



# wwPDB EM Validation Summary Report ⓘ

Feb 25, 2024 – 10:33 AM EST

PDB ID : 7JMF  
EMDB ID : EMD-22392  
Title : Functional Pathways of Biomolecules Retrieved from Single-particle Snapshots  
- Frame 42 - State 6 (S6)  
Authors : Dashti, A.; des Georges, A.; Frank, J.; Ourmazd, A.  
Deposited on : 2020-07-31  
Resolution : 4.50 Å(reported)  
Based on initial model : 5TB4

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

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

A user guide is available at

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

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

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

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

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

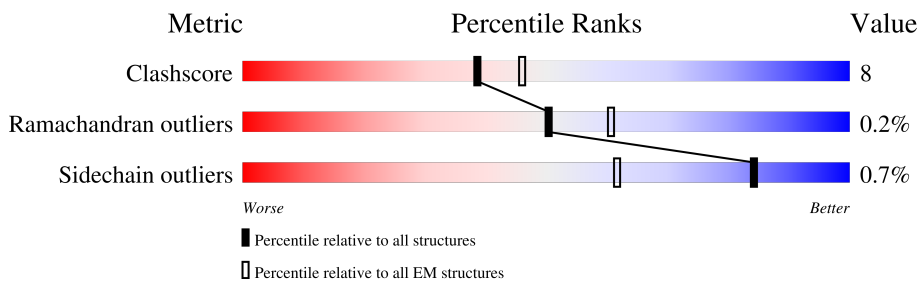
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*ELECTRON MICROSCOPY*

The reported resolution of this entry is 4.50 Å.

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



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

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

| Mol | Chain | Length | Quality of chain |
|-----|-------|--------|------------------|
| 1   | A     | 108    |                  |
| 1   | F     | 108    |                  |
| 1   | H     | 108    |                  |
| 1   | J     | 108    |                  |
| 2   | B     | 4687   |                  |
| 2   | E     | 4687   |                  |
| 2   | G     | 4687   |                  |
| 2   | I     | 4687   |                  |

## 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   | A     | 107      | 818   | 516 | 144 | 154 | 4 | 0       | 0     |
| 1   | F     | 107      | 818   | 516 | 144 | 154 | 4 | 0       | 0     |
| 1   | H     | 107      | 818   | 516 | 144 | 154 | 4 | 0       | 0     |
| 1   | J     | 107      | 818   | 516 | 144 | 154 | 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     | 29369 | 18608 | 5202 | 5402 | 157 | 0       | 0     |
| 2   | E     | 4168     | 29369 | 18608 | 5202 | 5402 | 157 | 0       | 0     |
| 2   | G     | 4168     | 29369 | 18608 | 5202 | 5402 | 157 | 0       | 0     |
| 2   | I     | 4168     | 29369 | 18608 | 5202 | 5402 | 157 | 0       | 0     |

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

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

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

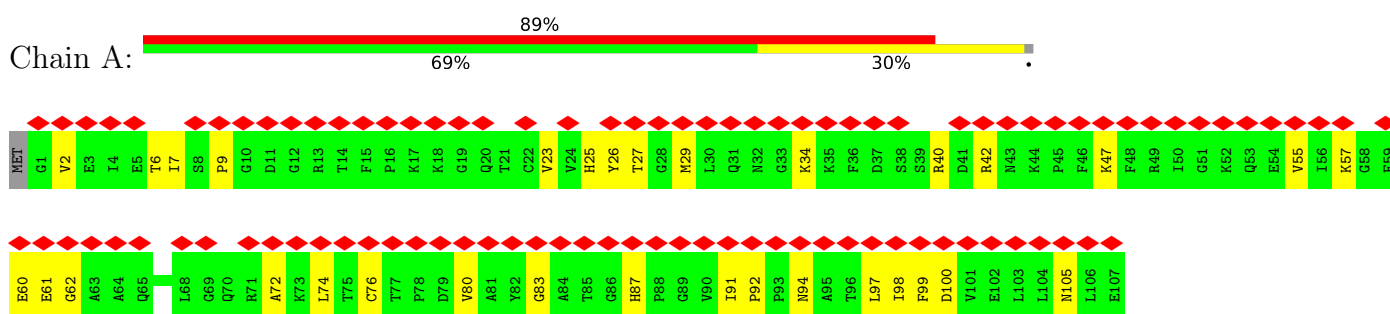
Interest" by depositor).

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

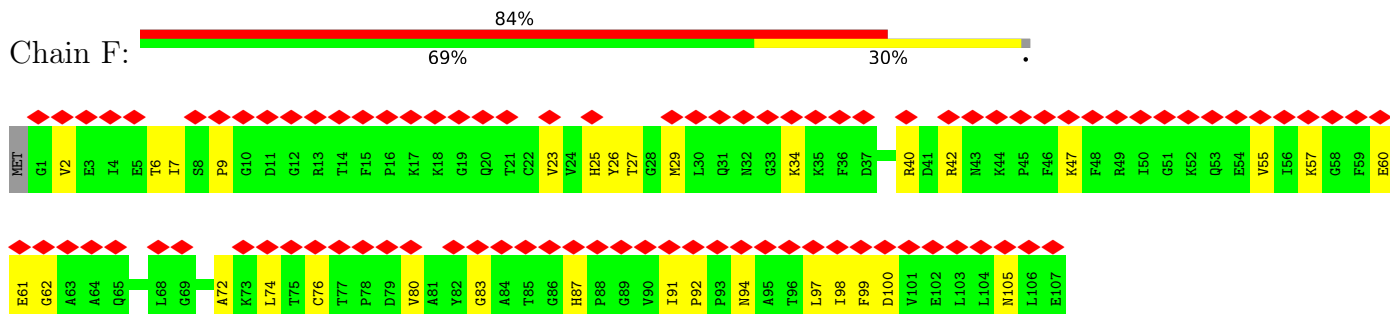
### 3 Residue-property plots [i](#)

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.

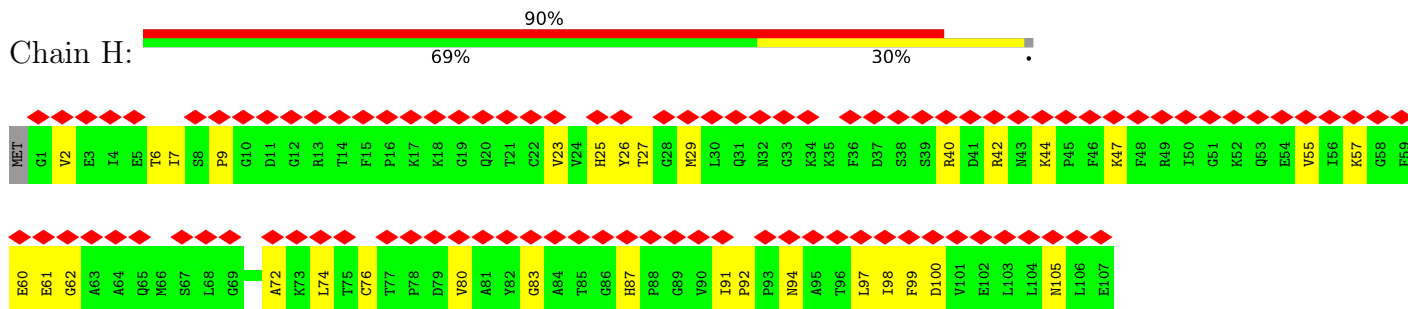
- Molecule 1: Peptidyl-prolyl cis-trans isomerase FKBP1B



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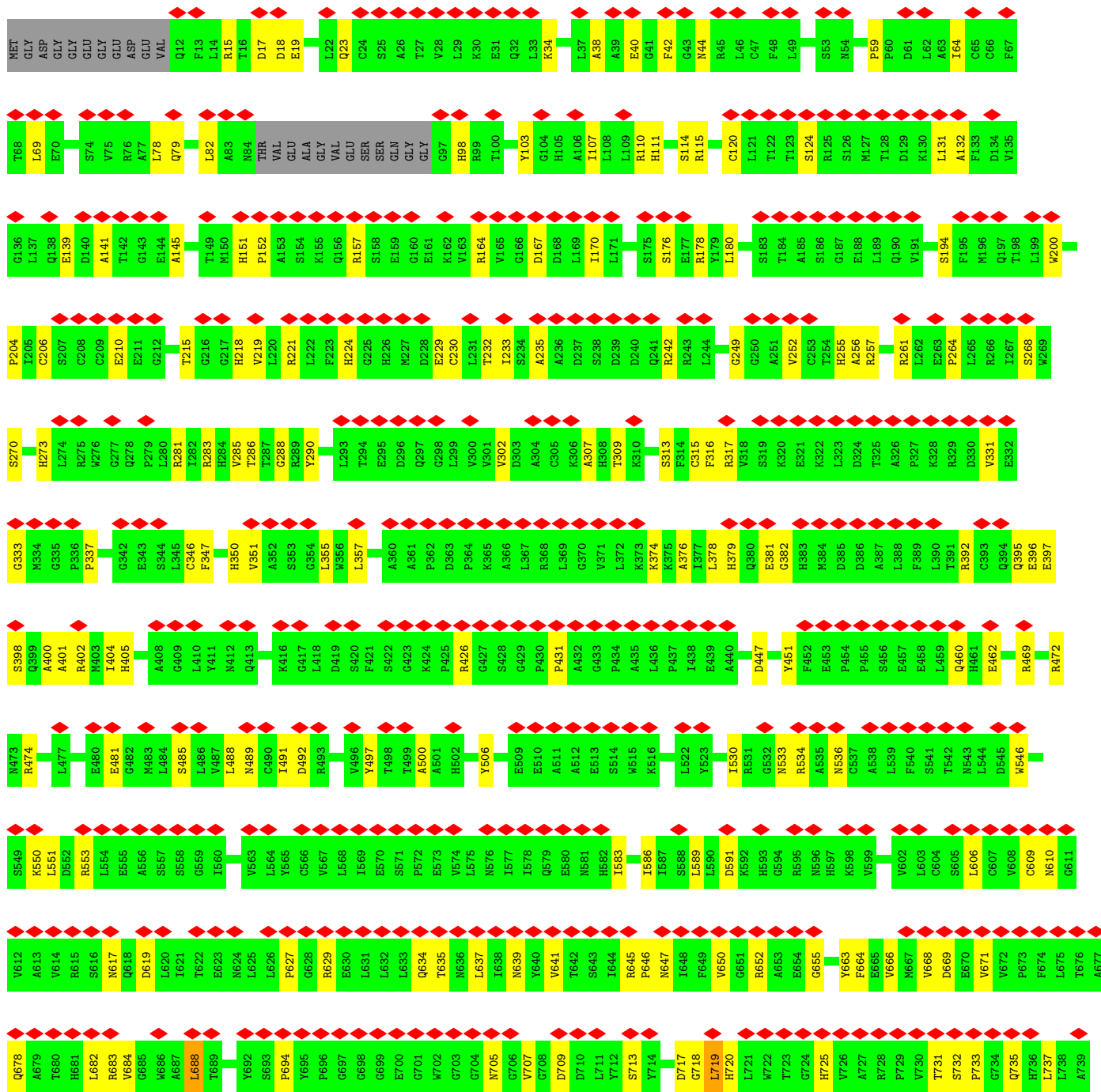
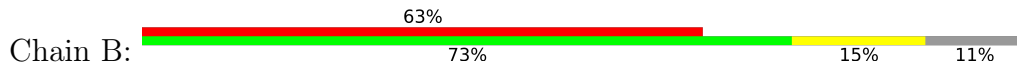


- Molecule 1: Peptidyl-prolyl cis-trans isomerase FKBP1B





• Molecule 2: ryanodine receptor 1



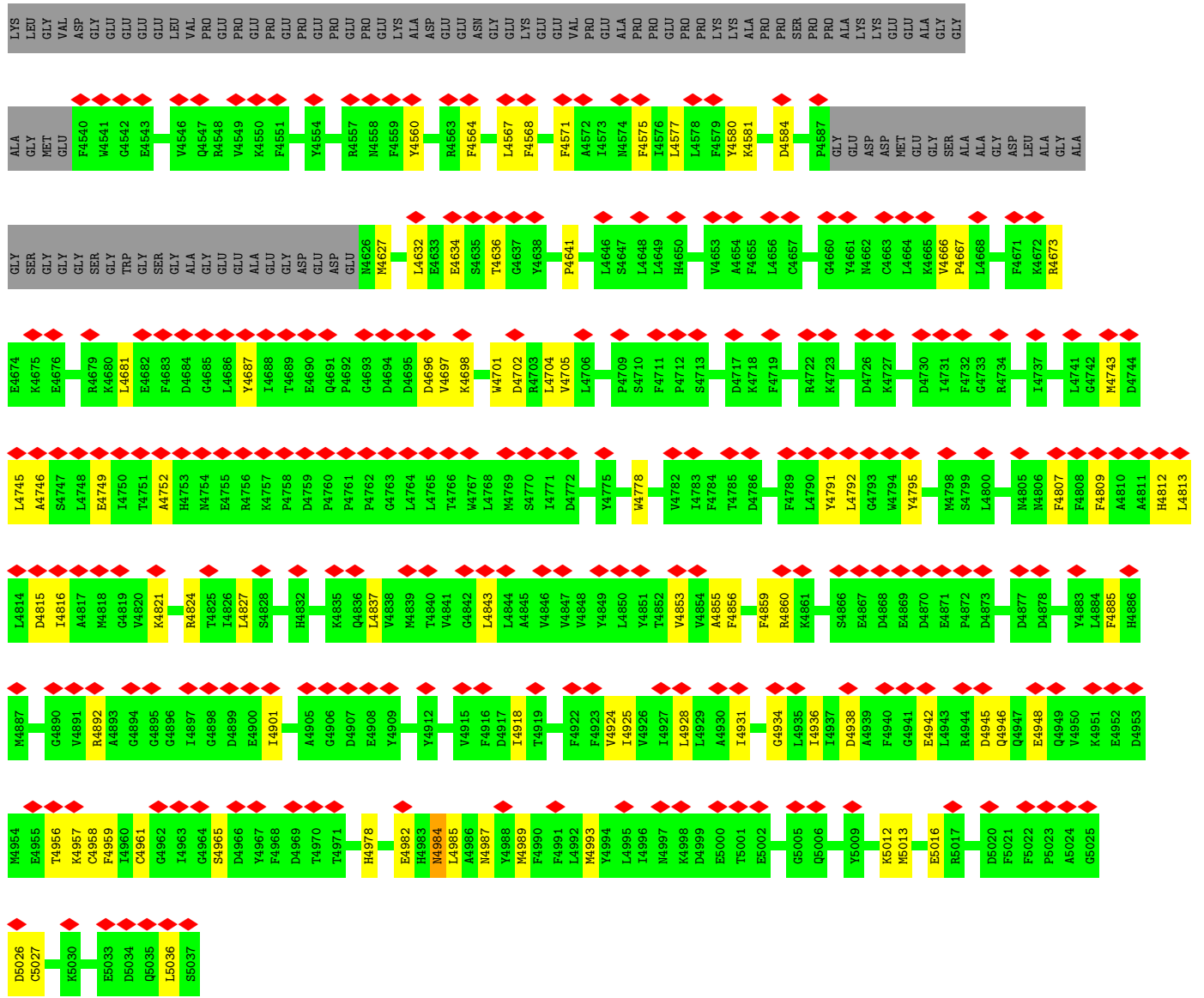
|       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| M1648 | D1649 | I1650 | L1651 | E1652 | L1653 | R1656 | L1657 | D1658 | L1659 | Q1660 | R1661 | F1662 | H1663 | S1664 | T1665 | L1667 | R1668 | L1669 | Y1670 | R1671 | A1672 | A1675 | L1676 | G1677 | H1678 | M1679 | R1680 | V1681 | A1682 | H1683 | A1684 | S1687 | H1688 | G1689 | D1690 | Q1691 | Q1692 | L1694 | L1695 | H1696 | A1697 | L1698 | E1699 | D1700 | A1701 | H1702 | L1703 | P1704 | G1705 | P1706 | L1707 | L1703 | A1709 | G1710 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| P1587 | A1588 | P1589 | Q1590 | C1591 | P1592 | P1593 | R1594 | L1595 | E1596 | V1597 | M1598 | L1600 | V1603 | S1604 | W1605 | S1606 | R1607 | M1608 | P1609 | M1610 | H1611 | F1612 | L1613 | Q1614 | GLU   | THR   | ARG   | ALA   | GLY   | E1622 | R1623 | L1624 | G1625 | W1626 | A1627 | V1628 | Q1629 | C1630 | Q1631 | D1632 | P1633 | L1634 | L1635 | M1636 | M1637 | A1638 | L1639 | H1640 | I1641 | P1642 | E1643 | E1644 | M1645 | R1646 | C1647 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| X1437 | X1438 | X1439 | X1440 | X1441 | X1442 | X1443 | X1444 | X1445 | X1446 | X1447 | X1448 | X1449 | X1450 | X1451 | X1452 | X1453 | X1454 | X1455 | X1456 | X1459 | X1460 | X1467 | X1468 | X1469 | X1470 | X1471 | X1472 | X1475 | X1476 | X1485 | X1486 | X1487 | X1488 | X1489 | X1490 | X1491 | X1492 | X1493 | X1494 | X1497 | X1498 | X1499 | X1500 | X1501 | X1502 | X1503 | X1504 | X1505 | X1506 | X1507 | X1508 | X1509 | X1510 | X1511 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| Q1244 | F1245 | E1246 | P1247 | V1248 | P1250 | E1251 | H1252 | P1253 | H1254 | Y1255 | E1256 | V1257 | A1258 | R1259 | D1261 | G1262 | T1263 | D1264 | D1265 | T1266 | P1267 | C1269 | L1270 | R1271 | L1272 | A1273 | H1274 | R1275 | X1276 | X1277 | X1278 | X1279 | X1280 | X1281 | X1282 | X1283 | X1284 | X1285 | X1286 | X1287 | X1288 | X1289 | X1290 | X1291 | X1292 | X1293 | X1294 | X1295 | X1296 | X1297 | X1298 | X1299 | X1300 | X1301 | X1302 | X1303 | X1304 | X1305 | X1306 | X1307 | X1308 | X1309 | X1310 | X1311 | X1312 | X1313 | X1314 | X1315 | X1316 | X1317 | X1318 | X1319 | X1320 | X1321 | X1322 | X1323 | X1324 | X1325 | X1326 | X1327 | F1238 | S1239 | X1240 | S1241 | L1242 | P1243 | X1434 | X1435 | X1436 |
| I1184 | G1185 | D1186 | G1187 | F1188 | L1189 | P1190 | V1191 | C1192 | S1193 | L1194 | G1195 | P1196 | G1197 | Q1198 | V1199 | G1200 | H1201 | M1202 | M1203 | L1204 | G1205 | Q1206 | D1207 | V1208 | D1147 | V1148 | V1149 | G1150 | C1151 | M1152 | L1155 | T1156 | E1157 | M1158 | I1161 | F1162 | L1164 | M1165 | G1166 | E1167 | V1168 | L1169 | M1170 | S1171 | D1172 | S1173 | G1174 | S1175 | E1176 | T1177 | A1178 | S1179 | R1180 | E1181 | I1182 | E1183 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| A1121 | Y1122 | V1123 | F1124 | M1125 | G1126 | H1127 | R1128 | G1129 | Q1130 | R1131 | W1132 | H1133 | L1134 | G1135 | S1136 | F1139 | G1140 | R1141 | P1142 | Q1144 | S1145 | G1146 | D1147 | V1148 | V1149 | G1150 | C1151 | M1152 | L1155 | T1156 | E1157 | M1158 | I1161 | F1162 | L1164 | M1165 | G1166 | E1167 | V1168 | L1169 | M1170 | S1171 | D1172 | S1173 | G1174 | S1175 | E1176 | T1177 | A1178 | S1179 | R1180 | E1181 | I1182 | E1183 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| PRO   | SER   | GLN   | VAL   | GLU   | ASN   | GLN   | SER   | ARG   | TRP   | D1070 | R1071 | V1072 | R1073 | L1074 | F1075 | R1076 | A1077 | E1078 | K1079 | S1080 | Y1081 | T1082 | V1083 | Q1084 | S1085 | G1086 | R1087 | W1088 | Y1089 | F1090 | E1091 | F1092 | E1093 | A1094 | V1095 | T1096 | T1097 | M1100 | R1101 | V1102 | G1103 | W1104 | A1105 | R1106 | P1107 | E1108 | L1109 | R1110 | P1111 | M1112 | V1113 | E1114 | L1115 | G1116 | A1117 | D1118 | E1119 | L1120 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| G982  | V1001 | A1002 | Q1003 | G1004 | W1005 | S1006 | Y1007 | S1008 | A1009 | VAL   | GLN   | ASP   | ILE   | PRO   | ALA   | ARG   | ARG   | ASN   | PRO   | R1020 | Y1024 | R1025 | L1026 | L1027 | D1028 | E1029 | K951  | K952  | T953  | G994  | K995  | V996  | R997  | P998  | R999  | Y999  | M960  | D1037 | S1038 | L1039 | C1040 | Q1041 | A1042 | V1043 | R1044 | T1045 | L1046 | L1047 | G1048 | Y1049 | G1050 | R976  | L977  | T978  | P979  | A980  | PRO   | T982  | T983  | L984  | V985  | R986  | R987  | L988  | A989  |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| E968  | R969  | I970  | R971  | E972  | K973  | L974  | A975  | E976  | M977  | I978  | H979  | E980  | L981  | W982  | A983  | L984  | T985  | R986  | I987  | E988  | Q989  | G990  | W991  | T992  | Y993  | G994  | P995  | V996  | R997  | D998  | D999  | N900  | K901  | R902  | L903  | H904  | P905  | C906  | L907  | H908  | T909  | D910  | F911  | S912  | P913  | P914  | E915  | R916  | F917  | R918  | N919  | Y920  | V921  | L922  | Q923  | M924  | S925  | G926  | E927  |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| G907  | Y908  | A909  | P810  | C911  | H912  | E913  | A914  | V915  | L916  | P917  | R918  | E919  | R920  | L921  | R922  | L923  | E924  | P925  | I926  | K927  | E928  | Y929  | R930  | R931  | E932  | G933  | P934  | R935  | G936  | P937  | H938  | N900  | P942  | S943  | R944  | C945  | L946  | S947  | H948  | T949  | D950  | F951  | V952  | P953  | C954  | P955  | V956  | D957  | THR   | VAL   | GLN   | I961  | V962  | F963  | L964  | P965  | R966  | L967  |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| P740  | E741  | D742  | S745  | C746  | D749  | L750  | S751  | V752  | P753  | F757  | R758  | I759  | M760  | G761  | C762  | P763  | V764  | Q765  | G766  | V767  | F768  | E769  | A770  | F771  | N772  | L773  | D774  | G775  | L776  | F777  | F778  | P779  | V780  | V781  | S784  | A785  | G786  | V787  | K788  | V789  | R790  | F791  | L792  | L793  | H797  | G798  | E799  | F800  | K801  | F802  | L803  | P804  | P805  | P806  |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |



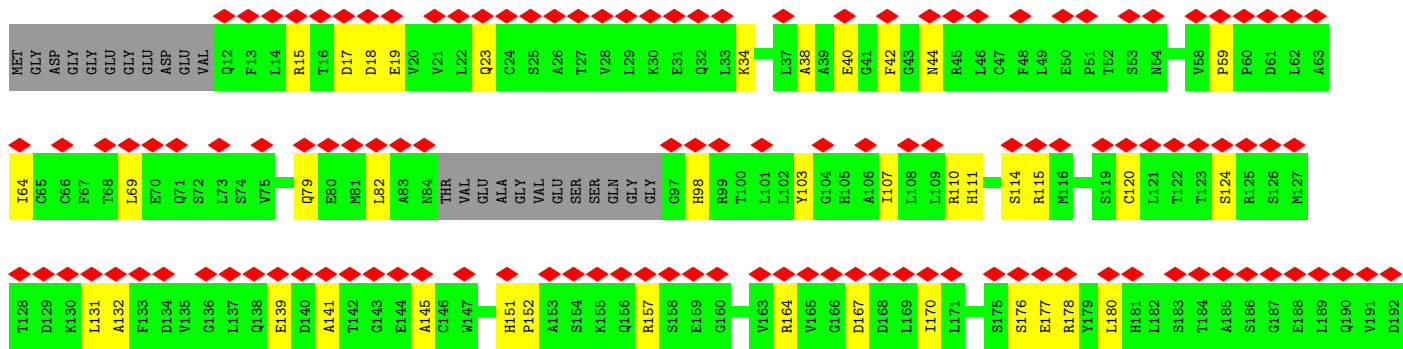
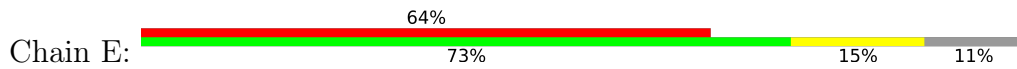


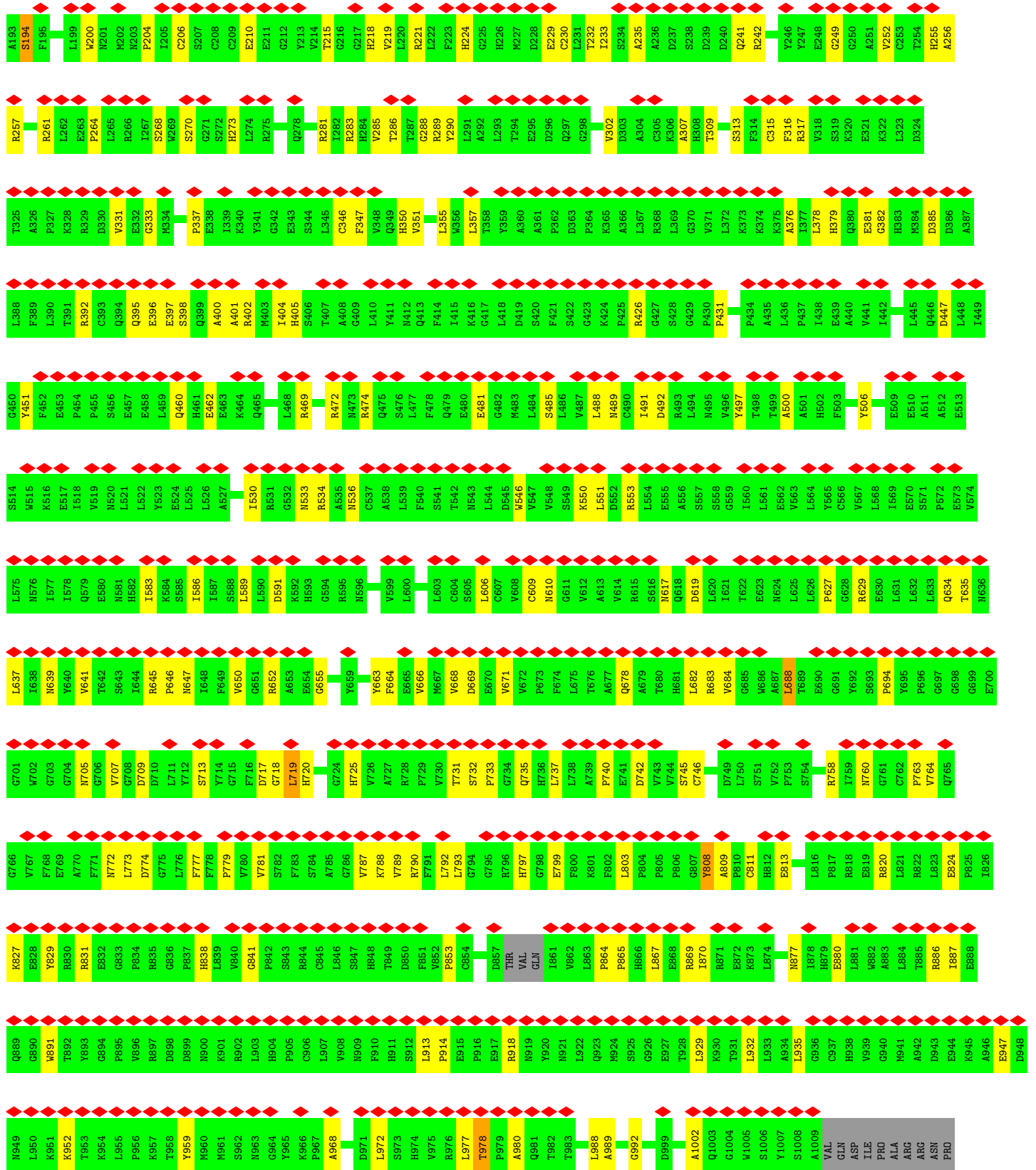
|       |       |       |       |       |       |       |       |       |       |       |       |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| X2544 | X2617 | X2684 | M2774 | L2894 | X2956 | X3037 | X3176 | X3244 | X3312 | X3372 | X3432 |
| X2550 | X2618 | X2685 | M2775 | E2895 | X2957 | X3038 | X3177 | X3245 | X3313 | X3373 | X3433 |
| X2552 | X2619 | X2686 | S2776 | A2896 | X2958 | X3039 | X3178 | X3246 | X3314 | X3374 | X3434 |
| X2553 | X2620 | X2687 | Y2777 | K2897 | X2959 | X3040 | X3179 | X3247 | X3315 | X3375 | X3435 |
| X2554 | X2621 | X2688 | G2778 | G2898 | X2960 | X3041 | X3180 | X3248 | X3316 | X3376 | X3436 |
| X2555 | X2622 | X2689 | E2779 | G2899 | X2961 | X3042 | X3181 | X3249 | X3317 | X3377 | X3437 |
| X2556 | X2623 | X2690 | M2780 | G2900 | X2962 | X3043 | X3182 | X3250 | X3318 | X3378 | X3438 |
| X2557 | X2624 | X2691 | V2781 | T2901 | X2963 | X3044 | X3183 | X3251 | X3319 | X3379 | X3439 |
| X2558 | X2625 | X2692 | D2782 | H2902 | X2964 | X3045 | X3184 | X3252 | X3320 | X3380 | X3440 |
| X2559 | X2626 | X2693 | E2783 | H2903 | X2965 | X3046 | X3185 | X3253 | X3321 | X3381 | X3441 |
| X2560 | X2627 | X2694 | D2784 | L2904 | X2966 | X3047 | X3186 | X3254 | X3322 | X3382 | X3442 |
| X2562 | X2628 | X2695 | L2785 | L2905 | X2967 | X3048 | X3187 | X3255 | X3323 | X3383 | X3443 |
| X2563 | X2629 | X2696 | T2786 | P2906 | X2968 | X3049 | X3188 | X3256 | X3324 | X3384 | X3444 |
| X2564 | X2630 | X2697 | K2787 | V2907 | X2969 | X3050 | X3189 | X3257 | X3325 | X3385 | X3445 |
| X2565 | X2631 | X2698 | H2788 | Y2908 | X2970 | X3051 | X3190 | X3258 | X3326 | X3386 | X3446 |
| X2566 | X2632 | X2699 | P2789 | D2909 | X2971 | X3052 | X3191 | X3259 | X3327 | X3387 | X3447 |
| X2567 | X2633 | X2700 | M2790 | T2910 | X2972 | X3053 | X3192 | X3260 | X3328 | X3388 | X3448 |
| X2568 | X2634 | X2701 | L2791 | L2911 | X2973 | X3054 | X3193 | X3261 | X3329 | X3389 | X3449 |
| X2569 | X2635 | X2702 | R2792 | T2912 | X2974 | X3055 | X3194 | X3262 | X3330 | X3390 | X3450 |
| X2570 | X2636 | X2703 | P2793 | A2913 | X2975 | X3056 | X3195 | X3263 | X3331 | X3391 | X3451 |
| X2582 | X2641 | X2704 | Q2858 | K2914 | X2976 | X3057 | X3196 | X3264 | X3332 | X3392 | X3452 |
| X2583 | X2642 | X2705 | P2859 | X2915 | X2977 | X3058 | X3197 | X3265 | X3333 | X3393 | X3453 |
| X2584 | X2643 | X2706 | P2860 | K2916 | X2978 | X3059 | X3198 | X3266 | X3334 | X3394 | X3454 |
| X2585 | X2644 | X2707 | P2861 | A2917 | X2979 | X3060 | X3199 | X3267 | X3335 | X3395 | X3455 |
| X2587 | X2645 | X2708 | L2862 | R2918 | X2980 | X3061 | X3200 | X3268 | X3336 | X3396 | X3456 |
| X2588 | X2646 | X2709 | S2863 | D2919 | X2981 | X3062 | X3201 | X3269 | X3337 | X3397 | X3457 |
| X2589 | X2647 | X2710 | G2864 | X2920 | X2982 | X3063 | X3202 | X3270 | X3338 | X3398 | X3458 |
| X2590 | X2648 | X2711 | G2865 | E2921 | X2983 | X3064 | X3203 | X3271 | X3339 | X3399 | X3459 |
| X2592 | X2649 | X2712 | T2866 | K2922 | X2984 | X3065 | X3204 | X3272 | X3340 | X3400 | X3460 |
| X2593 | X2650 | X2713 | L2867 | A2923 | X2985 | X3066 | X3205 | X3273 | X3341 | X3401 | X3461 |
| X2594 | X2651 | X2714 | S2868 | Q2924 | X2986 | X3067 | X3206 | X3274 | X3342 | X3402 | X3462 |
| X2595 | X2652 | X2715 | R2869 | Q2925 | X2987 | X3068 | X3207 | X3275 | X3343 | X3403 | X3463 |
| X2596 | X2653 | X2716 | E2870 | L2926 | X2988 | X3069 | X3208 | X3276 | X3344 | X3404 | X3464 |
| X2597 | X2654 | X2717 | L2871 | L2927 | X2989 | X3070 | X3209 | X3277 | X3345 | X3405 | X3465 |
| X2598 | X2655 | X2718 | Q2872 | K2928 | X2990 | X3071 | X3210 | X3278 | X3346 | X3406 | X3466 |
| X2599 | X2656 | X2719 | A2873 | X2929 | X2991 | X3072 | X3211 | X3279 | X3347 | X3407 | X3467 |
| X2599 | X2657 | X2720 | M2874 | L2930 | X2992 | X3073 | X3212 | X3280 | X3348 | X3408 | X3468 |
| X2599 | X2658 | X2721 | A2875 | Q2931 | X2993 | X3074 | X3213 | X3281 | X3349 | X3409 | X3469 |
| X2599 | X2659 | X2722 | E2876 | M2932 | X2994 | X3075 | X3214 | X3282 | X3350 | X3410 | X3470 |
| X2600 | X2660 | X2723 | Q2877 | K2933 | X2995 | X3076 | X3215 | X3283 | X3351 | X3411 | X3471 |
| X2601 | X2661 | X2724 | L2878 | M2934 | X2996 | X3077 | X3216 | X3284 | X3352 | X3412 | X3472 |
| X2602 | X2662 | X2725 | A2879 | Y2935 | X2997 | X3078 | X3217 | X3285 | X3353 | X3413 | X3473 |
| X2603 | X2663 | X2726 | E2880 | X2936 | X2998 | X3079 | X3218 | X3286 | X3354 | X3414 | X3474 |
| X2604 | X2664 | X2727 | M2881 | V2937 | X2999 | X3080 | X3219 | X3287 | X3355 | X3415 | X3475 |
| X2605 | X2665 | X2728 | Y2882 | Q2938 | X3000 | X3081 | X3220 | X3288 | X3356 | X3416 | X3476 |
| X2606 | X2666 | X2729 | H2883 | R2939 | X3001 | X3082 | X3221 | X3289 | X3357 | X3417 | X3477 |
| X2607 | X2667 | X2730 | M2884 | X2942 | X3002 | X3083 | X3222 | X3290 | X3358 | X3418 | X3478 |
| X2608 | X2668 | X2731 | W2886 | K2943 | X3003 | X3084 | X3223 | X3291 | X3359 | X3419 | X3479 |
| X2609 | X2669 | X2732 | G2887 | X2944 | X3004 | X3085 | X3224 | X3292 | X3360 | X3420 | X3480 |
| X2610 | X2670 | X2733 | R2888 | X2945 | X3005 | X3086 | X3225 | X3293 | X3361 | X3421 | X3481 |
| X2611 | X2671 | X2734 | E2889 | X2946 | X3006 | X3087 | X3226 | X3294 | X3362 | X3422 | X3482 |
| X2612 | X2672 | X2735 | K2890 | X2947 | X3007 | X3088 | X3227 | X3295 | X3363 | X3423 | X3483 |
| X2613 | X2673 | X2736 | X2891 | X2948 | X3008 | X3089 | X3228 | X3296 | X3364 | X3424 | X3484 |
| X2614 | X2674 | X2737 | A2892 | X2949 | X3009 | X3090 | X3229 | X3297 | X3365 | X3425 | X3485 |
| X2615 | X2675 | X2738 | Q2893 | X2950 | X3010 | X3091 | X3230 | X3298 | X3366 | X3426 | X3486 |
| X2616 | X2676 | X2739 | E2894 | X2951 | X3011 | X3092 | X3231 | X3299 | X3367 | X3427 | X3487 |
| X2616 | X2677 | X2740 | X2895 | X2952 | X3012 | X3093 | X3232 | X3300 | X3368 | X3428 | X3488 |
| X2616 | X2678 | X2741 | K2896 | X2953 | X3013 | X3094 | X3233 | X3301 | X3369 | X3429 | X3489 |
| X2616 | X2679 | X2742 | M2897 | X2954 | X3014 | X3095 | X3234 | X3302 | X3370 | X3430 | X3490 |
| X2616 | X2680 | X2743 | E2898 | X2955 | X3015 | X3096 | X3235 | X3303 | X3371 | X3431 | X3491 |
| X2616 | X2681 | X2744 | S2899 | X2956 | X3016 | X3097 | X3236 | X3304 | X3372 | X3432 | X3492 |
| X2616 | X2682 | X2745 | L2800 | X2957 | X3017 | X3098 | X3237 | X3305 | X3373 | X3433 | X3493 |
| X2616 | X2683 | X2746 | Y2805 | X2958 | X3018 | X3099 | X3238 | X3306 | X3374 | X3434 | X3494 |
| X2616 | X2684 | X2747 | R2806 | X2959 | X3019 | X3100 | X3239 | X3307 | X3375 | X3435 | X3495 |
| X2616 | X2685 | X2748 | L2807 | X2960 | X3020 | X3101 | X3240 | X3308 | X3376 | X3436 | X3496 |
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| X2616 | X2691 | X2754 | L2813 | X2966 | X3026 | X3107 | X3246 | X3314 | X3382 | X3442 | X3502 |
| X2616 | X2692 | X2755 | K2814 | X2967 | X3027 | X3108 | X3247 | X3315 | X3383 | X3443 | X3503 |
| X2616 | X2693 | X2756 | A2815 | X2968 | X3028 | X3109 | X3248 | X3316 | X3384 | X3444 | X3504 |
| X2616 | X2694 | X2757 | M2816 | X2969 | X3029 | X3110 | X3249 | X3317 | X3385 | X3445 | X3505 |
| X2616 | X2695 | X2758 | X2817 | X2970 | X3030 | X3111 | X3250 | X3318 | X3386 | X3446 | X3506 |
| X2616 | X2696 | X2759 | A2818 | X2971 | X3031 | X3112 | X3251 | X3319 | X3387 | X3447 | X3507 |
| X2616 | X2697 | X2760 | M2819 | X2972 | X3032 | X3113 | X3252 | X3320 | X3388 | X3448 | X3508 |
| X2616 | X2698 | X2761 | E2820 | X2973 | X3033 | X3114 | X3253 | X3321 | X3389 | X3449 | X3509 |
| X2616 | X2699 | X2762 | K2821 | X2974 | X3034 | X3115 | X3254 | X3322 | X3390 | X3450 | X3510 |
| X2616 | X2700 | X2763 | M2822 | X2975 | X3035 | X3116 | X3255 | X3323 | X3391 | X3451 | X3511 |
| X2616 | X2701 | X2764 | T2823 | X2976 | X3036 | X3117 | X3256 | X3324 | X3392 | X3452 | X3512 |
| X2616 | X2702 | X2765 | L2824 | X2977 | X3037 | X3118 | X3257 | X3325 | X3393 | X3453 | X3513 |
| X2616 | X2703 | X2766 | E2825 | X2978 | X3038 | X3119 | X3258 | X3326 | X3394 | X3454 | X3514 |
| X2616 | X2704 | X2767 | K2826 | X2979 | X3039 | X3120 | X3259 | X3327 | X3395 | X3455 | X3515 |
| X2616 | X2705 | X2768 | A2827 | X2980 | X3040 | X3121 | X3260 | X3328 | X3396 | X3456 | X3516 |
| X2616 | X2706 | X2769 | M2828 | X2981 | X3041 | X3122 | X3261 | X3329 | X3397 | X3457 | X3517 |
| X2616 | X2707 | X2770 | E2829 | X2982 | X3042 | X3123 | X3262 | X3330 | X3398 | X3458 | X3518 |
| X2616 | X2708 | X2771 | X2830 | X2983 | X3043 | X3124 | X3263 | X3331 | X3399 | X3459 | X3519 |
| X2616 | X2709 | X2772 | L2831 | X2984 | X3044 | X3125 | X3264 | X3332 | X3400 | X3460 | X3520 |
| X2616 | X2710 | X2773 | E2832 | X2985 | X3045 | X3126 | X3265 | X3333 | X3401 | X3461 | X3521 |
| X2616 | X2711 | X2774 | K2833 | X2986 | X3046 | X3127 | X3266 | X3334 | X3402 | X3462 | X3522 |
| X2616 | X2712 | X2775 | A2834 | X2987 | X3047 | X3128 | X3267 | X3335 | X3403 | X3463 | X3523 |
| X2616 | X2713 | X2776 | M2835 | X2988 | X3048 | X3129 | X3268 | X3336 | X3404 | X3464 | X3524 |
| X2616 | X2714 | X2777 | E2836 | X2989 | X3049 | X3130 | X3269 | X3337 | X3405 | X3465 | X3525 |
| X2616 | X2715 | X2778 | K2837 | X2990 | X3050 | X3131 | X3270 | X3338 | X3406 | X3466 | X3526 |
| X2616 | X2716 | X2779 | A2838 | X2991 | X3051 | X3132 | X3271 | X3339 | X3407 | X3467 | X3527 |
| X2616 | X2717 | X2780 | M2839 | X2992 | X3052 | X3133 | X3272 | X3340 | X3408 | X3468 | X3528 |
| X2616 | X2718 | X2781 | E2840 | X2993 | X3053 | X3134 | X3273 | X3341 | X3409 | X3469 | X3529 |
| X2616 | X2719 | X2782 | K2841 | X2994 | X3054 | X3135 | X3274 | X3342 | X3410 | X3470 | X3530 |
| X2616 | X2720 | X2783 | A2842 | X2995 | X3055 | X3136 | X3275 | X3343 | X3411 | X3471 | X3531 |
| X2616 | X2721 | X2784 | M2843 | X2996 | X3056 | X3137 | X3276 | X3344 | X3412 | X3472 | X3532 |
| X2616 | X2722 | X2785 | E2844 | X2997 | X3057 | X3138 | X3277 | X3345 | X3413 | X3473 | X3533 |
| X2616 | X2723 | X2786 | K2845 | X2998 | X3058 | X3139 | X3278 | X3346 | X3414 | X3474 | X3534 |
| X2616 | X2724 | X2787 | A2846 | X2999 | X3059 | X3140 | X3279 | X3347 | X3415 | X3475 | X3535 |
| X2616 | X2725 | X2788 | M2847 | X3000 | X3060 | X3141 | X3280 | X3348 | X3416 | X3476 | X3536 |
| X2616 | X2726 | X2789 | E2848 | X3001 | X3061 | X3142 | X3281 | X3349 | X3417 | X3477 | X3537 |
| X2616 | X2727 | X2790 | K2849 | X3002 | X3062 | X3143 | X3282 | X3350 | X3418 | X3478 | X3538 |
| X2616 | X2728 | X2791 | A2850 | X3003 | X3063 | X3144 | X3283 | X3351 | X3419 | X3479 | X3539 |
| X26   |       |       |       |       |       |       |       |       |       |       |       |





• Molecule 2: ryanodine receptor 1





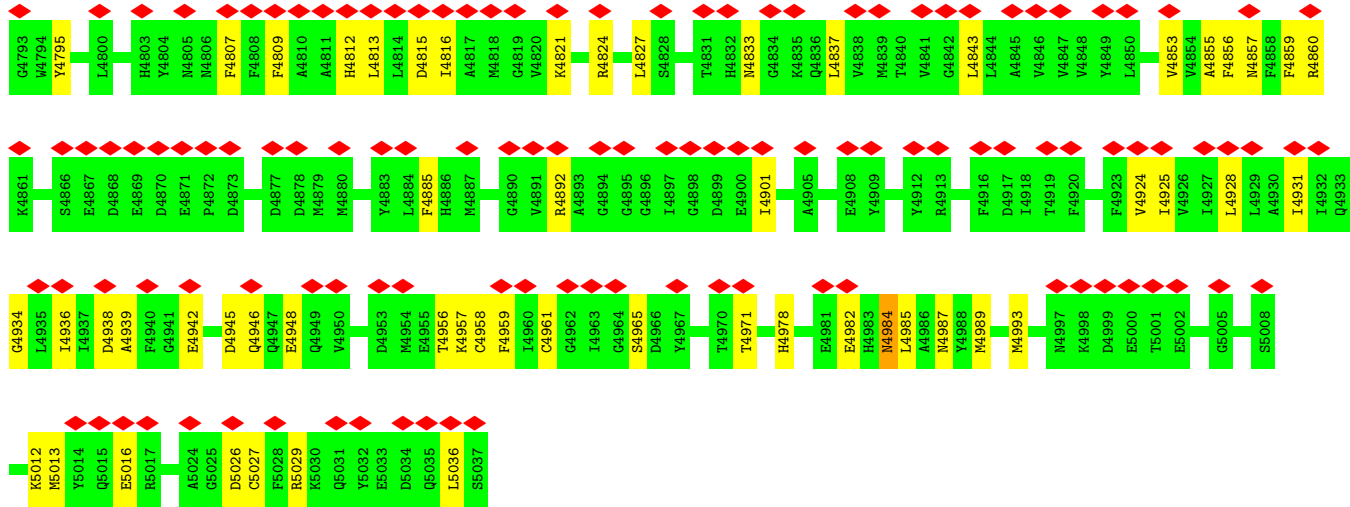
|     |       |       |       |         |       |       |       |       |       |       |       |       |
|-----|-------|-------|-------|---------|-------|-------|-------|-------|-------|-------|-------|-------|
| GLU | W1839 | P1779 | I1718 | S1654   | R1594 | X1526 | X1461 | P1267 | D1207 | S1145 | V1083 | R1020 |
| GLU | P1840 | P1780 | H1719 | E1655   | L1595 | X1526 | X1462 | P1268 | V1208 | G1146 | Q1084 | Y1024 |
| GLU | L1841 | C1781 | L1720 | R1656   | E1596 | X1527 | X1463 | C1269 | S1209 | D1147 | Q1085 |       |
| LYS | L1842 | F1782 | E1721 | Q1598   | E1597 | X1528 | X1464 | L1270 | S1210 | V1148 | G1086 |       |
| ASP | K1843 | V1783 | S1722 | M1599   | Q1599 | X1529 | X1465 | R1271 | L2111 | G1149 | L1027 |       |
| GLU | L1844 | A1784 | A1723 | L1600   | L1600 | X1530 | X1466 | L1272 | R1212 | V1150 | D1028 |       |
| GLU | V1845 | A1785 | R1725 | M1601   | M1601 | X1531 | X1467 | A1273 | F1213 | C1151 | E1029 |       |
| LYS | L1848 | L1786 | S1726 | P1602   | P1602 | X1532 | X1468 | H1274 | R1214 | C1152 | E1091 |       |
| GLU | L1849 | P1787 | H1665 | V1603   | V1603 | X1533 | X1469 | R1275 | F1215 | M1152 | A1030 |       |
| GLU | V1850 | A1788 | R1728 | S1604   | S1604 | X1534 | X1470 | X1276 | A1216 | L1155 | K1032 |       |
| GLU | M1851 | ALA   | S1729 | W1605   | W1605 | X1535 | X1471 | X1277 | I2126 | T1156 | R1033 |       |
| ALA | G1852 | GLY   | M1730 | S1606   | S1606 | X1536 | X1472 | X1278 | G1218 | E1157 | E1083 |       |
| GLU | L1853 | VAL   | L1731 | R1607   | R1607 | X1537 | X1473 | X1279 | L1219 | M1158 | V1095 |       |
| GLU | F1854 | ALA   | L1732 | M1608   | M1608 | X1538 | X1474 | X1280 | L1219 | T1096 | R1036 |       |
| GLU | G1855 | E1793 | S1732 | M1609   | M1609 | X1539 | X1475 | X1281 | L1219 | T1087 | D1037 |       |
| LYS | D1856 | A1794 | E1733 | P1609   | P1609 | X1538 | X1476 | X1282 | E1221 | G1098 | S1038 |       |
| GLU | E1857 | P1795 | V1734 | M1610   | M1610 | X1540 | X1477 | X1283 | G1222 | F1162 | E1099 |       |
| ASP | E1858 | A1796 | I1735 | H1611   | H1611 | X1541 | X1478 | X1284 | F1223 | L1163 | L1039 |       |
| GLU | V1859 | R1797 | V1736 | F1612   | F1612 | X1542 | X1479 | X1284 | E1224 | L1164 | C1040 |       |
| GLU | K1860 | L1798 | P1737 | X1543   | X1543 | X1542 | X1480 | X1285 | P1225 | M1165 | Q1041 |       |
| GLU | Q1861 | L1799 | L1738 | X1544   | X1544 | X1544 | X1484 | X1286 | F1226 | G1166 | A1042 |       |
| GLU | L1862 | P1800 | L1739 | X1545   | X1545 | X1546 | X1485 | X1287 | A1227 | E1167 | V1043 |       |
| GLU | L1863 | A1801 | P1740 | X1546   | X1546 | X1547 | X1486 | X1288 | I1228 | R1106 | R1044 |       |
| GLU | K1864 | I1802 | E1741 | X1547   | X1547 | X1548 | X1487 | X1289 | M1229 | M1170 | T1045 |       |
| GLU | M1865 | P1803 | R1742 | X1548   | X1548 | X1549 | X1488 | X1290 | M1230 | S1171 | L1046 |       |
| GLU | L1866 | L1804 | T1743 | X1549   | X1549 | X1550 | X1489 | X1291 | Q1231 | D1172 | L1047 |       |
| GLU | E1867 | E1805 | A1744 | X1550   | X1550 | X1551 | X1492 | X1292 | R1232 | L1109 | G1048 |       |
| GLU | P1868 | I1806 | I1745 | X1551   | X1551 | X1552 | X1493 | X1293 | P1233 | R1110 | G1050 |       |
| GLU | E1869 | A1807 | T1746 | X1552   | X1552 | X1553 | X1494 | X1294 | G1174 | P1111 | Y1049 |       |
| GLU | V1870 | R1808 | L1747 | X1553   | X1553 | X1554 | X1495 | X1295 | V1234 | S1175 | Y1051 |       |
| GLU | F1871 | D1809 | F1748 | X1554   | X1554 | X1555 | X1496 | X1296 | T1235 | E1176 | M1052 |       |
| GLU | T1872 | K1810 | P1749 | X1555   | X1555 | X1556 | X1497 | X1297 | W1237 | T1177 | I1053 |       |
| GLU | E1873 | L1811 | P1750 | X1556   | X1556 | X1557 | X1498 | X1300 | F1238 | A1178 | E1054 |       |
| GLU | E1874 | L1812 | G1751 | X1557   | X1557 | X1560 | X1499 | X1431 | S1239 | F1179 | PRO   |       |
| GLU | M1939 | R1813 | R1752 | X1560   | X1560 | X1561 | X1499 | X1432 | K1240 | R1180 | ASP   |       |
| GLU | C1940 | M1814 | Q1693 | X1562   | X1562 | X1563 | X1500 | X1433 | S1241 | E1181 | GLN   |       |
| GLU | M1941 | L1815 | L1694 | X1563   | X1563 | X1564 | X1501 | X1434 | S1241 | L1182 | GLU   |       |
| GLU | L1942 | L1816 | L1695 | X1564   | X1564 | X1565 | X1502 | X1435 | S1241 | E1183 | GLU   |       |
| GLU | V1945 | H1817 | H1696 | X1565   | X1565 | X1566 | X1503 | L1242 | L1242 | E1183 | PRO   |       |
| GLU | F1946 | A1818 | A1697 | X1566   | X1566 | X1567 | X1504 | X1437 | P1243 | I1184 | GLN   |       |
| GLU | Q1949 | V1819 | E1698 | X1567   | X1567 | X1568 | X1506 | X1438 | Q1244 | G1185 | VAL   |       |
| GLU | L1951 | R1820 | E1699 | X1568   | X1568 | X1569 | X1507 | X1439 | F1245 | D1186 | GLU   |       |
| GLU | Q1952 | D1821 | A1701 | X1569   | X1569 | X1570 | X1508 | X1440 | E1246 | G1187 | ASN   |       |
| GLU | H1953 | G1822 | H1702 | X1570   | X1570 | X1571 | X1509 | X1441 | P1247 | F1188 | GLN   |       |
| ASP | V1954 | G1823 | H1703 | X1571   | X1571 | X1572 | X1510 | X1442 | P1249 | L1189 | GLN   |       |
| GLU | V1955 | H1824 | L1704 | X1572   | X1572 | X1573 | X1511 | X1443 | P1250 | P1190 | TRP   |       |
| GLU | E1956 | R1825 | P1705 | X1573   | X1573 | X1574 | X1512 | X1444 | E1251 | C1192 | R1071 |       |
| GLU | A1960 | R1827 | L1707 | X1574   | X1574 | X1575 | X1513 | X1445 | H1252 | S1193 | V1072 |       |
| GLU | R1964 | D1828 | R1708 | X1575   | X1575 | X1576 | X1514 | X1446 | H1252 | L1194 | R1073 |       |
| GLU | Y1965 | P1829 | A1709 | X1576   | X1576 | X1577 | X1515 | X1447 | P1253 | G1195 | I1074 |       |
| ASP |       | L1830 | G1710 | X1577   | X1577 | X1578 | X1516 | X1448 | H1254 | P1196 | F1075 |       |
| ASP |       | G1831 | Y1711 | X1578   | X1578 | X1579 | X1517 | X1449 | E1256 | G1197 | R1076 |       |
| ASP |       | R1832 | D1712 | X1579   | X1579 | X1580 | X1518 | X1450 | A1258 | Q1198 | A1077 |       |
| GLU |       | S1833 | L1714 | X1580   | X1580 | X1581 | X1519 | X1451 | R1259 | V1199 | E1078 |       |
| GLU |       | L1834 | L1715 | X1581   | X1581 | X1582 | X1520 | X1452 | M1260 | G1200 | K1079 |       |
| GLU |       | E1835 | I1716 | X1582   | X1582 | X1583 | X1521 | X1453 | R1261 | H1201 | S1080 |       |
| GLU |       | F1836 | S1717 | X1583   | X1583 | X1584 | X1522 | X1454 | D1261 | F1139 | V1081 |       |
| GLU |       | Q1837 | H1776 | X1584   | X1584 | X1585 | X1523 | X1455 | G1262 | L1202 | T1082 |       |
| GLU |       | F1838 | S1778 | X1585   | X1585 | X1586 | X1524 | X1456 | T1263 | M1203 | R1141 |       |
| GLU |       |       |       | X1586   | X1586 | X1587 | X1525 | X1457 | V1264 | G1205 | W1143 |       |
| GLU |       |       |       | X1587   | X1587 | X1588 | X1526 | X1458 | T1265 | Q1206 | Q1144 |       |
| GLU |       |       |       | X1588   | X1588 | X1589 | X1527 | X1459 |       |       |       |       |
| GLU |       |       |       | X1589   | X1589 | X1590 | X1528 | X1460 |       |       |       |       |
| GLU |       |       |       | X1590   | X1590 | X1591 | X1529 | X1461 |       |       |       |       |
| GLU |       |       |       | X1591   | X1591 | X1592 | X1530 | X1462 |       |       |       |       |
| GLU |       |       |       | X1592   | X1592 | X1593 | X1531 | X1463 |       |       |       |       |
| GLU |       |       |       | X1593   | X1593 | X1594 | X1532 | X1464 |       |       |       |       |
| GLU |       |       |       | X1594   | X1594 | X1595 | X1533 | X1465 |       |       |       |       |
| GLU |       |       |       | X1595   | X1595 | X1596 | X1534 | X1466 |       |       |       |       |
| GLU |       |       |       | X1596   | X1596 | X1597 | X1535 | X1467 |       |       |       |       |
| GLU |       |       |       | X1597   | X1597 | X1598 | X1536 | X1468 |       |       |       |       |
| GLU |       |       |       | X1598   | X1598 | X1599 | X1537 | X1469 |       |       |       |       |
| GLU |       |       |       | X1599   | X1599 | X1600 | X1538 | X1470 |       |       |       |       |
| GLU |       |       |       | X1600   | X1600 | X1601 | X1539 | X1471 |       |       |       |       |
| GLU |       |       |       | X1601   | X1601 | X1602 | X1540 | X1472 |       |       |       |       |
| GLU |       |       |       | X1602   | X1602 | X1603 | X1541 | X1473 |       |       |       |       |
| GLU |       |       |       | X1603   | X1603 | X1604 | X1542 | X1474 |       |       |       |       |
| GLU |       |       |       | X1604   | X1604 | X1605 | X1543 | X1475 |       |       |       |       |
| GLU |       |       |       | X1605   | X1605 | X1606 | X1544 | X1476 |       |       |       |       |
| GLU |       |       |       | X1606   | X1606 | X1607 | X1545 | X1477 |       |       |       |       |
| GLU |       |       |       | X1607   | X1607 | X1608 | X1546 | X1478 |       |       |       |       |
| GLU |       |       |       | X1608   | X1608 | X1609 | X1547 | X1479 |       |       |       |       |
| GLU |       |       |       | X1609   | X1609 | X1610 | X1548 | X1480 |       |       |       |       |
| GLU |       |       |       | X1610   | X1610 | X1611 | X1549 | X1481 |       |       |       |       |
| GLU |       |       |       | X1611   | X1611 | X1612 | X1550 | X1482 |       |       |       |       |
| GLU |       |       |       | X1612   | X1612 | X1613 | X1551 | X1483 |       |       |       |       |
| GLU |       |       |       | X1613   | X1613 | X1614 | X1552 | X1484 |       |       |       |       |
| GLU |       |       |       | X1614   | X1614 | X1615 | X1553 | X1485 |       |       |       |       |
| GLU |       |       |       | X1615   | X1615 | X1616 | X1554 | X1486 |       |       |       |       |
| GLU |       |       |       | X1616   | X1616 | X1617 | X1555 | X1487 |       |       |       |       |
| GLU |       |       |       | X1617   | X1617 | X1618 | X1556 | X1488 |       |       |       |       |
| GLU |       |       |       | X1618   | X1618 | X1619 | X1557 | X1489 |       |       |       |       |
| GLU |       |       |       | X1619   | X1619 | X1620 | X1558 | X1490 |       |       |       |       |
| GLU |       |       |       | X1620   | X1620 | X1621 | X1559 | X1491 |       |       |       |       |
| GLU |       |       |       | X1621   | X1621 | X1622 | X1560 | X1492 |       |       |       |       |
| GLU |       |       |       | X1622   | X1622 | X1623 | X1561 | X1493 |       |       |       |       |
| GLU |       |       |       | X1623   | X1623 | X1624 | X1562 | X1494 |       |       |       |       |
| GLU |       |       |       | X1624   | X1624 | X1625 | X1563 | X1495 |       |       |       |       |
| GLU |       |       |       | X1625   | X1625 | X1626 | X1564 | X1496 |       |       |       |       |
| GLU |       |       |       | X1626   | X1626 | X1627 | X1565 | X1497 |       |       |       |       |
| GLU |       |       |       | X1627   | X1627 | X1628 | X1566 | X1498 |       |       |       |       |
| GLU |       |       |       | X1628   | X1628 | X1629 | X1567 | X1499 |       |       |       |       |
| GLU |       |       |       | X1629   | X1629 | X1630 | X1568 | X1500 |       |       |       |       |
| GLU |       |       |       | X1630   | X1630 | X1631 | X1569 | X1501 |       |       |       |       |
| GLU |       |       |       | X1631   | X1631 | X1632 | X1570 | X1502 |       |       |       |       |
| GLU |       |       |       | X1632   | X1632 | X1633 | X1571 | X1503 |       |       |       |       |
| GLU |       |       |       | X1633   | X1633 | X1634 | X1572 | X1504 |       |       |       |       |
| GLU |       |       |       | X1634   | X1634 | X1635 | X1573 | X1505 |       |       |       |       |
| GLU |       |       |       | X1635   | X1635 | X1636 | X1574 | X1506 |       |       |       |       |
| GLU |       |       |       | X1636   | X1636 | X1637 | X1575 | X1507 |       |       |       |       |
| GLU |       |       |       | X1637   | X1637 | X1638 | X1576 | X1508 |       |       |       |       |
| GLU |       |       |       | X1638   | X1638 | X1639 | X1577 | X1509 |       |       |       |       |
| GLU |       |       |       | X1639   | X1639 | X1640 | X1578 | X1510 |       |       |       |       |
| GLU |       |       |       | X1640   | X1640 | X1641 | X1579 | X1511 |       |       |       |       |
| GLU |       |       |       | X1641   | X1641 | X1642 | X1580 | X1512 |       |       |       |       |
| GLU |       |       |       | X1642   | X1642 | X1643 | X1581 | X1513 |       |       |       |       |
| GLU |       |       |       | X1643   | X1643 | X1644 | X1582 | X1514 |       |       |       |       |
| GLU |       |       |       | X1644   | X1644 | X1645 | X1583 | X1515 |       |       |       |       |
| GLU |       |       |       | X1645   | X1645 | X1646 | X1584 | X1516 |       |       |       |       |
| GLU |       |       |       | X1646   | X1646 | X1647 | X1585 | X1517 |       |       |       |       |
| GLU |       |       |       | X1647   | X1647 | X1648 | X1586 | X1518 |       |       |       |       |
| GLU |       |       |       | X1648   | X1648 | X1649 | X1587 | X1519 |       |       |       |       |
| GLU |       |       |       | X1649   | X1649 | X1650 | X1588 | X1520 |       |       |       |       |
| GLU |       |       |       | X1650</ |       |       |       |       |       |       |       |       |



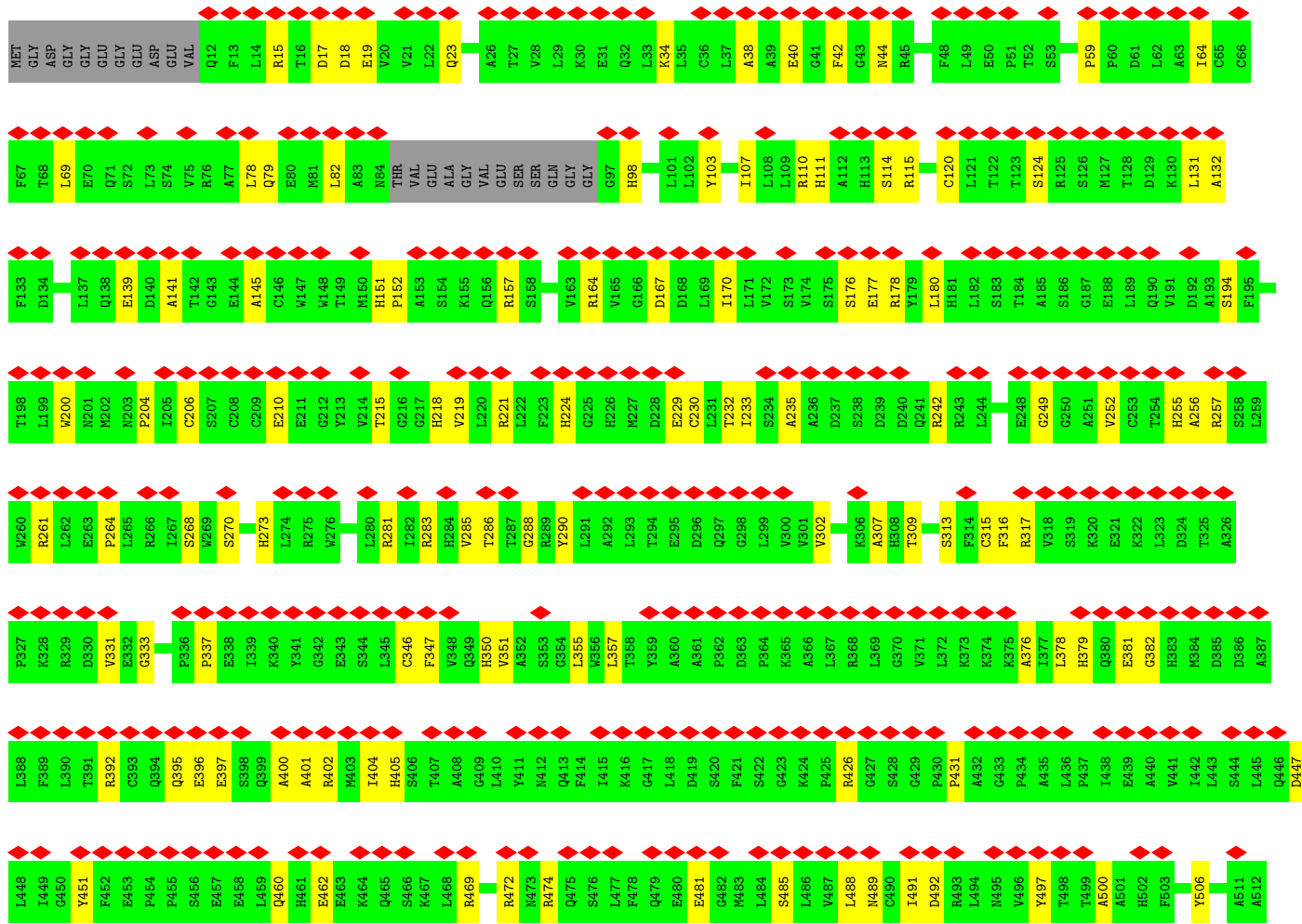
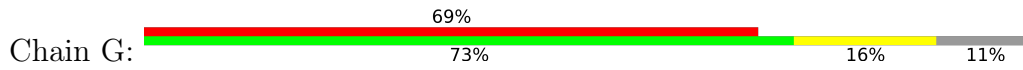
|       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       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|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------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| Tyr   | ASP   | PRO   | ARG   | GLU   | GLY   | Y2855 | H2856 | P2857 | Q2858 | P2859 | P2860 | D2861 | L2862 | S2863 | O2864 | T2865 | V2866 | L2867 | S2868 | R2869 | E2870 | L2871 | O2872 | A2873 | M2874 | A2875 | E2876 | Q2877 | L2878 | A2879 | E2880 | H2881 | Y2882 | H2883 | N2884 | T2885 | V2886 | G2887 | R2888 | K2889 | T2890 | A2891 | O2892 | E2893 | L2894 | E2895 | A2896 | K2897 | G2898 | G2899 | G2900 | T2901 | F2903 | L2904 | L2905 | V2906 | F2907 | V2908 | X2909 | T2910 | L2911 | T2912 | A2913 | K2914 | E2915 | K2916 | A2917 | R2918 | D2919 | R2920 | E2921 | K2922 | A2923 | Q2924 | E2925 | L2926 | L2927 | K2928 | F2929 | L2930 | Q2931 | M2932 | N2933 | G2934 | Y2935 | A2936 | V2937 | T2938 | R2939 | X2942 | X2943 | X2944 | X2945 | X2946 | X2947 | X2948 | X2949 | X2950 | X2951 | X2952 | X2953 | X2954 | X2955 | X2956 | X2957 | X2958 | X2959 | X2960 | X2961 | X2962 | X2963 | X2964 | X2965 | X2966 | X2967 | X2968 | X2969 | X2970 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       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| X3050 | X3051 | X3052 | X3053 | X3054 | X3055 | X3056 | X3057 | X3058 | X3059 | X3060 | X3061 | X3062 | X3063 | X3064 | X3065 | X3066 | X3067 | X3068 | X3069 | X3070 | X3071 | X3072 | X3073 | X3074 | X3075 | X3076 | X3077 | X3078 | X3079 | X3080 | X3081 | X3082 | X3083 | X3084 | X3085 | X3086 | X3087 | X3088 | X3089 | X3090 | X3091 | X3092 | X3093 | X3094 | X3095 | X3096 | X3097 | X3098 | X3099 | X3100 | X3101 | X3102 | X3103 | X3104 | X3105 | X3106 | X3107 | X3108 | X3109 | X3110 | X3111 | X3112 | X3113 | X3114 | X3115 | X3116 | X3117 | X3118 | X3119 | X3120 | X3121 | X3122 | X3123 | X3124 | X3125 | X3126 | X3127 | X3128 | X3129 | X3130 | X3131 | X3132 | X3133 | X3134 | X3135 | X3136 | X3137 | X3138 | X3139 | X3140 | X3141 | X3142 | X3143 | X3144 | X3145 | X3146 | X3147 | X3148 | X3149 | X3150 | X3151 | X3152 | X3153 | X3154 | X3155 | X3156 | X3157 | X3158 | X3159 | X3160 | X3161 | X3162 | X3163 | X3164 | X3165 | X3166 | X3167 | X3168 | X3169 | X3170 | X3171 | X3172 | X3173 | X3174 | X3175 | X3176 | X3177 | X3178 | X3179 | X3180 | X3181 | X3182 | X3183 | X3184 | X3185 | X3186 | X3187 | X3188 | X3189 | X3190 | X3191 | X3192 | X3193 | X3194 | X3195 | X3196 | X3197 | X3198 | X3199 | X3200 | X3201 | X3202 | X3203 | X3204 | X3205 | X3206 | X3207 | X3208 | X3209 | X3210 | X3211 | X3212 | X3213 | X3214 | X3215 | X3216 | X3217 | X3218 | X3219 | X3220 | X3221 | X3222 | X3223 | X3224 | X3225 | X3226 | X3227 | X3228 | X3229 | X3230 | X3231 | X3232 | X3233 | X3234 | X3235 | X3236 | X3237 | X3238 | X3239 | X3240 | X3241 | X3242 | X3243 | X3244 | X3245 | X3246 | X3247 | X3248 | X3249 | X3250 | X3251 | X3252 | X3253 | X3254 | X3255 | X3256 | X3257 | X3258 | X3259 | X3260 | X3261 | X3262 | X3263 | X3264 | X3265 | X3266 | X3267 | X3268 | X3269 | X3270 | X3271 | X3272 | X3273 | X3274 | X3275 | X3276 | X3277 | X3278 | X3279 | X3280 | X3281 | X3282 | X3283 | X3284 | X3285 | X3286 | X3287 | X3288 | X3289 | X3290 | X3291 | X3292 | X3293 | X3294 | X3295 | X3296 | X3297 | X3298 | X3299 | X3300 | X3301 | X3302 | X3303 | X3304 | X3305 | X3306 | X3307 | X3308 | X3309 | X3310 | X3311 | X3312 | X3313 | X3314 | X3315 | X3316 | X3317 | X3318 | X3319 | X3320 | X3321 | X3322 | X3323 | X3324 | X3325 | X3326 | X3327 | X3328 | X3329 | X3330 | X3331 | X3332 | X3333 | X3334 | X3335 | X3336 | X3337 | X3338 | X3339 | X3340 | X3341 | X3342 | X3343 | X3344 | X3345 | X3346 | X3347 | X3348 | X3349 | X3350 | X3351 | X3352 | X3353 | X3354 | X3355 | X3356 | X3357 | X3358 | X3359 | X3360 | X3361 | X3362 | X3363 | X3364 | X3365 | X3366 | X3367 | X3368 | X3369 | X3370 | X3371 | X3372 | X3373 | X3374 | X3375 | X3376 | X3377 | X3378 | X3379 | X3380 | X3381 | X3382 | X3383 | X3384 | X3385 | X3386 | X3387 | X3388 | X3389 | X3390 | X3391 | X3392 | X3393 | X3394 | X3395 | X3396 | X3397 | X3398 | X3399 | X3400 | X3401 | X3402 | X3403 | X3404 | X3405 | X3406 | X3407 | X3408 | X3409 | X3410 | X3411 | X3412 | X3413 | X3414 | X3415 | X3416 | X3417 | X3418 | X3419 | X3420 | X3421 | X3422 | X3423 | X3424 | X3425 | X3426 | X3427 | X3428 | X3429 | X3430 | X3431 | X3432 | X3433 | X3434 | X3435 | X3436 | X3437 | X3438 | X3439 | X3440 | X3441 | X3442 | X3443 | X3444 | X3445 | X3446 | X3447 | X3448 | X3449 | X3450 | X3451 | X3452 | X3453 | X3454 | X3455 | X3456 | X3457 | X3458 | X3459 | X3460 | X3461 | X3462 | X3463 | X3464 | X3465 | X3466 | X3467 | X3468 | X3469 | X3470 | X3471 | X3472 | X3473 | X3474 | X3475 | X3476 | X3477 | X3478 | X3479 | X3480 | X3481 | X3482 | X3483 | X3484 | X3485 | X3486 | X3487 | X3488 | X3489 | X3490 | X3491 | X3492 | X3493 | X3494 | X3495 | X3496 | X3497 | X3498 | X3499 | X3500 | X3501 | X3502 | X3503 | X3504 | X3505 | X3506 | X3507 | X3508 | X3509 | X3510 | X3511 | X3512 | X3513 | X3514 | X3515 | X3516 | X3517 | X3518 | X3519 | X3520 | X3521 | X3522 | X3523 | X3524 | X3525 | X3526 | X3527 | X3528 | X3529 | X3530 | X3531 | X3532 | X3533 | X3534 | X3535 | X3536 | X3537 | X3538 | X3539 | X3540 | X3541 | X3542 | X3543 | X3544 | X3545 | X3546 | X3547 | X3548 | X3549 | X3550 | X3551 | X3552 | X3553 | X3554 | X3555 | X3556 | X3557 | X3558 | X3559 | X3560 | X3561 | X3562 | X3563 | X3564 | X3565 | X3566 | X3567 | X3568 | X3569 | X3570 | X3571 | X3572 | X3573 | X3574 | X3575 | X3576 | X3577 | X3578 | X3579 | X3580 | X3581 | X3582 | X3583 | X3584 | X3585 | X3586 | X3587 | X3588 | X3589 | X3590 | X3591 | X3592 | X3593 | X3594 | X3595 | X3596 | X3597 | X3598 | X3599 | X3600 | X3601 | X3602 | X3603 | X3604 | X3605 | X3606 | X3607 | X3608 | X3609 | X3610 | X3611 | X3612 | X3613 | X3614 | X3615 | X3616 | X3617 | X3618 | X3619 | X3620 | X3621 | X3622 | X3623 | X3624 | X3625 | X3626 | X3627 | X3628 | X3629 | X3630 | X3631 | X3632 | X3633 | X3634 | X3635 | X3636 | X3637 | X3638 | X3639 | X3640 | X3641 | X3642 | X3643 | X3644 | X3645 | X3646 | X3647 | X3648 | X3649 | X3650 | X3651 | X3652 | X3653 | X3654 | X3655 | X3656 | X3657 | X3658 | X3659 | X3660 | X3661 | X3662 | X3663 | X3664 | X3665 | X3666 | X3667 | X3668 | X3669 | X3670 | X3671 | X3672 | X3673 | X3674 | X3675 | X3676 | X3677 | X3678 | X3679 | X3680 | X3681 | X3682 | X3683 | X3684 | X3685 | X3686 | X3687 | X3688 | X3689 | X3690 | X3691 | X3692 | X3693 | X3694 | X3695 | X3696 | X3697 | X3698 | X3699 | X3700 | X3701 | X3702 | X3703 | X3704 | X3705 | X3706 | X3707 | X3708 | X3709 | X3710 | X3711 | X3712 | X3713 | X3714 | X3715 | X3716 | X3717 | X3718 | X3719 | X3720 | X3721 | X3722 | X3723 | X3724 | X3725 | X3726 | X3727 | X3728 | X3729 | X3730 | X3731 | X3732 | X3733 | X3734 | X3735 | X3736 | X3737 | X3738 | X3739 | X3740 | X3741 | X3742 | X3743 | X3744 | X3745 | X3746 | X3747 | X3748 | X3749 | X3750 | X3751 | X3752 | X3753 | X3754 | X3755 | X3756 | X3757 | X3758 | X3759 | X3760 | X3761 | X3762 | X3763 | X3764 | X3765 | X3766 | X3767 | X3768 | X3769 | X3770 | X3771 | X3772 | X3773 | X3774 | X3775 | X3776 | X3777 | X3778 | X3779 | X3780 | X3781 | X3782 | X3783 | X3784 | X3785 | X3786 | X3787 | X3788 | X3789 | X3790 | X3791 | X3792 | X3793 | X3794 | X3795 | X3796 | X3797 | X3798 | X3799 | X3800 | X3801 | X3802 | X3803 | X3804 | X3805 | X3806 | X3807 | X3808 | X3809 | X3810 | X3811 | X3812 | X3813 | X3814 | X3815 | X3816 | X3817 | X3818 | X3819 | X3820 | X3821 | X3822 | X3823 | X3824 | X3825 | X3826 | X3827 | X3828 | X3829 | X3830 | X3831 | X3832 | X3833 | X3834 | X3835 | X3836 | X3837 | X3838 | X3839 | X3840 | X3841 | X3842 | X3843 | X3844 | X3845 | X3846 | X3847 | X3848 | X3849 | X3850 | X3851 | X3852 | X3853 | X3854 | X3855 | X3856 | X3857 | X3858 | X3859 | X3860 | X3861 | X3862 | X3863 | X3864 | X3865 | X3866 | X3867 | X3868 | X3869 | X3870 | X3871 | X3872 | X3873 | X3874 | X3875 | X3876 | X3877 | X3878 | X3879 | X3880 | X3881 | X3882 | X3883 | X3884 | X3885 | X3886 | X3887 | X3888 | X3889 | X3890 | X3891 | X3892 | X3893 | X3894 | X3895 | X3896 | X3897 | X3898 | X3899 | X3900 | X3901 | X3902 | X3903 | X3904 | X3905 | X3906 | X3907 | X3908 | X3909 | X3910 | X3911 | X3912 | X3913 | X3914 | X3915 | X3916 | X3917 | X3918 | X3919 | X3920 | X3921 | X3922 | X3923 | X3924 | X3925 | X3926 | X3927 | X3928 | X3929 | X3930 | X3931 | X3932 | X3933 | X3934 | X3935 | X3936 | X3937 | X3938 | X3939 | X3940 | X3941 | X3942 | X3943 | X3944 | X3945 | X3946 | X3947 | X3948 | X3949 | X3950 | X3951 | X3952 | X3953 | X3954 | X3955 | X3956 | X3957 | X3958 | X3959 | X3960 | X3961 | X3962 | X3963 | X3964 | X3965 | X3966 | X3967 | X3968 | X3969 | X3970 | X3971 | X3972 | X3973 | X3974 | X3975 | X3976 | X3977 | X3978 | X3979 | X3980 | X3981 | X3982 | X3983 | X3984 | X3985 | X3986 | X3987 | X3988 | X3989 | X3990 | X3991 | X3992 | X3993 | X3994 | X3995 | X3996 | X3997 | X3998 | X3999 | X4000 | X4001 | X4002 | X4003 | X4004 | X4005 | X4006 | X4007 | X4008 | X4009 | X4010 | X4011 | X4012 | X4013 | X4014 | X4015 | X4016 | X4017 | X4018 | X4019 | X4020 | X4021 | X4022 | X4023 | X4024 | X4025 | X4026 | X4027 | X4028 | X4029 | X4030 | X4031 | X4032 | X4033 | X4034 | X4035 | X4036 | X4037 | X4038 | X4039 | X4040 | X4041 | X4042 | X4043 | X4044 | X4045 | X4046 | X4047 | X4048 | X4049 | X4050 | X4051 | X4052 | X4053 | X4054 | X4055 | X4056 | X4057 | X4058 | X4059 | X4060 | X4061 | X4062 | X4063 | X4064 | X4065 | X4066 | X4067 | X4068 | X4069 | X4070 | X4071 | X4072 | X4073 | X4074 | X4075 | X4076 | X4077 | X4078 | X4079 | X4080 | X4081 | X4082 | X4083 | X4084 | X4085 | X4086 | X4087 | X4088 | X4089 | X4090 | X4091 | X4092 | X4093 | X4094 | X4095 | X4096 | X4097 | X4098 | X4099 | X4100 | X4101 | X4102 | X4103 | X4104 | X4105 | X4106 | X4107 | X4108 | X4109 | X4110 | X4111 | X4112 | X4113 | X4114 | X4115 | X4116 | X4117 | X4118 | X4119 | X4120 | X4121 | X4122 | X4123 | X4124 | X4125 | X4126 | X4127 | X4128 | X4129 | X4130 | X4131 | X4132 | X4133 | X4134 | X4135 | X4136 | X4137 | X4138 | X4139 | X4140 | X4141 | X4142 | X4143 | X4144 | X4145 | X4146 | X4147 | X4148 | X4149 | X4150 | X4151 | X4152 | X4153 | X4154 | X4155 | X4156 | X4157 | X4158 | X4159 | X4160 | X4161 | X4162 | X4163 | X4164 | X4165 | X4166 | X4167 | X4168 | X4169 | X4170 | X4171 | X4172 | X4173 | X4174 | X4175 | X4176 | X4177 | X4178 | X4179 | X4180 | X4181 | X4182 | X4183 | X4184 | X4185 | X4186 | X4187 | X4188 | X4189 | X4190 | X4191 | X4192 | X4193 | X4194 | X4195 | X4196 | X4197 | X4198 | X4199 | X4200 | X4201 | X4202 | X4203 | X4204 | X4205 | X4206 | X4207 | X4208 | X4209 | X4210 | X4211 | X4212 | X4213 | X4214 | X4215 | X4216 | X4217 | X4218 | X4219 | X4220 | X4221 | X4222 | X4223 | X4224 | X4225 | X4226 | X4227 | X4228 | X4229 | X4230 | X4231 | X4232 | X4233 | X4234 | X4235 | X4236 | X4237 | X4238 | X4239 | X4240 | X4241 | X4242 | X4243 | X4244 | X4245 | X4246 | X4247 | X4248 | X4249 | X4250 | X4251 | X4252 | X4253 | X4254 | X4255 | X4256 | X4257 | X4258 | X4259 | X4260 | X4261 | X4262 | X4263 | X4264 | X4265 | X4266 | X4267 | X4268 | X4269 | X4270 | X4271 | X4272 | X4273 | X4274 | X4275 | X4276 | X4277 | X4278 | X4279 | X4280 | X4281 | X4282 | X4283 | X4284 | X4285 | X4286 | X4287 | X4288 | X |







● Molecule 2: ryanodine receptor 1



|       |       |       |       |       |      |      |      |      |      |      |
|-------|-------|-------|-------|-------|------|------|------|------|------|------|
| V1257 | G1197 | G1135 | F1075 | K945  | P825 | V764 | G701 | L637 | L575 | E513 |
| A1258 | Q1198 | S1136 | R1076 | A946  | T826 | G765 | W702 | I638 | N576 | S614 |
| R1259 | V1199 | E1137 | A1077 | E947  | K927 | G766 | G703 | M639 | N577 | W615 |
| M1260 | H1200 | P1138 | E1078 | D948  | E828 | V767 | G704 | Y640 | I578 | K616 |
| D1261 | H1201 | F1139 | A1079 | N949  | Q889 | F768 | N705 | V641 | Q579 | E517 |
| G1262 | L1202 | G1140 | K1079 | L950  | G890 | E769 | G706 | S643 | Q580 | I518 |
| T1263 | M1203 | R1141 | S1080 | K951  | W891 | A770 | V707 | S644 | N581 | V519 |
| V1264 | L1204 | P1142 | T1082 | K952  | T892 | F771 | G708 | I644 | H582 | N520 |
| D1265 | G1205 | W1143 | V1083 | T953  | Y893 | N772 | D709 | R645 | I583 | L521 |
| T1266 | Q1206 | Q1144 | Q1084 | K954  | G894 | L773 | D710 | P646 | K584 | L522 |
| P1267 | D1207 | S1145 | S1085 | L955  | P895 | D774 | L711 | N647 | S585 | Y523 |
| P1268 | V1208 | G1146 | G1086 | P956  | W896 | G775 | Y712 | I648 | I586 | E524 |
| G1269 | S1209 | D1147 | L1087 | K957  | H897 | L776 | S713 | F649 | F525 | L525 |
| L1270 | S1210 | V1148 | W1088 | T958  | D898 | F777 | Y714 | V650 | S588 | L526 |
| R1271 | L1211 | V1149 | Y1089 | Y959  | D899 | F778 | D717 | G651 | L589 | A527 |
| L1272 | F1212 | G1150 | F1090 | M960  | N900 | P779 | G718 | R652 | L590 | I530 |
| A1273 | F1213 | K1151 | E1091 | M961  | K901 | V780 | L719 | A653 | D591 | R531 |
| R1274 | F1214 | M1152 | F1092 | S962  | R902 | W781 | H720 | E654 | K592 | G532 |
| R1275 | A1215 | L1155 | E1093 | N963  | L903 | S782 | L721 | G655 | G594 | N533 |
| X1276 | I1216 | T1156 | A1094 | G964  | H904 | F783 | W722 | K661 | R595 | R534 |
| X1277 | C1217 | E1157 | V1095 | A968  | P905 | S784 | W723 | Y662 | N596 | A535 |
| X1278 | G1218 | M1158 | T1096 | L970  | C906 | A785 | G724 | F664 | F599 | M536 |
| X1279 | L1219 | L1161 | T1097 | L971  | L907 | W787 | W726 | E665 | V599 | C537 |
| X1280 | Q1220 | I1162 | G1098 | L972  | V908 | H788 | V727 | V666 | L600 | A538 |
| X1281 | E1221 | T1163 | E1099 | D971  | W909 | T849 | A727 | M667 | L603 | L539 |
| X1282 | G1222 | L1164 | M1100 | S972  | F910 | D850 | R728 | V668 | C604 | F540 |
| X1283 | F1223 | L1165 | R1101 | H974  | H911 | F851 | P729 | D669 | S605 | S541 |
| X1284 | P1225 | M1166 | V1102 | R975  | S912 | W52  | V730 | E670 | S606 | T542 |
| X1285 | F1226 | E1167 | L1045 | R976  | L913 | C854 | W731 | V671 | L606 | N543 |
| X1286 | A1227 | V1168 | L1046 | T978  | P914 | P855 | S732 | V672 | G607 | L544 |
| X1287 | I1228 | M1169 | L1047 | P979  | E915 | W56  | P733 | P673 | V608 | D545 |
| X1288 | N1229 | L1170 | G1048 | A980  | P916 | V857 | G734 | F674 | C609 | V546 |
| X1290 | M1230 | S1171 | Y1049 | Q981  | E917 | H977 | Q735 | L675 | G611 | V547 |
| X1291 | Q1231 | D1172 | G1050 | R982  | R918 | G798 | H736 | T676 | V548 | V548 |
| X1292 | P1233 | S1173 | Y1051 | T982  | N919 | E799 | L737 | A677 | A613 | S549 |
| X1293 | V1234 | G1174 | M1052 | D986  | Y920 | F800 | L738 | Q678 | V614 | K550 |
| X1294 | T1235 | S1175 | I1053 | R987  | N921 | K801 | P740 | A679 | R615 | L551 |
| X1295 | T1236 | E1176 | E1054 | L988  | Q923 | F802 | E741 | T680 | S616 | D552 |
| X1296 | W1237 | T1177 | PRO   | A989  | N924 | L803 | D742 | H681 | N617 | R553 |
| X1297 | F1238 | A1178 | ASP   | G992  | S925 | P804 | V743 | L682 | L554 | L554 |
| X1430 | S1239 | F1179 | GLN   | R998  | G926 | P805 | W744 | R683 | E555 | E556 |
| X1431 | S1240 | A1180 | GLN   | V1001 | E927 | P806 | S745 | V684 | A556 | A556 |
| X1432 | S1241 | E1181 | VAL   | L1002 | T928 | G807 | C746 | G685 | S657 | S657 |
| X1433 | S1242 | E1182 | VAL   | A1003 | L929 | Y808 | D749 | W686 | T622 | I560 |
| X1434 | P1243 | I1184 | ASN   | Q1003 | K930 | A809 | L750 | A687 | E623 | L561 |
| X1436 | Q1244 | I1185 | GLN   | G1004 | E872 | C811 | L688 | L688 | N624 | E562 |
| X1437 | F1245 | D1186 | SER   | G1005 | K873 | H812 | T689 | T689 | L625 | V563 |
| X1438 | E1246 | G1187 | ARG   | W1005 | L874 | E813 | V752 | E900 | L626 | L564 |
| X1439 | P1247 | F1188 | TRP   | S1006 | A875 | L816 | G828 | G628 | P627 | Y565 |
| X1440 | V1248 | L1189 | D1070 | S1007 | E876 | P817 | G829 | Y692 | G628 | C566 |
| X1441 | P1249 | P1190 | R1071 | I1007 | N877 | R818 | F757 | S993 | R629 | V567 |
| X1442 | P1250 | H1127 | VAL   | S1008 | T878 | E819 | R758 | P694 | E630 | L568 |
| X1443 | E1251 | V1191 | GLM   | A1009 | H879 | R20  | I759 | Y695 | L631 | I569 |
| X1444 | H1252 | C1192 | ASP   | GLM   | H938 | L821 | N760 | P696 | L632 | E570 |
| X1445 | P1253 | S1193 | ASP   | ILE   | W881 | R822 | G761 | G697 | L633 | S571 |
| X1446 | H1254 | L1194 | ASP   | ILE   | W882 | L823 | C762 | G698 | Q634 | P572 |
| X1447 | H1255 | G1195 | ASP   | ILE   | W883 | E824 | P763 | G699 | T635 | E573 |
| X1448 | E1256 | P1196 | ASP   | ILE   | L884 | E824 | E700 | E700 | M636 | V574 |



|       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| X3155 | X3156 | X3157 | X3158 | X3159 | X3160 | X3161 | X3162 | X3163 | X3164 | X3165 | X3166 | X3167 | X3168 | X3169 | X3170 | X3171 | X3172 | X3173 | X3174 | X3175 | X3176 | X3177 | X3178 | X3181 | X3182 | X3183 | X3184 | X3185 | X3186 | X3187 | X3188 | X3189 | X3190 | X3191 | X3192 | X3193 | X3194 | X3195 | X3196 | X3197 | X3198 | X3199 | X3200 | X3201 | X3202 | X3203 | X3204 | X3205 | X3206 | X3207 | X3208 | X3209 | X3210 | X3211 | X3212 | X3213 | X3214 | X3215 | X3216 | X3217 | X3218 | X3219 | X3220 | X3221 | X3222 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| X2943 | X2944 | X2945 | X2946 | X2947 | X2948 | X2949 | X2950 | X2951 | X2952 | X2953 | X2954 | X2955 | X2956 | X2957 | X2958 | X2959 | X2960 | X2961 | X2964 | X2965 | X2966 | X2967 | X2968 | X2969 | X2970 | X2971 | X2972 | X2973 | X2974 | X2975 | X2976 | X2977 | X2978 | X2979 | X2980 | X2981 | X2982 | X2983 | X2984 | X2985 | X2986 | X2987 | X2988 | X2989 | X2990 | X2991 | X2992 | X2993 | X2994 | X2995 | X2996 | X2997 | X2998 | X2999 | X3000 | X3001 | X3002 | X3003 | X3004 | X3005 | X3008 | X3009 | X3010 | X3011 | X3012 | X3013 | X3014 | X3015 | X3016 | X3017 | X3018 | X3019 | X3020 | X3021 | X3022 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| X2881 | X2882 | X2883 | X2884 | X2885 | X2886 | X2887 | X2888 | X2889 | X2890 | X2891 | X2892 | X2893 | X2894 | X2895 | X2896 | X2897 | X2898 | X2899 | X2900 | X2901 | X2902 | X2903 | X2904 | X2905 | X2906 | X2907 | X2908 | X2909 | X2910 | X2911 | X2912 | X2913 | X2914 | X2915 | X2916 | X2917 | X2918 | X2919 | X2920 | X2921 | X2922 | X2923 | X2924 | X2925 | X2926 | X2927 | X2928 | X2929 | X2930 | X2931 | X2932 | X2933 | X2934 | X2935 | X2936 | X2937 | X2938 | X2939 | X2942 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| X2821 | X2822 | X2823 | X2824 | X2825 | X2826 | X2827 | X2828 | X2829 | X2830 | GLU   | GLU   | ARG   | THR   | GLU   | LYS   | LYS   | LYS   | THR   | ARG   | LYS   | LYS   | ILE   | SER   | GLN   | THR   | GLN   | ALA   | GLN   | THR   | TVR   | ASP   | PRG   | ARG   | GLU   | GLY   | X2855 | X2856 | X2857 | X2858 | X2859 | X2860 | X2861 | X2862 | X2863 | X2864 | X2865 | X2866 | X2867 | X2868 | X2869 | X2870 | X2871 | X2872 | X2873 | X2874 | X2875 | X2876 | X2877 | X2878 | X2879 | X2880 | X2881 | X2882 | X2883 | X2884 | X2885 | X2886 | X2887 | X2888 | X2889 | X2890 | X2891 | X2892 | X2893 | X2894 | X2895 | X2896 | X2897 | X2898 | X2899 | X2900 |       |       |       |       |       |       |       |       |
| X2671 | X2672 | X2673 | X2674 | X2675 | X2676 | X2677 | X2678 | X2679 | X2680 | X2681 | X2682 | X2683 | X2684 | X2685 | X2686 | X2687 | X2688 | X2689 | X2690 | X2691 | X2692 | X2693 | X2694 | X2695 | X2696 | X2697 | X2698 | X2699 | X2700 | X2701 | X2702 | X2703 | X2704 | X2705 | X2706 | X2707 | X2708 | X2709 | X2710 | X2711 | X2712 | X2713 | X2714 | X2715 | X2716 | X2717 | X2718 | X2719 | X2720 | X2721 | X2722 | X2723 | X2724 | X2725 | X2726 | X2727 | X2728 | X2729 | X2730 | X2731 | X2732 | X2733 | X2734 | X2735 | X2736 | X2737 | X2738 | X2739 | X2740 | X2741 | X2742 | X2743 | X2744 | X2745 | X2746 | X2747 | X2748 | X2749 | X2750 | X2751 | X2752 | X2753 | X2754 | X2755 | X2756 | X2757 | X2758 | X2759 | X2760 |
| X2607 | X2608 | X2609 | X2610 | X2611 | X2612 | X2613 | X2614 | X2615 | X2616 | X2617 | X2618 | X2619 | X2620 | X2621 | X2622 | X2623 | X2624 | X2625 | X2626 | X2627 | X2628 | X2629 | X2632 | X2633 | X2636 | X2637 | X2640 | X2641 | X2644 | X2645 | X2646 | X2647 | X2648 | X2649 | X2650 | X2651 | X2652 | X2653 | X2654 | X2655 | X2656 | X2657 | X2658 | X2659 | X2660 | X2661 | X2662 | X2663 | X2664 | X2665 | X2666 | X2667 | X2668 | X2669 | X2670 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| X2543 | X2544 | X2545 | X2546 | X2547 | X2548 | X2549 | X2550 | X2551 | X2552 | X2555 | X2556 | X2557 | X2558 | X2559 | X2560 | X2561 | X2562 | X2563 | X2564 | X2565 | X2566 | X2567 | X2568 | X2569 | X2570 | X2571 | X2572 | X2573 | X2574 | X2575 | X2576 | X2577 | X2578 | X2579 | X2580 | X2581 | X2582 | X2583 | X2584 | X2585 | X2586 | X2587 | X2588 | X2591 | X2592 | X2593 | X2594 | X2595 | X2598 | X2599 | X2602 | X2603 | X2604 | X2605 | X2606 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| X2474 | X2475 | X2476 | X2477 | X2478 | X2479 | X2487 | X2488 | X2489 | X2490 | X2491 | X2492 | X2493 | X2494 | X2495 | X2496 | X2497 | X2498 | X2499 | X2500 | X2501 | X2502 | X2503 | X2504 | X2505 | X2506 | X2507 | X2508 | X2509 | X2510 | X2511 | X2512 | X2513 | X2514 | X2515 | X2516 | X2517 | X2518 | X2519 | X2520 | X2521 | X2522 | X2523 | X2524 | X2525 | X2526 | X2527 | X2528 | X2529 | X2530 | X2531 | X2532 | X2533 | X2534 | X2535 | X2536 | X2537 | X2538 | X2541 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| X2350 | X2351 | X2352 | X2353 | X2354 | X2355 | X2356 | X2357 | X2358 | X2359 | X2360 | X2361 | X2362 | X2363 | X2364 | X2365 | X2366 | X2367 | X2368 | X2369 | X2370 | X2371 | X2372 | X2373 | X2374 | X2375 | X2376 | X2377 | X2378 | X2379 | X2380 | X2381 | X2382 | X2383 | X2384 | X2385 | X2386 | X2387 | X2388 | X2389 | X2390 | X2391 | X2394 | X2395 | VAL   | ARG   | ARG   | ASP   | ARG   | ARG   | ARG   | ARG   | ARG   | GLU   | HIS   | PHE   | GLY   | GLY   | GLU   | GLU   | PRG   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| P2319 | D2320 | I2321 | I2322 | G2322 | G2327 | G2328 | E2329 | R2330 | X2331 | L2332 | D2333 | F2334 | L2335 | R2336 | F2337 | F2340 | V2341 | N2342 | G2343 | E2344 | S2345 | V2346 | E2347 | E2348 | N2349 | P2319 | D2320 | I2321 | I2322 | G2322 | G2327 | G2328 | E2329 | R2330 | X2331 | L2332 | D2333 | F2334 | L2335 | R2336 | F2337 | F2340 | V2341 | N2342 | G2343 | E2344 | S2345 | V2346 | E2347 | E2348 | N2349 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| PRG   | GLU   | GLU   | N2414 | R2415 | G2419 | I2422 | M2423 | S2424 | F2425 | Y2426 | A2427 | A2428 | L2429 | I2430 | D2431 | L2432 | L2433 | G2434 | R2435 | C2436 | A2437 | P2438 | E2439 | M2440 | H2441 | L2442 | I2443 | Q2444 | A2445 | G2446 | L2447 | G2448 | E2449 | A2450 | L2451 | R2452 | I2453 | R2454 | A2455 | D2456 | L2457 | S2458 | L2460 | V2461 | P2462 | L2463 | D2464 | D2465 | L2466 | V2467 | G2468 | I2469 | I2470 | X2471 | L2472 | P2473 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |

|       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| X3223 | X3224 | X3225 | X3226 | X3228 | X3229 | X3230 | X3231 | X3232 | X3233 | X3234 | X3235 | X3236 | X3241 | X3242 | X3243 | X3244 | X3245 | X3246 | X3247 | X3248 | X3249 | X3250 | X3251 | X3252 | X3253 | X3254 | X3261 | X3262 | X3263 | X3264 | X3265 | X3266 | X3267 | X3268 | X3269 | X3270 | X3271 | X3272 | X3273 | X3274 | X3275 | X3276 | X3277 | X3278 | X3279 | X3280 | X3281 | X3282 | X3283 | X3284 | X3285 | X3286 | X3287 | X3288 | X3289 | X3290 | X3291 | X3292 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| X3293 | X3294 | X3295 | X3296 | X3297 | X3298 | X3299 | X3300 | X3301 | X3302 | X3303 | X3307 | X3308 | X3309 | X3310 | X3311 | X3312 | X3313 | X3314 | X3315 | X3316 | X3317 | X3318 | X3319 | X3320 | X3321 | X3322 | X3323 | X3324 | X3325 | X3326 | X3327 | X3328 | X3329 | X3330 | X3331 | X3332 | X3333 | X3334 | X3335 | X3336 | X3337 | X3338 | X3339 | X3340 | X3341 | X3342 | X3343 | X3344 | X3345 | X3346 | X3347 | X3348 | X3349 | X3350 | X3351 | X3352 | X3353 | X3354 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| X3355 | X3356 | X3357 | X3358 | X3359 | X3360 | X3361 | X3362 | X3363 | X3364 | X3365 | X3366 | X3367 | X3368 | X3369 | X3370 | X3371 | X3372 | X3373 | X3374 | X3375 | X3376 | X3377 | X3378 | X3379 | X3380 | X3381 | X3382 | X3383 | X3384 | X3385 | X3386 | X3387 | X3388 | X3389 | X3390 | X3391 | X3392 | X3393 | X3394 | X3395 | X3396 | X3397 | X3398 | X3399 | X3400 | X3401 | X3402 | X3403 | X3404 | X3405 | X3406 | X3407 | X3408 | X3409 | X3410 | X3411 | X3412 | X3413 | X3414 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| X3415 | X3416 | X3417 | X3418 | X3419 | X3420 | X3421 | X3422 | X3423 | X3424 | X3425 | X3426 | X3427 | X3428 | X3429 | X3430 | X3431 | X3432 | X3433 | X3434 | X3435 | X3436 | X3437 | X3438 | X3439 | X3440 | X3441 | X3442 | X3443 | X3444 | X3445 | X3446 | X3447 | X3448 | X3449 | X3450 | X3451 | X3452 | X3453 | X3454 | X3455 | X3456 | X3457 | X3458 | X3459 | X3460 | X3461 | X3462 | X3463 | X3464 | X3465 | X3466 | X3467 | X3468 | X3469 | X3470 | X3471 | X3472 | X3473 | X3474 | X3475 | X3476 | X3477 | X3478 | X3479 | X3480 | X3481 | X3482 | X3483 | X3484 | X3485 | X3486 | X3487 | X3488 | X3489 | X3490 | X3491 | X3492 | X3493 | X3494 | X3495 | X3496 | X3497 | X3498 | X3499 | X3500 | X3501 | X3502 | X3503 | X3504 | X3505 | X3506 | X3507 | X3508 | X3509 | X3510 | X3511 | X3512 | X3513 | X3514 | X3515 | X3516 | X3517 | X3518 | X3519 | X3520 | X3521 |
| X3522 | X3523 | X3524 | X3525 | X3526 | X3527 | X3528 | X3529 | X3530 | X3531 | X3532 | X3533 | X3534 | X3535 | X3536 | X3537 | X3538 | X3539 | X3540 | X3541 | X3542 | X3543 | X3544 | X3545 | X3546 | X3547 | X3548 | X3549 | X3550 | X3551 | X3552 | X3553 | X3554 | X3555 | X3556 | X3557 | X3558 | X3559 | X3560 | X3561 | X3562 | X3563 | X3564 | X3565 | X3566 | X3567 | X3568 | X3569 | X3570 | X3571 | X3572 | X3573 | X3574 | X3575 | X3576 | X3577 | X3578 | X3579 | X3580 | X3581 | X3582 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| X3583 | X3584 | X3585 | X3586 | X3587 | X3588 | X3589 | X3590 | X3591 | X3592 | X3593 | X3594 | X3595 | X3596 | X3597 | X3598 | X3599 | X3600 | X3601 | X3602 | X3603 | X3604 | X3605 | X3606 | X3607 | X3608 | X3609 | X3610 | X3611 | X3612 | X3613 | X3614 | X3615 | X3616 | X3617 | X3618 | X3619 | X3620 | X3621 | X3622 | X3623 | X3624 | X3625 | X3626 | X3627 | X3628 | X3629 | X3630 | X3631 | X3632 | X3633 | X3634 | X3635 | X3636 | X3637 | X3638 | X3639 | X3640 | X3641 | X3642 | X3643 | X3644 | X3645 | X3646 | X3647 | X3648 | X3649 | X3650 | X3651 | X3652 | X3653 | X3654 | X3655 | X3656 | X3657 | X3658 | X3659 | X3660 | X3661 | X3662 | X3663 | X3664 | X3665 | X3666 | X3667 | X3668 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| F3669 | E3670 | D3671 | R3672 | M3673 | I3674 | D3675 | D3676 | L3677 | S3678 | K3679 | A3680 | G3681 | E3682 | Q3683 | E3684 | E3685 | E3686 | E3687 | E3688 | E3689 | V3690 | E3691 | E3692 | K3693 | K3694 | P3697 | L3698 | H3699 | Q3700 | L3701 | V3702 | L3703 | H3704 | F3705 | S3706 | R3707 | T3708 | A3709 | L3710 | T3711 | E3712 | K3713 | S3714 | K3715 | L3716 | D3717 | E3718 | L3719 | D3720 | L3721 | Y3722 | M3723 | A3724 | Y3725 | E3726 | D3727 | I3728 | M3729 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| A3730 | K3731 | S3732 | C3733 | H3734 | L3735 | E3736 | E3737 | G3738 | G3739 | L3740 | M3741 | GLY   | GLU   | ALA   | GLU   | GLU   | E3747 | E3748 | V3749 | E3750 | V3751 | S3752 | F3753 | E3754 | E3755 | K3756 | E3757 | M3758 | L3759 | K3760 | Q3761 | R3762 | L3763 | L3764 | I3765 | Q3766 | Q3767 | S3768 | R3769 | L3770 | H3771 | T3772 | R3773 | G3774 | A3775 | A3776 | E3777 | M3778 | V3779 | L3780 | F3781 | M3782 | L3783 | S3784 | A3785 | C3786 | K3787 | G3788 | E3789 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| T3790 | G3791 | A3792 | M3793 | V3794 | S3795 | S3796 | T3797 | L3798 | K3799 | L3800 | G3801 | L3802 | S3803 | L3804 | L3805 | N3806 | G3807 | G3808 | N3809 | V3812 | Q3813 | Q3814 | K3815 | M3816 | L3817 | D3818 | V3819 | L3820 | K3821 | D3822 | K3823 | F3829 | Q3830 | S3831 | L3832 | Q3833 | M3836 | Q3837 | T3838 | C3839 | S3840 | V3841 | D3842 | L3843 | L3844 | N3845 | A3846 | F3847 | E3848 | R3849 | Q3850 | N3851 | K3852 | A3853 | E3854 | G3855 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| L3856 | G3857 | M3858 | V3859 | N3860 | E3861 | D3862 | G3863 | T3864 | V3865 | L3866 | M3867 | K3868 | Q3869 | N3870 | G3871 | E3872 | K3873 | V3874 | M3875 | A3876 | D3877 | D3878 | E3879 | F3880 | T3881 | Q3882 | D3883 | L3884 | F3885 | K3886 | Q3889 | L3890 | L3891 | C3892 | E3893 | G3894 | H3895 | N3896 | N3897 | D3898 | F3899 | Y3902 | L3903 | R3904 | T3905 | Q3906 | T3907 | G3908 | T3910 | T3911 | T3912 | I3913 | N3914 | L3915 | I3916 | I3917 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| C3918 | T3919 | V3920 | L3924 | R3925 | L3926 | Q3927 | E3928 | S3929 | L3930 | L3931 | D3932 | M3935 | T3936 | Y3937 | S3938 | G3939 | K3940 | D3941 | V3942 | L3943 | E3944 | E3945 | Q3946 | G3947 | K3948 | R3949 | N3950 | F3951 | S3952 | K3953 | A3954 | M3955 | S3956 | V3957 | A3958 | D4002 | K3959 | F3962 | N3963 | S3964 | L3965 | V3966 | I3969 | Q3970 | G3971 | F3972 | C3973 | T3974 | Q3977 | L3980 | A3981 | H3982 | S3983 | R3984 | L4003 | L4004 | M4007 | L4008 | L4009 | L4010 | L4011 | L4012 | Y4080 | L4013 | K4014 | E4015 | L4016 | L4017 | L4018 | L4019 | Q4020 | K4021 | D4022 | K4090 | M4023 | V4024 | L4027 | D4092 | L4094 | K4095 | A4096 | L4097 | D4098 | V4036 | M4037 | R4042 | Q4043 | M4044 | M4047 | L4048 | V4049 | E4050 | S4051 |       |       |       |       |       |       |       |       |       |       |       |       |       |
| S4052 | S4053 | N4054 | V4055 | E4056 | M4057 | K4060 | F4061 | F4062 | D4063 | M4064 | F4065 | H3998 | M3999 | M4000 | M4001 | K4002 | L4003 | A4004 | Q4005 | D4006 | S4007 | S4008 | Q4009 | I4010 | E4011 | L4012 | L4013 | K4014 | E4015 | L4016 | L4017 | L4018 | L4019 | Q4020 | K4021 | D4022 | K4090 | M4023 | V4024 | L4027 | D4092 | L4094 | K4095 | A4096 | L4097 | D4098 | V4036 | M4037 | R4042 | Q4043 | M4044 | M4047 | L4048 | V4049 | E4050 | S4051 | L4112 | S4113 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |





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|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| G701  | G702  | G703  | G704  | G705  | G706  | G707  | G708  | G709  | G710  | G711  | G712  | G713  | G714  | G717  | G718  | G719  | H720  | L721  | V722  | T723  | G724  | H725  | V726  | A727  | R728  | P729  | V730  | T731  | S732  | P733  | G734  | H735  | H736  | L737  | L738  | A739  | P740  | E741  | V742  | V743  | V744  | S745  | C746  | D749  | L750  | S751  | V752  | P753  | S754  | I755  | S756  | F757  | F758  | I759  | N760  | L761  | C762  |       |       |
| P763  | V764  | Q765  | G766  | V767  | F768  | E769  | A770  | F771  | N772  | L773  | D774  | G775  | L776  | F777  | F778  | F779  | V780  | H781  | S782  | F783  | S784  | A785  | G786  | V787  | K788  | V789  | S790  | S791  | L792  | L793  | H797  | G798  | E799  | F800  | V801  | F802  | L803  | P804  | P805  | P806  | G807  | Y808  | A809  | P810  | C811  | H812  | E813  | A814  | V815  | L816  | P817  | R818  | E819  | R820  | L821  | R822  | L823  | E824  |       |
| P825  | I826  | K827  | E828  | V829  | R830  | R831  | E832  | G833  | P834  | R835  | G836  | P837  | H838  | L839  | V840  | G841  | P842  | S843  | R844  | C845  | L846  | S847  | H848  | T849  | D850  | F851  | S852  | P853  | C854  | P855  | V856  | D857  | THR   | VAL   | I861  | V862  | L863  | P864  | P865  | H866  | L867  | E868  | R869  | I870  | R871  | E872  | K873  | L874  | A875  | E876  | N877  | I878  | H879  | E880  | L881  | W882  | A883  | L884  |       |
| T885  | R886  | I887  | E888  | Q889  | G890  | K891  | T892  | G893  | G894  | P895  | V896  | R897  | D898  | D899  | N900  | K901  | R902  | L903  | P905  | C906  | L907  | V908  | N909  | F910  | H911  | S912  | L913  | P914  | E915  | P916  | E917  | R918  | N919  | Y920  | N921  | L922  | Q923  | N924  | S925  | G926  | E927  | T928  | L929  | K930  | R931  | L932  | L933  | A934  | E935  | G936  | C937  | H938  | V939  | L940  | M941  | A942  | D943  | E944  |       |
| K945  | A946  | E947  | D948  | N949  | L950  | K951  | K952  | T953  | K954  | L955  | P956  | K957  | T958  | Y959  | N960  | N961  | S962  | N963  | G964  | A968  | P969  | L970  | D971  | L972  | S973  | H974  | V975  | R976  | L977  | T978  | P979  | A980  | Q981  | T982  | T983  | L984  | V985  | D986  | E987  | L988  | A989  | G992  | A997  | R998  | D999  | R1000 | V1001 | A1002 | Q1003 | G1004 | V1005 | S1006 | Y1007 | S1008 | A1009 | VAL   |       |       |       |
| GLN   | ASP   | ILE   | PRD   | ALA   | ARG   | ASN   | PRD   | L1020 | L1021 | V1022 | P1023 | Y1024 | R1025 | L1026 | L1027 | D1028 | E1029 | A1030 | T1031 | K1032 | R1033 | S1034 | N1035 | R1036 | D1037 | S1038 | L1039 | C1040 | Q1041 | A1042 | V1043 | R1044 | T1045 | L1046 | L1047 | G1048 | Y1049 | G1050 | Y1051 | N1052 | I1053 | E1054 | PRD   | PRD   | ASP   | GLN   | GLU   | PRO   | PRO   | GLN   | GLN   | VAL   | ASN   | GLN   | ARG   | TRP   | D1070 |       |       |
| R1071 | V1072 | R1073 | F1074 | R1075 | R1076 | A1077 | E1078 | K1079 | S1080 | Y1081 | T1082 | V1083 | Q1084 | S1085 | W1086 | R1087 | W1088 | Y1089 | F1090 | E1091 | F1092 | E1093 | A1094 | V1095 | T1096 | E1099 | M1100 | V1102 | G1103 | W1104 | A1105 | R1106 | P1107 | L1108 | L1109 | R1110 | P1111 | D1112 | W1113 | E1114 | L1115 | G1116 | A1117 | D1118 | E1119 | L1120 | A1121 | Y1122 | V1123 | F1124 | M1125 | G1126 | H1127 | R1128 | L1129 | Q1130 | R1131 |       |       |
| M1132 | H1133 | L1134 | G1135 | S1136 | F1139 | G1140 | R1141 | P1142 | M1143 | Q1144 | S1145 | G1146 | D1147 | V1148 | W1149 | G1150 | C1151 | M1152 | I1153 | D1154 | L1155 | T1156 | E1157 | M1158 | T1159 | I1160 | F1161 | F1162 | L1164 | M1165 | G1166 | E1167 | V1168 | L1169 | M1170 | S1171 | D1172 | S1173 | G1174 | S1175 | E1176 | T1177 | A1178 | F1179 | R1180 | E1181 | I1182 | E1183 | G1185 | D1186 | G1187 | F1188 | L1189 | P1190 | V1191 | C1192 |       |       |       |
| S1193 | L1194 | G1195 | P1196 | Q1197 | Q1198 | Y1199 | G1200 | H201  | L202  | N203  | L204  | G205  | Q206  | D207  | V208  | S209  | S210  | L211  | R212  | F213  | F214  | A215  | I216  | C217  | G218  | L219  | Q220  | E221  | G222  | F223  | P225  | F226  | A227  | I228  | N229  | M230  | Q231  | P233  | V234  | T235  | T236  | W237  | F238  | S239  | K240  | S241  | L242  | P243  | Q244  | F245  | E246  | P247  | V248  | P249  | P250  | E251  | H252  |       |       |
| P1253 | H1254 | Y1255 | E1256 | V1257 | A1258 | R1259 | M1260 | L1261 | G1262 | T1263 | V1264 | D1265 | T1266 | P1267 | P1268 | C1269 | L1270 | R1271 | L1272 | H1273 | A1274 | R1275 | X1276 | X1277 | X1278 | X1279 | X1280 | X1281 | X1282 | X1283 | X1284 | X1285 | X1286 | X1287 | X1288 | X1289 | X1290 | X1291 | X1292 | X1293 | X1294 | X1295 | X1296 | X1297 | X1430 | X1431 | X1432 | X1433 | X1434 | X1435 | X1436 | X1437 | X1438 | X1439 | X1440 | X1441 | X1442 | X1443 | X1444 |
| X1445 | X1446 | X1449 | X1450 | X1451 | X1452 | X1453 | X1454 | X1455 | X1456 | X1457 | X1458 | X1459 | X1460 | X1461 | X1462 | X1463 | X1464 | X1465 | X1466 | X1467 | X1468 | X1469 | X1470 | X1471 | X1472 | X1473 | X1474 | X1475 | X1476 | X1477 | X1484 | X1485 | X1486 | X1487 | X1488 | X1489 | X1490 | X1491 | X1492 | X1493 | X1494 | X1495 | X1496 | X1497 | X1498 | X1499 | X1500 | X1503 | X1504 | X1505 | X1506 | X1507 | X1508 | X1509 | X1510 | X1511 |       |       |       |
| X1512 | X1513 | X1514 | X1515 | X1516 | X1517 | X1518 | X1519 | X1520 | X1521 | X1522 | X1523 | X1524 | X1525 | X1526 | X1527 | X1528 | X1529 | X1530 | X1531 | X1532 | X1533 | X1534 | X1535 | X1536 | X1537 | X1538 | X1539 | X1540 | X1541 | X1542 | X1543 | X1544 | X1545 | X1546 | X1547 | X1548 | X1549 | X1550 | X1551 | X1552 | X1553 | X1554 | X1559 | X1560 | X1561 | X1562 | X1563 | X1564 | M1573 | P1574 | A1577 | A1578 | M1579 | F1580 | L1581 | S1582 | E1583 |       |       |
| R1584 | K1585 | M1586 | P1587 | A1588 | P1589 | Q1590 | C1591 | P1592 | P1593 | R1594 | L1595 | E1596 | V1597 | Q1598 | M1599 | L1600 | M1601 | P1602 | S1604 | M1605 | S1606 | R1607 | M1608 | P1609 | M1610 | H1611 | F1612 | L1613 | Q1614 | V1615 | GLU   | THR   | ARG   | ARG   | ALA   | GLY   | E1622 | R1623 | L1624 | G1625 | M1626 | A1627 | V1628 | Q1629 | Q1630 | Q1631 | D1632 | P1633 | L1634 | T1635 | M1636 | M1637 | A1638 | L1639 | H1640 | I1641 | P1642 | E1643 |       |





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|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| X2445 | G2446 | R2447 | G2448 | E2449 | L2450 | R2452 | L2453 | R2454 | A2455 | L2456 | L2457 | R2458 | S2459 | L2460 | V2461 | L2463 | D2464 | D2465 | V2467 | G2468 | L2469 | S2471 | L2472 | P2473 | L2474 | Q2475 | L2476 | T2477 | T2478 | L2479 | X2487 | X2488 | X2489 | X2490 | X2491 | X2492 | X2493 | X2494 | X2495 | X2496 | X2497 | X2498 | X2500 | X2501 | X2502 | X2503 | X2504 | X2505 | X2506 | X2507 | X2508 | X2509 | X2510 | X2511 |       |       |       |       |       |       |
| X2512 | X2513 | X2514 | X2515 | X2516 | X2517 | X2518 | X2519 | X2520 | X2521 | X2522 | X2523 | X2524 | X2525 | X2526 | X2527 | X2528 | X2529 | X2530 | X2531 | X2532 | X2533 | X2534 | X2535 | X2536 | X2537 | X2538 | X2539 | X2540 | X2541 | X2542 | X2543 | X2544 | X2545 | X2546 | X2547 | X2548 | X2549 | X2550 | X2551 | X2552 | X2553 | X2554 | X2555 | X2556 | X2557 | X2558 | X2559 | X2560 | X2561 | X2562 | X2563 | X2564 | X2565 | X2566 | X2567 | X2568 | X2569 | X2570 | X2571 |       |
| X2572 | X2573 | X2580 | X2583 | X2584 | X2585 | X2586 | X2587 | X2588 | X2591 | X2592 | X2593 | X2594 | X2595 | X2596 | X2597 | X2598 | X2599 | X2600 | X2601 | X2602 | X2603 | X2604 | X2605 | X2606 | X2607 | X2608 | X2609 | X2610 | X2611 | X2612 | X2613 | X2614 | X2615 | X2616 | X2617 | X2618 | X2619 | X2620 | X2621 | X2622 | X2623 | X2624 | X2625 | X2626 | X2627 | X2628 | X2629 | X2630 | X2631 | X2632 | X2633 | X2634 | X2635 | X2641 | X2642 |       |       |       |       |       |
| X2643 | X2644 | X2645 | X2646 | X2647 | X2648 | X2649 | X2650 | X2651 | X2652 | X2653 | X2654 | X2655 | X2656 | X2657 | X2658 | X2659 | X2660 | X2661 | X2662 | X2663 | X2664 | X2665 | X2666 | X2667 | X2668 | X2669 | X2670 | X2671 | X2672 | X2673 | X2674 | X2675 | X2676 | X2677 | X2678 | X2679 | X2683 | X2684 | X2685 | X2686 | X2687 | X2688 | X2689 | X2690 | X2691 | X2692 | X2693 | X2694 | X2695 | 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 | Y2761 | T2762 | H2763 | E2764 | K2765 | W2766 | A2767 | F2768 | D2769 | K2770 | L2771 | Q2772 | N2773 | N2774 | W2775 | Y2776 | Y2777 | G2778 | E2779 | N2780 | V2781 | D2782 | E2783 | E2784 | L2785 | L2786 | K2787 | L2788 | H2789 | P2789 | M2790 | L2791 | R2792 | P2793 | Y2794 |
| K2795 | T2796 | F2797 | S2798 | E2799 | K2800 | D2801 | K2802 | E2803 | L2804 | Y2805 | R2806 | W2807 | L2808 | R2809 | L2809 | K2810 | E2811 | S2812 | L2813 | K2814 | A2815 | W2816 | L2817 | L2818 | W2819 | E2820 | W2821 | T2822 | L2823 | E2824 | K2825 | A2826 | R2827 | E2828 | G2829 | GLU   | GLU   | ARG   | THR   | GLU   | LYS   | LYS   | THR   | ARG   | LYS   | ILE   | SER   | GLN   | ALA   | THR   | GLN   | THR   | TVR   | ASP   | PRO   | ARG   | GLU   | GLY   |       |       |
| Y2855 | N2856 | P2857 | Q2858 | P2859 | R2860 | D2861 | L2862 | S2863 | R2864 | V2865 | T2866 | L2867 | S2868 | R2869 | E2870 | L2871 | Q2872 | A2873 | M2874 | A2875 | E2876 | Q2877 | L2878 | A2879 | E2880 | N2881 | Y2882 | H2883 | T2885 | W2886 | G2887 | R2888 | K2889 | K2890 | K2891 | Q2892 | E2893 | L2894 | E2895 | X2895 | X2896 | X2897 | X2898 | X2899 | X2900 | T2901 | H2902 | P2903 | L2904 | W2905 | V2906 | P2907 | P2908 | D2909 | T2910 | L2911 | T2912 | A2913 | K2914 |       |
| E2915 | K2916 | A2917 | R2918 | D2919 | R2920 | E2921 | K2922 | S2923 | Q2924 | E2925 | L2926 | L2927 | K2928 | F2929 | L2930 | Q2931 | M2932 | N2933 | G2934 | Y2935 | V2937 | T2938 | R2939 | X2940 | X2941 | X2942 | X2943 | X2944 | X2945 | X2946 | X2947 | X2948 | X2949 | X2950 | X2951 | X2952 | X2953 | X2954 | X2955 | X2956 | X2957 | X2958 | X2959 | X2960 | X2961 | X2962 | X2963 | X2964 | X2965 | X2966 | X2967 | X2968 | X2971 | X2972 | X2973 | X2974 | X2975 | X2976 | X2995 |       |
| X2996 | X2997 | X2998 | X2999 | X3000 | X3001 | X3002 | X3003 | X3004 | X3005 | X3009 | X3010 | X3011 | X3012 | X3013 | X3014 | X3015 | X3016 | X3017 | X3018 | X3019 | X3020 | X3021 | X3022 | X3023 | X3024 | X3025 | X3026 | X3027 | X3028 | X3029 | X3030 | X3031 | X3032 | X3033 | X3034 | X3035 | X3036 | X3037 | X3038 | X3039 | X3040 | X3041 | X3042 | X3043 | X3044 | X3045 | X3046 | X3047 | X3048 | X3049 | X3050 | X3053 | X3054 | X3055 | X3056 | X3057 | X3058 |       |       |       |
| X3059 | X3060 | X3061 | X3062 | X3063 | X3134 | X3135 | X3136 | X3137 | X3138 | X3139 | X3140 | X3141 | X3142 | X3143 | X3144 | X3145 | X3146 | X3147 | X3148 | X3149 | X3150 | X3153 | X3156 | X3160 | X3161 | X3162 | X3163 | X3170 | X3171 | X3172 | X3173 | X3174 | X3175 | X3176 | X3177 | X3178 | X3179 | X3180 | X3181 | X3182 | X3183 | X3184 | X3185 | X3186 | X3187 | X3188 | X3189 | X3190 | X3191 | X3192 | X3193 | X3194 | X3195 | X3196 | X3197 | X3198 |       |       |       |       |
| X3199 | X3200 | X3201 | X3202 | X3203 | X3204 | X3205 | X3206 | X3207 | X3208 | X3209 | X3210 | X3211 | X3212 | X3213 | X3214 | X3215 | X3216 | X3217 | X3218 | X3219 | X3220 | X3221 | X3222 | X3223 | X3226 | X3229 | X3230 | X3231 | X3232 | X3233 | X3234 | X3235 | X3236 | X3241 | X3242 | X3243 | X3244 | X3245 | X3246 | X3247 | X3248 | X3250 | X3251 | X3252 | X3253 | X3254 | X3255 | X3261 | X3262 | X3263 | X3264 | X3265 | X3266 | X3267 | X3268 | X3269 | X3270 |       |       |       |
| X3271 | X3272 | X3273 | X3274 | X3275 | X3276 | X3277 | X3278 | X3279 | X3280 | X3281 | X3282 | X3283 | X3284 | X3285 | X3286 | X3287 | X3288 | X3289 | X3290 | X3291 | X3292 | X3293 | X3294 | X3295 | X3296 | X3297 | X3298 | X3299 | X3300 | X3301 | X3304 | X3305 | X3306 | X3307 | X3308 | X3309 | X3310 | X3311 | X3312 | X3313 | X3314 | X3315 | X3316 | X3317 | X3318 | X3319 | X3320 | X3321 | X3322 | X3323 | X3324 | X3325 | X3326 | X3327 | X3328 | X3329 | X3330 | X3331 |       |       |
| X3332 | X3333 | X3334 | X3335 | X3336 | X3337 | X3338 | X3339 | X3340 | X3341 | X3342 | X3343 | X3344 | X3345 | X3346 | X3347 | X3348 | X3349 | X3350 | X3351 | X3352 | X3353 | X3354 | X3355 | X3356 | X3357 | X3358 | X3359 | X3360 | X3361 | X3362 | X3363 | X3364 | X3365 | X3366 | X3367 | X3368 | X3370 | X3371 | X3372 | X3373 | X3374 | X3375 | X3376 | X3377 | X3378 | X3379 | X3380 | X3381 | X3382 | X3383 | X3384 | X3385 | X3386 | X3387 | X3388 | X3389 | X3390 | X3391 |       |       |





## 4 Experimental information

| Property                             | Value                                   | Source    |
|--------------------------------------|---|-----------|
| EM reconstruction method             | SINGLE PARTICLE                         | Depositor |
| Imposed symmetry                     | POINT, C4                               | Depositor |
| Number of particles used             | 791956                                  | Depositor |
| Resolution determination method      | OTHER                                   | Depositor |
| CTF correction method                | PHASE FLIPPING AND AMPLITUDE CORRECTION | Depositor |
| Microscope                           | FEI POLARA 300                          | Depositor |
| Voltage (kV)                         | 300                                     | Depositor |
| Electron dose ( $e^-/\text{\AA}^2$ ) | 50                                      | Depositor |
| Minimum defocus (nm)                 | Not provided                            |           |
| Maximum defocus (nm)                 | Not provided                            |           |
| Magnification                        | Not provided                            |           |
| Image detector                       | GATAN K2 SUMMIT (4k x 4k)               | Depositor |
| Maximum map value                    | 0.404                                   | Depositor |
| Minimum map value                    | -0.232                                  | Depositor |
| Average map value                    | 0.001                                   | Depositor |
| Map value standard deviation         | 0.022                                   | Depositor |
| Recommended contour level            | 0.16                                    | 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 i

### 5.1 Standard geometry i

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

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

| Mol | Chain | Bond lengths |          | Bond angles |                  |
|-----|-------|--------------|----------|-------------|------------------|
|     |       | RMSZ         | # Z  >5  | RMSZ        | # Z  >5          |
| 1   | A     | 0.32         | 0/834    | 0.58        | 0/1123           |
| 1   | F     | 0.32         | 0/834    | 0.57        | 0/1123           |
| 1   | H     | 0.32         | 0/834    | 0.58        | 0/1123           |
| 1   | J     | 0.32         | 0/834    | 0.57        | 0/1123           |
| 2   | B     | 0.32         | 0/25428  | 0.57        | 5/34534 (0.0%)   |
| 2   | E     | 0.33         | 0/25428  | 0.57        | 5/34534 (0.0%)   |
| 2   | G     | 0.33         | 0/25428  | 0.57        | 5/34534 (0.0%)   |
| 2   | I     | 0.33         | 0/25428  | 0.57        | 5/34534 (0.0%)   |
| All | All   | 0.33         | 0/105048 | 0.57        | 20/142628 (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 |
|-----|-------|---------------------|---------------------|
| 2   | B     | 0                   | 17                  |
| 2   | E     | 0                   | 18                  |
| 2   | G     | 0                   | 17                  |
| 2   | I     | 0                   | 17                  |
| All | All   | 0                   | 69                  |

There are no bond length outliers.

The worst 5 of 20 bond angle outliers are listed below:

| Mol | Chain | Res | Type | Atoms    | Z    | Observed(°) | Ideal(°) |
|-----|-------|-----|------|----------|------|-------------|----------|
| 2   | I     | 719 | LEU  | CA-CB-CG | 6.48 | 130.21      | 115.30   |
| 2   | E     | 719 | LEU  | CA-CB-CG | 6.45 | 130.14      | 115.30   |
| 2   | G     | 719 | LEU  | CA-CB-CG | 6.45 | 130.13      | 115.30   |
| 2   | B     | 719 | LEU  | CA-CB-CG | 6.44 | 130.11      | 115.30   |

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| Mol | Chain | Res | Type | Atoms    | Z    | Observed( $^{\circ}$ ) | Ideal( $^{\circ}$ ) |
|-----|-------|-----|------|----------|------|------------------------|---------------------|
| 2   | B     | 977 | LEU  | CA-CB-CG | 6.06 | 129.24                 | 115.30              |

There are no chirality outliers.

5 of 69 planarity outliers are listed below:

| Mol | Chain | Res  | Type | Group   |
|-----|-------|------|------|---------|
| 2   | B     | 1676 | LEU  | Peptide |
| 2   | B     | 1690 | ASP  | Peptide |
| 2   | B     | 1712 | TYR  | Peptide |
| 2   | B     | 694  | PRO  | Peptide |
| 2   | B     | 808  | TYR  | Peptide |

## 5.2 Too-close contacts [i](#)

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

| Mol | Chain | Non-H  | H(model) | H(added) | Clashes | Symm-Clashes |
|-----|-------|--------|----------|----------|---------|--------------|
| 1   | A     | 818    | 0        | 824      | 19      | 0            |
| 1   | F     | 818    | 0        | 824      | 19      | 0            |
| 1   | H     | 818    | 0        | 824      | 19      | 0            |
| 1   | J     | 818    | 0        | 824      | 21      | 0            |
| 2   | B     | 29369  | 0        | 24710    | 415     | 0            |
| 2   | E     | 29369  | 0        | 24708    | 425     | 0            |
| 2   | G     | 29369  | 0        | 24708    | 429     | 0            |
| 2   | I     | 29369  | 0        | 24711    | 430     | 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        | 102133   | 1756    | 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 8.

The worst 5 of 1756 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:G:4860:ARG:HD2 | 2:I:4582:VAL:HG11 | 1.65                     | 0.78              |
| 2:G:177:GLU:HG3  | 2:I:2452:ARG:HH12 | 1.54                     | 0.70              |
| 2:B:646:PRO:HD2  | 2:B:779:PRO:HB2   | 1.72                     | 0.70              |
| 2:G:111:HIS:HD2  | 2:G:114:SER:H     | 1.38                     | 0.70              |
| 2:G:646:PRO:HD2  | 2:G:779:PRO:HB2   | 1.72                     | 0.70              |

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%)     | 96 (91%)    | 9 (9%)     | 0        | 100         | 100 |
| 1   | F     | 105/108 (97%)     | 96 (91%)    | 9 (9%)     | 0        | 100         | 100 |
| 1   | H     | 105/108 (97%)     | 96 (91%)    | 9 (9%)     | 0        | 100         | 100 |
| 1   | J     | 105/108 (97%)     | 96 (91%)    | 9 (9%)     | 0        | 100         | 100 |
| 2   | B     | 3235/4687 (69%)   | 2862 (88%)  | 367 (11%)  | 6 (0%)   | 47          | 81  |
| 2   | E     | 3235/4687 (69%)   | 2861 (88%)  | 367 (11%)  | 7 (0%)   | 47          | 81  |
| 2   | G     | 3235/4687 (69%)   | 2863 (88%)  | 365 (11%)  | 7 (0%)   | 47          | 81  |
| 2   | I     | 3235/4687 (69%)   | 2863 (88%)  | 365 (11%)  | 7 (0%)   | 47          | 81  |
| All | All   | 13360/19180 (70%) | 11833 (89%) | 1500 (11%) | 27 (0%)  | 50          | 81  |

5 of 27 Ramachandran outliers are listed below:

| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 2   | B     | 1829 | PRO  |
| 2   | B     | 1932 | PRO  |
| 2   | E     | 1829 | PRO  |
| 2   | G     | 1829 | PRO  |

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| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 2   | I     | 1829 | PRO  |

### 5.3.2 Protein sidechains [i](#)

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all PDB entries followed by that with respect to all EM entries.

The Analysed column shows the number of residues for which the sidechain conformation was analysed, and the total number of residues.

| Mol | Chain | Analysed          | Rotameric   | Outliers | Percentiles |     |
|-----|-------|-------------------|-------------|----------|-------------|-----|
| 1   | 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     | 2493/3209 (78%)   | 2475 (99%)  | 18 (1%)  | 84          | 90  |
| 2   | E     | 2493/3209 (78%)   | 2475 (99%)  | 18 (1%)  | 84          | 90  |
| 2   | G     | 2493/3209 (78%)   | 2475 (99%)  | 18 (1%)  | 84          | 90  |
| 2   | I     | 2493/3209 (78%)   | 2475 (99%)  | 18 (1%)  | 84          | 90  |
| All | All   | 10324/13192 (78%) | 10252 (99%) | 72 (1%)  | 84          | 90  |

5 of 72 residues with a non-rotameric sidechain are listed below:

| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 2   | I     | 688  | LEU  |
| 2   | I     | 4984 | ASN  |
| 2   | I     | 1076 | ARG  |
| 2   | I     | 3805 | LEU  |
| 2   | E     | 1141 | ARG  |

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 157 such sidechains are listed below:

| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 2   | G     | 4886 | HIS  |
| 2   | I     | 3882 | GLN  |
| 2   | I     | 57   | ASN  |
| 2   | I     | 765  | GLN  |

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| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 2   | I     | 4130 | 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 monosaccharides in this entry.

### 5.6 Ligand geometry [i](#)

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

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

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

There are no such residues in this entry.

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

The following chains have linkage breaks:

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

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

The worst 5 of 48 chain breaks are listed below:

| Model | Chain | Residue-1 | Atom-1 | Residue-2 | Atom-2 | Distance (Å) |
|-------|-------|-----------|--------|-----------|--------|--------------|
| 1     | I     | 3613:UNK  | C      | 3639:THR  | N      | 43.91        |
| 1     | B     | 3613:UNK  | C      | 3639:THR  | N      | 43.68        |
| 1     | G     | 3613:UNK  | C      | 3639:THR  | N      | 43.62        |
| 1     | E     | 3613:UNK  | C      | 3639:THR  | N      | 43.61        |
| 1     | I     | 3163:UNK  | C      | 3170:UNK  | N      | 16.30        |

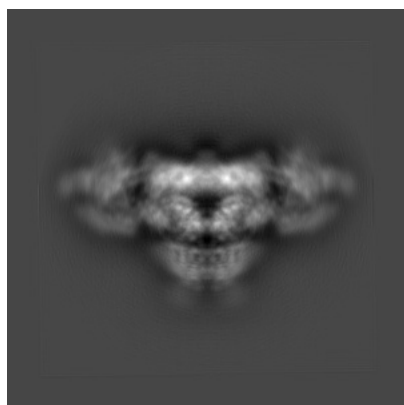
## 6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-22392. These allow visual inspection of the internal detail of the map and identification of artifacts.

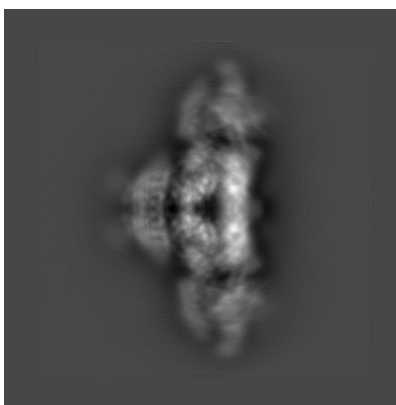
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

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

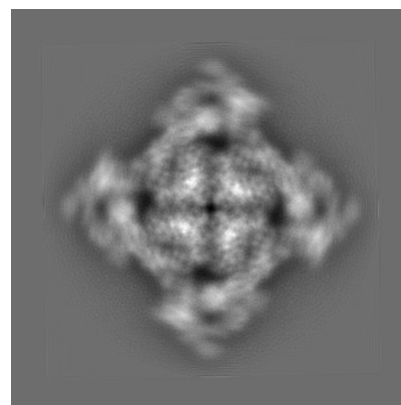
#### 6.1.1 Primary map



X



Y

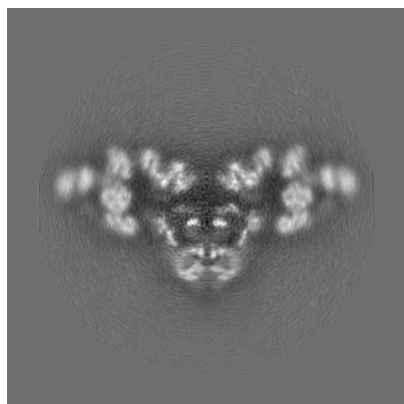


Z

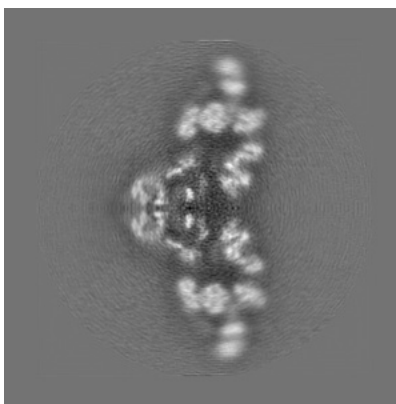
The images above show the map projected in three orthogonal directions.

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

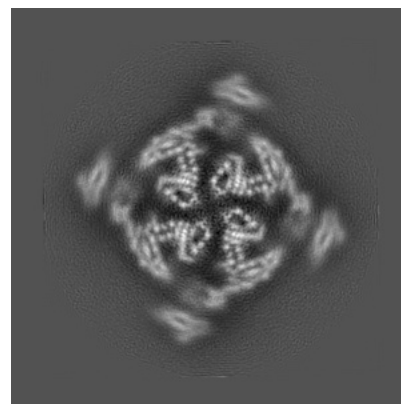
#### 6.2.1 Primary map



X Index: 200



Y Index: 200

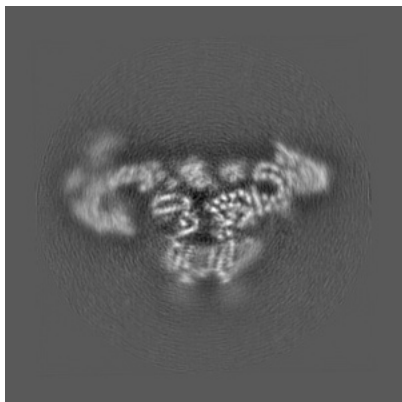


Z Index: 200

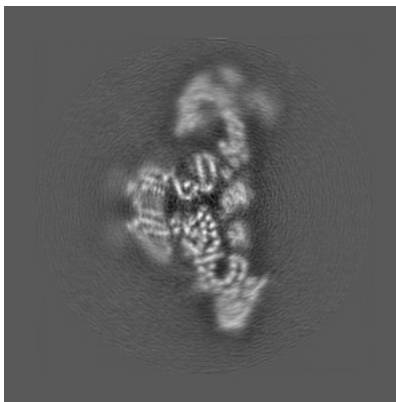
The images above show central slices of the map in three orthogonal directions.

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

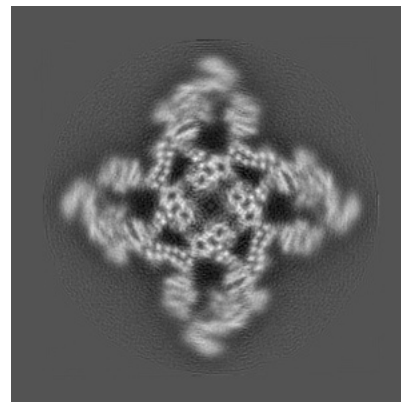
### 6.3.1 Primary map



X Index: 177



Y Index: 177

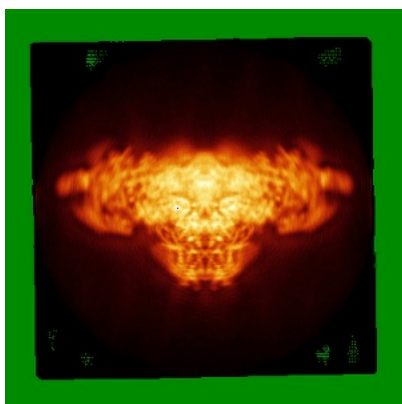


Z Index: 226

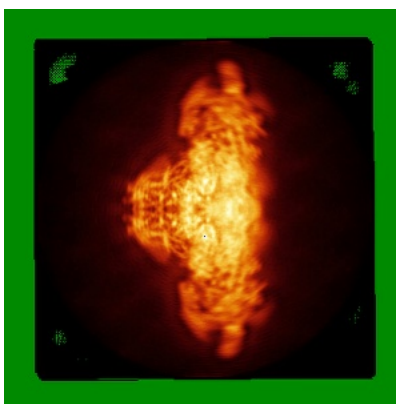
The images above show the largest variance slices of the map in three orthogonal directions.

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

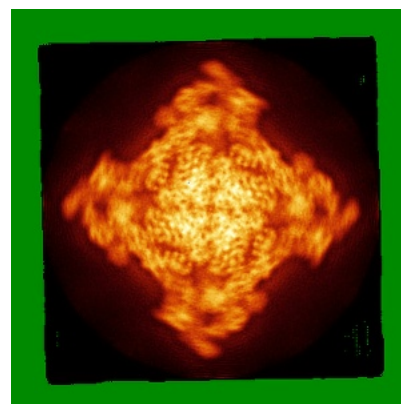
### 6.4.1 Primary map



X



Y

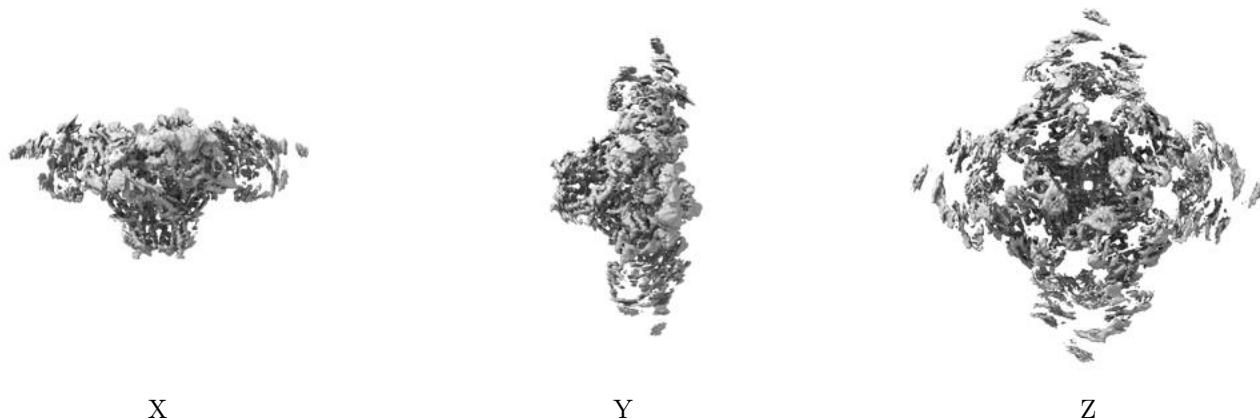


Z

The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

## 6.5 Orthogonal surface views [i](#)

### 6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.16. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

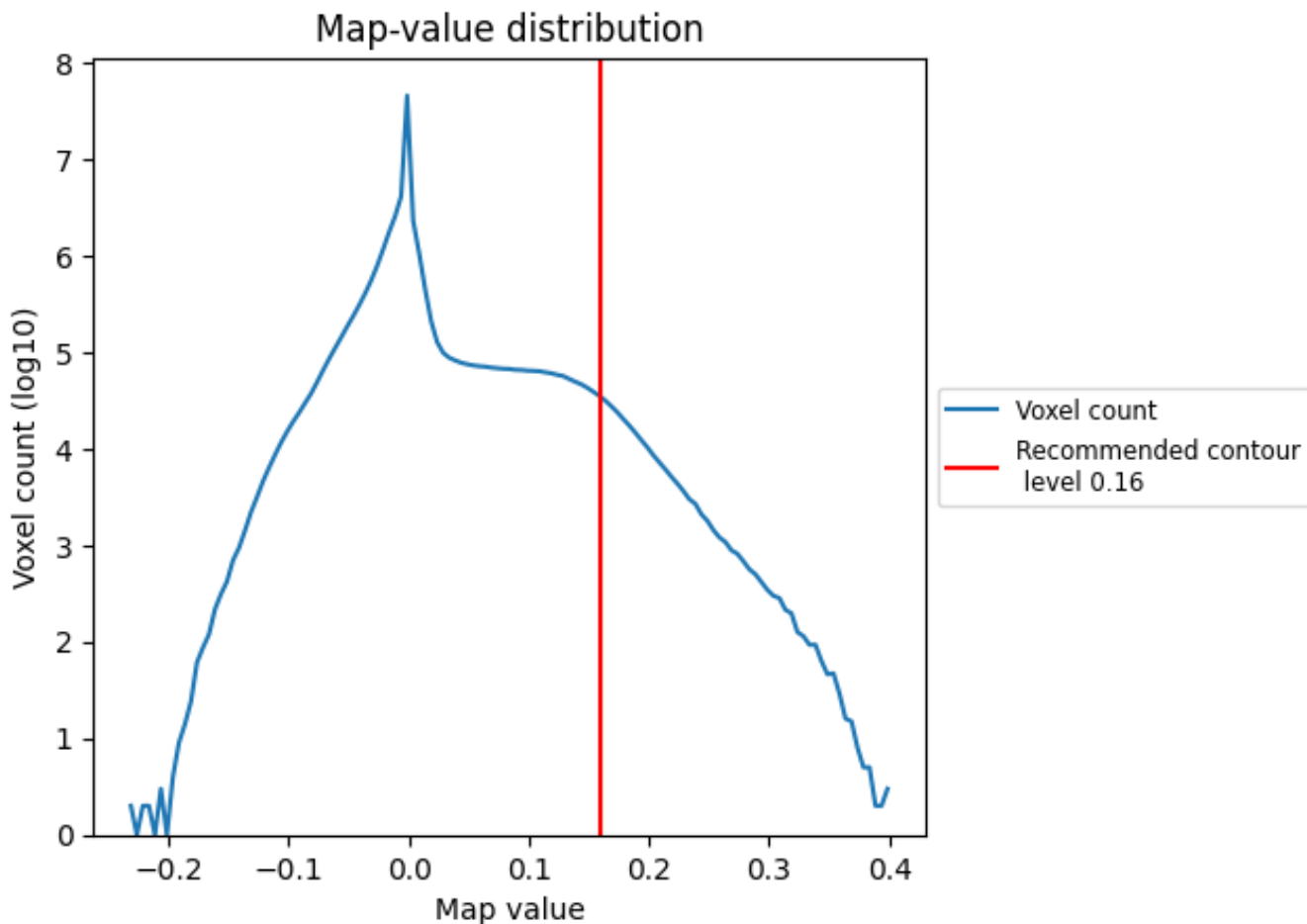
## 6.6 Mask visualisation [i](#)

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

## 7 Map analysis [i](#)

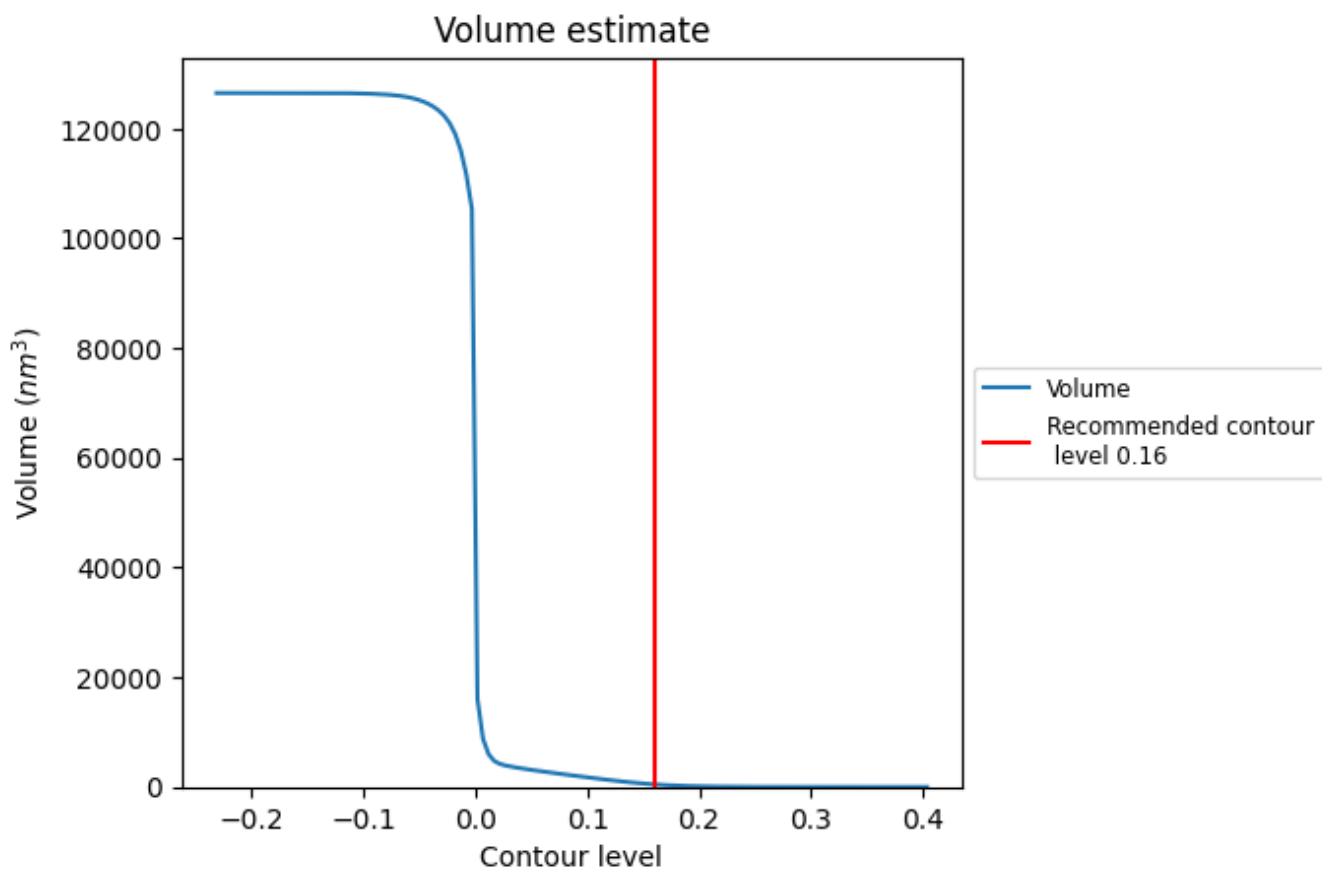
This section contains the results of statistical analysis of the map.

### 7.1 Map-value distribution [i](#)



The map-value distribution is plotted in 128 intervals along the x-axis. The y-axis is logarithmic. A spike in this graph at zero usually indicates that the volume has been masked.

## 7.2 Volume estimate [i](#)

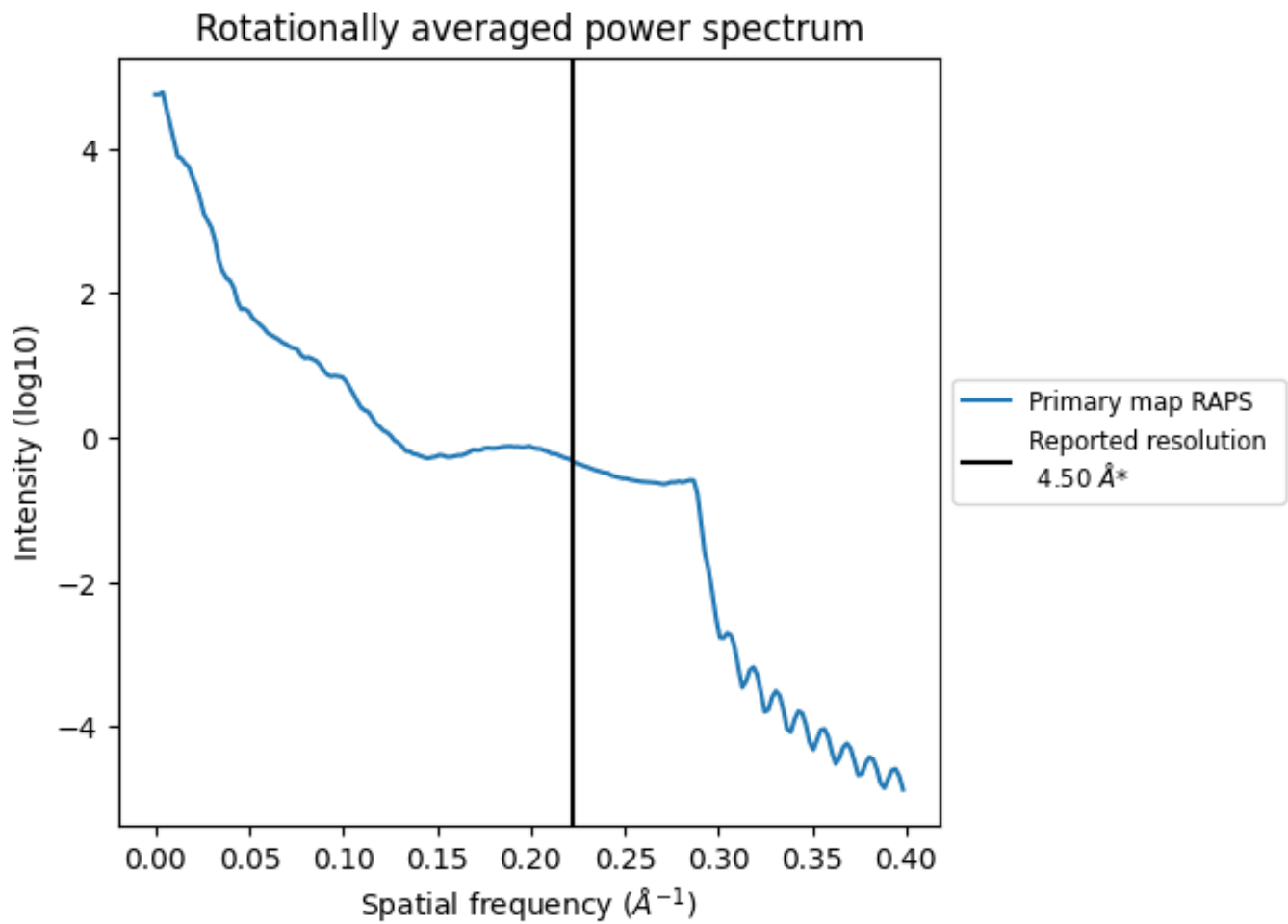


The volume at the recommended contour level is 469  $\text{nm}^3$ ; this corresponds to an approximate mass of 423 kDa.

The volume estimate graph shows how the enclosed volume varies with the contour level. The recommended contour level is shown as a vertical line and the intersection between the line and the curve gives the volume of the enclosed surface at the given level.



### 7.3 Rotationally averaged power spectrum [i](#)



\*Reported resolution corresponds to spatial frequency of  $0.222 \text{\AA}^{-1}$

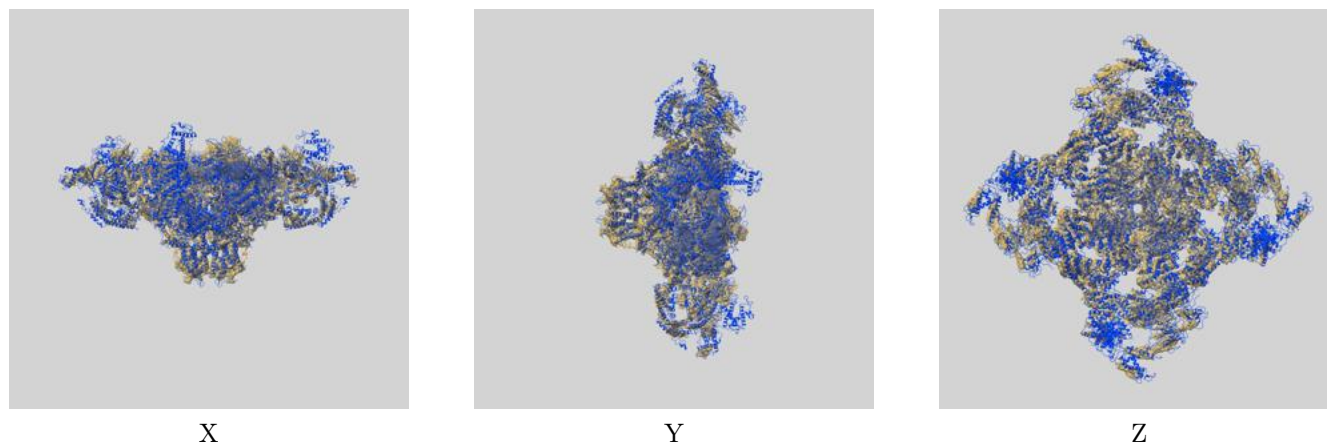
## 8 Fourier-Shell correlation

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

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

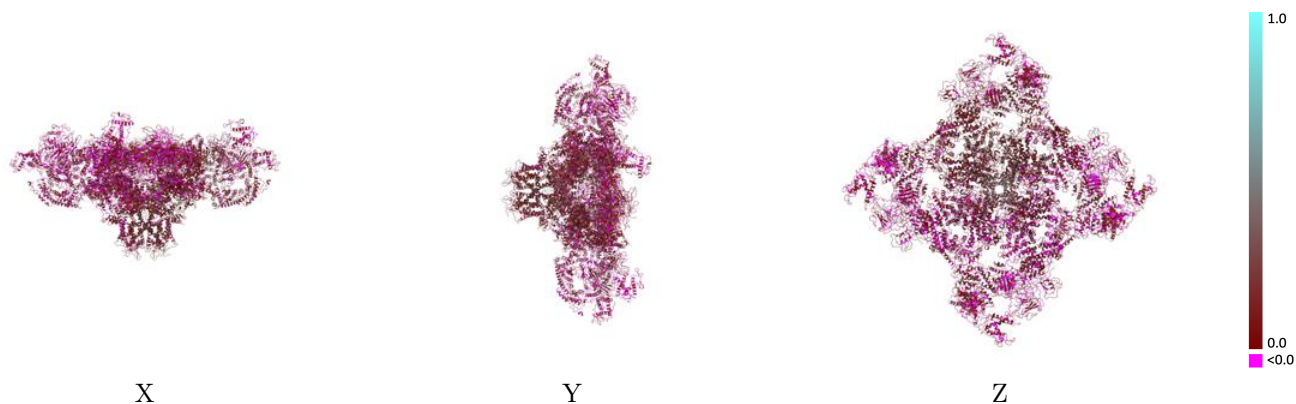
This section contains information regarding the fit between EMDB map EMD-22392 and PDB model 7JMF. Per-residue inclusion information can be found in section 3 on page 5.

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



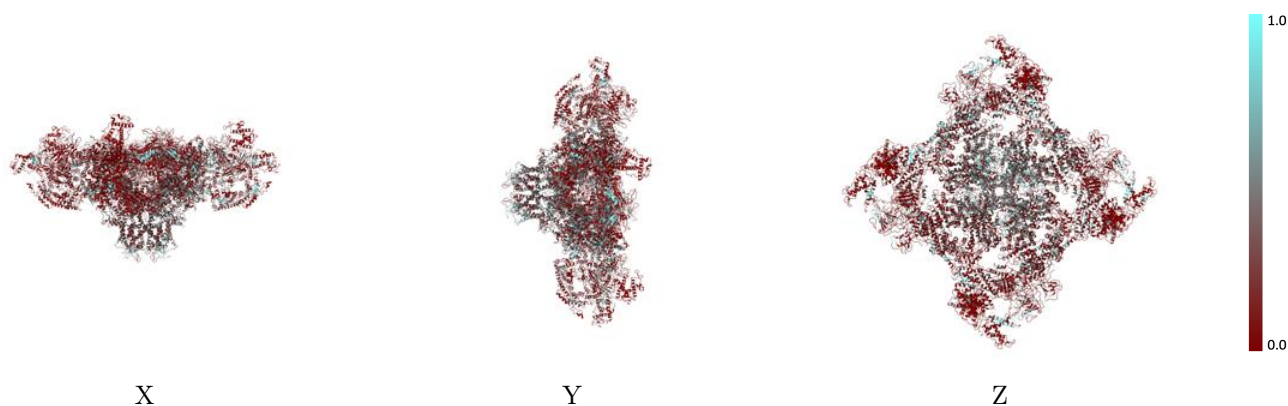
The images above show the 3D surface view of the map at the recommended contour level 0.16 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



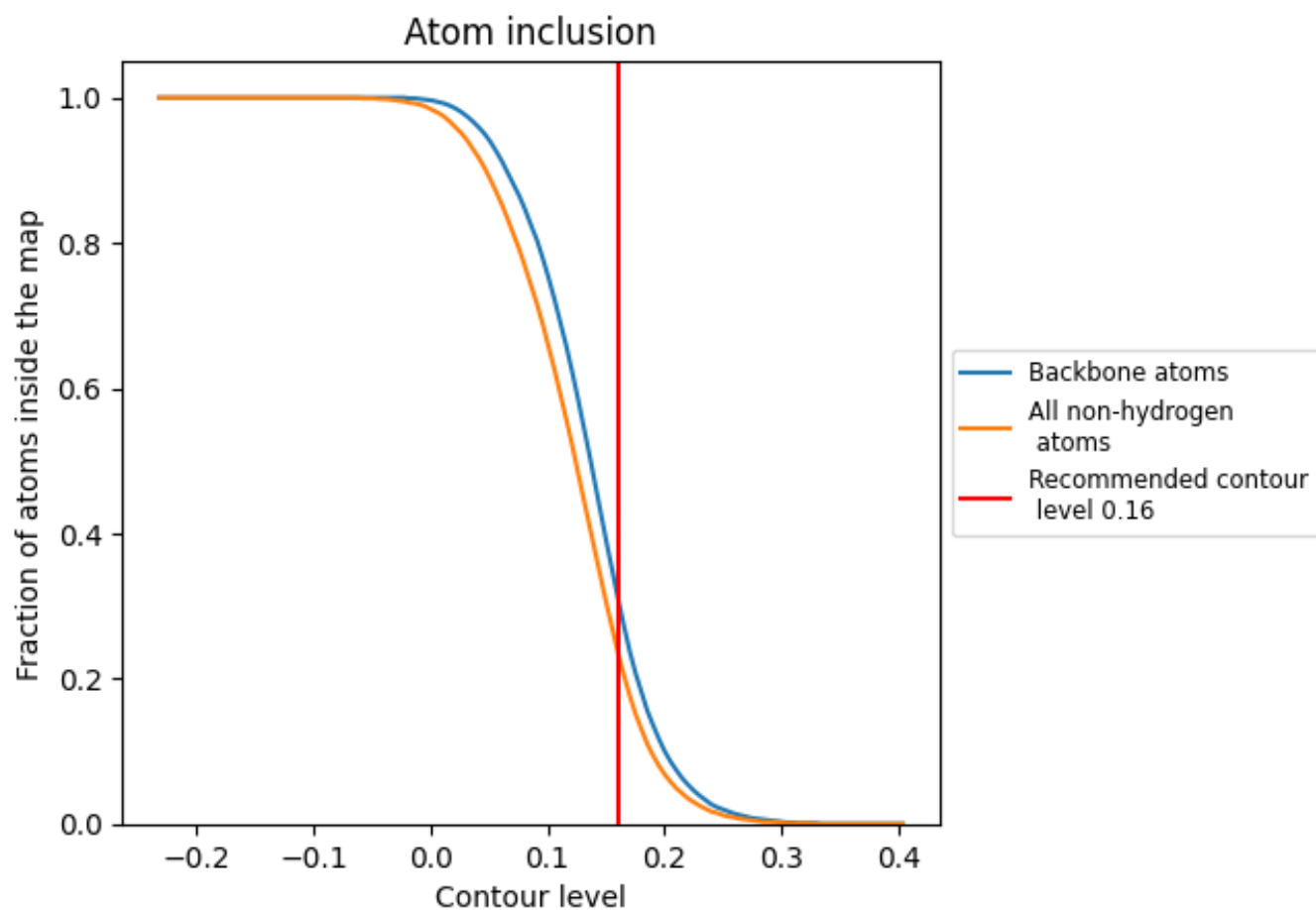
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.16).



















## 9.4 Atom inclusion [i](#)



At the recommended contour level, 31% of all backbone atoms, 24% of all non-hydrogen atoms, are inside the map.

## 9.5 Map-model fit summary

The table lists the average atom inclusion at the recommended contour level (0.16) and Q-score for the entire model and for each chain.

| Chain | Atom inclusion   | Q-score  |
|-------|--|--|
| All   |  0.2380 |  0.1100 |
| A     |  0.1450 |  0.1330 |
| B     |  0.2720 |  0.1490 |
| E     |  0.2580 |  0.1200 |
| F     |  0.1430 |  0.0750 |
| G     |  0.2200 |  0.0820 |
| H     |  0.1090 |  0.0850 |
| I     |  0.2150 |  0.0890 |
| J     |  0.1250 |  0.0820 |

