**INTRODUCTION**

Atrial chemoreceptors sense blood oxygen and send afferent information to the nucleus tractus solitarii (nTS) in the brainstem to elicit cardiorespiratory responses. The primary pathway contributing to this cardiorespiratory response involves projections from the atrial chemoreceptors to the nTS. This neural pathway is also essential to other important functions, such as cardiovascular responses to hypoxia, which is a key factor in the pathogenesis of cardiovascular disease.

**RESULTS**

**PVN neurons project to the nTS**

- A. Rostral-caudal distributions of identified PVN neurons
- B. Phenotypes of nTS-projecting neurons
- C. Percent of each phenotype that projects to the nTS
- D. Percent of nTS-projecting PVN neurons of a given phenotype

**CRH- and nNOS-IR nTS-projecting PVN neurons are activated by hypoxia**

- A. Percent of identified phenotypes activated by hypoxia
- B. Percent of nTS-projecting phenotypes activated by hypoxia

**HYPOTHESES**

- **Hypothesis 1:** nTS-projecting PVN neurons are activated by hypoxia
- **Hypothesis 2:** Merging PVN neurons includes CRH, nNOS, Oxy, and AP-IR neurons

**METHODS**

- **Activation:** Male Sprague-Dawley rats (250-350g) were used.
- **Microinjection:** Microinjection neurotrophic factor (NTF) was used to label the nTS.
- **Examination:** Fos, a protein expressed when cells are activated, was used to study the activation of the nTS by hypoxia.

**SUMMARY, CONCLUSIONS and FUTURE DIRECTIONS**

- **Summary:**
  - Hypoxia activated the PVN shown by an increase in Fos-IR after two hours of hypoxia versus normoxia.
  - No-IR cells were not significantly activated by two hours of hypoxia.
  - A greater percent of nTS-projecting CRH- and nNOS-IR cells were activated by hypoxia.
  - Cells that were not significantly activated by hypoxia and no AP-IR cells were also not activated.

- **Conclusions:**
  - These neurons were found in the rostral PVN.
  - Hypoxia activated nTS-projecting neurons that were found in the rostral PVN.
  - The phenotypes of the nTS-projecting neurons were primarily CRH- and nNOS-IR.
  - The highest percent of nTS-projecting neurons were CRH- and nNOS-IR.

- **Future Directions:**
  - Examine the activation of nTS-projecting PVN neurons that display both CRH- and nNOS-IR.
  - Determine the extent to which these cells play a role in the chemoreflex response to hypoxia.

**FIGURES**

- Fig 1. Verification of bilateral nTS injections and PVN implants
- Fig 2. PVN neurons project to the nTS
- Fig 3. Hypoxia activates nTS-projecting PVN neurons.
- Fig 4. CRH- and nNOS-IR PVN neurons are both activated by hypoxia and project to the nTS.
- Fig 5. Hypoxia activated PVN and nTS-projecting PVN neurons expressing both CRH- and nNOS-IR.