

## Intravesical Liposomes Relieve Painful Bladder

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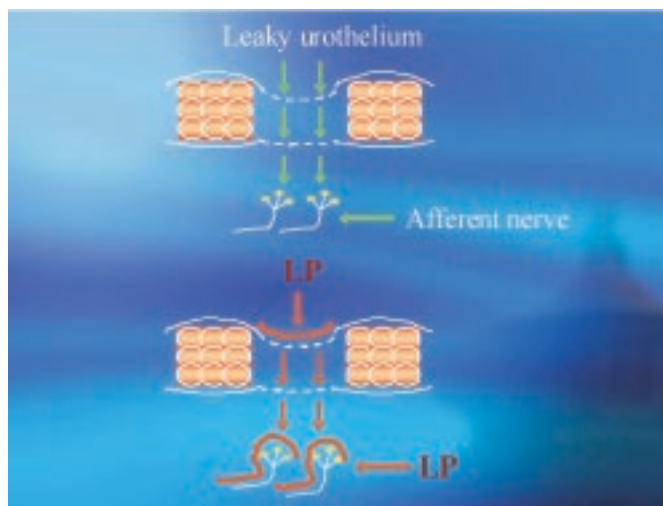
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Interstitial cystitis (IC) is a chronic disease of the bladder, characterized by urinary frequency, urgency, nocturia and suprapubic pain, affecting approximately 1 million Americans. IC affects women much more frequently than men, with a ratio of 10:1. The onset of symptoms usually occurs from 30 to 40 years of age. Although the pathogenesis of IC is uncertain, it has been proposed that a dysfunctional epithelium allows the transepithelial migration of solutes, such as potassium, which can depolarize subepithelial afferent nerves and provoke sensory symptoms.

Liposomes (LPs) are vesicles composed of concentric phospholipid bilayers separated by aqueous compartments. LPs adsorb onto cell surfaces and fuse with cells, so they are being used as vehicles for drug delivery and gene therapy. In addition, they create a molecular film on cell surfaces and, therefore, are being tested as possible therapeutic agents to promote wound healing. LP-based drug products provide a moisture film over the wound and raise outstanding wound healing without chronic inflammatory reaction in the neodermal layer. Other investigators suggest that LPs could interact with cells by stable absorption, endocytosis, lipid transfer and fusion.

Intravesical administration of LPs into wounded uroepithelium may improve the dysfunctional uroepithelium and provide an alternative treatment for IC. In addition, we have proved these concepts in hypersensitive bladder rat models, which showed that intravesical instillation of LPs could reduce the bladder hypersensitivity induced by intravesical potassium chloride or acetic acid.

Through translational research from bench to clinical, we will conduct a randomized comparative study to compare the safety and efficacy of LP topical solution and oral pentosan polysulfate (Elmiron®) in patients with IC. This phase 2 study, supported by Professor Chancellor at the University of Pittsburgh, is approved by the Center for Drug Evaluation (CDE) in Taiwan and the Institutional Review Board (IRB) of Chang Gung Memorial Hospital, Kaohsiung, Taiwan.



**Fig.** Proposed mechanism: liposomes (LP) will coat the wounded uroepithelium and reduce irritation of the submucosal afferent nerve.

### REFERENCES

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