

SEMINAR ANNOUNCEMENT

We would like to invite you to attend this seminar hosted by A/Prof. Vladimir Korzh:

Date: 12 January 2015, Monday

Time: 4:00PM – 5:00PM

Venue: Level 3, IMCB Seminar Room 3-46, Proteos, Biopolis

Speaker: Prof. Yaroslav Shuba, Head of the Department of Neuromuscular Physiology, Bogomoletz Institute of Physiology of the National Academy of Sciences of Ukraine (NASU), Ukraine

Title: Calcium channels in cancer: how specificity in conferring cancer hallmarks is achieved?

Ca^{2+} is the universal second messenger in the cell controlling processes as diverse as life and death. Progression of normal cells to their malignant derivatives is associated with remodeling of intracellular Ca^{2+} homeostasis and Ca^{2+} signaling to promote two principal cancer hallmarks, enhanced proliferation and resistance to apoptosis. Plasma membrane Ca^{2+} entry channels, which in non-excitabile cells are primarily represented by various members of Transient Receptor Potential (TRP) and ORAI families, play key roles in defining Ca^{2+} homeostasis. Despite all these channels transport the same ion (i.e. Ca^{2+}), they differentially affect cancer cells proliferation and apoptosis. In prostate cancer cells activation of TRP members, TRPC6 and TRPC1, is controlled by $\alpha 1$ adreno- and P2Y purinoreceptors, respectively. Activation of TRPC6 stimulates proliferation, whereas activation of TRPC1 causes proliferation arrest. This presentation will demonstrate that such specificity is determined by differential sensitivity of TRPC6 and TRPC1 to the second messengers, diacylglycerol and inositol trisphosphate, generated during stimulation of phospholipase C signaling pathway linked to both receptors. At the same time, oncogenic switch of prostate cancer cells to a more aggressive phenotype is associated with aberrant expression of ORAI1 and ORAI3 proteins. Altered ORAI1/ORAI3 ratio shifts the balance of preferred Ca^{2+} entry pathway from the one relying on ORAI1-based store-dependent channels, which is required for maintaining susceptibility to apoptosis, to the ORAI3-based, arachidonate-dependent one, which promotes proliferation.

Biography:

Prof. Y. Shuba is a well known internationally Ukrainian scientist in the field of cellular electrophysiology, ion channels function and regulation. He graduated from radiophysics department of Kiev State University (USSR) in 1977, but his research career is closely associated with Bogomoletz Institute of Physiology of the National Academy of Sciences of Ukraine (NASU), where he began to do research in 1980 as PhD student, received his two scientific degrees in biophysics (PhD in 1983 and DSc in 1991) and progressed to the current position of the head of the Department of Neuromuscular Physiology. Prof. Shuba's research primarily focused on investigation of functional diversity, permeation and selectivity of voltage-gated Ca^{2+} channels,

pharmacology and regulation of cardiac Ca^{2+} channels and various types of K^{+} channels and on characterization of ion channels involvement in carcinogenesis. In 80s and 90s he worked at post-doctoral positions in the University of Saarland (Germany), Dalhousie University (Canada) and for the longest period (1993-97) as research assistant professor at Georgetown University (Washington, DC, USA) where he studied the mechanisms of β -adrenergic regulation of cardiac Ca^{2+} channels, Na^{+} - Ca^{2+} exchanger and pharmacology of cardiac K^{+} channels. In 1999 he established fruitful collaboration with the Laboratory of Cell Physiology at the University of Lille1 (France) on elucidation of ion channels and Ca^{2+} signaling involvement in prostate carcinogenesis which was supported by several grants from EU and generated a number of important publications in the scientific literature.

ALL ARE WELCOME (No registration required)