

光合成細菌の光機能を活用する癌診断・治療法の創出

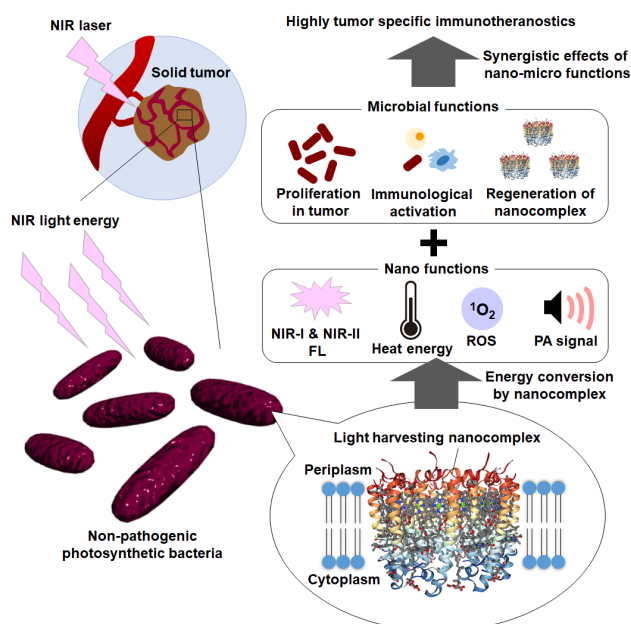
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Cancer theranostic using optical functions of photosynthetic bacteria (¹*Graduate School of Advanced Science and Technology, Japan Advanced Institute of Science and Technology*)○
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Despite the growing promise of bacterial therapy, due to the tumor targeting effect, in solid tumor treatment, most conventional therapeutic bacteria exhibit pathogenicity and insufficient therapeutic efficacy in the tumor milieu. The living photosynthetic bacteria are applied in cancer theranostics, using near-infrared (NIR) light. Photosynthetic bacteria exhibit strong NIR reporter fluorescence, powerful photothermal conversion, excellent reactive oxygen species generation, and contrasting photo-acoustic effects, via the energy transfer system of light harvesting nanocomplexes in bacterial membranes, making photosynthetic bacteria useful for highly targeted tumor elimination and precisely marking tumor location with the help of immune system.

Keywords : *Cancer; Photosynthetic Bacteria*

体内の高精度な癌細胞検出技術ならびに癌細胞を根絶可能な治療法の開発は、癌医療における究極の目的である。本研究では、低酸素状態の腫瘍環境内で高選択的に集積・増殖が可能で、かつ生体透過性の高い近赤外光によって様々な機能を発現する非病原性の光合成細菌を発見した¹⁾。当該細菌の特性を活用することで体内の腫瘍を高選択的に蛍光あるいは光音響検出し、標的部位のみをレーザー照射により効果的に排除することが可能である。



1) Optically activatable photosynthetic bacteria-based highly tumor specific immunotheranostics. X. Yang, S. Komatsu, S. Reghu, E. Miyako, *Nano Today* **2021**, 37, 101100.