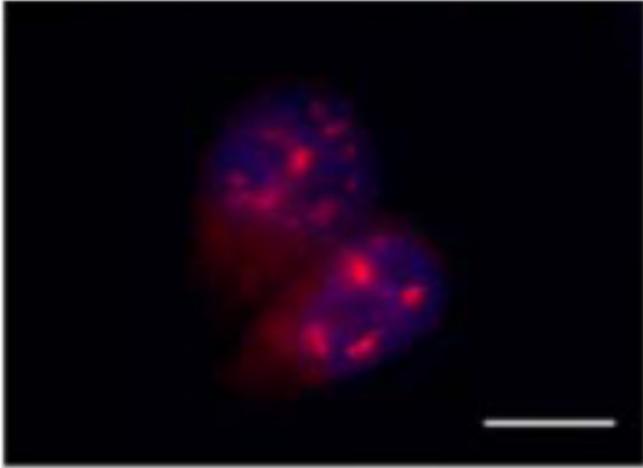


New way to control genetic material altered in cancer discovered

5 June 2014



This image shows colon cancer cells where the ultra-conserved RNA identified appears in red. Credit: IDIBELL

When we talk about genetic material, we are usually referring to the DNA (deoxyribonucleic acid) that we inherit from our parents. This DNA is the factory where is built a similar molecule called RNA (ribonucleic acid) which produces our proteins, such as hemoglobin or insulin , allowing the lives of our cells. But there is a special group called non-coding RNA that has a more enigmatic function.

The best known is microRNAs, tiny molecules that are responsible for turning on or off our genome like an electrical current switch. Today, an article published in the prestigious journal *Molecular Cell* by Manel Esteller, Director of Epigenetics and Cancer Biology Program of the Bellvitge Biomedical Research Institute (IDIBELL), ICREA researcher and Professor of Genetics at the University of Barcelona, provides a twist over this mystery.

Research shows that there is a second type of non-

coding RNA, called ultra-conserved RNA that acts as switches switch, ie , controls the activity of microRNAs.

"Who watches the watchers? This was one of the issues that we set at the beginning of the research" says Esteller. "We have found that special molecules called ultra-conserved RNA were not produced in human tumors and this contributed to their growth, but we knew nothing about this mechanism. It should be an important role because these molecules are highly conserved in evolution and there is no variation from chickens to humans. We realized ultraconserved RNAs attached to the other family of non-coding RNAs , microRNAs, as a magnet and prevented its function. That is, they are the police internal affairs officers who supervise the battle soldiers in healthy cells . If a cell fails to produce the ultraconserved RNA, microRNA gets altered and hundreds of genes that should maintain cellular balance does and thus contributes to the formation of human tumors, " concludes Manel Esteller.

The results obtained by the group Esteller in *Molecular Cell* article are very important for understanding the function of the dark genome. Deciphering encrypted codes of cellular activity in these sequences of our DNA represents one of the most exciting challenges of modern biology. This cutting edge research is beginning to bear its first fruits in the field of medical research such as that described ultraconserved RNA is related with cancer development.

Provided by IDIBELL-Bellvitge Biomedical Research Institute

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