How to discuss the neurobiology of psychiatric disorders with our patients

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- Website with course syllabus & readings:
  www.psychiatry.wisc.edu/courses/Nitschke/2017_bio_psycho_class/

  Login: seminar

  Password: brain7

The course is designed to directly support work with patients

- Expand our repertoire of language, metaphors, and diagrams for discussions of biology with patients
- Deepen knowledge of relevant neurobiological concepts
- Dispel myths and assumptions about the biology of mental illness

What are some common conceptions of biological causes of mental illness?

- The so-called “Nature vs. Nuture Debate” is now moot
- We now understand mechanisms through which our experiences create lasting neurobiological changes

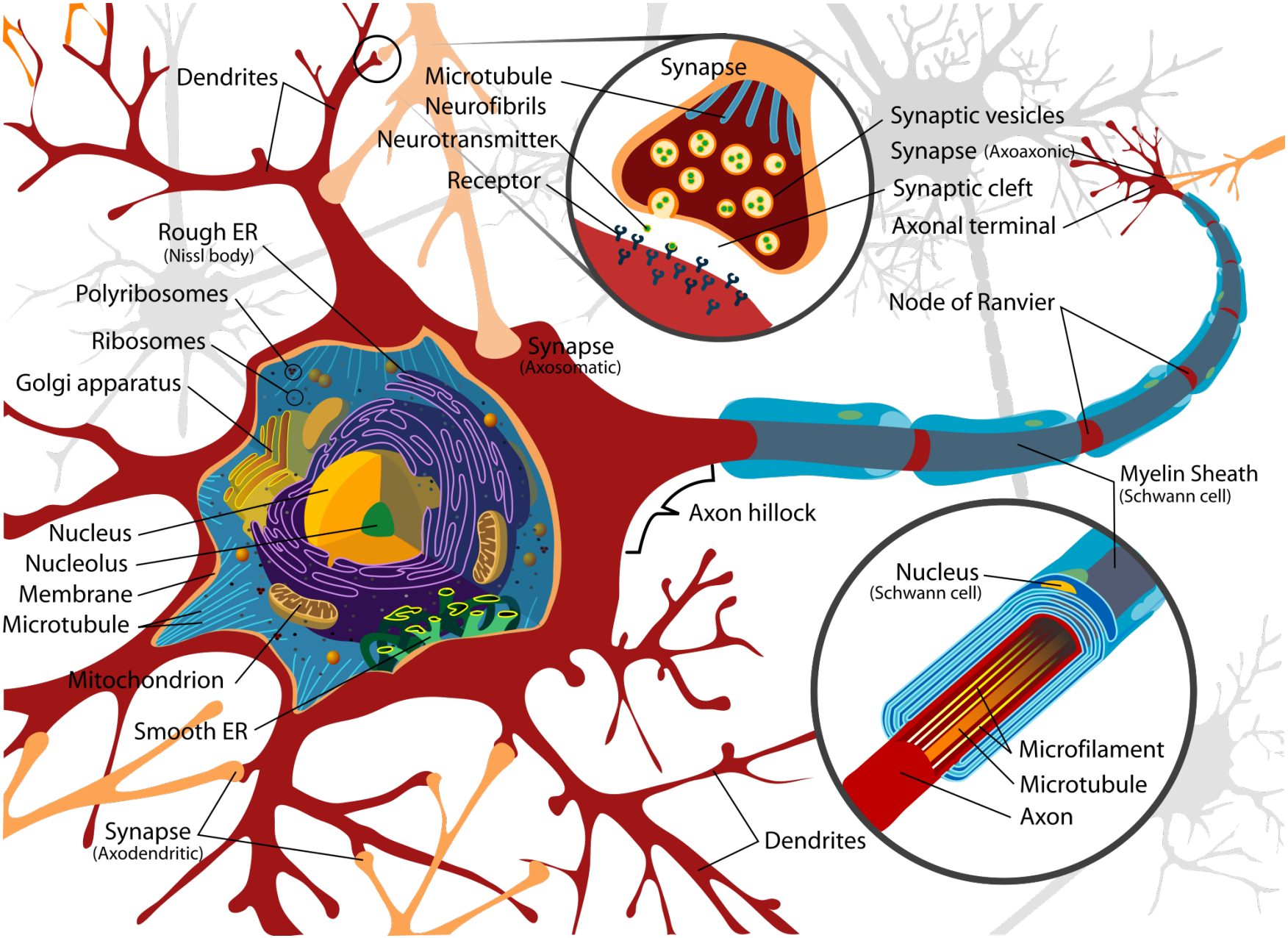
Neuroplasticity: What is it?

- Functional & structural neural adaptations to the environment (Citri & Malenka, 2008)

- Experience-dependent changes in brain function & structure, related to:
  - Learning and acquiring new information
  - Adaptive behavioral choices
  - Practice & repetition of new behaviors

    (Pittenger & Duman, 2008; Kasper & McEwen, 2008; Tononi & Cirelli, 2006)

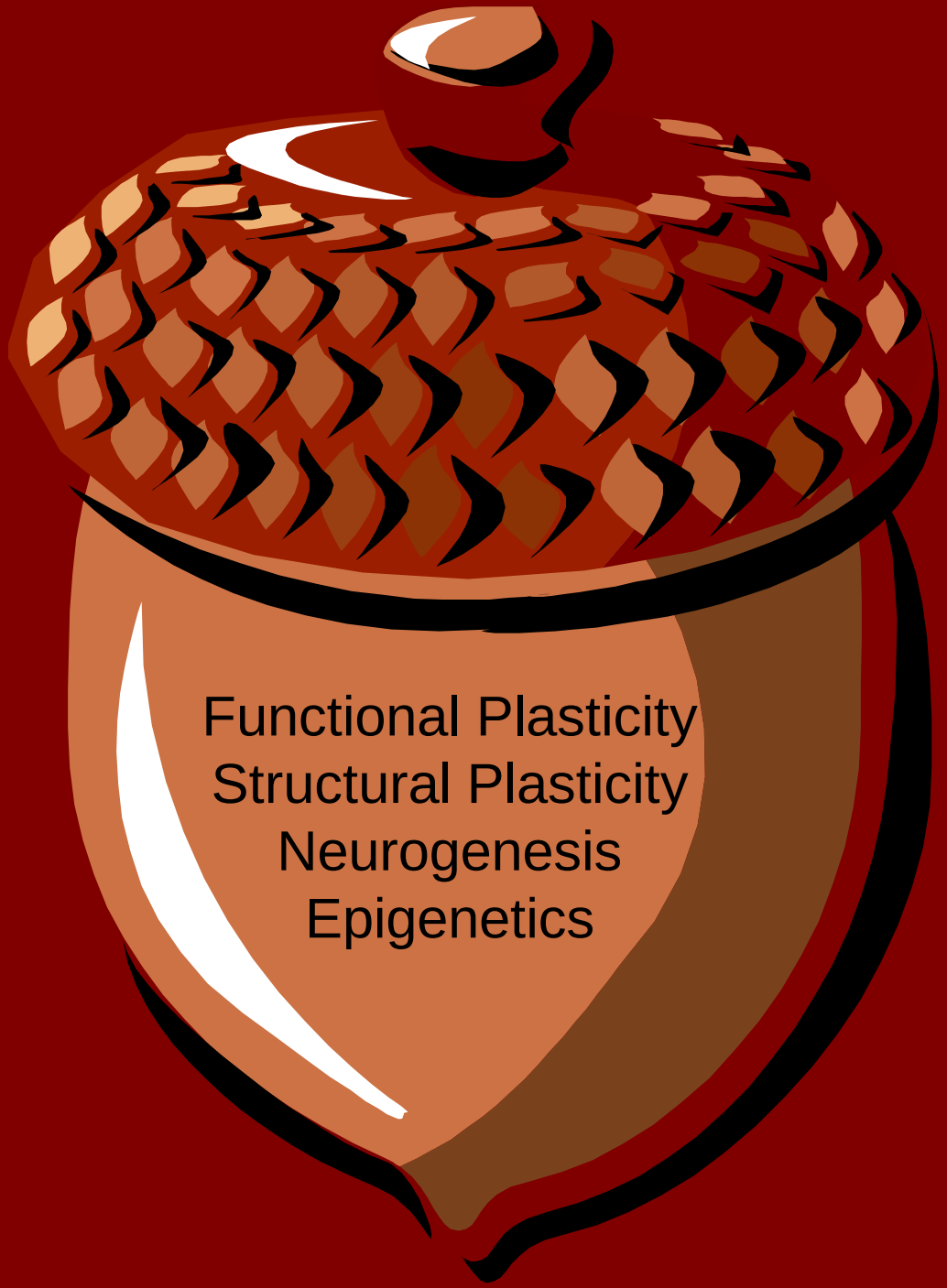
- Activity-dependent: "Cells that fire together wire together" (referred to as Hebb's law)



From: http://en.wikipedia.org/wiki/Activity-dependent_plasticity

Some mechanisms of neuroplasticity

- “Functional” or synaptic plasticity (e.g., long-term potentiation)
- Structural plasticity (e.g., dendritic growth)
- Neurogenesis (mainly in dentate gyrus of hippocampus)
  - Proliferation and survival of newborn neurons
  - Migration into neural circuits sculpted by experience
- Experience-induced epigenetic marks
  - Long-term changes in gene expression without changing the DNA


Functional Plasticity
Structural Plasticity
Neurogenesis
Epigenetics

Myth: If the disorder is biologically-based, then it must be treated medically (and behavioral or psychological treatments are irrelevant)

Alternatives:

-- Psychological treatments are biological treatments

-- Direct and indirect *synergism* between medical and psychological treatments

"The pharmacological effects of antidepressants need to be combined with psychological rehabilitation to reorganize networks rendered more plastic by the drug treatment."

Karpova et al. (2011) *Science.*

“The joint use of pharmacological and psychotherapeutic interventions might be especially successful because of a potentially interactive and synergistic—not only additive—effect of the two interventions.

Psychopharmacological treatment may help consolidate the biological changes caused by psychotherapy.”

Eric R. Kandel, M.D., 1998

Summary

- Psychotherapeutic learning: behavioral sculpting of new circuits requires practice & repetition
- Many psychotherapies are biologically-informed behavioral treatments (e.g., Mindfulness, CBT, IPSRT)
- Synergism between medical & behavioral treatment:

  Many medically-oriented psychiatric treatments alter neuroplastic mechanisms (creating the neural conditions upon which behavioral practice may change the brain)

Role-plays – We are going to practice!