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2008 Körber European Science Award: Drugs to fight cancer and ageing



The Körber European Science Award 2008 goes to the Spanish molecular biologist Maria Blasco

Maria Blasco and her team conduct research into the dynamics of the telomerase enzyme. Their work not only promises to create a new kind of drug to fight cancer, but could also help to make somatic cells – and therefore humans – live longer.

The Hamburg-based Körber Foundation is giving this year's Körber Award, endowed with 750,000 euros, to Maria Blasco. Born in Spain in 1965, the molecular biologist has distinguished herself with pioneering work in the field of telomeres, the end pieces of chromosomes. Her findings gathered in mouse experiments promise new kinds of cancer therapy and could help to prolong the life of cells – and hence possibly also that of humans. The Körber Award, which is now in its 24th year, promotes European scientists with particularly innovative research projects. The winners are determined by an international trustee committee chaired by the president of the Max Planck Society, Prof. Dr. Peter Gruss.

Maria Blasco heads the Research Group for Telomeres and Telomerase at the Spanish National Cancer Research Centre (CNIO) in Madrid. Telomeres protect the hereditary information of our genes in a similar way to the plastic caps on the ends of shoe-laces. The protection provided by the telomeres does not last for ever. After roughly 50 cell divisions they become so short that the cells can no longer divide and consequently die. This is probably the main cause of natural ageing.

There are, however, cells in the body which are theoretically "immortal". These include cancer cells and stem cells, which are not differentiated and help to repair injuries to the skin, for example. The special feature of these cells is an enzyme, discovered in 1984, called telomerase, which enables the shortened telomeres to regain their former length. This is a vital clue to the immortality of cancer cells.

This is where Mario Blasco comes in: her team aims to develop an active ingredient which inhibits telomerase in cancer cells. This would make them mortal like normal cells – and once they are killed, the cancer would be conquered.

Maria Blasco succeeded in identifying the gene for the telomerase enzyme in the mouse genome and thereby in creating so-called knock-out mice in which this gene is specifically rendered inoperable. These mice aged more quickly and their wounds healed less well; however, they also showed significantly less susceptibility to tumours. This supports the theory that a lack of telomerase is helpful against cancer, but also shortens life at the same time.

In further experiments, Blasco and her colleagues created transgenic mice which produce an excess of telomerase. These rodents lived longer and showed good wound healing, but also came down with cancer more frequently. Large quantities of telomerase therefore not only promote the length of the telomeres, but also evidently increase susceptibility to cancer – further confirmation of Blasco's theory that a medicinal telomerase inhibitor could help against cancer. In the future, the team intends to create a mouse which lives long without coming down with cancer – i.e. the benefits of the two above-mentioned mouse types combined.

Maria Blasco studied biochemistry and molecular biology at the University of Madrid. Upon gaining her doctorate in 1993 she worked for three years as a post-graduate at the Cold Spring Harbor Laboratory in New York. In 1997, she returned to Madrid where she headed the Research Group for Telomeres and Telomerase at the National Centre for Biotechnology, with which she moved over to the CNIO in 2003. Here she became head of the Research Group for Molecular Oncology in the same year. Maria Blasco is the author of numerous influence publications and has received many prizes and awards for her research work.

The Körber European Science Award 2008 will be presented on 8 September in the Main Festival Hall of Hamburg City Hall.

Detailed information on the project and a photo of the award winner at www.koerber-award.org.