

Regeneration

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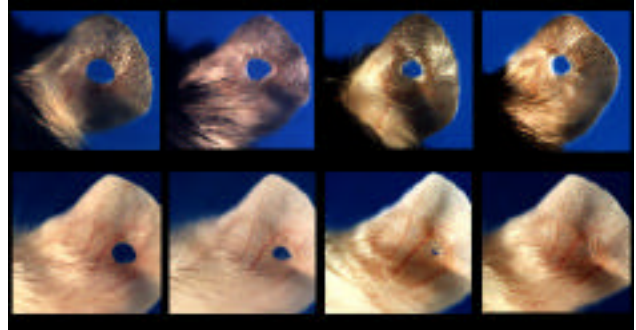
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Humans gaze in envy of the regenerative characteristics of other species. And until recently, most have passed off the idea as impossibility in humans. Thought only to be a trait of amphibians, a recent accident during a autoimmune study of mice which was looking for a cure to multiple sclerosis, has shown a certain breed of mouse has regenerative abilities.

This was discovered purely by accident, when the mice ears were pierced to separate the control group from the experimental. After only a few weeks, these mice healed the pierced hole with little to no scar tissue. Thinking she had made a mistake, the professor in charge, Dr. Heber-Katz tried piercing the ears again, and again attained the same results. This breed of mice, now dubbed MRL mice, have the ability to divide up to 20 percent of their cells in response to injury, which is astronomical compared to the 1-3 percent cell division capabilities of normal mice. Dr. Heber-Katz has moved from the study for multiple sclerosis to the study of epimorphic regeneration.

Mice and Men share many similar genes because they are both mammals, and this is why the scientific community is very excited. Normally, no mammals in their adult stages show regenerative abilities. Fetuses in their first trimester have similar characteristics, where “scar tissue is minimal, and regeneration is abundant”, but lose this ability quickly. While these mice have shown to be able to fully regrow tails, heal their liver, heart, and optic nerve. Even in some cases, they have the ability to regrow an organ that has been irreparably damaged or destroyed.



Scientists have narrowed the enabling of this trait down to 12 genes which are common with humans. They hope that once they know how this works, they can give people gene therapy to utilize this ability, which would revolutionize medicine as we know it. Researchers have injected foetal liver cells from a MRL mouse, into an ordinary mouse, and the ordinary mouse has gained the MRL’s abilities. Also, when a MRL mouse breeds with an ordinary mouse, the offspring have regenerative abilities.

This one case is very exciting, and there are also many studies of amphibian genes going on to someday attain the power of regeneration. Studies involving flat worms, starfish, and salamanders all seem very promising, but the discovery of regeneration in mammals is a giant step towards the future of epimorphic regeneration.

Dr. Heber-Katz is a professor at the Wistar institute in Pennsylvania, and has funding from the National institute of Health for this research endeavor.

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