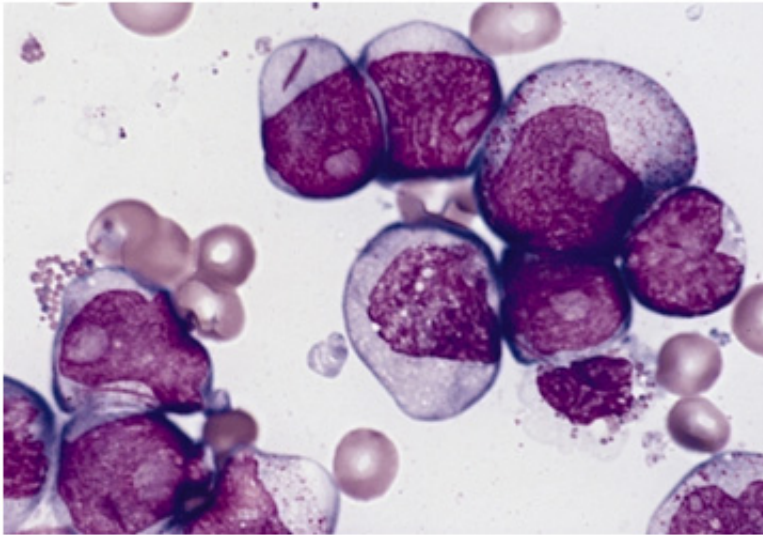


Identified an 'alarm clock' of a leukemia-causing oncogene

October 8 2015



Leukemia cells. Credit: PEBC-IDIBELL

In the last thirty years it has been described in the field of oncology a large number of mutations in genes involved in multiple cellular pathways. The current ability to sequence all the genetic material of a tumor implies that it has been identified an even greater number of mutations in human tumors. However, we know very little about what are the consequences for the activity of the cells of these changes in the structure and composition of DNA.

Today, an article published in *Oncogene*, led by Manel Esteller, director of the Program Epigenetics and Cancer Biology of IDIBELL, ICREA

researcher and Professor of Genetics at the University of Barcelona, shows how a mutation in a gene results the activation of a gene that triggers leukemia.

"Recently it has been discovered the existence of [mutations](#) in the DNMT3A gene in leukemia. It seemed that history stopped here. But this gene is responsible for silencing other genes that should not be active in the cell; so we wonder which DNA sequence was being "awakened" by this mutation in leukemias "explained Manel Esteller, director of the study.

"By analyzing the entire genome of [leukemia cells](#) carrying the mutation, we realized that the activated target gene was called oncogene MEIS1. This is a powerful gene inducing [acute myeloid leukemia](#) which its proleucémica function was known, but not as it gets underway. The mutation of another gene explains it"says the researcher.

"We can imagine it as a house of cards. If you remove the card from the bottom row (DNMT3A) just falling all upper layers, such as oncogene MEIS1. The finding, in addition to its usefulness in predicting patients with poor prognosis leukemias, suggests that this subtype of leukemia may be sensitive to drugs that have as target the two [genes](#) studied".

More information: HJ Ferreira, Heyn H, Vizoso M, C Moutinho, Vidal E, Gomez A, Martinez-Cardus A, Simo-Riudalbas L, S Moran, Jost E, Esteller M. DNMT3A mutations mediate the epigenetic reactivation of the leukemogenic factor in acute MEIS1 myeloid leukemia. *Oncogene*, October 5th, 2015.

Provided by IDIBELL-Bellvitge Biomedical Research Institute

Citation: Identified an 'alarm clock' of a leukemia-causing oncogene (2015, October 8) retrieved 18 April 2024 from

<https://medicalxpress.com/news/2015-10-alarm-clock-leukemia-causing-oncogene.html>

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