

Evidence of Direct Hormonic Influence on Growth and Differentiation of Frog's Tongue During Metamorphosis.

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During metamorphosis, the tongue anlage of the tadpole undergoes rapid growth and differentiation. Autoplastic transplantations of the anlage to the musculature of the back of metamorphosing and normal *Rana pipiens* tadpoles were made, to determine whether normally adjacent structures of the mouth influence the development of the tongue, or whether differentiation is due to direct hormonic (thyroid) control.

Growth of the anlage transplanted to the back was apparent in over 90% of the cases during metamorphosis, and produced distinct bulging of the integument of the back. In many cases growth resulted in the formation of tissue 8 to 12 times greater in volume than that of the original anlage. The tissue masses were generally oval in shape.

Histological sections of the grafts exhibited the differentiation of typical tongue elements to a considerable extent. These included the formation of a mucous membrane containing both filiform and fungiform papillae. Muscle fibers and mucous glands were also fully developed. All grafts appeared fairly well vascularized and in some, slight movement or twitching occurred indicating, possibly, some degree of innervation.

Macroscopically, the grafts never attained the typical elongated and forked appearance of the normal tongue. This was probably due to a decreased rate of growth and differentiation, coupled with the limited time available for growth before the death of the animal at the close of metamorphosis.

The results indicate that growth and differentiation of the tongue is controlled directly through hormonic influences (probably of the thyroid gland) operating through the blood supply to the anlage. This seems logical in view of the fact that the tongue anlage requires only an adequate blood supply for growth and differentiation, and is not dependent on the possible influence of normally adjacent structures of the buccal cavity. Failure of growth or differentiation when transplanted to other regions would have strongly indicated a secondary influence. Since the reverse was found to be true, however, direct hormonic influence through the blood stream would appear to be responsible.