

# Applied Molecular Biology

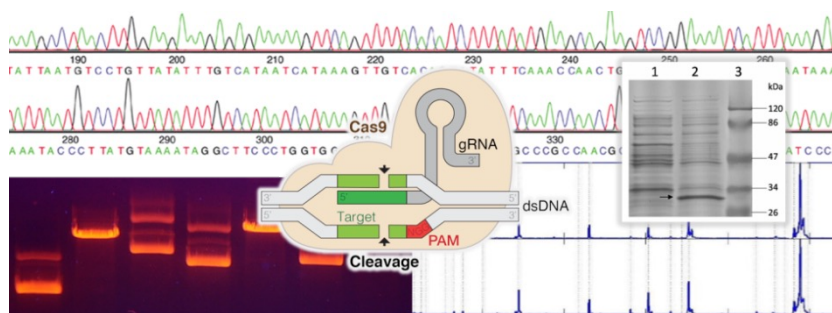
**2023-2024**

## Term

Spring semester: February 2024 – July 2024

## General information

This minor is open to students in the third year or higher of the bachelor phase of biology, biomedicine or biotechnology. A good background in molecular biology is desired. The minor is taught in English and has a study load of 30 ECTS.



## The Applied Molecular Biology program

Science moves extremely fast and many traditional methods are being complemented or replaced by molecular methods. Think about the arrival of CRISPR-Cas9 technology, allowing straightforward genetic engineering. In the recombinant biotechnology module you will gain hands-on experience with the CRISPR-Cas9 technique. For instance by removing antibiotic resistance in bacteria or by making specific point mutations in eukaryotic cells and study their effects. What about knocking in fluorescent tags in human cells? It is all possible using CRISPR-Cas9.

During the proteomics part you will learn ways to study all proteins and their biological functions in a cell or tissue on a large scale. Using mass-spectrometry, a lot of data are obtained and samples can easily be discriminated. Obtaining pure single protein is very important for scientific studies and for business based on that, as this is a multi-million euro market and it is predicted to keep growing in the future. Using different kinds of chromatography you will learn how to purify a protein of interest.

Finally, you will learn how to set up your own company in biosciences and you will be guided by experts from within the Bio Science park. Writing a business case may be part of the module as well. A module focused on sustainable innovation following *lean startup* and *design thinking* methods.

The program is split in two parts in which the first part consists of lectures and practical courses as described above. The second part of the program is focused on 'big data analysis'. We will start with an introduction and computer practicals. After that, you will do a project on big data obtained from an institute in the Bioscience Park Leiden. Alternatively, if it can be arranged, an internship can be done in an institute or company on the Bio Science Park.

This program will make you a true professional in Applied Molecular Biology. Many exciting fields at many companies and research laboratories will be open to you or maybe you will start your own!

## Courses

The following courses are included in the minor:

- Recombinant Biotechnology (M11RBT, 5 EC)
- Proteomics (M11PRO, 5 EC)
- Entrepreneurship in Bioscience (M11EBS, 5 EC)
- Biotechnology Project - or - Internship (M12TMC 15 EC)

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### Entry requirements / level

The program is at undergraduate level, but you will need three years of training in a biomedical or a biological study to be able to follow the tuition. Furthermore, basic knowledge of molecular biology and English is required.

### Literature

Relevant and recent scientific literature, to be announced later.

### Examination

Examination of the courses will be based on assignments, a presentation, a report and keeping a good lab journal. The project will be judged by marks for a final presentation and the performance during the work.

### Biotechnology project or internship

Some research institutions, most of them localized in the Leiden Bio Science park, participate in the module. You will be involved in the transformation of big data into biology in the field of biotechnology. Alternatively, if it can be organized, you can do an internship in the Bio Science park.

### Application form

Interested? Please fill in the required application form, which can be downloaded from our website: <http://www.hsleiden.nl/english>

### Application deadline

15 November 2023

### Tuition fees

There are no tuition fees required for students from partner institutions.

### Accommodation

Our university does not have its own student accommodation. A local student housing corporation offers temporary, furnished rooms and apartments to international students. You can find more information about accommodation on our website.

### Contact

If you have questions about the content and/or the organization of the minor please contact Wouter van Zon, PhD

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For information about the application procedure and/or accommodation please contact Lisette Oosterhuis

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