



## 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:



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**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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