

Neuromics

Large scale organization of the nervous system for adaptive behavior

- Analogy to Genomics

One-gene-at-a time vs panoramic view of genes and their organization

Number of genes (measure of complexity)

Proportion genes of particular types (measure of importance)

Operons (type of gene coordination)

Synteny (cross-species homology blocks)

- Neuromics

One-behavior/sense-at-a time vs panoramic view of all sub-networks

What is the ratio of dedicated to multifunctional sub-networks?

Which behaviors are controlled by dedicated vs multifunctional sub-networks?

How do sub-networks stay out of each other's way (or cooperate)?

How does sub-network organization vary with species/behavioral complexity?

- Prospects

Crick-Jacobs Center, Salk Institute (worm)

Janalia Farms (worm & fly)

Optophysiology

Electrode-free neurophysiology

- Genetically targetable optical probes

GFP derivatives

Ion channel derivatives

- Activity monitoring

Ca

V

- Activity control

Excitation

(Inhibition)

- Simultaneous control and monitoring

Necessity and sufficiency

Physiological connectivity maps