

# **Respiratory-sympathetic interactions: Yet another baroreflex pathway?**

## **Insights from computational modeling**

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The sympathetic nerve activity (SNA) is modulated by respiratory activity which indicates the existence of direct interactions between the respiratory and sympathetic networks within the brainstem. Our experimental studies reveal the respiratory phase- and pontine-dependent effects of baroreceptor stimulation on the respiratory pattern and the respiratory modulation of SNA. This suggests that the sympathetic baroreceptor reflex, providing negative feedback from baroreceptors to the rostral ventrolateral medulla and SNA, has two pathways: one, independent of the respiratory-sympathetic interactions, and the other operating via the respiratory pattern generator and hence dependent on the respiratory modulation of SNA. Our experimental studies in the perfused in situ rat preparation and complementary computational modelling studies support the hypothesis that baroreceptor activation during expiration prolongs the expiratory phase via activation of the post-inspiratory neurons of the Bötzing Complex. We propose that these Bötzing Complex neurons are also involved in the respiratory modulation of SNA, and hence contribute to the sympathetic baroreceptor reflex.