



Undergraduate Research Symposium May 17, 2019 Mary Gates Hall

Online Proceedings

POSTER SESSION 2

MGH 258, Easel 184

1:00 PM to 2:30 PM

The Effects of Isoflurane Exposure, Length of Surgery, and Rest before Hypoxia on Ferret Mortality and Gross Brain Injury

Vivienne Etain Riggs Acuna, Senior, Biology (General), Sociology

Mentor: Thomas Wood, Pediatrics

Mentor: Kylie Corry, Pediatrics

Mentor: Daniel Moralejo, Pediatrics

The most recent National Vital Statistics Report reports that approximately 9.85% of babies in the United States are born preterm, with 72% of those born late-preterm (at 34-36 weeks of gestation). Using neonatal ferrets at age 17 days old, the Juul lab in the Division of Neonatology at the University of Washington Medical Center has developed a preliminary model of brain injury to mimic late-preterm neonatal injuries. In this species-specific adaptation of the Vannucci Model, the left carotid artery is permanently ligated, along with a temporary (4h) occlusion of the right carotid artery. Ferrets are then exposed to periods of hypoxia and hyperoxia. By looking at data and outcomes from our surgeries, I aim to examine the effects of certain surgical parameters on ferret mortality. These parameters include: time the animal is exposed to isoflurane, the length of surgery, and the amount of time the animal is given to recover between surgery and hypoxia. Aside from mortality, I will also analyze the effects of these parameters on respiratory rate after surgery as well as gross brain injury and data from behavioral testing in an attempt to discern the level of injury in living animals and the most common predictors of death in those that died prior to their determined endpoint.

POSTER SESSION 4

MGH 258, Easel 186

4:00 PM to 6:00 PM

Late Behavioral Effects of Early Neonatal Injury in Rats

Simar Virk, Senior, Psychology

Mentor: Pratik Parikh

Mentor: Kylie Corry, Pediatrics

Hypoxic-ischemic encephalopathy (HIE) and inflammatory responses are commonly seen in premature infants which can lead to cognitive delay and behavioral problems. A novel rodent preterm brain injury model is being developed to simulate histological and behavioral changes seen in preterm brain injury. It was hypothesized that injured pups [(*in-utero*) hypoxia-ischemia followed by post-natal inflammation with lipopolysaccharide (LPS) + hypoxia + hyperoxia] will have a significant late behavioral deficit compared to controls. The rodent model of preterm brain injury includes: intrauterine hypoxia at embryological day 18, with LPS administration on Postnatal (P) day 2 followed by hypoxia (8% oxygen) and hyperoxia (80% oxygen). In order to assess late behavioral effect of early neonatal injury, I conducted motor tests on rats. The motor testing included: gait analysis via CatWalk XT and Rotarod analysis. For the Rotarod analysis, I performed testing on both, the injured rats and controls, on P28 to test their locomotor ability. Gait analysis was performed on P35. The results will be tested for significant differences between the groups. Future research will be conducted by repeating this experiment to verify these results and clarify what aspects of late behavior are impacted most by this injury model.