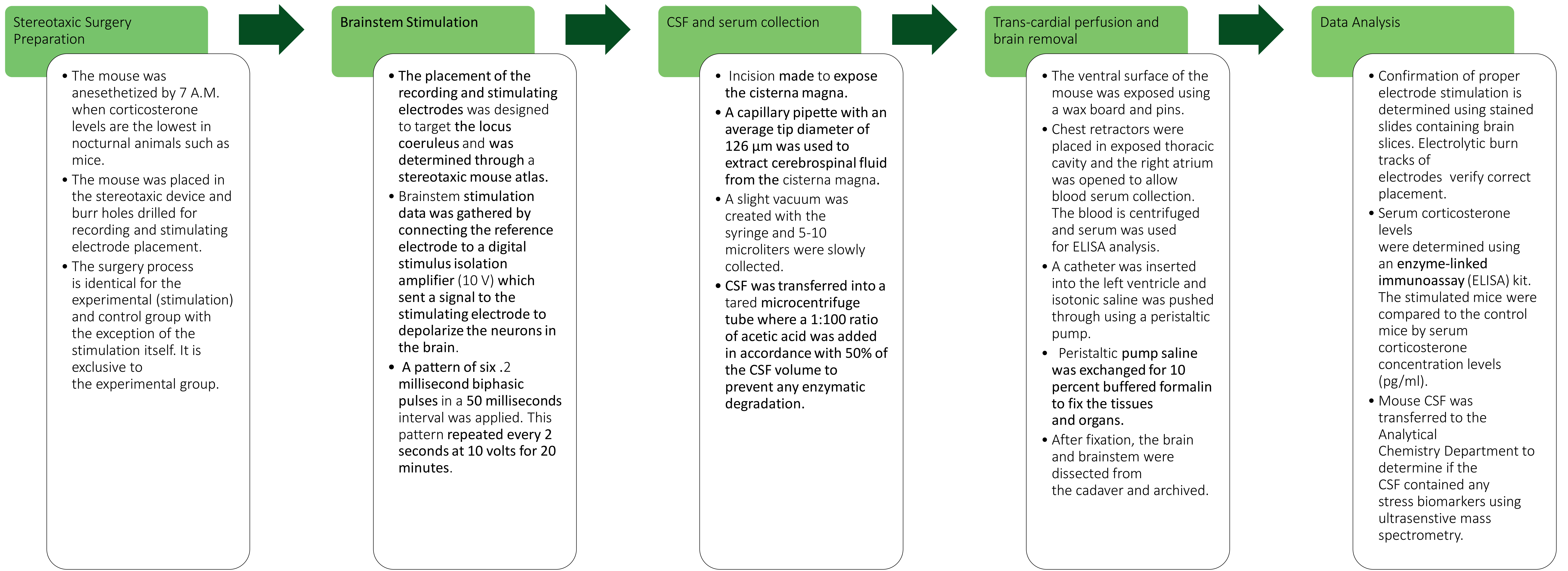
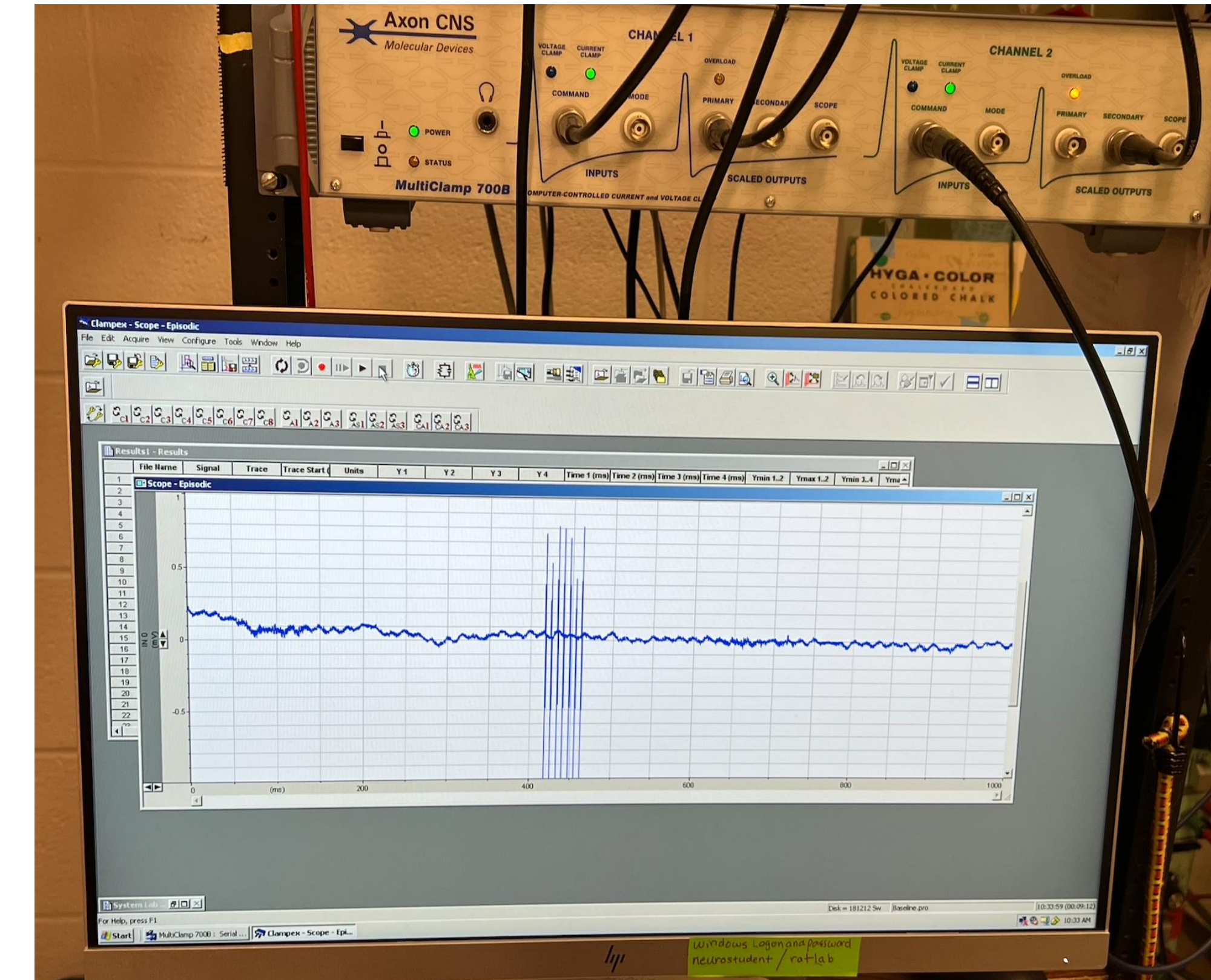


Identifying Stress Biomarkers in Mouse Serum and Cerebrospinal Fluid through Electrode-based Brainstem Stimulation

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Abstract:
Stress is a physiological response that is unavoidable in life. Currently, the understanding of the brainstem interaction in the stress response and subsequent stress biomarker production are not clearly defined in recent literary works. This poster aims to connect the brainstem nucleus locus coeruleus to a stress response following electrode-based stimulation. We hypothesized that locus coeruleus stimulation would result in higher stress hormone production of corticosterone in mice. The cerebrospinal fluid (CSF) collected from the mice was analyzed using a mass spectrometer to detect other inflammatory compounds by Cleveland State's Analytical Chemistry Department. Samples of serum were collected and used in an enzyme-linked immunoassay (ELISA) kit to measure corticosterone levels; a product of stress responses released by the adrenal cortex. The fixed brain was later sliced via cryostat and stained on a frosted slide to confirm the accurate placement of the electrodes. The overall hypothesis for the experiment was that stimulated mice would have higher corticosterone serum levels when compared to controls (non-stimulated mice). Currently, additional cryostat slicing, staining, and ELISA assays are needed to optimize experimental results. After investigating the locus coeruleus in these stress hormone experiments, the long-term goal of the lab is to make a direct connection between the brainstem and inflammatory compounds that exacerbate cochlear auditory dysfunction.



Results:

- 90% confidence interval used to analyze significance between control and stimulated mice
 - Significance confirmed by the rho value of $\rho=.04$ (significant $p<.05$)
- Top stained slide: Mouse #61
 - Stimulating electrode burn hole in proper location for locus coeruleus stimulation at -5.40 mm posterior location from bregma landmark.
 - Mouse atlas included to show the locus coeruleus in a coronal slice at -5.40 mm posterior from bregma.

