Nanowire-Coated Planar Microdevices For Transmucosal Drug Delivery

Tech ID: 28794 / UC Case 2015-082-0

INVENTION NOVELTY

This invention describes a first-of-a-kind methodology using micro- and nanofabrication techniques to create polymeric microscale devices that are asymmetrically coated with nanowires. The nanowire coating provides an inherent high-throughput, low-waste drug loading mechanism, enhanced cytoadhesion, and may potentially interact with epithelial tissue to enhance drug permeation.

VALUE PROPOSITION

Oral drug administration is the preferred route due to its low cost, ease of use, and high patient compliance. However, many therapeutics have low oral uptake, thereby requiring other routes of administration (e.g. intravenous injections), which can be less ideal. The major barriers to oral drug delivery are drug solubility, drug permeability, and drug degradation. This invention is meant to address all three barriers. The nanowire-coated microdevices are expected to enhance oral uptake of a wide range of drugs that currently have low oral bioavailabilities.

TECHNOLOGY DESCRIPTION

The device enhances oral drug delivery because of the following: (1) it binds to the lining of the gastrointestinal tract, thereby providing proximal drug release and prolonged drug exposure, addressing issues of solubility; (2) the planar shape of these devices coupled with their adhesive properties will allow for unidirectional drug release toward epithelial tissue, addressing issues of drug permeation; (3) the drug loaded onto the devices will be released in a sustained manner, decreasing exposure to harsh conditions of the gastrointestinal tract, thereby reducing drug degradation.

LOOKING FOR PARTNERS

To develop & commercialize the technology as an oral drug delivery system.

STAGE OF DEVELOPMENT

Pre-clinical

RELATED MATERIALS

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OTHER INFORMATION

KEYWORDS

Nanotechnology, Nanomaterials, Oral drug delivery, Microdevice

CATEGORIZED AS

- **Medical**
  - Delivery Systems
- **Nanotechnology**
  - NanoBio

RELATED CASES

2015-082-0

▶ Fox CB, Kim J, Schlesinger EB, Chirra HD, Desai TA. Fabrication of micropatterned polymeric nanowire arrays for high-resolution reagent localization and topographical cellular control (2015). Nano Letters, 15(3):1540-6

DATA AVAILABILITY

Under CDA / NDA

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	11,173,129	11/16/2021	2015-082
United States Of America	Issued Patent	10,596,125	03/24/2020	2015-082

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

▶ Sealed Nanostraw Microdevices For Oral Drug Delivery

▶ PRO- RESOLVING MEDIATORS AND DEVICES FOR THERAPEUTIC MODULATION OF BLOOD VESSEL HEALING

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