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# INVITATION

**PROF. MARIA MINUNNI & DR. CHRISTIAN REICHEL**  
18TH JULY 2011

AIT Austrian Institute of Technology and the  
University of Natural Resources and Life Sciences (BOKU)  
invite you to:

PROF. MARIA MINUNNI  
LABORATORIO BIOSENSORI, DIP. DI CHIMICA  
UNIVERSITÀ DEGLI STUDI DI FIRENZE, ITALY

## BIOSENSING DEVELOPMENT: RECENT ADVANCES AND APPLICATIONS

DR. CHRISTIAN REICHEL  
PROTEOMICS AND ANALYTICAL BIOCHEMISTRY  
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## APPLICATION OF PROTEOMICS AND PROTEIN BIOCHEMISTRY IN ANTI-DOPING CONTROL

**Date** 18TH July 2011

**Time** 17.00 h

**Venue** AIT, Health & Environment Department, Conference Room  
Muthgasse 11, 2nd floor, 1190 Vienna

### BIOSENSING DEVELOPMENT: RECENT ADVANCES AND APPLICATIONS

Affinity-based sensing using based on different transduction principles will be illustrated in relation to the recent application to health, food, drug and anti-doping analysis. In particular piezoelectric and Surface Plasmon Resonance (SPR) and SPR imaging transduction will be presented with the eye of analytical chemist.

Analysis of oligonucleotides target sequences and proteins will be presented in relation with different application: For DNA-based sensing application to genetically modified organism detection (OGM) in food analysis, point mutation in theranostic, gene doping in anti-doping analysis will be discussed. Protein analysis will be also discussed with application to clinical diagnostic.

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### APPLICATION OF PROTEOMICS AND PROTEIN BIOCHEMISTRY IN ANTI-DOPING CONTROL

The detection of doping with recombinant protein and peptide hormones is currently the most challenging task in anti-doping control. In addition to their short serum half-lives and the application of microdoses, the differentiation between recombinant and endogenous versions of these hormones has to be accomplished. Erythropoiesis stimulating agents (ESA) are among the most frequently abused protein-based pharmaceuticals for doping purposes. During the past decade our laboratory focused on research projects related to doping with erythropoietin (Epo) and its analogs. Latest developments will be presented, which include the newly developed Sarcosyl-PAGE, the elucidation of a masking effect of heparin in isoelectric focusing (IEF) of Epo, the non-specific interaction of a monoclonal anti-Epo antibody and subsequent identification of the interacting protein with shotgun proteomics, and the results of basic research project on the molecular structure of human endogenous Epo, which revealed a fundamental and for decades overlooked difference to recombinant erythropoietins. A brief overview of additional ongoing research projects will be given, which also include non-doping related medical proteomics studies.

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