Registration Form - declaration of willingness for establishing interdisciplinary Dioscuri Centres of Scientific Excellence

This is a registration form for Host Institutions wanting to establish an interdisciplinary Dioscuri Centre of Scientific Excellence within Dioscuri 5 call.

Registration form for Polish research institution

1. Research institution data (name and address):

   Jagiellonian University
   ul. Gołębia 24
   31-007 Kraków
   NIP 675-000-22-36
   Malopolska Centre of Biotechnology
   ul. Gronostajowa 7A
   30-387 Kraków

2. Type of research institution[1] (select only one from the listed options):

   higher education institutions

3. Head of the Institution:

   Prof. dr hab. Wojciech Macyk – Vice – Rector for Research

4. Contact information of designated person(s) for applicants and the NCN: first and last name, position, e-mail address, phone number, correspondence address:

   Contact information for applicants:
   prof. dr hab. Grzegorz Dubin - Interim Director of MCB UJ:
   dyrektor_mcb@uj.edu.pl, 12 664 5369

   Malopolska Centre of Biotechnology
   ul. Gronostajowa 7A
   30-387 Kraków

   Contact information for NCN:
   Katarzyna Maziarka - deputy director for finance and administration,
   katarzyna.maziarka@uj.edu.pl, 12 664 6334

[1]

Malopolska Centre of Biotechnology
ul. Gronostajowa 7A
30-387 Kraków

5. Research disciplines in which the institution ensures establishing of an interdisciplinary Dioscuri Centre (select two (and if necessary three) of the domains that should be combined; select two (or if necessary three) from the 25 listed auxiliary panels of disciplines). Provide two (and if necessary three) specific NCN subpanels according to the list[2].

NZ6_03 Regulation of the immune response

ST5_11 Macromolecular chemistry

[2] Lists of the disciplines for each auxiliary panel of disciplines to be found here: https://www.ncn.gov.pl/en/finansowanie-nauki/panele-ncn

☐ **DOMAIN: Humanities, Social Sciences and Art Sciences** [3]

☐ Fundamental questions about human existence and the nature of reality

☐ Culture and cultural production

☐ The study of the human past

☐ Institutions, markets, space

☐ Law and political science

☐ Human nature and human society

X **DOMAIN: Life Sciences**[4]

☐ Molecules of Life: Biological Mechanisms, Structures and Functions

☐ Integrative Biology: from Genes and Genomes to Systems

☐ Cellular, Developmental and Regenerative Biology

☐ Physiology in Health, Disease and Ageing

☐ Neuroscience and Disorders of the Nervous System

X Immunity, Infection and Immunotherapy

☐ Prevention, Diagnosis and Treatment of Human Diseases

☐ Environmental Biology, Ecology and Evolution

☐ Biotechnology and Biosystems Engineering

X **DOMAIN: Physical Sciences and Engineering**[5]

☐ Mathematics

[3] Lists of the disciplines for each auxiliary panel of disciplines to be found here: https://www.ncn.gov.pl/en/finansowanie-nauki/panele-ncn

[4] Lists of the disciplines for each auxiliary panel of disciplines to be found here: https://www.ncn.gov.pl/en/finansowanie-nauki/panele-ncn

[5] Lists of the disciplines for each auxiliary panel of disciplines to be found here: https://www.ncn.gov.pl/en/finansowanie-nauki/panele-ncn

☐ Fundamental constituents of matter

☐ Condensed matter physics

☐ Chemistry

X Synthetic Chemistry and Materials Science

☐ Computer science and informatics

☐ Systems Engineering

☐ Production and processes engineering

☐ Earth sciences

☐ Materials Engineering

6. Description of important research achievements from the selected disciplines from the last 5 years including a list of the most important publications, data bases, series of workshops, patents, policy briefs, field work/ field site, exhibitions, other:

Malopolska Centre of Biotechnology of the Jagiellonian University (MCB) is a recognized centre of bioscience research excellence in Poland operating at the forefront of modern life sciences. Research disciplines specified for a Dioscuri Center are indicative. We are open to exploring relevant alternatives at the interface of Life Sciences and Physical Sciences, Engineering or Humanities. Active since 2014, we currently employ ~110 personnel and ~65 Phd candidates organized in 17 research groups working across a continuum of genes to protein to function to translational research and supported by 6 core facilities. The Center supports both experimental and data-driven science at the highest international level. A defining feature of MCB is its strong international outlook. We've built a vibrant international community with a quarter of Principal Investigators (PI) and ~30% of researchers being non-Polish nationals and all the key personnel having experienced substantial training in best institutions worldwide (including Harvard, Riken, MPI, Cambridge, Imperial and more) and maintaining strong ties abroad. This collaborative culture is reinforced by regular evaluations by Scientific Advisory Board which gathers 12 world-class scientists and science managers ensuring that research quality remains competitive on a global scale. We host a Max-Planck Society associated research group, a Dioscuri center, have several EMBO installation grant holders, actively participate in European Horizon projects and have ERC funding. MCB routinely secures national funds from all major Polish research councils including the National Science Center (NCN), National Centre for Research and Development (NCBiR) and the Foundation for Polish Science (FNP). We have recently completed construction of a laboratory building extension ensuring space for future growth. For prospective Dioscuri center, MCB offers a stimulating and well-resourced environment where ambitious ideas can flourish making it an attractive destination for researchers seeking to build impactful, globally connected careers in life sciences and extending beyond to engineering and humanities.

In 2025 we have published 20 articles in journals above the Impact factor of 10. Our 5 most notable publications from the last 5 years include:

- "Rapid simulation of glycoprotein structures by grafting and steric exclusion of glycan conformer libraries" (Cell, 2024, 10.1016/j.cell.2024.01.034) where MCB group leader M. Sikora describes GlycoSHIELD, a computational tool for rapid simulation of glycoprotein structures and glycan shields, enabling prediction of glycan conformations and their impact on protein accessibility; validated experimentally and released as open-source.
- "The molecular basis of tRNA selectivity by human pseudouridine synthase 3" (Mol. Cell., 2024, 10.1016/j.molcel.2024.06.013) where MCB group leader S. Glatt describes how pseudouridine synthase 3 recognizes and modifies specific positions in tRNAs
- "Reengineering of an Artificial Protein Cage for Efficient Packaging of Active Enzymes" (Small, 2024, doi: 10.1002/smll.202312286) where a now former MCB group leader J. Heddle (currently at Durham University) described a guest packaging system based on an artificial protein cage with programmable disassembly
- "Nuclear retention of unspliced HIV-1 RNA as a reversible post-transcriptional block in latency" (Nat. Comm., 2025, 10.1038/s41467-025-57290-y) where MCB group leader A. Kula-Pacurar describes that HIV-1 latency can be maintained by a reversible post-transcriptional block caused by nuclear retention of unspliced RNA
- "Linker histones consolidate heterogenous nucleosome fiber contacts by linking together multiple nucleosomes" (Nat. Comm., 2026, 10.1038/s41467-026-69842-x) where MCB group leader C. Davey shows that linker histone H1 binds nucleosomes in multiple variant-dependent ways, including bridging between them, enabling flexible regulation of chromatin structure and compaction

7. List of no more than 4 important research projects from the selected disciplines awarded in national and international calls to the institution in the last 5 years (title, name of PI, source of funding, amount of funding):

4 most important ongoning research projects:

"Deciphering the role of RNA modifications during ribosomal decoding and protein synthesis", dr hab. Sebastian Glatt, ERC Consolidator Grant, European Research Council, source of funding: total Funding: 1,997,000 EUR. **Description:** The project aims to structurally characterize key RNA modification complexes, create sets of fully modified RNAs in vitro, understand the role of individual rRNA and tRNA modifications during translation elongation, and provide mechanistic insights into the links between patient derived mutations of the underlying pathways and the occurrence of severe human diseases.

'Dioscuri Centre for Modelling of Posttranslational Modifications', dr Mateusz Sikora sources of funding: Polish Ministry of Education and Science and the German Federal Ministry of Education and Research, operated by National Science Center, Dioscuri Centers of Scientific Excellence, total funding: 1 500 000 EUR. **Description:** The Dioscuri Programme, initiated by the Max Planck Society and jointly managed by the National Science Centre, establishes internationally competitive research groups in Central and Eastern Europe. Centers are co-developed with German partners, promoting knowledge transfer, structural development and integration into European

networks. Dioscuri Centre for modelling PTMs hosts 10 researchers working on computational aspects of PTMs and prediction of their roles in proteins.

'Inducing Molecular Proximity to Modulate Cellular Polyamine Metabolism', dr hab. Przemysław Grudniak, sources of funding: Foundation for Polish Science, First Team European Funds for a Modern Economy, total funding: 3,967,720 PLN. **Description:** Competitive programme of the Foundation for Polish Science supporting the establishment of an independent research team. The project focuses on inducing molecular proximity to modulate polyamine metabolism and hypusination using structural biology, fragment screening and chemical biology approaches.

"Delivering a Unified Research Alliance of Biomedical and public health Laboratories against Epidemics", prof. dr hab. Krzysztof Pyrć, sources of funding: Europen Commision, EU4Health programme. Total funding 31,8M EUR, funding for MCB: 0,5M, description: EU-funded project building a multidisciplinary network of research and public health labs across Europe. It provides rapid, high-quality scientific data and analyses to support preparedness, detection, and response to cross-border health threats using a One Health approach. The overarching objective of the DURABLE project is to establish a one-stop shop for laboratory preparedness for emerging infectious diseases through a collaborative partnership of public health, veterinary, diagnostic, and research laboratories with recognized expertise in diagnostics, research, preparedness, and response. All activities are focused on preparedness for both currently known and future epidemic threats, collectively referred to as "Disease X".

8. Description of the available office space, working space, laboratory for the Dioscuri Centre:

All research and office space at Malopolska Center for Biotechnology is dynamically allocated to research groups according to current needs. We believe that rigid organizational division is counterproductive as groups will shrink and expand according to grant success rate and have our system is adjusted accordingly.
MCB has recently completed research and office building expansion providing us with flexible modern laboratory space and comfortable office premises. These will be allocated to a newly formed Dioscuri Center according to needs, with the below description constituting the starting offer
For Dioscuri Centre usage we initially offer over 64 m^2 equipped laboratory space in modern MCB building. Additionally, researchers and students will have access to common laboratory space when needed. Common laboratory space is not dedicated to any research group acting at MCB and could be used by any group which requires additional space for certain time- period. The Centre leader will be provided with separate office room and additional office space for team members employed at MCB. The Centre employees will also have full access to seminar rooms, kitchen with lunchroom and common areas. On top of above, we provide access to 7 core facilities operating on site including: Proteomics, Genomics, Structural Biology, Biomolecular interactions, Flow cytometry, Cell Bank and Animal facility. Other core facilities are available at nearby faculties and research institutes. Data processing and storage is available onsite as well as via a well working collaboration with supercomputer center Cyfronet in Krakow with their Prometheus computational cluster and BigData storage facility.

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

The MCB is fully operational and equipped for research projects in the fields of broadly defined cell and molecular biology. The institute has an open access policy, which grants open access to all available instruments to all hosted groups. In addition 7 core facilities operating at MCB support researchers with state-of-the-art technology, experience and knowledge. Centralized MCB media kitchen provides all groups with microbial medias, an autoclaving service and a regular dish washing service on-demand. The Dioscuri center will benefit from all above mentioned established and operating infrastructure and service facilities at MCB from its first day of existence.
The major equipment available at MCB and made available to Dioscuri center is listed below. It is, however, just an example list. Multiple modern, sophisticated equipment is located at MCB and life science faculties next door. The equipment base is exceptionally good in Poland following significant government and EU investment in the last decade. All that equipment and modern facilities will benefit the Dioscuri Center.

Major equipment available at MCB
Available via core facilities:

1. Confocal microscope (Zeiss AxioObserver inverted microscope with the LSM 880 laser scanning confocal module)
2. Biophysical characterization of proteins -quantitative analysis of molecular stability and interactions
   a) Monolith
   b) Prometheus Panta
   c) Andromeda
   d) Tecan and Hidex Plate readers
   e) OpenSPR
   f) nanoITC
   g) DSC
   h) Agilent 1200 HPLC
   i) through structured external collaborations: Dianthus, Opera Phenix Plus, Biocore S200
3. Flow cytometry - cell analysis and sorting
   a) Aurora CS (Cytek)
   b) S3e (Bio-Rad)
   c) Navios (Beckman Coulter)
4. Animal facility for small rodents - research in BSL-2 and BSL-3 containment conditions
5. Proteomics - provides simple and advanced analysis of proteomes and posttranslational modifications
   a) Orbitrap Astral mass spectrometer coupled to Vanquish Neo UHPLC
   b) Orbitrap Q Exactive mass spectrometer coupled to Ultimate 3000 RSLCnano
   c) micrOTOF-Q II
6. Structural biology - crystalization and sample preparation for cryo-EM, handling of samples, measurements, handling of data
   a) Crystal Phoenix
   b) Mosquito HTS
   c) Nanotemper Tycho™ NT.6
   d) Vitrobot
   e) JEOL HDT-400 (glow discharger)

7. Genomics - services in the area of DNA and RNA analysis utilizing next-generation sequencing (NGS) and capillary electrophoresis (CE) methods
    a) NextSeq 2000 (Illumina)
    b) MinION (Oxford Nanopore Technologies)
    c) GridION (Oxford Nanopore Technologies)
    d) P2 Solo (Oxford Nanopore Technologies)
    e) CE system: 3500 Series Genetic Analyzer (Applied Biosystems)
    f) Quant Studio 12K flex qPCR
    g) Qubit fluorometer (Invitrogen), 2100 Bioanalyzer (Agilent), Nanodrop spectrophotometer (Thermo Fisher Scientific)
    h) recellys 24 Tissue Homogenizer (Bertin Instruments), Bioruptor Pico (Diagenode)
8. Cell Bank - authorization from the Ministry of Health for the procurement, processing, storage, and distribution of human cells. Recommendations from the EMA and approval from the Main Pharmaceutical Inspectorate for the manufacturing of advanced therapy medicinal products (HE-ATMP).

Other specialized equipment (most in multiple copies):

1. Tecan plate readers
2. Fluorescent microscopes
3. ASA chromatograph
4. Gas chromatograph
5. Vibratone
6. Chemidocs
7. French Press
8. Tissue staining
9. Embedded station – histology
10. Microtome (paraffin)
11. Cryotome (frozen samples)
12. Luminex 200
13. Excelsior ES tissue processor
14. Cell culture – hoods, incubators, microscopes, peripherals
15. Celldiscoverer (HTS fluorescent microscope)
16. Imagescanners
17. Optima XPN-90 Ultracentrifuge
18. Bioruptor Pico
19. LN2 cell storage
20. QiaCube
21. Freedom evo pipetting station
22. Precellys 24
23. Cryolys
24. Azure biosystems
25. Lyophylizers
26. Speedvac
27. Chromatography: HPLCs and FPLCs (Aktas)
28. Lynx high capacity centrifuges

Standard instruments and infrastructure

PCR Thermocyclers (gradient and non-gradient), nanospectrophotometers, table top centrifuges, protein and nucleic acid electrophoresis systems (+ power supplies), temperature controlled incubators (Innova and table top; for bacteria, insect and

eucaryotic cells) , laminar hoods, blotting devices, water baths, thermomixers, -80°C and -20°C freezers, refrigerators, manual and automated pipettes, vortex, rotators, rolling tables, microwaves, sonicators, MilliQ Ultrapure Water Systems, hybrydization oven, UV corsslinker, Autoclaves and dish washers (Media Kitchen)

Computational cluster

MCB provides organized infrastructure for installation of group owned servers and storage devices. Close collaboration with Cyfronet supersomuter center provides for large scale computations.

Instruments and infrastructure available in neighboring JU faculties and in Kraków area

MCB is located at the new campus of the Jagiellonian university with all life science faculties and next door to Faculty of Biochemistry, Biophysics and Biotechnology (the buildings are connected via an indoor bridge) and Institute of Zoology (across the street). Faculty of Chemistry and Solaris Synchrotron are less than 10 min. walk from MCB. All these units are research extensive and provide a multitude of modern research infrastructure and equipment. Further, Kraków is one of the research centers of Poland with Collegium Medicum and external research institutes providing further equipment and expertise base in life sciences.

10. List of the additional benefits (other than listed in invitation call) that the Institution declares to provide for the Dioscuri Centre (i.e.: additional funds, personal benefits, other).

Financial support for Centre

As a benefit for Dioscuri Centre JU will provide additional financial support in amount at least 25 000 EUR annually.

Additionally MCB JU supports group leaders with additional annual funding, known as the ‘core budget’, which consists of a fixed component (the same amount for each group) and a performance bonus (an amount dependent on achievements - total grant funding).

Moreover, Dioscuri Centre employees will have access to social benefits offered by JU:

- Access to Multisport programme (75% cost coverage by JU),
- Access to private healthcare for employees and their family members, cofinanced by JU,
- Possibility of enrolment in group insurance for JU employees
- JU resort hotel rooms (Zakopane, Rabka, Ustroń k. Wisły) on preferable prices,
- Loans for buying/renovation of flat/house available on preferable financial conditions,
- Loans from JU social allowance and benefit fund available on preferable financial conditions,
- Trips organized by JU on preferable financial conditions,
- Financing support for self-arranged summer and winter holidays,
- One month additional salary (“so called thirteen salary”),
- Access to JU kindergarten and nursery,
- Language courses at Jagiellonian Language Centre on preferable prices.

Access to JU infrastructure and personnel:
MCB is located at JU Campus in close neighborhood of JU Faculties (Biology, Chemistry; Physics, Astronomy and Applied Computer Science; Biochemistry, Biophysic and Biotechnology; Mathematics and Computer Science; Solaris synchrotron, JCET, ect.) porviding opportunity for cooperation, access to specialized equipment not directly available at MCB building as well as a convenient contact with MSc and PhD students and researchers working within various scientific fields.
JU administration support

- Research Support Center - will provide information concerning present grant achievements possibilities as well as formal support in grant application preparation,
- Welcome Centre - will help in all formalities concerning persons from abroad employment,
- Technology Transfer Centre (CITTRU) will offer support in all matters concerning Intellectual Property Rights (IPR).

11. Other information about the internationalisation of the research institution e.g. international environment (international researchers community at the institution, internationalization of the management and administration), didactic in English, availability of Polish course for Foreigners etc.

MCB is an international research institute with operating English language both among the research and administrative personnel. All seminar series at the institute are in English. Research groups at MCB are regularly evaluated by International Advisory Board (IAB), which gathers 11 world-class scientists and science managers.

The former director of MCB was a foreign national who spent the majority of her career in pharma industry in the UK. The incoming director (from October) is also a foreign national whose academic career was entirely in th USA.

5 groups are led by foreign nationals. S.Glatt coming from Austria and trained at EMBL, C. Davey from the UK, trained in ETH, with long-term experience as a group leader in Singapore, K. Yamada coming from and trained in Japan, S. Mangul from Moldova and with the experience of a group leader in California, USA, and an incoming group leader (from September), M. Schacherl trained and with earlier group leader experience in Germany. Additionally, a former group leader (currently at Durham University), Jonathan Heddle from the UK and with earlier experience in Riken, Japan. The majority of remaining research group leaders had extensive training abroad both in Europe and the USA and therefore understand the benefit and importance of internationalisation in research.

~30% of research personnel and PhD students are foreign nationals. The program of the PhD school is entirely in English. Polish courses are available for interested foreigners via Jagiellonian Language Center.

The major funding institutions in Poland require that the grant submissions were in English.

Employees of MCB have no teaching obligations. Voluntary teaching in English can be performed as nearby faculties for those willing to sustain their interactions with very early

career adepts. The nearby life science faculties have significant commitment to internationalization, having courses and entire study programs in English and a significant portion of PhD students from foreign countries.

The Jagiellonian University operates a “Welcome center” which assists employees with immigration and other legal matters encountered by relocating foreigners.

Kraków, being an international tourist attraction attracts millions of people from every nationality, culture and race and thus has become an open and tolerant society. On top of that, the strong IT industry and other international industries have over the years attracted a large group of foreigners, many of whom have now settled here for lives blending in and transforming the local population making Kraków a hospitable place to live. International preschools and schools are available. Quisine from over the world is readily available in the city.