

Date: **June 12, 2012**
Time: **3:00 p.m.**
Place: **Building 801, Room P142**



NEW SERIES

Talks by international renowned experts

BIONANOINTERACTIONS – FUNDAMENTAL PRINCIPLES FOR UNDERSTANDING INTERACTIONS BETWEEN NANOSCALE ENGINEERED MATERIALS AND LIVING ORGANISMS

KENNETH A. DAWSON

Director of the Centre for BioNano Interactions (CBNI)
University College Dublin

ABSTRACT Nanoscale materials can interact with living organisms in a qualitatively different manner than small molecules. Crucially, biological phenomena such as immune clearance, cellular uptake and biological barrier crossing are all determined by processes on the nanometer scale. Harnessing these endogeneous biological processes (for example in creation of new nanomedicines or nanodiagnostics) will therefore require us to work on the nanoscale. This ensures that nanoscience, biology and medicine will be intimately connected for generations to come, and may well provide the best hope of tackling currently intractable diseases.

Whilst nanoparticle size is important, the detailed nature of the nanoparticle interface is key to understanding interactions with living organisms. This interface may be quite complex, involving also adsorbed protein from the biological fluid (blood, or other), leading to a sort of ‘protein corona’ around the nanomaterial surface. We discuss how this corona is formed, and how it may be a determining feature in biological interactions. We give examples of these interactions relevant to several systems, including the blood brain barrier where some significant outcomes seem affected by the role of the protein layer.

We look forward to seeing you.

Prof. Dr. Dr. h. c. Roland Sauerbrey
HZDR Scientific Director