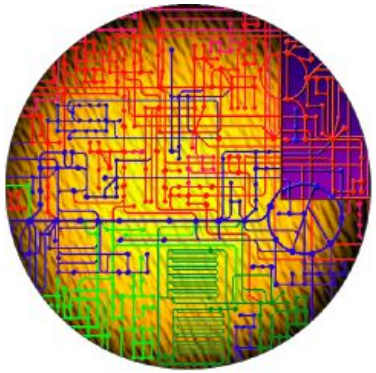
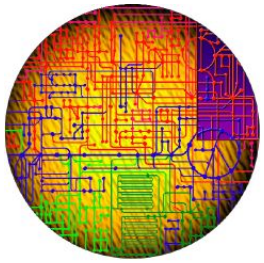


A Systems Biology Approach to Alzheimer's Disease

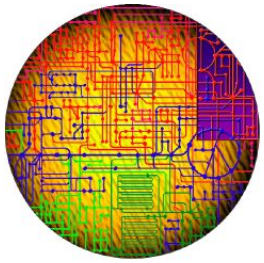
ADC Directors Meeting

September 24, 2011



Systems Biology

- Diseases are disruptions of one or more parts of a biological system
  - Affect interactions within the system
  - Alter the functions of the entire system
- System approach is different that the “bottom up” approach
- To overcome the potential complexity of disease the entire system needs to be studied
  - Genes, proteins, molecules and metabolites interact in a unified system
  - Each need to be investigated
  - Data need to be re-integrated into the system



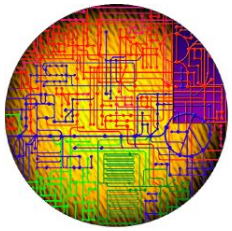
A Systems Biology in the ADCs

Individual efforts

- Identify key elements and interactions
- Develop specific testable hypotheses
- Test observed or inferred interactions as networks or connections that lead to modifiable targets

Group efforts

- Global data collection and analyses
- All types of data included
- Mathematical and statistical modeling
- Biological relevance
- Inter-disciplinary
- Dissemination



A Systems Biology Approach to Alzheimer's Disease

- Genome Wide Association Studies
  - Gerard Schellenberg
- Genome Wide Expression
  - Amanda Myers
- Master Regulators of Alzheimer's Disease Neurons
  - Michael Shelanski
- Integrating genetic, genomic and phenotypic data
  - Daniel Geschwind