

RESEARCH REVIEW  
AMSTERDAM REPRODUCTION AND  
DEVELOPMENT RESEARCH INSTITUTE  
2017-2022

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## Preface

On January 9-10 2024, an external review committee visited Amsterdam Reproduction and Development (AR&D), one of the research institutes of Amsterdam UMC. The committee assessed the quality and relevance of the research conducted in the period 2017-2022 in the light of the research strategy formulated by AR&D. In addition, the committee evaluated the viability of the research programme, the academic environment and personnel policy. The assessment was performed according to the Dutch Strategy Evaluation Protocol (SEP 2021-2027).

The committee highly appreciated the confidence placed in the review committee, the warm welcome and the well organised site-visit at Amsterdam UMC and wishes to thank AR&Ds management for the opportunity to conduct this review and to obtain a detailed understanding of AR&D. All discussions took place in an open, positive, and constructive atmosphere. AR&D interviewees openly answered questions and clarified issues that were not clear to the committee. It was obvious that the spirit to further develop AR&D into a world-leading research institute on human reproduction and development was present.

The committee hopes that the recommendations can be used to extend AR&Ds unique position as a translational research institute on reproduction and development and to improve its visibility as a scientific and societal knowledge hub.

Manon van Engeland, chair of the committee



## 1. Introduction

### 1.1 Aim of the assessment

All publicly funded university research in the Netherlands is evaluated at regular intervals in compliance with a national strategy evaluation protocol (SEP 2021-2027), as agreed by the Universities of the Netherlands (UNL), the Netherlands Organisation for Scientific Research (NWO) and the Royal Netherlands Academy of Arts and Sciences (KNAW). The evaluation process, which is applied at the research unit level, consists of an external peer review conducted every six years.

The committee is requested to assess the quality of research conducted by the Amsterdam Reproduction and Development Research Institute (AR&D) as well as to offer recommendations to improve the quality of research and the strategy of AR&D.

This report describes the findings, conclusions, and recommendations of this external assessment of the research of AR&D.

### 1.2 The committee

The Board of the University of Amsterdam (UvA) appointed the following members of the committee:

- Prof. Manon van Engeland (chair), professor pathobiology of cancer-specifically the role of epigenetics, scientific director GROW-Research Institute for Oncology and Reproduction, Maastricht University
- Dr. Roseriet Beijers, Associate Professor, Behavioural Science Institute, Radboud University Nijmegen and Radboudumc, Donders Institute. Moreover, Roseriet is Head of Quality at the social enterprise Pro Parents.
- Prof. John Challis, Professor of Physiology, University of Toronto and Western Australia;
- Alies Depla, Resident in Obstetrics and Gynecology, UMC Utrecht (currently Gelre Ziekenhuizen, department of Obstetrics and Gynaecology);
- Igor Ivakic, Director of Dutch Centre for Youth Health (Nederlands Centrum Jeugdgezondheid)
- Prof. Tjitske Kleefstra, Professor of Clinical Genetics, and Head of Department of Clinical Genetics, Erasmus MC Rotterdam; Endowed professor in clinical genetics and psychopathology of rare syndromes, Radboudumc.
- Prof. Hanan El Marroun, professor biological psychology, Department of Social and Behavioural Sciences, Erasmus University Rotterdam & Department of Child and Adolescent Psychiatry, Erasmus MC.

The university board appointed Dr. Annemarie Venemans of De Onderzoekerij as the committee secretary. All committee members signed a declaration form stating no conflict of interest and ensuring impartiality and confidentiality.

### 1.3 Procedures followed by the committee

Before the site visit, the committee reviewed detailed documentation comprising the self-assessment report of the institute including appendices.

The committee proceeded according to the Strategy Evaluation Protocol (SEP) 2021-2027. The assessment was based on the documentation provided by AR&D and the interviews with the dean, AR&D management, selections of senior and junior researchers, division directors, the Doctoral School,



and PhD candidate representatives. The interviews took place on January 9 and 10, 2024 (see Appendix A). Due to personal circumstances the chair attended the interviews online. Therefore, Tjitske Kleefstra acted as a technical chair during the interviews on site.

The committee discussed its assessment at its final session during the site visit. The committee chair had a coordinating role in the writing procedure and delegated the writing of sections to members of the committee. The committee members commented by email on the draft report. The draft version was then presented to the institute for factual corrections and comments. Subsequently, the text was finalised and presented to the Board of the UvA.



## 2. Assessment of the research of AR&D

### 2.1 Management, organisation and strategy

#### *Mission and strategy*

AR&D is inspired by a vision of continuous and sustainable improvement in health for all. It aspires 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. AR&D's strategic approach, building along four key development stages and research areas namely preconception and conception, embryonic and fetal development, pregnancy and birth and child development, enables a comprehensive understanding of health-related issues from early stages to childhood, highlighting commitment to a holistic perspective.

The mission of AR&D 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. According to the committee, the overall vision and mission of AR&D have been defined clearly. The strategy to achieve these goals, i.e., increase internal coherence and connectivity, contribute to a stimulating environment for cutting-edge transdisciplinary research, increase scientific output and acquisition of (inter)national funds for research, and expand its role as an (inter)national knowledge hub, is sound and well defined. In addition, a future strategy (2023-2028) has been developed in which AR&D will 1) improve organisational support and align responsibilities, 2) improve the institute's visibility and open science, 3) support a safe academic environment and talent development, 4) increase attention to sustainability, 5) align research with grand societal challenges, 6) optimize a transdisciplinary approach for advancing knowledge in human reproduction and development, 7) capitalise on unique cohorts and biobanks and 8) connect with Amsterdam's ambition to be AI capital, increase societal relevance and impact.

AR&D's management has done an amazing job in community building by organizing meetings, workshops, retreats and distributing newsletters. However, the committee thinks that increasing external funding and becoming an (inter)national knowledge hub will require more 'business control' for AR&D management and (additional) marketing actions. To successfully execute AR&D's strategy:

- this strategy should be agreed on by all decision makers and stakeholders,
- affiliated staff should be aware of and aligned to the strategy,
- the strategy execution should be measured and monitored on performance.

Therefore, the committee strongly recommends providing AR&D the opportunity to proactively discuss and align its research strategy and HR policy with the leadership of the organizational units involved in AR&D, such as departments and divisions as well as all personnel associated with AR&D. This will stimulate coherence and scientific output and will benefit all organizational units. In addition, the committee recommends defining operational outcome parameters which are being measured and monitored to evaluate, and if required, pivot the strategy. A strategy to address research areas that are under- and overperforming (again in alignment with the leadership of the departments and divisions) is recommended. A dashboard with reliable input and output data will be very helpful to successfully execute and monitor the strategy. The committee also thinks that making use of the experience of AR&D scientists which are successful in grant acquisition and/or serve as grant review committee members thereby able to provide insights in success strategies, could help to improve grant acquisition. In addition, the institute's unique position in the Reproduction and Development field should make





AR&D an attractive partner for EU grants. A dedicated strategy to stimulate EU funding applications could be developed in collaboration with for example Amsterdam UMC research grant support office. Moreover, administrating grants fairly (at more than one research institute if researchers from more than one research institutes are involved) is highly recommended.

Regarding the ambition to expand its role as an international knowledge hub, AR&D should present and position itself as such. This requires not only a more professional marketing strategy, but also a knowledge management strategy on how to organize development/sharing and application of knowledge and expertise. In addition, awareness of the research- and (knowledge) marketing strategy amongst all AR&D associated personnel and alignment to this strategy is strongly recommended.

#### *Research organization*

AR&D is a research network organization connecting researchers with a focus on reproduction and development at Amsterdam UMC. Here the committee addresses the AR&D organization as well as the position of AR&D within the Amsterdam UMC organization.

#### AR&D organization

Since the formation of AR&D in 2016, the institute has focused on building bridges between scientists from different disciplines, backgrounds and generations. This is being achieved by supporting networking and skill building activities. The committee commends AR&D for these activities. These activities, especially the AR&D retreat, are highly appreciated by the AR&D community, as was communicated during the site visit interviews and presentations. However, the interviews also revealed that other aspects of the AR&D organization are not clear to the community. For example, it is not clear to the committee and AR&D community how members of the research board are being selected (are there exclusion criteria to avoid conflicts of interest?), what are the tasks of the board members, and what is the term of office? It is also not clear how the review process and decision making of the internal grants programme is being organized. The committee recommends developing transparent regulations on appointments and internal grant evaluation processes.

The committee strongly recommends the AR&D directors to spend more dedicated time on leading an institute the size of AR&D. Currently, little dedicated time for leading the institute is being provided.

The committee highly appreciates the establishment of a societal advisory board. The societal board can serve as a sounding board, facilitating the input of external perspectives to contribute ideas on strategy and focus areas collaboratively, akin to a form of co-creation. The committee also recommends establishing a scientific advisory board for (bi)annual independent external scientific advice on the research (strategy) of AR&D. Amsterdam UMC division 4 is an important player which is strongly represented in AR&D. During the interviews, the committee was under the impression that the participation and involvement of other disciplines and divisions was underrepresented. Especially active input on the child development research was lacking during the visit. The committee recommends encouraging more active participation of other relevant disciplines, departments, divisions in order to facilitate multidisciplinary collaborations.

#### Amsterdam UMC organization

The organizational structure of Amsterdam UMC provides a framework for AR&D to excel. Centrally organized offices ensure high quality support for education and research. The matrix structure in which



departments, divisions and research institutes collaborate facilitates multidisciplinary collaboration. The committee noticed however that the organizational structure also comes with the following limitations for AR&D.

First, AR&D members do not primarily feel connected to the research institute, but rather feel affiliated to a department and/or division and/or another research institute of Amsterdam UMC. Connection to AR&D was mainly observed at the PhD level and is currently obtained through the opportunity to obtain research grants. To become more visible as a knowledge hub on reproduction and development, the AR&D community should feel connection with, and should affiliate to, the research institute and its research strategy as well. The committee recommends continuing stimulating community building, especially by making the AR&D community aware that they are part of AR&D and therefore must affiliate with AR&D in scientific output.

Second, the Amsterdam UMC organizational structure allows limited control and steering on the strategy for the AR&D leadership. As mentioned above, for the AR&D strategy to be successfully executed, research strategy and subsequently HR should be aligned with the departments and divisions.

## 2.2 Research quality

### *Scientific output*

The research institute has demonstrated remarkable success and productivity across various quality indicators solidifying its role as a young research institute. Notably, the team has excelled in scientific publications, recognition through citations by peers (MCS over the review period is 1.68, which is clearly above world average and 19% of all papers is published in the top 10% journals), at testament of scientific impact of the research output. Furthermore, the establishment and management of biobanks and large (clinical) cohorts showcase the institute's commitment to robust data collecting enabling in-depth, transdisciplinary studies. In addition to these achievements, the institute has cultivated an extensive national and international network, fostering collaborations that enrich and broaden the scope of its research activities. This network not only enhances the institute's visibility but also provides valuable opportunities for transdisciplinary exchanges and collaborative initiatives. The combination of impactful research output and a well-established collaborative network positions the institute as a key player in the global research landscape.

The institute's achievement extends beyond academia, as evidenced by acquisition of grants and prizes, both internally and externally and the high number of citations in policy documents. This not only speaks to the quality of the research but also underscores the institute's ability to secure support for innovative projects.

Although the examples provided in the self-evaluation are excellent, it is not clear how well these reflect activity throughout the organization, i.e. the four research areas defined by AR&D and individual research groups. It is also not clear what strategies are in place to manage underperforming research groups. As mentioned above, a strategy to address research areas that are under- and overperforming (again in alignment with the leadership of the departments and divisions) is recommended. A dashboard with reliable input and output data will be very helpful to successfully execute and monitor the strategy.



### *Financing*

#### Basic funding AR&D:

The basic annual funding for AR&D comprises approximately 550k€. This budget is being used to organize events, to facilitate community building and for the internal open research grant system. The interviews conducted during the site visit showed that the internal open research grants are highly appreciated by the AR&D community. The committee has been presented beautiful examples of how these grants facilitate multidisciplinary science. The committee recommends continuing the internal open research grants, but as mentioned above, also advises to monitor the long-term effectiveness of the awarded grants in terms of follow-up funding and to provide transparency regarding independent reviewing and allocation of the funding.

#### Acquired grants:

AR&D scientists have acquired some prestigious grants, mostly national grants, as illustrated in the self-evaluation report. The committee thinks acquisition of grants could be improved considering the number of senior scientists affiliated to AR&D, as is mentioned in the self-evaluation report. While interviewing the AR&D management and members it became clear that not all the grants acquired by AR&D members are assigned to AR&D, thereby likely underestimating the grants obtained by AR&D researchers. As mentioned above, the committee recommends implementing a fair output administration. In the current Amsterdam UMC system, grants are being assigned to one research institute, even when scientists from multiple research institutes participated in obtaining the grant. This could be addressed by sharing grants between research institutes based on the input, for AR&D to have a fair share of the funding. As mentioned above, the committee also recommends developing a strategy to apply for EU funding and to make use of the experience and best practices of AR&D scientists successful in fundraising and AR&D scientists serving on grant review committees to improve the quality of the grants that are being submitted.

### **2.3 Societal relevance**

The committee is highly impressed by the societal relevance of the research conducted by AR&D. AR&D is involved actively in generating a variety of products, books, media outlets, guidelines, software, advisory boards and the e-health initiative appropriate for a myriad of end-users including the public and government. Relevance to health policy and practice is clearly a major focus of the institute and AR&D is an international exemplar. Good policy must be informed by excellent research and AR&D excels in these respects. In addition, the interaction with societal stakeholders such as the general public, patients, parents, social organizations and governmental bodies is very strong. The committee appreciates that the priority of research questions is being discussed with the stakeholders. The committee commends the appointment of the impact officer to pro-actively develop an impact strategy. The strong focus on societal relevance and valorisation comes undoubtedly with additional workload for the scientists involved and should be valued appropriately. The committee recommends viewing these activities in the light of the recognition and rewards programme which is currently being implemented at all Dutch universities.



## 2.4 Viability

### *Research collaboration*

AR&D holds a unique position as a network research organisation. This uniqueness does not only help to define AR&D's individual position, but also contributes to a more diverse and impactful scientific landscape in the Amsterdam UMC research setting. Careful consideration of this delicate balance will be essential for optimizing collaborative efforts and maintaining the research unit's distinct and valuable contribution to the field. For example, navigating the overlap between AR&D and the Amsterdam Public Health Institute presents a dynamic landscape that can yield both collaborative opportunities and potential competition. Finding a balance between collaboration and healthy competition is crucial, as it can foster innovation and drive advancements in research. But, acknowledging the potential benefits of collaboration while also recognizing the need to maintain a distinct identity through a slightly different research agenda is key.

The committee has been presented beautiful examples of multidisciplinary collaborations that have initiated as a result of the matrix- and network organisation. The committee recommends continuing, strengthening, and extending these collaborations. Especially collaborations between basic scientists and clinician-researchers within AR&D should be encouraged to promote team-science and to help clinicians to maintain successful research lines, despite their limited time for research.

### *Research focus*

AR&D covers four research areas across the human life cycle: preconception and conception, embryonic and fetal development, pregnancy and birth, and child development. Some research areas were more visible than others (child development) during the site visit interviews. The research institute has demonstrated its capability to make valuable contributions across these developmental domains, showcasing a commitment to addressing diverse aspects of health research. The multifaceted/interdisciplinary nature of the research is a significant asset, promising a nuanced and comprehensive exploration of important societal topics/problems.

However, it is essential to consider how the broad array of research projects and topics within these domains may be perceived by external parties or stakeholders. While the diversity of research endeavours is undoubtedly a strength, there is a potential risk of ambiguity for those unfamiliar with the institute. The outlined projects in the self-evaluation report are multiple and diverse, and establishing clear priorities and focus areas could enhance the effectiveness and impact of the research initiatives. Such priorities should be discussed and set openly within the AR&D community.

While pursuing diverse research topics is valuable, moving into new areas of research may be risky. A potential focus on research related to climate change, for instance, should only be undertaken if the institute possesses the necessary depth of expertise in this complex field. Based on the examples provided in the report, the committee recommends further clarification and demonstration of the institute's proficiency in climate change and AI research (strategy 2023-2028) before such a focus is prioritized. Ensuring that the institute's research agenda aligns with its existing strengths will not only maintain the high standards of quality but also contribute to sustained impact in areas where the institute can truly excel.



*Facilities*

Amsterdam UMC centrally offers a range of core facilities utilized by AR&D researchers. These facilities cover areas such as animal experimentation, genomics, CRISPR technology, metabolomics, microscopy and cytometry, human induced pluripotent stem cells, and imaging. During the site visit, it was evident that researchers are generally satisfied with the core facilities of the Amsterdam UMC. In addition, educational-, valorisation-, GRP- and research support provided centrally by Amsterdam UMC is appreciated by the AR&D community.

The committee would like to address the threat of the possible termination of the Laboratory of Reproductive Biology (currently in division 9, laboratories), a key asset to multiple AR&D research areas. The committee strongly recommends that AR&D leadership gets involved in the discussion about the future of this laboratory.

**2.5 Working environment and personnel policies***Open science*

AR&D has underscored the importance of open science and shows a dedicated commitment to adopting open science practices as is Amsterdam UMC. Notable initiatives include embracing open access publishing, sharing data according to FAIR principles, and actively engaging with the public. These strides reflect a positive approach toward transparency and collaboration. However, it remains unclear to what extent other crucial components of open science, such as the sharing of scripts, protocols, and preregistration, are integrated into the institute's work activities. Awareness and knowledge amongst AR&D community members also can be improved. Expanding the institute's open science practices to encompass activities like sharing research scripts, detailing protocols, and preregistration can contribute significantly to fostering a culture of transparency and reproducibility. These practices not only enhance the reliability of research outcomes but also facilitate collaboration within the scientific community. Therefore, it would be beneficial for the institute to provide clarity on whether these specific aspects of open science are actively incorporated into the ongoing work activities. Additionally, promoting awareness and providing necessary resources for researchers to adopt these practices could further solidify the institute's commitment to advancing open science in a comprehensive manner.

*Academic culture*

Overall, the committee has a strong impression that AR&D's leadership has worked very hard and achieved great success in building a strong academic culture. The Amsterdam UMC Research Code establishes guidelines for researchers at Amsterdam UMC. The Executive Board has appointed independent confidential counsellors, including those dedicated to PhD candidates, to address research integrity concerns. AR&D frequently extends invitations to speakers for presentations on research and data integrity at their retreats and symposia, fostering engaging discussions in the process. AR&D's commitment creates a positive and conducive environment for scholarly pursuits, fostering a culture of trust, collaboration, and ethical research practices. Furthermore, the proactive approach of addressing these topics at recurring retreats, symposia and network events demonstrates a commitment to fostering a supportive and healthy working environment, enhancing the overall academic experience for researchers and contributors. However, it also became clear during the interviews that many clinician-scientists do not have dedicated time for research and are performing research in their spare time. This is not a sustainable way of performing research in a safe and healthy academic culture. The committee



advises to revisit this model and to address the mental health of not only clinician-scientists but all AR&D scientists.

#### *Work pressure*

During the interviews the committee spoke with very ambitious and dedicated researchers. However, as mentioned above, it became clear that many clinician-scientists have no or limited official research labelling and that research is being performed in the evening hours and weekends. The work-pressure is a concern, especially amongst clinicians whose personal ambition and motivation is high. As mentioned above, the committee advises to promote team science, in which scientific teams consisting of basic, translational and clinical scientists share responsibility for a specific project. This ensures continuity of research, without being dependent on a single scientist who has other important priorities such as patient care. Team science also enhances collaborative problem-solving, enables pooling of resources to accomplish tasks more efficiently, and stimulates peer support.

#### *Talent management*

The panel is positive about Amsterdam UMC's policies for talent management. Amsterdam UMC has a Committee for Talent and Appointments (CTA) that aims to enhance the transparency of Amsterdam UMC's appointment policies for talents. Also, an Amsterdam UMC institute-wide research mentoring programme is being set up allowing for mentor-mentee matching within and across research institutes. However, it became apparent to the committee that there is room for improvement in delineating the training and support mechanisms for postdoctoral fellows, assistant professors, and associated professors. The clarity and comprehensiveness observed in the training of PhD candidates should ideally extend to encompass the evolving needs of academic staff at various career stages. Specifically, the transition from a researcher to a leadership role presents unique challenges and demands, underscoring the importance of addressing the needs of postdoctoral fellows and faculty members. Incorporating provisions for lifelong learning and professional development tailored to the changing career dynamics is crucial. Clear guidelines, mentorship programmes, and targeted resources for career progression would contribute significantly to the success and satisfaction of these academic staff members.

The committee also noticed that AR&D boasts a substantial number of PhD candidates and full professors; however, the middle layer consisting of post-docs, assistant professors and associate professors appears relatively small. This observation raises concerns about the potential loss of valuable talents with these crucial mid-level positions. Having a healthy mid-career level group of scientists allows higher-career level professionals to delegate responsibilities effectively, contributing to a more efficient and collaborative work environment. It is essential to assess and refine strategies to attract, develop, and retain talented individuals at various career stages to ensure the organization benefits from a diverse and flourishing pool of expertise. Further exploration into the optimization of policies supporting the career progression of academic staff in these mid-level positions could be beneficial for ensuring a balanced and sustainable faculty structure.

During the interviews it became clear that the postdoc group is in need of more support. Clarity regarding career opportunities and permanent positions within Amsterdam UMC is highly recommended. The committee recommends starting an AR&D postdoc network, to provide information on positions and career opportunities (also addressing career opportunities outside academia) and networking opportunities. This will benefit the postdocs as well as AR&D. After all, the postdocs, of



which the majority will leave AR&D for other jobs, will be the alumni and ambassadors for AR&D worldwide.

### *Diversity*

The committee is pleased to note that Amsterdam UMC has dedicated resources and expertise to promote equal opportunities for women and people from underrepresented groups, such as a Diversity & Inclusion (D&I) Office and Principal D&I investigators and educators. Amsterdam UMC offers workshops and courses to help raise awareness and promote the integration of diversity in their own teams and collaborations. In addition, the committee praises AR&D's ability to successfully attract a policy advisor who also serves as the programme secretary for Diversity & Inclusion.

Currently, the AR&D leadership and team exemplify gender balance: 42% of the professors are female, with women comprising half of the 16-member research board. The institute didn't present figures of other types of diversity but diversity in ethnicity or culture seems to be less balanced.

## **2.6 PhD programme**

Centralized PhD support and training are administered through the Amsterdam UMC Doctoral School. The services offered by the Doctoral School encompass the provision of information and guidance to PhD candidates. Comprehensive training is provided in essential academic skills, including writing, presenting, personal development, research ethics, scientific integrity, and scientific methods. The programme also emphasizes the refinement of research skills, with a focus on expanding and deepening scientific comprehension, along with the enhancement of social and personal competencies.

It's worth noting that since PhD degrees are conferred by individual universities, distinct doctoral regulations are applicable to Amsterdam UMC PhD candidates in accordance with the policies of UvA and VU Amsterdam. During the interview with the PhD candidates, the committee did indeed observe significant differences in both the regulations and supervision among individual candidates. It encourages the Doctoral School to further harmonize the procedures for PhD candidates from both universities.

Overall, PhD candidates express satisfaction with their supervision, feeling heard and are aware of where to seek assistance for any issues. Nevertheless, they perceive the threshold to approach a counsellor as high. The committee is encouraged by the recent establishment of an Amsterdam UMC institute-wide research mentoring programme, catering to all researchers affiliated with an Amsterdam UMC research institute. According to the committee, an external senior researcher (not a member of the PhD's supervision committee) can provide accessible feedback on the PhD process and supervision. However, the committee observed that this programme is not widely known among PhD candidates, yet. It recommends enhancing awareness of this programme among PhD candidates, either through more effective promotion or by making participation mandatory.

The committee acknowledges the efforts of AR&D in organizing PhD activities aimed at fostering personal and professional development. These include workshops covering a range of topics such as work-life balance and burn-out prevention, achievement psychology, scientific storytelling, data visualization, research integrity, and grant writing. Additionally, the annual two-day AR&D retreat is highly valued by the PhD candidates.

Nevertheless, it was observed that PhD candidates do not primarily perceive themselves as part of the research institute community. The degree of connection varies significantly depending on the



supervisor. Given that PhD candidates enter from diverse disciplines, they would value greater involvement in the institute and increased interaction with fellow PhD candidates right from the outset of their PhD trajectory. The committee suggests that implementing an onboarding programme (on scientific content as well as the role of AR&D in their training programme) for PhD candidates could effectively address this issue.

Because of the distinct administrative systems employed by UvA and VU in managing PhD candidates, along with the inability of associating each PhD candidate with a single institute, PhD success rate and future career data (in and outside academia) for most of the PhD candidates are not available. The committee recommends investing more effort in obtaining this data.

## 2.7 Final conclusions and recommendations

AR&D was established in 2016 and has managed to become a research network organization in which scientists from the Vrije Universiteit Amsterdam and University of Amsterdam successfully collaborate. AR&D has the potential to become a world-leading institute on reproduction and development research, especially because of its focus and efforts to generate societal impact and its enthusiastic and committed directors. In order to become a recognized international knowledge hub, the committee advises to introduce some strategic and organization adaptations that will help AR&D in its transition from a network organization with limited steering power into a recognized and powerful key research institute.

The committee made several recommendations for further improvements in the future. The most important recommendations are:

1. To align the research strategies of the departments, divisions and AR&D, the committee strongly recommends the AR&D management to proactively discuss research strategy with department and division leadership. PIs affiliated to AR&D should be more engaged in the future research strategy as well.
2. Allocate (more) dedicated time from AR&D leadership to lead the institute.
3. To establish a dashboard on research input and output to support and monitor research strategy decisions, including an overview of the efficacy of the AR&D grants (in terms of publications, grant proposals, PhD theses (success rate) and valorisation).
4. To develop a dedicated strategy to increase external research funding, including EU funding. Make use of the expertise and strategies of scientists successful in obtaining funding and the experience of scientists serving on review committees.
5. To better communicate the profile, purpose and societal relevance of the institute, to become more visible internally and externally through independent branding as an Amsterdam UMC Institute, knowledge hub and resource for reproduction and development research, translation, implementation and policy dissemination.
6. To develop a transparent policy on the appointment of AR&D's board members and the internal grant review and selection.
7. To establish an external scientific advisory board to reflect on AR&D's research strategy.
8. To improve innovation, AR&D should make more use of the multidisciplinary expertise of the scientists in the institute.





9. To encourage team-science collaborations between clinicians and basic scientists. This could be done by organizing thematic research meetings. Team science might help clinicians balancing clinical and research activities and decrease the risk of research integrity issues.
10. To maintain and extend AR&Ds unique (inter)national translational position, key facilities such as the Lab of Reproductive Biology (currently in division 9) should be protected.
11. To invest in and communicate open science (not only open access publishing) in the AR&D institute.
12. To establish an AR&D young/mid-career investigator (including postdocs) network providing network possibilities and courses on diverse career development (within or outside academia).
13. To establish a PhD onboarding programme/course to ensure that PhD candidates better connect to the AR&D institute.



## Appendix A - Programme of the site visit

<b>January 9</b>	
08:30 – 09:30	Internal committee meeting
09.30 – 10.15	Word of welcome by the chair of the Board of Directors of Amsterdam UMC and introduction of AR&D by directors and former director
10.15 – 10.30	Evaluation/break panel
10.30 – 11.15	Meeting with management / AR&D Research board
11.15 – 11.30	Evaluation/break panel
11.30 – 12.15	Thematic meeting 1 - Added value of AR&D
12.15 – 13.15	Lunch
13.15 – 14.00	Meeting with PhD researchers
14.00 – 14.15	Evaluation/break panel
14.15 – 14.45	Visit to the Dutch Fetal biobank
14.45 – 15.15	Visit Museum Vrolik
15.15 – 15.30	Evaluation/break panel
15.30 – 16.15	Meeting with Principal Investigators (PI's)
16.15 – 16.45	Evaluation/break panel
16.45 – 17.15	Meeting with management of Division Women Children
<b>January 10</b>	
08.30 – 09.15	Internal committee meeting
09.15 – 10.00	Thematic meeting 2 - The balancing act of combining clinical work with clinical research
10.00 – 10.30	Evaluation/break panel
10.30 – 11.15	Meeting with post-docs and mid-career researchers
11.15 – 11.30	Evaluation/break panel
11.30 – 12.15	Presentations by PhD researcher, post-doc and senior researcher on AR&D research
12.15 – 13.00	Lunch
13.00 – 13.45	Thematic meeting 3 - Science for society: creating impact
14.00 – 14.20	Optional meeting with management (if necessary)
14.20 – 16.00	Internal committee meeting
16.00 – 16.30	Presentation of findings by committee chair
16.30	Drinks



## Appendix B - Quantitative data

### B.1 - Research staff <sup>a</sup>

	2017	2018	2019	2020	2021	2022
<i>Scientific staff</i>						
Full professor	74	77	75	72	68	68
Endowed professor	2	3	3	3	2	2
Associate professor	17	17	18	18	17	17
Assistant professor	16	14	14	15	15	14
Research associate	76	75	70	70	65	68
PhD candidate	272	291	288	263	252	250
<b>Total</b>	<b>457</b>	<b>477</b>	<b>468</b>	<b>441</b>	<b>419</b>	<b>419</b>

<sup>a</sup> Collected using the Research Information System Pure (May 2023), excluding support staff, visiting fellows, medical specialists and other academic staff who also actively participate in AR&D research. Researchers at Amsterdam UMC can be affiliated with two institutes. Due to incomplete registration in Pure, the actual number of members affiliated to AR&D is expected to be higher (>500 members).

### B.2 Funding (in k€)

	2017	2018	2019	2020	2021	2022
Funding						
First-flow funding <sup>a</sup>	500	500	558	558	558	558
Second-flow funding <sup>b</sup>	4,384	1,733	€ 2,691	1,058	2,787	3,381
Third-flow funding <sup>c</sup>	1,326	2,166	1,123	475	1,154	886
Fourth-flow funding <sup>d</sup>	754	399	1,648	103	765	171

a Direct funding; internal institutional funding only.

b Research grants obtained in scientific competition (e.g., grants from NWO, ZonMw, KNAW).

c Charity funding by non-profit organizations (e.g., KWF, Stichting Steun Emma Kinderziekenhuis, Metakids, Sikkelfonds).

d Private funding from commercial sources: contract research and clinical trial research funded by biotech and pharma industry.

