

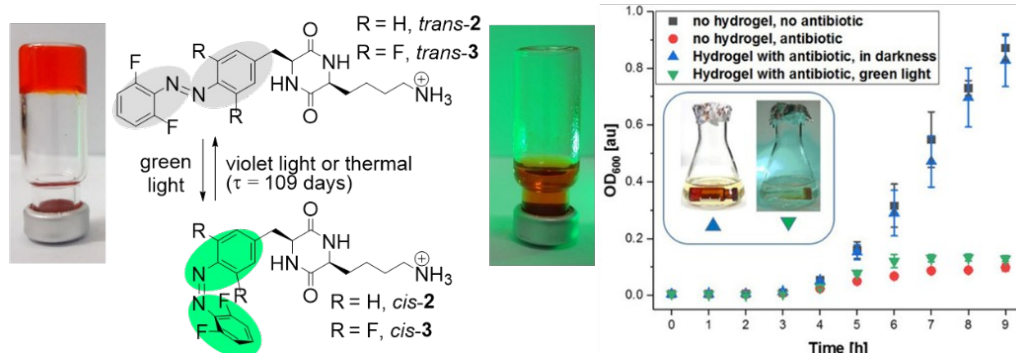
Photoswitching of cyclic dipeptide-based systems with visible light

Zbigniew Pianowski,

Institute of Organic Chemistry, KIT Karlsruhe, Fritz-Haber-Weg 6, 76131 Karlsruhe

Cyclic dipeptides (CDP) are common structural motifs in biology, potent pharmacophores, and important constituents of numerous supramolecular systems based on hydrogen bonding.[1] Light-triggered photomodulation of their properties opens the way for photopharmacology applications, or producing smart materials. This can be done upon merger of CDPs with molecular photoswitches – molecules which reversibly change light into changes in molecular geometry, rigidity, or polarity.[2-3] Our group developed a family of CDPs decorated with azobenzenes,[4-6] which form photochromic hydrogels under physiological conditions. These gels can be reversibly dissipated with visible light into non-viscous fluids. The gels physically encapsulate a wide variety of common drugs, and can release them selectively upon visible light stimulation. We have demonstrated a simple system, where our hydrogel with encapsulated antibiotic can modulate bacterial growth in response to green light.[7]

Green-light-triggered hydrogelator



In the lecture, we will show the recent progress of our group in the area of visible-light-triggered cyclic dipeptides, and their applications in phototriggered materials, as well as in photopharmacology.

Literature:

- [1] C. Balachandra, D. Padhi, T. Govindaraju *ChemMedChem*. **2021** *16*, 2558-2587.
- [2] Z. Pianowski *Chem. Eur. J.* **2019**, *25*, 5128-5144;
- [3] Leistner A.-L., Pianowski Z. *Eur. J. Org. Chem.*, **2022**, *19*, e202101271
- [4] Karcher J., *et al.* *RSC Adv.*, **2021** *11(15)*, 8546-8551
- [5] Leistner A.-L., *et al.* *Chem. Eur. J.*, **2021** *27*, 8094-8099
- [6] Leistner A.-L., Kistner D., Fengler C., Pianowski Z. *RSC Adv.*, **2022** *12*, 4771-4776.
- [7] J. Karcher, Z. Pianowski, *Chem. Eur. J.* **2018**, *24*, 11605-11610