

## Molecular mechanisms of odor sensing in the mouse

The peripheral olfactory system in mice consists of several subsystems including the main olfactory epithelium (MOE), the vomeronasal organ (VNO), the Grueneberg ganglion and the septal organ of Masera. Each of these subsystems projects to different parts of the brain, detects a specific set of chemosensory signals, employs distinct signaling pathways, and controls distinct behavioral repertoires. A main focus of this work is the analysis of chemo-electrical signaling pathways of the olfactory and vomeronasal sensory neurons. The ion channels and second messenger pathways that contribute to the activation, adaptation and propagation of odor- and pheromone-induced electrical signals are incompletely understood. It appears that these mechanisms are highly different between olfactory subsystems. These questions are investigated in the native olfactory system of wildtype or gene-targeted mice by using a wide variety of methodological approaches, from high-resolution electrophysiological and imaging techniques in acute tissue slices to in vivo analysis in behaving mice. A long-term goal of this work is to understand to cellular and molecular mechanisms that underlie mammalian chemical communication.