

Amsterdam Reproduction & Development research institute

SUMMARY SELF-EVALUATION REPORT 2017-2022




Amsterdam Reproduction & Development research institute of Amsterdam UMC

The research institute Amsterdam Reproduction & Development (AR&D) was founded in 2016 in recognition of the fundamental importance of reproduction and development for the health of current and future generations. Amsterdam UMC is the only academic centre in the Netherlands with a research institute dedicated to reproduction and development, recognizing this formative period in life as the foundations for health.

AR&D is a collaborative research network embedded at Amsterdam UMC that connects researchers from two previous separate medical centres (VU University Medical Center and the Academic Medical Center), as well as affiliates from two universities, Vrije Universiteit (VU) and University of Amsterdam (UvA). AR&D is one of Amsterdam UMC's eight research institutes.

Over the review period 2017-2022, our strategic goals were to: [1] Increase internal coherence and connectivity of research groups working on human reproduction

and development; [2] Stimulate cutting-edge transdisciplinary research by bringing together expertise and approaches from different disciplines; [3] Increase scientific output and acquisition of (inter)national funds for research; [4] Expand our role as an (inter)national knowledge hub for guiding the responsible implementation of scientific developments in healthcare, to the benefit of society at large.



AR&D's mission is the advancement of knowledge in all aspects of human reproduction and development through interdisciplinary team science aimed at improving the health, from preconception to adulthood, of current and future generations.

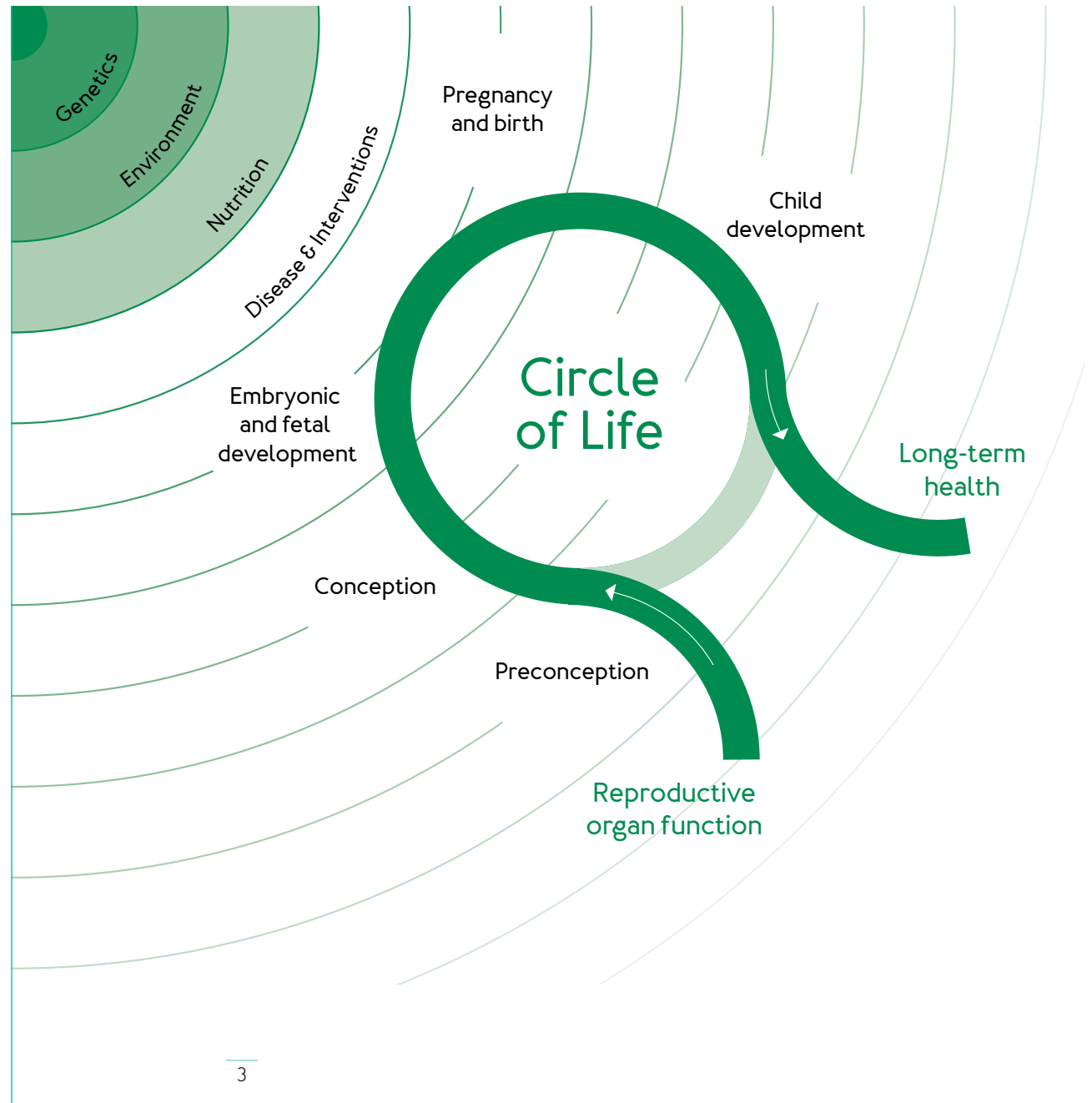
AR&D circle of life

Researchers at AR&D use different methodologies in basic, translational, clinical, and public health science involving human reproduction and development.

Our diversity strengthens scientific excellence and fosters the translation of new discoveries into clinical application and societal impact.

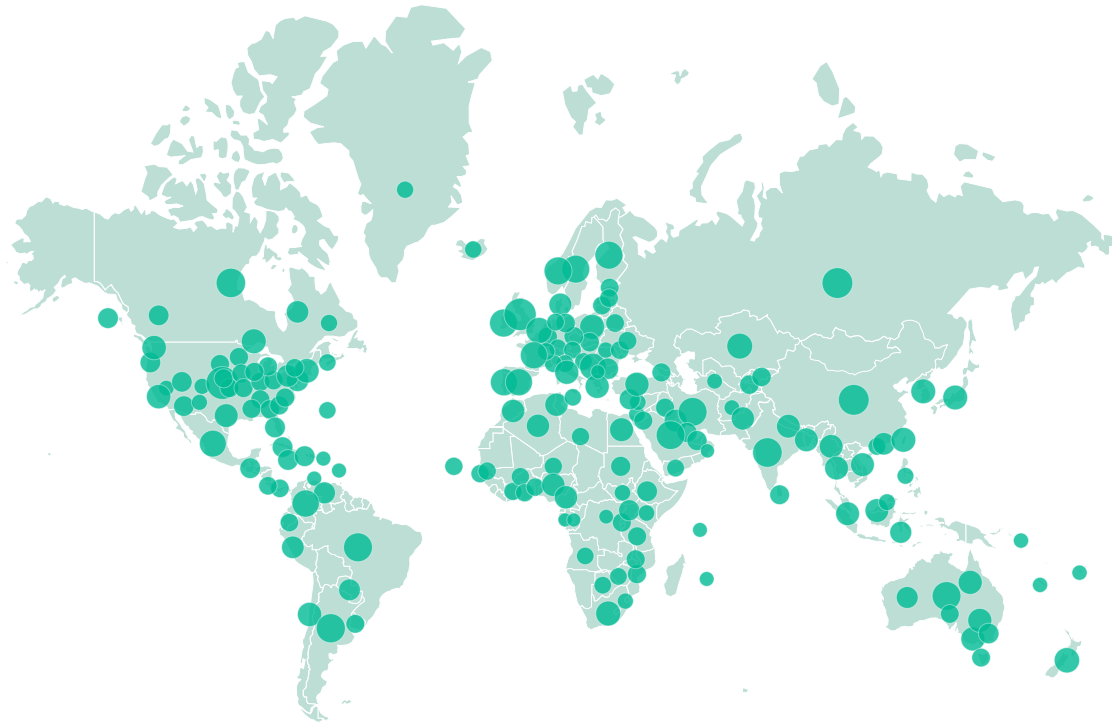
Our work is organized along four interrelated research areas of the circle of life: preconception and conception, embryonic and fetal development, pregnancy and birth, and child development.

AR&D offers support and encourages networking through seed grants, social activities, retreats, and symposiums. We also offer skill-building activities, courses and mentoring to support professional training and career development. AR&D's unique resources such as biobanks and cohorts help fuel our scientific research to understand human development, improve clinical care and public health.



AR&D facts

Research collaborations
(based on shared publications)



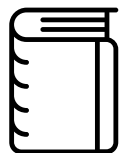
>500
Researchers



111
Principal
Investigators



250
PhD
candidates



53
PhD theses
(yearly)



>900
Publications
(yearly)
(80% open access)



€5,000,000
Funding (yearly)

Accomplishments

Over the review period 2017-2022, AR&D has worked hard to build bridges between disciplines and generations, connecting young and experienced scientists from various backgrounds to work together to learn and discover the intricacies of human reproduction and development in a vibrant and stimulating research environment.

These efforts are paying off. We have observed a steady increase in publication rates. Our researchers have been honoured with prestigious (inter)national prizes and obtained national and

international research grants, further underlining our leading role in this field.

Moreover, our research has been translated into policy and practice to actually build the foundations for healthier generations. Although our research and collaborations have been impacted by the COVID-19 pandemic and the logistics of centralization, we are proud of our members' resilience, flexibility and dedication to making a positive impact on society through science.

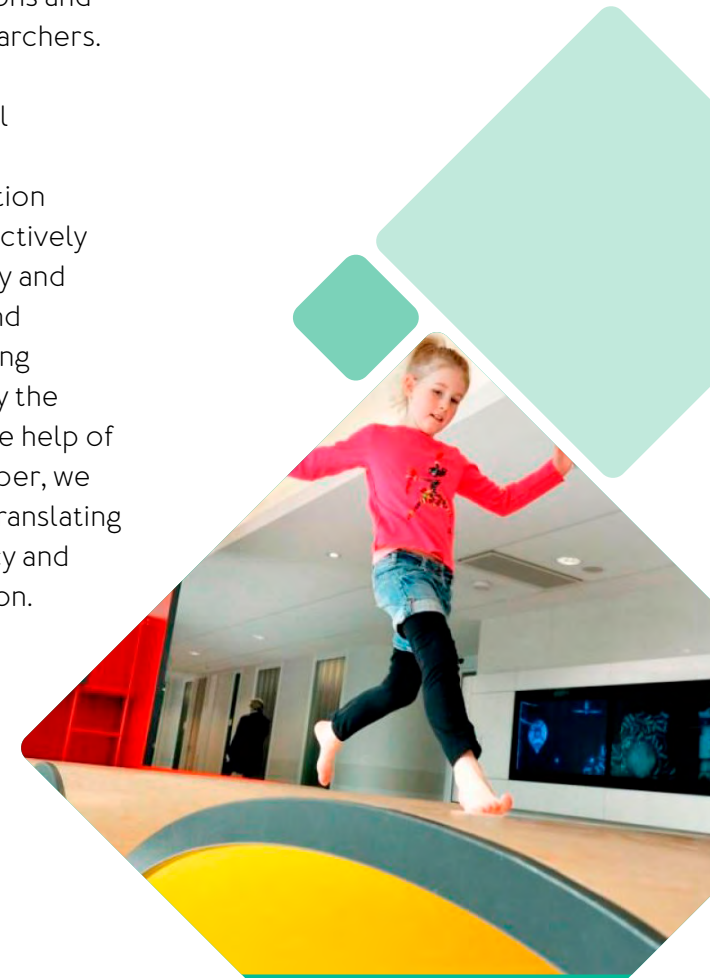


Strategy for the future

In the coming period, we will continue to work on improving our organization. We will better define and align internal organization in collaboration with Amsterdam UMC to streamline operations and optimally support our researchers.

We will continue to channel resources to stimulate transdisciplinary collaboration and team science. We will actively shape our research strategy and strengthen our scientific and societal impact by addressing serious challenges faced by the world today. Finally, with the help of a dedicated impact developer, we will strategically focus on translating scientific findings into policy and practice through valorization.

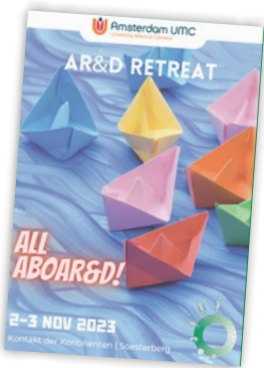
With this strategy, we are inspired to continue to realize our vision of continuous and sustainable improvement in health for all.



Examples of AR&D highlights

Annual AR&D Retreat

To ensure that affiliated researchers feel connected to the institute, AR&D annually organizes an inspiring two-day retreat event. As PhD researchers represent the future of the institute, they take the lead in the organization. The retreat serves a threefold purpose: (1) to learn more about the reproduction and development research field, (2) to create connections between AR&D researchers linking different departments and disciplines, and (3) to facilitate personal growth and the development of soft skills. These retreats exemplify AR&D's core function as a networking organization.



The Mystery of Twinning: Netherlands Twin Register

From one egg to two, the occurrence of identical twins arises in about one in 250 pregnancies. Yet, for a long time the mystery surrounding their origins remained unresolved. The Netherlands Twin Register, a unique longitudinal cohort, enabled AR&D researchers to reach a major breakthrough in the evolutionary mystery of multiple births. The discovery not only enhances our comprehension of twin formation but also opens doors to other research endeavors stimulating new collaborations between AR&D research groups.

Video:

[See video on the mystery of identical twins.](#)

Info:

[Tweelingenregister.vu.nl](https://tweelingenregister.vu.nl)

EpiSign: Improving Diagnostics in Rare Genetic Disorders

Although the identification of the underlying genetic causes of inherited disorders is rapidly improving, many patients and their families still experience prolonged diagnostic journeys, delaying proper care and treatment. However, for some patients, there is good news. Supported by an AR&D grant, the newly developed EpiSign test enables the identification of epigenetic DNA changes, chemical modifications that do not change the DNA sequence, but do affect whether genes are turned on or off. The test greatly improves the correct diagnosis of patients with rare congenital disorders caused by such changes. Its clinical launch advances our strategic goal of responsibly implementing scientific advancements in healthcare for the greater benefit of society.

Info:

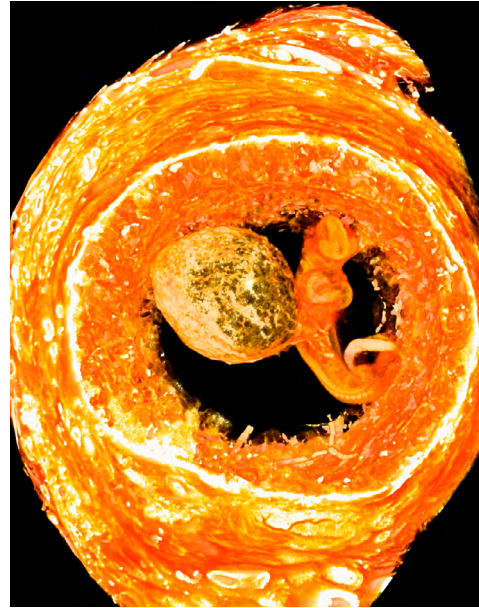
genoomdiagnostiek.nl



The 3D Human Development Project: Rewriting textbooks on human development

Truly understanding the earliest phases of human development requires extraordinary approaches and creativity. Supported by various AR&D grants, the researchers involved in this initiative have carefully built unique resources that offer an entirely novel portrayal of early human developmental phases. Together, the 3D Embryo Atlas, the Dutch Fetal Biobank and the 3D Fetal Atlas form a flagship project for AR&D. This 3D Human Development project serves as a powerful illustration of our commitment to facilitating cross-departmental collaboration of researchers, with the overarching objective to provide a new and completely unique view on the earliest phases of human development.

Info:
3dhumandevelopment.com



First ever image of a 6-week human embryo. [Source](#).

NIPT: Changing the Prenatal Screening Landscape

For many years scientists dreamt about the possibility of a non-invasive prenatal test (NIPT) with no harm to the fetus. The NIPT uses fetal DNA in maternal blood, enabling the detection of chromosomal conditions in the fetus. The NIPT is accurate, though not diagnostic, and significantly diminishes the necessity for invasive procedures that carry a small yet definite risk of miscarriage. AR&D researchers were involved in the development and implementation of NIPT in the Netherlands. Their studies led to the responsible introduction of this test, now accessible to all pregnant women free of charge. As such, NIPT exemplifies AR&D's strategic objective to benefiting society at large.

Video:
[See video on TRIDENT studies.](#)

Info:
NIPTconsortium.nl

H2Oil study: Mixed methods research covering the entire circle of life to establish safety of reproductive techniques

The H2Oil study stands as a clear example of how the collective effort of experts from different fields can create results that are more than the sum of their parts. Supported by an AR&D grant, this transdisciplinary initiative brings together experts from reproductive medicine, obstetrics, child psychology, paediatric endocrinology, and developmental epidemiology. The study covers the full circle of life from before conception, through fertilization, pregnancy, birth and child development. It initiated collaborations between different departments that would not have started without the grant, it catalyzed mixed methods research and has led to several further research projects.

Info:
h2olie.nl

Advancing research in human
reproduction and development
to improve the health of current
and future generations

Amsterdam UMC in collaboration with Vrije Universiteit Amsterdam and the University of Amsterdam

