

Table S3. Average shortest path values of KEGG pathway sets in the HPRD-based interactome network

Pathway	Average shortest path
Non-topologically robust	
KEGG_CIRCADIAN_RHYTHM_MAMMAL	2.22
KEGG_NON_HOMOLOGOUS_END_JOINING	2.28
KEGG_MISMATCH_REPAIR	2.60
KEGG_SNARE_INTERACTIONS_IN_VESICULAR_TRANSPORT	2.69
KEGG_FC_GAMMA_R_MEDIATED_PHAGOCYTOSIS	2.85
KEGG_ALDOSTERONE_REGULATED_SODIUM_REABSORPTION	2.88
KEGG_LONG_TERM_POTENTIATION	2.91
KEGG_PATHOGENIC_ESCHERICHIA_COLI_INFECTION	2.93
KEGG_TOLL_LIKE_RECEPTOR_SIGNALING_PATHWAY	3.01
KEGG_GNRH_SIGNALING_PATHWAY	3.01
KEGG_LONG_TERM_DEPRESSION	3.03
KEGG_NOD_LIKE_RECEPTOR_SIGNALING_PATHWAY	3.04
KEGG_ADIPOCYTOKINE_SIGNALING_PATHWAY	3.06
KEGG_ECM_RECEPTOR_INTERACTION	3.08
KEGG_TYPE_II_DIABETES_MELLITUS	3.08
KEGG_LEUKOCYTE_TRANSENDOTHELIAL_MIGRATION	3.08
KEGG_COMPLEMENT_AND_COAGULATION_CASCADES	3.11
KEGG_AMYOTROPHIC_LATERAL_SCLEROSIS_ALS	3.13
KEGG_EPITHELIAL_CELL_SIGNALING_IN_HELICOBACTER_PYLORI_INFECTION	3.23
KEGG_TIGHT_JUNCTION	3.27
KEGG_MATURITY_ONSET_DIABETES_OF_THE_YOUNG	3.28
KEGG_ARRHYTHMOGENIC_RIGHT_VENTRICULAR_CARDIOMYOPATHY_ARVC	3.29
KEGG_HOMOLOGOUS_RECOMBINATION	3.30
KEGG_ENDOCYTOSIS	3.34
KEGG_PRIMARY_IMMUNODEFICIENCY	3.36
KEGG_CHEMOKINE_SIGNALING_PATHWAY	3.36
KEGG_NATURAL_KILLER_CELL_MEDIATED_CYTOTOXICITY	3.37
KEGG_PRION_DISEASES	3.39
KEGG_TASTE_TRANSDUCTION	3.41
KEGG_LEISHMANIA_INFECTION	3.42
KEGG_VASCULAR_SMOOTH_MUSCLE_CONTRACTION	3.43
KEGG_DILATED_CARDIOMYOPATHY	3.47
KEGG_DORSO_VENTRAL_AXIS_FORMATION	3.47
KEGG_MELANOGENESIS	3.49
KEGG_HEMATOPOIETIC_CELL_LINEAGE	3.55
KEGG_RNA_POLYMERASE	3.55
KEGG_RENIN_ANGIOTENSIN_SYSTEM	3.57
KEGG_HYPERTROPHIC_CARDIOMYOPATHY_HCM	3.59
KEGG_CALCIIUM_SIGNALING_PATHWAY	3.60
KEGG_OLFACTORY_TRANSDUCTION	3.60
KEGG_ALZHEIMERS_DISEASE	3.60
KEGG_CELL_ADHESION_MOLECULES_CAMS	3.65
KEGG_VASOPRESSIN_REGULATED_WATER_REABSORPTION	3.70
KEGG_REGULATION_OF_AUTOPHAGY	3.76
KEGG_HUNTINGTONS_DISEASE	3.76
KEGG_CYTOSOLIC_DNA_SENSING_PATHWAY	3.80
KEGG_ANTIGEN_PROCESSING_AND_PRESENTATION	3.83
KEGG_VIRAL_MYOCARDITIS	3.86
KEGG_GRAFT_VERSUS_HOST_DISEASE	3.86
KEGG_ALLOGRAFT_REJECTION	3.92
KEGG_ETHER_LIPID_METABOLISM	3.92
KEGG_TYPE_I_DIABETES_MELLITUS	3.93
KEGG_AUTOIMMUNE_THYROID_DISEASE	3.98
KEGG_CYTOKINE_CYTOKINE_RECEPTOR_INTERACTION	4.00
KEGG_VIBRIO_CHOLERAЕ_INFECTION	4.02
KEGG_AMINOACYL_TRNA_BIOSYNTHESIS	4.04
KEGG_GLYCOSYLPHOSPHATIDYLINOSITOL_GPI_ANCHOR_BIOSYNTHESIS	4.05
KEGG_PPAR_SIGNALING_PATHWAY	4.06
KEGG_GLYCOLYSIS_GLUconeogenesis	4.08
KEGG_FRUCTOSE_AND_MANNose_METABOLISM	4.08
KEGG_ASTHMA	4.10
KEGG_PARKINSONS_DISEASE	4.12
KEGG_CYSTEINE_AND_METHIONINE_METABOLISM	4.16
KEGG_PENTOSE_PHOSPHATE_PATHWAY	4.17
KEGG_ALANINE ASPARTATE AND GLUTAMATE METABOLISM	4.20
KEGG_INTESTINAL_IMMUNE_NETWORK_FOR_IGA_PRODUCTION	4.21
KEGG_GALACTOSE_METABOLISM	4.23
KEGG_NEUROACTIVE_LIGAND_RECEPTOR_INTERACTION	4.24
KEGG_HEDGEHOG_SIGNALING_PATHWAY	4.25
KEGG_PORPHYRIN_AND_CHLOROPHYLL_METABOLISM	4.26

KEGG_PROXIMAL_TUBULE_BICARBONATE_RECLAMATION	4.28
KEGG_GLYCEROLIPID_METABOLISM	4.29
KEGG_LYSOSOME	4.30
KEGG_PURINE_METABOLISM	4.31
KEGG_CARDIAC_MUSCLE_CONTRACTION	4.32
KEGG_GLYCEROPHOSPHOLIPID_METABOLISM	4.33
KEGG_ARGININE_AND_PROLINE_METABOLISM	4.36
KEGG_LYSINE_DEGRADATION	4.36
KEGG_SYSTEMIC_LUPUS_ERYTHEMATOSUS	4.37
KEGG_NITROGEN_METABOLISM	4.40
KEGG_RIBOSOME	4.40
KEGG_DRUG_METABOLISM_OTHER_ENZYMES	4.42
KEGG_ABC_TRANSPORTERS	4.51
KEGG_FATTY_ACID_METABOLISM	4.53
KEGG_SPHINGOLIPID_METABOLISM	4.55
KEGG_PEROXISOME	4.57
KEGG_TYROSINE_METABOLISM	4.58
KEGG_PYRUVATE_METABOLISM	4.64
KEGG_VALINE_LEUCINE_AND_ISOLEUCINE_DEGRADATION	4.64
KEGG_STARCH_AND_SUCROSE_METABOLISM	4.66
KEGG_TRYPTOPHAN_METABOLISM	4.67
KEGG_N_GLYCAN_BIOSYNTHESIS	4.68
KEGG_OXIDATIVE_PHOSPHORYLATION	4.71
KEGG_GLYCINE_SERINE_AND_THREONINE_METABOLISM	4.75
KEGG_ARACHIDONIC_ACID_METABOLISM	4.76
KEGG_O_GLYCAN_BIOSYNTHESIS	4.77
KEGG_BUTANOATE_METABOLISM	4.79
KEGG_RIBOFLAVIN_METABOLISM	4.79
KEGG_DRUG_METABOLISM_CYTOCHROME_P450	4.79
KEGG_GLUTATHIONE_METABOLISM	4.80
KEGG_CITRATE_CYCLE_TCA_CYCLE	4.81
KEGG_METABOLISM_OF_XENOBIOTICS_BY_CYTOCHROME_P450	4.83
KEGG_AMINO_SUGAR_AND_NUCLEOTIDE_SUGAR_METABOLISM	4.85
KEGG_PROPANOATE_METABOLISM	4.92
KEGG_PROTEIN_EXPORT	5.10
KEGG_OTHER_GLYCAN_DEGRADATION	5.11

Topologically robust

KEGG_BASAL_TRANSCRIPTION_FACTORS	2.40
KEGG_NOTCH_SIGNALING_PATHWAY	2.45
KEGG_ERBB_SIGNALING_PATHWAY	2.46
KEGG_ADHERENS_JUNCTION	2.51
KEGG_NEUROTROPHIN_SIGNALING_PATHWAY	2.58
KEGG_CELL_CYCLE	2.67
KEGG_B_CELL_RECEPTOR_SIGNALING_PATHWAY	2.70
KEGG_DNA_REPLICATION	2.72
KEGG_FC_EPSILON_R1_SIGNALING_PATHWAY	2.74
KEGG_T_CELL_RECEPTOR_SIGNALING_PATHWAY	2.80
KEGG_APOPTOSIS	2.83
KEGG_P53_SIGNALING_PATHWAY	2.86
KEGG_BASE_EXCISION_REPAIR	2.91
KEGG_NUCLEOTIDE_EXCISION_REPAIR	2.92
KEGG_VEGF_SIGNALING_PATHWAY	2.93
KEGG_PROGESTERONE_MEDIATED_OOCYTE_MATURATION	3.00
KEGG_FOCAL_ADHESION	3.01
KEGG_TGF_BETA_SIGNALING_PATHWAY	3.03
KEGG_GAP_JUNCTION	3.04
KEGG_INSULIN_SIGNALING_PATHWAY	3.09
KEGG_MTOR_SIGNALING_PATHWAY	3.09
KEGG_MAPK_SIGNALING_PATHWAY	3.11
KEGG_OOCYTE_MEIOSIS	3.19
KEGG_REGULATION_OF_ACTIN_CYTOSKELETON	3.23
KEGG_JAK_STAT_SIGNALING_PATHWAY	3.24
KEGG_RIG_I_LIKE_RECEPTOR_SIGNALING_PATHWAY	3.26
KEGG_WNT_SIGNALING_PATHWAY	3.34
KEGG_UBIQUITIN_MEDIATED_PROTEOLYSIS	3.40
KEGG_PROTEASOME	3.42
KEGG_RNA_DEGRADATION	3.42
KEGG_PHOSPHATIDYLINOSITOL_SIGNALING_SYSTEM	3.50
KEGG_SPLICEOSOME	3.52
KEGG_AXON_GUIDANCE	3.57
KEGG_INOSITOL_PHOSPHATE_METABOLISM	3.79
KEGG_PYRIMIDINE_METABOLISM	4.03
