

MSC Radiation Biology TUM-School of Medicine and Health

Master's Day

Munich, 27 March 2025



What is Radiation Biology?

✓ Key Areas of Study:

- Effects of ionizing radiation on humans, plants, animals, and ecosystems.
- The sequence of biological responses following radiation exposure.
- Medical applications of radiation in cancer research and treatment.

✦ **Focus Area:** Exploring radiation's role and uses in medicine, oncology and cancer research.

↪ More details: [https://www.tum.de/en/studies/degree-programs/detail/radiation-biology-master-of-science-msc -](https://www.tum.de/en/studies/degree-programs/detail/radiation-biology-master-of-science-msc-)

M.Sc Radiation Biology at TUM

 *School of Medicine, Technical University of Munich (TUM)*

 **International Program** – Taught in **English**

 **Tuition Fees:**

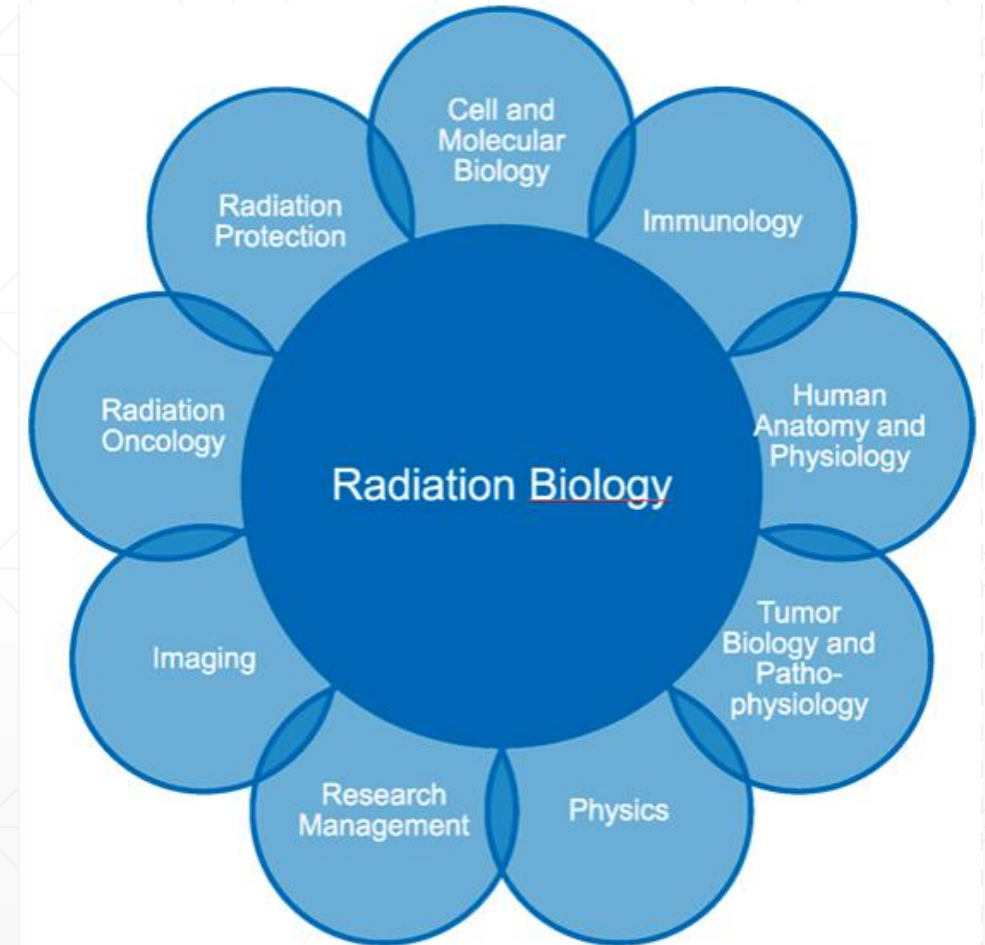
- **Free** for students from Germany & the European Economic Area (EEA)
- **€6,000 per semester** for non-EEA international students
⇒ <https://www.tum.de/en/studies/fees/tuition> -

 **Program Start:** October (Winter Semester)

 **Application Period:** January 1 – May 31 ⇒ <http://www.campus.tum.de/> -

Interdisciplinary program

- Cell, molecular biology & Genetics
- Pathophysiology
- Tumour biology and Cancer Hallmarks
- Cytogenetics
- Immunobiology
- Radiation-induced early and late morbidities
- Radiation physics
- (Bio)Dosimetry
- Epidemiology
- Radiation protection
- Epidemiology



<https://www.mh.tum.de/en/mh/academic-programs/msc-radiation-biology/>

Requirements

✦ Mandatory Documents for Application:

- ✓ Letter of Motivation: Explain your interest in the program.
- ✓ Curriculum Vitae (CV): Include academic & professional experience.
- ✓ Scientific Essay: A research-based essay on a relevant topic.
- ✓ Transcript of Records: Must show at least 140 ECTS credits.
- ✓ Proof of English Proficiency: TOEFL, IELTS, or equivalent.

⇒ More info: <https://www.tum.de/en/studies/application/master/application-master>

Knowledge Requirements

✦ **Bachelor's Degree Required:** BSc in Physics, Biology, Medicine, Chemistry, Environmental Sciences, or a related field.

✦ **Scientific & Professional Qualifications Considered:**

- ✓ Biology – Human & molecular biology fundamentals.
- ✓ Physics – Biophysics, nuclear & particle physics, experimental physics.
- ✓ Mathematics – Algebra, calculus, statistics.
- ✓ Chemistry – General chemistry & biochemistry.
- ✓ Practical Experience – Lab work, **sterile techniques**, cell & molecular biology methods.

Scientific Essay

✦ Essay Topics Change Annually

✓ Evaluation Criteria:

1. Understanding of ecological, human biological, health, or medical issues.
2. Ability to conduct scientific, fundamental, and method-oriented research.
3. Proficiency in scientific/medical English.

🗣️ Interview Process:

- Your essay will be discussed during the admission interview.

📅 Topics for 2025:

- “Combining immunotherapy and radiotherapy for cancer treatment: What are the current challenges?”
- “Heavy-ion radiotherapy: What are the physical and radiobiological benefits?”
- “Nuclear energy is often classified as “green energy”: Discuss the arguments with regard to ecological, economic, and public awareness of health impacts.”

Aptitude Assessment

1st stage

- 0-40 points for qualification/ competences
- 0-20 points for final grade of the degree
- 0-10 points for letter of motivation
- 0 - 10 points for scientific essay



60 points: Acceptance

40 – 59 points: Invitation to interview (2nd stage)

< 40 points: Rejection



2nd stage

- Individual interviews via Zoom (20 to 30 minutes)
- Questions:
 - Motivation
 - Scientific background knowledge
 - Essay

Modules and Structure

Semester	Module							Credits	
1.	Human Anatomy and Physiology Written Exam 6 CP	Principles of Radiation Protection Written Exam 6 CP	Molecular Biology of the Cell Oral Exam 6 CP	Radiation Physics and Dosimetry Oral Exam 6 CP	Research Practical Report 6 CP			30	
2.	Mechanisms of Radiation Effects on Cells and Tissue Examination Parcours 8 CP	Molecular Radiation Biology Oral Exam 6 CP	Medical Applications of Radiation Oral Exam 5 CP	Research Management Learning Portfolio 5 CP	Medical Radiation Protection Practical Presentation 6 CP			30	
3.	Mobility	Clinical and Experimental Radiation Oncology Oral Exam 8 CP	Medical Imaging in Radiation Research Theranostics Presentation with report 8 CP	Advanced Molecular Radiation Biology Oral Exam 8CP	Current Research Topics/Developments Presentation 8 CP	Support Electives: Ethics of Responsibility: Current Areas of Application 2CP	Support Electives: Meaningful Project Management (Workshop) 1CP	Support Electives: Science Communication Entering Virtual Museum Worlds via the Dark Side of Science Communication 3CP	30
		2 out of 3 elective modules							
4.	Master's Thesis 30 CP							30	

Dark blue = Thesis Module
Light blue = Elective Modules
Grey = Mandatory Modules

Lab work and research internships

 **Several Lab Work Phases - Throughout the Semesters – Hands on Training with:**

- Cell culture
- Tumor cell research
- Cytogenetics etc...

 **Mandatory Research Internship - 4 weeks**

- Radiation Protection
- Preclinical Research
- Medical Physics



What can you do with Radiation Biology degree?

- Researcher as Radiation Biologist (PhD, Post-doc, Professor...)
- Can work on radio-pharmaceutical industry.
- Depending on one's interests , skills and educational background, there are many other opportunities in **industry** and **government sectors**.

Visa and settlement

! Need to apply from respective embassy from your country. **Apply as soon as you get acceptance letter from university .**

! Finding an accomodation is not easy in Munich... But there are application possibilities for Student apartments.

↪ <https://www.studierendenwerk-muenchen-oberbayern.de/wohnen>

i Tips

- **At least learn some basics of German language (A1-A2)**
- **Bring all vaccination/immunization certificates**

Contact

📌 General Questions about Studying at TUM

🏛️ Student Service Center

📍 Arcisstrasse 21, 80333 Munich (Room 0144 – Service Desk)

☎️ Tel: +49 89 289 22245

✉️ Email: studium@tum.de

📌 Program-Specific Inquiries

✉️ Email: radiationbiology.sto@mh.tum.de

Thank you :)

Questions?

