

## Description

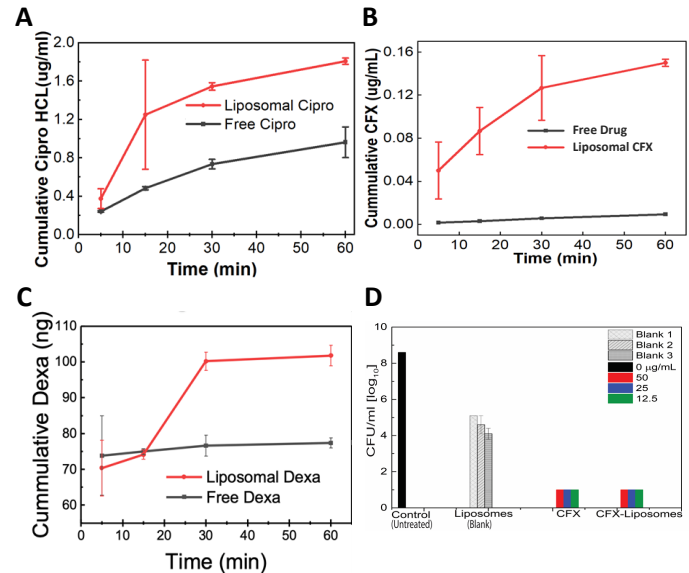
MCW inventors have developed a novel technology that enables non-invasive, local drug delivery across the Tympanic Membrane to treat Otitis Media. The technology consists of uniquely designed cationic DOTAP liposomes as carriers to transport antibiotics and/or steroid therapies directly to the site of Otitis Media infection.

## Problem Solved

Otitis Media is the leading cause for visits to the pediatrician's office and is the most common cause of hearing loss in children. Largely because current Otitis Media treatment options are not effective enough. Oral administration of antibiotics does not guarantee delivery to the middle ear (site of infection) and has many unwanted side-effects. Moreover, unmodified antibiotics cannot cross the tympanic membrane efficiently. **The current technology overcomes these problems by allowing medication to easily cross the tympanic membrane and enabling a simple route of administration.**

## Application

Treatment of Otitis Media using standard ear drop application to deliver antibiotics, steroids, or both without the need of tympanostomy tubes.



**Figure: (A-C)** Validation of trans-tympanic membrane diffusion. 200µL drug-loaded liposome suspension was applied to the external auditory canal of excised chinchilla auditory bullae. Middle ear was sampled at various timepoints for Ciprofloxacin HCL (A), Ceftriaxone (CFX) (B), Dexamethasone (C). Equivalent free-drug was applied as control. **(D)** Antibacterial activity. CFX-loaded liposomes maintained their antibacterial activity to equivalent free drug, when tested on NTHi bacterial cultures. Blank DOTAP liposomes exhibited dose dependent antibacterial efficacy.

## Key Advantages

- Non-Invasive, local delivery to middle ear
- Biocompatible drug delivery system with rapid drug uptake
- Applicable to both antibiotic and steroid drugs

**Stage of Development:**  
Ex Vivo Model

**Intellectual Property Status:**  
PCT Application filed  
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## Lead Inventors



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