

Why cancer cells change their appearance?

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Like snakes, tumour cells shed their skin. Cancer is not a static disease but during its development the disease accumulates changes to evade natural defences adapting to new environmental circumstances, protecting against chemotherapy and radiotherapy and invading neighbouring organs, eventually causing metastasis.

Until now little was known about the mechanisms involved in these changing processes in a tumour. There is a particularly intriguing way in which a tumour that initially presents a solid state, attached to [nearby cells](#) (epithelial), afterwards becomes a semiliquid mass, detached from tissues and more flexible (mesenchymal).

The team led by Manel Esteller, director of the Cancer Epigenetics and Biology Program at the Bellvitge Biomedical Research Institute (IDIBELL), professor of Genetics at the University of Barcelona and ICREA researcher, has identified a mechanism that explains this change. Tumours "shed their skin" because some molecular switches called microRNAs -responsible for maintaining epithelial appearance of cells- turn off. The finding has been published this week in the online version of the international scientific [journal Oncogene](#), Nature group.

"We have discovered that some microRNAs, a group called microRNA-200S, undergoes a chemical inactivation and inhibit their expression. When these cellular appearance drivers are not present, [tumour cells](#) change, stretch, stop their inhibition and thus the tumour progresses", explains Dr. Esteller, adding that "the results from research show that this is a very dynamic process."

Change involves from the appearance of the tumour to the onset of [metastasis](#), but if we change the environmental circumstances that influence these cells, the process reverses. Dr Esteller compares the process "with a small planet in [Darwinian evolution](#) but in an expedited manner."

The study was conducted mainly in breast and colon tumours. Besides serving to better understand the disease, the results are important because they predict that external intervention is possible in the process. In this sense, drug treatments can reverse the process and move from a highly evolved tumour form to a more primitive form, which would be associated with a slower progression of the disease.

More information: V Davalos, C Moutinho, A Villanueva, R Boque, P Silva, F Carneiro, and M Esteller. Dynamic epigenetic regulation of the micro RNA-200 family mediates epithelial and mesenchymal transitions in human tumorigenesis. 2011 Aug 29. [doi:10.1038/onc.2011.383](https://doi.org/10.1038/onc.2011.383) [Epub ahead of print]

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