

1106-VC-1095 **G Peng***, gpeng@mdanderson.org. *Network flow as a systems biology approach to understand the DNA repair network in cancer.* Preliminary report.

The DNA repair process plays a fundamental role in maintaining genomic integrity and preventing the development of cancer. Hundreds molecules have been identified in the DNA repair pathways. However it remains to be a key question: how can we understand the DNA repair process as a functional network instead of studying each individual component? We present a model where the concept of flow network is modified and used to model the impact between genes involved in the DNA repair network. As a result, key target genes can be predicted that have significant influence on DNA repair capacity of cancer cell. This study provides proof-of-principal that advanced mathematical concepts and theories can be used to guide the target selection for understanding cancer etiology and designing therapeutic strategies. (Received September 10, 2014)