

INTERNATIONAL CONFERENCE “TUMOR AND HOST: NOVEL ASPECTS OF OLD PROBLEM”

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The International Conference “Tumor and Host: Novel Aspects of Old Problem” dedicated to the 50th anniversary of RE Kavetsky Institute of Experimental Pathology, Oncology and Radiobiology (IEPOR) of National Academy of Sciences of Ukraine (NASU) was held during September 21–24, 2010 in Kiev, Ukraine. It was organized by IEPOR, and passed under patronage of the President of Ukraine Viktor Yanukovich.

The Scientific Program covered the most important topics of cancer research and was divided into five Sessions:

1. “Tumor Biology and Immunology” that focused on the basic aspects of tumor biology and immunology in a single issue framework. Topics included mechanisms that determined metastasis and homing of tumor cells, tumor angiogenesis and lymphangiogenesis, the biology and molecular biology of cancer stem cells, immunological aspects of tumor – host interaction.

2. “Metabolic and Stromal Microenvironment of Tumor Cells” that focused on the tumor microenvironment as a key factor in tumor development and progression. Topics included hypoxia signaling, angiogenesis and aerobic glycolysis in human tumors as a basis for diagnostics and anticancer strategies. Key questions which were discussed: 1) Inflammation and cancer: what is common and what is different? 2) Tumor hypoxia impact on tumor – host interaction: a main regulator of malignant process outcome?

3. “Tumor markers: Signaling, Diagnosis and Prognosis” that covered fundamental and practical aspects of tumor markers: identification of novel tumor markers, peculiarity of signal transduction pathways in tumor cells, application of tumor markers and cell differentiation antigens for cancer diagnosis and prognosis.

4. “Mechanism of Carcinogenesis and Cancer Prevention” that focused on underlying mechanisms of tumorigenesis and cancer prevention. Special emphases were given: a) addressing the role of genetic and epigenetic alterations and their interactions in cancer development; and b) novel approaches for development of sensitive and reliable biomarkers for early detection and prevention of cancer, including nutrition.

5. “Cancer Therapy: New Technologies, Biotherapy, Individualization” that covered the clinical and experimental investigations of cancer therapeutics mediated through tumor – host interactions (biotherapy, vascular disruptive therapy, etc.), validation of new targets for cancer therapy and new strategies for delivering therapy to tumors.

The Conference was officially opened by President of the National Academy of Sciences of Ukraine academician Boris E. Paton. The scientific part of the meeting was started by academician Vasyl F. Chekhun (IEPOR NASU, Kyiv, Ukraine) with lecture “The Concept Tumor and Host in the Post-Genomic Era” followed by lecture “The Cancer Epigenome and Epigenetic “Therapy” of Peter A. Jones (University of Southern California/Norris Comprehensive Cancer Center, Los Angeles, CA, USA).

Prof. P. Vaupel (Technical University of Munich, Germany) presented the plenary lecture “Metabolic microenvironment of tumor cells: a key factor in malignant progression” and accented attention on the impact of relevant pathophysiological factors, such as chronic and fluctuating tissue hypoxia or anoxia, acidosis, nutrient deprivation, energy depletion, elevated vascular permeability and high interstitial fluid pressure on tumor growth and malignant progression.

Prof. H. Friess (Technical University of Munich, Germany) in the plenary lecture “Surgical procedure as an inducer of tumor angiogenesis” discussed the problem of surgical resection in the light of well known fact that the healing process following surgery necessitates extensive angiogenesis, which can be a clinical challenge due to its tumor-promoting effect. It was suggested that initiation of anti-angiogenesis therapies may be used for the early postoperative period before the start of conventional chemotherapy.

Prof. G. Klein (Karolinska Institutet, Stockholm, Sweden) presented a plenary lecture “Intercellular surveillance against cancer” and decided to look for variation in cancer resistance in humans, focusing on one particular mechanism of resistance, namely microenvironmental control (also called intercellular surveillance). It was established that high throughput system allows the quantitative analysis of the inhibitory effect of fibroblasts on the population level and the exploration of differences depending on the source of the normal cells.

Prof. E. Klein (Karolinska Institutet, Stockholm, Sweden) presented a plenary lecture “EBV causes mononucleosis, a common disease, but it was discovered in a rare lymphoma”. It was discussed in the accordance of recent studies that EBV-encoded proteins can inhibit myc induced apoptosis. Author has shown that the SAP protein expressed in lymphocytes has a proapoptotic function and assumed that the constitutively activated myc can induce proliferation in such B lymphocytes that lack SAP, while the myc translocation can induce

proliferation in EBV carrying cells even if they express SAP because EBNA-1 inhibits apoptosis.

Prof. M. Horsman (Aarhus University, Denmark) concentrated on the tumor vasculature and vascular targeting therapy and discussed significance two forms of vascular targeting agents (VTAs): those that inhibit the angiogenesis process (angiogenesis inhibitors; AIs) and those that damage the already established vessels (vascular disrupting agents; VDAs).

Prof. J. Kleeff (Technical University of Munich, Germany) focused on the role of tumor microenvironment in pancreatic cancer development and progression and suggested to target the activated stroma in order to uncouple epithelial-stromal interactions to interrupt multiple aberrant autocrine and paracrine pathways that promote pancreatic cancer cell growth, invasion, metastasis, and angiogenesis.

Prof. S. Osinsky (IEPOR NASU, Kyiv, Ukraine) discussed the tumor cell microenvironment as a machinery for tumor-host interaction and presented recent data allowing to suggest that metabolic microenvironment of tumor cells (hypoxia, low extracellular pH, low perfusion and high interstitial fluid pressure) is a key factor determining the character and direction of tumor-host interactions.

Prof. A. Sica (Fondazione Humanitas per la Ricerca, Milan, Italy) discussed the role of tumor-associated macrophages (TAM) in cancer-related inflammation and suggested that the development of effective strategies to tip the balance by blocking cancer promoting inflammation and/or activating protective innate immunity may require definition of actors at play at different anatomical sites and in different tumors.

Prof. N. Berezhnaya (IEPOR NASU, Kyiv, Ukraine) discussed the aspects of interaction between tumor and immune system with special attention to the role of tumor cell biology and analyzed the involvement of cytokines, chemokines, lymphocytes, and tumor cells in the phenomenon of elevated sensitivity to LAK action that can be particularly mediated by decreased E-cadherin expression and increased CD40 expression.

Prof. M. Molls (Technical University Munich, Germany) presented data about imaging of tumor physiology through new methods of tumor visualization and accented that the number of questions are kept to be answered: How to assess 3-D-images of hypoxia? How to account for changes of hypoxia over time? How to assess the blood flow? What is a correlation between imaging and histopathology?

Dr. N. Volodko (D Galytsky National Medical University, Lviv, Ukraine) presented the data about the relationship between microvessels density, degree of macrophage infiltration, expression of TNF and TGF β in human ovarian cancer and its chemosensitivity.

Dr. A. Kovel'skaya (IEPOR NASU, Kyiv, Ukraine) presented data about hypoxia and tumor-associated macrophages (TAM) in human gastric cancer (GC) and their impact on malignant progression concluding that the severe tumor hypoxia and high TAMs are the parameters that are associated with tumor aggressiveness, and can

be characterized as strong worse prognostic factors for GC independently from the type of tumor treatment.

Dr. B. Gerashchenko (IEPOR NASU, Kyiv, Ukraine) presented data on the hyperthermia effect of interaction of proteins of the Mre11 complex (composed of Mre11, Rad50 and Nbs1) that is involved in DSB repair. *Dr. N. Florovskaya* (Murmansk Oncological Hospital, Russia) presented results of thermochemotherapy of colorectal cancer patients with liver metastases that improved the clinical outcome. *Dr. I. Ganusevich* (IEPOR NASU, Kyiv, Ukraine) presented data about MMP-2 and -9 activities in tumor tissue and bone marrow in the connection with disseminated tumor cells as a prognostic factor for human gastric cancer outcome.

Session 3 "Tumor Markers: signaling, diagnosis and prognosis" integrated conceptual reviews and scientific reports covering different levels of biomedical research: fundamental, translational research and applied studies. In the plenary lecture *Prof. Ivan Gout* (University College, London, UK) presented thorough overview of mTOR (mammalian target of rapamycin) signaling pathway in control of cell metabolism, growth and proliferation and also its role in oncogenic transformation. Tumor-associated changes in transcriptome (*Prof. V.M. Kavsan*, Institute of Molecular Biology and Genetics of NASU, Kyiv, Ukraine), proteome (*Dr. P.V. Belousov*, Chair of Immunology, Faculty of Biology, Moscow State University, Moscow, Russia) and deregulation of transcription factors in tumor progression (*Dr. N.L. Lazarevich*, N.N. Blokhin Russian Cancer Research Center, Moscow, Russia) formed the block of lectures on molecular biology of tumors. The role of signal transduction pathways in regulation of tumor cell biology was covered in lectures on receptor-mediated signaling in Hodgkin lymphoma cells (*Drs. S.P. Sidorenko and M. Yurchenko*, IEPOR NASU, Kyiv, Ukraine) and the role of adaptor proteins in cancerogenesis (*Prof. L.B. Drobot*, Palladin Institute of Biochemistry of NASU, Kyiv, Ukraine). Presentations of *Dr. V.O. Nadgornaya and Prof. D.F. Gluzman* (IEPOR NASU, Kyiv, NASU) and also *Dr. I.N. Kravchuk* (Institute of Molecular Biology and Genetics of NASU, Kyiv, Ukraine) were devoted to leukemia markers, while *Dr. N.T. Pande* (Division of Gynecological Oncology, Oregon Health and Science university, USA) and *Prof. V.V. Filonenko* (Institute of Molecular Biology and Genetics of NASU, Kyiv, Ukraine) focused on new markers of ovarian cancer. It should be noted that oral and poster reports on translational and applied studies included evaluation of tumor cell molecular profile for prognosis and treatment individualization (*Dr. N.Yu. Lukianova*, IEPOR NASU, Kyiv, Ukraine), studies of mutant epidermal growth factor receptor and MDM2 expression in ependymomas (*Dr. E.S. Galanta*, Romodanov Institute of Neurosurgery, NAMSU, Kyiv, Ukraine) and methylation status in colorectal tumors (*Dr. Gordiyuk*, Institute of Molecular Biology and Genetics of NASU, Kyiv, Ukraine), and others.

The number of lectures and reports were presented in the frame of Session 5. *Prof. V.A. Shlyakhovenko*

(IEPOR NASU, Kyiv, Ukraine) presented lecture on the investigation of anticancer activity of glycopeptidic cancer vaccine (GPV) and certain adjuvants against transplantable metastasizing and nonmetastasizing tumors.

Invited lecture of *Prof. N.F. Gamaleia* (IEPOR NASU, Kyiv, Ukraine) was devoted for the development of new approaches to improve photodynamic therapy of malignant neoplasms, in particularly by the modern bionanotechnology approaches using nanocomposites, comprising both photosensitizing agent and nanoparticles.

Dr. D.N. Kaluzhny (Institute of Molecular Biology of RAS, Moscow, Russia) gave the insight into conventional and unusual DNA structures for anticancer drug design.

Prof. V.G. Nikolaev (IEPOR NASU, Kyiv, Ukraine) presented results of long-term investigations aimed to use the methods of adsorptive therapy — hemo-sorption, enterosorption and application sorption in oncologic practice with special attention on the new generation of highly active sorbents as well as new possibilities for the use of modern adsorptive technologies in clinical oncology.

The invited lecture of *Dr. G.I. Solyanik* (IEPOR NASU, Kyiv, Ukraine) was dedicated to multifactorial nature of tumor drug resistance, in particular tumor microenvironment (including tumor vascularization

and extracellular matrix) that plays an important role in protecting cancer cells from initial drug exposure.

Prof. B.T. Bilynskyi (D. Galytsky National Medical University, Lviv, Ukraine) in the invited lecture discussed the influence of fundamental investigations in biology and oncology on the clinical strategy and tactics at the example of the breast cancer.

Dr. S. Souchelnytskyi (Karolinska institutet, Stockholm, Sweden) presented data about role of proteome signatures of immortalization, acquisition of high proliferation potential in the formation of tumor and metastases, especially correlation between components of the DRNet that provide a tool for diagnostics and personalized treatment.

The conference was attended by 259 leading experts of the experimental, clinical, medical, pharmaceutical oncology, as well as students and graduate students of Universities and Research Institutes of Ukraine, near and far abroad. The scientists from 14 countries were represented by 30 Academic and 24 Educational institutions. The media sector, in particular television, radio, and newspapers has highlighted the work of conference. Public and government organizations including international ones have also attended the conference.

Conference Organizing Committee