Photocontrolled release of antibiotics and other bioactive molecules from supramolecular hydrogels with green light

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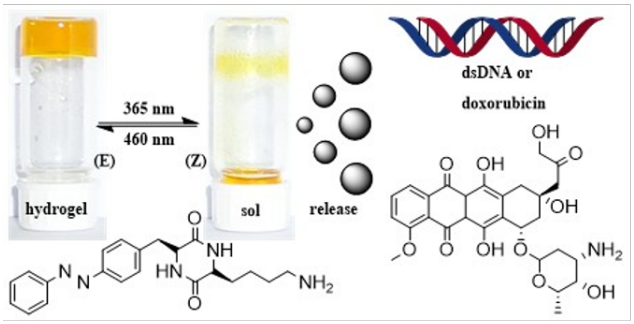
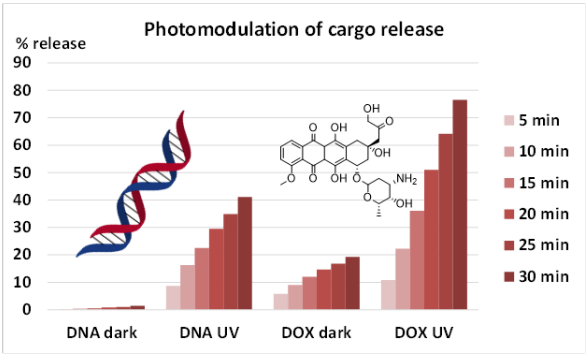
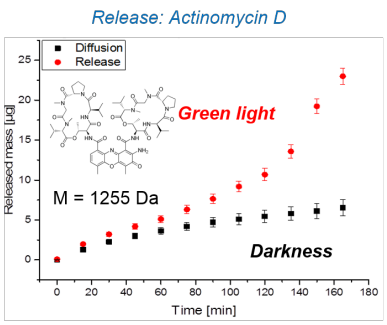
Recently we have reported [1] photoresponsive supramolecular hydrogels based on an azobenzene-containing cyclic dipeptide (or 2,5-diketopiperazine; PAP-DKP-Lys), which is a low-MW hydrogelator. The gelation process can be triggered with temperature, pH, light, and ionic strength. The resulting gels exhibit excellent self-healing properties. In presence of DNA the compound forms hydrogels that release the oligonucleotides upon irradiation with 365 nm UV light. Hydrogels formed in presence of anticancer drug doxorubicin also release the cargo in a light-dependent manner.

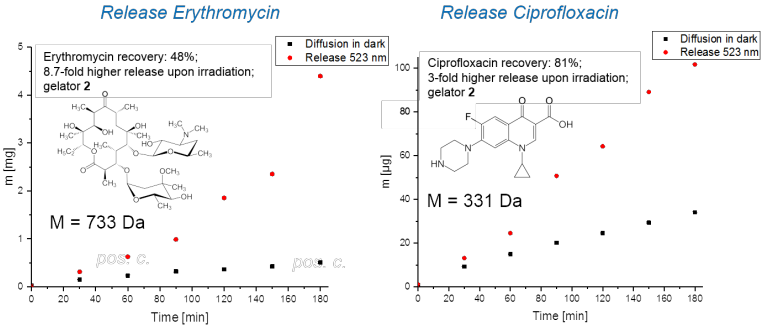




The current report regards modified supramolecular hydrogel matrix, which now became capable of efficiently releasing cargo molecules upon irradiation with green light (530 nm). In case of antibiotic molecules as guest, we achieved up to eight-fold release discrimination between samples irradiated with green light and those kept in darkness. [2]



actinomycin D - antibiotic and an anticancer drug (i. A. testicular cancer, ovarian cancer)



Erythromycin and Ciprofloxacin are antibiotics useful for the treatment of a number of bacterial infections

[1] Zbigniew Pianowski*, Johannes Karcher, Knut Schneider, *Chem. Commun.*, **2016**, *52*, 3143-3146
[2] Johannes Karcher, Zbigniew Pianowski* *manuscript in preparation*
[3] Zbigniew Pianowski, Johannes Karcher, Knut Schneider, *German patent application 10* ***2015*** *014 034.6 (pending)*