



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

5 postdoctoral researcher positions

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 will 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 will be on basic research in simple *in vitro* models, the long-term goal is the creation of quantitative, predictive models of *in vivo* bacterial infections that could be applied 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 based at the Institute for Physical Chemistry (IPC, Polish: IChF), Polish Academy of Sciences, Warsaw, Poland.

Job purpose:

We seek excellent candidates with diverse background and skills to undertake research in the area of physics and chemistry of infections. Possible projects may include:

- 1) Development of a co-culture system for bacteria and epithelial cells
- 2) New methods for accurate, real-time, *in situ* measurement of bacterial growth
- 3) The structure and growth dynamics of intra-cellular colonies (*in vivo* biofilms)
- 4) Population dynamics of bacteria in complex fluids (such as mucus) and topologies (such as lung bronchioles)
- 5) Population dynamics of intracellular bacteria during antibiotic treatment
- 6) Bacterial growth on micro-patterned and dynamic surfaces

However, the Centre will offer a certain degree of autonomy to experienced candidates to pursue their own projects as long as they broadly align with the Centre's research focus.

Candidates with limited experimental training but very strong skills in modelling/data analysis who are interested in combining modelling and experiments are also encouraged to apply.

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.



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4. Writing reports and scientific papers.
5. Attending and presenting at workshops and conferences.

The candidate is expected to work closely with other modellers and experimentalists 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 biology, physics, chemistry, or engineering
- 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 about biological systems using quantitative methods.
- 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, microbiology, systems biology, bioengineering, soft matter, physical chemistry, or another related topic.
- Experience in one or more of the following areas optical imaging (microscopy: imaging biological samples, image processing, building custom-made microscopes); DNA/RNA isolation, library preparation and sequencing; genetic engineering of bacteria; bioreactors (chemostats, turbidostats); 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.
- Experience in combining theoretical / computational and experimental work.

Career perspectives

Each position is initially for 2 years and can be extended up to 5 years. 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



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the Department of Evolutionary Theory in MPI in Plön, Germany. The candidate will have the opportunity to regularly visit MPI in Plön and other research institutions (up to a few weeks/year).

Salary. Gross salary 1600 - 4600 EUR/month, approximately 7000 - 20000 PLN, depending on experience and role in the group.

Application procedure.

A complete application should include the following items:

- motivation letter
- professional curriculum vitae
- list of publications
- in addition, two letters of reference should be arranged to be sent to rekrutacja@ichf.edu.pl

All documents (including the reference letters) should be emailed to rekrutacja@ichf.edu.pl quoting "Rekrutacja nr 44/2020" in the subject line.

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

Application deadline: Applications must be submitted between 15 July and 15 September. Applications submitted after 15 September will not be considered. Applications will be assessed on a rolling basis until all positions have been filled or the deadline has passed, whichever occurs first.

Job start date: 1 October 2020 or later.

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

http://ichf.edu.pl/home_en.html

Personal data protection



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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



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