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"From Basic to Translational Research in Oncology"

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Report from organized International Conference:

Translational Research in Oncology in New Member State Economies (TRON)
21-22 May 2015

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In order to reduce the size of this report Attachments 2 to 5 containing the conference book, lists of participants, conference evaluation forms, lectures of the second day are available online at: http://bastion.wum.edu.pl/en/raporty/

Introduction

The conference was organized by the Department of Immunology, Medical University of Warsaw, as a part of the BASTION project due to Work Package WP2, Task T2.2.

The two-day international conference "Translational Research in Oncology in New Member State Economies – TRON" was dedicated to outlining a way forward promoting translational cancer research in new member state economies and health systems. The program of the conference was designed on one side to provide an overview of general principles of cancer biology and treatment, epidemiology, mechanisms of resistance, metastasis, use of preclinical models, and identification of novel molecular targets. On the other side, the second day of the conference involved health economists, policy makers, people from pharma industry and grant agencies who addressed issues on how to best stimulate translational research from the health economics and public health perspective.

The impact of the conference was to transfer best practice approaches in translational medicine to MUW and to influence health policy aimed at closing the gap in cancer prevention and treatment between the EU-15 and the new member states of CEE.

Participants had an unprecedented opportunity to learn new information, glimpse into future developments of translational research in clinical oncology and meet leaders in cancer research.

The invited speakers of the first day specialize in defining important clinical problems experienced in oncologic practice, and are working to solve them using modern laboratory research methods. Others work to test whether emerging basic scientific discoveries can lead to specific improvements in the clinical care of cancer patients.

The speakers during the first day of the conference were the leading experts in the field of oncology:

- Dr. Takanori Kitamura from the University of Edinburgh (UK),
- Prof. Sven Brandau from the University of Duisburg-Essen (Germany),
- Dr. Munitta Muthana from the University of Sheffield (UK),
- Dr. Seth Coffelt from the Netherlands Cancer Institute (The Netherlands),
- Prof. Lars Bullinger from the University of Ulm (Germany),
- Dr. Rederick L. Beijersbergen from the Netherlands Cancer Institute (The Netherlands),
- Dr. Laszlo Tarnoki and Dr. Adam Tarnoki from the Semmeweis University (Hungary),
- Prof. Jacques A. Nunes from the Centre de Recherche en Cancerologie de Marseille (France),
- Dr. Josee Golay from the Center of Cellular Therapy `G. Lanzani' (Italy),
- Dr. Charles Dumontet from the Cancer Research Center of Lyon (France),
- Dr. Frank Beurskens from Genman (The Netherlands),
- Prof. Tadeusz Robak from Medical University of Lodz (Poland).

The speakers of the second day were:

- Tim Kievits from the Vitromics (The Netherlands),
- Magda Chlebus from the European Federation of Pharmaceutical Industries and Associations (Belgium),
- Marcin Kapczynski from Thomson Reuters (Poland),
- Dr. Ali Gure from the Bilkent University (Turkey),
- Prof. Bruno Botta from the Sapienza University of Rome (Italy),
- Dr. Agnieszka Turowska from the Sterna Biologicals GmbH (Germany),
- Danuta Mossakowska from Glaxo Smith Klein (UK),
- Prof. Michal Karonski from the National Research Centre (Poland) and
- Ioana Ispas from the Ministry of National Education (Romania).

The honorary patronage over the conference was held by:

- Ministry of Science and Higher Education,
- President of Warsaw and (Attachment 1)
- Governor of Mazovia district (Attachment 1)

Partners of the event ware:

- Eppendorf, Biomedica,
- A&A Biotechnology,
- Science\Business,
- Thomson Reuters,
- Med Tube,
- Biotechnologia.pl and
- dolinabiotechnologiczna.pl.

The special website dedicated to the conference has been created: http://www.tron.wum.edu.pl as well as mobile event application "Convene" provided by Thomson Reuters. Mobile application contained agenda, list of the speakers, their bio sketch, list of registered attendees, conference address with map, information about patronage and partners.

Photo 1: Prof Jakub Golab

The first day of the TRON Conference

The first day of the conference (21st May 2015) was opened by prof. Jakub Golab, who gave a talk about the BASTION project. Prof. Golab told about the objective of the project to build up the research potential of the Medical University of Warsaw (MUW) in experimental oncology, and also to reduce the time from scientific discovery to clinical application. The research was focused in particular on personalized oncology and development of diagnostic and therapeutic methods customized to patients' individual needs. The project involved eleven research teams of MUW, represented by more than 100 researchers in oncology, cooperating with the university hospitals that also provide training for future medical doctors as well as other research institutes.

The opening session of the day was the `Immunooncology`, chaired by Prof. Jakub Golab and Dr. Radoslaw Zagozdzon.

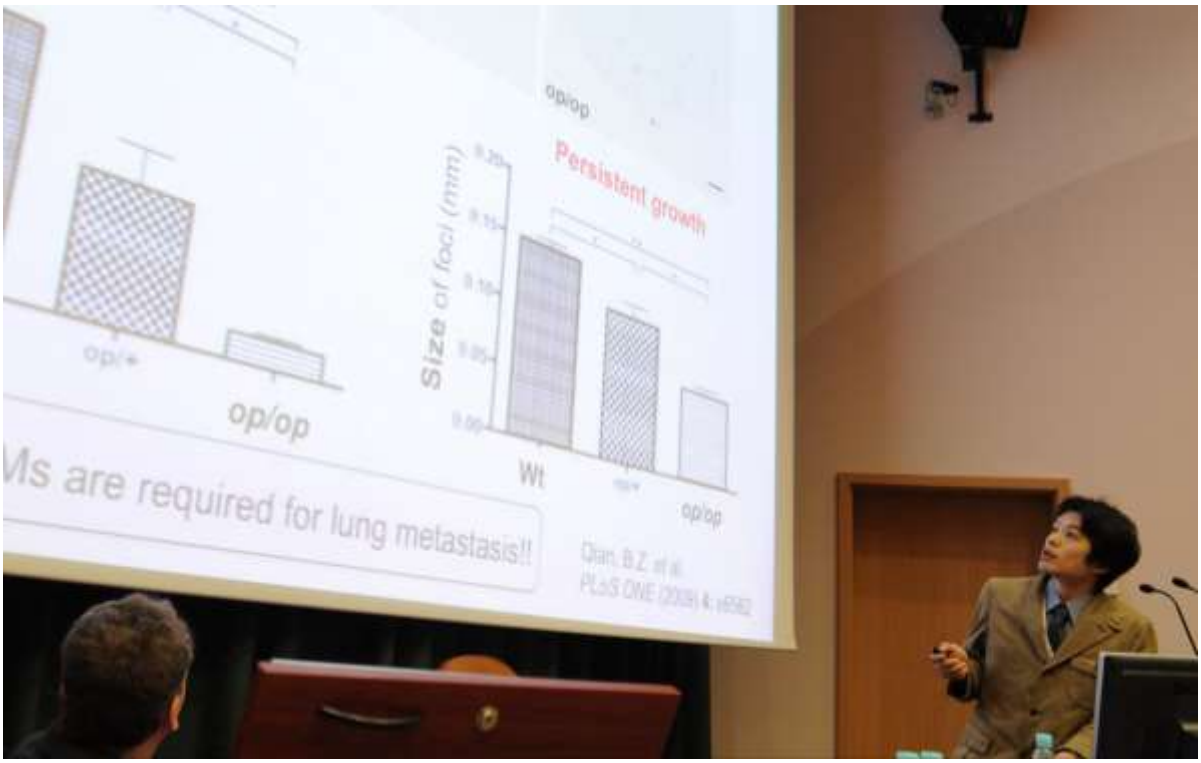

Photo2: Dr. Takanori Kitamura

Dr. Takanori Kitamura was the first speaker. He graduated Veterinary Medicine at Hokkaido University (Sapporo, Japan) and obtained PhD title in Biochemistry at the same University. He was also a Research Associate at Albert Einstein College of Medicine (New York, USA) in a group of prof. Jeffrey W. Pollard. Currently, he is a Chancellor's Fellow at MRC Centre for Reproductive Health, Queen's Medical Research Institute (University of Edinburgh, UK). His talk was about pulmonary metastasis of breast cancer cells which is promoted by a distinct population of macrophages, metastasis-associated macrophages (MAMs) recruited by the CC-chemokine ligand 2 (CCL2). He has demonstrated that, through activation of the CCL2 receptor CCR2, the recruited MAMs secrete another chemokine ligand CCL3. Genetic deletion of CCL3 or its receptor CCR1 in macrophages reduces the number of lung metastasis foci, as well as the number of MAMs accumulated in tumor-challenged lung in mice.

Photo 3: Prof. Sven Brandau

The next speaker, Prof. Sven Brandau studied biology in Hamburg and Los Angeles and performed his PhD work at the Bernhard-Nocht Institute for Tropical Medicine in Hamburg. He worked as a post-doc and later as senior scientist and independent group leader at the Research Center Borstel. During his habilitation period he started to focus on cancer immunotherapy and obtained his *venia legendi* in Immunology and Cell Biology at the University of Lübeck. Prof. Brandau is the Head of the Experimental Research Division of the Department of Otorhinolarnygology, University Hospital Essen, and co-chairman of the BIOME graduate school. He talked about striking dichotomy in the role of neutrophils and myeloid-derived suppressor cells (MDSC) in head and neck cancer. In certain therapeutic settings, such as antibody immunotherapy or immunotherapy with BCG mycobacteria, granulocytes exert direct and indirect anti-tumor activity. However, in the majority of tumor types, a high neutrophil-lymphocyte ratio in the blood and/or high numbers of tumor-infiltrating neutrophils are associated with disease progression and poor survival.

Photo 4: Dr. Munitta Muthana

After this exciting talk about the neutrophils and MDSC we came back to macrophages, because Dr. Munitta Muthana gave a lecture about using macrophages as "Trojan horse". She is lecturer at the University of Sheffield. Her research has focused on the role of innate immune cells like macrophages and dendritic cells in tumor progression, and response to frontline therapies like chemotherapy. She told about using macrophages to deliver large quantities of a prostate-specific oncolytic virus (OV) to prostate tumors. That combined macrophage virotherapy with conventional therapies significantly reduced primary tumor growth and metastatic spread as well as increased the lifespan of tumor-bearing mice. These findings suggest that such macrophage-based virotherapy could be used to markedly increase the efficacy of chemotherapy and irradiation in patients with prostate cancer. Moreover, her group set out to improve targeted delivery of macrophage therapy to specific tissues using magnetic resonance targeting (MRT). This exciting approach uses the magnetic field gradient coils inherent to all MRI systems; to non-invasively steer ferromagnetic particles (or cells containing them) towards specific sites in the body.

Photo 5: Dr. Seth Coffelt

The last speaker of this session, Dr. Seth Coffelt completed his Ph.D. studies in Molecular & Cellular Biology at Tulane University (New Orleans, USA) and later was a postdoc in Dr. Claire Lewis's lab at the University of Sheffield (UK). Then he joined Dr. Karin de Visser's group at the Netherlands Cancer Institute (Amsterdam, The Netherlands) to study the role of neutrophils and gamma delta T cells in breast cancer metastasis. During his lecture, Dr. Coffelt pointed out an urgent need for novel therapies with efficacious anti-metastatic activity. The different steps of the metastatic cascade are largely regulated by reciprocal interactions between cancer cells and immune cells in the tumor microenvironment. He tries to understand and test different approaches to block inflammatory cascade from promoting metastasis. One such discussed approach includes the combination of chemotherapy with immunomodulatory drugs. Through mechanistic understanding of the crosstalk between the immune system and cancer, he aimed to fight metastatic breast cancer and to increase the efficacy of conventional anti-cancer therapies. Ultimately, the outcome of these studies may shift therapeutic focus from a cancer cell-intrinsic point of view towards a more combined cancer cell-intrinsic and -extrinsic point of view.

All the lectures of the morning session were very interesting and raised many questions and extensive scientific discussion between speakers and the audience. Fruitful discussion was followed by a coffee break.

Photo 6: **Discussion**

Photo 7: **Hanging the poster**

During the coffee/lunch breaks of the conference attendees could take part in poster presentations and discuss the results with the posters authors. Two various sessions have been organized: one for the scientists involved in BASTION project (they presented 12 posters) and second one for the other conference participants (19 posters have been presented). All poster abstracts have been published in the conference book.

The next session, `Genomics` was chaired by Prof. Rafal Ploski and Dr. Dominika Nowis. Opening lecture gave Prof. Lars Bullinger.

Photo 8: Prof. Lars Bullinger

Prof. Lars Bullinger is a hematologist/oncologist of the University of Ulm, Germany. Dissection of the molecular pathogenesis of leukemias by using “omics” approaches is his main research field. His work contributed to the discovery of novel clinically relevant acute myelogenous leukemia (AML) subclasses and currently he is also working on the implementation of “omics” and next generation sequencing (NGS) findings into the clinic. During his lecture he provided a brief summary of the genetic markers that have already entered clinical practice and are important for diagnosis and guidance of therapeutic decisions in adult AML. In addition, he discussed the prognostic value and potential clinical impact of novel markers that remain investigational.

Photo 9: Dr. Rederick Beijersbergen

The second speaker of this session, Dr. Rederick Beijersbergen is a group leader at the Netherlands Cancer Institute and heads the NKI Robotics and Screening Center. His work evolves around the development and application of large-scale functional genomic technologies with the goal to identify more effective cancer treatments. His talk was about the personalized cancer therapy. He pointed out the complexity and heterogeneity of cancer and therefore enormous challenge for the identification and selection of effective cancer therapies. In his work he applies large scale functional genomic screening technologies including RNAi screening (shRNA and siRNA) and CRISPR-based gene editing in combination with (clinically) relevant screening models for the identification of specific dependencies in the context of specific genetic alterations. Using this platform he has identified novel effective drug combinations that are currently tested in the clinic. He discussed the results of his work and its clinical implications.

Photo 10: Dr. David Tarnoki

Dr. David Tarnoki, the next speaker, finished radiology residency training and PhD at Semmelweis University (Budapest, Hungary). In his research he mainly focused on twin studies. Investigation of monozygotic twins, who share almost 100% of their genes is of the increasing interest of current twin research. Since monozygotic twins share a common DNA sequence, their study represents an ideal design for investigating the contribution of environmental, such as epigenetic factors to a disease etiology. These epigenetic factors mean cellular modifications that can be heritable to the next generation, but appear unrelated to DNA sequence changes, and can be modified by environmental stimuli. In conclusion, he said monozygotic discordant twin study design combined with sequencing technologies were possible to explore the complexity of the gene–environment relationships and individual variability to provide important insights into the pathogenesis of various chronic diseases in the future.

Photo 11: Dr. Adam Tarnoki

Lecture of Dr. David Tarnoki was followed by the talk of the next speaker, Dr. Adam Tarnoki. He also works at Semmelweis University. Dr. Tarnoki investigates high variety of twin diseases: effect of fibrin structure on fibrinolysis, twin study, patients with kidney disease in the praxis, the role of twin studies in the public health, heredity of weather changes among twin brothers and sisters; effect of early cardiac rehabilitation after biventricular pacemaker implantation, role of genetics and environment in evolution of metabolic syndrome (glucometabolic risk) among twins; heritability of vein distensibility among twins and sleep twin study. During his lecture he said about familial clustering for cancers that occur at specific sites, such as breast, colon, prostate, lung and stomach. To study the influence of genetic and environmental factors in a cancer epidemiology, the study of twins should be of value because twins either are genetically identical or share half of their segregating genes. Thus, if heritable factors play a role in the origin of a disease, disease concordance should be greater in monozygotic twin pairs than in dizygotic twin pairs. His studies suggest that most cancers have a multifactorial (polygenic) origin. Studies on disease-discordant monozygotic twins now offer an opportunity to study epigenetic variation as a dynamic quantitative trait, since high monozygotic twin discordance rates for cancers indicate the influence of environmental or epigenetic factors. At the end of his lecture he said, that large-scale epigenetic studies in twins across different ages and tissues will improve our understanding of the etiology and mechanisms of a wide range of cancers in the future.

This session was followed by the very interesting discussion and lunch break. It was also a good opportunity for scientific networking.

Photo 12: **Discussion**

Photo 13 **Lunch break**

The last session of the day, `Hematooncology`, chaired by Prof. Przemyslaw Juszczynski and Dr. Tomasz Stoklosa started with the lecture of Prof. Jacques Nunes.

Photo 14: Prof. Jacques Nunes

Prof. Nunes is working in Immunology and Cell Signaling field. He studied Immunology in Marseille and London and completed his PhD work at the Cancer Research Centre in Marseille. After his post-doc at the Cancer Research UK (London Research Institute) he got a permanent position from the French biomedical agency (Institut National de la Sante et de la Recherche Medicale - Inserm) at the Cancer Research Centre in Marseille (CRCM), where he developed his own research as a group leader in the "Immunity & Cancer" team. His lecture was about downstream of tyrosine kinase (DOK) proteins in lymphoid and myeloid lineage. Using cell lines, genetic modified mouse strains and biological samples from leukemia patients, he investigates the role of these proteins both in cancer cells and in immune cells acting as anti-tumor effectors. Identified by his group, DOK gene variations in chronic myelomonocytic leukemia (CMML) patients could participate to the development of a myeloproliferative neoplasm. Further investigations are performed to evaluate the impact of DOK genes ablation in hematopoietic stem cell compartment. These findings highlight the role of these signaling molecules in the control of the tumorigenesis.

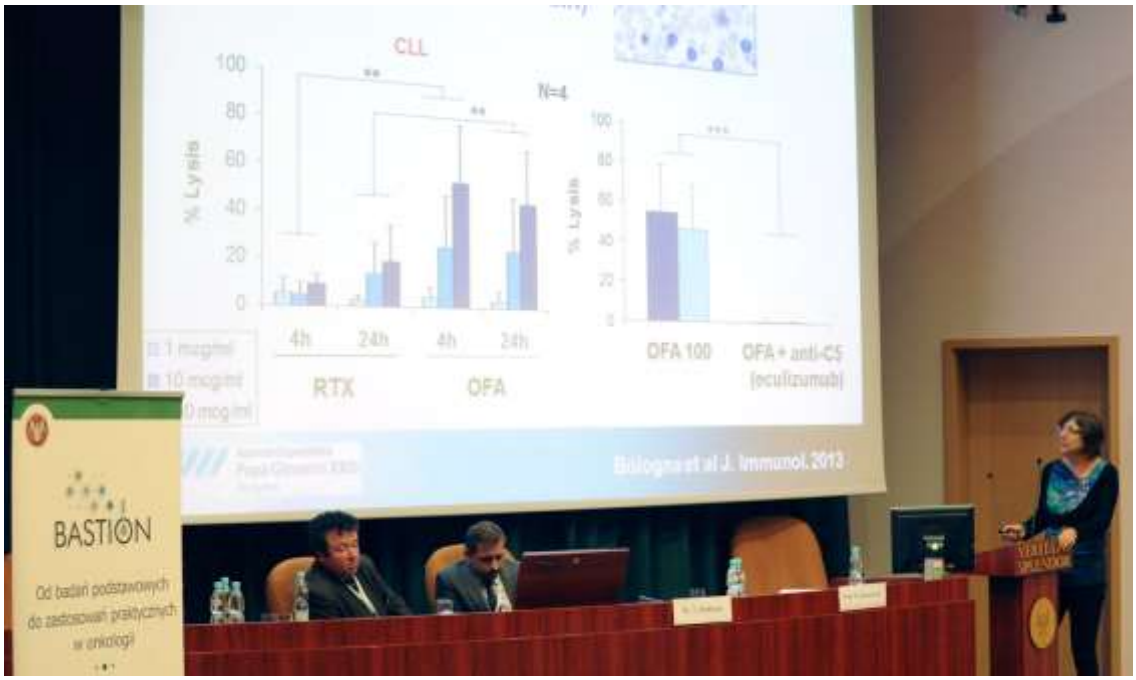

Photo 15: **Dr. Josee Golay**

The next speaker, Dr. Josee Golay obtained degree in Biochemistry at Oxford University (UK) and PhD in Cellular Immunology at University College London. Then, she moved to the European Molecular Biology Laboratory (EMBL), Heidelberg, Germany, where she gained experience in molecular biology techniques in the context of leukemogenesis. Then she moved to the Institute of Pharmacological Research Mario Negri (IRFMN) (Milan, Italy) and obtained a permanent position at IRFMN. In 2004 she moved as staff scientist to the Haematology Unit of the Bergamo main Hospital. She is co-inventor of 2 patents and author of 100 publications in refereed journals. Her talk was about monoclonal antibodies (MAbs). Dr. Golay highlighted that MAbs become important therapeutic tools in a variety of clinical contexts and in particular for cancer treatment. The anti-CD20 antibody Rituximab has been approved by the FDA for treatment of B-Non Hodgkin's lymphoma (B-NHL) and later chronic lymphocytic leukemia (CLL), alone and in combination with chemotherapeutic agents. Nonetheless, drug resistance or relapses raise the necessity to improve the activity of this drug. In Dr. Golay`s opinion despite improved activities *in vitro* and *in vivo* of anti-CD20, and the design of successful combined treatment of these antibodies with chemotherapeutic agents, the following questions still need to be fully answered: 1) What are the most important resistance factors and how to overcome them? 2) Which are the most effective chemotherapeutic agents to be combined with anti-CD20 and according to which schedule? 3) What is the relative role of different effector mechanisms (CDC, ADCC, direct cell death) in different diseases or different tissues? 4) Is it possible to induce or enhance a vaccine effect of anti-CD20 antibodies that would lead to long term response in treated patients? So, she reviewed and put in the context of these important questions the major mechanism of anti-CD20 antibodies.

Photo 16: Dr. Charles Dumontet

The next speaker, Dr. Charles Dumontet graduated Alexis Carrel Medical School, Université Lyon (France). He did his PhD in Immunology at Université Claude Bernard, Lyon (France) and postdoc at Stanford Medical Center (USA). He spent a year at Yale University (USA). Currently he works as a Professor in Hematology at University of Lyon and as a Senior Physician at Hospices Civils de Lyon. He is P.I. of "Anticancer Antibodies" team. Dr. Dumontet pointed out that antibody drug conjugates (ADC) combine the specificity of monoclonal antibody therapy with the potency of cytotoxic chemotherapy. While the first approved ADC contains cytotoxic agents with conventional mechanisms of action, novel conjugates are currently being evaluated. An important issue currently being addressed is the standardization of the number of conjugates per antibody molecule. Toxicity and off-target effects will be the subject of close scrutiny, in particular in the context of combination regimens. A key topic will be the positioning of these novel agents in the global therapeutic strategy of patients with neoplasia.

Photo 17: **Dr. Frank Beurskens**

Dr. Frank Beurskens, who was following Dr. Dumonetet, studied biology at the Utrecht University. He received a PhD in immunology at the same university. During his PhD and his postdoctoral fellowship at Harvard Medical School he specialized in the complement system and inflammation. In 2002 he started to work at Genmab biotech company and has been involved in the development of several therapeutic antibodies, like ofatumumab. He was involved in unravelling the mechanism of action of this antibody. With the knowledge of the basic understanding of natural behavior antibodies he co-developed Genmab's proprietary HexaBodyTM platform, which creates effector function enhanced antibodies. During his presentation, he demonstrated that IgG antibodies form hexamers on the cell surface following antigen binding. These hexamers are critical for optimal C1q binding and CDC. IgG hexamerization occurs through specific non-covalent interactions between Fc-segments. He now identified mutations that enhanced IgG clustering after antigen binding to cells which led to an increase in C1q binding and CDC. This data represented a promising novel approach for improving the efficacy of therapeutic antibodies.

Photo 18: Prof. Tadeusz Robak

The last speaker, Prof. Tadeusz Robak is a professor of hematology at the Medical University of Lodz, Poland. He studied medicine at this institution and he undertook further postgraduate training at Hammersmith Hospital, London. He currently holds the posts of Professor of Hematology at the Medical University of Lodz and Chief of the Department of Hematology at the Copernicus Memorial Hospital in Lodz. He is current president of the Polish Society of Hematology and a member of European Hematology Association, European Society for Clinical Oncology and American Society for Hematology. The particular research emphasis has been on the application of new drugs in the treatment of leukemia, multiple myeloma and lymphoma. His special interest is in chronic lymphocytic leukemia, lymphoma and autoimmune disorders with particular emphasis on the use of purine analogues and monoclonal antibodies in the treatment of these diseases. His talk was about Cladribine (2-CdA, 2-chlorodeoxyadenosine), the drug of choice in the treatment of hairy cell leukemia (HCL) but is also highly active in low-grade B-cell lymphoid malignancies, including chronic lymphocytic leukemia (CLL), Waldenström macroglobulinemia and non-Hodgkin lymphoma.

Because some data presented during the first, scientific day of the conference have not been published as yet, the slides are not shared for the administrative purposes.

Photo 19: **Discussion**

After the presentations of the last session and fruitful discussion, participants were invited for the coffee break and cocktail party in the conference hall. Nice atmosphere of the evening supported the effective scientific networking between scientists from various fields of oncology.

Photo 20: **Cocktail party**

After the cocktail party, organizers invited everyone for the artistic part of the conference: JAGODZINSKI TRIO concert. The best polish jazz band presented their interpretation of the Frederic Chopin music.

Photo 21: **JAGODZINSKI TRIO - Adam Cegielski on bass and Czeslaw Bartkowski on drums**

Photo 22: **Andrzej Jagodziński jazz pianist**

Photo 23: **Listening jazz**

The second day of the TRON Conference

Photo 24: **Prof. Slawomir Majewski**

The second day of the conference was opened by Prof. Slawomir Majewski, Co-Chair of all sessions of the day. He told about BASTION project as a multidisciplinary collaborative project designed to build at MUW the capacity in cancer research to translate promising therapeutic concepts from bench to bedside by developing and testing new tools, technologies and devices. He told about the aims of the project at technology transfer, acquiring knowledge and establishing closer or new research-oriented cooperation with 11 science centers and two companies operating in the commercialization of science research. The research effort was supported by institutes and companies from eight EU countries as partner organizations. He concluded that the BASTION project not only strengthened the research potential of the MUW, but also helped to improve research project management, helped to develop the innovation capacity and promote cooperation with the EU leading scientific centers, and achieve integration with the European Research Area by improving the quality of scientific research.

This day of the conference was dedicated to innovations in medicine and bridging the gap between basic research and industry. There were three sessions: `Translational research – International case studies`, `Incentives for translation – evaluation, IP and enterprise` and `Getting the money`.

Photo 25: Richard Hudson

All day was co-chaired by Richard Hudson (Science Business) who after every session asked questions to the speakers and at the end of the day chaired round table discussion and gave closing remarks.

Photo 26: **Tim Kievits**

The first speaker of the first session was Tim Kievits who started his career as a biochemist in the department of Human Genetics at the University of Leiden. Then he joined Organon Teknika's nucleic acid diagnostics R&D group. He left to spin-out and developed an innovative microarray technology. In 2000, he founded PamGene, a science and technology driven company in the multi marker testing area with a specialization in protein activity scans in clinical samples. As CEO of PamGene, he organized several finance rounds for Pamgene, securing investments from international venture capital funds, corporate, local and private funds. He built up an experienced management team that has developed, under his leadership, the novel technology into a robust CE marked system (PamStation® and PamChips®). This system is now in use by pharmaceutical companies such as MSD, Johnson&Johnson and Amgen as well as national and international academic institutes (Europe, US, Japan). His presentation covered on-going projects that are examples of the added-value Personalized Medicine approaches can bring to patients, payers, physicians and innovators. This is achieved by aiming at reducing overtreatment and limiting healthcare budget spillage while introducing innovative tools. In one example Dutch healthcare insurer CZ, the Center for Personalized Cancer Treatment (CPCT) and VitrOmics, a company specialized in personalized medicine, have started a joint project to address the overtreatment issue within a certain group of patients with breast cancer. The goal set by the collaborators is to provide therapy to this group much more selective than currently is done in practice.

Photo 27: **Magda Chlebus**

The second speaker, Magda Chlebus, Director Science Policy at the European Federation of Pharmaceutical Industries and Associations is in charge of policy and legislative debates which shape research environment in Europe. In 1995 she joined EFPIA, the representative voice of R&D-based pharmaceutical industry in Europe. Her experience covers public and government affairs with focus on Brussels Village, including designing and implementing advocacy campaigns on EU legislation as well as implementation of the pharmaceutical legislation in new Member States. Her talk was about challenges facing healthcare systems and the scientific community. EFPIA believes that the Innovative Medicines Initiative (IMI), Europe's public private partnership for health between the European Union and the European pharmaceutical industry, provides an effective vehicle to test the boundaries of open collaboration and to integrate different perspectives to reduce attrition, speed up patient access to innovative healthcare solutions and to improve outcomes. It does this by facilitating collaboration between the key players involved in healthcare research, including universities, the pharmaceutical and other industries, small and medium-sized enterprises (SMEs), patient organizations, and medicines regulators.

After this lecture followed by short discussion, scientific conversations and networking were continued during the coffee break.

Photo 28: **Coffee break**

Photo 29: **Marcin Kapczynski**

Marcin Kapczynski, the first speaker of the second session is a Strategic Business Manager at Thomson Reuters Intellectual Property & Science. He provides support for research analytical and discovery tools such as Web of Science, InCites or Journal Citation Reports. Kapczynski works with researchers, academics and librarians at all levels and offers consultancy services

to government and corporate institutions. During his presentation he showed the ways of using research analytics tools such as Web of Science and InCites for determining research impact, identifying prospective research areas, choosing organizations and scientists for collaboration and monitoring the results of research activities.

Photo 30: Dr. Ali O. Gure

Dr. Ali O. Gure, the next speaker, is an Assistant Professor at Bilkent University, Department of Molecular Biology and Genetics, Ankara, Turkey. He obtained his MD degree from the University of Ankara, and a PhD in immunology from Cornell University Graduate School of Medical Sciences, USA. He worked as an Assistant Member at the Ludwig Institute for Cancer Research - NYC branch after completing a post-doctoral fellowship at the Memorial Sloan Kettering Cancer Center in New York City. He is a co-inventor in 22 international patents related to tumor antigens/biomarkers. His more recent work focuses on those mechanisms leading to expression of cancer-testis antigen genes which function as biomarkers of ectopic hypomethylation in cancer, and the identification of biomarkers of diagnosis, prognosis and chemosensitivity. He co-authored 40 manuscripts receiving over 5500 citations. During the conference he was talking about the patenting and IPR. He said that the idea of assigning the intellectual property rights to the inventor was intended as a "retrospective reward" to the scientists involved in the discovery and a "prospective reward" for the companies that would obtain the licenses for them. Despite these facts, and that many

scientific institutions promote “number of patents” as a measure of scientific output, only a few scientists aim for a patent as the end point of their work, and most don't even have the impression that this is what should be aimed for. Dr. Gure argued that each scientist needs to know the basic instruments available to him in this area and to actively participate in the shaping of the pertinent laws which can be considered to be still at their youth if not infancy. He also explained how he favored the “non-exclusive” licensing option over some others as the most feasible solution in the interim.

Photo 31: Prof. Bruno Botta

Third speaker of this session, Prof. Bruno Botta, is full professor, Head of the Dipartimento di Chimica e Tecnologie del Farmaco and Deputy Rector for the Internationalization at Sapienza University of Rome. His interest during the years has been focused on the structural elucidation and synthesis of biologically active compounds derived from living plants. Since 20 years, he has been working on the field of plant tissue cultures in combination with chemistry directed toward the understanding of biosynthetic pathways of the compounds under investigation. During the last 15 years, Prof. Botta focused his attention also on both the synthesis and host-guest studies of artificial receptors of the resorcarenes family. During the last 7 years he focused his attention on the Hedgehog (Hh) signalling pathway which plays a pivotal role in the initiation, proliferation, invasion and metastasis of various cancers. He is author of 130 publications, including 5 patents (3 national and 2 international – USA and Europe), and, besides that, he is author and co-author of 10 books. During his presentation

Prof. Botta showed case study how his research developed to the spin-off company. He described application of Computer Modeling Techniques by his group following both structure-based and ligand-based drug design approaches applied in the research of novel antiviral, anti-TB and anticancer agents. In some cases automatic docking simulations has performed to find the orientation(s) of each ligand among the 850 natural compounds of chemical libraries belonging to his unit leading to the most profitable interactions with the corresponding binding site on the target proteins/receptors. These studies allowed to select just a few compounds (e.g. Antraquinones, Ferruginines and Iboga-alkaloids all of them containing different alkyl side chains) as possible lead compounds for medulloblastoma. The selected compounds have been submitted to the very innovative computational methodology (very often applied in the last three years) of the virtual library design technique (VLD) that allowed to generate virtual focused libraries around previously identified hit compounds. These were then submitted to virtual screening, second generation hit compounds with improved pharmacological profile were identified. VLD also allowed manipulating a large number of compounds from databases of virtual or available compounds. On this basis, VLD allowed also, applied in conjunction with pharmacophoric and other ligand-based models, either to predict activity of virtually generated compounds (i.e., from focused libraries) or as screening tools for databases of available compounds (i.e., compounds from natural sources) to find new hits to be directly submitted to the biological tests, completely avoiding the synthesis step. Among selected compounds, it turned out that one product named Glabrescione B (GlaB, an isoflavone naturally found in the seeds of Derris glabrescens – Leguminosae) showed a robust inhibitory effect on Gli1 activity. Its interaction with Gli1 was characterized by NMR spectroscopy and a good agreement with molecular modeling predictions was observed. Moreover, Glabrescione B inhibited the growth of Hedgehog-dependent tumor cells *in vitro* and *in vivo* as well as the self-renewal ability and clonogenicity of tumor-derived stem cells, thus becoming a profitable pre-clinical candidate. These results were then patented.

Photo 32: **Dr. Agnieszka Turowska**

The last speaker of this session, Dr. Agnieszka Turowska is a scientific project manager in biotechnological spin-off company Sterna Biologicals GmbH in Marburg, Germany. She is involved in all stages of innovative drug development: starting from the design of preclinical experiments to the organization and management of clinical trials. Her work evolves around the development and application of novel treatments for chronic inflammatory diseases of lung and gut such as asthma, COPD and inflammatory bowel disease. Her primary focus is on targeting transcription factors that play a pivotal role in regulating underlying inflammatory mechanisms by antisense molecules DNAzymes. Her major task is to link university and business and to collaborate very closely with academic partners. Dr. Turowska graduated Biotechnology at Warsaw University of Life Sciences and obtained PhD title in Faculty of Veterinary Medicine at the same university. Recently, she completed her executive MBA at University of Applied Sciences in Germany. Before joining the industry she was working as post-doc in the Department of Internal Medicine at Justus Liebig University in Giessen Lung Center in Germany. She gave a very interesting lecture about working for spin-off company. She pointed out that the development of a new drug costs from one to three billion euros, and takes 10 to 15 years. Moreover, only one out 10,000 active substances will succeed in completing the journey from initial discovery to a place on the market. Each ongoing stage of drug development is frequently associated with larger investments and higher risk. This is

especially true for biotech spin-off companies, formed to commercialize inventions generated from the research work from a parent institution. Spin-off is not a new research project; it is a business project that can generate a return on investment for the investors. Cooperation with investors is of crucial importance for the high-cost development of biotech products and therefore, preparing for such an interaction should be inscribed in the spin-off strategy at its foundation stage already. During her lecture she discussed drug development stages with regard to identification of optimal time points for external investments. She gave practical tips how to succeed in preparation of an academic spin-off company for interaction with external business partners and thus to secure seed financing.

Talk given by Dr. Turowska was followed by short discussion and coffee break.

Photo 33: Dr. Danuta Mossakowska

The first speaker of the last session `Getting money` was Dr. Danuta Mossakowska from GlaxoSmithKlein. She graduated from University College London with a degree in Biochemistry which was followed by a PhD at the University of Surrey studying the mechanisms of bacterial resistance. She continued her academic studies with two Post Doctoral Fellowships working with Professor Alan Fersht followed by a second fellowship at the Institute of Cancer Research on understanding the biochemical architecture of transcriptional regulation factors involved in the regulation of cancer cell lines. She then moved to SmithKline Beecham Pharmaceuticals working on methods to inhibit the complement system. This research led to a number of publications and patents that in turn formed the basis of a Biotech company; one of the proteins she designed is currently in clinical trials for prevention of acute rejection in renal transplantation. She is currently one of

the biology leaders in Discovery Partnerships with Academia (DPAc) where she runs projects in collaboration with academic investigators. During the conference she was talking mainly about this program. Discovery Partnerships with Academia (DPAc) is a unique global GlaxoSmithKline initiative that establishes integrated partnerships with academic groups to undertake early drug discovery and translate innovative research into medicines that benefit patients. Multiple projects are now up and running with academics in major European and North American institutions, bringing together the deep biology and disease knowledge of academia with the drug discovery expertise of GSK to research and develop new medicines. These partnerships are focused from start to finish on delivery of a specific project with a joint team working together towards agreed common goals. She highlighted examples of collaborations, and discussed the potential as well as the challenges of working across the industry – academia interface.

Photo 34: Prof. Michal Karonski

The second speaker, Prof. Michal Karonski is a head of the Department of Discrete Mathematics at the Faculty of Mathematics and Computer Science at Adam Mickiewicz University in Poznan and Chairman of the Council at National Science Centre (Narodowe Centrum Nauki). He has authored over 50 publications and delivered over 30 plenary lectures and guest speaker talks at international conferences. During his academic career he has held several positions including a postdoctoral fellowship at the University of Florida and visiting professorships at Southern Methodist University, Purdue University and the Johns Hopkins University. Since 2010 he has been the Chairman of the Council of the National Science

Centre. He showed the main aims and mission of the National Science Centre as an executive agency for funding basic research in Poland. Thanks to this institution, researchers themselves can decide how a substantial portion of research funds is allocated from the state budget. The Centre funds research projects carried out by a wide range of applicants from pre-doctoral researchers to advanced researchers. One of the priorities of the Centre is to support and develop the scientific careers of pre-doctoral and doctoral scientists. The Centre allocates more than 20% of its budget towards grants for this group of researchers. Then, he told about proposal evaluation. As the National Science Centre seeks to select the very best proposals for funding, it employs an evaluation procedure based on a two-stage peer review process similar to that used by the European Research Council.

Photo 35: Ioana Ispas

The last lecture of the conference was delivered by Ioana Ispas, Advisor for European Affairs in Genomics, Bioethics and Health at Romanian Authority for Scientific Research and Innovation. She graduated Biochemistry at University of Bucharest. As a scientist she was Assistant Professor in Biochemistry and Organic Chemistry at the University of Ecology in Bucharest and scientific researcher (Molecular Biology Department) at University of Bucharest. Current research interests focus on: bioethical issues related primarily with new and emerging fields of science and technology and development of the ethical matrix as a tool for evaluation of research projects. She worked for European Commission, as National Expert for three DGs: DG RTD, DG SANCO and DG ENV, being in charge with monitoring of Framework Programme contracts, policy briefings and foresight in biotechnology, ethics, gender research and environmental risk assessment for genetically modified organisms. She has extensive experience in EU project management (more than 16 years), currently being scientific officer for 6 FP7 and H2020 projects in: neurosciences, nanomedicine, infectious diseases (NEURON II, JPI AMR, EURONANOMED II, ERASYSAPP, HIVERA, INFECT-

ERA, JPND COFUND) on behalf of Romanian Ministry of National Education. Her talk was about the New Research Development and Innovation Strategy for 2014-2020 is the result of the broad public consultation of scientific community. She underlined the Romanian research landscape in area of cancer research involving not only 10 Medical Universities but also public and private research institutes and hospitals dedicated to oncology. Defining health as national priority should open the very good prospective for funding an increasing number of research activities based on national problems identified.

This lecture was followed by long , very interesting and interactive discussion about the best way to promote translational cancer research in new member state economies and health systems. Chairman of this round table discussion was Richard Hudson, who involved both speakers and audience in active participation to the conversation.

Photo 36: **Discussion**

Conclusions

1. Important problem is money. But the positive point was that everyone agreed, this should change over time. Biotech is new in Poland and it needs time to seep into the economy.
2. What is the most important is that proper people and good science are in Poland. Researchers in Poland are very creative and have plenty of good ideas however there is no tradition to build effective drug discovery partnerships with industry. It needs some time for people to understand how to build relationships – and that's going to be a very important part.
3. The government should help to this relationship easier to happen. Very likely that would do a lot more than investing in research itself. Money is important, but it is useless if relationships cannot be built. If the government can make academia and industry to work together through money and/or new regulations, the gap between basic science and clinical practice can be bridged.
4. Another important problem is the lack of knowledge about IPR among the scientists. Until last year the Polish law was not clear about who owns a right to patented invention: University or the scientists. But the awareness of scientists about the possible advantages of patenting and even knowledge which steps they should make to start with patenting procedure is really bad. Moreover, scientists are involved in paperwork and do not have enough time and energy to do their research and take care of the legal stuff as well, so they prefer to publish their results rather than patent and publish afterword. Thus, all the paperwork related to patenting procedure should be relieved by technology transfer offices. They should know about the expectations and the needs of the industry and share this knowledge among scientists and to advise scientists on commercialization opportunities. In recent years big pharma companies have put significant effort to improve interactions with academia, for example GSK's DPAc programme. However, companies should also put more effort on direct interactions with academia to explain their needs and to support basic research with the aim of identifying novel targets for future therapies.

To summarize, currently there are obstacles to build fruitful collaboration between science and industry in Poland, including little awareness of intellectual property law and the need to cooperate with industry, and the difficult relationship between scientists and technology transfer offices.

The conference hosted 187 participants, including scientists, medical doctors, basic scientists, PhD students and medical students. All the participants had the chance to discuss important issues during coffee and lunch breaks.

For researchers employed within BASTION project this conference was a good opportunity to improve their knowledge, to start new cooperation, both within the Medical University of Warsaw and with speakers, or other members of external laboratories.

Corresponding estimated*/budget

PERSONNEL, TRAVEL AND OTHER MAJOR DIRECT COST ITEMS FOR BENEFICIARY "1" FOR M19-M36			
WP no.	Item description	Amount [EUR]	Explanations
5	Personnel costs	32,494.48	Salary of the T2 Leader(2,15 PM) and T2.2 Leader (5 PM); fees of the supporting staff of WUM (2,53 PM),
	Travel	13,870.75	Travel & accommodation (invited speakers – TRON Conference)
	Subcontracting	22,522.06	Catering on the conference
			Creating dedicated to the conference web-page
	Remaining direct costs	5,316.34	Printing conference materials
			Dinners for invited speakers
TOTAL DIRECT WP2 COST (T2.2)		74,203.63	

/* - exact costs for M19-M36 will be presented in the 2nd Period Report and Form C (October 2015)

Dr. Magdalena Król

T2.2-Leader

Prof. Jakub Golab

BASTION Project Coordinator

Warsaw, August 2015

Photos List:

Attachment 1

Warszawa, 19 listopada 2014 r.

WOJEWODA MAZOWIECKI
Jacek Kozłowski

BW-II.031.266.2014

Pan
Michał Gierałtowski
Menedżer ds. Komunikacji
Projekt BASTION

Szanowny Panie,

w odpowiedzi na Pana wniosek z 5 listopada br., dotyczący organizacji przez Warszawski Uniwersytet Medyczny konferencji: *Translational research in oncology in new member state economies*, pragnę zapewnić o moim poparciu dla tej inicjatywy i poinformować, że wyrażam zgodę na objęcie nad planowanym przedsięwzięciem honorowego patronatu.

Tematem konferencji będzie obszar współpracy między nauką a przemysłem oraz zmiany, które w najbliższych latach powinny zostać wdrożone w zakresie wspierania i zarządzania innowacją. Cieszy mnie, że tematyka dotycząca tego zagadnienia staje się coraz bardziej powszechna, a umożliwia to w dużej mierze dofinansowany przez Komisję Europejską - projekt BASTION.

Wierzę, że uda się Państwu zrealizować cele konferencji, zwiększyć potencjał badawczy Warszawskiego Uniwersytetu Medycznego w dziedzinie onkologii doświadczalnej, a tym samym skrócić drogę między odkryciem naukowym a wykorzystaniem go w praktyce klinicznej. Życzę pomyślnej realizacji przedsięwzięcia.

Z poważaniem

Dariusz Piątek
Wicewojewoda Mazowiecki

URZĄD MIASTA STOŁECZNEGO WARSZAWY
Gabinet Prezydenta
pl. Bankowy 3/5, 00-950 Warszawa, tel. 22 443 10 26, 22 443 10 29, faks 22 443 59 55
gabinet.prezydenta@um.warszawa.pl, www.um.warszawa.pl

GP-RM.0054.551.2014.KZA

Warszawa, 21 listopada 2014 r.

Pan
Michał Gierałtowski
Kierownik ds. komunikacji
Projekt BASTION
Warszawski Uniwersytet Medyczny

Szanowny Panie!

w imieniu Prezydent Miasta Stołecznego Warszawy Hanny Gronkiewicz-Waltz dziękuję Panu za zaproszenie do objęcia honorowym patronatem międzynarodowej konferencji „Translational research in oncology in new member state economies", która odbędzie się w dniach 21 – 22 maja 2015 r.

Miło mi poinformować, że Pani Prezydent wyraziła zgodę i obejmie swoim patronatem przedsięwzięcie, które ma zwiększyć potencjał badawczy Warszawskiego Uniwersytetu Medycznego w dziedzinie onkologii doświadczalnej.

Jednocześnie uprzejmie informuję, że projekty wszelkich materiałów informacyjnych dotyczących Państwa wydarzenia z zamieszczonym identyfikatorem herbowym patronatu honorowego Prezydenta m. st. Warszawy, powinny zostać przesłane do akceptacji grafika miejskiego na adres: gm@um.warszawa.pl.
Pliki do pobrania oraz katalog systemu identyfikacji wizualnej m.st. Warszawy znajdują się na stronie http://symbole.um.warszawa.pl/identyfikator-herbowy-patronatu-prezydenta-mst-warszawy-pliki-do-pobrania.

Z poważaniem

DYREKTOR
GABINETU PREZYDENTA
Renata Wiśniewska

Do wiadomości:
1. Pan Dariusz Hajdukiewicz – Dyrektor Biura Polityki Zdrowotnej