THE RETROSPLENIAL CORTEX:

AFFERENT PROJECTIONS AND CHOLINERGIC PROPERTIES

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VI. SUMMARY

This series of studies was undertaken to clarify and uncover anatomical and neurochemical aspects of the RSC. To this end lesion techniques, AChE histochemistry, retrograde fluorescent tracing, neurotransplantation, and neurochemical assays were combined in various ways to clearly demonstrate the sources of CNS afferent projections to the RSC, characterize the cholinergic properties of the RSC, determine the pathways of cholinergic projection to the RSC, and assess the properties of cholinergic reinnervation of the denervated RSC by fetal cell transplants.

These studies have confirmed the validity of previously reported major sources of afferent projections to the RSC. Also, several new hypothalamic and brainstem nuclei have been demonstrated to project to the RSC, including potential sources of cholinergic, dopaminergic, and enkephalinergic terminals. Cholinergic terminals in the RSC as displayed by AChE were demonstrated to be an inaccurate representation of the cholinergic system, as the prominent features of AChE histochemistry in this area were demonstrated to be caused by non-specific cholinesterase projections from the thalamus. Cholinergic neurochemical markers demonstrated more accurately the normal functioning of the cholinergic system in this region. The previously reported cholinergic projection from the MSN, VDB, and HDB

via the cingulate bundle was verified in this report, and in addition, the fornix was also demonstrated to mediate a projection from these nuclei. The cholinergic nature of the fornix projection was substantiated using the post lesion measure of cholinergic neurochemical markers. Finally, cholinergic transplants into the RSC were evaluated histologically and neurochemically, and were noted to survive, extend fibers, and partially restore cholinergic function to the denervated RSC.