

New breast cancer classification based on epigenetics

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Breast tumor identified as Epi-Luminal B of poor prognosis. Credit: IDIBELL

Breast cancer is the most common in women. One in nine will suffer breast cancer over their lifetime. Progress in prevention and early detection, and the use of chemotherapy after surgery (adjuvant chemotherapy), have achieved significantly increase survival in this disease in the last ten years, but much remains to be done.



The identification of patients with high-risk breast cancer is key to knowing whether a patient will require only the removal of the tumor by surgery or whether if she will need additional chemotherapy to make sure the removal of <u>breast cancer cells</u>. Currently, known genetic mutations and expression patterns are determined, but the puzzle of the genetics of the disease remains a large unfinished part.

The director of the Program Epigenetics and Cancer Biology (PEBC) at Bellvitge Biomedical Research Institute (IDIBELL), Professor of Genetics at the University of Barcelona and ICREA researcher, Manel Esteller, has established the epigenetic patterns of <u>breast cancer</u> and also its clinical consequences. The finding is published in the journal *Molecular Oncology*.

"We've analyzed epigenetic alterations, namely the chemical signal called DNA methylation in 500 <u>breast tumors</u> and have compared the patterns obtained with the clinical behavior of these cancers," says Esteller.

Two new subtypes of breast cancer

"We note that there are two subgroups of breast tumors by epigenome: one which we have called Epi-Basal, characterized by loss of <u>epigenetic</u> <u>marks</u> causing breakage of chromosomes and the other that we have called Epi-Luminal B, that presents epigenetic inactivation of genes that should protect us from cancer and these altered cells can no longer do it".

The researcher highlights that "the subtype Epi-Luminal B behaves particularly aggressive form, and is associated with reduced survival of patients. This can be useful to recommend that these tumors do not be conformed to surgery and determine that it will probably be necessary to administer <u>adjuvant chemotherapy</u> in other words, in those tumors with a



more 'benign' epigenetic pattern; surgery alone may be curative, thus avoiding the side effects of <u>chemotherapy</u>, "concludes the researcher.

More information: A DNA methylation-based definition of biologically distinct breast cancer subtypes. Stefansson OA, Moran S, Gomez A, Sayols S, Arribas-Jorba C, Sandoval J, Hilmarsdottir H, Ólafsdóttir I, Tryggvadottir L, Jonasson JG, Eyfjord J, Esteller M. *Molecular Oncology*, PII: S1574-7891 (14) 00261 -0, 2014.

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