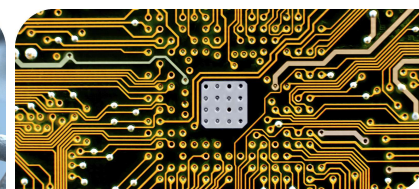


Point-of-Care Diagnostics and Monitoring for Coeliac Disease Patients



COELIAC DISEASE MANAGEMENT
MONITORING AND DIAGNOSIS
USING BIOSENSORS AND AN
INTEGRATED CHIP SYSTEM



Partners in the four-year European Commission funded CD-MEDICS project will put together their large scientific experience with the aim of exploiting breakthroughs at the confluences of bio-, micro- and nano- technologies to create a low-cost non-invasive intelligent technology platform for point-of-care diagnostics, capable of simultaneous genomic and proteomic detection, with embedded communication abilities for direct interfacing with hospital information systems. Developed initially to provide a low-cost portable system for the diagnosis and monitoring of coeliac disease, the CD-MEDICS technology platform will be exploitable in a diversity of applications. It should contribute to the advent of a more individualised medicine where diagnostics and treatment go hand in hand.

Coeliac disease (CD) affects 1 in 100 genetically predisposed individuals who develop a small intestinal inflammation (enteropathy) on exposure to dietary gluten. Symptoms can include bloating, abdominal pain, nausea, constipation, diarrhoea, wind, tiredness, anaemia, headaches, mouth ulcers, recurrent miscarriages, weight loss, skin problems, depression, joint or bone pain and nerve problems.

Fortunately all these problems can be reversed with a gluten free diet.

Diagnosis can be difficult as many doctors are not aware of the disease and the symptoms often lead to misdiagnosis. This can result in inappropriate treatments, hospitalisation, and the use of unnecessary drugs. Current invasive procedures for diagnosis of coeliac disease require a biopsy of the intestine, which is time consuming and uncomfortable for the patient, and it is not unusual for it to take over eleven years for an accurate diagnosis of coeliac disease.

It is reported that for every positive diagnosis of coeliac disease, there are seven undiagnosed.

How much better it would be to have a tool for screening of the population for coeliac disease, simply using a finger prick obtained blood sample? An easy-to-use point of care test for use in the primary care setting, would provide better opportunities for early diagnosis and allow periodic monitoring of the patient's compliance with a gluten-free diet.

A combination of serology and HLA-typing is a possible route for a definitive screening test for coeliac disease; a combined diagnosis accounting for symptomatic, silent and latent CD patients aiming for a 100% specificity and sensitivity.

An ICT project called CD-MEDICS (Coeliac Disease Management Monitoring and Diagnosis using Biosensors and an Integrated Chip System) is tackling this grand challenge.



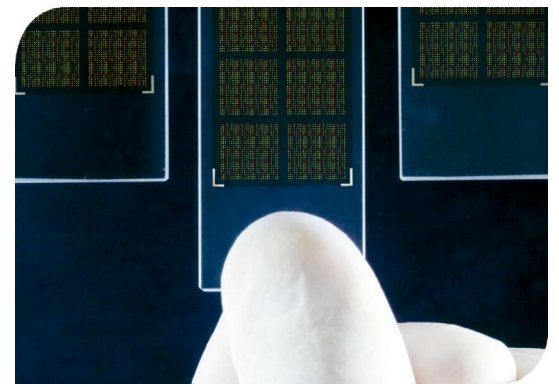
CD-MEDICS contributions and health benefits

Given recent breakthroughs in bio-, micro-, and nanotechnology, the CD-MEDICS consortium views miniaturisation as the way to go towards the development of labour- and cost-effective solutions for routine diagnosis. CD-MEDICS will build on these advances to develop a point of care, low-cost, disposable, intelligent, non-invasive diagnosis microfluidic cartridge that will contain assays, reagents and sensors, for primary diagnosis and subsequent monitoring of the disease. This cartridge will be inserted into and controlled by an instrument that will analyse the data from the sensors and provide the information to the clinician. The instrument will be capable of seamlessly operating in all point-of-care-driven environments (e.g. clinical laboratories, hospitals and physicians' offices.) and transparently communicating with existing Hospital Information Systems (HIS) and patient's Electronic Health Record (EHR). Once developed the evaluation of the complete system will take place in a hospital environment, using samples from patients.

Accurate and reliable diagnosis together with dietary monitoring are a must for the well-being of CD patients.

The CD-MEDICS project brings together a unique combination of skills and disciplines - from experts in biosensors to microfluidics and from information technology to the commercial exploitation of antibody and genetic testing. Harnessing these skills, the project will share expertise across the disciplines with a series of training workshops aimed at researchers and technicians across Europe. Engaging healthcare professionals with the potential of the new technology will also be a key feature of the project. As a practical tool which will allow the healthcare professional to proactively investigate and manage coeliac disease, the technology will prompt a better recognition of the needs of coeliac patients and the potential for diverse technologies to enhance healthcare.

The rapid dissemination of the innovative screening technology as well as an increase in awareness of CD amongst primary health workers is required to gain the utmost advantage from the screening method. CD-MEDICS is wholly dedicated to dissemination and synergies and collaborative activities with other CD related research will be identified. A series of roadshows will be organised to obtain the necessary feedback from other researchers and end users as well as participation in conferences, trade fairs and publications.



AT A GLANCE

Official title:
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- Greece: Intracom S.A. Telecom Solutions and Microsystems-Microfluidics for Genetic Tests S.A.
- Ireland: Valentia Technologies
- Italy: Eurospital SPA and Fondazione IRCCS Policlinico San Matteo
- Belgium: Association of European Coeliac Societies
- Slovenia: Maribor General Hospital
- Spain: Asociación de Celiacos de Madrid
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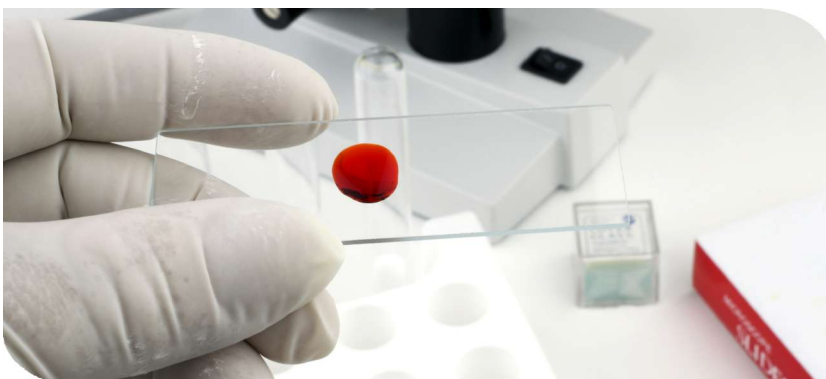
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