

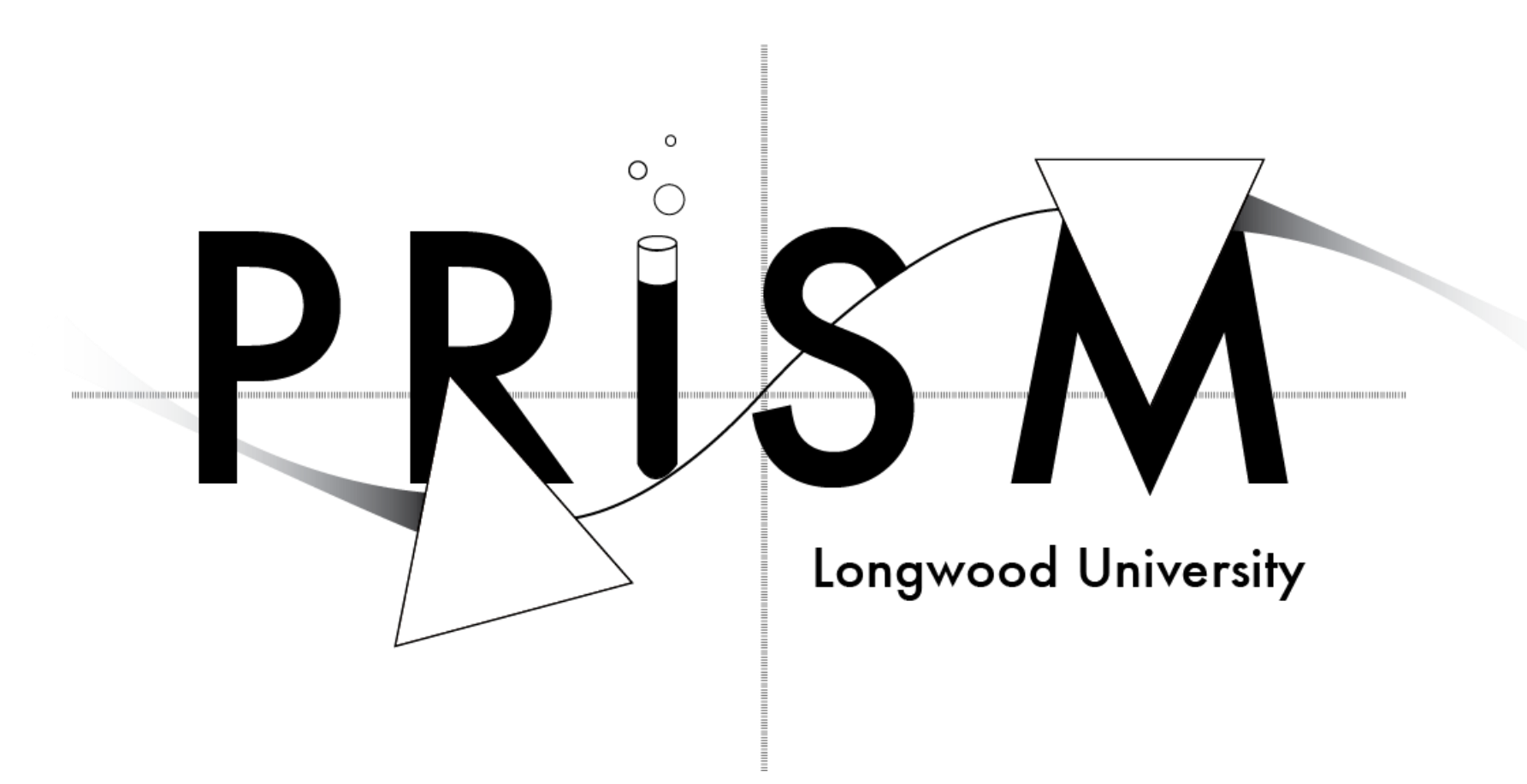


Epigenetically Heritable Effects of Maternal Behavior in Rats

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Research Questions

1. Maternal behavior in rats is epigenetically heritable from one generation to the next. **What are other neurobiological consequences of maternal behavior?**
2. Can **environmental enrichment mitigate the effects of bad maternal behavior?**

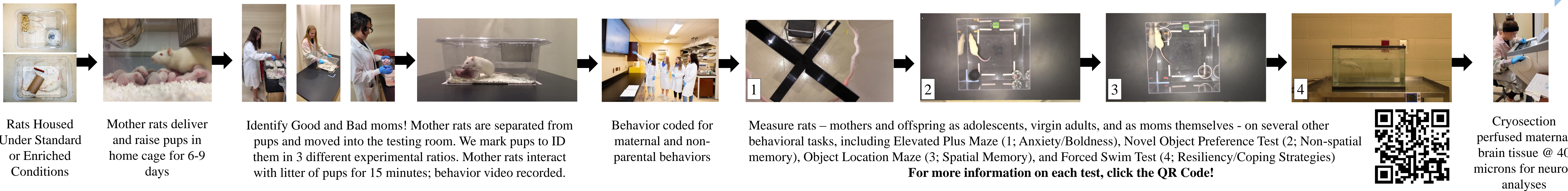
Background

- Epigenetics is the study of how cells control gene activity without changing the DNA sequence¹
- There is robust literature detailing how maternal behavior in rats is epigenetically heritable²
 - Good moms raise relaxed pups that become Good moms
 - Bad moms raise anxious pups that become Bad moms
- Anxiety has been shown to negatively effect learning and memory in rats³
- Early environmental enrichment has been demonstrated to reduce anxiety in adult rats⁴

Hypotheses

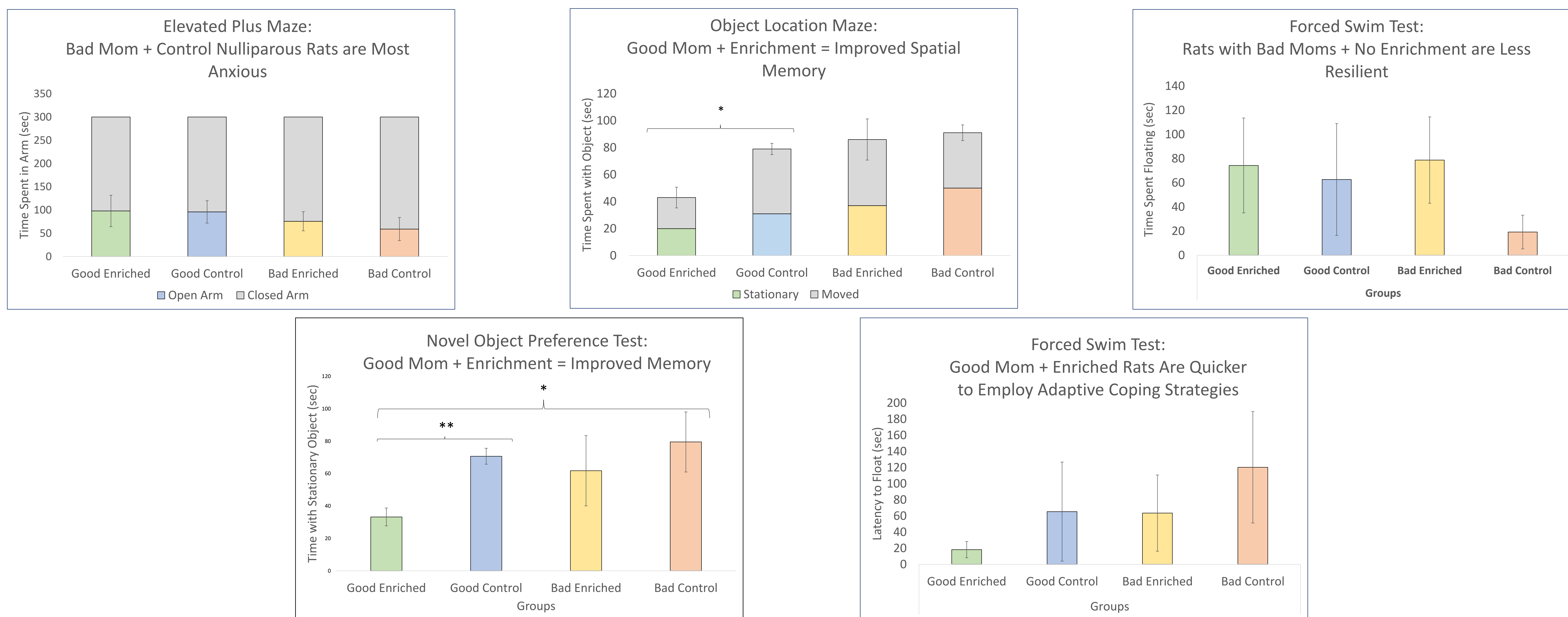
1. We hypothesize that the **epigenetic effects of maternal behavior have transgenerational, epigenetic neurobiological consequences**. These include anxiety, boldness, resiliency, spatial memory, and non-spatial memory.
2. We also hypothesize that **enriched environments will improve rat performance** regardless of parental behavior.

Methods in Brief – Click on the QR Code for More Videos and Details



Work in Progress! Results to Date

Applying the Science: Childhood Resiliency



- Children’s psychopathology risk and behavior can be influenced by parental characteristics⁵
- Having a ‘bad’ household or ‘bad’ parents can have severe neurological and psychological consequences^{6,7}
- Types of enrichment for kids are numerous and varied, including virtually all sensory/motor stimulation⁷
 1. Meet minimal needs, such as sleep and access to healthful foods
 2. Social interactions such as play dates and group sports/activities
 3. Early childhood education and good schools throughout adolescence⁸
- **Our preliminary findings offer evidence that enriching environments may help children overcome negative childhood experiences.**

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 ➤ **Interested in collaboration or other questions?** Contact franssenra@longwood.edu