

CEIPEX BUT TOPIC

Položka / Field	Obsah / Content
CEIPEX RESEARCH TOPIC LEVEL 1	Advanced Materials
CEIPEX RESEARCH TOPIC LEVEL 2	Bioelectronics
NAME OF THE RESEARCH GROUP	Bioelectronics Materials and Devices (RG-2-08)
SUPERVISOR	Prof. Eric Daniel Głowacki
PROPOSED RESEARCH TOPIC TITLE	Neurostimulation for Next-Generation Control of the Autonomic Nervous System
RESEARCH TOPIC DESCRIPTION	Neurostimulation devices that interface with the autonomic nervous system, either invasively or noninvasively, are a rapidly growing pillar of bioelectronic medicine. Targets such as the vagus and trigeminal nerves provide routes to modulate parasympathetic and sympathetic activity, and with it the inflammatory, cardiovascular, and nociceptive processes under autonomic control, with the goal of achieving a therapeutic outcome. Our group combines excellent in-house infrastructure with a strong collaboration network, allowing us to develop novel neuromodulation strategies at many different levels: microfabrication of new minimally invasive or fully noninvasive stimulation devices, computational modelling, in vitro models, studies in healthy human volunteers, and clinical collaborations within the city of Brno. The postdoctoral project should fit within the framework of neuromodulation of the autonomic nervous system, take a device-focused perspective, and have a clear motivation in addressing a specific pathology, such as inflammatory conditions or chronic pain. We welcome candidates from biomedical or electrical engineering, materials science, neuroscience, or applied physics who are motivated to take a stimulation concept from device design and modelling through to validation in humans.
KEYWORDS	neuromodulation, autonomic nervous system, vagus nerve stimulation, bioelectronic medicine, biomedical devices
INTERDISCIPLINARY DIMENSION	The research spans biomedical engineering and microdevice science, neuroscience, and clinical medicine. It will involve collaboration with the Applied Neuroscience cluster at CEITEC MUNI, as well as with neurology departments of local hospitals in Brno.
WEBPAGE OF THE RESEARCH GROUP	https://www.ceitec.eu/bioelectronics-materials-and-devices/rg375