Primary paper for discussion

Development 134, 1323-1335 (2007) doi:10.1242/dev.02812

H^+ pump-dependent changes in membrane voltage are an early mechanism necessary and sufficient to induce *Xenopus* tail regeneration

Dany S. Adams, Alessio Masi and Michael Levin*

Potentially useful reviews

Review TRENDS in Cell Biology Vol.17 No.5

Large-scale biophysics: ion flows and regeneration

Michael Levin

Center for Regenerative and Developmental Biology, Forsyth Institute and Developmental Biology Department, Harvard School of Dental Medicine, Boston, MA 02115, USA

J Dent Res. 2008 September ; 87(9): 806–816. doi:10.1177/154405910808700909.

Tail Regeneration in *Xenopus laevis* as a Model for Understanding Tissue Repair

A.-S. Tseng,

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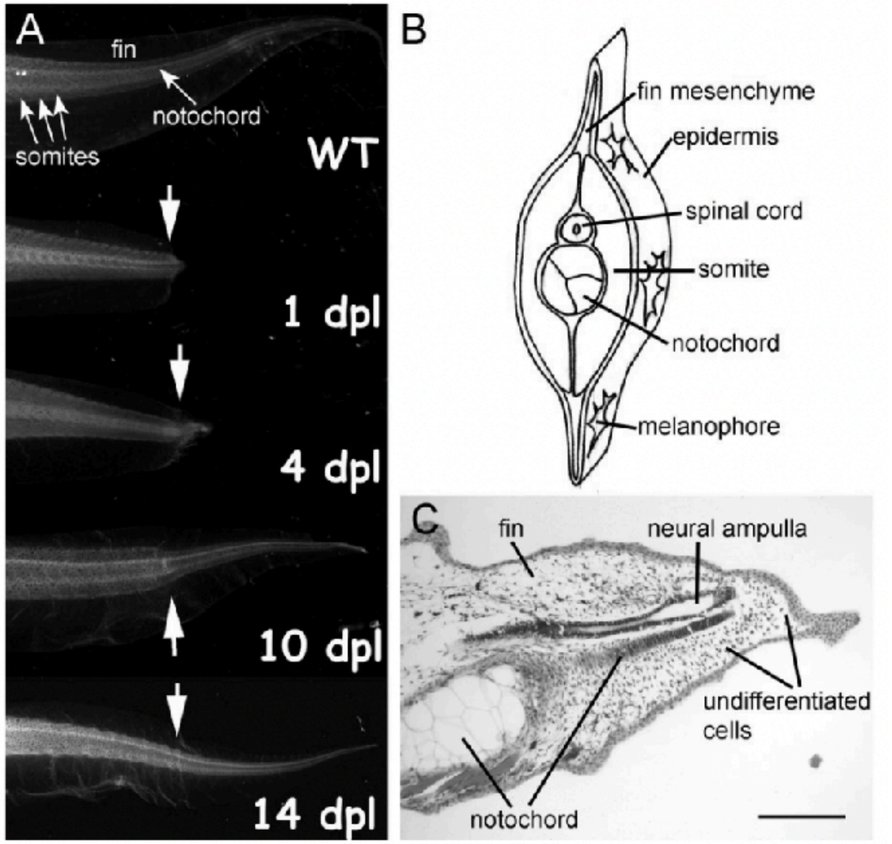
DEVELOPMENTAL DYNAMICS 238:1226–1248, 2009

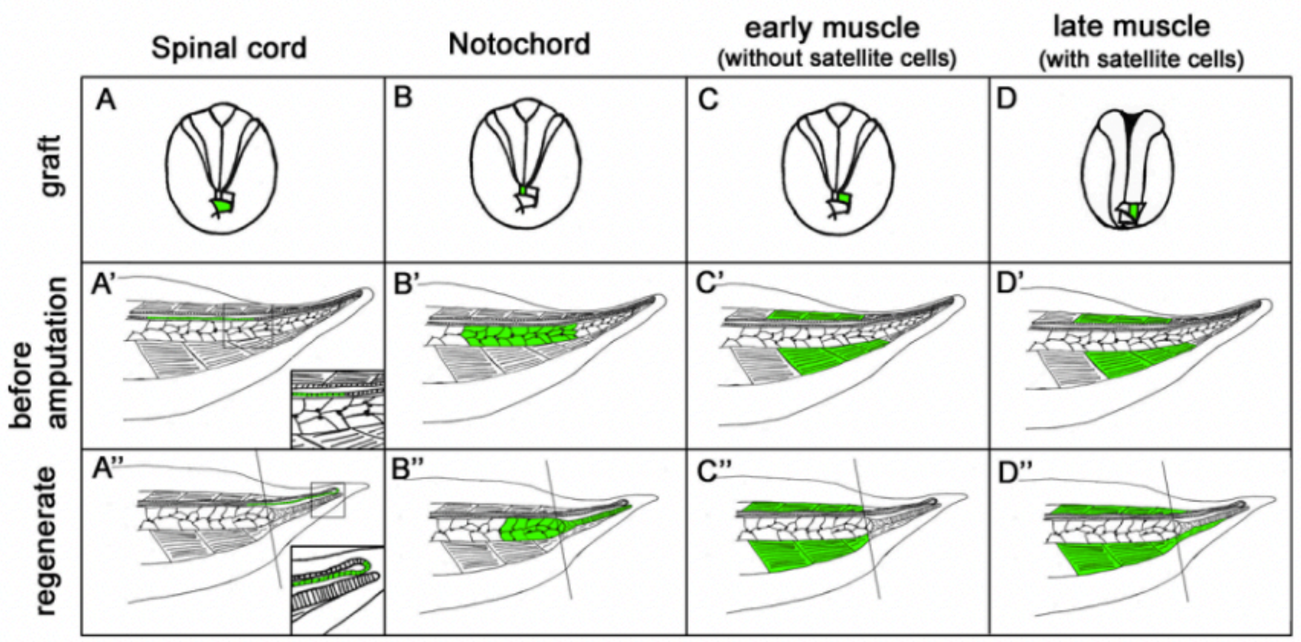
SPECIAL ISSUE REVIEWS–A PEER REVIEWED FORUM

Beyond Early Development: *Xenopus* as an Emerging Model for the Study of Regenerative Mechanisms

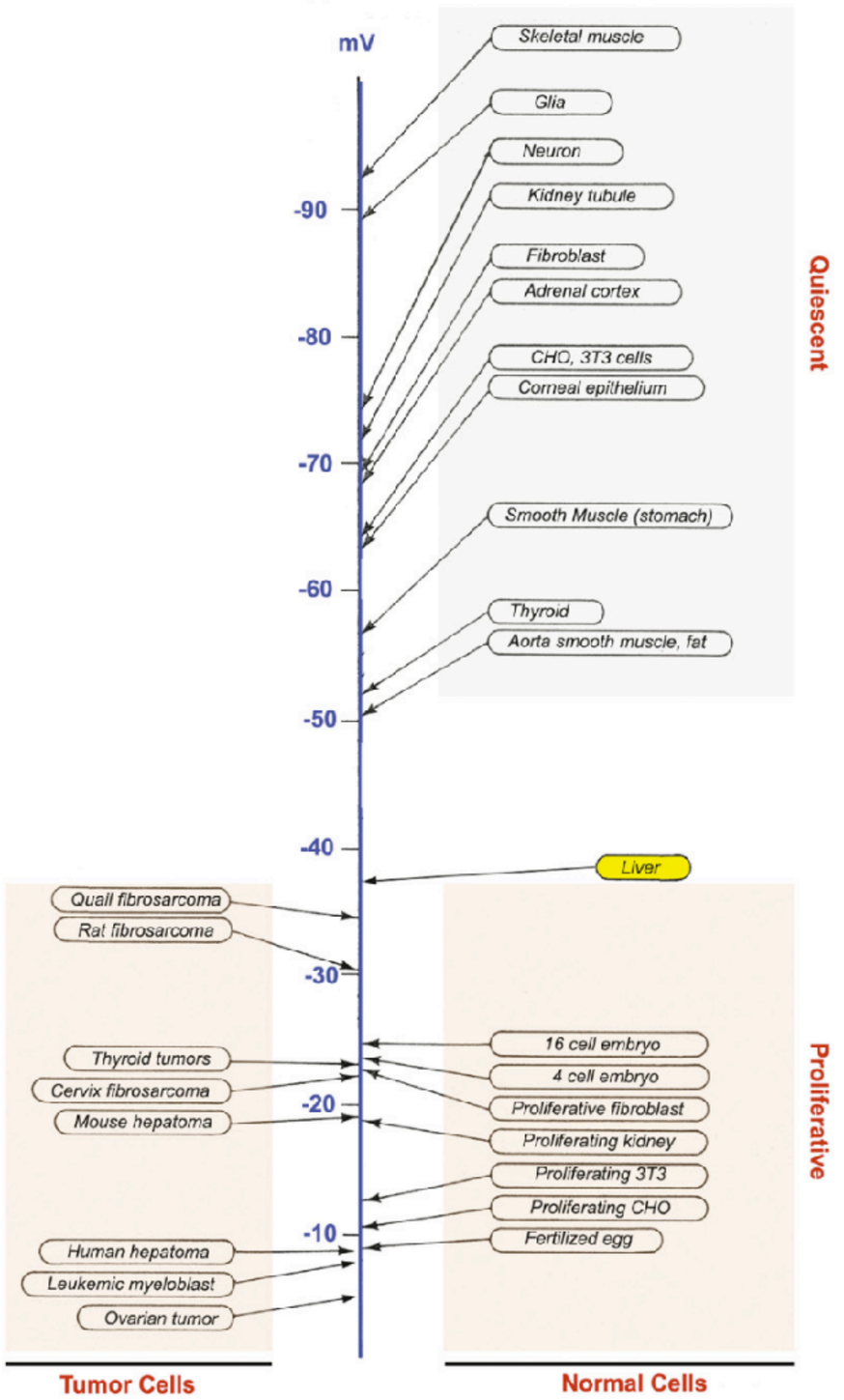
Caroline W. Beck,[1]* Juan Carlos Izpisúa Belmonte,[2,3] and Bea Christen[2]

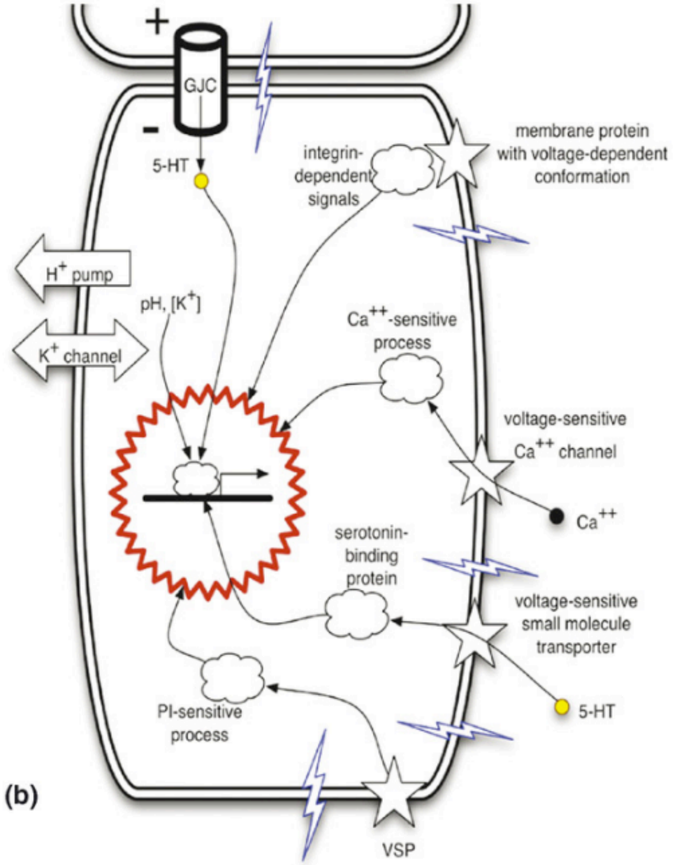
Anatomy of *Xenopus* tail regeneration

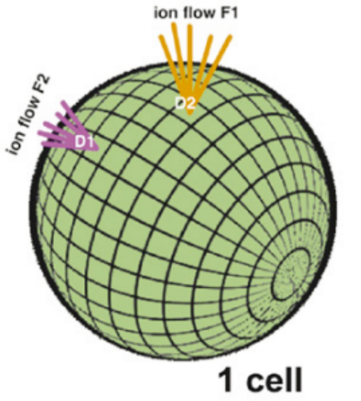




Beck et al., 2009


mV
Skeletal muscle
Glia
Neuron
Kidney tubule
Fibroblast
Adrenal cortex
CHO, 3T3 cells
Corneal epithelium
Smooth Muscle (stomach)
Thyroid
Aorta smooth muscle, fat
Liver
Quail fibrosarcoma
Rat fibrosarcoma
Thyroid tumors
Cervix fibrosarcoma
Mouse hepatoma
Human hepatoma
Leukemic myeloblast
Ovarian tumor
16 cell embryo
4 cell embryo
Proliferative fibroblast
Proliferating kidney
Proliferating 3T3
Proliferating CHO
Fertilized egg
-90
-80
-70
-60
-50
-40
-30
-20
-10
Quiescent
Proliferative
Tumor Cells
Normal Cells


+
GJC
-
5-HT
integrin-dependent signals
membrane protein with voltage-dependent conformation
H+ pump
pH, [K+]
K+ channel
Ca++-sensitive process
voltage-sensitive Ca++ channel
Ca++
serotonin-binding protein
voltage-sensitive small molecule transporter
5-HT
PI-sensitive process
VSP
(b)


ion flow F1
ion flow F2
P2
P1
1 cell

Levin 2008