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Transplanted olfactory mucosal cells restore function without regeneration of severed corticospinal tract fibres

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> ABSTRACT

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Previous studies from our laboratory reported that transplantation of a mixture of 50% p75+ olfactory ensheathing cells (OECs) and fibroblasts derived from the outer layers of the adult olfactory bulb into unilateral lesions of the rat corticospinal tract (CST) restore function in a directed fore-paw retrieval task and induce regeneration of severed CST axons across the lesion.

For future clinical application it would be preferable to obtain reparative cells from an olfactory mucosal biopsy via intranasal endoscopy rather than requiring the more invasive intracranial approach to remove an olfactory bulb. With this purpose, we used our original CST lesions paradigm to examine whether mucosal OEC preparations can provide a similar repair to those from the bulb.

We found that, as in the case of bulbar OEC preparations, the mucosal cells also restored directed fore-paw retrieval. Surprisingly, however, there was no evidence of any of the severed CST axons crossing the lesion site, suggesting that the recovery of function is due to some other reaction, such as sprouting of damaged or undamaged fibres.

Compared with the previous findings with bulbar cells, the mucosal cell cultures contained only 5% of OECs and a conversely much larger proportion of fibroblasts.

These cell preparations showed minimal migratory ability and failed to form complete bridges across the lesions.