

## Investigating the behavioral effects of microinjecting hormones into the brain of the Syrian hamster (*Mesocricetus auratus*)

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**Presenter Information (List ALL Authors)**

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Title: Investigating the behavioral effects of microinjecting hormones into the brain of the Syrian hamster (*Mesocricetus auratus*)

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**Background:** Hormones are important modulators of physiological functions, behaviors, emotions, and cognition; however, most neuroscientists focus on neurotransmitters and how these chemicals affect the brain and behavioral outcomes. Studies have shown that arginine-vasopressin (AVP), a hormone that is typically known for its regulation of kidney function, microinjected in the anterior hypothalamus (AHA) induces flank marking and aggressive behaviors in Syrian hamsters (*Mesocricetus auratus*). In the present study, we investigated the behavioral effects of two hormones, AVP and angiotensin, microinjected into the interfascicular nucleus (IF) and the bed nucleus stria terminalis (BNST), respectively, in the Syrian hamster.

**Methods:** Eleven hamsters (8 males, 3 females) were cannulated using stereotaxic surgeries. Seven days post-surgery, 10 hamsters (8 males, 2 females) were microinjected with 200nL of AVP, and 1 female was injected with 200nL of Angiotensin. Hamsters were also microinjected with 200nL of normal saline, which served as the control condition. Following microinjections, hamsters were placed in an apparatus and recorded using ANY-maze software for behavior observation. After finishing behavior observation, animals were anesthetized, and brains extracted. Brains were placed in 10% Formalin and later moved into 30% sucrose solution. Brains were then sliced using a cryostat and mounted onto microscope slides. Tissues were stained with toluidine blue to facilitate identification of cannula placement.

**Results:** Six out of the 11 hamsters (1 Female, 5 Males) were placed in an apparatus one minute after the microinjections. Hamsters were tested to quantify flank marking, which is a type of social communication behavior; 3 out of 6 hamsters microinjected with AVP showed expressions of flank marking and flank grooming. While the other 3 hamsters did not express any flank marking or flank grooming. When microinjected with normal saline, all 6 animals showed zero expression of flank marking. Social interaction tests with cannulated and non-cannulated hamsters was also conducted but video scoring is pending.

**Conclusions:** This study has shed light on the important impact hormones play in behavioral outcomes. By targeting brain regions and neural circuits we can come closer to finding interventions for neurological and psychiatric disorders using hormones. In addition to behavioral tests, immunohistochemistry will also be conducted in future dates as well as increasing our sample size for the behavioral studies.