2017/12/06

求人のご案内： Postdoctoral and PhD. studentship at International Iberian Nanotechnology Laboratory (INL)

株式会社 JEOL RESONANCE＆理化学研究所 西山裕介

ポルトガルの INL にて、ポスドクおよびドクターコースの学生の求人があります。候補者は、Dr. Weng Kung (weng.kung@inl.int)の下で NMR を用いた precision medicine の研究に従事します。詳細は添付の pdf を参照してください。応募の締め切りは 2018 年 1 月末です。

お問い合わせ先：Dr. Weng Kung (weng.kung@inl.int)

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At **INL** – International Iberian Nanotechnology Laboratory, located in Braga (North of Portugal), scientists and engineers from all over the world work in a highly interdisciplinary environment and strive to make INL become a world-wide hub for the deployment of Nanotechnology addressing society's grand challenges. The **INL** was founded by the governments of Portugal and Spain under an international legal framework to perform interdisciplinary research, deploy and articulate nanotechnology for the benefit of society. The research programme comprises four strategic fields of application of nanoscience and nanotechnology**:** Food and Environment monitoring**,** ICT**,** Renewable Energy and Health. The full-fledged nanotechnology laboratory enables leading research of the highest international standard.

The newly established Precision Medicine Engineering (PME) Group under the Department of Nanoelectronic Engineering, INL is seeking for several candidates at postdoctoral level and PhD. studentships are available. The Group aim at developing "The Next Generation of NMR based Molecular Phenotyping for Precision Medicine/Agriculture", programme at INL.

In the early 90's, as the first human genome project was initiated, an extensive effort has been placed on mapping the role of genes in the onset of disease. Genetic contribution to different diseases however, were found to be varies and often very little, with non-genetic factors (e.g., environmental hazards, diet) having much greater attributable risks, and thereby producing 'stochastically' large phenotypic pool. The key goal to understanding human health and disease is to access the 'genotype-phenotype' map, and the success of translating precision medicine (e.g., molecular medicine) into clinical setting.

Subtopic 1: This project focuses on introducing the next generation of molecular phenotyping by exploiting the (ultra)fast, multidimensional NMR spectroscopic (in time and frequency domain) to produce highly unique molecular fingerprinting of cells/tissue, using microscale compact NMR system (e.g., low-field benchtop, hand-held single chip).

Requirement: One Postdoctoral research position, and PhD. programme funded by EU scholarship is available. Candidate is expected to have PhD. in electrical/biomedical/ mechanical engineering, applied physics, or biochemistry. Relevant experience in multidimensional NMR spectroscopy, metabolomics NMR, multivariate analysis, or/and instrumentation development is highly preferred. Experience in life sciences (e.g., cell culture) will be helpful but training will be provided.

Subtopic 2: With advances in microelectronics technology, magnetic resonance (MR) community sees the emergence of portable and compact MR spectrometer (i.e., pulse

programmer, trans-receiver, and digital signal processing) on a highly integrated circuit platform (e.g., field programmable gate array, complementary-metal-oxide semiconductor) targeting on in-situ applications such as geological studies, disease diagnosis/monitoring, and precision agriculture at point-of-use setting. This project aiming at designing and developing (relatively) homogenous magnetic field using thin-film microfabrication technology, with the eventual goal of producing the first scalable, low power, single chip, (ultra) low field Nuclear Magnetic Resonance (NMR) spectrometry, which is capable of measuring femtoliter volume sample (e.g., single cells).

Requirement: One Postdoctoral research position, and PhD. programme funded by EU scholarship is available. Candidate is expected to have PhD. in electrical engineering, mechanical engineering, applied physics, or relevant experience and strong background in microelectronic, microcontroller, system engineering, and/or radio-frequency instrumentation development and preferably with experience in NMR spectroscopy.

About the team: Weng Kung (weng.kung@inl.int) the Group Leader of Precision Medicine Engineering Group (PME) at Department of Nanoelectronic Engineering, INL, led by Professor Paulo Freitas as the Head of Department. Weng Kung research group interest focuses on developing and translating technological innovations (e.g., nuclear magnetic resonance, electron spin resonance, spintronic, Raman spectroscopic) for the next generation of precision medicine/agriculture at molecular level, which enables in-situ, rapid, high-throughput, and multidimensional molecular phenotyping in functional manner. Some of his team successful projects validated in clinical setting include the rapid and label-free malaria screening, high-throughput molecular phenotyping of oxidative stress in diabetes mellitus, sub-stratification of endometriosis, and multidimensional spectroscopy for molecular phenotyping in hemoglobinopathies.

Interested candidates should provide a cover letter, a statement of your past experience and future proposal (2 to 3 pages) and detailed CV to Weng Kung by 31st Jan 2017.