Molecular Biomedicine examiners the molecular and cytological fundamentals of life, including pathological changes. The cross-disciplinary program combines methods and molecular understanding of natural sciences with relevant healthcare topics. The aim is to identify and understand mechanisms and functionalities of complex vital processes on a molecular level as well as pathological changes in body functions. This also forms the basis for the development of new approaches in diagnostics and therapy which are to combat human diseases.

At the beginning of the program, students acquire specialized competences in basic areas of the natural sciences (biology, chemistry, physics) and medicine (histology, physiology, biochemistry). This is followed by a specialization in a chosen focus area (e.g. developmental biology, human genetics, immunobiology and microbiology, toxicology or pathobiology).

Students receive theoretical and practical training as well as support and guidance from a mentor throughout the course of the program.

POSSIBLE LINES OF WORK

- Biomedical foundational research (Max Planck Institutes, large research institutes, etc.)
- Development/production/marketing (industry)
- Molecular diagnostics (at medical, biotechnical, environmental, forensic research institutions; in medical disciplines, e.g. pediatrics, human genetics, internal medicine)
- Academia (teaching/research at universities, research institutions, etc.)

Central Study Advisory and Counseling Service
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Molecular Biomedicine Study Advisory Service
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Degree Program Option Standard Period of Study Beginning of Semester
Bachelor of Science (BSc) Single-Subject 6 Semesters Winter semester

Molecular Biomedicine

Faculty of Mathematics and Natural Sciences

Bachelor
- Bachelor of Science (BSc)

Master
- Staatsexamen | Kirchliches Examen

Climate Neutral
Molecular Biomedicine in Bonn

The cross-disciplinary Molecular Biomedicine degree program is a joint offer by the University of Bonn’s Faculty of Mathematics and Natural Sciences and Faculty of Medicine. Students of the program learn about the molecular and cytological fundamentals of life as well as pathological changes, connecting methods and molecular understanding of natural sciences with relevant medical topics. The aim is to gain an understanding of mechanisms and functionalities of complex vital processes as well as pathology of human diseases on a molecular level. This also forms the basis for the development of new approaches in diagnostics and therapy aimed at combating human diseases.

**Fundamental fields and subdisciplines of general biomedicine are:**
- Principles of physics
- General chemistry and biochemistry
- Combinatorial chemistry
- Genetics
- Developmental biology
- Anatomy and cell biology
- Reconstructive neurobiology and physiology
- Pathology and pathology of tumors
- Molecular medicine
- Microbiology and immunology
- Pharmacology and toxicology
- Medical chemistry
- Experimental medicine

In a combination of practical and theoretical training, students are prepared for various professions in the field of life sciences as well as consecutive master/doctoral programs at the LIMES Institute and other related national and international master degree programs.

**Additional Information**
Department of Molecular Biomedicine
[www.limes-institut-bonn.de](http://www.limes-institut-bonn.de)

**CONTENTS AND COURSE OF STUDIES**

The standard period of studies in the BSc Molecular Biomedicine program is 6 semesters. The program consists of teaching units (modules) that are completed by passing the module exam.

All modules in the first two years of the program are compulsory. In year 3, students deepen their studies by choosing compulsory elective modules in which they acquire key skills and competences in biomedical research. By choosing a topic for their bachelor’s thesis in a specific subdiscipline of biomedicine, students can establish their individual research focus.

At the beginning of the program, students gain knowledge in all basic subjects of the natural sciences and medicine:
- Biology
- General and inorganic chemistry
- Organic chemistry
- Physics
- Biochemistry
- Cell biology/histology
- Physiology
- Developmental biology & genetics
- Microbiology and virology
- Immunobiology
- Bioinformatics
- Biostatistics/Medical statistics
- Bioethics

In year 3, students establish an individual research focus by choosing compulsory elective modules. These modules offer courses in the following fields: “Bench to bedside – from developmental genetics to molecular diagnostics and beyond”, “Chemical biology and medical chemistry”, “Immunology and microbiology”, “Immunoregulation”, “Pharmacology and toxicology”,” Genomics and gene targeting” as well as “Cell biology and molecular biology”.

**PROGRAM REQUIREMENTS**

Courses and exams are held in German and English. In addition to level C1 German (according to the Common European Framework of Reference for Languages, CEFR), students must provide proof of English skills at level B2 or higher by submitting a recognized language certificate (e.g. TOEFL, IELTS) or equivalent certificate (e.g. Abitur). Students are furthermore expected to have sounds skills in chemistry, biology, physics and mathematics.