Connectivity of Neocortical Transplants Placed into the *N*-Methyl-D-Aspartate (NMDA) Ablated Cortex of Adult Rats

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In comparison to previous studies on the connectivity of neocortical transplants placed into cortical aspiration lesions made in newborn or adult recipients, the present experiment used adult hosts with excitotoxic cortical lesions. In this work, fetal sensorimotor cortex was transplanted as block grafts into the sensorimotor cortical region of adult rats that sustained *N*-methyl-D-aspartate (NMDA) induced cortical lesions eight days before grafting. Transplant afferents and efferents were examined 3-6 months later by injecting retrograde (fast blue and diamidino yellow) or anterograde (*Phaseolus vulgaris* leucoagglutinin, PHA-L) tracers into the grafts. Histological analysis verified whether the injections were confined to the transplants.

Fluorescent labeled neurons were found in several areas of the host brain, providing evidence of host projections to the transplants (Fig.). Such labeled cells were observed in the ipsilateral cerebral cortex as well as in subcortical areas such as zona incerta, claustrum, hypothalamus, thalamus, nucleus basalis, dorsal raphe and locus coeruleus. Immunoreactive PHA-L labeled fibers were observed extending throughout the grafts, but few fibers were observed to exit the transplants and project into the host parenchyma immediately adjacent to the transplants.

These results demonstrate that block grafts placed in excitotoxically ablated adult rat somatosensory cortex receive afferent input from sources normally projecting to the area in which the transplant is located. Previous work showed only sparse thalamic inputs to grafts placed into cortical aspiration lesions made in adult hosts. Presumably, the axon-sparing nature of excitotoxic lesions promoted the establish-

Distribution of retrogradely labeled neurons (dots) after injection of fast blue into the transplant.

ment of the thalamic inputs. Efferent outgrowth, however, was limited to areas adjacent to the grafts suggesting that some environmental influence may arrest axonal growth into the host brain. This observation stands in contrast to previous findings of axonal growth from neocortical tissue grafted into newborn recipients.

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