

## Registration form

**This is a registration form for Host Institutions wanting to establish a Dioscuri Centre of Scientific Excellence within Dioscuri 4 call.**

### Registration form for Polish research institution

1. Research institution data (name and address): Institute of Genetics and Animal Biotechnology of the Polish Academy of Sciences, Jastrzębiec 36A, Postępu st. 05-552 Magdalenka
2. Type of research institution<sup>1</sup> (select one from the 9 listed options):
  - 1) higher education institution
  - 2) federation of higher education institutions established on the territory of Poland
  - 3) research unit of the Polish Academy of Sciences**
  - 4) research institute
  - 5) international research institute
  - 6) Lukasiewicz Centre
  - 7) Institute of Lukasiewicz Centre
  - 8) The Polish Academy of Arts and Sciences
  - 9) other units which carry out independently and continuously mainly research activity
  - 10) other units which carry out independently and continuously mainly research activity
3. Head of the institution: Professor Agnieszka Wierzbicka, PhD, DSc Director of IGAB PAS
4. Contact information of designated person(s) for applicants and the NCN: first and last name, position, e-mail address, phone number, correspondence address:  
Joanna Marchewka, PhD, Scientific Secretary  
e-mail: [J.Marchewka@igbzpan.pl](mailto:J.Marchewka@igbzpan.pl)

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<sup>1</sup> As specified in "Addressees of the call"

Tel: +48 22 736-71-29,  
Jastrzębiec 36A, Postępu st. 05-552 Magdalenka

5. Research discipline in which the strong international position of the institution ensures establishing a Dioscuri Centre (**select one from the 25 listed disciplines**):

Natural Sciences and Technology

- Mathematics
- Fundamental constituents of matter
- Condensed matter physics
- Chemistry
- Materials
- Computer science and informatics
- Systems and communication engineering
- Production and processes engineering
- Astronomy and space research
- Earth sciences

Life Sciences

- Molecular biology, structural biology, biotechnology**
- Genetics, genomics
- Cellular and developmental biology
- Biology of tissues, organs and organisms
- Human and animal non-infectious diseases
- Human and animal immunology and infection
- Diagnostic tools, therapies and public health
- Evolutionary and environmental biology
- Applied life sciences and biotechnology

Arts, Humanities and Social Sciences

- Fundamental questions of human existence and the nature of reality
- Culture
- The study of the human past
- Individuals, institutions, markets
- Norms and governance
- Human nature and human society

6. Description of important research achievements from the selected discipline from the last 5 years including a list of the most important publications, patents, other (*up to one page in A4 format*):

The Institute has the status of the European Center of Excellence in Genomics and Biotechnology and the Quality of Animal Products, and in 2015-2019 it had the status of the Leading National Scientific Center (KNOW) in the field of agricultural, forestry and veterinary sciences. In the first Horizon 2020 competition in the TWINNING area, the Institute was awarded the international project "Epigenetic Risk Assessment of Assisted Reproduction Technologies (ERAofART)" (2016-2018), concerning research in the field of molecular embryology, as a coordinator.

Selected publications in a given discipline:

- Wang D. et al., 2019 - Targeting Foam Cell Formation in Atherosclerosis: Therapeutic Potential of Natural Products. *Pharmacological Reviews*. IF=18.886
- Banach M., et al., 2018 - The Role of Nutraceuticals in Statin Intolerant Patients. *Journal of the American College of Cardiology*. IF=16,834
- Afrin S., et al., 2018 - Dietary phytochemicals in colorectal cancer prevention and treatment: A focus on the molecular mechanisms involved. *Biotechnology Advances*. IF=11,452
- Atanasov A.G., et al., 2018 - Natural products for targeted therapy in precision medicine. *Biotechnology Advances*. 36(6):1559-1562. IF=11,452
- Cătană C.S., et al., 2018 – Natural products with anti-aging potential: Affected targets and molecular mechanisms. *Biotechnology Advances*. IF=11,452
- Huminiecki L., Horbańczuk J. 2018 – The functional genomic studies of resveratrol in respect to its anti-cancer effects. *Biotechnology advances*, IF=11,452
- Singh B.N., et al., 2017 - Organic Nanoparticle-Based Combinatory Approaches for Gene Therapy. *Trends in Biotechnology* 35(12):1121-1124. IF=11,126;.

The Institute received the title of INNOVATION LEADER 2016 for innovative scientific research and implementation activities for the promotion of health and conscious nutrition, and in particular for the development of products with high nutritional value and pro-health in the 14th edition of the National Competition LEADER of INNOVATION 2016.

Among the most important implementation works are award-winning patents such as:  
I. Patent "Method of obtaining culinary ostrich meat" (P.412491) granted 10/10/2018, no. 230222. Selected international awards:

- Gold Medal at the 46th International Invention Fair in Geneva, Geneva, 2018
- Gold Medal at the International Fair of Intellectual Property of Inventions, Innovation and Technology in Bangkok, IPITEX 2016
- Gold Medal at the International Trade Fair for Inventions and Innovations INTARG 2017

II. Patent "Method of obtaining culinary pork and pork meat" (SGGW) (P.410127) granted 31.05.2017, No. 225686. Selected international awards:

- Bronze Medal BRUSSELS INNOVA, 2016

7. List of no more than 3 important research projects from the selected discipline awarded in national and international calls to the institution in the last 5 years (title, name of PI, source of funding, amount of funding):

- BovReg - Identification of functionally active genomic features relevant to phenotypic diversity and plasticity in cattle' - 'BovReg Hiroaki Taniguchi, Horizon 2020, Amount of funding: IGAB PAS 181 437,50 EUR, total: 5 993 458,83 EUR
- Mechanisms of trophectoderm differentiation in rabbit embryos, Anna Piliszek, National Science Centre SONATA BIS 7, Amount of funding: 2 223 600,00 PLN
- Epigenetic effect on therapeutic activities of all-trans-retinoic acid in acute myeloid leukemia, Artur Zelent, National Science Centre OPUS 17, Amount of funding: 2 307 032,00 PLN

8. Description of the available laboratory and office space for the Dioscuri Centre (*up to one page in A4 format*):

The Institute is able to provide adequate laboratory and office space in accordance with the requirements agreed with the Leader of Dioscuri Center. For the benefit of the Dioscuri Center, resources available in the Department of Research Coordination and Scientific Liaison and fully equipped laboratories will be used, such as:

Laboratory of Genomes and Transcriptomes Sequencing - is based on the ability to analyze entire transcriptomes and animal genomes in a very short period of time. Bioinformatic analysis of the obtained sequencing results allows to learn about new genes and learn about the mechanisms of expression of existing genes.

Laboratory of Food Quality of Animal Origin - laboratory offers analyzes related to the determination of the nutritional and pro-health value of products and raw materials of animal origin and feed. It has a unique, modern set of scientific and research equipment that allows the analysis of not only the basic chemical composition, but also biologically active ingredients in food of animal origin.

Laboratory of Fluorescence and Confocal Microscopy - microscopic analysis of biological material at the cellular and subcellular level, with the use of fluorescent markers and confocal analysis methods.

Laboratory of Proteomics - the main research concerns the systemic analysis of gene activity at the proteome level in animals. These studies are aimed at finding specific biomarkers for production traits. There are also studies in the field of nutrigenomics aimed at determining changes in proteomic profiles under the influence of different levels of bioactive components of feed/diet.

Laboratory of Tissue Culture and Genomic Engineering - collection of tissues and organs for research. Preparation and maintenance of the culture of cells, tissues and embryos, preparation of microscopic preparations and their analysis, isolation of nucleic acids and proteins and their qualitative and quantitative analysis, genomic analysis.

In addition, the Institute also has a unique collection of farm and laboratory animals, including lines of mice selected for over 100 generations for high and low post-stress analgesia as a model for biomedical research.

9. List of the available research equipment for the Dioscuri Centre:

The Institute is a well-equipped state-of-the-art research institute well suited to studies of animal genetics and biotechnology. In addition to the basic laboratory equipment, Dioscuri researchers will have access to many facilities of IGAB PAS. In particular, the following equipment and facilities will be available:

(A) Laboratory of Confocal and Fluorescent Microscopy. Available equipment includes Nikon A1R Confocal inverted microscope (405 nm, 488 nm, 561 nm, 640 nm lasers) hybrid and resonant scanners, equipped with environmental chamber (OKO lab) for long-term imaging. Also available in the facility are epifluorescent microscopes (inverted and stereo).

(B) Proteomics laboratory. Available equipment includes: (1) MALDI-TOF ultrafleXtreme Bruker Mass Spectrometer (2) amaZon speed ETD Bruker Mass Spectrometer (3) The UltiMate 3000 Nano LC systems Dionex (4) Proteiner fc II TM -The LC-MALDI Fraction Collector Bruker (5) Image Prep -Patented Matrix Preparation for MALDI Tissue Imaging Bruker (6) EXQuest Spot Cutter Bio-rad

(C) Laboratory of Genome and Transcriptome Sequencing. Available equipment includes: Miseq (Illumina) and Ion Proton (Life Technology)

- Dedicated equipment for molecular biology, including: LightCycler 96 (Roche); Thermal Cyclers (MJ Research, BioRad); MolecularImager FX (BioRad); Liquid Scintillator Counter 1209 Rackbeta (Pharmacia); DU®-68 Spectrophotometer (Beckman); L7-65 Ultracentrifuge (Beckman); Benchtop DNA/RNA UV cleaner boxes (Biosan); Laminar Flow Hoods MSC 12 (Jouan); Novex-Mini-Cell (Invitrogen); Multifunctional microplate reader FLUOstar OPTIMA (BMG Labtechnologies); NanoDrop2000 (ThermoScientific); BioAnalyzer 2100 (Agilent); PyroMark Q24 Sequencer etc. Also available are: computer workstation with Pyro Q - CpCt 1.0.9 software (Qiagen) and workstation with SAS

- Dedicated facilities for animal tissue culture, including: Class II Laminar Flow Hoods (ESCO), humidified CO<sub>2</sub>/O<sub>2</sub> incubators with decontamination system (ESCO, HeraCell), fluorescent inverted microscope (Zeiss), cell electroporators (Multiporator, Eppendorf; Genome editor GEB15 (BEX)LN<sub>2</sub> storage system, centrifuges (Eppendorf) etc.

- Dedicated facilities for mammalian embryo manipulation and culture, including: inverted microscopes (Nikon, Leitz, Zeiss) with Nomarski, DIC and Hoffman contrast, equipped with micromanipulators (Leitz, Narishige, Eppendorf) and microinjector (Cell tram and Femtojet, eppendorf); humidified CO<sub>2</sub>/O<sub>2</sub> incubators for mammalian embryo culture (HeraCell, Galaxy); equipment for microtools preparation: pullers (Narishige, Sutter), bevellers (Narishige), microforges (Narishige, Beaudouin); stereomicroscopes (Nikon, Leica) etc. Also available are computer workstations with advanced image reconstruction and analysis software: NIS Elements (Nikon) and Imaris Cell (Bitplane).

10. List of the additional benefits (other than listed in call text) that the Institution declares to provide for the Dioscuri Centre (i.e.: additional funds, personal benefits, other) (*up to one page in A4 format*):

The Institute of Genetics and Animal Biotechnology of the Polish Academy of Sciences has the HR Excellence in Research logo awarded by the European Commission to institutions which implement rules of the "European Charter for Researchers" and the "Code of Conduct for the Recruitment of Researchers".

For scientists with outstanding achievements, the Institute provides a financial bonus for highly scored publications. The English-speaking administrative staff of the Institute fully supports scientists in submitting their grant applications.

The Institute also has many family bonuses, such as holiday funding, the opportunity to spend holidays in houses by the sea/mountains belonging to the Institute at attractive prices, funding for children's holidays (summer camps, winter camps), Christmas packages for employees' children, loans for housing purposes (purchase of a flat, house) and renovation (flat, house), allowances and special purpose loans for people in a difficult life/health situation, and the Employee Pension Program.

In addition, for people coming from abroad, the Institute supports in the preparation of the required documents for obtaining a visa and is able to provide accommodation in a hotel located on the premises of the Institute.



11. Other information about the internationalisation of the research institution, international researchers employed at the institution, the availability of English language seminars etc. (*up to one page in A4 format*):

The Institute actively cooperates with about 40 foreign research centers. Thanks to the conducted modern research, extensive cooperation with one of the best universities in the world - Harvard University (Harvard Medical School) was developed and strengthened, and a strategic cooperation agreement was signed with Wageningen University and Research - the world's best research center in the field of natural and agricultural sciences.

In the last 5 years, the Institute has implemented 11 international projects, in particular:

- 7 projects under the framework programs of the European Union, including 1 project coordinated under the Horizon 2020 program and 1 stand-alone project implemented under the prestigious Polonez competition for incoming international researchers.
- 3 projects under operational programs, including 1 coordinated project and 2 independent projects;
- 1 coordinated project financed by a foreign foundation.

In the last years the Institute has developed several new smart specializations and run wide international employment programme. The Institute employed several research workers from abroad (including from the following renowned foreign units: University of Uppsala, Karolinska Institutet, University of Tokyo, University of Vienna, University of Manchester, University of Aarhus, Teagasac in Ireland) which resulted in a 200% increase in the number of publications in journals from the Journal Citation Reports list and as much as 700% increase in publications in the journals from the 1 (Q1) quartile from the JCR list. In addition, the staff internationalization rate at the Institute is close to 30% and is one of the highest in Poland, therefore the administrative staff uses both Polish and English on a daily basis and all documents and meetings are prepared in two languages. The Institute also runs a postgraduate study and a doctoral school in English.

Currently, the research staff of the Institute can boast of excellent scientific leaders who publish in journals such as Nature and Science and relocated from foreign institutions, which include:

- Artur Zelent PhD, New York University - h-index = 52; citations = 10223
- Atanas Atanasov PhD, University of Bern - h-index = 38; citations = 6011
- Łukasz Huminiecki PhD, Oxford Brookes University - h-index = 23; citations = 6176
- Irene Camerlink PhD, Wageningen University - h-index = 16; citations = 563
- Hiroaki Taniguchi PhD, Okayama University - h-index = 15; citations = 1104