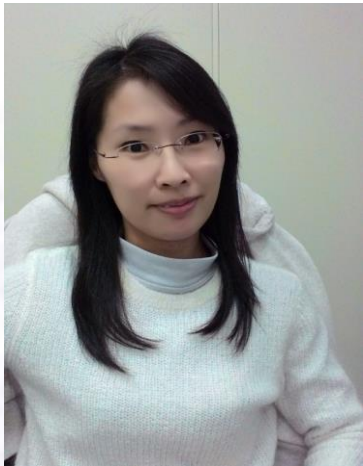


生醫電資所 專題演講



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Development and application of multifunctional microbubbles for ultrasound mediated transdermal drug delivery

For the ultrasonic technology, the microbubble (MB) ultrasound (US) contrast agent is applied intravascularly and the tiny bubbles of the MB US contrast agent in the blood vessel are excited by ultrasonic energy to generate harmonic resonance, which enhances the received US images or drug treatment, drug delivery, gene transfection. Our present invention firstly provides a new multifunctional MB which can be applied to a topical region of the body surface of organisms by applying, instead of using injection. This external type MB may employ a medium, either aqueous or a gel form, and contain MBs of a specific particle size and at a specific concentration. The material of the MBs may be albumin, liposomes, polymers, copolymers or mixtures of the aforementioned material or a combination of those above. The MB could be widely used in medical or beauty fields, to help strengthen the absorption of painkillers after surgery or the absorption of beauty care ingredients. The study also explores: 1. US-aided MBs facilitate the delivery of drugs to the inner ear via the round window membrane, 2. US-mediated EGF-coated-MB cavitation in dressings for wound-healing applications, 3. drug-carrying modified MB combine with a new designed device to connect to US system for the application of hair growth promotion and clinical trial, and 4. combined US-MBs-Mediated diclofenac gel delivery to enhance transdermal permeation in adjuvant-induced rheumatoid arthritis in the rat. This invention has designed an external drug accelerators based on the principle of designing ultrasonic molecular imaging probes. It is further designed as a composite medical material for MBs dressings and develops a wide range of use values.

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