Title
Requirement for Fgf8 in olfactory neurogenesis.

Journal
DEVELOPMENTAL BIOLOGY, 247(2)

ISSN
0012-1606

Authors
Kawauchi, S
Shou, J
Calof, AL

Publication Date
2002

274. **Requirement for *Fgf8* in Olfactory Neurogenesis.** S. Kawauchi, J. Shou, and A. L. Calof. Department of Anatomy and Neurobiology and Developmental Biology Center, University of California, Irvine, California.

The ability of mouse olfactory epithelium (OE) to generate neurons throughout life suggests that endogenous proliferative signals drive OE neurogenesis. Studies in our lab have shown that fibroblast growth factors (FGFs) promote proliferation of both OE stem cells and immediate neuronal precursors (INPs), cells that give rise to olfactory receptor neurons (ORNs). Here, we sought to determine if the hypothesized endogenous stimulatory signal in OE is FGF8. Fgf8 is expressed in a "rim" of epithelium outlining the developing olfactory pit at E10.5; by E14.5, *Fgf8*+ cells are found throughout the OE. Since this pattern is suggestive of a role for *Fgf8* in OE neurogenesis, we performed tissue culture assays in which OE explants were treated with recombinant FGF8. The results indicate that FGF8 stimulates proliferation of OE stem cells and INPs *in vitro*. To determine if *Fgf8* regulates neurogenesis *in vivo*, we generated mice with *Fgf8* inactivated in the Bf-1 (*Foxg1*) domain. Pronounced defects in forebrain and facial structures were observed from E9.5 onward. Normal numbers of neuronal progenitors (*Mash1*+ and *Ngn1*+) and ORNs (*Ncam*+) were present in olfactory pit at E10.5. However, at E17.5 no neuronal cells were evident in the epithelium lining the nasal cavity, itself much smaller than normal. These results suggest that *Fgf8* is not required for determination of the OE neuronal lineage, but is necessary for neurogenesis to be maintained. Current experiments seek to identify the developmental stage at which the requirement for *Fgf8* becomes evident. (Supported by NIH (DC03583 and HD38761) and March of Dimes. S.K. is a Human Frontier Science Program Fellow.)