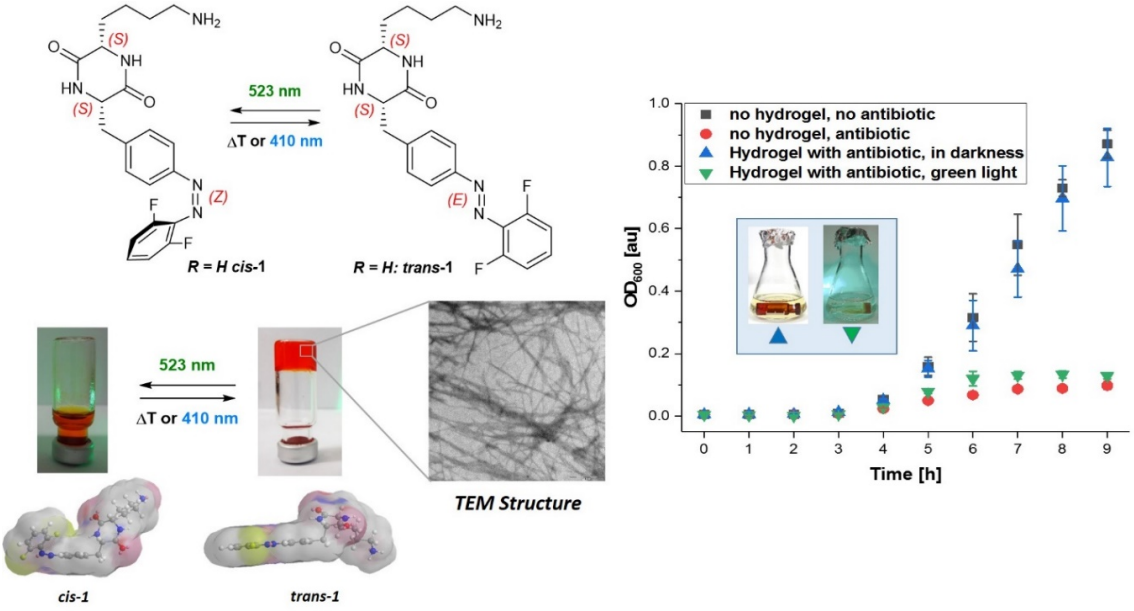
PHOTOCHROMIC PEPTIDES FOR LIGHT-TRIGGERED DRUG DELIVERY AND BEYOND

Susanne Kirchner, Johannes Karcher, and Zbigniew Pianowski

Institute of Organic Chemistry (IOC), Karlsruhe Institute of Technology (KIT), Karlsruhe, Germany

Photoresponsive smart materials transform light energy into sophisticated functions. [1] They find increasing biomedical applications in light-induced drug release and photopharmacology, as they can locally provide the desired therapeutic effect due to precise spatiotemporal dosage control.

Recently, we reported supramolecular hydrogels based on photochromic cyclic dipeptides, which reversibly dissipate into fluids upon irradiation with UV [2] or green light (figure - left). [3] We demonstrated efficient encapsulation and light-induced release of structurally unmodified antibiotic, anticancer, and anti-inflammatory drugs, as well as proteins and oligonucleotides under physiological conditions. Using the antibiotic-loaded gel, we selectively inhibited bacterial growth with green light (figure - right).



Our most recent results in the area of photochromic cyclic dipeptides and their applications will be demonstrated.

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[1] Z. Pianowski "Recent Implementations of Molecular Photoswitches into Smart Materials and Biological Systems" (review) *Chem. Eur. J.* **2019**, *25*, 5128-5144.

[2] Z. Pianowski, J. Karcher, K. Schneider, „Photoresponsive self-healing supramolecular hydrogels for light-induced release of DNA and doxorubicin" *Chem. Commun.* **2016**, *52*, 3143-3146.; Z. Pianowski, J. Karcher, K. Schneider, *patent* DE 10 2015 014 834 A1

[3] J. Karcher, Z. Pianowski, "Photocontrol of Antimicrobial Activity and Cytotoxicity with Green Light *Chem. Eur. J.* **2018**, *24*, 11605-116