# Important Papers

Friday 16 September 2016     18:24

## Biology

1. Biological networks: the tinkerer as an engineer.
2. Mass-spectrometric exploration of proteome structure and function # general info about proteomics
3. Transcriptome-Based Network Analysis Reveals a Spectrum Model of Human Macrophage Activation # nice example for the questions that networks help to explore and also extensive use of GeneOntology!
4. Uses and abuses of mathematics in biology # general
5. Subnets of scale-free networks are not scale-free: sampling properties of networks. # to keep in mind !!!!
6. Transcriptional regulatory networks in Saccharomyces cerevisiae.
7. **Signed weighted gene co-expression network analysis of transcriptional regulation in murine embryonic stem cells  # Hovarth, correlation transformation from [-1,1] to [0,1] with 0,5 as no correlation.**
8. Gene regulatory networks and the role of robustness and stochasticity in the control of gene expression # Biology of gene regulatory networks
9. Relationship between di erentially expressed mRNA and mRNA- protein correlations in a xenograft model system
10. Reconstruction of biochemical networks in microorganisms ## All steps for different types of networks, with assembly of different datasets in each type. **Most relevant biological networks**!!!
11. **The Language of Gene Interaction #**
12. <span style="color:blue">**Genetic interaction networks: better understand to better predict # Nice review of the different types of molecular networks**</span>
13. **Interactome Networks and Human Disease # barabasi review of the types of networks and their integration!!**
14. **Detecting protein complexes from signed protein-protein interaction networks # great use of Perrimor 2014 data, for complex detection, signed protein networks**
15. **Link communities reveal multiscale complexity in networks ### Important for the links**

Gene essentiality

Gene essentiality

1. Network analysis of gene essentiality in functional genomics experiments## A novel method called NEST used to predict gene essentiality
2. Gene Essentiality Is a Quantitative Property Linked to Cellular Evolvability
3. The importance of bottlenecks in protein networks: Correlation with gene essentiality and expression dynamics
4. **High-Betweenness Proteins in the Yeast Protein Interaction Network ## Prior to the previous paper (Bottlenecks), well written.**
5. Network rewiring is an important mechanism of gene essentiality change.
6. Redefining gene essentiality
7. Predicting essential genes based on network and sequence analysis
8. **Predicting Essential Genes and Proteins Based on Machine Learning and Network Topological Features: A Comprehensive Review ## very nice review! Poses important questions and future challenges**
9. Gene co-expression network analysis reveals common system-level properties of prognostic genes across cancer types ## Nice review of the importance of networks, and identification of prognostic cancer genes using network theory
10. **A new method for identifying essential proteins based on network topology properties and protein complexes** # Most recent paper about gene essentiality. Nicely structured and well presented work, especially the evaluation methods!
11. A new essential protein discovery method based on the integration of protein-protein interaction and gene expression data
12. **Evolution of Centrality Measurements for the Detection of Essential Proteins in Biological Networks** # 2016 Nice review for the centralities used to predict essential genes.
13. **All or Nothing/ Protein Complexes Flip Essentiality between Distantly Related Eukaryotes** ## Modular essentiality. Protein complexes. Nice paper!!!
14. Up-to-date catalogues of yeast protein complexes # introduction of database of protein complexes
15. Rechecking the centrality-lethality rule in the scope of protein subcellular localization interaction networks # Comparison of methods for Drosophila, Human, Yeast, Mouse
16. Lethality and Entropy of Protein Interaction Networks

Ecological networks: keystone species

1. Keystone species and food webs.
2. Centrality measures and the importance of generalist species in pollination

1. Keystone species and food webs.
2. Centrality measures and the importance of generalist species in pollination networks
3. Characterization of topological keystone species. Local, global and "meso-scale" centralities in food webs

Transcription regulation network. Centralities and global regulators

1. **Centrality Analysis Methods for Biological Networks and Their Application to Gene Regulatory Networks**

Protein Complexes

1. Global landscape of protein complexes in the yeast Saccharomyces cerevisiae.
2. detecting overlapping protein complexes in protein-protein interaction networks
3. Detecting protein complexes from signed protein-protein interaction networks
4. **All or Nothing/ Protein Complexes Flip Essentiality between Distantly Related Eukaryotes**
5. Up-to-date catalogues of yeast protein complexes
6. Protein complex-based analysis framework for high-throughput data sets
7. Identification of protein complexes from multi-relationship protein interaction networks

Protein Residue Network: Protein folding
1. Protein structure networks
2. Universality in protein residue networks
3. NAPS: Network analysis of protein structures
4. Network analysis of protein structures identifies functional residues

Usually these networks use a cutoff distance for the residues interactions. Extensive use of centralities.

From Nikolaou

1. Uncovering a Hidden Distributed Architecture Behind Scale-free Transcriptional Regulatory Networks
2. Gene networks of fully connected triads with complete auto-activation enable multistability and stepwise stochastic transitions

**Graph theory, Decomposition**

1.    **GraphBase: A Platform for Combinatorial Computing**

2. Gene networks of fully connected triads with complete auto-activation enable multistability and stepwise stochastic transitions

**Graph theory, Decomposition**

1. **GraphBase: A Platform for Combinatorial Computing**
2. **Depth-first search and linear graph algorithms, # strongly connected components**
3. **Finding All the Elementary Circuits of a Directed Graph # Johnson**
4. **The Boost Graph Library: User Guide and Reference Manual**
5. **Matrix Iterative Analysis**

# Data

1. Drosophila Network: https://doi.org/doi:10.1038/nmeth.2733
2. Yeast PPI, GIN Networks: https://thebiogrid.org/download.php
3. Gene Essentiality: http://ogee.medgenius.info/browse/
4. Yeast Protein Complexes: http://wodaklab.org/cyc2008/downloads

# Network construction

1. Statistical inference of the time-varying structure of gene-regulation networks.
2. Information theory and signal transduction systems/ From molecular information processing to network inference ## good, pros and cons of information based approaches to network construction
3. **Reverse Engineering of Genome-wide Gene Regulatory Networks from Gene Expression Data** ## Nice review of ALL different approaches to construct a network from gene expression data!!
4. Inference of dynamic networks using time-course data ## another review as the previews paper!
5. **ARACNE: An Algorithm for the Reconstruction of Gene Regulatory Networks in a Mammalian Cellular Context**
6. **Reverse engineering gene regulatory networks ## nice review based on biological challenges**
7. **Statistical inference and reverse engineering of gene regulatory networks from observational expression data ##** we present a systematic and conceptual overview of methods for inferring gene regulatory networks from observational gene expression data ##
8. Wisdom of crowds for robust gene network inference ## AMAZING!!!! Compares all methods for different species, and uses a combined method for better results!
9. **Signed weighted gene co-expression network analysis of transcriptional regulation in murine embryonic stem cells ### Different method for**

8. Wisdom of crowds for robust gene network inference ## AMAZING!!!!
   Compares all methods, for different species, and uses a combined method for better results!

9. **Signed weighted gene co-expression network analysis of transcriptional regulation in murine embryonic stem cells ### Different method for negative weights !!!!!!!!!**

10. Biological networks 2007 Chapter 3 & 4

11. Understanding biological functions through molecular networks

12. Reconstruction of biochemical networks in microorganisms ### Work flows for network construction by assembling different types of datasets

13. Towards genome-scale signalling- network reconstructions

14. **Link Clustering Reveals Structural Characteristics and Biological Contexts in Signed Molecular Networks** ## Comprehensive analysis of distributions, motifs, clusters of negative and positive links of Gene Coexpression Networks

15. Quantitative maps of genetic interactions in yeast - Comparative evaluation and integrative analysis # negative weight in yeast!!

16. Systematic Mapping of Genetic Interaction Networks ## Genotype Phenotype technics

17. Exploring genetic interactions and networks with yeast ##

18. The Genetic Landscape of a Cell

19. **A strategy for extracting and analyzing large-scale quantitative epistatic interaction data #** Nice explanatory paper for SGA quantification!

20. Genetic Interaction Networks: Toward an Understanding of Heritability # nice review of GIN

21. **A Robust Toolkit for Functional Technique Profiling of the Yeast Genome ## SGA technique method for extracting correlations**

22. **Systematic interpretation of genetic interactions using protein networks ## SGA and physical interactions intergraded for yeast**

23. **Functional Analysis and Characterization of Differential Coexpression Networks ## yeast time course and negative weights**

24. **Integrative approaches for finding modular structure in biological networks. #### Nice overview- TABLE!!!!! of biological networks, the importance of modularity**

25. Missing value imputation for microarray data: a comprehensive comparison study and a web tool Threshold for correlation

26. Identifying essential genes in bacterial metabolic networks with machine learning methods # Metabolic network

# Centralities and node influence

# Centralities and node influence

**With dynamic models (e.g SIR, SI, SIS)**

1. Locating influential nodes via dynamics-sensitive centrality

**Static**

1. Complex network measures of brain connectivity: Uses and interpretations
2. Identifying important nodes in weighted functional brain networks: A comparison of different centrality approaches
3. The importance of bottlenecks in protein networks: Correlation with gene essentiality and expression dynamics
4. Weighted gene coexpression network analysis: state of the art.
5. Vital nodes identification in complex networks # Up to date review

# Data enrichment

- Gene Ontology
  - Gene Ontology: tool for the unification of biology
  - Bingo and Cytoscape
    http://www.psb.ugent.be/cbd/papers/BiNGO/Tutorial.html
  - Use and misuse of the gene ontology annotations GLAD: an Online Database of Gene List Annotation for *Drosophila*
  - http://www.flyrnai.org/tools/glad/web/findgroups
  - https://www.bioconductor.org/packages/devel/bioc/vignettes/FGNet/inst/doc/FGNet.html
    - Functional networks
      - Bipartite networks, transformed to 2 associate networks.
  - NEAT/ an efficient network enrichment analysis test
  - https://www.bioconductor.org/packages/devel/bioc/manuals/annotate/man/annotate.pdf
  - http://www.psb.ugent.be/cbd/papers/BiNGO/Tutorial.html
    - Creates the association network of gene ontology terms
    - Also have the file of bipartite network
  - **Orchestrating high-throughput genomic analysis with Bioconductor**
  - **Annotation Enrichment Analysis: An Alternative Method for Evaluating the Functional Properties of Gene Sets # Nice paper on the problems of Fisher's Exact Test.**
  - **Bioinformatics enrichment tools: Paths toward the comprehensive**

○ Also have the file of bipartite network

- **Orchestrating high-throughput genomic analysis with Bioconductor**

  **Functional Properties of Gene Sets # Nice paper on the problems of Fisher's Exact Test.**
- **Bioinformatics enrichment tools: Paths toward the comprehensive functional analysis of large gene lists**
- **Matthias Dehmer, Yongtang Shi, Frank Emmert-Streib (eds.)-Computational Network Analysis with R_ Applications in Biology, Medicine and Chemistry-Wiley-VCH (2016)**


- Gene essentiality annotation
  - https://www.biostars.org/p/112101/
  - **OGEE: an online gene essentiality database**
  - **Use of the BioGRID Database for Analysis of Yeast Protein and Genetic Interactions**
  - Database of Essential Genes (DEG) database.

- Protein Complexes
  - Protein Complex–Based Analysis Framework for High-Throughput Data Sets
  - http://fgr.hms.harvard.edu/compleat
  - All or nothing: Protein complexes flip essentiality between distantly related eukaryotes
  - A high-accuracy consensus map of yeast protein complexes reveals modular nature of gene essentiality