

# MSE-Colloquium@NTU

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Lecture Theatre 5, Nanyang Technological University

## Elements of Molecular Sensory Engineering



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### About the Talk

This presentation gives a short summary of elements of a Molecular Sensory Engineering program with examples from protein sensing, DNA analytics and small molecule detection concepts. Particular emphasis will be put on (graphene-based) electronic devices that can be developed into new classes of biosensors, highly sensitive, label free, disposable and cheap, with electronic signals that are easy to analyse and interpret, suitable for multiplexed operation and for remote control, compatible with NFC technology, etc. – in many cases a clear alternative to optical sensors.

The presented examples concern diagnostic challenges in:

- DNA/ Amplicon/ Aptamer sensing
- Protein/ Biomarker diagnostics
- Food Quality Monitoring and Pathogen Detection
- Electronic Crop Disease Detection
- Bio-Mimetic Smell Sensor for Medical/ Cancer Diagnostics
- Developing a Membrane Chip

### About the Speaker

Wolfgang Knoll graduated from the University of Konstanz in 1976 with a PhD degree in Biophysics after having completed a physics education at the Karlsruhe University of Technology. From 1980-1981 he was a visiting scientist at the IBM Research Laboratory in San Jose and the Institute Laue-Langevin in Grenoble, from 1981-1986 an Assistant Professor at the Technical University of Munich, and in 1986 he joined the Max Planck Institute for Polymer Research in Mainz, Germany, as a group leader. From 1991-1999 he was the Director of the Laboratory for Exotic Nanomaterials, hosted by the Institute of Physical and Chemical Research (RIKEN) in Wako/Japan. From 1993 to 2008 he was a Director at the Max Planck Institute for Polymer Research in Mainz, Germany. Since 2008 he has been the Scientific Managing Director at the AIT Austrian Institute of Technology, Vienna, Austria, and became a Visiting Professor at Nanyang Technological University in Singapore in 2010. He is a Member of the Austrian Academy of Sciences and holds an Honorary PhD degree from the University of Twente, the Netherlands. He has published more than 850 papers with 41000 citations which earned him an h-index of 105 (Google Scholar).