



Photonics21 Press Release

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Medical tools developed quicker thanks to new EU Pilot Line

The COVID-19 pandemic has exposed the need to quickly develop diagnostic equipment in the face of a novel threat. Thanks to a dedicated medical pilot production line that gives easy access to prototyping, new medical tools that use photonics to detect major diseases will be quicker, cheaper and easier to develop.

At present, many infectious diseases like COVID-19 or HIV/AIDS do not have an adequate vaccine so patients rely on early, rapid diagnosis for effective treatment and survival.

Photonics – the technology based on light – provides healthcare professionals with advanced, highly targeted, minimally invasive diagnostics that detect body signals, symptoms and diseases early on.

Developing medical devices, however, can take many years from concept to clinical trials.

While researchers and SMEs throughout the world work tirelessly to develop life-saving surgical tools, therapeutics and diagnostic devices, the work is carried out often in small and medium-sized companies, that often struggle to overcome such long and expensive processes. The team behind the pilot line aims to cut the costs involved in research and development of diagnostic devices.

So, to speed up the manufacturing of innovative photonics medical equipment, the European Commission has dedicated €15 million to set up a unique, single-point entry medical 'pilot production line' under Horizon 2020, the Framework Programme for Research and Innovation.

Easy Access

Called [MedPhab](#), the initiative is the world's first open-access medical pilot line that enables researchers, SMEs and businesses to turn their diagnostic and treatment devices that use photonics into industrially-relevant demonstrators.

The aim is to create easy access for European SMEs, researchers and businesses to a unified infrastructure dedicated to manufacturing, testing, validation and up-scaling of new photonics technologies that are used for medical diagnostics.

MedPhab coordinator Jussi Hiltunen said: "MedPhab is Europe's first Pilot Line dedicated to manufacturing, testing and up-scaling of new photonics technologies for medical diagnostics enabling accelerated product launch with reduced R&D costs.

“We are giving researchers a way to develop research and development to market and to bridge the ‘valley of death’ – the impasse often associated with moving from prototyping to low-volume fabrication - while being cost-effective with faster delivery times.

“Our easy infrastructure provides the right experts for our clients to help them overcome integrating miniaturised photonic devices.”

“When a project leaves MedPhab, their device will be at TRL 6 to 7, at a stage ready for pre-clinical trials, however, our clients can come to us at many different Technology Readiness Levels,” said Hiltunen.

Photonics

MedPhab focuses on photonics products to tackle one of the biggest societal challenges, the ‘instant diagnosis of major diseases’.

With its ability to reveal constituents and visualize incredibly small details in cells and tissues at a molecular level, photonics – the technology that uses and manipulates light – helps doctors and clinicians to understand diseases with greater specificity and sensitivity without being invasive.

Helping its clients to implement cutting-edge photonics technologies into their medical diagnostics products, MedPhab believes it will significantly improve health and patient care:

“There are exciting opportunities for research into the next generation of photonics-based medical diagnostic devices and MedPhab partners can help academic research groups by providing test devices that are required in pre-clinical studies,” said Hiltunen.

New devices from MedPhab technology will improve health and patient care and also generate revenue, job-growth and training opportunities for Europe. This will contribute to the European photonics sector in which 5,000 technology-intensive companies (many of them SMEs) directly employ over 300,000 people.

Use Case Validation Program

To ensure that the prototypes adhere to the highest medical standards, MedPhab selects companies that are validated with ISO13485 standardised manufacturing.

ISO13485 is the standard for a Quality Management System for the design and manufacture of Medical Devices, and MedPhab only selected these certified medical companies as part of our production line.

“Their participation ensures the seamless transition from pilot line production to up-scaled production without a need for changing service providers,” said Hiltunen.

Use-case companies have been selected for the validation of the pilot line services covering both in-vivo and in-vitro domains.

Applications

The devices MedPhab focuses on are within three application areas: hospital use, home care devices and equipment for molecular diagnostics.

In the hospital setting, solutions assist doctors by giving them real-time information on how a treatment is progressing without the need to send patient samples to a lab.

The equipment for home diagnostics can be used for monitoring a patient's recovery and for obtaining a broader picture than is currently possible.

Molecular diagnostics is about establishing a clinical perspective or diagnosing an infection based on a locally-tested serum, saliva or urine sample.

The pilot line also focuses on some specific technologies, including Fibre optics, Microfluidics, Surface functionalisation, Instrumentation, Optoelectronic integration, Custom medical patches, Miniaturisation for micromodules and wearables.

The pilot line is coordinated by Teknologian tutkimuskeskus VTT Oy in Finland and includes seventeen other partners from across Europe, including (Ireland) University College Cork - National University of Ireland, Cork, Stryker European Operations Limited, Radisens Diagnostics Limited; (Austria) Joanneum Research Forschungsgesellschaft Mbh, Jabil Circuit Austria GmbH, Genspeed Biotech GmbH, Viennalab Diagnostics GmbH; (Belgium) Interuniversitair Micro-Electronica Centrum, Antelope Dx; (Finland) Screentec Oy, Polar Electro Oy; (Switzerland) Csem Centre Suisse D'electronique Et De Microtechnique Sa - Recherche Et Developpement; (Netherlands) Philips Electronics Nederland Bv, Stichting Het Nederlands Kanker Instituut-Antoni Van Leeuwenhoek Ziekenhuis; (France) III-V LAB, European Photonics Industry Consortium; (Czechia) Amires Sro.

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About Photonics21

Photonics21 is the European Technology Platform (ETP) for photonics, a technology encompassing all of the products and processes around the emission, manipulation and detection of light. Photonics is integral to a wide range of industries that include the medical, healthcare, transport, manufacturing, and telecommunications sectors.

"Photonics21" was set up in December 2005 to bring the community of photonics researchers and industries together. The European Commission defined photonics as one of five European Key Enabling Technologies (KET's) in September 2009. Shortly after, the European Research & Innovation Program "Horizon 2020" invited Photonics21 to become a

"Public-Private Partnership" (PPP). The "Photonics 21 Association", a legal entity under Belgium law, became the private contract partner in November 2013 in a Public-Private Partnership (PPP) in conjunction with the EU Commission.

Today Photonics21 represents more than 3000 personal members from across Europe and abroad. Our members are experts in the photonics industry, research organisations and universities who actively engage with us to develop a joint photonics strategy for future research and innovation in Europe.

With the global photonics market growing from €350 Billion in 2011 to €447 Billion in 2015, Photonics remains a strong industry. The European photonics industry, estimated to be worth €70 billion, has considerable global leadership positions and employs over 300,000 people directly.

With positive growth forecast, current industry trends like digitalisation, resource efficiency, individual and zero failure production will drive the photonics industry further.

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