Light powered platinum more targeted and 80 times more powerful than similar cancer treatments

21 December 2007

Researchers from the Universities of Warwick, Edinburgh, Dundee and the Czech Republic's Institute of Biophysics have discovered a new light-activated platinum-based compound that is up to 80 times more powerful than other platinum-based anti-cancer drugs and which can use "light activation" to kill cancer cells in much more targeted way than similar treatments.

The platinum-based compound known as "trans, trans, trans- [Pt(N3)2(OH)2(NH3)(py)]", or a light activated PtIV complex, is highly stable and non-toxic if left in the dark but if light falls upon it becomes much less stable and highly toxic to cancer cells. In fact it is between 13 and 80 times more toxic (depending on how and on which cells it is used) to cancer cells than the current platinum based anti-cancer drug Cisplatin. Moreover it kills the cells by a different mechanism of action, so it can also kill cisplatin-resistant cells.

Professor Peter Sadler, Chairman of the Chemistry Department of the University of Warwick, who led the research project said:

"Light activation provides its massive toxic power and also allows treatment to be targeted much more accurately against cancer cells."

The compound could be used in particular to treat surface cancers. Patients could be treated in a darkened environment with light directed specifically at cancer cells containing the compound activating the compound's toxicity and killing those cells. Normal cells exposed to the compound would be protected by keeping the patient in darkness until the compound has passed through and out of the patient.

The new light activated PtIV complex is also more efficient in its toxic action on cancer cells in that, unlike other compounds currently used in photodynamic therapy, it does not require the presence of significant amounts of oxygen within a cancer cell to become toxic. Cancer cells tend to have less oxygen present than normal cells.

Although this work is in its early stages, the researches are hopeful that, in a few years time, the new platinum compound could be used in a new type of photoactivated chemotherapy for cancer.

Source: University of Warwick