Registration Form

TEAM INFORMATION

Team Name/Project Title: All in Vein

Department: Dept. of Bioengineering

Faculty Advisors: Casey Howard & Steve Lammers

Team Members: Mandy Perras, Kevin Nicoll, Brandon Lee, Josh Carlin

PROJECT INFORMATION

Description:

Transdermal Patch, which uses the mechanical properties of microneedles, to treat infusion reactions in late-stage MS patients.

Abstract:

The current standard of care for treating multiple sclerosis (MS) are disease-modifying therapies (DMT) which are done through infusible intravenous delivery. From the infused DMT, there are patients that encounter adverse infusion-related skin reactions that include symptoms such as itching, hives, and rashes. Currently, there is a 24-40% discontinuation rate of treatment due to adverse infusion-related reactions. The goal for our product is to increase compliance of patients undergoing DMTs who discontinue treatment because of infusion-related reactions.

These infusion-related reactions lead to the patients being administered a nonsteroidal anti-inflammatory drug (NSAID), corticosteroid, and an antihistamine before the infusion can be started. The NSAID and antihistamine are administered orally taking considerable time for the drug to reach systemic circulation because it must go through the first pass metabolism of the liver that also decreases the concentration of the active pharmaceutical ingredients. This requires the patient to spend more time in the clinic which the infusion itself can take more than five hours.

A transdermal delivery system would deliver the pre-medications across the skin barrier giving patients a new non-invasive and pain-free method of drug delivery. This will better counteract infusion-related reactions by bypassing the first-pass metabolism and localizing the drug delivery to the site of the reaction. Transdermal delivery systems have the advantage of being safer, more reliable, and a precise application of drug delivery. Therefore, transdermal delivery would void the first-pass metabolism and have less loss of the active pharmaceutical ingredient.