

Developmental Biology 13e, Chapter 24 Literature Cited

Adamska, M. 2018. Differentiation and transdifferentiation of sponge cells. *Results Probl. Cell Differ.* 65: 229–253.

Adler, C. E. and A. Sánchez Alvarado. 2015. Types or states? Cellular dynamics and regenerative potential. *Trends Cell Biol.* 25: 687–696.

Apte, U. and 10 others. 2009. Enhanced liver regeneration following changes induced by hepatocyte-specific genetic ablation of integrin-linked kinase. *Hepatology* 50: 844–85.

Baguñà, J. 2012. The planarian neoblast: The rambling history of its origin and some current black boxes. *Int. J. Dev. Biol.* 56: 19–37.

Beane, W. S., J. Morokuma, D. S. Adams and M. Levin. 2011. A chemical genetics approach reveals H,K-ATPase-mediated membrane voltage is required for planarian head regeneration. *Chem. Biol.* 18: 77–89.

Bennett, T., G. Hines and O. Leyser. 2014. Canalization: What the flux? *Trends Genet.* 30: 41–48.

Birkholz, T. R., A. V. Van Huizen and W. S. Beane. 2018. Staying in shape: Planarians as a model for understanding regenerative morphology. *Semin. Cell Dev. Biol.* 87: 105–115.

Birnbaum, K. D. and A. Sánchez Alvarado. 2008. Slicing across kingdoms: Regeneration in plants and animals. *Cell* 132: 697–710.

Bode, H. R. 2009. Axial patterning in *Hydra*. *Cold Spring Harbor Persp. Biol.* 1: a000463.

Bode, H. R. 2011. Axis formation in hydra. *Annu. Rev. Genet.* 45: 105–117.

Borisenko, I. E., M. Adamska, D. B. Tokina and A. V. Ereskovsky. 2015. Transdifferentiation is a driving force of regeneration in *Halisarca dujardini* (Demospongiae, Porifera). *Peer J.* 3: e1211.

- Brockes, J. P. and A. Kumar. 2002. Plasticity and reprogramming of differentiated cells in amphibian regeneration. *Nat. Rev. Mol. Cell Biol.* 3: 566–574.
- Broun, M. and H. R. Bode. 2002. Characterization of the head organizer in hydra. *Development* 129: 875–884.
- Broun, M., L. Gee, B. Reinhardt and H. R. Bode. 2005. Formation of the head organizer in hydra involves the canonical Wnt pathway. *Development* 132: 2907–2916.
- Broun, M., S. Sokol and H. R. Bode. 1999. *Cngsc*, a homologue of *goosecoid*, participates in the patterning of the head and is expressed in the organizer region of *Hydra*. *Development* 126: 5245–5254.
- Browne, E. N. 1909. The production of small hydranths in hydra by insertion of small grafts. *J. Exp. Zool.* 7: 1–23.
- Bryant, S. 1999. A regeneration renaissance. *Semin. Cell Dev. Biol.* 10: 313.
- Butler, E. G. 1935. Studies on limb regeneration in X-rayed *Ambystoma* larvae. *Anat. Rec.* 62: 295–307.
- Buzgariu, W., M. Crescenzi and B. Galliot. 2014. Robust G2 pausing of adult stem cells in *Hydra*. *Differentiation* 87: 83–99.
- Campbell, R. D. 1967a. Tissue dynamics of steady state growth in *Hydra littoralis*. I. Patterns of cell division. *Dev. Biol.* 15: 487–502.
- Campbell, R. D. 1967b. Tissue dynamics of steady state growth in *Hydra littoralis*. II. Patterns of tissue movement. *J. Morphol.* 121: 19–28.
- Chera, S., L. and 7 otheres. 2009. Apoptotic cells provide an unexpected source of Wnt3 signaling to drive *Hydra* head regeneration. *Dev. Cell* 17: 279–289.
- Chernoff, E. A. G. and D. Stocum. 1995. Developmental aspects of spinal cord and limb regeneration. *Dev. Growth Diff.* 37: 133–147.
- Child, C. M. 1905. Studies on regulation. VII. Further experiments on form regulation in *Leptoplana*. *J. Exp. Zool.* 2: 253–285.

Costa, A., J. D. Naranjo, R. Londono and S. F. Badylak. 2017. Biologic scaffolds. *Cold Spring Harb. Perspect. Med.* 7: a025676.

Crawford, K. and D. L. Stocum. 1988. Retinoic acid proximalizes level-specific properties responsible for intercalary regeneration in axolotl limbs. *Development* 104: 703–712.

De Mulder, K., and 10 others. 2009. Characterization of the stem cell system of the acoel *Isodiametra pulchra*. *BMC Dev. Biol.* 9: 69.

Del Rio-Tsonis, K., C. H. Washabaugh and P. A. Tsonis. 1995. Expression of Pax-6 during urodele eye development and lens regeneration. *Proc Natl Acad Sci USA* 92: 5092–5096.

Dinsmore, C. E. (ed.). 1991. *A History of Regeneration Research: Milestones in the Evolution of a Science*. Cambridge University Press, New York.

Eerkes-Medrano, D., C. J. Feehan and S. P. Leys. 2015. Sponge cell aggregation: Checkpoints in development indicate a high level of organismal complexity. *Invert. Biol.* 134: 1–18.

Eguchi, G. 1963. Electron microscopic studies on lens regeneration. I. epignmentation of the iris. *Embryologia* 8: 45–62.

Eguchi, G. 1964. Electron microscopic studies on lens regeneration. II. Formation and growth of lens vesicle and differentiation of lens fibers. *Embryologia* 8: 247–287.

Eguchi, G., Y. Eguchi, K. Nakamura, K., M. C. Yadav, J. L. Millan and P. A. Tsonis. 2011. Regenerative capacity in newts is not altered by repeated regeneration and ageing. *Nat. Commun.* 2: 384.

Endo, T., S. V. Bryant and D. M. Gardiner. 2004. A stepwise model system for limb regeneration. *Dev. Biol.* 270: 135–145.

Ereskovsky, A. V., I. E. Borisenko, P. Lapébie, E. Gazave, D. B. Tokina and C. Borchiellini. 2015. *Oscarella lobularis* (Homoscleromorpha, Porifera) regeneration: Epithelial morphogenesis and metaplasia. *PLoS ONE* 10: 1–19.

Ereskovsky, A. V., A. I. Lavrov, F. V. Bolshakov and D. B. Tokina. 2017. Regeneration in white sea sponge *Leucosolenia complicata* (Porifera, Calcarea). *Invert. Zool.* 14: 108–113.

Farkas, J. E. and J. R. Monaghan. 2017. A brief history of the study of nerve-dependent regeneration. *Neurogenesis* 4: e1302216.

Farkas, J. E., P. D. Freitas, D. M. Bryant, J. L. Whited and J. R. Monaghan. 2016. Neuregulin-1 signaling is essential for nerve-dependent axolotl limb regeneration. *Development* 143: 2724–2731.

Farrell, J. A., Y. Wang, S. J. Riesenfeld, K. Shekhar, A. Regev and A. F. Schier. 2018. Single-cell reconstruction of developmental trajectories during zebrafish embryogenesis. *Science* 360:eaar3131.

Fausto, N. and J. S. Campbell. 2005. The role of hepatocytes and oval cells in liver regeneration. *Mech. Dev.* 120: 117–130.

Funayama, N. 2018. The cellular and molecular bases of the sponge stem cell systems underlying reproduction, homeostasis and regeneration. *Int. J. Dev. Biol.* 62: 513–525.

Gardiner, D. M., T. Endo and S. V. Bryant. 2002. The molecular basis of amphibian limb regeneration: Integrating the old with the new. *Semin. Cell Dev. Biol.* 13: 345–352.

Gatza, C., L. Moore, M. Dumble and L. A. Donehower. 2007. Tumor suppressor dosage regulates stem cell dynamics during aging. *Cell Cycle* 6: 52–55.

Gawriluk, T. R. and 9 others. 2016. Comparative analysis of ear-hole closure identifies epimorphic regeneration as a discrete trait in mammals. *Nat. Commun.* 7: 11164.

Gee, L., J. Hartig, L. Law, J. Wittlieb, K. Khalturin, T. C. Bosch and H. R. Bode. 2010. Beta-catenin plays a central role in setting up the head organizer in *Hydra*. *Dev. Biol.* 340: 116–124.

Gentile, L., F. Cebrìà, and K. Bartscherer. 2011. The planarian flatworm: An *in vivo* model for stem cell biology and nervous system regeneration. *Disease Models Mech.* 4: 12–19.

Gerber, T. and 13 others. 2018. Single-cell analysis uncovers convergence of cell identities during axolotl limb regeneration. *Science* 362:eaaq0681.

Gierer, A., S. and 7 others. 1972. Regeneration of *Hydra* from reaggregated cells. *Nat. New Biol.* 239: 98–101.

Gilgenkrantz, H. and A. C. de l'Hortet A. 2018. Understanding liver regeneration: From mechanisms to regenerative medicine. *Am. J. Pathol.* 188: 1316–1327.

Gkretsi, V., W. C. Bowen, Y. Yang, C. Wu and G. K. Michalopoulos. 2007. Integrin-linked kinase is involved in matrix-induced hepatocyte differentiation. *Biochem Biophys Res Commun.* 353: 638–643.

Gkretsi, V. and 11 others. 2008. Liver-specific ablation of integrin-linked kinase in mice results in abnormal histology, enhanced cell proliferation, and hepatomegaly. *Hepatology* 48: 1932–1941.

Godwin, J. W., A. R. Pinto and N. A. Rosenthal. 2013. Macrophages are required for adult salamander limb regeneration. *Proc. Natl. Acad. Sci. USA* 110: 9415–9420.

Goss, R. J. 1969. *Principles of Regeneration*. Academic Press, New York.

Goss, R. J. 1991. The natural history (and mystery) of regeneration. In C. E. Dinsmore (ed.), *A History of Regeneration Research*. Cambridge University Press, Cambridge.

Gurley, K. A., J. C. Rink and A. Sánchez Alvarado. 2008. Beta-catenin defines head versus tail identity during planarian regeneration and homeostasis. *Science* 319: 323–327.

Haas, B. J. and J. L. Whited. 2017. Advances in decoding axolotl limb regeneration. *Trends Genet.* 33: 553–565.

Han, M. J., J. Y. An and W. S. Kim. 2001. Expression patterns of Fgf-8 during development and limb regeneration of the axolotl. *Dev. Dyn.* 220: 40–48.

Herlands, R. and H. Bode. 1974. The influence of tissue polarity on nematocyte migration in *Hydra attenuata*. *Dev. Biol.* 40: 323–339.

Higgins, G. M. and R. M. Anderson. 1931. Experimental pathology of the liver. I. Restoration of the liver of the white rat following partial surgical removal. *Arch. Pathol.* 12: 186–202.

Hill, E. M. and C. P. Petersen. 2015. Wnt/Notum spatial feedback inhibition controls neoblast differentiation to regulate reversible growth of the planarian brain. *Development* 142: 4217–

Hobmayer, B. and 7 others. 2000. WNT signalling molecules act in axis formation in the diploblastic metazoan *Hydra*. *Nature* 407: 186–189.

Hu, C. K. and A. Brunet. 2018. The African turquoise killifish: A research organism to study vertebrate aging and diapause. *Aging Cell* 17: e12757.

Huang, M. and 11 others. 2022. CC motif chemokin ligand-5 confines liver regeneration by downregulating reparative macrophage-derived HGF in an Forkhead Box O3a-dependent manner. *Hepatology* 76:1706–1722.

Huang, S.-M. and 35 others. 2009. Tankyrase inhibition stabilizes axin and antagonizes Wnt signalling. *Nature* 461: 614–620.

Huang, W. and 8 others. 2006. Nuclear receptor-dependent bile acid signaling is required for normal liver regeneration. *Science* 312: 233–236.

Iglesias, M., J. L. Gomez-Skarmeta, E. Saló and T. Adell. 2008. Silencing of Smed-b-catenin1 generates radial-like hypercephalized planarians. *Development* 135: 1215–1221.

Johnson, K., J. Bateman, T. DiTommaso, A. Y. Wong and J. L. Whited. 2018. Systemic cell cycle activation is induced following complex tissue injury in axolotl. *Dev. Biol.* 433: 461–472.

Jouannet, V., K. Brackmann and T. Greb. 2015. (Pro)cambium formation and proliferation: Two sides of the same coin? *Curr. Opin. Plant Biol.* 23: 54–60.

Karasaki, S. 1964. An electron microscopic study of Wolffian lens regeneration in the adult newt. *J. Ultrastruct. Res.* 11: 246–273.

Kareem, A., and 6 others. 2016a. De novo assembly of plant body plan: A step ahead of Deadpool. *Regeneration* 3: 182–197.

Kareem, A. and 8 others. 2016b. Protocol: A method to study the direct reprogramming of lateral root primordia to fertile shoots. *Plant Methods* 12: 27.

Kawakami, Y. and 6 others. 2006. Wnt/beta-catenin signaling regulates vertebrate limb regeneration. *Genes Dev.* 20: 3232–3237.

Kim, G. H., T. A. Klotchkova and Y. M. Kang. 2001. Life without a cell membrane: Regeneration of protoplasts from disintegrated cells of the marine green alga *Bryopsis plumosa*. *J. Cell Sci.* 114: 2009–2014.

Kim, T. H., W. M. Mars, D. B. Stolz, B. E. Petersen and G. K. Michalopoulos. 1997. Extracellular matrix remodeling at the early stages of liver regeneration in the rat. *Hepatology* 26: 896–904.

Knopf, F. and 10 others. 2011. Bone regenerates via dedifferentiation of osteoblasts in the zebrafish fin. *Dev. Cell* 20: 713–724.

Kragl, M., D. Knapp, E. Nacu, S. Khattak, M. Maden, H. H. Epperlein and E. M. Tanaka. 2009. Cells keep a memory of their tissue origin during axolotl limb regeneration. *Nature* 460: 60–65.

Lander, R. and C. P. Petersen. 2016. Wnt, Ptk7, and FGFRL expression gradients control trunk positional identity in planarian regeneration. *eLife* 5:e12850.

Lengfeld, T., H. Watanabe, O. Simakov, D. Lindgens, L. Gee, L. Law, H. A. Schmidt, S. Ozbek, H. Bode and T. W. Holstein. 2009. Multiple Wnts are involved in *Hydra* organizer formation and regeneration. *Dev. Biol.* 330: 186–199.

Lenhoff, H. M. 1991. Ethel Browne Harvey, Hans Spemann, and the discovery of the organizer phenomenon. *Biol. Bull.* 181: 72–80.

Levin, M., G. Pezzulo and J. M. Finkelstein. 2017. Endogenous bioelectric signaling networks: Exploiting voltage gradients for control of growth and form. *Annu. Rev. Biomed. Eng.* 19: 353–387.

Levin, M., A. M. Pietak and J. Bischof. 2018. Planarian regeneration as a model of anatomical homeostasis: Recent progress in biophysical and computational approaches. *Semin. Cell Dev. Biol.* 87: 125–144.

Li, Q., H. Yang and T. P. Zhong. 2015. Regeneration across metazoan phylogeny: Lessons from model organisms. *J. Genet. Genomics* 42: 57–70.

Li, S. 2015. The *Arabidopsis thaliana* TCP transcription factors: A broadening horizon beyond development. *Plant Signal Behav.* 10: e1044192.

Lin, T.-Y. and 8 others. 2021. Fibroblast dedifferentiation as a determinant of successful regeneration. *Dev. Cell* 56: 1541–1551.e6.

Liu, J., L. Sheng, Y. Xu, J. Li, Z. Yang, H. Huang and L. Xu. 2014. WOX11 and 12 are involved in the first-step cell fate transition during de novo root organogenesis in *Arabidopsis*. *Plant Cell* 26: 1081–1093.

Liu, S.-Y. and 9 others. 2013. Reactivating head regrowth in a regeneration-deficient planarian species. *Nature* 500: 81–84.

Londono, R. and S. F. Badylak. 2015. Biologic scaffolds for regenerative medicine: mechanisms of in vivo remodeling. *Ann. Biomed. Eng.* 43: 577–592.

MacWilliams, H. K. 1983. Hydra transplantation phenomena and the mechanism of *Holm* head regeneration. II. Properties of head activation. *Dev. Biol.* 96: 239–257.

Maden, M. 1983. The effect of vitamin A on the regenerating axolotl limb. *J. Embryol. Exp. Morph.* 77: 273–95.

Madhavan, M. and 6 others. 2006. The role of Pax-6 in lens regeneration. *Proc. Natl. Acad. Sci. USA* 103: 14848–14853.

Makanae, A., K. Mitogawa and A. Satoh. 2014. Co-operative BMP and FGF signaling inputs convert skin wound healing to limb formation in urodele amphibians. *Dev. Biol.* 396: 57–66.

Mandoli, D. F. 1998. Elaboration of body plan and phase change during development of *Acetabularia*: How is the complex architecture of a giant unicell built? *Annu. Rev. Plant Physiol. Plant Mol. Biol.* 49: 173–198.

Mars, W. M., T. H. Kim, D. B. Stoltz, M. L. Liu and G. K. Michalopoulos. 1996. Presence of urokinase in serum-free primary rat hepatocyte cultures and its role in activating hepatocyte growth factor. *Cancer Res.* 56: 2837–2843.

Mazur, E., E. Benková and J. Friml. 2016. Vascular cambium regeneration and vessel formation in wounded inflorescence stems of *Arabidopsis*. *Sci. Rep.* 6: 33754.

McCusker, C. D. and D. M. Gardiner. 2011. The axolotl model for regeneration and aging research: A mini-review. *Gerontology* 57: 565–571.

McCusker, C. D. and D. M. Gardiner. 2014. Understanding positional cues in salamander limb regeneration: implications for optimizing cell-based regenerative therapies. *Disease Models Mech.* 7: 593–599.

McCusker, C., J. Lehrberg and D. Gardiner. 2014. Position-specific induction of ectopic limbs in non-regenerating blastemas on axolotl forelimbs. *Regeneration* 1: 27–34.

McLaughlin, K. A. and M. Levin. 2018. Bioelectric signaling in regeneration: Mechanisms of ionic controls of growth and form. *Dev. Biol.* 433: 177–189.

Michalopoulos, G. K. 2017. Hepatostat: Liver regeneration and normal liver tissue maintenance. *Hepatology* 5:1384–1392.

Michalopoulos, G. K. and B. Bhushan. 2021. Liver regeneration: Biological and pathological mechanisms and implications. *Nat. Rev. Gastroenterol. Hepatol.* 18: 40–55.

Mittman, G. and A. Fausto Sterling. 1992. Whatever happened to planaria? C.M. Child and the physiology of inheritance. In *The Right Tools for the Job: At Work in Twentieth-Century Life Science*. A. Clarke and J. Fujimara (eds.). Princeton University Press, Princeton, NJ.

Miyashima, S., J. Sebastian, J. Y. Lee and Y. Helariutta. 2013. Stem cell function during plant vascular development. *EMBO J.* 32: 178–193.

Mizuno, N., M. Mochii, T. S. Yamamoto, T. C. Takahashi, G. Eguchi and T. S. Okada. 1999. Pax-6 and Prox 1 expression during lens regeneration from *Cynops* iris and *Xenopus* cornea: evidence for a genetic program common to embryonic lens development. *Differentiation* 65: 141–149.

Moolten, F. L. and N. L. Bucher. 1967. Regeneration of rat liver: Transfer of humoral agent by cross circulation. *Science* 158: 272–274.

Morgan, T. H. 1905. *Regeneration*. Macmillan, New York.

Morrison, J. I., S. Lööf, S. P. He and A. Simon. 2006. Salamander limb regeneration involves the activation of a multipotent skeletal muscle satellite cell population. *J. Cell Biol.* 172: 433–440.

Mullen, L. M., S. V. Bryant, M. A. Torok, B. Blumberg and D. M. Gardiner. 1996. Nerve dependency of regeneration: The role of Distal-less and FGF signaling in amphibian limb regeneration. *Development* 122: 3487–3497.

Murugan, N. J. and 9 others. 2022. Acute multidrug delivery via a wearable bioreactor facilitates long-term limb regeneration and functional recovery in adult *Xenopus laevis*. *Sci. Adv.* 8:eabj2164.

Nacu, E., and E. M. Tanaka. 2011. Limb regeneration: A new development? *Annu. Rev. Cell Dev. Biol.* 27: 409–440.

Nejak-Bowen, K., A. Orr, W. C. Bowen Jr. and G. K. Michalopoulos. 2013. Conditional genetic elimination of hepatocyte growth factor in mice compromises liver regeneration after partial hepatectomy. *PLoS ONE* 8, e59836.

Newman, S. A. 1974. The interaction of the organizing regions of hydra and its possible relation to the role of the cut end of regeneration. *J. Embryol. Exp. Morphol.* 31: 541–555.

Newmark, P. A. and A. Sánchez Alvarado. 2000. Bromodeoxyuridine specifically labels the regenerative stem cells of planarians. *Dev. Biol.* 220: 142–153.

Niazi, I. A., M. J. Pescitelli and D. L. Stocum. 1985. Stage-dependent effects of retinoic acid on regenerating urodele limbs. *W. Roux Archiv für Entwicklungsmechanik.* 194: 355–363.

Oviedo, N. J. and W. S. Beane. 2009. Regeneration: The origin of cancer or a possible cure?. *Semin. Cell Dev. Biol.* 20: 557–564.

Pai, V. P., C. J. Martyniuk, K. Echeverri, S. Sundelacruz, D. L. Kaplan and M. Levin. 2015. Genome-wide analysis reveals conserved transcriptional responses downstream of resting potential change in *Xenopus* embryos, axolotl regeneration, and human mesenchymal cell differentiation. *Regeneration* 3: 3–25.

Pallas, P. S. 1766. *Miscellanea zoologica, quibus novae imprimis atque obscurae animalium species Hagae Comitum*. Apud Pterum van Cleef, Holland.

Payzin-Dogru, D. and J. L. Whited. 2018. An integrative framework for salamander and mouse limb regeneration. *Int. J. Dev. Biol.* 62: 393–402.

Pearson, B. J. and A. Sánchez Alvarado. 2009. Regeneration, stem cells, and the evolution of tumor suppression. *Cold Spring Harb. Symp. Quant. Biol.* 73: 565–572.

Pellettieri, J. and A. Sánchez Alvarado. 2007. Cell turnover and adult tissue homeostasis: From humans to planarians. *Annu. Rev. Genet.* 41: 83–105.

Pellettieri, J., P. Fitzgerald, S. Watanabe, J. Mancuso, D. R. Green and A. Sánchez Alvarado. 2010. Cell death and tissue remodeling in planarian regeneration. *Dev. Biol.* 338: 76–85.

Petersen, C. P. and P. W. Reddien. 2008. Smed-beta catenin-1 is required for anteroposterior blastema polarity in planarian regeneration. *Science* 319: 327–330.

Petersen, C. P. and P. W. Reddien. 2009. A wound-induced Wnt expression program controls planarian regeneration polarity. *Proc Natl Acad Sci USA* 106: 17061–17066.

Petersen, C. P. and P. W. Reddien. 2011. Polarized notum activation at wounds inhibits Wnt function to promote planarian head regeneration. *Science* 332: 852–855.

Petrie, T.A., N. S. Strand, C. T. Yang, J. S. Rabinowitz and R. T. Moon. 2014. Macrophages modulate adult zebrafish tail fin regeneration. *Development* 141: 2581–2591.

Raz, A. A., M. Srivastava, R. Salvamoser and P. W. Reddien. 2017. Acoel regeneration mechanisms indicate an ancient role for muscle in regenerative patterning. *Nat. Commun.* 8: 1260.

Reddien, P. W. 2011. Constitutive gene expression and the specification of tissue identity in adult planarian biology. *Trends Genet.* 27: 277–285.

Reddien, P. W. 2013. Specialized progenitors and regeneration. *Development* 140: 951–957.

Reddien, P. W. 2018. The cellular and molecular basis for planarian regeneration. *Cell* 175: 327–345.

- Reddien, P. W. 2021. Positional information and stem cells combine to result in planarian regeneration. *Cold Spring Harb. Perspect. Biol.* 13:a040717.
- Reddien, P. W., N. J. Oviedo, J. R. Jennings, J. C. Jenkin and A. Sánchez Alvarado. 2005. SMEDWI-2 is a PIWI-like protein that regulates planarian stem cells. *Science* 310: 1327–1330.
- Reyer, R. 1990. Macrophage invasion and phagocytic activity during lens regeneration from the iris epithelium in newts. *Am. J. Anat.* 188: 329–344.
- Riehle, K. J., Y. Y. Dan, J. S. Campbell and N. Fausto. 2011. New concepts in liver regeneration. *J. Gastroenterol. Hepatol.* 1: 203–212.
- Rink, J. C. 2018. Stem cells, patterning and regeneration in planarians: Self-organization at the organismal scale. *Methods Mol. Biol.* 1774: 57–172.
- Roberts-Galbraith, R. H. and P. A. Newmark. 2015. On the organ trail: Insights into organ regeneration in the planarian. *Curr. Opin. Genet. Dev.* 32: 37–46.
- Rudolph, K. L. and 7 others. 1999. Differential regulation of extracellular matrix synthesis during liver regeneration after partial hepatectomy in rats. *Hepatology* 5: 1159–1166.
- Satoh, A., K. Mitogawa and A. Makanae. 2015. Regeneration inducers in limb regeneration. *Dev. Growth Differ.* 57: 421–429.
- Scimone, M. L., L. E. Cote, T. Rogers and P. W. Reddien. 2016. Two FGFRL-Wnt circuits organize the planarian anteroposterior axis. *eLife* 5: e12845.
- Scimone, M. L., L. E. Cote and P. W. Reddien. 2017. Orthogonal muscle fibres have different instructive roles in planarian regeneration. *Nature* 551: 623–628.
- Seifert, A. W. and K. Muneoka. 2018. The blastema and epimorphic regeneration in mammals. *Dev. Biol.* 433: 190–199.
- Seifert, A. W., S. G. Kiama, M. G. Seifert, J. R. Goheen, T. M. Palmer and M. Maden. 2012. Skin shedding and tissue regeneration in African spiny mice (*Acomys*). *Nature* 489: 561–565.

Shi, W., Z. Fang, L. Li and L. Luo. 2015. Using zebrafish as the model organism to understand organ regeneration. *Sci. China Life Sci.* 58: 343–351.

Shimotohno, A., R. Heidstra, I. Blilou and B. Scheres. 2018. Root stem cell niche organizer specification by molecular convergence of PLETHORA and SCARECROW transcription factor modules. *Genes Dev.* 32: 1085–1100.

Sidman, R. L. and M. Singer. 1951. Stimulation of forelimb regeneration in the newt, *Triturus viridescens*, by a sensory nerve supply isolated from the central nervous system. *Am. J. Physiol.* 165: 257–260.

Sidman, R. L. and M. Singer. 1960. Limb regeneration without innervation of the apical epidermis in the adult newt, *Triturus*. *J. Exp. Zool.* 144: 105–110.

Siebert, S. and 6 others. 2019. Stem cell differentiation trajectories in *Hydra* resolved at single-cell resolution. *Science* 365:eaav9314.

Sikes, J. M. and P. A. Newmark. 2013. Restoration of anterior regeneration in a planarian with limited regenerative ability. *Nature* 500: 77–80.

Simkin, J., T. R. Gawriluk, J. C. Gensel and A. W. Seifert. 2017. Macrophages are necessary for epimorphic regeneration in African spiny mice. *eLife* 6:e24623.

Simon, A. and E. M. Tanaka. 2013. Limb regeneration. *Wiley Interdiscip. Rev. Dev. Biol.* 2: 291–300.

Simon, H. G., C. Nelson, D. Goff, E. Laufer, B. A. Morgan and C. Tabin. 1995. The differential expression of myogenic regulatory genes and *msx-1* during dedifferentiation and redifferentiation of regenerating amphibian limbs. *Dev. Dyn.* 202: 1–12.

Singer, M. 1946. The nervous system and regeneration of the forelimb of adult *Triturus*; the stimulating action of a regenerated motor supply. *J. Exp. Zool.* 101: 221–239.

Singer, M. 1952. The influence of the nerve in regeneration of the amphibian extremity. *Q. Rev. Biol.* 27: 169–200.

Singer, M. 1954. Induction of regeneration of the forelimb of the postmetamorphic frog by augmentation of the nerve supply. *J. Exp. Zool.* 126: 419–472.

Singer, M. and J. D. Caston. 1972. Neurotrophic dependence of macromolecular synthesis in the early limb regenerate of the newt, *Triturus*. *J. Embryol. Exp. Morphol.* 28: 1–11.

Singer, M. and L. Craven. 1948. The growth and morphogenesis of the regenerating forelimb of adult *Triturus* following denervation at various stages of development. *J. Exp. Zool.* 108: 279–308.

Singh, B. N., N. Koyano-Nakagawa, A. Donaldson, C. V. Weaver, M. G. Garry and D. J. Garry. 2015. Hedgehog signaling during appendage development and regeneration. *Genes* 6: 417–435.

Singh, S. P., J. E. Holdway and K. D. Poss. 2012. Regeneration of amputated zebrafish fin rays from de novo osteoblasts. *Dev. Cell* 22: 879–886.

Skoog, F. and C. O. Miller. 1957. Chemical regulation of growth and organ formation in plant tissues cultured in vitro. *Symp. Soc. Exp. Biol.* 11: 118–130.

Sousounis, K., M. Looso, N. Maki, C. J. Ivester, T. Braun and P.A. Tsonis. 2013. Transcriptome analysis of newt lens regeneration reveals distinct gradients in gene expression patterns. *PLoS One* 8: e61445.

Sousounis, K. and 6 others. 2014. Molecular signatures that correlate with induction of lens regeneration in newts: lessons from proteomic analysis. *Hum. Genomics* 8: 22.

Srivastava, M., K. L. Mazza-Curll, J. C. van Wolfswinkel and P. W. Reddien. 2014. Whole-body acoel regeneration is controlled by Wnt and Bmp-Admp signaling. *Curr. Biol.* 24: 1107–1113.

Steward, F. C., M. O. Mapes and K. Mears. 1958. Growth and organized development of cultured cells. II. Organization in cultures grown from freely suspended cells. *Am. J. Bot.* 45: 705–708.

Stewart, S. and K. Stankunas. 2012. Limited dedifferentiation provides replacement tissue during zebrafish fin regeneration. *Dev. Biol.* 365: 339–349.

Stoick-Cooper, C. L., G. Weidinger, K. J. Riehle, C. Hubbert, M. B. Major, N. Fausto and R. T. Moon. 2007. Distinct Wnt signaling pathways have opposing roles in appendage regeneration. *Development* 134: 479–489.

Su, Y. H. and X. S. Zhang. 2014. The hormonal control of regeneration in plants. *Curr. Top. Dev. Biol.* 108: 35–69.

Sugimoto, K., Y. Jiao and E. M. Meyerowitz. 2010. *Arabidopsis* regeneration from multiple tissues occurs via a root development pathway. *Dev. Cell* 18: 463–471.

Sundelacruz, S., M. Levin and D. L. Kaplan. 2013. Depolarization alters phenotype, maintains plasticity of predifferentiated mesenchymal stem cells. *Tissue Eng.* 19A: 1889–1908.

Sunderland, M. E. 2010. Regeneration: Thomas Hunt Morgan's window into development. *J. Hist. Biol.* 43: 325–361.

Tanaka, E. and P. W. Reddien. 2011. The cellular basis for animal regeneration. *Dev. Cell* 21: 172–185.

Taub, R. 2004. Liver regeneration: From myth to mechanism. *Nat. Rev. Mol. Cell Biol.* 5: 836–847.

Technau, U., C. Cramer von Laue, F. Rentzsch, S. Luft, B. Hobmayer, H. R. Bode and T. W. Holstein. 2000. Parameters of self-organization in *Hydra* aggregates. *Proc. Natl. Acad. Sci. USA* 97: 12127–12131.

Todd, T. J. 1823. On the process of reproduction of the members of the aquatic salamander. *Q. J. Sci. Lit. Arts* 16: 84–96.

Tseng, A. and M. Levin. 2013. Cracking the bioelectric code: Probing endogenous ionic controls of pattern formation. *Commun. Integr. Biol.* 6: e22595.

Umesono, Y. and 9 others. 2013. The molecular logic for planarian regeneration along the anterior-posterior axis. *Nature* 500: 73–76.

Vasil, V. and A. C. Hildebrandt. 1965. Differentiation of tobacco plants from single, isolated cells in microcultures. *Science* 150: 889–892.

Vergara, M. N., G. Tsissios and K. Del Rio-Tsonis. 2018. Lens regeneration: A historical perspective. *Int. J. Dev. Biol.* 62: 351–361.

Wagner, D. E., I. E. Wang and P. W. Reddien. 2011. Clonogenic neoblasts are pluripotent adult stem cells that underlie planarian regeneration. *Science* 332: 811–816.

Wang, W. and 15 others. 2020. Changes in regeneration-responsive enhancers shape regenerative capacities in vertebrates. *Science* 369: eaaz3090.

Wehner, D. and 11 others. 2014. Wnt/b-catenin signaling defines organizing centers that orchestrate growth and differentiation of the regenerating zebrafish caudal fin. *Cell Rep.* 6: 467–481.

Wehner, D. and G. Weidinger. 2015. Signaling networks organizing regenerative growth of the zebrafish fin. *Trends Genet.* 31: 336–343.

Wenemoser, D., S. W. Lapan, A. W. Wilkinson, G. W. Bell and P. W. Reddien. 2012. A molecular wound response program associated with regeneration initiation in planarians. *Genes Dev.* 26: 988–1002.

White, P., J. E. Brestelli, K. H. Kaestner and L. E. Greenbaum. 2005. Identification of transcriptional networks during liver regeneration. *J. Biol. Chem.* 280: 3715–3722.

Whited, J. L. and C. J. Tabin. 2009. Limb regeneration revisited. *J. Biol.* 8: 5.

Wilby, O. K. and G. Webster. 1970. Experimental studies on axial polarity in hydra. *J. Embryol. Exp. Morphol.* 24: 595–613.

Wilson, H. V. 1907. On some phenomena of coalescence and regeneration in sponges. *J. Exp. Zool.* 5: 245–258.

Witchley, J. N., M. Mayer, D. E. Wagner, J. H. Owen and P. W. Reddien. 2013. Muscle cells provide instructions for planarian regeneration. *Cell Rep.* 4: 633–641.

Wurtzel, O., L. E. Cote, A. Poirier, R. Satija, A. Regev and P. W. Reddien. 2015. A generic and cell-type-specific wound response precedes regeneration in planarians. *Dev. Cell* 35: 632–645.

Xu, J., H. Hofhuis, R. Heidstra, M. Sauer, J. Friml and B. Scheres. 2006. A molecular framework for plant regeneration. *Science* 311: 385–388.

- Yamada, T. and D. McDevitt. 1974. Direct evidence for transformation of differentiated iris epithelial cells into lens cells. *Dev. Biol.* 38: 104–118.
- Yasuda, K. 2004. A life in research on lens regeneration and transdifferentiation. An interview with Goro Eguchi. *Int. J. Dev. Biol.* 48: 695–700.
- Yin, V. P. and K. D. Poss. 2008. New regulators of vertebrate appendage regeneration. *Curr. Opin. Genet. Dev.* 18: 381–386.
- Yun, M. H., H. Davaapil and J. P. Brockes. 2015. Recurrent turnover of senescent cells during regeneration of a complex structure. *eLife* 4: e05505.
- Zhong, Z., L. Yang, Y. E. Zhang, Y. Xue and S. He. 2016. Correlated expression of retrocopies and parental genes in zebrafish. *Mol. Genet. Genomics* 291: 723–737.
- Zhu, S. J. and B. J. Pearson. 2016. (Neo)blast from the past: New insights into planarian stem cell lineages. *Curr. Opin. Genet. Dev.* 40: 74–80.