

ONDERZOEKERIJ

Research Master  
Cardiovascular Research  
VU Amsterdam

Report of the limited programme assessment

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# Executive summary

The outcome of the external assessment of the research master's programme Cardiovascular Research (CVR) of VU Amsterdam by an NVAO approved panel is positive.

The English-taught CVR research master is a two-year (120 EC) programme. The panel considers that the CVR research master has a unique position in the Dutch higher education landscape with a coverage of research in cardiovascular and related diseases. The programme aims to educate talented students who have the ambition to become top scientists in Cardiovascular Sciences or related fields. The programme's formulated intended learning outcomes demonstrate the level that may be expected of graduates of a research master's programme.

According to the panel, the inflow of twelve to eighteen students per year is quite low. The panel suggests to attract a broader range of students for example by starting an active recruitment of international students and make more explicit that the programme also aims to prepare for research jobs outside academia.

The panel studied the curriculum of the programme and found it to be well-structured with a build-up of theoretical courses and electives to integration in research projects. The panel is very positive about the content of the compulsory subject matter courses but is of the opinion that these courses are too fragmented. A point of attention is the methodological part of the curriculum. According to the panel, research skills need to have been covered prior to internships. It therefore advises the programme to pay more attention to academic and scientific methodologies in the compulsory courses, in particular the Biostatistics course, and the learning line of the Academic Core. The panel is positive about the two research projects in which students can experience research skills hands-on. During the research projects, the whole research cycle is covered. The panel is pleased that students can spend their second research project abroad.

The programme has formulated a didactic concept based on the VU educational principles. According to the panel, this concept looks good on paper, but could be better incorporated into the programme and shared amongst students and staff.

The teaching staff allocated to the programme is properly qualified in terms of contents and academic skills. During the visit, the panel met very competent and enthusiastic staff members. Lecturers are very engaged with students and the programme. The study guidance in general appears to be sufficiently well-organised. Students spoke highly about the actively involved programme coordinator.

The programme has a clear framework for assessment and makes use of an appropriate range of assessment methods. The panel values the use of rubrics in the assessment procedures. It encourages the programme to give more attention to formative assessment as a learning tool throughout the courses and internships. The panel established that the Minor and Major Research Project did not differ much in nature. The panel advises to better reflect the differences between the two projects in the requirements for the projects and in the assessment criteria.

The panel considers that the intended learning outcomes of the research master's programme are achieved by the end of the curriculum. The theses are in general of good quality and reflect the research orientation of the programme. The panel concludes that students are prepared for a career inside as well as outside the research area in cardiovascular (or related) sciences.



The chair and the secretary of the panel hereby declare that all panel members have studied this report and that they agree with the judgements laid down in the report. They confirm that the assessment has been conducted in accordance with the demands relating to independence.

Date: 16 December, 2021

Frans Ramaekers  
(chair)

Annemarie Venemans  
(secretary)



# 1. Introduction

## 1.1 Administrative data

Name of the programme:	Cardiovascular Research (research)
CROHO number:	66586
Level of the programme:	Master of science
Orientation of the programme:	Academic
Study load:	120 EC
Location:	Amsterdam
Variant:	Full-time
Submission deadline:	1 May 2022

## 1.2 Introduction

This report focuses on the assessment of the research master's programme Cardiovascular Research (CVR). This assessment forms part of a cluster assessment of six research master's programmes at three universities. The cluster was divided into two subclusters, each consisting of three programmes: a health cluster and a molecular cluster. Appendix A provides an overview of the six participating research master's programmes and the composition of the total panel.

The assessment is based on the standards and criteria described in the NVAO Assessment framework for the higher education accreditation system of the Netherlands 2018 (limited framework). Research master's programmes must meet a number of additional criteria as described by the NVAO (specification of additional criteria for research master's programmes, 2016).

## 1.3 Panel composition

In total, seven panel members participated in this cluster assessment. Three panel members participated in all assessments (the core panel). In addition, for both clusters a subpanel of two panel members was composed. The panel that assessed this research master's programme consisted of the following members:

- Prof. Frans Ramaekers (chair), professor emeritus Molecular Cell Biology, Maastricht University;
- Dr. Jolanda van der Zee, associate professor in Education of Biomedical Science and Medicine, Leiden University;
- Prof. Marieke van der Schaaf, professor of Research and Development of Health Professions Education, University Medical Center Utrecht;
- Prof. Monique Breteler, Director of Population Health Sciences, German Center for Neurodegenerative Diseases (DZNE), professor of Population Health Sciences, University of Bonn, Germany;
- Lotte Klein MSc (student member), student Clinical Psychosocial Epidemiology (research), University of Groningen.



The panel was supported by dr. Annemarie Venemans-Jellema, who acted as secretary.

All panel members and the secretary have signed a declaration of independence and confidentiality. In this declaration they affirm not to have had any business or personal ties with the programme in question for at least five years prior to the review.

The NVAO approved the composition of the panel on 25 May 2021.

## **1.4 Working method**

### *Preparation*

On 28 June 2021, the panel of the entire cluster held a general online kick off meeting. In this meeting, the panel received an introduction to the assessment framework and discussed the working methods in preparation to and during the site visits.

The programme drew up a self-evaluation report describing the programme's strengths and weaknesses. This self-evaluation report included a chapter in which the students reflected on the programme. The panel members prepared the assessment by analysing the self-evaluation report and the appendices provided by the institution. The panel also studied a selection of fifteen master theses and the accompanying assessment forms from the programme. The theses selection was made by the panel's secretary based on a provided list of at least thirty theses of the most recent years. In the selection, consideration was given to a variation in assessments (grades) and topics.

The panel members individually formulated their preliminary findings and a number of questions they wanted to raise during the site visit. The secretary made an overview of these preliminary findings and questions and sent it to the panel members as a starting point for the preparation of the panel during the site visit.

### *Visit*

The site visit took place on 30 September 2021 (see Appendix B for the schedule). During the preparatory meeting, the panel discussed the preliminary findings and decided which questions to raise in their meetings with the programme representatives. During the visit, the panel spoke with representatives of the management, students, lecturers, alumni, and the Examination Board. Everybody involved in the programme had the opportunity to inform the panel in confidence about matters they consider important to the assessment. No one made use of this opportunity. The panel used the last part of the visit to evaluate the interviews and had a second meeting with the programme's management to receive answers to any remaining questions. At the end of the visit, the chair presented the panel's preliminary findings and impressions of the programme.

### *Report*

The secretary drew up a draft report based on the panel's findings. This draft report was presented to the members of the panel and adjusted on the basis of their feedback. After adaptation, the draft report was sent to the institution for verification of factual inaccuracies. The secretary discussed the programme's comments with the chair, after which the secretary drew up the final report and circulated it to the panel for a final round of comments.



The report follows the four standards such as set of in the NVAO's Assessment Framework 2018 (limited framework): 1) the intended learning outcomes, 2) the teaching-learning environment, 3) assessment, and 4) achieved learning outcomes. Regarding each of the standards, the assessment panel gave a substantiated judgement on a three-point scale: meets, does not meet, or partially meets the standard. The panel subsequently gave a substantiated final conclusion regarding the quality of the programme, also on a three-point scale: positive, conditionally positive, or negative.

*Development dialogue*

Although clearly separated from the process of the programme assessment, the assessment panel members and programme representatives conduct a development dialogue, with the objective to discuss future developments of the programme in light of the outcomes of the assessment report.





## 2. Review

### 2.1 Intended learning outcomes

*The intended learning outcomes tie in with the level and orientation of the programme; they are geared to the expectations of the professional field, the discipline, and international requirements.*

#### *Findings, analysis, and considerations*

The master Cardiovascular Research (CVR) aims to educate talented students who have the ambition to become top scientists in Cardiovascular Sciences or related fields. As stated in the self-evaluation report, the programme includes education regarding the development, diagnosis and treatment of heart and vessel disease, and focuses on diseases with a huge societal impact, such as diabetes, myocardial infarction, thrombosis, and heart failure. Furthermore, students learn about medical technology, preclinical and clinical research and imaging.

According to the panel, this research master's programme is at the intersection of science and clinic. As described in the self-evaluation report, graduates of the CVR research master have the capacity to translate health-related and societal issues into research questions in the cardiovascular field as well as in other biomedical and clinical research fields.

The panel established that the programme is quite unique with its focus on cardiovascular research. In the Netherlands, there is no other programme specifically focussing on cardiovascular research. The panel is of the opinion that with this focus, the programme really found a niche. During the site visit, students and lecturers endorsed this.

Partly motivated by the alliance between the two Amsterdam UMCs leading to relocation of departments from AMC to VUmc and vice versa, as well as of teachers and scientists within those departments and location profiles, the programme plans to broaden the programme in the near future. In the intended revised curriculum, more attention will be paid to, among others, personalised medicine and imaging, in line with the educational profile of the Faculty of Medicine VU Amsterdam. The panel understands this choice but advises the programme not to lose its unique focus.

The panel established that the programme formulated a final attainment level that fits with a research master's programme. The programme described this final attainment level as the level of *'a novice researcher that can perform independent scientific research in the field of clinical life sciences. He/she is up-to-date regarding knowledge and research methods in this field. The novice researcher is a good organizer and is effective in a multidisciplinary partnership to jointly achieve high quality research. He/she demonstrates professional behaviour and promotes the development, improvement and dissemination of scientific knowledge.'* In the eyes of the panel, the research-oriented nature of the programme has been substantiated in the final attainment level. However, it struck the panel that the final attainment level of the 120 EC regular master 'Oncology' (VU master's programme of the same Faculty) is exactly the same. The panel encourages the programme to discuss with the master's programme Oncology in what way the intended learning outcomes between these programmes can become distinctive.

Based on the description of the novice researcher the programme has formulated a set of fourteen intended learning outcomes (ILOs). According to the panel, these ILOs are clearly formulated and sufficiently reflect the level and orientation of an academically oriented research master's



programme. All ILOs are related to the Dublin descriptors (knowledge and insight, application of knowledge and insight, judgment, communication and learning skills), in line with international standards for the master's level.

### *Conclusion*

The panel concludes that the research master Cardiovascular Research is a unique programme that prepares students for a research career in the cardiovascular or a related field, both inside and outside academia. The intended learning outcomes clearly reflect the programme's profile. The programme therefore meets standard 1.

## **2.2 Teaching-learning environment**

*The curriculum, the teaching-learning environment and the quality of the teaching staff enable the incoming students to achieve the intended learning outcomes.*

### *Findings, analysis, and considerations*

#### *Curriculum*

The CVR research master's programme is a full-time programme of 120 EC, divided into four semesters. The curriculum consists of a required core curriculum (30 EC), a minor internship (30 EC), optional courses (12 EC), a literature thesis (9 EC), a major internship (36 EC), and an Academic Core (3 EC). The panel noted that the ILOs are translated into concrete learning objectives per course which are included in the course descriptions. The panel gathered that each ILO is addressed several times throughout the curriculum.

The panel is of the opinion that the programme is organised in a structured manner. According to the panel there is a build-up of theoretical courses and electives to integration into research projects.

During the compulsory courses, different aspects of cardiovascular research and related disorders are discussed, such as different research methods (both clinical and pre-clinical), the use of analytical instrumentation, and the most important statistical techniques needed for data analysis. In addition, attention is paid to the analysis of (patient)casuistry and the relevant biological, social, scientific and ethical aspects, financial aspects of research, collaborations between academia and bio-business and a career as a scientist in a company. The compulsory courses also include biostatistics and writing a research proposal, preparing students for the research internships.

The panel speaks highly about the theoretical level of the four compulsory courses 'Cardiac Disease', 'Heart and Circulation', 'Diabetes and Vascular Disease', and 'From Advance imaging to Personalized Medicine', each consisting of four weeks. Based on interviews with staff and students the panel noted that these courses cover in depth state-of-the-art knowledge of cardiac and related diseases and diagnostic and therapeutic modalities. The panel applauds the good integration of the academy with the work floor (lab, clinic) in these courses. However, the panel characterised the courses listed above as fragmented. The panel believes that this is mainly due to the fact that each separate week of these courses deals with a particular subject and is organised by separate 'week ambassadors'.

The panel had extensive discussions with management, students and staff about the research level of the core curriculum. According to the interviewees, the focus on the students' research training is



during the internships by means of learning by doing. In addition, the interviewees stated that several aspects of the research cycle are already touched upon in the core courses, for example by reflecting on scientific articles.

Although the panel recognised aspects of the research cycle in the compulsory courses, it misses the alignment between courses in the curriculum. In addition, the level of the 'Biostatistics' course was rather basic in the panel's opinion, which is undoubtedly related to the small number of credits (3 EC) for this course. The panel feels that it is important that research skills which are typically expected from a research master's student have already been covered prior to internships. It therefore strongly suggests to introduce a learning line in research methods within the compulsory courses and, in addition, to increase the level of the 'Biostatistics' course, for example by introducing 'R', a software environment for statistical computing and graphics, and by including more advanced statistical methods.

In the first semester of the second year, students plan 12 EC of electives. The electives have to be approved by the Examination Board (EB) and serve to provide a more in-depth appreciation of the subjects selected by the student. Students can follow courses from regular master's programmes, without having to meet any additional requirements. The panel is pleased that with electives students have the possibility to adapt the programme to their personal interest or ambitions, but a certain percentage of these courses should be tailored to a research master's level.

The panel appreciates that the curriculum consists of two research projects, one in the second semester of the first year and one in the second semester of the second year. This allows students to engage actively in different research activities, offering ample possibilities for learning to conduct research. Together with the literature review (9 EC) this allows the students to experience a full research cycle hands-on. Both internships involve different aspects and skills of scientific research, such as literature survey, theoretical experiment preparation, practical execution, report writing, oral presentation, and participation in the scientific activities and discussions of a research department. During the site visit, it became clear that students perform the first internship in the Amsterdam University Medical Centers (Amsterdam UMC; Academic Medical Center (AMC) or VU University medical center (VUmc). For the second internship, students are encouraged to choose an internship outside the Amsterdam University Medical Center (AUMC). The panel is pleased to note that a significant group of students chooses an internship abroad. In its opinion, it helps students to develop a truly international orientation and to start building their own international research network.

The Academic Core is based on a learning line, developed to prepare students for the next step in their career. During this learning line students develop academic skills, transferable skills, and presentation skills, including research ethics. Students that met with the panel were not satisfied with this learning line, because of the broad and generic nature. The panel is of the opinion that it would help to make this Academic Core more personalised, based on students' personal learning goals.

From September 2022 onwards, the curriculum will be changed, due to the move of cardiovascular research to the former AMC. A major part of the scientific content of the first three compulsory courses (heart development, cardiac disease and vascular disease) of the programme will move to the University of Amsterdam (UvA) (Biomedical Sciences (BMS) track of Cardiovascular Sciences, joint programme VU-UvA). In addition, the remainder containing the more clinical content imaging, personalised medicine and biobusiness from the current programme will be the core of a new programme track. The panel took note of the plans but did not consider it in this evaluation.

As stated in the self-evaluation report, the programme has five educational principles: 1) The student is primarily responsible for his/her own student life cycle and academic success; 2) Each student is given a substantial measure of autonomy and encouraged to utilize his/her capacity for self-



management; 3) The programme is inclusive; 4) The programme is inter/multidisciplinary; and 5) The programme has social responsibility. These principles are in line with the VU educational vision. The panel values this student-centred didactic concept on paper, but noted that it is not alive among students and staff. It advises the programme to ensure that the educational philosophy not only exists on paper, but that it will be incorporated in the programme and known and supported by staff members.

According to the self-evaluation document the programme has an international orientation as demonstrated by the presence of international students, the possibility to attend international conferences and to perform an international internship. The title of the programme and language of instruction is English. The programme management substantiates its choice by arguing that students will function in an international work environment, also when they do not continue their career in research. In addition, the programme welcomes international students. The panel supports this choice.

#### *Admission*

The criteria for applicants to be admitted to the programme are a bachelor degree in (bio)medical or life science, above-average grades, good command of English, and a motivation and talent fitting the programme. The panel observed that the admission criteria are formulated clearly and adequately reflect the high demands of the programme. The admission conditions and procedure are rather strict and transparent.

However, during the site visit, the programme management indicated that at the start of the programme some of the students did not know whether they would pursue a research career. The panel would like to advise the programme to match better on research interest. In order to attract a broader range of students, the programme should communicate more explicitly that it not only prepares graduates for a PhD position, but also for research positions outside academia.

The programme aims at a minimum of twenty new students per academic year. The panel notes that the programme has not been able to meet this objective in recent years. The panel is of the opinion that cohort sizes between eleven and eighteen students have advantages, but also provide challenges for the viability of the programme. According to the panel, attracting more students is desired. In its opinion, it is a missed opportunity that international students are not actively recruited at the moment both for the student-body composition and thereby the programme itself, and because of the internationally unique and highly relevant profile of the programme.

#### *Staff*

From the teaching staff overview in the self-evaluation report and meetings with staff members, the panel concluded that the teaching staff of the programme is dedicated and qualified for teaching in this research master's programme. The majority (81%) has a University Teaching Qualification (UTQ) and 4% holds or is in training for a Senior University Teaching Qualification (SUTQ). The English proficiency of lecturers is positively evaluated by the students.

The scientific orientation and academic standards of the programme are reflected in the qualifications of all staff involved. The programme is taught by scientific staff members, who are tenured at the level of assistant, associate or full professor and affiliated at Amsterdam UMC.



The content of the programme is closely connected to the research that is executed by the Amsterdam Cardiovascular Sciences (ACS), one of the eight research institutes of Amsterdam UMC, which is visible in the content of the curriculum and the topics of the theses. The staff members are active in numerous national and international research projects. In 2017, ACS was assessed as part of the evaluation of the AMC, according to SEP guidelines, with positive evaluations in terms of research quality, societal relevance, and viability.

Based on the interviews with students and staff, the panel observed that the staff is very motivated to work with this specific group of students. The students have ample personal contacts with the teaching staff, who are easily accessible.

In the panel's opinion the teaching community mainly relies on informal structures. During the visit, lecturers mentioned that there is also a lot of informal contact between lecturers. To increase the cohesion between courses, the panel was pleased to note that there is an annual plenary meeting of teachers during which communication and interaction between all instructors is fostered. The panel encourages the programme to intensify these formal meetings between lecturers, in order to better align the compulsory courses. In particular, interactions between the subsequent week ambassadors will strengthen the structure of the course.

#### *Study load*

Although students experience a heavy workload, the programme appears to be feasible. According to the panel the programme load is certainly heavy, but given the level of commitment, qualifications, and results of the student population, this seems very suitable for this type of programme.

In the past six years, between 92% and 100% of the students who enrolled in the programme eventually completed it successfully. However, less than 50% of the students completed the programme within two years. The panel understood from the materials and discussions that there are several causes for a delay, e.g., an internship abroad, or starting an additional second master programme such as a medical training. The panel established that in many cases the delay is caused by the students' calculated strategies to increase their job opportunities and was often unrelated to the difficulty of the programme. It was pleased to note that the programme took several measures to reduce the study duration. One important adjustment has been monitoring the progress of students by the examiner of the internships and the programme coordinator.

#### *Study guidance and quality assurance*

The study guidance in general appears to be sufficiently well organised. Each student is assigned to a mentor (senior lecturer of the programme) and has to schedule at least one meeting each year with this mentor. In addition, the panel noted that the programme coordinator plays a pivotal role in stimulating interaction and cohesion amongst students and staff. The coordinator closely watches the progress that students make in course work, and for finding a thesis supervisor. Students mention that the programme coordinator is very easy to approach. The panel considers the strong involvement of (and for students the easy access to) the programme coordinator a clear strength.

The master's programme is systematically evaluated by students. Every course is evaluated when it is finished. The Programme Committee monitors the programme for structure and coherence, based on evaluation and feedback from the students.



*COVID-19*

Having the advantage of being a small-scale programme, for the CVR research master it remained possible to organise on-site teaching. The setting at the VU campus allowed for adhering to the safety regulations, while also having an online connection with students who are abroad, ill, or for other reasons unable or reluctant to travel to the VU. However, the crisis has posed some problems regarding the internships. Some internships were temporarily cancelled or continued from home. The panel asked students and teachers about their experience with online teaching. Whilst COVID-19 evidently had an impact on the interaction between students and teachers, both were positive about the quick and efficient transition.

The panel concluded that the programme adequately adapted to the COVID-19 situation and allows students to achieve the academic objectives despite this pandemic.

*Conclusion*

The panel concludes that the programme fulfils all specific requirements for the teaching and learning environment of a research master's programme and therefore meets standard 2.

**2.3 Student assessment**

*The programme has an adequate system of student assessment in place.*

*Findings, analysis, and considerations**Assessment policy and methods*

The programme developed an assessment policy including an assessment plan that provides a description of the final qualifications of the programme, a table that shows the contribution of all the courses from the programme to the final qualifications, and an explanation how each final qualification is assessed by one or more courses. In addition, the relationship between educational principles, the final qualifications and learning objectives of the courses has been described. Miller's pyramid is used to distinguish between various levels of knowledge and skills.

The panel is pleased that the intended learning outcomes are measured with a variety of assessment methods, such as written exams, writing assignments, research proposals, debating clubs, and article discussions. According to the self-evaluation report, the assessment procedures of individual courses are formulated in the course descriptions that are provided in the course catalogue each year. The panel verified that students are well-informed about the type of assessment and grading criteria before the start of each course.

The programme makes primarily use of summative assessment. The panel is of the opinion that formative assessment really fits with the programme's educational principle that each student is given a substantial measure of autonomy and encouraged to utilise his/her capacity for self-management. It encourages the programme to systematically address ways of formative assessment, such as peer feedback.



### *Grading of the research projects*

The panel established that the internship assessment is done according to clear criteria. The assessment consists of three parts, i.e. laboratory practice, presentation and final report using a weight of 40%-20%-40%. The programme makes use of standardised assessment forms and rubrics. When the average mark of any of the three assessment items of the internship is insufficient (<5.5), the specific item that was insufficient should be redone. A maximum of two repeats is allowed only for the presentation and the report. An insufficient mark for the practical work leads to a fail directly after which the student has to redo an internship.

The thesis is evaluated by the first assessor/supervisor and an independent second assessor who was not involved in the project prior to submission of the final thesis. Two staff members always grade the thesis independently. When the difference in grades is more than 1.5 or when the grade of the second assessor is lower than 5.50, a third assessor is appointed by the examiner internships. In this case the final mark will be the average of the three grades.

The panel noted some diversity and variation in interpretation of the rubrics in the assessment forms of the theses, especially in international projects. During the site visit, the panel discussed this topic with management and Examination Board (EB). Both explained that they are aware of this phenomenon and already have taken actions to prevent this. For example, for international internships an extra VU assessor has been appointed who evaluates the report of the international supervisor. In the case of excessive marks, an interview between the assessor and the international supervisor takes place in which the Dutch assessment system is explained. The panel was pleased to note that the programme pays attention to this issue and advises to keep monitoring this closely.

During the internship there are four formal assessment moments: 1) within two weeks a completed List of Agreements made between the student and the assessor of the internship has to be handed in; 2) within six weeks the student has to write a Research Proposal; 3) at least two oral presentations are required during an internship of which the second one is graded; and 4) an end assessment of lab practice and thesis.

The panel noted that some of the thesis assessment forms contained very limited qualitative feedback. In addition, the amount of additional feedback during the internships differs greatly per supervisor. The panel welcomes the fact that students keep a portfolio during their internship, but at this moment this is only used to collect the formal assessments. In order to further enhance the quality of the assessment, the panel suggests to formalise the formative feedback during the internships, for instance by using the portfolio.

The panel also established that the Minor and Major Research Project did not differ much in nature. The panel advises to better reflect the differences between the two projects in the requirements for the projects and in the assessment criteria.

### *Examination Board*

The Faculty of Medicine VU has one Central Examination Board (CEB) and two Shared Examination Boards (SEB); one for the bachelor's and master's programmes in Medicine, and one for the three medical sciences master programmes: Epidemiology, Cardiovascular Research and Oncology.

According to the panel, the SEB performs thoroughly its tasks to control the quality of the exams, the assessment procedures and research projects. It approves the examiners, it annually draws up 'Rules and guidelines' regarding the examination, it monitors the quality of the examination, and deals with requests for admission and for approval of elective courses, with fraud and plagiarism, requests



concerning examination, and with complaints. The panel was pleased to note that a sample of the theses are assessed independently by external examiner(s) of Maastricht University once every three years.

However, in the eyes of the panel, the SEB carries out its formal tasks but lacked good knowledge of the programme and its assessment to develop a more visionary and proactive approach. For example, the SEB was not familiar with the didactical concept of the programme or the programme's vision on assessment. The panel encourages the SEB to interact more closely with the programme management in order to improve their monitoring of this specific master programme.

#### *Conclusion*

The panel concludes that CVR has an adequate assessment system. The programme therefore meets standard 3.

## **2.4 Achieved learning outcomes**

*The programme demonstrates that the intended learning outcomes are achieved.*

#### *Findings, analysis, and considerations*

In order to assess whether the intended learning outcomes are achieved, the panel has studied a sample of fifteen recent theses and has examined the graduates' success in a research career. As described under standard 2, students finish the programme with a Major Internship of 36 EC. The report of this Major Internship is considered the master thesis, the final product of the programme in which the student shows the acquired competences. The aim of the Major Internship is to obtain in depth knowledge and practice of a certain research subject in the field of cardiovascular sciences and related. The panel established that the internship covers the whole research cycle.

Based on the fifteen theses the panel studied, the panel found that fourteen of the fifteen fulfilled at least the minimum requirements one would expect of a final master's thesis of an academic programme at research master's level. The panel is positive about the quality and academic level of the majority of theses it examined. For some of the theses, however, the panel would have given lower grades than the two original assessors. Although the panel would have awarded lower grades in a number of cases, all theses are sound pieces of research, both theoretically and methodologically, with the necessary carefulness for the validity of conclusions. The quality of the projects is also reflected in the fact that some students were able to publish the results obtained in the research projects.

According to the panel, one project did not meet the requirements. The thesis was assessed with a 7.2 by the first assessor, with a 5.3 by the second assessor and with a 7.4 by the third assessor. The panel agreed with the second examiner. Especially, the English writing was unsatisfactory. The panel estimates that this might not be representative for the overall end level of the programme. The panel discussed this issue with the programme management. The management was aware of the poor quality of this thesis.

The panel noticed that the programme has a wide-ranging outflow, with a large proportion of alumni holding a variety of positions in various organisations. About half of the alumni ended up in research positions of which 24% in a PhD programme. According to the panel this percentage is quite low and





not what one would expect from a research master's programme. The programme explained that this has partly to do with the significant group of students that start with a second master programme such as Medicine or Health Care Management.

During the visit, the panel met with a number of alumni and also teachers working as researchers representing the professional field. The alumni were very enthusiastic about the programme and its practical use in their profession. They indicated that the programme prepared them for a career inside as well as outside research. Some of the alumni continued their profession as a lecturer in the programme.

#### *Conclusion*

The panel concludes that students of the programme achieve an adequate final level and find suitable jobs. The programme therefore meets standard 4.



## 3. Strengths and recommendations

### 3.1 Strengths of the programme

The panel is impressed by the following features:

- Teaching team – The teaching staff is enthusiastic, well-qualified and knowledgeable in their respective areas. They are active researchers and able to bring in the latest developments in their field;
- Programme structure – The programme has elective courses and two research projects which give students ample opportunity to tailor the programme to their own interests;
- Variety of assessment system – The programme uses a variety of assessment methods that are geared to the learning outcomes, the mode of instruction and level of the course;
- International internship - Students can spend a period abroad, which helps them to develop a truly international orientation and to start building their own international research network.

### 3.2 Recommendations

For further improvement of the programme, the panel makes the following recommendations:

- Research oriented nature – Pay more attention to academic and scientific methodologies in the compulsory courses of the programme, extend in particular the (bio)statistics course, and ensure that a substantial part of the electives is at a research master's level;
- Coherence of the programme– Provide better insight into the coherence of the programme and how the individual components relate to and build on each other, in particular the research projects;
- Didactic concept – Incorporate the didactic concept into the programme, and make it visible to students and staff;
- Formative assessment – give more attention to formative assessment as a learning tool throughout the courses and internships;
- Ensure a sufficient inflow of students in the programme, for example by starting an active recruitment of international students. In order to attract a broader range of students, make more explicit that the programme also aims to prepare for research jobs outside academia.



## 4. Conclusion

The panel concludes that the objectives and intended learning outcomes of the research master's programme Cardiovascular Research meet the standards required for an academic programme. It is of the opinion that the content and structure of the curriculum and the available staff constitute an attractive teaching-learning environment for the students. The programme has an adequate assessment system and demonstrates that the intended learning outcomes are achieved. The quality of the theses is in general good.

Standard	Judgement
Standard 1	Meets the standard
Standard 2	Meets the standard
Standard 3	Meets the standard
Standard 4	Meets the standard
Final conclusion	<b>Positive</b>



# Appendix A – Panel composition and programmes of the cluster

The cluster consists of six research master's programmes:

66586	M Cardiovascular Research (research)	Vrije University Amsterdam
60312	M Clinical Research (research)	Erasmus University Rotterdam
60120	M Health Sciences (research)	Erasmus University Rotterdam
60375	M Infection and Immunity (research)	Erasmus University Rotterdam
60322	M Molecular Mechanisms of Disease	Radboud University Nijmegen
60279	M Molecular Medicine (research)	Erasmus University Rotterdam

## Panel composition of the cluster

### Core panel

- Prof. dr. F.C.S. (Frans) Ramaekers, professor emeritus Molecular Cell Biology, Maastricht University;
- Prof. dr. M. (Marieke) van der Schaaf, professor of Research and Development of Health Professions Education, University Medical Center Utrecht;
- Dr. J. (Jolanda) van der Zee, associate professor in Education of Biomedical Science and Medicine, Leiden University.

### Health Cluster

- Prof. dr. M.B. (Monique) Breteler, Director of Population Health Sciences, German Center for Neurodegenerative Diseases (DZNE), professor of Population Health Sciences, University of Bonn, Germany;
- L. (Lotte) Klein BSc, student Clinical Psychosocial Epidemiology (research), University of Groningen.

### Molecular Cluster

- Prof. dr. J. (John) Creemers, professor of Biomedical Science, KU Leuven;
- V.E.J.M. (Victoria) Palasantzas MSc, student Molecular Medicine and Innovative Treatment (research), University of Groningen (graduated in 2021).



## Appendix B – Schedule of the visit

30 September 2021

Time	Session
08.30 – 10.00	Preparation panel
10.00 – 10.45	Programme management
10.45 – 11.00	Evaluation
11.00 – 11.45	Students
11.45 – 12.00	Evaluation
12.45 – 13.30	Lecturers
13.30 – 13.45	Evaluation
13.45 – 14.15	Alumni
14.15 – 14.30	Evaluation
14.30 – 15.00	Examination Board
15.00 – 15.30	Evaluation and preparing questions for management
15.30 -16.00	Second meeting programme management
16.00 – 17.30	Evaluation
17.30 – 17.45	Presentation of first findings



## Appendix C – Documents studied

- Self-evaluation report with appendices:
  - Appendix 1 Composition of the consultation bodies of the programme;
  - Appendix 2 Intended learning outcomes of the programme;
  - Appendix 3 Bachelor degree of the students that start with the master and jobs of alumni;
  - Appendix 4 Description of the course components;
  - Appendix 5 Overview of teaching team;
  - Appendix 6 List of graduates from the three preceding academic years;
  - Appendix 7 Dropout rate, completion rate and/or average study duration;
  - Appendix 8 Teacher-student ratio achieved;
  - Appendix 9 Teacher quality;
  - Appendix 10 Assessment AMC according to Standard Evaluation Protocol 2015-2021;
  - Appendix 11 Academic and Examination Regulations.
- Fifteen theses with assessment forms
- Documents presented during the site visit:
  - Course documents (advanced imaging, biostatistics, cardiac disease, diabetes and vascular disease, heart and circulation);
  - Regulations literature study;
  - Regulations internships;
  - Educational vision;
  - Educational framework;
  - Study guide;
  - Course evaluations;
  - Assessment plan and assessment guide CVR;
  - Annual report EB;
  - Annual report programme committee.



## Appendix D – Abbreviations

ACS	Amsterdam Cardiovascular Sciences
AMC	Academic Medical Centre
AUMC	Amsterdam University Medical Centers
BMS	Biomedical Sciences
CEB	Central Examination Board
CVR	Cardiovascular Research
EB	Examination Board
EC	European Credit
ILOs	Intended learning outcomes
NVAO	Nederlands-Vlaamse Accreditatie Organisatie
SEB	Shared Examination Board
SUTQ	Senior university Teaching Qualification
UTQ	University Teaching Qualification
UvA	University of Amsterdam
VU	Vrije Universiteit
VUmc	VU University medical center

