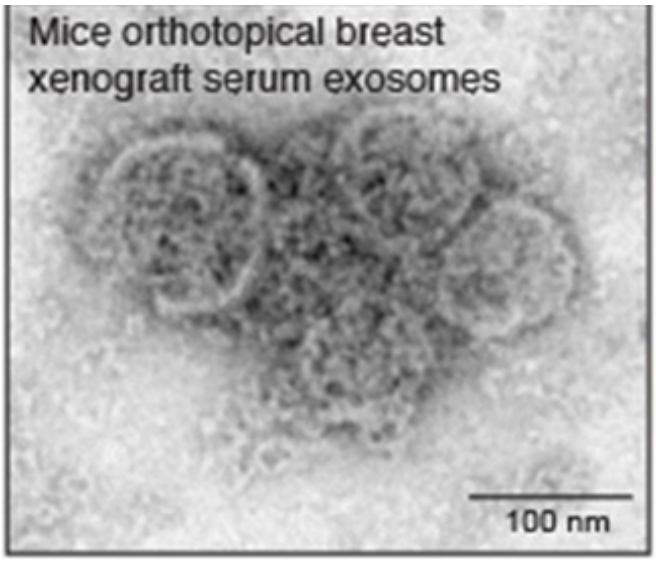
How the breast cancer cells transform normal cells into tumoral ones?

13 November 2014



Mice orthotopical breast xenograft serum exosomes. Credit: IDIBELL

Researchers at the Bellvitge Biomedical Research Institute of Bellvitge, the Catalan Institute of Oncology and the University Hospital of Bellvitge have participated in an international study published in the journal *Cancer Cell* that describes how exosomes secreted by tumor cells contain protein and microRNA molecules capable of transform neighboring cells into tumoral cells promoting tumor growth.

What are exosomes?

Exosomes are small vesicles which are secreted by all cells and contain proteins and messenger RNAs and microRNAs. At first it was thought that only functioned as cellular debris warehouses but in recent years has been that could have an important role as a messenger between cells of the body and now many groups focus their research on the role that could be played exosomes in various diseases, including cancer.

The study published in *Cancer Cell* shows that exosomes from tumor cells of breast cancer (and other tumor types such as ovarian and endometrial) are different in size and composition than those of healthy cells. According to the head of the research group of chemoresistance and Predictors of tumor response and stromal environment ICO-IDIBELL, Alberto Villanueva, "tumor exosomes contain certain proteins (Dicer, TRBP and Ago2) able to process microRNAs that can alter the around the tumor cells transforming them into tumoral cells. "

The pathologist of the Department of Pathology at the University Hospital of Bellvitge August Vidal explained that "this tumorigenic transformation depends on Dicer protein that could serve as a marker for the presence of tumor cells, or as a therapeutic target."

In human samples and in mice

Researchers have isolated exosomes from tumors and from blood of patients with breast cancer, and from blood of mice with human tumors grown after breast implantation in mice, called ortoxenogratfs.

"This finding," Villanueva said "opens the door to developing new biomarkers and new therapeutic strategies exploiting these characteristics of exosomes in breast tumors, and other tumors such as ovarian and endometrial cancer among others."

More information: Melo S.S., Sugimoto H., O'Conell J.T:, Kato N., Villanueva A., Vidal A., Le Qiu E.V:, Perelman L.T., Melo C.A., Lucci A., Ivan C., Calin G.A., Kalluri R.Cancer exosomes perform cell-independent MicroARN biogenesis and promote tumorogenesis. dx.doi.org/10.1016/j.ccell.2014.09.005

Provided by IDIBELL-Bellvitge Biomedical Research Institute