
Workgroup of Biological and Medical Sciences

Offer

We are opened to a wide spectrum of collaboration with academic partners, partners from applied research and clinical partners. We can offer our help particularly in these fields:

- Histological and immunohistochemical analysis
- Genes and proteins analysis in tissues and cells
- Functional analysis of blood vessel contractility
- Testing of microbial and metabolic activity

Expertise

- In vivo and in vitro research of TGF- β signaling in models of atherosclerosis and in endothelial cells
- In vitro antimicrobial activity testing methods based on internationally accepted standard methods, implementation and optimization of methodical approaches for screening of antimicrobial effect on biofilm-forming microorganisms
- Isolation, purification and analysis of secreted/secerned proteins from microbial agents

Research Areas

- Research in the field of experimental atherogenesis. Study of the role of endoglin (CD105, TGF- β RIII) and its related signaling in atherogenesis
- Testing of antimicrobial activity, simulation of host-pathogen interaction via tissue explants
- Optimization of methodical procedures for drug-microbe interaction analysis
- Analysis and identification of proteins expressed/transported from microbes after interaction with host cells
- Research of the role of endoglin and its soluble form in pathogenesis of endothelial dysfunction and atherosclerosis
- Considering the role of soluble endoglin as a disease biomarker or possibly as an inducer of endothelial dysfunction in various cardiovascular diseases
- Finding of new candidate molecules with antimicrobial activity
- Study of molecular mechanisms of microbial pathogenesis

Main Capabilities

- Cultivation of endothelial cells (especially HUVECs)
- Breeding of various knockout hypercholesterolemic mice – models of experimental atherosclerosis
- Quantification of relevant proteins in cell cultures and sample tissues. Evaluation of tissue morphology. Assessment of mouse aorta function
- Cultivation of microbes under different conditions, determination of minimal inhibitory concentration of antimicrobial compounds, testing of microbial metabolic activity, detection and quantification of biofilm formation
- Microbial proteins isolation and purification

Key Research Equipment

- Histology and microscopy
- Light and fluorescent microscopy
- Western blot analysis
- Wire myograph technique
- Flow cytometry
- ELISA, qRT-PCR
- BSL2 microbiological labs
- Analytical devices: fluorescent microscope, confocal laser scanning microscope, spectrophotometers, microbiological incubators, autoclaves, biohazard safety boxes.

Partnerships & Collaborations

- prof. Carmelo Bernabeu, Center for Biological Research, Spanish National Research Council (CSIC), and Biomedical Research Networking Center on Rare Diseases, Madrid, Spain
- prof. Jose Lopez-Novoa, University of Salamanca, Spain
- prof. Stefan Chlopicki, Jagiellonian Centre for Experimental Therapeutics (JCET), Krakow, Poland

Main Projects

- 2015–2017 GACR project GA15-24015S: “Tissue and soluble endoglin and their importance in endothelial dysfunction and atherogenesis in vivo and in vitro”
- 2015–2018 AZV project NV15-29225A: “Study of vaginal microbiota and its relationship to recurrent vulvovaginal discomfort”, principal investigator: Assoc. Prof. Vladimír Buchta.

Achievements

- Publications in respected international journals with impact factor
- Presentations in domestic and international congresses

Are you interested in this expertise?

Please contact CPPT UK

Web: www.cppt.cuni.cz/

Mail: transfer@cuni.cz

Phone: +420 224 491 255

Experts and their department

Prof. PharmD. Petr Nachtigal, Ph.D.

Department of Biological and Medical Sciences

Web: www.portal.faf.cuni.cz/Profile/Nachtigal-Petr