

Project Title: Delivery of sRNA to target drug resistant bacteria

應對抗生素耐藥性問題的策略

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The team has successfully generated outer membrane vesicle and nanoparticles as the delivery carriers to drug resistant bacteria. Currently, the therapeutic development has been working on to target the causative agents that cause urinary tract infection.

Urinary tract infections (UTIs) are one of the most common infections in human, and a vast majority of which are caused by uropathogenic Escherichia coli (UPEC), affecting over 400 million patients worldwide every year. Nowadays, no effective vaccine has been developed to prevent UTIs, and treatment of antibiotics is the only choice for UTI patients. However, the effectiveness of conventional antibiotic treatment and the delivery to the infection sites is decreasing. Apart from the exposure of patients to a higher level of antibiotics which lead to the development of multidrug-resistant bacteria, another reason is the internalisation of UPEC into the bladder epithelium. The intracellular reservoirs provide a shelter for UPEC to prevent the attack of antibiotics and the immune response, which is prone to the recurrence of UTIs. Therefore, it is important to develop novel antimicrobial agents that can target intracellular pathogens. The team has already developed the nanodiamond which successfully eradicated the intracellular bacteria in-vitro and in-vivo.

In addition to drug delivery, collaboration has been made with another member of the Centre, Prof Kiwon Ban, to develop the probiotics that can prevent cardiovascular disease. The products were successfully tested in the mouse model and the effect of regeneration was obvious and encouraging.