Press Release – Science

Leuven - 23 February 2009

Anti-cancer gene discovered: perspective for therapy

Starting with the tiny fruit fly, and then moving into mouse and human patients, researchers at VIB connected to the Center for Human Genetics (K.U.Leuven) showed that the same gene suppresses cancer in all three. Reciprocally, switching off the gene leads to cancer. The scientists think there is a good chance that the gene can be switched on again with a drug. They report their findings in the reputed scientific journal PLoS Biology.

Specialized cells

All of us begin our lives as one cell, which divides into two, four, eight … into a human of a few billion cells. Almost all cells in an adult human – skin cells, liver cells, eye lens cells, nerve cells, insulin-producing cells etc – are highly specialized to perform a specific function. They are no longer capable of taking on another task: when a skin cell divides, you get more skin cells. During the growth from an embryo to an adult human, the cells become more and more specialized ("differentiated", biologists say).

Cancer cells are an exception to that rule: they are much less specialized, and feel at home in different places in the body. Researchers have long believed that cells must take the last step in their specialization to be better protected from turning into cancer cells. However, this was not proven in a living organism.

Suppressing cancer

Wouter Bossuyt from the Group of **Bassem Hassan** and their fellow VIB researchers at K.U.Leuven, now demonstrate with fruit flies that master control genes steering the specialization step indeed inhibit tumor formation. The specific example the VIB scientists used, are the ones biologists call the Atonal genes. These genes are very similar to each other in all species, from flies to humans.

With mice, and in collaboration with colleagues from the United States, they showed that loss of one of those genes, Atonal homolog 1 or ATOH1, causes colon cancer. The gene regulates the last step in the specialization to epithelial cell of the colon. Humans with colon cancer frequently have an inactivated ATOH1 gene, the researchers observed.

Treatment

The researchers could – in a test tube – reactivate the gene in human colon cancer cells. The tumor cells stopped growing and committed suicide. Since they were able to switch the gene on with a reasonably simple chemical, this opens possibilities to one day perhaps switch the gene back on in living patients. It will be very important in the future to study in detail how exactly ATOH1 does performs its anti-cancer job

Questions

Given that this research can raise a lot of questions, we ask you to please refer questions in your report or article to the e-mail address that VIB makes available for this purpose: patienteninfo@vib.be. Everyone can submit questions concerning this and other medically-oriented research directly to VIB via this address.

Relevant scientific publication

Bossuyt *et al.,* Atonal homolog 1 is a tumor suppressor gene, PLoS Biology: http://biology.plosjournals.org (7(2): e1000040. doi:10.1371/journal.pbio.1000040)

Bossuyt *et al.,* Atonal proneural transcription factor links differentiation and tumor formation in *Drosphila*, PLoS Biology: http://biology.plosjournals.org (7(2): e1000039. doi: 10.1371/ journal.pbio.1000039

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Mention both VIB and the university
When reporting this research, please always mention VIB as well as the university concerned.

Note to the Editor
This research was conducted by **Wouter Bossuyt** and colleagues of the VIB Department of Developmental and Molecular Genetics, K.U.Leuven, under the direction of **Bassem Hassan**. (More info at: www.vib.be/Research/EN/Research+Departments/Department+of+Molecular+and+Developmental+Genetics/Bassem+Hassan)

VIB
VIB is a non-profit research institute in the life sciences. Some 1100 scientists and technicians conduct strategic basic research on the molecular mechanisms that control the functioning of the human body, plants, and micro-organisms. Through a close partnership with four Flemish universities – Ghent University, the Katholieke Universiteit Leuven, the University of Antwerp, and the Vrije Universiteit Brussel – and a solid investment program, VIB unites the forces of 65 research groups in a single institute. Their research aims at fundamentally extending the frontiers of our knowledge. Through its technology transfer activities, VIB strives to convert the research results into products for the benefit of consumers and patients. VIB also develops and distributes a broad range of scientifically substantiated information about all aspects of biotechnology. More info at: www.vib.be.

K.U.Leuven
The Katholieke Universiteit Leuven, founded in 1425, is one of the oldest universities in Europe. The university offers a wide range of programs of study, in Dutch as well as in English. In addition, the K.U.Leuven is an international management research center, with a good balance between fundamental and applied research in a variety of disciplines. The university has over 33,000 students, a tenth of which come from abroad. Over 17,000 people work at the university, about half of whom are employed by UZ Leuven, the university hospitals.

Center for Human Genetics
The Center for Human Genetics (Centrum Menselijke Erfelijkheid) provides research, training and services in the fields of human genetics, cancer and neurological diseases. The Center seeks to increase understanding of human diseases with the aid of genetics. It conducts leading research in molecular genetics and provides a platform of genetic technologies to support clinical and fundamental research both within and outside Belgium. The Center places its clinical and scientific expertise at the service of society in the form of advice, diagnosis and treatment. Attention is also given to the social, ethical and psychological implications that new concepts and clinical practices in human genetics have on the individual and society.
More info at: http://med.kuleuven.be/dme.

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