

Senescence in action

Madrid, 7th January 2010 - Senescence is a cellular response to stress that blocks cell division. Its aim is to avoid the propagation of cells under aberrant conditions, such as those present in tumour cells. Scientists from the Spanish National Cancer Research Centre (CNIO) have long been investigating senescence and made important contributions to this emerging field. Now, Manuel Collado and Manuel Serrano summarize the large body of evidence implicating senescence in the control of tumours in mice and humans in the prestigious journal *Nature Cancer Reviews*.

When cells fall under the aberrant control of oncogenes, their primary reaction is to trigger a number of emergency systems aimed to block their propagation. One of these responses is termed senescence. The name derives from the fact that the cells remain alive but unable to divide and produce new cells. Another important response to stress is programmed cell death or apoptosis. In 2005, CNIO scientists Manuel Collado and Manuel Serrano, together with Mariano Barbacid and other colleagues reported in *Nature*, for the first time, the detection of senescent cells within mouse tumours. This finding was accompanied by similar findings by other groups and initiated an increasing number of reports pointing to senescence as a major brake to the development of cancer, probably more relevant than apoptosis.

In the current publication, Collado and Serrano review this field and propose that senescence, rather than apoptosis, could be a more informative readout when analyzing the potency of chemotherapy. In this regard it is important to mention that senescent tumour cells, although viable, are rapidly cleared by the immune system and thus therapies aimed to induce senescence are expected to trigger tumour regression as well.

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