

## **Bisphenol A and Genistein-Induced Changes on miRNA Profiles and Associated Behavioral Changes in California Mice (*Peromyscus californicus*)**

### **Abstract:**

Endocrine disruptors, such as bisphenol A (BPA) and genistein, mimic estrogen and interfere with estrogen pathways in both males and females. BPA is used worldwide in the production of common household items, especially for food storage. Because BPA can leach from such containers, individuals are often unknowingly consuming this chemical. Genistein is a weak phytoestrogen found in soy and soy-based products. BPA and genistein can disrupt normal steroid and non-steroid receptor signaling pathways in the brain and other organs. Such chemicals may also induce epigenetic changes that alter gene and/or protein expression without changing the DNA structure. miRNA can bind to RNA and destroy them before RNA is transcribed into a protein. Little is known how BPA and genistein may affect neural miRNA profiles, although such chemicals affect these biomolecules in other tissues.

We hypothesized thus that developmental exposure to BPA and genistein alter the miRNA profiles in the hypothalamic region of the brain, and these molecular changes are associated with behavioral disruptions caused by such endocrine disrupting chemicals. Accordingly, we exposed California mice (*Peromyscus californicus*) females for 2 weeks prior to conception and throughout lactation to low dose BPA, high dose BPA, genistein, BPA+genistein, or phytoestrogen-free control diet. Behaviors that were tested and currently being analyzed include cognitive, socio-communication, and anxiety-like behaviors using Barnes maze, Crawley's sociability test, ultrasonic vocalizations, and elevated plus maze. We isolated hypothalamic miRNA for high throughput sequencing, which is currently ongoing.