Advanced Molecular Diagnostics

2019-2020

Term
Spring semester
10 February 2020 – 13 July 2020

General information
This minor is open to students in the third year or higher of the bachelor phase of a biomedical study. A good background in molecular biology and microbiology is desired. The minor is taught in English and has a study load of 30 ECTS. Tuition will be in the Spring semester.

The field of Innovative Molecular Diagnostics
The molecular diagnostic field is developing extremely fast. Traditional methods are complemented or replaced by molecular methods, which are further developed into more advanced methods with higher quality and throughput. Think about Next Generation Sequencing methods for instance. If you are trained as a professional in molecular diagnostics, an innovative sector of food, agricultural, pharmaceutical and biotechnological companies, hospital and forensic laboratories will be open to you!

In this minor, your training will focus on molecular techniques in a theoretical and practical sense. The minor is split in two parts. The first part consists of lectures and practical courses, which will be held at the university and will end in April. In this period, you will learn about techniques like real time methylation-specific PCR, NGS and HPLC. Furthermore, an outbreak scenario simulation will be done, which relates to molecular forensics and epidemiology. The theory will focus on the experimental part and on advanced techniques like NGS and mutation detection systems. A computer practice on primer/probe design and on proteomics data forms part of the course.

The second part of the minor is focused on “big data analysis”. We will start with an introduction and some computer practicals using for instance Galaxy. After that, you will do a project on big data obtained from an institute in the Bioscience Park Leiden. Alternatively, an internship can be done in a biomedical, biological or biotechnological institute.

Courses
The following courses are included in the minor:
• Nucleic Acids Diagnostics (5 EC)
• Molecular Diagnostics (5 EC)
• Proteomics (5 EC)
• Big Data Diagnostics - or - Internship (15 EC)
Entry requirements / level
The minor 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, reports and tests. The diagnostics project will be judged by marks for the final written report and the performance during the work.

Big data 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 innovative molecular diagnostics and 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
14 November 2019

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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