



Silesian Park of Medical Technology

Kardio-Med Silesia

**Cardiovascular Research Center for New
Technology and Innovations in Medicine and
BioTechnology**



Kardio-Med Silesia is a research centre meeting the highest standards established on September 21st, 2015.

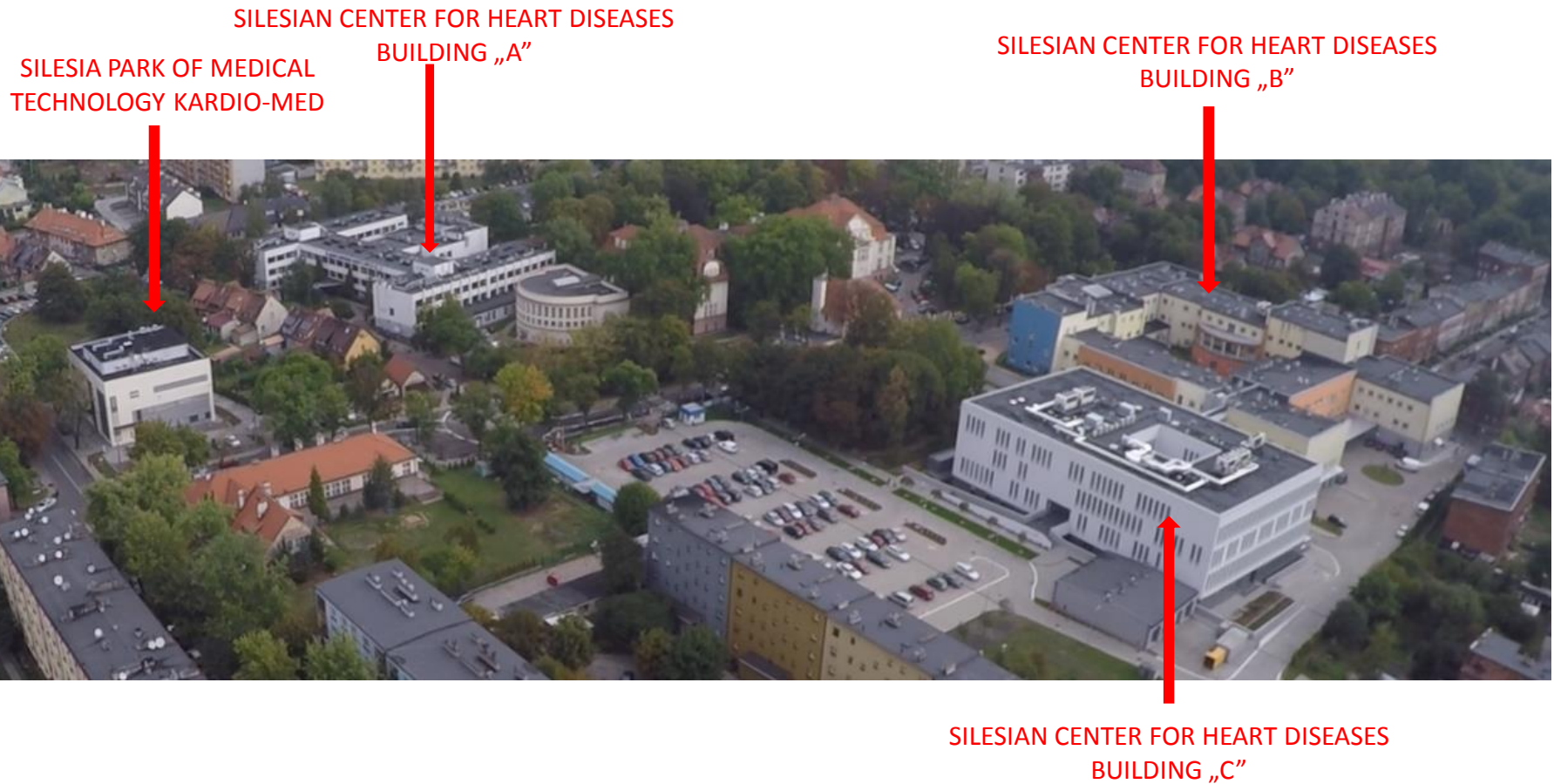
Our Units:

- Animal Facility
- Laboratory of Isolated Organs
- Genomics Laboratory,
- Cell and Tissue Bank,
- Test and Implementation Laboratory of New Technologies and Medical Devices,
- Laboratory of Environmental and Civilizational Hazards,
- Telemedicine Center,
- Kardio-Med Silesia Clinic Complex

Conduction of pre-clinical and clinical trials in specialties:

- cardiology, interventional cardiology, cardiac surgery,
- oncology,
- diabetology,
- geriatrics,
- environmental diseases

From 2017 Elektrophysiology Scholl for doctors from Poland and European Countries will be established in Kardio-Med Silesia.





Partnership Centers:

- **Silesian Center for Heart Diseases (SCCS)**
- Medical University of Silesia (SUM)
- Foundation of Cardiac Surgery Development (FRK)
- Institute of Medical Technology and Equipment (ITAM)
- Jagiellonian University & Jagiellonian University - Collegium Medicum (UJ–CM)
- Faculty of Biotechnology at Silesian University of Technology (SUT)
- Medical University of Gdańsk (GUMED)
- Pomeranian Medical University in Szczecin (PUM)
- Medical University of Warsaw (WUM)

Collaborations:

- Medical solutions: **Balton, Abbott (St. Jude), Medtronic, Biotronik, Boston**
- Biopharmacy and biotechnology: **Adamed Group, Actelion, AstraZeneca, Sanofi Aventis, Amgen, Pfizer**
- Telemedicine, education, healthcare and IT solutions : **Philips, Servier Poland, Comarch Group, Elsevier, Silermedia, Severux, Wasko**



Kardio-Med Silesia Medical Technology Park



CEO – Adam Konka, MBA

Scientific Director – Professor Józef Dulak, PhD.

Supervisory Board: Professor Zbigniew Kalarus, MD, PhD (Chairman); Professor Lech Poloński, MD, PhD; Magdalena Korzeniowska, PhD; Jan Sarna, PhD

Cooperation in cardiac surgery:

- Professor Marian Zembala, MD, PhD; Michał Zembala, MD, PhD

Cooperation in interventional cardiology (electrophysiology and electrocardiology):

- Professor Zbigniew Kalarus, MD, PhD (former President of the Polish Cardiac Society); Oskar Kowalski, MD, PhD; Radosław Lenarczyk, MD, PhD; Adam Sokal, MD, PhD

During the surgeries we cooperate with the following teams:

- Anesthesia Team
- Vets
- Zootechnician's Team
- Radiological Care
- Auxiliary Staff



Level „-1”: CathLab for big animal models and for experiments on small animal models;

Level „0”: Clinical trials and administrative offices;

Levels „1” and „2”: Laboratories and lecture halls;





Current Projects in

Kardio-Med Silesia Medical Technology Park



NOMED–AF – Development and implementation of a long-term non-invasive heart rhythm monitoring system capable of early discovery of atrial fibrillation (AF) and application of the system in calculating AF incidence in 65+ population in Poland. Project is conducted under the auspices of the Health Minister. More information available on www.nomed-af.eu.

PHOENIX – Evaluation of measure heart's regenerative potential with use of autological mesenchymal stem cells (MSC) given to patients with advanced heart failure. Achievement of the product, which stimulate the revascularisation and recover contractility of the heart.

RH ROT – Induction of increase in the usage of mechanical circulatory support system in treating heart failure in Poland, which is possible due to the development and implementation of innovative technology of long-term circulatory support with implanted centrifugal pumps.

GRAPHENE PROJECT – Testing the effects of different forms of graphene on the working ex-vivo rat heart. Observation of the heart work alterations caused by changes at different coronary flows, coronary endothelial function testing, integrity cardiomyocytes verification related to different graphen concentration.

Point of interest - **induced pluripotent stem cells- iPSC technology**, to formulate innovative therapies:

- Using iPSC differentiating to cardiomyocytes to treat diseases (**Cardiotoxicity research of anticancer agents**)
- Using iPSCs differentiating to neurons– **Alzheimer's disease, Parkinson's disease, amyotrophic lateral sclerosis (ALS)**
- Using iPSCs differentiating to hepatocytes or _ear cilliary cells– toxicity of the substance research (**analysis of environmental hazards presence in Silesia area**)

Current Projects in Kardio-Med Silesia Medical Technology Park



Telemedicine Center

Opened in March 2017 to monitor 400 hundred patients in the clinical trial of the NOMED project, commercially available in the future.

Miasto Zdrowia

pilot, telemedicine project for citizens of Zabrze in years 2017 – 2019. Project dedicated for 65+ patients suffering from cardiac and pulmonary disease, diabetes, stroke.





Cath Lab for Big Animals

in

Kardio-Med Silesia Medical Technology Park

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Level „-1”: Operating Block





- EPLab with Fluoro system
- EP Cardiac Stimulator
- Irrigation pump for ablations catheter
- EP generator for ablation
- Anaesthetic mechine
- Infusion pumps
- External pacemaker
- Electrocautery device
- Ac T Analyzer
- External defibrillator
- Transport ventilator
- Stationary Mechanical Ventilation System



- Facility adapter for maximum 20 animals residing at the same time (quarantine room, dwell room, postoperative room)
- BMS system All (Building Management System) designed to monitor the correct functioning of the installation by continuous monitoring of the environment and technical parameters.





First experimental surgeries on pigs performed in the Silesian Center for Heart Diseases and Kardio-Med Silesia

Experimental procedure of stents coated in antimitotic agent implementation into peripheral arteries conducted on big animal models in Kardio-Med Silesia Medical Technology Park.

The long-term experiment of 3 months was successfully completed by histological confirmation it's functionality on swine heart.

After pre-clinical trials, stents was allowed to clinical trials in SCCS.





Stroke workshops on big animal models performed in the Silesian Center for Heart Diseases and Kardio-Med Silesia

Getting a practical knowledge about a rheolytic thrombectomy appliance in a training in the facilities of the Silesian Center for Heart Diseases and Kardio-Med Silesia.

One of many course planned, that combine a theoretical part in our lecture hall with SCCS operating theatre via an AV system.

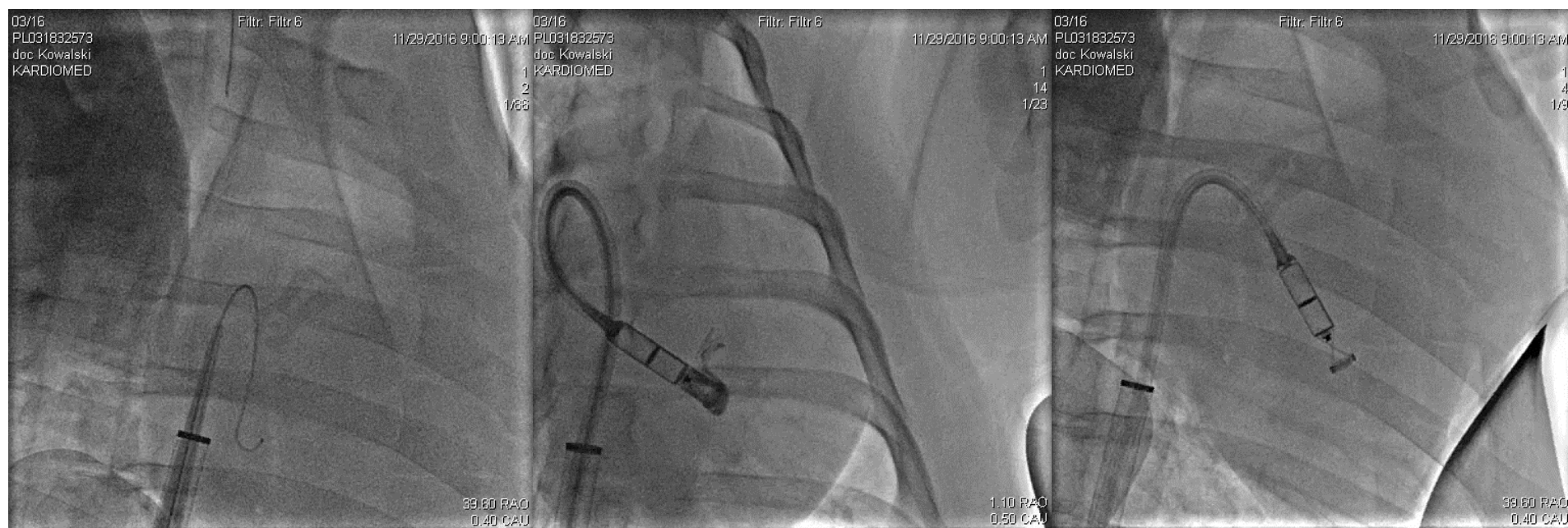




Pacemaker implantation workshops

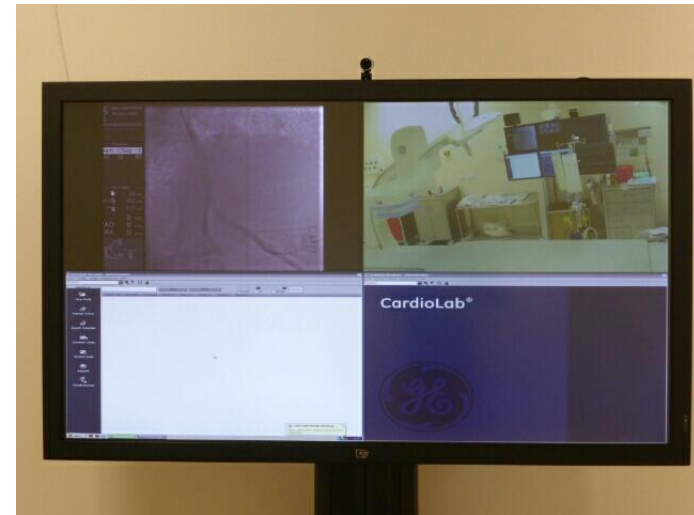
The scheme of the workshop:

- Theoretical Introduction including pig's heart anatomy and fluoroscopy imaging
- Exercises in pacemaker implementation on swine model
- Discussion of the outcome and ex vivo macroscopic analysis of the pig's heart
- Analysis of efficacy and functionality of pacemaker





The audiovisual connection with the Silesian Center for Heart Diseases and the possibility of transmission of audiovisual transfer worldwide through two independent optic fibers and facilitate to carry out live broadcasts.



Stroke workshops on big animal models performed in the Silesian Center for Heart Diseases and Kardio-Med Silesia in 2016



Cath Lab for Animals

(mice, rats)

in

Kardio-Med Silesia Medical Technology Park



- IVC units - individually ventilated cages with HEPA filters for 5000 rodents (mice, rats)
- Operating theatre with vevo system (echocardiography), anesthetic equipment for rodent, blood morphology and biochemistry analyzers
- BMS system All (Building Management System) designed to monitor the correct functioning of the installation by continuous monitoring of the environment and technical parameters.





GENETIC TESTS

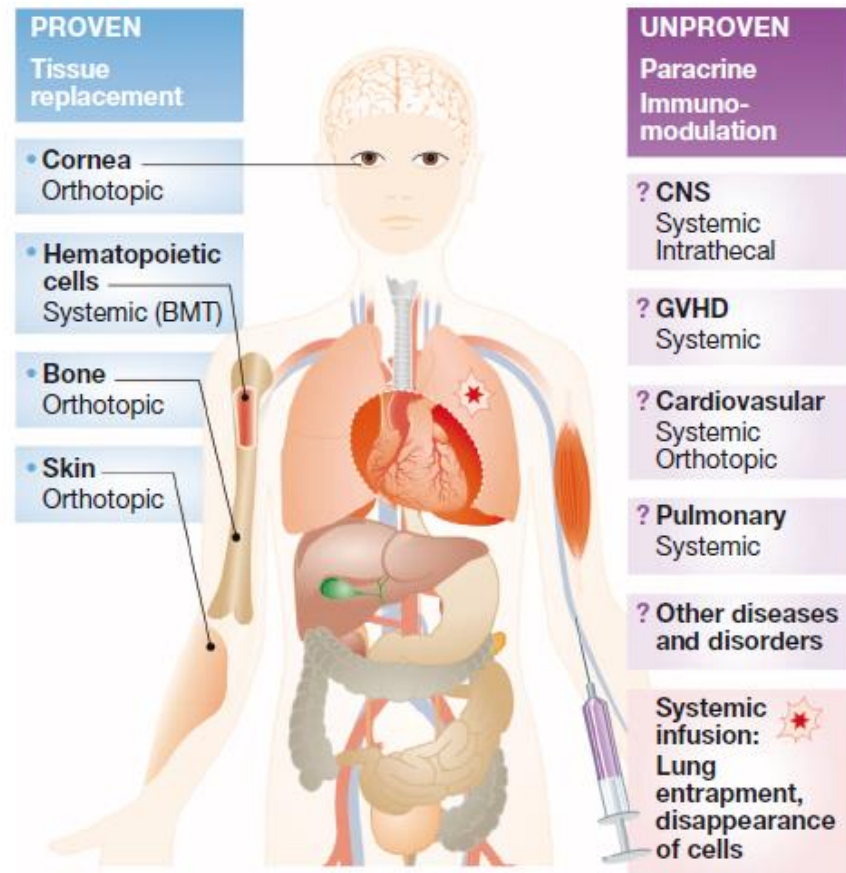
Implemented:

- **Congenital thrombophilia:** indication of mutation *97G>A (20210G>A) in *F2* gene and in mutation p.Arg534Gln (factor V Leiden) in *F5* gene
- **Warfarin sensitivity testing:** indication of mutation 1639G>A in *VKORC1* gene and variants*2 and*3 of *CYP2C9* gene
- Congenital thrombophilia: indication of mutation *MTHFR* gene
- **Clopidogrel sensitivity testing**
- **Genetic background of cholesterol and lipid disorders:** apolipoprotein E (ApoE) genotyping
- **Gilbert's syndrome:** detection of dinucleotide repetitions (TA)_n in the promoter region of *UGT1A1* gene



Clean room class B rooms with controlled environmental parameters: particles and microorganisms, air pressure and air exchange amount. Use of material and personal sluices.

Unit is currently focused on the isolation of mesenchymal stem cells (MSC) from adipose tissue and their usage in patients with advanced heart failure. Research is being carried out within PHOENIX project.





Publications of Kardio-Med Silesia Medical Technology Park



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9. Bujak K., Wasilewski J., **Osadnik T.**, Jonczyk S., Kołodziejska A., Gierlotka M., Gąsior M., *The prognostic role of red blood cell distribution width in coronary artery disease: A review of the pathophysiology*, *Disease markers* 2015, vol. 1, p. 1-12.



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MedTrends Conference



Kardio - Med Silesia organizes the annual cyclic meeting dedicated to novel technologies in health care (www.medtrends.pl)

“MedTrends – European Modern Health Care Forum” is a conference whose attendants are leading experts representing fields of cardiology, cardiac surgery, diabetes, neurology, and genomics who aim to exchange knowledge and experience concerning research and development of modern solutions in medicine between various representatives of science, medicine, new technology and telemedicine solutions as well as Polish, British and European businesses. The conference focuses on personalised medicine, e-Health tools, 3D print and e-education in medicine. Additionally, innovatory medical start-ups have a chance to present their ideas to a range of leading figures from the world of medicine, investment societies and business experts during "TOP-TRENDS" competition.

We cordially invite you to 4th MedTrends 2018!

Med Trends 2018
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