## Science News



# Molecules Discovered With A Higher Selective Ability To Exterminate Cancer Cells

*ScienceDaily (July 9, 2009)* — Researchers of the Department of Pharmaceutical Chemistry of the University of Granada (UGR), led by Joaquín Campos Rosa, have obtained a new type of molecules which have proven -in in vitro cultivations- a high level of efficiency against cancer cells, as well as very low toxicity against the body's normal cells.

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This important discovery in the cancer therapy field is the result of a Project of Excellence of the Andalusian Ministry of Innovation, Science and Enterprise in its first call, funded with 102,400 euros.

This discovery, which was made possible thanks to natural substances never used before for the treatment of tumours, is the result of modifying the chemical structure of a very used drug against cancer - 5-fluoruracile, one of the first drugs used in Oncology, by another similar substance called uracile. Uracile is a substance that is naturally present in our body, which is part of the cells' RNA. After the good results obtained with uracile, this substance was replaced by other similar molecules, but even more effective (guanine and cytosine). With them, the new molecules have been obtained, whose main feature is a higher therapeutical rate, that is, the quotient between the affectation over cancer cells and that over healthy cells. More specifically, their toxicity for the body is ten times lower than that of 5-fluoruracile.

The efficiency of the molecules obtained is related to their high capacity to induce apoptosis in cancer cells. Apoptosis is a function of the body that consists of programming the oldest cells' death, as they are no longer useful. Just like new cells are constantly born in our tissues, the oldest ones must also gradually die as they no longer carry out their function properly. Therefore apoptosis is a mechanism of defence of the body as it also takes place in those cells that are a threat due to failures in their normal activity. When the capability of a cell to carry out the apoptosis is damaged (for example due to a mutation) or if the beginning of apoptosis has been blocked (by a virus), the damaged cell can keep on splitting without any major restriction, thus giving rise to a tumour that can be carcinogen.

These good results in molecules designed by this research group of the UGR can be explained as a result of the capacity of such molecules to cause the cellular death of cancer-related cells. Therefore a new important research horizon has been opened regarding the identification of molecular mechanisms that induce apoptosis. From now on, these researchers will be focusing on genomics so as to go more deeply into the action mechanisms of these molecules in their interaction with pro-apoptotic genes, as they represent an enormous potential to be applied as drugs.

*Adapted from materials provided by Andalucía Innova.*



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