A promising step toward new treatment against cancer

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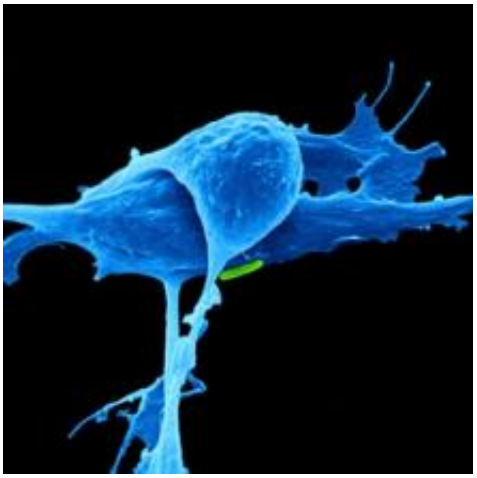

A research team of Université catholique de Louvain's de Duve Institute, co-financed by the WELBIO Institute of the Walloon Region, has developed a new treatment approach against cancer.

These researchers explore treatments stimulating the immunity system of the patients. It is known for a fact that the cells of the immunity system named " T-lymphocytes" are able to recognise the cancer cells and to destroy them. But in the end a resistance against the immunity system will arise, as a consequence of the creation of an immunosuppressive environment within the tumour cells.

This immunosuppression paralyses the lymphocytes focussing on the tumour cells and the cancer can continue to develop. A recent cancer treatment method tries to stimulate the paralysed lymphocytes, referred to as an "immunotherapy of the cancer". Certain immunotherapy approaches lead to spectacular results, but not for all patients and sometimes with important secondary effects.

The work of this UCL research team, to be published shortly on April 22 in the prestigious scientific magazine *Science Translational Medicine*, allows taking into consideration new methods of immunotherapy against cancer, which could lead to an improvement of the efficiency of the current treatment methods.

More concrete, the UCL research team lead by Sophie Lucas and Pierre Coulie, in collaboration with the biotech company arGEN-X, has fine-tuned a therapeutic agent, stimulating the immunity responses in an original way. This agent puts focus on a particular type of immunosuppressive cells, known as " T-lymphocytes regulators " or " Tregs ". The natural mission of those Tregs is to restrict the activity of the immunity system. When present within the body of persons in good health, the Tregs act as moderators, or like firefighters against the fire that might be the consequence of an excessive immunity activity. As such, the Tregs protect us against illnesses defined as " auto-immune ", such as MS, Type I-diabetes, blocking the development of the lymphocyte activity focussing on or own tissues. The Tregs carry out this immunosuppressive function by producing some kind of hormone, the TGF-beta, inhibiting the lymphocytes. Following the analogy between a Treg and a firefighter, the TGF-beta is the water projected via the fire hose.

When used for cancer patients, the Tregs will function in an exaggerated manner: they will accumulate within the tumours and will overload them with TGF-beta, paralysing as such the lymphocytes that might destroy

the cancer cells. The therapeutic agent proposed by the UCL-researchers is using the Tregs: it blocs their TGF-beta production systems and locks as such somehow the fire hose. More precisely, this therapeutic agent is composed of monoclonal antibody, acting against the " GARP ", a protein required for the production of TGF-beta by the human Tregs. This therapeutic agent should allow stimulating the activity of the lymphocytes capable to destroy the tumours.

So far, this new therapeutic agent has only been tested on mice. The UCL-researchers will have to evaluate the efficiency on cancer patients. This approach could also be useful to treat other diseases characterised by an insufficient functioning of the immunity system, such as certain chronic infections.

More information: "Monoclonal antibodies against GARP/TGF-β1 complexes inhibit the immunosuppressive activity of human regulatory T cells in vivo," stm.sciencemag.org/lookup/doi/ … scitranslmed.aaa1983

Provided by Université catholique de Louvain