### S1 Table – Hypergraph-based Connectivity Measures for Signaling Pathway Topologies

| Signaling Pathway | Reactome ID     | # in Pathway | # in Hypergraph | # in Filtered Hypergraph |
|-------------------|----------------|--------------|-----------------|--------------------------|
| EGFR              | R-HSA-177929   | 164          | 110             | 101                      |
| ERBB2             | R-HSA-1227986  | 220          | 118             | 105                      |
| ERBB4             | R-HSA-1236394  | 181          | 101             | 92                       |
| PI3K/AKT          | R-HSA-1257604  | 753          | 357             | 333                      |
| MET               | R-HSA-6806834  | 240          | 130             | 121                      |
| FGFR              | R-HSA-190236   | 373          | 232             | 221                      |
| ERK1/ERK2         | R-HSA-5684996  | 656          | 310             | 291                      |
| IGF1R             | R-HSA-2404192  | 160          | 75              | 64                       |
| Insulin           | R-HSA-74752    | 207          | 90              | 76                       |
| Integrin          | R-HSA-9006921  | 88           | 66              | 53                       |
| GPCR              | R-HSA-372790   | 2456         | 1006            | 796                      |
| DAG/IP3           | R-HSA-1489509  | 107          | 50              | 32                       |
| PDGF              | R-HSA-186797   | 244          | 88              | 80                       |
| VEGF              | R-HSA-194138   | 351          | 215             | 183                      |
| NTRKs             | R-HSA-166520   | 362          | 205             | 184                      |
| Wnt               | R-HSA-195721   | 921          | 358             | 326                      |
| TNF               | R-HSA-75893    | 127          | 97              | 93                       |
| PTK6              | R-HSA-8848021  | 187          | 122             | 114                      |
| TGFβ              | R-HSA-170834   | 247          | 179             | 166                      |
| TRAIL             | R-HSA-75158    | 17           | 13              | 13                       |
| FasL/CD95L        | R-HSA-75157    | 10           | 10              | 10                       |
| Notch             | R-HSA-157118   | 505          | 286             | 271                      |
| BMP               | R-HSA-201451   | 74           | 38              | 36                       |
| Activin           | R-HSA-1502540  | 44           | 30              | 28                       |
| MAPK4/MAPK6       | R-HSA-5687128  | 200          | 113             | 105                      |
| NTR               | R-HSA-193704   | 245          | 141             | 129                      |
| SCF-KIT           | R-HSA-1433557  | 122          | 86              | 79                       |
| Hedgehog          | R-HSA-5358351  | 417          | 190             | 172                      |
| Nuclear           | R-HSA-9006931  | 431          | 261             | 208                      |
| Leptin            | R-HSA-2586552  | 54           | 33              | 31                       |
| Hippo             | R-HSA-2028269  | 79           | 47              | 45                       |
| Rho GTPases       | R-HSA-194315   | 808          | 330             | 291                      |
| MST1              | R-HSA-8852405  | 21           | 12              | 9                        |
| mTOR              | R-HSA-165159   | 111          | 67              | 57                       |

**Reactome signaling pathways considered for pathway influence analysis.** Members that are not part of any hyperedge are ignored from the hypergraph. The filtered hypergraph has removed all small molecules, two forms of Ubiquitinase, and the Nuclear Pore Complex from the hyperedges.