Praktikumsbericht

Auslandspraktikum

Angaben zur Person und zum Praktikum der/des Studierenden

Studienfach: Molecular & Cellular Biology

Bachelor/Master/Staatsexamen: Master

Praktikumszeitraum: 20.10.2025 – 13.02.2026

Praktikumsort: Milan, Italy

Praktikumsinstitution: Human Technopole

Vorgaben:

- Der Praktikumsbericht sollte mindestens 4 Seiten lang sein (Times New Roman, 12pt, 1.5 Zeilenabstand)
- Wenn Sie Namen nennen möchten, geben Sie bitte nicht den vollen Namen der Person an. Nutzen Sie nur den Vornamen oder Abkürzungen wie „L.“.
- Bitte beachten Sie bei der Integration von Fotos, dass Ihr Bericht bei der Veröffentlichung und der damit einhergehenden Verbreitung des Bildmaterials gegebenenfalls die Einwilligung der fotografierten Person/en erfordert.
- Speichern Sie Ihren Bericht als Word-Dokument (max. Dateigröße: 8 MB) und laden Sie ihn auf MoveON hoch.
- Falls Sie ein wenig Inspiration für Ihren eigenen Bericht suchen oder Ihre Erfahrungen mit denen anderer Studierender vergleichen möchten, werfen Sie gerne einen Blick auf unsere Website.

Sie können Ihren Praktikumsbericht beispielsweise wie folgt strukturieren:

1. Planung und Vorbereitung (z.B. Bewerbungsprozess, Organisation der Unterkunft, Sprachkurs)
2. Praktikumsverlauf (Aufgaben, typischer Arbeitstag, Auslastung)
3. Soziale Kontakte
4. Alltag und Freizeit
5. Kosten und Finanzierung (Lebenshaltungskosten, Tipps für Einkäufe) inklusive der Relevanz des Stipendiums für deren Bewältigung
6. Praktikum und Studium (Konnten Sie im Studium Erlerntes umsetzen, Wie haben sich durch das Praktikum Ihre Studienmotivation und/oder Ihre Einstellung zum künftigen Beruf geändert)
7. Fazit (wurden Ihre Erwartungen erfüllt, Herausforderungen, besonders prägende Erfahrungen, Tipps an zukünftige Praktikanten und Praktikantinnen)

1. Planning and Preparation

I completed my traineeship at Human Technopole in Milan through the Erasmus+ traineeship program from October 2025 to February 2026. As part of the Soranzo Group at the Genomics Research Centre, I concentrated on human embryonic stem cells and genome editing.

My background in Molecular and Cellular Biology had already familiarised me with many molecular biology techniques, but this internship marked my first extensive experience working with human embryonic stem cells and utilising CRISPR-based genome editing in a formal research setting.

During the preparation phase, I coordinated documents between LMU and Human Technopole and finalised the Learning Agreement. The administrative process was straightforward, and once signed, my transition into the internship was seamless.

Even before arriving, I was impressed by the international environment at Human Technopole, which clearly gathers people from diverse scientific and cultural backgrounds – a prospect I was eager to experience.

2. Internship Activities and Scientific Work

The primary aim of my traineeship was to assist in a larger research project by creating genetically modified human embryonic stem cell lines for subsequent functional analyses. My contribution was a component of the group's overall research initiative.

During this period, I completed the entire genome editing process, which involved:

- Designing guide RNAs for the target area
- Performing molecular cloning
- Optimising transfection protocols
- Selecting successfully edited cells
- Confirming genetic modifications with molecular analysis

A large part of my daily tasks involved maintaining human embryonic stem cells in feeder-free, chemically defined environments. This entailed closely monitoring cell morphology, performing routine passaging, and adhering to strict sterility and culture quality standards. Working with stem cells is challenging, as even minor deviations can impact their viability and pluripotency. Over time, I improved my ability to detect subtle changes in cell morphology and adjust my approach as needed.

One of the most technically challenging parts of the project was improving transfection efficiency. Ensuring consistent delivery of genome editing components into delicate stem cells involved multiple tests and fine-tuning. This stage needed patience and systematic troubleshooting. While I didn't handle every issue alone, I participated in analysing potential causes and brainstorming alternative solutions with my supervisor.

Importantly, during this funding period, I was able to confirm and produce edited clones. Seeing validated modifications after completing the entire workflow was a rewarding moment, as it showed that the process from design to validation had been successful.

Alongside CRISPR-based editing, I developed skills in molecular confirmation methods like PCR genotyping and Sanger sequencing analysis. Interpreting sequencing results critically enhanced my understanding of how minor experimental choices can impact subsequent analysis.

3. Supervision and Lab Environment

At the start of my internship, I received close supervision. Every step was detailed, and I was led through the reasoning behind each experimental choice. This structured approach provided a strong foundation, particularly since I was new to working with human embryonic stem cells.

Over the course of the months, I gradually assumed greater responsibilities. By the end of the traineeship, I could independently plan parts of my experiments and had a better understanding of the necessary steps to advance a project. Although I still consulted my supervisor for troubleshooting and big decisions, I was much more confident in managing routine tasks and experimental planning.

The lab environment was highly supportive and welcoming, especially for international researchers. The team collaborated well, and lab meetings featured constructive rather than confrontational discussions. When I shared my progress, the feedback I received was considerate and focused on enhancing my work. My supervisor also offered support during presentations and helped steer discussions when necessary.

This environment facilitated my scientific growth by enabling me to ask questions freely and acknowledge uncertainties without fear of judgment. Such an atmosphere significantly enhanced my learning.

4. Skills and Personal Development

Technically, I gained strong hands-on experience in:

- Feeder-free human embryonic stem cell culture
- Genome editing procedures
- Clone selection and growth
- Molecular validation methods
- Interpreting sequencing data critically

Beyond technical skills, I observed notable personal growth during this period.

My confidence grew considerably. Initially, working with stem cells was intimidating due to their sensitivity. Over time, handling them became routine, and I became more confident in my skills.

My technical accuracy has improved, making me more aware of how small mistakes in pipetting, timing, or cell handling can impact results. I now approach experiments with greater attention to detail.

Additionally, I have started thinking more critically about controls and experimental design. Instead of merely following protocols, I ask myself why each step is necessary and identify potential sources of error. This change in mindset is one of the most valuable outcomes of my internship.

Although I am not yet fully independent in troubleshooting complex experimental issues, I now understand how to systematically analyse problems and consider relevant factors.

5. Everyday Life in Milan

Living in Milan during this traineeship was a memorable experience. Human Technopole is situated in the MIND area, a growing hub for science and innovation. The setting is modern and centred on research.

The institute's international nature facilitated social integration. With many researchers originating from outside Italy, a common experience was fostered among trainees and staff. Lab discussions were primarily held in English, contributing to a comfortable working atmosphere.

Beyond work, Milan provides numerous cultural and social activities. However, as a pricey city, careful planning is essential to manage expenses. Overall, living and working in an international research setting contributed significantly to personal development during the traineeship.

6. Academic Relevance and Future Perspective

This internship closely aligned with my academic background in Molecular and Cellular Biology. The theoretical knowledge I acquired during my studies helped me grasp the principles of genome editing and stem cell biology. Simultaneously, this traineeship allowed me to turn that theoretical understanding into hands-on experience.

Notably, this was my first hands-on experience with human embryonic stem cells. It deepened my interest in stem cell biology and confirmed that I enjoy working with genome engineering methods. If I pursue a PhD in the future, I want it to be closely related to my current work.

The internship revealed how fundamental molecular techniques relate to broader biological questions. It also provided me with a clearer understanding of daily research activities at a professional research institute.

7. Conclusion

My traineeship at Human Technopole was a valuable experience both scientifically and personally. I contributed to a major genome editing project by creating and verifying genetically modified human embryonic stem cell lines. I handled the entire experimental process, from design through confirmation of edited clones.

More importantly, I gained confidence, improved my technical skills, and developed a more critical scientific mindset. Working in a supportive, international environment enabled me to grow steadily during the internship.

This experience has deepened my interest in stem cell biology and genome engineering and clarified the type of research environment I want to pursue in the future.