Made possible by UniSysCat: research into new anti-cancer drugs

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End Time:

In May 2025, a decision will be made on the next round of funding for the clusters of excellence throughout Germany. Before that, the Berlin newspaper Tagesspiegel publishes a series of articles to introduce the seven clusters of excellence currently working in Berlin. The article about UniSysCat was released on April 26 and deals with a pioneering but daring UniSysCat project: A new drug technology for chemotherapy.

Chemotherapy has severe side effects because it also attacks healthy cells of cancer patients. A UniSysCat research team led by Juri Rappsilber wants to reduce the side effects of chemotherapy and improve the efficacy of cancer therapies. They are developing novel anti-cancer medication that only target tumor cells. The idea is that not the actual drug circulates through the body, but only a precursor that is harmless to other cells. This precursor is then only activated directly in the tumor.

The research team uses a catalyst made of palladium to activate the drug. The catalyst is stabilized in a molecular cage made of peptides and then coupled to an antibody that recognizes the diseased cells. In this way, the palladium is deposited on the tumor cells – exactly where the anti-cancer drug is needed. By the aid of the catalyst, the harmless precursor of the drug is then converted into the active ingredient at the tumor. This is precisely targeted medicine.

“We are building on existing knowledge,” says Rappsilber. “But the combination of antibody, peptide cage and palladium in this form is new.” What is special is that it is the first time that

the catalyst has been successfully applied to cancer. “No one has ever managed to stabilize the metal as effectively as we have with our peptide.”

Yet, Rappsilber's project remains challenging. Studies still need to provide many answers. Until then, the project is an exciting research approach with the potential to make tomorrow's cancer therapy more precise and more tolerable.

UniSysCat aims to better understand and utilize catalysis in chemistry and biology. It is being funded by the federal and state governments in the Excellence Initiative since 2007. If successfully renewed, UniSysCat will receive six million euros a year over seven years through the Excellence Initiative. Within the cluster, colleagues distribute the money among themselves after reviewing each other's projects. Even daring projects are funded and some, like the anti-cancer drug project, are made possible in the first place.

The full article can be read online: https://www.tagesspiegel.de/wissen/medikamente-sollen-erst-im-tumor-wirken-neue-wirkstoff-technik-fur-die-chemotherapie-13540042.html