

Press release

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Jury report for Prof. A. (Albert) van den Berg

Professor of Miniaturised Sensor systems for biomedical and environmental applications at the University of Twente

Professor Van den Berg receives the NWO/Spinoza Prize 2009 for his key breakthroughs in the understanding and manipulation of fluids in micro- and nanochannels, and the application of this knowledge to areas such as new medical equipment.

Albert van den Berg (20 September 1957, Zaandam) gained his degree in technical physics in 1983 from the University of Twente where he gained his doctorate five years later. From 1988 to 1993 he worked in Switzerland at the Centre for Microtechnology (CSEM) and the University of Neuchatel. Since 1993 he has worked at the University of Twente at the MESA+ Institute for Nanotechnology, where he has been a full-time professor since 2002. He has won many prizes and repeatedly knows how to acquire large (often international) grants, such as the ERC Advanced Investigator Grant in 2008. In 2002, Van den Berg became a Simon Stevin Master. Since 2003 he has played a leading role in NanoNed and in May 2008 he became a member of the Royal Netherlands Academy of Arts and Sciences (KNAW).

Albert van den Berg is an excellent researcher in the field of microfluidics and nanofluidics. He works on so-called labs-on-a-chip: miniature laboratories which fit completely on a chip. These tiny laboratories can, for example, be used in healthcare to perform rapid and cheap analyses. With such a chip a drop of blood is enough to establish a diagnosis.

Albert van den Berg has made important contributions to our understanding of how fluids move in invisible small structures on a chip. If you allow fluids to flow in tiny channels the size of a human hair then they behave differently than they do in large volumes. To be able to separate these fluids, into proteins and plasma for example, and then mix these with reagents further up, you need to understand the physical characteristics of fluids in such small structures. With his insights, Van den Berg was able to use electrical fields to guide the movement of fluids in the channels on such a chip (analogous to how electrical currents are steered in a transistor). This result was published in Science.

At present the physicist from Twente is busy testing human cells on chips. The aim is to manipulate (fuse) the cells in a lab-on-a-chip so that, for example, new medicines can be produced. This approach could lead to considerably shorter development pathways for new medicines, as a result of which far fewer laboratory animals would be needed for test purposes. He is also working on the development of a 'nanopill' which after intake can detect the presence of cancer-specific DNA in the intestines. This allows intestinal cancer to be diagnosed at an early stage.

Van den Berg is a scientific pioneer, with a sharp eye for applications. He has about 10 patents and his work has spawned many spin-off companies. One of these is Medimate, which produces chips to measure the level of lithium in the blood of manic depressive patients. He is praised for his organisational talent and his capacity to bring together different parties and disciplines. He is the initiator of executive international congresses that have since been successfully repeated each year. The physicist is a passionate, inspiring and visionary research leader, whose research group has a strong international reputation. In addition to this he brings science and technology to the attention of a wider public. For example, he is involved in initiatives to allow high school pupils to gain experience in a university setting and he frequently holds public lectures.

Albert van den Berg is curious, enthusiastic and full of ideas, and according to one of the referees 'he will not stop his research before his first heart attack'. The Spinoza committee is therefore highly confident that he will know how to put his Spinoza Prize of 2.5 million euro to good use.

Further information for the press available from:

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This jury report served as the basis for the speech given by Prof. Pauline Schaap at the announcement ceremony for the NWO/Spinoza Prizes 2009 on 9 June 2009.

