

IMPROVED

Personalised medicine for pregnant women: novel metabolomic and proteomic biomarkers to detect pre-eclampsia and improve outcome (IMproved Pregnancy Outcomes by Early Detection)

Background

Of the estimated 50 million babies who are born to first time mothers worldwide every year, 2.4 million are in the 27 EU countries. Almost 1 in 20 of these pregnancies are complicated by pre-eclampsia, a disease of late pregnancy characterized by the concomitant occurrence of hypertension and proteinuria.

The condition is associated globally with 70,000-80,000 maternal and over 500,000 infant deaths annually. For the mother it can lead to acute problems in the liver, kidneys, brain and the clotting system, and pre-eclampsia is the most important cause of maternal death in Europe accounting for 17-24% of all maternal deaths.

Two recent epidemiological studies have demonstrated that pre-eclampsia is associated with an increased risk of cardiovascular and metabolic diseases later in the mother's life. A quarter of the babies born to mothers with pre-eclampsia are growth restricted and a third are premature; pre-eclampsia accounts for occupancy of approximately 20% of neonatal intensive care unit costs. The child may have problems with neurocognitive development that can result in mild learning difficulties through to severe disabilities. Being born growth restricted also predisposes the child to cardiovascular disease (high blood pressure, heart attacks and diabetes) as an adult. Prevention of these health problems is of paramount importance to future mothers, fathers and children.

Objectives

Pre-eclampsia is a complex pathogenesis that requires a personalised medicine approach. The main goal of the IMPROVED project is therefore to develop a clinically robust predictive blood test for pre-eclampsia, using innovative technologies and utilising novel metabolite and protein biomarkers. This blood test is targeted to all first time mothers during early pregnancy to determine their risk for this major pregnancy complication.

Such a personalised medicine approach, that offers first time mothers accurate risk assessment for pre-eclampsia, will radically impact the provision of antenatal care, both in Europe and the rest of the world, and will reduce the clinical complications of the leading cause of maternal death in Europe.

Funding Programme:

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Project Duration:

01/11/2012 – 31/10/2016

Project Budget:

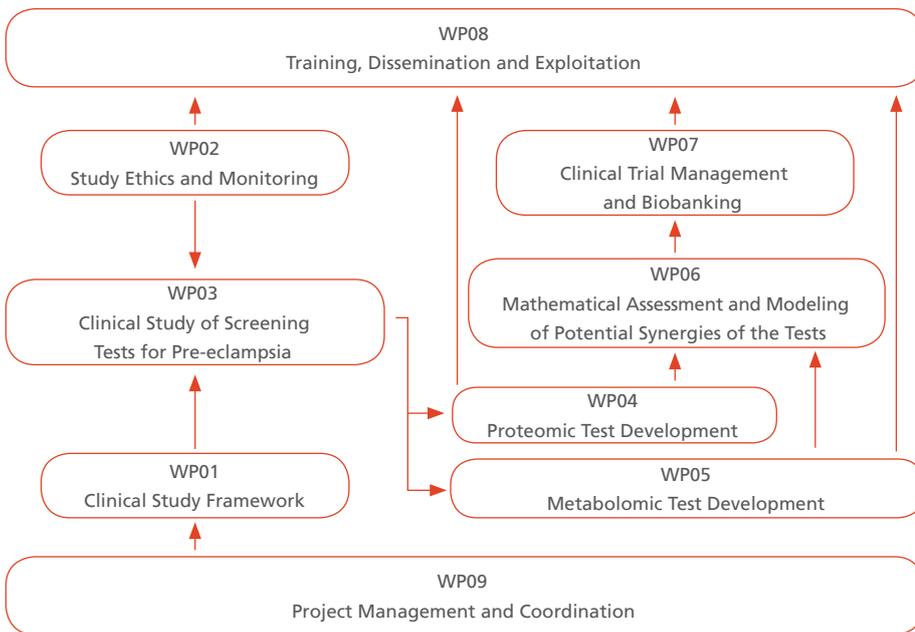
7.8 million euro

Project Website:

www.fp7-improved.eu

Activities

The IMPROVED project will develop a robust, sensitive, specific, high-throughput and economically viable early pregnancy screening test for pre-eclampsia.



Impact

The project will demonstrate that development and application of new and improved technologies in the respective fields of metabolomics and proteomics can lead to truly novel screening tests. These tests can significantly reduce the burden of individual patients as well as burden to healthcare costs and society of a major healthcare problem: Pre-eclampsia. IMPROVED will thus lead to:

- Uptake of personalised medicine into clinical practice – reducing the disease burden on mothers and babies
- Demonstration of the benefit of synergistic personalised medicine approaches
- Facilitation of high calibre research
- Development of novel treatment strategies
- Reduce healthcare costs
- Increase competitiveness of Europe in this area
- A positive impact in the relevant industry

Development of a predictive test and its application in a personalised medicine approach to stratify first time pregnant mothers would be a first and key step in the reduction and eventual prevention of the life-threatening complications of pre-eclampsia.

Project Coordinator:

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Project Participants:

- accelopment AG, CH
- Erasmus Universitair Medisch Centrum, NL
- Karolinska Institutet, SE
- Klinikum der Universitaet zu Koeln, DE
- MedSciNet AB, SE
- Metabolomic Diagnostics Ltd, IE
- Pronota NV, IE
- Region Hovedstaden, DK
- Rijksuniversiteit Groningen, NL
- The University of Liverpool, UK
- University College Cork, IE
- University of Keele, UK