**Table S12 The *P* values between TNP and other five expression profile-based methods for Fmax and AUPRon CAFA3 test dataset for each of 7 species**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Species** | **Measure** | **GO aspect** | **(TNP, MR)** | **(TNP, PCC)** | **(TNP, MLC)** | **(TNP, SRC)** | **(TNP, ED)** |
| Human | Fmax | MF | 1.69×10-02 | 4.86×10-05 | 2.09×10-04 | 4.09×10-03 | 9.32×10-06 |
| BP | 1.48×10-02 | 4.96×10-06 | 2.54×10-09 | 1.57×10-03 | 2.15×10-05 |
| CC | 3.58×10-04 | 6.87×10-07 | 5.46×10-09 | 1.09×10-05 | 2.79×10-07 |
| AUPR | MF | 4.64×10-04 | 2.80×10-04 | 9.63×10-01 | 4.54×10-05 | 3.01×10-05 |
| BP | 7.63×10-02 | 3.40×10-04 | 3.79×10-08 | 1.37×10-01 | 3.87×10-03 |
| CC | 9.28×10-02 | 4.54×10-08 | 4.59×10-03 | 9.28×10-04 | 4.54×10-08 |
| Mouse | Fmax | MF | 6.45×10-06 | 3.51×10-08 | 8.42×10-09 | 3.32×10-07 | 1.70×10-07 |
| BP | 8.47×10-08 | 3.37×10-08 | 1.05×10-11 | 2.31×10-07 | 1.39×10-07 |
| CC | 1.98×10-04 | 3.74×10-03 | 2.39×10-04 | 5.25×10-03 | 1.23×10-04 |
| AUPR | MF | 7.05×10-01 | 9.43×10-07 | 3.90×10-06 | 8.26×10-02 | 2.30×10-06 |
| BP | 3.54×10-02 | 1.55×10-05 | 8.05×10-08 | 2.27×10-01 | 2.01×10-06 |
| CC | 8.23×10-09 | 4.69×10-07 | 2.96×10-10 | 2.28×10-08 | 8.67×10-07 |
| Arabidopsis | Fmax | MF | 6.05×10-06 | 2.64×10-06 | 6.28×10-08 | 1.56×10-04 | 7.72×10-07 |
| BP | 1.87×10-02 | 6.95×10-05 | 6.53×10-12 | 1.41×10-05 | 1.10×10-04 |
| CC | 7.25×10-05 | 6.74×10-07 | 2.14×10-05 | 6.90×10-06 | 1.53×10-07 |
| AUPR | MF | 2.48×10-03 | 2.48×10-03 | 3.16×10-06 | 5.81×10-01 | 3.41×10-04 |
| BP | 3.06×10-03 | 1.24×10-05 | 1.32×10-13 | 4.61×10-08 | 3.89×10-05 |
| CC | 6.33×10-03 | 1.60×10-04 | 4.47×10-06 | 3.20×10-03 | 2.76×10-04 |
| Rat | Fmax | MF | 5.23×10-01 | 3.58×10-01 | 5.07×10-04 | 9.21×10-03 | 2.41×10-01 |
| BP | 3.08×10-01 | 8.43×10-06 | 1.94×10-02 | 1.56×10-01 | 4.71×10-06 |
| CC | 2.76×10-02 | 4.50×10-02 | 3.07×10-04 | 6.25×10-01 | 1.93×10-02 |
| AUPR | MF | 4.14×10-01 | 4.14×10-01 | 3.48×10-03 | 9.47×10-02 | 1.37×10-01 |
| BP | 1.12×10-04 | 2.88×10-02 | 5.56×10-04 | 1.32×10-06 | 1.90×10-03 |
| CC | 6.57×10-03 | 1.87×10-02 | 2.39×10-03 | 9.17×10-02 | 6.57×10-03 |
| Fly | Fmax | MF | 6.79×10-03 | 1.08×10-01 | 5.13×10-05 | 8.70×10-04 | 1.23×10-02 |
| BP | 3.62×10-03 | 5.03×10-02 | 3.94×10-07 | 8.67×10-04 | 2.66×10-03 |
| CC | 2.40×10-04 | 1.48×10-04 | 1.36×10-06 | 2.42×10-05 | 4.67×10-06 |
| AUPR | MF | 5.84×10-06 | 1.03×10-05 | 8.06×10-11 | 1.48×10-08 | 2.05×10-06 |
| BP | 1.16×10-03 | 2.01×10-04 | 5.38×10-10 | 1.21×10-08 | 8.70×10-03 |
| CC | 3.51×10-04 | 6.82×10-06 | 1.02×10-06 | 1.20×10-05 | 6.14×10-07 |
| Budding  Yeast | Fmax | MF | 2.63×10-04 | 8.95×10-02 | 5.03×10-04 | 3.36×10-06 | 1.90×10-03 |
| BP | 1.02×10-01 | 1.28×10-06 | 1.28×10-02 | 2.08×10-05 | 2.99×10-06 |
| CC | 2.39×10-03 | 1.17×10-02 | 2.89×10-04 | 1.67×10-03 | 1.17×10-02 |
| AUPR | MF | 8.79×10-01 | 4.29×10-02 | 9.93×10-06 | 4.20×10-08 | 4.29×10-02 |
| BP | 6.74×10-01 | 6.74×10-01 | 6.41×10-01 | 4.03×10-04 | 7.47×10-01 |
| CC | 2.55×10-05 | 9.48×10-03 | 6.52×10-01 | 1.17×10-05 | 2.74×10-03 |
| Fission Yeast | Fmax | MF | 7.90×10-01 | 5.46×10-01 | 6.95×10-03 | 3.88×10-01 | 7.58×10-01 |
| BP | 2.72×10-10 | 7.08×10-11 | 2.30×10-16 | 3.86×10-11 | 7.08×10-11 |
| CC | 3.42×10-02 | 4.53×10-05 | 4.31×10-05 | 1.38×10-04 | 4.53×10-05 |
| AUPR | MF | 9.89×10-06 | 3.37×10-06 | 7.07×10-09 | 3.31×10-05 | 3.37×10-06 |
| BP | 7.06×10-13 | 3.08×10-13 | 1.59×10-19 | 2.49×10-13 | 3.08×10-13 |
| CC | 3.37×10-04 | 9.72×10-03 | 6.07×10-03 | 4.84×10-03 | 8.15×10-03 |