CAGING AND CONTROLLED RELEASE OF AN ANTIBACTERIAL DRUG BY CELL SURFACE FUNCTIONALIZATION

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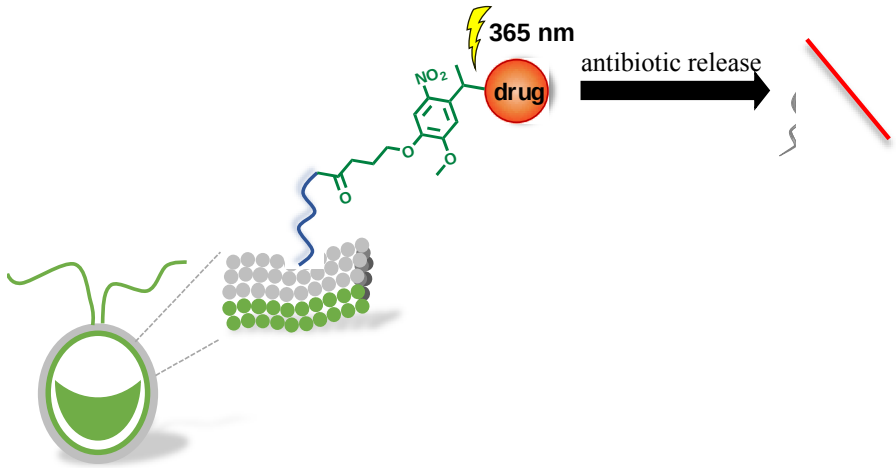
Due to a steady increase in the number of pathogenic bacteria, including resistant species, there is a strong need for the development of new antibacterial agents. However, the side effects caused by frequent antibiotic administration still need to be addressed. Therefore, the development of new approaches towards drug delivery systems whose release property can be controlled will allow to improve treatment efficiency, potentiate antibacterial action, increase selectivity of the drug while avoiding toxic damage to healthy tissue[1-3].

In this communication, we will present a novel delivery system based on the cell surface functionalization of *Chlamydomonas reinhardtii* (CR) with the antibacterial drug vancomycin, and its subsequent release by light. The overall goal consisted in generating cells with antibacterial properties for the caging and controlled release of an antibiotic which inhibits the growth of Gram positive bacteria.

Encouraged by previous results obtained in our group which showed successful inhibition of *B. subtilis* growth by modified green algae with non-covalently bound vancomycin on the surface[4], we developed a new approach which enabled covalent attachment of the antibiotic to the surface of CR. Thereby, we could decrease the concentration required for functionalization, show that algae might work as a caging tool for an antibacterial agent, and demonstrate controlled release of a drug at any growth stage.



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