

## Re: The ultimate cause of aging

---

*Source:* <http://sci.tech--archive.net/Archive/sci.bio.evolution/2008-03/msg00035.html>

---

- *From:* Lorentz <[drosen0000@xxxxxxxxxx](mailto:drosen0000@xxxxxxxxxx)>
  - *Date:* Sat, 8 Mar 2008 01:18:39 -0500 (EST)
- 

On Mar 7, 1:36 pm, dkomo <[dkomo...@xxxxxxxxxxxxx](mailto:dkomo...@xxxxxxxxxxxxx)> wrote:

But how do you explain the fact that the dog seems to age 8 times faster than the human if aging is simply parts wearing out? Do the dog's "parts" wear out 8 times faster than the human's? Why? Aren't the dog's "parts" pretty much the same as the human's? The same proteins, cells, organs, and so on?

I read some analysis of the evolution of dogs, but I don't remember the reference. However, I do remember a little bit relevant to your discussion.

Both dogs and humans have evolved to keep certain juvenile traits longer than individuals in their closest relatives (i.e., other species in the same family or order). However, they have evolved by different mechanisms.

Human beings are neotonous. Their developmental aging process has slowed down, even including the development of their sexual organs. They reach adolescence much later, and grow old much later. Their aging has especially slowed down with regards to the ability to learn, which is in most species of mammals basically a juvenile trait.

Neotony is characteristic of animals which undergo a large amount of competition, in environments where the abiotic environment is rather benign (Gould, Ontogeny and Phylogeny). Humans have to compete against each other, the savagery of the weather is somewhat secondary.

The main juvenile trait in humans is the ability to learn, by which I mean the maximum rate of learning. A mammal brain stops growing by adolescence, so if the adolescence is delayed the brain grows larger and the ability to learn gets larger. An adult human learns at a significant fraction of the rate of an infant human, whereas an adult chimpanzee learns at a rate that doesn't compare to that of an infant chimpanzee. Even though the infant chimpanzee and the infant human learn at approximately the same rate, adult humans learn at a much faster rate than an adult chimpanzee.

Humans also live longer than a chimpanzee. The longer lifespan is a secondary effect of the neotony. The aging process was slowed down so that the intelligence can last longer. Of course, there is a little feedback. A person who continues to learn all his life becomes more knowledgeable as he grows older. So the ability to learn is greatly

## Re: The ultimate cause of aging

enhanced by the delay of senescence. So the ratio of births rate to death rate may increase with age in primitive human societies. An old human knows how to avoid leopards better than an adolescent. A chimp wouldn't benefit as much from a slowed down aging process. His chances of being eaten by a leopard are just as great as an adult as for an adolescent.

A dog is paedomorphic. Its aging process is speeded up. His sexual organs age faster than his brains. A mammal brain stops growing by adolescence, so if the adolescence is advanced the brain doesn't grow as large and the ability to learn gets smaller.

Paedomorphy is characteristic of animals which undergo a large a small amount of competition, in environments where the abiotic environment is rather hostile (Gould, Ontogeny and Phylogeny). Sort of field of bullets selection. The earliest dogs were wolves that lived in the caveman equivalent of junkyards. There was lots of food thrown away in garbage heaps, so the wolves didn't have to compete with each other. The abiotic environment may have been hostile, people like to put their garbage heaps in areas that no one would want to live. Like areas with no water, etc. When it rained, there was probably enough water for all the dogs, when there was a drought, they all died.

Being smart wasn't as important as getting along with the humans who lived near by, not bothering them. Being

Dogs don't live as long as wolves. However, compared to wolves the dog is a sexual god. Dogs reach complete sexual maturity within two years, wolves take longer. Wolves are also much smarter than dogs, at least as adults.

Here is where the "ultimate" explanation of aging is lacking. In order to answer these questions we have to go into the "proximate" explanations of aging involving physiology, biochemistry, cell biology, molecular biology, and so forth. There are dozens if not hundreds of proximate aging processes involved, many of which still await discovery.

The adrenal glands may be involved in neotony. I know that in the axolytol, a neotonous salamander, the adrenal glands are slowed down. The axolytol grows into a superlarge tadpole and reproduces that way. I guess the competition in it little Mexican lake caused neotony. Add iodine, and it metamorphizes.

.