Università degli Studi di Ferrara
Dipartimento di Morfologia, Chirurgia e Medicina sperimentale
Via Luigi Borsari, 46 - 44121 Ferrara
Telefono: 0532 – 455752 email: dmcs@unife.it
Partita Iva 00434690384 - Codice Fiscale 80007370382

CALL FOR A RESEARCH POSITION

funded by European Funds to regione Emilia Romagna - POR FESR 2014-2020 ASSE 1 AZIONE 1.2.2 under the research project "Development and pilot validation of medical portable biophotonic imaging device integrated with Lipid-Omic testing methodology" (Project acronym BiophotOmics).

Title of the position: Development of imaging techniques (including algorithms) in conventional and hyperspectral miscroscopy and validation of hyperspectral patterns on a biosensor model of normal and pathological cell membrane.

Brief project description:

Development of an innovative medical device KET photonic and –omics approach based: a) photonic technology to develop a biophotonic portable device with a customized software tool for dark field hyperspectral microscopy on human samples, such as a blood drop; b) innovative testing with coupled biophotonic and lipidomic technology for integrated hyperspectral analysis on cell membrane fatty acids as an innovative global health marker, in particular on erythrocytes cell membrane.
The new testing methodology on cell membrane will be set up on erythrocytes and lymphocytes cell models, on animal and human samples of dismetabolic, hemato-oncology and neurologic (such as Alzheimer, Parkinson, multiple sclerosis) diseases.
The project is focused on the needs of the red-biotech sector for a non-invasive, low cost and easy to use analysis, regarding fragile and disabled figures (Homecare) and for precision and personalized medicine, linked to nutrition and lifestyle.

Work Plan Activities:

1) Perform biophotonic and advanced conventional (fluorescence and electron) microscopy analysis on a biosensor model of normal and pathological cell membrane and collect integrated biophotonic/microscopy/molecular data with bioinformatics procedures and algorithms, for qualitative standardization.

2) Perform image analysis on advanced conventional (fluorescence and electron) microscopy and biophotonic cell membrane samples in different metabolic-induced or pathological conditions.

3) Develop bioinformatics matrix analysis (and bioinformatics software) on cell and animal models for statistics and calibration of biophotonics quantitative measurements.

4) Validate hyperspectral patterns as representative of well-established molecular properties of cell membrane in normal and pathological (dismetabolic, hemato-oncology and neurologic) conditions.

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Profile of Candidate:

Any National, foreign or stateless candidate(s) that hold the following requirements:

- Master's Degree or PhD in: engineering (computer, biomedical or electronic), sciences, physics or informatics;
- Experience in image analysis including use or development of algorithm for 2D and 3D reconstruction, pixel segmentation and clustering, (automatic) thresholding, split and merging, mean shift segmentation (mandatory);
- Experience in software development (C++ and Python on OS Windows e Unix) for image acquisition, managing and processing (mandatory);
- Experience with statistics of data (highly valued);
- Experience with bioinformatics (desirable);
- Experience in microscopy (desirable);
- Experience with mammalian cell (cultured and/or ex vivo, human and/or animal) (desirable);
- Experience in hemato-oncology (desirable);
- High quality publication track record, with first authorship publications in high quality peer-reviewed scientific journals (highly valued);
- Excellent knowledge of written and spoken English;
- Good communication and presentation skills;
- Availability to work abroad in collaborating laboratories if necessary (highly valued).

Start Date and workplace:

The contract, after public competition, is expected to start in September 2019 for 12 months and will be renewable for other 12 months; the activities will be mainly developed in the Laboratory of Biomarkers, Biomolecular Targets and Personalized Medicine in Oncology, Dept. of Morphology, Surgery and Experimental Medicine, University of Ferrara. The activities may be developed for short(er) periods in other necessary locations to their execution.

Gross annual earnings:

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Gross annual remuneration is 23.822 € (corresponding to a net monthly remuneration around 1450 €).

If interested please contact Prof. Luca Maria Neri e-mail: luca.neri@unife.it sending:

a) Detailed CV
b) Motivation Letter in English explaining why the interest in the project and why the candidate would be an asset to it;
c) Two reference letters (optional but desirable).

Prof. Dr. Luca M. Neri, MD
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Section of Human Anatomy
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