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Top 100 Stories of 2011 #61: Aging Effects Reversed in Mice

Eliminating dying cells keeps a mouse healthy, wealthy, and wise.

by Ed Yong

It's not quite a fountain of youth, but it's an intriguing step in that direction: Darren Baker from the Mayo Clinic and colleagues have developed a cellular spring cleaning that delays the health problems of old age in mice. By selectively killing senescent cells—ones that no longer grow or divide—Baker impeded the onset of cataracts, weakening of muscles, and body fat loss. He even reversed some of these problems in elderly mice. The animals did not live longer, but they gained more healthy months.

Senescent cells have been linked to aging before, but the Mayo experiment demonstrates that they have specific harmful properties. “Our work indicates that a small number of these cells can have a big impact,” says physiologist James Kirkland, one of the study's leaders. If the same principle applies to humans, it may be possible to increase a person's “healthspan” by targeting senescent cells or the chemicals they secrete.

The research could have other benefits. Senescence helps contain cells so badly damaged that they could turn into cancers. Many tumors develop from senescent cells that somehow escape this quarantine; wiping out all the cellular retirees could nip cancers in the bud.

Attacking all senescent cells might not be desirable, though, since such cells may aid in repairing wounds and preventing infections. “There's a long way to go,” Kirkland admits, but after 15 months, equivalent to half a human lifetime, the mice were still doing well.