Robust control of the cardiovascular system requires two general brain pathways: feedforward, i.e. central commands (efferent) and sensory feedback (afferent), i.e. reflex control. The baroreceptor reflex (BRx) is essential for circulatory homeostasis in autonomic control of cardiovascular function.

**Clinical significance of the baroreflex (BRx) is well known:**
- Heart failure is a disease categorized by sympathetic hyperactivity, parasympathetic withdrawal, and impaired BRx control of sympathetic activation. (Shen & Zipes, 2015)
- BRx dysfunction is implicated in neurally mediated syncope, dysrhythmias and orthostatic hypotension. (Costil, 1994; Armour, 2004; Low, 2015)
- Impaired BRx sensitivity (BRS) and increased heart rate variability (HRV) suggest an increased risk of sudden cardiac death. (Monahan, 2007)

**Many clinically relevant questions remain concerning sex (gender) and sympathovagal balance:**
- Major differences in cardiovascular disease exist between men and women. (Regitz-Zagrosek and Kararigas, 2017)
- Parasympathetic markers for HRV and BRx differ between males and females. (Seave, 2001; Christou, 2003)
- Regulation of cardiovascular function differs between men and women. (Huxley, 2007)

The Schild lab was first to experimentally validate:
- An afferent explanation for sexual dimorphism in the baroreflex. (2014)
- Differential distribution of voltage-gated channels in myelinated and unmyelinated baroreceptor afferents extends to gender. (2012)
- Electrophysiological and neuroanatomical evidence of sexual dimorphism in baroreceptor neuron function. (2008)

The Schild lab utilizes a synergistic combination of in vitro, in situ, and in silico methodologies to study sexual dimorphism in the neural coding of blood pressure dynamics and BRx function.

**Regulation of cardiovascular function differs between men and women.** (Huxley, 2007)

**Sex differences in baroreflex (BRx) function are well documented.**
- Hormones likely contribute to this dimorphism, but many functional aspects remain unresolved. Our lab has been investigating a subset of vagal sensory neurons that constitutes nearly 50% of the total population of myelinated aortic baroreceptors (BR) in female rats but less than 2% in male rats. Termed "Ah," this unique phenotype has many of the nonoverlapping electrophysiological properties and chemical sensitivities of both myelinated A-type and unmyelinated C-type BR afferents. We utilize three distinct experimental protocols to determine if Ah-type barosensory afferents underlie, at least in part, the sex-related differences in BRx function.
- Electron microscopy of the aortic depressor nerve (ADN) revealed that female rats have less myelin (P < 0.03) and a smaller fiber cross-sectional area (P < 0.05) per BR fiber than male rats. Termed "Ah," this unique phenotype has many of the nonoverlapping electrophysiological properties and chemical sensitivities of both myelinated A-type and unmyelinated C-type BR afferents. We utilize three distinct experimental protocols to determine if Ah-type barosensory afferents underlie, at least in part, the sex-related differences in BRx function.
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