
ELECTRICAL STIMULATION OF PARTIAL LIMB REGENERATION IN MAMMALS

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SELF-REPAIR is a primary property of living systems. It reaches its highest expression in the regenerative growth processes evidenced by some of the amphibians, which are capable of the regrowth of a complete and fully organized vertebrate extremity containing varied tissues. Unfortunately man retains only vestiges of this capability; in man true regenerative healing occurs only in fractures. All other processes of repair in man demonstrate less competent mechanisms, including scarification or the simple enhancement of normal processes of cellular replacement.

It is important to characterize true regenerative growth accurately as the process that begins with the formation of a blastema. This mass of primitive and apparently undifferentiated cells formed by a variety of cellular processes can differentiate into the complete range of cell types necessary to replace the missing part. Following the formation of the blastema, mitotic activity rapidly produces the cellular mass necessary for replacement; a wave of differentiation producing the complex missing structure begins proximally and extends distally from the original site of injury. Obviously this is a highly effective process. If it could be restored to man, it would be of very great value, not only in replacing the complex parts of an extremity, but perhaps more importantly in the

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