PROTEIN-PROTEIN INTERACTION S GENES TO FUNCTION TO THERAPEUTICS

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Protein-Protein Interactions

Central to all biological processes and structural scaffolds The network is a medium for systems biology research But 90% of protein-protein interactions are <u>unknown</u> today



~22,500 proteincoding genes





Human Interactome ~1 Million PPIs Estimated

Theme of Research in Madhavi's Lab

Discovery of protein-protein interactions using Machine Learning methods over from large data sources

Results: 1000's of Novel PPIs discovered Accurately <u>Every predicted PPI validated by experiment found to be true PPI!</u>

PROTEIN-PROTEIN INTERACTIONS





Computationally Predicted PPIs are making Translational Impact

ONGOING WORK

COVID19 MOLECULAR PATHWAYS

INTERACTOME OF SPECIFIC TARGETS OF SARS-COV-2

> Host Protein Known Interactor Novel Interactor Viral Protein





Human proteins targeted by virus identified by Gordon et al 2020 Interactome of those human proteins assembled and analyzed by us (Karunarakarn, Balakrishnan and Ganapathiraju, 2020, preprints) https://www.researchsquare.com/article/rs-28592/v1

SEEKING COLLABORATORS TO VALIDATE OUR PREDICTED INTERACTIONS





AND TO STUDY BIOLOGY OF POST-COVID19 NEUROLOGICAL AND CARDIOVASCULAR COMPLICATIONS