

You Are Younger Than You Think

How old are your bones? If you believe they are the same age as you are, you're wrong. No matter how many candles on your birthday cake, most of your body is many years younger. And here you thought (as did we all) that we peaked at some point in our 20's and have been steadily degenerating ever since - our bodies wearing out and breaking down with each passing year. It is so very heartening to know that's not true!

How did this revolution in our understanding of aging come about? A stem cell biologist at the Karolinska Institute in Stockholm, Sweden named Jonas Frisen was attempting to answer a controversial question about the human brain – specifically, the cerebral cortex. Do the cells in that part of the brain endure from birth to death? Are new ones ever generated? In order to resolve this, he first needed to be able to determine the age of the cells in this part of the brain. The usual way of determining how old something is uses Carbon 14, a naturally occurring isotope. This method is not accurate for short time frames and because it is present in such small amounts it is best for dating things that lived in the distant past.

In order to precisely estimate the age of living tissues Mr. Frisen needed more Carbon 14 to work with and, thanks to modern warfare, he found it. The testing of nuclear weapons in the 1950's and 60's generated a whole new batch of Carbon 14 and it entered the food chain worldwide, becoming incorporated into the DNA of all living things.

Most of the molecules inside a cell are constantly being replaced but the genetic material is not. A cell's DNA, with some of its carbon atoms being of the Carbon 14 type, is made when its parent cell splits into two. By measuring the activity of this marker, he could now know, very accurately, just how long specific cells have been alive.

Each type of tissue turns over at a different rate, depending on what its cells do. The surface of our skin is replaced every two weeks while the cells lining our digestive tract only live for 5 days or so. Red blood cells live for 120 days and your liver a mere 18 months.

How old are those bones of yours? Well, whether you are forty or eighty, your entire skeleton is replaced every 10 years as old bone cells are removed and new ones installed.

Skeletal muscle cells have a longer run, sticking around for at least 15 years.

It seems the only parts that last a whole lifetime are the cells inside the lens of the eye, the muscle of the heart and those neurons of the cerebral cortex which initially inspired Mr. Frisen's investigation. It is this finding which could explain why we think we are as old as the calendar tells us.

Because DNA inevitably decays over a lifetime, none of us will live forever but it is good to know that you're not entirely as old as your birth certificate says. Think of yourself not as a body that is degenerating but as a work in progress.

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