



Report for the research review of

Amsterdam Cardiovascular Sciences
Research Institute

Site visit: 7 and 8 December 2023
Report: March 2024

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Preface

As a committee we would like to thank the management and members of the Amsterdam Cardiovascular Sciences Institute (ACS) for their hospitality and the excellent insight given in their research programmes and organisation. The committee really enjoyed the open and fruitful discussion on the organisation, the talent management, PhD programme and most of all the scientific programmes as they are ongoing within ACS. Based on the discussions and the provided self-evaluations, we - as a committee - evaluated ACS and have postulated some recommendations for improvement where we believe this could be helpful to improve ACS even further.

We hope that these recommendations will be seen as constructive suggestions for further improvement and which the ACS teams all the success for the upcoming period.

Professor Paul Quax
Chair research evaluation committee
February 2024

Summary

Amsterdam Cardiovascular Sciences (ACS) is committed to advancing cardiovascular disease treatment through innovative treatment strategies, combining fundamental and clinical sciences and supporting research talent. ACS strives for clinical and societal impact. Strategy includes infrastructure, visibility of the institute, opportunities for collaboration and sustainability. The main added value for many ACS scientist is the interaction with other scientists across research programmes. ACS supports an inspiring research environment, leading to high quality research. One of the major challenges faced by ACS, is the limited steering capacity due to limited funding. This is reflected in the broad research portfolio, but also in the infrastructure and housing challenges.

ACS focuses on supporting young scientists, enhancing infrastructure, and increasing visibility. The mission is clear, but very broad and could benefit by more clear definition of major focus points and clear strategy to strengthen those. The committee appreciates the activities and efforts by ACS to stimulate and facilitate the group of young scientists and encourages the institute to also include Young ACS in the strategy discussions. Not all ACS members are highly active in ACS and the committee suggest to develop strategies to motivate these members to integrate and contribute.

The culture at ACS is open and aimed at collaboration, which is appreciated by the research staff. Work pressure is high, although lowering workload is partly outside the scope of ACS. While efforts are made to promote diversity, more proactive measures are required, including mentoring programmes and targeted recruitment of talented female scientists and international fellows.

The quality of the research performed at ACS is very good, with some outstanding research lines. This is evidenced by the impact of publications, marks of recognitions and impressive earning capacity.

Increasing focus lies on societal relevance, impact and valorisation of the research, which is appreciated. The challenge is to capitalise on the impressive research towards societal impact. By focusing, making use of existing structures and continuing to expand networks, the committee thinks that major steps can be taken.

According to the committee, the future for ACS looks bright, with the major challenge being to capitalise on the outstanding research, both academic and societal. The committee provides several recommendations to ACS and to Amsterdam UMC to help ACS thrive in the upcoming years.

Introduction

Scope of the evaluation

The Executive Boards of Vrije Universiteit Amsterdam and University of Amsterdam commissioned a review of the research conducted in the Amsterdam Cardiovascular Sciences Research Institute (ACS). The review is part of the regular six-year quality assurance cycle of the universities and is intended to monitor and improve the quality of the research and fulfil the duty of accountability towards government and society. The quality assessment in this report is based on the assessment system in the Strategy Evaluation Protocol for Public Research Organisations 2021-2027 (SEP, appendix 1) drawn up by the Universities of the Netherlands, the Dutch Research Council (NWO) and the Royal Netherlands Academy of Arts and Sciences (KNAW).

The review committee

The Executive Boards have appointed a review committee (hereafter: committee) of eight external peers according to SEP. The committee consisted of:

- Prof. dr. Paul Quax, Leiden University Medical Centre (chair)
- Prof. dr. Philippe Charron, Pitie Salpêtrière APHP University Hospital, Paris
- Prof. dr. Christian Weber, Ludwig-Maximilians-University, Munich
- Prof. dr. Martin Wilkins, Imperial College London
- Prof. dr. Denise Hilfiker-Kleiner, Philipps University of Marburg
- Dr. Jorie Versmissen, Erasmus Medical Centre Rotterdam
- Tess Yntema MSc, PhD candidate, University Medical Centre Groningen
- Nelson Dapaah MBA, director patient organisation Harteraad

The Executive Boards appointed dr. Meg Van Bogaert as the secretary to the committee.

The evaluation criteria

The Standard Evaluation Protocol (SEP) was the starting point for the committee's evaluation. This protocol describes the objectives and methods for evaluating publicly funded research in the Netherlands. The SEP distinguishes three evaluation criteria: (1) quality of research, (2) societal relevance, and (3) viability. Additionally, the SEP asks committees to consider four specific aspects when evaluating the three central criteria. These aspects are: (1) Open Science, (2) PhD Policy and Training, (3) Academic Culture, and (4) Human Resources Policy. In addition to the guidelines and criteria in the SEP, the committee also considered its task established by the University Executive Board. Additionally, ACS requested the input of the committee on the future positioning of the theme 'Microcirculation (MC) within ACS.

Information provided to the committee

The committee received the following information:

- Self-evaluation report;
- Report previous research review;
- Strategy Evaluation Protocol 2021-2027;

Procedures followed by the committee

The site visit of ACS took place on 7 and 8 December 2023. Before the site visit, the committee members were asked to read the documentation and formulate preliminary findings and questions for the interviews.

Prior to the site visit, the committee received a presentation with an introduction to the SEP, specifics about the Dutch research landscape and the working methods. In an online kick-off meeting, approximately one week prior to the site visit, the committee agreed upon procedural matters. On the first day of the site visit, the committee discussed its preliminary findings and prepared the site visit. The first day of the site visit coincided with the annual ACS symposium, which the committee partly attended. On the second day of the site visit, 8 December, the committee met with representatives of the institute and discussed its findings. To conclude the site visit, the committee presented the main preliminary conclusions to the institute. The schedule for the site visit is included in appendix 2.

This report describes the findings, conclusions, and recommendations of the committee. ACS is assessed based on its own objectives and strategies as well as in relation to departments and institutes worldwide in similar disciplines and on similar topics. The texts for the assessment report were finalised through e-mail exchanges. The final version of the report was presented to the Institute Board, and Executive Board of the University for factual corrections and comments. The report was finalised on 13 March 2024.

Amsterdam Cardiovascular Sciences

Mission and strategy

The mission of Amsterdam Cardiovascular Sciences (ACS) is to design novel treatment strategies to prevent and cure cardiovascular disease. It aims to combine cutting edge basic and clinical science using patient data as the lead structure in research and to have clinical and societal impact. ACS aims at design knowledge-based treatment strategies to prevent and cure cardiovascular disease.

Education, research and clinical activities are equally central in all ACS research programmes. ACS aims at both translating experiments to potential clinical interventions, but also to use clinical observations to develop and validate novel, biological concepts (bench to bedside and back). The initial ACS strategy focused on three main topics.

The first strategy focus was promoting young scientists and stimulating **collaboration** between scientists at the two locations (VUmc and AMC). Out-of-the-Box grants and PhD grants were used to stimulate this collaboration. Additionally, grants for clinical fellows were awarded, ensuring they have one day a week of protected research time.

The second focus was to strengthen the **infrastructure** an inventory was made of the existing research infrastructure at the preclinical ACS departments, followed by a plan to renew, combine and harmonise. The aim is to create a 'hotspot' for translational cardiovascular research. Unfortunately, due to budget limitations, the empowerment of infrastructure has been postponed to 2027.

Thirdly, ACS aimed at increasing **visibility** of and **awareness** for ACS among cardiovascular scientists working at Amsterdam UMC, an annual glossy brochure is made.

In 2019, additional aims were formulated, including **broadening the scope** and developing international collaborations. In addition, ACS aims at increasing **visibility** to stakeholders other than (inter)national scientist colleagues, such as policy makers, patient organisations and industry. ACS is also working on **transparency about research in animals** and advances made in animal-free innovations. Finally, **sustainability** is increasingly getting attention in ACS.

From the perspective of cardiovascular diseases, all research is potentially relevant. However, due to limited personal and financial resources, ACS needs to focus on a limited number of topics to be competitive internationally with high end research. The committee recommends ACS to choose several focused spearpoints in the ambitions, formulating clear goals for the upcoming years, and select tools to make choices on the research to focus on. This does require that ACS engages the divisions in developing a robust and convincing proposal. The committee understands that there are several strong departments, e.g., Cardiogenetics and Pulmonology, that might be good starting points.

According to the committee, ACS has a very broad aim and mission to link the clinical and preclinical research in a variety of cardiovascular diseases. The committee appreciates the objective of translational research and connecting the clinical and preclinical research lines. However, the lack of focus might limit the impact and pace in delivering the mission

of ACS. In this respect, the committee suggests ACS reconsiders its mission and strategy, and include young ACS in this discussion.

The research programmes and many of the scientists are (inter)nationally visible and renowned. While Amsterdam UMC has a strong name, ACS as an institute is less visible at the international level. The group of young ACS scientists prefer to have Amsterdam UMC as their main visible organisation and ACS as sub-track to help them building networks, collaborations and internal cohesion. Several ACS scientists are also connected to another Amsterdam UMC institute, further complicating visibility of ACS. The committee believes that the approach to increase the 'branding' of ACS is valid, but thinks it is important to have consensus on the positioning of the institute, and the (internal) communication. For example, it has an impact on the affiliation used by scientists, both in publications and in the e-mail signature.

Organisation

Amsterdam UMC is merging from two separate institutions towards one entity. One of the initial aims of the Amsterdam UMC institutes was to stimulate collaboration across the two institutions and capitalise on the power of scientists working on similar research topics. The ACS governance structure was implemented in 2016, including a funding programme to stimulate education activities, talents and innovative collaborative research. The ACS is led by the ACS Directorate (two Directors and four Directorate members) that meets monthly to discuss the research strategy. The research is performed in five translational research programmes:

- A. Heart Failure & Arrhythmias (HF&A)
- B. Pulmonary Hypertension & Thrombosis PH&T)
- C. Atherosclerosis & Ischemic Syndromes (A&IS)
- D. Diabetes & Metabolism (D&M)
- E. Microcirculation (MC)

In each programme, key scientists (PIs) have been identified and monthly ACS science meetings are organised. In addition, there are annual conferences. To the committee it remains unclear to what extent and with what purpose the ACS Directorate structurally meets with the programme leaders. The young ACS group informed the committee that it notices differences between the research programmes in the way the programme leaders connect and communicate with them. The group of young ACS scientists would like to be better informed of the strategy and research directions chosen and – even more importantly – to be involved in strategy discussions. The committee is of the opinion that the young ACS group is very important for the institute and – as future research leaders – should be able to contribute to the discussions held. A&IS was mentioned as demonstrating best practice, in which young ACS scientists are included in joint strategy meetings and are able to provide input. For the other programmes the involvement differs and reasons for suboptimal functioning were diverse. The committee recommends that all research programmes work on an organisational structure that with clear communication and – preferably – includes all research staff.

The provision of cross cutting skills or themes would be one opportunity for ACS to demonstrate its added value. For example, with respect to Microcirculation, its biology and its pathophysiology are relevant for all other topics and could be organised as a cross-sectional unit within the ACS research structure. It could become a hub where

different expertise and techniques could be shared and developed and show added value. A similar argument can be made for the IPS cell facility, artificial intelligence and valorisation.

The structure of the organisation, decisions being made by (heads of) departments and the relative lack of funding hampers the ability of the ACS directors to influence PI behaviour. The provision of a pipeline of PhD candidates and cross-discipline training in techniques with appropriate mentorship would be one lever to make impact. However, it may need additional incentives to convince departments/colleagues who do not participate actively in the institute.

Funding

ACS as an Amsterdam UMC institute has limited funding with 0.5 m€ per year to manage the institute, organise events and to provide several (small) grants, such as the out-of-the-box grant (25k€) or equipment grants. ACS-grants stimulate interactive collaboration, which is an important objective according to the committee. Currently, a requisite of an application is that it includes both Amsterdam UMC locations. According to the committee, the merging of and collaboration between the two locations is going well but has not realised its full potential and therefore might still require explicit stimulation, for example through specific intramural grants. In fact, it appears that VUmc departments are transferring to the AMC location, making it increasingly difficult to combine both locations in an application. The committee recommends reconsidering the requirements for the out-of-the-box grants to make them more inclusive, for example by including different tracks (e.g., junior versus senior, promoting clinical-preclinical connection) instead of the requirement to include the two locations.

In addition, research staff can apply for grants from the Central Amsterdam UMC research support scheme, e.g., postdoc-bridging grants, Amsterdam UMC fellowships or starter grants. The majority of funding for cardiovascular disease research comes from second- and third-stream funding sources. Research staff affiliated with ACS are very successful in the acquisition of research grants throughout the evaluation period. Another main source of funding comes from non-profit organisations, such as the Heart Foundation and commercial sources (contract research).

Academic culture

Overall, research staff are satisfied regarding social safety and integrity in ACS. There is an external confidential advisor to deal with specific cases, should they arise. Communication and transparency on pathways to deal with (unwanted) issues is important, in particular towards PhD candidates and postdocs.

Work pressure was considered by scientists to be high, although some felt it was better compared to other institutes in which they had worked. The committee was told that there are differences between the Amsterdam UMC departments and the extent of support for young scientists for permanent positions. Dealing with excesses and unwanted pressure in departments is beyond the remit of ACS, although the committee thinks that the institutes could jointly address and discuss this within Amsterdam UMC.

Junior research staff, often at the PhD training level, follow a course in research integrity. The assignment that is required to be done together with a supervisor, was highly appreciated. A research integrity course for supervisors/Pis as performed in other

centres could be considered. According to the committee, it would be beneficial to offer a better support structure (clinician scientist programmes, mentoring programmes etc) to postdocs (both medical and non-medical scientists), to advance their careers in academia (for example towards professor ship) and industry.

Housing and infrastructure

ACS wants to facilitate core infrastructure and facilities to stimulate collaboration and high-quality research. In particular the stem-cell facility (IPS) and shared techniques are valued strongly by ACS scientists. Unfortunately, the move to a new building is postponed as the core facilities are an added value of ACS. The committee furthermore learned during the site visit that Amsterdam UMC will invest in central -omics facilities while bioinformatics will remain at PI level. The committee thinks that having basic bioinformatics support at central level is important to keep PIs connected to the central facilities. According to the committee, ACS should focus on task forces and developing structures to motivate scientists to jointly focus on specific research topics and research lines. As with other Amsterdam UMC institutes, the situation of ACS is complicated since ACS has very limited funding at institute level. A major challenge is insufficient funding for infrastructure, such as renovation of buildings and labs, dedicated equipment and core facilities/infrastructures. In addition, entering and promoting novel research direction is more difficult with limited resources. According to the committee, the funding model is of major importance, and the implementations of a fee-for-service system could have major impact because many grants do not include funding for this purpose.

Several of the research programmes mention biobanking initiatives. Not only is this expensive, the committee has some concern about the standardisation of procedures and quality of biomaterials in decentralised individual biobank location. The committee encourages ACS to develop a centralised biobank concept with SOPs for material acquisition and storage, contracts for users etc as it is standard at other national and international sites.

To streamline the organisation, building maintenance and other services are organised at Amsterdam UMC level. This is understandable as it minimises costs and streamlines the organisation. It was, however, mentioned to the committee that the level of support from some services is insufficient, for example the legal department. The lack of support in case of patents, spin-offs or collaborations with private partners is hampering the development of ACS research. Sometimes the interests for the own organisation seem to strongly dominate, making cooperation impossible. While it is clear to the committee that everyone tries to do their work at the best possible level, it would be good if this issue is addressed, and Amsterdam UMC services and the institutes collaborate towards the best possible outcomes, especially in respect to the valorisation initiatives.

Human Resources Policy

Research staff are not appointed at ACS, but to one of the divisions of Amsterdam UMC. From the interviews during the site visit, the committee learned that, although there is no formal role for the institutes in the appointment of new staff in divisions, the ACS director is able to give recommendations on what expertise is required from ACS's perspective. The committee suggest considering streamlining administration in both institutions to save resources and optimise administrative processes. Throughout the meetings with groups of representatives and research programmes, the committee was informed about best practices regarding talent management in the different research themes. The

committee stimulates ACS to share these best practices or, even better, make them into an ACS-wide theme or policy.

Young ACS

In the evaluation period, Young ACS was established, a team of junior high-potential, mid-career scientists who have taken the lead in the organisation of the monthly and annual ACS meetings. Similar to other Amsterdam UMC institutes, ACS is hampered in making strategic choices by the fact that money- and decision-making power is at the level of departments and divisions. The ACS board actively engages in discussions with the divisions and departments to influence decision making but would benefit from a more formal role in the HRM decision making process. The committee recommends to the Amsterdam UMC board to considering formal involvement of the institutes in, for example, division boards.

The committee appreciates the activities and efforts by ACS to stimulate and facilitate the group of young PIs who are building their research profile and academic careers. Although ACS is not directly involved in tenure and promotion decisions, it can and does play an important role in the support and guidance of its scientists, for example with the organisation of a mentoring system, InterVision, and stimulating and supporting the young ACS community. From the meeting with young ACS, the committee learnt that support and guidance is often good but is dependent on the programme leaders and is not evident in all programmes at the required level. Programme management sometimes has limited time to focus on aspects such as supporting young ACS scientists in network building, for example as speakers at (inter)national meetings. The committee suggests ACS could stimulate and support the group of programme managers to jointly develop this in all research programmes. A good example of how joint efforts have impact is the mentoring programme that was recently setup by the joint institutes of Amsterdam UMC and seems to work well. It is also suggested that the different research themes could share best practices regarding talent management or make it an ACS wide theme.

The committee was impressed by the group of young ACS it met during the site visit but did notice that the definition of “young” in young ACS is a stretched concept as the majority seems to have a permanent position. It recommends refreshing young ACS to align the aims with the current career phase of young ACS. As mentioned before in this report, the committee is of the opinion that the group of young ACS scientists – in particular the current group – could and should be better involved in strategy discussions of the research programmes.

An issue that was brought forward by the young ACS members was the fact that *ius promovendi* for associate professors, although possible, has to be requested for each PhD candidate supervised. Whether or not it is granted, seems to strongly depend on the department head. The committee advocates clear and transparent rules concerning *ius promovendi* for associate professors and is of the opinion that once granted, it should be permanent.

Clinician scientists

Another important group of research staff is the group of clinical scientists (physicians in clinical training with protected time for research), in particular regarding the ACS objective to do translational research. As in many other clinical disciplines, it is difficult for clinician scientists in ACS to get sufficient dedicated research time. The clinic takes

priority and management does not always see the importance of doing research. In particular, young clinician scientists who face a very high workload. ACS recognises this challenge and supports this group of research staff with specialisation grants that provide time to secure more research time. Unfortunately, it requires a permanent contract (or 3-4 years continuation of the temporary contract) to be eligible for this programme. These requirements is discouraging them from applying for a research position. The committee recommends that clinician scientists in training are granted protected research time (one day/week or whole weeks or months with at least 20% of their worktime during the year) to support them in their research career. Best would be to develop specific programmes for clinician scientists with defined requirements and rules. The directors of ACS should make sure that this protected time is granted by making agreements with the department heads regarding dedicated research time agreements, and no cross-subsidisation of clinical duty is done by research money.

In the interview with young ACS, it was mentioned that membership of the national committee of cardiovascular science, *Young at Heart*, is valuable for this group of clinical scientists. Similarly, the *International Society for Heart Research* (ISHR) for mid-career scientists. The committee believes that encouraging such memberships could be done ACS-wide.

Postdocs

In general, postdoc scientists are a vulnerable group, and this is also true at Amsterdam UMC and ACS. Privacy rules are restrictive in identifying who are postdocs, which means that ACS is not aware who to target when focusing on the group of postdocs. The committee thinks that this is an over-interpretation of the privacy regulations. In any case, ACS could deal with this issue by including information for postdocs in the starting package, helping them to identify as a postdoc and become part of the postdoc community. The committee thinks that specific career support programmes have to be developed for postdocs to help getting scientific independence and define their own carrier plans. It would be also important to develop networking structures for postdocs for example in form of a faculty club within the institution.

Diversity

Although ACS has no direct influence on the hiring process, it is working to enable a diversified research community. It was mentioned in the interviews that it is particularly difficult to appoint female clinical scientists at the more senior level. Focus lies on the work-life balance and providing mentoring. It was also mentioned in the interviews that culture changes might be required, for example to avoid organising meetings at 17h. Gender diversity is improving, which is already observed in young ACS. At student and PhD level, the gender balance is good. Additional diversity aspects, e.g. international scientists, scientists with disabilities and/or first-generation scientists are not registered, nor is it clear to the committee in what way ACS stimulates diversity on these aspects.

ACS explicitly mentions that quality is dominant when hiring new (research) staff. Although the committee fully agrees with this statement, it recommends to the institute to analyse if the definition of quality might be unconsciously biased, leading to a disadvantage for outstanding female candidates. Another suggestion by the committee is to more actively approach talented female candidates, as they are – in general – more hesitant in self-promotion and pushing themselves forward. A mentoring programme

specifically for female scientists is strongly considered as well as funding for courses, workshops and travel.

Research quality

According to the committee, the quality of the research across the institute ranges from very good to excellent. This assessment is evidenced, among others, by the marks of recognition from peers, membership of important boards and committees, the use of knowledge by stakeholders and peers, and the acquisition of prestigious, highly competitive research funds, particularly on the European level. Furthermore, the impact of publications based on the MNCS and publications in the top10% is very impressive. More specific findings and assessment on the research quality is provided in the next chapters, in which the different research programmes are evaluated.

In addition to the information from the self-evaluation report, the committee had the opportunity to join the annual ACS symposium. Through listening to the scientific presentations and talking to PhD candidates, it was clear to the committee that scientists are enthusiastic and dedicated to their work and skilled at presenting their work confidently and professionally.

From the interviews it became clear to the committee that the main added value for many of ACS's scientists is the interaction with scientists across research programmes. ACS supports an inspiring research environment, leading to high quality research. At the same time, the committee noted that the interaction between – and even within - the research programmes is limited.

Atherosclerosis & Ischemic syndromes

The research programme indicates 50 PIs, with some 10-12 forming the core group that is actually active in ACS. The committee is pleased to learn that this number of active ACS PIs is increasing. Various members of the A&IS theme have an excellent international reputation and network, and as such help in positioning this ACS theme.

The theme A&IS is a broad theme addressing atherosclerosis, aneurysm, coronary and peripheral ischemic syndromes, renovascular diseases as well as cerebrovascular syndromes. Although the freedom for choosing a research direction is highly appreciated and valued, the coordinators recognise the need for defining 3-4 focus areas and identifying opportunities to better position the programme's effort considering these focus areas. The potential of the very talented Young ACS scientists could be of help in defining strategic choices for the future.

Traditionally, the clinical scientists in this theme have large experience with clinical studies and the interaction with the preclinical scientists appears to be excellent, the committee noted real bench-to-bedside interactions and vice versa to be in place. The fact that the collaboration between clinical PIs and preclinical PIs is actually occurring can be deduced for the fact that in many of the clinical cohort studies the analysis really stretches out into the pre-clinical area, e.g. extensive single cells sequence studies are being planned and performed on the patients in the cohorts.

The A&IS research programme is quite far in exchanging data between the various cohorts in the studies they are involved in, including all issues relating to this. For

instance, the documents prepared for the HORIZON grant can be (re)used for other applications with similar data exchange/patient data related items including privacy related legal issues.

Regarding biobanking, the A&IS team feels that some central support would be helpful, especially regarding the exchange of (patient) data. Moreover, the biobank of living cells requires special attention and can basically only be run in the institute since exchange of living cells is difficult

Overall, A&IS is a strong programme with impressive results regarding funding and publications, and a clear sense of added value of working in the constellation of ACS. Items for improvement with support of ACS would relate to more support in grant writing, especially in the consortium grants, more support regarding biobank organisation, structure and procedures for use and acquisition of materials.

Pulmonary hypertension & thrombosis

The PH&T research programme is excellent. It promotes and hosts a bench-to-bedside ethos, in the spirit of the ACS translational medicine mission. The programme is well led and funded, and elements of the research are well recognised at international level. A number of current research leaders have come through the institution.

A critique of the PH&T research programme as currently structured is the somewhat forced marriage between three groups: pulmonary hypertension, thrombosis & haemostasis, and respiratory muscle. The programme leaders recognised and volunteered that they do not consider the three themes to function as one programme or discuss research opportunities and discoveries as a group. The five-year vision, expressed in the self-evaluation report and in the presentation, suggests this will continue with the three groupings pursuing their independent ambitions. Although this is understandable and may be a pragmatic operational approach, the committee had trouble identifying the added value and metric(s) of success for this theme as currently structured in ACS.

The committee would understand if the three components were dispersed among the other themes/research programmes but would not want this to be at the expense of good science or reduced resources. One consideration is that the respiratory muscle, which is particularly small and vulnerable, might join the Heart Failure programme. Whatever the construct, the committee encourages a dynamic environment such that strong and innovative science can be recognised, supported, developed, evolved and accommodated to be able to compete internationally.

Heart failure & Arrhythmias

The research quality is outstanding in this research area, with excellent track records, especially on arrhythmia. Both in preclinical and clinical research, the committee notices high expertise, with the programme taking advantage of large cohorts of patients and collection of bioresources (especially DNA). In the evaluation period, HF&A group published a large number of papers, with high impact factors, including Nat. Genet, Nat. Comm, NEJM) and high number top 10% publications. The number of grants acquired is also impressive, both at national and international level, often as coordinator. According to the committee, there is a good balance between funding between first, second, third and fourth streams. Several of the HF&A scientists were awarded prestigious personal

awards (e.g., Gold medal ESC) of membership (e.g., Royal Dutch Academy of Sciences). Despite the outstanding quality and great expertise in preclinical and clinical research, interactions and cross-fertilisation between preclinical and clinical research are not fully clear and – according to the committee – could be improved. The committee suggests working on a process, especially on further involvement of clinicians and encourages the programme to – in consultation with Young ACS - make clear strategic choices for the future to continue doing research at this impressive level.

Research results of this programme led, among others – to the integration of publications in International Guidelines and progress towards therapeutic investigational products (project on RNA based in HFpEF). HF&A is also involved in coordination of European entities such as ERN-Guard Heart for rare cardiac diseases.

The area of heart failure is probably less developed compared to the area of arrhythmia. The committee suggests working on this as there is potential; for example, the identification of programme leaders (no programme leader identified in HF in the self-evaluation document), improving networking between the Heart Failure and Arrhythmia groups at various levels, think more about common facilities etc. It might be beneficial for both heart failure and arrhythmia to focus on genetics, as there are common lines visible in both groups.

An important objective seems to be the development of core facilities and infrastructures, with the support of ACS, especially regarding the recently initiated iPS core facility. The committee emphasises the importance of sustainable core facilities, requiring dedicated efforts from ACS and Amsterdam UMC. One way is to have a business plan and be open to external teams.

The self-evaluation report did not provide a lot of information about priorities for the next five years. This is an important strategic issue that seems to be missing, though it was addressed partially during the site visit. According to the committee, the future strategy could be addressed more clearly as it is important to adjust actions and progress efficiently.

Diabetes & metabolism (new name: Cardiometabolic Syndromes)

The presentation by the research programme leaders during the site visit made clear to the committee that many developments have taken place in 2023, including new programme leaders. Another development is the addition of chronic kidney disease (CKD) as one of the topics, including the part that was previously included in the A&IS research programme. The changes led to the research programme proposing a new name: cardiometabolic syndromes. According to the programme leaders, this name better reflects the main focus in the programme that lies on microbioma, CKD, obesity and microcirculation. The committee is positive about the changes and improvements that are being made.

The committee notes that the research programme is very broad, making it a challenge to organise a coherent programme. Many PIs (39) associate with the research programme, which is a positive sign as well as a challenge. Only a small part of the PIs is really active in the programme. With the previous programme leaders leaving the institute, the strategic goals as formulated in the self-evaluation report are no longer relevant. In the interview, SGLT2 trials and mechanisms were mentioned, as well as

microbiome and the connection between diabetes and fatty liver. The committee recommends framing these aspects clearly in the strategic plans; by identifying three to four topics and combine the (outstanding) expertise on these topics, the programme could excel. By pinpointing a goal in the future, e.g., integrating cohorts with basic and valorisation tracks, the focus and strategy of the programme will become clear.

Looking at the past performance, the research programme has been doing very well. Funding and output are well established. The number of awards and (inhouse) talent grants confirm the academic recognition, although the committee noticed a disbalance between the number of awarded talent grants (table 2) and PIs (Figure 7). A clear definition of who can consider oneself PI was not given; potentially a lower number of dedicated PIs could help for focus.

The committee noted a clear and strong example of valorisation (novel treatment) and was surprised that it was not mentioned in the session on valorisation during the site visit. By strengthening the connection between the programme and ACS directorate regarding the strategy, the impressive research in the programme will be better seen and heard, both on valorisation and academic output.

Micro-circulation

The research topics addressed in this research programme are important and the quality of the research is excellent, with internationally highly visible PIs, top publications and impressive third-stream funding. The research in the Micro-Circulation (MC) research programme is furthermore highly recognised across the other research programmes at ACS that deal with diseases. Unfortunately, the number of PIs in this programme is declining as many ACS scientists who are involved in MC-relevant research topics prefer to connect to one of the other programmes. The committee understands the dilemma and does not have a clear cut advise on the best solution.

It is important to link the strong basic research in microcirculation more to the clinical needs, for example by setting up an interdisciplinary ambulance for patient with microvascular disorders and disease, or even think about a “molecular microcirculation disease board” to discuss patients with complex diagnosis to define best therapeutic options but also use them to further develop excellent science. It would also be a great opportunity for interdisciplinary PhD theses and grant applications.

The committee suggests not to dissolve the research programme on microcirculation but rather place it more dominantly into the centre of ACS as a connecting or cross-sectional structure. In this regard, rethinking the graphical presentation of the ACS might be a good idea.

Societal relevance

Recently, ACS appointed a dedicated valorisation officer, a cardiologist who combines clinical and translational work while providing knowledge and support to ACS PIs to develop their own valorisation strategies. The ultimate goal is to maximise the societal impact of ACS research, which is in line with the Amsterdam UMC valorisation strategy. Another aspect of societal relevance that is getting attention in ACS is citizen science, which is being implemented into translational cardiovascular research. ACS organises strategy days on impact, for example on valorisation. These meetings are appreciated by

the research staff; it was mentioned that this is recognition of societal impact as a priority and all participants are welcome to contribute, regardless of seniority. The committee compliments ACS with the organisation of these meetings, which clearly lead to an increase in integration and impact.

The committee appreciates impact on society is difficult to measure. In the near future, the institute wants to focus on alignment with clinical departments, in which focus and attention to (clinical) research is often limited. Sometimes decisions are made in clinical departments that are not aligned with a (translational) research climate but are outside of ACS's governance.

The main challenge ACS has is how to capitalise on their excellency: Valorisation is a goal and, in some respects, well performed and invested in. The research has clear societal relevance with patient participation being a goal and investment in, for example, "citizen science". Although efforts are made and impact is improving, the committee thinks that there is still a lot to gain.

The first step, according to the committee, is to make choices. The current, broad strategy makes valorisation and societal significance very difficult. It might help to choose a limited number of research directions and be more focused as an institute. This makes it easier to work towards a joint goal and capitalise on that, automatically achieving valorisation and securing societal impact.

The second advice is to make better use of structures that are already in place. For example, instead of setting up a new platform and database with patient and data (e.g., as Atrial fibrillation and Heart Failure is doing), the committee recommends connecting to the NHR (Netherlands Heart Registration) and make use of their data in a collaborative manner. An additional benefit might be that it creates time that scientists now lack to connect their research to clinical achievements.

The third recommendation is to continue expanding the external ACS network. It might be good to explore if ACS as an institute can be a member of the DCVA consortium. This allows ACS to get access to patient institutions, securing patient participation in the scientific research.

Viability

One of the initial goals for ACS and other Amsterdam UMC research institutes was to connect the two locations and hospitals. This was done successfully, and the committee recognises that the institute is now in a transition phase towards delivering further added value. The network function is important, bringing people with similar research interests together, through regular meetings, annual symposia and focus on translational research. Beyond serving as a network might be a challenge; for example, ACS has no formal decision-making power in the hiring and promotion of research staff and insufficient funding to set-up and maintain core facilities. The lack of significant funding to steer scientists towards a joint strategy and the lack of decision-making power is a major handicap for the institute and the committee stresses the urgency for the board of Amsterdam UMC to review and - where necessary - revise the organisational structure and governance. Given the reality, the committee considers that promoting networking,

stimulating discussion and collaboration and facilitating scientist interaction is a good approach given the current reality.

Branding is an issue. It is difficult and not necessarily optional for ACS to compete with such a visible and well-known name as Amsterdam UMC at national and international level. But this potentially compromises the added value of ACS. Many of the scientists who are associated with ACS feel more strongly part of their department and Amsterdam UMC. Although many PIs associate with ACS, it remains unclear to the committee how many PIs are really involved in each research programme. It is the view of the committee that ACS will benefit by getting more people involved and enthusiastic about joint projects etc. This requires that within the research programmes and between research programmes, ACS staff work towards being one entity. One way to finding cohesion within ACS could be on common treatments or strategies, e.g., SGLT2 inhibitors used in many different research themes as already seen during the posters and presentations during the annual ACS symposium. The committee does not want to prescribe the best approach or objective but advises those involved to make a clear and joint decision on the external and internal role of ACS. In this respect, ACS could be aiming at more focus and develop concrete plans on where they institute should be in five years from now.

In conclusion, the committee assesses the viability of ACS positively. As can be read in the section on research quality, the committee thinks that the research performed by ACS is outstanding. The strong basis of high-quality research, with high impact publications and impressive earning capacity as well as excellent scientists with academic reputations, gives the committee every confidence that the quality of research will continue to be very high in the upcoming period. The main challenge the committee identifies for ACS is how to capitalise on this outstanding research towards making more academic and societal impact as an institute. In all programmes, the research output provides a solid foundation, but making actual impact requires focus, making choices and collaboration.

PhD policy and training

PhD degrees are obtained at one of the participating universities and although Amsterdam UMC aims at alignment of the requirements, rules on training remain different. General PhD support and training is centralised at Amsterdam UMC level in the Amsterdam Doctoral School. To the committee, it seems that the role of ACS in the PhD policy, training and supervision is limited. Having stated that, the committee met with a vibrant PhD community who are invested in their research. This was evident from the symposium and from meeting with individual PhD candidates. It was also good to meet a PhD candidate who was trying to capitalise on his research through a spin out. An annual PhD retreat is organised by ACS. PhD candidates informed the committee to strongly appreciate this retreat, however there are limited spots available.

The requirements for a PhD thesis are not clear for everyone; it would be helpful if this were provided to PhD candidates at the start of their trajectory, including a check on implementation and whether supervisors are indeed keeping to arrangements. It appears that in some cases, the focus on output (numbers) is larger than the focus on personal development and quality of research.

From meetings with PhD candidates, the committee concludes that overall PhD candidates are happy with their supervision. Most have weekly or monthly meetings with

their supervisors and feel that more supervision could be arranged when needed. The PhD candidates mentioned that this is really dependent on the supervisor and certain groups are known for better supervision than others. Although there could be a bias in the PhD candidates that were present at the meetings, no cases of high rates of absence or burnout as markers of an unhealthy workplace were known by the PhD candidates the committee met.

Yearly meetings with supervisors that include external supervisors, the guidance committee, are organised to discuss projects and to stay on track. After this meeting supervisors will leave and the PhD candidate has the opportunity to discuss issues with the external supervisors on how things are going, what the work environment is like etc. An example was given by PhD candidates on how this external supervisor was valuable in the improvement of interaction between a colleague PhD candidate and their supervisor. The committee was pleased to learn that the structure works, on other hand the committee was slightly disappointed that not all PhD candidates they spoke with were aware of yearly guidance committee system.

The committee emphasises the important role of the PhD guidance committee and the actual execution of the annual progress meetings. Also, the role of the independent members of the PhD guidance committee is considered to be very important in addition to the supervision team (promotor and co-promoters). The role of the independent person(s) that the PhD candidate can contact in case there are issues or conflicts with the supervisor(s) is very important for the PhD candidate.

The committee understands that the responsibility for the supervision of PhD candidates only partially lies at ACS; the department is predominantly responsible. Hence, this recommendation might be directed to Amsterdam UMC and the divisions/departments.

One area for improvement that was raised by the PhD candidates is better guidance for future career perspectives. One suggestion was to organise a speed date session with former PhD candidates. It was also mentioned that due to the lack of postdocs and/or technicians for support and expertise, it takes quite some time to find out everything themselves.

Recommendations

Overall, the committee is very positive about the high level of research quality at ACS in the period of this review. The main challenges for ACS is to capitalise on this outstanding research towards more academic and societal impact as an institute. To continue to thrive as an institute, the committee has several recommendations, both for ACS and for Amsterdam UMC:

Focus and organisation of the research: The diverse and widespread research is understood from historical perspective, with respect to the merger of the two locations. Going forward, the committee recommends to ACS to apply more focus, for example by choosing several focused spearpoints in the ambitions for the upcoming years and select tools to make choices on the research to focus on. In this process and discussion, young ACS should be included (page 8/9). Focus and making choices, will also help ACS with more focussed valorisation and societal significance (page 17). Provision of cross cutting skills or themes is considered an opportunity for ACS to demonstrate added value. For example, Microcirculation could become a hub where different expertise and techniques could be shared and developed, leading to added value. Similarly, the iPS cell facility, artificial intelligence and valorisation could be cross-cutting themes uniting ACS (page 9).

Branding: At (inter)national level, ACS as an institute is less visible than Amsterdam UMC. It appears that different scientists make different choices in using ACS as affiliation in, for example, publications or e-mail signature. The external and internal role of ACS should be clear. It is important to have consensus, clear directions on affiliations used and frequent communication on the directions and strategy (page 9).

Communication: The committee learned about differences between research programmes in including (young) scientists in discussions and strategy meetings. It is recommended to all research programmes to work on an organisational structure with clear communication and – preferably – includes all research staff (page 9).

Funding: At ACS level, it is suggested to reconsider the requirements for the out-of-the-box grants to make them more inclusive, for example by including tracks or (new) focus areas instead of locations as a requirement (page 10). These grants also offer ACS a good opportunity to motivate scientists to jointly focus on specific, strategic research topics (page 11).

Career support: ACS could play a central role in the support of the young ACS community, like helping them with building a network but also jointly work on clear and uniform rules concerning ius promovendi for associate professors (page 12). The ACS directorate could furthermore aim at helping clinician scientists in training by developing specific clinician scientist programmes with rules and regulation to promote their careers and to ensure protect research time, which should be at least 20% of their working time in a year (page 12).

PhD candidates and postdocs: The committee recommends increasing attention to career options after the PhD, for instance information on postdoc grants, going abroad or a career outside academia (page 20). For postdocs (medical and non-medical), it would be beneficial to offer them a support structure, to stimulate community building and

advancing them in their academic or other career (page 10). The committee recommends implementing a concept for carrier support for PhD and postdoc and to promote their networking in a PhD and postdoc ACS club, to stimulate exchanging of information and improve communication (page 19).

Central support: The lack of appropriate support in case of patent application, spin-offs and collaborations with private partners, is hampering valorisation. Amsterdam UMC is recommended to address this issue, in order to improve the services and collaboration with institutes towards the best possible outcomes. It is also recommended to streamline administration in both institutions to save resources and optimise administrative processes (page 11).

Diversity: the gender balance at more senior levels requires further improvement. The committee recommends analysing the hiring policy for unconscious biases, leading to a disadvantage for outstanding female candidates. Other tactics might be more actively approaching talented female candidates for positions and providing mentoring programmes specifically for female scientists (page 13). In addition, ACS should develop strategies to attract international research fellows.

Viability: Amsterdam UMC should review and – where necessary – revise the organisational structure and governance of its institutes and departments, as the lack of significant funding at ACS level prohibits the institute to steer research towards a joint strategy (page 18).

Appendices

Appendix 1: Programme for the site visit

Wednesday 6 December 2023

19.00 Dinner Committee

Thursday 7 December 2023

08.15 Arrival at Felix Meritis

09.00 Programme ACS symposium

12.30 Lunch

13.00 Preparatory meeting committee

18.30 Dinner with ACS Directorate

Friday 8 December 2023

8.30 Arrival at VUmc

9.00 Meeting with ACS management

10.00 Young ACS

10.45 Break

11.00 ACS Valorisation

12.00 Lunch with ACS postdocs and PhD candidates

13.30 Parallel sessions with research programmes

15.00 Break

15.15 Microcirculation

15.45 Committee meeting

17.30 Feedback session by committee chair

Appendix 2: quantitative data ACS

Research staff at ACS:

	2017	2018	2019	2020	2021	2022
Scientific core staff	136	143	151	142	158	162
Other scientific staff	323	338	311	332	445	400
PhD candidates	551	553	547	533	550	498
Total research staff	1010	1034	1009	1007	1153	1060

Funding at ACS:

Research Program	2 nd cash flow	3 rd cash flow	4 th cashflow	Grand Total
ACS - A&IS	20,189,893	15,971,435	17,777,570	53,938,898
ACS - D&M	18,189,602	14,729,731	8,005,887	40,925,220
ACS - HF&A	27,119,053	23,660,038	20,443,248	71,222,339
ACS - MC	6,349,598	10,257,794	4,204,056	20,811,448
ACS - PH&T	6,191,420	4,650,601	2,210,368	13,052,389
Grand Total	78,039,566	69,269,599	52,641,129	199,950,294