



Press release
Barcelona, 8 September 2011

A study confirms the prognostic value of a new therapeutic target against breast cancer

- Experts from Hospital del Mar demonstrate the prognostic value of the PARP1 protein in triple-negative breast cancer patients.
- Between 16,000 and 17,000 new cases of breast cancer are diagnosed in Spain each year, 20% of which belong to what is known as 'triple-negative' cancer, the most aggressive subtype and one that affects mostly younger women.

Researchers from the Hospital del Mar Oncology Department and the Cancer Research Programme of its research Institute, the 'IMIM', have confirmed the prognostic value of a new therapeutic target, the PARP1 protein, in breast cancer patients. This finding, which was published today in the *Annals of Oncology*, was achieved in partnership with the Jiménez-Díaz Foundation in Madrid and the Hospital Clínico in Valencia. The importance of the PARP1 protein resides in the fact that its amounts are found to be higher in breast tumours with a poor prognosis as a whole, and especially in tumours termed 'triple-negative', the subtype of cancer associated with the highest rates of recurrence and mortality, especially among younger women, and for which there are no specific or targeted treatments available.

PARP1, an encouraging therapeutic target

The research team led by Dr. Joan Albanell, Head of Oncology at Hospital del Mar and Director of the Cancer Research programme at the IMIM ('Instituto de Investigación del Hospital del Mar', i.e. the *Hospital del Mar Research Institute*) was the first to study the implications of the PARP1 protein in human samples in order to establish its actual prognostic value in the behaviour and evolution of breast cancer patients. The study showed that women with tumours containing an above-average quantity of PARP1 have a poorer prognosis, which is particularly the case in triple-negative tumours. ***"The most important finding of the study is that it determines that the overexpression of this protein -PARP1- constitutes an independent prognostic factor which correlates with patient survival"***, Dr. Joan Albanell, the consultant in charge of this study, explains. He tells us: ***"Therefore, the higher the***

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*amount of PARP1 present, the worse the prognosis and, in all likelihood, the worse the response to the anticancer treatments used, and adds: **According to this study, the PARP1 protein could serve as a current treatment response indicator. That is, the results obtained to date allow us to formulate the hypothesis that PARP1 could enable us to determine which patients would benefit from chemotherapy combined with PARP inhibitors, based on the quantity of PARP1 protein presented***", Dr. Albanell specifies.

Some PARP inhibitors are currently available which are being used on an experimental level for research work and in clinical trials, with results that, although promising, are not sufficient to allow their direct clinical application. ***"These are non-specific inhibitors of the PARP protein family. We need to find some selective PARP1 inhibitors to achieve a more targeted, less toxic inhibition and be able to devise clinical trials which can provide real treatment response data. This would enable advances in the treatment of breast cancer, the triple-negative subtype especially, which to date is an orphan when it comes to specific, targeted treatments that would allow maximum efficacy with minimum toxicity"***, Dr. Albanell concludes.

Triple-negative breast cancer: the major challenge facing oncologists this decade

Triple-negative breast cancer (Oestrogen Receptor Negative, Progesterone Receptor Negative and HER2 Negative) is a type of breast cancer of peculiar clinical and pathological characteristics which represents a major clinical problem, given that it affects 20% of all breast cancer sufferers, younger women especially. 'Triple-negative' cancer is associated with mutations in the gene that predisposes to hereditary breast cancer and tends to be diagnosed in the advanced stages, being difficult to detect during the early stages; this means that screening programmes are less effective for this type of tumour.

A further problem with 'triple-negative' tumours is the absence of hormone receptors (Oestrogen Receptor and Progesterone Receptor) and the HER2 marker, which means that treatments that antagonise these receptors cannot be applied (hormone therapy or anti-HER2 therapy) and that the basis for treating these patients is thus reduced to chemotherapy only. For the majority of patients, treatment with cytotoxic combination chemotherapy is ineffective and causes toxicity.

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Faced with this scenario, oncologists at Hospital del Mar and researchers from its research institute, the IMIM, are focusing all of their efforts on this subtype of breast cancer, the results of this study being among the fruit born from this line of research. Along the same line, in late 2010, Hospital del Mar signed an agreement with the CRG ('Centro de Regulación Genómica', the *Centre for Genomic Regulation*) and, in partnership with Roche Diagnostics, initiated an ambitious project which aims to identify new therapeutic targets and biomarkers to assess the clinical evolution of this cancer subtype.

About the Functional Unit of Breast Pathology at Hospital del Mar

Hospital del Mar was one of the first centres in Catalonia to set up a Unit that encompasses everything from early diagnosis –with the most consolidated programme and the highest number of years of registration – to breast reconstruction following breast cancer surgery. The Unit brings together all of the specialists involved in the diagnostic process –radiologists, gynaecologists and pathologists-, the surgical and oncological treatment-, rehabilitation, case management nurses and a major research programme. Pioneering research is conducted in areas such as the identification of treatment response markers, the objective being to optimise treatments from the very start, thus preventing ineffective treatments with multiple-side-effects and making everyday advances towards 'à la carte' treatments, with healthcare of the highest technical and human quality.

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