PhD student in Biophysics/Physical Chemistry

The position is part of the Innovative Training Network (ITN) "PROTON". The network is devoted to the investigation of proton transport and proton-coupled transport. It is funded under Marie Sklodowska-Curie actions (H2020-MSCA-ITN-2019, grant agreement number: 860592).
The successful applicant will perform her/his studies and research at the

Institute of Biophysics (Division of Molecular and Membrane Biophysics) at Johannes Kepler Universität Linz, Austria, She/he will join the Membrane Transport Group (Head Peter Pohl) that is mainly interested in spontaneous and facilitated transport of water, protons and other small molecules as well as in membrane protein translocation across the reconstituted translocation channel. Preferentially we use electrophysiology, fluorescence correlation spectroscopy, light scattering (in stopped flow mode) and electrochemical microscopy.

Job Description

The successful applicant will investigate proton's ability to migrate along the membrane surface. The process is important to bioenergetics, since it ensures the most efficient coupling between mitochondrial proton pumps and ATPases. The scope of this research project is to understand the compositional and geometrical requirements that the membrane surface must fulfil for its waters of hydration to generate these forces.

The researcher will record pH profiles of traveling proton waves by using membrane anchored pH dependent dyes. Monitoring proton diffusion along differently shaped model membranes will help to elucidate the role of membrane curvature in proton lateral migration. Conducting similar experiments with other biological objects will demonstrate whether proton surface migration is a general phenomenon. The work involves overexpression, purification and reconstitution of membrane proteins. We will explore the role of regulatory factors like the presence of counterions, cation adsorption to the bilayer or the application of an electric field across and along the bilayer.

The PhD student will have two secondments (2 to 3 months each):

- Keysight Linz, Austria; Study of interfacial protons at solid surfaces
- EPFL, Lausanne, Lab of Sylvie Roke; Visualizing the effect of compositional and geometrical changes of the membrane surface on structure of its hydration layers

Finances

We are offering a full time position for three years. The gross salary amounts to about €40,000 per year (corresponds to roughly €1900 x 14 (12 months + 2 additional payments) after taxes and social security). A monthly mobility allowance and - if applicable - a family allowance will be paid in addition.

The earliest starting date is the 1. October 2019.

Required Qualifications

1. Applicants must, at the date of recruitment by PROTON, be in the first four years (full-time equivalent research experience measured from the date when the researcher obtained the degree entitling him/her to embark on a doctorate) of their research careers
2. They should not have been awarded a doctoral degree.
3. Applicants must not have resided or carried out their main activity (work, studies, etc.) in the country of the recruiting institution for more than 12 months in the 3 years immediately before the recruitment date. This excludes short stays such as holidays or compulsory national service.
4. We look for students with exceptional academic performance holding or very close to completing their Master degree in Physics, Chemistry, Biophysics, Biochemistry or closely related subjects,
5. Knowledge of the English language is essential.

Additional Qualifications

.Knowledge of light microscopic and spectroscopic techniques (e.g. confocal microscopy, fluorescence correlation spectroscopy, single dye tracing)

1. Experience in handling fluorescent molecules, quantum dots, etc.
2. Publications in international journals/attendance of international conferences in the following fields: optics, surface chemistry, biophysics.
3. Site directed mutagenesis, protein overexpression
4. Protein purification and membrane reconstitution
5. Ability to use programming languages for data acquisition
6. Soft skills: presentation skill, team working ability

For all the above, knowledge is proven by publications, certificates, master thesis or equivalent documentation. Skills should be acknowledged in reference letters and demonstrated during the interview (presentation skills). During the interview each applicants presents his/her master thesis and a scientific paper from an area unrelated to his/her specialization (chosen by the interviewers).

Women are encouraged to apply. The recruitment committee gives preference to female candidates if they are equally qualified as male candidates.

Documents Required:

1. Motivation letter
2. Reference letters
3. Curriculum Vitae
4. Copies of Bachelor and Master certificates
5. Publications (if available).

Address for applications: peter.pohl@jku.at

Table to rank the applicants:

	Qualifications criteria	Credits
1	Publication in peer reviewed international journals in a related field	$\frac{100 \ldots 500}{1 + years_{post\ master}}$
2	English language 2a. Excellent 2b. Very good 2c. Good	100 60
3	Conference contributions	$\frac{10 \ldots 50}{1 + years_{post\ master}}$
4	Work with light microscopic and spectroscopic	100
5	Experience in site directed mutagenesis, protein	100
6	Experience in handling fluorescent molecules, quantum dots, etc.	50
7	Protein purification and membrane reconstitution	100
8	Ability to use programming languages for data	100
9	Presentation skills	100
10	Grasp of an unknown scientific topic (understanding of a scientific paper)	100
11	Interview	200