

MicroRNAs can be tumor suppressors

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University of Virginia researchers have discovered that microRNAs, a form of genetic material, can function as tumor suppressors in laboratory studies.

In the May 1 issue of *Genes & Development*, UVA researchers Drs. Yong Sun Lee and Anindya Dutta have shown that microRNAs can suppress the overexpression of a gene called HMGA2. This gene is related to creation of fatty tissue and certain tumors, as well as diet-induced obesity.

MicroRNA is a single-stranded RNA that is typically only 20-25 nucleotides long and is related to regulating the expression of other genes.

"Overexpression of the HMGA2 gene is an essential feature of many medically significant tumors, such as uterine fibroids," explains Dr. Dutta. "It is very exciting to realize that microRNAs have an important role in suppressing the overexpression of HMGA2. Thus, they may also have a role in causing, and perhaps curing, a disease that is responsible for the vast majority of hysterectomies in the Western world."

Studying chromosomal HMGA2 translocations that are associated with human tumors, the researchers found that, in normal cells, a microRNA called let-7 binds to the 3' end of the HMGA2 mRNA transcript and suppresses its expression in the cell cytosol. However, chromosomal breaks that shorten the 3' end of the HMGA2 transcript, and prevent let-7 binding, result in aberrantly high levels of HMGA2 expression and

tumorigenesis (formation of tumors).

This paper establishes that HMGA2 is a target of let-7, and that the let-7 microRNA functions as a tumor suppressor to prevent cancer formation in healthy cells.

Source: University of Virginia

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