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Mechanism Linking Progesterone and Hereditary Breast Cancer Discovered

ScienceDaily (May 4, 2011) — Two researchers from the Centre for Genomic Regulation in Barcelona have discovered a new mechanism by which mutations in gene BRCA1 can induce breast cancer. The work, which is published in the journal *Cancer Research*, explains the greater growth in cancerous cells with BRCA1 defects on two levels: by an increase in the quantity of progesterone receptor that is found in the cells and by its increased effect on the expression of the genes which activate cell proliferation.

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- Breast Cancer
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Reference

- BRCA1
- BRCA2
- Insulin-like growth factor
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It has long been known that the existence of mutations in the gene BRCA1 can cause breast cancer in approximately 80% of cases, as well as ovarian cancer in 54% of cases. Although this gene is related to other types of cancer, the fact that it is so specific for breast cancer has aroused great interest among the scientific and medical community.

One of the most accepted hypotheses to explain the specificity of BRCA1 in the development of cancer in tissues with high levels of female hormones is the role of this gene in regulating the activity of these hormones.

In a paper published in the journal *Cancer Research*, the researchers from the Centre for Genomic Regulation, Miguel Beato and Veronica Calvo, describe the role of BRCA1 in relation to one of the two female hormones: progesterone. Their work demonstrates that BRCA1 plays a crucial role in the control of progesterone receptors found in cells.

"When the BRCA1 gene is mutated and is not expressed correctly, the cell has more progesterone receptors consequently increasing the effect on cell proliferation," explains Miguel Beato who is responsible for the work and director of the CRG. "We knew that this gene played an important role in breast cancer but now we know what one of the mechanisms used is" adds Beato.

BRCA1 acts on two levels, firstly, on the amount of progesterone receptor found in cells and, secondly, by controlling the expression of the progesterone genes.

These findings demonstrate the direct relationship between an excess of the cellular effects of progesterone and the risk of developing breast cancer. The knowledge of the way the BRCA1 gene acts enables an understanding of its importance in the development of breast cancer and helps in designing improved therapies, which act directly on the molecules involved.

In addition, the work of Veronica Calvo Miguel Beato and may have an influence at the level of cancer prevention. Just as when the direct relationship between oestrogen levels and the risk of developing breast cancer was demonstrated hormonal contraceptive methods were modified, perhaps the contribution of these researchers about the role of progesterone will also have repercussions for the prescription of contraceptive treatment.

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The above story is reprinted (with editorial adaptations by *ScienceDaily* staff) from materials provided by [Centre for Genomic Regulation](#), via [AlphaGalileo](#).

Journal Reference:

1. V. Calvo, M. Beato. **BRCA1 Counteracts Progesterone Action by Ubiquitination Leading to Progesterone**

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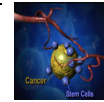
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