RESEARCH GROUP

Interventional Cardiac Electrophysiology (ICE)

KEY INTERESTS
Cardiac Electrophysiology • Cardiac Arrhythmia • Stem Cells Therapy • Epicardial Pacing • Ablation • Defibrillation • Electroporation • Apoptosis • In-vitro models

RESEARCH FOCUS
The Interventional Cardiac Electrophysiology Research Group is focused on clinical research of catheter navigation, 3D imaging of heart structures and image integration during catheter ablations of cardiac arrhythmias. The main aim is prototype catheter testing and development in animal models, based on the collaboration with researchers from Mayo Clinic, USA. The ICE is further focused on development of catheters for epicardial stimulation, defibrillation and ablation towards chronic experiments and new catheters with direct visualization of ablated tissue. The further area are regenerative strategies of bradyarrhythmias using stem cell technologies and novel ablation modalities. There is ongoing brain vasculature research with neurologist and neurosurgeons. The magnetic navigated micro-catheter is utilized for endovascular mapping of deep brain structures in animal models, in order to help patients with epilepsy and improve quality of brain structures mapping. The ICE Research Group is also running research on microRNA in atrial fibrillation.

RESEARCH OBJECTIVES
* Development of new catheters and devices for interventional treatment of cardiac and brain diseases.
* Clinical research of catheter navigation, 3D imaging of heart structures and image integration during catheter ablations of cardiac arrhythmias.
* Translational focus on stem cell-derived cardiomyocytes and regeneration strategies.

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EDUCATION
▲ 2005: Ph.D. in Cardiology, Masaryk University, Brno, Czech Republic
▲ 1994: MUDr./MD in Cardiology, Masaryk University, Brno, Czech Republic

TRAINING
▲ 2003: Fellow, Cardiac electrophysiology, Onze-Lieve-Vrouwziekenhuis, OLV Hospital, Aalst, Belgium
TOP PUBLICATIONS

- **Multi-electrode Epicardial Pacing** – Systems and methods for epicardial pacing using a percutaneously delivered bifurcated pacing lead that has multiple electrodes that are directionally insulated to prevent extracardiac stimulation, including prevention of phrenic stimulation. In addition, the devices, systems, and methods can be used for ablation, defibrillation, and/or defibrillation in combination with pacing. Invention is covered by US and PCT patent application.

TECHNOLOGICAL EQUIPMENT

- **STEREOTAXIS EPOCH™** – two units of magnetic catheter navigation system – for human (clinical research) and for animals (preclinical research).
- **EnSite Velocity a Carto 3** – 3D electroanatomical mapping system.
- **Catheter Ablation Systems** – radiofrequency ablation, cryoablation, laser ablation.
- **Implantation room with full electrophysiological equipment.**
- **Fully equipped electrophysiological laboratory with novel technologies.**

OFFERED SERVICES AND EXPERTISE

- Catheter testing both in human and in animal models.
- Technical assistance on animal studies involving imaging and electrophysiology equipment.
- Human electrophysiology clinical evaluation.
- Registry setup.

MAIN PARTNERS AND COLLABORATING INSTITUTIONS

- **Mayo Clinic**, Rochester, MN, USA
- **Mount Sinai Hospital**, New York, USA
- **Herzzentrum Leipzig**, Leipzig, Germany