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**Yoo-Ah Kim, Jozef H Przytycka, Stefan Wuchty and Teresa M Przytycka\***,  
przytyck@ncbi.nlm.nih.gov. *From Genotype to Phenotype - network biology approach.*

New experimental techniques facilitating genome-wide measurements of various molecular quantities provide us with an unprecedented opportunity to gain new insights into functioning of cellular systems and help explaining the relation between genotype and phenotype. In particular, we would like to understand how the genotypic changes are propagated along molecular pathways. On one hand, in complex diseases, different genotypic perturbations often lead to the same disease phenotype presumably dys-regulating the same pathways of the cellular system. On the other hand, there are numerous examples where the impact of a large genotypic change such as gene copy number variations appears to be “buffered” and has no apparent phenotypic effect. I will discuss systems level approaches, combining various types of experimental data, statistical data analysis, and new graph theoretical and algorithmic techniques developed by our group in the quest to address these questions. (Received January 29, 2012)