Bioinformatics: Network Analysis

Networks in Biology

COMP 572 (BIOS 572 / BIOE 564) - Fall 2013

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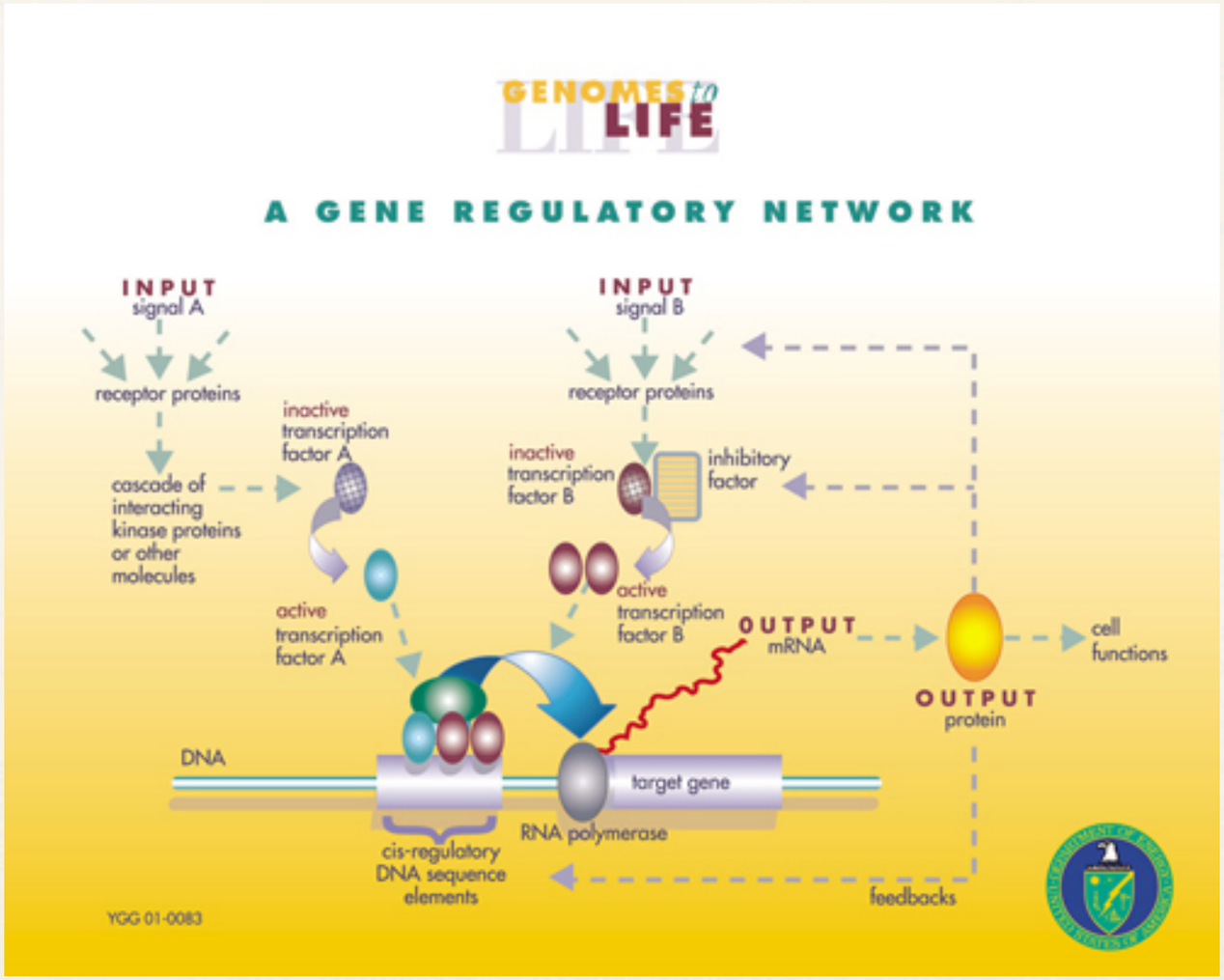
Transcriptional Networks

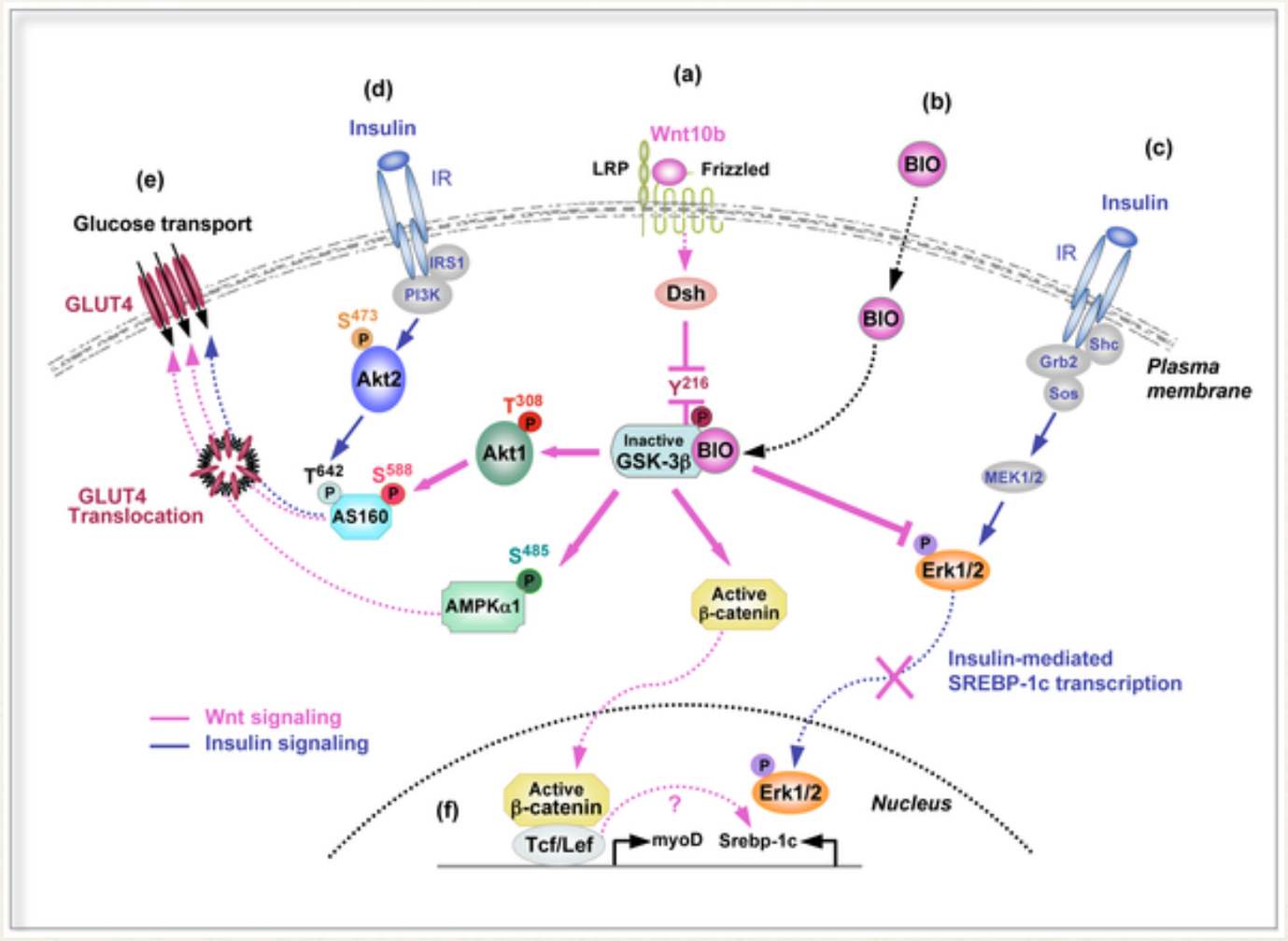
Systems of transcription factors (TFs) and their target genes



[Source: Wikimedia]

Signaling Networks

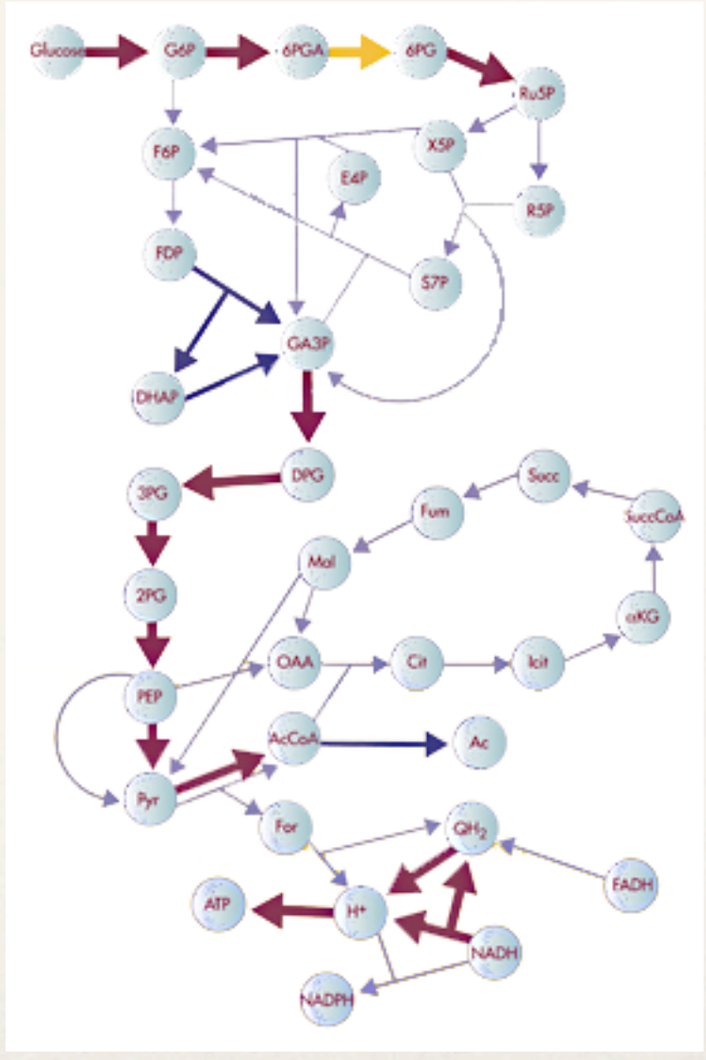
Systems of signaling proteins and their interactions



[Source: Wikimedia]

Metabolic Networks

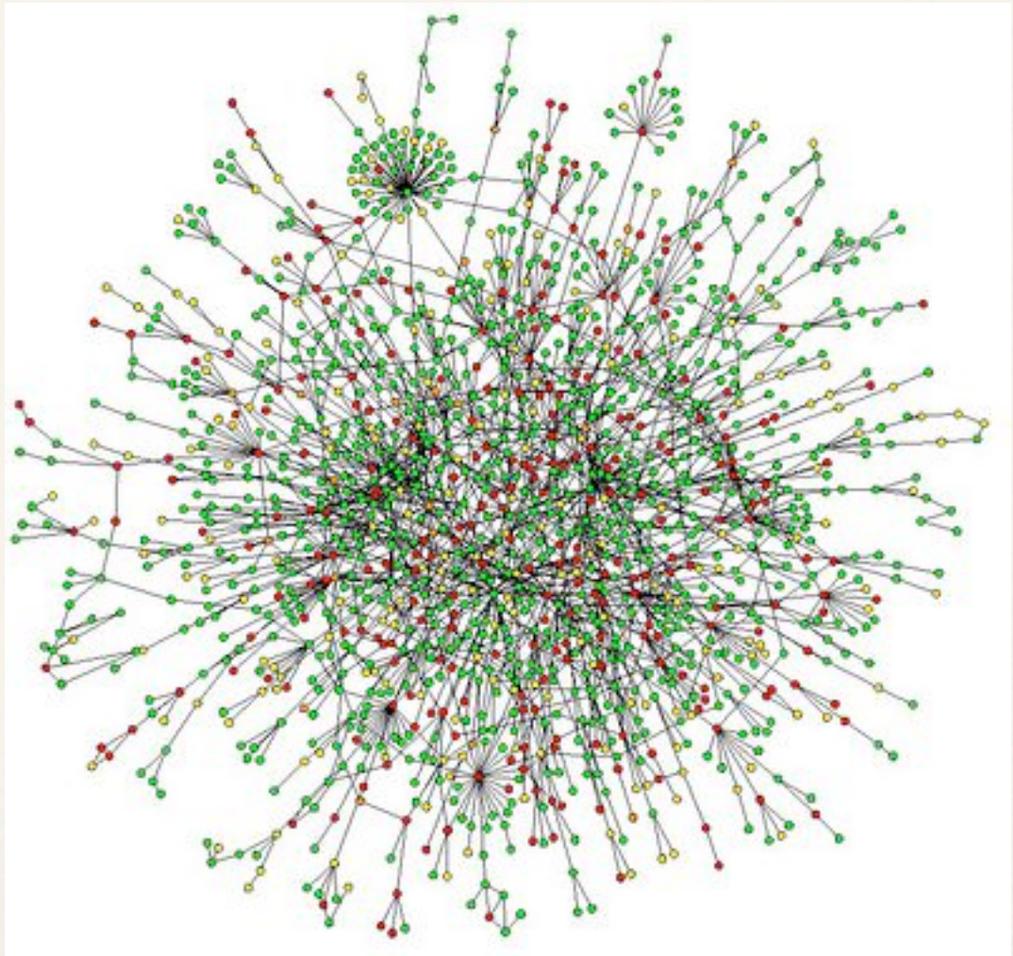
Systems of chemical reactions that convert nutrients into cellular materials or use them to provide energy



[Source: Wikimedia]

Protein Interaction Networks

Systems of proteins and their interactions



[Source: Barabasi et al., 2004]

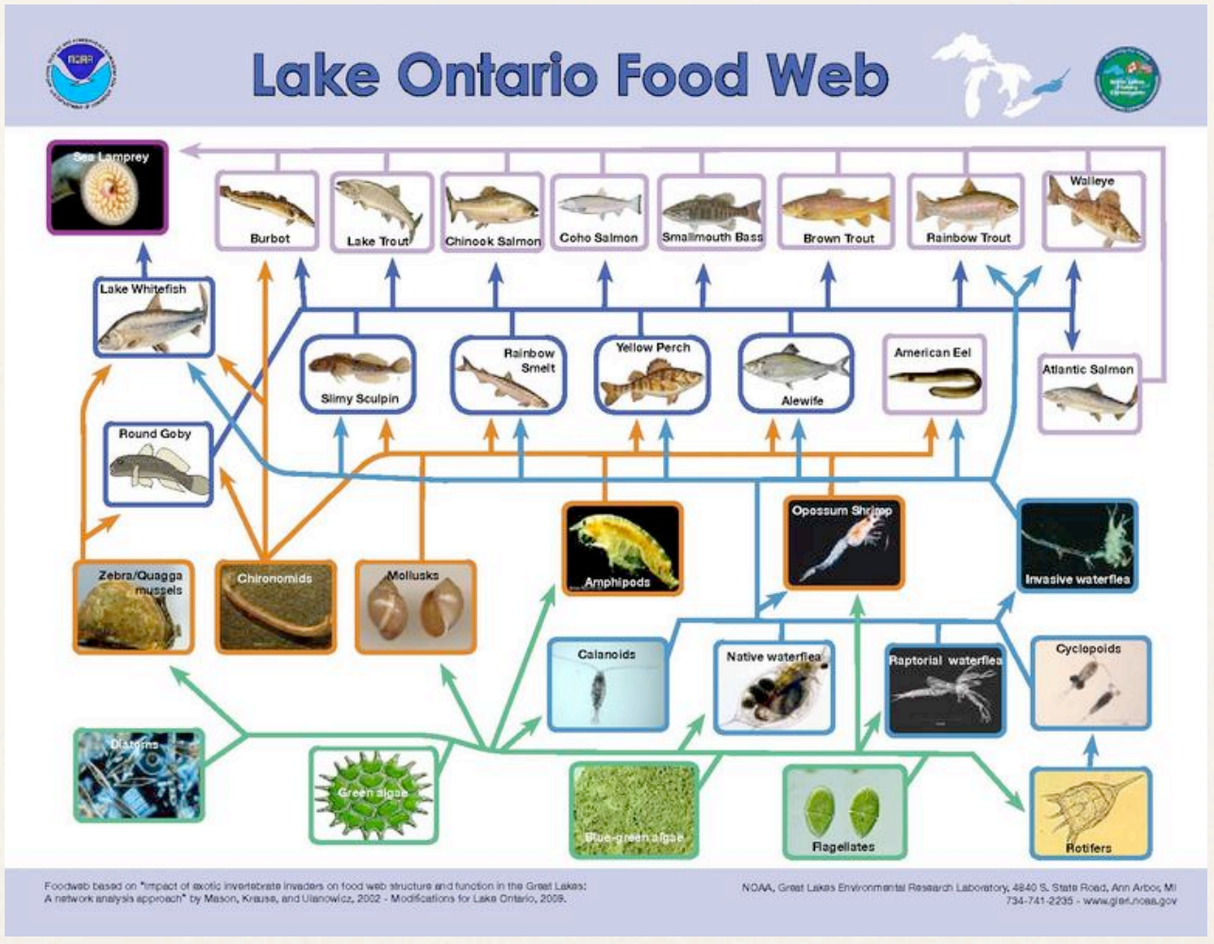
Neuronal Networks

Systems of neurons and their interactions

[Source: neuralwiki.blogpost.com]

Ecological Networks

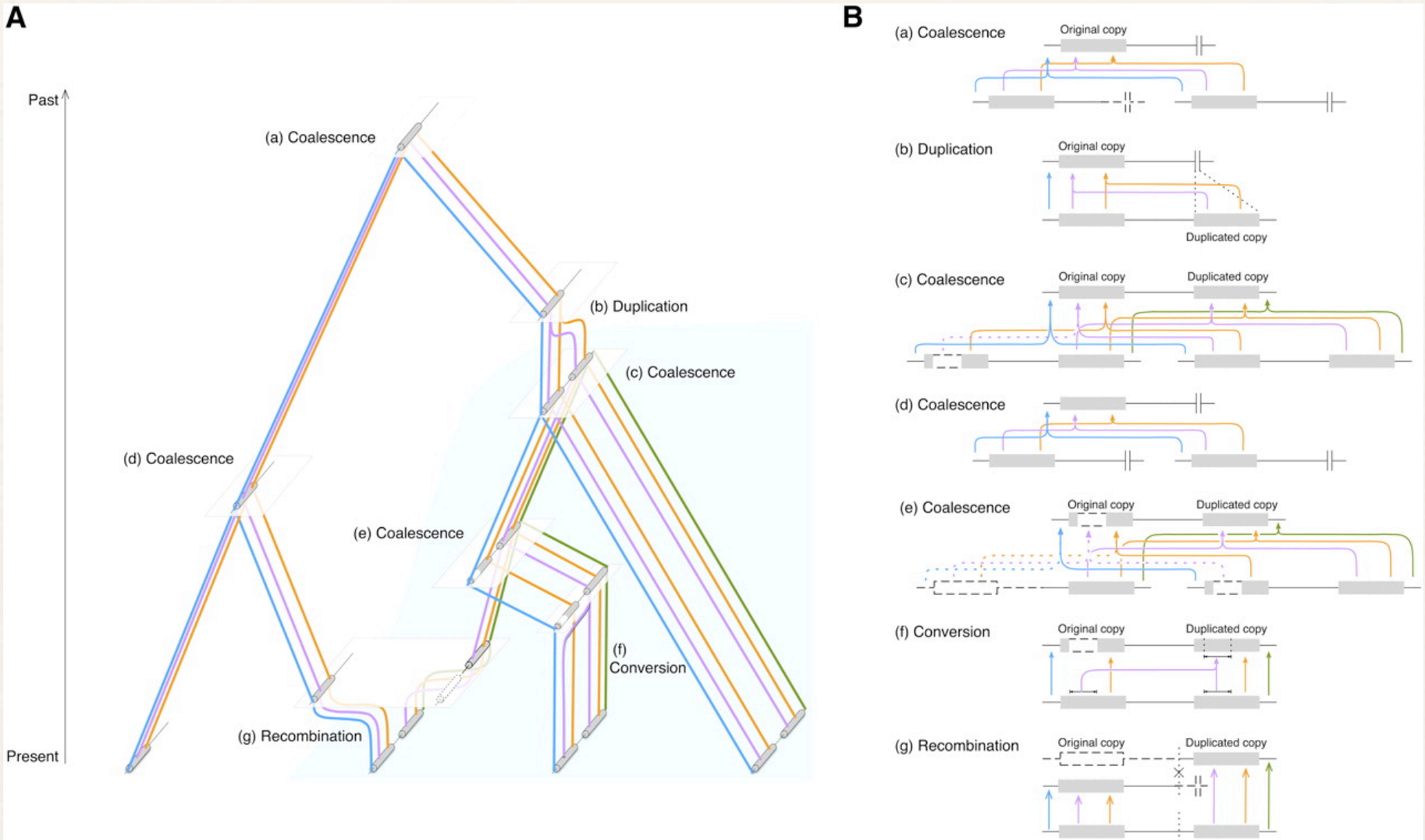
Systems of organisms and their interactions



[Source: Wikimedia]

Phylogenetic Networks

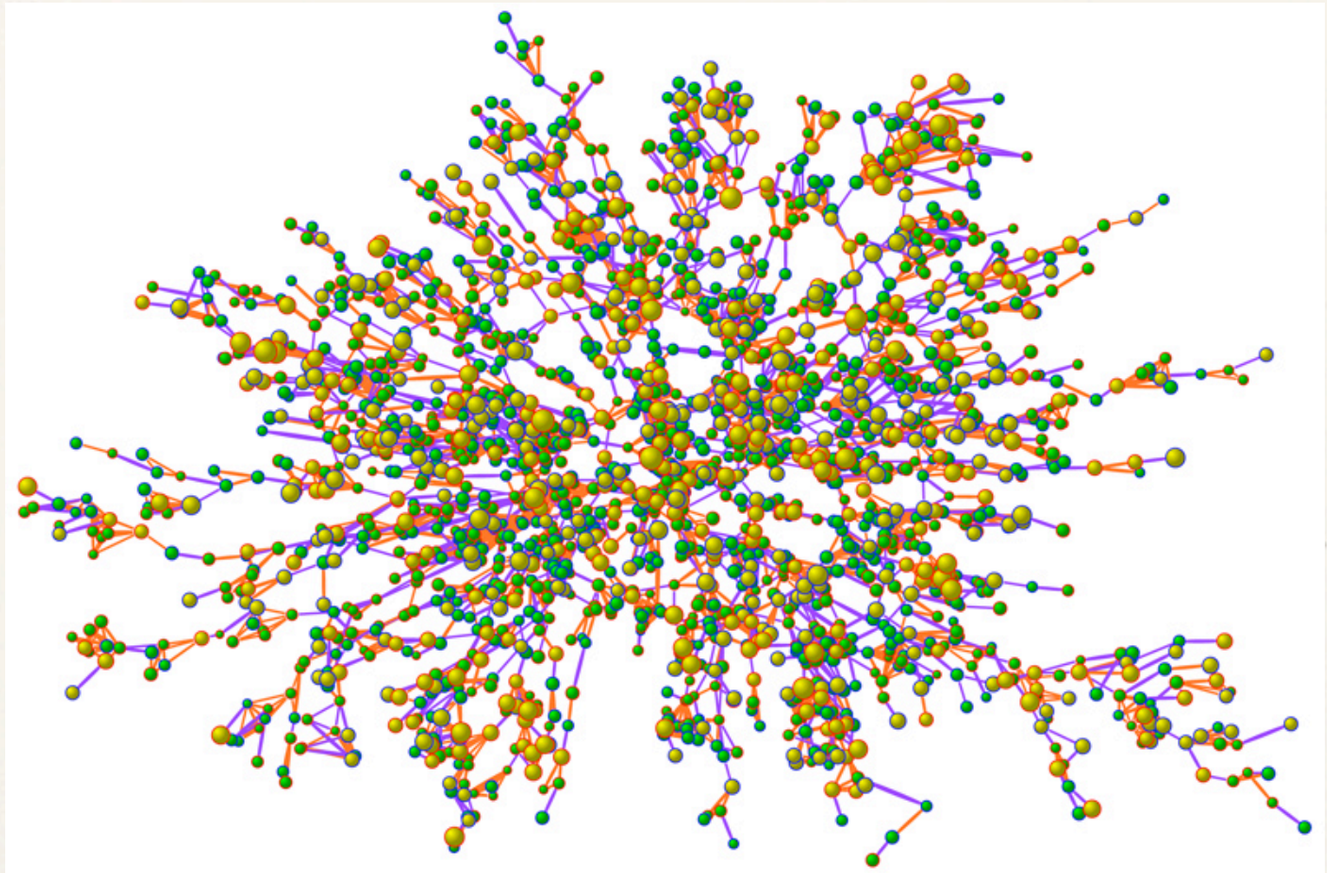
Reticulate evolutionary histories



[Source: Teshima and Innan, 2012]

Social Interaction Networks

Systems of individuals and their interactions



[Source: Christakis and Fowler, 2007]

Keep In Mind

- A network can represent any system of entities where pairwise relationships can be established...

- The network representation lends the system to a wide array of network-oriented analytical and visualization tools.