

**THE RME
CONFERENCE
SERIES**

**14TH
CONFERENCE**

RME 2022

3-5

OCTOBER

2022

AMSTERDAM

THE NETHERLANDS

**Rapid
Analysis &
Diagnostics**

FOOD

FEED

WATER

PLANT

ANIMAL

HUMAN

FORENSICS

www.RapidMethods.eu

SPONSORS & EXHIBITORS

SILVER SPONSORS



EXHIBITORS



PROGRAMME

MONDAY 3 OCTOBER 2022

10:30 – 10:45	Opening of RME2022	Exhibition & Innovation playground
10:45 – 12:30	Plenary session <i>Rapid analysis and diagnostics – where are we?</i>	
12:30 – 13:30	Lunch break & poster viewing	
13:30 – 15:15	Plenary session <i>Food & feed integrity – Part 1</i>	
15:15 – 15:45	Networking break & poster viewing	
15:45 – 16:15	Company pitches <i>Short presentation by exhibitors</i>	
16:15 – 16:45	Speed presentations <i>Short presentation by selected poster presenters</i>	
16:45 – 17:45	Workshops	

TUESDAY 4 OCTOBER 2022

08:45 – 10:30	Session 1 <i>Micro- and nano-enabled analysis and diagnostics</i>	Session 2 <i>Plant diagnostics</i>	Exhibition & Innovation playground
10:30 – 11:00	Networking break & poster viewing		
11:00 – 12:45	Session 3 <i>Focus on environmental quality</i>	Session 4 <i>Rapid diagnostics for human health – Part 1</i>	
12:45 – 14:00	Lunch break & poster viewing Workshops		
14:00 – 15:45	Session 5 <i>Advanced photonics for food safety and quality testing</i>	Session 6 <i>Rapid diagnostics for human health – Part 2</i>	
15:45 – 16:15	Networking break & poster viewing		
16:15 – 17:35	Session 7 <i>Rapid analysis for forensic applications</i>	Session 8 <i>Rapid diagnostics for animal health</i>	
18:30 – 22:00	Conference dinner (optional)		

WEDNESDAY 5 OCTOBER 2022

09:00 – 10:45	Session 9 <i>On-site DNA techniques</i>	Session 10 <i>Food & feed integrity – Part 2</i>	Exhibition & Innovation playground
10:45 – 11:15	Networking break & poster viewing		
11:15 – 12:45	Final plenary session <i>Rapid analysis and diagnostics – what further?</i>		
12:45	Closing of RME2022		

CONFERENCE PROGRAMME

MONDAY 3 OCTOBER 2022

10:30 **Opening and rapid overview of RME2022**

RME2022 aims to further strengthen the academia-industry relations and disseminate advanced research towards practical applications. From concept to product, from analytical methods to systems, and from laboratory to on-site testing are the main themes of the conference.

Dr Aart van Amerongen, BioSensing & Diagnostics, Wageningen University & Research, the Netherlands

PLENARY SESSION

RAPID ANALYSIS AND DIAGNOSTICS – WHERE ARE WE?

A selection of recent research in the area of rapid analysis & diagnostics will be presented.

Chair: Dr Aart van Amerongen, BioSensing & Diagnostics, Wageningen University & Research, the Netherlands

10:45 *The enemy of my enemy is my friend: the evolution of hybrid nanobots as sensors for food and water safety*

Prof. Sam Nugen, Department of Food Science, Cornell University, USA

11:10 *Disposable micro-qPCR for on-site detection of pathogens*

Dr Firat Guder, Department of Bioengineering, Imperial College London, UK

11:30 *Rapid detection platforms for environmental and human pathogens using functional nucleic acids*

Prof. Yingfu Li, Department of Biochemistry and Biomedical Sciences, McMaster University, Canada

11:50 *Laser-induced functional carbon nanofibers for highly sensitive point-of-care testing*

Dr Nongnoot Wongkaew, Institute of Analytical Chemistry, Chemo- and Biosensors, University of Regensburg, Germany

12:10 *Continuous biomolecular sensing for next-level process control*

Rafiq Lubken, Department of Biomedical Engineering, Eindhoven University of Technology and Helia Biomonitoring, the Netherlands

12:30 **Lunch break**

Exhibition & poster viewing

MONDAY 3 OCTOBER 2022

PLENARY SESSION

FOOD & FEED INTEGRITY – PART 1

Chair: Dr Bert Popping, FOCOS GbR, Germany

- 13:30 *Benchtop and portable spectroscopy techniques for food authenticity screening*
Dr Alina Mihailova, Food Safety and Control Laboratory, Joint FAO/IAEA Centre of Nuclear Techniques in Food and Agriculture, Department of Nuclear Sciences and Applications, International Atomic Energy Agency, Austria
- 13:50 *Exploring third-generation sequencing for rapid authentication of seafood products*
Dr Miguel Angel Pardo, Food Quality, Safety and Identity, AZTI and Basque Research and Technology Alliance, Spain
- 14:10 *From raw/toasted to paste: hazelnuts geographical origin through near infrared spectroscopy approach*
Prof. Michele Suman, Barilla and Università Cattolica del Sacro Cuore, Italy
- 14:30 *Fingerprinting tea with AI and machine learning*
Dr Di Wu, Institute for Global Food Security, Queen's University Belfast, Northern Ireland
- 14:50 *Prospects and challenges of near-infrared spectroscopy in analysing animal feeds*
Dr George Bázár, Adexgo Kft., Hungary
- 15:15 **Networking break**
Exhibition & poster viewing

PLENARY SESSION

COMPANY PITCHES AND SPEED PRESENTATIONS

Chair: Prof. Michele Suman, Barilla and Università Cattolica del Sacro Cuore, Italy

- 15:45 **Company pitches**
Short presentations (5-minutes) by sponsors/exhibitors to inspire the audience to visit their booths
Surfix – R-Biopharm – BBI Solutions – BioDot – Randox Food Diagnostics – Nano Flow
- 16:15 **Speed presentations**
Selected poster presenters are given 5 minutes to present an overview of their research:
- Nihad Achetib: *Validation study of an on-site analysis tool to determine the time of deposition of human biological traces*
 - Johanna Kreuter: *Hydrophilic ionic liquids for the rapid and simple release of nucleic acids from bacteria*
 - Ruben Massop: *Improving sensitivity and applicability of lateral flow assays*
 - Haruna Gado Yakubu: *Rapid method to monitor the effect of feeding on the odor profile of bovine milk*

16:45 – 17:45

WORKSHOPS (see pages 11-12)

TUESDAY 4 OCTOBER 2022

SESSION 1

MICRO- AND NANO-ENABLED ANALYSIS AND DIAGNOSTICS

Chair: Hans Dijk, Surfix Diagnostics, the Netherlands

08:45 *Surfix's ultrasensitive plug-and-play photonic diagnostics platform*
Dr Luc Scheres, Surfix Diagnostics, the Netherlands

09:05 *Personalized near patient diagnostics – an unmet need in personalized medicine*
Waander van Heerde, Enzyre, the Netherlands

09:25 *Microfluidic architectures for point-of-care diagnostics and food monitoring*
Dr Marko Dorrestijn, CSEM, Switzerland

09:45 *Oxford Nanopore sequencing: a story of tiny holes and big data*
Rob Janssen Oxford Nanopore Technologies, UK

10:05 *Rapid SARS-CoV-2 whole-genome sequencing and analysis for informed public health decision-making in the Netherlands*
David Nieuwenhuijse, Department Viroscience, Erasmus MC, the Netherlands

10:30 **Networking break**
Exhibition & poster viewing

SESSION 2

PLANT DIAGNOSTICS

In this session, a range of diagnostic methods for different kind of plant pathogens will be presented.

Chair: Dr Peter Bonants, Plant Research, Wageningen University & Research, the Netherlands

08:45 *Detection of plant virus particles with a capacitive field-effect sensor*
Prof. Michael J. Schöning, Institute of Nano- and Biotechnologies, Aachen University of Applied Sciences, Germany

09:05 *Real-time on-site diagnosis of quarantine pathogens in plant tissues by nanopore-based sequencing*
Dr Marzia Rossato, Department of Biotechnology, University of Verona, Italy

09:25 *Detection and imaging of the plant pathogen response by near infrared fluorescent polyphenol sensors*
Dr Robert Nissler, Department of Mechanical and Process Engineering, ETH Zurich, Switzerland

09:45 *Air microbiome: metabarcoding methods for risk assessment*
Dr Frédéric Debode, Life Sciences Department, Walloon Agricultural Research Centre, Belgium

10:05 *Digital plant pathology*
Dr René Heim, Institute for Sugar Beet Research, Germany

10:30 **Networking break**
Exhibition & poster viewing

TUESDAY 4 OCTOBER 2022

SESSION 3

FOCUS ON ENVIRONMENTAL QUALITY

Chair: Dr Bert Popping, FOCOS GbR, Germany

11:00 *Practical experiences with validation of microbiological rapid methods for drinking water diagnostics*
Adrie Atsma, Vitens, the Netherlands

11:20 *A suitcase laboratory for molecular water microbiology*
Rixia Zan, School of Engineering, Newcastle University, UK

11:40 *Gold nanozymes for the detection of mercury ions (Hg²⁺) in seawater*
Dr Cuong Cao, Institute for Global Food Security, Queen's University Belfast, Northern Ireland

12:00 *NITERYX: the hand-held nitrate sensor for environmental and agricultural in situ monitoring*
Joris van Nieuwstadt, imec the Netherlands – OnePlanet Research Center, the Netherlands

12:20 *Bee-Plex: The detection of pesticides harmful to bees by planar array imaging*
Dr Jeroen Peters, Wageningen Food Safety Research, the Netherlands

12:45 **Lunch break**
Exhibition & poster viewing

WORKSHOPS (see pages 11-12)

SESSION 4

RAPID DIAGNOSTICS FOR HUMAN HEALTH – PART 1

Rapid methods for human health are being developed parallel to those for other fields of application. We must observe what others do and learn from each other, taking and adapting from each other what suits best.

Chair: Dr Andy Ward, Department of Civil and Environmental Engineering, University of Strathclyde, UK

11:00 *Electrochemical impedance biosensors and biologically sensitive field-effect transistors (BioFETs) for point-of-care diagnostics*
Prof. Pedro Estrela, Centre for Biosensors, Bioelectronics and Biodevices (C3Bio), University of Bath, UK

11:20 *Nanoplasmonic biosensors for diagnostics and real-time bioprocess monitoring*
Prof. Daniel Aili, Department of Physics, Chemistry and Biology, University of Linköping and ArgusEye, Sweden

11:40 *Determination of NH₄⁺ in gastrointestinal fluids: an on-site evaluation study*
Dr Francesca Leonardi, OnePlanet Research Center, the Netherlands

12:00 *Rapid electroanalysis of sialic acids for multi-sectoral applications*
Dr Saurav K. Guin, Department of Chemistry, National University of Ireland, Ireland

12:20 *A novel method for high throughput lyobead formation in diagnostic kit manufacturing*
John Witton, BioDot, UK

12:45 **Lunch break**
Exhibition & poster viewing

WORKSHOPS (see pages 11-12)

TUESDAY 4 OCTOBER 2022

SESSION 5

ADVANCED PHOTONICS FOR FOOD SAFETY AND QUALITY TESTING

Co-ordinated by the European Cluster of Research projects for Environmental and Agri-food Monitoring (ECEAM), a group of EU projects working in the area of environmental and food monitoring.

Chair: Dr Volha Shapaval, Faculty of Science and Technology, Norwegian University of Life Sciences, Norway

14:00 *Low-cost, multi-analyte plasmo-photonic sensor for faster, on-the-spot food quality & safety controls* (project 'GRACED')
Dr Alessandro Giusti, CyRIC, Cyprus

14:20 *A fully integrated optical biosensor for plasmonic-based quantitative detection of multiple analytes from milk* (projects 'h-ALO' and 'MOLOKO')
Dr Stefano Toffanin, Institute of Nanostructured Materials, National Research Council, Italy

14:40 *Flexible mid-Infrared photonic solutions for rapid farm-to-fork sensing of food contaminants* (project 'PHOTONFOOD')
Prof. Boris Mizaikoff, Institute of Analytical and Bioanalytical Chemistry, Ulm University and Hahn-Schickard, Institute for Microanalysis Systems, Germany

15:00 *Smart spectroscopic sensors contribute to a successful digitalization of the food industry* (project 'DigiFoods')
Dr Jens Petter Wold, Raw Materials and Process Optimization, Nofima, Norway

15:20 *Vibrational spectroscopy for rapid and reliable source tracking of fungal contamination in food production* (project 'PHOTONFOOD')
Miriam Aleda, Faculty of Science and Technology, Norwegian University of Life Sciences, Norway

15:45 **Networking break**
Exhibition & poster viewing

SESSION 6

RAPID DIAGNOSTICS FOR HUMAN HEALTH – Part 2

Chair: Hans Dijk, Surfix Diagnostics, the Netherlands

14:00 *Multiplex lateral flow assay for detection of bladder cancer*
Talena Jarling, Scienion, Germany

14:20 *Phenotypic and genotypic approaches to electrochemical detection of antimicrobial resistance*
Prof. Damion Corrigan, Department of Pure and Applied Chemistry, University of Strathclyde, UK

14:40 *On-site and user-friendly lateral flow test to quantify insulin in blood*
Dr Aart van Amerongen, BioSensing & Diagnostics, Wageningen University & Research, the Netherlands

15:00 *Refining cardiovascular risk stratification in patients using graphene-based bioFETs*
Prof. Sabine Szunerits, Institut d'Electronique, de Microelectronique et de Nanotechnologie, University of Lille, France

15:20 *Making lateral flow tests smarter*
Dr Karrie Melville and Dr Neil Polwart, BBI Solutions UK

15:45 **Networking break**
Exhibition & poster viewing

TUESDAY 4 OCTOBER 2022

SESSION 7

RAPID ANALYSIS FOR FORENSIC APPLICATIONS

Forensic investigation is increasingly impacted by new rapid methods and technologies. This session provides insight into some selected areas.

Chair: Dr Annemieke van Dam, Department of Biomedical Engineering and Physics, Amsterdam UMC, the Netherlands

16:15 *Portable electrochemical detection of illicit drugs in smuggled samples: towards more secure borders*
Prof. Karolien De Wael, Department of Bioscience Engineering, University of Antwerp, Belgium

16:35 *Bringing forensic DNA analysis to the crime scene*
Olivier Tytgat, Department of Pharmaceutics, Ghent University, Belgium

16:55 *Sniffing out answers: ion mobility spectrometry (IMS) for forensic analysis*
Dr Cameron Heaton, Foster + Freeman, UK

17:15 *Volatile compounds analysis in virgin olive oils to support the Panel test: an overall approach for promoting authenticity and fraud detection*
Dr Enrico Valli, Department of Agricultural and Food Sciences, University of Bologna, Italy

SESSION 8

RAPID DIAGNOSTICS FOR ANIMAL HEALTH

Rapid methods for animal health are being developed parallel to those for other fields of application. We must observe what others do and learn from each other, taking and adapting from each other what suits best.

Chair: Dr Aart van Amerongen, BioSensing & Diagnostics, Wageningen University & Research, the Netherlands

16:15 *Smart use of rapid diagnostics in pandemic crisis management*
Dr Joukje Siebenga, Animal Sciences Group, Wageningen University & Research, the Netherlands

16:35 *A journey from lab to kennel*
Dr Lynn Dennany, Department of Pure and Applied Chemistry, University of Strathclyde, UK

16:55 *Use of rapid antigen tests for detection of SARS-CoV-2 in animals*
Dr Markus Keller, Friedrich-Loeffler-Institut, Federal Research Institute for Animal Health, Germany

17:15 *Developing lateral flow microarrays to detect arbovirus-specific antibodies across species.*
Bijan Godarzi, Department Biomolecular Health Sciences, Utrecht University, the Netherlands

CONFERENCE DINNER (optional)

18:30 – 22:00

WEDNESDAY 5 OCTOBER 2022

SESSION 9

ON-SITE DNA TECHNIQUES

Chair: Dr Andy Ward, Department of Civil and Environmental Engineering, University of Strathclyde, UK

09:00 *Integrated DNA analysis on miniaturized devices for agro-food applications*
Dr Marta Prado, NeoXenica and International Iberian Nanotechnology Laboratory, Spain

09:20 *Portable LAMP/CRISPR-Cas diagnostics*
Marleen Voorhuijzen, Wageningen Food Safety Research, the Netherlands

09:40 *Novel molecular detection and recognition molecules for health-relevant bacteria*
Dr Claudia Kolm, Institute of Chemical, Environmental and Bioscience Engineering, TU Wien, Austria

10:00 *Spoiler surveillance with at-line DNA-sequencing*
Dr Freja Lütthje, Danish Technological Institute, Denmark

10:20 *A point-of-care sensor for the detection of SARS-CoV-2 with loop mediated isothermal amplification and electrochemical detection*
Ane Rivas-Macho, GAIKER Technology Centre, Spain

10:45 **Networking break**
Exhibition & poster viewing

SESSION 10

FOOD & FEED INTEGRITY – PART 2

Chair: Dr Bert Popping, FOCOS GbR, Germany

09:00 *Rapid analysis of volatile organic compounds (VOCs) in foods by HS-GC-IMS: hazelnut, tomato, and green coffee as case studies*
Prof. Marco Arlorio, Dipartimento di Scienze del Farmaco, Università del Piemonte Orientale 'Amedeo Avogadro', Italy

09:20 *The use of modelling for the design of food safety monitoring programmes*
Prof. Ine van der Fels, Business Economics, Wageningen University & Research, the Netherlands

09:40 *Smartphone-based electrochemical biosensors towards ASSURED food safety screening*
Safiye Jafari, ETH Zürich and CSEM, Switzerland

10:00 *Multivariate versus machine learning-based modelling of rapid evaporative ionisation mass spectrometry spectra for large-scale fish speciation*
Prof. Lynn Vanhaecke, Institute for Global Food Security, Queen's University Belfast, UK

10:20 *Fingerprint to footprint: handheld spectroscopy to measure environmental sustainability*
Dr Jeroen Jansen, Analytical Chemistry & Chemometrics, Institute for Molecules and Materials, Radboud University, the Netherlands

10:45 **Networking break**
Exhibition & poster viewing

WEDNESDAY 5 OCTOBER 2022

FINAL PLENARY SESSION

RAPID ANALYSIS AND DIAGNOSTICS – WHAT FURTHER?

Chair: Dr Bert Popping, FOCOS GbR, Germany

11:15 Duo presentation:

- *SensUs, the international student competition in the field of rapid sensors*
Myrthe Boone, Molecular Biosensing for Medical Diagnostics, Eindhoven University of Technology, the Netherlands
- *Experiences of a SensUs team*
Britte Treure, Molecular Biosensing for Medical Diagnostics, Eindhoven University of Technology, the Netherlands

11:45 *Zero waste electrochemical sensor substrates inspired by art and design printing*
Dr Andrew Ward, Department of Civil and Environmental Engineering, University of Strathclyde, UK

12:05 *Inreda Artificial Pancreas, passion for a better life!*
Robin Koops, Inreda Diabetic, the Netherlands

12:30 Lessons learned

12:45 Closing of **RME2022**

WORKSHOP PROGRAMME

MONDAY 3 OCTOBER 2022
17:00 – 18:00

AND

TUESDAY 4 OCTOBER 2022
13:00 – 14:00

WORKSHOP 1

'DIAGNOSTICS@WUR' BY DIAGNOSTIC GROUPS FROM WAGENINGEN UNIVERSITY & RESEARCH

Sponsored and presented by Wageningen University & Research

Background

The development of new diagnostics (on-site and multiplex detection) is driven by new questions from governments (new legislation, international treaties, new target molecules) and industry (faster, more upstream in the production chain, applicable by non-technically trained personnel). Moreover, the ongoing COVID-19 pandemic elicited the development of fast detection concepts that could equally well be used in the agrifood domain. The need for new diagnostic methods is further driven by other events: new origins of raw food materials as a consequence of globalization; circular production systems and, therefore, new contaminants; new diseases and pests caused by climate change; emerging fraud; and new needs of empowered consumers. All this emphasizes the great importance of monitoring the safety and quality of food (production) and the possible presence of pathogens in animals and plants. What is needed for this are smart, affordable solutions for measuring and detecting particular compounds and (micro)organisms at all possible locations in the production and processing chain. Therefore, five application-directed research institutes from Wageningen University & Research (WUR) joined their diagnostic forces in Diagnostics@WUR.

Objectives

Development of new, innovative diagnostic platforms and applications that meet the demands from players in the Wageningen domains: environment, plants, food and animals. This also includes the improvement of current platforms. The important objectives are: simple and efficient sample pre-processing, on-site (field/farm, transport, factory, port, etc.), applicable by non-lab-trained employees, greater detection sensitivity, multiple targets simultaneously (multiplex), automatic reading of test signals as well as processing and forwarding of results. Spin-off applications of human diagnostics are studied as well.

Subjects

1. DNA/RNA-based methods: extraction protocols, isothermal pre-amplification, lateral flow tests, on-site, CRISPR-Cas and multiplex detection methods.
2. Immuno-based methods: extraction protocols, lateral flow tests, guided flow, signal enhancers, easy readout, multiplex detection, real-time readers.
3. Spectroscopy-based methods: hyperspectral and terahertz cameras, review detection of nanoplastics.

WORKSHOP 2

BEYOND RAPID METHODS – REAL TIME QUALITY CONTROL

Sponsored and presented by Trilogy and R-Biopharm

Trilogy organizes proficiency tests (ISO 17043 accredited), provides (certified) reference materials (ISO 17034 accredited), provides analytical services (ISO 17025 accredited) and consultancy in the food and feed area. The focus of Trilogy is knowledge transfer and quality assurance for laboratories, governments institutes and companies to monitor, guarantee and improve their quality. Trilogy offers by their QualiT™ products excellent quality tools in an all-in-one concept.

We developed a toolbox for real time quality control on QC material that gives you a quick view on your results of the daily analysis, the validation, harmonization, troubleshooting of (new) analysis methods for checking for example the precision, accuracy, bias, or trend of the used method. For staff training purposes the requirements of the ISO 17025 document 'Analyst training and continued competence' is also built in the toolbox with objective and measurable goals. The toolbox is designed for unbiased robust real time laboratory quality control with information being shared to decision makers and quality control departments for quality improving and risk reducing decisions. The system is highly customizable. Trilogy can develop customized matrices, parameters, assigned values, and acceptable result deviations ranges based on the needs of each individual organization.

Regular proficiency testing (PT) provides results on a scheduled basis, with our 'on demand' and customized (bilateral) PT, your company could check blindly the results in a shorter and more real time, on PT performance level with a Z-score, derived from an assigned value and the prescribed standard deviation on proficiency assessment (SDPA).

In this workshop, we will present and discuss the real time features, because rapid methods deserve real time quality solutions.

WORKSHOP 3

THE EASY WAY TO MAKE A LATERAL FLOW TEST

Sponsored and presented by BioDot Ltd.

Biodot will present a dispenser, laminator and cutter, the three steps to making a lateral flow test. The machines will be shown operating, dispensing test and control lines, spraying conjugate, laminate the materials and then cut. Discussion of the steps and opportunity for people to get up close to see the process.