Univerza v Ljubljani

Expression of supervisor's interest to host
Marie Skłodowska-Curie Individual Fellows at the University of Ljubljana

Prof. dr. Damijan Miklavčič from University of Ljubljana (UL) is searching for a top-class experienced researcher of any nationality interested in **developing collaborative MSCA IF application** for the following EU Framework Programme for Research and Innovation **Horizon 2020** actions:

- Marie Skłodowska-Curie Individual Fellowships – European (MSCA-IF-2017-EF)
- Marie Skłodowska-Curie Individual Fellowships – Global (MSCA-IF-2017-GF)

H2020 Call MSCA-IF-2017

Planned opening date: 11 April 2017
Deadline: 14 September 2017

More info H2020-MSCA-IF-2017

ELIGIBILITY CRITERIA FOR MSC IF RESEARCHER

- The researcher must, at the deadline for the submission of proposals, be in possession of a doctoral degree or have at least four years of full-time equivalent research experience. The researcher may be of any nationality.
- Mobility rule: the researcher must not have resided or carried out his/her main activity (work, studies) in the country of the host organisation for more than 12 months in the 3 years immediately prior to the deadline for submission of proposals.

OPPORTUNITIES FOR POTENTIAL CANDIDATES – RESEARCHER´S CAREER DEVELOPMENT

The goal of MSCA Individual Fellowships is to enhance the creative and innovative potential of experienced researchers (post-doctoral or with 4 years of equivalent research experience) wishing to diversify their individual competence in terms of skill acquisition through advanced training, international and intersectoral mobility. The researcher and supervisor will develop the MSC IF application jointly. If the application will be successful, the grant provides an allowance to cover your living, travel and family costs. The research costs and overhead of the host organisation(s) are also supported. More information about the call may be found here.

University of Ljubljana offers stimulating environment for postdoctoral research providing modern core facilities in a supported environment with on-the-job training and supervision. In addition, postdoctoral researchers will have access to the generic and transferable skills trainings, they will have the possibility to be involved in educational process and if suitable, they will be seconded to industry all with the purpose for further development of their careers in the academic and non-academic sector.

Researchers who wish to cooperate with UL for the submission of a project proposal under the Marie S.-Curie Individual Fellowships should check that they fulfil the respective eligibility criteria and then send an Expression of interest, consisting of a CV and a summary presentation of their research proposal by email to: MSCA@uni-lj.si with the following reference: "MSCA prof. *name*". The deadline for submission is **15 March 2017**. Proposals will be pre-selected based on internal evaluation and the availability of suitable supervision. Candidates will be informed of the results of the pre-selection by 20 March 2017.

Selected candidates will be invited to meet the supervisor and visit the research environment of the University within a 2-day MSCA-IF Proposal writing Workshop in Ljubljana organised by the UL in June 2017.

UNIVERSITY OF LJUBLJANA

University of Ljubljana (Univerza v Ljubljani, UL) is the oldest and largest higher education and scientific research institution in Slovenia. It encompasses 23 faculties and 3 art academies and has more than 40.000 undergraduate and postgraduate students and approximately 5.600 employees. UL is listed amongst the **top 500 universities** in the world according to the ARWU Shanghai, Times THES-QS and WEBOMETRICS rankings. UL is very active in national and international R&D and educational programmes, and creates almost half of the research results of Slovenia. In the period 2007-2013 UL cooperated in 163 FP7 projects, which places UL between **the leading organisations in the EU 13** member states. In 2016 UL cooperated in 54 Horizon2020 projects, including 2 ERC grants and is involved in over 300 other EU projects. The University of Ljubljana has close ties with many excellent Slovenian and foreign companies. In May 2015, UL founded the Slovenian Innovation Hub, which will operate mainly as a facilitator and promoter of development and research teams in the academic and business sphere. UL is also founder of the University incubator, the Institute for Research and Innovation, and recently the SMUL network - a global alumni and associates network. UL is committed to respect the principles of the European Charter for Researchers and the Code of Conduct for Recruitment of Researchers, which led to the right, from 2013, to use the logo *'HR Excellence in Research'*.

PROFILE OF THE UL SUPERVISOR

NAME OF THE SUPERVISOR: Damijan Miklavčič

MAIN RESEARCH FIELD: biomedical engineering

E-MAIL address: damijan.miklavcic@fe.uni-lj.si

LINK to SUPERVISOR's CV: http://lbk.fe.uni-lj.si/damijan.html

DESCRIPTION OF THE SUPERVISOR (max. 200 words)

Damijan Miklavčič received a Ph.D. in Electrical Engineering from the University of Ljubljana in 1993. He is Full Professor and Head of the Laboratory of Biocybernetics at the Faculty of Electrical Engineering, University of Ljubljana, where he previously served also as vice-dean for research and Chair of the Department of Biomedical Engineering.
Throughout his academic career he has been active in rehabilitation engineering, experimental oncology, and cell biology. In the last two decades he specifically focused on electroporation-based gene transfer and drug delivery coupled with theoretical modeling of biophysical and biological processes, as well as development of electronic hardware. His current interests lie in further advancing electrochemotherapy as local treatment of internal malignant tumors, transferring the knowledge on tissue electroporation to other fields like food science, and development of innovative environmentally-friendly applications of electroporation.
Damijan Miklavčič has lead a number of national and international research projects including a global network funded by COST (www.electroporation.net), and organized various international scientific meetings with one of most recent being the 1st World Congress on Electroporation. He has supervised more than 20 PhD students, served as editor and guest editor in various scientific journals, and collaborated with more than 60 SCI journals as reviewer.

RESEARCH FIELD OF THE SUPERVISOR

Main research field: electroporation based technologies and treatments

Sub-fields: biomedicine, lifesciences, cancer treatement, DNA vaccination and gene therapy, tissue ablation, medical imaging, hardware development, modelling, food processing

RECENT TRACK-RECORD and other SIGNIFICANT ACHIEVEMENTS

Yarmush ML, Golberg A, Serša G, Kotnik T, Miklavčič D. Electroporation-based technologies for medicine: principles, applications, and challenges. Annu. Rev. Biomed. Eng. 16: 295-320, 2014.

Kranjc M, Markelc B, Bajd F, Čemažar M, Serša I, Blagus T, Miklavčič D. In situ monitoring of electric field distribution in mouse tumor during electroporation. Radiology 274: 115-123, 2015.

Rosazza C, Haberl Meglič S, Zumbusch A, Rols MP, Miklavčič D. Gene electrotransfer: a mechanistic perspective. *Curr. Gene Ther.* 16: 98-129, 2016.

Kotnik T, Frey W, Sack M, Haberl Meglič S, Peterka M, Miklavčič D. Electroporation-based applications in biotechnology. Trends Biotechnol. 33: 480-488, 2015.

Langus J, Kranjc M, Kos B, Šuštar M, Miklavčič D. Dynamic finite-element model for efficient modelling of electric currents in electroporated tissue. *Sci. Rep.* 6: 26409, 2016.

RESEARCH ENVIRONMENT

FACULTY/DEPARTMENT/LABORATORY

The host Laboratory of Biocybernetics is a multidisciplinary group of 20 senior and junior researchers with expertise in electrical engineering and different life sciences. The laboratory is one of the largest and internationally most recognized groups at the Faculty of Electrical Engineering. The main research focus of the group is investigation of the influence of electric currents and electromagnetic fields on the physiological state of cells, tissues, organs, and the body as a whole. The aims of this research are to understand the basic mechanisms of bioelectric phenomena and to facilitate their use for therapeutic and technological purposes. To gain an insight into the studied phenomena, we are coupling *in vitro*, *ex vivo*, and *in vivo* experimental work with theoretical (analytical, numerical, molecular) modeling. We are also developing electronic devices for application in these fields of research, as well as information communication technologies in support of clinical trials. Specific emphasis is given to cell membrane electroporation with its applications in medicine, particularly electrochemotherapy of tumors and gene therapy, irreversible electroporation as non-thermal tissue ablation technique, as well as the use of electroporation in biotechnological processes.

RESEARCH INFRASTRUCTURE

Infrastructure available to the candidate is mainly located at the Faculty of Electrical Engineering (Laboratory of Biocybernetics) and allows conducting experiments on lipid bilayers, cells, and tissues in microbiological, cell culture (safety level 1 and 2), and ex vivo tissue laboratories (see http://lbk.fe.uni-lj.si/ic/index_eng.html). Experiments can be conducted using a wide palette of electrodes and electrode chambers (also flow-through chambers) together with custom-designed and commercial electroporation devices which span from nanosecond to millisecond pulse generators. Experimental techniques routinely used in our group include electrical measurements (electric current, voltage, sample impedance), optical (particularly fluorescence) microscopy, spectrofluorometry, spectrophotometry, and various cell viability assays. We have also recently added a new flow cytometer to our equipment. Electronic workshop for developing hardware is available as well. For numerical modeling, we use in-house computer facilities with licensed software including COMSOL and Matlab. In addition, we are tightly collaborating with other laboratories from Ljubljana as well as outside Slovenia, with access to experimental equipment and computational resources allowing, e.g. in vivo experiments and molecular dynamics simulations.

ACADEMIC AND NON-ACADEMIC COLLABORATION

The host group is widely recognized as one of major groups involved in electroporation research and is as such strongly involved in numerous international research projects and activities (for detailed list of past and ongoing projects please see: http://lbk.fe.uni-lj.si/project.html). Laboratory of Biocyberentics is the host of Electroporation Based Technologies and Treatments postgraduate school and scientific workshop (www.ebtt.org) which is organized biannually since 2003 and annually since 2011. In addition to close collaboration with academic partners we also collaborate with numerous companies from Slovenia as well as internationally (see: http://lbk.fe.uni-lj.si/coopera.html). Our laboratory is widely open to international cooperation and is hosting a number of visitors from around the world every year (http://lbk.fe.uni-lj.si/visitors.html). The members of our group are also frequently visiting other research groups, and many of our former members have pursued their careers in collaborating institutions.

SPECIFIC REQUIREMENTS/PREFERENCES

The prospective candidate should (in addition to the general requirements of the call) have experience in one of the aspects of electroporation or expertise, which can be used in relation to electroporation research either on model membranes such as lipid bilayers, cells or tissues; new applications based on electroporation are also welcomed. Work in a multidisciplinary team requires the ability to reach beyond the specific discipline, thereby the candidate has to show the willingness and abilities to bridge across different disciplines and be willing to combine experimentation and wet-lab experimentation with modeling or hardware development. In this respect experience which clearly shows the potential for interdisciplinary research is important. The primary field of research is less important as the project that we will develop will be adapted to the existing experience and general research directions of the host laboratory (http://lbk.fe.uni-lj.si/index.html). Good knowledge of written and spoken English is required.

Additional information regarding possible projects can be obtained by inquiries directly to: damijan.miklavcic@fe.uni-lj.si.