

Molecular Mechanisms Specifying Cell Identity in the Regenerating
Adult Urodele Limb- Robert Blassberg

Abstract

Urodele amphibians such as the newt are able to regenerate a variety of missing body structures, one of the most anatomically complex being the limb. When lost, sections are replaced such as to regenerate all and only those missing in order to reconstruct the limb. How it is that the cells remaining in the amputated stump of the limb encode positional information able to direct growth of appropriate structures is poorly understood, however one candidate molecule exists which may prove central to the dissection of the processes involved.

Prod1 is a molecule which is found expressed on the surface of limb cells in a gradient, being highest proximally, and when overexpressed in blastemal cells is able to re-specify cells to more proximal identities. Prod1 is anchored to the membrane by a Guanosyl-Phosphatidyl-Inositol anchor and as such is not directly linked to the cytoplasm making the mode by which it signals unclear.

Prod1 is a member of the Ly-6 family of proteins, of which a number associate with the Epidermal Growth Factor Receptor. On this premise an investigation has been undertaken to determine whether Prod1 also associates with the EGFR and furthermore, whether it signals via the EGFR phosphorylation cascade in order to mediate cell identity.