Choon Peng Teng, J Nanomed Nanotechnol 2016, 7:4(Suppl)
http://dx.doi.org/10.4172/2157-7439.C1.038

NIR-absorbing gold nanostructures for targeted antimicrobial treatments

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The use of conventional antibiotics for treatment of multi-drug resistant bacteria and biofilms has become very challenging due to the evolving antibiotic tolerance, and this poses a serious threat to healthcare. Hence, it is of great necessity to develop a non-chemical based approach in efficiently eradicating multi-drug resistant bacteria. We have used the colloidal synthetic strategy to prepare multi-branched gold nanostructures having strong near-infrared (NIR) absorption that corresponds with the biological window. These novel nanomaterials heat up rapidly under NIR irradiation. When conjugated to antibodies, they can be used to target specific bacteria of interest. In our study, these conjugated branched gold nanostructures are capable of completely destroying *Pseudomonas aeruginosa* and its biofilm after NIR light irradiation for 5 min with an 800-nm laser at a low power density. No bacterial activity was observed after 48 hours post irradiation.

Biography

Choon Peng Teng is currently working in Institute of Materials Research and Engineering, Agency for Science, Technology and Research (A*Star). He is also pursuing his PhD studies in Biomedical Engineering from National University of Singapore. He is the first author and co-author of more than 10 papers in prestigious journals.

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