

Triplet



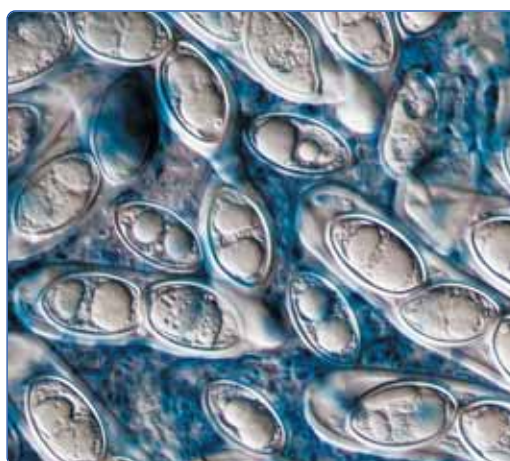
The Quarterly of the Faculty of Biochemistry, Biophysics and Biotechnology, JU

1 / 2010 (8)

AWARDS AND SCHOLARSHIPS

Honourable mention in the Olimpus Competition

Sebastian Pintscher, a 4th year student of biotechnology, took part in the international competition of microscope photography BioScapes organised by Olympus (www.olympusbioscapes.com). He obtained an honourable mention for the photograph of the ascospores of the tropical ascomycete *Cookeina speciosa*, taken on a microscope with DIC. Over 2000 entries from 62 countries comprised the 6th edition of the competition; all those awarded prizes can be seen in the gallery on the organisers' website. The official announcement of results and the handing out of prizes took place on the 6th of December in San



Spores of *Cookeina speciosa*, phot. Sebastian Pintscher

Diego at a conference organised by the American Society for Cell Biology. Sebastian has been interested in academic photography for a number of years. His photographs may be seen on www.spinczer.xt.pl **see p. 4** ▶

GRANTS

DARPA

Professor Froncisz's group from the Department of Biophysics has been awarded a developmental research grant DARPA (Defense Advanced Research Project Agency) from the United States Defence Department for the design and construction of a modern microwave bridge and digital receiver for dosimeter measurements. The funding amounts to \$150,000 and has been allocated for the period of one year.

The project will be performed in close cooperation with AGH University of Science and Technology. Its main goal is the development of the optimal methodology for the measurement of electron paramagnetic resonance (EPR) signals induced by ionizing radiation in the enamel of a human tooth. This is a continuation of the earlier work conducted by Dartmouth College in Hanover, NH, USA. Worthy of note is the fact that the project was submitted directly by the Laboratory of Spectroscopic Methods of

Studying BioBiomolecules' Structure and Function and is one of few research projects commissioned by the United States Defence Department. In mid December, representatives of the Agency, dr. Donlon and dr. Barnes, visited our Faculty to discuss the details for project execution. Interestingly, dr. Barnes, the technical coordinator of the DARPA projects in Poland, is a lieutenant-colonel in the United States air force.

A new microwave bridge and digital receiver will be designed and constructed within the framework of the project. It will allow EPR measurement by traditional approaches as well as using new methods based on the polychromatic excitation of the spin system. The direct result of the work will be the modern, commercially unavailable EPR spectrometer for research in vivo available in Department of Biophysics. We are convinced that besides its application for dosimeter measurements the developed spectrometer will find a wide usage within a variety of other areas of EPR spectroscopy.

see p. 2 ▶

dr. Ryszard Gurbiel

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INNOVATIVE ECONOMY
NATIONAL COHESION STRATEGY

► Grants

cont. from p.1



Prof. Karol Subczyński

NIH FIC

The National Institutes of Health's Fogarty International Center grant "*Is cholesterol crystalline domain a barrier to oxygen transport in the eye lens?*" is shared between the Medical College of Wisconsin, Milwaukee, USA and the Jagiellonian University in Krakow, Poland. The three-year, \$97,458 grant is complementary to the NIH parent grant "*Lipid rafts in eye lens: discrimination by pulse EPR*". The principal investigator for the Fogarty as well as the parent grants is Witold Karol Subczyński, PhD from the Medical College of Wisconsin, and Marta Pasenkiewicz-Gierula, PhD from the Faculty of Biochemistry, Biophysics and Biotechnology is the overseas collaborator. Dr. Subczyński and Dr. Pasenkiewicz-Gierula have been scientific collaborators for more than 25 years, and have co-authored 11 papers. They are both specialists in membrane biophysics, the study of biological membranes using physical, computational, mathematical, and biophysical methods; Dr. Subczyński experiments on tangible membranes, and Dr. Pasenkiewicz-Gierula studies virtual computer models of membranes.

The aim of the grant is to understand the role that cholesterol plays in eye lenses that are healthy and eye lenses with cataract development, a disorder that causes the eye lens to become opaque, decreases vision, and may eventually cause blindness if untreated. Membranes of fiber cells, which build the human eye lens, become overloaded with cholesterol. The overload of cholesterol creates a buildup, and leads to the formation of cholesterol crystalline domains, or two-dimensional cholesterol crystals,

within these membranes. The appearance of these domains is usually a sign of disease; however, only in the lens can cholesterol crystalline domains play a positive biological function, maintaining lens transparency, and possibly protecting against cataract formation. The presence of a cholesterol crystalline domain suggests that it forms a barrier for oxygen transport into the lens, which helps to maintain low levels of oxygen concentration in the lens; an increase in oxygen concentration causes the development of cataracts.

prof. Marta Pasenkiewicz-Gierula

Projects within the Operational Programme Innovative Economy (OP IE)

The results of the competition for the national programmes for strategic research within the framework of the 1.1.2. Operational Programme Innovative Economy were announced in November 2009. Over 120 applications were submitted to the competition. Amongst the beneficiaries of the programme are academic teams from the Jagiellonian University's Faculty of Biochemistry, Biophysics and Biotechnology. The considerable part of the project *Innovative Methods of Application of Stem Cells*, which came first obtaining 96.2 points, will be carried out at our Faculty. It is coordinated by Professor Mariusz Ratajczak of the Pomeranian Medical Academy and received financial support to the order of 45 million Polish zloty, for the period 2010 to 2015, with over 16 million being allocated for research at our Faculty. The research into the application of stem cells in the treat-

PROFESSORSHIP



Prof. Jan Białczyk

Jan Białczyk, the head of the Department of Physiology and Development Biology of Plants obtained the academic title of professor of biological sciences on the 25th of September 2009. He began his academic career in 1973. After graduation from biology he was employed at the Department of Plant Physiology of the Jagiellonian University's Institute of Molecular Biology. At the time, Professor Jan Zurzycki was the head of the department and the team research involved motor reactions occurring in the plant world.

He gave his doctoral defence in 1976 on the subject of the motor reactions of plasmodia of slime moulds under Professor Leo-

kadia Rakoczy. The results of the thesis were published in 1979 in Photochemistry and Photobiology. In the years 1982 – 1984 he was working at the Max-Planck-Institut für Biochemie in Munich (Germany). At this time his research objectives were isolation of slime moulds mutants as well as the explanation of the process of fructification in the white mutant *Physarum polycephalum* of the strain A-22b.

After his return from abroad he engaged in research with dr. Zbigniew Lechowski into the movements of cellular organelle. His new area of interest was the mechanism of the nyctinastic movements of the leaves of *Phaseolus coccineus*. Professor Białczyk and his team continue research of both a theoretical and practical nature within the following areas:

- the physiology of plant movement: research into the photoreception and mechanism of the movement of whole organisms (photo-

ment of diseases of the cardiovascular system and in the stimulation of the healing of wounds will be conducted at the Department of Medical Biotechnology and the Department of Cell Biology. The expertise and experience of other teams will also be employed (the Department of Analytical Biochemistry, the Laboratory of Cell Biophysics, the Department of Cellular Biochemistry, the Department of Immunology), as well as the modern equipment purchased within the project Molecular Biotechnology for Health. The project's coordinator at our Faculty prof. Józef Dulak, while the individual tasks will be equally supervised by dr. Alicja Józkwicz, dr. Ewa Zuba-Surma, dr. Justyna Drukala and dr. Zbigniew Madeja.

The Department of Biophysics and the Department of Medical Biotechnology will also be conducting research within the framework of another project which obtained support in the same competition POIG 1.1.2. The project *Vascular Endothelium in Civilization-related Diseases* coordinated by prof. Stefan Chłopicki from Jagiellonian University Medical College, is a research program connected with the investment project The Jagiellonian Centre for Experimental Therapeutics (see Triplet No 5). Total support of Vascular Endothelium research amounts to 62 million złoty, and the combined financing of the Faculty's teams is 6.5 million. The studies will be coordinated by prof. Wojciech Froncisz of the Department of Biophysics as well as dr. Alicja Józkwicz and prof. Józef Dulak of the Department of Medical Biotechnology.

DOKTORATY

Anna Barbasz *The assembly and activation of kinin-forming system on the surface of monocytes and macrophages*, advisor: prof. Andrzej Kozik, October 9th, 2009

Ewa Wybieralska *Contact stimulation of DU-145 human prostate cancer cell migration*, advisor: dr. Zbigniew Madeja, October 13th, 2009

Tomasz Mikołajczyk *Interactions of monocytes with apoptotic neutrophils*, advisor: prof. Juliusz Pryjma, October 13th, 2009

Jerzy Frączek *The requirement of IRAK4 kinase activity for IL-1R/TLR-induced TAK-1 dependent NF-κB activation and subsequent cytokine production*, advisors: prof. Juliusz Pryjma, dr. Xiaoxia Li, October 16th, 2009

Justyna Stec-Niemczyk *Functional and structural characterization of Spl proteases from Staphylococcus aureus*, advisor: prof. Adam Dubin, October 7th, 2009

Andrzej Żądło *The influence of photodegradation of melanosomes from retinal pigmented endothelium on their antioxidant properties*, advisor: prof. Tadeusz Sarna, November 13th, 2009

HABILITATION

On the 17th of November 2009 at the Pomeranian Medical Academy in Szczecin there took place the post doctoral thesis defence (habilitacja) of Dr. Ewa Zuba-Surma, who currently works at our Faculty, in Department of Medical Biotechnology.

The post-doctoral thesis entitled: *"ImageStream Technology as a Method Supporting Classical Flow Cytometry in the Analysis of Primitive Stem Cell Populations"* presents the results identifying and characterising a rare population of very small and primitive stem cells called Very Small Embryonic – Like stem cells (VSEs). These unique cells have been described in several fetal and adult animal as well as human tissues. Based on capabilities of imaging cytometry – the ImageStream system – it has been possible to unquestionably confirm the presence of these extremely small (smaller than erythrocytes) embryonic-like stem cells in the tissues of mature organisms.

The Faculty of Medicine of the Pomeranian Medical Academy agreeably bestowed on Dr. Ewa Zuba-Surma the Polish post-doctoral degree of Doctor of Science in medical biology.

tactic motor reactions of slime moulds plasmodia), cellular organelle and in particular, plant organs (the nyctinastic movements of leaves).

- the search for biotechnological methods in the stimulation of increased plant productivity – a) the root absorption of HCO₃⁻ ions b) tannins as components of the resistance system of plants to pathogen attack.
- the determining of the conditions for the synthesis of secondary metabolites in plants and cyanobacteria (tannins, bioactive cyanobacterial toxins, polysaccharides of external cellular cyanobacteria) the toxic effects of the reactions of microcystines and cylindrospermopsin on human lymph cells, their influence on the repair of DNA damage, biotests as well as the methods of degradation of toxins of cyanobacterial origin.

AWARDS AND SCHOLARSHIPS

The Nicholas Copernicus Medal for Dr. Claudine Kieda

On the 24th of November dr. Claudine Kieda received the Nicholas Copernicus Medal. This is the highest of accolades that the presidium of the Polish Academy of Sciences awards academics who are not members of the Academy in recognition of their service for the Polish research community.



Dr Claudine Kieda receives the Copernicus Prize from the President of Polish Academy of Sciences

Dr Kieda is the research director at the CNRS Molecular Biophysics Centre in Orlean. Her scientific interests are focused on the mechanisms of angiogenesis, hypoxia and glycobiology. She has been for many years involved in the developing of cooperation between her institute and academic institutions in Poland.

During the winter semester 2009/2010 dr. Kieda was a visiting professor at the Faculty of Biochemistry, Biophysics and Biotechnology, where she gave a series of lectures entitled 'Cancer therapy'. She also conducted classes within the framework of the Polish-French MSc program co-organised by the Jagiellonian University and the University of Orlean. It is worth mentioning here that three years ago dr. Kieda received the Jagellonian University Merentibus medal for her services to our University.

The Minister of Science and Higher Education's Scholarship for Achievements in Science for the Academic Year 2009/2010

The Ministry of Science and Higher Education once again has awarded scholarships for outstanding academic and sporting achievements. From amongst the 986 academic scholarships awarded 197 went to students of the University of Warsaw. The second place with regard to the number of scholarships awarded (85) was held by the Jagiellonian University; amongst whom were 5 students from our Faculty. The scholarship holders for this year's com-

petition were: Katarzyna Kowalik of the Department of Cellular Biochemistry as well as Monika Maleszewska, Jacek Stępniewski, Agata Szade and Krzysztof Szade of the Department of Medical Biotechnology.

The Sapere Auso Scholarships

The Małopolska Sapere Auso Scholarship Foundation brought into being by the Provincial Council has as its aim to support those who have made the effort to gain knowledge. The scholarships granted by the Foundation are directed first and foremost to those talented pupils and students who are able to boast of particular achievements in the fields of science, culture, sport or ecology.

Amongst the victors in this year's edition of the SAPERE AUSO Scholarship Programme 2009/2010 were the following representatives of the Faculty of Biochemistry, Biophysics and Biotechnology: Barbara Augustynek, Katarzyna Kowalik, Monika Maleszewska, Kamila Miłkowska, Barbara Mojsa, Małgorzata Olech, Agata Szade, Krzysztof Szade and Jakub Tomasik. Further information on the subject of the Foundation's activities as well as the regulations for scholarship awards may be found at <http://www.sapereauso.org/>

Rector's Awards

Traditionally at the beginning of the academic year his Magnificence the Rector of the Jagiellonian University awards university employees prizes for academic, teaching and organisational achievements. The individual prize for academic activity for 2008/2009 was awarded to: dr. Jarosław Czyż and dr. Maria Rąpała-Kozik. The team prize for academic activity was awarded to: dr. Jerzy Kruk and dr. Artur Osyczka, as well as the team: dr. Krystyna Urbańska, dr. Martyna Elas, dr. Przemysław Płonka and Dominika Michalczyk. For excellent PhD thesis the awards were granted to dr. Renata Mężyk-Kopeć i dr. Agnieszka Jaźwa. For teaching, the individual prizes were obtained by dr. Joanna Kozieł and dr. Irena Horwacik.

The group prize for the organisation of the 35th Winter School was awarded to the team from the Department of Physical Biochemistry comprising: dr. Piotr Bonarek, dr. Ewelina Fic, dr. Andrzej Górecki, dr. Sylwia Kędracka-Krok, dr. Agnieszka Polit, dr. Magdalena Tworzydło.

From amongst the non-teachers, prizes went to: Barbara Czuba-Pełech, Halina Kasprzyk, Jerzy Kozioł, Tadeusz Oleś, Dorota Panek, Aneta Sroka, dr. Krystyna Stalińska, Jadwiga Sukiennik and Waldemar Śnieżyński (individual prize).

The Molecular Biotechnology Project for Health – the purchase of equipment for new laboratories

In the last quarter of 2009, over six million zloty was spent on the purchase of equipment in the Molecular Biotechnology for Health project, financed by EU funds. The new equipment has been delivered for five of the seven newly created laboratories functioning within the MBH project: the Transcriptomics and Proteomics Laboratory, the Laboratory for Tissue and Cell Engineering, the Laboratory of Virological Molecular Diagnostics, the Laboratory of Plant Biotechnology and Central Bank of Biological Samples.

System for laser micropreparation (Laser Capture Microdissection) was purchased for the Transcriptomics and Proteomics Laboratory. The same lab obtained the Biacore 3000 system for testing the intermolecular interactions in real time using changes in surface plasma resonance, as well as a mass spectrometer and other equipment, including an ultracentrifuge, a magnetic cell sorter, a shaker for cultures of insect cells, shaker for bacterial cultures, a plate reader for absorbance, fluorescence and luminescence measurements.

Laboratory for Tissue and Cell Engineering received a low temperature freezer, an inverted fluorescent microscope, laboratory centrifuges and an autoclave. The Laboratory of Virological Molecular Diagnostics obtained a flow cytometer and centrifuges.

The Laboratory of Plant Biotechnology was equipped with a Corona CAD detector, a radioactivity detector, a magnetic mixer, centrifuges, anodic stripping voltamperometer, a device for genetic transformation using biolistic method, shakers, a horizontal autoclave, a two-beam UV/VIS spectrophotometer and a spectrophotometer for DNA/RNA/protein concentration measurements. An existing chromatograph was expanded by adding another channel and a mass detector, and spectrophotometer for UV/VIS/NIR.

Cryogenic tanks for tissue bank have been delivered. The room adaptation for tissue bank purposes is under the way and should be completed in January.

Design effort on animal facility is continuing according to the schedule. The bid for the purchase of high class microscopes for the Laboratory of Image Cytometry was concluded.

Photographs of the purchased equipment as well as additional information on the project may be found at www.wbbib.uj.edu.pl/bmz.

The Biacore 3000 system for testing the intermolecular interactions in real time using changes in surface plasma resonance, GE Healthcare (Transcriptomics and Proteomics Laboratory)



Flow cytometer FACSCalibur with sorting, Becton Dickinson (Laboratory of Virological Molecular Diagnostics)



Laser Capture Microdissection system LMD7000, Leica (Transcriptomics and Proteomics Laboratory)



Mass spectrometer with ion trap ESI-HCTUltra, Bruker Daltonics (Transcriptomics and Proteomics Laboratory)



The 37th Winter School of the Faculty of the Faculty of Biochemistry, Biophysics and Biotechnology of the Jagiellonian University

The 37th Winter school will take place once again in Zakopane from the 13th to the 17th of February. This year's School organiser, dr. Jerzy Dobrucki, decided to return to the initial character of the event: 'I have proposed *Bioinformatics* as the theme for this year's School. It is an area we should all learn about

as much as possible and use it widely in our research. Still, the academic employees of our Faculty never had courses in bioinformatics during their university years. Therefore, for many of us this field is completely new and it is vital for us to broaden our knowledge'. Additional theme will be celebrating the 40th anniversary of Institute of Molecular Biology, the predecessor of our Faculty. Detailed information and the registration form may be obtained from <http://www.wbbib.uj.edu.pl/zakopane2010>

THE CHRISTMAS MEETING



phot. Marcin Zawrotniak

On Friday afternoon the 18th of December, a few minutes after three, the corridors of the building at Gronostajowa 7 were filled with the sounds of carols sung in four parts... This was the faculty choir introducing a truly Christmassy atmosphere and starting the festive meeting at the Christmas tree. A moment later the Faculty Dean, Professor Wojciech Froncisz in a beautiful speech wished all those present – academic teachers, technical assistants, administrative and service staff together with PhD students and undergraduates of the Jagiellonian University's Faculty of Biochemistry, Biophysics and Biotechnology – Christmas and New Year wishes. Again carols sounded forth after which the floor was taken by Professor Maria Kapiszewska in her farewell to our Faculty after many years of fruitful academic, teaching and promotional work. We would like to wish you all the very best at your post of vice-rector of the Frycz Modrzewski Cracow Academy!

The less official part of the meeting began with Christmas wishes. Our lecture room D107 was miraculously transformed into a sumptuous buffet of mouth-watering Christmas snacks. Giving a helping hand were innocent angels and fun-loving devils, recruited from the ranks of *Nobel* and the Student Self-governing Body.

There was the traditional Polish Christmas wafer to be broken and borsch with savoury pastries and also the individually brought contributions of herring done in a variety of ways, salads, colourful canapés, pickles, cheeses, fruit and prize-winning cakes. There was also a Christmas tree and under it... presents! For each department and laboratory, handmade, wonderful, mind-blowing, witty: as 'gingercake antibodies' for Immunology. In order to receive one, however, one had to buy favour amongst the angels and devils by singing a carol. As far as the carols went they could be heard long after the last presents had been given out, with the joint rendition of the Polish carol 'Bracia, patrzcie jeno' being enough to grace any choir.



phot. Jerzy Koziol



phot. Marcin Zawrotniak



phot. Marcin Zawrotniak



phot. Marcin Zawrotniak



phot. Jerzy Koziol

The end of the year is a good time for a summary. The Student Biotechnology Student Club *Mygen* decided summarize our achievements in this year. Our most deeply rooted tradition is the weekly student seminars, which we maintained throughout the year. We witnessed many valuable presentations prepared by our colleagues, we shared experiences and observations, and became acquainted with each others' passions and interests. This constituted a source for inspiration for many other undertakings which we engaged in during the year and which we would like to recall.

April brought with it some particularly important changes – the General Meeting of the Club elected a new board for *Mygen*. Agnieszka Węgrzyn, at present a 3rd year student of Biotechnology, became the president. To her aid three vice-presidents were elected: Anna Oszmiana, Sebastian Pintscher and Adrian Grzybowski. There was also selected the Audit Committee comprising: Joanna Kaczanowska, Jakub Siemiączko and Rajmund Królikowski as well as the secretary – Grzegorz Majka. The academic overseer elected for the Club was dr. Joanna Bereta, continuing her role from the previous years. The new board had the opportunity to try its new role extremely quickly – the very next day there was the *Mygen's* spring trip to Mszana. During the three days we heard several presentations – on the Friday by Sebastian Pintscher, a student, as well as by Wojciech Gałan, a graduate of our Faculty. On the Saturday we had the pleasure to listen to some eminent guests - professor Halina Gabryś, dr. Krzysztof Pyrc, dr. Benedykt Władyka as well as dr. Dominik Czaplicki. Besides, the trip's participants were able to take advantage of other attractions, including excursions into the mountains and a communal bonfire.

In May the Club's activities concentrated on two events. The first was the participation in the international student conference in Lvov. Eleven members of the Club took part in the trip. The presentations and posters organised by our colleagues drew the recognition of the

Competition Commission, something borne out by the numerous prizes received and brought back to Cracow. The second important event for us was the Science Festival at the Main Market Square in Cracow. The *Mygen*, as every year, was involved in preparing the stand for our Faculty.

After the summer holidays we welcomed the new students of biotechnology and inviting them to join the ranks of *Mygen*. By means of encouragement we organised a further trip to Mszana, this time inviting dr. Joanna Cichy, dr. Jarosław Czyż and dr. Artur Osyczka to give lectures. The student session saw presentations by Paweł Nowak, Sebastian Pintscher and Jarosław Surkont. In October changes occurred in the board – Adrian Grzybowski resigned from his function as vice-president and was replaced by Jarosław Surkont.

November brought another interesting conference – this time organised by the Academic Association of Students of Biotechnology in Poznan. Posters and presentations were prepared and shown by 15 *Mygen* members.

And so we arrived in December, the most pleasant element of the month being our traditional Christmas Meeting. Over a joint Christmas Eve supper we once more recalled all the successes that the old year had brought us.

The *Mygen* Student Club would like to wish a very Happy New year along with deep felt thanks for all the help and kindness to the authorities and employees of the faculty of Biochemistry, Biophysics and Biotechnology.



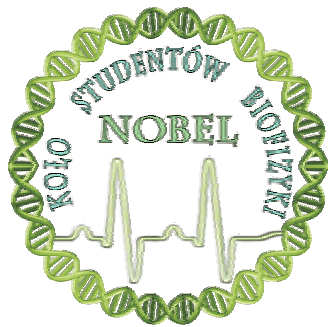
Bonfire at Mszana, phot. J. Siemiączko

Anna Oszmiana

Mygen's Christmas meeting, phot. J. Siemiączko



NOBEL



Science Festival 2009: lots of colours, lab equipment and parsley leaves – “same as your mom uses in the kitchen” – good recipe for invoking interest in science in the youngest generation



Science Festival 2009: Natural Obsession for Biophysics already Emanated from Labs...



On our way to a trip around Poznan in an ancient tram

The route to the Stockholm prize requires extraordinary knowledge, abilities and a enormous input of work... Our Faculty gained 15 students of Biophysics, who are already now putting in all possible effort in order to enter onto this difficult path. Reactivation of the Biophysics Student Club, under the new graceful name of *NOBEL*, started 2008. The acronym could be read as Natural Obsession for Biophysics Emanating from Laboratories. The academic overseer for the *Nobelists* is dr. Jerzy Dobrucki.

The first president of the reactivated Club was Patryk Kuleta, at the time a student of the 3rd year. At the beginning of the current academic year 2009/2010 a new *NOBEL* board was elected: its president is Paulina Rybak (4th year), the function of vice-president is performed by Maciej Bratek (2nd year) while the Circle's funds are administered by Joanna Kwiatek (4th year).

The members of *NOBEL* meet on Wednesdays – in the very middle of the working week. Besides the friendly atmosphere, an important fact is that students from the 1st as well as the 2nd, 3rd and 4th years are all involved to various degrees in the organisation of the respective projects.

Despite the fact that the Club has only been in existence for a short time we have already managed to take part in several important undertakings. One should note that many of these have been conducted in association with the Departments and Laboratories of our Faculty. The first important event for the Club was its presence at the annual Science Festival. At the Main Market Square, amongst historians staging battles, and students of culture teaching Asiatic dances, there stood our Faculty's tent full of a 'field laboratory'. The Biophysics Student Club organised a stand on which the cosmic looking pipettes, bottles and beakers with their mysterious liquids allowed one to extract from the plants and vegetables used every day in the kitchen, a whole array of colours – plant dyes. The rainbow of testers caught the attention of visiting adults and children alike.

Under the presidency of Patryk Kuleta, combining strength and zeal with students from other parts of Poland, 1st *Biophysics Student Exchange Programme* was launched. The inaugurating round, organised by biophysicists from Poznań, took place in May. This allowed the most active of our Club's members to go on an academic trip and visit the sister faculty of Biophysics at the Adam Mickiewicz University in Poznan. The project had its finale at the end of November at the Jagiellonian University's Faculty of Biochemistry, Biophysics and Biotechnology, where our guests had the opportunity to take part in seminars and practical laboratory classes. However, cooperation with the Poznań biophysicists has not come to an end, for on the horizon are waiting other joint ideas.

To make biophysics more popular among the high school students, we decided to answer the most often asked question: 'What really is biophysics?', and so we have started a series of lectures entitled *Meetings with Biophysics!* To date we have been hosted by three high schools (in Cracow and environs). Remembering our own rebellious attitude to studying while at secondary school, we were more than pleasantly surprised by the lively reaction on the part of the young and the genuine interest in the subject we presented.

We are aware that a lot of work still lies ahead of us, as well as challenges – those every day and those more extraordinary, but we have also the hope that our *NOBEL* is on the right route to a Nobel.

Agnieszka Pierzyńska-Mach
Agnieszka Grabowiecka

VISITING LECTURERS

- Prof. Charles Cantor, Center for Advanced Biotechnology, Boston University, SEQUENOM, Inc., SelectX Pharmaceuticals, *New Applications of Sensitive Quantitative DNA Analysis in Cancer, Prenatal Diagnostics, and Infectious Disease*, September 30th
- Prof. Roger Lijnen, Center for Molecular and Vascular Biology Campus Gasthuisberg, Leuven, Belgia, *Functional role of matrix metalloproteinases in development of adipose tissue*, October 13th, guest of Medical Biotechnology Department
- Dr Gabriella Csik, Institute of Biophysics and Radiation Biology, Semmelweis University, Budapest, Węgry, October 16th–18th, guest of Plant Physiology and Biochemistry Department
- Prof. Zygmunt Derewenda, Dept. of Molecular Physiology and Biological Physics, University of Virginia, Charlottesville, VA, USA, *1959-2009: 50 years of structural studies of biomolecules*, October 19th, guest of FBBB
- Prof. Rudiger Ettrich, Zakład Struktury i Funkcji Białek, Instytutu Biologii Systemów i Ekologii Akademii Nauk Republiki Czech, *Coupling of endonuclease and translocase functions in Type I restriction-modification complexes*, November 3rd, guest of Cell Biophysics Laboratory
- Prof. dr. hab. Jakub Gołąb, Immunology Department, Warsaw Medical University, *Photodynamic therapy, monoclonal antibodies and new medicines in oncology – progress, obstacles and perspectives*, November 13th, guest of Medical Biotechnology Department
- Prof. Ivo Konopasek, Dept. of Microbiology, and Genetics, Faculty of Science, Charles University in Prague, Czechy, November 9th-23th, guest of Plant Physiology and Biochemistry Department
- Dr. Marek Langner, Wroclaw University of Technology, *Lipid bilayer as a biological model and a nano-medicine tool*, November 10th, guest of Cell Biophysics Laboratory
- Prof. Lars Björck, Division of Infection Medicine, Lund University, Lund, Sweden, *Streptococcus pyogenes: proteolysis, immunity and virulence*, November 20th-23rd, guest of Microbiology Department
- Dr. Tomasz Guzik, prof. JU, Jagiellonian University Medical College, *Immune mechanisms of hypertension - it is time for new therapies*, November 24th, guest of Medical Biotechnology Department
- Prof. Herbert Thiele, Bruker Daltonik, Bremen, Niemcy, *Statistical Data Analysis of Metabolomics Data Generated by MS and NMR Spectroscopy*, December 3rd
- Dr Farida Minibayeva, Institute of Biochemistry and Biophysics, Russian Academy of Sciences, Kazan, Russia, December 16th-20th, guest of Plant Physiology and Biochemistry Department
- Prof. Richard Beckett, School of Biological and Conservation Sciences, University of KwaZulu Natal, Republika Południowej Afryki, December 16th -20th, guest of Plant Physiology and Biochemistry Department
- Dr Claudine Kieda, Centre de Biophysique Moléculaire, CNRS Orleans, Francja, visiting professor at FBBB, lecture series *Cancer therapies: 1) Cancer in its microenvironment: new insights for targeted therapies*, November 16th, 2) *Cancer microenvironment and chemotherapy: news about tumor hypoxia*, November 18th, 3) *Cancer microenvironment and radiotherapy*, November 20th, 4) *Cancer microenvironment and immunotherapy: The host immune response to cancer*, November 23rd, 5) *Targeted Cancer treatments: How to reach a tumor and the metastases*, November 25th, 6) *Targeted Cancer treatments: Several new approaches to regulate tumor angiogenesis*, November 27th, and a seminar *The potential therapeutic effect of targeted hypoxia compensation in cancer and heart failure*, December 18th.



Prof. Roger Lijnen



Dr Farida Minibayeva and prof. Richard Beckett



Dr. Claudine Kieda

THAT'S A HISTORY! – Prof. STANISŁAW ŁUKIEWICZ



Prof. Stanisław Łukiewicz



During the lecture

Professor Stanisław Jan Łukiewicz was born on the 8th of January 1927 in Cracow, where he spent his whole life. During the period of the German occupation (1939-1945) he completed three-year schooling at the Cracow Trade School. That allowed him to work at the Tax Office. He mentioned being forced by the Germans to work physically for the preparation of the defense infrastructure at Niedźwiedź near Cracow. At the same time he studied at the underground education system functioning in the Poland of the time. He passed his secondary school examinations under the auspices of the secret State Examination Commission.

His School Leaving Certificate was obtained after the liberation of Poland and in 1946 he started to study at the Mathematical-Natural Science Faculty of the Jagiellonian University, from which he graduated in 1952 with the degree of M.Phil. in Biology. At this same time he also studied physics. During the final years of his university studies he was also working at the State Institute for Physical-Chemical Research.

Professor Łukiewicz began his academic career in 1952 following his employment as an academic teaching assistant in the Department of Animal Physiology and Biochemistry at the Agricultural Faculty of the Jagiellonian University. During the

period 1954-1958 he studied as a postgraduate student at the Polish Academy of Sciences (PAS), becoming in 1958 lecturer at the PAS Department of Experimental Zoology in Cracow. He was awarded the degree of PhD in natural sciences in 1961 for his thesis '*Research into the prolonging of electronarcosis and galvanic contraction*' which he defended at the M. Nencki Institute of Experimental Biology at PAS in Warsaw.

From 1961 to 1965 dr. Łukiewicz was in Sicily, Italy for post-doctoral studies. At the Institute of Physics and the Institute of Comparative Anatomy of the University of Palermo he used the spectroscopy of electronic paramagnetic resonance (EPR) in the analysis of the physiochemical properties of biological systems. This research was pioneering for EPR applications in biology and allowed dr. Łukiewicz to prepare his post-doctoral thesis entitled: '*Electronic paramagnetic resonance and the absorptive spectra of the sea urchin cell and its components*'. He was awarded the DSc degree (habilitation) in the field of biophysics on the 26th

of September 1966 by the Biology and Earth Sciences Faculty Council of the Jagiellonian University.

In 1965 on the recommendation of the Ministry of Higher Education Dr. S. Łukiewicz together with Dr. M. Sarnecka-Keller (see: No 06 (3/09) of 'Triplet') undertook the organisation of the Department of Biochemistry and Biophysics at the Jagiellonian University. In May 1969 the Professor was transferred from the Polish Academy of Sciences to the newly opened research and teaching unit at the university where he took up the position of Reader. A year later, as a result of reorganisation, the department became the Institute of Molecular Biology, while from the 1st of January 1972 Dr. Łukiewicz was appointed Head of the Biophysics Department of the Jagiellonian University's Institute of Molecular Biology; a function he fulfilled until 1984. It needs to be stressed that the founding of the Department of Biophysics at that time was only possible thanks to the initiative, involvement, power of persuasion and enormous energy of Professor Łukiewicz. In 1976 Łukiewicz gained the first of the two-tiered title of professor in force in Poland, "profesor nadzwyczajny" and was appointed to the relevant professorial position, while in 1991 he obtained the second ranking in the professorial hierarchy, that of "profesor zwyczajny", at the Department of Biophysics. In 1986 the professor organised at the Department of Biophysics the Laboratory of Radiospectroscopy of Cancer and Radiobiology which he headed until 2002. Even following his formal retirement in 1997, Professor Łukiewicz displayed an exceptional degree of academic and teaching activity; employed within Department of Biophysics on a part time basis he directed academic research and doctoral theses almost up until the day he died. He passed away on the 20th of February 2005.

Throughout of over half a century of academic activity Professor Łukiewicz remained faithful to the academic interest he had developed while still an undergraduate and during the first years of his work as a researcher. His scientific development was characterised by a rarely met consistency – the Professor persistently strove to understand the nature and physical mechanisms of phenomena occurring within biological systems. Besides, he was always interested in new physical methods useful for the research of such processes. It is worth emphasising that some of these methods or techniques were developed by the Professor himself or were adapted by him. His earliest research interests concerned bioelectric effects, particularly the role of stationary bioelectrical potential as well as the electrokinetic potentials

of the cell surface. Professor Łukiewicz became interested in the magnetic properties of biological systems and the EPR techniques during his time in Italy.

Of particular note from amongst the 1970s scientific accomplishments of Professor Łukiewicz are a series of experimental works devoted to analysis of the EPR spectra of live cells and amphibian embryos. These studies are the first academic publications to demonstrate in a convincing way that EPR spectroscopy, despite known physical limitations, may be applied for studies of living organisms. The Professor's work from this period showed that in certain conditions the EPR spectrum is a source of unique information on disturbances in the permeability of cytoplasmic membranes as well as on the physiological state and vitality of cells. What's more, the Professor was the author of new methodological solutions enabling EPR measurements of the X-ray irradiated samples. An extremely important achievement by Professor Łukiewicz's research team from the 1970s and 1980s was the conceptualization and methodological development of the measurement of concentrations and diffusion of oxygen in biological systems using EPR oxymetry. This advanced physical method, used widely at present, enables an analysis of the transportation of molecular oxygen in biological membranes and other supermolecular biostructures.

The Professor's attention was drawn in 1988 to the atypical paramagnetic properties of rejected heart transplants and some tumors, connected with the appearance of complexes of nitric oxide. This work was done in parallel with analogical research conducted at the best American and English laboratories, and for which the Nobel Prize in physiology and medicine was awarded in 1998. In the same year Professor Łukiewicz gathered the main research trends on the subject in a monograph which was published by the renowned publishers Kluwer Academic Publishers. He was awarded, together with his team, the Cracow City Prize II Degree in 1999 in the field of science and technology for this editorial work.

The professor's particular passion, one that he developed early, was the application of EPR spectroscopy in the search for new methods in the treatment of tumours. Paramagnetism of melanins led to his interest in melanoma. The Professor strove to a multimodal sensitization of melanoma to radiation, and later to visible light in the presence of a photosensitizer. He established many academic contacts with clinical institutions, many of which are still in effect to this day. One of them is the Ophthalmology Clinic of the Jagiellonian University's Medical College, which is at the fore in Poland in the treatment of melanoma of the eyeball.

The professor's research achievements met with lively interest and recognition on the

part of foreign institutions. This was reflected by the numerous invitations to international scientific meetings at a time that the participation of Polish academics was rather rare. In 1963 Professor Łukiewicz was the guest of the British Biophysical Society, from 1962-1964 he lectured at the Italian universities of Pavia and Genoa, and in 1973 at the University of Zurich within the framework of the European School of EPR. A year earlier he had actively participated in the work of the 4th Congress on Biophysics held in Moscow, while in 1974 he gave two papers at the 5th Congress on Radiation Research in Seattle (USA). In 1974, he participated in the Gordon Conference, presenting the results of the research into the paramagnetic properties of living cells.

In the 1970s the Professor initiated cooperation with the Medical College of Wisconsin (MCW), Milwaukee, USA, on biophysical applications of EPR. This cooperation, continued by the Biophysics Department to this day, was amongst some of the most fruitful that the Jagiellonian University has engaged in over the last few decades. It has resulted, among other things, in the publication of over 200 joint papers in prestigious academic journals, several patents and several joint research projects funded by the National Institute of Health.

Professor Stanisław J. Łukiewicz belonged to the group of eminent initiators of biophysical research in Poland; he played a decisive role in the development of this discipline in Poland and in a significant way was instrumental in the introduction of EPR spectroscopy to biophysical research. He was a cofounder of the specialist journal *Current Topics in Biophysics*. It is no exaggeration to say that Professor Łukiewicz created the Cracow School of Biophysicists, recognizable worldwide. The Professor possessed a unique talent of endearing students to biophysics through his perfect lectures, exceptionally friendly attitude towards students and devoting his time to students with embarrassing generosity. He would personally oversee the first experimental steps of novices to science, sometimes to late at night. He was often visiting laboratory classes, and willingly and most attentively fulfilled the role of tutor. It is therefore no surprise that the basis of the Professor's School has been first and foremost the numerous group of the PhD and MSc students tutored by the professor (in total over a hundred persons) as well as a significant body of independent academics amongst whom are many professors. Worth emphasizing is the

► **That's a History...**

cont. from p. 10



During the 1998 EPR Workshop. Celebration of Professor's Łukiewicz 70th Anniversary – commenting on the old photographs, in the company of co-workers.

high quality equipment of the present Department of Biophysics, as well as the extensive academic contacts with the leading laboratories in the world. Out of the individuals, equipment and classes nurtured, assembled and designed by the Professor, one could easily create a large academic institution. This has established the

basis for the further dynamic development of biophysics in Cracow, which was always Professor Łukiewicz's dream.

*prof. Tadeusz Sarna
dr. Krystyna Urbańska
dr. Przemysław M. Płonka*

Publications

Publications FBBB – third quarter 2009, continuation (according to ISI Web of Science, M. Tworzydło)

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