

(a)

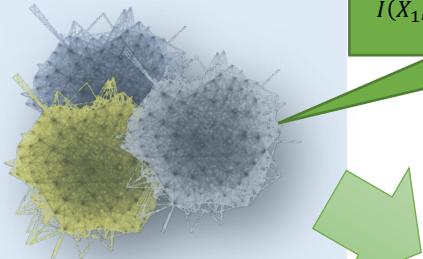
population



Multi-omics data
with outcome



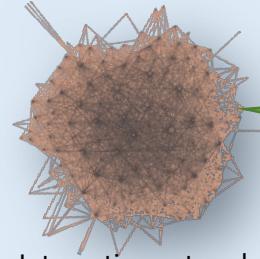
Single profile networks



$$\text{The weight of edge between gene } X_1 \text{ and } X_2: \\ I(X_1, X_2; Y) = H(X_1, X_2) + H(Y) - H(X_1, X_2, Y)$$

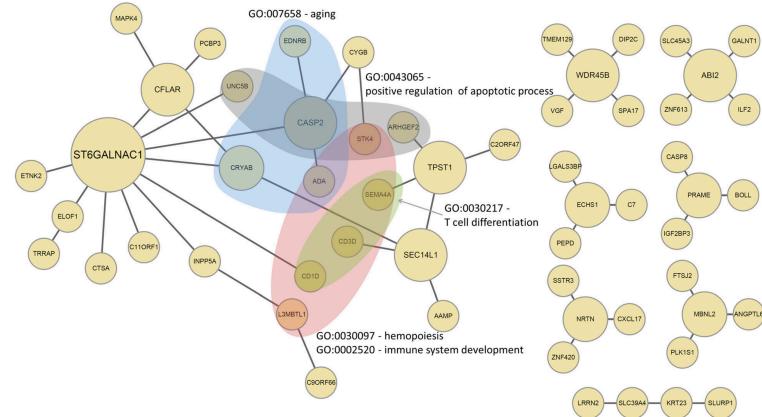
Application

- Module finding
- Prediction
- Topology analysis
- Pathway-inference
- ...

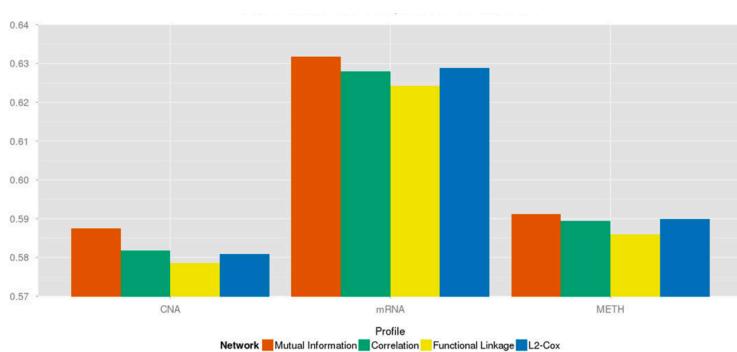


$$P^{(v)} = S^{(v)} \times \left(\frac{\sum_{k \neq v} P^{(k)}}{m-1} \right) \times (S^{(v)})^T \text{ from SNF}$$

Integrative network

(b)

An integrative ovarian cancer network



An application to machine learning algorithm