



Scheda di Offerta Tesi

Titolo (provvisorio): Simulation and characterization of encapsulation optical waveguide

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Descrizione

Motivazione e campo di applicazione

An estimated 10 million people worldwide are living with Parkinson's disease. Parkinson's is a neurodegenerative disease. In Parkinson's disease, dopamine-producing neurons in the mid-brain degenerate leading to the loss of the neurotransmitter dopamine. As a result, a person suffers from movement-related symptoms such as tremors at rest, rigidity of limbs and slowness of motion. There are some medications available to relieve the symptoms, but there is currently no cure for this disease.

Obiettivi generali e principali attività

This project deals with a possible treatment of Parkinson's disease based on the use of implanted stem cells to substitute malfunctioning dopaminergic neurons. The aim of the work is to design, simulate, fabricate, and characterize an optical waveguide device that simultaneously acts as an optical stimulator (using laser light) and encapsulation for cells during implantation in the striatum.

The waveguide will be designed in order to optimize light diffusion in order to stimulate as many cells as possible.

Obiettivi di apprendimento (strumenti tecnici e analitici, metodologie sperimentali)

The student will be trained in:

- microfabrication
- optical simulation using COMSOL Multiphysics software
- optical characterization using a class IIIB laser
- general experimental practice: planning, execution, and documentation of experiments and results

Luogo/i in cui si svolgerà il lavoro:

Department of Health Technology, Technical University of
Denmark, Kongens Lyngby, Denmark

Informazioni aggiuntive

Numero massimo di studenti: 1