# **Supplementary Figure S1**



Figure S1. Correlation between interface area B (Å2) and interface atoms/nucleotides/residues. The number of atoms (i) and nucleotides or amino acid residues (ii) is plotted against the interface area in (A) protein-protein interfaces (•), (B) protein-RNA interfaces (×)and (C) RNA-RNA interfaces (+).

# **Supplementary Figure S2**

# Table S1. Characteristics of macromolecular interfaces in ribosomal assemblies



Figure S2. Distribution of different features of pairwise interfaces. (A) interface area B and (B) structural and physicochemical features at PP, PR and RR interfaces.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Interface parameters | PP | | | | | | PR | | | | | | | RR | | | | |
| Subunits | 50s | 30s | 70s | 60s | 40s | 80s | 50s | 30s | 70s | 60s | 40s | 80s | 50s | | 30s | 70s | 60s | 80s |
| No. of interfaces | 107 | 39 | 6 | 150 | 117 | 9 | 170 | 49 | 19 | 116 | 68 | 12 | 5 | | 9 | 5 | 4 | 1 |
| Average B (Å2)  atoms  residues/nucleotides | 655  ±580  70  20 | 653  ±602  71  19 | 415  ±338  47  15 | 821  ±701  88  24 | 880  ±712  96  26 | 481  ±540  54  16 | 4084  ±3162  459  48/47 | 3090  ±1823  345  38/35 | 396  ±283  48  8/6 | 4909  ±3886  557  59/53 | 4043  ±2340  459  50/44 | 905  ±698  105  14/14 | 1650  ±252  222  47 | | 612  ±500  81  14 | 2840  ±1505  375  73 | 6480  ±4552  836  141 | 2780  394  94 |
| Fraction (%) of non-polar area (fnp)  Protein  RNA | 60 | 60 | 64 | 59 | 58 | 52 | 48  38 | 42  41 | 41  29 | 54  30 | 54  31 | 56  29 | 36 | | 36 | 38 | 35 | 40 |
| Fraction (%) of buried atoms (fbu)  Protein  RNA | 15 | 14 | 6 | 15 | 15 | 9 | 24  25 | 21  21 | 8  10 | 21  23 | 20  24 | 6  9 | 37 | | 18 | 21 | 32 | 23 |
| Density index (LD)  Protein  RNA | 39 | 41 | 26 | 44 | 47 | 30 | 41  40 | 37  36 | 13  12 | 41  41 | 42  42 | 19  20 | 65 | | 37 | 63 | 71 | 52 |
| H-bonds  No. per interface  B per bond (Å2)  per 1000 Å2 B | 2  347  3 | 2  339  3 | 1  829  1 | 2  224  2 | 2  293  5 | 2  181  3 | 30  136  7 | 23  135  7 | 2  215  5 | 32  234  11 | 25  177  6 | 4  359  2 | 24  68  15 | | 6  100  10 | 17  163  6 | 98  73  14 | 34  82  12 |
| Salt bridges  No. per interface  B per bridge (Å2)  per 1000 Å2 B | 1  855  1 | 0  1958  1 | 1  415  2 | 1  169  3 | 1  236  1 | 1  195  3 | 11  370  3 | 16  202  5 | 2  199  5 | 23  241  5 | 19  297  4 | 4  168  3 | -  - | | -  - | -  - | -  - | -  - |
| Sc index | 0.6 | 0.5 | 0.5 | 0.6 | 0.6 | 0.5 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | | 0.7 | 0.6 | 0.7 | 0.7 |
| Secondary structure  No. of residues in Helix  per interface  per 1000 Å2 B  No. of residues in Strands  per interface  per 1000 Å2 B  No. of residues in others  per interface  per 1000 Å2 B | 4  6  4  6  4  7 | 5  8  3  5  5  7 | 4  9  1  2  5  12 | 7  9  3  4  6  12 | 6  9  5  5  7  9 | 3  13  2  16  4  20 | 11  5  8  4  12  6 | 12  8  7  5  8  5 | 2  12  2  8  1  7 | 16  5  8  3  15  5 | 12  4  9  3  13  4 | 7  16  1  2  2  10 | -  -  - | | -  -  - | -  -  - | -  -  - | -  -  - |

# Table S2: Intersubunit interactions

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Organism | PP interfaces | | PR interfaces | |
|  | Interacting subunits | Size B (Å2) | Interacting subunits | Size B (Å2) |
| prokaryotes | bL31:uS19 | 896 | 16S rRNA:bL19 | 925 |
|  | bL31:uS13 | 856 | 16S rRNA:uL14 | 608 |
|  | uL5:uS13 | 260 | 16S rRNA: uL2 | 377 |
|  | uL2:bS6 | 108 | 23S rRNA: uS15 | 666 |
|  |  |  | 23S rRNA: uS13 | 326 |
|  |  |  |  |  |
| eukaryotes | eL24:eS6 | 1765 | 18S rRNA: eL41 | 2568 |
|  | uL5:uS19 | 568 | 18S rRNA:eL19 | 1300 |
|  | eL19:eS7 | 313 | 18S rRNA:eL24 | 1102 |
|  | eL43:eS1 | 275 | 18S rRNA:uL2 | 937 |
|  | uL3:eS6 | 187 | 18S rRNA:eL43 | 813 |
|  | uL5:uS13 | 157 | 18S rRNA:eL23 | 634 |
|  |  |  | 25S rRNA:eS8 | 701 |
|  |  |  | 25S rRNA:uS15 | 335 |

# Table S3. The summary of similarities as well as differences in the interface properties between prokaryotes and eukaryotes

|  |  |  |
| --- | --- | --- |
| The structural and physicochemical properties | prokaryotes | eukaryotes |
| Similarities | * The largest PR interface is found between LSU and the smallest is found between LSU and SSU. * At the RNA side of PR interfaces, the fnp is higher in SSU and lower between LSU and SSU. * Average fbu is higher in the LSU and significantly lower (p-value < 0.05) between LSU and SSU. * LD is significantly poor at the interfaces between the LSU and SSU. * Among all the subunits of prokaryotes and eukaryotes, RR interfaces have the highest Sc values than PP and PR interfaces. * The LSU r-protein eL22 has four interacting partners and SSU r-proteins eS8, uS15, uS11, uS19, and eS19 have equivalent number of interacting partners in both prokaryotes and eukaryotes. | |
| Differences | * The largest PP interfaces are in the LSU. * fnp is higher between LSU and SSU at PP interfaces. * fnp is higher in LSU at the protein side of PR interfaces. * At PR interfaces, LD is higher in LSU. * Overall LD is lower. * Salt bridge density is lower at PR interfaces. * The average number of interacting partners for SSU, LSU r-proteins and RNA are three, three and 15 respectively. | * The largest PP interfaces are in the SSU. * fnp is higher in LSU at PP interfaces. * fnp is higher between LSU and SSU at the protein side of PR interfaces. * At PR interfaces, LD is higher in SSU. * Overall LD is higher. * Salt bridge density is higher at PR interfaces. * The average number of interacting partners for SSU, LSU r-proteins and RNA are six, nine and 33 respectively. |
| LSU: Large subunit, SSU: Small subunit, PP: Protein-protein, PR: Protein-RNA, RR: RNA-RNA.  fnp: Percentage of area contributed by the non-polar groups (carbon-containing groups).  fbu : Percentage of area contributed by the interface atoms that are fully buried.  LD is the mean number of interface atoms that are within 12 Å of a given interface atom.  Sc index: Shape complementarity and was calculated using the GPU-SC program. | | |

# Table S4. The structural and physicochemical properties of r-proteins at PR interfaces

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| PDB ID | r-proteins\* | Class | B (Å2)a | No. of atoms | No. of residues | Fnpb | Fbuc | LDd | H-bond | Salt bridges | Helices | Strands | Otherse |
| 5dm6\_XZ | bL32 | Late | 2517 | 191 | 35 | 61 | 26 | 54 | 43 | 0 | 5 | 0 | 8 |
| 5dm6\_VX | uL29 | Intermediate | 860 | 113 | 25 | 31 | 28 | 40 | 7 | 8 | 21 | 13 | 6 |
| 5dm6\_UX | bL28 | Late | 1892 | 240 | 46 | 27 | 18 | 39 | 17 | 11 | 5 | 15 | 17 |
| 5dm6\_TY | bL27 | Late | 81 | 15 | 2 | 53 | 7 | 14 | 1 | 2 | 0 | 5 | 4 |
| 5dm6\_TX | bL27 | Late | 2306 | 295 | 55 | 27 | 31 | 41 | 34 | 19 | 11 | 5 | 15 |
| 5dm6\_SY | bL25 | Late | 632 | 73 | 21 | 28 | 27 | 33 | 9 | 4 | 15 | 0 | 5 |
| 5dm6\_SX | bL25 | Late | 421 | 64 | 17 | 27 | 8 | 22 | 1 | 7 | 17 | 4 | 0 |
| 5dm6\_RX | uL24 | Intermediate | 1796 | 241 | 53 | 26 | 24 | 40 | 23 | 15 | 9 | 18 | 5 |
| 5dm6\_PX | uL22 | Intermediate | 3111 | 407 | 75 | 29 | 28 | 44 | 45 | 32 | 33 | 10 | 7 |
| 5dm6\_OX | bL21 | Late | 1426 | 200 | 31 | 29 | 23 | 35 | 23 | 23 | 2 | 0 | 10 |
| 5dm6\_NX | bL20 | Early | 3933 | 533 | 69 | 28 | 29 | 53 | 59 | 70 | 19 | 24 | 12 |
| 5dm6\_MX | bL19 | Late | 1100 | 134 | 26 | 31 | 13 | 29 | 15 | 12 | 0 | 0 | 0 |
| 5dm6\_KX | bL17 | Intermediate | 3056 | 414 | 68 | 30 | 25 | 46 | 40 | 30 | 12 | 7 | 16 |
| 5dm6\_IX | uL15 | Late | 4141 | 578 | 87 | 26 | 29 | 46 | 56 | 42 | 21 | 5 | 34 |
| 5dm6\_GX | uL13 | Early | 2642 | 334 | 74 | 30 | 23 | 40 | 35 | 25 | 28 | 0 | 7 |
| 5dm6\_FX | uL11 | Late | 1160 | 150 | 38 | 31 | 36 | 45 | 11 | 3 | 3 | 2 | 14 |
| 5dm6\_DY | uL5 | Late | 688 | 94 | 19 | 34 | 33 | 36 | 10 | 4 | 7 | 1 | 11 |
| 5dm6\_DX | uL5 | Late | 1234 | 133 | 46 | 34 | 35 | 50 | 12 | 3 | 0 | 11 | 10 |
| 5dm6\_CX | uL4 | Early | 3960 | 523 | 96 | 29 | 25 | 48 | 48 | 30 | 48 | 0 | 5 |
| 5dm6\_BX | uL3 | Early | 4934 | 643 | 108 | 30 | 32 | 52 | 72 | 45 | 8 | 5 | 32 |
| 5dm6\_3X | bL35 | Late | 2453 | 312 | 51 | 21 | 19 | 39 | 31 | 27 | 7 | 2 | 11 |
| 5dm6\_2X | bL34 | Late | 2425 | 337 | 46 | 30 | 28 | 52 | 27 | 29 | 0 | 12 | 17 |
| 5dm6\_1X | bL33 | Late | 1162 | 155 | 31 | 30 | 27 | 38 | 11 | 5 | 10 | 1 | 13 |
| 5dm6\_0X | uL1 | Early | 1292 | 158 | 43 | 32 | 18 | 42 | 7 | 9 | 2 | 3 | 20 |
| 4yb2\_JN | uL5 | Late | 748 | 81 | 22 | 62 | 26 | 29 | 10 | 0 | 7 | 8 | 3 |
| 4yb2\_IZ | bL21 | Late | 1762 | 161 | 31 | 43 | 14 | 48 | 22 | 0 | 0 | 17 | 8 |
| 4yb2\_IY | bL20 | Early | 4150 | 349 | 68 | 55 | 27 | 60 | 69 | 0 | 55 | 0 | 3 |
| 4yb2\_IX | bL19 | Late | 1105 | 104 | 24 | 46 | 19 | 38 | 19 | 0 | 5 | 6 | 3 |
| 4yb2\_IV | bL17 | Intermediate | 3510 | 326 | 78 | 50 | 36 | 52 | 53 | 0 | 36 | 13 | 12 |
| 4yb2\_IT | uL15 | Late | 4712 | 392 | 88 | 56 | 20 | 49 | 71 | 0 | 14 | 4 | 32 |
| 4yb2\_IR | uL13 | Early | 2634 | 289 | 77 | 56 | 27 | 43 | 36 | 0 | 27 | 12 | 19 |
| 4yb2\_IQ | uL11 | Late | 1119 | 126 | 38 | 56 | 33 | 39 | 20 | 0 | 13 | 5 | 12 |
| 4yb2\_IP | bL9 | Early | 404 | 46 | 12 | 61 | 22 | 35 | 3 | 0 | 4 | 0 | 6 |
| 4yb2\_IN | uL5 | Late | 1164 | 140 | 39 | 64 | 24 | 41 | 13 | 0 | 0 | 20 | 8 |
| 4yb2\_Im | bL36 | Late | 1450 | 122 | 29 | 54 | 21 | 51 | 24 | 0 | 2 | 14 | 4 |
| 4yb2\_IM | uL4 | Early | 4304 | 402 | 91 | 58 | 23 | 58 | 58 | 0 | 24 | 0 | 32 |
| 4yb2\_Il | bL35 | Late | 2855 | 239 | 53 | 58 | 18 | 51 | 48 | 0 | 11 | 6 | 19 |
| 4yb2\_IL | uL3 | Early | 4983 | 492 | 107 | 58 | 30 | 64 | 73 | 0 | 15 | 34 | 23 |
| 4yb2\_Ik | bL34 | Late | 2623 | 221 | 44 | 57 | 24 | 61 | 28 | 0 | 25 | 0 | 7 |
| 4yb2\_Ij | bL33 | Late | 1146 | 107 | 26 | 61 | 20 | 37 | 16 | 0 | 0 | 14 | 4 |
| 4yb2\_iI | bL32 | Late | 2054 | 297 | 37 | 30 | 28 | 56 | 34 | 23 | 4 | 6 | 8 |
| 4yb2\_gI | uL29 | Intermediate | 908 | 121 | 21 | 37 | 30 | 43 | 9 | 0 | 13 | 0 | 4 |
| 4yb2\_fI | bL28 | Late | 2059 | 256 | 45 | 25 | 29 | 41 | 41 | 0 | 7 | 22 | 3 |
| 4yb2\_eJ | bL27 | Late | 166 | 18 | 5 | 25 | 11 | 17 | 3 | 25 | 0 | 2 | 3 |
| 4yb2\_eI | bL27 | Late | 2103 | 288 | 50 | 27 | 33 | 45 | 36 | 0 | 0 | 17 | 13 |
| 4yb2\_dJ | bL25 | Late | 863 | 93 | 25 | 20 | 28 | 40 | 19 | 3 | 7 | 8 | 2 |
| 4yb2\_dI | bL25 | Late | 236 | 30 | 8 | 29 | 10 | 20 | 2 | 17 | 4 | 0 | 3 |
| 4yb2\_cI | uL24 | Intermediate | 1691 | 212 | 51 | 27 | 21 | 41 | 22 | 0 | 3 | 16 | 12 |
| 4yb2\_aI | uL22 | Intermediate | 2431 | 317 | 56 | 30 | 21 | 44 | 30 | 19 | 16 | 27 | 3 |
| 4yb1\_VY | uS4 | Early | 3038 | 298 | 78 | 51 | 27 | 46 | 57 | 3 | 30 | 4 | 23 |
| 4yb1\_VX | uS3 | Late | 1848 | 176 | 48 | 56 | 24 | 41 | 17 | 0 | 7 | 17 | 12 |
| 4yb1\_HV | bS21 | Late | 582 | 88 | 20 | 30 | 14 | 23 | 8 | 11 | 15 | 0 | 2 |
| 4yb1\_GV | bS20 | Early | 2230 | 280 | 59 | 25 | 17 | 36 | 28 | 17 | 48 | 0 | 7 |
| 4yb1\_fV | uS11 | Late | 1868 | 246 | 44 | 30 | 36 | 44 | 38 | 0 | 1 | 12 | 13 |
| 4yb1\_eV | bL27 | Late | 1674 | 234 | 42 | 30 | 29 | 45 | 15 | 0 | 2 | 17 | 7 |
| 4yb1\_DV | uS17 | Early | 1632 | 205 | 40 | 29 | 22 | 37 | 19 | 45 | 1 | 19 | 12 |
| 4yb1\_dV | uS9 | Intermediate | 2784 | 334 | 59 | 29 | 28 | 49 | 51 | 0 | 11 | 12 | 16 |
| 4yb1\_CV | bS16 | Intermediate | 2006 | 245 | 49 | 31 | 21 | 39 | 26 | 3 | 7 | 12 | 17 |
| 4yb1\_BV | uS15 | Early | 1544 | 199 | 41 | 29 | 25 | 41 | 25 | 0 | 29 | 0 | 6 |
| 4yb1\_aV | bS6 | Intermediate | 457 | 50 | 17 | 33 | 8 | 21 | 6 | 0 | 4 | 4 | 4 |
| 4yb1\_AV | uS14 | Late | 2102 | 268 | 48 | 26 | 22 | 44 | 38 | 8 | 25 | 2 | 8 |
| 4wfa\_ZX | bL32 | Late | 1845 | 278 | 50 | 30 | 32 | 57 | 34 | 28 | 6 | 3 | 5 |
| 4wfa\_VX | uL29 | Intermediate | 623 | 88 | 17 | 36 | 25 | 33 | 6 | 2 | 15 | 0 | 0 |
| 4wfa\_UX | bL28 | Late | 1257 | 158 | 41 | 26 | 14 | 33 | 5 | 0 | 0 | 3 | 6 |
| 4wfa\_TY | bL27 | Late | 65 | 15 | 2 | 31 | 7 | 14 | 0 | 0 | 0 | 1 | 2 |
| 4wfa\_TX | bL27 | Late | 1856 | 250 | 51 | 32 | 30 | 40 | 30 | 7 | 0 | 13 | 14 |
| 4wfa\_SY | bL25 | Late | 607 | 67 | 12 | 25 | 34 | 31 | 9 | 2 | 3 | 11 | 3 |
| 4wfa\_SX | bL25 | Late | 262 | 40 | 12 | 28 | 10 | 13 | 1 | 0 | 2 | 0 | 6 |
| 4wfa\_RX | uL24 | Intermediate | 1375 | 182 | 38 | 24 | 19 | 34 | 8 | 4 | 2 | 7 | 13 |
| 4wfa\_PX | uL22 | Intermediate | 2272 | 301 | 48 | 29 | 26 | 44 | 36 | 20 | 16 | 26 | 6 |
| 4wfa\_OX | bL21 | Late | 1640 | 213 | 40 | 30 | 26 | 37 | 23 | 26 | 0 | 13 | 7 |
| 4wfa\_NX | bL20 | Early | 3666 | 497 | 88 | 28 | 28 | 51 | 69 | 67 | 47 | 0 | 5 |
| 4wfa\_MX | bL19 | Late | 1009 | 132 | 26 | 29 | 17 | 36 | 12 | 14 | 1 | 6 | 7 |
| 4wfa\_KX | bL17 | Intermediate | 2680 | 345 | 61 | 34 | 23 | 43 | 35 | 22 | 34 | 10 | 9 |
| 4wfa\_IX | uL15 | Late | 3217 | 462 | 100 | 27 | 27 | 41 | 33 | 19 | 2 | 3 | 29 |
| 4wfa\_GX | uL13 | Early | 2397 | 315 | 59 | 33 | 23 | 37 | 34 | 22 | 20 | 4 | 19 |
| 4wfa\_DY | uL5 | Late | 428 | 67 | 11 | 44 | 27 | 29 | 4 | 0 | 3 | 2 | 3 |
| 4wfa\_DX | uL5 | Late | 793 | 98 | 14 | 38 | 13 | 42 | 3 | 0 | 0 | 7 | 7 |
| 4wfa\_CX | uL4 | Early | 3835 | 531 | 85 | 32 | 28 | 48 | 26 | 27 | 18 | 0 | 35 |
| 4wfa\_BX | uL3 | Early | 4672 | 635 | 114 | 31 | 32 | 51 | 70 | 33 | 12 | 30 | 29 |
| 4wfa\_4X | bL36 | Late | 1097 | 162 | 35 | 29 | 21 | 39 | 15 | 11 | 2 | 9 | 5 |
| 4wfa\_3X | bL35 | Late | 2106 | 284 | 64 | 24 | 20 | 38 | 16 | 16 | 3 | 2 | 23 |
| 4wfa\_2X | bL34 | Late | 2334 | 328 | 62 | 29 | 25 | 50 | 30 | 25 | 23 | 0 | 8 |
| 4w2f\_50S\_BZ | bL31 | Late | 238 | 17 | 4 | 68 | 18 | 16 | 5 | 0 | 0 | 0 | 2 |
| 4w2f\_50S\_BV | bL27 | Late | 193 | 22 | 6 | 37 | 36 | 20 | 5 | 0 | 3 | 2 | 0 |
| 4w2f\_50S\_BU | bL20 | Early | 768 | 87 | 24 | 40 | 34 | 35 | 18 | 0 | 4 | 13 | 4 |
| 4w2f\_50S\_BF | uL5 | Late | 792 | 86 | 21 | 52 | 33 | 30 | 11 | 0 | 2 | 7 | 7 |
| 4w2f\_50S\_AX | uL29 | Intermediate | 1215 | 117 | 29 | 54 | 32 | 43 | 19 | 0 | 22 | 0 | 2 |
| 4w2f\_50S\_AW | bL28 | Late | 2679 | 268 | 63 | 52 | 24 | 51 | 45 | 0 | 12 | 28 | 9 |
| 4w2f\_50S\_AV | bL27 | Late | 2640 | 242 | 52 | 54 | 23 | 47 | 39 | 0 | 2 | 10 | 16 |
| 4w2f\_50S\_AU | bL25 | Late | 306 | 27 | 10 | 51 | 7 | 14 | 1 | 0 | 1 | 0 | 1 |
| 4w2f\_50S\_AT | uL24 | Intermediate | 1955 | 185 | 50 | 59 | 17 | 41 | 28 | 0 | 5 | 17 | 12 |
| 4w2f\_50S\_AR | uL22 | Intermediate | 2495 | 254 | 57 | 49 | 22 | 52 | 43 | 0 | 17 | 26 | 6 |
| 4w2f\_50S\_AQ | bL21 | Late | 1605 | 152 | 33 | 56 | 20 | 43 | 22 | 0 | 0 | 20 | 8 |
| 4w2f\_50S\_AP | bL20 | Early | 4287 | 360 | 67 | 56 | 26 | 62 | 79 | 0 | 51 | 0 | 6 |
| 4w2f\_50S\_AM | bL17 | Intermediate | 3601 | 316 | 71 | 52 | 29 | 48 | 58 | 0 | 33 | 12 | 8 |
| 4w2f\_50S\_AK | uL15 | Late | 5287 | 452 | 95 | 52 | 21 | 54 | 90 | 0 | 11 | 7 | 40 |
| 4w2f\_50S\_AI | uL13 | Early | 2424 | 251 | 68 | 58 | 25 | 44 | 35 | 0 | 27 | 11 | 14 |
| 4w2f\_50S\_AH | bL9 | Early | 766 | 86 | 23 | 60 | 29 | 32 | 7 | 0 | 17 | 2 | 3 |
| 4w2f\_50S\_AF | uL5 | Late | 1097 | 138 | 41 | 58 | 37 | 44 | 15 | 0 | 0 | 21 | 10 |
| 4w2f\_50S\_Ae | bL36 | Late | 1520 | 126 | 28 | 49 | 20 | 51 | 58 | 0 | 28 | 2 | 27 |
| 4w2f\_50S\_AE | uL4 | Early | 4620 | 435 | 94 | 59 | 23 | 62 | 30 | 0 | 2 | 14 | 4 |
| 4w2f\_50S\_Ad | bL35 | Late | 2750 | 230 | 54 | 58 | 14 | 48 | 96 | 0 | 12 | 31 | 26 |
| 4w2f\_50S\_AD | uL3 | Early | 5285 | 499 | 105 | 57 | 30 | 62 | 37 | 0 | 15 | 7 | 16 |
| 4w2f\_50S\_Ac | bL34 | Late | 2836 | 256 | 46 | 53 | 22 | 66 | 146 | 0 | 20 | 26 | 61 |
| 4w2f\_50S\_Ab | bL33 | Late | 1259 | 125 | 30 | 53 | 31 | 42 | 19 | 0 | 0 | 17 | 6 |
| 4w2f\_50S\_Aa | bL32 | Late | 2612 | 190 | 36 | 63 | 25 | 54 | 40 | 0 | 10 | 6 | 6 |
| 4w2f\_30S\_MX | uS13 | Late | 110 | 15 | 7 | 43 | 7 | 9 | 1 | 0 | 0 | 0 | 0 |
| 4w2f\_30S\_MW | uS13 | Late | 189 | 23 | 5 | 51 | 17 | 19 | 0 | 0 | 0 | 0 | 0 |
| 4w2f\_30S\_KY | uS11 | Late | 51 | 7 | 1 | 52 | 0 | 6 | 0 | 0 | 1 | 0 | 0 |
| 4w2f\_30S\_IX | uS9 | Intermediate | 116 | 19 | 2 | 18 | 21 | 18 | 2 | 5 | 0 | 0 | 0 |
| 4w2f\_30S\_CV | uS3 | Late | 50 | 5 | 1 | 18 | 0 | 4 | 1 | 0 | 0 | 0 | 1 |
| 4w2f\_30S\_AT | bS20 | Early | 2571 | 247 | 61 | 53 | 19 | 51 | 32 | 30 | 50 | 0 | 5 |
| 4w2f\_30S\_AR | bS18 | Intermediate | 858 | 91 | 20 | 66 | 27 | 40 | 13 | 11 | 12 | 1 | 3 |
| 4w2f\_30S\_AQ | uS17 | Early | 2687 | 248 | 52 | 52 | 20 | 47 | 41 | 20 | 8 | 30 | 7 |
| 4w2f\_30S\_AP | bS16 | Intermediate | 2466 | 245 | 55 | 58 | 20 | 58 | 32 | 24 | 12 | 18 | 16 |
| 4w2f\_30S\_AO | uS15 | Early | 1782 | 189 | 43 | 59 | 29 | 53 | 23 | 18 | 32 | 0 | 5 |
| 4w2f\_30S\_AN | uS14 | Late | 2101 | 173 | 38 | 51 | 23 | 42 | 33 | 21 | 10 | 3 | 12 |
| 4w2f\_30S\_AM | uS13 | Late | 2097 | 209 | 54 | 54 | 24 | 49 | 41 | 32 | 22 | 2 | 13 |
| 4w2f\_30S\_AK | uS11 | Late | 1878 | 172 | 42 | 55 | 35 | 42 | 25 | 17 | 7 | 12 | 10 |
| 4w2f\_30S\_AJ | uS10 | Late | 1909 | 159 | 40 | 56 | 20 | 42 | 24 | 0 | 2 | 29 | 7 |
| 4w2f\_30S\_AI | uS9 | Intermediate | 2924 | 264 | 60 | 52 | 20 | 51 | 43 | 30 | 8 | 13 | 17 |
| 4w2f\_30S\_AF | bS6 | Intermediate | 601 | 64 | 18 | 39 | 17 | 25 | 11 | 0 | 6 | 10 | 1 |
| 4w2f\_30S\_AD | uS4 | Early | 3125 | 317 | 79 | 43 | 21 | 47 | 62 | 54 | 35 | 3 | 21 |
| 4w2f\_30S\_AC | uS3 | Late | 1675 | 158 | 39 | 58 | 26 | 41 | 22 | 8 | 1 | 17 | 12 |
| 4V8P\_3x | eL18 | Early | 755 | 76 | 16 | 45 | 17 | 32 | 47 | 3 | 0 | 0 | 11 |
| 4V8P\_3P | eL21 | Late | 204 | 24 | 7 | 69 | 13 | 16 | 9 | 0 | 7 | 3 | 17 |
| 4V8P\_3D | uL5 | Late | 1151 | 117 | 22 | 45 | 24 | 35 | 2 | 10 | 9 | 1 | 6 |
| 4V8P\_2u | eL13 | Early | 162 | 22 | 4 | 81 | 23 | 19 | 16 | 0 | 24 | 42 | 62 |
| 4V8P\_2U | uL29 | Intermediate | 1631 | 164 | 28 | 57 | 14 | 38 | 17 | 17 | 12 | 4 | 4 |
| 4V8P\_2S | uL24 | Intermediate | 1223 | 125 | 23 | 49 | 22 | 38 | 5 | 18 | 11 | 0 | 7 |
| 4V8P\_2Q | uL22 | Intermediate | 458 | 58 | 9 | 37 | 22 | 24 | 5 | 4 | 4 | 1 | 1 |
| 4V8P\_2F | eL8 | Early | 592 | 66 | 9 | 51 | 21 | 24 | 7 | 5 | 1 | 6 | 1 |
| 4V8P\_2C | uL4 | Early | 363 | 48 | 6 | 61 | 17 | 21 | 1 | 2 | 1 | 4 | 7 |
| 4V8P\_2b | eL39 | Late | 1081 | 119 | 16 | 58 | 25 | 42 | 8 | 9 | 4 | 2 | 4 |
| 4V8P\_2a | eL37 | Intermediate | 1693 | 173 | 29 | 52 | 19 | 40 | 14 | 10 | 27 | 0 | 3 |
| 4V8P\_1Y | eL37 | Intermediate | 2025 | 179 | 52 | 54 | 20 | 46 | 21 | 15 | 9 | 7 | 8 |
| 4V8P\_1x | eL18 | Early | 2995 | 326 | 50 | 57 | 24 | 42 | 20 | 30 | 16 | 15 | 20 |
| 4V8P\_1W | eL31 | Intermediate | 2303 | 225 | 50 | 53 | 27 | 49 | 11 | 29 | 13 | 6 | 12 |
| 4V8P\_1u | eL13 | Early | 5106 | 466 | 122 | 50 | 18 | 45 | 22 | 52 | 29 | 7 | 24 |
| 4V8P\_1U | uL29 | Intermediate | 1306 | 121 | 34 | 55 | 13 | 29 | 22 | 20 | 10 | 8 | 4 |
| 4V8P\_1S | uL24 | Intermediate | 2281 | 221 | 49 | 60 | 26 | 42 | 24 | 23 | 25 | 11 | 16 |
| 4V8P\_1q | eL36 | Late | 2146 | 199 | 44 | 55 | 16 | 40 | 62 | 20 | 7 | 11 | 10 |
| 4V8P\_1Q | uL22 | Intermediate | 3470 | 353 | 73 | 46 | 26 | 52 | 12 | 31 | 15 | 5 | 31 |
| 4V8P\_1P | eL21 | Late | 3960 | 378 | 83 | 54 | 29 | 56 | 41 | 32 | 34 | 4 | 13 |
| 4V8P\_1O | eL19 | Intermediate | 4621 | 401 | 107 | 52 | 22 | 48 | 21 | 78 | 7 | 5 | 36 |
| 4V8P\_1o | uL15 | Late | 2117 | 225 | 44 | 56 | 18 | 37 | 47 | 19 | 26 | 0 | 6 |
| 4V8P\_1N | eL18 | Early | 4603 | 445 | 92 | 51 | 19 | 44 | 19 | 51 | 48 | 4 | 30 |
| 4V8P\_1n | eL27 | Intermediate | 1715 | 158 | 42 | 42 | 15 | 37 | 70 | 27 | 6 | 0 | 10 |
| 4V8P\_1l | eL34 | Intermediate | 4513 | 391 | 109 | 52 | 17 | 58 | 47 | 39 | 54 | 3 | 17 |
| 4V8P\_1K | eL27 | Intermediate | 5692 | 487 | 133 | 57 | 25 | 56 | 17 | 52 | 36 | 5 | 25 |
| 4V8P\_1I | eL34 | Intermediate | 4141 | 441 | 75 | 54 | 23 | 54 | 11 | 39 | 20 | 11 | 24 |
| 4V8P\_1h | uL29 | Intermediate | 3424 | 341 | 72 | 52 | 16 | 53 | 21 | 24 | 27 | 0 | 9 |
| 4V8P\_1F | eL8 | Early | 3350 | 337 | 61 | 55 | 17 | 41 | 10 | 16 | 18 | 30 | 18 |
| 4V8P\_1e | eL6 | Early | 3400 | 328 | 78 | 53 | 17 | 37 | 30 | 18 | 41 | 9 | 19 |
| 4V8P\_1D | uL5 | Late | 1484 | 164 | 24 | 53 | 34 | 42 | 32 | 17 | 4 | 4 | 8 |
| 4V8P\_1c | eL36 | Late | 3312 | 311 | 65 | 61 | 20 | 48 | 26 | 17 | 10 | 5 | 25 |
| 4V8P\_1C | uL4 | Early | 8123 | 784 | 165 | 51 | 17 | 49 | 46 | 74 | 22 | 17 | 54 |
| 4V8P\_1b | eL39 | Late | 1651 | 161 | 40 | 56 | 24 | 49 | 66 | 15 | 21 | 10 | 7 |
| 4V8P\_1B | uL3 | Early | 8942 | 906 | 167 | 56 | 28 | 69 | 42 | 72 | 65 | 18 | 44 |
| 4V8P\_1a | eL37 | Intermediate | 3230 | 284 | 78 | 56 | 26 | 52 | 47 | 31 | 16 | 11 | 19 |
| 4V88\_8Y | uL24 | Intermediate | 1281 | 139 | 22 | 47 | 30 | 43 | 20 | 16 | 4 | 1 | 8 |
| 4V88\_8P | uL22 | Intermediate | 513 | 66 | 10 | 40 | 17 | 24 | 9 | 7 | 1 | 4 | 8 |
| 4V88\_8L | eL13 | Early | 175 | 26 | 4 | 76 | 15 | 21 | 1 | 0 | 9 | 0 | 7 |
| 4V88\_8l | eL39 | Late | 976 | 103 | 15 | 62 | 24 | 37 | 15 | 10 | 7 | 2 | 17 |
| 4V88\_8j | eL37 | Intermediate | 1748 | 185 | 32 | 55 | 18 | 40 | 20 | 9 | 27 | 0 | 3 |
| 4V88\_8h | uL29 | Intermediate | 1370 | 139 | 25 | 56 | 20 | 36 | 18 | 11 | 9 | 0 | 1 |
| 4V88\_8G | eL8 | Early | 499 | 57 | 8 | 61 | 14 | 24 | 8 | 5 | 0 | 0 | 1 |
| 4V88\_8C | uL4 | Early | 330 | 43 | 6 | 57 | 16 | 18 | 3 | 2 | 2 | 0 | 4 |
| 4V88\_7T | eL21 | Late | 223 | 23 | 6 | 38 | 4 | 12 | 4 | 0 | 2 | 0 | 2 |
| 4V88\_7S | eL20 | Early | 883 | 94 | 18 | 50 | 18 | 36 | 8 | 8 | 6 | 2 | 8 |
| 4V88\_7J | uL5 | Late | 1061 | 113 | 19 | 48 | 30 | 37 | 20 | 11 | 2 | 4 | 12 |
| 4V88\_6V | eS21 | Intermediate | 123 | 11 | 3 | 35 | 0 | 10 | 0 | 0 | 2 | 0 | 1 |
| 4V88\_6U | uS10 | Late | 1754 | 162 | 41 | 57 | 22 | 47 | 23 | 16 | 3 | 25 | 7 |
| 4V88\_6T | eS19 | Late | 2808 | 314 | 59 | 55 | 27 | 55 | 44 | 27 | 32 | 15 | 14 |
| 4V88\_6S | uS13 | Late | 2228 | 232 | 39 | 53 | 23 | 52 | 35 | 22 | 17 | 3 | 18 |
| 4V88\_6R | eS17 | Late | 1609 | 131 | 36 | 48 | 28 | 50 | 21 | 27 | 20 | 0 | 4 |
| 4V88\_6Q | uS9 | Intermediate | 2905 | 268 | 70 | 58 | 18 | 50 | 33 | 15 | 7 | 14 | 17 |
| 4V88\_6O | uS11 | Late | 2345 | 218 | 45 | 49 | 31 | 44 | 39 | 25 | 3 | 11 | 19 |
| 4V88\_6N | uS15 | Early | 3042 | 310 | 56 | 58 | 21 | 54 | 45 | 33 | 38 | 0 | 12 |
| 4V88\_6L | uS17 | Early | 2984 | 309 | 70 | 62 | 18 | 42 | 38 | 22 | 5 | 32 | 23 |
| 4V88\_6J | uS4 | Early | 3516 | 339 | 78 | 54 | 15 | 40 | 43 | 38 | 35 | 3 | 22 |
| 4V88\_6I | eS8 | Early | 4051 | 377 | 93 | 48 | 25 | 55 | 74 | 53 | 17 | 21 | 18 |
| 4V88\_6H | eS7 | Late | 1763 | 172 | 33 | 52 | 19 | 60 | 22 | 3 | 7 | 2 | 12 |
| 4V88\_6G | eS6 | Early | 5055 | 481 | 103 | 50 | 25 | 56 | 70 | 33 | 25 | 30 | 17 |
| 4V88\_6f | eS31 | Late | 645 | 78 | 11 | 55 | 46 | 46 | 14 | 2 | 0 | 5 | 5 |
| 4V88\_6e | eS30 | Late | 1798 | 168 | 40 | 57 | 20 | 30 | 22 | 28 | 13 | 0 | 10 |
| 4V88\_6d | uS14 | Late | 1907 | 172 | 50 | 57 | 19 | 42 | 25 | 19 | 7 | 3 | 11 |
| 4V88\_6D | uS3 | Late | 1729 | 166 | 35 | 61 | 23 | 36 | 21 | 12 | 6 | 14 | 13 |
| 4V88\_6c | eS28 | Intermediate | 417 | 37 | 10 | 55 | 19 | 25 | 4 | 2 | 0 | 1 | 5 |
| 4V88\_6B | eS1 | Early | 1787 | 183 | 41 | 51 | 18 | 37 | 26 | 16 | 8 | 18 | 15 |
| 4V88\_6b | eS27 | Early | 1015 | 95 | 20 | 61 | 20 | 40 | 8 | 4 | 3 | 3 | 7 |
| 4V88\_5Z | eL27 | Intermediate | 1715 | 166 | 41 | 51 | 21 | 35 | 23 | 28 | 11 | 9 | 9 |
| 4V88\_5Y | uL24 | Intermediate | 1913 | 184 | 46 | 57 | 27 | 37 | 29 | 15 | 15 | 9 | 13 |
| 4V88\_5T | eL21 | Late | 3690 | 363 | 82 | 53 | 21 | 55 | 59 | 31 | 16 | 19 | 24 |
| 4V88\_5S | eL20 | Early | 2464 | 260 | 45 | 55 | 14 | 39 | 40 | 19 | 15 | 11 | 19 |
| 4V88\_5R | eL19 | Intermediate | 4825 | 447 | 114 | 52 | 24 | 51 | 83 | 77 | 61 | 4 | 15 |
| 4V88\_5Q | eL18 | Early | 4567 | 458 | 99 | 53 | 21 | 49 | 70 | 44 | 27 | 9 | 37 |
| 4V88\_5p | eL43 | Late | 1766 | 159 | 40 | 57 | 23 | 41 | 25 | 15 | 13 | 3 | 14 |
| 4V88\_5P | uL22 | Intermediate | 3369 | 346 | 68 | 47 | 24 | 52 | 52 | 34 | 21 | 29 | 17 |
| 4V88\_5O | uL13 | Early | 4462 | 470 | 87 | 59 | 24 | 55 | 55 | 59 | 57 | 8 | 26 |
| 4V88\_5L | eL13 | Early | 4432 | 397 | 109 | 54 | 18 | 43 | 43 | 50 | 38 | 1 | 16 |
| 4V88\_5l | eL39 | Late | 1602 | 153 | 39 | 54 | 26 | 45 | 15 | 13 | 6 | 0 | 8 |
| 4V88\_5j | eL37 | Intermediate | 2870 | 245 | 74 | 56 | 25 | 51 | 47 | 19 | 9 | 4 | 23 |
| 4V88\_5J | uL5 | Late | 1346 | 171 | 21 | 57 | 40 | 47 | 23 | 6 | 4 | 21 | 12 |
| 4V88\_5i | eL36 | Late | 1873 | 180 | 46 | 58 | 14 | 39 | 21 | 15 | 25 | 0 | 7 |
| 4V88\_5h | uL29 | Intermediate | 1005 | 92 | 32 | 59 | 4 | 23 | 11 | 16 | 15 | 0 | 3 |
| 4V88\_5g | eL34 | Intermediate | 4264 | 376 | 102 | 54 | 26 | 58 | 63 | 37 | 24 | 11 | 20 |
| 4V88\_5G | eL8 | Early | 3365 | 349 | 57 | 61 | 23 | 43 | 31 | 15 | 29 | 0 | 17 |
| 4V88\_5f | eL33 | Early | 3183 | 296 | 74 | 47 | 17 | 45 | 39 | 23 | 4 | 35 | 20 |
| 4V88\_5e | eL32 | Early | 3729 | 366 | 95 | 54 | 23 | 55 | 57 | 40 | 9 | 5 | 35 |
| 4V88\_5E | eL6 | Early | 3045 | 293 | 63 | 53 | 18 | 38 | 34 | 16 | 13 | 4 | 14 |
| 4V88\_5d | eL31 | Intermediate | 2095 | 212 | 49 | 56 | 29 | 47 | 28 | 18 | 18 | 13 | 14 |
| 4V88\_5C | uL4 | Early | 8054 | 802 | 156 | 54 | 21 | 53 | 116 | 62 | 50 | 12 | 62 |
| 4V88\_5B | uL3 | Early | 8744 | 919 | 175 | 59 | 28 | 68 | 159 | 75 | 23 | 38 | 62 |
| 4V88\_5a | uL15 | Late | 4983 | 423 | 124 | 59 | 23 | 58 | 63 | 34 | 15 | 5 | 39 |
| 4V5O\_AZ | eS21 | Intermediate | 130 | 17 | 4 | 50 | 18 | 12 | 2 | 1 | 31 | 13 | 13 |
| 4V5O\_AY | eS6 | Early | 5046 | 478 | 103 | 50 | 18 | 49 | 66 | 47 | 14 | 27 | 22 |
| 4V5O\_AX | eS30 | Late | 2175 | 203 | 43 | 56 | 18 | 37 | 29 | 18 | 10 | 27 | 9 |
| 4V5O\_AV | eS17 | Late | 1399 | 134 | 31 | 54 | 21 | 53 | 11 | 24 | 1 | 3 | 10 |
| 4V5O\_AT | eS19 | Late | 2844 | 302 | 60 | 55 | 19 | 54 | 34 | 36 | 7 | 8 | 12 |
| 4V5O\_AR | RACK1 | Late | 553 | 54 | 15 | 35 | 11 | 22 | 7 | 3 | 4 | 2 | 1 |
| 4V5O\_AQ | eS17 | Late | 3073 | 317 | 68 | 57 | 21 | 45 | 45 | 30 | 7 | 16 | 21 |
| 4V5O\_AP | eS24 | Early | 2282 | 230 | 51 | 65 | 19 | 33 | 17 | 22 | 5 | 9 | 14 |
| 4V5O\_AO | uS15 | Early | 3231 | 326 | 58 | 53 | 22 | 56 | 34 | 26 | 3 | 25 | 27 |
| 4V5O\_AN | uS14 | Late | 1912 | 193 | 49 | 58 | 16 | 49 | 24 | 15 | 13 | 5 | 8 |
| 4V5O\_AM | uS13 | Late | 2456 | 238 | 46 | 56 | 25 | 51 | 30 | 21 | 22 | 13 | 12 |
| 4V5O\_AK | uS11 | Late | 2422 | 221 | 51 | 51 | 24 | 44 | 26 | 22 | 17 | 0 | 17 |
| 4V5O\_AI | uS9 | Intermediate | 3232 | 302 | 71 | 51 | 18 | 52 | 31 | 27 | 30 | 7 | 19 |
| 4V5O\_AH | eS8 | Early | 2595 | 245 | 55 | 53 | 18 | 45 | 28 | 17 | 17 | 3 | 19 |
| 4V5O\_AG | eS7 | Late | 2051 | 201 | 44 | 58 | 18 | 49 | 18 | 18 | 7 | 0 | 13 |
| 4V5O\_A9 | eS31 | Late | 1900 | 175 | 47 | 62 | 18 | 34 | 20 | 13 | 8 | 14 | 12 |
| 4V5O\_A6 | eS27 | Early | 896 | 91 | 18 | 54 | 23 | 37 | 11 | 4 | 5 | 4 | 7 |
| 4V5O\_A4 | uS3 | Late | 1740 | 185 | 38 | 52 | 18 | 37 | 17 | 15 | 19 | 0 | 4 |
| 4V5O\_A3 | eS7 | Late | 2078 | 211 | 34 | 58 | 24 | 57 | 20 | 4 | 22 | 3 | 16 |
| 4V5O\_A2 | eS8 | Early | 4290 | 410 | 96 | 51 | 20 | 56 | 62 | 48 | 12 | 18 | 33 |
| 4V5O\_A1 | eS28 | Intermediate | 377 | 34 | 9 | 50 | 18 | 24 | 5 | 1 | 3 | 0 | 2 |
| a interface area B, b fraction of non-polar area, c fraction of buried atoms, d local density, e non-regulatory secondary structures.  \* b: bacterial, e: eukaryotic, u: universal; r-protein nomenclature is taken from Ban et al. 2014[1](#_ENREF_1). | | | | | | | | | | | | | |

# References

1. Ban N, Beckmann R, Cate JH, Dinman JD, Dragon F, Ellis SR, et al. A new system for naming ribosomal proteins. Current opinion in structural biology 2014; 24:165-9.