PhD student @ Maastricht University and King's College London with an interest in vascular PET/MRI

Position: Early Stage Researcher (PhD-student) in Marie Skłodowska-Curie ITN project (FHML/School for Cardiovascular Diseases/CARIM-Department of Radiology and Nuclear Medicine)

Summary: You will perform the PhD project "**Hybrid PET/MRI of key aspects of plaque vulnerability in different vascular beds"** within Maastricht University with a secondment in King's College London. The project is part of a large international consortium of renown institutes on Imaging and Vascular Biology.

Job description: The Early Stage Researcher (ESR) will be trained within the Marie Skłodowska-Curie Innovative Training Network (ITN) INTRICARE and will perform the research project nr. 10 "**Hybrid PET/MRI of key aspects of plaque vulnerability in different vascular beds",** primarily within CARIM at Maastricht University under the supervision of Dr. M.E. Kooi and Prof.dr. R.M. Botnar in order to realise the objectives of INTRICARE (International Network for Training on Risks of vascular intimal Calcification And roads to Regression of cardiovascular diseasE).

INTRICARE is an interdisciplinary international consortium involving 4 leading academic institutions and 9 SME's from 6 countries. The ESR will engage in network-wide training events, public engagement activities and international collaboration through secondments, at industrial or academic partner institutions within the EU.

Objectives of the PhD position: The ESR aims to develop and employ state of the art hybrid molecular non-invasive imaging ((PET)/MRI) together with comprehensive multiparameter data analysis for the in-vivo assessment of "vulnerable" plaque. This will be approached in different vascular beds (carotids, coronaries) to provide morphologic, functional and molecular information on the development and response to treatment of atherosclerosis. Depending on the background of the PhD student, the project will be focused on patient studies (for an MD) or on technical developments (for a physicist or biomedical engineer). This project will be closely linked to other projects within INTRICARE and will have links to Siemens, which will provide their acquisition and reconstruction software for imaging sequences and clinical translation.

Methodologies: The ESR focuses on MRI and hybrid PET/MRI of plaque vulnerability. Maastricht and London have an identical clinical integrated PET/MRI system, a fully digital preclinical PET and identical clinical MRI systems and complementary expertise in cardiac and vascular PET imaging including MR carotid and coronary artery imaging, thereby providing an excellent research and training platform for cardiovascular PET/MRI. Human and preclinical PET/MRI studies will focus on vulnerable plaque characterization, i.e. endothelial permeability (contrast enhancement on LGE), inflammation (uptake of ^{18}F choline in PET), plaque deformation, and intraplaque haemorrhage (hyperintense signal on T1w TFE MRI or short T1 on T1 map). As the major challenge for coronary plaque imaging using PET/MRI is respiratory and cardiac motion we will use the MR navigator for respiratory motion correction. Cardiac motion will be corrected using ECG-gating.

Expected results: At the end of the project, we will have 1) demonstrated the feasibility of imaging plaque vulnerability in different vascular beds with hybrid PET/MRI, 2) obtained more knowledge on

processes leading to plaque destabilisation and clinical events. The project will be finalised with several papers in international peer-reviewed journals and a PhD thesis.

Secondments: The ESR will visit King's College London (UK) for 5 months. Furthermore, the ESR will spend one month at Ttopstart in the final year of the project to write a grant application for a follow-up project.

Requirements

At the time of the appointment: Applicants must not have resided or carried out his/her main activity (work, studies, etc.) in the Netherlands for more than 12 months in the 3 years immediately before appointment under the project; Applicants shall also be in the first four years of their research careers at the time of appointment by the host organisation and have not been awarded a doctoral degree. For more information on Marie Skłodowska-Curie Innovative Training Networks (ITNs), please see: http://ec.europa.eu/mariecurieactions.

Qualifications: You are a Medical Doctor or you have a Master Degree in Physics or Biomedical Engineering. Excellent command of the English language is essential. Command of the Dutch language is desirable to be able to communicate with patients.

Experience: Experience with MRI, PET, and/or atherosclerosis is desirable.

Knowledge & skills: Knowledge of cardiovascular disease, vascular biology, and inflammation is desirable. Good communication skills and analytical skills are essential.

Abilities: Interpreting scientific literature and incorporation into project and understanding the research process are essential. Organising and prioritising own work and organising research within the project timetable are essential. Maintaining accurate and up to date records are essential.

Attitude & disposition: Following abilities and dispositions are essential: Flexible and co-operative; Good relationships with staff and to communicate effectively; Self-motivated and hardworking; Enquiring, critical approach to work; Willingness to learn new skills; and Willing to travel and go on secondments.

Other circumstances: Willingness to work flexibly in order to achieve project demands and targets as agreed with Supervisor is essential. Able to travel to workshops and for research collaboration in other EU countries with notice is essential.

Terms of employment: The terms of employment of Maastricht University are set out in the Collective Labour Agreement of Dutch Universities (CAO). Furthermore, local UM provisions also apply. For more information look at the website https://www.maastrichtuniversity.nl/support/um-employees

Additional information and application: For more information and application see www.intricare.eu or contact: Dr. M.E. (Eline) Kooi, eline.kooi@mumc.nl or prof. dr. R.M. (René) Botnar, rene.botnar@kcl.ac.uk.