

## A postdoctoral researcher in microbiology and genetic engineering of bacteria

We seek a talented researcher with experience in microbiology, genetic engineering of bacteria and whole-genome sequencing to contribute to the project “Transition from genetic to phenotypic antibiotic resistance in *de novo* bacterial mutants”.

The project will involve genetic engineering of *E. coli* strains to enable CRISPR/Cas9-based imaging of *de novo* mutations in live bacterial cells. The bacteria will be cultured in a large microfluidic device suitable for live imaging of  $10^9$  cells, tracking antibiotic-resistant spontaneous mutants that evolve in the device, and measuring their growth rate over several generations. Antibiotic-resistant mutants from the end point of the experiment will be sequenced to confirm the presence of genetic alterations. The design and construction of the microfluidic device, image analysis, and mathematical modelling will be performed by other team members.

### About the Dioscuri Centre

The Centre’s main objective is to better understand bacterial growth and evolution in the natural environment of pathogenic bacteria: the interior of an animal cell and animal secretions. The members of the Centre use experimental *in vitro* models of infections, computer simulations and mathematical theory to create data driven, quantitative models of bacterial growth and evolution in these environments. Research performed in the Centre will contribute towards the understanding of bacterial infections and the evolution of antimicrobial resistance in animal and human hosts. The Centre collaborates with research institutions in Germany, the UK and the US. The Centre is co-funded by the Polish Ministry of Science and Higher Education and the German Federal Ministry of Education and Research, with additional support coming from NAWA.

The Centre is located in the Institute of Physical Chemistry (IPC, Polish: IChF), Polish Academy of Sciences, Warsaw, Poland.

### Main responsibilities:

1. Planning and execution of specific elements of the research program, acting under general guidance of the supervisor. This will involve deciding (with the supervisor) on the detailed direction of the research, formulating a strategy for day-to-day research work, implementing the strategy (without close supervision), interpreting obtained data, drawing conclusions, and reporting progress to the supervisor.
2. Communicating research results to team members and collaborators at IPC and other institutions through talks and discussions, as well as learning about others’ research through seminars and journal clubs.
3. Assisting with supervision of junior researchers (Master and PhD students), where appropriate.
4. Writing reports and scientific papers.
5. Attending and presenting at workshops and conferences.
6. Keeping up-to-date with relevant scientific developments through literature review.

**Line manager/supervisor.** Dr Bartłomiej Waclaw, Dioscuri Centre Leader.

### Person Specification (Knowledge, Skills and Experience Needed for the Job)

### Essential

- PhD in microbiology or bioengineering, held or to be completed before the job start date.
- Expertise in microbiology and genetic engineering of *E. coli*.
- Very good academic achievements as evidenced by peer-reviewed publications and talks/poster presentations at international conferences.
- Ability to draft (in English) scientific papers for academic journals.
- Ability to communicate (in English) complex information clearly, orally and in writing.
- Ability to think creatively, propose and develop new ideas.
- Capability of working without close supervision, exercising a high degree of initiative and demonstrating a pro-active approach to work.
- Ability to develop and maintain effective working relationships.

### Desirable

- Experience with CRISPR/Cas9.
- Experience with DNA sequencing (DNA isolation, library prep, variant calling).
- Experience with automated epi-fluorescent microscopes.
- Microfluidics experience.
- Experience in cross-disciplinary and / or collaborative research projects.
- Ability to communicate with researchers with different scientific backgrounds.
- Ability to adapt to new ideas and willingness to approach new challenges and adjust plans to suit new priorities.
- Ability to work hard and organise work so as to perform multiple tasks simultaneously.
- Ability to maintain a clean and well-organised laboratory environment and to set up and maintain a well-organised digital repository of experimental data and protocols.
- Potential for career advancement as an independent researcher.

### Career perspectives

The position is initially for 1 year, after which it may be extended for another 2 years (maximum total duration: 3 years) subject to satisfactory performance. The successful candidate will benefit from working in an international, interdisciplinary research group, and a newly refurbished, modern lab and office space. The candidate will work closely with other experimentalists and modellers from the Dioscuri Centre. The candidate will have an opportunity to visit other research groups in Europe and to participate in international workshops and conferences.

**Salary.** Gross salary 11000 PLN/month (net salary approx. 8700 PLN, approximately 1800 EUR).

### Application procedure.

A complete application should include the following items:

- motivation letter
- professional curriculum vitae
- list of publications
- personal data processing consent
- in addition, two letters of reference should be arranged to be sent to [rekrutacja@ichf.edu.pl](mailto:rekrutacja@ichf.edu.pl)

All documents (including the reference letters) should be emailed to [rekrutacja@ichf.edu.pl](mailto:rekrutacja@ichf.edu.pl) quoting "Rekrutacja nr 53/2022" in the subject line.



Short-listed candidates will be invited for an in-person interview or a conference call (Zoom or Skype) in January 2023.

**Application deadline:** 10 January 2023.

**Job start date:** 1 February 2023 or at a mutually agreed date.

### About IPC

IPC (established in 1954) is one of the top research institutes in Poland, ranked A+ by the Ministry of Science and Higher Education (top 5% of research units in PL). IPC publishes ~200 papers/year which generate over 7500 citation/year. 30% of papers are published in journals with IF>5: Nature Chemistry, Nature Physics, Science, Phys. Rev. Letters, JACS, Ang. Chemie Int. Ed., Nucl. Acid Research, and many others. IPC employs ~340 staff (physicists, chemists, biologists, biotechnologists) and is strongly committed to interdisciplinary research. IPC attracts talented students and experienced researchers from Poland and beyond (30% PhDs and 20% of PIs come from abroad). In acknowledgment of its efforts to enhance working conditions for researchers, the European Commission has awarded IPC the "HR Excellence in Research Award".

IPC has been very successful in attracting external funding from Polish and European funding agencies (>100 projects), for example the CREATE project (H2020; 2.5 M€), interdisciplinary International PhD studies (NaMeS project, CO-FUND, H2020; 2.3 M€) and the postdoctoral fellowship programme PD2PI (CO-FUND, H2020, 1.4 M€), the International Center for Translational Eye Research (ICTER, ~10M€), and the Dioscuri Centre (~2M€). IPC has a strong record of collaboration with industry, developed culture of fostering spin-off companies, and international patents.

### External links:

<https://dioscuricentrebacteria.com/>

<https://bartekwaclaw.wordpress.com>

[https://www.evolbio.mpg.de/16397/group\\_evolutionarytheory](https://www.evolbio.mpg.de/16397/group_evolutionarytheory)

[http://ichf.edu.pl/home\\_en.html](http://ichf.edu.pl/home_en.html)

### Personal data protection

By submitting the application, you give the Institute of Physical Chemistry consent to process your personal data for the purpose of the recruitment process.

The controller of your personal data is the Institute of Physical Chemistry of the Polish Academy of Sciences with its registered office in Warsaw, NIP: 5250008755 (the "Institute"). The Institute will process your data for the purpose of carrying out scientific and research activities, providing services and contact with the Institute, on the basis of a contract (in connection with the performance of the contract or in order to take action on your request before the contract is concluded – Article 6, paragraph 1, letter b) of GDPR), the legitimate interest of the Institute (Article 6, paragraph 1, letter f) of the GDPR) and legal provisions (Article 6, paragraph 1, letter c) of the GDPR) - depending on the circumstances.

You have the right to: request access to your data, receive a copy of it; rectify (correct) it; delete it; limit its processing; transfer it; lodge a complaint to the supervisory body; withdraw your consent for processing at any time (withdrawal of consent does not affect the lawfulness of the processing carried out prior to its withdrawal) or to lodge an objection to data processing. More information is available on the Institute's website:

[http://ichf.edu.pl/gen\\_inf/gen\\_en/GDPR%20-%20General%20Information%20Clause.pdf](http://ichf.edu.pl/gen_inf/gen_en/GDPR%20-%20General%20Information%20Clause.pdf)



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