

From knowing to growing

Ever thought of doing research?

Erasmus MC
Graduate School

WELCOME TO ROTTERDAM!

Located in the heart of the bustling city of Rotterdam, Erasmus MC is committed to a healthy population and excellence in health care through research and education. Currently, it is the largest hospital in the Netherlands, with over 17,000 (medical) staff, researchers, and students. It is home to leading scientists in the (bio)medical field and the ideal place for highly talented, motivated and aspiring young researchers!

In 1966, the *Medische Faculteit Rotterdam* (MFR) was opened as the seventh medical school in the Netherlands and has since developed into what is now known as Erasmus MC. From the start, Erasmus MC has always been at the forefront of (bio) medical innovations and innovative (bio)medical research, ranging from delivering the first Dutch IVF baby in 1983 and boasting the first heart transplant in the Netherlands in 1984 to its active involvement in battling Covid-19 in 2020.

To this day, Erasmus MC continues to pay tribute to the original vision of its Founding Father, Prof. Andries Querido, by putting great emphasis on the importance of *research* and *scientific training* as part of our curriculum. Moreover, our current research masters in Health Sciences, Genomics in Society, Infection & Immunity, Molecular Medicine, and Neuroscience offer an in-depth, high-level scientific training in (bio)medical research fields. Initially set up as (additional) master programs for medical students at Erasmus MC, these five programs have now developed into highly acclaimed, officially accredited, and internationally renowned research masters -- open to both Dutch and international students.

Together with our PhD programs, the research masters constitute the Erasmus MC Graduate school. At the core of our educational philosophy is that good scientific training requires active learning. This means that theoretical knowledge and practical skills are taught in an integrated way, and that we teach both PhD and research master students in small groups or sometimes even individually. Hence, students are stimulated to use their newly acquired knowledge actively, which both embeds their knowledge and improves the quality of their research.

Our two-year, English-taught research master programs provide students with a high-level scientific training in the (bio)medical field, spanning the entire spectrum of biomedical, clinical, and population health research. The programs are open to both medical students as well as students with a bachelor's degree in various other disciplines, including Life Sciences, Behavioral Sciences, Medical Sciences, and Public Health Sciences. Some programs might have additional requirements. For Erasmus MC medical students, we aim to adapt the program in such a way that it can be completed in addition to their medical studies.

Upon successful completion of one of the research master programs, students are awarded an internationally recognized Master of Science (M.Sc.) degree. Quite a number of graduates from each program continue their scientific careers by pursuing a PhD.

Hopefully, this brochure will give you a taste of what we have to offer. We look forward to welcoming you to Erasmus MC in Rotterdam!

Prof. Maarten Frens
Vice Dean Erasmus MC



1 HEALTH SCIENCES

The research master Health Sciences provides students with a solid scientific foundation and high-level research skills, that will enable the graduate to perform cutting-edge research and to develop a successful international career as a (clinical) researcher.

Taught by world-renowned international faculty, the program combines theoretical training in quantitative methods with practical research training, and comprises both compulsory and elective courses. Individual assignments and presentations alternate with group work, discussions and case studies with fellow students. Erasmus MC medical students have the possibility to combine the program with their medical master's program.

Theoretical training

The core curriculum of this two-year, full-time Master of Science program includes courses in study design, data analysis, biostatistics and clinical and public health epidemiological research methods. Elective courses permit students to tailor the program to their own interests and professional needs.

Depending on your interest, you can major in one of the following fields: epidemiology, clinical research, clinical epidemiology, genomic & molecular epidemiology, public health epidemiology, biostatistics, or health decision sciences & technology assessment.

Research training

The research phase involves the design and implementation of a research project under the guidance of a personal supervisor. Successful completion of the research training may lead to a paper on the research project that is ready for submission to an international scientific journal.

Research areas comprise, amongst others, major neurological and cardiovascular diseases, genomics and metabolomics, lifestyle, mental health, child development, epidemics and pandemics, screening, decision making in medical practice and public health, and social factors affecting health outcomes and access to health care.

Students choosing the clinical research major will have research opportunities in a large variety of clinical fields such as endocrinology and neuro-endocrine immunology, cardiovascular research, hemato-oncology, medical oncology, gynaecologic oncology, pediatric research, obstetrics, urology, transplantation medicine, gastroenterology & hepatology, surgical research, medical imaging, and musculo-skeletal science.

Admission Requirements and Procedure

- Applicants should have a university bachelor's degree in clinical medicine, biomedical sciences, public health, health sciences, clinical technology, nutrition, (medical) biology, pharmacy, human movement sciences, psychology, health economics, or a broad bachelor's education (e.g. university college) with subjects in these disciplines;
- Relevant knowledge, insight and skills such as research skills and statistical knowledge at bachelor level.
- Personal competences as demonstrated in your CV and motivation to participate in our research master program and starting a career in biomedical research. Academic performance and competences, based on your average grade and study progress will be taken in consideration as well.
- A good command of written and spoken English;
- Application deadlines for non-EEA/EU students: March 1; for EEA/EU students: May 1.

FAST FACTS

Annual intake: **65 students**

Male/Female ratio: **31-69%**

Nationality: **24 different** nationalities

Percentage studying for a **PhD** after graduation: **70%**

Other career options: positions in **public health, health policy, clinical medicine or clinical**

Ratio Research Supervisor/Student: **1:1**

Ratio Student/teacher: **16:1**

The learning environment is fully international, from an international student population to faculty members with international experience and networks who teach and supervise students.

We have nearly 120 professors and teaching staff. Some of them hold a primary appointment at Erasmus MC and an adjunct professorship at Harvard T.H. Chan School of Public Health.

€2.771
(Statutory fee: Dutch / EEA students)

€24.500
(Institutional fee: Dutch / EEA students)

€24.500
(Institutional fee: non-EEA students)

ORGANIZATION

Prof. Bettina Hansen *(Program Director Health Sciences & Clinical Research)*

Sarah Edrisy *(Program Coordinator)*

www.linkedin.com/school/erasmusmc-graduateschool-healthsciences/

View the website for more information or contact us via the Contact Form on STiP.

www.eur.nl/en/erasmusmc/healthsciences

https://stip.erasmusmc.nl/

TESTIMONIAL

Sanne Hoepel (The Netherlands)

"I have chosen the research master in Health Sciences to develop my knowledge in the field of epidemiology and population-based research. The program definitely met my expectations, as the classes were taught by renown professors who were always open to questions and discussions. The program's focus on study design and statistics gives you a solid foundation for performing research. You are taught to dive deeper, think critically and ask the right questions. During my research internship I was able to further develop these skills and become an independent researcher. This experience was a kick-starter for the PhD-project I set up after my master. I am currently working as a PhD-candidate in the department of Epidemiology.

I would highly recommend the program to other ambitious students that want to challenge themselves. The international and diverse group of students that you meet in class and the opportunity to tailor your program with the extensive options of elective courses make it not only a valuable but also a joyful experience!"



Sanne Hoepel



TESTIMONIAL

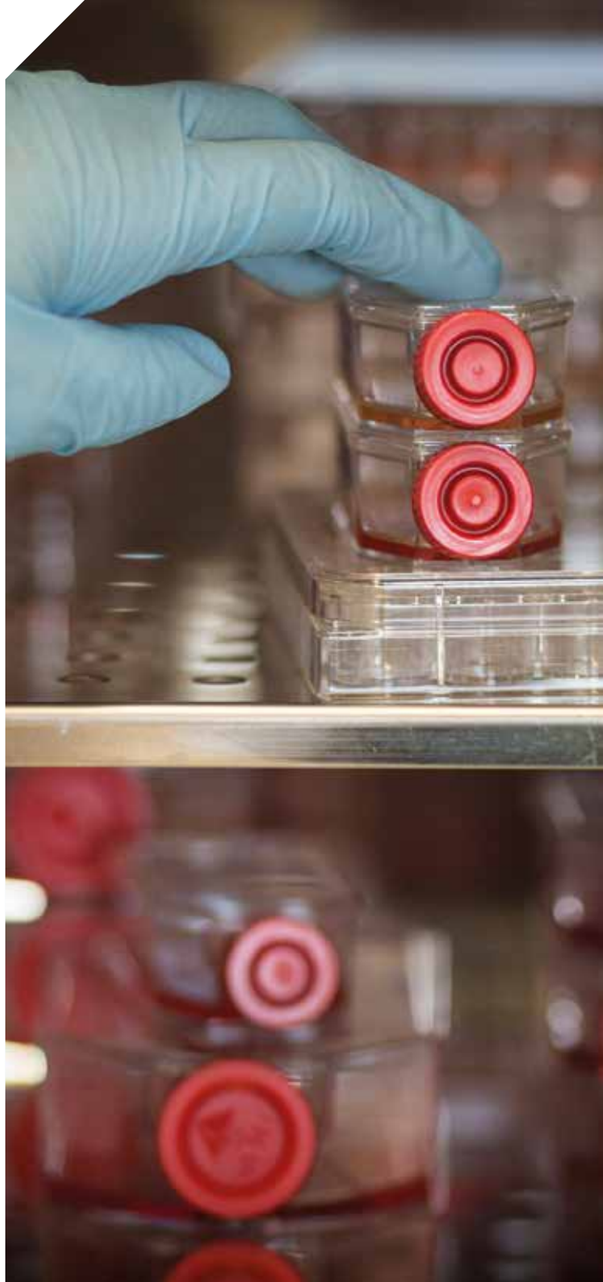
Victor Zeijen (The Netherlands)

"Already in the early stages of my bachelor program in Medicine, my interest in medical research was sparked. As soon as I found out about the research master programs offered by Erasmus MC Graduate School, I unequivocally decided to apply for the Clinical Research track, with the aim to combine clinical medicine with research in my future career. The two-year program started off with a predefined curriculum focussing on basic epidemiological and biostatistical concepts. Hereafter, I started an 18-month research internship at the department of Cardiology. Simultaneously, a multitude of in-depth elective courses were offered, which enabled me to select those which best matched my personal interests and the techniques required for my research projects.

The key quality of this program was the opportunity to directly implement the concepts taught in the classroom into daily practice. This program did not only improve my scientific knowledge and skills, but it also inspired me to pursue a PhD trajectory afterwards. I would personally recommend the Clinical Research track to every young (bio)medical professional who is interested in hands-on learning about medical research in a personalized way."



Victor Zeijen





ERASMUS MC

Erasmus MC University Medical Center, more commonly known as Erasmus MC, Erasmus University's Medical School and its three university hospitals are all integrated into one campus and led by one Executive Board. The Education Center has 400 study spots and 40 classrooms and lecture halls for up to 6,000 students. In 2018 the old hospitals were replaced with a state-of-the art single-patient 1,200+ bedroom hospital.

Erasmus MC is rated among the top research institutes of the Netherlands and participates in various nationally and internationally recognized research schools. In addition, our researchers work together extensively with other national and international health-care centers. Erasmus MC by far is the most multi-faceted university medical center in the Netherlands, including both a strong health sciences sector and leading research labs as well as covering the full range of medical specialties. Moreover, as part of Erasmus MC, the Erasmus School of Health Policy and Management (ESHPM) offers (post)graduate courses in health policy or health economics, and management positions in health care.

Erasmus MC
Universitair Medisch Centrum Rotterdam

Erasmus MC Graduate School

Erasmus MC Graduate School educates and prepares research master students and PhD candidates to become world-class scientists. Our research master programs and PhD tracks range from fundamental clinical research to research that is fully intertwined with societal projects.

Within Erasmus MC Graduate School we connect fundamental and practical research with results. Students develop into trained scientists, and PhD candidates conduct research that makes a difference – for science and for the wider community. We measure success not only in terms of scientific publications, but also, crucially, in terms of our impact on the health and well-being of society.

What unites us is our commitment to our students and PhD candidates, with plenty of personal guidance and room for personal initiative. An organization with many interdisciplinary collaborations and opportunities for new ideas. We collaborate with TU Delft, Erasmus University and societal partners. This is how we find inspiration for research with impact.

Our research master students and PhD candidates make the difference. Our goal is to support, motivate and challenge them to pursue new interests, so they become inspired connectors who work from an interdisciplinary perspective. This is how they become self-reliant, autonomous scientists, driven by curiosity. Thinkers who act.

www.erasmusmc.nl/en/graduate-school

Erasmus MC
Graduate School

ERASMUS UNIVERSITY ROTTERDAM...MAKE IT HAPPEN!

Erasmus MC is part of Erasmus University Rotterdam (EUR) - an internationally respected, innovative and vibrant university, driven to make a positive societal impact. Helping students develop into critically-minded world citizens is key to EUR's educational vision.

EUR's strong orientation to 'make it happen' is evident in its people, educational programs and research. The EUR mission is based on shared core values. These values define what it means to be an 'Erasmian', i.e. being engaged with society, connecting, a world citizen, entrepreneurial and open-minded. Students are encouraged to think beyond their own assumptions, to explore other perspectives, to search for new solutions and to discover different insights... Academics, students and alumni at Erasmus University endeavor to solve complex global societal challenges, drawing inspiration from the thriving, modern metropolis Rotterdam!

Erasmus University Rotterdam

ROTTERDAM: THE IDEAL ACADEMIC LABORATORY

Pioneering, hard-working, entrepreneurial and no-nonsense: that is the city of Rotterdam, a modern metropolis built around the largest port in Europe. Home to citizens representing more than 170 (!) nationalities, 65,000 students and many multinational companies, Rotterdam is a microcosm of the world.

The city, which has been flagged as a 'must see' in *The New York Times*, the *Lonely Planet* and *The Guardian*, offers Erasmus University Rotterdam the ideal academic laboratory: the university plays a prominent role in making substantial contributions to improving health care and the economic and socio-cultural development of the city and the wider region. Together with the Municipality of Rotterdam, Port of Rotterdam Authority and Rotterdam Partners, EUR aims to raise the already-high profile of Rotterdam even further, helping to attract the highly educated, businesses, trade, visitors and engaged citizens from the Netherlands and abroad. The brand alliance shared motto 'Make it happen' perfectly reflects what the city stands for and puts Rotterdam on the map more clearly.

ROTTERDAM. MAKE IT HAPPEN.

[Adapted from: At a Glance]

PRACTICAL MATTERS: HOUSING, FINANCIAL SUPPORT AND STUDENT COUNSELING

Although Erasmus MC itself does not offer on-campus housing facilities, research master students can apply for housing through Erasmus University's central Housing Office.

Financial support is available, albeit on a very limited basis only, through competitive scholarships, including the Erasmus University Holland Scholarship and the L-EARN for Impact Scholarship.

Each research master program has its own program coordinator who usually is the main contact person for practical matters. They also serve as first point of contact if students need advice regarding their studies or other (personal) matters. In addition, Erasmus University Rotterdam offers student counseling with a team of careers guidance counselors, student counselors, and university psychologists.

Please check www.eur.nl/en/erasmusmc for further details and application deadlines.



2 MOLECULAR MEDICINE

The Master of Science in Molecular Medicine is a two-year research master program, focusing on molecular and cellular principles of health and disease. We aim to bring students to the forefront of current developments in biomedical science. You will learn experimental design and technical approaches currently in use, such as cell and tissue culture, live cell imaging, genomics and proteomics technologies, genetic modification, use of small animal models, and much more.

Exploring the Biomedical Revolution

Imagine…stem cells for tissue replacement…timely detection and therapy of developmental defects…reprogramming of the genome in treatment of genetic disease and cancer…genetic profiling and personalized drug design…

Great discoveries in the 20th century have laid the foundations for today's advancements in life sciences. Many new insights and therapeutic possibilities may develop as a result of a better understanding of actions and interactions of molecules and cells in development and disease.

Educational Program

Year 1 of the program (60 EC) includes the courses 'Developmental Biology', 'Molecular Biology of the Cell', 'Genetics and Bioinformatics', 'Biology of Disease', 'Contemporary Research Topics', 'Presentation Skills' and 'Report Writing'. In addition, you will perform a research project of approximately 6 months.

Year 2 (60 EC) consists of a full-year research project, with additional research-oriented courses, including writing a project proposal and interpreting and presenting scientific literature. By the end of the year you will write, present and defend your master's thesis. Upon successful completion of the program you will be awarded the Master of Science in Molecular Medicine degree.

Career Perspectives

The Master of Science in Molecular Medicine degree may lead to a career in basic or translational research or to a position at a company or institute as a life science researcher. Molecular Medicine graduates with a background in medicine are likely to become successful clinical researchers who are actively involved in the initiation and supervision of basic or translational research projects. More than 80% of the MSc Molecular Medicine students continue their training as PhD student, either at Erasmus MC or at other internationally renowned institutes and universities.

Admission Requirements and Procedure

The Molecular Medicine research master program starts in September and can be completed in two academic years (120 EC). The program is taught in English.

The entry requirements are:

- A Bachelor of Science degree in one of the biomedical sciences (e.g. Biology, Biochemistry, Biomedical Sciences or Nanobiology), a Bachelor degree in Medicine or a Bachelor of Science degree from a Dutch higher professional program in biomedical laboratory techniques (HBO-BML);
- Personal motivation, assessed by written statement and/or interview;
- Letters of reference;
- Proficiency in English is required.
- Good overall performance in previous educational programs;
- In some cases: a written entrance examination;
- Application deadline for non-EEA/EU students March 1; for EEA/EU students May 1.

Please note that for foreign candidates previous study results are used in the assessment; they must have a minimum GPA of 80%.

FAST FACTS

Annual intake: **20-25 students**

1999
2006

The program was first offered in **1999**; we have accommodated students from abroad since **2006.**

International outlook: The student body is very diverse with approximately **one third** international students, **one third** Dutch students with a biomedical bachelor's degree and **one third** students with a Bachelor of Science in Medicine degree from Erasmus MC.

Faculty members are directly involved in basic biomedical research and training, within many different Erasmus MC research departments, thus reflecting the multi-disciplinary nature of this program.

Departments involved include: Developmental Biology, Clinical Genetics, Gynaecology and Obstetrics, Hematology, Immunology, Internal Medicine, Molecular Genetics, Neuroscience, Orthopaedics, Pathology and Experimental Pathology, Pediatric Endocrinology, Pediatric Surgery, Pediatric Oncology, Pulmonary Medicine, Radiation Oncology, Urology and Virology.

€2.771
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€24.500
(Institutional fee: non-EEA students)

ORGANIZATION

Dr. Gert Jansen *(Program Director)*
Dr. Willy Baarends *(Board member)*
Dr. Gerben Schaaf *(Board member)*
Marjoleine van Berckel Bik *(Program Coordinator)*

mscmolmed@erasmusmc.nl

www.eur.nl/en/erasmusmc/molecular-medicine

TESTIMONIAL

Katrin Pachler (Austria)

"I liked the practical aspect of this research master and the opportunity to choose your own project out of a lot of different research topics. The group size was nice and small with nearly 50% internationals. Currently, I am undertaking my PhD at Erasmus MC. The master's degree in Molecular Medicine helped me a lot, because it showed me what it is like to start your own research project, from planning everything to writing academic papers. This is very useful for me now!

I believe that Molecular Medicine really prepares you very well for your PhD. It offers two long internships with many different laboratories and topics to choose from. In addition, you have a lot of useful and interactive courses. You can dive into your individual research project and learn a lot of different (research) techniques. Another great thing is that the number of students per year is small, so you have a nice small group, that usually gets along very well and does a lot together. That is especially nice as an international student.

I would definitely choose this research master again if given the choice. I learned a lot and it helped me get the position I have now. And I also met some of my closest friends here!"



Katrin Pachler



2 MOLECULAR MEDICINE

TESTIMONIAL

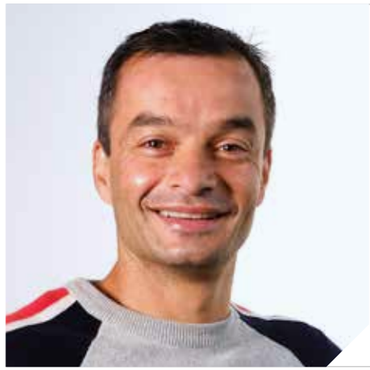
Gerben Schaaf (The Netherlands)

"Why I decided to work for this research master? Well, in fact my students are to blame ;-). As supervisor of Molecular Medicine students I was introduced to this particular research master when I first started here. I was quite impressed with the program right from the start, particularly because of the relatively long time the students dedicate to actually working in a lab. After a while I was asked to also teach in some of the courses, initially for just a few hours. I enjoyed that a lot and, luckily, I got involved in other courses and activities of the program.

I would like to continue combining doing research and be involved in the research master, which I think is a great combination. The total experience helps me to grow further in my academic career. I also hope that I can contribute to keeping our program at the same high level as well as updated to the current standards.

The Molecular Medicine research master aims at preparing students for a scientific career with an emphasis on acquiring actual lab experience in doing research through two intensive internships. There is a good balance with courses on essential theoretical skills and knowledge. I think that this is a clever package that allows the student to continue in science, but also helps to decide if indeed an academic career would fit their interest and ambition.

I will be working for the master still for a while more. And I do try to recommend colleagues to join the program. Teaching is very important to secure science for a next generation, although it seems to be valued not as much compared to research in the academic world. From my own experience with this master it is quite rewarding to see the enthusiasm for science in students and contribute to expanding that. At the same time the teacher also learns skills that you can use in your other activities (e.g., presentation skills, organizational skills, etc.). So, in a way, it is a win-win situation for all!"



Gerben Schaaf

3 NEUROSCIENCE

The main objective of the research master program in Neuroscience is to train talented students in the rapidly expanding field of neuroscience. The program prepares students for future fundamental research in various medical fields in which neuroscience becomes increasingly important; these include neurology, neurosurgery, ophthalmology, neuro-oncology, otolaryngology, psychiatry and gerontology. The program combines a broad range of tutorials and workshops in neuro-anatomy, neurophysiology, computational neuroscience, molecular biology, and behavioral neuroscience.

The research master program in Neuroscience is hosted by the Department of Neuroscience at Erasmus MC which provides an excellent basis for training in fundamental neurosciences. Students will become acquainted with all facets of modern neuroscientific research.

Within the Department of Neuroscience brain functions are studied at many levels, varying from individual genes to complex systems, from peripheral nerves to the central nervous system, from autonomic functions to consciousness, and from synaptic transmission to neuronal firing patterns. In addition, integration with clinical departments at Erasmus MC, Erasmus University's Psychology program, and the cooperation with TU Delft and Leiden University Medical Center within the so-called Medical Delta allow students to be introduced to all clinical, cognitive and computational disciplines of neuroscience. To learn more about the research groups and projects at the Department of Neuroscience, please visit www.neuro.nl.

Educational Program

The first year of the program starts with an introduction in August. The program is centered around 7 modules of 3 to 8 weeks each. Each module provides in-depth theoretical and practical training on important issues and essential techniques in neuroscience. The books *Principles of Neural Science* written by Nobel Prize winner Eric Kandel and colleagues and *Neuroscience* by Purves *et al*. provide the theoretical background to this part of the program.

Presentation skills are trained during the first year in journal clubs and tutor sessions. Students will also elaborate on a research topic of their choice. Supervised by a tutor, they have to complete an extensive literature search, conduct pilot experiments, and learn to formulate relevant and novel research questions. In addition, they have to design an experimental plan to tackle these questions. This results in a research proposal at the end of the first year.

During the second year students conduct the experiments as outlined in their research proposal. They will choose workshops to gain hands-on experience that will help them perform their research. After completing their research project students present their results in a master's thesis. The master's thesis is in the format of a paper that is of sufficient quality to be published in an international peer-reviewed journal.

Admission Requirements and Procedure

- Students with a bachelor's degree in one of the life sciences disciplines including medicine, pharmaceutical sciences, psychology, biology, biomedical engineering and nanobiology are invited to apply;
- National and international students who want to enter the fundamental research master program in Neuroscience will be selected on the basis of the performance in their bachelor's program, their curriculum and motivation. The most eligible applicants will be invited for an interview;
- This interview will be added to the overall competence chart and will be part of the final decision for admission;
- The top applicants will be admitted to our research master program.
- Application deadlines for non-EEA/EU students: March 1; for EEA/EU students: April 1.

FAST FACTS

Annual intake: **30-40 students**

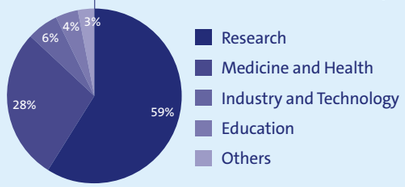
Male/Female ratio: **41-59%**

Nationality: **45-55%** international students

Percentage studying for a **PhD** after graduation: **60%**

Number of research groups: **20+** within the Neuroscience Dept.

Where do our students end up...



€2.771
(Statutory fee: Dutch / EEA students)

€24.500
(Institutional fee: Dutch / EEA students)

€24.500
(Institutional fee: non-EEA students)

ORGANIZATION

Dr. Marcel de Jeu *(Program Director)*
Prof. Chris de Zeeuw *(Scientific Board)*
Prof. Gerard Borst *(Scientific Board)*
Elise Buitenhuis-Linssen *(Program Coordinator)*

masterneuroscience@erasmusmc.nl

www.eur.nl/en/erasmusmc/neuroscience

TESTIMONIAL

Tiago Beck (Germany)

"Neuroscience has always been my fascination. I have been researching, learning and taking part in neuroscience competitions to broaden my knowledge of the field and understand this incredibly complex organ. I see this master as the necessary foundation for any aspiring neuroscientist. I heard about this master while I was a member of a research group at Erasmus MC as part of my bachelor's thesis and it offered the best of all worlds: research, neuroscience, and Erasmus MC - a prestigious and world-renowned research institution!

I am planning to start a Master's in Health Economics, Policy and Law at Erasmus University after this master. While I was originally planning to continue with a PhD (and a small part of me is still playing with this idea), the research master in Neuroscience has offered me a number of opportunities that have peaked my interest to pivot towards health-care management. Specifically, as Student Chair of the Education Committee of all five research masters, it is a fun challenge to coordinate different projects and to be involved in allocating grant money for the so-called HOKa projects. This is further developed through my research project that requires a lot of management and organization with(in) a number of different departments (the Dept. of Neuroscience with the Dept. of Neurosurgery, the KNF, and Dept. of Pain Medicine) for planning surgeries and necessary outcome measures for my research.

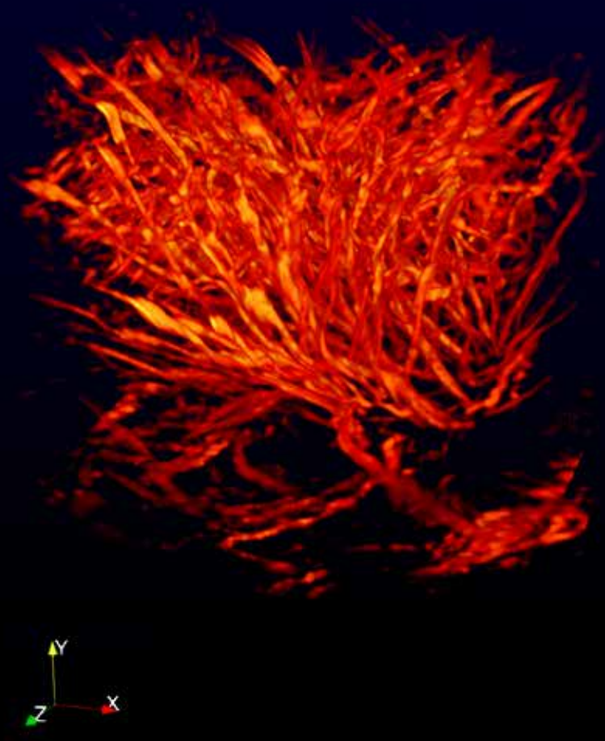
The quality of research done at Erasmus MC is incredible. I am grateful for the opportunities offered and the freedom and capacity for research that I am able to do as part of this master and in a greater sense at Erasmus MC. I think the skills I have developed here, the opportunities I have had, and the connections I have made, have helped me become a self-disciplined, forward thinking, and communicative researcher.

I would certainly opt for this master again if given the choice. While the first year was extremely tough and stressful, I have learned and developed strategies to deal with these challenges, specifically by using my time effectively, studying efficiently, and most importantly in how to communicate with professors, supervisors, and fellow students. Apart from the educational program, it is the research projects which I am forever grateful for. The opportunity to work on a project similar to what originally peaked my fascination with neuroscience is something I could have never imagined. I feel very fortunate to be a part of my research group, with a very supportive and experienced supervisor, where I am given the freedom to develop my own ideas and make valuable contributions to the project."



Tiago Beck

"FINDING THE BRAIN TUMOR'S ACHILLES HEEL"



By Sadaf Soloukey *et al.* 2020, was selected as one of the 15 images to be displayed in the FENS website and shared via Instagram and Twitter.

This image shows a 3D-reconstruction of a Low Grade Glioma (LGG), taken from a patient's brain during awake surgery using a brand new technique called 'functional Ultrasound' (fUS). The brain tumor's vasculature seems to originate completely from a single vessel of origin - its Achilles heel- arborizing into a larger tree-like structure. Never before have surgeons or researchers had access to an in-vivo vascular map of the human brain with such level of detail (300 µm) and imaging depth (5 cm). fUS has the potential to revolutionize surgical, neuroscientific as well as oncological practice - just by showing us what has always been there.

The FENS-ENJ Image Competition was held for the first time in 2020. Over 80 Images were submitted, from a wide range of topics.

4 INFECTION AND IMMUNITY

The research master program Infection & Immunity is a two-year, English-taught, international program that aims to train students in translational research at the crossroads of infection and immunity by top-quality research groups at Erasmus MC. With new epidemics unfolding regularly (for example the corona pandemic) and rapidly evolving immunotherapies, amongst others, knowledge of infectious and immune diseases has never been more critical.
The master program combines intensive training in fundamental and advanced immunology and microbiology with extensive training in clinical and population-based research. After two years, the research master program Infection & Immunity will result in a master's thesis, to be presented at the yearly Research Master Infection & Immunity Symposium. In the past, Infection & Immunity has been awarded the TOP-rated program seal several times.

Mission and vision

It is our mission to select and train excellent students at an early stage of their careers in performing top research in the field of infectious and immune diseases, covering the complete field of host-microbe interplay and autoimmunity, challenging them to become translational investigators, fostering them and committing them to the academic world.

Recent developments in (bio)medical technologies provide novel tools to gain in-depth knowledge of the fundamental mechanisms of infectious and immune diseases. Translational research is the hallmark of Erasmus MC. Its quality relies on strong communications between clinicians and basic scientists. Undoubtedly, Erasmus MC continues to invest in a new generation of translational scientists with this research master program, which will ultimately strengthen and improve Erasmus MC research.

Educational Program

The main topics in the program covered include:

- Immunology: fundamental, organ-specific, transplant immunology, auto-immune diseases, immunodeficiencies;
- Infectious diseases: basic and advanced microbiology, emerging infectious diseases, host-microbe interplay, role of genetic variation in host and microbe, chronic inflammatory diseases, vaccine development;
- Epidemiology of infectious diseases: epidemics and pandemics;
- Animal models;
- Bio safety;
- Students need to do two research internships, one of five months and one of 10 months, of which the second one may also be done outside Erasmus MC or even abroad.

Admission Requirements and Procedure

- Application form, CV, motivation, certificates and interview;
- The fulltime program starts around September 1 with a compulsory Summer Course;
- Application deadline for non-EEA/EU students March 1; for EEA/EU students: May 1.

FAST FACTS

Annual intake: **18-20 students**

Male/Female ratio: **1/3** male, **2/3** female

Nationality: **75%** Dutch **25%** different nationalities

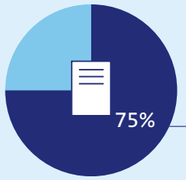
Percentage studying for a **PhD** after graduation: **40%**

Students are **highly satisfied** with the program and feel **very committed**

600 hours of classes/courses, plenary or in smaller groups

Ratio Student/teacher: **150 teaching staff 20 students**

Small groups and **personal approach**



About **75%** of the program consists of research projects at various labs, including Immunology, Virology, Microbiology, Gastroenterology, Neurology, Neuro-Immunology, Lung Diseases, Immuno-Oncology, Rheumatology, etc.

€2.771
(Statutory fee: Dutch / EEA students)

€24.500
(Institutional fee: Dutch / EEA students)

€24.500
(Institutional fee: non-EEA students)

ORGANIZATION

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www.eur.nl/en/erasmusmc/infectionandimmunity

TESTIMONIAL

Shweta Mahajan (India)

"I am from a small city in India (so basically the size of Rotterdam) and I was born in a middle-class family to hard-working parents. We were taught to feel gratitude every moment but never settle. I have been interested in biology since my middle school so I opted to do a bachelor's in Biotechnology. In my second year I really started to like immunology and I decided to do internships during every summer to measure where my interests lie. I got an internship at the Max Planck institute in Germany where I learnt a lot and most importantly figured out that this is what I wanted to do for my future. I thought the next best thing was to go to the U.S. and do my master. However, upon further research I concluded that going to the U.S. was not an economically sound decision. The Netherlands offered me the perfect opportunity to do a translational master's in Immunology in an international environment without taking on a huge debt.

The I&I research master taught us the basics of virology, microbiology and immunology. The professors would share their research, we could ask all the questions we wanted and there would be great discussions. We also did assignments teaching us how to design a clinical trial and mouse experiments to test a hypothesis or an investigative product. I did my first internship in tumor immunology trying to isolate T cells for the treatment of chronic hepatitis and I fell in love with immunotherapy. For my second internship I wanted to work with how viruses can be used as immunotherapeutic agents. My internships taught me how to independently work in the lab and how to present and write about your work. During the master I had the opportunity to go to a conference. I was able to listen to latest unpublished research, make posters about my research and participate in competitions as well. Moreover, we could also attend a wide range of courses organized in Erasmus MC via the master for free.

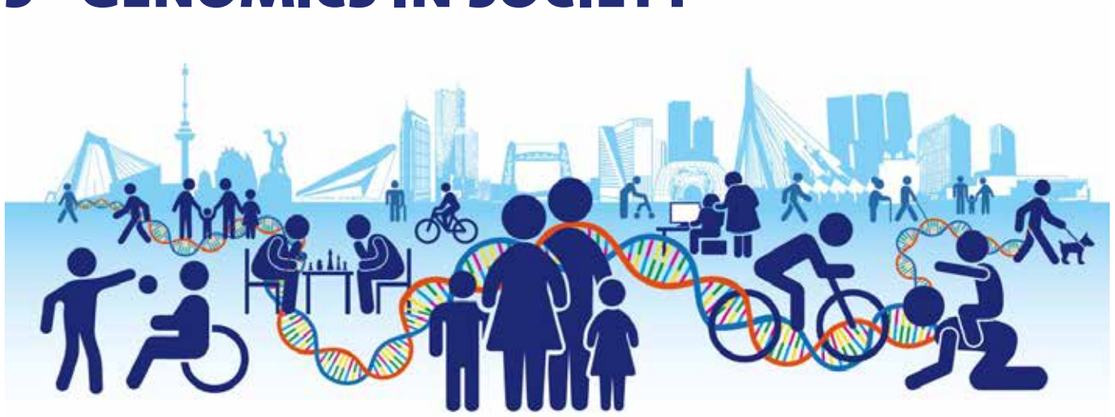


Shweta Mahajan

As an international student this master was a very special experience. I came to this country alone, with no family and no friends. The coordinators took care of each and every student professionally and personally. They understood that every student in the master is unique and always created an atmosphere of support for us. My classmates were immensely helpful and I ended having a full family of friends. We did Sinterklaas, Thanksgiving, Diwali, Christmas and took vacation together. This master is unique because of the diverse range of opportunities it offers combined with education. The organizers and teachers of this master are always open to suggestions and since I graduated I have seen many positive changes happen in this master based on our experience

I wanted to do a PhD and this master played a major role in building my foundation. It shaped me into an analytical, confident and hardworking researcher. In the future I would like to go back to India and work towards building collaborative research between Indian and European universities and implement similar master programs in India. My experience during this master has certainly been a major leap towards my life goals and I would certainly go back in time do this master again if given the choice!"

5 GENOMICS IN SOCIETY



Definition Genomics: "Genomics is an interdisciplinary field of biology focusing on the structure, function, evolution, mapping, and editing of genomes"

Bridging Genomics and Society

The field of genomics is the arena for fast technological developments that impacts society. In recent years, genomic scientists have not only unravelled the human genome, but also developed the technology to rewrite it. Gene therapies are being developed for a rapidly increasing number of severe genetic diseases, but as promising as they are, they also present with challenges to equal accessibility and social justice. As the genome may be analysed in-depth, big data are generated that may provide individuals and families with knowledge about their genetic susceptibilities that could contribute to disease prevention. The use of AI is not only necessary but also presents with issues on privacy, as well as responsible and sustainable usage.

From a governance and health-care system perspective, prevention may sound like a blessing, however, the psychological challenge of having to live with the threat of a genetic disease to one-self and family members, is often a significant burden. Besides, offering genomic knowledge to all for prevention purposes presents with numerous societal challenges such as; financing, privacy, scalability and regulation. These genomic developments require societal alignment, meaning that their governance and application should be aligned with values and needs of society. Such societal alignment requires the input of societal stakeholders, which in itself is challenged by the ability of researchers to engage with society as well as by the willingness of societal stakeholders to engage with society. We know that many of our databases lack diversity, but how should we approach this sensitive topic in the context of a low trust in science?

About the program

The research master program Genomics in Society trains the next generation of genomics researchers for positive societal impact. Students in the program will be equipped to work in an interdisciplinary context, think critically and constructively about the societal and ethical aspects of genomics, while having a thorough understanding of genomics to contribute to a positive impact of genomics in society. Furthermore, students will build on 21st century (research) competencies, that include collaboration, communication, creativity and innovation.

Educational program

During the first year students develop an interdisciplinary language; combining deep knowledge of genomics with knowledge of ethics, communication, governance, psychology and entrepreneurship. The Genomics & the City assignment,

that lasts the entire first year, trains students in the various aspects of co-creation, innovation and entrepreneurial learning. They will use design thinking to identify (genomic) issues from society and develop solutions that have the potential of direct social impact. As such, students will work in teams on building bridges between genomics and society.

In Year 2, students will design and carry out a Research for Impact research internship, comprising a Research Proposal (including a Theory of Change), Proposal Defense, a Thesis, a Capacity Building Activity, and the Presentation of Results.

After completing the two-year Genomics in Society (GiS) Research Master program, you will have developed competencies to both critically appraise and perform scientific research and will have made important steps towards becoming an independent impact researcher. In Year 2, you will design and carry out a Research for Impact research internship, comprising a Research Proposal (including a Theory of Change), a Thesis, a Capacity Building Activity, Midterm and Final Presentations. During your research internship you will have an active and self-guiding role. When the thesis is completed, the final course 'Innovation' aims to translate the research back to society, which is the essence of impact research.

Admission Requirements and Procedure

- Applicants should hold a relevant Bachelor's degree. We welcome students from biomedical and social science backgrounds, including Biomedical Sciences, Medicine, Health Sciences, Psychology, Sociology and related disciplines.
- Applicants should have knowledge of research methods and statistics, and a strong motivation to explore the societal impact of genomics in an interdisciplinary context.
- A narrative CV is required as part of the application procedure.
- Proficiency in English is required. Please visit our website for further information.
- Application deadline for non-EEA/EU students March 1; for EEA/EU students May 1.

Career perspectives

The Master of Genomics in Society degree may lead to a career in genomic and social science research, to a position at a company or institute as a (genomic) impact researcher, or as a university teacher, policy maker, (science) communicator or consultant.

Professional profile

A T-shaped professional with an in-depth expertise in the field of genomics, who includes a broad knowledge of psychology, governance, ethics, and entrepreneurship. With this T-shaped profile, they are able to synergize between different fields, speak and connect their languages, while remaining focused on scientific and societal issues at stake. They are trained in doing interdisciplinary research that is tailored to the future roles and positions of you as a bridge builder between Genomics and Society.

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ORGANIZATION

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Kim Verdel *(Program Coordinator)*
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TESTIMONIAL

Jay van Kleef (The Netherlands)

"This master is a combination of courses in molecular biology and in the social sciences, such as psychology and health policy. Also, while having ample attention for transparent research design, statistics and research for impact.

In the second year of the program you will work on your internship that is also related to your thesis. I worked in a research group that works on *The DNA-dialogues*. I researched the values and opinions of healthcare professionals regarding the potential use of human germline editing for clinical purposes. I looked into the underlying values of healthcare professionals that are present in their opinions regarding human germline editing, using both qualitative and quantitative approaches, in order to eventually inform policy.

The Genomics in Society master program helped me to become the bridge between what is happening in the lab regarding human germline editing, and what broader society wants with this new technology and inform policy based on this."



Jay van Kleef

THE STUDY PROGRAM IN A NUTSHELL

- We believe our **enthusiasm** for Genomics in Society is contagious!
- **Openness, curiosity,** and **empathy** are our core values
- Genomics in Society takes place in an **international classroom**
- In order to achieve an **interdisciplinary** profile we admit students from both biomedical as well as social sciences study directions
- We use **active teaching methods**, blended learning and design thinking
- Programmatic assessment focuses on stimulating your **learning curve** and is part of our assessment plan
- Our educational environment that is **fun**, fosters **curiosity**, embraces **learning from mistakes** and has an **open-door climate**.

SURE – RESEARCH MASTERS STUDENT UNION ERASMUS MC

SURE is the student organization that aims to bring all students from the five Erasmus MC research masters together (i.e., Health Sciences, Molecular Medicine, Infection and Immunity, Neuroscience and Genomics in Society). The SURE Board is run by members from several of these masters. Ever wondered what the other research master students do at Erasmus MC? Would you like to meet people outside of your own research master and discuss research-related and research-unrelated topics? Then SURE is just the right student organization to join!

We will keep you updated on our upcoming events through our social media pages. For more information and registration, please check:

- sure.erasmus@gmail.com
- www.facebook.com/SUREMC
- https://www.linkedin.com/company/sure-erasmusmc/
- https://www.instagram.com/sure.mc/



COLOPHON

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Make it happen.