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323. Fibroblast Growth Factor 8: A Crucial Signaling Molecule for Olfactory Epithelium Neurogenesis. Rosaysela Santos, Shimako Kawauchi, and Anne L. Calof. Univ. of California, Irvine.

Signaling molecules of the fibroblast growth factor (FGF) family have been shown to promote neurogenesis in vitro. Among FGFs, Fgf8 has been shown to be important for development in neural regions, but its mechanism of action is unclear. To understand this, we are investigating the role of Fgf8 in the olfactory epithelium (OE). The OE is a useful model system to study neurogenesis because neural development proceeds in a linear fashion in which each stage of the lineage can be identified. FGFs promote proliferation of olfactory stem cells in vivo, suggesting that FGFs have a regulatory role in OE neurogenesis, however, the identity of FGFs crucial roles for this process in vivo have not been investigated. To study the role of Fgf8 in the OE, we used a genetic approach in which the Fgf8 gene becomes inactivated at the earliest stage of OE development. These Fgf8^{fllox/D23};Foxg1^{+/cre} (mutant) mice showed strong defects in several neural regions including the OE. Using in situ hybridization, we found that cells of the OE neuronal lineage are initially produced in mutant mice during development (e10.5), but then fail to develop, indicating that Fgf8 is required for OE neurogenesis. To test the hypothesis that OE neuronal cells require Fgf8 for survival, we performed TUNEL assays to identify apoptotic cells. A large increase in the number of TUNEL⁺ cells was found in the OE of mutant mice when compared to their wild-type littermates at e10.5, and this increase in apoptotic cells is maintained in the mutant mice until approximately e14.5. These results suggest that Fgf8 is a crucial signaling molecule for OE neurogenesis.^Δ