# PSYC4481: RESEARCH PRACTICUM IN BEHAVIORAL NEUROSCIENCE

## In-Class Activity: Mapping Neural Pathways

Today you were shown the results from a study where a retrograde tracer was ionotophoretically deposited into a discrete region of the lateral hypothalamus (LHA). This injection resulted in cell body labeling in the central nucleus of the amygdala (CEA). Your task is to design a follow-up experiment to further characterize the specifics of the CEA-LHA pathway. You can focus on characterizing any aspect of the pathway: anatomical, topographical, neurochemical, reciprocity, or any combo thereof.

Here is what you know:
- LHA
  - The original injection was confined to the region above fornix, but spread across three subdivisions of the LHA: juxtadorsomedial (LHAjd), suprafornical (LHAs), and dorsal (LHAd).
  - These regions of the LHA are known to contain neurons which express the neuropeptides orexin and melanin-concentrating hormone (MCH).
- CEA
  - In the original experiment back-labeled neurons were observed in all three divisions of the CEA: lateral (CEAl), medial (CEAm), and capsular (CEAc).
  - Most neurons in the CEA are GABAergic, as indicated by the presence of glutamic acid decarboxylase (GAD).
  - Additionally, many neurons also coexpress neuropeptides including: corticotropin-releasing hormone (CRH), prodynorphin, enkephalin, and calbindin.

Here are the tools at your disposal:
- Retrograde tracers: FG, CTB, HRP
- Anterograde tracers: PHA-L, BDA
- The biochemical and immunological prowess to construct any antibody you'd like.

---

What is your research question?

Explain your experimental design and reasoning. (e.g. What/where/how do you inject? Where do you analyze? What do you stain for? What staining technique(s) do you use? Why?)