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Abstract

[Back to Hit List](#)**Grant Number:** 1R01DC003452-01**PI Name:** MOMBAERTS, PETER**PI Email:** peter@rockefeller.edu**PI Title:** ASSISTANT PROFESSOR**Project Title:** OLFATORY RECEPTOR AND CONNECTIVITY

Abstract: DESCRIPTION: The initial step in olfactory discrimination involves the interaction of odorous ligands with olfactory receptors on the surface of olfactory sensory neurons. In mice the repertoire of olfactory receptor genes is comprised of more than 1,000 genes, each of which encodes a seven-transmembrane protein. A single olfactory neuron expresses a single olfactory receptor gene. Neurons expressing a given receptor are scattered over a large part of the olfactory epithelium, yet their axons converge on two discrete loci, called glomeruli, in the olfactory bulb. This is the first relay station where olfactory information is processed. The position of these glomeruli is invariant and this topographical organization poses a formidable wiring problem. The objectives of this lab are to unravel the wiring problem in the olfactory system, using this as a model system to study axonal guidance. In preliminary studies the PI has developed a genetic approach to visualize individual axons of olfactory sensory neurons, marked with tau-lacZ, as they project from the epithelium to the bulb. These experiments have led to the hypothesis that the olfactory receptor plays a role in the guidance process that establishes the precise connections between neurons expressing the same receptor and their glomerular targets in the bulb. The specific aims of this proposal are to study 1) the development of neurons expressing a given receptor, 2) to determine if expression of a functional olfactory receptor is required for axonal convergence, 3) to examine the subcellular localization of receptors during migration and 4) to examine the consequences on pathfinding, of swapping one receptor with another.

Thesaurus Terms:

developmental neurobiology, neurogenesis, olfactory nerve (I), receptor, receptor expression

growth cone

laboratory mouse, tissue /cell culture, transgenic animal

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