# Medical Epigenomics

## Specialisation of the Master's in Medical Biology, Molecular Life Sciences, and Science

### Covering the function of our epigenome, a key factor in regulating gene expression in health and disease

Our skin cells, liver cells, and blood cells all contain the same genetic information. Yet these are different types of cells, each performing their own specific tasks. How is this possible? The explanation lies in the epigenome: a heritable, cell-type specific set of chromosomal modifications, which regulates gene expression. Radboud University is specialised in studying the epigenome and is proud offer the only Dutch Master's specialisation on this topic.

**Why study this specialisation at Radboud University?**

- The Radboud Institute for Molecular Life Sciences (RIMLS), a leading multidisciplinary research institute, is world-leading in studying the epigenome.
- Radboud University combines various state-of-the-art technologies with downstream bioinformatics analyses in one department, which is unique in Europe.
- We have close contacts with high-profile medically oriented groups on the Radboud campus and with international institutes.
- Radboud University coordinates BLUEPRINT, a European project focusing on the epigenomics of leukaemia.

*change perspective*

Radboud University

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## Programme outline (2 years, 120 EC)

The programme of this specialisation depends on the Master's that you follow: Medical Biology, Molecular Life Sciences, or Science.

| Medical Biology | Molecular Life Sciences | Science |
|---|---|---|
| Compulsory courses (15 EC) | Compulsory courses (15 EC) | Compulsory courses (15 EC) |
| Specialisation electives (12 EC) | Specialisation electives (6 EC) | Specialisation electives (6 EC) |
| Free electives (6 EC) | Free electives (6 EC) | Free electives (6 EC) |
| Philosophy elective (3 EC) | Philosophy elective (3 EC) | Philosophy elective (3 EC) |
| 2 Internships (2 x 36 EC) | 2 Internships (2 x 36 EC) | Internship 1 (39-54 EC) |
| 2 Literature theses (2 x 6 EC) | 2 Literature theses (2 x 6 EC) | Literature thesis (6 EC) |
| | 2 Internship electives (2 x 3 EC) | Internship 2 (30-45 EC) |

## Courses

Below you can find an overview of the compulsory courses and some examples of electives. Please have a look at the online prospectus (see 'More information') for more detailed information.

**Compulsory courses**

- Trends in Medical Biosciences I (3 EC)
- Protein Dynamics and Networks (3 EC)
- Epigenomics in Health and Disease (3 EC)
- Computation for Biologists (3 EC)
- Trends in Medical Biosciences II (3 EC)

**Examples of specialisation electives**

- Human Fertility (3 EC)
- Principles of Systems Biology (3 EC)
- Molecular Mechanisms of Novel Therapeutics (3 EC)
- Human Genetics (3 EC)
- Advanced Endocrinology (3 EC)
- Apoptosis (3 EC)

## Research internship

You'll perform one research internship on systems biology, molecular genetics or molecular epigenetics, during which you'll learn to work with big data sets. This internship will take place at the Radboud Institute for Molecular Life sciences (RIMLS), Faculty of Science or the Radboud university medical center (Radboud*umc*). Possible departments here are:

- Molecular Biology (molbio.science.ru.nl)
  > Prof. Henk Stunnenberg and Prof. Michiel Vermeulen
- Molecular Developmental Biology (molbio.science.ru.nl)
  > Prof. Gert-Jan Veenstra
- Human Genetics (radboudumc.nl/research)
  > Prof. Hans van Bokhoven and Prof. Joris Veltman

For your second internship you can also choose to go to a company or another university in the Netherlands or abroad. There are, for example, close contacts with the Max Planck Institute in Germany.

For other possibilities, you can always contact a lecturer or the student advisor (see 'More information').

## Your advantages on the labour market

As a Master's student of Medical Epigenomics you'll be trained in using state-of-the art technology in combination with biological software tools to study complete networks in cells in an unbiased manner. With this background, you can become an excellent researcher at a university, research institute, or company. Every year the RIMLS offers 5 to 10 PhD positions in this field. Alternatively you could also find a job as a consultant, teacher, policy coordinator, patent attorney, or research associate.

## Admission requirements

You are required to have a Bachelor's degree in Medical Biology, Molecular Life Sciences, Biomedical Sciences, Biology (with a minor in Medical Biology, Neurobiology or Medicine), or a closely related discipline. You must also have a sufficient proficiency in English.
Students from a University of Applied Sciences (HBO) need to follow a relevant pre-Master or minor. Other additional deficiency programmes are tailor-made. For details, please visit the website or contact the student advisor (see 'More information').

## Application procedure

The programme starts in September. The application deadline is 1 April for students from non-EU/EEA countries and 1 May for students from within the EU/EEA.
You apply for the Master's programme in Medical Biology, Molecular Life Sciences, or Science via www.studielink.nl. After admittance to the Master's programme, you can enrol for the specialisation in Medical Epigenomics.

## >>> More information

Prospectus: www.ru.nl/prospectus/sciencefaculty

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**www.ru.nl/masters/medicalepigenomics**

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