PRESS RELEASE

Research published in 'Breast Cancer Research and Treatment'

Oestrogen reduces the aggressiveness of breast cancer

- *According to a study carried out by researchers at CIC bioGUNE, led by Dr. María Vivanco, oestrogen reduces the proportion of stem cells in breast cancer, and this may correlate with a less aggressive prognosis.*
- *The research, published in the journal* Breast Cancer Research and Treatment*, opens a door to possible new preventative therapies for breast cancer*

(*Bilbao, 7th February 2011*). - The identification of cancer stem cells (or tumour-initiating cells) opened new perspectives in breast cancer research and created new expectations for treatment in the future. Until now, treatments against cancer were designed to reduce the tumour mass. However, what has been recently discovered is that traditional cancer treatments are able to kill the bulk of the cells in the tumour, but the cancer stem cells are more resistant to common interventions such as chemotherapy and radiotherapy. Therefore, to cure cancer with greater effectiveness, it is important to find ways to eliminate the cancer stem cells.

Oestrogen is a complex hormone; it is essential for the normal development and physiology of the breast but, on the other hand, this same hormone increases the proliferation of cancer cells once a breast tumour has arisen; therefore oestrogen is also a risk factor for breast cancer. However, little or nothing is known about the effect of oestrogen on tumour-initiating cells.

In recent years, a lot of progress has been made in the fight against breast cancer, notably, improvements in diagnosis, prognosis and possible treatments. This gave rise to a considerable increase in patient survival. It has been proposed that the number of cancer stem cells correlates with the aggressiveness of the tumour: the higher the percentage of breast cancer stem cells, the more aggressive the tumour, and therefore, the worse its prognosis.

A group of researchers at the CIC bioGUNE, led by Dr. María Vivanco, revealed another aspect of oestrogen, unknown until now: its role as a possible agent to reduce the aggressiveness of breast cancer. Their work shows that oestrogen is also able to reduce the number of breast cancer stem cells, which explains the lower aggressiveness of tumours and consequently the possibility of a better prognosis.

For more information, please contact: Iñaki Gorostidi (637 273 729 / gorostidi@guk.es)

PRESS RELEASE

Dr. Vivanco and her team will present *the results of this project at the International Breast Cancer Conference, to be held in Madrid from 7t^{h} to 9th of February.*

The project, which is published in the journal *Breast Cancer Research and Treatment*, was carried out in collaboration with a number of clinical professionals including Dr. José Antonio López-Ruiz (radiologist, PreteImagen, Bilbao), Dr. Iñaki Zabalza (pathologist, Hospital Galdakao-Usánsolo) and Dr. Jon Mieza (gynaecologist, Instituto Ginecológico de Deusto), as well as Dr. Olga Acinas (pathologist, Hospital de Sierrallana). The study combined the use of human samples and laboratory cell lines.

“What we observed, to our surprise, it that oestrogen is reducing the proportion of breast cancer stem cells, which would be a mechanism to explain the better prognosis observed in tumours that express the oestrogen receptor. That is, those tumours that express the oestrogen receptor are less aggressive, better differentiated and therefore have a better prognosis”, explains María Vivanco.

Vivanco considers that this study raises a new aspect of oestrogen action, owing to its ability to act in different ways according to the type of cell.

In the opinion of the CIC bioGUNE researcher, this study “has provided a molecular basis for understanding the direct effects of oestrogen on the proportion of stem cells, whether in healthy or cancerous tissue, and the fact that the oestrogen receptor is an excellent prognosis marker. Furthermore, this is an explanation for several clinical observations, for example: high levels of oestrogen in the blood of post-menopausal patients is associated with less aggressive tumours; poorly differentiated tumours contain more cancer stem cells, which is linked to a high tumour grade, lack of oestrogen receptor and low survival rate; and the observed benefits of breast-feeding attributed to a higher state of differentiation in the breast.

The new study represents an important step that should open new perspectives for developing tools for breast cancer prevention.

For more information, please contact: Iñaki Gorostidi (637 273 729 / gorostidi@guk.es)