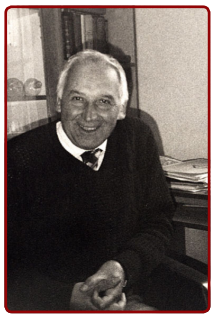
Triplet

The Quarterly of the Faculty of Biochemistry, Biophysics and Biotechnology, JU 3/2015 (30)

PROFESSOR ŻAK PASSED AWAY



Professor Zdzisław Żak, accomplished and long-standing staff member at the Jagiellonian University Faculty of Biochemistry, Biophysics and Biotechnology, passed away after a long illness on 5 June, at the age of 85.

Professor Żak was born on 9 September 1930 in Brest-on-the-Bug. In 1952 he graduated from the Jagiellonian University, completing his biological studies at the Faculty of Biology and Earth Sciences and chemical studies at the Faculty of Mathematics, Physics and Chemistry. After graduation, Professor Żak began teaching at the Chair of Physiological Chemistry, Nicolaus Copernicus Academy of Medicine in Cracow. In 1964, the Jagiellonian University Faculty of Mathematics, Physics and Chemistry awarded Professor Żak a doctoral degree in natural sciences (biochemistry) which reflected his interests in biology and chemistry. In 1974, Professor Żak received his Doctor Habilitatus degree in physiological chemistry from the Faculty of Medicine, Nicolaus Copernicus Academy of Medicine where he educated many generations of future physicians in biochemistry. In 1989 he obtained the academic title of professor and the position of associate professor.

Professor Żak developed his scientific interests not only in Poland, but also abroad: in laboratories of Karolinska Institutet in Stockholm, Sweden (1970-1971), Emory University in Atlanta, USA (1981-1982) and at the Wageningen Agricultural University, Netherlands (1989) where he explored physical and chemical properties of proteins involved in transport and storage of vitamins and their mechanisms of action. He was also engaged in studies on proteins requiring B vitamins to function.

In 1976, Professor Żak joined the Institute of Molecular Biology at the Jagiellonian University Faculty of Biology and Earth Sciences, where he was a highly respected Scientific Secretary (1978-1982), Deputy Director of the Institute for Science (1982-1984) and the Director of the Institute (1984-1987). He was also involved in the development and implementation of a new degree programme – biotechnology, which soon became the flagship field of study at the Faculty of Biochemistry, Biophysics and Biotechnology (established by transformation of the Institute of Molecular Biology in 2002). Professor Żak was highly respected and popular academic teacher; he successfully supervised many MSc (55) and PhD (5) students. Three of them are now senior academic staff members.

Professor Żak was involved in a wide range of activities with the academic community: he was a member of the Biological Commission of the Cracow Branch of the Polish Academy of Sciences, held the posts of Secretary, President and Council member of the Cracow Branch of the Polish Biochemical Society and *Acta Biochimica Polonica* Editorial Board member. In the 1980s, during democratic transitions in Poland, Professor Żak was the vice-Chairman of the Jagiellonian University Committee of the Independent Self-governing Trade Union *Solidarity*.

The scientific, educational and organizational activities of Professor Żak were rewarded with many University prizes and national honours: Gold Cross of Merit and Knight's Cross of the Order of Polonia Restituta. In 2012 he was awarded the title of Honorary Member of the Polish Biochemical Society.

Professor Żak was cordial and joyful. We will miss him enormously.

Maria Rąpała-Kozik

CONTENT

JU BIOTECHNOLOGY WON THE PERSPEKTYWY RANKING

Our biotechnology on the podium again! It is with pride and pleasure that we announce the biotechnology degree programme at the Jagiellonian University Faculty of Biochemistry, Biophysics and Biotechnology won the Perspektywy Ranking by Field of Study.

The results of both rankings, i.e. Ranking of Universities and Ranking by Field of Study were officially announced in Warsaw on 9 June. The ceremony was attended by the Dean of the Faculty of Biochemistry, Biophysics and Biotechnology Prof. Zbigniew Madeja and vice-Dean for Student Affairs Prof. Marta Dziedzicka-Wasylewska.

Ranking by Field of Study has been running since 2010. It is intended to help inform secondary school graduates and students who wish to study beyond undergraduate degree level about the quality of postgraduate teaching and make an informed choice about pursuing further study.

This year, 38 universities ('general', medical and technological) were assessed in the group of biotechnological studies. This ranking was based on the following criteria:

- academic teachers' assessment (weight 35%),
- employers' preferences (weight 20%),
- publications (weight 25%),
- Hirsch index (weight 20%).

Our Faculty was awarded the highest scores in two categories: publications and the Hirsch index. In the categories of academic teachers' assessment and employers' preferences the higher scores gained only the University of Warsaw and the University of Wrocław, respectively.

ACADEMIC YEAR CLOSING CEREMONY AND AWARD OF DIPLOMAS

The farewell ceremony for 2015 graduates from the Faculty of Biochemistry, Biophysics and Biotechnology took place on 26 June. At four in the afternoon, the graduates, supervisors, the Dean and vice-Deans, wearing academic gowns, marched into the Assembly Hall. A moment later, the hymn *Gaude Mater Polonia* could be heard. Not only graduates attended this ceremony but also their relatives and friends.

Prof. Zbigniew Madeja, Dean of the Faculty of Biochemistry, Biophysics and Biotechnology started the meeting and the second speaker was Prof. Marta Dziedzicka-Wasylewska, vice-Dean for Student Affairs. Afterwards, the graduates in biotechnology, biophysics and biochemistry were presented with commemorative diplomas by their supervisors. Finally, the official part of the ceremony was concluded by Oskar Szelest, the outgoing President of the Student Research Club *Nobel* who, on behalf of the recent graduates, sincerely thanked all who had contributed to their success.

After singing *Gaudeamus igitur*, all attendees arranged for a group photo to be taken in front of the entrance to the building. Green graduation caps were thrown in the air. For many graduates the adventure with our Faculty has just ended.

HELLENIC PICNIC UNDER AN OAK TREE

On 29 May, the terrace of the café at our Faculty transformed into an ancient acropolis. This year, the team of the Laboratory of Cell Biophysics had the honour to organise the Faculty picnic. The idea of an ancient Greek-style party had been inspired by the Laboratory website address (besides, the picnic photos can be found there): http://helios.wbbib.uj.edu.pl/piknik-foto/. Once again, thanks to the courtesy of Mr Aleksander Jurek, owner of the *Jurek Catering*, the guests could enjoy their meals sitting outside on benches at tables, in the shade of umbrellas, all specially brought to the terrace. The sun was burning so hot that we felt as if we were in the Peloponnese!

The Hellenic Picnic started with performances of a string quartet and the Faculty Choir. This feast for the soul was followed by dining and it was truly a feast worthy of the Olympians. Next, a competition prepared by the organiser was launched.

This year we played according to a new rule: the winning department would gain the privilege of indicating the organiser of the next year's picnic. In the Best Dish competition, the Panel of Judges awarded the Department of Cell Biology for the best Greek snack, the Department of Plant Physiology and Biochemistry for a delicious dessert and the Department of Analytical Biochemistry for very tasty grilled food and excellent beer brewed at the Faculty of Biochemistry, Biophysics and Biotechnology.

Although the fight was very close, the team of the Department of Cell Biology proved to be the best in the word guessing game on the ancient Greek culture. In the next contest, the participants were expected to prepare Greek salad and the Department of General Biochemistry earned the highest number of votes for their creation. Another competition was a real surprise: the Panel of Judges composed of three lady professors - Marta Dziedzicka-Wasylewska, Joanna Bereta and Jolanta Jura – assessed the guests' costumes for how accurately they conformed to Greek mythology. Costumes of the organisers, representatives of the Department of Plant Physiology and Biochemistry and the Cyclops' suit of Doctor Weronika Krzeszowiec-Jeleń of the Department of Plant Biotechnology won most points.

Just before five o'clock, the long-awaited results of competitions were announced. Representatives of the winning teams were decorated with medals and received book awards. The Picnic Challenge Cups were awarded to the Department of Immunology whose team showed the best teamwork in the general classification. They also won a 'basket of plenty'. The winners, along with the Dean, Prof. Zbigniew Madeja decided that the Department of Plant Physiology and Biochemistry would be honoured to organise the picnic next year.

We would like to thank most sincerely all who contributed in any way to this year's picnic. Special thanks go to Ms Dominika Giza. Thank you for your attendance and for playing together, for fantastic costumes, delicious food and beautiful flowers donated for our auction. The money raised from this auction (643.50 zł) was donated to the Alma Spei foundation. See you next year!

Muses, Nymphs and Heros
of the Laboratory of Cell Biophysics

CRACOW FESTIVAL OF SCIENCE, THE 2015 EDITION

The 15th edition of the Festival of Science, under the heading 'Enlighten Yourself!' was launched. This heading refers to a global initiative adopted by the General Assembly of the United Nations – The International Year of Light and Light-based Technologies. Our Faculty of Biochemistry, Biophysics and Biotechnology opened a stand in the Main Market Square on Saturday 23 May, at eleven in the morning.

Almost 35 people were involved in running the stand and preparation of shows, among them PhD students, members of students' research clubs, as well as 'ordinary' students. The entire project was supervised by Dr Monika Rak of the Department of Cell Biology and Paweł Jedynak of the Department of Plant Physiology and Biochemistry. All experiments, presentations and demonstrations were grouped into four subject areas and the fifth one was a quiz:

- secrets of colour vision (Benham's disk; mysterious after-images; daltonism test; to 'see' invisible – infrared; don't be fooled by advertising or how contrast affects the

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CRACOW FESTIVAL OF SCIENCE, THE 2015 EDITION cont. from p. 3

perception of colours; runaway chloroplasts – how plants protect themselves from harmful excess of light; photodynamic therapy 'in a test tube'),

- colourful bacteria - what do microorganisms need pigments for if they don't have eyes? (Observation of colourful bacterial cultures, e.g. *Serratia marcescens*),
- what do scientists use light for? (Filters – interference, polarisation, colour addition and subtraction; how can light measure particles? - measurement of sugar concentration using polarimeter; glowing protein (GFP) worth a Noble Prize; build your own spectrophotometer; plant as a computer – programming with light, photosynthesis – observation of photosynthetic oxygen release; how heavy is the photon rain today? – demonstration of a light quantum meter),
- Chamber of Dark Secrets. (Fluorescent dyes and their usage, forensic reports – how to detect blood traces; what are quantum dots?),
- laboratory glassware – guess the name or use (prize quiz).

The weather was perfect for walking with family so the Main Market Square was crowded with people. Not only parents with children visited our stand, but also seniors and many foreigners. Children were attracted mostly by the quiz (it's nice to win something) and the Chamber of Dark Secrets. Once again this event was a success. We could relax and enjoy a moment of satisfaction but soon it would be necessary to focus on the next-year experiments.

FASCINATING WORLD OF PLANTS

In 2015 the Faculty of Biochemistry, Biophysics and Biotechnology joined an international initiative *Fascination of Plants Day*. The goal of this activity is to get people interested in the importance of plant science not only for agriculture, food production and forestry but also for energetics and pharmaceutical industry.

Various companies and institutions are involved in organisation of plant-based events all over the world. In Poland, many universities, botanical gardens, regional directorates of state forests and learned societies joined this initiative. As it could be expected, three departments of the Faculty of Biochemistry, Biophysics and Biotechnology were engaged in preparing an interesting programme for the visitors (mainly students of middle and secondary schools), these were: Department of Plant Biotechnology, Department of Plant Physiology and Biochemistry and Department of Plant Physiology and Development.

On 18 May, coaches full of school students arrived at the University campus. The students listened to four lectures and participated in interesting shows at three stands, prepared specially for them. The subject of the lecture given by Bartosz Pluciński, MSc was plant biotechnology, Prof. Halina Gabryś discussed light-induced chloroplast movements, Paweł Jedynak, MSc addressed the amazing phenomena of plant intelligent behaviour and Ariel Kamiński demonstrated some experiments that everyone would be able to perform in his or her kitchen - analysis of plant pigments and their possible uses. In the breaks between lectures, the students could benefit from the following additional opportunities:

- see how quickly can chloroplasts escape strong blue light which intensity has been measured,
- pick up the bimolecular fluorescence complementation (BiFC) technique – one of the methods of investigating protein interactions,
- watch *in vitro* plant cultures (tissue fragments used to artificially propagate plants),
- grasp how to explore relationships between plants, using DNA analysis,
- determine the amounts of carbon dioxide absorbed and released by plants,
- observe carnivorous plants and cyanobacteria.

Although the Faculty of Biochemistry, Biophysics and Biotechnology took part in the *Fascination of Plants Day* for the first time, the attendance was surprisingly high; almost 300 people arrived. It is important to note that we heard many kind words from teachers accompanying their students. Many organizational ideas proved to be successful, some of them need improvement but we are generally satisfied and we will be happy to join this initiative again next year.

GRANTS

Grants under the National Science Centre

On 11 May, the National Science Centre published on its website the ranking lists of projects selected to receive funding under the OPUS 8, PRELUDIUM 8 and SONATA 8 competitions. A month later, the results of ETIUDA 3 and FUGA 4 were announced. The following scientists of our Faculty were among the winners:

- **Małgorzata Durbas, MSc** from the Laboratory of Molecular Genetics and Virology (project entitled: 'Role of autophagy in neuroblastoma cell death induced by anti-GD2 antibodies', financing of 99,600 zł, PRELUDIUM 8),
- **Dr Dariusz Dziga** from the Department of Plant Physiology and Development (project entitled: 'Analysis of alternative mechanisms of cyanobacterial toxins' biodegradation', financing of 611,750 zł, OPUS 8),
- **Dr Justyna Łabuz** from the Department of Plant Biotechnology (project entitled: 'The mechanisms and significance of light-dependent regulation of phototropin expression in *Arabidopsis thaliana*', financing of 799,000 zł, SONATA 8),
- **Dr Danuta Mizgalska** from the Department of Microbiology (project entitled: 'SELEX technique to generate aptamers used as research, diagnostic and potential therapeutic tools in periodontitis', financing of 457,300 zł, SONATA 8),
- **Magdalena Kordon, MSc** from the Laboratory of Cell Biophysics (project entitled: 'Quantitative and qualitative analysis of the mechanisms of XRCC1 protein accumulation in the regions of endogenous DNA single-strand breaks occurring during DNA replication', financing of 98,540 zł, ETIUDA 8),
- **Przemysław Golik, MSc** from the Department of Microbiology (project entitled: 'Biochemical and structural characterization of the proteinase YabG, a protein involved in sporulation', financing of 92,758 zł, ETIUDA 8),
- **Ewelina Chrapusta, MSc** from the Department of Plant Physiology and Development (project entitled: 'Mycosporine, a component of UV-protection system of *Cladonia arbuscula* (Wallr.) Flot. – physicochemical properties and ecological function', financing of 112,576 zł, ETIUDA 8),
- **Dr Aleksandra Piechota-Polańczyk** from the Department of Medical Biotechnology (project entitled: 'Haem oxygenase-1 in the formation and progression of abdominal aortic aneurysm', financing of 612,000 zł, FUGA 8).

Grants under the National Centre for Research and Development (NCRD) in Poland

Dr Martyna Elas and Prof. Krystyna Urbańska from the Department of Biophysics received funding for a project entitled: 'Theranostic nanoparticles AguIX and their use in intratissue vascular-targeted photodynamic treatment of brain tumours' under the ERA-NET EuroNanoMed II competition organised by the NCRD. This project will be implemented by a consortium, including four foreign partners from France and Sweden.

A project co-authored by Dr Przemysław Malec from the Department of Plant Physiology and Biochemistry, entitled: 'Bioconversion of post-fermentation waste from biogas plants: water protection and third generation biofuel' was also approved for implementation. This research enterprise will be financed form the GEKON programme coordinated by the NCRD and the National Fund for Environmental Protection and Water Management (NFEP&WM). The following entities are involved in the technology of biofuel production via microalgal fixation of carbon dioxide during photosynthesis:

- EKOSPOT Sp. z o.o., Łódź (project leader),
- Jagiellonian University,
- Łódź University of Technology,
- University of Agriculture in Cracow

AWARDS AND FELLOWSHIPS

Best Educator Award

Dr Małgorzata Dutka from the Department of Molecular Biophysics and Dr Ewelina Fic from the Department of Physical Biochemistry received the Best Educator Award from the Jagiellonian University Rector. This award is based on the results of questionnaires completed by students in the previous academic year. The winners were chosen from among persons recommended by the vice-Dean for Student Affairs. Congratulations!

START Scholarship

Witold Nowak, who is a PhD student at the Department of Medical Biotechnology, was awarded a START scholarship by the Foundation for Polish Science. The one-year scholarships are given to scholars, whos academic output, despite their young age, is of outstanding quality. This financial support is to help the recipients focus on their research and scientific development. Witold Nowak has been studying the role of haem oxygenase in the differentiation of mesenchymal cells.

CONFERENCES

40 Years of Research on Proteolysis

On 15 and 16 May a conference was held in Collegium Maius, the oldest Jagiellonian University building. The theme of the conference was: 'Proteolysis – from the bench to the bed – 40 years of scientific breakthrough'. The aim of this conference was to review 40 years of research into proteolysis and its role in physiological and physiopathological processes.

The conference was attended by scientists from all over the world. In collaboration with Polish researchers, mainly from the Jagiellonian University, they have made important discoveries in the field of proteolysis. During two days, 19 speakers from abroad and six from Poland gave 25 lectures. There was an opportunity to discuss both the breakthroughs and recent results. Many of them have clinical utility leading to the development of innovative diagnostic and therapeutic methods based on proteolytic enzymes, used in the management of various clinical conditions: autoimmune diseases, cancer, neurodegenerative disorders or infections.

The Chief Organiser of this conference was Dr Joanna Kozieł from the Department of Microbiology. It was also a perfect opportunity to celebrate the 60th birthday of Prof. Jan Potempa, whose findings concerning *Porphyromonas gingivalis* shed new light on the pathogenesis of periodontal inflammatory diseases.

Perspectives in Medical Biotechnology

On 22-23 May, a conference 'Perspectives in Medical Biotechnology' was held at the Polish Academy of Arts and Sciences in Cracow. This meeting was organised by the Department of Medical Biotechnology of the Jagiellonian University Faculty of Biochemistry, Biophysics and Biotechnology, in collaboration with the Polish Cell Biology Society, the Cracow Branch of the Polish Biochemical Society and LIA (Laboratoire International Associé). This conference was hosted under the auspices of the Jagiellonian University Rector Prof. Wojciech Nowak.

During the inauguration ceremony, the guests and participants – almost 140 scientists and students from Poland and abroad – were welcomed by: Prof. Andrzej Borowski (vice-President of the Polish Academy of Arts and Sciences), Prof. Wiesław Pawlik (Director of Class V: Medicine of the Polish Academy of Arts and Sciences), Prof. Piotr Laidler (vice-Rector for Medical College) and Prof. Zbigniew Madeja (Dean of the Faculty of Biochemistry, Biophysics and Biotechnology).

Prof. Józef Dulak, Chair of the Organizing Committee and Head of the Department of Medical Biotechnology, outlined the conference objectives and read a letter from Prof. Aleksander Koj, a member of the Honorary Committee. Professor Koj referred to the ten-year history of scientific research at the Department of Medical Biotechnology, including LIA established by the Jagiellonian University and CNRS, Orléans.

This conference could take place due to the financing provided by the Faculty of Biochemistry, Biophysics and Biotechnology (under a KNOW grant), Polish Cell Biology Society, Polish Biochemical Society, Cracow authorities, companies: Eppendorf and Cellab and last but not least, the Polish Academy of Arts and Sciences, who kindly offered their premises as a venue.

The conference covered issues relating to medical biotechnology in Poland and throughout the world, but had a particular focus on research carried out in Cracow at the Faculty of Biochemistry, Biophysics and Biotechnology. Among 25 presenters there were scientists from the USA, South Africa, Italy, France, Ireland, Finland and from Polish academic centres.

Young scientists and PhD students from the Department of Medical Biotechnology moderated the sessions very efficiently so the conference ran smoothly. Full programme is available at the conference website: http://www.biomed2015.pl/

Joanna Uchto

HABILITATIONS

On 16 June 2015, Council of the Faculty of Biochemistry, Biophysics and Biotechnology accepted the habilitation thesis of Dr Agnieszka Wolnicka-Głubisz from the Department of Biophysics. The thesis was entitled: 'Inflammation and melanoma as results of skin exposure to UV in selected mouse models'.

Malignant melanoma (*melanoma malignum*) is one of the most malignant cancers with steadily increasing rate of morbidity. Although research on melanoma is carried out in laboratories around the world, little is known about the mechanisms of its formation. Epidemiological studies are the main source of information on the aetiology of melanoma. Their authors suggest that the main risk factors for melanoma include exposure to solar ultraviolet radiation, age and skin phototype.

Dr Agnieszka Wolnicka-Głubisz conducted basic research on UV-induced processes in skin, using test animals whose skin mimics human skin, i.e. contains extra-follicular melanocytes which undergo UV-induced malignant transformation (transgenic mice overexpressing hepatocyte growth factor/scatter factor – HGF/SF). HGF/SF acts as a multi-functional cytokine responsible for proliferation, differentiation and migration of cells that express tyrosine-kinase receptor c-Met on their surface, as in the case of melanocytes. Doctor Wolnicka-Głubisz, during her stay at George Washington University in the USA, entered into collaboration with Professor Noonan team. They explored the relationship between UV-induced inflammation and melanoma carcinogenesis and the effect of genetic background of pigmentation on these processes, using the type-1 melanocortin receptor – Mc1r. Doctor Wolnicka-Głubisz continued her research in Poland, at the Department of Biophysics of our Faculty.

Dr Agnieszka Wolnicka-Głubisz

Studies included in the thesis explored the susceptibility of newborn mice to UV–induced melanoma and it has been shown that the neonatal immune response, in comparison to adult mice, is not only impaired but can also lead to immune tolerance thus creating conditions favourable for survival of transformed melanocytes. Doctor Wolnicka-Głubisz has also demonstrated that although Mc1r is a key determinant of hair colour in mice and is unrelated to their susceptibility to UV-induced inflammation or immunosuppression, it is an essential factor in melanoma initiation in HGF/SF transgenic mice. Demonstration of an unknown signal pathway between Mc1r and HGF/Met in UV-induced melanoma provides a scientific reason for therapeutic use of kinase c-Met inhibitors in human melanoma to suppress neoplasm invasiveness.

Throughout her academic career, Doctor Wolnicka-Głubisz was granted the Individual Award of the Rector of the Jagiellonian University for her research activities and received conference grants from the Foundation for Polish Science, the American Society for Photobiology (ASP) (Urbach Travel Award) and the European Society for Photobiology (ESP).

PHD THESES

Rafał Pietras – 'Description of the spatial distribution of proteins with the use of intermolecular magnetic interactions in the cytochrome c2 - cytochrome bc1 system'. Supervisors: Prof. Artur Osyczka, Dr Marcin Sarewicz. 26 June 2015.

Dominika Żurek-Biesiada – 'Photoconversion of stains with an affinity for DNA. Applications in high-resolution microscopy'. Supervisor: Prof. Jerzy Dobrucki. 23 June 2015.

Elżbieta Plesnar – 'Computer model of the eye-lens fibre-cell membrane'. Supervisor: Prof. Marta Pasenkiewicz-Gierula. 19 June 2015.

Natalia Wolak – 'Involvement of vitamin B1 in the response of model organisms of the genera *Saccharomyces* and *Candida* to abiotic stress'. Supervisor: Dr Maria Rąpała-Kozik. 12 June 2015.

Michał Bukowski – 'Characteristics of the hypothetical saoABC operon potentially coding for an unknown system of *Staphylococcus aureus* gene transcription regulation'. Supervisors: Prof. Adam Dubin, Dr Benedykt Władyka. 22 May 2015.

Magdalena Banaś – 'Protective function of chemerin in epidermis physiology'. Supervisor: Prof. Joanna Cichy. 5 May 2015.

KNOW

In the second quarter of 2015, under the Activities A of the KNOW project (Development and Enhancement of Research Capacity and Application Potential of the Faculty of Biochemistry, Biophysics and Biotechnology), members of the Faculty research staff received incentive pay for their scientific achievements.

Furthermore, under the Activities B (Development of Education), 13 lab classrooms were equipped with small laboratory facilities, funding was granted to improve the course WBT--BT350 (In vivo Veritas – practical course of work with laboratory animals) and for implementation of Student Research Projects.

Competition for these projects was announced on 15 May and resolved on 9 June 2015. The panel of judges consisting of Dr Krzysztof Pyrć – the Chairman, Dr Ibeth Guevara-Lora, Dr Krzysztof Guzik, Prof. Jolanta Jura and Dr Agnieszka Wolnicka-Głubisz granted funds to 11 student teams to do their own research. The winners are as follows:

- Paulina Nowak, Magdalena Firlej and Daniel Krochmal ('Development and analysis of stains for detection of viral RNA'),
- Paulina Leszczyńska, Magdalena Maroszek, Natalia Waras and Łukasz Wieliński ('Effects of LR microcystine on the growth of bacterial strains capable of degrading cyanobacterial hepatotoxins and on the expression of proteins responsible for biodegradation'),
- Filip Pamuła, Urszula Cichoń, Przemysław Dutka and Marta Kluz ('Analysis of interactions between heterotrimeric G proteins and lipid bilayers with different compositions – a study with the use of nanodisc model membrane systems'),
- Natalia Pydyn, Agata Kalita and Dobrochna Dolicka ('Effect of introduction of a mutation into the nuclear localisation signal for the MCPIP1 protein on the differentiation of pre-adipocytes to adipocytes'),
- Rostyslav Krutyholova, Agnieszka Seretny and Aleksandra Augustyniak ('Effect of haem oxygenase-1 expression on the interactions between melanoma cells with the cells of their niche'),
- Karol Zakrzewski, Anna Salerno-Kochan and Joanna Sykut ('Activation of factor XII by aspartyl proteases of pathogenic *Candida albicans* strains'),
- Gabriela Pruś, Cyntia Kubicka and Artur Pomadowski ('Effects of pro- and anti-inflammatory proteins on the expression and phosphorylation of proteins responsible for the formation of connections between cells of the blood-brain barrier epithelium'),
- Anna Mądry, Rafał Piwowarczyk and Karolina Żak ('Development of a quick method for the determination of microbial cell numbers in culture suspensions of five species commonly used in the laboratory practice'),
- Gabriela Jędruszewska, Kinga Hińcza and Dominika Kądziołka ('Effect of sulforaphane on the signal pathways involved in the formation of myofibroblasts in bronchial asthma'),
- Wiktor Tokarek, Joanna Pagacz, Stanisław Listwan, Piotr Leśniak, Katarzyna Lorencik, Monika Kocemba, Aleksandra Pisarek and Gracjana Leonowicz ('Anti-neoplastic properties of the secondary metabolites of *Pheodactylum tricornutum*'),
- Karol Pitra, Artur Kowalik, Justyna Zawadzka and Mateusz Szwalec ('Effects of pH and the endogenous antioxidants on photoreactivity of (16:0)(22:6)PC – one of the main retinal phospholipids'),

COLLABORATION WITH SCHOOLS

On 4 and 6 May 2015, laboratory workshops for 20 students from the August Witkowski General Education Secondary School No. 5 (V Liceum Ogólnokształcące im. Augusta Witkowskiego) in Cracow were held at the Faculty of Biochemistry, Biophysics and Biotechnology. The workshops were a part of the project 'Cell metabolism and toxic agents' (financed from the 'University of Young Inventors' programme of the Ministry of Science and Higher Education). The participants were selected out of a larger group of candidates on the basis of their results in the previous stages of the project.

The Departments of: Cell Biology, Plant Physiology and Biochemistry and the Department of Plant Physiology and Development offered the school students four workshops in the following subjects: '*In vitro* analysis of cell viability by fluorescence microscopy and flow cytometry', 'Cell wall and cell membrane – the first barriers protecting cells against toxic agents', 'Are plants afraid of light?' and 'Chlorophyll reveals the plant condition'.

Under the supervision of our Faculty staff members and PhD students, the school students carried out simple experiments and analysed the results. The best experimenters were qualified to the next stage of the project which would involve advanced experiments in specialist laboratories of the Faculty of Biochemistry, Biophysics and Biotechnology.

NOBEL

IV International Student Conference on Biophysics is closed. During three days (22-24 May), the participants presented 56 posters and gave 21 oral presentations. We are extremely pleased that this conference inspired our colleagues in USA to organise a similar meeting. Also growing interest in our conference attests to its success – every year the number of participants, both from Poland and from abroad, becomes larger.

As many as five special guests were also present at the Conference: Prof. Wladek Minor (The University of Virginia in Charlottesville, USA), Prof. Chantal Pichon (The University of Orléans), Prof. Thomas Cremer (Ludwig Maximilian University of Munich, Germany), Prof. Christoph Cremer (Heidelberg University, Germany) and Prof. Wiesław Gruszecki (Maria Curie-Skłodowska University in Lublin). We were able to invite them due to the financing provided by KNOW and from other sources.

Conference participants

The summer holidays are here and it is time to relax, but we will take to organise the V Conference as soon as the new semester starts.

Katarzyna Radoń

Prof. Cristoph Cremer

N-ZYME

Yet again this academic year, the Student Research Club *N.Zyme* had the pleasure to invite everyone to the next seminar in the series *ScienceCorner*. On 23 April, representatives of the PL-Grid consortium presented the possibilities of testing the Polish Grid Infrastructure in scientific research based on simulations and large-scale calculations using the computing clusters.

We can also boast that thanks to the coordinated teamwork from all involved, we successfully completed our research project. The results were presented as a poster during the student conference 'Numbers, Computers, Life' held between 15 and 17 May 2015.

Finally, referring to a note in the 29th issue of Triplet, we would like to add that the team-building trip to Ochotnica Górna (29-31 May) was very successful. The veteran *N.Zyme* members shared their club experience with novices and we all made acquaintance with each other.

Małgorzata Mnich

GUESTS OF THE FACULTY

3 April 2015
Dr Dominika Rudnicka (editor at *Nature Communications*). Lecture entitled: 'How to get published in *Nature* (and its sister journals)'.

14 April 2015
Prof. Piotr Stępień (Institute of Genetics and Biotechnology, University of Warsaw), Lecture entitled: 'Migration of mitochondrial RNA'. Guest of the Laboratory of Cell Biophysics.

17 April 2015
Prof. Qingbo Xu (King's College, London, UK), Lecture entitled: 'An update of vascular stem cell research in arteriosclerosis'. Guest of the Department of Medical Biotechnology.

11 May 2015
Dr Tomasz Włodarski (Research Department of Structural and Molecular Biology, University College London, UK), Lecture entitled: 'Computational studies of co-translational folding and misfolding on the ribosome'. Guest of the Laboratory of Cell Biophysics.

Tea meetings at Gronostajowa – lecture series of the Cracow Branch of the Polish Biochemical Society:

29 April 2015
Prof. Franciszek Ziejka (Jagiellonian University Faculty of Polish Studies). Lecture entitled: 'Code of Ethics for Researchers – theory and practice (experience gained form working in the Committee of Ethics in Science)'.

27 May 2015
Bart Krist (PhD student, Jagiellonian University Faculty of Biochemistry, Biophysics and Biotechnology). Lecture entitled: 'Science in the Netherlands and Germany – money and structures – and what about Poland…?'

IT'S PAST BELIEF!

„Probity"

Probity[1] means being completely honest and trustworthy, acting with integrity and transparency. This English term has no equivalent in Polish. This year marks 150 years since the main work of Gregor Johann Mendel was published, that is since the beginning of scientific genetics. This is an excellent opportunity not only to remind ourselves this prominent scholar (without whom our Faculty would not have existed), but also to consider whether probity in science is at all possible.

The father of contemporary statistics Ronald Aylmer Fisher (1890-1962), without whom our Faculty would not have existed either, went to great lengths to undermine the reliability of Mendel's results[1]. Strictly speaking, Fisher did not accuse Mendel but Mendel's results of being too much consistent with the theory, too cute. According to the theory of probability and taking into account the number of generations, traits and organisms (*n*) studied by Mendel, the results of experiments should have differed from those predicted and expected by him. What did Mendel actually do? Probably, he carried out his experiments increasing the number of organisms (*n*) until the segregation ratios reached the expected values. Some authors suspect that he could have categorised some organisms with, let's say, 'intermediate' traits into predetermined groups or even had excluded them.

When we are about it, the complete documentation of Mendel's experiments would have been now an invaluable source of information but it had been probably burned one day with fallen leaves in a bonfire (the lesson can be drawn that never ever should we burn results of our failed experiments!). But was Mendel really cheating? Seventy years before the origin of statistics and thirty years before the founder of statistics was born? On what basis could he have classified differently the 'intermediate' organisms if he had assumed a priori that traits segregated independently and each gamete carried only one allele for each trait? How could he determine the sufficient *n* value? What at all did Gregor Mendel want to achieve?

His idea was to show that species were created in their final form, which would never change! And here we come to the second paradox which is related to Mendel's attitude to the theory of evolution. Charles Darwin's book *On the Origin of Species* was first published in 1859, six years before Mendel's presentation. Mendel knew this work. Now it is clearly known that Mendelian genetics forms one of the cornerstones of the synthetic theory of evolution and the modern evolutionary synthesis could not have developed without Mendel's findings, but Mendel himself was very sceptical about the origin of new species by means of cross-breeding and trait segregation. He did not criticise Darwin's hypothesis openly but undermined it as many other clerics in 1860s. Undoubtedly, Mendel was an opponent of evolutionism[2]! His message can be summarised as: phenotypic diversity of hybrids is not an evidence of speciation but it is simply the result of segregation and recombination of permanent and indivisible ('eternal'?) trait buds. Starting species can be restored from each generation of hybrids provided that the number of individual organisms is sufficient. Furthermore, if Darwin knew Mendel's works, he would have never developed his theory of evolution[3]. Darwin assumed phenotypic plasticity (he really did, and also inheritance of acquired characteristics![3]), because only then the emergence and 'preservation of favoured races' would have been be possible. The assumption that the trait buds are unchangeable and segregate randomly is in conflict with the theory of Darwin, but neither Darwin nor Mendel imagined the phenomenon of mutation.

It is astonishing that our contemporaries who have investigated Mendel's work, together with geneticists, stubbornly put appreciation of Darwinism into Mendel's mouth. Professor Romana Czapik writes: '…Mendel emphasised several times that his studies were crucial for understanding the mechanism of evolution' (which does not exist?) and Professor Jan Wilczyński – Mendel's translator and commentator – concludes[5]: "…Mendel was not only familiar with the idea of evolution but, in his experiments, he was searching for tangible evidence that it is true…' Gregor Mendel, however writes in support of his contemporary Gärtner, that taking into account the results of species cross-breeding[5] '…Gärtner had to oppose the views of these scientists who reject unchangeability of plant species and accept their sustained formation.' In another place he is sceptical about:[5] 'the Darwin's point of view that some creatures (crane hawk hybrids) WOULD HAVE[6] originated from transmutation of extinct species or even species still existing.'

So Mendel meant to undermine the newly emerging theory of evolution and the efforts Fisher made to discredit Mendel's work were undermined by our contemporary scientists[1]. 'Probity'? We are wrong about the intentions of Mendel because, trying to prove the unchangeability of species, he did not so much discovered as ESTABLISHED the objective principles of heredity, later tested and confirmed several times by other researchers. In fact, the principles describe one of the most important mechanisms of speciation. Mendel, manipulating his results or interpreting them non-objectively, formulated principles absolutely true and objective. Now we are stubbornly wrong about his intentions! 'Probity'?

Przemysław M. Płonka

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