Bacteria do age after all

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Amsterdam - Bacteria do age and that is exactly what keeps the population fit. This was shown by research at the University of California, San Diego.

The biologists publish their results in the journal *Current Biology* of 8 november.
Lin Chao, one of the scientists, explains: "In most organisms, aging is caused by accumulation of non-genetic damage, like the slow oxidation of proteins."

Daughter cells

If a bacterial cell divides into two daughter cells, which will divide into four daughters and then eight, sixteen, etc., it has been long thought that there would be a forever young population of bacteria. It was thought that bacteria do not age, at least not in a way similar to aging in other organisms.

But now it is shown that bacteria do actually age by accumulating non-genetic damage. In some way, this even keeps them fit. A one-celled organism has two options: dividing and seperating the damage evenly over both new cells, or passing all damage to one daughter cell, and none to the other.

Computer Simulation

The research from San Diego shows that more damage is passed onto one of the daughter cells, and less onto the other. The daughter receiving less damage in the cell gets 'rejuvenated'. The researchers discovered this by applying computer simulations to two earlier experimental studies performed in 2005 and 2010. In 2005 evidence was found for aging in bacteria, while the study from 2010 suggested the opposite.

By re-analyzing the data from both studies, it is now found that both studies basically showed the same. Chao: "In a population of bacteria, aging and rejuvenation occur simultaneously. So,

depending on your methods, you can be easily misled into believing that aging does not take place."

Growth rate

In a study of their own, the biologists filmed many generations of splitting populations of E. coli bacteria. They found that after division the two daughter cells grow with different rates. They suspect that the slower growing cell received more damage.

The researchers explain that it is evolutionary advantageous to divide the damage unevenly over the daughter cells. Chao gives an example of a one million dollar investment: Should you put it all in the bank with an interest of 8%, or is it better to chose 6% for one half and 10% for the other half of your money? After one year you will not see a difference, but already after two years the investment with two different growth rates will have grown faster.