

Additional Table S3

| Amino acid | Anticodon | Coverage all experiments | PPM (prop. per million reads) | | | | | tRF Pattern | | | | length 18 | | | | | Length 19 | | | | | Length 20 | | | | | Length 31-35 | | | | | |
|------------|-----------|--------------------------|-------------------------------|--------|--------|-------|-------|----------------|--------------|--------------|-------------|-----------|------|------|------|------|-----------|------|------|------|------|-----------|------|------|------|------|--------------|------|------|------|------|------|
| | | | D | Fe | HL | LL | NL | 5' Dloop-antiC | 3' tRF short | 3' tRFs long | 5' tRF long | D | Fe | HL | LL | NL | D | Fe | HL | LL | NL | D | Fe | HL | LL | NL | D | Fe | HL | LL | NL | |
| Asp | GTC | 54 006 | 2 542 | 25 213 | 10 336 | 5 761 | 3 548 | | Y | Y | | | 0.02 | 0.01 | 0.01 | 0.01 | 0.02 | 0.33 | 0.08 | 0.31 | 0.28 | 0.41 | 0.01 | 0 | 0 | 0.01 | 0 | 0.37 | 0.65 | 0.5 | 0.5 | 0.35 |
| Gly | GCC | 18 351 | 792 | 5 142 | 7 526 | 1 351 | 3 671 | | Y | Fe | | | 0.04 | 0.01 | 0.01 | 0.01 | 0 | 0.36 | 0.13 | 0.77 | 0.57 | 0.72 | 0.03 | 0.02 | 0.04 | 0.03 | 0.03 | 0.23 | 0.54 | 0.08 | 0.19 | 0.13 |
| Gly | TCC | 15 474 | 896 | 1 915 | 7 055 | 1 659 | 4 325 | | Y | Fe | | | 0.03 | 0.02 | 0.01 | 0.01 | 0 | 0.58 | 0.21 | 0.85 | 0.7 | 0.86 | 0.03 | 0.02 | 0.01 | 0.01 | 0.02 | 0.14 | 0.41 | 0.04 | 0.14 | 0.05 |
| Pro | AGG | 17 736 | 858 | 6 100 | 6 873 | 1 357 | 2 350 | | Y | Fe, LL, HL | | | 0.02 | 0.01 | 0.01 | 0.02 | 0.01 | 0.03 | 0.02 | 0.01 | 0.02 | 0.03 | 0.49 | 0.2 | 0.72 | 0.58 | 0.7 | 0.22 | 0.58 | 0.14 | 0.25 | 0.14 |
| Pro | CGG | 10 745 | 398 | 2 114 | 6 078 | 1 456 | 1 374 | | Y | | | | 0.03 | 0.04 | 0.01 | 0.02 | 0.02 | 0.84 | 0.84 | 0.96 | 0.93 | 0.9 | 0.02 | 0.01 | 0 | 0.01 | 0.01 | 0.03 | 0.02 | 0 | 0 | 0.01 |
| Pro | TGG | 1 100 | 46 | 279 | 462 | 144 | 161 | | Y | Fe | | | 0.06 | 0.07 | 0.04 | 0.04 | 0.06 | 0.5 | 0.69 | 0.86 | 0.75 | 0.8 | 0.09 | 0.02 | 0.02 | 0.04 | 0.04 | 0.06 | 0.05 | 0.02 | 0.05 | 0.02 |
| Phe | GAA | 10 703 | 1 804 | 1 159 | 2 287 | 1 703 | 2 309 | | Y | | | | 0 | 0.01 | 0.01 | 0 | 0.01 | 0.75 | 0.56 | 0.67 | 0.81 | 0.65 | 0.01 | 0.06 | 0.01 | 0.01 | 0.01 | 0 | 0 | 0 | 0 | 0 |
| His | GTG | 9 352 | 362 | 4 488 | 2 098 | 523 | 1 071 | | Y | Fe, LL | | | 0 | 0.01 | 0.01 | 0 | 0 | 0.21 | 0.11 | 0.64 | 0.41 | 0.46 | 0.02 | 0.01 | 0.01 | 0.01 | 0.02 | 0.53 | 0.73 | 0.27 | 0.42 | 0.35 |
| Val | AAC | 6 258 | 590 | 1 254 | 2 165 | 955 | 921 | | Y | Fe | | | 0.01 | 0.03 | 0.01 | 0.01 | 0.01 | 0.58 | 0.78 | 0.76 | 0.73 | 0.69 | 0.1 | 0.02 | 0.03 | 0.02 | 0.04 | 0.02 | 0.03 | 0 | 0 | 0.03 |
| Val | CAC | 4 790 | 245 | 1 214 | 1 958 | 691 | 583 | | Y | Fe | | | 0.01 | 0.01 | 0 | 0 | 0.01 | 0.81 | 0.93 | 0.96 | 0.93 | 0.91 | 0.07 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| Val | TAC | 473 | 71 | 75 | 96 | 101 | 54 | | Y | Y | | | 0.19 | 0.17 | 0.03 | 0.04 | 0.03 | 0.2 | 0.1 | 0.05 | 0.03 | 0.07 | 0.14 | 0.36 | 0.61 | 0.65 | 0.48 | 0 | 0.03 | 0.04 | 0.01 | 0.02 |
| Glu | CTC | 6 201 | 933 | 1 309 | 1 866 | 653 | 956 | | Y | | Y | | 0.05 | 0.05 | 0.04 | 0.05 | 0.04 | 0.1 | 0.05 | 0.07 | 0.06 | 0.08 | 0.06 | 0.02 | 0.04 | 0.06 | 0.05 | 0.24 | 0.48 | 0.24 | 0.23 | 0.25 |
| Glu | TTC | 2 928 | 274 | 1 443 | 489 | 185 | 153 | | Y | Y | | | 0.49 | 0.63 | 0.49 | 0.52 | 0.4 | 0.26 | 0.21 | 0.2 | 0.18 | 0.27 | 0.18 | 0.03 | 0.08 | 0.05 | 0.09 | 0.05 | 0.07 | 0.1 | 0.07 | 0.07 |
| Ala | AGC | 5 423 | 397 | 1 176 | 1 014 | 840 | 1 298 | | Y | Fe | | | 0.08 | 0.03 | 0.04 | 0.03 | 0.02 | 0.1 | 0.12 | 0.06 | 0.03 | 0.05 | 0.54 | 0.5 | 0.66 | 0.78 | 0.75 | 0.01 | 0.04 | 0 | 0.01 | 0.01 |
| Ala | CGC | 4 143 | 171 | 568 | 1 570 | 789 | 881 | | Y | | | | 0 | 0.02 | 0 | 0 | 0 | 0.52 | 0.54 | 0.91 | 0.86 | 0.77 | 0.07 | 0.05 | 0.01 | 0.01 | 0.03 | 0.04 | 0.07 | 0.01 | 0.01 | |
| Ala | TGC | 1 061 | 62 | 489 | 254 | 101 | 50 | | Y | | Fe | | 0.27 | 0.17 | 0.09 | 0.07 | 0.04 | 0.02 | 0.01 | 0.01 | 0.01 | 0.07 | 0.28 | 0.05 | 0.03 | 0.08 | 0.16 | 0.07 | 0.47 | 0.36 | 0.44 | 0.18 |
| Gln | CTG | 4 780 | 844 | 637 | 1 908 | 500 | 732 | | Y | Y | Y | | 0.03 | 0.04 | 0.03 | 0.07 | 0.03 | 0.05 | 0.06 | 0.03 | 0.05 | 0.02 | 0.09 | 0.16 | 0.48 | 0.44 | 0.31 | 0.36 | 0.39 | 0.12 | 0.17 | 0.16 |
| Gln | TTG | 1 025 | 132 | 180 | 338 | 153 | 148 | | Y | Y | | | 0.42 | 0.21 | 0.07 | 0.22 | 0.05 | 0.27 | 0.43 | 0.74 | 0.52 | 0.68 | 0.03 | 0.13 | 0.05 | 0.07 | 0.06 | 0.03 | 0.02 | 0.03 | 0.01 | 0.02 |
| Ser | GCT | 4 155 | 377 | 991 | 1 131 | 561 | 727 | | Y | Y | Fe | | 0.18 | 0.08 | 0.04 | 0.04 | 0.06 | 0.38 | 0.5 | 0.72 | 0.77 | 0.65 | 0.02 | 0.02 | 0.02 | 0.01 | 0.02 | 0.07 | 0.1 | 0.06 | 0.02 | 0.05 |
| Ser | AGA | 1 474 | 91 | 754 | 280 | 85 | 100 | | Y | | | | 0.22 | 0.5 | 0.15 | 0.15 | 0.09 | 0.27 | 0.27 | 0.43 | 0.44 | 0.55 | 0.13 | 0.02 | 0.06 | 0.07 | 0.13 | 0 | 0 | 0.01 | 0 | 0.01 |
| Ser | CGA | 900 | 95 | 145 | 335 | 162 | 111 | | | | | | 0.2 | 0.29 | 0.1 | 0.1 | 0.06 | 0.18 | 0.23 | 0.11 | 0.08 | 0.07 | 0.07 | 0.05 | 0.35 | 0.15 | 0.26 | 0.01 | 0.02 | 0.01 | 0 | 0.07 |
| Ser | TGA | 478 | 52 | 170 | 94 | 59 | 40 | | | | | | 0.49 | 0.37 | 0.14 | 0.23 | 0.29 | 0.14 | 0.35 | 0.62 | 0.45 | 0.49 | 0.03 | 0.01 | 0.07 | 0.01 | 0.04 | 0.02 | 0.01 | 0 | 0.01 | 0 |
| Arg | TCG | 3 892 | 194 | 1 157 | 1 528 | 357 | 613 | | Y | Fe, HL, NL | | | 0 | 0 | 0 | 0.01 | 0.01 | 0.13 | 0.2 | 0.55 | 0.32 | 0.35 | 0.04 | 0.04 | 0.01 | 0.03 | 0.02 | 0.14 | 0.31 | 0.17 | 0.12 | 0.12 |
| Arg | CCT | 462 | 20 | 60 | 249 | 66 | 92 | | | | | | 0.07 | 0.07 | 0.01 | 0.04 | 0.03 | 0.36 | 0.36 | 0.77 | 0.54 | 0.66 | 0.07 | 0.03 | 0.01 | 0.02 | 0.02 | 0 | 0.02 | 0.02 | 0.02 | 0.02 |
| Arg | CCG | 436 | 16 | 114 | 182 | 68 | 49 | | | | | | 0.09 | 0.02 | 0.02 | 0.02 | 0.04 | 0.13 | 0.16 | 0.63 | 0.21 | 0.36 | 0.09 | 0.06 | 0.06 | 0.03 | 0.05 | 0 | 0.02 | 0.04 | 0.02 | 0 |
| Arg | TCT | 256 | 14 | 117 | 41 | 20 | 33 | | | | | | 0 | 0.03 | 0.08 | 0.03 | 0.19 | 0 | 0.01 | 0 | 0.06 | 0 | 0 | 0.03 | 0.04 | 0.03 | 0.05 | 0.05 | 0.1 | 0.12 | 0.09 | 0.14 |
| Thr | TGT | 3 632 | 897 | 596 | 725 | 552 | 265 | | Y | Y | Y | | 0.13 | 0.06 | 0.04 | 0.06 | 0.05 | 0 | 0.02 | 0.02 | 0.02 | 0.04 | 0.62 | 0.19 | 0.35 | 0.4 | 0.48 | 0.11 | 0.54 | 0.35 | 0.25 | 0.1 |
| Thr | AGT | 1 717 | 139 | 366 | 405 | 249 | 380 | | Y | Y | Fe | | 0.12 | 0.07 | 0.06 | 0.06 | 0.04 | 0.38 | 0.32 | 0.6 | 0.66 | 0.61 | 0.03 | 0.05 | 0.06 | 0.04 | 0.06 | 0.05 | 0.14 | 0.05 | 0.04 | 0.02 |
| Thr | CGT | 643 | 57 | 155 | 291 | 59 | 88 | | | HL | Fe, HL | | 0.09 | 0.06 | 0.07 | 0.11 | 0.1 | 0.12 | 0.07 | 0.37 | 0.08 | 0.1 | 0.11 | 0.07 | 0.08 | 0.04 | 0.07 | 0.09 | 0.51 | 0.23 | 0.22 | 0.11 |
| Leu | CAA | 2 359 | 257 | 499 | 788 | 272 | 412 | | Y | Y | | | 0.08 | 0.07 | 0.04 | 0.04 | 0.05 | 0.17 | 0.15 | 0.25 | 0.26 | 0.32 | 0.21 | 0.13 | 0.1 | 0.11 | 0.13 | 0 | 0.01 | 0.01 | 0.02 | 0 |
| Leu | CAG | 1 001 | 61 | 226 | 445 | 147 | 117 | | | | | | 0.18 | 0.08 | 0.07 | 0.07 | 0.05 | 0.05 | 0.08 | 0.19 | 0.17 | 0.14 | 0.03 | 0.1 | 0.06 | 0.12 | 0.09 | 0.06 | 0.11 | 0.1 | 0.11 | 0.12 |
| Leu | AAG | 956 | 60 | 170 | 257 | 115 | 286 | | | Y | | | 0.47 | 0.34 | 0.08 | 0.03 | 0.02 | 0.02 | 0.12 | 0.03 | 0.02 | 0.03 | 0.12 | 0.24 | 0.77 | 0.64 | 0.73 | 0.12 | 0.1 | 0.03 | 0.05 | 0.06 |
| Leu | TAG | 886 | 77 | 127 | 413 | 87 | 203 | | | Y | | | 0.33 | 0.18 | 0.03 | 0.01 | 0.03 | 0.42 | 0.31 | 0.87 | 0.81 | 0.83 | 0.09 | 0.09 | 0.03 | 0.03 | 0.02 | 0.08 | 0.19 | 0.02 | 0.02 | 0.05 |
| Leu | TAA | 731 | 61 | 139 | 263 | 84 | 158 | | | | | | 0.2 | 0.22 | 0.08 | 0.08 | 0.04 | 0.09 | 0.09 | 0.07 | 0.05 | 0.04 | 0.2 | 0.23 | 0.71 | 0.43 | 0.67 | 0.25 | 0.16 | 0.11 | 0.16 | 0.1 |
| Tyr | GTA | 1 435 | 91 | 288 | 413 | 263 | 251 | | Y | Fe | | | 0.15 | 0.15 | 0.11 | 0.13 | 0.07 | 0.18 | 0.17 | 0.09 | 0.1 | 0.1 | 0.15 | 0.28 | 0.19 | 0.12 | 0.11 | 0.04 | 0.01 | 0.06 | 0.02 | 0.1 |
| Met | CAT | 1 368 | 125 | 205 | 533 | 214 | 242 | | | | | | 0.02 | 0.06 | 0.03 | 0.02 | 0.01 | 0.1 | 0.05 | 0.02 | 0.06 | 0.05 | 0.04 | 0.09 | 0.13 | 0.05 | 0.03 | 0.01 | 0.03 | 0.02 | 0.03 | 0.03 |
| Asn | GTT | 1 345 | 96 | 333 | 517 | 157 | 207 | | | | | | 0.14 | 0.18 | 0.06 | 0.06 | 0.05 | 0.27 | 0.27 | 0.64 | 0.49 | 0.58 | 0.2 | 0.23 | 0.06 | 0.09 | 0.09 | 0.05 | 0.02 | 0.01 | 0.04 | 0.02 |
| Trp | CCA | 1 317 | 90 | 155 | 475 | 295 | 216 | | Y | | | | 0.16 | 0.21 | 0.12 | 0.06 | 0.21 | 0.03 | 0.06 | 0.01 | 0.03 | 0.02 | 0.55 | 0.37 | 0.66 | 0.61 | 0.55 | 0.03 | 0.07 | 0.03 | 0.04 | 0.04 |
| SeC | TCA | 1 282 | 93 | 610 | 229 | 90 | 104 | | | | | | 0.01 | 0.03 | 0.02 | 0.03 | 0.03 | 0.04 | 0.02 | 0.03 | 0.01 | 0.04 | 0.06 | 0.03 | 0.14 | 0.12 | 0.06 | 0.16 | 0.17 | 0.28 | 0.23 | 0.14 |
| Lys | CTT | 612 | 31 | 157 | 271 | 87 | 62 | | | | | | 0.09 | 0.15 | 0.07 | 0.08 | 0.17 | 0.04 | 0.05 | 0.06 | 0.07 | | | | | | | | | | | |