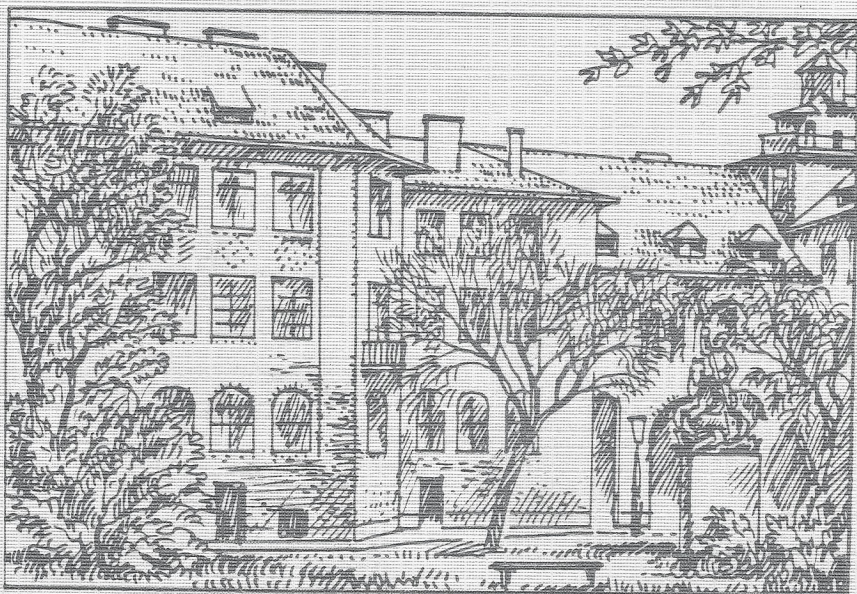




INTERNATIONAL SYMPOSIUM ON ADAPTIVE MECHANISMS OF MUSCLE



2-5 JULY 1986 SZEGED
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INTERNATIONAL SYMPOSIUM ON ADAPTIVE MECHANISMS
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INDUCTION OF STRIATED MUSCLE REGENERATION BY MYOGENIC CELLS AUTOGRAFTED IN RATS

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We know from the experiments of Studitsky and Carlson that striated muscle is endowed with a powerful capacity of regeneration. However, regeneration is never complete after a severe trauma. A possible explanation could be an insufficient number of viable myogenic cells inside the injured muscle itself. We tested this hypothesis, using adult Wistar rats the triceps surae of which were minced and orthotopically autografted. The extent of regeneration was measured physiologically (mechanical properties of the regenerates), histologically and biochemically (creatine dosages, protein contents and lactico-dehydrogenase activity).

If all the cells present in a mince were killed by a freeze and thaw procedure (devitalization of the mince), there was no muscle regeneration. If only half of them were killed, regeneration was also halved. Regeneration was thus depressed when the initial number of myogenic cells was diminished. If a devitalized mince was seeded with cells isolated from the contralateral muscle, regeneration occurred, although it was low. Grafted myogenic cells were thus able to regenerate muscle fibres by themselves. If a viable mince was seeded with such isolated cells, regeneration was not improved.

We conclude that in situ myogenic cells are essential to muscle regeneration and that their number determines the extent of the response when they are located inside the basal lamina. Despite that myogenic cells are able to regenerate muscle fibres by themselves, they do not improve regeneration when added to an injured muscle, likely because they are located outside the original endomysial tubes and thus cannot fuse easily with surviving muscle fibres.