

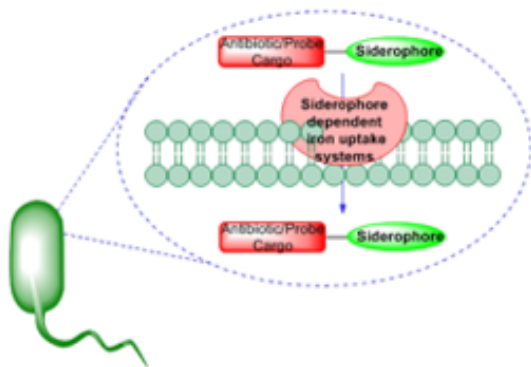
Technology Offer

Innovative DOTA-Linkers for Bacterial Targeting

Reference Number 02-00324

Challenge

Antimicrobial resistance not only poses an enormous threat to individuals affected by respective infections, but also to society by leading to increased healthcare costs. In 2011 the US Centers for Disease Control and Prevention estimated the health care costs caused by powerless therapeutics to combat resistant pathogens to be about 20 billion € a year. Furthermore, the launch of new compounds is frequently followed by the emergence of increasing resistance against said compounds. Improving current diagnostics is necessary to stratify antimicrobial therapies and thereby help to reduce the emergence of resistance. In addition, innovative methods or systems for drug delivery that actively transport drugs into bacterial cells may enhance efficacy and reduce side effects.



DOTA-Linkers: principle of action

Technology

Due to their well-known favorable properties as complexing agents, DOTA derivatives are successfully used in medicine, e.g. as PET tracers. The invention discloses new DOTA derivatives comprising siderophore moieties. These are able to harness bacterial iron uptake systems and transport effector molecules into bacterial cells. A proof-of-principle for enhanced antibiotic effects could be achieved. Another application of their promising features is the coupling of specific DOTA derivatives to diagnostic probes. Suitable for in-vivo imaging, the disclosed DOTA derivatives may be used to effectively localize and categorize bacterial infections and to monitor the therapeutic effect of applied drugs, e.g. using PET, SPEC or MRI. By combining therapeutic as well as diagnostic functions within one molecule, the innovative technology has the potential for the development of a theranostic composition.

Commercial Opportunity

The technology is offered for co-development or in-licensing.

Development Status

Proof-of-principle for enhanced antibiotic effect achieved; in-vivo data illustrating the potential diagnostic use were obtained in mouse models.

Patent Situation

A PCT application was filed in August 2015 (WO2016026841). European and US patent applications pending.

Further Reading

K. Ferreira, H.-Y. Hu, V. Fetz, H. Prochnow, B. Rais, P. P. Müller, M. Brönstrup: Multivalent siderophore-DOTAM conjugates as theranostics for imaging and treatment of bacterial infections. *Angewandte Chemie*, 2017, DOI: 10.1002/anie.201701358