RIBAK, Charles E., Division of Neurosciences, City of Hope National Medical Center, Duarte, California. Immunoc tochemical localization of lutamic acid decarbox lase GAD in the rat corpus striatum.

Glutamic acid decarboxylase (GAD), the enzyme that synthesizes the neurotransmitter, GABA, was immunocytochemically localized in neurons of the rat striatum and pallidum. Sections incubated in the immunochemical reagents were selected from colchicine-injected and non-injected preparations of the corpus striatum. In the non-injected preparations, GAD-positive axon terminals were observed to form symmetric and asymmetric synaptic junctions. The number of GAD-positive axon terminals per unit area was greater in the pallidum than in the striatum, and the pattern of GAD-positive terminals associated with dendrites of pallidal neurons resembled the pattern observed for GAD-positive axon terminals in the substantia nigra. Colchicine injections were made into the corpus striatum in order to cause an interruption of axonal transport so that GABAergic neurons would accumulate detectable concentrations of GAD within their somata and dendrites. Sections of these preparations revealed GAD-positive somata in both the striatum and pallidum. The GAD-positive somata of the striatum were medium-sized neurons with round or fusiform shapes. GAD-positive reaction product was observed in the perikaryal and dendritic cytoplasm of these neurons and it also extended into dendritic spines. These observations are consistent with results of studies which have indicated that medium-sized, spiny striatal neurons give rise to a GABAergic striatonigral pathway. The GAD-positive somata in the globus pallidus were medium-sized neurons, and these neurons may also provide GABAergic afferents to the substantia nigra.

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