**Week #6** (March 3 & 8), Robustness  
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In Wednesday’s lecture, we will discuss four elements which are thought to be features of robust systems: feedback, degeneracy, competition, and modularity. We will discuss examples of each these from neuroscience and other areas of biology. We will review several papers in detail that illustrate specific examples of degeneracy at the neuron level and the circuit level, examples of competition at the synaptic level, and examples of modularity at the level of network motifs.

On Monday we will discuss the following paper in class:

Your assignment this week is to write a Short summary & assessment of this paper. Please see the course website for specific guidelines and an annotated example of the “assessment” portion. Note that the summary portion of your assignment should be shorter than in your previous assignments.

As you are reading, please think about the following questions:
- What is the main question which this study seeks to address?
- Where does the “data” in this paper come from?
- How do the authors assess the statistical significance of their results?
- What are the main conclusions of the study?

As you are developing your critical assessment, you might want to consider the following issues:
- Are the main conclusions of the study well-supported?
- What is the significance of the study’s conclusions?
- What assumptions (explicit and implicit) go into this meta-analysis?
- Should we consider these motifs as candidate “modules”?
- If a particular motif is found in different data sets—e.g., the neural circuit and the food web—how likely is it that this motif corresponds to a functionally similar interaction?
- What sorts of functions or operations might the neural motifs correspond to? What more might we want to know in order to gain insight into this?
- Is the frequency of a motif’s occurrence a gauge of its importance?
- What are the implications of any problems you identify regarding this study?
- Do you feel strongly positive about any aspect of the study? If so, what and why?

Keep in mind that a “critical assessment” might be entirely negative, but it doesn’t need to be. Just like a food critic or a movie critic, a “paper critic” (i.e., a referee) might be mainly negative about some subjects and mainly positive about others.