



Centrum Wiskunde & Informatica



Postdoc position at CWI

## Postdoc

Subject:

Computational biomechanics

Department:

MAC 4 Life Sciences

Hours on a weekly basis:

38

Centrum Wiskunde & Informatica (CWI) is an internationally renowned research institute in mathematics and computer science, located in Amsterdam, The Netherlands. The focus is on fundamental research problems, derived from societal needs. Research is carried out in 14 research themes. More information about these themes can be found on the website [www.cwi.nl](http://www.cwi.nl) where you can also find the Annual Reports of the institute. A substantial part of this research is carried out in the framework of national or international programs.

CWI maintains excellent relations with industry and the academic world, both in the Netherlands as well as abroad. After their research careers at CWI, an increasing number of young staff members find employment in these sectors, for example in spin-off companies that are based on research results from CWI. Of course, library and computing facilities are first-rate. CWI's non-scientific services to its personnel include career planning, training and courses, assistance in finding housing, and tailor-made solutions to problems that may occasionally arise.

CWI has a **full time** vacancy for a

### **Postdoc position,**

for a three year period on **Computational biomechanics of extracellular matrix materials and cell-matrix interactions during blood vessel growth.**

The opening is a research position within the field of *computational science*.

The work will be embedded in the Biomodeling and Biosystems Analysis group of the Netherlands Consortium for Systems Biology (NCSB; [www.ncsb.nl](http://www.ncsb.nl)) at the CWI in Amsterdam. As the "core modeling group" of the NCSB, the group carries out biomodeling research in collaboration with systems biology groups in partner institutes.

## Research background

The outgrowth of new blood vessels from pre-existing vessels, called angiogenesis, is a crucial step in wound healing and tumor growth. Cell-based simulation models help to analyze how cells assemble into blood vessels and other tissue structures. Present cell-based numerical techniques, including the *cellular Potts model*, lack an accurate description of the biochemistry and biomechanics of one of the main controlling factors of angiogenesis and tumor progression: the extracellular matrix (ECM). The ECM is a diverse class of jelly or hard materials providing structural support to the tissue. The ECM also acts as a medium for cell-cell communication.

## Job description

As part of an NWO-funded Vidi-project on angiogenesis, your task will be to develop and apply state-of-the-art and efficient numerical codes for simulating the biomechanics of the ECM. These partial-differential equation-based simulations will interface naturally with pre-existing, stochastic models of endothelial cell behavior. You will also integrate the codes into an existing, internationally developed open-source cell-based modeling framework, and perform simulation experiments. You will interact closely with a PhD-student in applied computational biology and with experimental biologists at the Institute for Cardiovascular Research of the VU University Medical Center in Amsterdam.

Level:

Academic

Competences:

The post-doc is required to have a completed PhD in computational science, numerical mathematics, or a related discipline. The candidate is expected to have affinity with interdisciplinary applications, able to communicate with scientists in (theoretical) biology and mathematics, have excellent programming skills and a background in computational (fluid) mechanics. The candidate is expected to have a demonstrated record of excellent research, have strong organizational and guidance skills, be able to carry out his/her own research agenda, and to be able to collaborate with colleagues at CWI and other institutions.

Candidates are required to have an excellent spoken and written command of English.

Offer:

CWI offers excellent and flexible terms of employment, including an employee pension fund.

The terms of employment are in accordance with Dutch Collective Labor Agreement for Research Institutes ("CAO-onderzoeksinstituten"). Moreover, CWI offers attractive working conditions, including flexible scheduling and help with housing for expat employees. Depending on relevant work experience, the gross monthly salary for an employee on a full time basis ranges from € 3,090 to € 4,395.

Information:

Additional information can be obtained from dr. Roeland Merks, email [Roeland.Merks@cwj.nl](mailto:Roeland.Merks@cwj.nl), telephone +31(0)20 592 4117.

Website: [www.cwj.nl/~merks](http://www.cwj.nl/~merks)

### **Application**

Please send your application before 31 March 2011 to: [pd@cwj.nl](mailto:pd@cwj.nl).

Applications should include a detailed CV, a motivation letter, and a list of publications.

Locations:

Amsterdam

**Centrum Wiskunde & Informatica | Science Park 123 | 1098 XG Amsterdam | [info@cwj.nl](mailto:info@cwj.nl)**

**Disclaimer | Report suggestions or problems to [webmaster@cwj.nl](mailto:webmaster@cwj.nl)**