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Modern biology is increasingly connected with the industry and business

The high level of biological sciences in Poland should translate into improved living standards in the country and contribute to the development of its economy. The Nencki Institute of Experimental Biology of the Polish Academy of Sciences shows that the offer of the Polish biologists in that scope is constantly expanding. Opportunities and successes of the Institute in the field of commercialization of research were shown, among others, during the recent Warsaw conference summarizing a large European CePT project.

Currently, the quality of life of citizens and the international position of countries are very strongly associated with the innovation of the economy, which can be provided in Poland only by indigenous science, effectively cooperating with industry and business. The impetus for wider commercialization of research and development of new technologies can include achievements in the field of modern biology, as proved by the Nencki Institute of Experimental Biology of the Polish Academy of Sciences in Warsaw. The offer of the Institute aimed at implementations and examples of commercialization have been recently presented, among others, during the recent conference summarizing the implementation of the European key project of the Center of Preclinical Studies and Technologies (CePT). The conference, organized in the Educational Center of the Medical University of Warsaw, attracted over 300 people from the world of science, business and state administration.

“In the field of the commercialization of research, our institute has a very fresh example. A few years ago, using sophisticated biophysical techniques, we identified new properties of certain substances of plant origin. The use of these substances in dermocosmetics became the subject of not only the patent application, but was used in the product by Dr. Irena Eris, Pharmaceris series, which has already been available in pharmacies for several months”, says Prof. Adam Szewczyk, director of the Nencki Institute of Experimental Biology.

The cooperation of the team of Prof. Elzbieta Szlag with the Harpo company resulted in creation of an innovative therapeutic software “Dr Neuronowski®”, supporting rehabilitation of children and adults with speech disorders and other cognitive disorders. The package, which is already available on the market (www.neuronowski.pl), is addressed to both individuals and professionals (teachers, neuropsychologists, speech therapists and doctors), specializing in the therapy of linguistic functions and other cognitive functions. It consists of 9 modules containing 46 basic computer games improving various cognitive functions. The tool was prepared on the basis of approximately 70 scientific publications in Philadelphia journals, written by researchers from the Nencki Institute of Experimental Biology.

During the conference of the CePT, Prof. Leszek Kaczmarek presented the current issues concerning the molecular basis of neuro-psychiatric disorders, such as epilepsy, alcoholism, schizophrenia

or autism disorders. It appears that an attractive goal for new therapies can be, for example, extra-cellular proteolysis (especially the one controlling the signaling of cells), or matrix metalloproteinase MMP-9 (in modern therapeutic approaches to brain diseases), and the synaptic plasticity is becoming an increasingly interesting area of searching for neuro-psychiatric drugs.

Prof. Agnieszka Dobrzyn presented an advanced project with potentially high opportunities in the field of commercialization, associated with the bio-printing technology of 3D organs. Its aim is to create a bionic pancreas built of the scaffolding containing vessels and pancreatic islets, as well as stem cells transformed into insulin- and glucagon-secreting cells. If the project succeeds, the transplant of the bionic pancreas would become the fully-fledged method of treatment of diabetes.

Currently, research in the field of biology requires vast interdisciplinary, involving the combination of knowledge, abilities and efforts of people from many fields of science. Therefore, the presence in the European key project of the CePT, the largest biomedical and biotechnological undertaking in Central and Eastern Europe, is of great importance to the Nencki Institute. As part of the project of the Ochota district of Warsaw, the complex of related environmental laboratories was formed, integrating research and implementation activities of several Polish scientific institutions. Laboratories, built for more than PLN 388 million, are the workplace for nearly 1000 scientists conducting high-quality basic and preclinical research in the field of structural and functional analysis of proteins, physico-chemistry and nanotechnology of biomaterials, molecular biotechnology, support of medical technologies, pathophysiology and physiology, as well as oncology, genomics, neuroscience and diseases associated with aging.

The Centre for Neurobiology (CN) was established in the Nencki Institute as part of the CePT project. The cost of construction and equipment of the CN amounted to PLN 52 million, which represents approximately 15% of the total project (approximately PLN 30 million from this amount was allocated for the purchase of equipment, and PLN 15 million for the expansion of the building of the Institute with necessary rooms). The Centre has six laboratories of an environmental nature: Laboratory of Molecular Neurobiology, Laboratory of Imaging the Structure and Tissue Functions, Laboratory of Animal Models, Laboratory of Brain Imaging, Laboratory of Preclinical Studies of Higher Standard and Laboratory of Bioinformatics. The laboratories have cutting edge research and measurement equipment, including magnetic resonance imaging scanner, designed exclusively for scientific purposes. The construction of the Centre for Neurobiology allowed the Nencki Institute of Experimental Biology to take a leading role in prestigious European projects, such as EuroBioImaging from the Roadmap of the European Strategy Forum for Research Infrastructures (ESFRI).

“With respect to biological sciences, Poland is listed in the second group of ten countries in the world. In the context of population and previous budgetary outlays for Polish science, it is a disproportionately high position, evidencing large, and more importantly: constantly increasing national capabilities of biological institutions. So, it is not about the fact that there is nothing to commercialize, but about commercializing a growing number of achievements of Polish biologists as widely as possible,” concludes Prof. Szewczyk.

The Nencki Institute of Experimental Biology of the Polish Academy of Sciences has been established in 1918 and is the largest non-university centre for biological research in Poland. Priority fields for the Institute include neurobiology, neurophysiology, cellular biology and biochemistry and molecular biology – at the level of complexity from tissue organisms through cellular organelles to proteins and genes. There are 31 labs at the Institute, among them modern Laboratory of Confocal Microscopy, Laboratory of Cytometry, Laboratory of Electron Microscopy, Behavioural and Electrophysiological Tests. The Institute is equipped with state-of-the-art research equipment and modernized animal house, where lab animals are bred, also transgenic animals, in accordance with the highest standards. Quality of experiments, publications and close ties with the international science community, place the Institute among the leading biological research centres in Europe.

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LINKS:

<http://www.nencki.gov.pl/>

The official website of the Nencki Institute of Experimental Biology in Warsaw.

<http://press.nencki.gov.pl/>

Press service of the Nencki Institute of Experimental Biology in Warsaw.

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Research in the field of biology, conducted by scientists from the Nencki Institute of Experimental Biology of the Polish Academy of Sciences in Warsaw, arouse growing interest of business and industry. (Source: Nencki Institute, Grzegorz Krzyzewski).