



Vítězslav Bryja

Cellular communication

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- cell signaling research
- mechanism and components of Wnt signaling pathway
- role of Wnt signaling pathway in chronic lymphocytic leukemia and ovarian cancer pathogenesis
- role of extracellular vesicles in cellular communication
- proteomics in cell biology

Jan Vondráček

Cellular and molecular toxicology

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- biology of Ah receptor and its role in regulation of intercellular communication and metabolism
- toxic substances as carcinogens and endogenous disruptors
- lipid metabolism and lipid signaling
- epigenetic regulation of biotransformation enzymes
- mechanism of cell death and chemoresistance of tumor cells

Karel Souček

Cancer cell plasticity and heterogeneity

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- Trop-2 biology and its role in cancer cell dissemination and plasticity
- profiling of surface protein expression in tumor subpopulation
- identification of phenotype in metastasis initiating cells (MICs)
- chemoresistance mechanism and role of TLR

Jiří Pacherník, Jiřina Medalová

Stem cells and cell biotechnologies

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- cardiomyocyte stem cell biology, neural stem cell biology
- pluripotent stem cells and cardiomyogenesis
- regulation of cardiomyocyte phenotype
- myocard 3D bioprint
- neural stem cells and neurogenesis
- analysis of artificial material biocompatibility in biomedicine

Milan Číž

Nonspecific immunity

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- functional properties of myeloid cell and their epigenetic regulation
- antioxidant properties of body fluids, drugs, natural substances and food supplements; oxidative stress regulation
- role of extracellular vesicles in immune cell communication
- myeloperoxidase as an immune response modulator

Lukáš Kubala

Mechanism of immune response

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- immune regulation mechanisms - role of adenyllyl-cyclase, hyaluronan, TLR etc.
- immunotoxicology; mycotoxins as immunomodulators
- microfluid vascular models
- thrombolysis - testing and design of new thrombolytic drugs
- organic bioelectronics

Martin Vácha

Neuroethology

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- animal circadian rhythms and magnetic field
- magnetoreception of animals
- signal role of Cry and magnetic fields effects
- behavioral neurobiology of insects

Marcela Buchtová

Molecular and comparative morphogenesis

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- cellular and molecular processes during embryonic and postnatal development
- intercellular interactions participating on cell proliferation changes and their differentiation in hard and soft tissues during development
- molecular and cellular mechanism in development of cleft lips, cleft palate and other craniofacial area defects
- mechanism of limb development including related defects
- evolutionary aspects of dental development

Monika Dušková, Alena Žáková, Helena Nejezchlebová

Vertebrate immunology and parasitic infections

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- interaction between mammal immune system and different environment factors: pathogens, nanomaterials, excessive training loads etc.
- tick studies – tick presence, life cycle, natural environment factors, effect of repellents
- identification of pathogenic microorganisms in various animal samples

Pavel Hyršl

Comparative immunology and host-pathogen interactions

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- innate immunity of insects and its molecular basis
- role of eicosanoids in insect immune reaction
- entomopathogenic nematodes and their effect on host immune response
- *Photobacterium* bacteria and the role of their products on immune system
- immunology of fish and birds

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