

# MEDICAL DIAGNOSTIC PHOTONIC SENSOR DEVELOPMENT AND OTHER BIOSENSING TECHNOLOGIES FOR POINT-OF-CARE TESTING IN HEALTH APPLICATIONS

AIT Austrian Institute of Technology GmbH

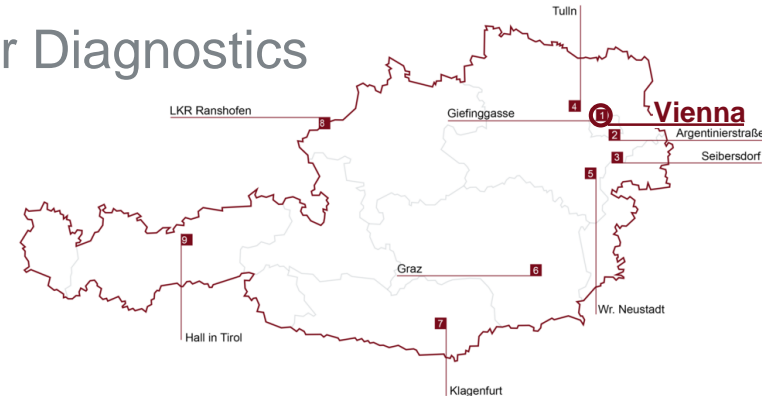
Center for Health & Bioresources, Molecular Diagnostics

Rainer Hainberger

**Successful R&I in Europe 2018**

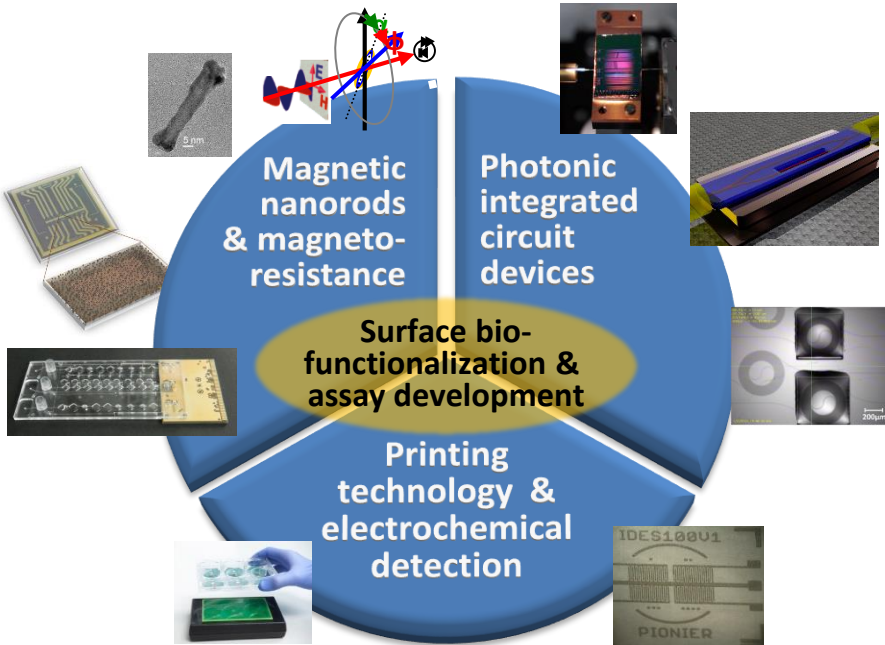
Düsseldorf, March 16<sup>th</sup>, 2018

Session 5, Workshop ICT



# SCIENTIFIC & TECHNOLOGICAL EXPERTISE

AIT competence unit “Molecular Diagnostics” offers expertise in **minimally or non-invasive detection point-of-need (bio)sensing solutions for health, well-being, and life-sciences**



- **Photonic, electrochemical, and nanomagnetic transducer concepts and technologies**
- **Strong expertise in photonic integrated circuit (PIC) technology for health applications:**
  - Know-how in design, characterisation & performance testing of integrated-optical waveguide devices
  - System level expertise
  - 450nm, 650nm, 750-900nm, 1280-1360nm & 1440 - 1640nm wavelength regions
  - Application of functional layers on waveguides
- **Inkjet printing of functional materials**
- **Surface biofunctionalisation & biochemical assays**
- **Microfluidic integration**

## **ICT-05-2019: Application driven Photonics components**

- i. Photonics devices to support monitoring therapeutic progress (IA)
- ii. Photonics systems for advanced imaging to support diagnostics driven therapy (RIA)

## **ICT-03-2018-2019: Photonics Manufacturing Pilot Lines for Photonic Components and Devices**

*Advanced optical medical device technologies for medical diagnostics (IA 2019 call):*

maturing a technology platform and providing access to novel, reliable, robust optical based devices for in-vivo and/or in-vitro medical diagnosis.

## **ICT-25-2018-2020: Interactive Technologies: Future interaction (RIA)**

developing future interactive systems offering higher quality experiences, for instance through systems which are mobile, support additional senses, have higher accuracy or incorporate bio or environmental sensors

## **FETOPEN-03-2018-2019-2020: Projects on novel technologies suitable for point-of-testing**

**EIC-FTI-2018-2020: Industry-driven projects with innovative concepts for point-of-testing in health, well-being, and life sciences**

# TYPE & ROLE OF PARTNERS SOUGHT

We are looking for the following partners:

- Medical experts/medical equipment developers who have validated a **new optical biosensing technique for monitoring therapeutic progress** and want to miniaturise it for a point-of-care setting
- **SMEs that are looking for a development partner** with strong know-how in photonic technologies, biosensing, and in-vitro diagnostics
- **Medical equipment manufacturers**
- **Research groups working on novel photonic biosensing principles** that can be integrated into PIC based platforms for medical diagnostics and therapy monitoring

# OUR CURRENT HORIZON 2020 PROJECTS

Our **Diagnostic Biosensors Group** of the “Molecular Diagnostics” competence unit is currently participating in the H2020 projects

- **IMPETUS** (coordinator, **NMBP-PILOTS-2017**, #761167, 2018/01-2021/12)  
*“Pilot line for paper based electrochemical test strips dedicated to quantitative biosensing in liquids”*
- **GREENSENSE** (partner, **NMBP-PILOTS-2017**, #761000, 2018/01-2021/12)  
*“Sustainable, wireless, autonomous nanocellulose-based quantitative DoA Biosensing Platform”*
- **ChipScope** (partner, **FETOPEN-1-2016-2017**, #737089, 2017/01-2020/12)  
*“Overcoming the Limits of Diffraction with Superresolution Lighting on a Chip”*
- **OCTCHIP** (partner, **ICT-2015**, #688173, 2016/01-2019/12)  
*“Ophthalmic OCT on a Chip”*
- **PLASMOfab** (partner, **ICT-2015**, #688166, 2016/01-2018/12)  
*“A generic CMOS-compatible platform for co-integrated plasmonics/photonics/electronics PICs towards volume manufacturing of low energy, small size and high performance photonic devices”*

# OUR CURRENT HORIZON 2020 PROJECTS

Our **competence unit “Molecular Diagnostics”** is currently also participating in the H2020 projects

- **MARA** (coordinator, **FETOPEN-2014-2015-RIA**, #686647, 2015/12-2019/11)  
*“Molecular Analytical Robotics Assays”*
- **DIAGORAS** (partner, **PHC-2014**, #633780, 2015/06-2019/05)  
*“Chair/bedside diagnosis of oral and respiratory tract infections, and identification of antibiotic resistances for personalised monitoring and treatment”*
- **ULTRAPLACAD** (partner, **PHC-2014**, #633937, 2015/05-2018/10)  
*“ULTRAsensitive PLAsmonic devices for early CAncer Diagnosis”*
- **FAPIC** (partner, **PHC-2014**, #634137, 2015/05-2020/04)  
*“Fast Assay for Pathogen Identification and Characterisation”*