

Area of Research: **Neuroscience**
Mentor: **Robert Bridges**

Project Description:

Previous research has demonstrated a possible opiate involvement in the establishment of maternal memory in female rats. Treating pregnant/postpartum dams with an opiate antagonist around the time of parturition prevents establishment of the long-term retention of maternal behavior 7 to 10 days later. The study proposed here will use inexperienced adult, nulliparous rats that are induced to show maternal care towards foster pups in order to evaluate whether treatment with opiates during the period of the establishment of maternal care enhances maternal memory. Techniques include small animal surgery, hormone administration, administration of opiates via subcutaneous Alzet minipumps, and behavioral testing. This study will help to delineate the neurochemical substrate involved in the establishment of maternal memory. Potential follow-up studies might include identification of the central sites of opiate action and characterization of neural opiate receptors.

Area of Research: Pregnancy-Induced Neurogenesis
Mentor: **Robert Bridges**

Project Description:

Recent studies in our and other laboratories have established that the state of pregnancy induces the formation of new neurons within the central nervous system. We have characterized this phenomenon using a rat model. Those factors, possibly hormonal, responsible for stimulating neurogenesis as well as the functional significance of these new neurons have not been delineated. During a summer project, a NIH-supported student would initiate studies that examine the role of key pregnancy hormones, i.e. progesterone, prolactin, in this process and explore the functional significance of newly identified neurons within context of the mother's reproductive success. The project involves a combination of small animal surgery, behavioral testing, histology, and microscopy. If interested, contact Dr. Bridges @ 8-7985 or by email - robert.bridges@tufts.edu

Area of Research: **Neuroscience**
Mentor: **Phyllis Mann**

Project Description:

Among the common domestic species, it is generally held that horses and cats consistently show the most dysphoric response to exogenous opioid analgesics. Typical behaviors seen in horses after opioid administration include an increase in locomotor activity, mydriasis, excitement, and

nervousness. Higher doses of opioids in cats are stimulatory, inducing mydriasis, apprehension, hypersalivation and excitement. These effects are in contrast to those observed in most other species, which include sedation, miosis, respiratory depression, hypothermia and euphoria. The endogenous mu opioid receptor mediates most of the analgesia and behavioral effects described above. A possible explanation for these species-specific differences in response to opioids is a difference in the distribution of cells that express the mRNA for the mu opioid receptor in the brain. The summer project will involve sectioning horse and/or cat brain, performing in situ hybridization histochemistry on brain tissues, and describing the distribution of cells that express mu receptor mRNA in horse and/or cat brain