

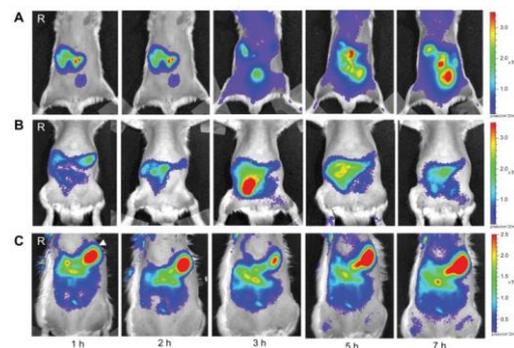
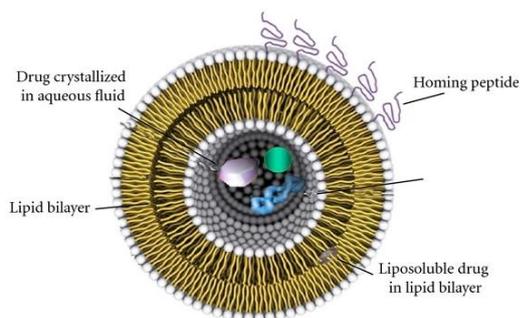
The aim of the Division "Experimental Molecular Imaging" is to develop and apply new imaging methods and contrast agents for the system-biological research on pathophysiological mechanisms and for monitoring the efficacy of novel therapeutics. Furthermore, we intend to better connect preclinical and clinical research and to translate novel surrogate markers and diagnostics into clinical evaluation.

The group "**Nanomedicines and Theranostics**" offers the following position:

M.Sc. Thesis:

"Temperature-Responsive and Multi-Drug-Loaded Liposomes for Tumor Targeted Combination Therapy"

Chemotherapy is extensively used to treat cancer. However, effective chemotherapy is limited by the toxic side effects of the drugs. Significant progress has been made in reducing the acute toxicity of chemotherapeutic drugs by the application of liposomal drug delivery systems. In the clinic, the simultaneous use of multiple chemotherapeutics is compromised by severe toxicity, in tissues such as heart, kidney, bone marrow and central nervous system. By co-entrapping multiple chemotherapeutic drugs within a single temperature-sensitive liposome, all of the drug effects are concentrated - besides in heated tumors - in liver and spleen. At the same time, very high chemotherapy concentrations locally at the tumor site are achieved by temperature-triggered drug release, resulting in substantially improved antitumor responses. As part of this work, we want to develop stimuli-responsive liposomes loaded with optimized combinations of hydrophilic and hydrophobic drugs, and we will evaluate their therapeutic potential in several *in vitro* and *in vivo* setups, including clinically relevant mouse models of pancreatic and colon cancer (for ultrasound-mediated heating and magnetic fluid hyperthermia (MFH), respectively). The overall objective of this work is to contribute to the development of better systems and strategies for drug targeting to tumors, and to come up with new (combination) concepts to really improve the treatment of cancer patients.



Skills / Experience Requirements

- high motivation in research
- interest in chemistry / biology
- pursuing a degree in chemistry, biology, biotechnology or a related field
- laboratory and cell culture experience would be advantageous

Contact

If you have any further question, please don't hesitate to contact me via email.
Please send your full application via e-mail to: sdadfar@ukaachen.de