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Statale University of Milan: new method to remove stem cells from breast cancer identified



In a study recently published in the EMBO Molecular Medicine journal, researchers of the Statale University of Milan in collaboration with the European Institute of Oncology (IEO) and the [Firc](#) Institute of Molecular Oncology (IFOM) showed the

efficacy of a new class of drugs which are already in the clinical development phase, Nutlins, to remove stem cells of breast cancer.

This discovery, if validated by adequate clinical trials, will lead to the development of a more effective and less toxic therapy for the treatment of breast cancer which will allow for administration of chemotherapy on cancer cells, as well as prevent their further proliferation.

“A drug targeting stem cells of breast cancer is a historical success – said Daniela Tosoni, a researcher of the IEO Programme of Molecular Medicine –: in many patients who receive chemotherapy, the tumour initially remits, but it reappears when the therapy is discontinued due to stem cell resistance to chemotherapy.”

The stem cells of breast cancer can reproduce indefinitely and promote tumour growth. The “daughter” cells resulting from this reproduction can be removed by chemotherapy, but this is not enough to stop their proliferation. In previous studies, researchers have discovered that the protein called NUMB is a suppressor of cancer activity related to the activity of another protein, called p53, which plays the same anticancer

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role. If the gene codifying the NUMB protein is damaged, p53 protein levels decrease, while increasing the likelihood that tumour stem cells appear.

“Therefore, the challenge was to restore the p53 levels, the shield which stops stem cells, in the most severe and chemo-resistant tumours – explained Pier Paolo Di Fiore, Director of the IEO Programme of Molecular Medicine and professor at the University of Milan – We have discovered that a molecule which is already in clinical development phase, Nutlin-3, can restore the p53 amount in breast cancers that show scarcity of NUMB, thus making the tumour less aggressive and with less stem cells.”

The results from the study, supported by the Italian Association for Cancer Research (AIRC), will be included in the clinical trials for the cure and treatment of breast cancer hoping that these studies will soon have an impact on the quality of life of cancer patients.

Source Università degli Studi di Milano

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