3rd CONGRESS OF PHYSIOLOGICAL SCIENCES OF SERBIA
WITH INTERNATIONAL PARTICIPATION

MOLECULAR, CELLULAR AND INTEGRATIVE BASIS OF HEALTH AND DISEASE: TRANSDISCIPLINARY APPROACH

Organized by
Serbian Physiological Society
Co-organized by
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Under the auspices of
Federation of European Physiological Societies (FEPS)
International Union of Physiological Sciences (IUPS)
International Society for Pathophysiology (ISP)
International Academy of Cardiovascular Sciences (IACS)

ABSTRACT BOOK

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Dear Colleagues,

It is our great pleasure to welcoming you to the 3rd *Congress of Physiological Sciences of Serbia with International Participation* which will be held during October 29-31, 2014 at the Military Medical Academy in Belgrade. For the last ten years, the Serbian Physiological Society has developed a series of internationally recognized meetings. The conference of physiological sciences with international participation on environmental risk factors and human health (Belgrade/Zrenjanin, 2003), the first congress of physiological sciences with international participation (Belgrade, 2005), the satellite symposium of the XIV International Symposium on Atherosclerosis (Belgrade, 2006), the scientific conference with international participation on nutrition, treatment and cardiovascular risk management (Novi Sad, 2007), the scientific conference with international participation devoted to our famous physiologist Richard A. Burian (Belgrade, 2008), second congress of physiological sciences with international participation (Kragujevac, 2009), the scientific conference with international participation on preclinical testing of active substances and cancer research with international symposium on anti-cancer agents, cardiotoxicity and neurotoxicity (Kragujevac, 2011) and under the auspice of EU 7th framework program, the joint scientific meeting of the national physiological societies organized by the Slovak Physiological Society and Serbian Physiological Society, Kovačica 2013, and a few CME meetings in the field of atherosclerosis, vascular biology and a risk factors, are excellent examples of such organizational activities. These meetings were recognized internationally, attracted a worldwide scientific audience, and had been supported by the Federation of European Physiological Societies (FEPS), the International Union of Physiological Sciences (IUPS), the International Society for Pathophysiology (ISP), the International Academy of Cardiovascular Sciences (IACS), and the International Atherosclerosis Society (IAS). Such success in recent years directed us to plan and organize the third national congress in order to improve research background, and make easier approach to the global research cooperation. The scientific program include a broad mix of topics from molecular, cellular and integrative aspects of physiological sciences going ahead to the scientific problems covered by the international scientific community from 27 countries (Belarus, Bosnia and Herzegovina, Bulgaria, Canada, Czech Republic, China, Cuba, France, FYR Macedonia, Germany, Greece, Hungary, Italy, Malaysia, Montenegro, Netherland, Poland, Romania, Russia, Serbia, Singapore, Slovakia, Slovenia, Sweden, Turkey, UK, USA).

Finally, Belgrade is not only the international city but also the place where you will find typical Serbian spirit of life. We appreciate your participation and wish you nice stay with us.

On behalf of the Program & Organizing Committee
Dragan Djurić and Vladimir Jakovljević

IMMUNOMODULATION OF ACUTE LIVER INJURY

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We used concanavalin A (Con A) and alphagalactoceramide (α-GalCer)-induced liver injury to study the role of galectin-3 (Gal-3), IL-33/ST2 signaling pathway and metformin in the induction of inflammatory pathology and hepatocellular damage in both relatively resistant BALB/c and highly susceptible C57Bl/6 mice. We noticed that Gal-3 plays an important proinflammatory role in acute liver injury by promoting the activation of T lymphocytes and natural killer T cells, maturation of DCs, secretion of proinflammatory cytokines, down-regulation of M2 macrophage polarization, and apoptosis of MNCs in the liver. Interleukin 33/ST2 axis has a protective role in Con A-induced liver injury. ST2 deletion as well as Interleukin 33 treatment led to attenuation of acute liver injury and milder infiltration of mononuclear cells, increase in total number of liver CD4+Foxp3+ cells and IL-4 producing CD4+ T cells. Interleukin 33 also suppressed the activation of caspase 3, prevented the expression of BAX, and enhanced the expression of antiapoptotic Bcl-2 in the liver. Our data indicate that antidiabetic drug metformin aggravates immune-mediated hepatitis by promoting autophagy and activation of immune cells, affecting effector, as well as liver-specific regulatory T cells and iNOS expression.

CO-LIGATION OF TLR3 AND DECTIN-1 AGONISTS POTENTIATES TH1 POLARIZATION CAPABILITY ON MONOCYTE DERIVED LANGERHANS CELLS IN VITRO

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Langerhans cells represent the first dendritic cell subtype that encounters foreign pathogens due to its localization in skin and stratified mucosa. Their potential to initiate T-cell responses has recently been challenged. Since viral and fungal infections are among the most common in these tissues, we have studied effects of Toll-like receptor 3 (TLR3) and Dectin-1 agonists, polyinosinic:polycytidylic acid (poly I:C) and curdlan, respectively, on maturation of their in vitro counterparts, monocyte derived Langerhans cells (MoLCs). Immature (im) MoLCs were generated in the presence of GM-CSF, IL-4 and TGF-β1 and then treated with polyI:C, curdlan or their combination for 2 days. Either single or combined treatments elicited phenotypic maturation of imMoLCs with increased allostimulatory capacity. Poly I:C-treated MoLCs up-regulated both the production of IFN-γ and IL-17 by alloreactive $CD4^+$ T cells while curdlan-treated MoLCs stimulated only the production of IFN-γ, compared to imMoLCs. Poly I:C+curdlan-treated MoLCs produced higher concentrations of IL-12 and IL-10 and stimulated more strongly the production of IFN-γ by alloreactive $CD4^+$ T cells then curdlan-treated MoLCs. At the same time, poly I:C+curdlan-treated MoLCs produced more IL-23 but less IL-27 and were weaker stimulators of IL-17 by alloreactive CD4+ T cells then poly I:C-treated cells. Poly I:C+curdlan-treated MoLCs showed higher expression of CD40 and CCR7 then both poly I:C- and curdlan-treated MoLCs. Ligation of both TLR3 and Dectin-1 agonists on imMoLCs upregulated their Th1 polarization capability compared to single agonists. This finding may suggest that MoLCs could be useful for immunotherapy.

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