



Universität
Basel

Research Project

Krebsliga: bacterial vector mediated cancer therapy

Third-party funded project

Project title Krebsliga: bacterial vector mediated cancer therapy

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Organisation / Research unit

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Department

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Status Completed

More than 100 years ago German physicians have made the observation that patients suffering from cancer can benefit from bacterial infections. Since then, many different bacteria have been found to preferentially grow within solid tumors. Therefore, bacteria offer an ideal vehicle to deliver cargo to cancer cells. Despite this, surprisingly few efforts have been made to develop this promising treatment strategy for clinical applications and only virulence-attenuated mycobacteria are currently used in the clinic. However, reflecting major improvements in genetic tools and the persistent need for novel approaches in cancer therapy, bacterial cancer therapy is receiving increasing attention in recent years. Bacteria have been engineered in different ways to manipulate cancer cells, but the delivery of cargo produced inside bacteria to its site of action inside cancer cells, i.e. outside of bacteria, remains a major challenge.

We have developed a technology based on bacteria allowing the delivery of cell death-inducing proteins produced by bacteria directly into cancer cells. We make use of a bacterial nano-machine, best described as a needle-like structure at the periphery of the bacteria. Using these needles, bacteria can inject proteins into cancer cells. Employing this technology, we have obtained very promising results in delivering toxic proteins to cancer cells leading to pronounced cell death of these cells. Our aim is to optimize this system and to validate its efficacy in cancer treatment in murine models of cancer. Our vision is to bring this novel and attractive treatment strategy into clinical practice.

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