THE RME CONFERENCE SERIES 13TH CONFERENCE

Rapid Analysis & Diagnostics

FOOD

FEED

WATER

PLANT

ANIMAL

HUMAN

LIVE

VIRTUAL CONFERENCE

RME 2021

1-3 FEBRUARY 2021

www.RapidMethods.eu

CONFERENCE PROGRAMME

(updated 30-1-2021)

ALL TIMES ARE IN CENTRAL EUROPEAN TIME (CET = UTC+1)

Monday 1 February 2021

10:00 - 13:10 Van Gogh Hall

Plenary session
Rapid analysis and diagnostics - where are we?
(8 presentations)

13:45 - 16:25 Van Gogh Hall

Session 1
Food Integrity - Part 1
(7 presentations)

13:45 - 16:30 Rembrandt Hall

Session 2
Towards rapid field testing of water quality
(6 presentations)

16:25 - 17:00 Relax Area

Time to relax!

Tuesday 2 February 2021

10:00 - 12:45 Van Gogh Hall

Session 3
Food Integrity - Part 2
(7 presentations)

10:15 - 12:35 Rembrandt Hall

Session 4
Healthy plants with better diagnostics
(6 presentations)

13:15 - 15:00 Van Gogh Hall

Session 5
The focus on SARS-CoV-2
(5 presentations)

13:15 - 15:00 Rembrandt Hall

Session 6
Rapid diagnostics for human and animal health
(5 presentations)

15:15 - 16:40 Van Gogh Hall

Session 7
Forensic applications
(4 presentations)

15:15 - 16:40 Rembrandt Hall

Session 6
continued
(4 presentations)

16:40 - 17:15 Relax Area

Time to relax!

Wednesday 3 February 2021

10:00 - 12:45 Van Gogh Hall

Session 8
Putting the frontiers from lab to point-of-need
(7 presentations)

10:00 - 12:45 Rembrandt Hall

Session 9
Spoilage and disease-causing microorganisms in the picture
(7 presentations)

13:15 - 16:00 Van Gogh Hall

Final plenary session
Rapid analysis and diagnostics - where to now?
(7 presentations)

16:15 - 16:45 Relax Area

Time to relax!

MONDAY 1 FEBRUARY 2021

10:00 **Opening and rapid overview of RME2021** **VAN GOGH HALL**

RME2021 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 **VAN GOGH HALL**
RAPID ANALYSIS AND DIAGNOSTICS – WHERE ARE WE?
Gain insight into the present status of rapid analysis and diagnostics in the field of food and feed, environmental water, human and animal health, and plant health. This overview serves as the starting point for the dedicated sessions referring in more detail to the various areas.

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

10:15 *A paradigm shift: from 'sample to lab' to 'lab to sample' – the benefits and challenges of portable food safety devices*
Dr Bert Popping, FOCOS – Food Consulting Strategically, Germany

10:35 *The use of next generation sequencing for food authenticity: a new era for DNA-based food analysis*
Dr Mário Gadanho, Thermo Fisher Scientific, Portugal

10:55 *Developments in e-nose technology for application in the food and environmental field*
Dr M. Carmen Horrillo Güemes, Institute for Physical and Information Technologies, Spanish National Research Council, Spain

11:15 *Rapid water testing with E. coli in the field: how UNICEF is innovating to address Sustainable Development Goal (SDG) 6*
Esther Shaylor, UNICEF, Denmark

11:35 **Break**

11:50 *Let's stick to the field test: a handy tool to the seed production specialist*
Dr Pauline Bernardo, Enza Zaden, the Netherlands

12:10 *POC-CCA in schistosomiasis control, a rapid test to diagnose one of the most impacting tropical parasitic diseases: from the need in the field to the lab and back again*
Dr Govert van Dam, Department of Parasitology, Leiden University Medical Center, the Netherlands

12:30 *Non-invasive intelligent nanosensors for pandemics*
Prof. Hossam Haick, Department of Chemical Engineering, Technion-Israel Institute of Technology, Israel

12:50 *Disposable sensors for next generation on-site diagnostics*
Dr Can Dincer, Freiburg Center for Interactive Materials and Bioinspired Technologies and University of Freiburg, Germany

13:10 **Break**

MONDAY 1 FEBRUARY 2021

SESSION 1 **VAN GOGH HALL**
FOOD INTEGRITY – PART 1
Providing assurance to consumers and other stakeholders about the safety, authenticity and quality of food (integrity) is of prime importance in adding value to the food chain. Therefore, the agrifood industry is seeking user-friendly and field-deployable methods for rapid screening. A variety of methods and technologies for application in various matrices will be presented.

Chair: Prof. Sarah De Saeger, Centre of Excellence in Mycotoxicology and Public Health, Ghent University, Belgium

13:45 Chair's introduction

13:50 *Rapid assessment of food safety by laser photoacoustic spectroscopy*
Dr Luca Fiorani, Department Nuclear Fusion and Safety Technologies, Italian National Agency for New Technologies, Energy and Sustainable Economic Development, Italy

14:10 *Adulteration of cow's milk with buffalo's milk detected by an on-site carbon nanoparticles-based lateral flow immunoassay*
Dr Rajan Sharma, Dairy Chemistry Division, ICAR-National Dairy Research Institute, India

14:30 *Ultrasensitive and rapid detection of wine DNA using a portable graphene sensor*
Dr Agnes Purwidyantri, International Iberian Nanotechnology Laboratory, Portugal

14:50 *Fast DNA biosensing based on gold nanoparticles and consumer electronic devices*
Prof. Luis A. Tortajada-Genaro, Department of Chemistry, Polytechnic University of Valencia, Spain

15:10 **Break**

15:25 *Mini-disk capillary array coupling with LAMP for visual detection of multiple nucleic acids*
Marleen Voorhuijzen, Wageningen Food Safety Research, Wageningen University & Research, the Netherlands

15:45 *Identification of plant species in raw and complex products*
Dr Frédéric Debode, Walloon Agricultural Research Centre, Belgium

16:05 *Critical evaluation of ambient mass spectrometry coupled with chemometrics for the early detection of adulteration scenarios in dried herbs*
Tito Damiani, Department of Food and Drug, University of Parma, Italy

16:25 – 17:00 **Join the Relax Area!**

MONDAY 1 FEBRUARY 2021

SESSION 2 **REMBRANDT HALL**

TOWARDS RAPID FIELD TESTING OF WATER QUALITY

Join us to discuss emerging technologies that are being trialled through the UNICEF Rapid Water Testing programme. The session will also look forward towards new approaches coming from academia and incorporate a regulatory perspective, with a focus on translation of research to market. Following the talks there will be discussions on issues such as technology, viability testing, and regulatory aspects.

Chairs: Esther Shaylor, UNICEF, Denmark
Dr Helen Bridle, Institute of Biological Chemistry, Biophysics & Bioengineering, Heriot-Watt University, UK

13:45 Chairs' introduction

13:50 *Innovating towards a rapid water test to empower local communities*
Dr Alex Patto, WaterScope, UK

14:10 *Water quality monitoring and faecal indicator organisms: techniques, technologies and monitoring programme*
Dr Eulyn Pagaling and Dr Ioanna Akoumianaki, The James Hutton Institute, UK

14:30 *Molecular faecal pollution diagnostics and source tracking: new approaches and future possibilities for rapid, inexpensive and on-site applicable water quality test systems*
Dr Claudia Kolm, Institute of Chemical, Environmental & Bioscience Engineering,TU Wien, Austria

14:50 *Highly sensitive and fast in situ detection system based on LAMP combined to electrochemical transduction: Legionella spp. case study*
Dr Garbiñe Olabarria, GAIKER Technology Centre, Basque Research and Technology Alliance, Spain

15:10 **Break**

15:25 *Capacitive sensor based on molecularly imprinted polymers for detection of the insecticide imidacloprid in water*
Suzan El-Akaad, Department of Bioanalysis, Ghent University, Belgium

15:45 *Regulatory approval – breaking through the barrier*
Matthew Bower, Drinking Water Quality Regulator for Scotland, UK

16:05 Q&A

16:30 – 17:00 **Join the Relax Area!**

TUESDAY 2 FEBRUARY 2021

SESSION 3 **VAN GOGH HALL**

FOOD INTEGRITY – PART 2

Providing assurance to consumers and other stakeholders about the safety, authenticity and quality of food (integrity) is of prime importance in adding value to the food chain. Therefore, the agrifood industry is seeking user-friendly and field-deployable methods for rapid screening. A variety of methods and technologies for application in various matrices will be presented.

Chair: Prof. Michel Nielen, Wageningen Food Safety Research, Wageningen University & Research, the Netherlands

10:00 Chair's introduction

10:05 *Genetic authentication: application of a programmable nuclease for selective detection of SNPs*
Prof. Markus Fischer, Hamburg School of Food Science, University of Hamburg, Germany

10:25 *Headspace-based profiling techniques for screening purposes to assess authenticity issues of extra virgin olive oil*
Dr Michele Suman, Barilla, Italy

10:45 *Durum wheat and pasta authentication by FT-NIR spectroscopy in combination with chemometric analysis*
Dr Annalisa De Girolamo, Institute of Sciences of Food Production, National Research Council of Italy

11:05 *Shining the light into the fate of microplastics in food – combining machine learning and vibrational spectroscopy*
Dr Daniel Cozzolino, Queensland Alliance for Agriculture and Food Innovation, The University of Queensland, Australia

11:25 **Break**

11:45 *Validation and on-site application of rapid multiplex mycotoxin dipstick tests*
Dr Christoph von Holst, EC Joint Research Centre, European Commission, Belgium

12:05 *Lab-on-chip micro-ELISA for the smart micro-sensoring based detection of mycotoxins, allergens and gluten in foods*
Prof. Marco Arlorio, Dipartimento di Scienze del Farmaco, Università del Piemonte Orientale, Italy

12:25 *Smartphone technology and big data in quality assurance for mycotoxins and allergens*
Ronald Niemeijer, R-Biopharm AG, Germany

12:45 **Break**

TUESDAY 2 FEBRUARY 2021

SESSION 4 **REMBRANDT HALL**

HEALTHY PLANTS WITH BETTER DIAGNOSTICS

International trade and travel have increased tremendously in recent years, with plants and plant products being moved around the whole world. As a consequence, the rate of introduction and establishment of new economically or environmentally damaging plant organisms and invasive species has increased steadily. In this session. a range of diagnostic methods for different kind of plant pathogens will be presented, which will help the National Plant Protection Organisations and their affiliated laboratories quickly and reliably detect and identify organisms critical for the effective performance of phytosanitary measures.

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

10:15 Chair's introduction

10:20 *Development of diagnostic tools for plant pathogens in a globalising world*
Dr Peter Bonants, Biointeractions and Plant Health, Wageningen University & Research, the Netherlands

10:40 *Untangling bioinformatics bias for the diagnostic of plant viruses by high throughput sequencing: lessons from an international performance testing of sequence analysis strategies*
Dr Sébastien Massart, Gembloux Agro-Bio Tech, University of Liège, Belgium

11:00 *Spoilt for choice: molecular detection of Xylella fastidiosa under changing circumstances*
Dr Tanja Dreo, Department of Biotechnology and Systems Biology, National Institute of Biology, Slovenia

11:20 **Break**

11:35 *Development and implementation of diagnostic tools to test for plant pathogens, a test laboratory perspective*
Dr Michel Ebskamp, Naktuinbouw, the Netherlands

11:55 *Development and utilisation of real-time LAMP for in-field detection of phytoplasmas*
Prof. Matthew Dickinson, School of Biosciences, University of Nottingham, UK

12:15 *Molecular plant pathogen detection in vegetable seed health testing*
Dr Roland Willmann, BASF Vegetable Seeds, Nunhem, the Netherlands

12:35 **Break**

TUESDAY 2 FEBRUARY 2021

SESSION 5 **VAN GOGH HALL**

THE FOCUS ON SARS-CoV-2

SARS-CoV-2 has gripped the world. Rapid tests that give results in 'minutes' are absolutely vital. What's going on in this field? A selection of developments in different fields will be presented.

Chair: Hans Dijk, Surfix, the Netherlands

13:15 Chair's introduction

13:20 *Immediate confirmation of infectious status by rapid detection of SARS-CoV-2 RNA*
Dr Markus Riester, midge medical GmbH, Germany

13:40 *Rapid diagnosis of SARS-CoV-2 by naked-eye loop-mediated isothermal amplification*
Dr Alejandro Garrido-Maestu, Food Quality and Safety Research Group, International Iberian Nanotechnology Laboratory, Portugal

14:00 *COVID-19 detection from exhaled breath is just the beginning: VOC gas sampling can open a new door into quick and easy diagnostics*
Pekka Rissanen, Deep Sensing Algorithms, Finland

14:20 *COVID-19 in vitro diagnostic devices and test methods database*
Mauro Petrillo, Joint Research Centre, European Commission, Italy

14:40 *Real-time RT-PCR kits for environmental surface testing of SARS-CoV-2*
Dr Nadine Göhring, Eurofins GeneScan Technologies, Germany

15:00 **Break**

TUESDAY 2 FEBRUARY 2021

SESSION 7 **VAN GOGH HALL**
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

15:15 Chair's introduction

15:20 *The development of rapid and presumptive methods for forensic analysis*
Prof. Bruce McCord, Department of Chemistry and Biochemistry, Florida International University, USA

15:40 *Human forensic DNA profiling: the road to near real-time identifications*
Dr Anna Mapes, Dutch Police Force, the Netherlands

16:00 *Ultrasensitive and selective cocaine fluorescence detection using functionalised hybrid nanomaterials*
Dr Oluwasesan Adegoke, Leverhulme Research Centre for Forensic Science, University of Dundee, UK

16:20 *Fighting crime with lasers*
Prof. Simona Francese, Centre for Mass Spectrometry Imaging, Sheffield Hallam University, UK

16:40 – 17:15 **Join the Relax Area!**

TUESDAY 2 FEBRUARY 2021

SESSION 6 **REMBRANDT HALL**

RAPID DIAGNOSTICS FOR HUMAN AND ANIMAL HEALTH

Rapid methods for human and 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.

Chairs: Prof. Menno Prins, Molecular Biosensing for Medical Diagnostics, Eindhoven University of Technology, the Netherlands
Hans Dijk, Surfix, the Netherlands

13:15 Chair's introduction

13:20 *Miniaturisation, integration and multiplexing – an excellent foundation for next generation diagnostics*
Dr Wilfried Weigel, SCIENION, Germany

13:40 *The use of volumetric absorptive microsampling to quantitatively determine mycotoxin blood biomarkers of exposure*
Prof. Marthe De Boevre, Centre of Excellence in Mycotoxicology and Public Health, Ghent University, Belgium

14:00 *Photonics for diagnostics: a bright light in the dark*
Dr Wout Knoben, Surfix, the Netherlands

14:20 *Moving towards advanced in vitro diagnostics for drug allergy*
Dr Sergi Morais, Department of Chemistry, Polytechnic University of Valencia, Spain

14:40 *Harnessing novel CRISPR systems for diagnostics*
Dr Jonathan Gootenberg and Dr Omar Abudayyeh, McGovern Institute for Brain Research, Massachusetts Institute of Technology, USA

15:00 **Break**

15:15 *Simple electrode modifications for enhanced diagnosis of infectious disease*
Dr Damion Corrigan, Department of Biomedical Engineering, University of Strathclyde, UK

15:35 *A point-of-care test for the biologics adalimumab and infliximab*
Dr Aart van Amerongen, BioSensing & Diagnostics, Wageningen University & Research, the Netherlands

15:55 *A point-of-care device with smartphone read-out for the rapid screening of chlorpyrifos intoxication incidents*
Dr Aristeidis Tsagkaris, Department of Food Analysis and Nutrition, University of Chemistry and Technology Prague, Czech Republic

16:15 *Enabling high quality rapid lateral flow testing using spectral sensors*
Dr Filip Frederix, ams Sensors Belgium, Belgium

16:35 – 17:15 **Join the Relax Area!**

WEDNESDAY 3 FEBRUARY 2021

SESSION 8 **VAN GOGH HALL**

RAPID ANALYSIS AND DIAGNOSTICS: PUSHING THE FRONTIERS FROM LAB TO POINT-OF-NEED

New devices are being developed for use outside the laboratory that do not require scientists to operate them or interpret the data. This session will present some recent developments and discuss which parameters such devices need to be assessed against.

Chair: Dr Bert Popping, FOCOS – Food Consulting Strategically, Germany

10:00 Chair's introduction

10:05 *The dog's nose knows Corona*
Dr Anna Hielm-Björkman, Department of Equine and Small Animal Medicine, University of Helsinki, Finland

10:25 *Robust identification and quantification of illicit drugs in forensic casework using handheld spectroscopic devices*
Ruben F. Kranenburg, Dutch National Police and Van 't Hoff Institute for Molecular Sciences, University of Amsterdam, the Netherlands

10:45 *Voltammetry as a tool for the rapid detection of perfluoroalkyl substances (PFAS)*
Prof. Damien Arrigan, Curtin Institute for Functional Molecules and Interfaces, Curtin University, Australia

11:05 *ROSALIND: an in vitro platform for rapid detection of water contaminants*
Kirsten Jaeyoung Jung, Department of Chemical and Biological Engineering, Northwestern University, USA

11:25 **Break**

11:45 *A portable 3D-printed micro-system for the integrated total extraction and immunochemical analysis of multiple food allergens with smartphone readout*
Georgina Ross, Wageningen Food Safety Research, Wageningen University & Research, the Netherlands

12:05 *Mobile NIR spectroscopy for food applications*
Dr Wilfried Hermes, trinamiX, Germany

12:25 *An electrochemical sensor for rapid, on-site detection of allergens in food*
Dr Lukasz Mendecki, Allergy Amulet, USA

12:45 **Break**

WEDNESDAY 3 FEBRUARY 2021

SESSION 9 **REMBRANDT HALL**

SPOILAGE AND DISEASE-CAUSING MICROORGANISMS IN THE PICTURE

Rapid analysis and diagnostics of spoilage and pathogenic microorganisms is of key importance for the food and drink supply chain as well as for healthcare. In this session, selected areas of recent research will be highlighted.

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

10:00 Chair's introduction

10:05 *Environmental monitoring of foodborne pathogens using chemiluminescence – the no lab story*
Dr Mario Hupfeld, NEMIS Technologies, Switzerland

10:25 *Low-cost sensor enabling rapid diagnosis and sewage testing for early warning of pandemic: COVID-19*
Dr Zhugen Yang, Water Science Institute, Cranfield University, UK

10:45 *Rapid test system for the detection of beer-spoilage bacteria*
Jvo Siegrist, Merck, Germany

11:05 *Fast point-of-care label-free detection of Campylobacter jejuni and Campylobacter coli with a biosensor using surface imprinted polymers and the heat-transfer method*
Prof. Marc Heyndrickx, Technology and Food Science Unit, Research Institute for Agriculture, Fisheries and Food, Belgium

11:25 **Break**

11:45 *Sensitive detection of bacterial cells using xMAP technology*
Dr Liyakat Hamid Mujawar, Department of Health Technology, Technical University of Denmark, Denmark

12:05 *Novel data-driven methods for diagnosis of infectious diseases and antimicrobial resistance*
Dr Jesus Rodriguez Manzano, Department of Infectious Disease, Imperial College London, UK

12:25 *Implementation of in silico analysis in the rapid validation of molecular methods*
Dr Sharon Brunelle, AOAC, USA

12:45 **Break**

WEDNESDAY 3 FEBRUARY 2021

FINAL PLENARY SESSION **VAN GOGH HALL**

RAPID ANALYSIS AND DIAGNOSTICS – WHERE TO NOW?

'Rapid' is not a goal in itself. In addition to increased speed, rapid methods must also take account of other criteria, such as sampling and sample preparation, multitarget screening, lower detection limits, accuracy and sensitivity, data analysis, total costs proportionate to the benefits, etc., eventually leading to methods best suited for use. What does the future hold?

Chairs: Prof. Chris Elliott, Institute for Global Food Security, Queen's University Belfast, UK
Dr Bert Popping, FOCOS – Food Consulting Strategically, Germany

13:15 Chairs' introduction

13:20 *What does a rapid assay mean to the food industry?*
Pamela Wilger, Cargill, Inc., USA

13:40 *Near 'zero-cost' paper-based electrical gas sensors for measuring food quality*
Dr Firat Güder, Department of Bioengineering, Imperial College London, UK

14:00 *A novel RNA targeting CRISPR-Cas system for rapid nucleic acid detection*
Jurre Steens, Scope Biosciences and Wageningen University & Research, the Netherlands

14:20 *Emerging opportunities of AI with lab-on-a-chip technology*
Prof. Keisuke Goda, Department of Chemistry, University of Tokyo, Japan

14:40 **Break**

15:00 *Microchip technology enabling rapid diagnostics for infectious diseases: from AMR to COVID-19*
Dr Pantelis Georgiou, Department of Electrical and Electronic Engineering, Imperial College London, UK

15:20 *Rapid tests against speedy doctors: who wins?*
Prof. Geert-Jan Dinant, Clinical Research in General Practice, Maastricht University, the Netherlands

15:40 *Why on Earth go to Space, and how to access?*
Dr Hilde Stenuit, ICE Cubes Space Application Services, Belgium

16:00 **Closing of RME2021**

16:15 – 16:45 **Join the Relax Area!**