Training the next generation of scientists for Maternal and Fetal Health

iPLACENTA is a major doctoral programme in Maternal and Fetal Health funded by the European Union. The 15 early-stage researchers in the programme are working with world-leading academics, clinics and industry partners in 10 European countries, forming a new network of international expertise.

The iPLACENTA fellows are involved in public events such as open days and visits to schools. They have a blog and show what they do in social media:

www.iplacenta.eu/blog

iPlacenta

The network

University of Dundee
St George's University of London
UCC University College Cork, Ireland
Università degli Studi di Torino
MIMETAS the organ-on-a-chip company
Katholieke Universiteit Leuven
institut cochin
Aston University Birmingham UK
Instituto de Investigación Sanitaria La Fe
Universität Rostock Traditio et Innovatio
Maastricht University

Partners

moor instruments innovation in microvascular assessment
FUJIFILM VISUALSONICS
FOSTER
Action on Pre-Eclampsia
University of Helsinki

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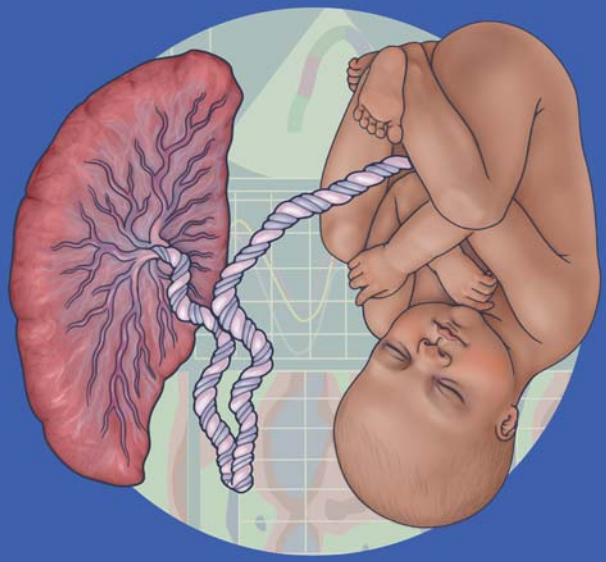

Innovation in modelling placenta for Maternal and Fetal Health

Funded by the European Union

Innovation in modelling placenta for Maternal and Fetal Health

Improving our ability to study, model and visualise the placenta

When the placenta fails to function normally, it can put the health and life of both the baby and mother at serious risk.

iPLACENTA is a network in which biologists, chemists, mathematicians, engineers and clinicians work together. The aim is to improve our understanding of both healthy and diseased placental development, in conditions such as preeclampsia and fetal growth restriction.

What are the underlying causes and the effects of these pregnancy complications on the mother and baby, and how can our research lead to better treatments?

First meeting of the iPLACENTA researchers at the University of Turin, 2019

In-vitro placenta modelling

There is no routine way to study the human placenta during pregnancy, which has so far restricted our ability to develop drugs to treat pregnancy disorders.

Gwenaëlle Rabussier, Camilla Soragni (Mimetas, The Organ-on-Chip Company) and **Agathe Lermant** (University of Dundee) are creating advanced cellular models in 3D and 2D to mimic the development of the placenta in healthy and complicated pregnancies and thus improve our ways of studying the organ in the lab.

Natalia Gebara (University of Turin) is investigating how the placenta produces extracellular vesicles. Extracellular vesicles go into the bloodstream and act as “messengers” between mother and baby. They can potentially be used to develop forms of diagnostics or therapeutic treatment.

Imaging placenta

New imaging techniques will provide ways to improve our assessment of the short-term and long-term effects of preeclampsia and fetal growth restriction on the cardiovascular system and other organs of mother and child.

Lukas Markwalder (University of Dundee) is an engineer working on in-vivo imaging devices to visualise blood flow and blood perfusion, that is the transportation of blood to the placenta and other organs. **Yolanda Correia** (Aston University) and **Ignacio Valenzuela Silva** (KU Leuven) are developing imaging techniques in preclinical models to study changes to blood flow in preeclampsia, and the consequences of fetal growth restriction for placenta, brain and lungs.

Clinicians **Anna Ridder** (St George’s Hospital, University of London) and **Gabriela Loscalzo** (Health Research Institute, Hospital La Fe) are developing methods using ultrasound to improve diagnosis of preeclampsia and fetal growth restriction. **Veronica Giorgione** (St George’s Hospital, University of London) is studying the cardiovascular health of women with preeclampsia with the aim of finding treatments that will decrease the risk of future cardiovascular disease.

Integrative placenta modelling

How can we combine available data from healthy and diseased placenta to identify causes of complicated pregnancies?

Clara Apicella (Institut Cochin/ Inserm) and **Jana-Charlotte Hegenbarth** (University of Maastricht) are using the latest genomic and transcriptomic tools to identify the genes that control placental function and may prevent healthy development. **Samprikta Manna** (University College Cork) is aiming to understand what leads to premature placental ageing in pregnancy complications.

Camino Ruano San Martin (Institut Cochin/ Inserm) focuses on the epigenetic factors (environmental factors such as lifestyle, diet, or stresses) that increase the risk of the two types of preeclampsia, occurring early and late in pregnancy.

Combining the data generated by her fellow researchers, **Julia Scheel** (University of Rostock) will develop a computational model that provides a “map” of diagnostic and prognostic markers of the two major pregnancy complications, preeclampsia and fetal growth restriction.