Pharmaceutical Sciences Seminar Series

Wednesday, March 29, 2023
4:00pm
NCRC Building 10 Research Auditorium
Zoom

“In vivo mechanistic evaluation of levonorgestrel PLGA microneedles”

Presented by:

Tao Zheng
PhD Candidate, Pharmaceutical Sciences
University of Michigan
Mentor: Dr. Steven Schwendeman

Abstract: Long-acting contraceptive microneedle (MN) patches present greater access to enduring contraception. A systematic methodology to evaluate the in vivo performance of MNs and its correlation with in vitro characterization may provide valuable feedback for formulation optimization.

A 20 × 20 array of MNs encapsulating levonorgestrel (LNG) was manufactured and enabled long-acting release of LNG for up to 28 days in vitro. A silicone cage was introduced to directly retrieve MNs in vivo after skin retrieval proved difficult. Cage containment and reduced shaking speed slightly decreased in vitro release. Confocal imaging of MNs retrieved in vitro displayed a clear diffusive gradient for analysis by diffusion models. SEM and confocal images suggested that matrix degradation started at the lower part of the MN, which abutted the aqueous backing during preparation.

We confirmed the feasibility of retrieving MNs from in vitro and in vivo assays by modifying a silicone cage system that was previously developed by our group for characterizing PLGA microspheres. Insights from investigating the release mechanism of LNG from PLGA MNs may facilitate optimizing LNG/MNs.

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