

The Dioscuri Centre for Physics and Chemistry of Bacteria invites applications for

## A postdoctoral researcher position in microfluidics and/or optics

### 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 (AMR) in animal and human hosts.

While the focus of the Centre is on fundamental research in simple *in vitro* models, the long-term goal is the creation of quantitative, predictive models of *in vivo* bacterial infections that could help to develop new antimicrobial therapies. To facilitate translation from the bench to the bedside, the Centre will develop collaborative projects with biological and biomedical researchers and with industrial partners. The Centre will closely collaborate with MPI for Evolutionary Biology in Plön and other 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 for Physical Chemistry (IPC, Polish: IChF), Polish Academy of Sciences, Warsaw, Poland.**

### Job purpose:

We seek an excellent candidate with background in microfluidics and/or optics to contribute to the development of experimental *in vitro* models of bacterial infections. The candidate will have the opportunity to contribute to the following projects:

- 1) Microfluidics-based device for co-culturing bacteria and animal epithelial cells
- 2) Novel optical methods for accurate, real-time, *in situ* measurement of bacterial growth in opaque fluids, and inside animal cells
- 3) Microfluidics for detection and phenotypic profiling of antibiotic-resistant mutants

In addition, candidates will be encouraged to pursue their own research interests as long as they broadly align with the Centre's research focus.

### Main responsibilities:

1. Undertaking research projects in pursuit of goals agreed with 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) and reporting progress to the supervisor and other research team members.
2. Communicating research strategies and results to team members and collaborators at IPC, Plön, 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.

The candidate is expected to work closely with other experimentalists and modellers from the Dioscuri Centre and with theorists from the Department of Evolutionary Theory in MPI Plön, Germany (Prof. A. Traulsen).

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

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

#### Essential

- PhD in physics, chemistry, or engineering
- Hands-on experience with optical systems and/or microfluidics
- 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.
- Enthusiasm for learning basic microbiology techniques
- 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

- Research experience in biological physics, bioengineering, soft matter, physical chemistry, microbiology, or another related topic.
- Experience in one or more of the following areas: optical imaging (microscopy: imaging biological samples, image processing, building DIY microscopes); bioreactors (chemostats, turbidostats); continuous-flow microfluidics; bacterial and/or cell tissue cultures; *in vitro* models of bacterial infections.
- Experience in cross-disciplinary and / or collaborative research projects.
- Ability to communicate with researchers or other project partners from other 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

Each position is initially for 2 years and may be extended until September 2025. The successful candidate will benefit from working in an international, interdisciplinary research group, a newly refurbished, modern lab and office space, and a competitive salary. The candidate will work closely with other experimentalists and modellers from the Dioscuri Centre and other IPC groups, and with theorists from the Department of Evolutionary Theory in MPI in Plön, Germany. The candidate will have the opportunity to regularly visit the MPI in Plön, and other research institutions (up to a few weeks/year).

**Salary.** Gross salary 11000 - 14000 PLN/month (net salary: 9000-11000 PLN, approximately 2000-2400 EUR), depending on experience (no. of years post PhD).

### 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 02/2021” in the subject line.

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

**Application deadline:** March 7<sup>th</sup> 2021.

**Interviews:** 2<sup>nd</sup> half of March 2021.

**Job start date:** 1 April 2021 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€). 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)