Macavity wasn't there! How absent reoviruses kill cancer

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Reoviruses are successfully being used in clinical trials to treat patients with cancer. Not only does the virus cause cancer cells to die, it also forces them to release pro-inflammatory chemokines and cytokines, which in turn causes the patient's immune system to attack the disease. New research published by BioMed Central's open access journal *Molecular Cancer* shows that reovirus infected cancer cells secrete proteins which, even when isolated, result in the death of cancer cells.

Normal human cells are protected from reovirus infection by a protein called PKR. However a cellular signalling protein (Ras), which can block PKR activity, is abnormally activated in many types of cancer and provides a window of opportunity for reovirus infection. A multi-centre study, involving labs in the UK and America, collected growth media from reovirus infected melanoma cells. The researchers showed that this media contained a range of small pro-inflammatory proteins, including an interleukin (IL-8) and Type 1 Interferon (INF-β), which recruited and activated white blood cells, specifically Natural Killer (NK) cells, dendritic cells (DC) and anti melanoma cytotoxic T cells (CTL).

Whilst the exact details behind this mode of action of cell signalling in response to viral infection are unclear, the release of cytokines was dependent on both 'inactive' PKR and a specific nuclear factor (NF-κβ). According to Prof Alan Melcher, from Leeds Institute of Molecular Medicine, "Bystander immune-mediated therapy may well be an important component in the treatment of cancer by reoviruses, and may have potential in treating cancer even in the absence of live virus."

More information: Pro-inflammatory cytokine/chemokine production by reovirus treated melanoma cells is PKR/NF-κB mediated and supports innate and adaptive anti-tumour immune priming, Lynette Steele, Fiona Errington, Robin Prestwich, Elizabeth Ilett, Kevin Harrington, Hardev Pandha, Matt Coffey, Peter Selby, Richard Vile, Alan Melcher, *Molecular Cancer* (in press)

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