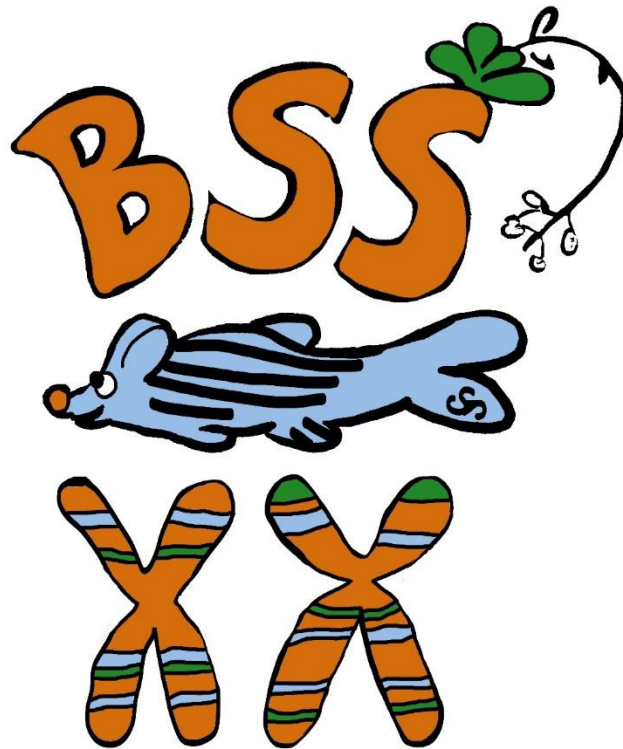


XX BIOTECHNOLOGY SUMMER SCHOOL



2-7 September 2014, Stegna, POLAND

Financial support

XX Biotechnology Summer School is organized within the project

“The University of Tomorrow: internationalization of the educational process at the University of Gdansk via cooperation with the University of Houston-Downtown”

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About XX Biotechnology Summer School

The topic of the XX Biotechnology Summer School is **MODEL ORGANISMS**.

A model organism is a non-human species that is extensively studied to understand particular biological phenomena. They are widely used for all kind of biotechnology investigation in order to simplify the mechanism of its action. They are used to accelerate the research, allow avoiding ethical problems, speed up the research and make it easy. Studying model organisms can be informative, but care must be taken when results are extrapolating from one organism to another.

The organisms chosen as the model organisms usually are harmless to the investigators, easily to grown in laboratory conditions and possess relatively short life cycle. We have chosen four different model organisms belonging to different kingdom of life: **fungi** (*Ustilago maydis*), **plants** (*Arabidopsis thaliana*) and **animals: fish** (*Danio rerio*), **mouse** (*Mus musculus*).

The program of Summer School will also consider some issues connected with the **GMO organism**, its legislation and **social acceptance of biotechnology**.

Speakers

Lectures and workshops will be led by leading World scientists whose main research objects are model organisms. We also invited speakers who will led workshops about ethical issues concerned the GMO organism, its legislation and workshops about public understanding of biotechnology. In addition, speakers are involved in undergraduate and graduate teaching.

The targeted audience

XX BSS is dedicated to students and PhD students studying in Poland who are interested in topics related to model organisms.

Venue

The XX Biotechnology Summer School takes place from 2nd to 7th of September 2014 in Ośrodek Wypoczynkowy SYRENKA (N 54 19.864 E 19 06.924). Holiday Camp is located at Grunwaldzka 11 Street, Stegna (POLAND), pomorskie province, 1 km to Baltic Sea, near a forest. It is about 50 km from Gdańsk.

Additional activities

In this year for our participants we have prepared additional activities like: integration field game (organized by *Students' Scientific Association BIO-MED*), first aid workshop, trip to Castle in Malbork and traditional fancy dress party – all participants are welcome to prepare a costume of “model organism”.

Organizing Committee

Workshop Chair



Prof. dr hab. Igor Konieczny (Intercollegiate Faculty of Biotechnology UG&MUG)

Dean of Intercollegiate Faculty of Biotechnology of University of Gdansk and Medical University of Gdansk. Professor at the Department of Molecular and Cellular Biology and leads Laboratory on Molecular Biology. His research concerns the analysis of DNA metabolism of extra-chromosomal genetic elements in bacteria with particular emphasis on DNA replication initiation, partitioning and post segregation killing systems. He teaches Molecular Biology of Nucleic Acids. Prof. Konieczny was awarded by EMBO and Howard Hughes YIP Programmes. He is COST Committee Member in Biomedicine and Molecular Biosciences Domain.

Workshop Scientific Coordinator



Prof. GUMed, dr hab. Michał Obuchowski (Intercollegiate Faculty of Biotechnology UG&MUG)

Vice Dean for Science at Intercollegiate Faculty of Biotechnology of University of Gdansk and Medical University of Gdansk. Head of the Laboratory of Molecular Bacteriology. His research is related to protein phosphorylation and the formation of spores and spore application for the use as carriers of antigens, a research model is *Bacillus subtilis*.

Contact details

All questions on conference please send to e-mail: bss_contact@bss.ug.edu.pl

You can contact also with our organizing team:



Elżbieta Moroz (Intercollegiate Faculty of Biotechnology UG&MUG)

Research Project Specialist

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phone: +48 58 523 64 06



Angelika Michalak (Students' Scientific Association BIO-MED, Intercollegiate Faculty of Biotechnology UG&MUG)

e-mail: angelique.michalak@gmail.com

phone: +48 535 368 033

During the conference we will use colors as follows:



About Intercollegiate Faculty of Biotechnology UG&MUG



The Intercollegiate Faculty of Biotechnology of the University of Gdańsk and the Medical University of Gdańsk was created by the decision of both Senates in June 1993. The idea of the Faculty was based on conviction that close interaction between research and teaching activities of the two universities will form a special, creative academic centre, using innovative methods of education and basing on top-level standards of research. Integration of the local scientific community remains a key element of our mission. Faculty continues tradition of molecular biology introduced in Gdańsk by Prof. Karol Taylor.

Today, the 17 Faculty groups trained scientists who are providing advanced education to approximately two hundred undergraduate and graduate students. Thanks to intercollegiate character of the Faculty we conduct **interdisciplinary research and teaching by combining biomedical and bio-molecular issues and their applications in biotechnology for health and life quality**.

The intercollegiate character of the Faculty allows for the use of infrastructure and expertise provided by two universities, and therefore combining the best international standards of research with the highest quality of teaching. Our research and teaching is performed in well-equipped modern laboratories at the Institute of Biotechnology and the Tri-City Central Animal Laboratory. The aim of our Faculty is to provide possibly the highest standard of education based on early integration of students into research activities of the faculty units.



Tri-City Central Animal Laboratory



Institut of Biotechnology

We believe that involvement of the students in the specific projects greatly supports the individualized system of study and facilitates formation of a unique, well-integrated academic community.

In 2011, the Polish Accreditation Committee awarded the Faculty with a **distinction for the quality of teaching**, and in 2012 the Ministry of Science and Higher Education granted the specialty of BIOTECHNOLOGY at the IFB the title of **The Best Major**.

Intercollegiate Faculty of Biotechnology of UG&MUG

ul. Kładki 24

80-822 Gdańsk, POLAND

tel.: + 48 58 523 63 20

Brief history of Biotechnology Summer Schools

Biotechnology Summer Schools are organized annually since 1994. The idea of Biotechnology Summer Schools came from Professor Anna J. Podhajska, who gained many people's support over Her initiative. Among them was Marian Kawczyński from Beckman. This firm became the main sponsor of the 1st, 2nd, 3rd Biotechnology Summer School. The number of sponsors increased every year and thanks to all these companies and institutions the organization of Biotechnology Summer School was possible (table 1). Schools are organized by professors and students from the Intercollegiate Faculty of Biotechnology UG&MUG.



The main aim of this event is to provide students a wide range of courses which are not available in the standard syllabus. We would also like to create a relaxed learning environment and give Polish and foreign students a chance to meet highly renowned specialists during lectures as well as in rather informal circumstances. Moreover, Biotechnology Summer Schools give Polish and foreign scientists chance to develop cooperative relationships and create a forum for integration. What is also important this meeting has become a great opportunity for professors who are of polish descent to renew contacts with their native country.



The first four Biotechnology Summer Schools did not have narrowly specified themes. Lectures and seminars covered topics such as human genetics, molecular biology of nucleic acids, the biotechnological application of microorganisms, gene therapy, molecular evolution, cell signaling, virology, transgenic plants and animals, analytical and preparative methods, pharmaceutical biotechnology, molecular diagnostics, plasmid vectors and many more. Students learned also about statistics, bioethics, legal and business issues in biotechnology, philosophy of science and even history of Poland. The 5th Biotechnology Summer School was the first BSS where thematic modules have been determined. However, lecturers also referred other subjects, not related to biotechnology (table 2). Panel discussions and commercial presentations of laboratory equipment complemented the Summer School's programme.

Biotechnology Summer Schools were honored with the presence of many eminent scientists such as professors: Ewa and Ernest Bartnik, Stanisław Bielecki, Klaus Halhlbrock, Waleria Hryniewicz, Robert Huber (Nobel Prize winner in Chemistry in 1988), Berndt Jastorf, Adam Jaworski, Roman Kaliszan, Władysław Kunicki Goldfinger, Andrzej Legocki, Janusz Limon, Mirosław Małuszyński, Jerzy Paszkowski, Andrzej Płucienniczak, Richard P. Sinden, Piotr Stępień, Waław Szybalski, Tomasz Twardowski, Jacques H. Weil, Robert Wells, Brigitte Wittman-Liebold, Maciej Zenkter, Maciej Żylicz.



No less important than learning is having fun. Many entertaining activities for Summer Schools are always planned. A fancy-dress party, a bonfire with singing, games, sports, playing on words, Petanque (thanks to prof. E. Bartnik), disco are the part and parcel of every School. These events are conducive to socializing among the participants. There was also a chance to visit interesting places such

as Gdańsk, Malbork, Gniew and Złota Lipka.

We hope that this year's Biotechnology Summer School will be as successful as previous ones and will be an unforgettable experience for all participants.

This text was based on conversations with prof. Ewa Łojkowska, Ewa Kiszka, dr Krzysztof Waleron and materials gathered by Monika Domachowska and Natalia Bednarz.

Table 1. Themes at Biotechnology Summer Schools

Summer School	Thematic Modules
Wilga 1994 Łączyno 1995 Stegna 1996 and 1997	Miscellaneous
Gołuli 1998	1. Biotechnological processes 2. Molecular medicine 3. Plant biotechnology
Łączyno 1999	1. New techniques for protein purification and identification 2. Fundamentals for bioprocess engineering 3. Molecular aspects of cancer biology
Twardy Dół 2000	1. Modern techniques of cell structure and cell function analysis 2. Genetic modifications in animals 3. Genetic modifications in plants 4. Transgenic food 5. Commercialization of biotechnology 6. Bioprocess control 7. Possible applications of DNA chips
Łączyno 2001	1. Modern methods of molecular biology and biotechnology 2. Molecular neurobiology 3. Ethical aspects of biotechnology
Sobieszewo 2003	1. Plants biotechnology 2. Molecular diagnosis of neoplastic disease 3. Bioinformatics – molecular evolution and protein structure
Sobieszewo 2004	1. Genomics, microarrays, molecular diagnosis of cancer 2. Biotechnological applications in agriculture 3. Biotechnological applications
Sobieszewo 2005	1. Bioprocess engineering 2. Proteomics 3. Molecular biology of signal transduction
Łapino 2006	1. Immunotherapy of cancer research and clinical stages 2. Molecular diagnosis and cancer treatments 3. Molecular diagnosis and treatment of human and plant pathogens 4. Legal and administrative aspects of research project (in polish)
Łapino 2007	1. Cancer causes, diagnosis and therapy 2. Others
Sobieszewo 2008	1. Virology, mostly involved with HCV 2. "Secret life of B. subtilis" – application oriented microbiology 3. Biomarkers of environmental pollutions
Gdańsk 2009	1. Plant resistance to biotic and abiotic factors 2. Plants as a "green factory" for pharmaceuticals, nutraceuticals and colorants 3. Microbe - plant systems 4. New trends and hot topics in plant biotechnology
Gdańsk Sobieszewo 2010	1. HCV - pathogenesis, disease, therapy 2. Influenza virus. AH1N1 influenza. Viral research 3. Absorption, distribution, metabolism and clearance of drugs 4. Information about EU fund
Gdańsk Górki-Zachodnie 2011	1. Biochemistry and biotechnology of plant lipids 2. Bacterial genetics
Jurata 2012	Current scientific research and its practical application – the possibilities of using the findings in any sector of industry
Gdańsk 2013	1. Basics of modern molecular evolution 2. Teaching soft skills – how to write a good grant

Table 2. Sponsors and organizers of Biotechnology Summer School

Summer School	Sponsors	Organizers
Wilga 1994	Beckman	Prof. Anna Podhajska (Vice-Dean of IFB), Marian Kawczyński (Beckman)
Łączyń 1995	Beckman, Promega, Tempus Programme EU	Prof. Ewa Łojkowska (IFB), Prof. Anna Podhajska (Vice-Dean of IFB), the group of biotechnology students, International Relations Office of MUG
Stegna 1996	Beckman, Promega, Tempus Programme EU, KBN	Prof. Ewa Łojkowska (IFB), Prof. Anna Podhajska (Vice-Dean of IFB), the group of biotechnology students, International Relations Office of MUG
Stegna 1997	Beckman, Promega, Tempus Programme EU, UNESCO/PAN MCBN Network, KBN	Prof. Ewa Łojkowska (IFB), Prof. Anna Podhajska (Vice-Dean of IFB), the group of biotechnology students, International Relations Office of MUG
Gołuli 1998	Beckman, Promega, Tempus Programme EU, UNESCO/PAN MCBN Network, MEN	Prof. Wiesław Makarewicz (Dean of IFB), Prof. Ewa Łojkowska (IFB), Prof. Anna Podhajska (Vice-Dean of IFB), the group of biotechnology students
Łączyń 1999	Promega, Bio-Rad, Kendro, UNESCO/PAN MCBN Network, MEN	Prof. Wiesław Makarewicz (Dean of IFB), Prof. Jacek Bigda (Vice-Dean of IFB), the group of biotechnology students, International Relations Office of MUG
Twardy Dół 2000	Promega, Bio-Rad, Kendro, UNESCO/PAN MCBN Network, MEN	Prof. Jacek Bigda (Dean of IFB), Prof. Ewa Łojkowska (Vice-Dean of IFB)
Łączyń 2001	Kendro, Promega, UNESCO/PAN MCBN Network, Bio-Rad, KBN, KAWA.SKA	Prof. Jacek Bigda (Vice-Dean of IFB), the group of biotechnology students, International Relations Office of MUG
Sobieszewo 2003	Alab, BioMoBil Centre Of Excellence, University of Gdańsk, UNESCO/PAN MCBN Network	Prof. Jacek Bigda (Dean of IFB), Prof. Ewa Łojkowska, the group of biotechnology students, International Relations Office of MUG
Sobieszewo 2004	BioMoBil Centre Of Excellence, UNESCO/PAN MCBN Network	Prof. Jacek Bigda (Dean of IFB), Prof. Ewa Łojkowska, the group of biotechnology students, International Relations Office of MUG
Sobieszewo 2005	BioMoBil Centre Of Excellence, UNESCO/PAN MCBN Network	Prof. Jacek Bigda (Dean of IFB), Prof. Ewa Łojkowska, the group of biotechnology students, International Relations Office of MUG
Łapino 2006	BioMoBil Centre Of Excellence, 5 th Thematic Programme Eu	Prof. Jacek Bigda (Dean of IFB), Prof. Ewa Łojkowska, the group of biotechnology students, International Relations Office of MUG
Łapino 2007	“Scan Balt” Campus Project Interreg III	Prof. Ewa Łojkowska, Prof. Andrzej Składanowski, BIO-MED, the group of biotechnology students
Sobieszewo 2008	Marie Curie Programme, 6 th Thematic Programme	Prof. Ewa Łojkowska (Dean of IFB), Prof. Krystyna Bieńkowska-Szewczyk, BIO-MED, the group of biotechnology students

Summer School	Sponsors	Organizers
Gdańsk 2009	European Social Fund (INNOpomorze), Polish Academy of Science, Russian Academy of Science	Prof. Ewa Łojkowska (Dean of IFB), the group of biotechnology students
Sobieszewo 2010	6 th Framework Programme: HEPACIVAC; European Social Fund (Human Capital Programme): PRO-GOS	Prof Krystyna Bieńkowska-Szewczyk, BIO-MED, the group of biotechnology students
Gdańsk Górki-Zachodnie 2011	European Social Fund (Human Capital Programme): PRO-GOS	Prof. Antoni Banaś, prof. Igor Konieczny, dr Anna Gwizdek-Wiśniewska, the group of biotechnology students
Jurata 2012	European Social Fund (Human Capital Programme): PRO-GOS	Prof. dr hab. Igor Konieczny (IFB UG & MUG), dr Anna Gwizdek-Wiśniewska (IFB UG & MUG), Students of the Intercollegiate Faculty of Biotechnology UG & MUG
Gdańsk 2013	FEBS (Federation of European Biochemical Societies) Education Committee Ministry of Science and Higher Education Polish Biochemical Society Foundation for Polish Science	Prof. dr hab. Igor Konieczny (IFB UG&MUG), Prof. Angel Herraiez (FEBS), Prof. Gül Güner-Akdogan (FEBS), Prof. dr hab. Jarosław Marszałek (IFB UG&MUG), Elżbieta Serżysko (IFB UG&MUG), dr Anna Gwizdek-Wiśniewska (IFB UG&MUG), Joanna Jaszczółt (FRUG), Katarzyna Sroślak-Janasiwicz (FRUG), Aleksandra Krypa (FNP)

Program

Tuesday, 2 nd September 2014		
13:45-14:00		Departure from Gdańsk (Gdańsk Główny Train Station, Podwale Grodzkie 2 Street)
16:00	18:00	Accommodation (OW SYRENKA in Stegna, Grunwaldzka 11 Street)
18:30	19:30	Dinner, organizational meeting
20:00	-	Integration field game*

* Organized by Students' Scientific Association BIO-MED (please take flashlight)

Wednesday, 3 rd September 2014			
07:00	08:00	Breakfast	
08:00	08:15	Welcome	
08:30	09:45	Lecture " An earful of corn smut "	Scott E. Gold (University of Georgia, USA)
9:45	11:00	Lecture " Of fungi and men: <i>Ustilago maydis</i> as a model system to study ribosomal readthrough and peroxisome function "	Michael Bölker (Philipps University of Marburg, Germany)
11:00	11:20	Coffee Break	
11:20	12:10	Lecture " Ethical and legal rules and regulations for animals experiment performance "	Jolanta Paradziej-Łukowicz (Medical University of Gdańsk, Poland)
12:10	13:25	Lecture " Guinea pig model of <i>Helicobacter pylori</i> infection, inflammation and immune response "	Magdalena Mikołajczyk-Chmiela (University of Łódź, Poland)
13:25	14:45	Lunch	
14:45	16:00	Lecture: " Host-pathogen-interactions during influenza infections – studies in the mouse model system "	Klaus Schughart (Helmholtz Centre for Infection Research, Germany)
18:30	19:30	Dinner	
21:00	-	Fancy dress party "Model organism"	

Thursday, 4 th September 2014			
07:00	08:00	Breakfast	
08:30	9:30	Lecture " Fish as model organisms in biomedical research "	Konrad Ocalewicz (University of Gdansk, Poland)
9:30	10:30	Lecture " The zebrafish as a tool in cancer genetics and cancer cell biology "	Maria Mione (Karlsruhe Institute of Technology, Germany)
10:30	10:50	Coffee Break	
10:50	12:10	Lecture " Zebrafish husbandry and health "	Małgorzata Wiweger (International Institute of Molecular and Cell Biology, Poland)
12:10	13:25	Lecture " Zebrafish in the study of developmental genomics "	Cecilia Lanny Winata (International Institute of Molecular and Cell Biology, Poland)
13:25	14:45	Lunch	

Thursday, 4 th September 2014			
14:45	16:00	Lecture " Tools and resources for zebrafish research: the European Zebrafish Resource and Screening Center "	Maria Mione for Uwe Strähle (Karlsruhe Institute of Technology, Germany)
18:30	19:30	Dinner	
20:00	22:00	First aid - workshop	

Friday, 5 th September 2014			
07:00	08:00	Breakfast	
08:30	10:00	Workshop " Public Understanding of Biotechnology ", gr. A*	Barbara Kijewska, Sylwia Mrozowska, Tomasz Besta (University of Gdansk, Poland)
10:00	10:20	Coffee Break	
10:20	11:50	Workshop " Public Understanding of Biotechnology ", gr. B*	Barbara Kijewska, Sylwia Mrozowska, Tomasz Besta (University of Gdansk, Poland)
11:50	12:00	Technical break	
12:00	13:15	Lecture " Xenopus: a Model System for Studies of Gene Regulation and Vertebrate Development "	Amy Sater (University of Houston, USA)
13:15	14:45	Lunch	
14:45	16:00	Lecture " Arabidopsis – The Model Plant for Biotechnology "	Jan Sadowski (Institute of Molecular Biology and Biotechnology, Adam Mickiewicz University, Poland)
16:00	17:15	Lecture " Diversity in the composition and function of fungal communities of native and farmed prairie soils "	Philip Lyons (University of Houston-Downtown, USA)
19:00	-	Dinner barbecue	

* The list with the division of participants into groups will be posted on a board during conference.

Saturday, 6 th September 2014			
07:30	08:30	Breakfast	
09:00	10:00	Lecture " Are we ready for GMO? "	Aleksandra Małyska, Tomasz Twardowski (Institute of Bioorganic Chemistry of Polish Academy of Sciences, Poland)
10:00	10:20	Coffee break	
10:20	12:00	Workshop " GMO and GM goods on Polish market " *	Aleksandra Małyska, Tomasz Twardowski (Institute of Bioorganic Chemistry of Polish Academy of Sciences, Poland)
12:00	13:15	Lunch	
13:45	20:00	Trip to Castle in Malbork	
20:00	-	Dinner	

* Please prepare and bring for a workshop etiquette from groceries/foodstuff labeled as "containing or produced using GMO" and food labeled as "GMO free".

Sunday, 7 th September 2014			
08:00	09:00	Breakfast	
09:00	09:30	Giving Certificate	
09:30	11:00	Checking out	
	11:00	Saying "Goodbye" to Stegna	

Information on Speakers and Talks

Tomasz Besta (University of Gdansk, Poland)



Social psychologist and an associate professor at the University of Gdansk, Institute of Psychology. He obtained his PhD in 2010 from the Polish Academy of Science and since then has been involved as a principal investigator or main researcher in national and international research projects (granted by, for example, the Polish National Science Center, the European Commission Jean Monet Programme and Norway Grants in the Polish-Norwegian Research Programme). His main research area is social and personality psychology; he analyzes the mechanisms of

intergroup relations, dynamics of social identities, and the consequences of the need for certainty and predictability. Recently, he has been involved in research into public understanding of technology and human cognitive distortions related to the protection of world-views and beliefs. He is also an ad-hoc reviewer in national and international journals and one of the editors of the Current Issues in Personality Psychology.

Workshop: **Public Understanding of Biotechnology**

TIME: Friday, 5th of September, 8:30 (gr. A), 10:45 (gr. B)

The growing impact of technology (including biotechnology) has brought science ever more into our daily lives. However the public is left with nothing to counterbalance the pervasive influence of science and technology. Tough questions about science and public interaction were raised in social sciences. The role of science communication is to remedy this lack and bring achievements in science into the public eye and to the attention of important stakeholders such as politicians and industry. The notion that public dissent over biotechnology was based in science illiteracy became widespread in Western democracies and was nurtured by large-scale public attitude surveys reporting a significantly low level of scientific knowledge among the public. This led to deep concerns in scientific organizations about the deficit in public understanding and nourished ideas about increasing the general level of public understanding through science and technology communication. There are three key functions of public knowledge about science and technology, and each of them will be discussed during a workshop. First, knowledge facilitates civic engagement with science, particularly when technologies raise emerging issues that intersect science and society. Second, knowledge facilitates decision making in everyday life, particularly when S&T intersects with citizens' work, home, and leisure activities. A third function of scientific knowledge

is broadly framed as knowledge for the sake of knowing more about the world and how it works, addressing human curiosity in ways that go beyond instrumental needs for practical knowledge. From the psychological point of view, main processes implicated in technology understanding are stereotypes, emotional stigmatization, heuristics (for example availability and anchoring), social representations (and new social myths associated with them). Complimentarily, the feeling of personal control and trust in information given by an authority turned out to be important factors in risk perception as well. Another approach highlights the role of values and cultural clues that are used for framing the process of understanding science and technology. All those approaches will be presented as will the influence of a person's attitudes and world-views on understanding the world, and specifically on risk perception.

Michael Bölker (Philipps University of Marburg, Germany)



Professor for Genetics at the Department of Biology, Philipps University Marburg. He obtained his PhD in biochemistry at the Institute for Genbiological Research in Berlin working on the field of bacteriophage genetics. Post doctoral fellow at the Institute for Microbiology and Genetics of the Ludwig-Maximilians University Munich working on fungal mating type determination. Since 1997 full professor in Marburg. Research interests: Regulation of morphogenesis and cytokinesis in the dimorphic fungus *Ustilago maydis*.

Functional genomics to study peroxisome function and fungal secondary metabolism. Translational recoding and its function for intracellular localization of proteins. Michael Bölker is member of the Marburg Center for Synthetic Microbiology (SYNMIKRO) and the Frankfurt Excellence Cluster for Integrative Fungal Research.

Talk: **Of fungi and men: *Ustilago maydis* as a model system to study ribosomal readthrough and peroxisome function**

TIME: Wednesday, 3rd of September, 9:45

We have recently discovered that in *Ustilago maydis* glycolytic enzymes are partially targeted to peroxisomes via alternative splicing and stop codon readthrough. Comparative genomics and phylogenetic analysis revealed that dual localization of glycolytic enzymes is conserved throughout the fungal kingdom. Recently, we could show that a short conserved stop codon context is sufficient for efficient translational readthrough. Bioinformatic analysis allowed us to discover human genes, for which peroxisomal isoforms are generated by stop codon readthrough. These genes code for neuronal transmembrane receptors and for metabolic enzymes involved in redox homeostasis and ATP metabolism. Our studies demonstrate that fungal model organisms are valuable systems to get important insights into biological processes conserved from fungi to men.

Scott Gold (University of Georgia, USA)



Research Plant Pathologist for the U.S. Department of Agriculture - Agricultural Research Service. Gold earned a PhD in Plant Pathology from the University of California in the laboratory of the pioneer plant pathologist Noel Keen. He joined ARS in 2011 after 17 years as a Professor of Plant Pathology at the University of Georgia (UGA). At UGA among other fungal plant pathogens Gold explored the genetics of dimorphism in the corn smut pathogen, *Ustilago maydis*. He and colleagues, primarily through forward genetic approaches, demonstrated the control of fungal dimorphism (budding vs filamentous growth forms) by the cAMP and MAP kinase signaling pathways. This ability to convert between these forms is critical to the ability of the pathogen to cause disease. Currently at the USDA-ARS, Gold is involved in studies toward the control of food contamination by poisonous mycotoxins. Gold has been an active volunteer in the American Phytopathological Society (APS) serving as a two term member of the APS Public Policy Board with focus on microbial genomics and culture collections. He is the recipient of the APS 2006 Outstanding Volunteer award and the 2010 APS Excellence in Teaching Award. He just completed a three year term as the inaugural Director of the APS Office of Education. While carrying out ARS research he continues to teach a general science elective course on that amazing biology of fungi at UGA entitled "Fungi, friends and foes".

Talk: **An earful of corn smut**

TIME: Wednesday, 3rd of September, 8:30

A brief overview of the diversity of species and activities of fungi will be provided. Approaches for the functional analysis of fungal genes will be introduced. The work of Gold and colleagues on the forward genetic analysis of fungal dimorphism and its relationship to virulence to maize will be reviewed. Finally a GMO approach showing potential for corn smut disease control will be presented.

Barbara Kijewska (University of Gdansk, Poland)



Political scientist and an associate professor at the Institute of Political Science at the University of Gdansk. She has been involved as a co-investigator in national and international research projects including the Jean Monet Programme (the European Commission), a strategic research project of the National Centre for Research and Development (NCBR) “Technologies supporting the development of safe nuclear energy”, “Public Understanding of Technology” (University of Gdansk). In particular, she is interested in studies

regarding the understanding of technologies and mass media coverage of science and technology.

Workshop: **Public Understanding of Biotechnology**

TIME: Friday, 5th of September, 8:30 (gr. A), 10:45 (gr. B)

The growing impact of technology (including biotechnology) has brought science ever more into our daily lives. However the public is left with nothing to counterbalance the pervasive influence of science and technology. Tough questions about science and public interaction were raised in social sciences. The role of science communication is to remedy this lack and bring achievements in science into the public eye and to the attention of important stakeholders such as politicians and industry. The notion that public dissent over biotechnology was based in science illiteracy became widespread in Western democracies and was nurtured by large-scale public attitude surveys reporting a significantly low level of scientific knowledge among the public. This led to deep concerns in scientific organizations about the deficit in public understanding and nourished ideas about increasing the general level of public understanding through science and technology communication. There are three key functions of public knowledge about science and technology, and each of them will be discussed during a workshop. First, knowledge facilitates civic engagement with science, particularly when technologies raise emerging issues that intersect science and society. Second, knowledge facilitates decision making in everyday life, particularly when S&T intersects with citizens' work, home, and leisure activities. A third function of scientific knowledge is broadly framed as knowledge for the sake of knowing more about the world and how it works, addressing human curiosity in ways that go beyond instrumental needs for practical knowledge. From the psychological point of view, main processes implicated in technology understanding are stereotypes, emotional stigmatization,

heuristics (for example availability and anchoring), social representations (and new social myths associated with them). Complimentarily, the feeling of personal control and trust in information given by an authority turned out to be important factors in risk perception as well. Another approach highlights the role of values and cultural clues that are used for framing the process of understanding science and technology. All those approaches will be presented as will the influence of a person's attitudes and world-views on understanding the world, and specifically on risk perception.

Philip C Lyons (University of Houston-Downtown, USA)



Phil Lyons earned his PhD in Plant Pathology from the University of Georgia and MS in Plant Pathology from Texas A & M University. He was Post-doctoral Associate in the Departments of Plant Pathology and Biology at Purdue University, and is now Associate Professor of Biology and Microbiology in the Department of Natural Sciences at UHD where he teaches courses on Biology of Fungi, Plant Biology, Microbial Biotechnology, and on Methods in Molecular Biology and Biochemistry. He also teaches General and Introductory Biology for science majors and non-majors. Lyons' current

research concerns diversity and ecology of tallgrass prairie soil fungi, including effects of farming and restoration. A related project involves the occurrence and variation in substrate specificities of laccases and other oxidoreductases produced by prairie soil fungi. He recently began a project on the diversity and geographical distribution of truffles (*Tuber* spp.) associated with pecans (*Carya illinoensis*) and other hardwoods throughout different vegetation zones of Texas (USA). Prior research involved plant-fungal interactions, including both pathogenic relationships in corn and sorghum and endophytic symbioses in tall fescue grass.

Talk: **Diversity in the composition and function of fungal communities of native and farmed prairie soils**

TIME: Friday, 5th of September, 16:45

Productive soils characteristically have extensive microbial diversity which influences the health of both natural and agricultural ecosystems. Fungi normally comprise the largest fraction of soil microbial biomass and are important not only to soil fertility, but as a source of many current and potential industrial and pharmaceutical products. To determine the effects of farming and associated reduction in vegetative complexity on soil fungal diversity and function, a comparative analysis of native vs. farmed tallgrass prairie is being conducted on the upper coast of the Gulf of Mexico (Texas, USA) using fungal ribosomal RNA analyses and other means. As expected, compared to native soils, fungal taxonomic diversity is significantly reduced and substantially altered in farmed (>50 years) soils with only a small fraction of fungi common to both soils. These taxonomic changes are reflected in changes in the functional phenotypes (nutritional modes and preferences, etc.) associated with fungi in farmed soils, which could in part be explained by reduced vegetative complexity associated with monoculture farming. To assess whether the occurrence of specific metabolic pathways important in fungal

nutrition is altered along with taxonomic diversity, profiles of fungal laccases-a large enzyme family involved in oxidative degradation of plant cell wall lignin and numerous other phenolic and non-phenolic substrates-are being analyzed by DNA and amino acid sequence variations in non-conserved regions and by differences in substrate specificities.

Aleksandra Małyska (Institute of Bioorganic Chemistry of Polish Academy of Sciences, Poland)



Aleksandra Małyska received a Master's degree in medical biotechnology at Poznan University of Medical Sciences in 2010. The second area of her research involves social sciences. She carried out a Directed Individual Study in social sciences and received a Master's degree in Psychology at Adam Mickiewicz University in Poznan in 2013. She continues her research within PhD studies at Lodz University of Technology. Since 2013 she works at Institute of Bioorganic Chemistry, Polish Academy of Sciences. Her research focuses on: public perception of innovative biotechnology, prospects for the commercial use of genetically engineered products, and biotechnology within the knowledge based bio-economy (KBBE).

Talk: **Are we ready for GMO?**

TIME: Saturday, 6th of September, 8:30

Innovative agrobiotechnology is based mainly on genetic engineering and therefore arises many controversies among public. Dynamic development in the agro-industrial sector for the past 40 years led to a phase of rapid growth of new breeding techniques that are not currently perceived as a part of genetic engineering (e.g. cis and intragenesis). At the same time a key factors providing a framework for further progress are both national and international legislation as well as public opinion. However, the issue of GMO within EU turned out to be far more expansive and expensive as well as complex. In addition to technological capacity, agrobiotechnology needs to be discussed in broader context covering the most recent amendments in legislation, market demands and consumer choices.

Workshop: **GMO and GM goods on Polish market, *Factors underlying commercialization of GMO in Poland within EU***

TIME: Saturday, 6th of September, 10:15

Biotechnology refers to industrial use of biological systems and therefore cannot be limited exclusively to research and development. The economic significance of this discipline is determined by the number of innovative biotech products, solutions and services brought to the market. Currently Polish customers can buy four types of goods:

- food and feed, that contains, consists of or was derived from GMOs,

- commodities label as a GMO-free products,
- biopharmaceuticals that were manufactured through the use of innovative biotechnology (e.g. genetic engineering),
- cosmetic products described as containing ingredients that were produced through the use of innovative biotechnology (description on the packaging are often unclear and usually referred to unspecified "DNA technology").

What is the characteristic of each product and whether any evidence-based link between these goods and achievements of innovative biotechnology exist?

Magdalena Mikołajczyk-Chmiela (University of Łódź, Poland)



With a master degree on biology, microbiology as speciality, upon her PhD on Immunology in 1991 and habilitation in 1999, Magdalena Mikołajczyk-Chmiela was nominated in 2005 on the position of permanent Professor (medical microbiology, immunology) at the Faculty of Biology and Environmental Protection, University of Lodz. She is currently head of the Department of Immunology and Infectious Biology at the Institute of Microbiology, Biotechnology and Immunology. Her research concerns the immunology of infectious diseases including: immune processes regulating host-pathogen interactions, bacterial virulence

factors that determine the course of infections, the use of microorganisms in the design and manufacture of biological components for potential therapeutic use, prevention and diagnostic. With particular attention she leads research on *Helicobacter pylori* infections, which are responsible for gastric and duodenal ulcers and even stomach cancers. Work on this subject she began in 1992, being a member of the research team at the Department of Medical Microbiology, Lund University in Sweden. With her experience she published numerous papers, review articles, coordinated and participated in a number of research projects supported by the Polish Research Committee, the Polish Ministry of Science and Education as well as the National Center of Science, and evaluated them as an expert. She is a member of the Scientific Council of the Institute of Medical Biology, Polish Academy of Sciences and the editorial board of the World Journal of Gastroenterology. She shares her professional activity between research work and academic professor activity.

Talk: **Guinea pig model of *Helicobacter pylori* infection, inflammation and immune response**

TIME: Wednesday, 3rd of September, 12:30

During the 19th and 20th centuries, the guinea pig (*Cavea porcellus*) was an important experimental animal for studying bacterial diseases such as tuberculosis and diphtheria. It was also used by Robert Koch for establishing his 5 postulates for identifying the causative agent of infectious disease. Since then, the guinea pig model has been used to elucidate the course and the mechanisms as well as potential prevention and treatments schedules of a broad range of human bacterial diseases including disorders related to *Helicobacter pylori* infections. The Gram-negative *H. pylori* rods are human pathogen causing symptomatic gastritis, peptic ulcer or even gastric cancer. Clinical manifestation of *H. pylori* infections result from multiple

gastrointestinal responses to various bacterial products, including the reactions of both epithelial cells and the cells of immune system. However, the nature and the consequences of interactions between *H. pylori* components and host cells promoting persistent colonization are not well understood. Little is also known about the kinetics of immune responses in *H. pylori* infected individuals because the initial moment of infection has not been identified. Various animal models have been used to investigate the pathophysiology and immune processes related to *H. pylori* infections. However, the guinea pig model seems to be more representative of human *H. pylori* infection than other animal models. For this purpose the guinea pig shares similarity with the human with regard to: the immune responses, both humoral and cellular, the complement system, the anatomy of the stomach and its lining by glandular epithelium, the similar composition of the stomach glands, the expression of interleukin (IL)-8, an important factor in the local inflammatory response, the requiring dietary vitamin C, the corticosteroid response and the development of delayed-type hypersensitivity reaction after exposure to infection. The guinea pig model has been successfully used in establishing the role of *H. pylori* outer membrane proteins in a colonization of the stomach, the persistence of infection, the cell turnover of *H. pylori*-infected gastric mucosa, the induction of antral gastritis and gastric mucosa-associated lymphoid tissue, the propagation of *H. pylori* specific lymphocyte responses and in testing of orogastric vaccination with *H. pylori* antigens.

Maria Mione (Karlsruhe Institute of Technology, Germany)



Group Leader at the Institute of Toxicology and Genetics Karlsruhe Institute of Technology, KIT.

Research interest: Cancer and disease models using the zebrafish platform. Special focus on genetic and epigenetic mechanisms of transformation and cell reprogramming by oncogenes.

Dr. Mione graduated in Medicine and Surgery at the University of Rome "La Sapienza", trained as a neurologist and received a PhD in Neurobiology from University College London. After postdoctoral work at University of California at San Francisco, on her return to U.K, she

adopted the zebrafish for her studies on neural development and disease. In 2005 she moved to the Institute of Molecular Oncology in Milan and developed zebrafish models for the study of cancer cell biology. Dr. Mione's work focuses on understanding early events in melanoma, myeloid leukemia and glioma development, including cancer initiating cells, mechanisms of transformation, epigenetic regulation and immune responses. From 2012, she is Visiting Professor at the Institute of Toxicology and Genetics at Karlsruhe Institute of Technology (KIT). She is an active member of the international community of zebrafish researchers. She organized of the VI European Development and Genetics Zebrafish meeting, held in Rome in 2009, and the satellite workshop on Cancer and Immune Responses in Zebrafish in July 2009. She was part of the planning committee of the 4th Strategic Conference of Zebrafish Investigators in Asilomar, 2009-2011, Vice Chair of the Cost action BM8024, EuFishBioMed and funding member of the European Zebrafish & Medaka Society (<http://www.eufishbiomed.kit.edu/>). She is a member of the scientific board of the newly established Zebrafish Disease Models society (http://www.zdmsociety.org/internation_expert_board.html).

Talk: **The zebrafish as a tool in cancer genetics and cancer cell biology**

TIME: Thursday, 4th of September, 9:30

As the zebrafish attracts interest and gains consideration as a powerful system to study diseases, its use in cancer research steadily increases. Cancer occurs naturally in zebrafish and can be induced with a variety of toxicological, environmental and genetic methods, making this small vertebrate an extraordinary tool in cancer research. Indeed, no other models offer the molecular toolbox, the superior imaging capabilities and the discovery power of forward genetic screens in just one tiny organism. Its similarities to higher vertebrates (namely humans) are remarkable. We study the early events in cancer, focusing on molecular and cellular aspects of

transformation, clonal expansion and exploitation of host resources that characterize cancer-initiating cells and cancer stem cells. We have developed powerful systems to initiate cancer in different organs and stages of development, with the goal of understanding the mechanisms of transformation, visualize transformed cells in vivo and establish platforms for genetic and chemical screens. A number of projects have been developed using this approach and will be presented here. These include: a study of microRNAs as global effectors of oncogenes, which led to the identification of Jmjd6 as a target of ras through the action of 3 microRNAs in our model of melanoma; the identification of an intricate network of signals to control cell fate determination under the Notch pathway co-opted by the oncogene during transformation of neural stem cells in our model of glioblastoma; and the discovery that targeting oncogene expression to hemogenic endothelial cells induces a myeloproliferative disease.

Talk: Tools and resources for zebrafish research: the European Zebrafish Resource and Screening Center

TIME: Thursday, 4th of September, 15:45

Maria Mione (for Uwe Strahle)

The small fresh water fishes zebrafish and medaka have become new model organisms for biomedical research. They currently represent the only vertebrate models to derive quantitative data on gene expression, signalling events and cell behavior in real time in the living animal. Relevant phenotypes in fish mutants easily compare to those of other mammalian disease models and can be analysed in great details and much faster than in mammals. In recent years, approximately 2500 fish lines have been generated by European research groups. Their potential including their possible use by the biotechnology industry is far from being exploited. The main objective of the European Zebrafish Resource and Screening Center at Karlsruhe Institute of Technology is to establish a platform for exchange of tools and knowledge for research on small fish models with a strong focus on biomedical applications and integration of European research efforts and resources. EZRC and the associated Screening Center coordinate the distribution of small fishes as human disease models, allow “shelf screen” for desired phenotypes and provide a “state of the art” screening facility for high throughput image-based chemical screens. These platforms are associated with a newly formed EuFishBioMed Society, which promotes the use of small fish models among the biomedical research community and industry for a faster translation of research into medical applications and as in vivo systems for drug development and toxicity testing.

Sylwia Mrozowska (University of Gdansk, Poland)



Associate professor at the Institute of Political Science at the University of Gdansk and the head of the post-graduate studies in the field of “Civic activation of local communities in the European Union”. She is the principal investigator and coordinator of national and international projects (the National Center for Research and Development (NCBR), the Jean Monnet Programme, the Swiss-Polish Cooperation Programme, the Ministry of Labour and Social Policy) and the author of publications dealing with the issues of lobbying, strategies, democratic engagement, social participation, civic society, public

understanding of technology. Currently, her work focuses on the development of the social communication model in the scope of new nuclear technologies (strategic research project NCBR).

In 2013 Sylwia Mrozowska became a founding member of the Polish Society of Technology Assessment.

Workshop: **Public Understanding of Biotechnology**
TIME: Friday, 5th of September, 8:30 (gr. A), 10:45 (gr. B)

The growing impact of technology (including biotechnology) has brought science ever more into our daily lives. However the public is left with nothing to counterbalance the pervasive influence of science and technology. Tough questions about science and public interaction were raised in social sciences. The role of science communication is to remedy this lack and bring achievements in science into the public eye and to the attention of important stakeholders such as politicians and industry. The notion that public dissent over biotechnology was based in science illiteracy became widespread in Western democracies and was nurtured by large-scale public attitude surveys reporting a significantly low level of scientific knowledge among the public. This led to deep concerns in scientific organizations about the deficit in public understanding and nourished ideas about increasing the general level of public understanding through science and technology communication. There are three key functions of public knowledge about science and technology, and each of them will be discussed during a workshop. First, knowledge facilitates civic engagement with science, particularly when technologies raise emerging issues that intersect science and society. Second, knowledge facilitates decision making in everyday life, particularly when S&T intersects with citizens' work, home, and leisure activities. A third function of scientific knowledge is broadly framed as knowledge for the sake of knowing more about the world and

how it works, addressing human curiosity in ways that go beyond instrumental needs for practical knowledge. From the psychological point of view, main processes implicated in technology understanding are stereotypes, emotional stigmatization, heuristics (for example availability and anchoring), social representations (and new social myths associated with them). Complimentarily, the feeling of personal control and trust in information given by an authority turned out to be important factors in risk perception as well. Another approach highlights the role of values and cultural clues that are used for framing the process of understanding science and technology. All those approaches will be presented as will the influence of a person's attitudes and world-views on understanding the world, and specifically on risk perception.

Konrad Ocalewicz (University of Gdansk, Poland)



Konrad Ocalewicz received his M.Sc. in the field of biotechnology in animal breeding from University of Agriculture and Technology in Olsztyn in 1998 and his PhD in agriculture and fisheries from University of Warmia and Mazury in 2002. In 2005, Konrad Ocalewicz completed two years of postdoctoral research in Laboratoire de Genetique des Poissons, INRA, Jouy-en-Josas, France where he studied functionality of L-gulonogamma-lactone oxidase gene in fish. HeIn 2006 he was also involved in the international project *Control of sex in Atlantic halibut:*

Towards production of monosex all-female stocks conducted in The University of Nordland (Bodo, Norway) and University in Stirling (UK) (2006). His scientific interests cover a range of issues such as genetic sex determination and evolution of the vertebrate sex chromosomes, development of the isogenic and clonal fish lines, recovery of the fish gene pools through artificially induced androgenesis, genomic organization of the telomeric DNA sequences and role of the telomerase in healing of the radiation-induced Double Strand Breaks. Results of his research on the spontaneous and induced chromosome mutations in the rainbow trout were part of his D.Sc. dissertation defended at the Department of Biology and Biotechnology, University of Warmia and Mazury in Olsztyn in 2011. Since 2013, Konrad Ocalewicz has been an assistant professor at the Department of Marine Biology and Ecology, Institute of Oceanography, University of Gdańsk. He also serves as an Assistant Editor in the Journal of Fish Biology, the official journal of The Fisheries Society of the British Isles (FSBI).

Talk: **Fish as model organisms in biomedical research**

TIME: Thursday, 4th of September, 8:30

Fishes with more than 30 000 species are the most numerous and diverse group of vertebrates. Easy access to fish species showing small size, short life cycles, high fecundity and low cost of breeding causes these animals become perfect models in studies of many biological processes including those relevant to human health. The main focus of this talk is to present the most promising fish species that serve as model systems in the biomedical research. It is not only zebrafish which is widely used in the scientific laboratories but also another aquaria fish like medaka, platyfish, stickleback or aquaculture stars like rainbow trout or tilapia are considered as excellent models in studies concerning genome evolution, DNA damage and repair, carcinogenesis, aging, sex determination and ontogeny, among others.

Jolanta Paradziej-Łukowicz (Medical University of Gdansk, Poland)



Director of Tri-City Central Animal Laboratory – Research and Service Centre of the Medical University of Gdansk.

She received MSc and PhD at the Faculty of Pharmacy, the Medical University of Gdańsk, and further scientific training at the Department of Pharmaceutical Technology and at the Biochemistry Chemical Faculty, Technical University of Gdansk.

She was particularly involved in many projects associated with investigation of potential anticancer drugs anticancer

activity on murine tumors and human tumor xenograft models *in vivo*. She also cooperates with biochemical and pharmaceutical industry in the field of potential antidiabetes drugs activity investigating.

In general she has expertise in conducting animal experiments and evaluation biological activity of compounds of chemical and natural origin. In 2011 -2013 she took part in Expert Working Group (EWG) on Education and Training within the context of 2010/63/EU Directive. For the past three year she also has organizing seminars and practical trainings for people performing experiments or doing work with or around laboratory animals with regional and state-wide range.

Talk: **Ethical and legal rules and regulations for animals experiment performance**

TIME: Wednesday, 3rd of September, 11:45

Today it is a major challenge for scientists to contribute to improve the welfare of animals used in scientific procedures. Animal-welfare considerations are the highest priority in the context of animal keeping, breeding and use.

Thus, the presentation will concern of following issues:

- the ethical and legal aspects of performing experiments on animals,
- how to understand 3R principle (*Replacement, Reduction, Refinement*: putting theory into practice,
- what requirements we should meet to receive permission for performing experiments on animals.

Jan Sadowski (Institute of Molecular Biology and Biotechnology, Adam Mickiewicz University, Poland)



Head of Biotechnology Department at Faculty of Biology, Adam Mickiewicz University (from 2001 up to now). He received extensive doctoral and postdoctoral training in plant molecular genetics and genomics: Fullbright-Hays fellowship, 1979-1980 (12 months); Rutgers University (4 months) and Texas A&M University (8 months); post-doc at University of Perpignan, France (18 months in the period of 1987-1992); geneticist position at University of California, Davis, USA (2.5 years, 1993-1996). His main achievements are connected with understanding the structure, organization and

evolution of Brassicaceae genomes. Currently, he is involved in genome-wide functional studies on cellular signalisation networks activated in plant cells in response to environmental stresses, such as drought, salinity and ozone. His team applies diverse physiological and genetic tests including specific signalisation pathway inhibition or activation and agro-transformation with protein kinases (CDPK and MAP kinases) and protein phosphatases (PP2C ABI1 and ABI2) encoding genes, combined with the genetic analysis of insertional mutants and/or specific transient gene expression. Selected genes with beneficiary characteristics for plant adaptation to drought stress (such as *BnCDPK5* and *AtCDPK5*) or other interesting phenotypes (*BnABI1* and *AtABI*) have been introduced to the winter rapeseed to prove and study further their application values. Prof. Sadowski is an author and co-author of dozens of peer-reviewed publications (Genetics, Nucleic Acids Research, Plant Journal, Journal of Experimental Botany, Molecular Plant, Molecular and General Genomics, among others).

Talk: **Arabidopsis – The Model Plant For Biotechnology**

TIME: Friday, 5th of September, 14:15

Over 40 years of Arabidopsis biological research established the basis for next stage: application of Arabidopsis model and generated toolkits as a starting point in crop plant modification for modern society needs.

In order to fulfill common expectations that crop plant production and its range/assortment/ variability should increase meaningfully in relatively short time, we have to apply already available knowledge and financial resources more efficiently. This could be achieved via application and further exploration of a model system, this means a plant species that is genetically simple and is easily manipulated. The model plant, *Arabidopsis thaliana*, offers the possibility to test general hypotheses immediately. It seems that with proper reference system, such

as the *Arabidopsis*, we should be able to move forward with advanced research that will directly affect improvement of crop plants. *Arabidopsis thaliana* is a weed, closely related to such economically important crop plants as rapeseed/conola, turnip, broccoli, and cabbage, among others. It has been the model in intense biochemical, physiological and genetic studies for over 40 years because of a set of characters that make *Arabidopsis* desirable for laboratory-based research. It has a short life cycle, generates numerous progeny, and has very limited space requirement. It contains small, genetically fine “understood” genome that has been manipulated through genetic engineering easily - comparing with genomes of other plants. This characteristics makes *Arabidopsis* an ideal model organism for biological research, biotechnological aspects including. Large toolkit for genetic manipulation and analysis has been developed for *Arabidopsis* in recent years, with efficient mutagenesis and transformation technologies at the first place. Presently, *Arabidopsis* biological tools and databases enable extensive and rapid biotechnology-oriented research progress. Ongoing studies carried out within the *Arabidopsis* research community has resulted in precise describing of the biochemical and physiological, as well as developmental processes. Finally, novel research tools were developed that assist researchers to establish new ideas (techniques/technologies) with use of model plant before their application in crop species. This should increase our ability to make the crop plant production more predictable, especially increase food production, introduce agricultural practices friendly at environmental level and new plant uses. It can be expected that the model organism *Arabidopsis thaliana* will serve in fast development of plant biotechnology. I will present several lines of our studies that concern the manipulation of selected genes to understand and improve *Arabidopsis* adaptation to environmental stresses.

Amy Sater (University of Houston, USA)



Developmental biologist and Professor of Biology and Biochemistry, University of Houston.

She obtained her Ph.D. from the University of Texas before embarking upon postdoctoral work at the University of California at Berkeley. Her ongoing research interests include cell signaling and the molecular regulation of embryonic development in the African Clawed Frog *Xenopus laevis*. She has also been extensively involved in the development of genomics resources in *Xenopus*,

contributing to genetic mapping and genome assembly in *Xenopus tropicalis*; she also served on the *Xenopus* Genome Steering Committee 2005-2013. Her current studies address the roles of microRNAs in the initiation of neural development, using a combination of genetic and biochemical approaches. She served as Instructor for the “Cell and Developmental Biology of *Xenopus*” course at Cold Spring Harbor Laboratory from 2011-2014.

Talk: ***Xenopus*: a Model System for Studies of Gene Regulation and Vertebrate Development**

TIME: Friday, 5th of September, 15:30

Xenopus has served as an outstanding model system for fundamental discoveries in gene regulation, cell signaling, vertebrate development, and the cell cycle. These frogs produce large numbers of oocytes or synchronously developing embryos, which allows for the integration of mechanistic and functional analyses of cellular and molecular events in early development. The first half of this talk will introduce both species of *Xenopus*, *X. laevis* and *X. tropicalis*, describing the basic characteristics and experimental strengths of each species. It will also discuss the roles of the *Xenopus* system in seminal findings in molecular, cell, and developmental biology, as well as the application of contemporary approaches (e.g., genome editing). The second half will focus on studies in our lab that investigate the roles of microRNA (miR)-dependent regulation in early neural development and eye formation. The initiation of neural development begins in the early embryo, when ectoderm cells become specified to adopt either a neural or an epidermal fate. Our first study compares the miRs and miR-targeted mRNAs in early neural vs. epidermal ectoderm. Overexpression of a myc-tagged Argonaute (Ago) allows us to isolate miR-targeted RNAs via immunoprecipitation of the Ago-RNP complex. We are now using next-generation sequencing to compare the Ago-RNP RNAs from neural and epidermal ectoderm; we have also carried out small-RNA sequencing to identify the miRs from

each cell type. These studies will allow us to elucidate miR-dependent regulatory networks that mediate the establishment of distinct ectodermal identities or initial steps along the neural developmental pathway. In our second study, transgenic expression of myc-Ago in the eye-forming region and subsequent isolation of Ago-RNP RNAs has led to the observation that several transcription factors critical to eye development are putative targets of miRs. Computational identification of miRs expected to bind these eye transcription factors implicate miR-199 as a critical regulator of eye development. Functional analyses indicate that miR-199 is required to maintain the population of committed eye precursor cells through effects on cell proliferation or survival. These studies illustrate the potential of *Xenopus* for studies that incorporate transcriptome analyses with transgenic, biochemical, and developmental approaches to investigate gene regulation in vertebrate development.

Klaus Schughart (Helmholtz Centre for Infection Research, Germany)



Klaus Schughart is Head of the Department of Infection Genetics (INFG) at the Helmholtz Center for Infection Research (HZI) in Germany. The HZI is a government funded public research institute dedicated to perform basic research on host-pathogen interactions with the aim to develop new strategies for diagnostics, prevention and therapy of infectious diseases.

The main research interest in the INFG department is to understand the role of genetic factors that determine resistance or susceptibility to influenza A virus infections. For these studies, we are using the mouse as model system. We established models for lethal and

non-lethal infections using different mouse populations and knock-out models.

Talk: **Host-pathogen-interactions during influenza infections – studies in the mouse model system**

TIME: Wednesday, 3rd of September, 15:45

The role of genetic determinants has been well documented for viral, bacterial, and parasite pathogens in humans. In the case of influenza A virus, the value of the mouse model has been demonstrated for recent and historical (1918) influenza A/H1N1 subtypes, as well as the highly pathogenic bird subtype A/H5N1. In our research laboratory, we are investigating genetic factors that influence the susceptibility of the host to influenza A infections. For these studies, we use different mouse families (genetic reference populations), mutants (knock-out lines) and various influenza virus subtypes (H1N1, 2009 H1N1, H7N7, H5N1). After infection, we study the survival, weight loss, viral load, immune cell infiltrates, histopathology, chemokine / cytokine profiles and changes in gene expression.

Our studies revealed a strong influence of the genetic background for the host susceptibility to influenza virus infections. One resistant and one susceptible mouse strain were studied in detail. The high susceptibility in the DBA/2J mouse strain is caused by high viral loads in infected lungs and a hyper-inflammatory response. The mapping of the susceptible trait in BXD recombinant inbred strains revealed five Quantitative Trait Loci (QTLs) that are currently investigated in more detail.

Also, we showed that several knock-out mice were more susceptible to influenza A infection than wild type mice. Most importantly, we discovered that *Tmprss2*-deficient mice were totally resistant to influenza H1N1 virus infection validating anti-proteases as potential new points for intervention.

In addition, we established a large scale systems biology project in which we profiled changes in gene expression patterns in the lungs, brains and blood of mice after influenza A virus infection.

Tomasz Twardowski (Institute of Bioorganic Chemistry of Polish Academy of Sciences, Poland)



Professor and Head of the Department of RNA Biology, Institute of Bioorganic Chemistry at Polish Academy of Sciences.

Research interests: His scientific experience is focused on isolation and purification of proteins and tRNAs, RNAs and studies on the mechanism of protein activity, regulation of protein biosynthesis at translational level [author and co-author of over 80 peer-reviewed papers]. Professor Tomasz Twardowski is engaged in social and legal aspects of biotechnology in Poland and on international area [intellectual property rights, legislation and public perception of biotechnology]. He was a delegate of Poland for “Working Party on

Biotechnology” of OECD and he participated in “Biosafety protocol” established by UNEP and chairman of the board of Polish “GMO information office”. Prof. Twardowski was a chairman of “GMO Committee” at Agriculture Ministry of Poland and member of the Board of Polish Biotechnology Committee and he was Editor-in-Chief of Polish journal “Biotechnologia” [for over 20 years]. In the field of social and legal aspects of biotechnology he is author [co-author] of about 200 papers, 50 books and chapters in books and is engaged in several public activities [including popularization of biotechnology]. In 2012 Professor Tomasz Twardowski was elected President of Polish Biotechnology Committee and a member of Executive Board of European Federation of Biotechnology.

Talk: **Are we ready for GMO?**

TIME: Saturday, 6th of September, 8:30

Innovative agrobiotechnology is based mainly on genetic engineering and therefore arises many controversies among public. Dynamic development in the agro-industrial sector for the past 40 years led to a phase of rapid growth of new breeding techniques that are not currently perceived as a part of genetic engineering (e.g. cis and intragenesis). At the same time a key factors providing a framework for further progress are both national and international legislation as well as public opinion. However, the issue of GMO within EU turned out to be far more expansive and expensive as well as complex. In addition to technological capacity, agrobiotechnology needs to be discussed in broader context covering the most recent amendments in legislation, market demands and consumer choices.

Workshop: **GMO and GM goods on Polish market, Factors underlying commercialization of GMO in Poland within EU**

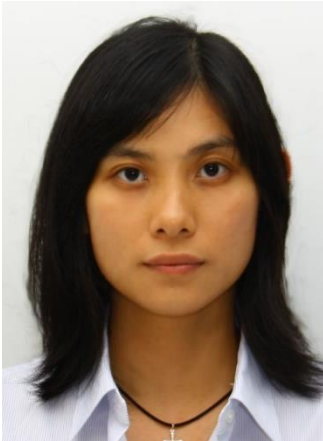
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- biopharmaceuticals that were manufactured through the use of innovative biotechnology (e.g. genetic engineering),
- cosmetic products described as containing ingredients that were produced through the use of innovative biotechnology (description on the packaging are often unclear and usually referred to unspecified "DNA technology").

What is the characteristic of each product and whether any evidence-based link between these goods and achievements of innovative biotechnology exist?

Cecilia Lanny Winata (International Institute of Molecular and Cell Biology, Poland)



Group leader at the International Institute of Molecular and Cell Biology, Warsaw.

Research interest: developmental biology using zebrafish as a model organism, the study of developmental mechanisms using genomics.

She obtained her PhD in 2009 from the National University of Singapore in the field of zebrafish developmental biology. She worked as a post doctoral fellow at the Genome Institute of Singapore where she picked up genomics techniques and applied them to study the regulation of maternal to zygotic transition and functional characterization of a transcription factor in zebrafish. Currently, her lab is

studying transcriptional regulation and epigenetics during heart development, as well as the regulation of early embryonic development in zebrafish.

Talk: **Zebrafish in the study of developmental genomics**

TIME: Thursday, 4th of September, 12:30

Zebrafish occupies a unique niche in the field of developmental biology. As an established model organism, its beneficial features have been exploited to unravel the molecular mechanisms of development. As a consequence of this, the zebrafish genome has been well characterized, and many genetics tools have been developed for functional characterizations of its genes. On the other hand, its comparatively low cost of maintenance and ability to produce large numbers of embryos makes the zebrafish an ideal organism for genomics studies. Here I present several examples of studies where we apply genomics to study development in zebrafish.

In the first project, we used high throughput transcriptome sequencing (RNA-seq) to study the molecular mechanism of the mid-blastula transition (MBT), during which the zygotic genome is activated for the first time. Our transcriptome profiling identified large scale delayed polyadenylation of maternal mRNAs which is believed to represent a mechanism to activate them at appropriate developmental time points. Pan embryonic inhibition of polyadenylation suggested its importance in ensuring developmental progression past the MBT stage. I will present our ongoing effort on characterizing the control mechanism of pre-MBT development in more detail.

In the second project, we use ChIP-seq to study the molecular mechanism of Zic3, a transcription factor known for its role in neural specification and L-R patterning. Our results uncovered novel links between Zic3 and several signalling pathways and provide insights into developmental regulation by a transcription factor.

Małgorzata Wiweger (International Institute of Molecular and Cell Biology, Poland)



Head of the Zebrafish Core Facility at the International Institute of Molecular and Cell Biology in Warsaw, Poland. She graduated at the Warsaw University of Life Sciences in Poland and obtained PhD at the Swedish University of Agricultural Sciences in Uppsala, Sweden in the field of plant development. In 2004 she switched from plants to animal model (zebrafish) and since then worked as a post-

doctoral fellow at the University of Sheffield (UK), Leiden University Medical Centre, Leiden University and ZF-screens in Leiden, The Netherlands. She is interested in proteoglycans regulating embryo development and uses zebrafish as a model for studies on the skeletal development in normal and pathological conditions. Her latest projects focused on skeletal tuberculosis and non-classical aspects of multiple osteochondromas.

Talk: **Zebrafish husbandry and health**

TIME: Thursday, 4th of September, 11:15

The quality of research relies on the quality of materials. In animal based research, health and well-being of laboratory organisms is essential. Likewise, it is extremely important to assure controlled and standardized conditions appropriate for given species. During my talk you will learn, among many things, what zebrafish like and what stresses them, what are the main aspects of husbandry and breeding, how to assure proper health status and what may cause problems and therefore should be avoided i.e. all basics that are needed for setting up and running successful facility. In addition, some aspect related to the legislation concerning zebrafish being used as a laboratory animal will be covered.

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