Silesian Park of Medical Technology

Kardio-Med Silesia

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

Kardio-Med Silesia Medical Technology Park

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

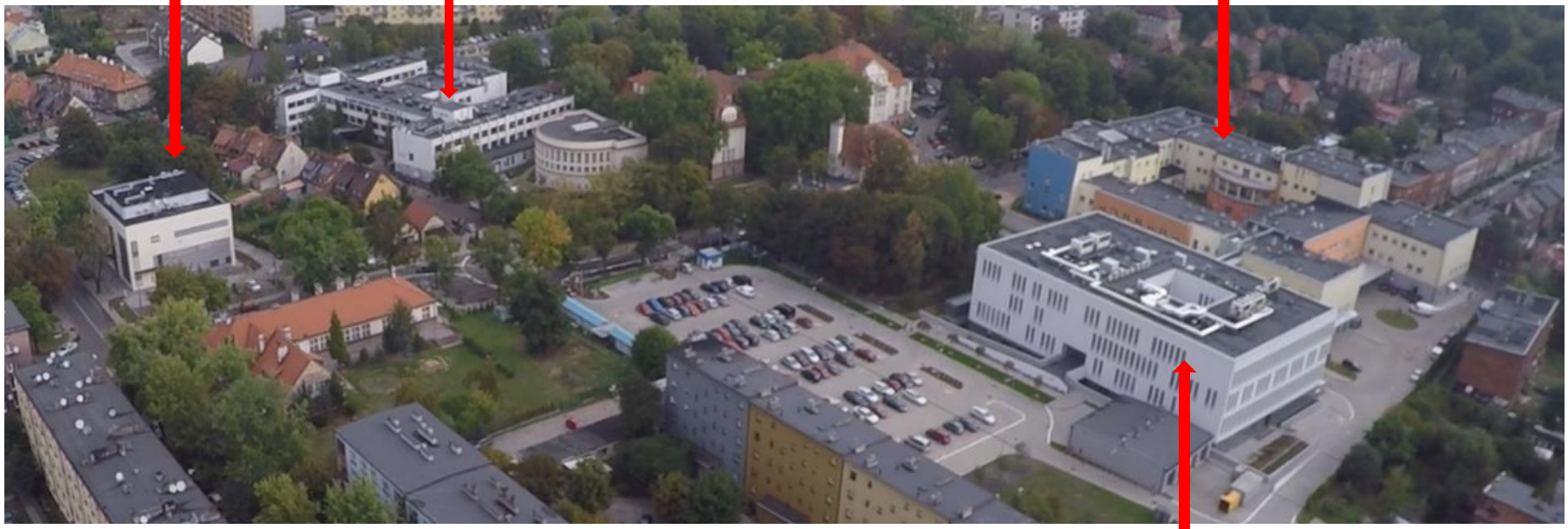
From 2017 Elektrophysiology Scholl for doctors from Poland and European Countries will be established in Kardio-Med Silesia.

Kardio-Med Silesia location

SILESIAN CENTER FOR HEART DISEASES BUILDING „A”

SILESIA PARK OF MEDICAL TECHNOLOGY KARDIO-MED

SILESIAN CENTER FOR HEART DISEASES BUILDING „B”



SILESIAN CENTER FOR HEART DISEASES BUILDING „C”

Maria Curie-Skłodowska street 10C in Zabrze

Kardio-Med Silesia Ltd.

Kardio-Med Silesia Medical Technology Park

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**
- Biophamacy 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 (electrophisiology 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:

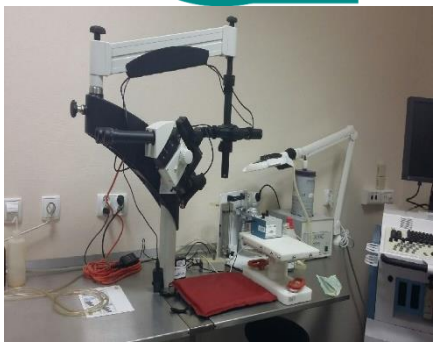
- Anesthesia Team
- Vets
- Zootechnician's Team
- Radiological Care
- Auxiliary Staff

Kardio-Med Silesia Medical Technology Park

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:

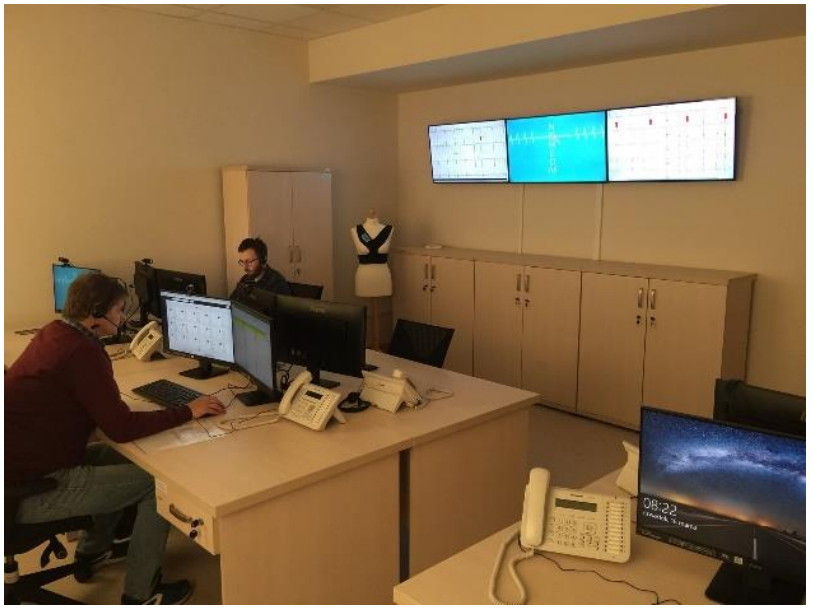
- Using iPSC differentiating to cardiomyocytes to treat diseases (**Cardiotoxicity research of anticancer agents)**
- Using iPSCs differentiating to neurons– **Alzheimer's disease, Parkinson's disease, amyotrophic lateral sclerosis (ALS)**
- Using iPSCs differentiating to hepatocytes or _ear cilliary 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, telemedicnie project for citizens of Zabrze in years 2017 – 2019. Project dedicated for 65+ patients suffering from cardiac and pulmonary disease, diabetes, stroke.



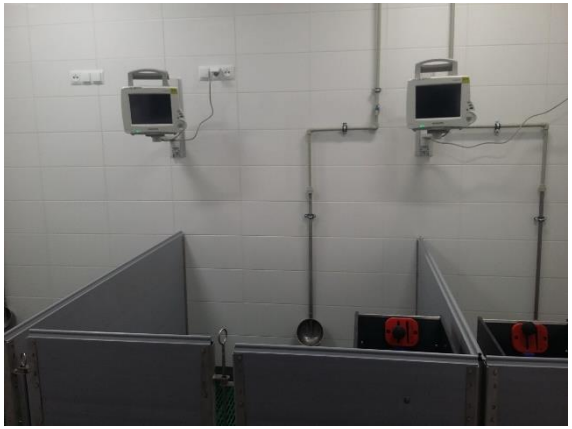
Cath Lab for Big Animals

in

Kardio-Med Silesia Medical Technology Park

Kardio-Med Silesia Medical Technology Park

Level „–1”: Operating Block



Equipment in Cath Lab for Big Animals

- 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

KMS Cath Lab- Swine

- 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.

Projects in Kardio-Med Silesia
Medical Technology Park

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.

Projects in Kardio-Med Silesia
Medical Technology Park

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 pllaned, that combine a theoretical part in our lecture hall with SCCS operating theatre via an AV system.

Projects in Kardio-Med Silesia
Medical Technology Park

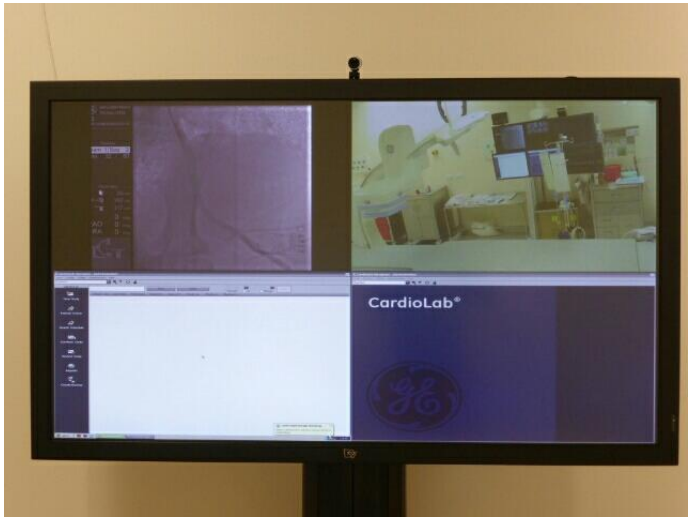
Pacemaker implantation workshops

The scheme of the workshop:

- Theoretical Introduction incuding 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

Kardio-Med Silesia
Medical Technology Park

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

KMS Cath Lab-Rodent

- IVC units - individually ventilated cages with HEPA filters for 5000 rodents (mice, rats)
- Operating theatre with vevo system (echocariography), 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.

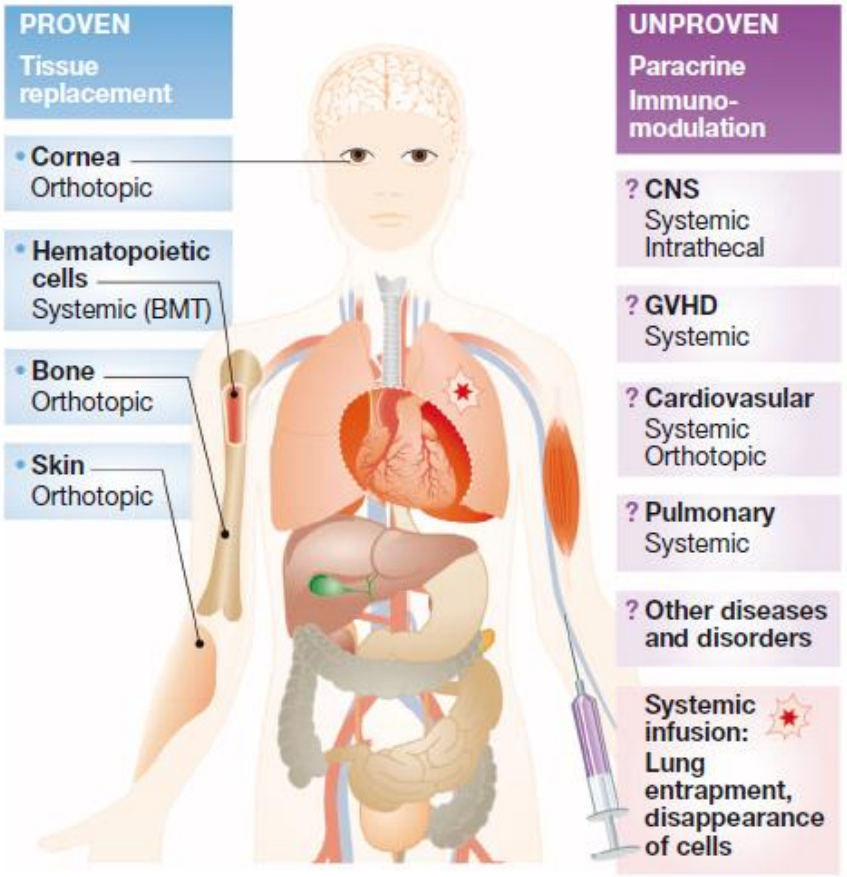
KMS Diagnostic Laboratory
(*GENE KMS)*

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

KMS Cell and Tissue Bank

Clean room class B rooms with controlled environmental parameters: particles and microorganisms, air pressure and air exhange 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.



P. Bianco et al., EMBO J, 3 May, 2013

Publications

of

Kardio-Med Silesia Medical Technology Park

Publications of Kardio-Med Silesia Medical Technology Park

1. Niska K., Pyszka K., Tukaj C., Wozniak C, **Radomski M. W.,** Inkielewicz-Stepniak I., *Titanium dioxide nanoparticles enhance production of superoxide anion and alter the antioxidant system in human osteoblast cells,* International Journal of Nanomedicine 2015, vol. 10, p. 1095-1107.

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5. Gobbo O. L., Sjaastad K., **Radomski M. W.,** Volkov Y., Prina-Mello A., *Magnetic Nanoparticles in Cancer Theranostics*, Theranostics 2015, vol. 5 (11), p. 1249-1263.

6. Radomska A., Leszczyszyn J., **Radomski M. W.,** *The Nanopharmacology and Nanotoxicology of Nanomaterials: New Opportunities and Challenges*, Advances in Clinical and Experimental Medicine 2016, vol. 1, p. 151-162.

7. 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.

8. Osadnik T., Strzelczyk J., Bujak K., Reguła R., Wasilewski J., Fronczek M., Kurek A., Gawlita M., Gonera M., Gierlotka M., Lekston A., Hawranek M., Myrda K., Wiczkowski A., Ostrowska Z., Gąsior M., Poloński L., *Functional polymorphism rs710218 in the gene coding GLUT1 protein is associated with in-stent restenosis*, Biomarkers in Medicine 2015, vol. 9, p. 743-50.

Publications of
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9. Osadnik T., Strzelczyk J. K., Fronczek M., Bujak K., Reguła R., Gonera M., Gawlita M., Kurek A., Wasilewski J., Lekston A., Gierlotka M., Hawranek M., Ostrowska Z., Wiczkowski A., Poloński L., Gąsior M., *Relationship of the rs1799752 polymorphism 4 of the angiotensin-converting enzyme gene and the polymorphism of the angiotensinogen gene to the process of in-stent 6 restenosis in a population of Polish patients*, Advances in Medical Sciences 2016, vol. 2, p. 276-281.

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12. Osadnik T., Strzelczyk J. K., Reguła R., Bujak K., Fronczek M., Gonera M., Gawlita M., Wasilewski J., Lekston A., Kurek A., Gierlotka M., Trzeciak P., Hawranek M., Ostrowska Z., Wiczkowski A., Poloński L., Gąsior M., *The relationships between polymorphisms in genes encoding the growth factors TGF-ß1, PDGFB, EGF, bFGF and VEGF-A and the restenosis process in patients with stable coronary artery disease treated with bare metal stent*", Plos One 2016, vol. 3, e. 0150500.

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14. Lenarczyk R., Mitręga K., Mazurek M., Janion M., Opolski G., Drożdż J., Streb W., Fuglewicz A., **Sokal A**., Laroche C., Lip G. Y., Kalarus Z., *Polish and European management strategies in patients with atrial fibrillation. Data from the EURObservational Research Programme-Atrial Fibrillation General Registry Pilot Phase (EORP-AF Pilot)*, Polish Archives of Internal Medicine 2016, vol. 3, p. 138-148.

15. Zielinska E., Tukaj C., **Radomski M. W.,** Inkielewicz-Stepniak I., *Molecular Mechanism of Silver Nanoparticles-InducedHuman Osteoblast Cell Death: Protective Effect of Inducible Nitric Oxide Synthase Inhibitor*, Plos One 2016, vol. 10, e: 0164137.

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18. **Konka A.,** Sokal A., Kalarus Z., Silent atrial fibrillation – Ignored secret homicide, Kardiologia i Diabetologia 2017, vol. 10, 11-16

19. Jez M, Ciesla M, Stepniewski J, **Langrzyk A**, Muchova L, Vitek L, Jozkowicz A, **Dulak J**., Valproic acid downregulates heme oxygenase-1 independently of Nrf2 by increasing ubiquitination and proteasomal degradation, Biochemical and Biophysical Research Communications 2017

Total Impact Factor - 49,152 points

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!

Kardio-Med Silesia Ltd.

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