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Metastases targeting aptamers

Acronym

META

Project partners

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Abstract

The selective targeting of tumours and metastases in vivo is one of the major challenges of biomolecular medicine today. Aptamers that recognize specific cell subpopulations have emerged as promising targeting vehicles and moreover they were shown to be suitable for in vivo imaging and 3D imaging of tumour sites. Compared to antibodies aptamers can be synthesized chemically and, thus, modified selectively without loss of activity. These advantages predestine aptamers for biomedical application in targeted therapy regimens and as in vivo diagnostics. The proposed project aims at the identification and characterisation of prostate tumour metastases targeting aptamers by applying an in vivo selection approach that uses orthotopic prostate tumour models. Once identified, in vivo proof of concept will be produced for the dual use of the novel aptamers. Firstly, aptamers will be linked to imagable labels and used in vivo as tools for the non-invasive imaging-based detection of primary and metastasizing tumour cells. Secondly, aptamers will be chemically coupled to nanoparticles loaded with chemotherapeutics and siRNAs, respectively, eliciting inhibition of tumour cell growth in vivo. Proteome analysis will be used to identify the proteins targeted by the aptamers, and will also allow to characterise the impact of aptamer-targeted treatment on the proteome of the tumour cells.

