MedicalXpress

Tumor-suppressing genes could play important role in obesity, diabetes and cancer

December 11 2013

The function of two tumor-suppressing genes could play a vital role in helping to control obesity and other diseases such as diabetes, heart disease and cancer, according to researchers in Temple University's Sbarro Institute for Cancer Research and Molecular Medicine.

The researchers published their findings, "Silencing of RB1 and RB2/p130 during adipogenesis of bone marrow stromal cells results in dysregulated differentiation," in the Feb. 1, 2014, issue (online Nov. 25) of the journal *Cell Cycle*.

"We found that these two genes of the retinoblastoma family, Rb1 and Rb2/p130, are key proteins in regulating the formation and function of fat tissue in the body," said Antonio Giordano, director of the Sbarro Institute and one of the paper's lead authors. "If these proteins are not functioning properly, they are unable to control the formation of fat tissue in the body, so you have a continuous formation of fat tissue."

Giordano said that many people believe that fat tissue is inert, but it is actually a very dynamic tissue and plays a very vital role in producing a number of important proteins in the human genome. "Everyone always thinks of fat tissue in negative terms," he said.

"Fat tissue does play an important function by producing molecules that assist bone marrow to function, grow and produce all three blood cell types: red, white and platelets," said Umberto Galderisi, associate professor of biology at the University of Naples in Italy and a co-author

of the study. "But if Rb1 and/or Rb2/p130 are damaged, they can deregulate the fat tissue and cause an overproduction, which can alter the bone marrow's ability to produce those necessary blood cells."

In their paper, the researchers suggest that in addition to altering the bone marrow's ability to assist in the production of blood cells, the overproduction of fat tissue can lead to obesity, which has been linked to several diseases, including diabetes, cardiovascular disease, cancer, and in older people, anemia.

"Fat tissue may also feed and sustain the growth of cancer cells in the body, which helps to explain the link between obesity and cancer," said Giordano, who discovered Rb2/p130 in the early 1990s while a researcher in Temple's Fels Institute for Cancer Research and Molecular Medicine.

Galderisi, also an adjunct professor of biology at Temple, said that understanding this mechanism for regulating the activity and the life of bone-marrow fat cells could pave the way for the development of therapies that might restore the proper function of fat cells, and be useful in the treatment of obesity and its related diseases.

Provided by Temple University