



PREVENTING CANCER RECURRENCE THANKS TO NANOTECHNOLOGIES

Politecnico di Torino's XtraUS project was granted with the prestigious European award ERC Proof of concept; 150 thousand euros for designing a prototype aimed at intercepting and destroying even the smallest traces of tumor cells circulating in the blood

Torino, 27 April 2020 - When a tumor enters in the stage of regression and the patient is considered as healed, there often remains the fear of recurrence, a disease that unfortunately has a certain incidence.

Sadly, indeed, many patients relapse into their primary tumour disease because their cancer is not completely healed and the available diagnostic tools have not been able to detect the persistence of the even smallest tumor cells. The minimal residual disease (MRD) after a potentially curative treatment often consists in the cause of the relapse, and it is the main objective of the early adjuvant treatments. In particular, the elimination of **circulating cancer cells (CTCs)** in the bloodstream can be the key to cancer progression and to the recurrence and spread of metastases. However, given their extremely scarce presence in the blood, it is very complex to intercept and eliminate them by using conventional laboratory tests and medications.

The project **XtraUS - Fighting cancer relapse with remote activation of smart and targeted nanoconstructs**, proposed by the research group of Professor **Valentina Cauda** from the **Department of Applied Science and Technology of the Politecnico di Torino**, is precisely aimed at testing and validating an innovative technology to contrast CTCs presence in the bloodstream and to consequently reduce recurrences. The project has been granted with 150 thousand euros, winning the prestigious European award **ERC Proof of Concept**, which is focused on the development of technologies that can become prototypes to be placed on the market once the project will end.

XtraUS consists in designing and prototyping a technique for extracorporeal circulation during which an innovative nanohybrid material - stimulus-reactive, targeted and non-immunogenic - is remotely activated against tumor cells circulating in the blood. It is therefore an approach tailored towards the cells to be eliminated, reducing collateral damage for blood and adjacent healthy tissues.

"Thanks to this technology, we intend to improve conventional treatments of CTCs in the bloodstream, proposing an effective and safe treatment to contrast cancer recurrence and the spread of metastases", states Valentina Cauda, concluding: "The basic idea is to maintain the effectiveness of patients' initial treatment for their primary tumor disease, avoiding cancer recurrence and reducing all the related costs. Furthermore, XtraUS is a versatile technology with potential applications on many other diseases, with huge social and economic impact on public health".