The University of Sydney

Excellence in Microscopy: Special Lecture

SMALL MATTERS
Exploring the World of Microscopy

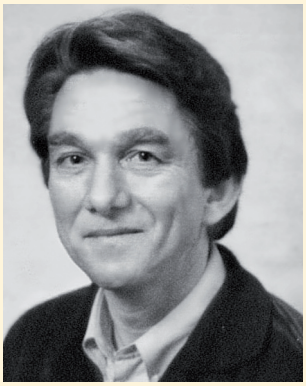
Tuesday 2 December 2008, 6–7pm
Old Geology Lecture Theatre
Edgeworth David Building (A11), Science Road
The University of Sydney

MACLEAY MUSEUM

Prof. Hans Tanke

Leiden University Medical Center, The Netherlands

Microscopy to See DNA Molecules at Work



Professor Tanke is Head of the Department of Molecular Cell Biology at Leiden University. He is visiting Australia in conjunction with the Electron Microscope Unit's golden jubilee commemorative symposium 'Excellence in Microscopy" from 3–5 December 2008. See www.emu.usyd.edu for details.

The human genome contains about 23,000 structural genes ordered in 24 types of chromosomes (46 in total), assembled together with proteins in a 10-micrometre-sized cell nucleus. These genes carry the code to produce most likely hundreds of thousands of proteins, each of which has a specific function in cells and tissues. They allow cells to grow, to differentiate, to divide and to die, and thereby enable tissues and organs to function. Abnormalities in these genes often cause defects in proteins, malfunctioning organs, and therefore illness or early death. The regulation processes that translate the DNA code into function are far from clear, but are essential to understand as they form the basis for early diagnosis, to develop new medication or advanced treatment modalties such as will become possible with stem cell or gene therapy.

In the past decade, biochemists and molecular biologists have made enormous progress in unraveling the DNA code and have indentified numerous proteins and determined their functions in the body. However, these studies lack the spatial and temporal context that is needed to fully understand the function of the human genome. Microscopic techniques such as time-lapse imaging of living cells, high-resolution electron microscopy, and scanning probe microscopy, in combination with specific fluorescent staining methods of DNA and proteins, do allow visualisation of genes and DNA molecules in the context of the – sometimes even living – cell. Both normal and disease situations can be studied in this way, and this the topic of this lecture.

After the lecture, please join us at the nearby Macleay Museum (on Gosper Lane off Science Road), for light refreshments, further discussion, and an opportunity to see *Small Matters – Exploring the World of Microscopy,* an exhibition showcasing modern microscopy. 7–8pm

Golden Jubilee 2008
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Electron Microscope Unit

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