

## Evaluation in the Monoamine Concentrations and Microglia Morphology in the Locus Coeruleus of Female Ovariectomized Rats Submitted to Hypercapnia

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**Introduction:** Ovariectomy reduces the hypercapnic ventilatory response and Locus Coeruleus (LC) appears to be involved in this response. Sex hormones as well as CO<sub>2</sub> can act in neurons of LC and also in microglial cells, however what these stimuli promoted in LC monoamine concentrations and microglial morphology is still unknown.

**Objective:** To evaluate monoamine release in the LC, we measured the concentration of norepinephrine (NE), serotonin (5-HT) and dopamine (DA), and the metabolites 5-hydroxyindoleacetic acid (5HIAA; metabolite of 5-HT) and 5-hydroxyphenylacetic acid (DOPAC; metabolite of DA) in the LC, by HPCL method.

**Material and Methods:** Protocols were approved by the local Animal Care and Use Committee (protocol no 8.129/16). For LC microglial analysis, we used ionized calcium-binding adapter molecule-1 (Iba1) immunolabeling to compare the density and morphology of microglia in the LC of OVX and intact female rats during normocapnia or hypercapnia (5%CO<sub>2</sub>). Protocols were approved by Laval University Animal Care Committee (Permit Number: 2012-023).

**Results:** No significant differences were found in the quantification of the monoamines analyzed as well as their metabolites in OVX female rats compared to intact animals during normocapnia and hypercapnia. Regarding microglia cells in the LC, we observed an increase on morphological index, that indicates a reactive form of the cell, of OVX animals, and also an increase in the nearest neighbor distance (NND) caused by hypercapnia, which may indicate a higher motility of those cells.

**Conclusions:** OVX and hypercapnia can affect microglial cells of LC but not monoamine concentrations.

**Keywords:** Locus coeruleus, ventilatory response, hipercapnia, female, sex hormones.

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