

## **Standoff detection of pathogens with near infrared fluorescent nanosensors (extension)**

Initiative: Integration molekularer Komponenten in funktionale makroskopische Systeme (beendet, nur noch

Fortsetzungsanträge)

Bewilligung: 01.06.2021

Laufzeit: 3 Jahre

Bacterial infections are one of the major causes of death around the world and an increasing problem due to antibiotic resistance. The best strategy against bacterial infections would be to prevent infections before they happen. An ideal diagnostic tool could provide fast and reliable information about a bacterial contamination without sample taking, isolation, purification or culturing. So far, such a technology does not exist. The project aims to develop fluorescent nanosensors that are able to identify bacteria based on near infrared (NIR) fluorescent single-walled carbon nanotubes (SWCNTs) as building blocks. SWCNTs will be chemically tailored to bind motifs that are released by bacteria or present on their surface. The central idea is that multiple sensors are needed to fingerprint bacteria. One major focus will be to use a novel type of sp<sup>3</sup> defects for SWCNT functionalization and improved chemical control and to increase the level of spatial/spectral multiplexing. These efforts could ultimately enable applications such as fast diagnostics of bacteria, monitoring of bacterial contaminations or smart implants.

### **Projektbeteiligte**

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