

**Poster: 47**

**Modeling axon guidance and target recognition in the mouse olfactory system**

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This project employs a multi-disciplinary, collaborative approach towards understanding axon guidance in the mouse olfactory system. A basic model incorporates the existence of both general guidance cues that promote axonal outgrowth and specific guidance cues that mediate target selection. Over the past decade, a large number of genes involved in guidance have been identified that are expressed by olfactory sensory neurons (OSNs) or along the path they traverse towards the bulb. However, the role of the target structure itself, the olfactory bulb, in guidance is still unknown. In one model, the bulb does indeed provide targeting information to OSNs, and genes are hypothesized to exist within the bulb that are spatially restricted in expression (e.g. expression occurs dorsally but not ventrally). This restricted expression would act to molecularly differentiate regions of the bulb from one another, and provide guidance information to OSNs expressing appropriate receptors. To identify these putative bulbar cues, laser microdissection was used to isolate small regions of tissue from throughout the anterior-posterior, medial-lateral, and dorsal-ventral extent of the bulb. After RNA amplification and hybridization to microarrays, statistical and computational approaches were employed to recreate the three dimensional pattern of gene expression for each gene on the array. Those genes that were predicted to be differentially expressed within this spatial reconstruction were then confirmed by RNA *in situ* hybridization. Twenty seven such genes have been identified, demonstrating that the bulb is molecularly heterogeneous. These genes therefore represent candidate targeting cues that may provide guidance information to OSNs.

**Project (or PI) website**

<http://www.biozon.org>

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