Master of Science in Molecular Medicine

Student Manual

2019-2020
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Images: students in pairs and group, June 2019
Photography: Ruud Koppenol

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Introduction

Developments in molecular and cell biology, such as studies on human genome variation and the control of stem cells, are reshaping many aspects of medical diagnosis and treatment. The rapid advancement of modern biomedical and computational technologies in this new century promises to provide many new tools to gain in-depth knowledge of the fundamental molecular and cellular mechanisms controlling health and disease.

The Erasmus MC Master of Science in Molecular Medicine program is a two-year, 120 EC points, research master’s program, focusing on molecular cell biology, developmental biology, and molecular genetics. We aim to bring students to the forefront of current developments in biomedical science. In 1999, the course program was given for the first time to a group of Erasmus MC medical students; accreditation by the Dutch-Flemish Accreditation Organization (NVAO) followed in 2004, 2010, and was renewed in 2016.

The Erasmus MC departments clustered under Biomedical Sciences are responsible for the MSc Molecular Medicine program. Teachers, course directors, and chairpersons of the MSc program are affiliated with the postgraduate schools Molecular Medicine (MolMed) and Medical Genetics Center South-West Netherlands (MGC), both recognized by the Royal Netherlands Academy of Arts and Sciences (KNAW), and work in 20 different research departments within Erasmus MC. Teachers and course directors are leading scientists in the field of biomedical research.

Many MSc graduates continue their careers as PhD students at Erasmus MC or elsewhere.

This manual is intended as a curriculum guide for our students and prospective students. We appreciate comments and suggestions for improvement.
Terms and definitions

Erasmus MC and Erasmus University:
Erasmus MC – University Medical Center Rotterdam is a combination of the academic general hospital, the Sophia children’s hospital, the Daniel den Hoed cancer clinic, and the medical faculty educational and research institutes of Erasmus University Rotterdam (EUR). Erasmus MC currently has around 14,000 employees, more than 2,000 students of medicine, and approximately 210 research master students, of which around 40 are enrolled in the MSc Molecular Medicine.

Biomedical Sciences:
The Erasmus MC – Biomedical Sciences organizational unit comprises the research departments of Biochemistry, Bioinformatics, Cell Biology, Developmental Biology, Molecular Genetics, Genetic Identification and Neuroscience, as well as the Erasmus Stem Cell Institute, the Optical Imaging Center, and the Proteomics and Biomics Center. Biomedical Sciences organizes the MSc programs in Molecular Medicine and Neuroscience, and has its own teaching program for PhD students.

Erasmus MC Graduate School:
Erasmus MC possesses (or participates in) five postgraduate schools, that offer research training and courses to PhD students. PhD students as a rule perform a research project of four years, and then write up their thesis. Erasmus MC currently has around 1200 PhD students. In the Netherlands, PhD students are regarded as employees and receive a salary with social benefits. The five Erasmus MC postgraduate schools are the Medical Genetics Center South-West Netherlands (MGC), Molecular Medicine (MolMed), Cardiovascular Research School EUR (COEUR), Netherlands Institute of Health Sciences (NIHES), and the Research School Neurosciences Amsterdam Rotterdam (ONWAR). The Erasmus MC MSc Molecular Medicine program is affiliated with the postgraduate schools Medical Genetics Center South-West Netherlands (MGC) and Molecular Medicine (MolMed). The postgraduate schools and research master’s programs combined make up the Erasmus MC Graduate School.

Faculty:
MSc Molecular Medicine faculty members are Erasmus MC research scientists with life science backgrounds in biology, biochemistry, and medicine. Faculty are affiliated with the postgraduate schools MGC and MolMed.

Course directors:
Course directors are MSc faculty members, organizing and coordinating the various components of the MSc program.

Research supervisor:
The supervisor is the principal investigator of a research project performed by the student in year 1 or year 2. Since the research topic and lab of choice will change in the transition from year 1 to year 2, students will have two supervisors. The tutor (see below) does not need to be one of the supervisors.

Tutor:
The tutor is a faculty member who is appointed to guide the student throughout the course of the MSc program. She or he acts as a personal mentor. Each student chooses her or his tutor from the list of faculty, or can propose additional names. It is possible to have two tutors, for example one with a basic/biomedical background and one with a clinical background.

Admissions committee:
The admissions committee is responsible for the admission of candidate students. Members of the admissions committee are the chairpersons, the program director, and occasionally one of the course directors.

Examination committee: (Examencommissie):
The MSc examination board carries formal responsibility for the outcome of all exams of the program. There is one board for all bachelor and master programs (including medicine). There is a separate chamber of the examination board for the combined five Erasmus MC research master programs. The MSc examination board chair reports to the dean of Erasmus MC. The board will delegate specific responsibilities to the MSc Molecular Medicine admissions committee. See also page 59.

MSc program board: (Opleidingscommissie research master apleidingen):
The MSc program board is responsible for continuous evaluation of the educational contents of the five Erasmus MC research master’s programs. The program board consists of five MSc faculty members (including the committee chair) and five MSc students: one for each Erasmus MC research master. Chairpersons and program directors are excluded from this committee. See also page 59-60.
Aims and objectives

The goal of the two-year **Master of Science in Molecular Medicine** program is to educate students to become researchers in biomedical and translational medical research.

The MSc program is modelled after renowned international research master's programs, such as those at Yale or Harvard University, in which the students are required to take on independent research projects, while following a number of relevant theory courses.

The courses of year 1 will provide students with the basic intellectual and technical knowledge, and establish the important framework necessary for development of a research proposal and subsequent performance of laboratory research.

The research projects provide the hands-on experience in top research laboratories at Erasmus MC, under the guidance of faculty members. During the laboratory periods students will develop technical skills and test their hypotheses. They will learn the principles of performing well-controlled experiments, and the interpretation, presentation, and publication of results.

On successful completion of all steps in the curriculum, including writing and defending the MSc thesis, the students are awarded the Master of Science Molecular Medicine degree.

1.1 Educational concepts

The following educational concepts are taken into consideration, when we determine the best way to offer course contents, and when student performance is evaluated:

1. Students have an active and self-directing attitude
2. Students are taught in small groups
3. In all parts of the program that involve (laboratory) practices, a master-apprentice relationship exists between the research supervisor and the student.
4. The study program has an open structure with ample choice between different areas of research.

1.2 End goals

The end goals of the combined Erasmus MC research masters, including the MSc Molecular Medicine, were laid down as follows:

1. The student is able to put in words a relevant problem and translate this into a research question.
2. The student is able to conduct elaborate literature investigations, related to the research question.
3. The student is able to translate a research question into a research proposal.
4. The student is able to apply knowledge on research methods and biostatistic analytical methods, as well as ethical principles, when drafting a research proposal.
5. In collaboration with other research group members, the student is able to set up and conduct a research project, collect data, analyze data, and come to conclusions.
6. The student is able to write down research findings in the form of a draft manuscript, which in collaboration with a research supervisor is developed into a scientific article, suitable for publication in an international, peer-reviewed magazine.
7. The student is able to estimate the relevance of basic scientific results for clinical practices.
8. The student is able to translate a clinical research question into an advice for basic scientific investigation.
9. The student is able to propose new healthcare policies, based on relevant research findings and literature investigations.
1.3 Student competences

MSc Molecular Medicine students are expected to meet the end goals of the educational program by acquiring a set of competences, as they progress through the various course modules:

1. Knowledge of methods and techniques
   a. Knowledge of scientific research methods
   b. Knowledge and mastery of laboratory research skills

2. Scientific thinking and acting
   a. The ability to formulate a hypothesis and translate this into a research question
   b. The ability to gather, select, and structure information, based on a research question
   c. The ability to set up and conduct a research project in collaboration with others; collect data, perform analyses, and draw conclusions
   d. The ability to express an opinion based on available scientific information, while taking current values and standards into account

3. Critical attitude
   a. The ability to read critically and purposefully
   b. The ability to ask critical questions with regard to the quality of scientific research
   c. The ability to ask critical questions with regard to scientific research findings, and estimate their value.

4. Written communication
   a. The ability to formulate in written form
   b. The ability to structure in written form
   c. The ability to present in written form

5. Oral communication
   a. The ability to formulate orally
   b. The ability to structure orally
   c. The ability to present orally
   d. The ability to discuss

6. Project management
   a. The ability to work in a group on a project basis
   b. The ability to examine and discuss the work of one’s own and of others, in a critical and creative way
   c. The ability to get the work done within the time available

7. Attitude
   a. The ability to reflect on one’s thoughts and actions, and see them in relation to the surrounding world
   b. The ability to see in perspective the ‘degree of truth’ of scientific knowledge

1.4 Dublin descriptors

The student competences listed above are based on the end goals for the combined Erasmus MC research master’s programs, and on the quality descriptors as adopted by the EU Joint Quality Initiative in 2004: the Dublin descriptors.

The Dublin descriptors are:

1. Knowledge and understanding:
   The student has demonstrated knowledge and understanding that is founded upon and extends and/or enhances that typically associated with bachelor’s level, and that provides a basis or opportunity for originality in developing and/or applying ideas, often within a research context.

2. Applying knowledge and understanding:
   The student can apply her or his knowledge and understanding, and problem-solving abilities in new or unfamiliar environments within broader (or multidisciplinary) contexts related to the field of study.

3. Making judgments:
   The student has the ability to integrate knowledge and handle complexity, and formulate judgments with incomplete or limited information, but that include reflecting on social and ethical responsibilities linked to the application of her or his knowledge and judgments.

4. Communication:
   The student can communicate her or his conclusions, and the knowledge and rationale underpinning these, to specialist and non-specialist audiences clearly and unambiguously.

5. Learning skills:
   The student has the learning skills to allow her or him to continue to study in a manner that may be largely self-directed or autonomous.
1.5 Academic context

The Master of Science in Molecular Medicine is a two-year, 120 EC, research master’s program. Students are trained to become junior scientists, who upon graduation are instantly ready for a PhD position within any national or international biomedical research laboratory.

From the very beginning, students will be absorbed into the scientific environment of the biomedical research laboratories at Erasmus MC. In all courses of the program, students are guided, instructed and taught by MSc faculty members who are internationally recognized scientists and educators.

Affiliations with departments and postgraduate schools

Teachers, course directors and chairpersons of the MSc Molecular Medicine program are affiliated with the postgraduate schools MGC and MolMed, both recognized by the KNAW (ECOS). Our MSc faculty members work in 20 different research departments within Erasmus MC: see pages 56-57-58 for details on our faculty.

Comparison with other Erasmus MC research masters

Apart from the MSc Molecular Medicine, Erasmus MC has four other research master’s programs:

- MSc Clinical Research
- MSc Health Sciences
- MSc Neuroscience
- MSc Infection and Immunity

The MSc Health Sciences and the MSc Clinical Research offer programs with a strong clinical perspective, especially attractive to students of medicine. The MSc programs in Neuroscience and Infection & Immunity, like us, focus on basic biomedical research, but have a more specialized curriculum confined to the fields of neuroscience, and microbiology and immunology. MSc Molecular Medicine students are given a broad view of possible lines of investigation, and are able to perform their research projects in many different labs of their choice, including labs at Erasmus MC departments that are generally associated with other MSc programs.

1.6 Collaborations

The MSc Molecular Medicine courses possess a theoretical and practical level of training that is comparable to the curricula of national and international MSc programs in the biomedical field. We have established partnerships with some of them:

- Wageningen University and Research Center: MSc Biotechnology
- Radboud University Nijmegen: MSc Molecular Mechanisms of Disease
- University of Barcelona, Spain: MSc Biology / Neurosciences
- Université Pierre et Marie Curie, Paris, France: MSc Molecular and Cellular Biology
- Friedrich-Alexander-Universität, Nürnberg, Germany: MSc Molecular Medicine
- Georg-August-Universität, Göttingen, Germany: MSc Biology

The collaborative agreement with Wageningen University and Research Center (WUR) gives students from the Wageningen MSc in Biotechnology the possibility to specialize in ‘Molecular Medicine’. This specialization fills a gap in the Wageningen curriculum, where medicine-related research projects are not available to the students.

In co-operation with the MSc program in Molecular Mechanisms of Disease, at Radboud University Nijmegen, MSc Molecular Medicine students can take a selection of classes and courses in Nijmegen, and vice versa, in year 2 of the curriculum. Topics may vary from a course on science and society, to a course on epigenetics.

With Paris, Barcelona, Nürnberg and Göttingen, we have set up student exchange agreements. See detailed info on page 52.

1.7 Career prospects

After having completed the MSc program, the majority of students with a background in medicine (mostly from within Erasmus MC) will further specialize in medicine, while maintaining an interest in biomedical science. Several medical students who received the MSc Molecular Medicine degree are now continuing, or have completed, advanced research training as PhDs, at both basic and clinical research levels.

MSc Molecular Medicine students with a BSc in biochemistry, biotechnology, or biology, or a BASc in biomedical laboratory techniques, upon graduation appear to be preferred and qualified candidates for PhD positions within Erasmus MC, and other high-ranking and international research institutions.
Curriculum

2.1 Course overview

The 120 EC points of the MSc Molecular Medicine program represent a total study load of 3,360 hours. An outline of the curriculum is given below:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Name</th>
<th>EC points</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MM-IW</td>
<td>Introduction Weeks</td>
<td>2</td>
<td>56</td>
</tr>
<tr>
<td>MM-DB</td>
<td>Developmental Biology</td>
<td>2</td>
<td>56</td>
</tr>
<tr>
<td></td>
<td>DB - Review Presentation</td>
<td>1</td>
<td>28</td>
</tr>
<tr>
<td>MM-MBC-A</td>
<td>Molecular Biology of the Cell part A</td>
<td>5</td>
<td>140</td>
</tr>
<tr>
<td>MM-MBC-B</td>
<td>Molecular Biology of the Cell part B</td>
<td>5</td>
<td>140</td>
</tr>
<tr>
<td>MM-BOD</td>
<td>Biology of Disease</td>
<td>3</td>
<td>84</td>
</tr>
<tr>
<td>MM-GEN</td>
<td>Genetics</td>
<td>4</td>
<td>112</td>
</tr>
<tr>
<td>MM-CRT-F</td>
<td>Contemporary Research Topics - Faculty sessions</td>
<td>4</td>
<td>112</td>
</tr>
<tr>
<td>MM-RES1</td>
<td>Lab Research Project Year 1</td>
<td>24</td>
<td>672</td>
</tr>
<tr>
<td>MM-PS</td>
<td>Presentation Skills</td>
<td>2</td>
<td>56</td>
</tr>
<tr>
<td>MM-P1</td>
<td>Research Progress Presentation - Year 1</td>
<td>2</td>
<td>56</td>
</tr>
<tr>
<td>MM-RW</td>
<td>Report Writing</td>
<td>2</td>
<td>56</td>
</tr>
<tr>
<td></td>
<td>Research Report</td>
<td>4</td>
<td>112</td>
</tr>
<tr>
<td><strong>Total Year 1</strong></td>
<td></td>
<td><strong>60</strong></td>
<td><strong>1680</strong></td>
</tr>
<tr>
<td>MM-CS</td>
<td>Courses and Seminars</td>
<td>4</td>
<td>112</td>
</tr>
<tr>
<td>MM-LR</td>
<td>Literature Review</td>
<td>4</td>
<td>112</td>
</tr>
<tr>
<td>MM-PP</td>
<td>Writing a Project Proposal</td>
<td>2</td>
<td>56</td>
</tr>
<tr>
<td>MM-P2</td>
<td>Research Progress Presentation - Year 2</td>
<td>2</td>
<td>56</td>
</tr>
<tr>
<td>MM-RES2</td>
<td>Lab Research Project Year 2</td>
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<td>1064</td>
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<td>MM-MSTH</td>
<td>Master Thesis</td>
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<td>224</td>
</tr>
<tr>
<td></td>
<td>Master Thesis – Presentation</td>
<td>2</td>
<td>56</td>
</tr>
<tr>
<td><strong>Total Year 2</strong></td>
<td></td>
<td><strong>60</strong></td>
<td><strong>1680</strong></td>
</tr>
</tbody>
</table>
2.2 Program summary

Year 1

At the start of the program (2nd of September 2019), students will be introduced to a number of MSc faculty members, scientific group leaders, and MSc course directors and coordinators. During these Introduction Weeks students will have the opportunity to visit several of our research laboratories, to get a broader view of possible lines of investigation, and to get (further) acquainted with various research techniques. This will enable students to make an informed choice for the research projects ahead.

During the Developmental Biology course, in September-October, students will learn about developmental biology from an evolutionary perspective. The evolution of complex multicellular organisms is based on genetic changes, which are translated into changes in embryonic and postnatal development. Students will learn about molecular and cellular mechanisms of embryonic development, and dysregulation of development, in animals and humans, in an evolutionary context. The written exam immediately follows the lecture series. Students will also prepare presentations on selected topics.

From the end of September till February onwards, the Molecular Biology of the Cell course is given. We will start this course with part A (MM-MBC-A) in the period October to November. Part A explores the basic aspects of biology. Students will have lectures twice a week. The course requires thorough and continuous reading of the textbook. Students are stimulated to actively take part in discussions. The MM-MBC-A course is followed by the Molecular Biology of the Cell part B (MM-MBC-B course) in the period December to February. Both exams aim to test insight and scientific ability.

The Biology of Disease course aims to give you a deeper insight into current problems in translational research, narrowing the gap between clinical and biological science and scientists. We will discuss several examples of translational research as it is running at Erasmus MC at this moment. This is meant as template for further discussion on demands/needs to set up a good translational research project.

After an introductory discussion on clinical needs (“a patient visits the doctor and what’s next…”), we will discuss several examples of translational research from the fields of oncology and immunology. The session on the road from finding a target in the lab to clinical trials and introduction of a new drug in clinical practice offers insight in the long process of validation and implementation in a clinical setting.

In groups of 3 students, you will work on, and finally present, a possible translational research project in which you investigate the biological cause of an illness and how your data will be valorised (i.e. gets back to the patient again).

In November-December the Genetics course is given to obtain a deeper theoretical understanding of genetic processes. This course will highlight some of the developments in modern genetics research. Building upon the knowledge of classical (Mendelian) genetics, we will discuss several aspects of molecular genetic research on model organisms as well as patients. Topics discussed include bacterial genetics, genomes of higher eukaryotes, recombinant DNA technology, epigenetics, genomic imprinting, genomics and bioinformatics, molecular genetic technology in the clinic. The course consists of 9 lectures. The exam immediately follows the lecture series.

The Contemporary Research Topics - Faculty sessions (CRT-F) course is given in weekly sessions throughout February to April (twice a week on average). The CRT-F course is setup as a journal club; a literature reading course.

Besides the research articles, some pages of the Molecular Biology of the Cell textbook should be studied, highlighting a technique or approach that is of importance to the paper. Furthermore, there will be excursions to a number of labs, to get familiar with specific technical equipment and, in small groups, students prepare short presentations about particular techniques. Writing an article abstract is practiced during class. The course is concluded with a written examination with open questions on a research article that was not discussed previously.

Based on faculty presentations, lab rotations, and discussions with research supervisors and course directors, students will choose a topic and research group for a research project (Lab Research Project Year 1). At the end of this project (average duration will be 8 months) the results are written up in a report (see course MM-RW).

The aim of the course Presentation Skills (MM-PS) is to practice organizing information for a concise and informative presentation and to practice oral presentations skills. In March you will have at least 3 MM-PS sessions.

Research Progress Presentation - Year 1 (MM-PS): In May students will present a 15 to 20 minute talk on the progress of their research project, accompanied by PowerPoint slides.
Finally, in June-July the course Report Writing (MM-RW) is given. Based on the experiments conducted and results obtained during the first year research project in the lab, you will write a scientific report. You will write up the results of your work in the form of a research article (manuscript) with the style used in PLOS Biology. This will include: Title, Abstract, Introduction, Methods (for this purpose in more detail than is currently standard in publications), Results, Discussion and References, accompanied by figures. The completed report will be about 20-30 pages long. Prior to the writing of the report, you will have two class sessions to receive instructions and make preparations.

The theory courses of year 1 are designed to help students acquire the basic knowledge and capacities that they need to start the research projects they will be conducting as they proceed through the program. Most importantly, the courses aim to develop a sense of urgency to stay informed of new developments, and to acquire a life-long learning attitude. Without exception, theory courses are led by scientific MSc faculty. The laboratory visits and the larger research projects, which together take up almost 19 months of the total two-year study program, are usually performed within the many basic and/or translational research laboratories that participate in the MSc program. When working and learning in the lab, students will be continuously guided and supported by the scientific group leader who acts as their direct supervisor.

**Year 2**

Year 2 of the program is almost entirely taken up by a second Lab Research Project. The laboratory, topic and research supervisor of the year 2 project will be different from those of the year 1 project. A new project proposal will have to be written, based on the interests of the student and the laboratory. Students will be trained in additional specific methods, and will carry responsibility on successful implementation of their research plan. Students should start looking for a new lab, new supervisor, and new topic in July of the preceding semester. The average duration of the research project for second year MSc students is 11 months.

In regular course meetings October and November, you are educated on how to write a scientific proposal. You will develop a first draft of your own research proposal, describing the plan of work for the one-year period leading to the MSc thesis. The written research proposal will be prepared together with, and approved by, your research supervisor. This plan, agreed upon by both student and faculty, will be the basis for your research work leading to the MSc Molecular Medicine degree. The research proposal should describe the plan of work for a full-year period of research.

This will include: Title, Summary, Description of the proposed research, Knowledge utilisation, and Reference list (including figures as appropriate). These parts will be written in a step-wise manner. At each stage, the written parts will be evaluated by faculty on specific elements of scientific writing, as well as content, and revised accordingly. Students will also review and evaluate the completed proposals of two of their peers to provide comments, during a discussion session, before the final revision.

Students are encouraged to participate in several courses, seminars, lectures, and symposia available at Erasmus MC or elsewhere. In consultation with their research supervisor and course directors, they may compose a program according to their individual needs and interests. Participation in an international meeting is to be considered.

Individually, students will write an insightful literature review on a specific topic within the wide field of biomedical science. We will provide students with an list of topics and will give literature suggestions to start reading. An experienced faculty member will be available to offer guidance and support.

In March, halfway of the full-year research project, students will give a 15-20 minute research progress presentation, accompanied by a slideshow. The students from the first MSc year are invited to these presentations. The presentation should include a brief introduction to the project, information on specific experiments and methods, actual data and controls and a conclusion.

The second, full-year, research project is concluded by submission and defence of the MSc thesis. The thesis will take the form of a full-length research article, suitable for publication in an international journal. In contrast to a regular article manuscript, the MSc thesis will include a more elaborate Introduction, describing the scientific background of the study; the Materials and Methods section will be expanded to include a complete and detailed description of all methods that have been applied; also, a List of Abbreviations will be added. The defence of the thesis will take about 20 minutes, and will be preceded by an oral half hour presentation of aim, results and conclusions of the thesis work.

Once the MSc thesis is written, approved, and defended, students are awarded the Master of Science in Molecular Medicine degree. The MSc graduation ceremony is held at the end of every academic year, in the first week of September. Faculty, undergraduate students, and alumni, are invited to this festive event.
2.3 Course descriptions

General information for all courses:

Target group: MSc Molecular Medicine students
Organization: Erasmus MC – Biomedical Sciences
Language: English
Number of participants: 15 – 20 students

Register: Courses are part of the MSc Molecular Medicine curriculum. Separate registration is not necessary for admitted students.

Absence: If you are unable to attend class, you are kindly requested to report your absence in advance, via mscmolmed@erasasmusmc.nl

Accountability: Erasmus MC – Biomedical Sciences

Contact: Marjoleine van Berckel Bik
E-mail: mscmolmed@erasasmusmc.nl
Phone: +31-10-7044844

Alumni: LinkedIn Group http://www.linkedin.com/groups?gid=1821478

Detailed descriptions of each course module in the curriculum are given below. The applicable Dublin descriptors and end goals of the MSc program (as listed on pages 11 and 9, respectively) are indicated by number.

Name: Introduction Weeks
Form: Faculty (speed date) presentations, introductory talks, lectures, lab visits, social events.
Code: MM-IW
Aim: To get acquainted with each other and MSc faculty members, research groups, and group leaders. To assign tutors. To give a broader view of possible lines of investigation, to help the students to make a choice for the 1st year research project.
Content: The Introduction Weeks serve as a general introduction to the whole MSc program. You will get to know a number of MSc faculty members, scientific group leaders, as well as the MSc course directors and coordinator. You will have the opportunity to visit several basic and/or translational research laboratories, to get a broader view of possible lines of investigation, and get (further) acquainted with various research techniques. This will enable you to make an informed choice for the research projects ahead.

Literature: Literature relevant to the topics presented in the lectures.

Faculty: Various MSc faculty members.
Level: 1st year MSc student
EC points: 2
Course load: 56 hours

Exam: Attendance and active participation. Evaluated by MSc faculty member. Grade appeal is subject to the rules laid out in the Teaching and Examinations Regulations of Erasmus MC.

Period: September, 2019

Coordination: Dik van Gent, Gert Jansen

For the Lab Research Project Year 1 and Year 2: individual placement in lab of choice.
Exam
Written exam (2 EC points) with closed and open questions on the topics discussed during the lectures and in the textbook. The written exam will be assessed by two MSc faculty members. You will receive a grade on a scale from 1 (worst) to 10 (best). After the assessment, the written examination is discussed with the students as a group.

Presentation (1 EC points): Teams of 4 Students will prepare a presentation about a specific topic within the field of evolutionary developmental biology. A list of candidate topics will be provided. The presentation will be graded by three MSc faculty members.

Upon completion of this course, if you have attended and actively participated in at least 80% of the classes, and when you have passed the written exam and successfully given a presentation, you are awarded 3 EC points.

Grade appeal is subject to the rules laid out in the Teaching and Examinations Regulations of Erasmus MC.

Period
September to October, 2019

Coordination
Robbert Rottier, Hegias Mira Bontenbal

Evaluation
The Developmental Biology course organizers and MSc program coordinators are open for suggestions from course participants on possible improvements. Course contents and setup are re-evaluated periodically, at least once a year, by the course directors and MSc program board members.

Dublin descriptors
1, 4, 5

End goals
1, 2, 7, 8

Name
Developmental Biology

Form
Lectures, presentation assignment, workshops, excursion.

Code
MM-DB

Aim
To learn about the molecular and cellular mechanisms of embryonic and postnatal development, and the experimental methods that can be used to obtain more information about (dys)regulation of (human) development.

Content
The evolutionary biologist Theodosius Dobzhansky emphasized that “nothing in biology makes sense except in the light of evolution”. This is particularly true for embryonic development. In this course, we will study evolutionary developmental biology. The students will learn how different species, from worms to flies and vertebrates, provide complementary ‘model systems’ with specific advantages and disadvantages for experimental analysis of developmental pathways and mechanisms. Indeed, research within Erasmus MC targets animal species at diverged branches of the evolutionary tree. In this course, the students will also gain an understanding of developmental aspects of cellular pluripotency and differentiation, in the context of stem cell research. It goes without saying that this approach also provides an illuminating picture of our own development.

Literature

Faculty
Robbert Rottier, Hegias Mira Bontenbal, Willy Baarends, Joost Gribnau, Tjakko van Ham, Gert Jansen, Erwin Kompanje.

Level
1st year MSc student

EC points
3

Course load
84 hours
Students are expected to thoroughly study the textbook, and to actively take part in discussions.

In broad outlines, the MM-MBC part A and B courses together will move from DNA and proteins to regulation of gene expression and control of cellular functions, finally leading to consideration of more complex systems and problems. MM-MBC-part A will focus on Alberts chapters 1, 2, 3, 5, 6, 16 and 17. The course is followed by the continued course part B.

**Literature**

**Faculty**

**Level**
1st year MSc students

**EC points**
5

**Course load**
140 hours

**Exam**
Written exam. The exam will contain open essay questions. You will not be allowed to use the textbook during the exam. The exam aims to test your insight and scientific inventiveness. The exam will be assessed by at least two MSc faculty members. You will receive a grade on a scale from 1 (worst) to 10 (best).

Upon completion of this course, if you have attended and actively participated in at least 80% of the classes, and when you have passed the written exam, you are awarded 5 EC points.

Grade appeal is subject to the rules laid out in the Teaching and Examinations Regulations of Erasmus MC.

**Period**
October to November, 2019

**Coordination**
Thamar van Dijk, Pim Pijnappel

**Evaluation**
The MBC part A course and MSc program coordinators are open for suggestions from course participants on possible improvements. At the end of the semester, students will receive an invitation for an online survey on the contents and setup of the course. Course contents and setup are re-evaluated periodically, at least once a year, by the course directors and MSc program board members.
At the end of the semester, students will receive an invitation for an online survey on the contents and setup of the course. Course contents and setup are re-evaluated periodically, at least once a year, by the course directors and MSc program board members.

Dublin descriptors 1, 2, 5
End goals 2, 7

Name Biology of Disease

Form Lectures, discussion/brainstorm, presentation assignment.

Code MM-BOD

Aim Gain insight into current problems in translational research, seen from the perspective of the life scientist as well as the clinician. Course is aimed to discuss the demands/needs to perform successful translational bench research that really gets back to the patients. Establish a deeper understanding between the viewpoints of students with a biology background and those of students with a medical background. Offers an overview of experimental design and clinical needs to students with a non-medical background.

Content The Biology of Disease course aims to give you a deeper insight into current problems in translational research, narrowing the gap between clinical and biological science and scientists. We will discuss several examples of translational research as it is running at Erasmus MC at this moment. This is meant as a template for further discussion on demands/needs to set up a good translational research project.

After an introductory discussion on clinical needs (‘a patient visits the doctor and what’s next...’), we will discuss several examples of translational research from the fields of oncology and immunology. The session on the road from finding a target in the lab to clinical trials and introduction of a new drug in clinical practice offers insight in the long process of validation and implementation in a clinical setting.

In groups of 3 students, you will work on, and finally present, a possible translational research project in which you investigate the biological cause of an illness and how your data will be valorised (i.e. gets back to the patient again).

To achieve the goal of making a successful translation of a problem ‘from bench to bed-side’, and vice versa, the students with a medical degree will team up with students who have an educational background in life sciences. At the end of each session, you will meet your fellow students in a small group to discuss how the new insights that were presented during that day’s course session can be implemented in your research project.

For the final course session, each of the groups will present a possible investigation strategy for a current clinical problem. These small projects will be presented to your fellow students and will stimulate you to think out of the box (and your own comfort zone).

Literature Literature on various topics to be distributed during the course.

Faculty Dik van Gent, Martin van Royen, Andrica de Vries, Agnes Jager, Ralph Stadhouders, Monique den Boer, Luc van der Laan, Bas Groot Koerkamp, Chris Bangma, Ferry Eskens.

Level 1st year MSc students
EC points 3
Course load 84 hours

Exam Presentation: in teams of 3 students, you will prepare a presentation about a current translational research question. The presentation will be graded by the MSc faculty members and the individual contribution to the presentation and discussion will be graded.

Upon completion of this course, if you have attended and actively participated in the classes, and when you have successfully given a presentation, you are awarded 3 EC points.

Grade appeal is subject to the rules laid out in the Teaching and Examinations Regulations of Erasmus MC.

Period December, 2019 to January, 2020

Coordination Dik van Gent, Martin van Royen

Evaluation The Biology of Disease course organizers and MSc program coordinators are open for suggestions from course participants on possible improvements. At the end of the semester, you will receive an invitation for an online survey on the contents and setup of the course. Course contents and setup are re-evaluated periodically, at least once a year, by the course directors and MSc program board members.
Coordination
Dik van Gent, Eskeatnaf Mulugeta

Evaluation
The Genetics course and MSc program coordinators are open for suggestions from course participants on possible improvements. At the end of the semester, students will receive an invitation for an online survey on the contents and setup of the course. Course contents and setup are re-evaluated periodically, at least once a year, by the course directors and MSc program board members.

Dublin descriptors
1, 2, 5

End goals
2, 7

Name
Genetics

Form
Textbook course lectures, workgroup sessions, and self-study.

Code
MM-GEN

Aim
Obtain a deeper theoretical understanding of genetic processes.

Content
This course will highlight some of the developments in modern genetics research. Building upon the knowledge of classical (Mendelian) genetics, we will discuss several aspects of molecular genetic research on model organisms as well as patients. Topics discussed include bacterial genetics, genomes of higher eukaryotes, DNA recombination in meiosis, transposable elements and site specific recombination, recombinant DNA technology, forward and reverse genetics, epigenetics, mouse genetics, genomic imprinting, non-coding RNA, genomics and bioinformatics, molecular genetic technology in the clinic.

Literature
Introduction to Genetics: A Molecular Approach. Terry Brown. Additional reviews and other course materials will be made available during the course.

Faculty
Dik van Gent, Eskeatnaf Mulugeta, Willy Baarends, Joost Gribnau, Manfred Kayser, Joris Pothof, and others.

Level
1st year MSc students

EC points
4

Course load
112 hours

Exam
Written exam. The exam will contain open essay questions. You will not be allowed to use the textbook during the exam. The exam aims to test your insight and scientific inventiveness. The exam will be assessed by at least two MSc faculty members. You will receive a grade on a scale from 1 (worst) to 10 (best).

Upon completion of this course, if you have attended and actively participated in at least 80% of the classes, and when you have passed the written exam, you are awarded 4 EC points.

Grade appeal is subject to the rules laid out in the Teaching and Examinations Regulations of Erasmus MC.

Period
November to December, 2019

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Name
Contemporary Research Topics - Faculty sessions

Form
Journal Club – literature reading course.

Code
MM-CRT-F

Aim
You will learn to critically read scientific publications within a restricted time frame, and identify strengths and weaknesses of the research presented in these articles. You will gain insight into strategies, complications, and new developments in life sciences research, and the connection of the research to molecular medicine.

Content
The Contemporary Research Topics course is setup as a journal club; a literature reading course. A number of research papers will be discussed by faculty members. Besides the research articles, some pages of the Molecular Biology of the Cell textbook should be studied, highlighting a technique or approach that is of importance to the paper. For some techniques, an excursion to the technical equipment is included. In small groups, you prepare short technique presentations. Writing an article abstract is practiced during class. You will have course sessions twice a week.

Literature

Faculty
Raymond Poot, Derk ten Berge, Dik van Gent, Willy Baarends, Niels Galjart, Maarten Fornerod, Gert Jansen, Guido Jenster, Jurgen Marteijn, Gerben Schaaf, and others.

Level
1st year MSc students

EC points
4

Course load
112 hours.
Exam

Written examination. The course is concluded with a written examination with open questions on a research article that was not discussed previously. The original title and abstract of the article are not given: you are asked to propose a title and write the abstract. Apart from this, the exam will contain specific questions on the design of the study and the interpretation of the results, as described in the article. The written exam will be assessed by at least two MSc faculty members. You will receive a grade on a scale from 1 (worst) to 10 (best).

After the assessment, the written examination is discussed with the students as a group. Grade appeal is subject to the rules laid out in the Teaching and Examinations Regulations of Erasmus MC.

Upon completion of this course, if you have attended and actively participated in at least 80% of the classes, and when you have passed the written exam, you are awarded 4 EC points.

Period

February to April, 2020

Coordination

Raymond Poot, Derk ten Berge

Evaluation

The CRT-F course and MSc program coordinators are open for suggestions from course participants on possible improvements. At the end of the semester, you will receive an invitation for an online survey on the contents and setup of the course. Course contents and setup are re-evaluated periodically, at least once a year, by the course directors and MSc program board members.

Dublin descriptors 1, 3, 4, 5
End goals 1, 2, 7, 8, 9
Lab Research Project Year 1

Form
Practical training; research project in lab of choice.

Code
MM-RES1

Aim
To obtain practical experience in laboratory research, to collect scientific data, to practice communication skills, master research techniques, and further develop scientific thinking and reasoning.

Content
Your first year research project will take approximately eight months, and is conducted in a host research laboratory of your choice, within any Erasmus MC department involved in basic (biomedical) science. The laboratory scientific group leader functions as your direct supervisor. While in the lab, you will obtain practical experience in laboratory research, collect scientific data, practice communication skills, master research techniques, and further develop scientific thinking and reasoning.

Literature
Literature relevant to the research topic.

Faculty
Various MSc faculty members.

Level
1st year MSc students

Exam
Assessment by research lab supervisor. Evaluations are made as written performance assessments, by the involved lab supervisors.
If you have successfully completed your lab project, you will be awarded 24 EC points.
Grade appeal is subject to the rules laid out in the Teaching and Examinations Regulations of Erasmus MC.

Period
October, 2019 to July, 2020

Coordination
Dik van Gent, Willy Baarends

Evaluation
The MSc program coordinators are open for suggestions from course participants on possible improvements. Course contents and setup are re-evaluated periodically, at least once a year, by the course directors and MSc program board members.

Dublin descriptors
1, 2, 3, 4, 5
1, 2, 4, 5, 7, 8, 9

Presentation Skills

Form
Workgroup sessions, presentation practice.

Code
MM-PS

Aim
To practice organizing information for a concise and informative presentation. To practice oral presentation skills.

Content
To start off the course, two or more volunteers will give a short oral presentation of one of the lab rotations they have done in the past months, or a research project done before. The presentation is not graded. The students will receive comments from the instructors on aspects that can be improved, but also on aspects that were good. Attention will be paid to clarity, organization, content, presentation, the use of visual aids, preparation, and the use of English.
In the next sessions, the course directors will further discuss:
• the structure of your talk
• figures
• PowerPoint tips
• common mistakes in English
• style, attitude, voice
• keeping the attention of your audience

Literature
Mary Ann Ahart and Carolyn Ash, The SURF Talk Book, Summer Undergraduate Research Fellowship.

Faculty
Willy Baarends, Steven Kushner.

Level
1st Year MSc Student

Exam
Mandatory attendance and active participation. Evaluated by MSc faculty member.
Grade appeal is subject to the rules laid out in the Teaching and Examinations Regulations of Erasmus MC.

Period
3 workgroup sessions in March, 2020

Coordination
Willy Baarends, Steven Kushner
The evaluation will be based on clarity, organization and presentation aspects. Separate numerical grades are for the oral presentation and the slides (or other visual aids) with attention to clarity, organization and content. These two scores are averaged for an overall grade.

The oral presentation will be assessed by at least two MSc faculty members. You will receive a grade on a scale from 1 (worst) to 10 (best).

Once you have given your presentation with sufficient results, and if you have attended at least 80% of the presentations of your peers, you are awarded 2 EC points.

Grade appeal is subject to the rules laid out in the Teaching and Examinations Regulations of Erasmus MC.

Period   Individual presentations in May, 2020
Coordination  Willy Baarends, Debbie van den Berg
Evaluation Course contents and setup are re-evaluated periodically, at least once a year, by the course directors and MSc program board members.
Dublin descriptors 4
End goals  1, 6

Name    Research Progress Presentation - Year 1
Form    Oral presentation
Code    MM-P1
Aim     To practice organizing experimental data for a concise and informative presentation. To practice communicating experimental results and their interpretation. To present information on background and methods appropriate to time and audience. To provide an update on what you are doing in your research project.
Content You should prepare an oral presentation in a work discussion style, sharing in some detail the methods used, the controls applied, and actual data obtained so far in your research project. The oral presentation will be evaluated on the basis of clarity, organization, content, presentation, the use of visual aids, and preparation. Special attention is given to the use of spoken English. You will not be evaluated on the degree to which you have achieved the experimental goals set out in your proposal. This is a chance to work on giving a presentation to scientists outside of your research group and to get some constructive feedback.

Faculty Willy Baarends, Thamar van Dijk, Dik van Gent, Debbie van den Berg, Hegias Mira Bontenbal, Kerstin Wendt.
Level 1st year MSc student
EC points 2
Course load 56 hours
Exam You should give a 15 to 20 minute talk on the progress of your 1st year research project, accompanied by PowerPoint slides.

The Presentation Skills course and MSc program coordinators are open for suggestions from course participants on possible improvements. Course adjustments can be made on the basis of your direct feedback. Course contents and setup are re-evaluated periodically, at least once a year, by the course directors and MSc program board members.

Dublin descriptors 4
End goals  1, 6

Name    Report Writing
Form    Workgroup sessions, written report assignment.
Code    MM-RW
Aim     To organize your work as you would for publication. To understand the parts of a written research article and present your work in this way. To develop skills in scientific writing; including technical aspects of preparing figures and referencing and dividing the relevant information into Abstract, Introduction, Results and Discussion sections. To produce a final written summary of the research work you have done.
Content Based on the experiments conducted and results obtained during the first year research project in the lab, you will write a scientific report. You will write up the results of your work in the form of a research article (manuscript) with the style used in PLOS Biology.
This will include: Title, Abstract, Introduction, Methods (for this purpose in more detail than is currently standard in publications), Results, Discussion and References, accompanied by figures. The completed report will be about 20-30 pages long. Prior to the writing of the report, you will have two class sessions to receive instructions and make preparations.

**Literature**

- *The Elements of Style, 4th Ed*  

- *How to Publish in Biomedicine*  
  Jane Fraser, Radcliffe Medical Press, 1997, (optional)

- *How to Write & Publish a Scientific Paper, 5th Ed*  

- *The Netherlands Code of Conduct for Scientific Practice*  
  General Board of the Association of Universities  
  (Algemeen Bestuur van de Vereniging van Universiteiten) January 1, 2005

- *On Being a Scientist, Responsible Conduct in Research*  
  Committee on Science, Engineering, and Public Policy; National Academy Press, 1995

**Faculty**

Willy Baarends, Debbie van den Berg, Tamar van Dijk, Dik van Gent, Tjakko van Ham, Annelies de Klein, Kerstin Wendt.

**Level**

1st year MSc student

**EC points**

6

**Course load**

168 hours

**Exam**

The writing assignment will be guided by your supervisor and then, after approval, evaluated by faculty. The comments of the faculty should be implemented in your final version, which should be accompanied with a rebuttal, stating the response to the comments received.

The final report is formally graded by one of the faculty based on scores in different categories such as: academic writing skills, theoretical knowledge and understanding, application of theory. Also the quality of the rebuttal will be graded. The final grade is adjusted if needed based on consensus among all faculty who have reviewed the proposal. Points are deducted for submitting assignments late. You will receive a grade on a scale from 1 (worst) to 10 (best).

Grade appeal is subject to the rules laid out in the Teaching and Examinations Regulations of Erasmus MC.
Courses and Seminars

Selection of courses, seminars, lectures, and symposia available within and outside the Erasmus MC. Participation in weekly lab meetings and journal clubs.

MM-CS

To develop skills in gathering information and knowledge from the attendance of scientific seminars and related events.

You are encouraged to participate in several courses, seminars, lectures, and symposia available at or outside the Erasmus MC (specific courses, seminars and symposia are organized by the postgraduate schools MGC and/or MolMed). In consultation with your research supervisor, you will compose a program according to your individual needs and interests. Participation in an international meeting is to be considered. Following lectures on topics outside the field of your project but with the Molecular Medicine program is recommended.

Various

Various

2nd year MSc student

4

112

Toward the end of the academic year, you will compile a list of all followed courses, seminars, lectures and symposiums. The list is examined and approved by MSc faculty.

Your compiled list of attended courses and seminars will be reviewed by Gert Jansen and Gerben Schaaf. If you have attended and actively participated in the required number of courses and seminars, you are awarded 4 EC points.

Grade appeal is subject to the rules laid out in the Teaching and Examinations Regulations of Erasmus MC.

throughout the year

Gert Jansen
Gerben Schaaf

Course contents and setup are re-evaluated periodically, at least once a year, by the course directors and MSc program board members.
Further information on the courses and online registration is available at:
http://www6.erasmusmc.nl/biomedicalsciences/
http://www.medgencentre.com/
http://www.molmed.nl/
Registration for these courses is not free of charge, there is a fee involved (on discount basis).

Courses at Radboud University Nijmegen
The students may take part in selected classes and courses from the MSc program in Molecular Mechanisms of Disease, at the Radboud University Nijmegen:
- Master Classes
- Translational Research Courses
- Course on Science and Society

More information on these courses can be found at the website http://www.ru.nl/master/ncmls-mmd/. Interested students can send their application to Prof.dr. Roland Brock, program director of the MSc Molecular Mechanisms of Disease, via email: r.brock@ncmls.ru.nl, with cc to mscmolmed@erasmusmc.nl.

Seminars and Meetings (max 2 EC)
You will attend lectures at or outside the Erasmus MC on topics that fit within the scope of the MSc Molecular Medicine program. A maximum of 2 EC gathered by following lectures and/or meetings can be used for the MM-CS course.

Throughout the year, various departments arrange regular seminars with well-known scientists speaking on topics concerning biomedical research and advances. These include different lecture series within the Biomedical Sciences (Erasmus MC Lecture Series on Biomedical Science, Lectures on Molecular Genetics), as well as the Hematology Lectures, JNI Oncology Lectures, Clinical Genetics Lectures and Erasmus MC Lecture Series on Endocrinology. You are free to choose from any of these lectures. In addition, the MGC, other postgraduate schools and other organizations organize one or more-days scientific meetings that you can attend. Some of these meetings may involve fees.

For updates and announcements on lectures and related activities, see the poster boards and websites of the respective departments:
http://www6.erasmusmc.nl/biomedicalsciences/
http://www6.erasmusmc.nl/hematologie/
http://www6.erasmusmc.nl/pathologie/

List of Courses and Seminars
The MSc-Molecular Medicine program has a small budget for students who want to participate in particular courses or seminars. Before registering, please discuss your plans with the coordinators of the MM-CS course.

Toward the end of the academic year, you will compile a list of all followed courses, seminars, and lectures. The list is examined and approved by faculty.
Evaluation

The Literature Review course and MSc program coordinators are open for suggestions from course participants on possible improvements. Course adjustments can be made on the basis of your direct feedback. Course contents and setup are re-evaluated periodically, at least once a year, by the course directors and MSc program board members.

Dublin descriptors 1, 2, 3, 4, 5

End goals 1, 2, 5, 7, 8, 9

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Name

**Writing a Project Proposal**

Form

Workgroup sessions and writing assignment.

Code

**MM-PP**

Aim

To develop skills in scientific writing in English.

To understand the content and purpose of different parts of a research proposal such as those prepared in order to obtain funds from granting agencies.

To obtain the necessary background information on the topic to be studied as a year-long project, and demonstrate this knowledge in written form.

To create a formal plan for the year-long research project.

To clearly state scientific questions and present a realistic experimental plan to answer them in written form.

To develop skills in evaluating scientific writing.

To allow the MSc faculty a chance to review and approve your plans.

Content

In regular course meetings Sept/October and November, you are educated on how to write a scientific proposal. You will develop a first draft of your own research proposal, describing the plan of work for the one-year period leading to the MSc thesis. The written research proposal will be prepared together with, and approved by, your research supervisor.

This plan, agreed upon by both student and faculty, will be the basis for your research work leading to the MSc Molecular Medicine degree.

The research proposal should describe the plan of work for a full-year period of research. This will include: Title, Summary, Description of the proposed research, Knowledge utilisation, and Reference list (including figures as appropriate). These parts will be written in a step-wise manner.

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Name

**Literature Review**

Form

Self study, written report.

Code

**MM-LR**

Aim

Students learn how to gather literature on a chosen topic and how to report on their findings in a written mini-review.

Content

Individually, you will write an insightful essay on a specific topic within the wide field of biomedical science. We will provide you with an list of topics and will give you literature suggestions to start reading.

An experienced faculty member will be available to offer guidance and support.

Literature

Literature on a chosen topic.

Faculty

Stefan Barakat, Arnab Ray Chaudhuri, Dik van Gent, Bram van der Eerden, Joost Gribnau, Tjakko van Ham, Bert van der Horst, Wim Mandemakers, Pim Pijnappel, Gerben Schaaf, Christopher Schliehe, Ralph Stadhouders, Heleen Vroman, Kerstin Wendt, Monique Verstegen, and others.

Level

2nd year MSc student

EC points

4

Course load

112 hours

Exam

You are to write a comparative review on a research topic within the broad area of biomedical science. Specific instructions for content and form are given.

The review will be assessed by at least two MSc faculty members. You will receive a grade on a scale from 1 (worst) to 10 (best).

Upon completion of this course, if you have successfully written your review and obtained a passing grade, you are awarded 4 EC points.

Grade appeal is subject to the rules laid out in the Teaching and Examinations Regulations of Erasmus MC.

Period

This assignment has to be completed in April 2020.

Deadlines:

- Thursday, March 5, 2020: Hand in Draft Literature Review
- Thursday, March 26, 2020: Receive comments from Literature Review supervisor
- Thursday, April 16, 2020: Hand in Final Literature Review for grading

Coordination

Dik van Gent
At each stage, the written parts will be evaluated by faculty on specific elements of scientific writing, as well as content, and revised accordingly. Students will also review and evaluate the completed proposals of two of their peers to provide comments, during a discussion session, before the final revision.

Special attention is given to the use of spoken and written English.

The research proposal should be submitted by begin December.

**Literature**
- *The Elements of Style, 4th Ed*  
- *How to Publish in Biomedicine*  
  Jane Fraser, Radcliffe Medical Press, 1997, (optional)
- *How to Write & Publish a Scientific Paper, 5th Ed*  
- *The Netherlands Code of Conduct for Scientific Practice*  
  General Board of the Association of Universities (Algemeen Bestuur van de Vereniging van Universiteiten) January 1, 2005
- *On Being a Scientist, Responsible Conduct in Research*  
  Committee on Science, Engineering, and Public Policy. National Academy Press, 1995

**Faculty**
- Willy Baarends, Esther Baart, Derk ten Berge,
- Debbie van den Berg, Thamar van Dijk, Maarten Fornerod,
- Gert Jansen, Mirjam Kool, Hannes Lans, Gerben Schaaf,
- Kerstin Wendt and others.

**Level**
- 2nd year MSc student

**EC points**
- 2

**Course load**
- 56 hours

**Exam**

The evaluation of the written research proposal assignment will be based on the NWO criteria for evaluating the scientific content of this type of proposal:

1. quality, innovation and scientific impact of the research proposal
2. knowledge utilization

These criteria weigh 40% and 20% of the total score judgment. Taking the following considerations into account:

1. Quality, innovative character and scientific impact of the research proposal
   - Challenging content;
   - Originality of the topic;
   - Innovative elements;
   - Potential to make important contributions to science;

- Effectiveness of proposed method.
- Special attention will be paid to research questions posed, the appropriateness of the experimental approach, feasibility of the work for a one-year project, and suitability of the work for completion of the MSc thesis.

2. Knowledge utilisation;
   - Contribution to society and / or to other disciplines;
   - Disciplines and organizations to which the results can benefit.

In addition, Organization, clarity, and grammar will be evaluated and form 40% of the score judgement.

The writing assignment will be evaluated by faculty at each stage to provide comments for correcting, revising and improving the proposal. The final proposal will be reviewed by 2 other students in the class to provide additional comments for revision.

The final proposal is formally graded by one of the faculty based on the following 7 categories for assessment: 1;organization, 2;clarity, 3;grammar (1-3 together 40%), 4;originality and challenging and innovative aspects, 4;effectiveness of methodology, 6;feasibility and likelihood of making a significant contribution to the field (4-6 together 40%), 7;knowledge utilisation (20%). The final grade is adjusted if needed based on consensus of all faculty who have reviewed the proposal and may additionally be adjusted based on class participation. Points are deducted for submitting assignments late.

You will receive a grade on a scale from 1 (worst) to 10 (best).

Grade appeal is subject to the rules laid out in the Teaching and Examinations Regulations of Erasmus MC.

**Period**
- End of September to begin of December, 2019

**Coordination**
- Willy Baarends

**Evaluation**

The Project Proposal course and MSc program coordinators are open for suggestions from course participants on possible improvements. Course adjustments can be made on the basis of your direct feedback.

Course contents and setup are re-evaluated periodically, at least once a year, by the course directors and MSc program board members.

**Dublin descriptors**
- 1, 2, 3, 4, 5

**End goals**
- 1, 2, 3, 4

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Name | Research Progress Presentation - Year 2
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Form | Oral presentation
Code | MM-P2
Aim | To practice organizing experimental data for a concise and informative presentation. To practice communicating experimental results and their interpretation. To present information on background and methods appropriate to time and audience. To provide an update on what you are doing in your research project.
Content | At the halfway point of the full-year research project, you will present a 15-20 minute talk on your research progress, accompanied by a slideshow. The students from the first MSc year are invited to these presentations. The presentation should include a brief introduction to the project, some information on specific experiments, details on methods, controls, and actual data, and a conclusion with a brief statement on the results obtained.
Literature | Instructions
Faculty | Gert Jansen, Gerben Schaaf.
Level | 2nd year MSc student
EC points | 2
Course load | 56 hours
Exam | You should give a 15 to 20 minute talk on the progress of your full-year research project, accompanied by Powerpoint slides. The evaluation will be based on clarity, organization and presentation aspects. The oral presentation will be assessed by at least two MSc faculty members. You will receive a grade on a scale from 1 (worst) to 10 (best). Once you have given your presentation with sufficient results, and if you have attended at least 80% of the presentations of your peers, you are awarded 2 EC points.
Grade appeal is subject to the rules laid out in the Teaching and Examinations Regulations of Erasmus MC.
Period | Individual presentations in March, 2020

Coordination | Gert Jansen, Gerben Schaaf
Evaluation | Course contents and setup are re-evaluated periodically, at least once a year, by the course directors and MSc program board members.
Dublin descriptors | 2, 4
End goals | 1, 2, 5, 7, 8, 9

Name | Lab Research Project Year 2
Form | Practical training; 12-month research project in lab of choice.
Code | MM-RES2
Aim | To obtain practical experience in laboratory research, to collect scientific data, to practice communication skills, to master a variety of research techniques, and further develop scientific thinking and reasoning.
Content | Your second year research project will take approximately 10 to 12 months, and is conducted in a host research laboratory of your choice, within any Erasmus MC department involved in basic (biomedical) science, or a comparable research lab elsewhere. The laboratory scientific group leader functions as your direct supervisor. While in the lab, you will obtain practical experience in laboratory research, collect scientific data, practice communication skills, master research techniques, and further develop scientific thinking and reasoning.
Literature | Literature relevant to the topic of choice.
Faculty | Individual scientific group leaders.
Level | 2nd year MSc student
EC points | 38
Course load | 1064 hours
Exam | Performance of the student during the full-year research project will be assessed in written form by the research supervisor. An extra mid-term moment of evaluation for both the supervisor and the student is recommended. This mid-term evaluation is not graded. Every student will also have an individual mid-term meeting with the course directors of the second year (Gert Jansen and Gerben Schaaf). This assessment is not graded.
Period | Individual presentations in March, 2020
The thesis is typically 20-50 total pages of 1.5 lines spacing, 10pt text, including figures, references, et cetera. and will contain separate 'chapters': List of Abbreviations, Summary, Introduction, Materials and Methods, Results, Discussion / Conclusions, and in some cases appendices or supplemental material.

The final version of the thesis will have to be accompanied by a 1-2 page summary of the specific improvements that were implemented in the final version, based on the comments the student has received by faculty on the draft version. This should be in the form of a rebuttal letter, as would accompany a manuscript resubmitted after review.

The defence of the thesis will take about 20 minutes, and will be preceded by an oral half hour presentation of aim, results and conclusions of the thesis work.

Literature

MSc theses of previous students

The Elements of Style, 4th Ed

How to Publish in Biomedicine
Jane Fraser, Radcliffe Medical Press, 1997, (optional)

How to Write & Publish a Scientific Paper, 5th Ed

The Netherlands Code of Conduct for Scientific Practice
General Board of the Association of Universities
(Algemeen Bestuur van de Vereniging van Universiteiten) January 1, 2005

On Being a Scientist, Responsible Conduct in Research
Committee on Science, Engineering, and Public Policy. National Academy Press, 1995

Evaluations are made as written performance assessments, by the involved lab supervisors.

For the total amount of lab work, upon completion, you will be awarded 38 EC points.

Grade appeal is subject to the rules laid out in the Teaching and Examinations Regulations of Erasmus MC.

Period
September, 2019 to August, 2020

Evaluation
The MSc program coordinators are open for suggestions from course participants on possible improvements. Course adjustments can be made on the basis of your direct feedback. Course contents and setup are re-evaluated periodically, at least once a year, by the course directors and MSc program board members.

Dublin descriptors 1, 2, 3, 4, 5
End goals 1, 2, 3, 4, 5, 6, 7, 8, 9

Name
Master Thesis

Form
Written report and oral presentation.

Code
MM-MSTH

Aim
The MSc thesis should demonstrate the ability of the student to organize and present results and knowledge in a form required for publication of a scientific article. Submission of the manuscript for publication is not a prerequisite, but is aimed at.

The MSc thesis should provide a record of the research work the student has done, a written presentation of knowledge and results, and a useful resource of information for others.

Content
The second, full-year, research project is concluded by submission and defence of the MSc thesis. The thesis will take the form of a full-length research article, suitable for publication in an international journal. In contrast to a regular article manuscript, the MSc thesis will include a more elaborate Introduction, describing the scientific background of the study: the Materials and Methods section will be expanded to include a complete and detailed description of all methods that have been applied; also, a List of Abbreviations will be added.

Faculty
Gert Jansen, Gerben Schaaf, individual scientific group leaders.

Level
2nd year MSc student

EC points
8 (MSc thesis) + 2 (thesis defence)

Course load
280 hours

Exam
The MSc thesis manuscript will be evaluated by the research supervisor and an independent faculty member.

The student’s research supervisor and at least two independent MSc faculty members will assess the MSc thesis presentation and defence. Together, they will come up with a final grade both the MSc thesis and the thesis presentation.
2.4 Course evaluations

After finishing the main theory courses of the MSc program, you will be asked to fill out an online evaluation form for each course. The online surveys allow you to give comments and/or suggestions for improvement.

When renewing the curriculum at the beginning of the academic year, the results of these evaluations are considered. Where deemed appropriate, changes in course contents are made by the course directors and/or the program director.

2.5 Workload, duration

The MSc Molecular Medicine program is a two-year research master's program of 120 EC, representing a total study load of 3,360 hours. The workload for the students is evenly distributed over the course years. Textbook courses are predominantly scheduled for year 1. In year 2, the emphasis is on performing a full-year research project, leading up to the MSc thesis.

Erasmus MC students of Medicine

Selected Erasmus MC students of medicine have the opportunity to follow the MSc Molecular Medicine program by starting with the whole year 1 of the MSc Molecular Medicine program, followed by the medical master 'new style'. After finishing medicine, students will come back to follow the second year of the MSc program (see page 15 for an outline of the curriculum).

Wageningen University – MSc Biotechnology students

WUR – MBT students have the possibility to specialize in 'Molecular Medicine' (WUR course modules XEU-80336 Thesis Molecular Medicine part A and XEU-80324 Thesis Molecular Medicine part B / 60 EC). These students follow the complete Year 2 of the MSc Molecular Medicine curriculum, conducting a full-year research project and writing and defending the MSc thesis in Rotterdam. Subsequently, WUR – MBT students will graduate in Wageningen. While at Erasmus MC, they can take part in additional courses and seminars (also see page 62).
2.6 Student exchanges – internships abroad

For a limited number of students, internships abroad are possible within the framework of our collaborative agreements with 3 universities:

Friedrich-Alexander-Universität, Nürnberg, Germany: MSc Molecular Medicine
Georg-August-Universität, Göttingen, Germany: MSc Biology
University of Barcelona, Spain: MSc Biology / Neurosciences
Université Pierre et Marie Curie, Paris, France: MSc Molecular and Cellular Biology

A typical student exchange will take the form of a clearly defined six-month research project, and will preferably be done while in year 2 of the program. When performing a research project in Nürnberg, Paris or Barcelona, students will receive supervision and guidance in accordance with the requirements in Rotterdam. The MSc thesis will always have to be defended in Rotterdam.

When visiting Rotterdam, exchange students from Nürnberg, Göttingen, Barcelona and Paris will be able to perform a six-month research project, with optional additional courses.

Incidentally, students are allowed to conduct their 2nd year research project in a research lab abroad (other than the labs at FAU, UPMC or UB). This can only happen on the conditions that collaborations already exist between the involved research groups, and that our requirements regarding course work, supervision, and assessment are met.

The Erasmus MC offers internships on a wide variety of topics. Students may consider internships at institutes outside the Erasmus MC or even abroad. To ensure optimal guidance and training for the student as well as participation of the student in the 2nd year course Writing a Project Proposal, a few additional requirements apply to these “extra-Erasmus MC” internships, in particular to those in institutes abroad. Excellence of the candidate and the hosting institute are major factors for support from the Molecular Medicine MSc program. In addition, the internship requires a mentor from within the Erasmus MC and should preferably be part of a collaboration with an Erasmus MC research group. Contact the year 2 coordinators (Dr. Gert Jansen and Dr. Gerben Schaaf) in time to discuss your plans and for more information.

An internship abroad can only be arranged and carried out in full agreement with the involved MSc faculty members: the lab supervisor, the course director(s), and the program director.
Staff

MSc Molecular Medicine faculty members are directly involved in basic biomedical research and training, within at least 20 different departments of Erasmus MC. This reflects the multi-disciplinary nature of our MSc program.

Faculty members are internationally recognized scientists and educators, with an excellent record of publications in peer-reviewed top international life science journals. Several faculty are members of the Royal Netherlands Academy of Arts and Sciences (KNAW), and many are elected members of the European Molecular Biology Organization, or are involved in other international organizations such as the World Health Organization.

Members of our staff have won many awards and prizes, such as the: Louis-Jeantet Prize for Medicine (1993 and 1995), Spinoza Prize (1995 and 1998), Laqueur Lecture Award (1999), Mulder-Masurel Award (2000), Descartes-Huygens Prize (2000), Van Gogh Award (2000), EC-Descartes Award (2000), Josephine Nefkens Award (2001), and the ESCV Gardner Lecture Award (2002). MSc faculty currently obtain research funding from NWO, KNAW, NKB-KWF, NIH, EC, ERC, and many other funding bodies. Since 2002, they have been awarded around 25 NWO – VIDI and NWO – VICI grants. As a lifetime achievement award, four of our faculty members were appointed KNAW Academy Professor.

The MSc faculty is experienced in training students and postdoctoral fellows for university faculty, medical school faculty, clinical laboratory and industrial biomedical research positions, both nationally and internationally. To date, more than 550 students have successfully finished their PhD under the supervision of one or more of our faculty members.

The individual quality of the faculty members is best evaluated by examining their CVs and publications on our website: www6.erasmusmc.nl/mscmolmed.

3.1 Chair and course directors

Chair
Dr. Dik van Gent, program director
d.vangent@erasmusmc.nl
Dr. Gert Jansen
g.jansen@erasmusmc.nl
Prof.dr. Gerjo van Osch
g.vanosch@erasmusmc.nl
Dr. Gerben Schaaf
g.schaaf@erasmusmc.nl

Course directors
Dr. Willy Baarends
w.baarends@erasmusmc.nl
Dr. Derk ten Berge
d.tenberge@erasmusmc.nl
Dr. Thamar van Dijk
t.vandijk@erasmusmc.nl
Dr. Dik van Gent
d.vangent@erasmusmc.nl
Prof.dr. Joost Gribnau
j.gribnau@erasmusmc.nl
Prof.dr. Gerjo van Osch
g.vanosch@erasmusmc.nl
Dr. Gert Jansen
g.jansen@erasmusmc.nl
Dr. Eskeatnaf Mulugeta
e.mulugeta@erasmusmc.nl
Dr. Pim Pijnappel
w.pijnappel@erasmusmc.nl
Dr. Raymond Poot
r.poot@erasmusmc.nl
Dr. Robbert Rottier
r.rottier@erasmusmc.nl
Dr. Martin van Royen
m.vanroyen@erasmusmc.nl
Dr. Gerben Schaaf
g.schaaf@erasmusmc.nl

Course coordinator
Marjoleine van Berckel Bik

Staff

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## 3.2 Faculty members

<table>
<thead>
<tr>
<th>Name</th>
<th>Erasmus MC department</th>
<th>Research field / keywords</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reuven Aghami</td>
<td>Netherlands Cancer Institute</td>
<td>Cancer, RNAi, microRNAs, Long noncoding RNAs, enhancer RNAs, Alternative polyadenylation, and protein translation</td>
</tr>
<tr>
<td>Willy Baarends</td>
<td>Developmental Biology</td>
<td>meiosis, chromatin dynamics, human IFV, embryo development, aneuploidy, chromosome segregation, transcription regulation, brain development, organoids, neurodevelopmental disorders</td>
</tr>
<tr>
<td>Esther Baart</td>
<td>Gynaecology and Obstetrics</td>
<td>hematopoietic and embryonic stem cells, Wnt signaling</td>
</tr>
<tr>
<td>Debbie van den Berg</td>
<td>Cell Biology</td>
<td>DNA replication stress, DNA damage response, cancer, chemoresistance, tumor or virus specific receptor gene transfer to reagent T cells, cancer and inflammation, novel immune technologies.</td>
</tr>
<tr>
<td>Jeroen Demmers</td>
<td>Biochemistry</td>
<td>Proteomics</td>
</tr>
<tr>
<td>Thamar van Dijk</td>
<td>Cell Biology</td>
<td>arginine methylation, signal transduction, transcription factors, lenti vector knockdown regulatory mechanisms in bone, steroid hormone action, bone</td>
</tr>
<tr>
<td>Bram van der Ierden</td>
<td>Internal Medicine</td>
<td>DNA duplication and genome maintenance mimicking the biological process of endochondral ossification to tissue engineer new bone for the treatment of bone defects</td>
</tr>
<tr>
<td>Jeroen Eisers</td>
<td>Radiotheraphy</td>
<td>colon cancer, breast cancer, Wnt/β-catenin signalling, cancer stem cells genomic basis of treatment of bone defects</td>
</tr>
<tr>
<td>Riccardo Fodde</td>
<td>Pathology</td>
<td>influenza, SARS</td>
</tr>
<tr>
<td>Maarten Fornerod</td>
<td>Cell Biology</td>
<td>glioma, omics, cell structure and dynamics, microtubules, cytoskeleton</td>
</tr>
<tr>
<td>Ron Fouchier</td>
<td>Viroscience</td>
<td>DNA repair, VDJJ recombination, immunodeficiency</td>
</tr>
<tr>
<td>Piem French</td>
<td>Neurology</td>
<td>X inactivation, genomic imprinting</td>
</tr>
</tbody>
</table>
| Niels Galjart         | Cell Biology                                   | DNA repair, microRNA editing, reprogramming, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRNA editing, reprogramming factor, RNAi, microRN
Assessments

4.1 Exams

The combined Master of Science programs at Erasmus MC have developed a shared set of Teaching and Examination Regulations (Onderwijs- en Examenreglement, OER). Students can obtain a copy of the full text of the Teaching and Examination Regulations Research Master Programs (in English) online, from the MSc Molecular Medicine website or SIN online. The main rules for course assessments are:

Examinations (OER annex – paragraph 2.1.3)

All course modules within the MSc Molecular Medicine program are assessed as stated in the course descriptions of this student manual (pages 20-50). Full attendance is mandatory for some courses or course sessions. For other courses, students are allowed to be absent a maximum of 20% of classes, but only when reporting their absence in advance to the MSc coordinator and/or the course director. EC points will only be awarded if the above requirements are met and if a test is passed with sufficient results.

Re-exams (OER annex – paragraph 2.2.3)

Students are entitled to take one re-exam for each test, per year.

Exemptions (OER rules and guidelines – paragraph 3.2)

All course modules in the program are mandatory. Requests for exemptions will be evaluated by the examination board (see below), which to this purpose needs to receive a written request from the student.

4.2 Examination board and program board

The combined research master’s programs at Erasmus MC have an examination board (examencommissie) as well as a program board (opleidingscommissie).

MSc examination board

The MSc examination board carries formal responsibility for the outcome of all exams of the program. There is one board for all bachelor and master programs (including medicine). There is a separate chamber of the examination board for the combined five
5.1 Selection criteria

The admissions committee is responsible for the admission of candidate students. Members of the admissions committee are the chairpersons, the program director, and occasionally, one of the course directors.

Candidate students are asked to submit their application on-line via the MSc Molecular Medicine website http://www6.erasmusmc.nl/mscmolmed/admissions/, and face the following selection criteria:

- BSc in any of the biomedical sciences (e.g. biology, biochemistry, medicine), or BASc from a Dutch vocational training program in biomedical laboratory techniques (HBO-BML)
- personal motivation, assessed by written statement and/or interview
- letters of reference
- TOEFL 575 / 232 / 90 or IELTS 6.5, or comparable English proficiency
- overall performance in previous educational programs
- in some cases: a written entrance examination

The academic records of prospective students are always examined. For foreign candidates we perform a detailed analysis of grades, bearing in mind the various grading systems of different countries. Generally speaking, we wish to see a minimum grade point average of 80%. You will be further evaluated on the basis of your personal motivation, and the ability to express this motivation in written form and/or during an (internet) interview.

5.2 Biomedical BSc students

Prospective international or Dutch students with a background in life sciences are advised to contact us before submitting an application on-line, preferably via email: mscmolmed@erasmusc.nl.

Application deadline for the academic year 2020-2021:
March 1, 2020 (non-EU students)
May 1, 2020 (EU students)
Money

6.1 Tuition fees, cost of living

Tuition fees per year, fixed amounts for 2019-2020

<table>
<thead>
<tr>
<th>Category</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>EU/EEA/Swiss/Surinamese students</td>
<td>€ 2,083</td>
</tr>
<tr>
<td>Students from non-EU countries</td>
<td>€ 18,700</td>
</tr>
</tbody>
</table>

Tuition fees per year, fixed amounts for 2020-2021

<table>
<thead>
<tr>
<th>Category</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>EU/EEA/Swiss/Surinamese students</td>
<td>€ 2,143</td>
</tr>
<tr>
<td>Students from non-EU countries</td>
<td>€ 19,000</td>
</tr>
</tbody>
</table>

Prospective students from abroad should be aware that for accommodation and the daily cost of living approximately € 950 per month is needed, in addition to the tuition fees mentioned above.

For a realistic cost estimate and advice on your financial situation, please visit https://www.eur.nl/en/education/practical-matters/financial-matters/financial-aid/scholarships-grants

6.2 Possible scholarships and grants

In recent years, some of our MSc Molecular Medicine students proved to be eligible for a scholarship, grant, or award:

A few scholarship links
- [http://www.studyinholland.nl](http://www.studyinholland.nl)
- [http://www.grantfinder.nl/content/index.asp](http://www.grantfinder.nl/content/index.asp)
- [http://www.study-in-europe.org](http://www.study-in-europe.org)
- [http://www.aiesec.org](http://www.aiesec.org)
- [https://duo.nl/particulier/international-student/](https://duo.nl/particulier/international-student/)

Study funding for EU/EEA citizens

EU/EEA citizens who work in the Netherlands for at least 32 hours a month may be eligible for study funding (Dutch: *studiesubschrijving*) by the Dutch government; see [https://duo.nl/particulier/international-student/student-finance/applying-for-student-finance.jsp](https://duo.nl/particulier/international-student/student-finance/applying-for-student-finance.jsp) for more information.
6.3 Working in the Netherlands

During your stay in Rotterdam as a MSc Molecular Medicine student, we strongly advise against taking on an extra job, alongside your studies. You will need your valuable time to study, prepare for classes, write reports, and perform your research projects in the lab. Nevertheless, we list the current rules here.

- Students from EU/EEA countries, including Switzerland
  Students from most countries of the European Union, and students from the European Economic Area including Switzerland, are allowed to work in the Netherlands without restrictions. Your employer does not need to apply for a work permit and you may work as many hours as you wish. However, you must pay income tax, so you will need a tax registration number (Dutch: Burger Service Nummer, BSN).
  Exception: if you are a national of Croatia, that entered the EU on July 1, 2013, your employer will still need to apply for a work permit.

- Students from outside the EU/EEA
  Students from outside the EU/EEA with a valid residence permit are allowed to work for a salary 10 hours a week on average per year. Your employer will need to apply for a work permit.

6.3 Working in the Netherlands

Dutch Tax Office website  http://www.belastingdienst.nl/english/
Dutch Immigration Office website  https://ind.nl/en
Expat recruitment agency  http://www.undutchables.nl/

Services

7.1 Facilities

Registration as a student

Existing and new students are required to (re-)register for the MSc program yearly, at http://eur.studielink.nl.

Registration as a guest employee / accident insurance

Students will additionally be registered as a 'guest employee', before the start of the laboratory practices in the program. This registration will allow you easy access to the faculty building. As a guest employee, you are insured against accidents in the workplace.

Introductory activities for new students

- MScMM introductions in August and September
  Apart from the mandatory introductory courses of the MSc program (MM-IW, see pages 20-21), newly admitted students are invited to attend the Thesis defences of our graduating students, in the 4th and 5th week of August. Our yearly MSc Graduation Ceremony is held in the first week of September. Students, faculty, and alumni, are invited to this event.

- EUR introduction activities for new students
  Every year in August, Erasmus University hosts Eureka Week, a week-long event for all new students. 'Eureka' stands for Erasmus University Rotterdam Erstejaars
  For more information please see https://www.eur.nl/en/about-eur/eurekaweek
  Kennismakings Activiteiten (Erasmus University Rotterdam First-year's Orientation Program). Shortly after, the Erasmus International Student Network ESN will hold their Introduction Days. For more information please see https://www.eur.nl/en/education/practical-matters/studying-eur/orientation/esn-introduction-days

Student Service Center, International Office

The Erasmus University Student Service Center and the university International Office have clear and up-to-date online information for students:
  https://www.eur.nl/en/education/practical-matters/contact

You can call them during office hours (Central European Time) at +31-10-4082323.
Visiting address: the hall of the E building, at the university Woudenstein campus, Burgemeester Oudlaan 50, Rotterdam.
University services at the Woudenstein campus

Erasmus University Rotterdam has two main locations: the Woudenstein campus and Erasmus MC (or 'Hoboken'). Most student facilities are situated at the Woudenstein campus. University facilities and services include:

- **the sports center.** Two sports halls, five squash courts, a fitness gym, and six open-air tennis courts are at your disposal. You may choose from a wide variety of sports, including basketball, boxing, aerobics, athletics, and football (soccer), and you can also take courses in tennis or squash. Or learn to dive or play golf at a reduced price. Buy your affordable sports card at the reception of the 5-building. More info: [https://erasmussport.nl/home/](https://erasmussport.nl/home/)

- **professional help.** During your time as a student, you may need to see a physiotherapist, a student psychologist, study counsellors, or religious counsellors. See [https://www.eur.nl/en/education/practical-matters](https://www.eur.nl/en/education/practical-matters) for details.

- **student organizations,** such as student unions, student associations (including associations specifically for international students), student cultural organizations, student sports clubs, political organizations, and many more. Again, visit [https://www.eur.nl/en/education/practical-matters](https://www.eur.nl/en/education/practical-matters) for details.

**MSc Molecular Medicine coordinator**

Any questions regarding your study program can be addressed directly to the MSc Molecular Medicine coordinator, Marjoleine van Berckel Bik. You can reach her by phone: +31-10-7044844, by email: mscmolmed@erasmusmc.nl, or you can stop by at the office in room Ee-971 (on the 9th floor of the Erasmus MC faculty building).

In the absence of Marjoleine, and in case of emergency only, you may contact Loes Nijide Langen, the coordinator of the MSc program in Neuroscience: L.nijs-delangen@erasmusmc.nl or +31-10-7043560 or the director of the MScMM program, Dik van Gent, or the vice-director, Gert Jansen.

**MScMM program links**

Students will receive regular updates by email and via the online student information channel: [http://emc.sin-online.nl/](http://emc.sin-online.nl/). Use your ERNA account to login to SIN-Online.

The program website [http://www6.erasmusmc.nl/mscmolmed](http://www6.erasmusmc.nl/mscmolmed) gives you general course information, and includes an extensive list of Faculty CVs and publications.

**Erasmus MC links**

Erasmus MC employee phone and address directory ("bereikbaarheidsgids"): [http://dtel.erasmusmc.nl/](http://dtel.erasmusmc.nl/)

Employee login to Erasmus MC intranet from home, with library and PubMed access: [http://www6.erasmusmc.nl/medewerkers/?lang=en](http://www6.erasmusmc.nl/medewerkers/?lang=en)

**LinkedIn**

A LinkedIn ([http://www.linkedin.com](http://www.linkedin.com)) network group was created to connect students, faculty members, and alumni. Current and former students are invited to join the group.

**Classrooms**

Weekly classes are held in the university Education Center colloquium rooms, or one of the meeting rooms of the Biomedical Sciences departments at Erasmus MC (Ee-1024, Ee-822, Ee-1473).

**Course materials**

Textbooks courses: students are offered the loan of these books. Course schedules, course documents, selected articles and presentations slides are handed out online [http://emc.sin-online.nl/](http://emc.sin-online.nl/)

**Timetable online**

The timetable for a part of the program can be viewed online via [https://asklepios.eur.nl/iris/definitief/index2019.html](https://asklepios.eur.nl/iris/definitief/index2019.html) (below Graduate School click the 'MScMM' link).

**Test results**

Test results are registered in OSIRIS, the Erasmus University student registration system. Students can check their results on OSIRIS Online: [http://osirisstudent.eur.nl](http://osirisstudent.eur.nl)

**Libraries**

- Erasmus MC Medical Library

Students have access to the Erasmus MC Medical Library and the various institutional libraries. The Medical Library is located in the Education Center of Erasmus MC, phone +31-10-7043783. The Medical Library can be visited online at: [http://www6.erasmusmc.nl/medbib](http://www6.erasmusmc.nl/medbib).
Student councils
According to the Dutch 'Modernizing University Administration' act (wet Moderniserings Universitaire Bestuursorganisatie - MUB), students have a say in the administration and policies of the university. Besides the EUR university council, with 2 employee members and 2 student members coming from the medical faculty, Erasmus MC has a student council, consisting of 8 student members. The MSc program board (see page 60) is specifically involved in the policies and educational programs of the five research master’s programs at Erasmus MC.

EUR university council: universiteitsraad@abd.eur.nl
Erasmus MC student council: studentenraad@erasmusmc.nl
MSc program board: s.manusama@erasmusmc.nl

7.2 Tutors, guidance
Because of relatively small student numbers, contacts between students and staff are informal and plentiful. As a student, you can come and see the program director, the course directors, and/or the coordinator whenever necessary.

In year 1 of the program, you can choose a tutor for personal guidance and counseling. The tutor may play an important role when you make a choice for your first research project.

As soon as you start the year 1 laboratory research project, you will be absorbed in the pertaining research group, with a group leader acting as your direct supervisor.

Before the start of year 2, you are required to draft a research proposal, in preparation for your engagement in the full-year research project. In January, the year 2 course director will have a personal talk with each individual student in year 2 on her or his study progress. If needed, the research supervisor is consulted as well.

The MSc chairpersons, program director, and course directors continually monitor the progress and performance of the students within the program. They can seek advice from tutors and supervisors.

7.3 Alumni
The first group of MSc Molecular Medicine students graduated in 2003. We try to stay in touch with our alumni on a basic level, by yearly monitoring their whereabouts and experiences. Via a LinkedIn (http://www.linkedin.com) network group we maintain contacts between current students, MSc Faculty members, and alumni.
Preparing your stay
when coming from abroad

8.1 Student Service Center, International Office

The Erasmus University Student Service Center (ESSC) and the university International Office have clear and up-to-date online information for prospective international students, on visa, student registration, finances, and various other services: https://www.eur.nl/en/education/practical-matters. You can call them during office hours (Central European Time) at +31-10-4082323. Visiting address: the hall of the E building, at the university Woudestein campus, Burgemeester Oudlaan 50, Rotterdam.

8.2 Practical matters

Introductory activities for new students

- MScMM introductions in September
  Apart from the mandatory introductory courses of the MSc program (MM-IW, see pages 20-21), newly admitted students are invited to attend the Thesis defences of our graduating students, in the 4th and 5th week of August. Our yearly MSc Graduation Ceremony is held in the first week of September. Students, faculty, and alumni, are invited to this event.

- EUR introduction activities for new students
  Every year in August, Erasmus University hosts Eureka Week, a week-long event for all new students. ‘Eureka’ stands for Erasmus University Rotterdam Eerstejaars. For more information please see https://www.eur.nl/en/about-eur/eurekaweek
  Kennismakings Activiteiten (Erasmus University Rotterdam First-year’s Orientation Program). Shortly after, the Erasmus International Student Network ESN will hold their Introduction Days. For more information please see https://www.eur.nl/en/education/practical-matters/studying-eur/orientation/esn-introduction-days

Accommodation

The Erasmus University International Office will make sure that you are offered a suitable student room or apartment in Rotterdam.
We recommend Aon Students Insurance: http://www.students-insurance.eu.
While a student and working on your projects in any of the labs of Erasmus MC, you are insured against accidents in the workplace.

The doctor

For medical assistance, it is common in the Netherlands to go see a general practitioner (Dutch: *huisarts*) first, before visiting any specialist in the hospital. Find a GP in your neighbourhood. Google ‘huisarts Rotterdam’ for a map and list.

After office hours and during weekends, the Rotterdam GPs have a collective emergency post at the Sint Franciscus Gasthuis, Kleiweg 500, Rotterdam, phone 010 - 461 6720.

The Erasmus MC Emergency Ward (Dutch: *Spoedeisende Hulp*, SEH) is located at the Wytemaweg 80, phone (010 - 70 )40145.

Pharmacy and chemist

Most medications are only available on prescription. You will be given the prescription by the general practitioner and can collect your medication at a pharmacy (Dutch: *apotheek*). the chemist (Dutch: *drogist*) and some supermarkets sell medications that do not require a prescription, such as aspirin and cough medicine. For night and weekend emergencies, one of the Rotterdam pharmacies will always be open. Call any pharmacy to find out which one is on duty, or check the notice in the window.

Opening a bank account

As you will be living in the Netherlands for an extended period of time, we recommend opening a Dutch bank account. You will for instance need a Dutch bank account if you want to pay your tuition fee in instalments. All banks can charge for products and services, but they must inform you of the charges levied. There are several major banks in the Netherlands.

The ABN AMRO Bank, ING Bank and Rabobank offer online banking facilities that are completely in English. To open a bank account, visit https://www.eur.nl/en/education/practical-matters/financial-matters/dutch-bank-account .

Visa and residence permit

If applicable, your visa and residence permit must be arranged before your arrival. The Erasmus University International Office will guide you through the process.

Passport

Your passport should be valid for at least six months after your intended arrival date in the Netherlands. If this is not the case, renew your passport prior to your departure, otherwise you will run the risk of not being admitted to the country.

Registration at the City Hall, including tax registration number - BSN

To officially register as a resident of Rotterdam with the Municipal Primary Administration (Dutch: *Gemeentelijke Basis Administratie, GBA*), you will need the following documents:

- Valid passport or valid identity card
- Original birth certificate (authenticated or legalized)
- Rent agreement or, for those who do not live in accommodation provided by Stadswonen, a declaration by the main occupant (Dutch: *verklaring van inwoning*), or a housing permit

Make sure you have these documents on arrival, or in case of the rent agreement, shortly after. You will register at the City Hall when you have actually arrived.

It is also possible to arrange this at the Woudenstein Campus during the ESN’s Introduction days at the ‘One Stop Shop’, you can register through https://www.eur.nl/en/education/practical-matters/studying-eur/orientation/one-stop-shop

Within approximately four weeks after you have been successfully registered, you will receive a unique tax registration number (Dutch: *Burger Service Number*, BSN), in a confirmation letter from the Municipal Administration (GBA). Certain agencies may ask you for your BSN number, for example an employer, your benefit provider, your bank or your insurance company.

Health insurance, third party liability insurance

Before you come to the Netherlands, check that you are properly insured against the costs of medical treatment and third party liabilities. Perhaps there is an insurance company in your home country that will cover medical costs and liabilities in the Netherlands. If so, bring international declaration forms or a European Insurance Card with you. If your current insurance is not sufficient, you will need to take out an insurance policy for the duration of your stay in the Netherlands.
Postal services
You can buy stamps for letters and postcards, or send larger packages, from post offices at various locations in Rotterdam. Mail can be posted at these post offices (bearing the sign TNT Post) or at any of the orange mailboxes you find in the street. Some TNT Post offices have banking services from ING. It is possible to pay bills through the TNT Post office, even if you don’t have an account with them, but you may have to pay a small charge. See website http://www.tntpost.nl for locations (only in Dutch).

Telephone
When calling within the Netherlands, all land lines will have an area code starting with a zero (010 for Rotterdam), followed by the actual phone number. When calling to the Netherlands from abroad, after the country code +31, the initial zero of the area code is left out (thus: +31-10 for Rotterdam). Similarly, mobile phone numbers start with 06 (or +31-6). Numbers beginning with 0800 are toll free but cannot be called from abroad; 0900 numbers are charged (per call or per minute).
Erasmus MC has a telephone exchange. Internal phone calls are toll free: dial the last 5 digits of the number (example: 44844 instead of +31-10-7044844).

Mobile phones
You may want to find a Dutch mobile phone service with a contract (in Dutch: abonnement), or perhaps you would prefer a prepaid card. Compare the latest rates at https://www.bellen.com (in Dutch only). Be aware that for a contract, you will need a Dutch bank account, a document that gives proof of your address and income (such as a bank statement), and a passport.

Power - electricity and gas
The Netherlands’ energy market is privatized. Utility companies offer integrated services, providing gas (for cooking and heating) and electricity. You may choose your own energy provider (but NOT if you are a tenant of Stadswonen property). Electricity is 230 Volts, alternating at 50 Hertz. If your device does not accept this, you will need a voltage converter.

Water
Clean drinking water is available straight from the tap all over the country. The water companies, the national government, and the ‘Water Control Board’ (Dutch: waterschap or hoogheemraadschap) together take care of the supply of clean water, the discharge of wastewater, and the groundwater level. Tax is charged for these water works. You will most likely receive a separate, yearly water bill.

Climate
The Netherlands have a typical ‘marine’ climate. In summer, fine, hot weather may last for weeks, but the weather may just as well be cool and unsettled. In winter, spells of cold weather lasting from a week to two months or more may cause rivers and canals to freeze, but in mild winters this may not occur at all. Rainfall is well distributed over the year. The average daily temperature in January is around 5°C, and in June around 20°C. Check for approaching showers real-time at http://www.buienradar.nl.

Public transport
The Rotterdam Transportation Authority (Dutch: Rotterdamse Electrische Tramweg maatschappij, RET) provides mass transit services in the greater Rotterdam area by tram, bus, and subway (metro). You need a public transport chipcard (Dutch: Openbaar Vervoer chipkaart, OV-chipkaart) to travel. Personalized, anonymous, and/or disposable cards can be purchased online at http://www.retticket.nl/home-1.htm. When using the OV-chipkaart, make sure to always check in and check out at the station (or in the bus or tram). If you plan on travelling by train and/or metro a lot, it might be a good idea to buy an off-peak discount pass. For both local and national public transport, 40% discount cards are available. For more information, visit the NS or RET website, or go to the NS or RET counter, for example at Rotterdam Central Station.

National public transport itinerary planner: http://journeyplanner.9292.nl

The bicycle
To get around quickly, easily and cheaply, buy a bicycle (Dutch: fiets). A used bike in reasonable shape will cost you between € 75 and € 150. Find them at second-hand bike shops or advertised in the small ads on the notice boards of supermarkets. Always use a good quality bicycle lock. If you’re interested in buying an affordable new bicycle, that you have to assemble yourself, visit http://urlm.nl/www.opdiefiets.nl. Erasmus MC has a bike repair man in the basement / bicycle shed below the Hospital building, open on Monday, Tuesday, and Wednesday mornings.
8.3 Checklist

Before you go

- Application and admission MSc Molecular Medicine
- Sufficient financial resources to cover tuition fees and cost of living
- Studielink – student registration
- Fast track MVV entry visa or residence permit application (if applicable, via Erasmus University International Office)
- Registration for housing at or elsewhere (via Erasmus University International Office)
- Health insurance (and third party liability insurance)
- Travel arrangements
- ID card valid for use in the Netherlands, or passport
- Original birth certificate (authenticated or legalized).

Upon arrival

- Bring some cash money to cover first travel expenses within the Netherlands
- Sign your rent agreement, pay the rent for the first month and possibly: a deposit
- If applicable, report to the ESSC – Erasmus Student Service Center within three days of arrival, in the main hall of the E-building, Woudestein campus, Burgemeester Oudlaan 50, Rotterdam, to complete the residence permit application. Bring all your papers.
- If applicable, take the tuberculosis check at the Municipal Public Health Authority GGD, Schiedamsedijk 95, Rotterdam.
- Register at the City Hall, Coolsingel 40, as a resident of Rotterdam. Bring all your papers.
- If applicable, pick up your residence permit from the City Hall.
- With help of the MSc coordinators, complete your registration as a guest employee of Erasmus MC.

Cheap and free stuff
http://www.marktplaats.nl/ - the Dutch equivalent of Ebay
http://www.gratisoptehalen.nl/aangeboden - free electronics, home appliances, and furniture.

NL news
If you are interested in Dutch society, mentality, and current issues, the preferred public news source is Radio Netherlands Worldwide: https://www.rnw.org/.

Supermarkets and markets
The larger supermarkets in Rotterdam are open 7 days a week. Albert Heijn and Jumbo supermarkets are considered as one of the best, ALDI and LIDL supermarkets are the cheapest. Besides groceries, most supermarkets sell stamps and mobile phone prepaid credit. Weekly open air markets for affordable fresh food, flowers, and clothing are held on Saturdays at the Binnenrotte square in the city center, and in other locations, for instance the Visserijplein in the west of Rotterdam.

Out and about in Rotterdam
The ‘Rotterdam Pass’ will give you lots of discounts on cultural events, travelling, restaurants, et cetera, within Rotterdam. As a student, you can buy it at the Rotterdam Central Library. You will need a passport photo, your student ID card and a valid ID. More info: http://www.rotterdampas.nl/ (only in Dutch).

Or rent a bike: https://swapfiets.nl/en/
“For a fixed monthly fee you get a Swapfiets bicycle. We make sure your Swapfiets bicycle always works”.

Cheap and free stuff
http://www.marktplaats.nl/ - the Dutch equivalent of eBay
http://www.gratisoptehalen.nl/aangeboden - free electronics, home appliances, and furniture.

NL news
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8.4 National Holidays

**December 5, 2019 (Thursday)**
Sinterklaas (not an official holiday)
*Sinterklaas, the original version of Santa Claus, is celebrated in Flanders and the Netherlands. Loosely based on Saint Nicholas, this fictional character arrives yearly from Spain to hand out presents and sweets to children, to this purpose accompanied by his Moorish servants: the Black Petes (Dutch: *Zwarte Pieten*).*

**December 25, 2019 (Wednesday)**
Christmas Day

**December 26, 2019 (Thursday)**
Second Christmas Day – Boxing Day

**December 31, 2019 (Tuesday)**
Old Year’s Day

**January 1, 2020 (Wednesday)**
New Year’s Day

**April 10, 2020 (Friday)**
Good Friday (not an official holiday)
Religious holiday for Christians, commemorating the crucifixion of Jesus Christ.

**April 12, 2020 (Sunday)**
Easter
Religious holiday for Christians, commemorating the resurrection of Jesus Christ.

**April 13, 2020 (Monday)**
Easter Monday

**April 27, 2020 (Monday)**
King’s Day
Celebration of the birthday of King Willem-Alexander, as a day of national unity. People wear orange, wave flags and drink beer. Others will hold or visit rummage sales in the streets.

**May 4, 2020 (Monday)**
Memorial Day (not an official holiday)
The *Dodenherdenking* is held for those who fought and died during World War II, or in later combat or peacekeeping operations. Throughout the country, two minutes of silence are observed at 20:00 hrs.

**May 5, 2020 (Tuesday)**
Liberation Day (not an official holiday)
Celebrated to mark the end of the occupation by Nazi Germany during World War II.

**May 21, 2020 (Thursday)**
Ascension Day
Religious holiday for Christians, commemorating the ascension of Jesus Christ into heaven.

**May 31, 2020 (Sunday)**
Pentecost
Religious holiday for Christians, 50 days after Easter, celebrating the descent of the Holy Spirit upon the disciples of Christ.

**June 1, 2020 (Monday)**
Pentecost Monday

8.5 Useful addresses and phone numbers

**Emergency telephone number:**
112
0900-8844

**Local police, non-emergency:**
Studielink
Student Help Desk
Tel: +31 (0)88 424 7600
*helpdesk@studielink.nl*
*www.studielink.nl*

**City Hall - Stadhuis**
Coolingel 40 (Dienst Burgerzaken)
3011 AD Rotterdam
Open: 09:00 – 16:00 hrs
Tel: 14 010 or +31 (0)10 267 16 25
*www.rotterdam.nl*

**Municipal Public Health Authority GGD**
Schiedamsedijk 95
3011 EN Rotterdam
Tel: +31 (0)10 433 9933
*info@ggd.rotterdam.nl*
*www.ggd.rotterdam.nl*

**Erasmus MC - hospital**
Wytemaweg 80
3015 CN Rotterdam
Tel: +31 (0)10 704 0704
*www.erasmusmc.nl*

**Stayokay Rotterdam Hostel**
Overblaak 85-87
3011 MH Rotterdam
Tel: +31 (0)10 436 5763
*rotterdam@stayokay.com*
*www.stayokay.com/en/hostel/rotterdam*

**Hostel ROOM**
Van Vollenhovenstraat 62
3016 BK Rotterdam
Tel: +31 (0)10 282 7277
*info@roomrotterdam.nl*
*www.roomrotterdam.nl*

**Stadswonen Rotterdam**
Rochussenstraat 21
3015 EA Rotterdam
Tel: +31 (0)10 245 67 00
*info@stadswonenrotterdam.nl*
*www.stadswonenrotterdam.nl/en/About-us/Contact*

**Tax Office - Belastingdienst Rotterdam**
Laan op Zuid 45
3072 DB Rotterdam
Tel: 0800 0543
*www.belastingdienst.nl*

**Rotterdam Central Library**
Hoogstraat 110
3011 PV Rotterdam
Tel: +31 (0)10 281 6100
*www.bibliotheek.rotterdam.nl/EN*

**Rotterdam Tourist Information**
Coolsingel 114
3011 AG Rotterdam
Tel: +31 (0)10 790 01 85
*info@rotterdamtouristinformation.nl*
*https://en.rotterdam.info/

**Aon Students Insurance**
*www.students-insurance.eu*

**Dutch Immigration Office IND**
PO Box 29777
2502 LT The Hague
Tel: +31 (0)70 426 0260
*www.ind.nl*

**Nuffic - Netherlands Organization for International Cooperation in Higher Education**
PO Box 29777
2502 LT The Hague
Tel: +31 (0)70 426 0260
*www.nuffic.nl*
# Contact details

| Institution: | Erasmus MC – University Medical Center Rotterdam  
Wytemaweg 80  
3015 CN Rotterdam  
The Netherlands |
|-------------|--------------------------------------------------|
| Web:        | [http://www.erasmusmc.nl](http://www.erasmusmc.nl)  
[http://www.eur.nl](http://www.eur.nl) |

| Course: | **Master of Science in Molecular Medicine**  
Erasmus MC – University Medical Center Rotterdam |
|---------|--------------------------------------------------|
| Program director: | Dr. Dik van Gent  
Vice-director: | Dr. Gert Jansen  
Program coordination: | Marjoleine van Berckel Bik |
| Type of education: | two-year research master's program (120 EC points)  
Degree: | Master of Science, MSc  
CROHO registration: | 60279  
| Contact: | Erasmus MC – MSc Molecular Medicine  
Room Ee-971 (postal address) / Ee-971 (visiting address)  
PO Box 2040 / Wytemaweg 80  
3000 CA Rotterdam / 3015 CN Rotterdam  
The Netherlands  
Tel: | +31-10-7044844  
Email: | mscmolmed@erasmusmc.nl  
Web: | [www6.erasmusmc.nl/mscmolmed](http://www6.erasmusmc.nl/mscmolmed) |
Erasmus University Rotterdam

Erasmus MC  MSc Molecular Medicine
www6.erasusmc.nl/mscmlmed

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