Research into a means of in-body transport for cancer medicines

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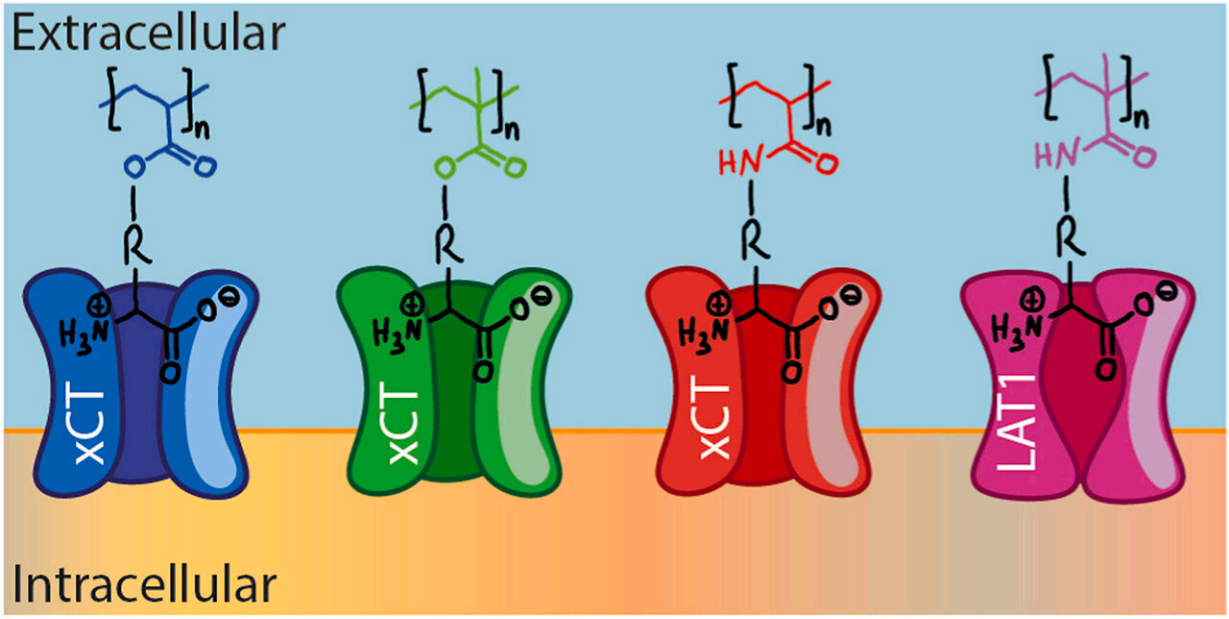

Graphical abstract. Credit: *Bioactive Materials* (2023). DOI: 10.1016/j.bioactmat.2023.01.005

In a study, Bayreuth junior professor Dr. Meike Leiske has demonstrated which properties polymers should have in order to reach only certain cells. In the future, this should enable active substances to reach cancer cells directly and avoid the healthy cells.

Due to their versatility and comparatively low production costs, synthetic

polymers are promising carrier materials for drugs. Prof. Dr. Meike Leiske, junior professor for sustainable and functional polymer systems at the University of Bayreuth, is working on such a transport medium for drugs in her research.

In the most recent study, the results of which she published together with two colleagues from Ghent University (Belgium) in the journal *Bioactive Materials*, transport without an active substance was tested in a cell culture on breast cancer cells.

In this context, polymers containing natural elements such as amino acids have shown promise. In the now published study, Leiske and her colleagues were able to reveal various properties that influence specificity. The term specificity indicates how reliably the polymer reaches the site of action, i.e. the cancer cell. This also identified the type of polymer that can reach the cancer cells but is not taken up by other, non-cancerous cells.

"If, in a further step, the active substance is then coupled to such a polymer, it comes directly to the affected cell, but not to the healthy cells in the patient's body," Leiske explains. "The results of the current study underline the importance of studying polymer-based carrier materials in detail, as even small changes to their chemical structure can have a major impact on their interactions in the biological environment."

These small changes and their influence need to be further explored in the future. "Cancer cells are very different. So this is just the beginning of the research now. Understanding the interactions is of great importance for the development of site-specific smart polymer nanomaterials in medical and pharmaceutical applications."

More information: Meike N. Leiske et al, Impact of the polymer backbone chemistry on interactions of amino-acid-derived zwitterionic

polymers with cells, *Bioactive Materials* (2023). DOI: 10.1016/j.bioactmat.2023.01.005

Provided by Bayreuth University

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