A Cytological Study of the Effect of Re-Innervation and Cross-Innervation on Rat Striated Muscle

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The changes of rat striated muscle fiber structure and fiber types after the reunification of the sciatic nerve and cross-innervation between the nerve to M. soleus (SOL) and M. extensor digitorum longus (EDL) were cytologically studied and the following results were obtained:

1. After the re-unification of the nerve, the tendency toward grouping to a single fiber type was observed, although in normal muscle, the red, white and intermediate fibers were distributed in mosaic pattern.

2. After the cross-innervation the changes of fiber types occurred, namely, in SOL, normally composed of red and intermediate fibers, the three types of fibers appeared after the cross-innervation with the nerve to EDL, which was originally composed of the red, white and intermediate muscle fibers, and vice versa. These changes were observed not only in histochemical sections of succinic dehydrogenase or Sudan black B staining but also in the ultrastructural level by electron microscope.