

研究講演会

事業主体：科学研究費補助金 基盤研究 (S) 23H05471



日時：2023年12月11日(月) am. 10:00~11:30

Date/Time: December 11 (Mon), 2023 a.m. 10:00 - a.m. 11:30

会場：筑波大学総合研究棟 A110 室

Venue: Advanced Research Build. A 110, University of Tsukuba

講師：Fan JIN 氏

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Speaker Prof. Fan JIN

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Lighting the Way: Spatiotemporal Control in Targeting *Pseudomonas aeruginosa* and Advancing Bacteria-Mediated Cancer Therapy



In our research, we address the challenges of combating *Pseudomonas aeruginosa* infections and enhancing bacteria-mediated cancer therapy (BMCT) through a multidisciplinary approach involving optogenetics and genetic engineering. Our cornerstone achievement is the development of a near-infrared (NIR) light-responsive bacterial strain engineered to produce and release a chimeric pyocin (ChPy) that specifically targets *P. aeruginosa*. This innovative method enables remote and precise control of drug release, effectively eradicating *P. aeruginosa* in mouse wound models. Building on this, we employed a sophisticated genetic circuit to govern bacterial lifestyles, thereby achieving targeted drug release and precise colonization within tumors. This modality was augmented by adaptive tracking illumination (ATI), which allows real-time manipulation of single-cell behaviors in bacterial biofilms. We also re-engineered the GacS kinase in *P. aeruginosa* to control its pathogenicity via light stimuli. Lastly, our development of a strain with light-responsive cAMP levels opens new avenues for manipulating bacterial motility. Collectively, these innovations present a paradigm shift in the spatiotemporal control and delivery of bacterial therapeutics for both infectious diseases and cancer treatment.

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生命環境系 野村暢彦研究室

参加費無料

事前申し込み不要

