

Company Description

BCAM is the research center on applied mathematics created with the support of the Basque Government and the University of the Basque Country, which aims to strengthen the Basque science and technology system, by performing interdisciplinary research in the frontiers of mathematics, talented scientists' training and attraction, so the excellence of our results are recognized by the Society.

Information

 **Deadline:** 2019-08-20
 **Category:** Academia
 **Province:** Bizkaia

 **Country:** Basque Country
 **City:** Bilbao

Company

BCAM



Main functions, requisites & benefits

Main functions

Applications are invited for a postdoctoral position in computational biomicrofluidics at the CFD group (BCAM). The focus of the project will be on multiscale modelling of the dynamics and adhesion of cells using Smoothed Particle Hydrodynamics and Dissipative Particle Dynamics methods. In many biological processes it is important to predict accurately the cellular transport, separation and deposition close to walls in presence of a complex unsteady flow. This is critical to control drug delivery and/or cellular sorting under microfluidics conditions, but also for the understanding of several cardiovascular pathologies such as, for example, atherosclerosis. This is a degenerative disease of the arterial wall that is thought to be initiated due to inflammation of the arterial endothelium, promoting the over-deposition of white blood cells. This anomalous WBC accumulation is sitespecific and can lead to initial stage lesions or, on a long-term timescale, atherosclerotic plaques. To study these complex flow problems, we have recently developed a multiscale transport model for leukocytes and coupled it to an endothelial cell receptor binding model in order to link the flow transport and surface biology. The postdoctoral candidate will work under the supervision of Prof. Marco Ellero (CFD group, BCAM) on the developments and use of novel mesoscopic particle-simulation methods to better understand the dynamics and adhesion of cells under microfluidics conditions. This task will be performed in collaboration with Prof. Jesus Ruiz-Cabello (CIC Biomagune) and the eHealth and Biomedical Department of VICOMTECH, an applied research centre in the Basque Country working on innovative technological solutions in the biomedical sector.

Requisites

Promising young researchers. Applicants must have their PhD completed before the starting date. PhD degree preferable in Physics, Applied Mathematics, Chemical, Medical or Mechanical Engineering. Good communication and interpersonal skills. Ability to effectively communicate and present research ideas to researchers with different background (e.g., mathematicians and engineers). Ability to clearly present and publish research outcomes in spoken (talks) and written (papers) form. Good command of spoken and written English. Background in biofluid mechanics, rheology, soft matter, particulate systems or complex fluids. Experience in modelling and simulation using particle methods such as smoothed particle hydrodynamics (SPH), dissipative particle dynamics (DPD) or molecular dynamics (MD) is required. Knowledge of C/C++ or Fortran programming languages is required. Experience in parallel programming for HPC is desirable.

Benefits

There is a moving allowance for those researchers that come from a research institution outside the Basque Country from EUR 1,000 to EUR 2,000 gross. Free access to the Public Health System in Spain is provided to all employees.