



LEARNING
BY DOING



25/26

MASTERS OF SCIENCE (MSc) PROGRAM

OF THE CLINICAL TRANSLATIONAL PROGRAM

Join our high quality educational program to learn the methods of translational medicine.



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TM-CENTRE.ORG

SEMMELWEIS UNIVERSITY
CENTRE FOR TRANSLATIONAL MEDICINE

PROGRAM SUMMARY

BASIC INFORMATION ABOUT THE PROGRAM

WHAT WE'RE OFFERING:

- Perform healthcare delivery science
- Understand the main modern clinical scientific methodologies
- Conduct independent research work
- Full career path, from basics to coordinator role
- MSc degree with high level scientific achievements



DURATION OF THE PROGRAM

1 calendar year (12 months), 60 credit

COURSE DIRECTOR

Péter Hegyi, MD, PhD, DSc, MAE

ORGANISERS

The **MSC PROGRAM** is organized jointly by the Centre for Translational Medicine, Semmelweis University, and the Translational Medicine Foundation.

TUITION FEES

- Registration fee for the application: **75 €**
- Tuition fee: **22,000 €** / academic year



INTRODUCTION

OF THE COLLABORATING INSTITUTES



SEMMELWEIS UNIVERSITY

Semmelweis University's (SU) history started more than 250 years ago in 1769. Today, SU is one of the leading institutions of higher education in Hungary and the Central European Region in the field of medicine and health sciences. At SU, our core commitment is based on the integrity of education, research, and medicine, which makes the University an internationally recognized center of excellence.

TRANSLATIONAL MEDICINE FOUNDATION

Our foundation focuses:

- Apply scientific results and innovations in healthcare.
- Facilitate data exchange between universities, hospitals, and research centers to improve multicenter research quality and efficiency.
- Help the public and professionals implement evidence-based knowledge through various platforms.
- Organize conferences and training and provide support for research services and human resource selection.

THE HISTORY

OF TRANSLATIONAL MEDICINE IN HUNGARY



The **Translational Medicine (TM)** “learning by doing” education model was launched at Hungary University of Pécs in 2016 under the leadership of Péter Hegyi. In the past five years, almost 50 PhD students and residents have participated in our programs. In this period, more than 300 high-quality publications have been published through scientific research and translational patient care initiated and supported by the **Translational Medicine Foundation**, the University of Pécs, the University of Szeged, and the Semmelweis University (*Nature Medicine*). The results have made it possible to develop and supplement a number of treatment guidelines and to immediately apply scientific results in patient care.

Semmelweis University aims to rank among the best universities in the world and recognize the importance and the high potential of translational medicine. Therefore, in 2021, this program was invited to function on a much bigger scale than before, now under the umbrella of Semmelweis University. As a result, the training at SU already enrolled more than 340 PhD students and almost 100 undergraduate research students.

THE IMPORTANCE

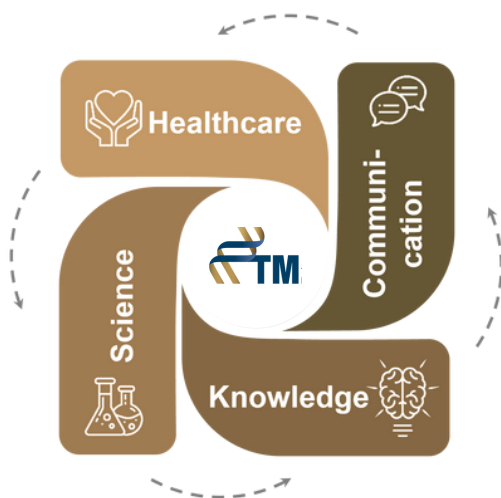
OF TRANSLATIONAL MEDICINE

The key goal of **Translational Medicine (TM)** is to transform scientific discoveries into tangible benefits for communities. This is crucial because scientific findings are currently underutilized in everyday medical practice, limiting their potential to save lives. In 2016, 1.7 million people under the age of 75 died in Europe, **and 1.2 million of these deaths could have been prevented** with effective public health interventions and better use of medical research.

Recognizing this, **Academia Europaea** launched a groundbreaking project in 2018 to speed up the application of scientific knowledge for the public good. Leading researchers, journal editors, and academic experts came together to develop the TM cycle—a model designed to close the gap between science and clinical practice. The **TM cycle** focuses on generating new scientific insights, making them accessible to healthcare providers, and communicating them effectively to the broader public. This approach aims to deliver more efficient, cost-effective healthcare—and that's where our summer school comes in.

By attending this program, you'll gain hands-on experience with the TM cycle, learning how to apply cutting-edge research directly to patient care. You'll work alongside international experts, growing your professional network and contributing to the future of global healthcare innovation. Join us to help make a real-world impact by transforming research into life-saving solutions.

Don't miss the chance to join the movement improving healthcare for everyone!



MSc PROGRAM

WHAT WE OFFER

The **MSc PROGRAM** covers all aspects of the TM Cycle. The program helps students to become critical consumers of medical research papers, to gather primary data on health issues through questioning and observation, and to conduct biomedical research. Students will gain an understanding of the planning of clinical research, including systematic reviews, patient registries and clinical trials, by designing an extended project in study groups, which are led by experienced members of the TM Centre.

COURSES

Our research fellows receive scientific and methodological education which is very intensive in the first year in the frame of weekly courses. A list of the included courses are summarized in Table 1. Most courses consist of an e-learning part, followed by an onsite workshop. The courses are held by members of the center or by invited highly qualified lecturers. Courses are organized three times per week, each day for a different set of groups. During the year, we follow the same weekly schedule for the groups.

LECTURES

Participating in this exclusive series of talks is not only an opportunity for MSc students to learn from the best but a crucial part of their academic journey. By engaging with our distinguished speakers, including Nobel laureates, students will gain unparalleled insights into the trajectories of successful careers and groundbreaking research projects. These talks provide practical knowledge and inspiration essential for navigating the complexities of academia and advancing personal research agendas. The challenges and solutions discussed will enhance critical thinking and problem-solving skills, directly contributing to the student's academic development. Participation in this series is therefore recognized with academic credit points.

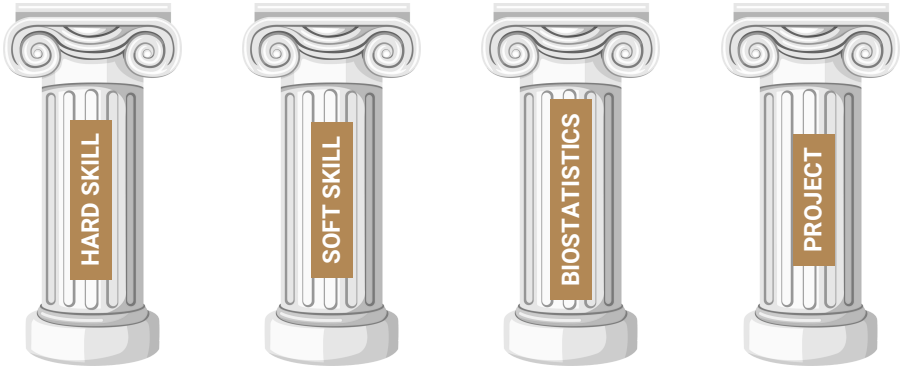
This program is a part of the Science to Society program of the National Academy of Scientist Education, which gives the unique opportunity to meet and discuss with outstanding members of the research community, including Nobel laureates. The program has been visited by 15 Nobel laureates so far; to see more on the program please visit this [link](#) or scan the QR code.



INTRODUCTION OF NASE

National Academy of Scientist Education
2012-2024 Summary video

THE FOUR PILLARS OF THE PROGRAM



HARD SKILL PILLAR

1. Systematic Reviews And Meta-Analysis – We aim to introduce the essentials of metaanalyses, focusing on their role in the evidence-based medicine and the main steps leading to a meta-analysis. Questions will cover key topics, such as how to design systematic search strategies, how to read forest plots, and how to assess the validity of the findings. By attending the series of lectures, participants will learn how to read, understand, and conduct meta-analyses.

2. Patient Registries – In this part we aim to introduce patient registries with their role in science, focusing on practical questions. Topics will embrace the entire process from planning a registry to publication. The general built of a registry, the role of the patient registry coordinator and the contributors in the phase of registry development will be discussed. The course will include presentations on the IT background, details on how to develop an electronic case report form, data management, ethical approval, and other roles, such as biostatisticians and clinical research administrators.

3. Clinical Trials – This part of the school aims to overview the main features of experimental study designs and their role in science, focusing on practical questions. Topics will encompass the entire process from study planning to conclusions from result. Questions will cover key topics, such as the identification of study designs, the role of randomization, the effects of bias, and the judgement of cause-effect relationship.

4. Clinical Pharmacology - The course will cover the fundamentals of clinical pharmacology as a translational scientific discipline focused on rational drug development and utilization in therapeutics. The course focuses on the following core principles of pharmacology: pharmacokinetics, pharmacodynamics and toxicology; drug discovery and development and clinical study protocol design. Furthermore, the course will cover advanced clinical trial concepts like medical device development, advanced therapeutical medicinal products (e.g. gene therapy), clinical trial and software development in clinical trials, and basics of pharmacovigilance. This course intends to complement the other courses of the translational research teaching program so that participants will have a broad and in-depth overview of the mainstream methodologies of clinical research.



SOFT SKILL PILLAR



Public speaking and presentation skills: Scientists and physicians may need to present their findings at conferences, to patients, or to the public. Effective public speaking and presentation skills can enhance their impact and credibility.



Communication skills: Effective communication is paramount. Physicians need to convey complex medical information to patients and their families, while scientists must communicate research findings to colleagues, funders, and the general public. Listening skills are equally important to understand patient concerns or collaborate effectively with other researchers.



Adaptability & Flexibility: The fields of medicine and science are everevolving. Professionals must adapt to new technologies, treatments, and research methodologies. Being open to change and continuous learning is essential.



Time management: Managing time efficiently is crucial, as physicians and scientists often juggle multiple responsibilities, from patient care to research projects. Effective time management ensures that tasks are completed promptly and with quality.



Leadership & Management: As one progresses in their career, leadership skills become increasingly important. Physicians may lead medical teams, and scientists might lead research projects or teams. Leadership qualities like decision-making, delegation, and mentorship are valuable. However operational management, often referred to as operations management, is the process of designing, overseeing, and controlling the day-to-day activities and processes within an organization to ensure efficient and effective operations. It involves coordinating resources, processes, and people to achieve organizational goals.



Teambuilding & Collaboration: Collaboration is integral in both professions. Physicians work in multidisciplinary teams, and scientists often collaborate on research projects. Being able to work effectively with others, delegate tasks, and share credit is essential. Team building is the process of enhancing the cohesion, collaboration, and performance of a group of individuals working together toward common goals. Effective team building involves various elements and activities to create a positive and productive team dynamic.



Crisis prevention & Management: Crisis management at a personal level involves a set of strategies and actions to effectively respond to and navigate challenging or unexpected situations. Here are the basic elements of personal crisis management.



Thinking smart: "Thinking smart" typically refers to the use of cognitive processes and strategies that lead to effective, efficient, and insightful thinking.



The secret of success: Achieving a high level of success in any area of life typically requires a combination of skills, traits, and habits. While success can be subjective and vary greatly from person to person, there are several fundamental skills and qualities that can contribute to a person's ability to reach their goals and aspirations.



Entrepreneurship: Entrepreneurship is a broad and multifaceted field, and covering its basics in a training session can be quite beneficial. Here are some key topics and points you can include in your training on entrepreneurship.





BIOSTATISTIC PILLAR

INTRODUCTORY STATISTICS

In today's data-driven world, having a solid understanding of statistics is essential for making informed decisions, conducting research, and interpreting the world around us.

Throughout this course, you will explore the basics of key statistical concepts and techniques, such as data collection, descriptive statistics, probability, hypothesis testing, correlation, regression, survival analysis, diagnostic tests, and study designs. We aim to make these concepts accessible and engaging, ensuring you fully grasp the subject matter. You will have access to comprehensive lessons, quizzes to test your knowledge, and exercises to practice the concepts mentioned in the videos.

CONTRIBUTORY STATISTICS

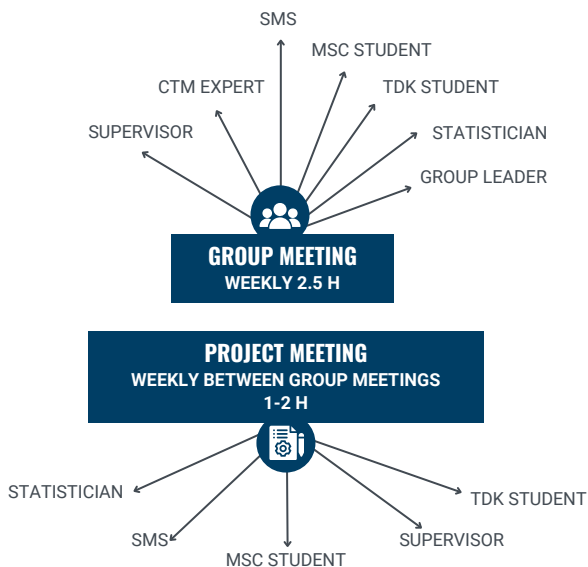
This course focuses mainly on the practical understanding of data extraction. It will help you understand how to obtain the important information in articles with sufficient accuracy so that the extracted data can be used to produce good results. We will cover the concept of different effect sizes in single group designs (mean, median, correlation, and proportions) and two or more group designs (mean difference, risk ratio, odds ratio, incident rate ratio, and hazard ratio). and we will practice data extraction.

ADVANCED STATISTICS

This course gives a deeper insight into those elements of probability theory and statistics, which are necessary to understand meta-analysis and registry analysis. Topics start with the basic notions of statistics (sample, population, data types, etc.), elements of necessary probability theory (probability, odds, risks, and their ratios), and random variables and their distributions (binomial, normal). We discuss descriptive statistics and the logic of inferential statistics, point and interval estimates, and Popper's theory of falsification. We conceptually introduce the hypothesis tests, significance, p-value, and error types. We cover parametric and nonparametric tests, correlation, regression and survival analysis, and diagnostic tests.



PROJECT PILLAR



GROUP MEETING

The main structure of the program is represented by the group meetings. Students in the program are grouped according to their scientific fields. Currently, we have groups based on the following topics: dentistry, gynecology, urology, cardiology, intensive care medicine, neuropsychiatry, orthopedics and traumatology, pediatrics, gastroenterology, endocrinology, COVID-19 and infectious diseases, pharmacology, others. Each group includes 7-14 students, their supervisor, and project students, while the center allocates 1- 2 SMSs, a statistician, and an expert discussant to the group. During the first year, each group has a meeting each week on a pre-specified day and hour for the year. In these meetings, each fellow presents his/her progress during the previous week, and the group jointly discusses the scientific questions, presentations, and progress. Starting from the second year, following the same group structure, there are pre-specified monthly meetings with the same purpose.



PROJECT MEETING

The individual projects are also weekly managed by small study groups, which consist of at least the junior fellow and a senior fellow, the tutor, the biostatistician, and, if necessary for the project, an expert specialist. The project meetings are led by the SMS, dedicated to the project team.

The project team contacts the SMS with any research-related question, who will ensure the fastest and most accurate guidance. The projects are essentially metaanalyses, patient registries, clinical trials, and basic research projects in which the research fellow is the principal investigator (i.e. first author). Every student will start with a systematic review and meta-analysis of his/ her research field, which should represent the literature search and the basis of other projects like clinical trials or prospective patient registries.



PROGRESS REPORTS

During the training, we will organize regular audits for the MSc students every 3 months. The aim of the progress reports is to provide a conference-like environment for the students, where they can present their scientific questions and progress since the previous audit, and they will gain important presentation skills and networking possibilities. During the progress report, students will have 8-10 minutes to present their progress, followed by an open discussion. For the progress report multiple groups are schedule for one day, therefore student can have an insight in other projects and practice multidisciplinary discussions. Watch a short summary of a previous Progress Report [here](#).



ARTICLE WRITING

Writing articles in medical sciences requires precision, clarity, and adherence to established scientific conventions. These elements are crucial for effectively communicating research findings and contributing to advancing knowledge in the field.



ARTICLE MANAGEMENT

Managing articles in medical sciences, from journal selection to publication, involves a series of steps and considerations to ensure the quality and dissemination of research findings.



GRANT WRITING

Grant writing is a specialized skill that involves preparing a persuasive proposal to secure funding for a project, program, or research endeavor. Whether you're seeking grants from government agencies, foundations, or private organizations, successful grant writing requires attention to detail, clear communication, and a compelling case for funding.



MILESTONES

The first three months are about the conceptualization of the systematic review. With the help of the group, during the group meeting, we aim to find the best research questions. During the first 3-months, students should end with the systematic search and selection of the literature. During the next 3 months, we will concentrate on the data collection and the results. In this period, we aim to discuss the result of each project on a structured way, therefore at the end of the first 6-months students should be able to present their results of the metaanalysis. The next 3-months is about the article writing, at the end of this period the manuscript should be ready to be submitted to top journals. At the end of the first year, having the first project submitted and all courses and credits completed is the pre-requisite for successful graduation.



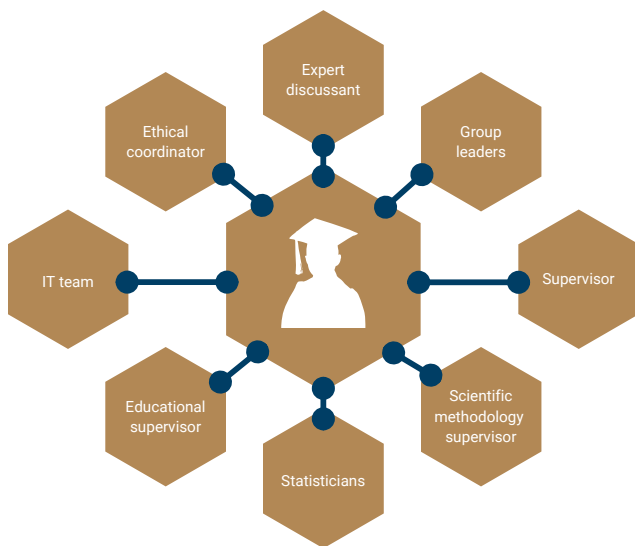
COURSES DURING THE FIRST YEAR OF THE PHD PROGRAM

DATE	COURSE/SEMINAR LECTURE
Week of September 1st	E-learning: systematic review and meta-analysis
September 8th	Practice: systematic review and meta-analysis
September 15th	E-learning: patient registries
September 22nd	Practice: patient registries
September 29th	E-learning: clinical trials
October 13th	E-learning: biostatistics
October 20th	Practice: biostatistics
October 27th	E-learning: clinical pharmacology
November 3rd	Practice: clinical pharmacology
November 10th	E-learning: advanced trial
November 17th	Practice: advanced trial
December 1st	E-learning: Excel training
December 8th	Practice: Excel trainings
January 5th, 2025	E-learning: article writing
January 12th	Practice: article writing
January 19th	Soft skill course part I: self-management
January 26th	Soft skill course part II: assertive communication
February 2nd	Soft skill course part III: effective cooperation and team-work
March 9th	Grants, research and developments
March 18th	Bioinformatics
April 6th	Introduction to basic science

CTM STAFF

INTERDISCIPLINARY RESEARCH SUPPORT

Our centre provides the help of an interdisciplinary research support team to support the work of researchers and Ph.D. students. Continuous support is provided in a weekly basis during the so called group meetings and project meetings. Additional support can be requested from the other members of the team.



CONTINUOUS SUPPORT IS OFFERED BY

1. An **Expert Discussant** is appointed for each group. She/He is a highly experienced physician-scientist who provides help from the design of the study until the publication. She/He helps the students (1) to polish their projects, (2) to find the big picture and (3) challenges them week after week.
2. The **group leaders** are experienced physician-scientists who are well known representatives of the given field and have a record of high level research productivity.
3. The **supervisor** of each fellow is senior clinicians (expert) who raises relevant clinical questions, determines the direction of the research and bridges the gap between the theoretical and clinical work. These tutors continuously lead the research work of the fellows during the whole program.
4. **Scientific methodology supervisors** (SMS) are a methodologist who has experience in designing and carrying out translational research projects and provides methodological support in various aspects of science including meta-analyses, patient registries, and clinical trials.

- 5. Science methodology advisor and expert** (SMA and SME) are highly experienced methodologists who are responsible for the development of the learning material, for the SMS group, and provide the coordination for the different scientific methods, e.g. meta-analysis coordinator
- 6. Biostatisticians** are appointed to each group to provide valuable help for the statistical work of the project.

ADDITIONAL SUPPORT

- 1. Educational supervisors** are expert in the various fields taught through courses to the fellows. Such courses include meta-analysis, patient registry, clinical trial, biostatistics, data handling and clinical pharmacology. Statisticians are appointed to each group to provide valuable help for the statistical work of the project.
- 2. IT team** continuously provides help in the development of the electronic case report forms. In addition, they will help with the testing of the electronic interface and ensures the coordination of maintenance.
- 3. Ethical coordinator** helps with the process of ethical licensing, obtaining, preparing and submitting the documentation required for ethical approval to the relevant authorities. Consultation with the principal investigator during the process.
- 4. Soft skill trainers** provide education regarding the art of scientific communication and networking.

ADDITIONAL ACTIVITIES

Three clubs were founded to provide students the chance to relax after meetings. Sport, Art and Social clubs organise different activities based on different interests. The sport club organises weekly running, swimming and squash, while the art club offers programs, like concerts, exhibitions. Occasionally there are different themed social evenings organised by our social club.

OUTCOMES OF THE TRAINING

- Participants will be able to understand the concept of the healthcare delivery science as part of the translational medicine cycle
- At the end of the training, participants will learn the main points of setting up a patient registry, initiating a clinical trial, or conducting a comprehensive systematic review with meta-analysis.
- Critically appraise clinical research studies using a systematic approach.
- Define the basic knowledges and skills required in translational research.
- Grow the professional international network of translational researchers.
- MSc degree with high level scientific achievements
- In addition, participants will gain presentation skills, debating skills, language skills, and organizational skills.

MINIMUM REQUIREMENTS DURING THE TRAINING

EVENT	REQUIREMENT
Group meetings	min. 80%
Project meeting	min. 80%
E-learning	100%
Courses	100%
Seminar lectures	min. 80%
Progress reports	100%
CTM events	highly suggested

Supervisors are required to spend a minimum of 4 hours/ week/ student. This is essential for the success of each project. Out of the 4 hours, 2.5 hours/ week is spent on the group meeting and 1-2 hours/ week on the project meeting.

TDK-students are asked to attend at least 75% of the group meeting and project meetings. Since these may overlap with other programs during their gradual training, this may vary depending on their research activity.

The completion of the **e-learning** is mandatory for every participant. For a successful closing exam, you need to score a minimum of 75%. After the completion of the e-learning an electronic certificate will be granted.

During the first-year **progress reports** are organized every 3-months and they present the official audit of each student. The attendance and successful completion are mandatory.

CTM events like sports events or social gatherings optional, however, are highly recommended.

The exact dates of the courses, group meetings, project meetings, progress reports will be decided after the admission period.

The attendance of the MSc student, supervisor, and TDK-student is continuously monitored, and the fulfillment of the minimum requirements is **reassessed every 3-months**. Please note that a continuously low attendance rate may result in exclusion from the program.

APPLICATION

HOW TO JOIN OUR PROGRAM

CLICK HERE
OR SCAN THE
CODE TO **APPLY**



TO THE TRANSLATIONAL MSc PROGRAM YOU MAY APPLY IF

- Doctoral applicants must be university graduate (BSc degree) students or registered for their final semester of university studies.
- Applicants for the English-Language program must have a good command of English, which is assessed at the entrance interviews (minimum B2 levels, see details [here](#)).
- Passed the entrance interview

The admission procedure is based on evaluating the candidate's general topic-related knowledge as well as personal ability, academic competence and previous scientific contribution.

FORMS OF FINANCING

This training is self-financed.

FEES

- Registration fee for the application: **75 €**
- Tuition fee: **22,000 €** / academic year
- **50% discount** for Semmelweis Alumni
- Teachers of two years or more at SU CTM are eligible for a tuition fee waiver

APPLICATION STEPS

1. Fill form to register interest ([here](#))
2. A CTM SU colleague will be in touch with by phone to discuss the details
3. Eligible candidates will be contacted for an interview
4. Notification of successful admission

IMPORTANT DATES

Application deadline: **May 18, 2025**

Interviews: **June 16-29, 2025**

Acceptance: **July 6, 2025**

Start of the program: **August 25, 2025**

INSTITUTIONAL AGREEMENTS

In the case of an institutional agreement concerning 12 or more participants an online group may be an option, if the sending institution can provide the necessary infrastructure (meeting room equipped with video equipment, appropriate for group meetings).

RESPONSIBILITIES OF THE CENTRE

The Centre will provide access to the training materials in case of successful recruitment, but this does not cover the technical requirements for access, in particular a stable internet connection and computer equipment. The application fee covers the costs of the application procedure, and the Centre does not undertake to reimburse the costs of unsuccessful applications. Students who are successfully admitted will be offered a training contract by the Centre. Hungarian law will apply to the application process and the training as a whole.



CONTACT US

FOR MORE INFORMATION

Should you need any further information, please do not hesitate to contact us! Also feel free to check out our and our partner's online content as well.

ORGANIZATION NAME

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tm-centre.org, semmelweis.hu/tmk

YOUTUBE CHANNEL

Translational Medicine Foundation

NATIONAL ACADEMY OF SCIENCES

edu-sci.org

ACADEMIA EUROPAEA

ae-info.org





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