

5th World Congress on **Cancer Therapy**

September 28-30, 2015 Atlanta, USA

Hypodermic drug delivery for androgen inhibition using dissolving microneedle patches in prostate cancer therapy

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Prostate cancer (PCa) is a slow-growing, potentially lethal disease, and also is the most frequently diagnosed cancer and the second leading cause of death in men in the USA. For advanced PCa, endocrine therapy by androgen ablation is still the mainstay of treatment. Leuporelin acetate (LA) is the clinical drug now for endocrine therapy via hypodermic injection to effectively control the disease progresses, but it causes pain, can lead to infection, requires trained personnel, and often needs frequent, repeated injections for the patient. Consequently, there exists the need for a minimally invasive, self-administered delivery system.

This study presents a hydrogel-mediated microneedle patches which can rapidly dissolve in the skin for the painless, self-administered delivery of LA. In this design, the LA is mixed with hydrogel then encapsulated within polymer microneedles and, after insertion into the skin, the needles dissolve within minutes to release the encapsulated cargo for further sustained drug release. Our preliminary data showed that GFP-pDNA would not lose its original activity after loading in the microneedles. In addition, the LA was also successfully encapsulated within microneedles and the encapsulated rate of LA in needles could be higher to 72%. This new drug delivery platform shows future promise for the delivery of a range of biomolecules, including vaccines, proteins, peptides, and nucleotides.

Keywords: leuporelin acetate, microneedles, hypodermic drug delivery, hormone treatment and prostate cancer.

Biography

Jing-Fong Liao is MS student from institute of Medic Science and Technology of National Sun Yat-sen University, Taiwan. I graduated from National Taipei University Technology, and my major was Chemical and Material Engineering. My present research is microneedle. Research directions is about cancer therapy. Addition a new method for clinical therapy.

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