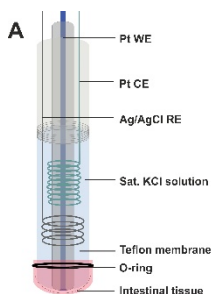


Bachelor / Master project

Tissue on electrode: electrochemical methods for real-time permeation monitoring



The goal of the project is to develop an electrochemical method for real-time detection of permeation enhancers through intestinal tissue. The method is aimed to be used as a tool during the development of smart, oral targeted drug delivery systems.

Despite the existence of several established methods to evaluate drug absorption using artificial membranes, and *in vitro* models, there is a need for fast, real-time drug permeation models and methods for early stage drug development [1].

Electrochemical detection techniques have been applied in different areas of drug discovery for a range of biological applications, e.g. detection of cancer markers, drug screening, and for real-time assessment of encapsulated drug release [2], however there are only a few reports on measuring drug permeation through tissue *in vitro* [3].

In the proposed experimental setup, oxygen production will be achieved by exposing the tissue layer to hydrogen peroxide. The effect of permeation could be measured in real time when the permeation enhancers alters the membrane integrity of the immobilized tissue. Smart drug delivery systems (e.g. microdevices) could be loaded with formulations containing an effective permeation enhancer to achieve targeted drug delivery at GI tract.

References

1. Aungst, B. J., J Pharmaceutical Science 2000, 89: 429-442.
2. Gari H. et al., Electroanalysis 2015, 27:111-117.
3. Mora L. et al., J Control Release 2009, 140:69-73.

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About IDUN

IDUN is a center of excellence funded by the Danish National Research Foundation and the Villum Foundation. The center is divided into two parts: IDUN Drug and IDUN Sensor, focusing on drug delivery and nanomechanical sensors, respectively.