

Regeneration in Amphibia  
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During the summer of 1960 the following experiments were undertaken on Amblystoma tigrinum melanosticum:

1. Since work done at the Station in six previous summers has indicated that limb regeneration in amphibians is initiated by an epidermal cap formed at the wound surface, the investigations of the present summer were concerned, in part, with analyzing the activity of the epidermal cap in controlling regenerative outgrowth.

First, the epidermal caps of A. tigrinum larvae were transplanted to the base of the limb blastema in 100 cases. As controls, 50 larvae received whole skin transplants to the base of the blastema. Results are still being recorded but approximately 12 per cent of the grafted caps induced extra regenerative outgrowth while the remaining cases showed a fusion of the implant cap and the host cap so that a unified regenerative outgrowth was produced.

Secondly, in order to avoid the complications arising from grafting the caps, the host epidermal cap was split in half and the two halves kept separated by a graft of whole skin placed in the groove between them. Again, results are still being recorded but approximately 45 per cent of the split caps remained well separated and each half gave rise to a limb outgrowth. As controls, 60 larvae underwent a splitting of the blastema, but not of the cap, and whole skin was grafted to the pocket made in the blastema. These regenerated quite normally.

2. In a second series of experiments, tritiated thymidine was injected into larvae at various stages of regeneration. Thus, in one group the 6-day epidermal cap was shifted to the posterior border of the limb tip just before thymidine injection. Cells in mitosis alone are labeled. The purpose of the experiment was to determine if the cap influenced mitosis or migration of blastema cells, or both. Larvae were preserved at intervals of 3, 9, 18, 24, and 48 hours after injection. The changed position of the cap should produce a change in orientation or mitotic pattern, or both in the blastema cells as seen in autoradiographs. The histology will be done this fall.

Facilities and working conditions have been excellent at the Station.

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