

Bioresorbable Materials for Unobtrusive, Sustained Topical Delivery of Therapeutics

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- Biomedical Engineering
- Biotechnology

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- Biomedical Engineering
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- Cancer
- Cancer Therapy
- Drug Delivery
- Ligand-Targeted Therapeutics
- Patient Care
- Targeted Therapeutic

Researchers at Purdue University have developed new bioresorbable materials for improving efficacy of unobtrusive, topical delivery of therapeutics. Currently, cancer therapies such as chemotherapy and radiation create cell toxicity as well as undesired side effects, and often require repeated treatments to be fully effective. Another technology, polymeric microneedles, is less invasive and improves drug targeting; however, these are not well adapted to delivery cancer drugs or for other skin diseases, which require lasting release times. In addition, these polymer-based needles cannot be used in many sensitive target areas such as corneas in ocular cancers. Purdue researchers introduce a small, thin, flexible, water-soluble medical film that can be interfaced amicably with the soft, curvilinear surface of the skin as inserted by porous silicon needles dissolving completely in just one minute. These needles are designed to degrade through a simple hydrolysis process which initiates drug release over the course of a couple days. Minimal side effects were observed in mice after using this method for chemotherapy delivery and no signs of muscle inflammation at the site of injection were observed. This technique also showed less relapse in melanoma in mice. An in vitro analysis was also conducted on human fibroblast cells, and cell viability remained at 99.3% over the course of three days of treatment.

Advantages:

- Minimally-invasive Sustained Drug Release
- Improves Patient Care

Potential Applications:

- Drug Delivery

-Biomedical
-Topical Cancer Therapy

Technology Validation:

This invention was tested in vivo in mice, reducing relapse in melanoma as well as in vitro with human fibroblast cells showing excellent cell viability over time.

Recent Publication:

"Wearable patch may provide new treatment option for skin cancer"

Purdue University Research Foundation News

<https://www.purdue.edu/newsroom/releases/2020/Q2/wearable-patch-may-provide-new-treatment-option-for-skin-cancer.html>

People:

- Lee, Chi Hwan (Project leader)
- Kim, Dong Rip
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Intellectual Property:

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