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The heart of the matter

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In humans, heart injury leads to the formation of scar tissue and cardiomyocyte hypertrophy, but the heart does not regenerate. In the December 13 *Science* Kenneth Poss and colleagues, at Harvard Medical School in Boston, show that zebrafish hearts are able to regenerate after injury without scarring (*Science* 2002, **298**:2188-2190). Surgical removal of 20% of the ventricular myocardium from adult fish induced initial fibrin clot formation. The clot was then replaced by cardiac myofibers, and by two months after injury the hearts appeared grossly normal. Bromodeoxyuridine (BrdU) incorporation experiments showed extensive proliferation of cardiomyocytes near the surgery site. Cardiac injury in fish with a temperature-sensitive mutation in the *mps1* gene, encoding a mitotic checkpoint kinase, led to the formation of large, connective-tissue scars in the absence of proliferation. These results provide an interesting model with which to investigate the molecular mechanisms underlying cardiac regeneration, and hint at the potential to manipulate cardiomyocyte proliferation in mammalian hearts.

References

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2. Harvard University , [<http://www.harvard.edu>]
3. Mps1 defines a proximal blastemal proliferative compartment essential for zebrafish fin regeneration