Capacities/Research Potential
FP7-REGPOT-2012-2013-1

Project No. 316254
BASTION

"From Basic to Translational Research in Oncology"

Deliverable D3.7

Report on publications and research/professional activities of all recruited researchers

Project start date:	1.09.2012
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3. Summary of research activity

All reports are available on BASTION Webpage: www.bastion.wum.edu.pl

1. Introduction

The BASTION project is envisioned to allow Medical University of Warsaw (MUW) to become a leading research and clinical oncology centre in Central Europe. One of the objectives realized in WP3 is to build human potential by attracting top-level scientists with international experience in basic and clinical oncology who can contribute to an increase in the quality of research. Deliverable D3.2 corresponds to the task T3.1 in WP3.

2. Reports on research activities of experienced researchers

I. Malgorzata Firczuk, PhD (TEAM of Dominika Nowis)

DATE (YEARS)	DEGREE/ EXPERIENCE	PLACE	SUPERVISOR
2002	M.Sc.	Department of Molecular Biology, Intercollegiate Faculty of Biotechnology, University of Gdańsk, Poland	Prof. Jarosław Marszałek
2003	M.Sc.	Department of Microbiology, Faculty of Pharmacy, Medical University of Gdańsk, Poland	Prof. Władysław Werel
2007	PhD	Laboratory of Structural Biology, International Institute of Molecular and Cell Biology, Warsaw, Poland	Prof. Matthias Bochtler
2008-2009	Postdoc	Laboratory of Structural Biology, International Institute of Molecular and Cell Biology, Warsaw, Poland	Prof. Matthias Bochtler
2009-2012	Postdoc	Department of Immunology, Medical University of Warsaw, Poland	Prof. Jakub Gołąb
2013-now	Postdoc	Department of Immunology, Medical University of Warsaw, Poland	Dr hab. Dominika Nowis

A. Biosketch (provided by Malgorzata Firczuk)

I gained an extensive academic background in bio-medical sciences, studying biotechnology and pharmacy. In 2001-2002 I was working on my first research project, at the Laboratory of Molecular Biology, Intercollegiate Faculty of Biotechnology, University of Gdańsk, in the group of prof. Jarosław Marszałek. I had learned there basic methods of protein expression in yeasts, principles of protein purification, and earned a master degree. In 2003 I had also completed my studies at Medical University of Gdańsk, Faculty of Pharmacy. I worked on my master thesis project at the Laboratory of Microbiology under the supervision of prof. Władysław Werel. I was studying the interactions between bacterial RNA polymerase and its promoter. My work was awarded as the best master thesis of all Polish pharmacy faculties, presented on the competition organized by Polish Pharmaceutical Society in 2003.

Being more and more fascinated with how proteins work and how protein structure determines its function, for a PhD I moved to Warsaw to work under the supervision of prof. Matthias Bochtler, the head of the Laboratory of Structural Biology at the International Institute of Molecular and Cell Biology. My PhD work

concentrated around structural biology and macromolecular crystallography. I have learned how to produce, purify, crystallize proteins, protein-DNA complexes, and solve their three - dimensional structures by X-ray crystallography. Moreover, I understood how proteins work at the atomic level, what are their mechanisms of interactions, and how the structure influences protein function. My main PhD theme involved peptidoglycan amidases, prokaryotic enzymes that contribute to bacterial pathogenicity. I have managed to obtain the crystal structures for two of them, LytM and MepA. Based on the structures, we designed mutated protein variants to conclude about the mechanisms of action, and studied small molecule interactions in the protein's active site.
Driven by the need to work on more medically-oriented research topics, I moved to the Department of Immunology at the Medical University of Warsaw, led by prof. Jakub Golab, working in the field of experimental oncology. I worked as a post-doctoral fellow in the TEAM project "Improvement of antitumor effectiveness of photodynamic therapy" financed by Foundation for Polish Science. I have learned molecular and cellular biology techniques, mammalian cell culture and *in vivo* mouse models. Importantly, I had an opportunity to supervise students, technicians, design whole projects and become more independent. I successfully applied for my own project funding. I am currently leading two research projects: "Improvement of photodynamic therapy by mobilization of dendritic cells", financed by Polish National Science Centre, and "Search for target proteins for the new compounds with antitumor activity", financed by Polish Ministry of Science and Higher Education within IUVENTUS program.

B. Publications published during BASTION project

	Authors, title, journal, year	**IF**
1	Siernicka M, Winiarska M, Bajor M**, Firczuk M**, Muchowicz A, Bobrowicz M, Fauriat C, Golab J, Olive D, Zagozdzon R. „Adenanthin, a new inhibitor of thiol-dependent antioxidant enzymes, impairs the effector functions of human natural killer cells." **Immunology.** 2015 Jun 11. doi: 10.1111/imm.12494.	**3,795**
2	Muchowicz A; **Firczuk M**; Wachowska M; Kujawa M; Jankowska-Steifer E; Gabrysiak M; Pilch Z; Klossowski S; Ostaszewski R; Golab J. „SK053 triggers tumor cells apoptosis by oxidative stress-mediated endoplasmic reticulum stress". **Biochem Pharmacol.** 2015 Feb 15;93(4):418-27. doi: 10.1016/j.bcp.2014.12.019.	**5,009**
3	Nowis D, Malenda A, Furs K, Oleszczak B, Sadowski R, Chlebowska J, **Firczuk M**, Bujnicki JM, Staruch AD, Zagozdzon R, Glodkowska-Mrowka E, Szablewski L, Golab J. „Statins impair glucose uptake in human cells", **BMJ Open Diabetes Research & Care**, 2014, vol.2, doi:10.1136/bmjdrc-2014-000017.	**0**
4	**Firczuk M**, Gabrysiak M, Gołąb J. „GRP78-targeting subtilase cytotoxin sensitizes cancer cells to photodynamic therapy", **book chapter 6**: "GRP78-targeting sensitizes cancer cells to cytotoxic effects of photoynamic therapy" in the book entitled: " **Resistance to Photodynamic Therapy in Cancer"**, Springer. 2014, DOI: 10.1007/978-3-319-12730-9.	**0**
5	Muchowicz A**, Firczuk M**, Chlebowska J, Nowis D, Stachura J, Barankiewicz J, Trzeciecka A, Kłossowski S, Ostaszewski R, Zagożdżon R, Pu JX,Sun HD, Golab J. Adenanthin targets proteins involved in the regulation of disulphide bonds. **Biochem Pharmacol**. 2014 May 15;89(2):210-6. doi: 10.1016/j.bcp.2014.02.022.	**5,009**
6	**Firczuk M**, Gabrysiak M, Barankiewicz J, Domagala A, Nowis D, Kujawa M, Jankowska-Steifer E, Wachowska M, Glodkowska-Mrowka E, Korsak B, Winiarska M,Golab J. GRP78-targeting subtilase cytotoxin sensitizes cancer cells to photodynamic therapy. **Cell Death Dis**. 2013 Jul 25;4:e741. doi: 10.1038/cddis.2013.265.	**5,177**
7	Winiarska M, Nowis D, Bil J, Glodkowska-Mrowka E, Muchowicz A, Wanczyk M, Bojarczuk K, Dwojak M, **Firczuk M**, Wilczek E, Wachowska M, Roszczenko K, Miaczynska M, Chlebowska J, Basak GW, Golab J. 2012. Prenyltransferases Regulate CD20 Protein Levels and Influence Anti-CD20 Monoclonal Antibody-mediated Activation of Complement-dependent Cytotoxicity. **J Biol Chem**. Sep 14;287(38):31983-93.	**4,651**

C. Grant applications submitted during BASTION project

1. OPUS7, National Science Centre, " The role for thiol-dependent antioxidant enzymes in estrogen receptor-positive breast cancer", Key Investigator. 2014. Funding granted.
2. Diamond Grant, Ministry of Science and Higher Education, Project Leader: Antoni Domagała, "Role of autophagy in tumor cells response to photodynamic therapy", 2014. Project supervisor. Funding granted.
3. OPUS 8, National Science Centre, „Studies of the role of peroxiredoxin 1 and other antioxidant enzymes in B cell acute lymphoblastic leukemia", leader (PI). 2014. Not funded.
4. Horizon 2020, Call: H2020-TWINN-2015. European Commission. Proposal entitled: Strategies towards Excellence in Immuno-Oncology - „*STREAM*". Role: work package deputy leader. June 2015. Under evaluation.

D. Participation in grants during BASTION project

Grant number	Title	Function	Duration	Funding Institution
N N401 037138	Improvement of the efficacy of photodynamic therapy by the mobilization of dendritic cells	Leader (PI)	2010-2014	Ministry of Science and Higher Education
1M19/DG8	Investigation of the effects of EGF-SubA fusion protein on the efficacy of photodaynamic therapy in vivo using mice models.	Project supervisor	2012-2014	Diamond Grant, Ministry of Science and Higher Education
IP1/2011/71	Search for target proteins for the new compounds with antitumor activity	Leader (PI)	2012-2015	Ministry of Science and Higher Education
1M19/DG8	Role of autophagy in tumor cells response to photodynamic therapy"	Project supervisor	2014-2016	Diamond Grant, Ministry of Science and Higher Education
1M19/PM13	Investigation of the role of peroxiredoxin 1 on the proliferation and survival of a human Burkitt's lymphoma cell line Raji	Leader (PI)	2013-2014	Medical University of Warsaw
NZ5/01354	The role for thiol-dependent antioxidant enzymes in estrogen receptor-positive breast cancer	Key Investigator	2015-2018	National Science Center

E. Participation in the conferences during BASTION project

1. European Society for Photobiology 2013 Congress, Liege, Belgium, 2-6 September 2013.
2. 21st ECDO Euro conference on Apoptosis on "Cell death: a Biomedical paradigm", Paris, France, 25-28 September, 2013.
3. 56th American Society of Hematology Annual Meeting, USA, San Francisco, 6-9 December 2014.
4. International Conference Translational Research in Oncology in New Member States Economies TRON, Warsaw, Poland, 21-22 May 2015.
5. 15th International Conference on Oxidative Stress Reduction, Redox Homeostasis & Antioxidants, France, Paris, Pasteur Institute, 22-24 June 2015.

F. Oral presentation at the conferences

1. European Society for Photobiology 2013 Congress, Liege, Belgium, 2-6 September 2013, lecture, title: "GRP78-targeting subtilase cytotoxin sensitizes cancer cells to photodynamic therapy".
2. 15th International Conference on Oxidative Stress Reduction, Redox Homeostasis & Antioxidants, France, Paris, Pasteur Institute, 22-24 June 2015. Oral presentation, title: "Thiol-reactive peptidomimetic SK053 targets dimeric peroxiredoxins in human lymphoma cell lines".

G. Poster presentation at the conferences

1. 21st ECDO Euro conference on Apoptosis on "Cell death: a Biomedical paradigm", 25-28 September, 2013, title" "Photodynamic therapy combined with GRP78-targeting subtilase cytotoxin trigger atypical cell death in apoptosis-deficient prostate cancer cells".
2. 56th American Society of Hematology Annual Meeting, poster title: "Peroxiredoxins-1 and 2 Affect Proliferation and Survival of Lymphoma Cells" –presenting author, USA, San Francisco, 6-9 December 2014
3. International Conference Translational Research in Oncology in New Member States Economies TRON, Poster presentation, poster title: "Peroxiredoxins-1 and 2 Affect Proliferation and Survival of Lymphoma Cells", Warsaw, Poland, 21-22 May 2015.

H. Participation in courses/trainings/workshops

1. Research Team Management Workshop organized by Foundation for Polish Science within SKILLS program, 10-11 May 2013.
2. Scientific Writing Workshop organized by Foundation for Polish Science within SKILLS program, 10-12 June 2013.
3. "Cancer genetics for medical community" - workshop organized by the Medical University of Warsaw in the project BASTION, Warsaw, Poland, 17 June 2013.
4. "Application of flow cytometry in molecular oncology ", workshop organized by BASTION, Medical University of Warsaw, 15 – 16 October 2014.
5. Workshop: "Genome-wide methods in cancer genetics", organized by BASTION, Medical University of Warsaw, 28 October 2014.
6. Coaching, training program organized by Foundation for Polish Science, within SKILLS project, October 2014-March 2015.
7. Workshop: "Molecular diagnostic in cancer" organized by BASTION, Medical University of Warsaw, 8 June 2015.

I. Awards/fellowships obtained during BASTION project

1st degree scientific reward from the Rector of the Medical University of Warsaw, for the participation in a publication series, diploma (2013).

J. Students supervision

Supervising three students, participants of student's scientific group at the Department of Immunology: Joanna Barankiewicz, Antoni Domagała and Anna Trzeciecka.

K. Collaboration with other research teams started during BASTION project

1. Prof. Eugene Jansen, National Institute for Public Health and Environment. Utrecht, Netherlands.
2. Prof. Wojciech Młynarski, dr Agata Pastorczak, Department of Pediatrics, Oncology, Hematology and Diabetology Medical University of Łódź, Poland.
3. Prof. Przemysław Juszczyński, mgr Anna Polak, Laboratory of Experimental Hematology, Institute of Hematology and Transfusion Medicine, Warsaw, Poland.
4. Prof. Ewa Lech-Marańda, lek med Elżbieta Patkowska, Department of Hematology, Institute of Hematology and Transfusion Medicine, Warsaw, Poland.
5. Prof. Monika Prochorec-Sobieszek, Department of Diagnostic Hematology, Institute of Hematology and Transfusion Medicine, Warsaw, Poland.
6. Prof. Matthias Bochtler, Laboratory of Structural Biology, International Institute of Molecular and Cell Biology, Warsaw, Poland.
7. Prof. Janusz Bujnicki, Dr Anna Czerwoniec, Laboratory of Bioinformatics and Protein Engineering, International Institute of Molecular and Cell Biology, Warsaw, Poland.
8. Prof. Michał Dadlez, Dr Agata Malinowska, Mass Spectrometry Laboratory, Institute of Biochemistry and Biophysics, Warsaw, Poland.

L. International research visits during BASTION project

University of Verona, Department of Neurology and Movement Sciences, 27 July 2013-10 August 2013

M. Current research interests

Recently, Malgorzata Firczuk has been trying to apply her knowledge of protein structure and structure-to-function relationships to the field of experimental oncology. She is particularly interested in disease-related proteins, which are involved in protein folding, redox homeostasis, and support tumour cell proliferation.
She is focused on investigating mechanisms of action of small molecule compounds, drug target selection and validation. Recently, she had identified peroxiredoxins as molecular targets for an electrophilic peptidomimetic compound, SK053, initially designed as thioredoxin / thioredoxin reductase system inhibitor. Using biotin-avidin affinity approach, she found two-cysteine dimeric peroxiredoxins as covalently bound to the biotin-labelled compound. She is now investigating the detailed mechanism of SK053 binding to peroxiredoxin-1, both in cells and with purified recombinant proteins. In addition, she is validating peroxiredoxins as potential targets in B lymphocyte-derived malignancies.
The second line of her scientific interest is focused on the role of endoplasmic reticulum resident chaperone, glucose regulated protein 78 (Grp78), in tumour cell survival and response to anti-tumour therapies. Grp78 is highly expressed in tumour cells and plays a cytoprotective role, supporting tumour growth. She had recently shown that Grp78 is up-regulated in response to photodynamic therapy, and contributes to the therapy resistance.

N. Envisioned carrier paths after BASTION project

Collaboration of Dr. Dominika Nowis with Dr. Malgorzata Firczuk ends with the finalization of the BASTION project as Dr. Firczuk joins the research team of Dr. Zagozdzon. She will be employment for 18 months (half-time contract) within project funded by National Science Center: “The role for thiol-dependent antioxidant enzymes in estrogen receptor-positive breast cancer “, NZ5/01354. Currently, Dr Firczuk is developing her expertise in the field of redox biology using in vitro and in vivo models. The results of Dr. Firczuk’s projects should allow development of her research carrier in the field of tumor biology and therapy and establishment of her own research team. In the following months Dr. Firczuk will focus on gathering the preliminary results to support her future grant applications to the National Science Center in Poland.

II. Anna Wojcicka (TEAM of Krystian Jazdzewski)

DATE (YEARS)	DEGREE/EXPERIENCE	PLACE	SUPERVISOR
1999-2006	M.Sc.	University of Warsaw, Faculty of Biology	Agnieszka Dzikowska, PhD
2007-2012	PhD	Centre of Postgraduate Medical Education, Warsaw, Poland	Prof. Alicja Nauman. Ph.D.
2012-present	Postdoc	Genomic Medicine, Department of General, Transplant and Liver Surgery, Medical University of Warsaw	Prof. Krystian Jazdzewski, M.D., Ph.D.

A. Biosketch (provided by Anna Wojcicka)

I graduated from the Faculty of Biology at the Warsaw University. My Master's thesis, concerning the arginine catabolism in fungus *Aspergillus nidulans* was performed in the Department of Genetics. After graduation I was employed at the Department of Genetics, Institute of Biochemistry and Biophysics, Polish Academy of Sciences, where I investigated mechanisms of sister chromatid cohesion in the fungal model of *Saccharomyces cerevisiae*. In October, 2007 I commenced PhD studies at the Medical Centre of Postgraduate Education in Warsaw, Laboratory of Molecular Biology, under supervision of Professor Alicja Nauman whose scientific interest has been focused on the elucidation of the role of thyroid hormones in carcinogenesis. The research I conducted within the topic of my PhD thesis consisted of the analysis of the thyroid hormone receptor beta (*THRB*) gene methylation and miRNA-dependent regulation in clear cell renal cell carcinoma, as well as of the evaluation of the effect of thyroid hormones on expression of genes coding for DNA methyltransferases.
I also gained additional experience working in international laboratories and cooperating with other laboratories in Poland. During my Master studies I spent six months at the Department of Clinical Genetics, Vrije Universiteit in Amsterdam, investigating mutations that could be potentially involved in pathogenesis of multiple sclerosis. Furthermore, since May until September 2011 I was an occasional student at Imperial College London, Laboratory of Molecular Endocrinology, where I performed part of my PhD thesis, analyzing expression of DNA methyltransfeases in tissues obtained from wild-type and mutant mice with disrupted T3 signalling. I also participated in other projects conducted in the Laboratory, analyzing in vivo phenotype of the developing and adult skeleton in murine and avian models. From October 2011 until February 2012 I worked at the Ohio State University Comprehensive Cancer Center. My research was focused on the analysis of the risk factors for thyroid cancer and included conduction of the genetic association study using the Sequenom technology and the analysis of microRNAs that are aberrantly expressed in thyroid cancer.

B. Publications published during BASTION project

	Authors, title, journal, year	**IF**
1	Lakshmanan A, Wojcicka A, Kotlarek M, Zhang X, Jazdzewski K, Jhiang SM. 2015 MicroRNA-339-5p modulates Na+/I- symporter-mediated radioiodide uptake. Endocr Relat Cancer	**4,805**

	Feb;22(1):11-21	
2	Wojcicka A, Swierniak M, Kornasiewicz O, Gierlikowski W, Maciag M, Kolanowska M, Kotlarek M, Gornicka B, Koperski L, Niewinski G, Krawczyk M, Jazdzewski K. 2014 Next generation sequencing reveals microRNA isoforms in liver cirrhosis and hepatocellular carcinoma. Int J Biochem Cell Biol. 53:208-17	**4,046**
3	Wojcicka A, Piekielko-Witkowska A, Kedzierska H, Rybicka B, Poplawski P, Boguslawska J, Master A, Nauman A. 2014 Epigenetic regulation of thyroid hormone receptor Beta in renal cancer. Plos One. 2014 May 21;9(5):e97624	**3,234**
4	Wójcicka A, Czetwertyńska M, Świerniak M, Długosińska J, Maciąg M, Czajka A, Dymecka K, Kubiak A, Kot A, Płoski R, de la Chapelle A, Jażdżewski K 2014 Variants in the ATM-CHEK2-BRCA1 axis determine genetic predisposition and clinical presentation of papillary thyroid carcinoma. Genes Chromosomes Cancer, 53(6): 516-23	**4,041**
5	Wojcicka A, de la Chapelle A, Jazdzewski K. 2014 MicroRNA-related sequence variations in human cancers. Human Genetics, 133(4):463-9	**4,824**
6	Boguslawska J, Piekielko-Witkowska A, Wojcicka A, Kędzierska H, Popławski P, Nauman A 2014 Regulatory feedback loop between T3 and microRNAs in renal cancer. Mol Cell Endocrinol. 25;384(1-2):61-70	**4,405**
7	Swierniak M, Wojcicka A, Czetwertynska M, Stachlewska E, Maciag M, Wiechno W, Gornicka G, Bogdanska M, Koperski L, de la Chapelle A. Jazdzewski K. 2013 In-depth characterization of the microRNA transcriptome in normal thyroid and papillary thyroid carcinoma. J Clin Endocrinol Metab, 2013 Aug;98(8):E1401-9.	**6,310**
8	Liyanarachchi S, Wojcicka A, Li W, Czetwertynska M, Stachlewska E, Nagy R, Hoag K, Wen B, Ploski R, Ringel MD, Kozłowicz-Gudzinska I, Gierlikowski W, Jazdzewski K, He H and Albert de la Chapelle 2013 Cumulative Risk Impact of Five Genetic Variants Associated With Papillary Thyroid Carcinoma Thyroid, 23(12):1532-40	**3,843**
9	Wojcicka A, Bassett JH; Williams GR 2013 Mechanisms of action of thyroid hormones in the skeleton. BBA - General Subjects, Special Issue: Thyroid hormone signalling. Biochim Biophys Acta Jul;1830(7):3979-86	**3,829**
10	Piekielko-Witkowska A, Kedzierska H, Poplawski P, Wojcicka A, Rybicka B, Maksymowicz M, Grajkowska W, Matyja E, Mandat T, Bonicki W, Nauman P. 2013 Alternative splicing of iodothyronine deiodinases in pituitary adenomas. Regulation by oncoprotein SF2/ASF Biochim Biophys Acta Jun;1832(6):763-72	**5,089**
11	He H, Li W, Wu D, Nagy R, Liyanarachchi S, Akagi K, Jendrzejewski J, Jiao H, Hoag K, Wen B, Srinivas M, Waidyaratne G, Wang R, Wojcicka A, Stachlewska E, Czetwertynska M, Dlugosinska J, Gierlikowski W, Ploski R, Krawczyk M, Jazdzewski K, Kere J, Symer DE, Jin V, Wang Q, de la Chapelle A. 2013 Ultra-rare mutation in long-range enhancer predisposes to thyroid carcinoma with high penetrance, PLoS One. 2013; 8(5): e61920	**3,534**
12	He H, Bronisz A, Liyanarachchi S, Nagy R, Li W, Huang Y, Akagi K, Saji M, Kula D, Wojcicka A, Nihil S, Wen B, Puch Z, Kalemba M, Stachlewska E, Czetwertynska M, Dlugosinska J, Dymecka K, Ploski R, Krawczyk M, Morrison PJ, Ringel MD, Kloos RT, Jazdzewski K, Symer DE, Vieland VJ, Ostrowski M, Jarząb B, de la Chapelle A. 2013 SRGAP1 is a candidate gene for papillary thyroid carcinoma susceptibility. J Clin Endocrinol Metab, 98(5):973-980	**6,310**

C. Patent applications submitted during BASTION project

1. World Intellectual Property Organization "Use Of A Micro-RNA Marker For Thyroid Tumor Diagnosis And A Diagnostic Kit Comprising Such Markers" PCT/IB2014/066057 (2014)
2. World Intellectual Property Organization "Use Of Micro-RNA Markers For Diagnosis Of Liver PCT/IB2014/065342 (2014)
3. Polish Patent Bureau "A new method for diagnosis of hepatocellular carcinoma, the use of microRNA markers in diagnostics of liver pathologies, in prediction of their progression and response to treatment,

together with a diagnostic panel based on the above markers" P30817PL00 (2013)

4. Polish Patent Bureau "A new method for diagnosis of thyroid carcinoma, the use of microRNA markers in diagnostics of thyroid pathologies, in prediction of their progression and response to treatment, together with a diagnostic panel based on the above markers". P30859PL00 (2013)

D. Participation in grants during BASTION project

1. National Science Centre Grant Sonata: MicroRNA-dependent regulation of iodide transporters: NIS, AIT and Pendrin and aberrations of this process in papillary thyroid carcinoma 2012/07/D/NZ3/04149 (2012-2015) – Principal Investigator
2. National Centre for Research and Development Lider Grant: The use of next-generation sequencing for elucidation of a sensitive and specific molecular panel for diagnostics of thyroid cancers (2014-2017) – Principal Investigator
3. Ministry of Science and Higher Education Iuventus Plus Grant: Evaluation of the possibility of using microRNA inhibitors as adjuvant therapy for thyroid cancer (2015-2017) – Principal Investigator
4. Foundation For Polish Science Impuls Programme: Implementation of a molecular prognostic panel for thyroid cancer (2015) – Principal Investigator
5. Foundation For Polish Science TEAM Programme: In search of new pathways of tumorigenesis - genome-wide functional analysis of microRNAs deregulated in human cancers, financed by the European Union within the European Regional Development Fund (2014) – Investigator
6. Foundation for Polish Science FOCUS Programme: Role of microRNAs in thyroid carcinogenesis (2011-2012) – Investigator

E. Participation in the conferences during BASTION project

1. European human genetics conference (ESHG), Glasgow, UK, 6-9 June 2015
2. 16th International Congress of Endocrinology/The Endocrine Society's 96th Annual Meeting (ICE/ENDO 2014), Chicago, USA, 20-25 June 2014
3. European Congress of Endocrinology, Wroclaw, Poland, 3-7 May 2014

F. Oral presentation at the conferences

1. M Kolanowska, A Wojcicka, A Kubiak, M Swierniak, M Maciag, W Wiechno and K Jazdzewski Next-Generation Sequencing Reveals a Novel, Thyroglobulin-Embedded microRNA Gene Deregulated in Papillary Thyroid Carcinoma ICE/ENDO, 20-25 June 2014, Chicago, USA

G. Poster presentation at the conferences

1. Wojcicka, A. Kubiak, M. Kotlarek, A. Czajka, M. Czetwertynska, J. Dlugosinska, M. Swierniak, N. Fedoryszak-Kuska, B. Gornicka, K. Jazdzewski A polymorphism in miR-146a tailors genetic predisposition to differentiated thyroid cancer, modulates its clinical outcome and alters proliferation of tumor cells. European human genetics conference, Glasgow, UK, 6-9 June 2015
2. M. Swierniak, A. Wojcicka, M. Czetwertynska, J. Dlugosinska, E. Stachlewska, W. Gierlikowski, B. Gornicka, L. Koperski, M. Bogdanska, W. Wiechno, K. Jazdzewski Association between GWAS-derived rs966423 genetic variant and overall mortality in patients with differentiated thyroid cancer European human genetics conference, Glasgow, UK, 6-9 June 2015

3. Wójcicka A, Czetwertyńska M, Świerniak M, Długosińska J, Maciąg M, Czajka A, Dymecka K, Płoski R, de la Chapelle A, Jażdżewski K. Variants in the ATM-CHEK2-BRCA1 Axis Determine Genetic Predisposition and Clinical Presentation of Papillary Thyroid Carcinoma; ICE/ENDO, Chicago, USA, Endocrine Society Presidential Award for the best poster in thyroidology, 20-25 June 2014.
4. Wójcicka A, Gierlikowski W, Kotlarek M, Bakuła-Zalewska E, Jażdżewski K. Apical iodide transporter (AIT) and its microRNA – induced silencing in thyroid malignancies ICE/ENDO, Chicago, USA, 20-25 June 2014.
5. The role of ATM-CHEK2-BRCA1 axis in determination of genetic predisposition and clinical presentation of papillary thyroid carcinoma. Anna Wójcicka, Małgorzata Czetwertyńska, Michał Świerniak, Joanna Długosińska, Monika Maciąg, Agnieszka Czajka, Kinga Dymecka, Adam Kot, Rafał Płoski, and Krystian Jażdżewski, European Congress of Endocrinology, Wroclaw, Poland, 3-7 May 2014
6. The effect of allelic variants of the thyroid hormone receptor beta (THRB) gene on the incidence of papillary thyroid carcinoma. Anna Wójcicka, Marek Rosłon, Małgorzata Czetwertyńska, Michał Świerniak, Joanna Długosińska, Adam Kot, Rafał Płoski, Aneta Hromada-Judycka, Marta Świech and Krystian Jażdżewski, European Congress of Endocrinology, Wroclaw, Poland, 3-7 May 2014

H. Participation in courses/trainings/workshops

1. 55th Annual Short Course of Medical and Experimental Mammalian Genetics, Jackson Laboratory, Bar Harbor, USA, 20 July-03 August 2014.

I. Organization of the conferences

1. Cancer Genetics for Medical Community, 17 June 2013, Warsaw

J. Awards/fellowships obtained during BASTION project

1. Minister of Science and Higher Education - Scholarship for outstanding young scientists (2014)
2. March of Dimes Foundation Scholarship towards participation in the 55th Annual Short Course of Medical and Experimental Mammalian Genetics, Jackson Laboratory, Bar Harbor, USA (2014)
3. Endocrine Society Presidential Poster Award for the best poster presentation in thyroidology (2014)
4. Fellowship within the Foundation for Polish Science Mentoring Programme (2013)
5. Ist degree Prize awarded by the Director of the Medical Centre of Postgraduate Education for a chapter in the “Clinical Endocrinology” textbook (2013)

K. Students supervision

Supervising two PhD students: Wojciech Gierlikowski and Marta Kotlarek

L. Collaboration with other research teams started during BASTION project

1. Group of Prof. Albert de la Chapelle, Department of Molecular Virology, Immunology and Medical Genetics, Ohio State University
2. Prof Sissy M. Jhiang, Ohio State University

M. International research visits during BASTION project

N. Current research interests

Anna Wojcicka is a molecular biologist working in the field of molecular endocrinology and oncology. For the past several years her research has been focused on the molecular basis of thyroid hormones action: their involvement in the processes of cell division and proliferation as well as on the role of aberrances in thyroid hormone signaling in development and progression of human cancers.
The projects she is currently involved in aim at elucidation of the role of microRNAs in the pathology of human diseases. Increased expression of miRs, observed in cancers, leads to their enhanced binding with target mRNAs, causing severe downregulation of synthesis of proteins and resulting in deregulation of numerous cellular pathways. In her ongoing projects she employs next-generation sequencing to identify comprehensive miRNa profiles of human cancers, including papillary thyroid carcinoma and hepatocellular carcinoma. She seeks to identify novel, previously unknown microRNAs and their isoforms, and to elucidate their impact on the cellular transcriptome together with a potential linkage with pathogenesis of cancer. She is also attempting to propose specific, microRNA-based diagnostic panels for non-invasive diagnostics of thyroid and liver malignancies.

O. Envisioned career paths in BASTION project

Anna's scientific plans are focused on further studies on the pathology of thyroid cancer. Her long-term goals include elaboration of specific diagnostic panels allowing for non-invasive diagnostics of thyroid cancers. Moreover, she is currently initiating collaboration on the project aiming at elucidation of therapeutic tools for thyroid cancer, based on reestablishment of expression of genes coding for iodide transporters. Within the project, she will supervise the projects and theses of two PhD students. Anna is currently a PI in 4 on-going grant projects and will be employed at the Medical University of Warsaw and at the Centre of New Technologies, University of Warsaw.

III. Malgorzata Czystowska-Kuzmicz (TEAM of Jakub Golab)

DATE (YEARS)	DEGREE/ EXPERIENCE	PLACE	SUPERVISOR
1998	M.Sc.	Heinrich-Heine University, Duesseldorf, Germany	Prof. Frank Wunderlich
2006	PhD	Heinrich-Heine University, Duesseldorf, Germany	Prof. Peter Dall
2006-2009	Postdoc	University of Pittsburgh Cancer Institute (UPMC), Pennsylvania, USA	Prof. Theresa Whiteside
2009-2013	Postdoc	Maternity leave	
since March 2013	Postdoc	BASTION	Prof. Jakub Golab

A. Biosketch (provided by Malgorzata Czystowska-Kuzmicz)

I earned my MSc degree at Heinrich-Heine University in Dusseldorf, Germany in 1998. During my Masters studies I also worked as an undergraduate research assistant at the Institute of Transplant-Diagnostic and Cell Therapeutics of the Heinrich-Heine University, participating in HLA-class I and II typification of patients and donors for bone-marrow and stem-cell transplantations. For graduate studies I joined Dr. Dieter Niederacher's Laboratory of Molecular Genetics, part of the Department of Obstetrics and Gynecology of Heinrich-Heine University. My Ph.D. thesis was a part of research projects of the German Cancer Aid Study and the German Human Genome Project. Basing on bioinformatic analysis of EST-databases and microarray data we tried to identify novel genetic markers in gynecological tumors. For this purpose I designed and developed a specific strategy to validate these candidate genes, which included expression analysis, high throughput pre-screening for mutations and promoter methylation (LOH-analysis, DHPLC) and functional cell-based assays. I identified the insulin-like growth factor binding protein 4 (IGFBP-4) as a putative tumor suppressor in ovarian cancer. I showed that IGFBP-4 downregulation in ovarian tumors was due to allelic loss and promoter-hypermethylation and was ER-status dependent. IGFBP-4 showed IGF-I-dependent anti-proliferative and partly IGF-I-independent pro-apoptotic effects in OvCa cell lines. After completing my Ph.D. in 2006, I moved to Prof. Theresa Whiteside's laboratory, at University of Pittsburgh Cancer Institute (UPMC), Pennsylvania, USA. Her laboratory had been doing pioneering work in characterizing tumor-mediated escape mechanisms and identifying surrogate immunologic markers of prognosis and response to therapy. During this time I was investigating mechanisms responsible for tumor-induced suppression of immune effector cells – primarily in head and neck cancer (HNC), but also in ovarian cancer and acute myelogenous leukemia. My special attention was devoted to the role of tumor-derived microvesicles as mediators of immune suppression and disease progression. In this context I also investigated the exosome-driven Treg (regulatory T cells)- mediated death of effector cells in HNC patients. My second focus was the chemokine receptor signalling that regulates host response to tumors. I found that patients with cancer have an increased frequency of circulating apoptosis-sensitive CD8+ cells, which do not express the chemokine receptor CCR7, and few CD8(+)CCR7(+) apoptosis-resistant T cells. Moreover, I showed that the CD8(+)CCR7(+) T-cell frequency in HNSCC patients' blood tested at diagnosis can discriminate them from normal controls and predicts disease recurrence. Finally, I was involved in the

development of cytokine therapies for cancer patients in cooperation with an industry partner, investigating the molecular mechanisms of T-cell protection of a new developed cytokine-based immunotherapeutic. I also participated in the evaluation of a randomized phase II p53 vaccine trial in ovarian cancer patients.

B. Publications published during BASTION project

	Authors, title, journal, year	IF
1	Czystowska M, Gooding W, Szczepanski MJ, Lopez-Abaitero A, Ferris RL, Johnson JT, Whiteside TL. The immune signature of CD8(+)CCR7(+) T cells in the peripheral circulation associates with disease recurrence in patients with HNSCC. Clin Cancer Res. 2013 Feb 15;19(4):889-99.	**8,193**

C. Grant applications submitted during BASTION project

1. OPUS6; Title: 'Elucidation of the role of tumor-derived and exosomal arginases in avoiding immune responses by ovarian cancer' – Principal investigator, Accepted for funding.

D. Participation in the conferences during BASTION project

1. Annual Meeting of the International Society of Extracellular Vesicles (ISEV), Washington DC, United States, 22-26 April 2015
2. BASTION conference "Translational Research in Oncology in New Member State Economies" 21-22 May 2015

E. Poster presentation at the conferences

1. Annual Meeting of the International Society of Extracellular Vesicles (ISEV), poster title: "The adenosine pathway in ovarian carcinoma: tumor cells and tumor-derived exosomes express CD39 and CD73 ectonucleotidases, produce adenosine and mediate immune suppression", Washington DC, United States, 22-26 April 2015.
2. BASTION conference "Translational Research in Oncology in New Member State Economies", poster title: "The adenosine pathway in ovarian carcinoma: tumor cells and tumor-derived exosomes express CD39 and CD73 ectonucleotidases, produce adenosine and mediate immune suppression", Warsaw, 21-22 May 2015.

F. Participation in courses/trainings/workshops

1. FNP "Project management" workshop (3-4 November 2014)
2. Training "Isolation and molecular characterisation of cancer-derived exosomes", University of Pittsburgh Cancer Institute in Pittsburgh, PA (United States), 13-19 July 2014
3. Nordic Immunohistochemistry Basic Course organized in DAKO's Glostrup/Kopenhagen facility, Denmark, 21-22 January 2015,
4. ISEV – NIH ERCC collaborative Education Day "RNA Diversity in Extracellular Vesicles", Washington DC, USA 22 April 2015
5. BASTION Molecular Diagnostics in Cancer Workshop, Warsaw 08 June 2015

G. Students supervision

Supervising student Anna Czekalska (participants of student's scientific group at the Department of Immunology), master student Karolina Soroczynska, title of master thesis "Role of exosome-derived arginase in tumor escape of ovarian cancer", end of master thesis: September 2015

H. Collaboration with other research teams started during BASTION project

1. Dr. Marta Szajnik-Szczepański from Poznań University of Medical Sciences, Department of Gynecologic Oncology,
2. Dr. Jacek Sieńko from Second Clinic of Obstetrics and Gynecology, Medical University of Warsaw

I. Current research interests

Recent research activities of Malgorzata focus on the understanding of the defensive strategies developed by tumors to protect against immune attack. This phenomenon is referred to as "tumor escape" and has been recently accepted as a major problem responsible for the tumor resistance to immune therapies and for the general lack of success in generation of clinical responses to vaccines in patients diagnosed with cancer. She and others have identified tumor-derived exosomes (TDE) as carriers for the delivery of defined signals from tumor site to distant organs, enabling the tumor to develop a systemic immune suppression. Recently, she identified on ovarian cancer exosomes two enzymes, i.e. arginase-1 and -2, that are involved in degradation of non-essential amino-acids and play a critical role in chronic inflammation and evasion of anti-tumor immunity. Thus, she hypothesizes that through the release of arginase-expressing exosomes which become systemically distributed through the bloodstream, tumor cells achieve a global L-Arg depletion leading to a systemic T-cell dysfunction. She plans to delineate the immunosuppressive role of these tumor-derived enzymes of the amino-acids metabolism. Taking also into account the recent development of inhibitors of amino acid metabolism, we also assume that the inhibition of the expression and enzymatic activity of the above-mentioned enzymes may tilt the balance from an immune-suppressive to an immune-active environment and should have a measurable impact on the disease outcome. Therefore, blocking arginase could be a target for novel anti-cancer strategies, especially in combination with existing molecularly targeted therapies, but also classical chemotherapy.

J. Envisioned career paths in BASTION project

Małgorzata Czystowska-Kuzmicz will be funded from the National Science Center grant (NCN; "Elucidation of the role of tumor-derived and exosomal arginases in avoiding immune responses by ovarian cancer") until July 2017. She will focus on elucidating the role of tumor-derived exosomes, which contain immune response-suppressing enzymes. The results of this project should allow development of research carrier of Dr. Malgorzata Czystowska in the field of tumor immunobiology. We also expect that the results of the research will allow to prepare a habilitation (Ds.C.) thesis of Dr. Malgorzata Czystowska in 2018. Further employment is warranted pending successful acquisition of grants from NCN or other sources.

IV. Beata Pyrzynska (TEAM of Magdalena Winiarska)

DATE (YEARS)	DEGREE/ Experience	PLACE	SUPERVISOR
1989-1994	M.Sc.	Faculty of Biology, Warsaw University, Poland	Prof. A. K. Tarkowski
1995-1997	Assistant	Nencki Institute of Experimental Biology, Polish Academy of Science, Warsaw, Poland	Prof. A. Sobota
1998-2001	PhD	Nencki Institute of Experimental Biology, Polish Academy of Science, Warsaw, Poland	Prof. B. Kaminska-Kaczmarek
2002-2006	Postdoc	Emory University, Atlanta, GA, USA	Prof. E. G. van Meir
2007-2013	Postdoc	International Institute of Molecular and Cell Biology, Warsaw, Poland	Prof. M. Miaczynska

A. Biosketch (provided by Beata Pyrzynska)

I was first time involved in the laboratory work as a M.Sc. student at the Department of Embryology, Warsaw University, studying development of the block against polyspermy in different stages of oocyte maturation. Later, as an assistant at the Nencki Institute of Experimental Biology in Warsaw I studied involvement of the cytoskeletal and signaling proteins in phagocytosis. During that time I also gained my first international research experience as a TEMPUS fellow at the Institute of General Pathology, Perugia, Italy. My interest in cancer biology started when I joined the Laboratory of Transcriptional Regulation at the Nencki Institute of Experimental Biology, where I conducted research on the molecular mechanisms leading to glioma cell death upon treatment with immunosuppressive drug cyclosporine A. I used the short-term fellowship from EMBO as an opportunity to collaborate with the National Center of Biotechnology (CNB) in Madrid. My Ph.D. thesis dissertation (2001) was awarded at the Nencki Institute of Experimental Biology and I was also recognized as a young outstanding scientist by the Foundation for Polish Science (FNP, START program).
In 2002 I was recruited to the Winship Cancer Institute, Emory University, Atlanta, USA, to work as a postdoctoral fellow in the Laboratory of Molecular Neuro-Oncology. I used the microarray approach to study the influence of tumor suppressors (such as p53 or p14ARF) status on the development and progression of glioblastoma. My work was awarded by the research fellowships from NATO and from the American Brain Tumor Association. In 2006 I returned to Poland to work at the International Institute of Molecular and Cell Biology in Warsaw. I brought the experience in cancer biology to study the signal transduction pathways originated at the endocytic compartments and influencing different aspects of tumor growth. Over the years I have conducted the research in cancer biology and cancer therapeutics fields. I studied the regulation of cellular signaling leading to changes in gene expression and tumorigenesis. Beside the basic methods of molecular and cell biology I had the opportunity to gain some experience in bioinformatics, microarray technique and proteomics. Recently, I was recruited under the BASTION program to work as an experienced scientist at the Department of Immunology, Medical University of Warsaw.

B. Publications published during BASTION project

	Authors, title, journal, year	IF
1	Zerrouqi A., Pyrzynska B., Brat D.J., Van Meir E.G. (2014). P14ARF suppresses tumor-induced thrombosis by regulating the tissue factor pathway Cancer Res. 74, 1371-8.1.	**9,329**
2	Pyrzynska B, Banach-Orlowska M, Teperek-Tkacz M, Miekus K, Drabik G, Majka M, Miaczynska M. Multifunctional protein APPL2 contributes to survival of human glioma cells. Mol Oncol. 2013 Feb;7(1):67-84.	**5,935**
3	Bojarczuk K., Siernicka M., Dwojak M., Bobrowicz M., Pyrzynska B., Gaj P., Karp M., Giannopoulos K., Efremov D.G., Golab J., Winiarska M. (2014). B-cell receptor pathway inhibitors affect CD20 levels and impair antitumor activity of anti-CD20 monoclonal antibodies. Leukemia 28, 1163-7.	**10,431**
4	Winiarska M., Bojarczuk K., Pyrzynska B., Bil J., Siernicka M., Dwojak M., Bobrowicz M., Miazek N., Zapala P., Zagozdzon A., Krol M., Syta A., Podszywalow-Bartnicka P., Pilch Z., Dabrowska-Iwanicka A., Juszczynski P., Efremov D.G., Slabicki M., Zenz T., Le Roy A., Olive D., Rygiel T.P., Leusen J., Golab J. (2014). Inhibitors of SRC kinases impair antitumor activity of anti-CD20 monoclonal antibodies. mAbs 6, 1300-13.	**4,558**
5	Dwojak M., Bobrowicz M., Bil J., Bojarczuk K., Pyrzynska B., Siernicka M., Malenda A., Lech-Maranda E., Tomczak W., Giannopoulos K., Golab J., Winiarska M. (2015) Sorafenib improves rituximab and ofatumumab efficacy by decreasing the expression of complement regulatory proteins. Blood Cancer J. 5(E300):1-4.	**3,467**

C. Grant applications submitted during BASTION project

1. Grant application as principal investigator “Influence of AKT signaling pathway on CD20 expression and antitumor activity of therapeutic monoclonal antibodies.” National Science Center (NCN, grant OPUS); December 2013;
2. Participation in grant application as supervisor of the student - Nina Miązek; Diamond Grant from the Ministry of Science and Higher Education “Impact of selected chemotherapeutic agents on the efficacy of anty-CD20 immunotherapy in B-cell lymphoma”; February 2015;
3. Participation in Twinning grant application, call: H2020-TWINN-2015, acronym: STREM; Principal Investigator – Prof. Jakub Golab; May 2015.

D. Participation in grants during BASTION project

1. Principal Investigator in grant OPUS “Influence of AKT signaling pathway on CD20 expression and antitumor activity of therapeutic monoclonal antibodies.” National Science Center (NCN; grant no: 2013/11/B/NZ5/03240; 1074759 PLN).

E. Participation in the conferences during BASTION project

1. “Research-driven, multidisciplinary oncological care in Poland: sharing experiences to foster collaborations between MD Anderson Cancer Center Sister Institutions”; Warsaw, Poland, 23-24 June 2014.
2. “56th ASH Annual Meeting and Exposition”, San Francisco, USA, 6-9 December 2014.
3. “Heart of Europe Zebrafish Meeting”; Warsaw, Poland, 17-19 September, 2014.
4. “Open Research Data: Implications for Science and Society”; Warsaw, Poland, 28-29 May 2015.

F. Oral presentation at the conferences

1. Oral presentation of data during Second International Advisory Board (IAB) Meeting of BASTION project ”Regulation of CD20 expression and its impact on the therapy.”; 22 May 2014;
2. Oral presentation of data for evaluators of BASTION project ”Regulation of CD20 expression and its impact on the therapy.”; 30 January 2015;

G. Poster presentation at the conferences

1. 55th ASH Annual Meeting and Exposition , poster presentation “Inhibitors of SRC family and AKT regulate the activity of CD20 promoter” Pyrzynska B, Bojarczuk K, Winiarska M, Bil J, Miazek N, Zapala P, Bobrowicz M, Dwojak M, Siernicka M, Golab J, abstract published in *Blood*, 122 (21): abstract no.1838, New Orleans, USA**,** 7-10 December 2013;
2. AACR Annual Meeting, poster presentation “PTEN regulates the CD20 antigen expression and affects rituximab-based therapy of lymphoma malignancies.” Pyrzynska B, Bojarczuk K, Siernicka M, Dwojak M, Bobrowicz M, Miazek N, Zapala P, Zagozdzon A., Bil J, Golab J, Winiarska M., late-breaking abstract no. LB-242/4, Philadelphia, USA**,** 18-22 April 2015.
3. Poster presentation “AKT and PTEN, two important players in the regulation of CD20 expression, affect the sensitivity of lymphoma malignancies to rituximab-based therapy.” Pyrzynska B, Bojarczuk K, Dwojak M, Bobrowicz M, Siernicka M, Miazek N, Zapala P, Zagozdzon A, Bil J, Golab J, Winiarska M. Conference “TRON”; Warsaw, Poland, 21-22 May 2015.

H. Participation in courses/trainings/workshops

1. Training in scientific project management “Scientists of Tomorrow” organized by pm2pm; Warsaw, Poland; Feb-June 2013
2. Flow Cytometry Workshop “Apoptosis and Cell Signaling” organized by the Nencki Institute of Experimental Biology as part of BIO-IMAGINE project, Warsaw, Poland, 22 April 2013;
3. Workshop “Cancer genetics for medical community” organized by the Medical University of Warsaw as part of the BASTION project, Warsaw, Poland, 17 June, 2013;
4. Workshop “Commercialization of research results” organized by the Bio&Technology Innovations Platform of Biocentrum Ochota, Warsaw, Poland, 27 June 2013;
5. Workshop “Application of flow cytometry in Molecular Oncology”; Medical University of Warsaw, Poland, 15-16 October, 2014;
6. Workshop “Genome-wide methods in cancer genetics”; Medical University of Warsaw, Poland, 28 October 2014;
7. Info day “Horizon2020 – programs related to health care” (www.kpk.gov.pl); Warsaw, Poland, 18 November 2014,
8. Workshop “Marie Sklodowska-Curie Innovative Training Network” (www.kpk.gov.pl); Warsaw, Poland, 19 November 2014,
9. Workshop “Idea 2 Business”; Medical University of Warsaw, Poland, 26 November – 17 December 2014,
10. Workshop “Molecular Diagnostics in Cancer”; Medical University of Warsaw, Poland, 08 June 2015,
11. Workshop "Individual Fellowships - MSCA - how to apply" (www.kpk.gov.pl); Warsaw, Poland, 18 June 2015,

I. Awards/fellowships obtained during BASTION project

1. Mentoring Program awarded to Beata Pyrzynska by the Foundation for Polish Science - FNP (Mentor: Prof. M.A. Shipp, Dana-Farber Cancer Institute, Boston, USA) – June 2014- May 2015

J. Students supervision

Co-supervising PhD student: Michał Dwojak, supervising students (participants of student's scientific group at the Department of Immunology): Piotr Zapała and Nina Miązek

K. Collaboration with other research teams started during BASTION project

1. Prof. dr hab. Przemysław Juszczyński, Institute of Hematology and Transfusion Medicine, Warsaw, Poland;
2. Prof. Daniel Olive and Dr Cyril Fauriat, Cancer Research Center of Marseille (CRCM), University of Mediterranean, INSERM, Institut Paoli Calmettes, Marseille, France;

L. International research visits during BASTION project

1. Twinning visit to Cancer Research Center of Marseille (CRCM), University of Mediterranean, INSERM, Institut Paoli Calmettes, Marseille, France; 25 June – 24 July 2015.

M. Current research interests

Current research interest of Beata Pyrzynska is focused on the molecular mechanisms that regulate expression of CD20 antigen in malignant B-cells. Clinical management of B-cell tumors (particularly non-Hodgkin's lymphoma and chronic lymphocytic leukemia) includes treatment with monoclonal antibodies (such as rituximab, ofatumumab or GA-101) directed against CD20 antigen. Nevertheless, the resistance to this therapy is a frequent problem in the clinic. The resistance is often related to decreased levels of CD20 on the surface of malignant cells. Therefore, before investigating novel therapeutic combinations in cancer patients, the molecular mechanisms modulating the level of CD20 antigen, such as its transcriptional regulation, protein stability and its cellular localization should be taken into consideration. Looking for signaling pathways affecting these processes the research group of Dr. Winiarska has recently found that the BCR-SRC-AKT signaling is the key regulator of CD20 expression. Beata would like to extend the study mentioned above by elucidating the molecular mechanism acting downstream of AKT and leading to transcriptional repression of CD20 expression upon treatment with AKT inhibitors. She has already performed the detailed characterization of the effect of clinically used AKT inhibitors on CD20 expression and on the efficacy of anti-CD20 treatment using different cell lines as well as primary samples of B-cell tumors. Importantly, she would like to employ modern molecular approaches to find the signaling molecules acting downstream of AKT and contributing to the regulation of CD20 expression. She expects that the proteomic approaches and database searches will lead to the identification of proteins that recognize and bind to the region of CD20 promoter that we have recently identified to be critical for regulation by AKT.

N. Envisioned career paths in BASTION project

Beata Pyrzynska has managed to secure funding until August 7th, 2017 for research and her salary as principal investigator of the grant OPUS (NCN; 2013/11/B/NZ5/03240) „Influence of AKT signaling pathway on CD20 expression and antitumor activity of therapeutic monoclonal antibodies". She would like to continue her studies in experimental hematology, in particular in anti-CD20 mAbs field. Moreover, we also expect that the results of Dr Pyrzynska project will allow her to develop scientific career in the field of monoclonal antibodies and establish her independent research team. In coming years she is also planning to present her results at the international conferences, publish the results of her project in peer-review journals and participate in other projects of Dr Winiarska group.

V. Joanna Drzewinska-Chanko (TEAM of Tomasz Stoklosa)

DATE (YEARS)	DEGREE/EXPERIENCE	PLACE	SUPERVISOR
2000-2005	M.Sc.	*Department* of Molecular Biophysics, University of Lodz	Prof. dr hab. G. Bartosz
2005-2010	Ph.D.	*Department* of Molecular Biophysics, University of Lodz	Prof. dr hab. M. Soszyński
2011	Research assistant	*Department* of Molecular Biophysics, University of Lodz	Prof. dr hab. G. Bartosz
2012	Postdoc	*Department* of General Biophysics, University of Lodz	Prof. dr hab. B. Klajnert
2013	Postdoc	BASTION, Department of Immunology, Warsaw Medical University	Dr T. Stoklosa

A. Biosketch (provided by Joanna Drzewinska)

I obtained Master of Science degree at University of Lodz, Department of Molecular Biology in 2005. During my Master's studies, I worked on molecular cloning, recombinant expression and transcriptional regulation of human proteins ABCC1, ABCC2, ABCC3 by MAP kinases signal transduction pathways. Upon completion of my M.Sc., I started my Ph.D. project focused on characterization of transcriptional regulation of *DHCR24* gene, which encodes seladin-1 protein. I investigated the transcriptional activity of *DHCR24* promoter in various mammalian cell types in response to oxidative stress, overexpression of wide array of transcriptional factors and transcriptional factors' inducers. As a result of these studies I demonstrated that mechanisms of DNA methylation and histone acetylation are responsible for tissue specific expression of *DHCR24* gene (Drzewinska et al., 2011). Moreover I identified glucocorticoids as inducers of *DHCR24* expression acting by glucocorticoid receptor-mediated mechanism in lung cancer cells. I completed my Ph.D. in biological sciences in 2010 from the Department of Molecular Biophysics, University of Lodz. In 2011 I worked in the project "Role of multidrug transporters in pharmacokinetics and toxicology – in vitro tests in pharmaceutical and clinical practice" conducted at University of Lodz in the frames of Innovative Economy National Cohesion Strategy. During this time, I worked on molecular cloning and recombinant expression of ABC proteins responsible for multidrug resistance in cancer cells. In the year 2012 I joined the lab of Prof. Barbara Klajnert to work as Postdoctoral Researcher in the project "Biological properties and biomedical applications of dendrimers" conducted within the framework of the TEAM programme, University of Lodz. In these studies we showed that dendrimers (synthesized branched cationic polymers) form stable complexes with anti-HIV antisense oligonucleotides and effectively protect them from nucleolytic degradation. Furthermore, we demonstrated that modification of dendrimer's surface with carbohydrates improves dendrimer's capability to protect the oligonucleotides from digestion by serum nucleases or nuclease S1 (Drzewinska et al., 2012). We also studied interactions between

dendriplexes (complexes composed from dendrimers and oligonucleotides) and glucosaminoglycans (the main components of extracellular matrix) which may limit effectiveness of transfection. We were able to demonstrate that the effect of glucosaminoglycans on dendriplexes depends on the glucosaminoglycan type and the oligosaccharide serving as the surface group of the dendrimer (Szewczyk et al., 2012). In 2013 I joined BASTION project as a Postdoctoral Researcher in the Department of Immunology, Medical University of Warsaw.

B. Publications published during BASTION project

	Authors, title, journal, year	IF
1	Szewczyk M, Drzewinska J, Dzmitruk V, Shcharbin D, Klajnert B, Appelhans D, Bryszewska M. Stability of Dendriplexes Formed by Anti-HIV Genetic Material and Poly(propylene imine) Dendrimers in the Presence of Glucosaminoglycans.The Journal of Physical Chemistry B. 2012; 116(50):14525-32.	**3,377**
2	Drzewinska J, Appelhans D, Voit B, Bryszewska M, Klajnert B. Poly(propylene imine) dendrimers modified with maltose or maltotriose protect phosphorothioate oligodeoxynucleotides against nuclease activity. Biochemical and Biophysical Research Communications. 2012 Oct 12;427(1):197-201	**2,281**

C. Grant applications submitted during BASTION project

1. Application for internal grant from Medical University of Warsaw. Project title: Investigation of influence of tyrosine kinases inhibitors on epigenetic changes in chronic myeloid leukemia – a potential association with drug resistance.

2. Grant application to National Science Center for funding "Opus" project entitled "Role of epigenetic mechanisms in chronic myeloid leukemia progression and resitance to targeted therapy" application registration number 2013/11/B/NZ2/02679

3. Grant application to Polish Ministry of Science and Higher Education for funding "Iuventus Plus" project entitled „Rola metylacji DNA w progresji przewlekłej białaczki szpikowej i mechanizmach lekooporności na terapię celowaną", application registration number IP2014 007973

D. Poster presentation at the conferences

1. Drzewinska-Chanko J., Seferynska I., Machnicki M., Bajorek K., Wnuk M., Glodkowska-Mrowka E., Stoklosa T. "Tyrosine kinase inhibitors do not affect expression of DNA Methyltransferases and global methylation level in chronic myeloid leukemia cells". 19th Congress of the European Hematology Association", Milano 2014
2. Drzewinska-Chanko J., Bajorek K., Glodkowska-Mrowka E., Barankiewicz J., Machnicki M., Seferynska I., Stoklosa T. „Badanie wpływu inhibitorów kinaz tyrozynowych I, II, i III generacji na ekspresję metylotransferaz DNA w przewlekłej białaczce szpikowej". Międzynarodowa Konferencja Szkoleniowa PTHiT „Hematologia Kliniczna i Doświadczalna", Kazimierz Dolny 2014
3. Stoklosa T, Deregowska A., Drzewinska-Chanko J., Barankiewicz J., Machnicki M., Pruszczyk K., Wnuk M., "Effects of First and Next-Generation Tyrosine Kinase Inhibitors on Telomere-Mediated Chromosomal Instability in Chronic Myeloid Leukemia Cells". Blood: 124 (21) December 6, 2014 (56th Annual Meeting and Exposition of The American Society of Hematology)

E. Current research interests

Research activities of Joanna concentrate on studying mechanisms of drug resistance in tumors with the main focus on haematological malignancies such as chronic lymphocytic leukaemia (CLL) and chronic myeloid leukaemia (CML). Introduction of tyrosine kinase inhibitors (TKI) occurred to be a milestone in targeted

therapy of CML. However, drug resistance becomes an emerging problem with novel targeted therapies. Many reports demonstrated that epigenetic processes remarkably modulate CML expression profiles and phenotypic outcomes, but a lot of questions regarding epigenetic mechanisms of pathogenesis in CML remain unanswered. Hence, unravelling the mechanisms of epigenetic changes in leukaemia cells may contribute to inhibition of development of resistance to TKIs and malignant progression of the disease. Although aberrant DNA methylation is considered to be associated with CML progression, there are almost no useful epigenetic biomarkers which would allow stratifying CML patients into groups with different risk and to personalize or change their treatment before clinical resistance will develop. Thus, she is studying the epigenetic landscape in CML with special focus on leukaemia stem cells (LSCs) which are intrinsically resistant to targeted therapy with tyrosine kinase inhibitors. Employing the next-generation sequencing technology in a follow-back study, she intends to define patterns of epigenetic changes in early phase of CML which predispose patients to the progression of the disease.

F. Envisioned career paths in BASTION project

Joanna Drzewińska-Chańko went for maternal leave in August 2013 (due to health problems during pregnancy she had to take sick leave already from April 2013) and she is on maternal leave till the end of the Project. Due to family reasons she is planning to come back to her hometown, Lodz and pursue her scientific career there.

VI. Iwona Solarska (TEAM of Tomasz Stoklosa) – hired for replacement

Years	Degree / experience	Place	Supervisor
06/1995	Medical laboratory Technician	Medical College in Warsaw, Poland	-
1995 - 1999	Technician	Department of Microbiology, Institute of Hematology and Transfusion Medicine, Warsaw, Poland	M.Sc. Irena Bednarska
06/1999	M.Sc.	Faculty of Biology, University of Lodz, Lodz, Poland	Prof. Barbara Różalska
1999 - 2004	Biologist	Department of Microbiology, Institute of Hematology and Blood Transfusion, Warsaw, Poland	M.Sc. Maria Zaleska
2004 – 2014	Assistant-specialist in laboratory medicine	Genetic Laboratory, Diagnostic Hematology Department, Institute of Hematology and Blood Transfusion, Warsaw, Poland	Prof. Monika Prochorec-Sobieszek, M.D.
06/2009	Ph.D.	Institute of Hematology and Blood Transfusion, Warsaw, Poland	Prof. Krzysztof Warzocha, M.D.
2014-2015	Postdoc	Department of Immunology, Medical University of Warsaw, Poland	Tomasz Stokłosa M.D. Ph.D

Biosketch (provided by Iwona Solarska)

I graduated from the Faculty of Biology at University of Lodz in 1999. My Master's thesis, entitled 'Phenotype characteristic of the *Staphylococcus* isolated from the blood of patients with hematological disorders' was performed in the Department of Infectious Biology, Institute of the Microbiology and Immunology, University of Lodz, Poland and in the Department of Microbiology in the Institute of Hematology and Blood Transfusion in Warsaw, where I was employed first as a technician, and then as a biologist (from 1999).

In October, 2006 I commenced PhD studies at the Molecular Genetic Department in the Institute of Hematology and Blood Transfusion in Warsaw, under supervision of Professor Krzysztof Warzocha. From the beginning of my work I was strongly interested in the area of chronic myeloid leukemia (CML), so the research I conducted within the topic of my PhD thesis consisted of the analysis of the minimal residual disease (*BCR-ABL* gene expression) in a group of CML patients treated with allogeneic stem cell transplantation. I was trying to determine the prognostic levels of minimal residual disease that correlate with risk of leukemia relapse. Finally I received my doctoral degree in medical sciences in June, 2009 from the Institute of Hematology and Blood Transfusion in Warsaw.

In the 2004 – 2014 in the Institute of Hematology and Blood Transfusion I was responsible for managing the registry of newly diagnosed patients with CML within the cooperation with Polish Society of Hematology and Transfusiology and European Leukemia Net (ELN). I participated also in Polish first control for the standardization of *BCR-ABL* quantitative PCR method within the collaboration with ELN, in a lab rounds control for minor-BCR-ABL within the collaboration between European Study Group on MRD detection in ALL (ESG-MRD-ALL) and European Working Group for Adult Acute Lymphoblastic Leukemia (EWALL), and in the Polish project MapTest – detection of the BCR-ABL mutations in a Polish population CML and ALL Ph+ patients. I was committed to some researches, including investigation of molecular mechanisms of progression and primary resistance to imatynib in CML (2006 – 2009), investigation of clinical implications of the somatic hypermutation VDJ genes, T-cell receptor and protooncogenes in non-Hodgkin lymphomas (2005 – 2007) or analysis the multi-drug resistance *MDR1*, *MRP*, *LRP*, *BCRP* genes in adult patients with non-lymphoblastic acute leukemia (2009 – 2012). In 2011 – 2012 I supervised the project 'Analysis of coexpression of endogenous transcripts of bidirectional genes *BAALC* and *C8orf56* in AML patients and its clinical implications'.
In 2014 I joined BASTION project as a Postdoctoral Researcher in the Department of Immunology, Medical University of Warsaw.

A. Publications published during BASTION project

	Authors, title, journal, year	**IF**
1	Nasilowska-Adamska B, Czyz A, Markiewicz M, Rzepecki P, Piatkowska-Jakubas B, Paluszewska M, **Solarska I**, Dzierzak-Mietla M, Borg K, Prochorec-Sobieszek M, Szydlo R, Lewandowski K, Skotnicki A, Jedrzejczak WW, Kyrcz-Krzemien S, Komarnicki M, Warzocha K. Mild chronic graft versus host disease may alleviate poor prognosis associated with FLT3-internal tandem duplication for adult acute myeloid leukemia following allogeneic stem cell transplantation with myeloablative conditioning in first complete remission; a retrospective study. **Eur J Haematol**. 2015 Apr 27. [Epub ahead of print]	**2,066**
2	Nasilowska-Adamska B, **Solarska I**, Paluszewska M, Malinowska I, Jedrzejczak WW, Warzocha K. FLT3-ITD and MLL-PTD influence the expression of MDR-1, MRP-1, and BCRP mRNA but not LRP mRNA assessed with RQ-PCR method in adult acute myeloid leukemia. **Ann. Hematol**. 2014, 93(4): 577-593.	**2,634**
3	Glodkowska-Mrowka E, **Solarska I**, Mrowka P, Bajorek K, Niesiobedzka-Krezel J, Seferynska I, Borg K, Stoklosa T. Differential expression of BIRC family genes in chronic myeloid leukemia BIRC3 and BIRC8 as potential new candidates to identify disease progression. **Br J Haematol** 2014, 164(5): 740-742.	**4,711**

B. Participation in the conferences during BASTION project

1. Conference: 'CML Forum Experts Meeting'. Gdansk, 19-21 February 2015.

2. Translational Research in Oncology in New Member State Economies International Conference, Warsaw, 21-22 May 2015

3. European Hematology Association Congress, Vienna, Austria, 11-14 June 2015

C. Poster presentation at the conferences

1. Marcin M. Machnicki, Joanna Niesiobedzka-Krezel, Iwona Solarska, Piotr Stawinski, Rafal Ploski, Tomasz Stoklosa. *Unraveling the mechanism of chronic myeloid leukemia progression by next-generation sequencing of leukemic progenitor and stem cells.*
2. FEBS-EMBO Conference, 1-4 September 2014, Paris, France. Abstract in: FEBS Journal 281(Suppl.1):782
3. Marcin M. Machnicki, Joanna Niesiobędzka-Krężel, Iwona Solarska, Piotr Stawiński, Rafał Płoski i Tomasz Stokłosa. *Poszukiwanie nowych zmian genetycznych odpowiedzialnych za oporność na terapię celowaną i progresję przewlekłej białaczki szpikowej przy zastosowaniu sekwencjonowania wysokoprzepustowego.*
4. Międzynarodowa Konferencja Szkoleniowa PTHiT „Hematologia Kliniczna i Doświadczalna". 16-18 May, 2014, Kazimierz Dolny, Poland.
5. Marcin M. Machnicki, Joanna Niesiobedzka-Krezel, Iwona Solarska, Piotr Stawinski, Rafal Ploski and Tomasz Stoklosa. *Exome and custom-gene sequencing as tools for analysis of chronic myeloid leukemia progression.Conference:* "NGS Milan 2015: From the clinic To single cell analysis", 9-10 March, 2015.
6. Iwona Solarska, Marcin M. Machnicki, Joanna Niesiobedzka-Krezel, Piotr Stawinski, Rafal Ploski, Tomasz Stoklosa.*Comparison of whole-exom and custom-gene sequencing as tools for analysis of chronic myeloid leukemia progression.*
7. Translational Research in Oncology in New Member State Economies Conference, Warsaw, 21-22 May, 2015
8. Iwona Solarska, Marcin M. Machnicki, Barbara Nasiłowska-Adamska, Barbara Pieńkowska-Grela, Ilona Seferyńska, Piotr Stawiński, Rafał Płoski and Tomasz Stokłosa
9. *Selection of RUNX1-mutated clone associated with relapse and blast crisis in chronic myeloid leukemia patient after allo-HSCT as revealed by targeted enrichment and deep sequencing.*
10. European Hematology Association, Vienna, Austria 11-14 June, 2015
11. Marta Libura, Sebastian Giebel, Beata Piątkowska-Jakubas, Marta Przestrzelska Pawełczyk, Izabella Florek, Karolina Matiakowska, Bożena Jaźwiec, Katarzyna Borg, Iwona Solarska, Magdalena Zawada, Sylwia Czekalska, Jolanta Libura, Małgorzata Jakóbczyk, Karolina Karabin, Małgorzata Calbecka, Justyna Gajkowska-Kulig, Grażyna Gadomska, Marek Kiełbiński, Anna Ejduk, Dariusz Kata, Sebastian Grosicki, Agnieszka Wierzbowska, Sławomira Kyrcz-Krzemień, Krzysztof Warzocha, Kazimierz Kuliczkowski, Aleksander Skotnicki, Jerzy Holowiecki, Wiesław Jedrzejczak, Olga Haus.
12. *Favorable outcome of patients with normal karyotype acute myeloid leukemia harboring FLT3-ITD and treated with cladribine added induction.* European Hematology Association, Vienna, Austria 11-14 June, 2015

D. Participation in courses/trainings/workshops

1. Workshop “Genome-wide methods in cancer genetics”; Medical University of Warsaw, Poland, 28 October 2014;

2. Workshop “Application of flow cytometry in Molecular Oncology”; Medical University of Warsaw, Poland, 15-16 October, 2014;

3. Workshop: “Molecular diagnostic in cancer” organized by BASTION, Medical University of Warsaw, 8 June 2015.

E. Current research interests

Iwona Solarska is a molecular biologist working in the field of molecular hematology. Her current research interest is focused on the molecular mechanisms that determined drug resistance and progression of hematological malignancies. The projects she is currently involved in aim at understanding molecular pathogenesis of chronic myeloid leukemia (CML) with special regard to mechanisms of resistance to tyrosine kinase inhibitors (TKI) and potential ways to overcome such resistance. TKIs resistance becomes an emerging problem with novel targeted therapies. For most of CML patients a therapy with TKIs is very effective, but some of them are resistant to therapy or even progressed to more advanced phases of the disease. That’s why there are still a lot of questions regarding drug resistance mechanisms or progression pathways of pathogenesis in CML to answered. The second line of her scientific interest is focused on the acute myeloid leukemias (AML) including investigation of the multi-drug resistance genes and its correlation with other prognostic factors. This is a very heterogeneous group of malignancies, so every finding appeared to be a milestone to understanding the biology and improving prognosis for AML patients.

F. Envisioned career paths in BASTION project

Iwona Solarska hired for replacement in September 2014 after the end of BASTION Project will come back to her previous position in the Institute of Hematology and Blood Transfusion in Warsaw and will continue to collaborate in the genetic studies on leukemia with Dr Stoklosa team.

VII. Magdalena Banach-Orlowska (TEAM of Pawel Wlodarski)

DATE (YEARS)	DEGREE/EXPERIENCE	PLACE	SUPERVISOR
1999	M.Sc. in molecular biology	Department of Genetics, University of Warsaw, Poland	Prof. Piotr Weglenski
2005	PhD in biochemistry	Institute of Biochemistry and Biophysics, PAS in Warsaw, Poland	Prof. Piotr Jonczyk
2006 - 2013	Postdoc	Laboratory of Cell Biology at International Institute of Molecular and Cell Biology, Warsaw, Poland	Prof. Marta Miaczynska
2013 – until present	Postdoc (research specialist)	Department of Histology and Embryology, Medical University of Warsaw	Dr hab. Pawel Wlodarski

A. Biosketch (provided by Magdalena Banach-Orlowska)

I graduated from the Department of Genetics, University of Warsaw in 1999. During my graduate studies in the laboratory of Prof. Weglenski I studied the regulation of Aspergillus nidulans agaA gene.
After completing my M.Sc., I successfully applied for the PhD-tract in the Laboratory of Mutagenesis and DNA Repair at the Institute of Biochemistry and Biophysics, PAS. The aim of my PhD project, being a part of systematic studies on a replication fidelity in Procaryota, was to determine the role of DNA polymerase II and DNA polymerase IV in replication. After publishing the results of my studies I received my doctoral degree (PhD) in biochemistry in 2005. In the years 2005–2006, I continued to work with the group of Prof. Fijalkowska and Prof. Jonczyk at the Institute of Biochemistry and Biophysics as a research fellow.
In the years 2006–2013, I was employed as a Postdoctoral Fellow at the International Institute of Molecular and Cell Biology. At that time I participated in studies concerning the role of endocytic proteins in signal transduction in mammalian cells. I have characterized the relationship between APPL1 endocytic protein and the nuclear repressor complex NuRD and its consequence for gene expression. We also demonstrated the role of APPL2 protein in survival of glioma cells. Since APPL adapter proteins interact with many partners involved in signal transduction we investigated their role in several signalling pathways. In 2010, I received grant from Foundation for Polish Science for investigation of the role of APPL1 protein in Wnt signaling. During my postdoctoral fellowship at Prof. Miaczynka Lab I was also involved in the project concerning the role of endocytic proteins in the NFkB pathway.
In 2013, I moved to dr hab. Pawel Wlodarski Lab at the Department of Histology and Embryology, Medical University of Warsaw. Since then I have been involved in three lines of work. The first one focuses on genetic basis of endometriosis. The second line of studies concerns the epigenetic regulation of gene expression. Employing NGS technology we plan to perform systematic analysis of methylation profile and in consequence find the changes in gene expression in response to female sex hormones (estradiol and progesterone).
The third line of work conducted in cooperation with Prof. Tomasz Ciach Lab from Warsaw University of Technology is devoted to investigation of the novel nanoparticles containing anticancer drug. Within this project we perform in vitro and in vivo studies of the new drug. I am particularly involved in investigating the intracellular trafficking of modified drug in breast and ovarian cancer cell lines.

B. Publications published during BASTION project

	Authors, title, journal, year	IF
1	Pyrzynska B, Banach-Orlowska M, Teperek-Tkacz M, Miekus K, Drabik G, Majka M, Miaczynska M. Multifunctional protein APPL2 contributes to survival of human glioma cells. Mol Oncol. 2013 Feb;7(1):67-84.	**5,935**
2	Banach-Orlowska M, Szymanska E, Miaczynska M. APPL1 endocytic adaptor as a fine tuner of Dvl2-induced transcription. FEBS Lett. 2015 Feb 13;589(4):532-9.	**3,169**

C. Grant applications submitted during BASTION project

1. Searching for the novel miRNAs and isomiRNAs in endometriosis (OPUS 8 – NSC) – as a principal investigator – failed

D. Participation in grants during BASTION project

1. Exome-wide search for somatic mutations in pathogenesis of endometriosis – OPUS 5 (NSC) - Main contractor
2. Epigenetic regulation of expression of genes involved in extracellular matrix remodeling and angiogenesis during development of endometriosis – contractor

E. Participation in the conferences during BASTION project

1. Application of flow cytometry in molecular oncology (BASTION workshop, 15-17th October, 2014)
2. Cancer genetics for medical community, July, 2013 Warsaw

F. Participation in courses/trainings/workshops

1. Microdissection - MicroBeam IV (training performed by Advanced Imaging Microscopy Specialist - Zeiss) October, 2013
2. Technology Day- miRNA solutions from profiling to validation" - Life Technologies 14.11.2013, Warsaw

G. Current research interests

For several years scientific interest of Magdalena concentrated on signal transduction and gene regulation. Since she joined BASTION program her scientific activity focuses on understanding the mechanism of endometriosis development – disease which in many cases leads to endometrioid or clear-cell ovarian cancer. The aim of this project is to identify mutation predisposing to endometriosis development and establish the origin of ectopic lesions. Since in some of the affected individuals, endometriosis develops into endometrioid or clear-cell ovarian cancer the identification of novel mutations could be helpful in understanding the cancer development. We have been sequencing DNA isolated from the eutopic and ectopic endometrium of affected woman as well as eutopic endometrium of healthy individuals using powerful Next Generation Sequencing (NGS) technology. The proposal for this project (accepted for founding by National Science Center) has been prepared by Dr Wlodarski group with Magdalena contribution, and she was to be the main executor of the NGS experiments.

H. Envisioned career paths in BASTION project

Dr Magdalena Banach- Orłowska has unexpectedly left the team on April 30, 2015. Her plans have not been disclosed neither to any of the team members (who are currently continuing her tasks) not to the group leader.

VIII. Agnieszka Pollak (TEAM of Pawel Wlodarski) – hired for replacement

DATE (YEARS)	DEGREE/EXPERIENCE	PLACE
1995–2000	M.Sc.	M.Sc. in Biology, with a specialization in Molecular Biology at University of Warsaw. Dissertation title: "Analysis of *suDpro* gene, proline mutations suppressor in *Aspergillus nidulans*"
2003		title "laboratory diagnostician"
2010	PhD	Ph.D. in Medicine with a specialization in Medical Biology at Warsaw Medical University. Dissertation title: "Connexins associated deafness: spectrum of mutations and clinical phenotype among polish patients"
2012		start of specialization in medical genetics laboratory

A. Publications (last 5 years)

1. Iwanicka-Pronicka K, **Pollak A**, Skórka A, Lechowicz U, Korniszewski L, Westfal P, Skarżyński H, Płoski R. Audio profiles in mitochondrial deafness m.1555A>G and m.3243A>G show distinct differences. Med Sci Monit. 2015 Mar 6;21:694-700. doi: 10.12659/MSM.890965. **IF=1,21**

2. Barg E, Skarżynska M, **Pollak A**, Ślęzak R, Głąb E, Petriczko E, Józwa A, Sąsiadek MM. Uncommon constellation of multiglandular deficiency with 2 mutations in AIRE gene in an 18-year-old girl - 12 years of observation. Endokrynol Pol. 2014;65(6):514-8. doi: 10.5603/EP.2014.0070. **IF=1,21**

3. *Ołdak M, Ścieżyńska A, Młynarski W, Borowiec M, Ruszkowska E, Szulborski K, **Pollak A**, Kosińska J, Mueller-Malesińska M, Stawiński P, Szaflik JP, Płoski R. Evidence against RAB40AL being the locus for Martin-Probst X-linked deafness-intellectual disability syndrome. Hum Mutat. 2014 Oct;35(10):1171-4. doi: 10.1002/humu.22620. Epub 2014 Aug 7. PubMed PMID: 25044830. **IF= 5.05**

4. *Ołdak M, Ruszkowska E, **Pollak A**, Sobczyk-Kopcioł A, Kowalewski C, Piwońska A, Drygas W, Płoski R. A note of caution on the diagnosis of Martin-Probst syndrome by the detection of the p.D59G mutation in the RAB40AL gene. Eur J Pediatr. 2014 Nov 5. [Epub ahead of print] PubMed PMID: 25370018. **IF=1.98**

5. *Kostera-Pruszczyk A, Kosinska J, **Pollak A**, Stawinski P, Walczak A, Wasilewska K, Potulska-Chromik A, Szczudlik P, Kaminska A, Ploski R. Exome sequencing reveals mutations in MFN2 and GDAP1 in severe

Charcot-Marie-Tooth disease. J Peripher Nerv Syst. 2014 Nov 18. doi: 10.1111/jns.12088. [Epub ahead of print] PubMed PMID: 25403865. **IF= 2.50**

6. Pawlak A, Pronicki M, Iwanicka-Pronicka K, Kuśnierz J, Płoski R, **Pollak A**, Gil RJ. [Cardiological manifestation of MELAS syndrome associated with mutation at position 3234]. Kardiol Pol. 2014;72(1):83. doi: 10.5603/KP.2014.0009. Polish. PubMed PMID: 24469753. **IF=0,53**

7. *Ploski R, **Pollak A**, Müller S, Franaszczyk M, Michalak E, Kosinska J, Stawinski P, Spiewak M, Seggewiss H, Bilinska ZT. Does p.Q247X in TRIM63 cause human hypertrophic cardiomyopathy? Circ Res. 2014 Jan 17;114(2):e2-5. doi: 10.1161/CIRCRESAHA.114.302662. PubMed PMID: 24436435. **IF=11,86**

8. Iwanicka-Pronicka K, **Pollak A**, Skórka A, Lechowicz U, Pajdowska M, Furmanek M, Rzeski M, Korniszewski L, Skarżyński H, Płoski R. Postlingual hearing loss as a mitochondrial 3243A>G mutation phenotype. PLoS One. 2012;7(10):e44054. doi: 10.1371/journal.pone.0044054. Epub 2012 Oct 25. PubMed PMID: 23133508; PubMed Central PMCID: PMC3485002. **IF=3,73**

9. Moraitou M, Dimitriou E, Mavridou I, Michelakakis H, Georgouli H, Ploski R, **Pollak A**. Transferrin isoelectric focusing and plasma lysosomal enzyme activities in the diagnosis and follow-up of hereditary fructose intolerance. Clin Chim Acta. 2012 Oct 9;413(19-20):1714-5. doi: 10.1016/j.cca.2012.06.010. Epub 2012 Jun 8. PubMed PMID: 22713622. **IF=2,53**

10. **Pollak A**, Mueller-Malesinska M, Lechowicz U, Skorka A, Korniszewski L, Sobczyk-Kopciol A, Waskiewicz A, Broda G, Iwanicka-Pronicka K, Oldak M, Skarzynski H, Płoski R. MTHFR 677T is a strong determinant of the degree of hearing loss among Polish males with postlingual sensorineural hearing impairment. DNA Cell Biol. 2012 Jul;31(7):1267-73. doi: 10.1089/dna.2012.1607. Epub 2012 Mar 16. PubMed PMID: 22424391; PubMed Central PMCID: PMC3391488. **IF=2,34**

11. Rydzanicz M, Cywińska K, Wróbel M, **Pollak A**, Gawęcki W, Wojsyk-Banaszak I, Lechowicz U, Mueller-Malesińska M, Ołdak M, Płoski R, Skarżyński H, Szyfter K, Szyfter W. The contribution of the mitochondrial COI/tRNA(Ser(UCN)) gene mutations to non-syndromic and aminoglycoside-induced hearing loss in Polish patients. Mol Genet Metab. 2011 Sep-Oct;104(1-2):153-9. doi: 10.1016/j.ymgme.2011.05.004. Epub 2011 May 13. PubMed PMID: 21621438. **IF=3,19**

12. Rydzanicz M, Wróbel M, **Pollak A**, Gawecki W, Brauze D, Kostrzewska-Poczekaj M, Wojsyk-Banaszak I, Lechowicz U, Mueller-Malesińska M, Ołdak M, Płoski R, Skarzyński H, Szyfter K. Mutation analysis of mitochondrial 12S rRNA gene in Polish patients with non-syndromic and aminoglycoside-induced hearing loss.Biochem Biophys Res Commun. 2010 Apr 23;395(1):116-21. doi: 10.1016/j.bbrc.2010.03.149. Epub 2010 Mar 28. PubMed PMID: 20353758. **IF=2,59**

B. Envisioned career path

Dr Agnieszka Pollak, who has been recruited in May to complete the tasks assigned initially to dr Banach, is planning to work with the team and finish the project on endometriosis, that is planned beyond the date of cessation of BASTION.

IX. Oksana Kovtonyuk (TEAM of Piotr Religa and prof. Zbigniew Gaciong)

DATE (YEARS)	DEGREE/ EXPERIENCE	PLACE	SUPERVISOR
1995–2000	M.Sc.	Zhytomyr State University, Faculty of Biology and Chemistry.	Dr. Sergej V.Verevka Dr. Vladimir N. Listvan
2008	PhD	R.E. Kavetsky Institute of Experimental Pathology, Oncology and Radiobiology of the National Academy of Sciences of Ukraine, Department of Anticancer Therapy Mechanisms	Prof., MD. Vasyl F. Chekhun
2009-2010	Postdoc	Jagiellonian University Faculty of Biochemistry, Biophysics and Biotechnology, Laboratory of Molecular Genetics and Virology	Prof. Hanna Rokita
2011-2012	Postdoc	Taras Shevchenko National University of Kyiv, Ukraine. The Institute of Higher Technology, Molecular Biology, Biotechnology and Biophysics Dept.	Prof. Lidia S. Kholodna
2012	Postdoc	Laboratory of Mutagenesis and DNA Repair, Institute of Biochemistry and Biophysics, Polish Academy of Sciences	Prof. Iwona J. Fijalkowska

A. Biosketch (provided by Oksana Kovtonyuk)

In 2000, after graduating from the Faculty of Natural Sciences, Zhytomyr I. Franko State University (Ukraine), I joined the Department of Anticancer Therapy Mechanisms at R.E. Kavetsky Institute of Experimental Pathology, Oncology and Radiobiology of the National Academy of Sciences of Ukraine and started my PhD thesis. Starting from 2004, I was employed as a young scientist in the same department. I worked on the study of the proteinase-antiproteinase balance in the dynamics of the growth of Guerin carcinoma and Lewis lung carcinoma with induced cisplatin resistance. In these studies we were able to show that tumor resistance to cisplatin is accompanied by significant changes of the kinetics of tumour growth. The change of the growth kinetics has been found to associate with the elevation of total proteolytic activity as well as the level of α_1-proteinase inhibitor and decreased α_2-macroglobuline level in blood plasma. It has been shown that cisplatin resistance is accompanied by the imbalance between proteolytic and antiproteolytic activities shifted to the total proteolytic activity increase in blood plasma and tumour tissue. Furthermore, we were able to demonstrate that Lewis lung carcinoma cisplatin drug resistance development is accompanied by the increase of its metastasis together with the elevation of total proteolytic activity in blood plasma.

In 2008, I have received my doctoral degree in oncology. To increase my expertise in the field of cancer biology, I moved to the Laboratory of Molecular Genetics and Virology of Prof. H. Rokita (Faculty of Biochemistry, Biophysics and Biotechnology, Jagiellonian University, Krakow, Poland) as a Postdoctoral Fellow within Marie-Curie fellowship funded under the EU's Seventh Framework Programme. My research project focused on MCPIP (Monocyte chemoattractant protein-induced protein) function in human neuroblastoma cell lines. During my 13-month stay at the lab, I worked on stable and transient transfection of neuroblastoma cells with mutant MCPIP forms and characterization of the clones at the level of MCPIP content, their proliferation and viability. In the

years 2011-2012, I worked as a Staff Scientist at the Taras Shevchenko National University of Kyiv, Ukraine.
In 2012, I joined as a postdoctoral training fellow the laboratory of Prof. Iwona Fijalkowska at the Institute of Biochemistry and Biophysics, Polish Academy of Sciences. During my 6 month stay at the lab I was working on a research project entitled "New players involved in the maintenance of genomic stability". I studied the role of PSF1 (a subunit of the GINS complex, which plays a key role at DNA replication forks) mutants in ensuring genomic microsatellite stability using *Saccharomyces Cerevisiae* cell as a model organism.

B. Publications published during BASTION project

	Authors, title, journal, year	**IF**
1	PatenYaiw KC, Mohammad AA, Taher C, Wilhelmi V, Davoudi B, Straat K, Assinger A, Ovchinnikova O, Shlyakhto E, Rahbar A, Kovtonyuk O, Religa P, Butler L, Khan Z, Streblow D, Pernow J, Söderberg-Nauclér C. Human cytomegalovirus induces upregulation of arginase II: possible implications for vasculopathies. Basic Res Cardiol. 2014 Mar;109(2):401. doi: 10.1007/s00395-014-0401-5. Epub 2014 Jan 19.	**5,414**

C. Grant applications submitted during BASTION project

1. CTCs-based novel diagnostic and screening method in cancer diseases – 3rd competition of PBS (NCBiR) – not funded
2. OPUS 8 (National Science Center) grant submitted: "Role of fibronectin in regulation of endothelial-mesenchymal transition in *in vitro* and *in vivo* models of colorectal cancer". Function: Principal Investigator – not funded

D. Participation in grants during BASTION project

1. grant of National Center of Science (Grant number 2011/01/B/NZ4/06635) ,,Effect of tumor biology of circulating tumor cells'' . Co-investigator. 2013-2014.

E. Participation in the conferences during BASTION project

1. COST working group meeting (19.09.2013-20.09.2013) Warsaw, Poland.
2. International Conference Translational Research in Oncology in New Member State Economies, Warsaw, Poland, 2015.

F. Poster presentation at the conferences

1. International Conference Translational Research in Oncology in New Member State Economies ("TRON") Kovtonyuk O, Ananthaseshan S., Soin J., Religa P. Evaluation of the role of CMV infection in colorectal cancer progression, Warsaw, Poland, 21-22 May 2015.

2. COST working group meeting. Soin J., Kovtonyuk O., Bojakowski K., Religa P. The role of CMV infection in tumor progression. Warsaw, Poland, 2013.

G. Participation in courses/trainings/workshops

1. Employing genome-wide technologies for functional regulation in development and disease course (2742), RIKEN Division of Genomic Technologies and Karolinska Institutet, 24 February – 28 April 2014.
2. Tumor virology course (1592) at Karolinska Institutet, 31 March -04 April 2014.
3. Apoptosis: Theory and Methods course (1201) at Karolinska Institutet, 07-11 April 2014.
4. "Application of flow cytometry in molecular oncology'' workshop organized by the Medical University of Warsaw as part of the BASTION project, Warsaw, 15-16 October 2014.

5. “Genome wide methods in cancer genetics” workshop organized by the Medical University of Warsaw as part of the BASTION project, Warsaw, 28 October 2014.
6. Workshop “Idea 2 Business”; Medical University of Warsaw, Poland, 26 November – 17 December 2014.
7. Workshop on flow cytometry, BASTION project, 6 May 2015.
8. “Exome analysis using the next generation sequencing platform Ion Proton”, BASTION project, 30-31 July 2015.
9. “Transcriptome analysis (RNA-seq)”, BASTION project, 5-7 August 2015.

H. Students supervision

1. PhD student Varsha Prakash
2. PhD student Sharan Ananthaseshan

I. Collaboration with other research teams started during BASTION project

1. Prof. Cecilia Söderberg-Nauclér research group, Department of Medicine, Karolinska Institutet, Cell and Molecular Immunology, Karolinska University Hospital, Stockholm, Sweden.
2. Alice Assinger, PhD, Institute of Physiology, Centre of Physiology and Pharmacolog, Vienna, Austria
3. Klas Strååt, PhD, Department of Cell and Molecular Biology, Karolinska University Hospital, Stockholm, Sweden.
4. Mariusz Sacharczuk, PhD, DSc, Department of Molecular Cytogenetics, Institute of Genetics and Animal Breeding of the Polish Academy of Sciences, Jastrzębiec, Poland.
5. Krzysztof Bojakowski, MD, PhD, DSc, Department of General, Vascular and Oncological Surgery, CSK MSW, Warsaw, Poland; Department of Immunology, Biochemistry and Nutrition, Medical University of Warsaw, Warsaw, Poland.

J. International research visits during BASTION project

Twinning at Karolinska Institute 03 November 2013 −22 December 2013, 16 February 2014 −12 April 2014, 30 May 2014 −29 June 2014

K. Current research interests

Recent studies indicate that circulating tumor cells (CTC), released by primary tumours into blood, represent an independent prognostic factor for patient survival. These are biomarkers which are increasingly being used in clinical trials.
A critical concept that has emerged to be relevant to CTCs is the epithelial to mesenchymal transition (EMT), which enables epithelial cells to lose their apical–basal polarity, detach from neighboring cells, acquire a fibroblast-like morphology and invade through the surrounding stroma. During this process, tumor cells loose expression of specific epithelial markers including E-cadherin and cytokeratin, gain expression of mesenchymal cytoskeletal and adhesion proteins such as vimentin, CD44 and N-cadherin, and upregulate kinases and growth factors including c-MET, TGF-β, Wnt. Our preliminary results show that the number and the structure of the vessels in a tumor mass is a better predictor of tumor dissemination and CTC number than tumor size. The project aims to identify the role of vascular factors in interrelationships between CTC with metastasis. Moreover, she works on modulation of angiogenesis and inhibition of tumor growth in colon cancer model through α5β1-integrin/c-Met/FAK/Src-dependent signaling pathway to identify possible molecular players that are involved in this process. Moreover, the important part of research work of Oksana is the study of anti-viral treatment of cytomegalovirus (CMV) -infected tumors (colon cancer, brain tumors) aimed to better understand the CMV role in cancer.

L. Envisioned career paths in BASTION project

Collaboration of Dr. Piotr Religa with Dr. Oksana Kovtonyuk ends with the finalization of the BASTION project. Oksana is going to look for next postdoctoral position.

X. TEAM of Zbigniew Gaciong

Marzena Lazarczyk

DATE (YEARS)	DEGREE/EXPERIENCE	PLACE	SUPERVISOR
2005	MSc.	University of Warsaw, Faculty of Biology, Warsaw, Poland	Prof. Mieczysław Kuras
2009	PhD	Mossakowski Medical Research Centre; Polish Academy of Sciences (PAS), Warsaw, Poland	Prof. Ewa Matyja

A. Biosketch (provided by Marzena Lazarczyk)

My research was previously focused on plant compounds and their potential role in anticancer therapy. Since 2009 I still continued my cancer research within PhD. I studied potential anti-proliferative properties of tachykinin and opioid peptides analoques (substance P/NK1 receptor antagonists, opioids agonists and hybrid peptides consisted of tachykinin-like and opioid sequences), as well as platinum (II) peptide complexes on human and rat glioma cell lines. The achievements of mentioned research activities were partially included in the Final Activity Report for Normolife project Specific targeted research or innovation project (Development of new therapeutic substances and strategies for treatment of pain in patients with advanced stages of cancer within Sixth Framework Programme Life Sciences, Genomics And Biotechnology For Health Liefescihealth-6).
In the meantime (2010-2013) I gained comprehensive knowledge and practical experience in clinical trials field cooperating with clinical research organizations. As a project coordinator and medical writer I had an excellent opportunity to further develop my scientific background in pre-clinical research getting familiar with clinical studies. I dealt with clinical data management, prepared numerous and completed clinical trial documentation for registration, including clinical study protocols submitted to European Medicines Agency and clinical study reports submitted to U.S. Food and Drug Administration.

B. Grant applications submitted during BASTION project

1. Preparation and coordination of project submitted for competitions: PBS III NCBiR and: Symfonia II, Symfonia III, Tango I, Sonata, Opus NCN

2. Sonata 9, NCN “Role of CCL9 chemokine in colon cancer progression” – principal investigator, failed

C. Participation in courses/trainings/workshops

1. Workshop “Application of flow cytometry in molecular oncology” 15 – 16 October 2014

D. Collaboration with other research teams started during BASTION project

Collaboration with CePT IMDiK and Institute of Genetics and Animal Breeding

E. International research visits during BASTION project

Twinning in Centre for Molecular Medicine in Stockholm (23 October – 21 December 2014, 30 June – 30 July 2015)

F. Current research interests

Since 2013 Marzena continues her cancer research trying to combine her experience in pharmaceutical industry /clinical trial companies and business area with scientific activity to commercialize the research results. We are investigating the role of distinct factors affecting tumour progression i.e. cytomegalovirus (CMV) and chemokines- mediated mechanisms of cancer metastasis. It is known that CMV contributes to increased motility of tumour cells and facilitate their migration. CMV virus presence has been detected in numerous cases of distinct human cancer types, including breast cancer, colon cancer, sarcomas, glioblastoma, medulloblastoma and neuroblastoma. We are intending to test selected compounds against CMV virus in animal model of human malignances to develop therapeutic strategies towards metastatic diseases.
Second line of research she is involved in relies on attempts to find explanation of the role of chemokines and their receptors in cancer invasiveness and migration. It has been demonstrated that chemokines can control organ predilection of metastasis. We assume that detailed insight into chemokines signaling may provide additional information on mechanisms of cancer metastasis. Upcoming studies of Marzena will focus on CXCL9-related paracrine and autocrine mechanisms by which tumors retain their own ability to spread.

G. Envisioned career paths in BASTION project

Dr Marzena Łazarczyk will be employed in a new Laboratory for Experimental Angiology, and her salary will be funded from NCN grants. She will try to build her position of an independent researcher applying for funding to Polish National Science Centre.

XI. TEAM of Rafal Ploski

Lech Trzeciak

DATE (YEARS)	DEGREE/EXPERIENCE	PLACE	SUPERVISOR
1984-1990	M.Sc.	Medical University of Warsaw, First Faculty of Medicine	- (none)
1991-1994	Assistantship	Medical Centre for Postgraduate Education, Warsaw	prof. J. Ostrowski
1994-1995	Fellowship	University of Washington, Seattle	Prof. K. Bomsztyk
1995-1999	PhD	Medical Centre for Postgraduate Education, Warsaw	prof. J. Ostrowski
2000-2001	Postdoc	M. Nencki Institute of Experimental Biology, Warsaw	prof. M. Żylicz
2001-2004	Postdoc	International Institute of Molecular and Cell Biology, Warsaw, Poland	prof. M. Żylicz

A. Biosketch (provided by Lech Trzeciak)

I began my scientific career in 1987 as a medical student, joining the research team of prof. Ostrowski at the Department of Gastroenterology, Medical Centre for Postgraduate Education in Warsaw. I started from biochemical research (such as HPLC analysis of various components or measuring activity of enzymes, looking for biomarkers of certain diseases, including neoplasms). Soon I made a transition to molecular biology, meanwhile graduating from Medical Faculty in 1990. My primary interest was cancer biology (molecular causes of transformation and metastasis) with particular emphasis on protein phosphorylation (culminated in 1.5 year fellowship in the molecular lab of prof. Bomsztyk in University of Washington, Seattle, USA, for studying phosphorylation of RNA-binding proteins, 1994-1995).
Initially I was involved in studies on the action of growth factors (via kinase receptors) on cancer cells, but it was then already clear that the reason for increased activity of certain receptors in neoplasms was DNA

mutation. In 1994 I have successfully applied for a grant for investigating p53 mutations and expression in colorectal cancer, and in 1999 completed my PhD thesis based on the results from this project that involved sequencing on first generation semi-automated DNA sequencers from ABI. In course of these studies we also looked for the contribution of DNA methylation to cancer development. I was hoping to extend these studies to cover more genes, reasoning that cancer development relies on interplay of at least several altered pathways, but we soon realized that semi-automated sequencing, although being a great improvement over radiolabeled manual method, wasn't really powered enough for a large scale cancer DNA study, considering the size and exon-intron composition of several just-cloned cancer-related genes.
In 2000 I got another grant, for cloning and studying a then-novel human protein kinase (discovered by myself through a PCR-based screen of a cancer cell transcriptome) and moved with this project to the International Institute for Molecular and Cellular Biology in Warsaw under supervision of prof. Maciej Żylicz. The study got an unexpected aid from HUGO project: an accelerated publication of a draft of human genome essentially produced a complete sequence of the gene we were attempting to clone. We followed with the studies on protein function, finding a plausible activation mechanism for the kinase and looking for its interacting partners. However, the kinase appeared to be unlikely involved in carcinogenesis. Meanwhile, we were again reminded that to study molecular biology of cancer one needs sufficient resources to cover multiple interaction networks at once.
Since then I had spent several years working in science/education, first for Polish edition of Scientific American and then for two medical book publishers, closely following the advances in the field. The development of next generation sequencing turned former impossibility into nearly a routine. Therefore I took this opportunity, quit my recent job and successfully applied for a position within BASTION project.

B. Grant applications submitted during BASTION project

1. Searching for genetic factors linked to early mortality in Polish population by means of whole-exome sequencing – co-author (primary investigator: prof. R. Płoski) – accepted for financing in May 2014
2. Pathogenesis of ovarian cancer and predicting its drug sensitivity from its molecular profile – co-author/consultant – application failed

C. Participation in grants during BASTION project

1. Searching for genetic factors linked to early mortality in Polish population by means of whole-exome sequencing – role: analyzing NGS data

D. Participation in the conferences during BASTION project

1. "Science and Business" - main topics: 1. management of intellectual property rights 2. applying for grants to governmental agencies, Warsaw, Poland, 22 November 2013
2. Workshop "Genome-wide methods in cancer genetics" Warsaw, Poland, 28 November 2014
3. "Translational Research in Oncology in New Member State Economies (TRON)", Warsaw, Poland, 21-22 May 2015.

E. Poster presentation at the conferences

1. "c.449-1G>T mutation of TMC8 gene - an unreported frequent cause of epidermodysplasia verruciformis in Polish population – a case study and molecular basis" TRON, Warsaw 2015.05.21-22.
2. "Functional analysis of SMAD4 mutants in an in vitro system reveals upregulation of SMAD2, SMAD3 and SMAD4 by Myhre syndrome-associated variants" TRON, Warsaw 21-22 May 2015.

F. Participation in courses/trainings/workshops

1. NGS workshop on SureSelect vs Haloplex; SureDesign, SureCall (dr Andreas Polten, Agilent Technologies; 29 November 2013)
2. training/tests of NimbleGen SeqCap EZ (03-07 February 2014)
3. training on the usage of Fluidigm system (13-14 March 2014)
4. Leica Microscopy Workshop in Cologne on DLS, GSD and STED (16-17 June 2015)
5. completion of postgraduate studies on statistics in biomedical research (1 year, 2014/2015) at Medical University Łódź (organized in cooperation with StatSoft)

G. Students supervision

Temporary supervising Joanna Sałkowska-Wanat, PhD student from Department of Dermatology

H. Collaboration with other research teams started during BASTION project

1) Twinning with the Institute of Virology (University of Cologne) / German National Reference Center for Papillomaviruses (head: prof. Herbert Pfister)
2) Collaboration with Department of Dermatology, WUM (also in conjunction with 1)
3) Collaboration with R. Zagożdżon team (BASTION member) on a preliminary study for possible grant application on SMAD4 function

I. International research visits during BASTION project

Twinning to Institute of Virology, University of Cologne, 23 April 2014 – 11 May 2014, 03 June 2015 – 17 July 2015

J. Current research interests

Research interests of Lech Trzeciak revolve around the role of genes in the development and outcome of cancer (incl. cancer therapy). The advent of Next Generation Sequencing allows now for a comprehensive (and relatively inexpensive) study of individual cancer exomes/genomes, methylomes and transcriptomes and compare these to the corresponding normal tissue of the same individual or its relatives, if appropriate. This approach may be used in several ways.
First, genetic predispositions towards cancer may be elucidated. Another possible way of using NGS data is to correlate an individual tumor mutation profile to the clinical parameters, most importantly to the susceptibility to treatment with conventional chemotherapeutics as well as modern targeted therapies (such as low-molecular weight kinase inhibitors etc). Lech is also interested in another use of NGS information, namely correlating mutational profile to immunologic parameters of a neoplasm.

K. Envisioned career paths in BASTION project

Regrettably, it is now impossible to extend current employment of Lech Trzeciak at Department of Medical Genetics. He is looking for a new job in the field of cancer studies, applying for a position in the newly opening laboratory studying hedgehog signaling and its role in medulloblastoma. This pathway is also of paramount importance for basal cell skin carcinomas, a field closely related to HPV-induced squamous cell skin carcinoma, so common in cases of erythrodysplasia verruciformis that he studied in twinning cooperation with Institute of Virology Cologne. There are also strong links between Hedgehog and TGFb signaling pathways, what would let Lech Trzeciak capitalize on his work with SMAD4 mutants during BASTION. He also plans to remain involved in NGS data analysis in the Department of Medical Genetics, hoping to continue developing skills and to introduce data analysis techniques he has learned last year in course of biostatistics studies.

XII. RADOSLAW ZAGOZDZON – lab leader of bioinformatics unit

A. Education:		
Year	**Degree**	**Institution**
1998	Ph.D. (Honors)	Medical University of Warsaw (Biomedical Sciences - Immunology)
1996	M.D.	Medical University of Warsaw (Medicine)
Employment History:		
Year	**Position**	**Place**
2008-2012	Postdoctoral Fellow/Occassional Lecturer	Conway Institute, School of Biomolecular and Biomedical Science, University College Dublin, Ireland
2005-2008	Instructor	Division of Experimental Medicine, Beth Israel Deaconess Medical Center, Harvard Medical School, Boston, MA
2000-2005	Postdoctoral Fellow	Division of Experimental Medicine, Beth Israel
		Deaconess Medical Center, Boston, MA
1999-2000	Adjunct	Department of Immunology, Medical University
		of Warsaw, Poland
1997-2000	Resident (General	Transplantation Institute, Holy Child Hospital,
	Medicine)	Medical University of Warsaw, Poland
1996-1997	Intern (Medicine)	Holy Child Hospital, Medical University of Warsaw, Poland

A. Biosketch (provided by Radoslaw Zagozdzon)

1. Department of Immunology, Center of Biostructure Research, Medical University of Warsaw, Poland (October 1992-July 2000) - As a medical student, I participated in research activities in experimental immunology, beginning from October 1992. Most of my scientific research was related to the antitumour immune response, especially to the effects of interleukin-12 on tumour growth in vivo. Based on the results of my research, in 1998 I have acquired a Ph.D. degree with honors. My Ph.D. thesis achieved an Award of Polish Prime Minister. The results of my work were published in more than 10 original and review articles in English and Polish. I was also co-authoring two chapters in Polish immunology textbook. In October 1999 I have been appointed as an adjunct at Medical University of Warsaw.

2. Division of Experimental Medicine, Beth Israel Deaconess Medical Center, Harvard Medical School, Boston, MA. (August 2000-June 2008) - As a postdoctoral fellow working under supervision of Dr. Hava Avraham, I have been conducting studies in the field of molecular and cellular biology. My main area of interest has been regulation of protein kinases in cancer, especially tyrosine kinases of Src- and Csk-families, however, also serine/threonine kinases such as Akt or Erk1/2. The results of my research have been summarized in several original publications. I have also co-authored a methodological chapter in the molecular biology textbook. I have been granted an instructor in medicine position in November 2005.

3. Conway Institute, University College Dublin – As a postdoctoral fellow, I have been involved in studies related to:

- Discovery and validation of biomarkers in cancer (e.g. CART, peroxiredoxin-1 [PRDX1] and anillin). As a part of this task, I have been responsible for statistical analysis (PASW software) of clinical databases to validate the value of newly discovered biomarkers in clinical settings. I have also supervised functional in vivo studies in xenograft models involving assessment of CART as a biomarker in breast cancer. Some results of these studies were summarized in the paper published in Oncogene. A manuscript summarizing results obtained with PRDX1 is currently under revision to Breast Cancer Research journal.
- Transgenic studies on generation of mice with mammary tissue specific expression of firefly luciferase (MMTV2-Luc2 mice). In addition to already known techniques related to transgenic studies, I have gained experience in advanced optical in vivo imaging using IVIS Spectrum system. Generation of this model is a solution to one of the important problems in in vivo breast cancer studies, as it allows for making many classical transgenic moise models suitable for modern optical imaging techniques. The manuscript with my equal senior authorship describing these studies has been accepted to BMC Cancer journal.
- Participation in bioinformatic analysis of putative biomarkers in breast cancer. I have closely collaborated with bioinformaticians employed under MTCI (www.mtci.ie) and RATHER (www.ratherproject.com) consortia to interrogate the role of new biomarkers or targets in breast cancer derived from transcriptomic, proteomic, NGS, RNA-Seq and SNP analyses

B. Publications published during BASTION project

	Authors, title, journal, year	**IF**
1	Siernicka M, Winiarska M, Bajor M, Firczuk M, Muchowicz A, Bobrowicz M, Fauriat C, Golab J, Olive D, **Zagozdzon R**. Adenanthin, a new inhibitor of thiol-dependent antioxidant enzymes, impairs the effector functions of human natural killer cells. Immunology. 2015 Jun 11. doi: 10.1111/imm.12494.	**3,795**
2	Nowis D, Malenda A, Furs K, Oleszczak B, Sadowski R, Chlebowska J, Firczuk M, Bujnicki JM, Staruch AD, **Zagozdzon R**, Glodkowska-Mrowka E, Szablewski L, Golab J. Statins impair glucose uptake in human cells. BMJ Open Diabetes Res Care. 2014 Apr 26;2(1):e000017.	**0**
3	O'Leary PC, Terrile M, Bajor M, Gaj P, Hennessy BT, Mills GB, Zagozdzon A, O'Connor DP, Brennan DJ, Connor K, Li J, Gonzalez-Angulo AM, Sun HD, Pu JX, Pontén F, Uhlén M, Jirström K, Nowis DA, Crown JP, **Zagozdzon R**, Gallagher WM. Peroxiredoxin-1 protects estrogen receptor	**5,881**

	α from oxidative stress-induced suppression and is a protein biomarker of favorable prognosis in breast cancer. Breast Cancer Res. 2014 Jul 10;16(4):R79.	
4	Gaj P, **Zagozdzon R**. In silico analysis of microRNA-510 as a potential oncomir in human breast cancer. Breast Cancer Research 2014, 16:403; doi:10.1186/bcr3624	**5,490**
5	Muchowicz A, Firczuk M, Chlebowska J, Nowis D, Stachura J, Barankiewicz J, Trzeciecka A, Klossowski S, Ostaszewski R, **Zagozdzon R**, Pu JX, Sun HD, Golab J. Adenanthin targets proteins involved in the regulation of disulphide bonds. Biochem Pharmacol. 2014 May 15;89(2):210-6.	**5,009**
6	Burdzinska A, Gala K, Kowalewski C, **Zagozdzon R**, Gajewski Z, Pączek L. Dynamics of acute local inflammatory response after autologous transplantation of muscle-derived cells into the skeletal muscle. Mediators Inflamm. 2014;2014:482352. doi: 10.1155/2014/482352.	**3,236**
7	**Zagozdzon R**, Golab J. Cancer stem cells in haematological malignancies. Contemp Oncol (Pozn) 2015; 19 (1A): A1–A6	**0**
8	Lasek W, **Zagożdżon R**, Jakobisiak M. Interleukin 12: still a promising candidate for tumor immunotherapy? Cancer Immunol Immunother. 2014 May;63(5):419-35. doi: 10.1007/s00262-014-1523-1.	**3,941**
9	**Zagozdzon R**, Gaj P. Modern methods of risk assessment and infections diagnosis in patients after transplantation. in 'Transplantologia praktyczna', vol. 5: 'Zakażenia w transplantologii'. Eds. Leszek Pączek, Krzysztof Mucha, Bartosz Foroncewicz; PWN, Warsaw 2013 [in Polish]	**0**
10	Gaj P, **Zagozdzon R**. Modern biomarkers of allograft survival. in 'Transplantologia praktyczna', vol. 6: 'Wyniki odlegle transplantacji narzadow'. Eds. Leszek Pączek, Krzysztof Mucha, Bartosz Foroncewicz; PWN, Warsaw 2013	**0**

C. Patent applications filed during BASTION project

Pawel Gaj, Radoslaw Zagozdzon. Stratification of B-cell lymphoma cases using a gene expression signature. European Patent Application No. EP14461567.1

D. Grant applications submitted during BASTION project

Title	Funding Institution	Principal Investigator	Period	Funds (PLN)
Evaluation of peroxiredoxins 1 and 2 along with the thioredoxin-thioredoxin reductase system as new therapeutic targets in B cell lymphomas	NCN	**Radoslaw Zagozdzon**	2013-2016	987 000
The role for thiol-dependent antioxidant enzymes in estrogen receptor-positive breast cancer	NCN	**Radoslaw Zagozdzon**	2015-2018	1 213 233

G. Participation in the conferences during BASTION project

1. EMBO Conference, Cellular signalling and cancer therapy. Cavtat, Croatia, 23-27 May 2014

2. 15th International Conference on Oxidative Stress Reduction, Redox Homeostasis and Antioxidants; Paris, France, 22-24 June 2015

3. „Translational Research in Oncology in New Member State Economies" (TRON) conference, Warsaw, Poland, 21-22 May 2015

F. Poster presentation at the conferences

Active:

1. **Radoslaw Zagozdzon**, Patrick C. O'Leary, Gaj Pawel, Bryan T Hennessy, Gordon B. Mills, Ana M. Gonzalez-Angulo, Han-Dong Sun, Fredrik Pontén, Karin Jirström, William M. Gallagher, et al. Peroxiredoxin-1 regulates estrogen receptor alpha protein content in breast cancer cells undergoing oxidative stress and is a prognostic biomarker in this disease, EMBO Conference, Cellular signalling and cancer therapy. Cavtat, Croatia, 23-27 May 2014
2. **Radoslaw Zagozdzon**, Marta Siernicka, Malgorzata Bajor, Malgorzata Firczuk, Angelika Muchowicz, Malgorzata Bobrowicz, Cyril Fauriat, Jakub Golab, Daniel Olive, Magdalena Winiarska. Adenanthin, a new inhibitor of thiol-dependent antioxidant enzymes, deeply impairs the effector functions of human natural killer cells. 15th International Conference on Oxidative Stress Reduction, Redox Homeostasis and Antioxidants; Paris, France, 22-24 June 2015
3. **Radoslaw Zagozdzon**, Marta Siernicka, Malgorzata Bajor, Malgorzata Firczuk, Angelika Muchowicz, Malgorzata Bobrowicz, Cyril Fauriat, Jakub Golab, Daniel Olive, Magdalena Winiarska. Anti-cancer effector functions of human natural killer cells are hampered by adenanthin, a new inhibitor of thiol-dependent antioxidant enzymes. Warsaw, Poland, TRON, 21-22 May 2015

Passive:

1. Malgorzata Bajor, Agata O Zych, Patrick C O'Leary, Anna Czekalska, William M Gallagher, Jakub Golab, **Radoslaw Zagozdzon.** Adenanthin, a new peroxiredoxin inhibitor, induces a switch between estrogen receptor alpha-mediated and Akt-driven signaling in breast cancer cells. Warsaw, Poland, TRON, 21-22 May 2015
2. Lech Trzeciak, Paweł Gaj, Agata Skórka, Paulina Nadkowska, Agnieszka Pollak, Joanna Kosińska, Rafał Płoski, **Radosław Zagożdżon**. Functional analysis of SMAD4 mutants in an in vitro system reveals upregulation of SMAD2, SMAD3 and SMAD4 by Myhre syndrome-associated variants. Warsaw, Poland, TRON, 21-22 May 2015
3. Robert Świder, Agnieszka Perkowska-Ptasińska. Anna Stachurska, Jadwiga Fabijańska-Mitek, Radosław Zagożdżon, Sławomir Gruca, Jakub Gołąb, Marcin Poterski, Magdalena Durlik. Morphometry of the Epithelial-Mesenchymal Transition (EMT) in Subsequent Biopsies from Transplanted Kidney. American Transplant Congress, Philadelphia, PA, USA, 2-6 May 2015
4. Malgorzata Bajor, Agata O Zych, Patrick C O'Leary, Anna Czekalska, William M Gallagher, Jakub Golab, **Radoslaw Zagozdzon.** Adenanthin, a new peroxiredoxin inhibitor, induces a switch between estrogen receptor alpha-mediated and Src/Akt-driven signaling in breast cancer cells. San Antonio Breast Cancer Symposium, San Antonio, Texas, USA (Cancer Res May 1, 2015 *75;* P5-07-09), 9-13 December 2014
5. Malgorzata Firczuk, Anna Trzeciecka, Malgorzata Bajor, Angelika Muchowicz, **Radoslaw Zagozdzon**, Joanna Barankiewicz, Antoni Domagala, Szymon Klossowski, Agata Malinowska, Justyna Chlebowska, Ryszard Ostaszewski, Jakub Golab, Dominika Nowis. Peroxiredoxins-1 and 2 Affect Proliferation and Survival of Lymphoma Cells. 56th ASH Annual Meeting, San Francisco, CA, USA, 6-9 December 2014
6. Malgorzata Bajor, Patrick C. O'Leary, Pawel Gaj, Bryan T. Hennessy, Jakub Golab, William M. Gallagher, **Radoslaw Zagozdzon.** An antibody-based proteomic approach for identification of PRDX1 as a biomarker in estrogen receptor positive breast cancer. 10th Siena Meeting "From genome to proteome" 20 Years of Proteomics, Siena, Italy, 31 August – 4 September 2014
7. Malgorzata Bajor, Patrick C. O'Leary, Agata Zych, Jakub Golab, William M. Gallagher, **Radoslaw Zagozdzon.** Evaluation of adenanthin as an intracellular signaling modulator and potential therapeutic agent in estrogen receptor positive breast cancer. EMBO Conference, Cellular signalling and cancer therapy. Cavtat, Croatia, 23-27 May 2014

8. Martina McDermott, Lee Anderson, Liam Shields, Neil O'Brien, Allison Prendergast, Susan Kennedy, William Gallagher, **Radoslaw Zagozdzon**, Annette Byrne, John Crown, Dennis Slamon, Norma O'Donovan. Increased co-amplification of HER2 and STARD3 in a cell line model of acquired lapatinib resistance. [abstract]. In: Proceedings of the 104th Annual Meeting of the American Association for Cancer Research; Washington, DC. Philadelphia (PA): AACR; Cancer Res 2013;73(8 Suppl):Abstract nr 5634. doi:10.1158/1538-7445.AM2013-5634, 6 – 10 April 2013
9. PC O'Leary, DJ Brennan, DP O'Connor, BT Hennessy, AM Gonzalez-Angulo, J Li, GB Mills, F Pontén, K Jirström, M Uhlen, HD Sun, JX Pu, AM Zagozdzon, D Nowis, J Crown, **R Zagozdzon**, WM Gallagher. The antioxidant enzyme, peroxiredoxin-1, protects the estrogen receptor against oxidative stress-induced suppression and is correlated with differential outcome of patients with breast cancer. Irish Association for Cancer Research Annual Meeting; Dublin, Ireland, 28 February-1 March 2013,

H. Participation in courses/trainings/workshops

1. Workshop: Roundtable from lab to clinic, Brussels, Belgium, 4 June 2013
2. Pharma Day 2014, Warsaw, Poland, 25 April 2014
3. Techniques in analysis of cancer vascular biology, Warsaw, Poland, 6 June 2014
4. Application of flow cytometry in molecular oncology, Warsaw, Poland, 15-16 October 2014
5. Genome-wide methods in cancer genetics, Warsaw, Poland, 28 October 2014
6. Nordic Immunohistochemistry Basic Course, Kopenhagen, Denmark, 21-22 January 2015
7. Pharma Day 2015, Warsaw, Poland, 24 April 2015
8. Molecular Diagnostic in Cancer, Warsaw, Poland, 8 June 2015

I. Organization of the conferences

Member of the organizing committee and co-chair of a session at „Translational Research in Oncology in New Member State Economies" (TRON) conference, 21-22 May 2015, Warsaw, Poland

J. Students supervision

Co-Supervising of the First Faculty of Medicine, Medical University of Warsaw PhD student – Agata Zych, MSc

Supervising the students of the Students' Scientific Group at the Department of Immunology, the Medical University of Warsaw: Pawel Koczara, Paulina Nadkowska, Anna Czekalska

K. Collaboration with other research teams started during BASTION project

Domestic:

1. Prof. Leszek Paczek, Dr. Krzysztof Mucha, Dr. Anna Burdzinska, Transplantation Institute, Warsaw, Poland
2. Prof. Magdalena Durlik, Dr. Robert Swider, Transplantation Institute, Warsaw, Poland
3. Dr. Maciej Wiznerowicz, Greater Poland Cancer Centre, Poznan, Poland

Foreign:

1. Prof. William Gallagher, Cancer Biology & Therapeutics Laboratory, UCD Conway Institute, UCD School of Biomolecular and Biomedical Science, Dublin, Ireland.

2. Prof. Bryan Hennessy, Department of Medical Oncology, Beaumont Hospital, Royal College of Surgeons in Ireland, Dublin, Ireland.
3. Prof. Han-Dong Sun, State Key Laboratory of Phytochemistry and Plant Resources in West China, Kunming Institute of Botany, Chinese Academy of Sciences, Yunnan, China
4. Prof. Daniel Olive, Dr. Cyril Fauriat, Research Center in Oncology of Marseille, France
5. Dr. Patrick O'Leary, UCSF, CA, USA

L. Current Research Interests (provided by Dr Zagozdzon)

Advances in biomedical technology in recent years resulted in a dramatic increase in the inflow of information acquired in scientific research. To cope with this flood of data, it is necessary to create research groups specializing in bioinformatics, systems biology, and validation of the results obtained via modern biotechniques. This indeed is the main goal of the activities carried out in our new group. One of the specific tasks is to evaluate the role of one of the enzymatic systems responsible for eliminating the effects of oxidative stress within the tumor cell. We assume that this pathway can become be a potential target for new anticancer drugs. In our study we utilize the data generated by genomic sequencing techniques, transcriptomics and proteomics methods supported by histological and molecular biology experiments. This project is carried out in collaboration with two research centers from Ireland (University College Dublin, UCD, and Royal College of Surgeons Dublin, RCSI) and the group from China. Our efforts in this project gained support from the Polish National Science Center under the OPUS sponsorship program. Three other funding proposals from our group are submitted and decisions are pending (please see the details of the grants in the scientific report).

Furthermore, we are in process of establishing and utilizing a computing cluster as a part of the bioinformatic activities under the BASTION program. This cluster will also serve the other groups involved in the BASTION program in order to catalogue and process biological information derived from the newly created or publicly available databases. The main applications for this computing cluster will be related to the support for the analysis Next Generation Sequencing (NGS) and transcriptomic and epigenetic profiling assays. In addition to that, we are in a process of purchasing the histology slide scanner (for which we have already managed to secure funding from the National Science Center) in order to establish a digital pathology facility working in conjunction with the computer cluster.

Our research team provides a number of comprehensive and versatile biotechnological approaches to the tasks delineated under the BASTION program. In more details, Drs Malgorzata Bajor and Radoslaw Zagozdzon are responsible for generating and analyzing the biological and biomedical data. Dr Pawel Gaj is mainly responsible for in silico analyses of the results generated within our team, by the collaborators or originating from the publically available datasets. Mr. Piotr Stawinski provides bionformatic support for Next Generation Sequencing data acquired mainly by the group of Prof. Rafal Ploski. Mr. Slawomir Gruca is mainly responsible for purchasing, installation and maintenance of the computer cluster and computer workstations. Additionally, Dr Zagozdzon along with Dr Dominika Nowis have also initiated a close collaboration with the Oncology Institute, Warsaw, in order to provide a bioinformatics support for the analysis the databases of clinical information from cancer patients.

The efforts of our group have resulted so far in authorships or co-authorships of four original and one review publications as well as two book chapters. Currently, three other publications are submitted (please see the scientific report for the details). Moreover, the study with participation of Drs Dominika Nowis and Radoslaw Zagozdzon received a Beatson Medal award for the best presentation in the breast cancer area at the Irish Association for Cancer Research Annual Meeting; 28 February-1 March 2013, Dublin, Ireland. The award was given for the presentation given by Mr. Patrick O'Leary, a member of our partnering lab at

UCD.

L. Envisioned career path

Dr. Radoslaw Zagozdzon will continue his work in the Department of Immunology, WUM as a part-time coordinator of two projects sponsored by National Science Center (2.5 years). Additionally, he will proceed with his clinical training in the field of clinical immunology as a volunteer in the Department of Clinical Immunology, Infant Jesus Clinical Hospital, Warsaw.

XIII. MALGORZATA BAJOR (TEAM of Radoslaw Zagozdzon)

DATE (YEARS)	DEGREE/EXPERIENCE	PLACE	SUPERVISOR
2003	M.Sc.	University of Maria Curie-Sklodowska, Lublin, Poland	Prof. dr hab. Magdalena Fikus
2010	PhD	Institute of Biochemistry and Biophysics Polish Academy of Sciences, Warsaw, Poland	Prof. dr hab. Michał Dadlez
2008-2010	Predoc	The Nencki Institute, Warsaw, Poland	Prof. dr hab. Leszek Kaczmarek
2011-2012	Postdoc		
2012/2013 (6 months)	Postdoc	Peninsula College of Medicine and Dentistry University of Exeter, Exeter, United Kingdom	Prof. Robert Pawlak

A. Biosketch (provided by Malgorzata Bajor)

I have gained my Master's degree in Biotechnology from the Department of Biology and Earth Sciences, University of Maria Curie-Sklodowska in Lublin, Poland in 2003. During my M.Sc. research work I used molecular biology and genetics techniques to study role of genes involved in translation termination in yeast.

After completing my M.Sc. I joined to the group of Prof. Michal Dadlez where I started my PhD studies. My PhD research work was focused on the determination of the impact of S-nitrosylation of S100A1 and S100B proteins on their structural changes and metal binding properties. The obtained results uncovered S-nitrosylation as a novel post-translational modification of S100A1 and S100B proteins which may contribute to their activation by metal ions and may suggest an interplay between several signaling mechanisms in governing function of these proteins in the cell. The second line of my PhD research work was to determine the exact interaction site(s) between S100A1, S100B proteins and Receptor for Advanced Glycation End products. Understanding how these proteins interact with each other will allow to elucidate their biological functions. In the future, they might be used as therapeutic targets for treating in heart failure and neurodegenerative diseases, in which they are involved. During my PhD study I gained a set of new abilities and techniques including: determination of the protocols for efficient protein expression and purification, an extensive knowledge of column chromatography (e.g. HPLC, FPLC, SEC), a wide range of biophysical and biochemical methods for protein characterization and related to them data analysis and finally techniques coupled with mass spectrometry and MS data analysis.

Next, I have worked as an independent research fellow in the Laboratory of Neurobiology at the Nencki Institute in a group of Prof. Leszek Kaczmarek. There, I was involved in project focused on the identification of the matrix metalloproteinase-9 (MMP-9) protein targets at the synapse. I used the two dimensional fluorescence difference gel electrophoresis (DIGE) coupled with mass spectrometry to characterize the changes

taking place in synaptodegradome of the wild-type and MMP-9 knockout mice. The extensive research allowed proposing new members of the MMP-9 degradome.

Furthermore, with the support of Short-Term Scientific Mission Grant from the COST Action I spent six months, as a visiting research fellow, at the University of Exeter in group of Prof. Robert Pawlak. I was involved in projects focused on understanding the regulating neuronal activity underlying fear and anxiety. To achieve my goals I used a combination of molecular biology and novel proteomic techniques based on the isotopic labeling of N-terminal ends that allowed for direct identification of the protease dependent protein cleavage sites. Moreover, I was also involved in the project related to PAR1 receptor and its role in mediating contrasting neuronal responses depending on the emotional status of an animal.

B. Publications published during BASTION project

	Authors, title, journal, year	IF
1	Siernicka M, Winiarska M, Bajor M, Firczuk M, Muchowicz A, Bobrowicz M, Fauriat C, Golab J, Olive D, Zagozdzon R. Adenanthin, a new inhibitor of thiol-dependent antioxidant enzymes, impairs the effector functions of human natural killer cells. Immunology. 2015 Jun 11. doi: 10.1111/imm.12494.	**3,795**
2	O'Leary PC, Terrile M, Bajor M, Gaj P, Hennessy BT, Mills GB, Zagozdzon A, O'Connor DP, Brennan DJ, Connor K, Li J, Gonzalez-Angulo AM, Sun HD, Pu JX, Pontén F, Uhlén M, Jirström K, Nowis DA, Crown JP, Zagozdzon R, Gallagher WM. Peroxiredoxin-1 protects estrogen receptor α from oxidative stress-induced suppression and is a protein biomarker of favorable prognosis in breast cancer. Breast Cancer Res. 2014 Jul 10;16(4):R79.	**5,881**
3	Mucha K, Bakun M, Jaźwiec R, Dadlez M, Florczak M, Bajor M, Gala K, Pączek L. 'Complement components, proteolysis‐related, and cell communication‐related proteins detected in urine proteomics are associated with IgA nephropathy' Pol Arch Med Wewn. 2014 Aug 7;124(7-8):380-6	**2,121**
4	Wiera G, Wozniak G, Bajor M, Kaczmarek L, Mozrzymas JW. Maintenance of long-term potentiation in hippocampal mossy fiber-CA3 pathway requires fine-tuned MMP-9 proteolytic activity. Hippocampus. 2013 Jun;23(6):529-43.	**4,302**

C. Grant applications submitted during BASTION project

Grant number	Title	Function	Duration	Funding	Awarding institution
2013/11/D/NZ5/03173	Interrogating the mechanisms of function of peroxiredoxin 1 (PRDX1) in estrogen receptor-positive breast cancer	Project Leader	2014-2017	Project not granted	National Science Center
1M19/PM14/14/14	[Zbadanie mechanizmów regulujących proces S-nitrozylacji receptora estrogenowego w raku piersi]	Project Leader	2014	37 500 PLN	Medical University of Warsaw - Young Researcher Grant
IP2014 001573	["Zbadanie roli peroksyredoksyny 2 (PRDX 2) w raku piersi z dodatnią ekspresją receptora estrogenowego]	Project Leader	2014-2016	Project not granted	Ministry of Science and Higher Education

2015/17/B/NZ6/04254	The role of thiol-dependent antioxidant defense system in regulation of the natural killer cell activity	Project Leader	2016-2019	Undergoing evaluation	National Science Center

D. Participation in the conferences during BASTION project

1. EMBO Conference, Cellular signalling and cancer therapy, Cavtat, Croatia, 23-27 May 2014
2. San Antonio Breast Cancer Symposium, San Antonio, Texas, USA, 9-13 December 2014
3. 10th Siena Meeting "From genome to proteome" 20 Years of Proteomics, Siena, Italy, 31 August – 4 September, 2014
4. International Conference Translational Research in Oncology in New Member States Economies TRON, Warsaw, Poland, 21-22 May 2015
5. ISANH Antioxidants World Congress 2015, Institut Pasteur, Paris, France, 22-24 June 2015

E. Poster presentation at the conferences

1. EMBO Conference: "Cellular signalling and cancer therapy", **Bajor M***, O'Leary PC, Zych AO, Golab J, Gallagher WM, Zagozdzon R Poster title: Evaluation of adenanthin as an intracellular signaling modulator and potential therapeutic agent in estrogen receptor positive breast cancer, Cavtat, Croatia, 23-27 May 2014
2. 10th Siena Meeting "From genome to proteome" 20 Years of Proteomics, **Bajor M***, O'Leary PC, Gaj P, Hennessy BT, Golab J, Gallagher WM, Zagozdzon R Poster title: An antibody-based proteomic approach for identification of PRDX1 as a biomarker in estrogen receptor positive breast cancer, Siena, Italy, 31 August – 4 September 2014
3. ASH Annual Meeting, Firczuk M, Malinowska A, Trzeciecka A, **Bajor M**[#], Chlebowska J, Ostaszewski R, Muchowicz A, Golab J, Zagozdzon R, Nowis D Poster title: Peroxiredoxins-1 and 2 Affect Proliferation and Survival of Lymphoma Cells, San Francisco, CA, USA, 6-9 December 2013
4. San Antonio Breast Cancer Symposium, **Bajor M***, Zych AO, O'Leary PC, Czekalska A, Gallagher WM, Golab J Zagozdzon R Poster title: Adenanthin, a new peroxiredoxin inhibitor, induces a switch between estrogen receptor alpha-mediated and Src/Akt-driven signaling in breast cancer cells, San Antonio, Texas, USA, 9-13 December 2014
5. International Conference Translational Research in Oncology in New Member States Economies TRON, **Bajor M***, Zych AO, O'Leary PC, Czekalska A, Gallagher WM, Golab J Zagozdzon R Poster title: Adenanthin, a new peroxiredoxin inhibitor, induces a switch between estrogen receptor alpha-mediated and Akt-driven signaling in breast cancer cells, Warsaw, Poland, 21-22 May 2015
6. International Conference Translational Research in Oncology in New Member States Economies TRON, Firczuk M, Trzeciecka A, **Bajor M**[#], Muchowicz A, Zagożdżon R, Barankiewicz J,Domagala A, Klossowski S, Malinowska A, Chlebowska J, Ostaszewski R, Golab J,Nowis D Poster title: Peroxiredoxins-1 and 2 affect proliferation and survival of lymphoma cells, Warsaw, Poland, 21-22 May 2015
7. International Conference Translational Research in Oncology in New Member States Economies TRON, Zagozdzon, Siernicka M, **Bajor M**[#], Firczuk M, Muchowicz A, Bobrowicz M, Fauriat C, Golab J, Olive D, Winiarska M Poster title: Anti-cancer effector functions of human natural killer cells are hampered by adenanthin, a new inhibitor of thiol-dependent antioxidant enzymes, Warsaw, Poland, 21-22 May 2015
8. ISANH Antioxidants World Congress 2015 – Institut Pasteur, **Bajor M***, O'Leary PC, Zych AO, Gallagher WM, Golab J Zagozdzon R Poster title: Role of thiol-dependent peroxiredoxins in regulation of Akt signaling in breast cancer, Paris, France, 22-24 June 2015
9. ISANH Antioxidants World Congress 2015 – Institut Pasteur, Zagozdzon R., Siernicka M, **Bajor M**[#], Firczuk M, Muchowicz A, Bobrowicz M, Fauriat C, Golab J, Olive D, Winiarska M Poster title: Adenanthin, a new inhibitor of thiol-dependent antioxidant enzymes, deeply impairs the effector functions of human natural killer cells, Paris, France, 22-24 June 2015

***** as presenting author
[#] as co-author

F. Participation in courses/trainings/workshops

1. Cancer genetics for medical community Workshop organized by the Medical University of Warsaw in the project BASTION, Warsaw, Poland, 17 June 2013
2. Techniques in analysis of cancer vascular biology, Warsaw, Poland, 6 June 2014
3. Application of flow cytometry in molecular oncology, Warsaw, Poland, 15-16 October 2014
4. Genome-wide methods in cancer genetics, Warsaw, Poland, 28 October 2014
5. Molecular Diagnostic in Cancer, Warsaw, Poland, 8 June 2015

G. Awards/fellowships obtained during BASTION project

2nd degree Award for the Best Publication from Polish Society of Internal Medicine
http://tip.org.pl/artykul.html?aid=117906

H. International research visits during BASTION project

1. Prof. Bryan HennessyDepartment of Oncology, Molecular Medicine Laboratories, Beaumont Hospital, Royal College of Surgeons, Dublin, Ireland, 30 June -13 July 2014
2. Prof. William M. Gallagher Cancer Biology and Therapeutics Lab, Conway Institute, University College Dublin, Dublin, Ireland, 6- 20 May 2015 and 1 - 31 July 2015

I. Current Research Interests

Currently, I am working as an experienced postdoctoral fellow in the group of Dr. Radosław Zagozdzon. I am studying the role of the one of free radical scavenging systems responsible for removal of the effects of oxidative stress within the tumor cell. Mounting evidence suggests that deregulation of the intracellular redox status along with the changes in the production of reactive oxygen species (ROS) scavengers and the activity of antioxidant enzymes are associated with various human diseases. My current research interest is related to interrogation of the precise molecular mechanism(s) of one of the crucial redox-dependent processes in breast cancer, namely, the regulation of estrogen receptor (ER) alpha function by oxidative stress. Breast cancer is a heterogeneous disease driven by a continuum of mutations and abnormal gene/protein expression that control the tumorigenic phenotype and molecular mechanisms underpinning the complexity of its clinical behavior. Roughly 70% of breast cancers express estrogen receptor alpha (ERα), but many aspects of regulation of this expression remain insufficiently studied. Understanding these processes is a key to find better therapeutic approaches to this disease. Based on, our preliminary results we hypothesized, that one of the most prominent ROS scavenging enzymes within the cell, peroxiredoxin 1 (PRDX1), acts as a protector of dependence of mammary tumors on estrogen-mediated growth stimulation during oxidative and/or nitrosative stress and is an independent predictor of favorable prognosis in estrogen receptor-positive breast cancer. The aim of my work is to elucidate the detailed molecular mechanism(s) of function of the PRDX1 in ER-positive breast cancer. This knowledge will provide an assessment of the link between PRDX1, oxidative stress and estrogen receptor signaling cascade and can create various opportunities for pharmacological intervention in ER-positive breast cancer. We plan to investigate the mechanisms of the PRDX1-dependent regulation of ERα in response to oxidative stress conditions at three various areas, namely, at the level of transcription, at the protein level and by studying the protein-protein interactions. To achieve our objectives we will use a variety of state-of-the-art approaches including powerful quantitative techniques to study gene expression, genetic engineering of cells using lentiviral vectors, next-generation sequencing, microRNA profiling studies, proteomics approaches to study the redox state in the cell, and protein-protein interaction studies including bioinformatics data analysis for all high throughput transcriptomic studies.

J. Envisioned career path

Continuation of employment in Dept. of Immunology, WUM, based on funding from National Science Center. Key investigator in R. Zagozdzon grant - The role for thiol-dependent antioxidant enzymes in estrogen receptor-

positive breast cancer, 2014/13/B/NZ5/01354. My work is focused on the explaining the precise molecular mechanisms of actions, one of the most prevalent scavenging enzymes, PRDX1 in estrogen receptor-positive breast cancer. Moreover, I submitted a grant application to National Science Center, Poland, to support study on the role of thiol-dependent antioxidant defense system in regulation of the natural killer cell activity.

XIV. Pawel Gaj (TEAM of Radoslaw Zagozdzon)

DATE (YEARS)	DEGREE/ EXPERIENCE	PLACE	SUPERVISOR
2005-2013	Research Scientist	Department of Gastroenterology and Hepatology at Medical Centre of Postgraduate Education	Professor Jerzy Ostrowski
2005-2009	PhD in medical sciences	Department of Gastroenterology and Hepatology at Medical Centre of Postgraduate Education	Professor Jerzy Ostrowski
2003-2004		Hiroshima University, JAPAN; Hiroshima University Study Abroad Program	Professor Taiji Hotta
2001-2005	M.Sc.	Warsaw Agricultural University, Department of Plant Genetics Breeding and Biotechnology	Professor Stefan Malepszy

A. Biosketch (provided by Pawel Gaj)

The character of my research has evolved over time from purely laboratory oriented work towards my present profile of a person who is involved in both the laboratory work and computational analyses of the experimental data. My research interests focused mainly on genomics, i.e. genome-wide association studies (GWAS) in various types of complex diseases: colorectal cancer, prostate cancer, breast cancer and late-onset Alzheimer's disease. The aim of my research was the identification of new and verification of already described polymorphic markers (SNPs) involved in modified susceptibility to the sporadic Alzheimer's disease as well as . During this study I have not only had a chance to use various readily available bioinformatic tools, including PLINK, Haploview, R-project, but I have also had an opportunity to develop a simple Perl language-based analytical approach for analysis of pooled-DNA sample GWAS data. This cost-effective genetic variation screening method has let me identify several genetic polymorphisms differentially represented in the groups of Alzheimer's disease patients and control subjects. After TaqMan® validation of the GWAS results I was able to identify a novel candidate SNP marker on chromosome 9 (9q21.33), which showed association with LOAD in a manner independent from the one described by the already known APOE ε4 variant (DOI: 10.3233/JAD-2012-120520). During the course of this study I highly enjoyed both working at the laboratory and running all of the statistical analyses.

Besides the population based studies I am also interested in resolving genetic background of very rare syndromes, with the use of emerging availability of next generation sequencing techniques. Recently, I have had a chance to apply an analytical Genome Analysis Toolkit (GATK) based workflow to an Exome-seq experimental data obtained from a family diagnosed with a condition resulting in exceptionally high levels of

serum amino-transferases. This work enabled me to identify non-synonymous single nucleotide variants (SNV), as well as short frameshift insertions/deletions in the coding portion of the human genome.

B. Publications published during BASTION project

	Authors, title, journal, year	IF
1	O'Leary PC, Terrile M, Bajor M, Gaj P, Hennessy BT, Mills GB, Zagozdzon A, O'Connor DP, Brennan DJ, Connor K, Li J, Gonzalez-Angulo AM, Sun HD, Pu JX, Pontén F, Uhlén M, Jirström K, Nowis DA, Crown JP, Zagozdzon R, Gallagher WM. Peroxiredoxin-1 protects estrogen receptor α from oxidative stress-induced suppression and is a protein biomarker of favorable prognosis in breast cancer. Breast Cancer Res. 2014 Jul 10;16(4):R79.	**5,881**
2	Gaj P, Zagozdzon R. In silico analysis of microRNA-510 as a potential oncomir in human breast cancer. Breast Cancer Research 2014, 16:403; doi:10.1186/bcr3624	**5,881**
3	Bojarczuk K., Siernicka M., Dwojak M., Bobrowicz M., Pyrzynska B., Gaj P., Karp M., Giannopoulos K., Efremov D.G., Golab J., Winiarska M. (2014). B-cell receptor pathway inhibitors affect CD20 levels and impair antitumor activity of anti-CD20 monoclonal antibodies. Leukemia 28, 1163-7.	**10,431**
4	Gil J, Gaj P, Misiak B, Ostrowski J, Karpinski P, Jarczyńska A, Kielan W, Sasiadek MM. CYP1A1 Ile462Val polymorphism and colorectal cancer risk in Polish patients. Med Oncol. 2014 Jul;31(7):72.	**2,634**
5	Noreen F, Röösli M, Gaj P, Pietrzak J, Weis S, Urfer P, Regula J, Schär P, Truninger K. Modulation of age- and cancer-associated DNA methylation change in the healthy colon by aspirin and lifestyle. J Natl Cancer Inst. 2014 Jun 28;106(7).	**12,583**
6	Zagozdzon R, Gaj P. Modern methods of risk assessment and infections diagnosis in patients after transplantation. in 'Transplantologia praktyczna', vol. 5: 'Zakażenia w transplantologii'. Eds. Leszek Pączek, Krzysztof Mucha, Bartosz Foroncewicz; PWN, Warsaw 2013 [in Polish]	**0**
7	Gaj P, Zagozdzon R. Modern biomarkers of allograft survival. in 'Transplantologia praktyczna', vol. 6: 'Wyniki odlegle transplantacji narzadow'. Eds. Leszek Pączek, Krzysztof Mucha, Bartosz Foroncewicz; PWN, Warsaw 2013	**0**
8	Bielinska B, Gaj P, Kluska A, Nowakowska D, Balabas A, Dabrowska M, Niwinska A, Gruchota J, Zub R, Skasko E, Steffen J, Ostrowski J, Siedlecki JA. Association of the BRCA1 promoter polymorphism rs11655505 with the risk of familial breast and/or ovarian cancer. Fam Cancer. 2013 Dec;12(4):691-8	**1,618**

C. Patent applications filed during BASTION project

Pawel Gaj, Radoslaw Zagozdzon. Stratification of B-cell lymphoma cases using a gene expression signature. European Patent Application No. EP14461567.1

D. Grant applications submitted during BASTION project

Grant number	Title	Function	Duration	Funding	Awarding institution
2013/11/D/NZ2/02769	Analysis and evaluation of significance of molecular differences between Burkitt's lymphoma and diffuse large B-cell lymphoma	Project Leader	2014-2017	Project not granted	National Science Center

E. Participation in the conferences during BASTION project

1. „Translational Research in Oncology in New Member State Economies" (TRON) conference, Warsaw, Poland, 21-22 May 2015

F. Poster presentation at the conferences

Active:

1. **Pawel Gaj**, Dominika Nowis, Stefano Volinia. Imunophenotypic identities of clinical samples have the potential to correlate with overall survival in cytogenetically normal AML patients. TRON, 21-22 May 2015, Warsaw, Poland

Passive:

1. Lech Trzeciak, **Paweł Gaj**, Agata Skórka, Paulina Nadkowska, Agnieszka Pollak, Joanna Kosińska, Rafał Płoski, Radosław Zagożdżon. Functional analysis of SMAD4 mutants in an in vitro system reveals upregulation of SMAD2, SMAD3 and SMAD4 by Myhre syndrome-associated variants. TRON, Warsaw, Poland, 21-22 May 2015
2. Anna Trzeciecka, Szymon Klossowski, Malgorzata Bajor, Radoslaw Zagozdzon, **Pawel Gaj**, Angelika Muchowicz, Agata Malinowska, Anna Czerwoniec, Joanna Barankiewicz, Antoni Domagala, Justyna Chlebowska, Monika Prochorec, Ryszard Ostaszewski, Jakub Golab, Dominika Nowis and Malgorzata Firczuk. Thiol-reactive peptiomimetic sk053 targets dimeric peroxiredoxins in human lymphoma cell lines. 15th International Conference on Oxidative Stress Reduction, Redox Homeostasis and Antioxidants; Paris, France, 22-24 June 2015
3. Justyna Chlebowska, **Paweł Gaj**, Piotr Stawiński, Michal Lazniewski, Malgorzata Firczuk, Karolina Furs, Radoslaw Sadowski, Szymon Klossowski. Ryszard Ostaszewski, Jakub Golab, Krzysztof Giannopoulos, Rafal Ploski, Dominika Nowis. SK053 an inhibitor of enzymes involved in allosteric disulfide bonds formation targets expression of histone genes and induces differentiation of human AML cells. 56th ASH Annual Meeting, San Francisco, CA, USA, 6-9 December 2014
4. Elzbieta Iskierka-Jazdzewska, Anna Stepien, Federico Canzian, Alessandro Martino, Daniele Campa, Angelika Stein, Malgorzata Krawczyk-Kulis, Malwina Rybicka, Slawomira Kyrcz-Krzemien,, Aleksandra K. Butrym, Grzegorz Mazur, MD, Artur J. Jurczyszyn, Daria Zawirska, Norbert Grzasko, Waldemar Tomczak, Edyta Subocz, Marzena Watek, Marcin Pasiarski, Marcin Rymko, Malgorzata Calbecka, Agnieszka Druzd-Sitek, Jan Walewski, Marcin Kruszewski, Malgorzata Razny, Jan M Zaucha, Marek Dudzinski, **Pawel Gaj**, Krzysztof Warzocha, MD, Krzysztof Jamroziak,. Cereblon (CRBN) Gene Polymorphisms Predict Clinical Response and Progression-Free Survival in Multiple Myeloma Patients Treated with Lenalidomide: A Pharmacogenetic Study of Immense Consortium. 56th ASH Annual Meeting, San Francisco, CA, USA, 6-9 December 2014
5. Malgorzata Bajor, Patrick C. O'Leary, **Pawel Gaj**, Bryan T. Hennessy, Jakub Golab, William M. Gallagher, Radoslaw Zagozdzon. An antibody-based proteomic approach for identification of PRDX1 as a biomarker in estrogen receptor positive breast cancer. 10th Siena Meeting "From genome to proteome" 20 Years of Proteomics, Siena, Italy, 31 August – 4 September 2014

G. Participation in courses/trainings/workshops

1. Cancer genetics for medical community Workshop organized by the Medical University of Warsaw in the project BASTION, Warsaw, Poland, 17 June 2013
2. Analysis of Next Generation Sequence Data Course For Complex and Mendelian Traits - Max Delbrück Center for Molecular Medicine, Berlin, Germany; 23-27 June 2014
3. Techniques in analysis of cancer vascular biology, Warsaw, Poland, 6 June 2014

4. Application of flow cytometry in molecular oncology, Warsaw, Poland, 15-16 October 2014
5. Genome-wide methods in cancer genetics, Warsaw, Poland, 28 October 2014
6. Molecular Diagnostic in Cancer, Warsaw, Poland, 8 June 2015
7. Participation in courses offered by ICM of the University of Warsaw:
   21-22.11.2013 „Jak to powiedzieć w R?"
   12.3.2014 „Jak to wykreślić w R?"
   13.3.2014 „Jak to zrobić lepiej w R?"
   9.4.2014 „Wprowadzenie do obliczeń w programie MATLAB"
   14.5.2014 „Podstawy Pythona"

H. International research visits during BASTION project

1. 3rd -17th of July, 2013 Conway Institute, University College Dublin (UCD), Professor William Gallagher Research Group
2. September 17th - November 17th, 2014, University of Ferrara, Professor Stefano Volinia Research Group
3. February 2nd – April 4th, 2015, University of Ferrara, Professor Stefano Volinia Research Group

I. Current Research Interests

My present scientific interests focus on various subjects mainly involving application of bioinformatic methods in the analysis of RNA-seq data, generated in the New Generation Sequencing (NGS) experiments.
I have also been interested in data mining of publically available data sets. These activities focus primarily on subjects like i.e. tumorgenesiss of breast cancer, multiple myeloma as well as mature B-cell lymphoma malignancies.
Importantly, the analyses conducted so far by other research teams were based on the biopsy tissue material. These approaches have both advantages and shortcomings. The obvious downside of studying the tissue samples in the transcriptomic context is (i) the fact that the clinical diagnosis for the analyzed cases was made in each of the patients ad hoc, which could introduce a bias related to the diagnostic criteria discrepancies and (ii) the biopsy tissue sample specimens contain variable proportions of the cancer cells, a factor which has a strong potential to decrease power of the study. Both of these factors are likely to effectively bias the resulting gene signature composition, and can lead to a lesser degree of confidence in the discovery part of a study.
The bioinformatics approach that I developed allowed us to overcome both of the mentioned shortcomings of the discovery stage of the project by using a training set consisting of 38 cell lines classified as B-cell lymphoma originating from the mature B lymphocytes that included a panel of 11 BL and 18 DLBCL cell lines. The significant advantage of this approach comes from the fact that, as opposed to the clinical biopsy samples, cell lines consist of a pure population of cancer cells and therefore the differential expression effects are unlikely to be masked by the variable amounts of healthy tissue cells, usually sampled together with the cancer cells in the biopsy material. Secondly, the cell lines are by their nature very well described in terms of their phenotypes and their identity and their sub-classification has been validated multiple times by independent research groups leaving virtually no chance for their miss-classification. Hence in this way our approach substantially gains in terms of the discovery power as compared with the previously described studies. We have successfully identified a gene expression signature in the context of lymphomas originating from the mature stage B lymphocytes. Then, we have singled-out the gene signature to select a small number of 11 genes with strong differential expression levels allowing for precise discrimination between the BL and DLBCL cell lines. There were four genes with a previously identified role in BL pathogenesis, in addition to seven newly identified ones, among the allocated genes.

J. Envisioned career path

My future career path will focus on continuous development of my bioinformatics skills in terms of finding causative relationships and correlations between the molecular signatures of cancer tissues, the clinical outcomes and possible differences in efficacy of therapeutic agents. In a long perspective I am going to focus on studies taking advantage of emerging accessibility of the high-throughput -omics experimental techniques i.e. Next Generation Sequencing in various fields of biology. In parallel to the computational data analysis work, I am going to get involved in wet-lab activities elucidating significance of selected mutation events on the structure and function of the subject proteins. I am presently planning to become a member of the Department of Human Cancer Genetics, University of Warsaw. The new position is going to let me use all the experience gathered in the course of the research I have done under the BASTION Project. Working in the field of bioinformatics primarily related to the Next Generation Sequencing is very likely going to let me advance my research career to the next level. The employment has been so far planned for the next three years.

XV. Piotr Stawinski (IT professional, TEAM of Radoslaw Zagozdzon)

DATE (YEARS)	DEGREE/ EXPERIENCE	PLACE	SUPERVISOR
2009	B.Sc.	Faculty of Biology, University of Warsaw	Professor Mirosława Włodarczyk
2008	M.Sc.	Faculty of Mathematics, Informatics and Mechanics, University of Warsaw	Professor Andrzej Skowron

A. Biosketch

I completed my M.Sc. degree at the Warsaw University, Faculty of Mathematics, Informatics and Mechanics in 2008. In 2009 I've completed my bachelor's degree at the Faculty of Biology, University of Warsaw. In 2006 I've undertaken one year Erasmus scholarship at the bioinformatics program at the Uppsala University via the Linnaeus Centre for Bioinformatics in Sweden. After finished my studies I started a sole proprietorship, mainly concerned on huge linguistic databases processing. In 2012 I received a bioinformatics position at the Department of Medical Genetics, Medical University of Warsaw, where I was responsible for the Next Generation Sequencing data analysis. In 2013 I joined the Bastion Bioinformatics group where I continue NGS data analysis.

B. Publications published during BASTION project

	Authors, title, journal, year	IF
1	Truszkowska GT, Bilińska ZT, Kosińska J, Śleszycka J, Rydzanicz M, Sobieszczańska-Małek M, Franaszczyk M, Bilińska M, Stawiński P, Michalak E, Małek ŁA, Chmielewski P, Foss-Nieradko B, Machnicki MM, Stokłosa T, Ponińska J, Szumowski Ł, Grzybowski J, Piwoński J, Drygas W, Zieliński T, Płoski R. A study in Polish patients with cardiomyopathy emphasizes pathogenicity of phospholamban (PLN) mutations at amino acid position 9 and low penetrance of heterozygous null PLN mutations. BMC Med Genet. 2015;16:21. doi: 10.1186/s12881-015-0167-0	**2.083**
2	Ołdak M, Ścieżyńska A, Młynarski W, Borowiec M, Ruszkowska E, Szulborski K, Pollak A, Kosińska J, Mueller-Malesińska M, Stawiński P, Szaflik JP, Płoski R. Evidence against RAB40AL being the locus for Martin-Probst X-linked deafness-intellectual disability syndrome. Hum Mutat. 2014 Oct;35(10):1171-4.	**5.144**
3	Kostera-Pruszczyk A, Kosinska J, Pollak A, Stawinski P, Walczak A, Wasilewska K, Potulska-	**2,504**

	Chromik A, Szczudlik P, Kaminska A, Ploski R. Exome sequencing reveals mutations in MFN2 and GDAP1 in severe Charcot-Marie-Tooth disease. J Peripher Nerv Syst. 2014 Sep;19(3):242-5.	
4	Ploski R, Pollak A, Müller S, Franaszczyk M, Michalak E, Kosinska J, Stawinski P, Spiewak M, Seggewiss H, Bilinska ZT. Does p.Q247X in TRIM63 cause human hypertrophic cardiomyopathy? Circ Res. 2014 Jan 17;114(2):e2-5	**11,019**
5	Chojnicka I, Fudalej S, Walczak A, Wasilewska K, Fudalej M, Stawiński P, Strawa K, Pawlak A, Wojnar M, Krajewski P, Płoski R. Inverse association between obesity predisposing FTO genotype and completed suicide. PLoS One. 2014 Sep 29;9(9):e108900.	**3,234**
6	Prochenka A, Pokarowski P, Gasperowicz P, Kosińska J, Stawiński P, Zbieć-Piekarska R, Spólnicka M, Branicki W, Płoski R. A cautionary note on using binary calls for analysis of DNA methylation. Bioinformatics. 2015 May 1;31(9):1519-20.	**4,981**
7	Chojnicka I, Gajos K, Strawa K, Broda G, Fudalej S, Fudalej M, Stawiński P, Pawlak A, Krajewski P, Wojnar M, Płoski R. Possible association between suicide committed under influence of ethanol and a variant in the AUTS2 gene. PLoS One. 2013;8(2):e57199.	**3,534**

C. Grant applications submitted during BASTION project

Grant number	Title	Function	Duration	Funding	Awarding institution
2013/11/N/NZ 2/02544	Novel computational approaches for analysis of the Next Generation Sequencing data: development of the indel calling algorithm	Project Leader	2014-2017	Project not granted	National Science Center

D. Participation in courses/trainings/workshops

1. Cancer genetics for medical community Workshop organized by the Medical University of Warsaw in the project BASTION, Warsaw, Poland, 17 June 2013
2. Analysis of Next Generation Sequence Data Course For Complex and Mendelian Traits - Max Delbrück Center for Molecular Medicine, Berlin, Germany; 23-27 June 2014

E. Current Research Interests

Next Generation Sequencing (NGS) is a great technique, that produces huge amount of genetics data in a very short period of time. Currently NGS have a lot of applications, to mention targeted sequencing, ChIP seq, RNA-seq, *de novo* sequencing. NGS data processing requires both deep computer science knowledge, including High Performance Computing and programming skills, as well as deep understanding of the biology beneath the data received. My current research interest is in data processing of Whole-exome sequencing and Reduced representation bisulfite sequencing experiments. The former includes Single and Multi Nucleotide Polymorphisms detection and their biological interpretation as well as Copy Number Variation analysis, the latter includes Methylome data extraction, interpretation and identification of differentially methylated regions.

F. Envisioned career path

My employment under BASTION project expired on 31th Dec 2014. In the next few years, I am planning to complete my PhD in the field of Whole-Exome Sequencing data analysis for clinical purposes. I am also planning to publish current results in peer reviewed journal and make my data processing software available online for other researchers.

XVI. Slawomir Gruca (IT professional, TEAM of Radoslaw Zagozdzon)

DATE (YEARS)	DEGREE/EXPERIENCE	PLACE	SUPERVISOR
1997-2002	M.Sc. in Engineering in Electronics and Telecommunications	Poznan University of Technology, Poland	Dr inż. Janusz Kleban
2001-2002	M.En in Telecommunication Engineering	Dublin City University, Ireland	Dr. Derek Molloy
2003-2006	investigating technologies, programming, Sun Solaris and GNU/Linux system administration	Research and Academic Computer Network (NASK), Warsaw, Poland	not applicable
2006-2007	M.Sc. in Bioinformatics	Dublin City University, Ireland	Dr. Mary O'Connell

A. Biosketch (provided by Slawomir Gruca)

After obtaining the degree in Electronics and Telecommunications I joined Research and Academic Computer Network. The assigned position provided me with possibilities for deepening knowledge and gaining experience in many areas of engineering. My activities predominantly involved computer programming, operating system administration and investigating technologies for future deployment. Shortly after being hired, I was assigned to projects regarding computer systems that were of a major importance to the organization. As the work involved server room hardware, I additionally received training regarding power infrastructure. Although my position was a technical one, on occasions I handled soft tasks as well, sometimes influencing important policies of the organization. Thanks to collaboration with many internal teams and participation in international conferences and meetings I had a chance to enrich my interpersonal skills. After gaining professional experience as an engineer, I decided to revive my passion for the sciences and went to Dublin, where successfully completed a postgraduate course in bioinformatics. After returning Poland I had been engaged in several personal projects that resulted in gaining new knowledge in the areas of electronic hardware, programming, GNU/Linux system administration, databases, and also biology.

B. Participation in courses/trainings/workshops

1. "Jak to powiedzieć w R" [*How to say this in R*]; Interdysciplinary Centre for Mathematical and Computational Modelling, University of Warsaw, Warsaw, Poland, 21-22 November 2013
2. How to plot it in R? (Jak to wykreślić w R?)", ICM, Warsaw, Poland, 12 March 2014

3. „How to do it better in R? (Jak to zrobić lepiej w R?)", ICM, Warsaw, Poland, 13 March 2014
4. „Python basics (Podstawy Pythona)", ICM, Warsaw, Poland, 14 May 2014
5. "Bioinformatics fundamentals of Next Generation Sequencing (Bioinformatyczne podstawy sekwencjonowania nowej generacji)" training by "Ideas for Biology, Izabela Makałowska, Michał Szcześniak s.c." company (ideas4biology.com), Warsaw, Poland, 26 September 2014
6. "NGS in the regulation of genes (NGS w badaniach regulacji genów)" training by "Ideas for Biology, Izabela Makałowska, Michał Szcześniak s.c." company (ideas4biology.com), Warsaw, Poland, 27-28 September 2014

C. International research visits during BASTION project

1. Visiting Researcher in Conway Institute, University College Dublin, Ireland - 3-17 July 2013
2. Bioinformatics Group, Institute of Molecular and Cellular Biology, University of Leeds, Leeds, LS2 9JT, UK, 5 October – 23 December 2014

D. Current Research Interests

The first major task I was responsible for, since joining the BASTION project, was to design an IT infrastructure for our bioinformatics laboratory. Analysis of bio-data often involves processing large volumes of information and thus benefits from high-performing computing systems, equipped with fast and reliable mass storage of large capacity. When investigating candidate technologies, apart from budget constraints, I considered aspects of future upgrades to the system and an integration with an existing computer network infrastructure. The design process also included elements of server room air conditioning and power infrastructure. The implemented solution is an universal bioinformatics platform, able to efficiently cope with tasks of Next Generation Sequencing and digital imaging. It has been in active use by two departments of the university.

Apart from working on the IT infrastructure I played a significant role in setting up the Digital Imaging Facility at Department of Immunology in Medical University of Warsaw. I was responsible for evaluating microscopic slide scanner solutions and preparing a technical vision for the facility. Subsequently, the purchased scanner device was successfully integrated with aforementioned computing infrastructure. The established facility have already benefited multiple scientists. Having background in computer vision topics, I have also been engaged in creating software solutions for virtual slide processing and analysis.

During the BASTION project, I initiated scientific collaborations with several colleagues at MUW, and also at the University of Leeds – during my second twinning. The started projects involve statistical analysis, digital pathology, genetics and epigenetics of cancer. I also co-authored a book chapter (currently in preparation) on NGS based analysis of genome structural variation.

E. Envisioned career path

I will be searching for a new position following my BASTION employment and will also consider continuing collaboration with the Department of Immunology on a voluntary basis. I will strive to continue the research projects started with the University of Leeds.

3. Summary of research activity of recruited postdocs

BASTION project has fully used its opportunity to recruit eleven top-level qualified researchers with high ability to increase research potential in basic and translational oncology at Medical University of Warsaw. Since two postdocs had to quit due to their personal reasons (Joanna Drzewinska-Chanko went to maternal leave and afterwards prefers to continue her career in her home City; Magdalena Banach-Orlowska decided to continue her research activity in a different research area), we managed to hire for replacement two another highly qualified researchers. Altogether, we employed sixteen people (thirteen postdoc researchers, one lab leader and two IT professionals). The technological expertise and scientific background of all sixteen recruits fit BASTION effort to strengthen the existing areas of excellence in oncology research. Moreover, each individual used the opportunity to bring in know-how and experience in translational oncology work and helped to bridge the gaps and create links among research groups working at MUW. All leaders have succeeded in recruiting extremely diligent and hardworking postdocs showing a great enthusiasm for their work in the field of experimental oncology. All newly employed researchers contributed to the great success of BASTION project.
In summary, all researchers recruited in BASTION project are authors and co-authors of 51 publications, they managed to secure funding for their research and get 11 grants (9 grants as Principal Investigators, 2 grants as supervisors), they were awarded with 8 different awards and are authors of 5 patent applications).

Working space:
All recruited researchers were provided with research and office space by leaders of research groups already existing at MUW. Since four research groups in BASTION project were located at the Department of Immunology the option to increase the research and office space was necessary and inevitable. We managed to redesign and renovate one room to provide new researchers with sufficient working space. Team of Pawel Wlodarski during BASTION project moved to a new laboratory located in a newly built CePT (Centre for Preclinical Research and Technology) building.

Status of recruited researchers:
The number of faculty positions at Medical University of Warsaw is regulated by a quota of teaching hours (pensum). Thus, according to the recruitment policy of Medical University of Warsaw recruited researchers were employed at the university as the experienced research specialists. They were entitled to all benefits of governmental employees.

Details of employment are shown in the table below.

Name	Group Leader	1st day of employment	last day of employment	Months of employment	Comments
Anna Wojcicka	Krystian Jazdzewski	2013.01.01	2015.08.31	32	2 months extension
Malgorzata Firczuk	Dominika Nowis	2013.01.01	2015.08.31	32	2 months extension
Malgorzata Czystowska-Kuzmicz	Jakub Golab	2013.03.05	2015.08.31	30	
Oksana Kovtonyuk	Piotr Religa	2013.04.06	2015.08.31	29	
Beata Pyrzynska	Magdalena Winiarska	2013.04.01	2015.08.31	29	
Joanna Drzewinska	Tomasz Stoklosa	2013.04.01	2015.08.31	14,7	14,3 months of maternity leave
Iwona Solarska	Tomasz Stoklosa	2014.09.01	2015.08.31	12	replaced Joanna Drzewinska
Magdalena Banach-Orlowska	Pawel Wlodarski	2013.04.01	2015.04.30	25	

Agnieszka Pollak	Pawel Wlodarski	2015.05.15	2015.08.31	3,50	replaced Magdalena Banach-Orlowska
Marzena Lazarczk	Zbigniew Gaciong	2013.10.23	2015.08.31	22,30	
Lech Trzeciak	Rafal Ploski	2013.09.01	2015.08.31	24	
Radoslaw Zagozdzon		2012.10.11	2015.08.31	34,65	4,65 months extension
Malgorzata Bajor	Radoslaw Zagozdzon	2013.04.16	2015.08.31	28,50	4,5 months extension
Pawel Gaj	Radoslaw Zagozdzon	2013.04.16	2015.08.31	28,50	4,5 months extension
Slawomir Gruca	Radoslaw Zagozdzon	2013.04.22	2015.08.31	28,30	4,3 months extension
Piotr Stawinski	Radoslaw Zagozdzon	2013.01.01	2014.12.31	24	

For two postdocs (Anna Wojcicka and Malgorzata Firczuk) 2 months' employment extension was requested. Both recruited experienced postdocs have become a highly successful members of BASTION's research groups. Dr. Anna Wojcicka has participated in most projects performed at the Laboratory of Genomic Medicine at the Medical University of Warsaw. She was involved in completion of 5 projects aimed at analysis of the role of microRNAs in thyroid cancer, 2 projects aimed at analysis of the role of microRNAs in hepatocellular carcinoma, and 3 projects showing the role of single nucleotide polymorphisms in tailoring the clinical outcome of papillary thyroid carcinoma. The projects shall be completed within the next couple of months, and dr. Wojcicka will be responsible for evaluation of results and preparation of manuscripts resulting from the projects. The extension of her employment within the BASTION project has allowed for proper completion of all her tasks. During the period of her employment within the BASTION project (since January 2013), dr. Wojcicka published 12 papers in peer-reviewed journals, obtained funding for 4 grant projects and was awarded a number of scientific awards.
Dr. Malgorzata Firczuk is a co-investigator of the project: "Evaluation of peroxiredoxins 1 and 2 along with the thioredoxin-thioredoxin reductase system as new therapeutic targets in B cell lymphomas" financed by Polish National Science Centre, the funding of which was obtained during BASTION project. She is currently working on development of inducible downregulation of peroxiredoxin 1 in lymphoma cell lines. The additional one month of employment allowed her to complete this experiment.

Moreover, the employment extension up to 29,5 months was requested for 3 members of the BioInfo group in the BASTION project.

A new bioinformatics group has been created under the BASTION project in order to focus on tasks related to personalized medicine and high-level data analysis. Indeed, since its creation the group fully accomplished its technology-related tasks by setting up a computing cluster, acquiring three multi-core workstations, organizing adequate back-up storage and database management software, and specialized software for data analysis and visualization. It also successfully created a new digital image analysis facility with a state-of-art histological slide scanner. At present, the group actively utilized the newly established bioinformatics laboratory in order to conduct their own research, as well as to support the actions of the whole BASTION project. Altogether the group has participated so far as authors in 11 original publications, 4 review articles or book chapters, and one European Patent application. The detailed commitment of each person is described below:

Postdoc - Dr Pawel Gaj: During the course of the BASTION project Dr Pawel Gaj has been involved in a whole host of activities mainly concerning high throughput data analyses for experiments carried out on a genome-wide scale. Dr Gaj's work was a part of a collaborative effort of a number of different BASTION project research groups and the BASTION project collaborating partners running projects which take great advantage of Dr Gaj's expertise. Two of those projects recently entered a very advanced stage where statistical support is absolutely

essential. First of those is a project led by Dr Tomasz Stoklosa with whom Dr Gaj is investigating genetic variation effects on disease progression in patients diagnosed with gastric cancer. The project is now in the final stage of data analysis carried out by Dr Gaj.
The other project is a result of a very successful collaboration between Dr Gaj and the group led by Professor Stefano Volinia, University of Ferrara, Italy; one of the international partners of the BASTION project. Being the leading author of the project initiated by Professor Volinia Dr Gaj has been the person responsible for the entire bioinformatics work and recently he has been drafting the manuscript of an article which will summarize the results.

Postdoc - Dr Malgorzata Bajor: Dr Malgorzata Bajor has been working as an experienced research fellow at the bioinformatics group. Under the BASTION project, her scientific work was focused on the explaining the precise molecular mechanisms of actions, one of the most prevalent scavenging enzymes, PRDX1 in estrogen receptor-positive breast cancer. To carry out research tasks, a variety approaches including powerful quantitative techniques to study gene expression, genetic engineering of cells using lentiviral vectors, proteomics approaches to study the redox state in the cell, protein-protein interaction studies including bioinformatics data analysis have been used. Besides, during work under the BASTION project she has established fruitful collaboration with Laboratory of Prof. Bryan Hennessy at the Royal College of Surgeons in Dublin, Ireland where she had an opportunity to learn and use RPPA platform to study PRDX1 and PRDX2 protein expression in panel of different type cancer cell lines. Partial results of this project have been already published with Dr Bajor's coauthorship in the Breast Cancer Research journal. Furthermore, Dr. Bajor visited a group of Prof. William Gallagher at UCD in Dublin, Ireland to perform additional research which helped to explain molecular consequences of rapid dysfunction of PRDX-related system in ER-positive breast cancer. This project is currently being continued, and contribution of Dr Bajor is highly important for the further conduct of this study. The same holds true for the another project of our scientific group, related to identification of new therapeutic targets in B-cell lymphomas. The manuscript with Dr Bajor coauthorship has just been submitted to the prestigious Oncogene journal and further continuation of this project is planned for next several months, with crucial contribution of Dr Bajor being envisaged.

IT Professional - MSc Slawomir Gruca: For the duration of his employment under the BASTION project, Mr Gruca has played a crucial role in establishing a new computing cluster in the Department of Immunology. Recently, during twinning with the University of Leeds, in November and December of 2014, Mr Slawomir Gruca has started two scientific collaborations. The first one is a research with Dr Peter Laslo and involves investigation of gene regulation events upon drug resistance acquirement during Chronic Myeloid Leukaemia (CML) treatment. Secondly, Mr Gruca has started a collaboration with the cancer biostatistics group of professor Tim Bishop, researching melanoma; Mr Gruca has been assigned to the analysis of WGS data of melanoma samples. Extension of participation in the BASTION project enabled Mr Sławomir Gruca visiting the University of Leeds again and resulted in a high-impact outcome from the projects. Moreover, extending Mr Gruca employment was also necessary for a continuous IT support for the laboratory and newly created computing cluster at Medical University of Warsaw.

Since the extension was in the limits of the BASTION project realization and the salaries for extended periods were covered from the personnel category of the budget dedicated to WP3, the request for extension was accepted. The extension of the employment period was highly beneficial for Medical University of Warsaw as a whole and served to strengthen MUW's research potential in basic and translational oncology by strengthening the existing areas of excellence in oncology research and bringing in know-how and experience in translational oncology work.

Research funding:

BASTION project did not directly provide research support for newly employed post docs. All recruited researchers were eligible for applying for national funding from National Science Centre (NCN), The National Centre for Research and Development (NCBiR), The Foundation for Polish Science (FNP) and Ministry of Science and Higher Education. All researchers made attempts to get funds for their research and prolong their employment.

For three researchers (Joanna Drzewinska-Chanko, Magdalena Banach-Orlowska and Oksana Kovtonyuk) it was not possible to extend employment at MUW after completion of the BASTION project.

Three researchers (Iwona Solarska, Lech Trzeciak and Pawel Gaj), due to shortage of money, with the finalization of BASTION project end their cooperation with team leaders. However, they declare their interest in BASTION projects and willingness to cooperate with BASTION leaders. Pawel Gaj will be employed by Krystian Jazdzewski, one of the BASTION group leaders until 2018.

Three postdocs (Anna Wojcicka, Beata Pyrzynska and Malgorzata Czystowska-Kuzmicz) with the help of their current group leaders have managed to secure funding for research and their salaries as principal investigators:

1. Anna Wojcicka until 2017 (National Centre for Research and Development Lider Grant: The use of next-generation sequencing for elucidation of a sensitive and specific molecular panel for diagnostics of thyroid cancers and Ministry of Science and Higher Education Iuventus Plus Grant: Evaluation of the possibility of using microRNA inhibitors as adjuvant therapy for thyroid cancer)
2. Beata Pyrzynska until 2017 (grant OPUS, NCN; 2013/11/B/NZ5/03240) Influence of AKT signaling pathway on CD20 expression and antitumor activity of therapeutic monoclonal antibodies)
3. Malgorzata Czystowska-Kuzmicz until 2017 (grant OPUS, NCN Elucidation of the role of tumor-derived and exosomal arginases in avoiding immune responses by ovarian cancer)

Moreover, team leaders will support the extended employment of three other researchers (Malgorzata Firczuk, Agnieszka Pollak, Marzena Lazarczyk and Malgorzata Bajor) with their grant funding:

1. Malgorzata Firczuk as a postdoc until 2016 in the team of Radoslaw Zagozdzon (OPUS, NCN, Evaluation of peroxiredoxins 1 and 2 along with the thioredoxin-thioredoxin reductase system as new therapeutic targets in B cell lymphomas)
2. Agnieszka Pollak as a postdoc until 2017 in the team of Pawel Wlodarski (OPUS, NCN, Exome-wide search for somatic mutations in pathogenesis of endometriosis)
3. Marzena Lazarczyk as a postdoc until 2018 in the team of Zbigniew Gaciong (OPUS, NCN, Red cel heterogeneity as a risk factor for thrombotic complications)
4. Malgorzata Bajor as a postdoc until 2018 in the team of Radoslaw Zagozdzon (OPUS, NCN, The role for thiol-dependent antioxidant enzymes in estrogen receptor-positive breast cancer)

The newly recruited lab leader (Radoslaw Zagozdzon) managed to secure funding for the research and his salary by getting two grants from National Science Center. Two IT professionals are going to search for new positions. However, they both consider continuing collaboration with the BASTION teams.

The bioinformatics research unit provided a number of comprehensive and versatile biotechnological approaches to the tasks delineated under the BASTION program. In more details, Drs Malgorzata Bajor and Radoslaw Zagozdzon have been responsible for generating and analyzing the biological and biomedical data. Dr Pawel Gaj has been mainly responsible for in silico analyses of the results generated within our team, by the collaborators or originating from the publically available datasets. Mr. Piotr Stawinski provided bionformatics support for Next Generation Sequencing data acquired mainly by the group of Prof. Rafal Ploski. Mr. Slawomir Gruca has been mainly responsible for purchasing, installation and maintenance of the computer cluster and computer workstations. Additionally, Dr Zagozdzon along with Dr Dominika Nowis have also initiated a close collaboration with the Oncology Institute, Warsaw, in order to provide a bioinformatics support for the analysis the databases of clinical information from cancer patients.

Prof. Jakub Golab
BASTION Project Coordinator
Warsaw, August 2015