

Low-toxin anticancer compounds may mitigate side effects of chemotherapy

December 3 2015



Eva Falomir

The Universitat Jaume I de Castellón (James I University of Castellón, UJI) and the Consejo Superior de Investigaciones Científicas (Spanish National Research Council, CSIC) have patented new compounds that

exhibit extremely potent anticancer properties, while also being low in toxicity and thus less harmful to healthy cells. They have the potential to dramatically mitigate the side effects experienced by patients during chemotherapy. Therapeutic effects are particularly high for breast and colon cancer cells.

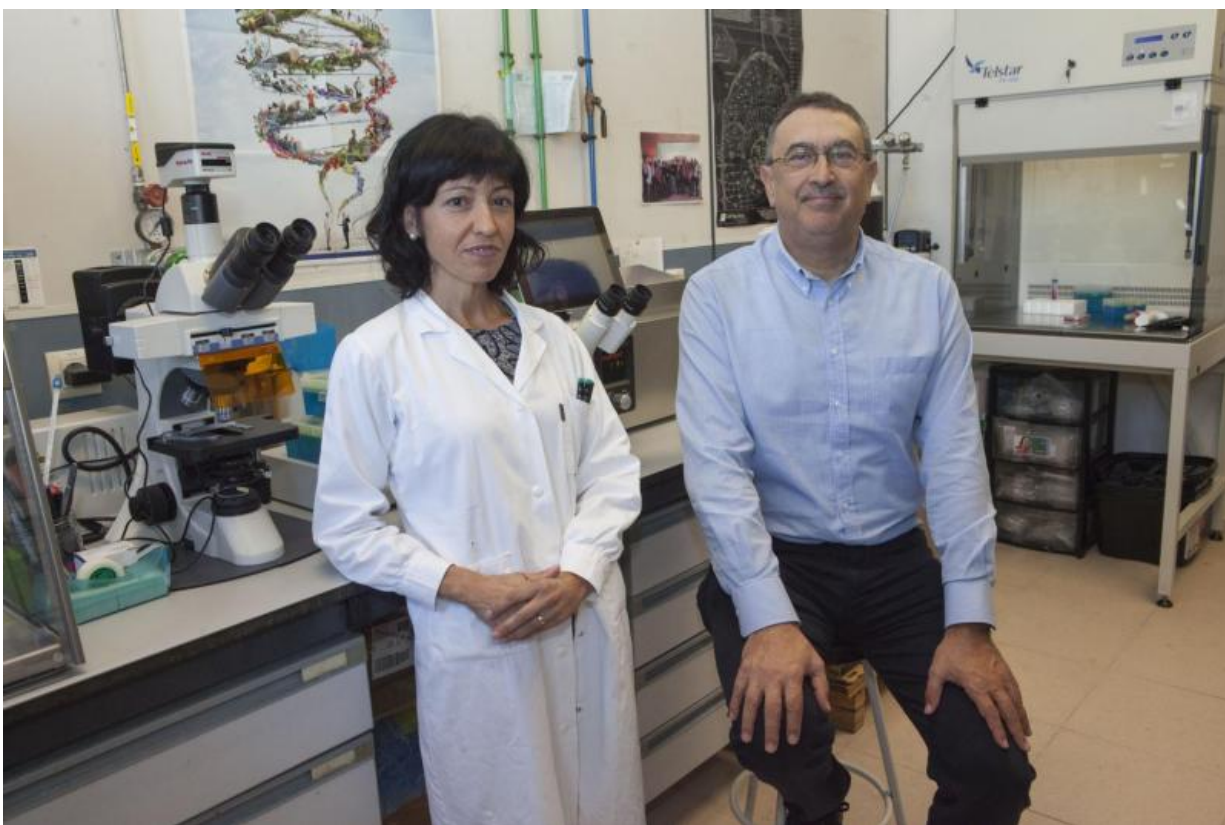
Acting on the sick [cells](#) without harming the healthy ones, these low-toxin [compounds](#) can be used as the base for narrow-spectrum "targeted" oncological drugs. As researcher Miguel Carda Usó says, "In the early days, cancer treatments were not very refined and led to side effects in parts of the body not affected by the tumour itself. Yes, they beat the cancer, but not without provoking a whole host of pathological consequences associated with non-targeted treatment. Today the search is on for treatments that target each type of cancer. New compounds like these may be used to develop made-to-measure cancer treatments with greatly mitigated side effects."

This encouraging finding emerged in the context of the search in oncology for new treatment strategies that hijack the mechanisms cancer cells feed off in order to multiply and spread throughout the body or affected organ. Fellow lecturer at UJI, Eva Falomir, and the person conducting the biological analyses, explains: "Our new compounds act against the telomeres, the structures at each end of the chromosome that are truncated or shortened with each round of cell division. Eventually, when there is no telomere left to shorten, the cell ages and dies. This is a natural process. However, in tumour cells, this shortening does not occur because an enzyme called telomerase protects the telomeres from this process. Consequently, tumour cells do not die, becoming immortal. This is why they are so difficult to beat". The potency of the new compounds designed at UJI lies in their ability to reduce the amount of active telomerase in tumour cells, thereby denying them immortality.

Besides this winning combination of being especially effective at killing

off [tumour cells](#) while being low-toxic to healthy ones, the new compounds can also inhibit the expression of oncogenes, genes with the potential to cause [cancer](#), by blocking the generation of telomerase and other proteins related to tumour development.

The design of the new compounds and the biological trials on tumour cell lines were carried out jointly by the CSIC's Institute of Parasitology and Biomedicine (www.ipb.csic.es/) and the UJI's Organic Synthesis Research Group (www.sinorg.uji.es/).



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Provided by Asociacion RUVID

Citation: Low-toxin anticancer compounds may mitigate side effects of chemotherapy (2015, December 3) retrieved 26 April 2024 from <https://medicalxpress.com/news/2015-12-low-toxin-anticancer-compounds-mitigate-side.html>

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