VILNIUS GEDIMINAS
TECHNICAL UNIVERSITY
FACULTY OF ELECTRONICS

INSTITUTE OF HIGH MAGNETIC FIELDS

PhD in Electrical and Electronics Engineering

Topic:

"Didelės galios modulinių impulsų formavimo sistemų kūrimas ir tyrimas supra-elektroporacijai iššaukti"

"Research and development of high power modular pulse forming systems for induction of supra-electroporation"

One of the interventional methods that has long been studied and applied in the treatment of tumors is electroporation. Electroporation (ELP) is a phenomenon of increased cell membrane permeability, which is triggered by pulsed electric fields. Properly selected pulse parameters can control the entry of various compounds into the cells, f.e. anticancer drugs into tumor cells, thereby locally increasing their cytotoxic efficacy. Due to the particularly successful application, this branch of electroporation has acquired a separate term - electrochemotherapy. However, the electroporation methodology is not limited to biomedicine. A significant part of the applications is in the field of food processing and / or biotechnological applications (algae treatment, target molecule extraction, etc.). The field is inseparable from the field of electrical and electronics engineering, since the effects are dependent on the applied pulse parameters, and thus - pulse generators.

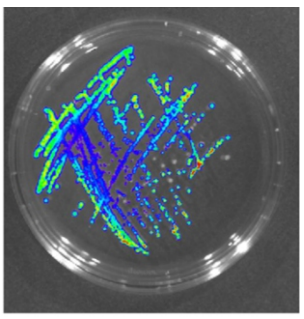
The topic of this dissertation is focused on the development of a new technological platform for electroporation. The main goals are in the field of electrical and electronic engineering, however, due to specifics of the topic the future PhD candidate will have the opportunity to collaborate with professionals in the field of biomedical engineering and acquire new and significant transdisciplinary results.

Requirements for candidate:

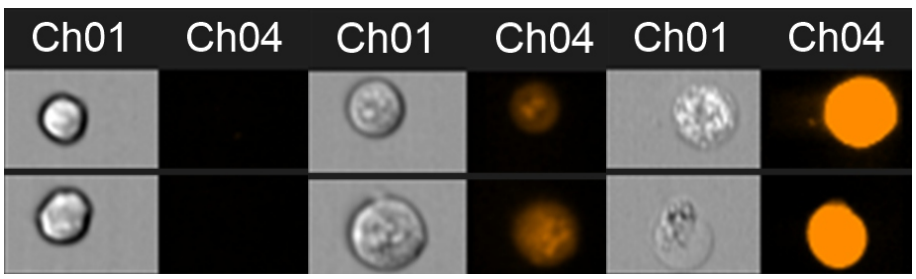
MSc in Technological Sciences, motivation to get a PhD and learn advanced electronics, English B2+ level
Capability to travel abroad for several month internships, participation in international conferences

Applications

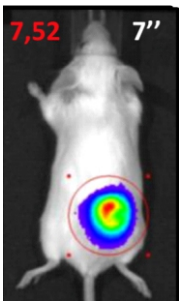
Bacteria inactivation



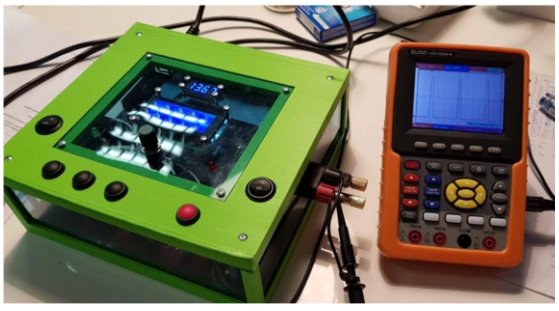
Cell membrane permeabilization for delivery of various compounds



In vivo



Examples of previously built pulsed power generators



P.S. You will be allowed to choose the color of your generator

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