



The Henryk Niewodniczański
INSTITUTE OF NUCLEAR PHYSICS
POLISH ACADEMY OF SCIENCES

Project title: *Biomechanical heterogeneity of cancer cells as a parameter for high throughput detectability (BioMechCanDet)*

Post-doc positions - two

Start date: the earliest from 1 of January 2020

Project: The proposed research aims to study mechanical, adhesive and rheological properties of human cancer cells (bladder, melanoma, pancreas).

The idea of our project is to combine the microfluidic approach with atomic force microscopy (AFM) to enhance the identification of mechanically altered cells.

Research group:

Post-docs will be working at the Institute of Nuclear Physics located in Kraków (Poland), at the Department of Biophysical Microstructures (DBM IFJ PAN). Our activity is grouped around three main directions: (i) mechanical properties of cells and tissues aiming at mechanical fingerprints of pathological changes, (ii) extracellular matrix mechanics and its influence on cancer development, (iii) mechanistic approach to evaluate the effectiveness of anti-tumor drugs. The group has several collaborations of national and international levels gathering scientists with distinct expertise.

The project BioMechCanDet will be realized with the strong collaboration with the Norwegian University of Science and Technology (Dept. of Physics, prof. Bjorn Stokke group).

Candidate qualifications:

We are looking for excellent and highly motivated candidates with a PhD degrees in physics, biophysics, biology, chemistry, bioengineering or related subjects.

We expect dedication and enthusiasm for experimental research, combined with openness and curiosity, and the ability and willingness to team working in an interdisciplinary environment. Good proficiency in written and spoken English is needed.

Positions' description:

Post-doc 1

The main tasks that will be realized within the post-doc position #1 are measurements, analysis, and interpretation of data related to mechanical, adhesive, and rheological properties of living cells (bladder, pancreas and melanoma cells) using atomic force microscopy (AFM). Measurements will be carried out on cells culture/immobilized on lectin-modified surfaces.

Requirements:

- PhD in physics (physics, biophysics, related sciences)



- maintaining cell cultures
- working in the laboratory with biological material (including cells and proteins)
- conducting AFM-based, not exclusively, measurements on biological material together with data analysis
- knowledge of methods of statistical verification of obtained results
- English at the level of B2 (written and spoken).

Detailed description is included under the link <https://www.ifj.edu.pl/kariera/oferty-pracy/naukowe/adiunkt-asystent>

Post-doc 2

The main tasks that will be realized within the post-doc position #2 is development of theoretical approaches modelling the link between mechanical and rheological properties of cells in term of various cell adhesion and comparing the results with known mechanical models. In parallel, the software development is expected.

Requirements:

- PhD in physics (physics, biophysics, related sciences)
- advanced programming in Python or Java
- knowledge of mathematics at the level of algebra and analysis at the university level
- knowledge of methods of statistical verification of obtained results
- English at the level of B2 (written and spoken).
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Detailed description is included under the link <https://www.ifj.edu.pl/kariera/oferty-pracy/naukowe/adiunkt-asystent>

How to apply:

The applicant must send the following documents (in English) in pdf format to jobs@ifj.edu.pl referring to the announced position **post-doc 1** or **post-doc 2**, (<https://www.ifj.edu.pl/kariera/oferty-pracy/naukowe/adiunkt-asystent/>). For English speaking persons, we promise to help in the procedure.

Documents that have to be submitted:

- 1) an updated CV;
- 2) a personal motivation letter;
- 3) list of scientific and research achievements (e.g. list of publications, speeches at conferences, internships) with an indication of the two most important scientific publications
- 4) 2 recommendation letters or other document confirming that a candidate meets essential requirements specified in the competition advertisement,
- 5) a scanned copy of the PhD or an equivalent foreign academic qualification that is obtained before the date of employment.



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6) doctoral thesis (pdf version)

Eligible candidates will be interviewed, possibly by means of web-conferencing tools or Skype)

Candidates will be evaluated against *(i)* education record, *(ii)* scientific quality, *(ii)* previous experience in similar projects.

Contact:

For further information, please contact Prof. Malgorzata Lekka,
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