

POS-THU-06**OLFACTORY GLIA ENHANCE NEONATAL AXON REGENERATION**

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Olfactory ensheathing cells (OECs) migrate with olfactory axons that extend from the nasal epithelium into the olfactory bulb. Unlike other glia, OECs are thought to migrate ahead of growing axons instead of following defined axonal paths. However it remains unknown how the presence of axons and OECs influences the growth and migration of each other during regeneration. We have developed a regeneration model in neonatal mice to examine whether (i) the presence of OECs ahead of olfactory axons affects axonal growth and (ii) the presence of olfactory axons alters the distribution of OECs. We performed unilateral bulbectomy to ablate olfactory axons followed by methimazole administration to further delay neuronal growth. In this model OECs filled the cavity left by the bulbectomy before new axons extended into the cavity. We found that delaying axon growth increased the rate at which OECs filled the cavity. The axons subsequently grew over a significantly larger region and formed more distinct fascicles and glomeruli in comparison with growth in animals that had undergone only bulbectomy. In vitro, we confirmed (i) that olfactory axon growth was more rapid when OECs were more widely distributed than the axons and (ii) that OECs migrated faster in the absence of axons. These results demonstrate that the distribution of OECs can be increased by repressing by growth of olfactory axons and that olfactory axon growth is significantly enhanced if a permissive OEC environment is present prior to axon growth.