Amsterdam UMC

IMPROVING HEALTH

CIRCLE OF LIFE

AMSTERDAM REPRODUCTION AND DEVELOPMENT

ANNUAL REPORT 2024

2024

REPRODUCTION

SOCIETAL IMPACT

DEVELOPMENT

RESEARCH

Contents

Amsterdam Reproduction & Development
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A word from the director

It is with pride and enthusiasm that we present the 2024 Annual Report of the Amsterdam Reproduction & Development research institute. This report is a reflection of the dedication, innovation, and collaborative spirit that defines our institute and drives our mission to improve health across the human life cycle.

The year 2024 has been marked by remarkable progress and significant contributions from our diverse team of scientists, clinicians, and support staff. Within these pages, you will find highlights of the impactful research conducted across some of our core areas – from advancements in prenatal diagnostics and novel tissue engineering approaches for gynecological conditions to crucial insights into preterm birth and the long-term health of children born with complex conditions. While this report highlights key achievements, it represents only a fraction of the extensive work and dedication from our affiliated researchers. Given the sheer volume and impact of their contributions, presenting merely a selection feels like an understatement of their collective achievements. We are proud of the recognition received by our researchers, such as the Societal Impact Award for the vital work in women's health, underscoring the commitment to translating research into tangible societal benefits. The success of our events, including the symposium focused on sustainability in research and the retreat exploring the potential of Artificial Intelligence, further illustrates the dynamic and forward-thinking environment of the Amsterdam Reproduction & Development research institute.

We would like to thank Lidewij Henneman for her leadership and unwavering commitment during her time as director. Her vision and dedication have significantly shaped the institute and fostered the collaborative culture that is so central to our success. We look forward to building on the foundation that she laid out.

Looking back at the inspiring achievements of 2024, we are filled with renewed energy and eagerness for what lies ahead. The progress detailed in this report only strengthens our goal to pursue scientific excellence and impactful translation. As we move into 2025, our theme, "Shaping Tomorrow's Health Today", will guide us. We are excited to foster new collaborations and innovative research to actively shape a healthier future for generations to come. This is a team effort, and together, we are ready to take on the challenges and opportunities that await.

Sebastiaan Mastenbroek
Director of Amsterdam Reproduction & Development

Starting the Circle of life

The Amsterdam Reproduction and Development (AR&D) research institute was established in recognition of the fundamental importance of reproduction and development as the foundation for health across the human lifespan. As the Netherlands' sole academic medical center research institute singularly focused on this vital field, AR&D occupies a unique position within Amsterdam UMC. It serves as a collaborative network connecting researchers from the former VU University Medical Center and Academic Medical Center, as well as affiliates from both the Vrije Universiteit Amsterdam and the University of Amsterdam. AR&D is one of Amsterdam UMC's eight distinguished research institutes.

Our work is organized around the interconnected stages of the human life cycle, covering four key research areas: preconception and conception, embryonic and fetal development, pregnancy and birth, and child development. We bring together a diverse community of scientists, clinicians, and specialists from various backgrounds, including basic researchers, epidemiologists, psychologists, social and behavioral researchers, and clinical laboratory specialists. Our affiliates are active in both clinical care and research, employing a wide range of methodologies from basic science to translational, clinical, and public health research. This diversity strengthens scientific excellence and fosters the translation of new discoveries into clinical application and societal impact.

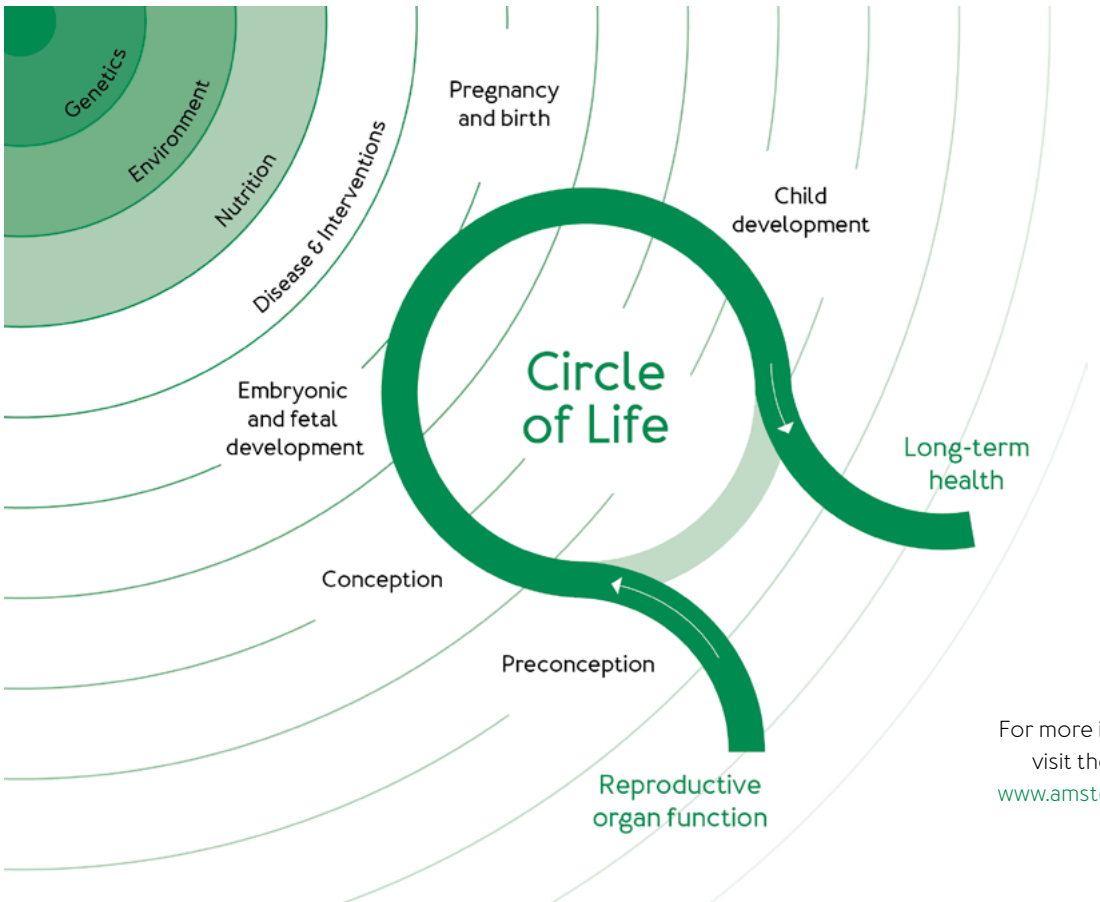
MISSION

The ambition of Amsterdam Reproduction & Development 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.

VISION

We are inspired by a vision of continuous and sustainable improvement in health for all. We aspire to play a role at the forefront of fundamental, translational, and clinical science and public health research in human reproduction and development, creating a knowledge hub to guide science that serves society.

Strategically, we are committed to stimulating cutting-edge transdisciplinary research and translating scientific findings into policy and practice through valorization, aiming to address serious challenges faced by society today. We actively support our researchers through initiatives like seed funding, networking events, and skill-building activities, leveraging unique resources such as our biobanks and cohorts to fuel scientific discovery.



For more information please visit the website of AR&D: www.amsterdamumc.org/ard.

AR&D and society

VALORIZATION AND IMPACT: 'CREATING VALUE FOR SOCIETY'

Our mission at the Amsterdam Reproduction and Development research institute goes beyond advancing scientific knowledge. We are also committed to ensuring that our acquired knowledge and expertise improves the health of current and future generations. This requires effective transformation of our research insights into 'impact' that benefits society and improves public health. This process is known as valorization and it is implicitly at the heart of everything we do. Yet, many of our researchers are unfamiliar or vaguely familiar with the concept. It is not well-anchored in the organization, despite the fact that valorization is a specific core task of Amsterdam UMC, next to care, research, and education & training. Therefore, for the first time, we have dedicated a separate chapter to 'Valorization and Impact' in our annual report. To inform our researchers about what valorization is, why it is important, the opportunities it brings, and what support is available.

WHAT IS VALORIZATION?

'Valor' in Latin means *'value'* and *'-ize'* means 'to make'. So 'to valorize' or 'valorization' is best described as *'to make or create value'* or *'the making or creation of value'*. In the setting of our research institute, and in line with our mission, value is created from the scientific knowledge and expertise we collectively generate by transforming our insights into suitable applications or solutions (e.g. innovative medical products, treatments, services, processes, policies, educational tools) that address and positively impact real-world, societal needs.

WHY IS VALORIZATION IMPORTANT?

In a world facing complex health challenges, valorization is important for several reasons:

- It ensures that academic research delivers tangible solutions;
- It connects researchers within academia with industry partners, policymakers, and civil society, creating an ecosystem where innovation can thrive;
- It contributes to generating (research) revenues for Amsterdam UMC and its researchers;
- It enhances research opportunities by opening doors to new collaborations, funding sources, and interdisciplinary approaches beyond academic boundaries.

In addition, it may add to personal growth, career advancement and global recognition for individual researchers or research groups.

HOW IS VALORIZATION SHAPED?

To anchor valorization as a fourth core task in our organization, Amsterdam UMC

is currently in the process of shaping valorization. Following the launch of the Position Paper *'Valorization: from academic knowledge to societal impact'* in 2023, the Valorization Compass was presented in 2024. These documents outline Amsterdam UMCs definition of valorization, its mission, vision, and valorization strategies, and provide an overview of valorization tools and instruments. In addition, dedicated Impact or Business Developers from Innovation Exchange Amsterdam (IXA) have been specifically assigned to each of the eight Amsterdam UMC research institutes to support researchers in their valorization endeavors, and the institute in defining an institute-specific valorization strategy. Furthermore, IXA provides trainings and workshops for researchers to improve their valorization and impact skills. As such, a robust framework for valorization is provided to make our work more explicit, valuable, visible and, thus, more impactful for society.

AR&D AND VALORIZATION IN 2024

At AR&D we recognize that the knowledge created within our institute has the potential to transform healthcare practices, influence policy, and empower individuals to enhance the health of current and future generations. Therefore, in 2024, we stepped up on our valorization efforts to increase the societal impact of our research and make it more explicit and visible.

First of all, our newly appointed impact developer, Eline van Dulmen-den Broeder, has picked up the process of taking stock of valorization efforts and opportunities within our institute in continuation of a previously performed assessment. Some AR&D researchers have shown to be particularly skilled in translating their research findings into policy and practice and have therefore made a significant contribution to society in the past year. All successful valorization efforts within our institute have been shared and disseminated through social media, website, newsletters, symposia, podcasts, video's and retreats to increase visibility.

"Valorization is not just a process; it is a mindset, a commitment to making science work for society."

To support our researchers in their valorization efforts, relevant trainings and workshops, organized by IXA, have been partly funded by AR&D. This year two AR&D researchers completed the IXA Impact Program and learned about ways to increase the societal or economic impact of their research. Finally, based on the robust valorization framework provided by Amsterdam UMC and the input from AR&D researchers on their knowledge and needs regarding valorization, Eline is currently developing an institute specific valorization strategy adapted to its specific focus areas. In the meantime, she is available for all your questions and support regarding your valorization efforts. Because don't forget, valorization is not just a process. It is a mindset, a commitment to making science work for society. Let's work on it together!

Societal Impact Award

Judith Huirne, Professor of Benign Gynecology at Amsterdam UMC and affiliated with the Amsterdam Reproduction and Development research institute, has been honored with the Amsterdam UMC Societal Impact Award. She received the award for her groundbreaking research on women-specific disorders and her tireless efforts to raise awareness about their societal and economic impact.

Since the beginning of her research career at Amsterdam UMC in 1998, Judith has been committed to improving women's health. She quickly recognized the alarming knowledge gap in women-specific conditions, such as hormonal imbalances, uterine disorders, and fertility issues. Despite the fact that nearly all women experience at least one of these conditions—often causing significant discomfort, infertility, or long-term sick leave—research in this field has long been neglected. As a result, most treatments offer only symptom relief, with few targeted and side-effect-free therapies available.

Judith's research has significantly advanced the understanding of hormonal regulation and the underlying causes of uterine disorders. Her work has led to major improvements in diagnostics and treatment options, transforming the lives of millions of women. An example of her contributions was identifying long-term complications after caesarean sections as a distinct disorder. Affecting up to 40% of women post-caesarean, this condition causes heavy menstrual bleeding, chronic pain, and infertility. Judith developed new diagnostic tools, international guidelines, and innovative surgical treatments to address and prevent these complications.

She also leads pioneering research into adenomyosis and fibroids—common yet underdiagnosed disorders affecting 25-40% of women. These conditions often result in excessive bleeding and infertility, but diagnosis typically takes seven years and multiple healthcare visits. To address this, Judith and her team developed mobileHealth tools to guide women on when to seek help, advanced imaging techniques for specialists, and strategies to match patients with the right minimally invasive therapies. Recently, she demonstrated the effectiveness of a promising new therapy for adenomyosis in mice, offering hope to women whose only current options are hormonal suppression or hysterectomy—both unsuitable for those wishing to conceive.

Judith's impact goes far beyond her research activities. Her advocacy has fundamentally shifted national awareness of women's health. Following her team's work, the Dutch Minister of Health visited Amsterdam UMC and allocated millions of euros to women's health research. The Dutch Parliament has based on her work mandated a national strategy. Her findings that, just three prevalent women-specific disorders cost over €7 billion annually in sick leave— underline the need for urgent action. It does not only provide options for money saving but it is also urgent given the unneeded national staff shortages, particularly in healthcare.

Parallel to the required action needed from all stakeholders to improve Women's Health Judith also established a free clinic for cycle- and hormone-related conditions for female staff within Amsterdam UMC, supporting the well-being and productivity.

Upon receiving the award on January 9th, 2025, Judith expressed deep gratitude—not just for the recognition, but for the collaborative spirit that made it possible. She credited her colleagues, PhD students, nurses, clinical staff, and support teams, emphasizing that it is a privilege to work alongside such passionate and talented individuals.

Photography by Marieke de Lorijn

Judith Huirne

The UN Declaration on Future Generations

AND THE APPOINTMENT OF THE FUTURE GENERATIONS COMMISSIONER

Informed by scientific insights from AR&D research on how human beings are shaped by their environment during early developmental phases, and driven by a commitment to serve society through science, Amsterdam UMC has appointed its first Future Generations Commissioner. AR&D researcher and former director, Tessa Roseboom, will be tasked with ensuring that the interests of future generations are incorporated into current decision-making processes and actions.

Roseboom's research, which includes studies on individuals conceived and born during the Dutch famine of 1944-45, provides the first direct evidence that undernutrition during critical stages of human development has long-lasting effects on physical and mental health. Furthermore, there is growing evidence that these effects are transmitted across generations. Her work has deepened our understanding of how early environmental exposures shape human health and well-being. These findings demonstrate that, like all living creatures, humans are particularly sensitive to their environment during periods of rapid growth and development.

The implications of developmental plasticity for public health and society are profound. Roseboom's research has fueled her ambition to translate these scientific insights into tangible policy and practice. Her advocacy was instrumental in the Dutch government's launch of the Solid Start program and a nationwide movement aimed at investing in the first 1,000 days of life.

Roseboom argues that the healthcare system often focuses on treating diseases that stem from decisions made decades earlier, leading to costly and reactive interventions. By considering the long-term consequences of our actions—particularly for children yet to be born—we can prevent avoidable suffering, ease the pressure on the healthcare system, and save significant societal costs. The well-being of both current and future generations hinges on our collective willingness to act. Our decisions today will shape the world in which future generations grow up. It is our responsibility to define the legacy we wish to leave and lay the foundations necessary for future generations to reach their full potential.

> **"It is our responsibility to define the legacy we wish to leave and lay the foundations necessary for future generations to reach their full potential."**

As Future Generations Commissioner, Roseboom provided input on the UN Declaration on Future Generations and participated in the UN Summit for the Future in September 2024, during the adoption of the Declaration. While the ambitious goals set forth in the Declaration are promising, they must now be translated into concrete action. To facilitate this process, the Future Generations Commissioner will organize roundtable discussions between scientists, societal organizations and policymakers (at the global, European, national and local level). These discussions will identify the questions that need to be addressed for policymakers to make informed decisions—ensuring that the needs of current generations are met without compromising the ability of future generations to meet theirs. AR&D will be able to play a key role in providing the scientific evidence needed to demonstrate how human health is affected by exposures and interventions during the critical periods of human development that occur in early life. And provide insights into how we are shaping tomorrow's health by our actions and decisions today.

Tessa Roseboom

“Improving health across the lifecycle.”

RESEARCH AT AR&D

ARDA ARDUÇ AND EVA PAJKRT
Advancements in genetic diagnosis of prenatally suspected limb anomalies

JAYS SUETERS AND ZELIHA GULER
Translational Tissue Engineering for Gynecologic Conditions

LARISSA VAN DER WINDT AND MARTIJN OUDIJK
Tocolytic therapy

JULIE VAN DER POST AND DASJA PAJKRT
Long-term health outcomes in children born with HIV: the unique NOVICE cohort's decade-long insights

“The prenatal detection of upper limb anomalies remains challenging, with more defects being recognized when other structural anomalies are present.”

ARDA ARDUÇ AND EVA PAJKRT

Advancements in genetic diagnosis

OF PRENATALLY SUSPECTED LIMB ANOMALIES

In the Netherlands, prenatal screening is integrated into a government-led national program, primarily conducted in primary and secondary healthcare centers. All pregnant women are offered two structural anomaly scans: a second-trimester anomaly scan (standard since 2007) and, in a research setting, a first-trimester anomaly scan (introduced in 2021). These scans follow strict protocols and are performed by trained sonographers. In case of the suspicion of a fetal anomaly, women are referred to a fetal medicine unit for further evaluation. When the anomaly is confirmed, additional testing will be offered.

Eva Pajkrt

Arda Arduç

Prenatal detection of congenital anomalies presents significant challenges due to the complexity and variability of phenotypic expression. The studies by Eva Pajkrt, professor of Obstetrics and Fetal Medicine, and PhD candidate Arda Arduç provide insight into the phenotype-to-genotype characterization limb anomalies, highlighting the diagnostic advancements in improving prenatal detection and the importance of genetic counselling.

GENETIC INSIGHTS INTO UPPER LIMB ANOMALIES

Upper limb anomalies, including polydactyly, syndactyly, and reduction defects, can have various genetic and non-genetic etiologies. Our retrospective cohort study analyzed 561 cases, comparing prenatal and postnatal diagnosed cases. When other structural anomalies were present, upper limb anomalies were more easily recognized prenatally. In this non-isolated prenatal group, genetic syndromes were significantly more often present compared to the isolated cases and the postnatal cases. Moreover, the results show that prenatal identification of minor limb anomalies of the hands remains difficult, with only 31% of polydactyly cases and 17% of syndactyly cases being detected before birth.

THE ROLE OF WHOLE EXOME SEQUENCING AS GENETIC TOOL IN FETUSES WITH ARTHROGRYPOSIS MULTIPLEX CONGENITA

Arthrogryposis multiplex congenita (AMC) is a spectrum of rare conditions with heterogeneous causes characterized by multiple congenital contractures. Prenatal detection is challenging due to its wide-ranging phenotypic spectrum. For our

“Advances in perinatal genetic testing, have enhanced our ability to determine the genetic etiology of AMC in half of the fetuses with multiple contractures.”

15-year cohort study we investigated 64 cases between 2007 and 2021 with prenatally suspected AMC. This study showed that the introduction of Whole Exome Sequencing (WES) increased the genetic diagnostic yield over time from 14 to 50%.

CONCLUSION

Detecting minor upper limb anomalies with prenatal ultrasound remains demanding. However, once diagnosed, advancements in invasive prenatal testing have greatly improved the chance of identifying the underlying genetic cause. Continued research and technological developments will enable more parents to make informed decisions through clearer prognostic guidance and reproductive options. Currently, we are working on a study where we evaluate the benefits of WES in apparently isolated clubfeet.


“Tissue engineering stands at the frontier of women’s health with its potential to benefit patients by bridging scientific innovation and clinical care.”
ELISA
Thermo
eppendorf
Centrifuge 5425 R
XILTRIX

JAYS SUETERS AND ZELIHA GULER

Translational Tissue Engineering for Gynecologic Conditions

Tissue engineering represents a rapidly evolving interdisciplinary field that aims to restore, maintain, or enhance tissue function by integrating biomaterials, cells and bioactive signals. While its application in gynecology remains relatively nascent, this innovative approach offers tremendous potential for addressing a spectrum of gynecological conditions, including pelvic floor disorders, birth-related complications, uterine scarring following Cesarean sections, and various organ dysfunctions. The research team led by Zeliha Guler, assistant professor Nanoscience and Nanoengineering, including PhD candidate Jays Sueters, has pioneered translational tissue engineering research focusing on developing clinically viable solutions to improve patient outcomes.

“A tissue-engineered matrix from human vagina wall offers an organ-mimicking solution to prevent current complications with grafts made from skin, intestine or peritoneum.”

PREVENTIVE AND THERAPEUTIC TISSUE ENGINEERING APPROACHES FOR PELVIC FLOOR DISORDERS

Pelvic floor disorders (PFDs) represent a significant global health challenge affecting millions of women. These disorders, including pelvic organ prolapse, urinary incontinence, and fecal incontinence, pose substantial societal and economic burdens. Aging populations and changing lifestyles will increase PFDs, highlighting the need for effective prevention and treatment.
Vaginal childbirth is the main cause for PDFs and the primary mechanism of pelvic floor damage during vaginal birth involves tissue overextension, leading to rupture of musculature, connective tissue, and nerve fibers. Dr. Guler conceptualizes pelvic disorders through a wound healing framework [Guler and Roovers, Biomolecules, 2022], conducting sophisticated tissue engineering research that utilizes diverse in vitro and in vivo models to develop innovative solutions. Dr. Guler focuses on understanding the mechanisms of birth-related trauma, early treatment of damaged pelvic tissue to prevent later PDFs by improving wound healing with the help of injectable biofunctional hydrogels or treatment of pelvic organ prolapse by using degradable implants for enhanced tissue regeneration and improved biomechanic of the pelvic floor [Guler et.al., Int.Urogyn.J, 2004].
She collaborates with clinicians, material scientists, and patient organizations believing a multidisciplinary approach benefits patients awaiting treatment for gynecological issues. Dr. Guler cares deeply about innovation and creating an impact through her research. After she won the Amsterdam Science and Innovation Award (2023) with her wound healing impact, AR&D supported her journey on impact development through an extensive Impact Program by IXA.

Jays Sueters

Zeliha Guler

TISSUE ENGINEERING A NEW GRAFT FROM THE HUMAN VAGINA WALL

The vagina can be absent or dysfunctional due to various conditions such as cancer, physical trauma, genital mutilation and gender incongruence. Approximately 300 Dutch individuals annually opt for surgical reconstruction of a vagina, which is typically made from a piece of the patient's skin, intestine or peritoneum. However, these tissues are different in properties and function and thus cause issues like graft shrinkage or excessive lubrication. At the same time, donor grafts carry risk of immunorejection and transmission of diseases and infections. To solve these problems, AR&D researcher Sueters developed a new tissue-engineered vagina graft (Sueters et.al., Int.J.Surg., 2023).

Healthy vagina wall tissue was collected from transmasculine donors who were in medical transition, and cells with their DNA were chemically removed to form a graft. By seeding it with cells from the recipient, a graft that resembles the natural vagina in biological composition, structure, elasticity, strength and morphology was developed. This could offer exciting new opportunities for future vagina transplantation.


“Delaying birth does not necessarily result in better outcomes for the infant.”

LARISSA VAN DER WINDT AND MARTIJN OUDIJK

Tocolytic therapy

Preterm birth is the leading cause of neonatal morbidity and mortality worldwide. Tocolytic drugs have been used since the 1950s, under the assumption that prolonging pregnancy and delaying birth would result in better outcomes for the child. Tocolytics are therefore recommended in many international guidelines. However, substantial evidence for this assumption was lacking.

> “Standard use of tocolytics as treatment for threatened preterm birth between 30 and 34 weeks should not be recommended.”

THE APOSTEL 8 STUDY

Therefore, the international multicenter randomized placebo-controlled APOSTEL 8 study was conducted, investigating the effectiveness of atosiban (a tocolytic drug) versus placebo in women with threatened preterm birth from 30 through 34 weeks gestation. The APOSTEL research line of the preterm birth research group systematically evaluates diagnosis and treatment of preterm birth. The primary outcome was a composite of severe adverse neonatal outcomes.
The principal investigator of the study was AR&D researcher Martijn Oudijk, professor of Obstetrics. After seven years of hard work, with the help of colleagues from 24 hospitals from the NVOG consortium and 2 international sites, the study was completed, after the recruitment of 755 participants with 884 infants. The study showed that atosiban did not reduce adverse neonatal outcomes compared to placebo and concluded that tocolytic drugs should not be recommended in case of threatened preterm birth above 30 weeks gestation.

PRESENTING THE FINDINGS

In January 2025, AR&D researcher Larissa van der Windt (PhD candidate in obstetrics) presented the results of the study in the openings session of the Society for Maternal-Fetal Medicine Pregnancy Meeting in Aurora, Colorado. This is the largest obstetric conference focused on maternal-fetal

Martijn Oudijk

Larissa van der Windt

research and treatment. The study was awarded with the Bruce A. Work Award for Best Research by a Practicing or Training Maternal-Fetal Medicine Physician outside of the United States. The results of the study were published in The Lancet.

IMPLICATIONS

"We believe that the primary goal of tocolysis should not be prolongation of pregnancy, but improvement of neonatal outcomes" says Larissa van der Windt. "Our results demonstrate that atosiban is not superior to placebo. This questions the widespread use of atosiban and other tocolytics as treatment for threatened preterm birth from 30 through 34 weeks gestation in many countries. While our findings may seem counterintuitive – since delaying birth does not necessarily result in better neonatal outcomes – they highlight a deeper conflict: not only between belief and evidence, but, more importantly, in the ongoing challenge of preventing preterm birth." The preterm birth research group of the Amsterdam UMC is currently performing a long-term follow-up of the APOSTEL 8 study and considering assessing the effectiveness of tocolytic drugs at lower gestational ages, which would be the APOSTEL 9 study. "After all, there were 12 apostles, so the research line continues!".

“The fight against HIV doesn’t end with viral suppression; as the virus persists in the brain and beyond.”

JULIE VAN DER POST AND DASJA PAJKRT

Long-term health outcomes in children born with HIV

THE UNIQUE NOVICE COHORT'S DECADE-LONG INSIGHTS

Combination antiretroviral therapy (cART) has significantly improved the survival of children with perinatally acquired HIV (PHIV). Neurological, cognitive, and cardiovascular impairments remain prevalent despite treatment in this already vulnerable population. PHIV patient care can only be improved by understanding the mechanisms that cause these health complications. A key strength of the NeurOlogical, Visual and CognitivE performance (NOVICE) cohort is the decade-long follow up time of PHIV children compared to a well-matched control group in combination with extensive outcome measures.

Julie van der Post

Dasja Pajkrt

The Amsterdam UMC's multidisciplinary collaborations enabled Dasja Pajkrt, professor of Viral Pediatric Infectious Diseases, and PhD candidate Julie van der Post to combine neuroimaging outcomes, neuropsychological assessments, participant-reported outcomes, clinical data with immunology and laboratory sciences, exemplifying a comprehensive approach. This has provided a unique, long-term insight into the mechanisms driving complications in PHIV youth, ultimately aiming to improve monitoring strategies and long-term healthcare outcomes.

NEUROCOGNITIVE AND CARDIOVASCULAR RISKS IN PHIV YOUTH

Despite viral suppression through cART, PHIV youth often experience cognitive impairments, including lower IQ, executive dysfunction, and academic issues. In collaboration with the Amsterdam UMC Pediatric Psychology department and the KLIK PROM portal led by Dr. Lotte Haverman and Dr. Hedy van Oers, we evaluated cognitive functioning and behavioral performance using neuropsychological assessments and validated cognitive questionnaires. By linking these outcomes to structural and functional brain differences observed in MRI scans, in collaboration with the Neuroradiology department with Dr. Anouk Schrantee, we revealed increased white matter hyperintensities, indicating possible neuroanatomical alterations. Selected biomarker studies further explored the role of systemic inflammation and neurodegeneration. Recent findings suggest that plasma neurofilament light —a marker of neuroaxonal injury—may not be directly associated with cognitive decline in PHIV adolescents. (Van Genderen et al. Neurology 2022, Van der Post et al. Viruses 2022).

PHIV youth also face a heightened risk of cardiovascular disease (CVD). Emerging evidence indicates endothelial dysfunction

> **"As we monitor the long-term effects of HIV on the developing brain and cardiovascular system, we will discover new approaches for treatment and care of PHIV children."**

and metabolic disturbances, similar to those seen in adults with HIV. NOVICE's longitudinal investigations help clarify these risks, assessing lipoprotein(a) levels and other vascular health indicators (Van Genderen et al. Viruses 2021). In collaboration with the Laboratory of Viral Immune Pathogenesis (LVIP) and Dr. Neeltje Kootstra and the Core Facility Metabolomics (CFM) with Dr. Fred Vaz at Amsterdam UMC, the NOVICE cohort investigates long-term changes in lipidomic profiles and disturbances in children born with HIV. The NOVICE cohort aims to blend clinical data—such as neuroradiology and psychology—with laboratory sciences to gain deeper insights into HIV's impact and enhance future treatment strategies.

BRIDGING SCIENCE AND CLINICAL APPLICATION

NOVICE has recently established international collaborations with Karolinska University (Dr. Ujjwal Neogi), a scientific institute with experience in omics research and HIV studies. This partnership allows for the incorporation of highly advanced molecular profiling techniques —such as metabolomics, proteomics, and transcriptomics— enabling even deeper exploration of neurocognitive and cardiovascular risks in PHIV youth. By combining our extensive clinical expertise with Karolinska's omics capabilities and knowledge as Amsterdam UMC research group, we not only gain new insights but also foster a valuable exchange of knowledge and methodologies that will benefit our research and care for patients at large.

Supported by AR&D and Stichting Zeldzame Ziekte Fonds (ZZF) and in collaboration with leading research institutions, NOVICE is at the forefront of translating scientific discovery into clinical applications and provides valuable insights that will add to future healthcare strategies for children born with HIV.

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AR&D events 2024

AR&D ANNUAL SYMPOSIUM

May 23rd, 2024

Everyone agrees that healthcare must become more sustainable. However, sustainability goes beyond just recycling or reducing plastic waste. Scientific research is all about the healthcare of tomorrow. By embedding sustainability in the research that we do, we can make healthcare sustainable in a future-proof way. At AR&D we embrace this philosophy and aim to promote sustainability in research. But how do you achieve this? On Thursday, May 23, the annual symposium **'The climate crisis and my research – How can I help?'** was held to address this topic.

Chairs **Wouter Hehenkamp** (Professor of Efficient and Sustainable Healthcare) and **Berber Kapitein** (Initiator of the Staff Council (in Dutch: medewerkersberaad) for Sustainable Mobility, Emma Green Team) organized a program to show PhD students and senior researchers how to integrate sustainability into their research. Whether you are conducting epidemiological, clinical, or translational research, or working in a laboratory, there is always something that can be done to work more sustainable.

The program began with Amsterdam UMC visiting professor **Hugh Montgomery** (program leader of the Lancet Countdown on planetary health), who compellingly

demonstrated why sustainability should be a top priority for everyone. Followed by **Anneke Kwee** from the ZEGG (Care Evaluation and Appropriate Use) program, who discussed the possibilities and necessity of embedding appropriate care as an important form of sustainable healthcare in research. **Aram de Haas** is committed to making laboratories more sustainable, including managing the LEAF program (see UCL). An example is the Freezer Challenge (see Freezer Challenge), which can save up to 30 percent energy without compromising the quality of stored tissue. Environmental scientist **Lynn Snijder** then explained how to measure environmental impact (CO2, or other environmental impact factors). Amsterdam UMC is taking important steps to simplify this with the 'Promeza tool' (developed in part by Lynn Snijder), but other methods such as Material Flow Analysis or a Life-Cycle Assessment (LCA) were also discussed. Finally, **Cristina Richie** (Lecturer in Ethics at

the University of Edinburgh) discussed how to view the question of healthcare limits through an ethical lens. The climate crisis is so severe and has such a concrete impact on human health that healthcare, as a significant emitter of greenhouse gases, must become more sustainable. This necessitates critical questioning whether to offer care that does not improve health and under what conditions.

In the panel discussion, most participants indicated that they saw ways to integrate sustainability into (part of) their research. A great way to implement this was the AR&D Sustainability Grant, announced during the symposium, with three types of grants to make research more sustainable. In addition, the **award ceremony** of previously won AR&D grants was also part of the symposium. Nine researchers received an AR&D Travel Grant, and six researchers were awarded an AR&D Seed Funding Grant.

Chairs Wouter Hehenkamp and Berber Kapitein looked back with satisfaction: "It was a successful afternoon where we inspired many researchers and provided practical tools on how to make research sustainable. If you want to integrate sustainability into your own research institute, contact one of the chairs or the Center for Sustainable Healthcare!"

AR&D MINI SYMPOSIUM

July 8th, 2024

On Monday, July 8, Dr. **Callista Mulde**r, Prof. **Ans van Pelt**, and Dr. **Geert Hamer** of the Reproductive Biology Laboratory (LVV) hosted a group of 15 prominent Japanese clinicians and scientists, including Katsuhiko Hayashi and Takashi Shinohara, both pioneers in the field of in vitro gametogenesis. While

some attended the ESHRE conference on human reproduction, embryology, and gynecology, others visited the Vrolik Museum with Geert Hamer.

Following this, a mini symposium on potential innovations and collaborations to preserve the fertility of prepubertal children undergoing gonadotoxic (cancer) treatment was held. Presentations were given by **Katsuhiko Hayashi, Takashi Shinohara,** and **Masahito Ikawa,** about the possibilities and risks of in vitro gametogenesis and large genetic screens. **Rod Mitchell, Ieva Masliukaite, and Andreas Meissner** presented the current progress on male and female fertility preservation in our clinics. The discussions highlighted the mutual learning opportunities and the potential for future collaborations to make safe fertility preservation for childhood cancer survivors a reality.

AR&D events 2024

AR&D LUNCH TALK MEETING

July 11th, 2024

On Thursday, July 11, AR&D held its first Lunch talk meeting on the future of human reproduction and reproductive techniques. The meeting was initiated and chaired by **Mandy Spaan** together with the AR&D team. This Lunch Talk Meeting **'The future of human reproductive techniques and it's safety'** aimed to share new knowledge about human reproduction and assisted reproductive techniques, but also to meet each other and increase opportunities for collaboration.

The meeting started with a presentation by postdoc and epidemiologist Mandy Spaan, who guided us through her journey from receiving an AR&D grant to an international research collaboration. Her research focuses on various long-term health outcomes in children conceived through assisted reproductive technologies, using national cohort data. Prof. **Michael Davies**, a reproductive epidemiologist from the University of Adelaide, Australia, shed light on research into the safety of assisted reproductive technologies and future prospects. In his presentation he emphasized the importance of long-term follow-up research, transparency and open science. Finally, **Geert Hamer**, associate professor, shared his intriguing work on the development of in vitro spermatogenesis, showing us the successes and difficulties of in vitro spermatogenesis, while taking into account the safety aspects when developing a new treatment.

AR&D RETREAT 2024

October 24th and 25th, 2024

This year's AR&D Retreat, held on October 24-25 at the Soesterberg venue Kontakt der Kontinenten, explored the theme of **Artificial Intelligence** (AI). Amid the growing public fascination with AI's potential and limitations, attendees gathered to examine how artificial intelligence can transform research and clinical applications.

The retreat began with keynote talks from four speakers. **Henk Marquering**, professor of Radiology, in particular Translational Artificial Intelligence at Amsterdam UMC, opened the session by reflecting on AI's evolution in healthcare, detailing the 'AI winters and summers' that shaped the field and cautioning against the overestimation of its immediate impact. He concluded with examples of successful implementations of AI in clinical settings. **Martijn Schut**, professor in translational AI in Laboratory medicine at Amsterdam UMC, followed with a discussion on the increasing complexity of AI models and the challenges of translating AI from research labs to clinical practice. **Elisabeth Kooi,** neonatologist and associate professor at UMC Groningen, presented a powerful case on the ethical and practical implications of using AI for end-of-life decision-making in neonatology. Lastly, **Beatrijs van der Hout,** assistant professor at

TU Eindhoven, shared insights into her work on an artificial womb, meant for extremely preterm born infants.

In the afternoon, PhD candidates presented research pitches evaluated by principal investigators of AR&D. After a competitive session, the top four finalists then presented in a plenary session, with **Maryam Khelil** winning the Best Pitch prize of €1000. Followed by the award ceremony for the AR&D Sustainability Grant, with Tamara Jannink and Esther Vermaas as winners. The first day closed with networking, a group dinner, and a social gathering.

The second day began with a choice of boxing/bootcamp classes or a Tai Chi session, allowing attendees to start the day energized or relaxed. Following breakfast, workshops were offered on topics such as Virtual Reality in healthcare, grant writing, research and AI, and the role of social media in research dissemination.

The retreat concluded with a panel discussion on AI's readiness for healthcare applications, introduced by an AI-generated podcast episode. Moderated by Prof. Judith Huirne, the panel featured Dr. **Robert de Leeuw,** Prof. **Julia van Weert**, and PhD candidates **Eva de Bock**, **Sheena Bhagirath**, and **Janette Huijser.** Together with an engaged audience, they debated the practicality, timing and responsibility of AI's integration into healthcare, making for a lively conclusion to the event.

This year's AR&D Retreat was a great success, thanks to the organization by the Retreat committee consisting of Arda Arduç, Anne Fischer, Annelotte van Haaps, Jacqueline Muts, Rosemarie de Ridder, Tessa Stolk, Wouter van Vugt and Aranka van Wesemael.

AR&D grants 2024

The AR&D Research Grant round 2024, called Seed Funding Grant, enabled researchers from Amsterdam UMC to perform research in the field of reproduction and development (the circle of life) and focused on research projects that take new ideas or current research lines to the next level, that are the start of new collaborations, or the beginning of new sample or data collections. The projects may comprise fundamental (biological), clinical, paramedical, implementation, translational or epidemiological research. Six grants of €30,000 were awarded.

Laura van Loendersloot

Laura van Loendersloot

Do thyroid antibodies impact fertility outcome in subfertile women? An observational cohort study evaluating fertility treatment outcomes in women with and without thyroid antibodies.

My name is Laura van Loendersloot. I am a postdoctoral researcher and gynecologist specialized in reproductive medicine and endometriosis. Our research project was inspired by the earlier work of Dr. Coes Delprat on female thyroid function and subfertility. Our current research team includes Prof. Mijatovic, Dr. Delprat, Dr. ir. Vergouw, Prof. Goddijn, Prof. Lambalk, Dr. Finken, Prof. Roseboom, and Dr. Van Wely, representing the departments of Reproductive Medicine, Pediatrics, and Epidemiology & Data Science. The primary objective of our research project is to assess the impact of thyroid peroxidase antibodies (TPOAbs) on pregnancy outcomes following fertility treatments.

The AR&D Seed Funding Grant has been instrumental in enabling us to complete a large cohort study initiated in 2020. With this support, we have been able to investigate whether subfertile women with TPOAbs have lower pregnancy rates after fertility treatment compared to those without TPOAbs and whether certain artificial reproductive therapies improve pregnancy outcomes for women with TPOAbs.

Our initial findings have been submitted for presentation at the annual meeting of the European Society of Human Reproduction and Embryology (ESHRE). We hope our research will provide valuable insights to better guide and counsel subfertile women with TPOAbs regarding their pregnancy prospects. Furthermore, the results of this large cohort study may serve as the foundation for a future large randomized clinical trial.

We were thrilled to receive the news of our grant award, as this project would not have been possible without the generous support of AR&D.

Jermo Hanemaaijer-van der Veer

Selective Contrast Enhancement of soft tissue for Microfocus Computed Tomography: the use of gold-labelled antibodies for visualization of neural tissue

My name is Jermo Hanemaaijer, and I am the Research Manager at the Dutch Fetal Biobank, within the Department of Obstetrics & Gynecology. In collaboration with Prof. Judith Huirne, Dr. Bernadette de Bakker, and Dr. Lynda Juffermans,

Jermo Hanemaaijer-van der Veer

we have joined forces to advance our understanding of the uterine neuronal network. Our team has been awarded the AR&D Seed Funding Grant 2024 to support this research initiative. Receiving this grant was an incredible moment of excitement and validation, it is incredibly exciting to get support from AR&D for pushing the boundaries of what is currently possible.

Our goal is to develop a non-destructive 3D imaging method using a gold-based immunodetection assay combined with X-ray microfocus computed tomography (microCT). This innovative approach will provide a high-resolution, 3D representation of molecular patterns, overcoming the limitations of traditional histology. By preserving tissue integrity, our technique will enable detailed visualization of neural tissue in the uterus.

Since receiving the grant, we have expanded our uterus biobank and successfully conducted our first microCT scans of included uteri. The AR&D grant has also allowed us to welcome Veerle Michels to our team. As a PhD student with a background in technical medicine, she brings the ideal expertise for this project. Her work will focus on analyzing and validating the imaging data obtained through microCT. Looking ahead, we plan to use 3D immunohistochemistry to validate the gold-based immunodetection method, which will, in turn, confirm the accuracy of the microCT imaging. This will enable us to precisely detect neural tissue in the uterus, further advancing our understanding of the uterine neuronal network.

Nina Johannesson

Investigating human cytomegalovirus infection in an in vitro human trophoblast organoid model

Nina Johannesson

My name is Nina Johannesson, and I am working as a research technician at the OrganoVIR Labs, together with Prof. Dasja Pajkrt (Pediatric Infectious Diseases), where we develop complex human organoid models for virology. Our organoid models are currently being used to study infections with various viruses such as human picornaviruses (Enterovirus A71 and parechoviruses 1 and 3), HIV, and cytomegalovirus (CMV). Over the last year, my research focus has been on studying the mechanisms of CMV infection in newborn infants (so-called congenital CMV disease).

The placenta forms a powerful barrier to infections, however certain congenital pathogens, like CMV, can be vertically transmitted to infect the fetus and cause congenital disease. Congenital CMV infection is the leading cause of congenital infection worldwide with a significant burden of disease. There is no cure or treatment due to lack of knowledge on CMV pathogenesis. How CMV is transmitted across the placenta to cause congenital CMV disease remains poorly defined.

With this AR&D Seed Funding Grant we aim to investigate CMV infection in an in vitro human trophoblast organoid model. In collaboration with the group of Dr. Gijs Afink (Reproductive Biology Laboratory), we aim to generate a human trophoblast organoid model and establish CMV infection. We try to identify molecular mechanisms of CMV infection in placental transmission. I am very grateful and excited to receive this grant, as these insights will importantly contribute to the development of innovative therapeutic or preventive intervention strategies for congenital CMV disease. Looking forward to our first results!

AR&D grants 2024

Amber Boots
The ART of brain development: brain and cognitive development in children conceived after assisted reproductive technology. A collaborative project between AR&D researchers and the Rotterdam Generation R study cohort

My name is Amber Boots, I am a neuroscientist and postdoctoral researcher at the department of Epidemiology & Data Science (EDS) at Amsterdam UMC, location University of Amsterdam. Last September, I defended my PhD thesis which focused on how the prenatal environment may shape brain health across the lifespan. Together with Dr. Susanne de Rooij (EDS), Dr. Mandy Spaan (EDS) and Dr. Anouk Schrantee (Radiology and Nuclear Medicine), I received an AR&D Seed Funding Grant in 2024. We were thrilled to receive the news, as this grant enables us to investigate the impact of conception using assisted reproductive technology (ART) on structural brain development and cognitive performance in children.

We will compare brain volumes from MRI neuroimaging data and cognitive performance at age 14 between ART children and children who were not born after ART. The data will be made available by the Generation R birth cohort. Results of the study will importantly contribute to a better understanding of the potential influence of prenatal exposures on brain development and whether these persist into childhood. After receiving the grant, we worked on arranging the legal approval for data sharing, which was approved this month. We are very excited to start working on data analysis soon!

Annemarie van de Geer
DISCLOSE (Discovery of Late Onset Sepsis in Preterm Infants)

My name is Annemarie van de Geer and I am a pediatrician currently working both as a clinical fellow and postdoc at the Neonatal Intensive Care Unit (NICU) at the Amsterdam UMC, location AMC. Together with Dr. Douwe Visser, Dr. Wes Onland and Dr. Bart Cortjens from the NICU and Prof. Taco Kuijpers from the department of Pediatric Immunology we work on early detection of sepsis in preterm infants. Due to the vulnerability of our patient group and the nonspecific clinical signs of neonatal sepsis we face considerable antibiotic overtreatment: approximately 10 patients per sepsis case receive antibiotic therapy. With the study we have obtained this wonderful grant for we aim to detect sepsis in preterm infants at disease onset in order to reduce this overtreatment. When we heard we were selected for the AR&D Seed Funding Grant we were beyond happy that we could start the study we wanted to conduct for so long! Thanks to the grant we are currently taking samples of exhaled breath and tiny amounts of blood in patients with suspected sepsis which will be analyzed for early indicative sepsis markers.

Bruno Sovran
Unravel the role of the MYO5B mutation in the intestinal epithelial cells to develop therapeutic strategies for children with chronic intestinal failure

My name is Vanesa Muncan, Principal Investigator at Tytgat Institute within the department of Gastroenterology. Together with Dr. Bruno Sovran and Dr. Merit Tabbers from Pediatric Gastroenterology department, with the help of this AR&D Seed Funding Grant, we are able to initialize a new research line with an aim to help find novel therapies for patients with congenital enteropathies. We focus on Microvillus inclusion disease (MVID), a group of inherited enteropathies with an onset very early in life. MVID involves defects in enterocyte structure causing severe chronic intestinal failure due to inability of gut epithelial cells to properly absorb nutrients and therefore sustain proper body functioning. Patients might end up with permanent chronic intestinal failure requiring long term parenteral nutrition that is accompanied with severe extra intestinal complications. Mutations in the Myosin VB (MYO5B) gene, highly expressed in the enterocytes of the small intestine, have been found to be causative for congenital enteropathies in a subset of patients. To this end, together with prof. Vivi Heine and Dr. Stephanie Doves we generated induced pluripotent stem cell (iPSC) lines from 5 MYO5B patients that will enable us to study cellular and molecular effects of MYO5B in iPSCs gut derived organoids. Additionally, these organoids can be employed for drug screening as well as gene therapy/correction strategies. Moreover, with an impulse of Emma Centre for Personalized Medicine we envision to further personalize research on each patient mutation in order to find the best personalized treatment.


Amber Boots


Annemarie van de Geer

In 2024 AR&D also introduced the AR&D Sustainability Grant, in line with the AR&D Symposium 2024 theme 'The climate crisis and my research – How can I help?'. Researchers could apply for three types of grants: DO grant (€5,000) to bring a good idea to fruition with a (likely) sustainable outcome that supports research; IMPLEMENT grant (€10,000) to implement a known sustainable action in research practice or to start a pilot study on more sustainable care; RESEARCH grant (€15,000) to conduct a small study in parallel to already ongoing research. Two RESEARCH grants were awarded.

Bruno Sovran

Tamara Jannink

Esther Vermaas

Esther Vermaas

Is there room for more sustainable follow-up care after gynecological cancer treatment?

My name is Esther Vermaas and I am a third year PhD student at the department of Gynecological Oncology at the Amsterdam UMC. My research focuses on improving the aftercare pathway for gynecological cancer survivors. I work together with Dr. Annemijn Aarts, Dr. Luc van Lonkhuijzen and also with colleagues at the Netherlands Comprehensive Cancer Organisation (IKNL). We wanted to broaden the scope of our research to include sustainability, and therefore we teamed up with Prof. Wouter Hehenkamp and PhD candidate Eva Cohen. This summer we received the AR&D Sustainability Grant, for our study that aims to quantify the carbon footprint of follow-up care.

When I found out that we won the grant, it both felt very unreal and a bit anticlimactic reading it on an email, in my work-from-home-office. Nevertheless, I was beyond excited. With this grant we are able to be the first study that aims to quantify the carbon footprint of follow-up after gynecological cancer. This will help to identify alternative strategies that reduce emissions. Ultimately, contributing to more sustainable practices that increase public and patient health.

Tamara Jannink

Patients and Practitioners' Considerations, Including Sustainability, in Choosing between Continuing Letrozole or Switching to Gonadotropins

My name is Tamara Jannink, and I am a first year PhD student at the Center for Reproductive Medicine, Amsterdam UMC. Under the guidance of Dr. Madelon van Wely, Prof. Mariette Goddijn and professionals from other fertility centers, I am conducting research on the treatment of women with PCOS in a fertility trajectory.

We are currently launching a randomized controlled trial that compares continuing letrozole with switching to gonadotrophins as ovulation induction treatment in women who have used letrozole for six months but did not yet conceive. In addition to cost-effectiveness and patient-reported outcomes, the study will evaluate carbon footprint as a key outcome.

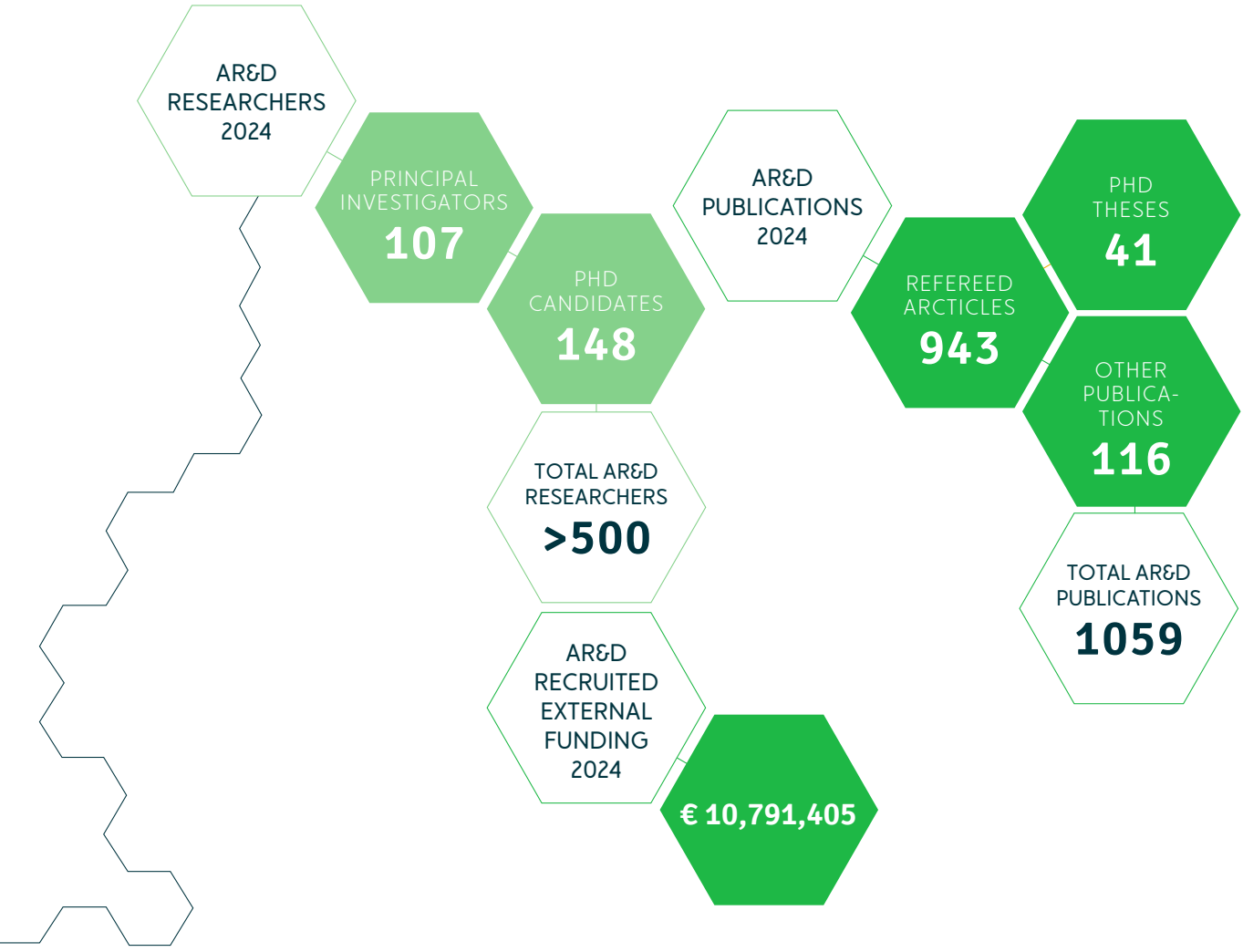
An important aspect not covered by this ZonMw funded RCT is the treatment preference of patients and fertility doctors. I am thrilled that the AR&D Sustainability Grant has enabled us to explore these preferences, with a particular focus on sustainability. We have received METC approval for this study and are currently developing an online survey. We expect to start with participants enrollment during spring 2025 with the aim of presenting initial results by fall 2025.

I am very grateful to AR&D for their support, particularly as this project forms an integral part of my PhD trajectory. Through this study, we aim to raise awareness for sustainability in healthcare and enhance counseling of patients, with the goal of providing the best care for women with PCOS.

“Central to AR&D research is the integration of different interdisciplinary approaches and research methodologies within Amsterdam UMC and the universities VU and UvA.”

Numbers and highlights

AR&D IN NUMBERS



DISCLAIMER RESEARCH INFORMATION RESEARCHERS

Information about the number of researchers affiliated with AR&D was collected using the Research Information System Pure Amsterdam UMC and Pure VU on March 17th, 2025. Registration of research institute affiliation was done by the researchers themselves, by personnel from the Medical Library, by secretary of corresponding department or by the policy officers of the AR&D research institute. Due to problems resulting from the merger of the two former Pure Systems of VUmc and AMC, the number of affiliated researchers may be lower than the actual number.

PUBLICATIONS

The reported data include all published research output as registered in the Research Information System Pure Amsterdam UMC on March 17th, 2025. Publications are ascribed to AR&D based on the affiliations of the authors and the content of the publication. A publication can be ascribed to one or more research institutes depending on the affiliations of the authors.
PhD theses are ascribed to AR&D based on the affiliations of the (co-)supervisors. A thesis can be ascribed to one or more research institutes depending on the affiliations of the (co-)supervisors. Due to problems resulting from the merger of the two former Pure Systems of VUmc and AMC, the number of published research output may be lower than the actual number.

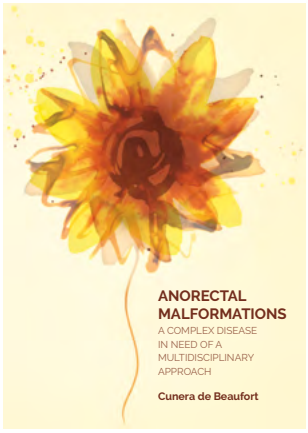
RECRUITED FUNDING

Information about funded research projects has been provided by the project administrations from Amsterdam UMC.

AR&D PHD THESES

In 2024, 41 researchers obtained their PhD in the area of reproduction and development.

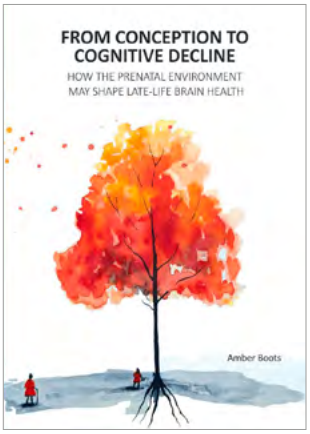
Below a cross section of the PhD theses.



Anorectal malformations: a complex disease in need of a multidisciplinary approach

Cunera de Beaufort

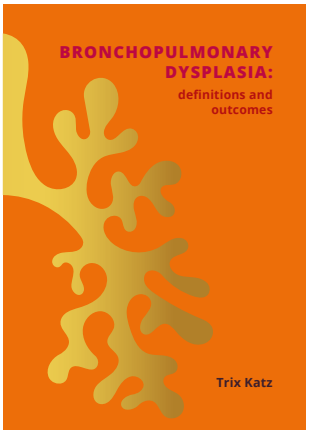
Research described in this thesis, entitled 'Anorectal malformations: a complex disease in need of a multidisciplinary approach', aimed to contribute to improvements in understanding of patient characteristics and complex additional anomalies that might be present in patients with anorectal malformations (ARM). Furthermore, despite available proposition papers, problems when entering primary school and the implementation of transition of care to adulthood were enlightened.



From conception to cognitive decline

Amber Boots

The effects of harmful prenatal exposures can be detected in the brain across the lifespan. Using MRI scans, we examined changes in late-life brain structure and function after prenatal famine exposure. We observed persistent effects of prenatal famine exposure on brain structure and function but found no evidence of accelerated brain aging between age 68 and 74. These persistent developmental effects may influence one's vulnerability to cognitive decline and dementia in later life.



Bronchopulmonary dysplasia: definitions and outcomes

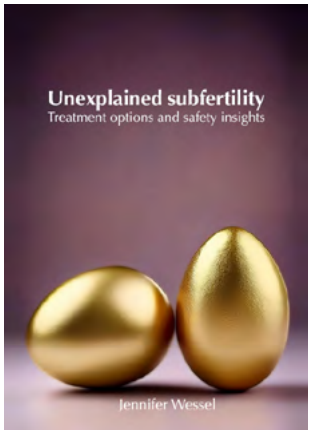
Trix Katz

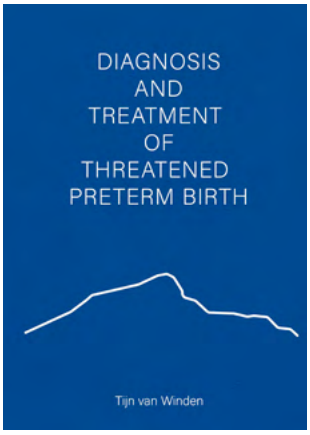
This research finds that more severe cases of bronchopulmonary dysplasia (BPD) in preterm infants are linked to a higher risk of neurological and respiratory issues. Factors like low birth weight, being small for gestational age, and male gender also contribute to this risk. Different definitions of BPD show similar effectiveness in predicting long-term outcomes. Efforts are underway to create a harmonized BPD definition through a collaborative process called a Delphi procedure.

Seeing the unseen

Malou Lugthart

Through prenatal screening, we seek to uncover, discover and understand the invisible aspects of the fetus. It provides opportunities, reduces risks and evaluates the health of the fetus. Over the past decade, the prenatal screening field has made tremendous progress. This dissertation describes the importance of the detection of subtle markers and chromosomal abnormalities, as well as the detection of structural abnormalities during the first and second trimester of pregnancy, in light of developments within the prenatal screening field. This allows parents to make a reproductive autonomous choice about the continuation of the pregnancy, which includes termination of pregnancy.





Surgical care and innovation for vesicovaginal fistula

Lennart Maljaars

An obstetric vesicovaginal fistula is an abnormal opening between the vagina and bladder caused by obstructed labor, resulting in uncontrollable urine leakage and significant physical and psychological distress. Surgical repair of the fistula is challenging due to tissue loss and poor tissue quality of the surrounding tissues. This thesis aims to improve conventional surgical repair techniques and to introduce a tissue-engineered surgical solution for vesicovaginal fistula. Ultimately, to relieve the suffering of obstetric fistula patients.

Transitional care for children with medical complexities

Liz van de Riet

This thesis aimed to enhance our understanding of care for children with medical complexities (CMC). In particular, to optimally support them and their families during the transition from hospital to home by increasing their self-sustainability. This thesis is part of a wider initiative, which explores the benefit of a Transitional Care Unit to improve transitional care for CMC, using a holistic approach to support the entire family. The ultimate goal: a sustainable transition home for all families.

Unexplained subfertility

Jennifer Wessel

This thesis investigates the effectiveness of six months of expectant management (EM) versus intrauterine insemination with ovarian stimulation (IUI-OS) for couples with unexplained subfertility and a poor prognosis for natural conception. Results indicate that EM leads to lower live birth rates compared to IUI-OS and a lower quality of life on the relational domain. Additionally, the study compares various ovarian stimulation agents and perinatal outcomes for singleton births from IUI-OS and IVF versus natural conception.

Diagnosis and treatment of threatened preterm birth

Tijn van Winden

This thesis explores the causes and management of preterm birth, which occurs before 37 weeks of pregnancy and can lead to serious health problems for newborns. The first part examines factors that predict preterm birth, such as ethnic differences and city living, and evaluates the effectiveness of a biomarker test that could help avoid unnecessary interventions. The second part reviews medications used to prevent preterm birth, comparing their effects on both mothers and the long-term health of their children.

EXTERNAL GRANTS AND PRIZES

In 2024, AR&D researchers were very successful in obtaining grants and prizes. Below some of the external grants and prizes awarded to AR&D researchers are highlighted.

HORIZON EUROPE - RESEARCH AND INNOVATION ACTION

€8,000,000, including €631,670 for Amsterdam UMC

COMBAT

Dasja Pajkrt and Adithya Sridhar, together with other parties

ZONMW – GOED GEBRUIK GENEESMIDDELEN

€921,309

Continueren ovulatie-inductie met letrozol versus switchen naar gonadotrofines bij vrouwen met PCOS

Madelon van Wely

ZONMW – GOED GEBRUIK GENEESMIDDELEN

€826,142

Presepsin to safely reduce antibiotics in preterm infants (PRESAFE trial): a randomized controlled trial

Douwe Visser and Anton van Kaam

TROMBOSE STICHTING NEDERLAND

€306,000

PHARMA KIDS

Karin Fijnvandraat and Irene Klaassen

ZONMW – NATIONAAL PLAN HOOFDZAKEN

€199,968

Triageboxx tegen versnippering in de zorg voor ontwikkelingsproblemen

Hilgo Bruining

ZELDZAME ZIEKTEN FONDS

€106,326

Multi-omics in Neurological and Neurocognitive functioning in HIV infected children; NOVICE study, a case –control cohort

Dasja Pajkrt and Julie van der Post

AWARDS

Societal Impact Award Amsterdam UMC

Judith Huirne

KNAW Early Career Award

Suzanne Fustolo-Gunnink

Frederik Paulsen Prijs

Velja Mijatovic

Hugo van Poelgeest Award

Giulia Moreni

KEY PUBLICATIONS

2024 was a very productive year. Here is a small selection of peer-reviewed publications that were highlights for our researchers.

This is by no means a complete overview of our researchers' highlights.

New insights into the (epi)genetics of twinning
Van Dongen et al.
Hum Reprod.
2024 Jan 5;39(1):35-42.

Favorable surgical and obstetrical outcomes in pre- and postconceptional laparoscopic abdominal cerclage
Abdulrahman et al.
Am J Obstet Gynecol MFM.
2024 Jan;6(1):101227.

DNA methylation episignature, extension of the clinical features, and comparative epigenomic profiling of Hao-Fountain syndrome caused by variants in USP7
Van der Laan et al.
Genet Med.
2024 Mar;26(3):101050.

Antenatal cardiotocography in primary midwife-led care: a budget impact analysis
Neppelenbroek et al.
BMJ Open Qual.
2024 Jun 5;13(2):e002578.

Doppler ultrasound of umbilical and middle cerebral artery in third trimester small-for-gestational age fetuses to decide on timing of delivery for suspected fetal growth restriction: A cohort with nested RCT (DRIGITAT)
Marijnen et al.
BJOG.
2024 Jul;131(8):1042-1053.

Oxygenation targets in critically ill children: the Oxy-PICU trial
Lilien et al.
Lancet.
2024 Aug 31;404(10455):848.

Multicentre external validation of the Neonatal Healthcare-associated infectiOn Prediction (NeoHoP) score: a retrospective case-control study
Lloyd et al.
BMJ Paediatr Open.
2024 Oct 1;8(1):e002748.

Neurodevelopmental outcomes of school-age children conceived after hysterosalpingography with oil-based or water-based iodinated contrast: long-term follow-up of a nationwide randomized controlled trial
Keestra et al.
Hum Reprod.
2024 Oct 1;39(10):2287-2296.

Parental Acceptance of Fetal Tissue Donation
Dawood et al.
JAMA Netw Open.
2024 Nov 4;7(11):e2444238.

AR&D RESEARCHERS IN THE MEDIA

In 2024, AR&D researchers have been active in sharing their knowledge and research findings. A small selection of media contributions is presented.

This is by no means a complete overview of our researchers' highlights.

Belangrijk onderzoek naar ziektes moet mogelijk stoppen door bezuiniging op universiteiten: 'Patiënten hebben zo geen perspectief meer'
Clara van Karnebeek at AVROTROS EenVandaag

Hormoon voorkomt vroeggeboorte bij moeders met korte baarmoedermond
Eva Pajkrt in newspaper NRC

Poepen op school? Veel kinderen houden het liever op
Marc Benninga on NOS Jeugdjournaal

Hoe zieke ouders hun gezonde kind ziek maken
Rian Teeuw in NOS Podcast De Dag

Instagram Live met Pia Dijkstra over endometriose
Velja Mijatovic on Instagram

Is de baby in de buik te klein, of gewoon klein? Nieuwe meting maakt dat duidelijk
Wessel Ganzevoort on NOS Radio 1 News

Marie heeft reuzegroei in haar vingers
Margriet van Doesburg in NPO Zapp Topdoks

Verweven met nanotechnologie
Zeliha Guler in Amsterdam UMC JANUS magazine

Newly appointed professors

In 2024, three professors were appointed at Amsterdam UMC in the field of AR&D and one AR&D professor was appointed as honorary professor.

Wouter Hehenkamp

PROF. WOUTER HEHENKAMP

Wouter Hehenkamp is a gynecologist and has been appointed professor in 2024 with the assignment: 'effective and sustainable healthcare'. He gave his inaugural lecture 'Individual versus the collective' on December 6th, 2024. His lecture is about the transformation of healthcare towards a sustainable healthcare system that is affordable, can be managed by the available healthcare professionals and operates within the planetary boundaries. "In order to achieve this, we need to look at the 'hotspots' and switch to more sustainable alternatives (more reusable instruments, ban anesthetic gases etc.)." states Wouter. "But also, we have to make choices on a different level: after having inquired the carbon footprint of care pathways, we can counsel patients on the environmental impact (EI) of the options they have. Patients are open to this (e.g. for contraception, treatment of heavy menstrual bleeding)." "Also, healthcare professionals need to rethink their actions: what does my research add to the world in terms of costs and EI? Should I fly to a congress or consider a sustainable alternative? Finally appropriate care is an important addition to the system change that is necessary within healthcare: what do we find appropriate in a healthcare system that is too expensive, short staffed and polluting? Where do we draw the line?" says Wouter. Wouter's research comprises of all the above-mentioned themes surrounding appropriate care, sustainable healthcare (quantification, patient preferences, circular transition) as well as the ethical choices that surround these themes.

“It is important for all women to have a positive childbirth experience, because it empowers and strengthens both themselves and their new family.”

PROF. MARELISE EEKHOFF

Marelise Eekhoff is an internist-endocrinologist and has been appointed professor of Rare Bone Diseases as of June 1, 2024. She gave her inaugural lecture ‘Rare bone diseases; Little awareness, big impact, big challenges’ on November 28th, 2024. “This appointment is a significant recognition for the Rare Bone Disease Center at Amsterdam UMC, exemplifying intensive and translational collaboration between disciplines of Amsterdam UMC, AMS and ACTA” she says.

Since 2002 she has been working as an internist-endocrinologist on endocrine disorders (diabetes, adrenal gland disorders), in addition to her dedicated focus on rare bone diseases. Her work encompasses outpatient care, education and research. Her expertise in rare bone diseases since 2012 includes among others fibrodysplasia ossificans progressiva (FOP), osteogenesis imperfecta (OI), hereditaryIX-linked osteoporosis, fibrous dysplasia (FD, skull) and Camurati Engelmann disease, in close collaboration with Dr. Dimitra Micha from the Human Genetics department. Marelise and her team are focusing their research on an integrated approach with patients, researcher initiatives and industry to find new diagnostic tools and new treatment methods for the aforementioned rare bone diseases, with prevention and recovery strategies as the main goal. To this end, they connect preclinical and clinical research in a translational research approach. The successful centre is training more than 9 PhD students and hosts several ongoing phase 2 and phase 3 studies. There is also an international collaboration to advance the development of gene therapy.

Marelise in collaboration with Dr. Dimitra Micha, and her team from Amsterdam UMC are officially recognized as a national center of expertise in the 5 stated rare bone diseases and are full members of ERNBOND. The design and broad collaboration developed within the Center for Rare Bone Diseases formed the springboard for the establishment of the Amsterdam Bone Center (ABC). The ABC is an open, flat organization where numerous bone-related care and research centers of Amsterdam UMC and ACTA are brought together to promote collaboration and innovative research.

PROF. CORINE VERHOEVEN

Corine Verhoeven has been appointed professor of Value-based Maternity Care at the Vrije Universiteit Amsterdam” since October 2024. She is principal investigator at the Department of Midwifery Science, Amsterdam UMC. Next to that she works as a professor of Midwifery at the University of Nottingham and as a hospital-based midwife at Máxima MC, Veldhoven.

In the department of Midwifery Science, she leads research into the evaluation of maternity care. Her research focuses on optimal management of term labour and client involvement. She initiated and leads the Childbirth Network program, which aims to combine research, (clinical) practice and education, i.e. by building a network of academic midwifery practices.

The Childbirth Network has its own website, where the research findings of Midwifery Science are presented in a popular scientific way, so that women and professionals can easily access evidence-based information. “Through

Marelise Eekhoff

Corine Verhoeven

the Childbirth Network website and social media, we reach out to women and practicing midwives to participate in our research." This has contributed to rapid recruitment of research participants in several studies. Midwives in the network contribute to data collection and are also closely involved in the formulation and selection of research projects.

Due to the increasing complexity of maternity care and the rising healthcare costs, the concept of 'value-based healthcare' is gaining increasing attention. Value-based healthcare emphasizes the delivery of high quality, efficient and patient-centered services, in collaboration across different healthcare disciplines. Next to the (clinical) outcomes of care, value-based healthcare also includes the experience of care and quality of life. Value-based Maternity Care focuses on optimal, equitable outcomes, a good care process and optimal use of resources (money, time, carbon, and space).

According to Verhoeven it is important for all women to have a positive childbirth experience, because it empowers and strengthens both themselves and their new family. "Achieving a positive childbirth experience should be the challenge for all maternity care providers."

PROF. CORSTIAAN BREUGEM

Corstiaan Breugem has been appointed as professor of plastic and reconstructive surgery at the University of Cape Town, South Africa since October 2024. He is already a professor at the University of Amsterdam and serves as a Principal Investigator, focusing primarily on research into oral clefts and microtia.

Born and raised in Cape Town, Corstiaan completed his medical training at Stellenbosch University (Tygerberg Hospital, Cape Town). "It is a great honor, but also a privilege, to give back to the country that has given me so much," he says.

His research will pay special attention to people in low-income countries, where challenges such as feeding difficulties can lead to complications in healing after surgical interventions. He also collaborates with Foundation Interplast Holland, an organization that trains and educates surgeons and healthcare professionals in resource-limited settings. His involvement in these projects fosters valuable synergy and cross-pollination with his work at the Amsterdam Center for Global Child Health. Corstiaan is engaged in various national and international projects on clefts and microtia, particularly focusing on 3D imaging techniques on how to improve treatment. "It is about making social impact." He is especially interested in improving speech outcomes after surgery, including MRI studies about palate surgery.

"Understanding why so many cleft palate patients do not achieve good speech outcomes after surgery is one of my main areas of focus."

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"Unique about the research institute Amsterdam Reproduction & Development is that we pay attention to reproduction and development in its totality: the stage before pregnancy, conception, pregnancy, childbirth, the child as it's growing up, and the resulting health of the adult stages of life"