Abstract
Basic metabolomics research has uncovered that combinations of blood borne metabolites can flag women early in pregnancy according to their risk of developing preeclampsia. Since then, a company has been established which is dedicated to translating this finding into a tool for health care providers and pregnant women. A targeted approach is being developed whereby metabolites of interest are (semi-)quantified using liquid chromatography-tandem mass spectrometry. Next, large scale verification and validation studies within dedicated prospectively collected biobanks will be performed to progress this multimarker assay and prediction algorithm.

Introduction
• Thus far preeclampsia risk prediction is mostly dependent on clinical risk factors, yet this risk prediction is inadequate for healthy first time pregnant women. With first time pregnancies accounting for >50% of all preeclampsia cases, there is a clear need for dedicated prediction tools.
• The complex pathogenesis of the syndrome, warrants a panel of biomarkers in order to predict preeclampsia in first time pregnant women.
• Kenny et al. from the University College Cork, Ireland found that accurate prediction of preeclampsia in 1st time pregnant women is possible using a panel of blood-borne metabolite present in plasma of ~15 weeks pregnant women.
• Metabolite analysis using a liquid chromatography-mass spectrometry platform (LC-MS) is well established in pharma (bioanalysis) and neonatal screening (‘heel prick”).
• A company was founded to further develop a metabolite-based preeclampsia risk stratification test on an LC-MS platform to deploy in clinical laboratories.
• A prototype LC-MS methodology has already been developed and is ready for application in clinical samples.
• Successful development of diagnostics requires access to intended population samples: public-private partnerships are in place with 2 large scale international prospectively collections of first time pregnancy biospecimens, i.e. Screening For Pregnancy Endpoints (SCOPE®1) and IMPoved Pregnancy Outcomes by Early Detection (IMPROvED®).

Methods
1. A product development plan was produced outlining the necessary technology development and validation phases.

2. Tech Phase 1: The original biomarker discovery study relied on metabolite profiling using a high-end LC-MS setup. To accommodate the large install base of quadrupole mass spectrometers (QqQ-MS) in clinical laboratories world-wide, a platform migration was necessary.

3. Tech Phase 2: For application into routine clinical laboratory practice a simple, reliable, automatable and cost-efficient sample preparation is required. This is integrated in a full analysis pipeline.

3. Tech Phase 3: Prior to subjecting precious biobank samples analysis, the analysis pipeline is field-tested on separate plasma samples obtained from pregnant women at 15 weeks.

Conclusions
Within Metabonomic Diagnostics key translational research steps are already taken to propel a promising metabolite panel for preeclampsia risk prediction early in pregnancy closer to the clinical arena.
All major components are in place to commence processing the clinical samples as available in SCOPE and IMPROvED biobanks.