FTIR Forum FTIR Diagnostics

Workshop

FTIR Spectroscopy in Microbiological and Medical Diagnostics

Robert Koch-Institute, Berlin
October 15-16, 2009

Program

Thursday, October 15th

8:30 - 09:45	**Registration**
10:00 - 10:15	Opening Remarks Introduction (**D. Naumann**, RKI)
10:15 - 10:35	**M. Wenning** (Freising, Germany) Comprehensive FT-IR reference data bases for microbial species identification and strain typing
10:40 - 11:00	**G. Puppels** (Rotterdam, The Netherlands) The SpectraCell Raman-system for strain differentiation of bacteria
11:05 - 11:25	**P. Rösch** (Jena, Germany) Micro-Raman spectroscopy of single bacterial cells
11:25 - 11:55	**Coffee Break**
12:00 - 12:20	**A. Bosch** (La Plata, Argentina) FT-IR and complementary techniques used to study microbial biofilms

12:25 - 12:45	**F. Humbert** (Villers-lès-Nancy, France) Applications of ATR-FTIR spectroscopy for the *in-situ* study of early stages of biofilm formation: spectroscopic characterization and monitoring
12:50 - 13:10	**N. P. Ivleva** (Munich, Germany) Raman microscopy and surface-enhanced Raman scattering (SERS) for *in situ* analysis of biofilms
13:15 - 14:00	**Lunch**
14:00 - 14:20	**J. Kneipp** (Berlin, Germany) 1-P and 2-P-excited SERS for biodiagnostic sensing
14:25 - 14:45	**R. A. Dluhy** (Athens, USA) Novel nanoarray SERS substrates for high sensitivity microarray sensing
14:50 - 15:10	**V. Deckert** (Jena, Germany) From amino acids to proteins – spectral analysis on the nanometer scale using tip-enhanced Raman scattering
15:15 - 15:35	**C. Krafft** (Jena, Germany) Cell identification based on Raman spectroscopy in combination with optical trapping
15:40 - 16:10	**Coffee Break**
16:10 - 16:30	**G. D. Sockalingum** (Reims, France) Analysis of human cancer cells and their response to antitumour drug treatment by Raman and infrared microspectroscopies
16:35 - 16:55	**H. M. Heise** (Dortmund, Germany) Leucocyte measurements during whole blood monitoring by infrared spectroscopy: Novel opportunities for testing the hemocompatibility of materials?
17:00 - 17:20	**A. Hobro** (Vienna, Austria) Fourier-Transform Infrared (FTIR) microscopic imaging of a whole organism

17:25 - 17:45 **A. Kohler** (Ås, Norway)
A new phenotyping paradigm for understanding the functional genomics of yeasts

17:50 - 19:30 **Poster Session** (Beer and beverages will be served)

P 1 **L. Ashton** (Manchester, UK)
Raman spectroscopic methods in bioprocessing: Two-dimension correlation analysis of pH-induced transitions in phosphorylated amino acids

P 2 **A. Barth** (Stockholm, Sweden)
Lipid metabolism affects the infrared spectrum of *E. coli*

P 3 **C. Barth** (Karlsruhe, Germany)
Potential applications of non-linear optical spectroscopy in medicine

P 4 **P. Bassan** (Manchester, UK)
Evaluating a correction algorithm for resonant Mie scattering (RMieS) in single cell spectra

P 5 **C. Beleites** (Trieste, Italy)
Chemometric analysis of spectroscopic data in R: hyperSpec

P 6 **A. Bénard** (Brussels, Belgium)
Infrared imaging: A new tool to refine breast cancer prognosis

P 7 **B. Bird** (Boston, USA)
Infrared micro-spectral measurements of single cells: Characterisation and correction of spectral artefacts attributed to cellular morphology and anomalous dispersion

P 8 **R. Böhme** (Jena, Germany)
Supported lipid bilayers as a bio membrane related model for tip-enhanced Raman spectroscopy

P 9 **A. Boßecker** (Jena, Germany)
Single-Cell-Identification of water borne pathogenic *Pseudomonas* by means of micro-Raman spectroscopy

P 10 **V. L. Brewster** (Manchester, UK)
Monitoring the glycosylation status of proteins using Raman spectroscopy

P 11 **N. Büchl** (Freising, Germany)
Differentiation of probiotic and environmental *Saccharomyces cerevisiae* strains by FTIR-spectroscopy and artificial neural networks

P 12 **D. Cialla** (Jena, Germany)
TERS as a diagnostic tool: Tip-enhanced Raman detection of a single virus particle

P 13 **V. Ciobotă** (Jena, Germany)
Characterization of *Acidiphilium cryptum* JF-5 by means of Raman spectroscopy

P 14 **S. Dochow** (Jena, Germany)
Optical traps for analysis of living cells by Raman spectroscopy

P 15 **D. Drescher** (Berlin, Germany)
Combined intracellular SERS and cytotoxicity studies after uptake of silica nanoparticles

P 16 **R. Gasper** (Brussels, Belgium)
FTIR 2D correlation analysis of prostate tumor cells exposed to anticancer agents

P 17 **T. Grunert** (Vienna, Austria)
Application of FT-IR spectroscopy for tracking and tracing of *Staphylococcus aureus* along the milk production chain

P 18 **M. Hedegaard** (Odense, Denmark)
Discriminating highly similar cancer cell lines using Raman spectroscopy and PLS-DA

P 19 **C. Hughes** (Manchester, UK)
Understanding chemometric separation of cell lines: Biochemical signatures versus physical effects

P 20 **C. Jebsen** (Leipzig, Germany)
Application of FT-IR spectroscopy for algal biomass production compared to fluorescent measuring techniques

P 21 **T. Jochum** (Karlsruhe, Germany)
Misfolding and aggregation of polyQ-extended androgen receptor: Structural biology and pathology aspects

P 22 **V. Joseph** (Berlin, Germany)
Design and characterization of new SERS substrates for analytical applications

P 23 **S. A. Khaustova** (Moscow, Russia)
Application of molecular spectroscopy in mid-infrared region to the determination of the serum and saliva biochemical parameters

P 24 **S. A. Khaustova** (Moscow, Russia)
Perspectives of application molecular fiber spectroscopy to the determination of the metabolic changes in biochemical fluids during endurance training

P 25 **M. Knauer** (Munich, Germany)
Surface-Enhanced Raman Scattering (SERS) as a label-free readout principle for microorganisms on microarray

P 26 **P. Knief** (Dublin, Ireland)
Accessment of direct and indirect toxicological effects of carbon nanotubes - by Raman spectroscopy

P 27 **J. Kowalska** (Kraków, Poland)
Preliminary FTIR analysis of cancerous cells

P 28 **A. Kuhm** (Fellbach, Germany)
FT-IR - a helpful tool in the differentiation of *Bacillus* species in food control

P 29 **L. Lai** (Manchester, UK)
Development of novel surfaces for MALDI imaging

P 30 **K. Lau** (Jena, Germany)
Towards the identification of hair follicle mesenchymal stem cells by FPA-FTIR

P 31 **S. Mabbott** (Manchester, UK)
Analysis of aflatoxins using surface enhanced Raman scattering

P 32 **A. Matschulat** (Berlin, Germany)
New hybrid probes for NIR-SERS sensing

P 33 **S. Meisel** (Jena, Germany)
Raman spectroscopic studies on inactivated and milk-extracted microorganisms

P 34 **U. Neugebauer** (Jena, Germany)
Single cell identification based on vibrational spectroscopy

P 35 **C. Paluszkiewicz** (Kraków, Poland)
Vibrational spectroscopy as a tool for biomaterials study

P 36 **J. Renpenning** (Berlin, Germany)
Raman-compatible inactivation of microbial spores: A protocol evaluation

P 37 **M. Richter** (Jena, Germany)
TERS for label free cell diagnostic

P 38 **G. Rieser** (Freising, Germany)
Identification of bacteria from a pharmaceutical environment by FT-IR spectroscopy

P 39 **C. Sandt** (Gif sur Yvette, France)
Analysis of stem cells by synchrotron FTIR microspectroscopy

P 40 **V. S. J. Schmidt** (Freising, Germany)
Changes in microbial diversity of ESL-milk over the production process

P 41 **F. Schulte** (Berlin, Germany)
Understanding *in-situ* generated resonance Raman spectra reflecting the overall carotenoids in pollen with the help of high performance thin layer chromatography

P 42 **W. Schumacher** (Jena, Germany)
Chemometric methods for identification and classification of microorganisms by micro-Raman spectroscopy

P 43 **F. Severcan** (Ankara, Turkey)
Application of FTIR spectroscopy to diabetes in rat animal model and the role of some antioxidants in the recovery of diabetes-induced damages

P 44 **S. Stöckel** (Jena, Germany)
Micro-Raman study and identification of inactivated *Bacillus* endospores

P 45 **E. Swain** (Boston, USA)
Observation of cellular events in live HeLa cells using FTIR microspectroscopy

P 46 **A. Walter** (Jena, Germany)
Vibrational spectroscopic study of the interaction between *Streptomyces* species and heavy metals

P 47 **A. Wold Åsli** (Ås, Norway)
A high-throughput microcultivation protocol for FT-IR spectroscopy of microorganisms

P 48 **O. Yantorno** (La Plata, Argentina)
Discrimination of clinical and environmental isolates of *Burkholderia contaminans*, a high prevalent species within Taxon K of *Burkholderia cepacia* complex, using PCR fingerprinting genotyping and FT-IR spectroscopy-based phenotyping

19:30 - ?? **Dinner buffet** (at the RKI canteen)

Friday, October 16th

9:00 - 9:20 **M. Diem** (Boston, USA)
Analysis of the spectral changes between normal and abnormal individual cells

9:25 - 9:45 **B. Wood** (Melbourne, Australia)
Shedding new light on dark DNA

9:50 - 10:10 **J. M. Schubert** (Boston, USA)
Spectral cytopathology: Observing biochemical changes within normal looking squamous cells of the oral cavity and cervical epithelium

10:15 - 10:35 **P. Gardner** (Manchester, UK)
Resonant Mie scattering in infrared spectroscopy of biological materials – understanding the "dispersion artefact"

10:40 - 11:10 **Coffee Break**

11:10 - 11:30	**K. Maquelin** (Rotterdam, The Netherlands) Raman spectroscopy for rapid identification and typing of microbial pathogens
11:35 - 11:55	**A. Hermelink** (Berlin, Germany) Raman-investigation of microbial cell populations
12:00 - 12:20	**R. Goodacre** (Manchester, UK) Mapping abiotic stress on microbial systems
12:25 - 12:45	**V. Shapaval** (Ås, Norway) A high-throughput microcultivation protocol for microbial source tracking of fungi by FTIR spectroscopy
12:50 - 13:45	**Lunch**
13:45 - 14:05	**P. Heraud** (Melbourne, Australia) Fourier transform infrared microspectroscopy identifies early lineage commitment in differentiating human embryonic stem cells (hESCs)
14:10 - 14:30	**D. McNaughton (**Melbourne, Australia) Raman micro-spectroscopy of *Chromera velia*, a photosynthetic alveolate closely related to apicomplexan parasites
14:35 - 14:55	**H. Wagner** (Leipzig, Germany) The use of FTIR spectroscopy for process optimization of microalgae biotechnology
15:00 - ??	Final Discussion Concluding Remarks **(NN)**

Aim

The workshop is intended to bring together scientists using and developing infrared and Raman spectroscopic techniques for the analysis of microbial, plant, animal or human cells, tissues, and body fluids. Following the lines of our former workshops in Berlin, a major point of discussion will be FT-IR applications in medical and other fields of microbiology. The aim of the meeting is also to facilitate the exchange of ideas, practical problem solutions and experiences.

Venue and Time

Robert Koch-Institute
Nordufer 20, 13353 Berlin, Germany

Registration:	October 15, 2009:	8:30 - 09:45
Beginning:	October 15, 2009:	10:00
End:	October 16, 2009:	15:30

Organisation

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