**Table S1.** Randomizations of biological activity for Y-randomizarion test.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Random 1** | **Random 2** | **Random 3** | **Random 4** | **Random 5** | **Random 6** | **Random 7** | **Random 8** | **Random 9** | **Random 10** |
| 9.036 | 7.886 | 7.000 | 6.590 | 5.886 | 7.921 | 6.310 | 7.301 | 7.824 | 5.984 |
| 8.174 | 7.553 | 5.984 | 8.114 | 7.444 | 9.301 | 8.000 | 7.553 | 7.301 | 6.854 |
| 7.208 | 6.854 | 7.208 | 5.972 | 6.893 | 8.061 | 6.456 | 8.658 | 8.114 | 7.018 |
| 5.558 | 5.731 | 6.762 | 7.444 | 6.854 | 7.161 | 8.061 | 10.097 | 5.574 | 5.731 |
| 7.921 | 7.301 | 5.886 | 7.824 | 7.161 | 8.886 | 9.000 | 5.984 | 5.886 | 7.495 |
| 7.553 | 8.114 | 5.731 | 7.921 | 5.933 | 7.301 | 7.638 | 8.495 | 7.161 | 6.310 |
| 6.818 | 5.933 | 6.987 | 8.620 | 6.987 | 8.824 | 7.301 | 9.174 | 5.176 | 6.575 |
| 9.000 | 7.495 | 6.854 | 6.854 | 6.310 | 7.018 | 8.174 | 9.000 | 6.854 | 9.000 |
| 8.061 | 7.000 | 7.886 | 10.097 | 7.921 | 7.131 | 8.678 | 9.000 | 8.000 | 8.319 |
| 7.155 | 5.972 | 7.018 | 6.714 | 7.161 | 7.987 | 8.538 | 6.762 | 8.620 | 8.495 |
| 6.987 | 9.000 | 5.331 | 8.824 | 7.638 | 7.921 | 5.886 | 6.079 | 9.301 | 8.921 |
| 6.079 | 7.921 | 5.574 | 6.762 | 10.143 | 8.770 | 7.553 | 7.886 | 8.061 | 10.097 |
| 5.984 | 6.495 | 10.602 | 8.495 | 8.854 | 6.495 | 9.000 | 8.174 | 9.174 | 9.036 |
| 7.553 | 7.638 | 8.319 | 10.143 | 10.602 | 8.678 | 10.143 | 8.678 | 8.658 | 5.176 |
| 8.658 | 6.987 | 9.000 | 9.301 | 10.097 | 6.818 | 8.658 | 7.658 | 7.553 | 7.301 |
| 7.301 | 6.893 | 8.678 | 7.770 | 8.921 | 9.000 | 10.097 | 7.131 | 6.310 | 5.886 |
| 5.731 | 6.762 | 9.036 | 7.638 | 8.620 | 7.495 | 6.575 | 5.886 | 7.638 | 7.000 |
| 5.886 | 9.301 | 9.301 | 7.495 | 7.301 | 6.762 | 8.854 | 7.499 | 6.714 | 8.538 |
| 5.972 | 5.331 | 7.824 | 7.301 | 8.538 | 8.114 | 7.553 | 5.176 | 5.331 | 5.558 |
| 7.161 | 9.174 | 5.933 | 5.176 | 5.886 | 5.331 | 8.319 | 7.553 | 8.921 | 6.987 |
| 6.310 | 8.538 | 8.770 | 5.574 | 8.114 | 8.319 | 5.731 | 6.456 | 6.590 | 10.602 |
| 6.893 | 7.208 | 7.155 | 9.000 | 8.174 | 8.237 | 7.824 | 5.972 | 7.444 | 7.824 |
| 8.678 | 7.987 | 8.061 | 7.987 | 6.818 | 6.495 | 8.824 | 5.886 | 7.155 | 8.886 |
| 5.574 | 7.824 | 7.131 | 7.337 | 6.079 | 10.602 | 5.331 | 8.237 | 7.658 | 6.495 |
| 8.620 | 8.921 | 8.886 | 7.553 | 7.000 | 10.097 | 6.495 | 7.921 | 6.893 | 6.079 |
| 6.854 | 7.337 | 7.987 | 7.553 | 7.824 | 7.337 | 5.972 | 5.574 | 8.678 | 7.658 |
| 6.575 | 9.000 | 7.770 | 10.602 | 5.984 | 7.658 | 8.495 | 8.854 | 7.553 | 5.331 |
| 8.538 | 10.097 | 6.575 | 5.331 | 7.987 | 7.553 | 6.818 | 6.987 | 6.854 | 8.678 |
| 7.000 | 10.602 | 7.658 | 9.036 | 8.495 | 6.590 | 7.000 | 7.208 | 6.456 | 6.893 |
| 7.499 | 6.590 | 6.456 | 6.079 | 7.553 | 6.714 | 6.762 | 7.921 | 6.762 | 8.620 |
| 10.097 | 8.319 | 9.174 | 7.208 | 9.036 | 10.143 | 7.482 | 7.444 | 7.482 | 8.658 |
| 7.161 | 10.143 | 7.638 | 7.131 | 7.018 | 9.174 | 8.620 | 7.482 | 5.558 | 5.933 |
| 8.921 | 8.886 | 10.143 | 5.886 | 7.921 | 9.000 | 5.984 | 7.161 | 7.131 | 6.714 |
| 5.331 | 8.061 | 7.499 | 6.495 | 7.770 | 6.079 | 8.237 | 7.638 | 10.602 | 6.818 |
| 5.886 | 7.161 | 6.590 | 7.161 | 6.854 | 6.987 | 5.886 | 7.987 | 6.079 | 7.921 |
| 5.331 | 9.036 | 6.495 | 7.000 | 9.174 | 7.000 | 7.987 | 5.731 | 9.000 | 9.000 |
| 6.762 | 7.444 | 8.495 | 8.000 | 9.000 | 8.000 | 5.176 | 6.575 | 8.854 | 9.301 |
| 8.237 | 6.495 | 8.174 | 8.921 | 6.590 | 6.854 | 6.854 | 8.114 | 7.921 | 8.061 |
| 7.444 | 8.824 | 8.432 | 8.658 | 5.972 | 7.886 | 7.499 | 6.310 | 6.495 | 8.114 |
| 8.770 | 5.558 | 6.310 | 8.886 | 6.495 | 6.310 | 5.933 | 7.770 | 6.495 | 6.456 |
| 8.114 | 8.770 | 8.114 | 9.174 | 6.456 | 8.854 | 7.131 | 5.331 | 7.000 | 7.131 |
| 7.131 | 5.331 | 6.079 | 6.987 | 7.155 | 5.933 | 8.432 | 6.495 | 8.824 | 8.237 |
| 7.337 | 6.310 | 7.921 | 5.984 | 5.558 | 8.658 | 7.886 | 7.000 | 5.331 | 8.000 |
| 7.018 | 5.176 | 8.620 | 7.658 | 5.331 | 6.893 | 7.161 | 8.824 | 7.987 | 8.174 |
| 6.495 | 6.575 | 5.176 | 6.575 | 9.000 | 8.620 | 6.854 | 8.432 | 5.972 | 5.972 |
| 6.854 | 7.155 | 5.886 | 7.886 | 6.575 | 6.456 | 6.495 | 7.155 | 10.097 | 6.495 |
| 10.143 | 6.079 | 6.893 | 8.770 | 7.337 | 7.824 | 7.155 | 7.337 | 5.984 | 6.854 |
| 8.000 | 8.432 | 9.000 | 7.018 | 5.176 | 5.984 | 7.018 | 6.495 | 7.495 | 7.208 |
| 8.319 | 7.921 | 7.553 | 7.482 | 6.495 | 8.495 | 5.574 | 5.331 | 8.237 | 7.553 |
| 7.658 | 5.886 | 8.854 | 5.331 | 8.432 | 7.444 | 9.174 | 6.893 | 8.319 | 5.574 |
| 5.933 | 6.714 | 7.444 | 6.854 | 7.553 | 9.036 | 6.987 | 6.714 | 9.000 | 7.499 |
| 7.495 | 7.658 | 10.097 | 6.456 | 7.499 | 7.499 | 8.921 | 8.620 | 5.731 | 8.854 |
| 7.886 | 8.000 | 6.854 | 7.161 | 7.208 | 8.538 | 8.770 | 6.854 | 6.575 | 7.987 |
| 8.495 | 8.678 | 6.495 | 5.933 | 5.731 | 5.731 | 9.036 | 6.590 | 7.886 | 8.824 |
| 6.714 | 7.482 | 8.000 | 8.854 | 7.482 | 8.432 | 7.208 | 8.319 | 10.143 | 9.174 |
| 8.824 | 7.499 | 7.161 | 7.155 | 8.678 | 7.770 | 6.079 | 8.000 | 9.036 | 8.432 |
| 10.602 | 6.456 | 6.714 | 6.893 | 8.658 | 5.574 | 7.921 | 5.558 | 7.161 | 6.762 |
| 6.456 | 8.495 | 7.553 | 6.310 | 7.495 | 7.482 | 6.714 | 7.018 | 7.499 | 7.553 |
| 6.495 | 6.818 | 5.331 | 9.000 | 5.574 | 8.921 | 7.161 | 10.143 | 8.174 | 7.921 |
| 9.000 | 7.018 | 8.921 | 8.319 | 8.061 | 7.638 | 5.331 | 7.824 | 8.495 | 7.161 |
| 8.886 | 7.553 | 8.237 | 8.678 | 8.886 | 7.155 | 6.893 | 6.818 | 8.886 | 7.155 |
| 9.301 | 8.174 | 6.818 | 6.818 | 7.131 | 7.208 | 8.114 | 10.602 | 8.538 | 7.638 |
| 5.176 | 7.131 | 8.538 | 7.921 | 8.319 | 5.331 | 7.495 | 8.538 | 7.921 | 5.886 |
| 7.921 | 5.984 | 7.161 | 8.432 | 6.714 | 6.575 | 6.590 | 8.061 | 8.432 | 7.482 |
| 9.174 | 8.237 | 7.482 | 5.731 | 7.658 | 5.176 | 8.886 | 7.161 | 7.018 | 5.331 |
| 8.854 | 5.886 | 7.495 | 7.499 | 6.762 | 5.886 | 5.558 | 7.495 | 6.818 | 10.143 |
| 7.638 | 5.574 | 5.558 | 8.061 | 8.237 | 6.854 | 10.602 | 8.770 | 7.208 | 7.337 |
| 8.432 | 7.770 | 7.301 | 8.174 | 7.886 | 5.558 | 7.337 | 9.301 | 8.770 | 7.886 |
| 7.987 | 7.161 | 7.921 | 5.886 | 9.301 | 5.972 | 7.770 | 5.933 | 5.886 | 8.770 |
| 7.824 | 6.854 | 8.658 | 8.237 | 8.770 | 7.553 | 7.444 | 9.036 | 6.987 | 7.161 |
| 6.590 | 8.854 | 5.972 | 5.558 | 8.824 | 7.161 | 7.658 | 6.854 | 5.933 | 7.444 |
| 7.770 | 8.620 | 8.824 | 8.538 | 8.000 | 5.886 | 9.301 | 8.921 | 7.337 | 6.590 |
| 7.482 | 8.658 | 7.337 | 6.495 | 5.331 | 8.174 | 7.921 | 8.886 | 7.770 | 7.770 |