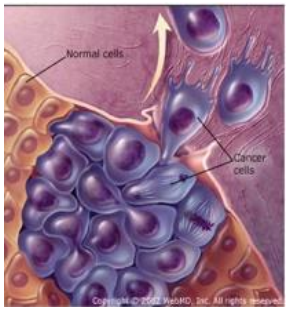
Job description



Cancer is not just about biochemistry – physical cues play a key regulatory role in continuously adapting the structure of tissue and cells, and thereby their properties, to the changing environment. Cells, in fact, constitute an intelligently responsive material. Under healthy conditions, mechanical forces contribute to tissue development and proper cellular functioning, by appropriate adaptive mechano-transduction signaling. In tumours, however, the physical properties change dramatically, leading to a feed-forward loop in which cells themselves become softer than healthy cells, whereas the tumour microenvironment stiffens.

A team of researchers from the University of Groningen and the University Medical Center Groningen have joined forces in a research program that aims to forge a quantitative connection between physical forces and genetic defects. Within this program, we are currently looking for a enthusiastic PhD student to develop a multi scale model of the tumour microenvironment, the cytoskeleton with its motor proteins and the interconnecting molecules. The aim of the model is to provide a quantitative link between the mechanical properties of these components and the forces at the molecular scale that activate the signalling pathways. Distinct from major lines of research elsewhere, we are focusing glioblastoma (brain cancer) and leukaemia. While the extracellular matrix of many 'solid' tissues is composed of collagen, glia cells reside in a fibrous matrix of hyaluronic acid.

The candidate will develop a homemade code building on an existing one for the viscoelasticity of biophysical networks which combines nonlinear beam finite elements with Monte Carlo methods. The code will be fine-tuned for actin-myosin networks and for hyaluronic networks, and validated to in-vitro experiments on reconstituted networks and engineered hydrogels. In a next step the two networks will be connected by the incorporation of integrins and associated proteins, the properties of which will be extracted from molecular dynamics simulations.

Qualifications

You have:

- an MSc degree from a good university in (applied) physics, materials science or (mechanical/aeronautical/materials) engineering;
- a strong background in solid mechanics and in computational materials modeling;
- demonstrable affinity with programming and computer simulations;
- good oral and written English proficiency.

Conditions

In accordance with the Collective Labour Agreement for Dutch Universities, we offer you:

- a salary of € 2,325 gross per month in the first year, up to a maximum of € 2,972 gross per month in the fourth and final year;
- a holiday allowance of 8% gross annual income
- an 8.3% end-of-the-year allowance
- a full-time position (1.0 FTE) for four years; first, you will get a temporary position of one year with the option of renewal for another three years; prolongation of the contract is contingent on sufficient progress in the first year to indicate that a successful completion of the PhD thesis within the contract period is to be expected.

A PhD training programme is part of the agreement and you will be enrolled in the Graduate School of the Faculty of Science and Engineering.

The conditions of employment are available at the University of Groningen website under Human Resources: www.rug.nl/about-us/work-with-us/.

Application

Do you meet our qualification criteria? If yes, your application should include:

- a letter of motivation,
- a complete CV (including contact information for at least two academic references),
- transcripts from your bachelor's and master's degree.

Please submit your application to professor Erik Van der Giessen until June 30, 23:59 (CEST).

Information

For more information and/or applications, contact professor Erik Van der Giessen at E.van.der.Giessen@rug.nl or +31-50-3638046.