

1 Programme Reproduction and Perinatal Medicine

1.1 Objectives and research area

GROW Programme 4, Reproduction and Perinatal Medicine, was established in 2014 upon reorganization of the former division Developmental Biology. The current programme has developed from the former Division's Theme I Reproduction and Development and Theme II (Epi)genetics of Reproduction and Development.

When evaluating the past period (2012–2017) we will focus on the past four years (2014–2017), which covers the start of this new programme up until the end of 2017. In the last two years the strategy of the programme has been aligned with the strategic document for the Maastricht UMC+ specialty EVA (Erfelijkheid, Voortplanting en Aanleg (*Genetics, Reproduction and Development*)), which largely overlaps with GROW Programme 4.

1.1.1 Vision, mission and objectives

Vision

Our vision is that high quality care and research in reproduction and childhood are of vital importance in an ageing society. Integration of research, education and clinical care devoted to genetics and reproduction on the one hand, and pregnancy and childhood on the other can lead to this high quality.

Mission

The mission of the programme Reproduction and Perinatal Medicine is to study the normal and abnormal development of the human gametes, embryo and foetus in order to prevent and treat (hereditary) abnormalities at the (pre-)implantation stage. Furthermore, the programme focusses on the development of the foetus and the mother-child relation to ensure a healthy pregnancy and its outcome.

1.1.2 Strategy and research area

The initial strategy was to merge the previously separate programmes (Reproduction and Development and (Epi)genetics of Reproduction and Development), thereby creating more critical mass and stronger interaction between the investigators. Regular programme meetings were mainly organized to discuss each other's research initiatives and to explore common ground and priorities, while working on the specific recommendations of the 2012 External Review Committee. During that same period the Maastricht UMC+ has identified EVA (Genetics, Reproduction and Development) as a 'specialty' within their strategic programme¹. Within this framework, the last two years (2016-2017), all investigators have been working together on a new strategic document for EVA, which also sets the goals for the GROW programme Reproduction and Perinatal Medicine. The ambition is to be recognized in 2020 as an international centre for early child development, with a clear

¹ 'Healthy living, Maastricht UMC+ Strategy for 2020', January 2015

research focus on the genetic and epigenetic factors that determine a child's development. The provisional name for this Centre is the Comprehensive Centre of Reproductive Health.

The Maastricht UMC+ has been maintaining a strong profile in the area of reproduction for many years. The genetic research group within Programme 4 is a leader in the field. Maastricht UMC+ is the only licensed centre for Pre-implantation Genetic Diagnosis (PGD), which is carried out in collaboration with three transport-IVF clinics. Since 2017, Maastricht UMC+ is one of three official centres for Non-Invasive Prenatal Testing (NIPT) in the Netherlands. This offers unique opportunities for scientific research focused on foetal personalized medicine.

Programme 4 encompasses most of the aspects of the previous Developmental Biology Division of GROW but more collaboration and focus has been achieved.

The three research lines in the programme are:

- 1: The Healthy Embryo: PGD, Reproductive Genetics and Embryonal Development.
- 2: The Normal Placenta: Implantation and Placentation.
- 3: The Mother and Child at Risk: Periconception, Preeclampsia and Prematurity.

Parallel to these three research lines, the section Ethics (from the Department of Health Ethics & Society) within Programme 4 works on the development and fine-tuning of normative frameworks in the above mentioned areas (Healthy Embryo, Normal Placenta and Mother and Child at Risk). For Programme 4 these ethical frameworks form an intrinsic part of the translational research-chain, when it comes to the potential implementation of certain research applications.

Integrated epidemiological, epigenetic and ethical research programmes in combination with fundamental and translational research in the area of developmental biology connects the three research lines. Research on the long term effects of foetal influences (Developmental Origin of Health and Disease (DOHaD) or Barker hypothesis), on the effect of pre- and neonatal interventions and of pregnancy related diseases are examples of the impact of this research on the lives of mothers and children.

The programme is strongly connected within the Maastricht UMC+. Strong collaborations exist between PIs of several departments within the programme (especially Genetics, Gynaecology and Obstetrics, and Paediatrics) and between PIs of Programme 4 and other departments, such as Internal Medicine, Radiology, Cardiology, Neurology, Epidemiology, Psychology and Data Sciences. These collaborations have been strengthened by discussions about the research projects and by the development of the strategic [EVA document](#) (available at the GROW website). Furthermore there is multidisciplinary cooperation with the other FHML-Schools (CARIM, NUTRIM, CAPHRI and MHeNs), the research institutes MERLN and M4I, and the Departments of Pathology, Surgery, Human Biology, Biochemistry and Biology.

Analogous to the future Maastricht Comprehensive Cancer Centre (Maastricht CCC), the aim of programme 4/EVA is to establish a Comprehensive Centre for Reproductive Health (Genetics, Reproduction and Child Health), where the current Programme 4/EVA is responsible for the scientific research. The clinical counterpart is the current Woman, Mother and Child Centre including Clinical Genetics and a multidisciplinary group of paediatricians. For Programme 4 multidisciplinary collaboration in the area of research is of utmost importance. Analogous to the framework of the Woman, Mother and Child Centre, where various disciplines work together towards the common goal of healthy pregnancies and healthy children, researchers in the programme work in a multidisciplinary way to provide the best possible cardio-vascular outcome, neurological outcome etc., both in patient care, as well as in research.