Table S4. Frequency of use of *VvSTARD*, *AtSTARD*, and *OsSTARD* gene synonymous codons

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  | | --- | | Amino acid | | | |  | | --- | | Codon | | | Codon Number | | | RSCU | | |
| Rice | Arabidopsis | Grape | Rice | Arabidopsis | Grape |
| Phe | UUU | 450 | 305 | 327 | 1.02 | 0.59 | 1.15 |
|  | UUC | 433 | 661 | 236 | 0.98 | 1.41 | 0.85 |
| Leu | UUA | 290 | 85 | 158 | 0.85 | 0.17 | 0.64 |
|  | UUG | 412 | 391 | 314 | 1.21 | 0.81 | 1.25 |
|  | CUU | 569 | 540 | 408 | 1.54 | 1.09 | 1.61 |
|  | CUC | 395 | 900 | 211 | 1.07 | 1.79 | 0.87 |
|  | CUA | 230 | 207 | 144 | 0.65 | 0.41 | 0.56 |
|  | CUG | 250 | 846 | 254 | 0.69 | 1.73 | 1.06 |
| Ile | AUU | 503 | 413 | 373 | 1.26 | 0.90 | 1.41 |
|  | AUC | 417 | 695 | 232 | 1.03 | 1.68 | 0.90 |
|  | AUA | 284 | 182 | 181 | 0.71 | 0.41 | 0.69 |
| Met | AUG | 734 | 1015 | 495 | 1.00 | 1.00 | 1.00 |
| Val | GUU | 645 | 453 | 417 | 1.55 | 0.79 | 1.46 |
|  | GUC | 344 | 690 | 190 | 0.82 | 1.16 | 0.68 |
|  | GUA | 236 | 193 | 161 | 0.57 | 0.34 | 0.59 |
|  | GUG | 444 | 1023 | 350 | 1.05 | 1.71 | 1.27 |
| Ser | UCU | 631 | 408 | 353 | 1.65 | 0.88 | 1.46 |
|  | UCC | 306 | 573 | 197 | 0.81 | 1.22 | 0.85 |
|  | UCA | 457 | 369 | 340 | 1.18 | 0.80 | 1.43 |
|  | UCG | 223 | 430 | 80 | 0.59 | 0.85 | 0.34 |
| Pro | CCU | 519 | 438 | 296 | 1.71 | 1.08 | 1.49 |
|  | CCC | 137 | 414 | 160 | 0.51 | 0.95 | 0.84 |
|  | CCA | 369 | 381 | 264 | 1.23 | 0.90 | 1.29 |
|  | CCG | 170 | 490 | 73 | 0.56 | 1.07 | 0.37 |
| Thr | ACU | 418 | 289 | 257 | 1.37 | 0.75 | 1.33 |
|  | ACC | 270 | 377 | 166 | 0.87 | 1.07 | 0.93 |
|  | ACA | 370 | 371 | 265 | 1.25 | 0.99 | 1.41 |
|  | ACG | 158 | 406 | 59 | 0.52 | 1.19 | 0.34 |
| Ala | GCU | 685 | 508 | 438 | 1.70 | 0.79 | 1.52 |
|  | GCC | 227 | 880 | 207 | 0.56 | 1.22 | 0.77 |
|  | GCA | 464 | 576 | 377 | 1.19 | 0.89 | 1.37 |
|  | GCG | 204 | 824 | 97 | 0.55 | 1.09 | 0.34 |
| Tyr | UAU | 301 | 227 | 226 | 1.04 | 0.60 | 1.16 |
|  | UAC | 250 | 441 | 146 | 0.96 | 1.40 | 0.84 |
| TER | UAA | 6 | 11 | 1 | 0.50 | 0.73 | 0.13 |
|  | UAG | 9 | 18 | 3 | 0.75 | 1.20 | 0.39 |
| His | CAU | 365 | 322 | 247 | 1.19 | 0.88 | 1.26 |
|  | CAC | 233 | 428 | 128 | 0.81 | 1.12 | 0.74 |
| Gln | CAA | 598 | 345 | 327 | 1.22 | 0.55 | 1.01 |
|  | CAG | 396 | 979 | 351 | 0.78 | 1.45 | 0.99 |
| Asn | AAU | 622 | 461 | 414 | 1.03 | 0.75 | 1.23 |
|  | AAC | 618 | 799 | 275 | 0.97 | 1.25 | 0.77 |
| Lys | AAA | 531 | 323 | 309 | 0.95 | 0.45 | 0.82 |
|  | AAG | 595 | 943 | 417 | 1.05 | 1.55 | 1.18 |
| Asp | GAU | 791 | 784 | 620 | 1.28 | 0.95 | 1.43 |
|  | GAC | 438 | 918 | 240 | 0.72 | 1.05 | 0.57 |
| Glu | GAA | 764 | 525 | 475 | 0.96 | 0.57 | 0.93 |
|  | GAG | 783 | 1318 | 538 | 1.04 | 1.43 | 1.07 |
| Cys | UGU | 293 | 193 | 180 | 1.22 | 0.65 | 0.99 |
|  | UGC | 199 | 430 | 177 | 0.78 | 1.35 | 1.01 |
| TER | UGA | 20 | 16 | 19 | 1.67 | 1.07 | 2.48 |
| Trp | UGG | 374 | 425 | 256 | 1.00 | 1.00 | 1.00 |
| Arg | CGU | 274 | 195 | 126 | 1.10 | 0.63 | 0.75 |
|  | CGC | 135 | 535 | 104 | 0.57 | 1.59 | 0.64 |
|  | CGA | 159 | 164 | 124 | 0.66 | 0.50 | 0.73 |
|  | CGG | 133 | 368 | 140 | 0.53 | 1.14 | 0.83 |
| Ser | AGU | 369 | 304 | 235 | 0.94 | 0.70 | 0.98 |
|  | AGC | 335 | 759 | 223 | 0.84 | 1.55 | 0.94 |
| Arg | AGA | 480 | 296 | 258 | 2.00 | 0.95 | 1.56 |
|  | AGG | 272 | 399 | 248 | 1.15 | 1.20 | 1.48 |
| Gly | GGU | 556 | 469 | 298 | 1.36 | 0.76 | 1.07 |
|  | GGC | 229 | 1159 | 213 | 0.57 | 1.70 | 0.74 |
|  | GGA | 607 | 421 | 343 | 1.49 | 0.74 | 1.29 |
|  | GGG | 230 | 507 | 248 | 0.58 | 0.79 | 0.89 |