

## The Inauguration of the Academic Year at the Faculty of Biochemistry, Biophysics and Biotechnology



The new academic year, 2010/2011, was inaugurated in ceremonious style on the 4th of October. The faculty Dean welcomed the assembled guests including the Rector of the Jagiellonian University, Professor Karol Musioł and especially the students of the first year, and presented a short history of the Faculty of Bio-

chemistry, Biophysics and Biotechnology. The vice-dean for student matters, Professor Marta Dziedzicka-Wasylewska spoke encouragingly to the first-year students about hard work, about using to maximum educational opportunities offered by our faculty and on the importance of using one's time at university to the full. Then

### GRANTS

A further two research groups within our Faculty have obtained funding within the framework of the TEAM program of Foundation for Polish Science. Its aim being to increase the involvement of young academics in research work conducted within the best research teams and laboratories in the country. In total at our Faculty we obtained three TEAM projects (in 2009 a grant was obtained by Prof. dr hab. Jan Potempa, Triplet 2/2010). At present the recruitment of new group members for both of the new projects is underway.

#### The Team project under the direction of Dr Joanna Cichy

The project entitled 'New Insights into Chemerin pathophysiology' is focused on chemerin, a recently discovered chemoattractant and adipokine. The immunological response as well as the regulation of metabolism are closely related, including the control of both processes by 'bi-functional' mediators involved in regulation of either immunological or metabolic processes. One of them is chemerin. Research in recent years has shown on the one hand the chemotactic properties of this protein

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It's past belief!  
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Publications

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the students took their oaths with a few students of the first year of biotechnology and biophysics were presented with their student mark books. Professor Jerzy Dobrucki gave an inaugural lecture entitled 'Contemporary optical microscopy – from cells to individual molecules'. The opening ceremony was also accompanied by a performance by the faculty choir with renditions of "Gaude Mater, Polonia" and "Gaudeamus Igitur".

This year saw 60 students commence fulltime day studies at Biotechnology program at BSc level with an additional 12 following an extra mural programme. The new degree program of Biochemistry was commenced by 31 students. Thirty two started the first year of Biophysics (a uniform, 5-year MSc programme). The Biotechnology programme at MSc level accepted 61 students, with Biochemistry 21. The faculty has been joined by over 30 new PhD students, and one year post-graduate diploma in Molecular Biology attracting 60 individuals. We would like to wish all students a fruitful academic year.

► **Grants** for specific subsets of dendrite cells and macrophages, and on the other hand the key chemerin influence on the differentiation of fat cells. Therefore, chemerin can be placed amongst the growing group of molecules linking immunological response with metabolic processes. As a potential target for the design of novel interventions against diseases associated with abnormal metabolism such as obesity or diabetes, chemerin has become the subject of increasing interest,

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The project proposes new directions of exploration that will take us beyond the existing state-of-the art and can lead to: I) the characterization of novel functions of chemerin, II) the identification of novel mechanisms regulating chemerin activity, III) the discovery of novel mechanisms underlying chemerin expression. The project will be performed in collaboration with Stanford University in the USA and the University in Lund, Sweden. The immunological aspects of chemerin activity will be coordinated at the Department of Immunology of JU by Dr. Joanna Skrzeczyńska-Moncznik.

The research team will comprise 1 post-doctoral fellow, 2 PhD students and three MSc students. Funding has been provided for 4 years, starting from the 1st of November 2010.

**The Team under the direction of Dr Leszek Fiedor**

The aim of the project entitled 'Model dyes and photosynthetic complexes in photodynamic therapy and the conversion of solar energy' is the application of the unique complexes of transition elements with chlorophylls in the phototherapy of cancers as well as in research into the physical and energy coupling of the chromophores of photosynthetic complexes.

The presence of a central ion of a transition element in the metal derivative chlorophyll and bacteriochlorophyll gives these dyes completely new physicochemical properties. This may, for example, raise the photocytotoxicity of such complexes. There will be sought within the framework of the project new derivatives of an increased pharmacological activity, inducted by light. At the same time there will be con-

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ducted a derivatization of the natural chlorophylls in order for it to result in the form of a drug. Synthesis and evaluation of photoactive compounds, of chlorophyll transition elements, constitutes a fundamental part of the project.

The second part of the research concentrates on becoming acquainted with the mechanisms of chromatophore coupling with photosynthetic systems and defining the share of dye-dye interactions in the highly efficient conversion of light energy in these systems. Here there will be applied the so-called ultra fast agitation trap approach utilising the exceptional properties of the nickel derivatives of chlorophylls (femtosecond non-radiant relaxation of the aroused states) which will be introduced to the chlorophyll-protein photosynthetic complexes. Within the framework of the project such an approach will be used for the first time to test the mechanism of energy transfer in plant systems.

The project will be realised in cooperation with foreign partners: The Weizmann Institute of Science and the Biozentrum der LMU in Munich. The participants of the TEAM project will spend a term of a few months working in a partner's laboratories, conducting appropriate research tasks. Of immense value is the participation in the project of Prof. Hugo Scheer (LMU, Munich), a world renowned expert in the field of the chemistry of chlorophylls, ensuring the highest quality of subject expertise for the project (senior adviser). Research into the development of new therapeutic models will be conducted in cooperation with Prof. Krystyna Urbańska (Jagiellonian University's Faculty of Biochemistry, Biophysics and Biotechnology) and Prof. Jakub Gołąb (Medical University Warsaw). The research team will comprise 2 doctors, 4 PhD students and 4 MSc students. Financing for the project has been given for the period from November 2010 to October 2014.

► **Grants**  
cont. from p. 2

### EBEC Satellite Meeting 2010

On the 23rd of July in the M. Bobrzyński Chamber at the Jagiellonian University's Collegium Maius there took place the international symposium Satellite Meeting to EBEC 2010 "Quinone and Oxygen in energy coupling and catalysis". The instigator of the symposium was dr Artur Osyczka of the Department of Biophysics who organised it in conjunction with dr M. Sarewicz, E. Cieluch, M. Czapla, A. Borek and R. Pietras. The seventy symposium participants discussed the subject of modern views on the role of quinines and oxygen in the processes of transforming energy in mitochondrial and photosynthetic chains. Particular attention was devoted to the mechanisms of catalysis at the molecular level, as equally the mechanisms of side reactions in which free radicals can arise. A series of physiological aspects were also discussed connected with the functioning of proteins transforming energy.

The meeting was divided into five sessions: 1) Concepts in respiratory and photosynthetic electron transfer; 2) Quinol oxidoreductases – complex I; 3) Quinol oxidoreductases – complex III; 4) Quinol and cytochrome c oxidases; 5) Quinol and oxygen interactions. These sessions also included talks given by invited guests as well as open discussions, in which young academics and students participated.

The meeting saw the participation of a whole series of eminent academics from the

field of molecular bioenergetics (including U. Brandt, P. Brzezinski, W. A. Cramer, F. Daldal, P. L. Dutton, T. Friedrich, R. B. Gennis, J. Hirst, C. Hunte, G. Lenaz, C. C. Moser, P. R. Rich, A. W. Rutherford, V. P. Skulachev, A. Vinogradov). The meeting had been commenced the day before the symposium proper by a supper evening at the Stuba Communis Chamber at Collegium Maius, and was concluded by a celebratory supper held at the Szara Restaurant in the Main Market Square.



EBEC Satellite Kraków 2010

Conference logo, designed by prof. P. Leslie Dutton from UPenn

Session at Bobrzyński room at Collegium Maius



Dinner at Szara restaurant

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► **Conferences**  
cont. from p. 3

At Collegium Maius



The main sponsor of proceedings was the British Wellcome Trust. Additional sponsors were: The Johnson Research Foundation, Cluster of Excellence Frankfurt, Rapp OptoElectronic, Genomed, and Sanlab.

*dr A. Osyczka*

**Central European Congress of Life Sciences – EUROBIOTECH 2010**

The international conference EUROBIOTECH 2010 – Central European Congress of Life Sciences took place from the 20th to the 22nd of September 2010 at the Faculty of Management and Social Communication's new building. It was organised by the University of Agriculture in Cracow in conjunction with the company "Targi w Krakowie". Previous EUROBIOTECH conferences had concentrated on green biotechnology (2007) and red biotechnology (2008), while this year the conference was devoted to white biotechnology. Lectures and poster presentations were divided into 5 thematic sessions:

- I. Environmental Biotechnology and Bioenergy (organisers – Profs. K. Turnau, T. Juliszewski, H. Kołoczek, K. Strzałka).

- II. Beverages, Medicine and Biotechnology (organisers – Profs. A. Dembinska-Kieć, P. Heczko, T. Tuszyński, K. Żyła).
- III. Clean Technologies and Biomaterials (organisers – Profs. A. Kononowicz, Dr C. Paluszkiwicz, Dr K. Sodzawiczny).
- IV. Pharmaceutical Biotechnology (organiser – Prof. J. Dulak).
- V. Intellectual Property Rights and Intellectual Value (organisers – Prof. T. Twardowski, Dr K. Murzyn, Prof. M. du Vall).

349 participants from 12 European, Asian and American countries attended the conference. The plenary and session lectures were given by 58 presenters from 10 countries. The meeting was an excellent opportunity to become acquainted with the latest achievements and modern trends within white biotechnology. It equally enabled a meeting of the world of science and the world of business, the transfer of information on new technologies and discussion upon the possibilities of bringing the said to functional realisation.

*prof. K. Strzałka*

**COSI Mid Term Review Meeting in Krakow**

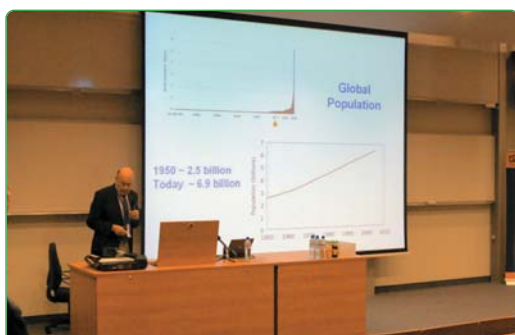
COSI (Chloroplast Signals) is an EU funded initial training network integrating young researchers into a highly innovative interdisciplinary approach aiming at identification of regulatory networks governing chloroplast functions. The Mid Term Review meeting of the COSI took place from May 5-7, 2010 at the Faculty of Biochemistry, Biophysics and Biotechnology, Jagiellonian University, organized by the group of Prof. Halina Gabrys. The first day was the informal welcome of all the scientists and researchers working under the network. The second day of the meeting was organized as Mini-Symposium "Chloroplast signaling and metabolic adaptation" and was open to the public. The symposium was started with an address from Prof Jurek Dobrucki who briefly spoke about our university and encouraged those assembled to visit the various places of beauty in Cracow. This was followed with the presentations from PhD students and Post docs working under the network about their respective research. It provided the employed researchers the possibility to present their results to a large audience. Future work, collaborations and organizational matters were discussed on the third day of the meeting. Beside the formal dis-



Logo konferencji



Marek Nawara, Marshal of małopolskie voivodeship, speaks during the opening ceremony



Prof. James Barber (Imperial College of London) during inauguration talk on solar radiation as an alternative energy source





cussions and seminars scientists visited Krakow, with the meeting luckily falling before the onslaught of this year's spring floods. All the scientists went to the Wieliczka salt mine while younger researchers had lovely experience visiting the Rynek, Wawel castel, Kazimierz district and Collegium Maius. The meeting ended with



Discussions

Visiting Collegium Maius

interesting scientific discussions and a detailed planning of collaboration among different groups.

The detailed meeting program can be found on the COSI webpage:

<http://www.univie.ac.at/cosi/Krakow.html>

*prof. H. Gabryś*

## AWARDS AND GRANTS

### Ministry Grants

Dr Agnieszka Łoboda of the Department of Medical Biotechnology has been awarded the prestigious grant of the Minister of Science and Higher Education for excellence in young academics. This is a further award given to this young researcher following on from the prize given by the weekly POLITYKA 'Stay with us' and the START FNP award.

This year's edition of the competition saw the participation of 296 scientists from whom 85 talented individuals were honoured with awards including 10 individuals from the Jagiellonian University.

Dr Łoboda in conjunction with Prof. Józef Dulak and other members of the Department of Medical Biotechnology researches the mechanisms of the regulation of gene expression participating in inflammatory and regulatory processes in the creation of blood vessels, in



dr Agnieszka Łoboda

particular taking into consideration the influence of anoxia on these processes. Besides she attempts to answer the question as to whether the enzyme breaking down heme, heme oxygenase-1 (HO-1) can have a protective effect in the induced fibrosis of the kidneys by ochratoxin A. She is also interested in the role of HO-1 in the function of endothelial progenitor cells, EPCs, and their participation in the processes of wound healing.

### Rector's prizes

As a result of vote conducted during the September Faculty Council of the Faculty of Biochemistry, Biophysics and Biotechnology the following were put forward for the Rector's Prize for academic staff:

- dr P. Mak (individual prize 2nd degree for one's entire work and academic activity)
- dr P. Malec (individual prize 3rd degree for academic achievements)
- dr J. Jura, prof. A. Koj, dr D. Mizgalska, Ł. Skalniak, dr P. Węgrzyn (team prize 1st degree for academic activity)
- dr S. Łukasiewicz, dr K. Stalińska, dr H. Waś (team prize 2nd degree for academic achievements – noted PhDs)
- dr A. Banaś, dr M. Michalik and dr T. Panz (team prize 2nd degree for teaching and organisational achievements)

From amongst employees who are not academic teaching members of staff the following were honoured:

cont. p. 6 ▶

# THE MOLECULAR BIOTECHNOLOGY FOR HEALTH PROJECT – A SUMMING UP OF THE THIRD QUARTER OF 2010

In the third quarter of 2010, within the framework of the project 'Molecular Biotechnology for Health' financed by the European Regional Development Fund, the Operational Programme Innovative Economy for the years 2007-2013, the tender process for selecting contractors for the realisation of construction-installation works for the animal unit at FBBB was concluded. The contract was awarded to the company Raciborskie Przedsiębiorstwo Inwestycyjne sp. z o.o.

Between the 4th to the 5th of October 2010, within the project framework, workshops devoted to modern research methods with the application of the instruments purchased within the project 'Molecular Biotechnology for Health' were organised. Over 90 people registered for participation in the workshops, including students and academic members of staff from the JU as equally from other Polish institutions of higher education like the Institute of Pharmacology of the Polish Academy of Sciences, the Cracow University of Agriculture, the Wrocław Medical Academy, the University of Gdańsk and the University of Silesia, as well as representatives of local biotechnology and pharmaceutical companies.

The workshops lasted three days during which the participants became acquainted with the functioning of such instruments as FCS/FLIM and STED confocal microscopes, mass spectrometer, an instrument for the measurement of the intermolecular interactions in real time with the application of Surface Plasmon Resonance (SPR), a system for microscopic laser dissection, a magnetic cell sorter. The participants visited new laboratories that are to be opened within the framework of the project 'Molecular Biotechnology for Health': The Animal Unit, The Cellular and Tissue Engineering Laboratory and the Laboratory of Molecular Vi-



foto Joanna Uchto

rology. The introduction to the lecture part was given by prof. Józef Dulak, the head of the project 'Molecular Biotechnology for Health'. Then lectures were given by: prof. A. Józkowicz, prof. J. Dobrucki, prof. H. Gabryś and dr K. Banaś, Prof. A. Kozik, dr Sylwia Kędracka-Krok (who presented one of the instruments for proteomic analyses purchased from the project 'Molecular Biotechnology for Health'), dr M. Rapała-Kozik, dr Agnieszka Łoboda, dr Joanna Cichy, dr Krzysztof Pyrc, prof. Zbigniew Madeja and dr Justyna Drukała. The practical workshop part took place in smaller working groups. The next round of workshops will take place in 2011.

Aneta Pazik



foto Joanna Uchto



foto Joanna Uchto

## ► Awards and Scholarships cont. from p. 5

- dr M. Kędra, M. Nowak MSc, M. Kujda, H. Kasprzyk, E. Sater (team prize 3rd degree)
- K. Broś, M. Jung, P. Szaflik, W. Pilch (team prize 3rd degree)
- M. Calikowska, J. Mrugalska, D. Żołnierczyk (team prize 3rd degree)
- U. Czaja-Prokop and U. Krzysztofek (team prize 3rd degree).

Independent Rector Prizes were received by dr Z. Madeja, dr K. Kozik and dr M. Tworzydło for the conducting classes that were the most highly rated for the academic year 2008/2009 in the student questionnaire. The evaluation of classes introduced several years ago is designed to improve the quality of education provided at the Jagiellonian University.

## HIGH NOON MEETINGS WITH BIOCHEMISTRY, BIOPHYSICS AND BIOTECHNOLOGY

On Saturday the 6<sup>th</sup> of November at 12 noon there will commence once again a series of lectures for secondary school students given by academics from the FBBB. This year's *Meetings with Biochemistry, Biophysics and Biotechnology* will be inaugurated by dr Ewa Zuba-Surma with a public lecture entitled *In Search of 'Immortality' – or stem cells and their appli-*

*cation in regenerative medicine*. The second lecture that day entitled *Angiogenesis – a matter of life or death*, will be given by dr Alicja Józkowicz.

A detailed programme of lectures is available on the faculty's website at <http://www.wbbib.uj.edu.pl>. We must cordially invite all those interested to attend.

With the end of September students from the Club took part in the 14th Convention of the Polish Biophysics Association in Łódź. Thanks to the generosity of the Polish Biophysics Association we had the opportunity to attend this unique convention as a group of twelve. The lectures of some of the most eminent Polish scientists from the field of biophysics (though not only) enabled us to view at times difficult and heavy problem areas in a way that was accessible to us. The Polish Biophysics Association Convention lasted for more than two days, which allowed those who had previously not been to Łódź to have a look around. Within the framework of the conference proceedings was an opportunity to visit the Film Museum – for Łódź is after all not only a city of large factories and plants but also of filmmaking.

The next project of the 'Nobel' Biophysics Students' Club was presentation of our degree program for new students of the first year of Biophysics. We have created the 'The student's student guide or how to actively study Biophysics', which was distributed during the first meeting following the inauguration of the academic year. We hope that students of the first years of Biophysics will be aware that a degree is not only diligent study but also active participation in faculty and university events as well as creating projects together and the whole array of activities that take place outside of lectures and seminars.

The plans for the upcoming quarter are chiefly directed towards the youngest Biophysics students, who we have more this year than in previous ones! On the 23<sup>rd</sup>-24<sup>th</sup> of October 2010 there will take place at Gliczarów

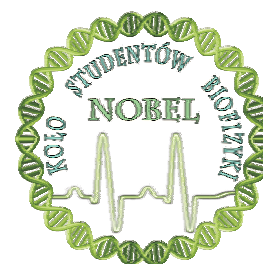
Górny the first organised integrational-educational trip entitled **Mountain Integration of Biophysics**. The trip which will include workshops and presentations and aims at acquainting students with the Faculty, and also the activities of the Biophysics Students' Club 'Nobel', the Faculty's Student Body as well as integration of student circles.

In order to make the choice of department or laboratory in which students decide to write their MSc dissertation easier, as well as to raise awareness of the equipment and possibilities available at the Faculty, we have organised a project entitled: 'What squeals in a lab? – a tour around the departments and laboratories of the Faculty of BB&B'. Students of the 1st and 2nd year of Biophysics are invited on a trip around the most interesting laboratories of the Faculty, which will take place on the 26th of October 2010. We hope that the new biophysicists will willingly join the ranks of our Club and that together we will be able to actively participate both scientifically and after hours when lectures and work are all done with.

*Agnieszka Pierzyńska-Mach*



## NOBEL





## THE MAŁOPOLSKIE BIOTECHNOLOGY CENTRE – THE HIGHEST CLASS OF RESEARCH APPARATUS

Within the framework of the Małopolskie Biotechnology Centre project there has been installed at the FBBB an X-ray diffractometer of the highest class (Rigaku), one unique in Poland. This enables research into a wide range of X-ray crystallography of biological macromolecules as well as small molecule crystallography. It also permits experiments in powder crystallography, used in chemistry, pharmacy and in material testing. The system is equipped with an extensive set of programs for the acquisition and analysis of data.



X-ray diffractometer

At present at the X-ray radiographic laboratory, under the supervision of Dr Grzegorz Dubin, research projects are under way which aim at defining the tertiary structures of proteins involved in the pathogenesis of bacteria. Structures of protein complexes important in carcinogenesis as well as virulent factors of bacteria in complexes with low molecular inhibitors are also being worked on.

The Małopolskie Biotechnology Centre has also purchased other pieces equipment: a mass spectrometer, a cluster for bioinformatics as well as a set of DSC and ITC calorimeters, together with a HPLC chromatograph with a ELSD detector enabling the detection of compounds that do not display light absorption. All the equipment purchased, until the completion of the main Małopolskie Biotechnology Centre building, will be housed in the building of the FBBB. The construction work of the main building will begin in the second quarter of 2011.

*Jolanta Rogowska*

## GOŚCILI U NAS Z WYKŁADAMI

Dr Elena Garmash and Dr Maria Maleva, Inst. of Biology, Syktyvkar, Russian Federation, 6-19 July, guests of the Department of Biochemistry and Plant Physiology



M. Maleva  
and A. Ermoshin

Prof. Boris Ivanov, Inst. of Basic Biological Problems of Russian Academy of Sciences, Puschino, Russian Federation, 20-26 July, guest of the Department of Biochemistry and Plant Physiology

Prof. Reimund Goss (26-30 July) and Susann Schaller (26 July – 3 September), Institute of Biology I – Plant Physiology, University of Leipzig, Germany, guests of the Department of Biochemistry and Plant Physiology

Dr Yuliya Miloslavina and Dr Petar Lambrev, Biological Research Center, Hungarian Academy of Sciences, Szeged, Hungary, 13 July – 6 August, guests of the Department of Biochemistry and Plant Physiology within the framework of the Maria Curie Programme

Dr Oksana Kosyk, Plant Physiology and Ecology Department, Kyiv National University, Kiev, Ukraine, 1-14 August, guest of the Department of Biochemistry and Plant Physiology

Prof. Zoltan Gombos, Dr Zsuzanna Varkonyi, and Dr Ildiko Domonkos, Institute of Plant Biology BRC, Hungarian Academy of Science, Szeged, Hungary, 9-14 September, guests of



R. Goss, S. Schaller  
and K. Strzałka



the Department of Biochemistry and Plant Physiology

Dr Lindsey N. Shaw, Department of Biochemistry and Molecular Biology, University of Georgia, Athens, USA, The Role of alternative Sigma Factors in the Pathogenesis of *Staphylococcus aureus*, 16 September, guest of the Department of Microbiology

Aleksander A. Ermoshin, Inst. of Biology, Syktyvkar, Russian Federation, 18-23 September, guest of the Department of Biochemistry and Plant Physiology

Prof. M N V Prasad, University of Hyderabad Department of Plant Sciences School of Life Sciences, India, 21 September, guest of the Department of Biochemistry and Plant Physiology

Prof. Frank L. Meyskens, University of California, Irvine USA, Heavy metals in melanoma, 24 September, guest of the Department of Biophysics

Dr Olga Timofeeva and Dr Gulshat Gasimova, Department of Plant Physiology, Kazan State University, Russian Federation, 5-11 October, guest of the Department of Biochemistry and Plant Physiology

### The Visit of Guests from Orleans and Tours

During the first half of May a French delegation composed of representatives of the highest authorities as well as individuals responsible for international cooperation, information and promotion from the University of Orleans (Université d'Orléans), Tours (Université François-Rabelais) as well as the National Centre for Academic Research, CNRS (Centre National de la Recherche Scientifique) paid a two-day visit to the Jagiellonian University.

One of the programme points of this short visit to Cracow was a tour of the Faculty of Biochemistry, Biophysics and Biotechnology, in the course of which the guest had the opportunity to become acquainted with the research conducted at the Faculty, the equipment resources and the system of student education.

The aim of the visit was to assess the possibility of closer cooperation between the various centres.

### A Visit to Japan

In August and September the head of the Department of Medical Biotechnology of our Faculty, Prof. Józef Dulak, spent six weeks visiting Japan. The trip was at the invitation of Prof. Toru Shimizu of the Institute of Multidisciplinary Research for Advanced Materials, Tohoku



Z. Gombos, I. Domonkos, and Z. Varkonyi



S. Schaller



Prof. J. Dulak

University in Sendai and was made possible due to the awarding of a visiting professorship to Prof. Dulak by the Japanese Society for the Promotion of Science. During the course of his stay Prof. Dulak gave a total of 19 lectures and seminars at several faculties of the Tohoku University in Sendai, Keio University in Tokyo, at the National Institute of Neuroscience as well as the National Cancer Institute in Tokyo and the Medical School of Nagoya University. In addition during the course of the visit at the invitation of the Tokyo company SymBio there took place a meeting with company representatives where he gave a paper discussing the possibility for the clinical application of inhibitors of heme oxygenase activity.

## IT'S PAST BELIEF! A SHORT STORY ON EPR WORKSHOPS IN KRAKÓW

Professor Stanislaw Lukiewicz was the originator and the first organizer of EPR Workshops in Cracow. The idea to invite world-leading investigators in the field of EPR to Cracow to the Jagiellonian University came to him on the occasion of the conferment of the title of Doctor Honoris Causa (honorary PhD) on Professor James Stewart Hyde, which took place in September 1989. The event was followed by a series of lectures given by the invited guests, which took the form of an informal workshop, allowing for a discussion of common ideas, problems and achievements, including experimental practices developed in the EPR laboratories of Cracow rather than a presentation of research typical of scientific conferences and symposia. This was the first Workshop on Applications of EPR in Biology and Medicine (in short "EPR Workshop"). Since then, the EPR Workshops have been organized in Kraków every 3 years. The second Workshop was organized also by Prof. Lukiewicz in December 1992, and the third by Prof. Witold Karol Subczynski in September 1995, to celebrate the 25th Anniversary of the founding of the Institute of Molecular Biology, UJ. The same year (November-December) prof. Łukiewicz organized a separate Workshop on Nitric Oxide and Immune Responses to Allografts and Tumors ("NO-Workshop"), with a substantial contribution of EPR-related topics. The 4th EPR Workshop was organized in September

1998 by Prof. Sarna, and honoured the 70th Birthday of Prof. Lukiewicz. The 5th EPR Workshop took place in 2001, 2 weeks after September 11th, and was devoted to the opening of the work of the Institute in the new building at Kraków-Pychowice. The next, 6th, EPR Workshop was organized in October 2004 by Prof. Tadeusz Sarna, Prof. Wojciech Froncisz, and Prof. Balaraman Kalyanaraman from Milwaukee, and this was to be the last Workshop with the participation of Prof. Lukiewicz. The 7th EPR Workshop in October 2007, and the present, 8th EPR Workshop (coinciding with the 40th Anniversary of the founding of our Faculty) were co-organised by Profs. Tadeusz Sarna and Balaraman Kalyanaraman. The present 8th EPR Workshop includes a special session dedicated to the late Ted Walczak.

Some of the Workshops were followed by the publication of special EPR issues of the journal of the Polish Biophysical Society – Current Topics in Biophysics. The 1st such issue was published in 1994, and the subsequent ones, respectively, in 1996, 1999, 2002, and 2005. The NO Workshop was followed by the publication of a book "Nitric Oxide in Allograft Rejection and Anti-Tumor Response" co-edited by Prof. Jay L Zweier and Prof. Stanislaw J. Lukiewicz by Kluwer Academic Publishers in 1998. This was subsequently awarded the Royal City of Cracow Prize in 1999, acknowledging the and appreciating promotion of Cracow by all the EPR and NO Workshops organized at the Jagiellonian University. Thanks to these events, Kraków is recognized all over the world as an outstanding expert centre in instrumentation and application of EPR techniques.

P. M. Płonka

### PhDs

Grzegorz Szewczyk *Identification of factors stimulating phototoxic activity of melanin from retinal pigmented epithelium*, advisor: Prof. Tadeusz Sarna, October 22<sup>nd</sup>, 2010

## VIII<sup>th</sup> International Workshop on EPR in Biology and Medicine Cracow, 3-7 October 2010

Workshops from the cycle "EPR in Biology and Medicine", organised by the Department of Biophysics of the FBBB JU have taken place every three years since 1989 and gather in Cracow world specialists in the field of EPR spectroscopy and its biomedical applications. The lectures took place in the following plenary sessions:

1. Instrumentation
2. EPR DEER Measurements
3. Spin-Label Oximetry

4. In vivo EPR Imaging
5. Radiation Dosimetry
6. Spin Trapping
7. Biological Applications of Novel Probes

This year's meeting enjoyed marked recognition from within academic circles drawing the most eminent researchers in our field. We hosted, among others, J. Hyde, B. Kalyaraman, G. and S. Eaton, H. Swartz, L. Berliner, W. Lubitz, H. Halpern, M. Krishna, A. Vanin. In total around 100 people participated in the conference.



## Publication in SCIENCE, or success in the shape of an 'H'

The July edition of Science published the research results of dr Artur Osyczka's team from the Department of Biophysics. The work examines one of the fundamental proteins involved in the bioenergetic processes of the cells – cytochrome bc<sub>1</sub> (defined also as mitochondrial complex III). The team, i.e. Monika Czapla (Świerczek) MSc, Ewelina Cieluch MSc, Arkadiusz Borek MSc. and dr Marcin Sarewicz has taken the opportunity to talk about his research specially for the readers of 'Triplet'.

*Why did you involve yourself in research specifically into cytochrome bc<sub>1</sub>?*

Research into the complexes converting energy in cells helps one to understand the mechanisms of particular stages in energy changes. One of the proteins that is engaged in these processes is cytochrome bc<sub>1</sub>. Work on this complex is particularly important and interesting because it is one of the universal components of cellular systems transforming energy. The function fulfilled by the bc<sub>1</sub> complex in these systems in broad outline is to connect the quinone membrane pool with the extramembrane cytochrome pool. This occurs through the participation of two chains of cofactors that link the two catalytic quinone binding sites. Many dysfunctions in the working of the complex result in the production of free radicals and various diseases e.g. neurodegenerative, or diseases of the muscles.

*What is the discovery you describe in the article 'An electronic bus bar lies in the core of cytochrome bc<sub>1</sub>'?*

Cytochrome bc<sub>1</sub> is a protein constructed from two identical monomers, which together create a complicated system of structural symmetry. To date this symmetry made it impossible for one to understand the mechanism of action of the whole protein. In our work we have applied an innovative experimental approach to solve this problem: using the model of photosynthetic bacteria and with the application of techniques of genetic engineering we have constructed a fusion protein in which both monomers are linked with one another. Such a form of protein becomes a unique instrument in breaking the structural symmetry which in turn gives the possibility for experimental testing of all the possible potential combinations of enzymatic electron transfer paths. Our research has shown that the protein creates an H-shaped electron transfer system which we can

compare to the activity of an electronic bus bar that is the prevailing component of many electrical devices.

*How did you all feel on having your research findings published in such a prestigious journal?*

Most motivating indeed for further work. We have a great sense of satisfaction that it is possible to work and publish at the highest possible levels not only in foreign academic centres.

*What is the significance of 'discovering the letter H'?*

In the sphere of a dimeric complex there exist four branches through which electrons are transported. Each monomer supplies two – one lower and one upper. We have proved the existence of a bridge linking the branches from each monomer, which serves in the transfer of electrons between them. The entirety creates a system that recalls the letter H, within which the electrons are able to freely move. What is more such movement allows functioning of the enzyme even after damaging of one branch.

*What are you working on at the present?*

At the moment our team is attempting to understand the role of the letter H and the structural symmetry of the protein in mitochondrial processes as well as also in processes of defence from free radicals and mitochondrial damages. We are trying to understand them not only in the context of pure bioenergetics but also within the context of mitochondrial disease and the processes of cell ageing.

*Thank you very much for talking with us.*

*(conducted by Dominika Giza)*

The research findings published in Science are a part of a research grant funded by the Wellcome Trust (British foundation), the author and project leader of which is A. Osyczka. The first author of the work is embarking on her PhD with this being at the same time her first publication in an scientific journal. As results from an analysis of the ISI database for the period 1945-2010, this constitutes the first publication by Polish researchers in the journal Science where the correspondence author is an employee of the Jagiellonian University. More information on the subject of the team and the research conducted may be found on [www.wbbib.uj.edu.pl/mbg](http://www.wbbib.uj.edu.pl/mbg)

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Monika Czapla, Marcin Sarewicz, Artur Osyczka, Ewelina Cieluch i Arkadiusz Borek holding the Science issue with their publication



Cofactors of cytochrome bc<sub>1</sub> generate an H-shaped system

# PUBLICATIONS

List of publications is compiled from a search ISI Web of Science database performed in the last day of the quarter. This list does not include publications in the journals outside the database or book chapters, etc. Authors are kindly requested to submit omitted publications to the Editorial board, so that they can be included in the next issue of Triplet.

## Publications FBBB – second quarter 2010, cont. (according to ISI Web of Science, M. Tworzydło)

Ilik P, Kotabova E, Spundova M, Novak O, Kana R, Strzalka K. Low-light-induced violaxanthin de-epoxidation in shortly preheated peaves: Uncoupling from delta pH-dependent nonphotochemical quenching. *Photochemistry and Photobiology* 2010 May-Jun; 86(3): 722-6.

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