

## **Bio-Circuit Reverse Engineering**

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Reverse engineering can be defined as a process with which an internal structure and dynamics of a given system is inferred and analyzed from external observations and relevant knowledge. This talk introduces existing techniques for bio-circuit reverse engineering such as Correlation Matrix Construction (CMC), Boolean network-based and Bayesian network-based methods. It also explains our system entitled MONET (modularized network learning), which alleviates the dimensionality problem, i.e. too few data for too many variables, by utilizing a divide-and-conquer approach based on priori biological annotations and mRNA expression data. We have achieved two-fold improved accuracy on genetic association prediction. Finally, our pipeline process of bio-circuit reverse engineering is briefly introduced along with an illustrative example.