Age- and sex-dependent expression of estrogen receptors in vomeronasal sensory neurons.

Mary P. Struziak[1] and Rona Delay[1]
[1]Department of Biology, University of Vermont

In most mammals, the vomeronasal organ (VNO) plays a critical role in pheromone detection and mediates conspecific interactions such as mate recognition and aggression. The VNO contributes to odorant-driven behavioral responses by the binding of chemical stimuli to select receptors on vomeronasal sensory neurons (VSN)s. Estrogen, a gonadal steroid hormone, has been observed to attenuate chemosensory responses in VSNs (Cherian, 2014). However, our previous work only examined estrogen receptor expression and function in adult animals. As gonadal steroid hormones produce age-dependent behavioral changes in both male and female mice, we hypothesized that there would be a critical point in development when the classical estrogen receptor ERα is expressed and can contribute to chemosensory signal transduction. We set out to investigate the expression of ERα receptors in VSNs during different stages of development in both male and female mice. These included 2.5 weeks (pre-weaning), 4-6 months (active reproduction) and 1 year (sexual decline/menopause in females). Following dissection of the VNO from the mouse, immunohistochemistry was used to observe ERα expression. Qualitative analysis of sections across each age group **in both sexes** indicated a decrease in labeling of Era in mice of 2.5 weeks compared to older mice. These results suggest that the capability of estrogen to modulate chemosensory signal transduction in VSNs develops alongside sexual maturity in mice. Furthermore, these results provide evidence for the importance of estrogen in modulating age-dependent behavioral changes that are driven by odorants. Currently, we are investigating the possible age-dependent correlation in expression of ERα with the non-classical estrogen receptor GPR30 in VSNs.