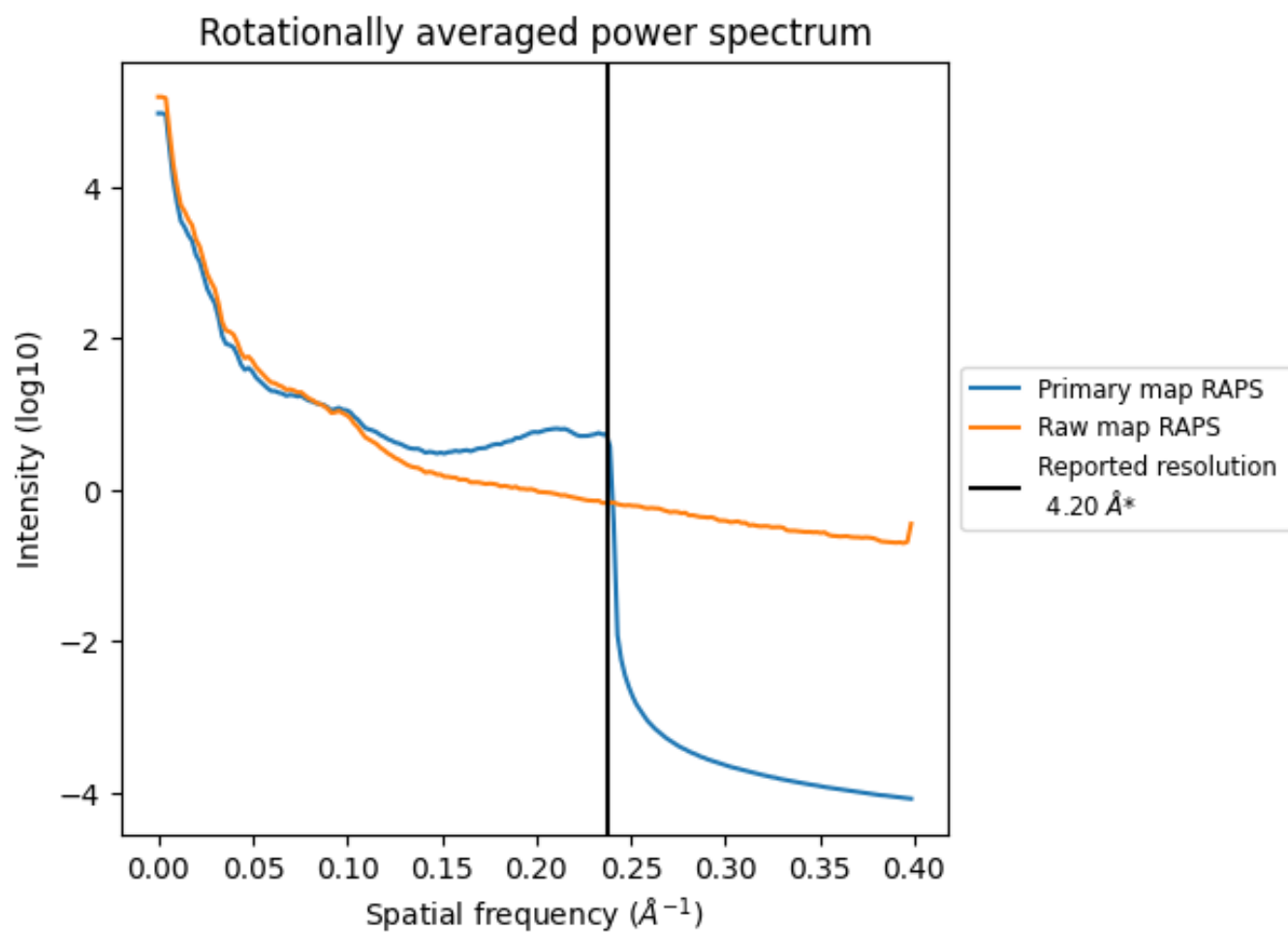
## 7.2 Volume estimate [i](#)



The volume at the recommended contour level is 651  $\text{nm}^3$ ; this corresponds to an approximate mass of 588 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



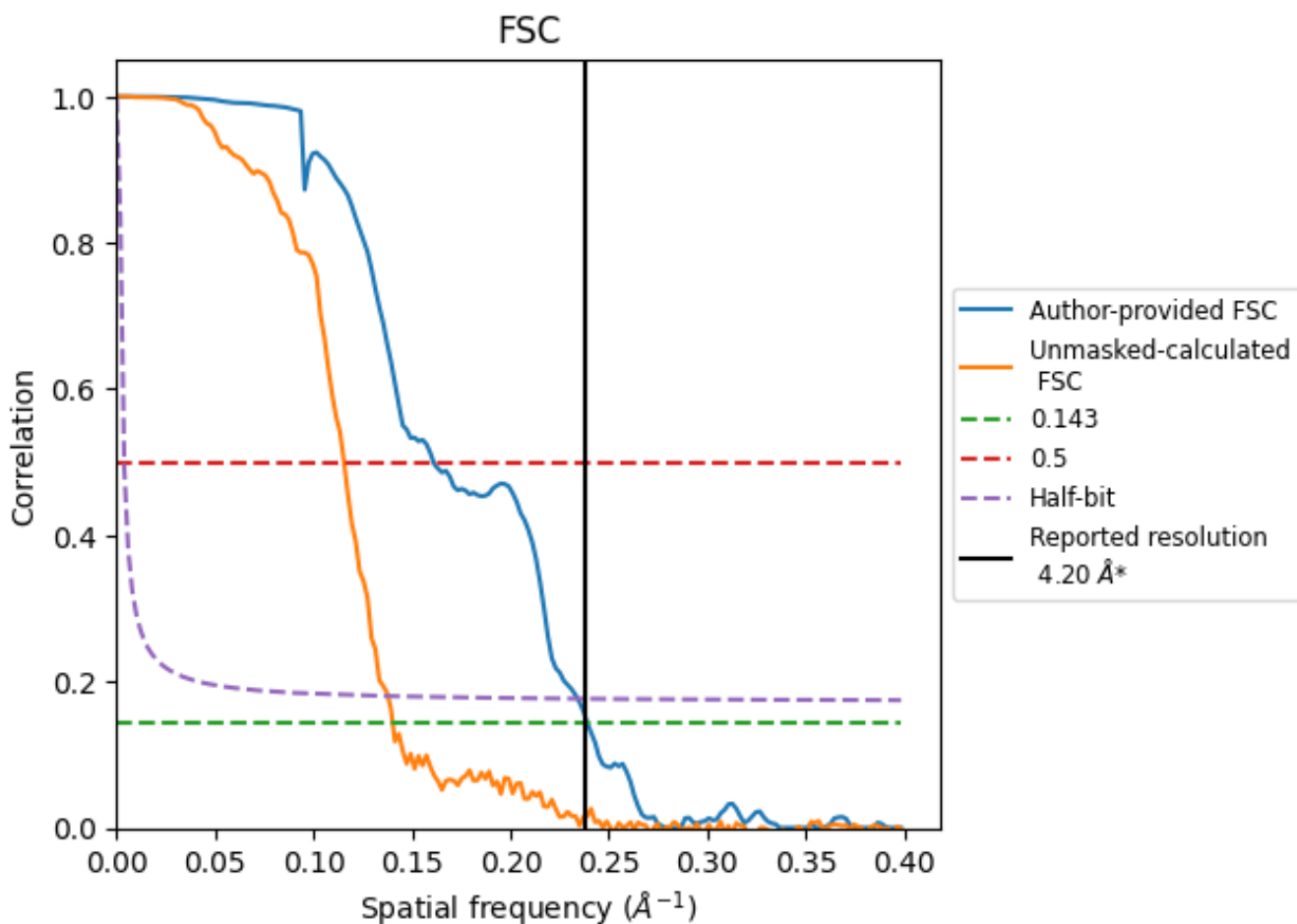
\*Reported resolution corresponds to spatial frequency of 0.238 Å<sup>-1</sup>



## 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 0.238 Å<sup>-1</sup>

## 8.2 Resolution estimates [i](#)

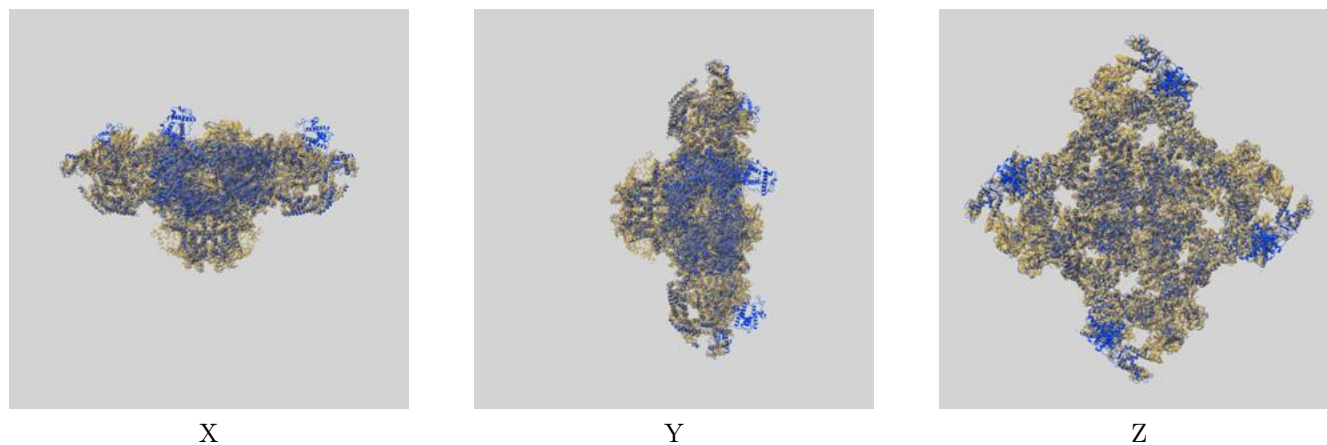
| Resolution estimate (Å)   | Estimation criterion (FSC cut-off) |      |          |
|---------------------------|------------------------------------|------|----------|
|                           | 0.143                              | 0.5  | Half-bit |
| Reported by author        | 4.20                               | -    | -        |
| Author-provided FSC curve | 4.18                               | 6.21 | 4.27     |
| Unmasked-calculated*      | 7.13                               | 8.65 | 7.26     |

\*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 7.13 differs from the reported value 4.2 by more than 10 %

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

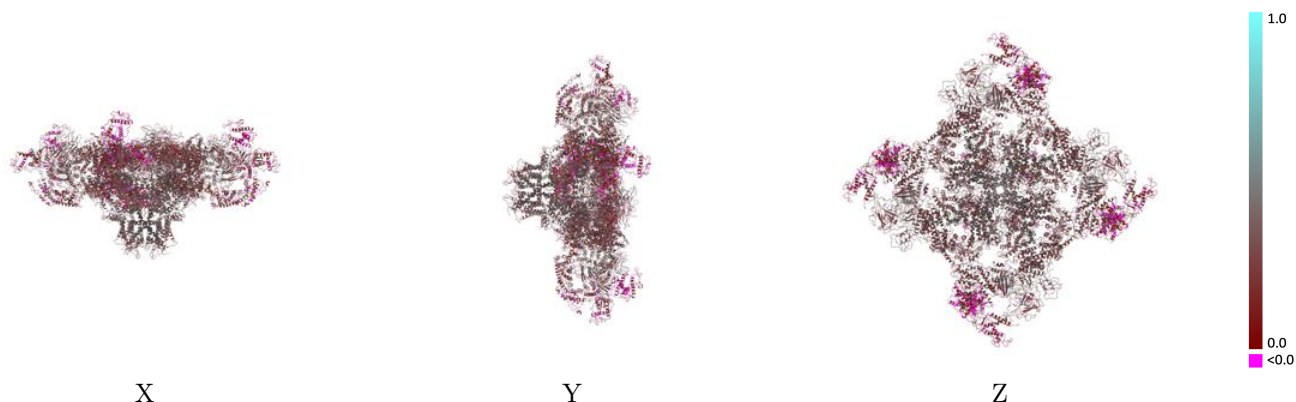
This section contains information regarding the fit between EMDB map EMD-8375 and PDB model 5T9S. Per-residue inclusion information can be found in section 3 on page 5.

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



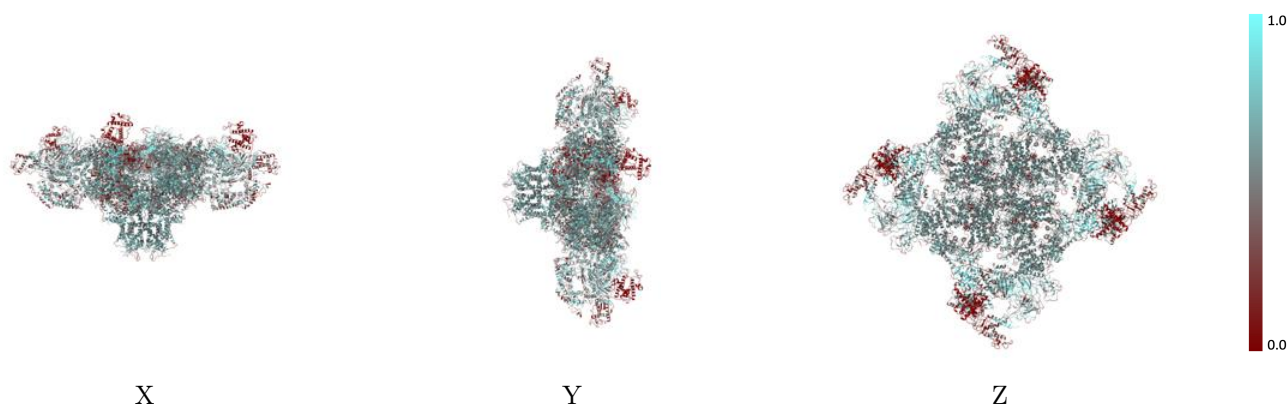
The images above show the 3D surface view of the map at the recommended contour level 0.04 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



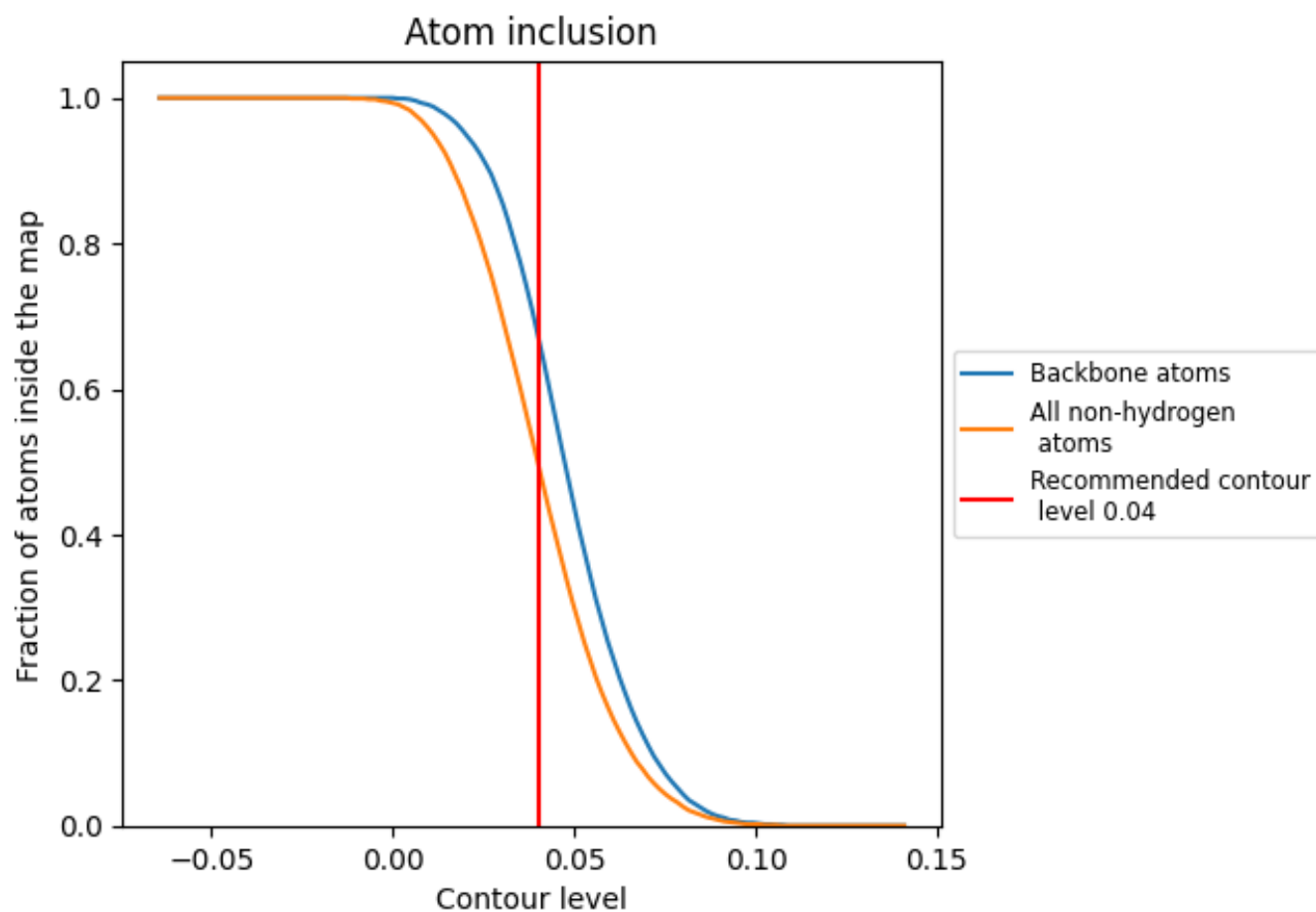
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.04).

## 9.4 Atom inclusion [i](#)



At the recommended contour level, 67% of all backbone atoms, 50% 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 (0.04) and Q-score for the entire model and for each chain.

| Chain | Atom inclusion | Q-score |
|-------|----------------|---------|
| All   | 0.4980         | 0.2870  |
| A     | 0.4780         | 0.3000  |
| B     | 0.5030         | 0.2900  |
| E     | 0.4950         | 0.2850  |
| F     | 0.4780         | 0.3050  |
| G     | 0.5000         | 0.2870  |
| H     | 0.4840         | 0.3060  |
| I     | 0.4950         | 0.2850  |
| J     | 0.4840         | 0.2990  |

