



DISCOVERY SCIENCE

LABORATORY HANDS-ON TRAINING IN HUNGARY

FOR SECONDARY SCHOOL PUPILS OR BSC STUDENTS

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**7-DAY SCIENTIFIC PROGRAM IN HUNGARY
REGISTRATION OPENS IN FALL 2025**

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SECONDARY SCHOOL EDUCATION PROGRAM

OF THE NASE IN HUNGARY



The main objective is to embrace talented young students interested in biomedical research and make them love exploratory research. We are determined to sensitize them towards science from an early age, help them to develop in their undergraduate years, support their research work throughout their university years, and thus make the scientific career model attractive.

INTRODUCTION

The first element of the Academy's education program focuses on secondary school-aged pupils.

The professional background of the Secondary School Education Program is given, on the one hand, by the talent-nurturing traditions of biology and chemistry education in Hungary and, on the other hand, represented by successful foreign examples.

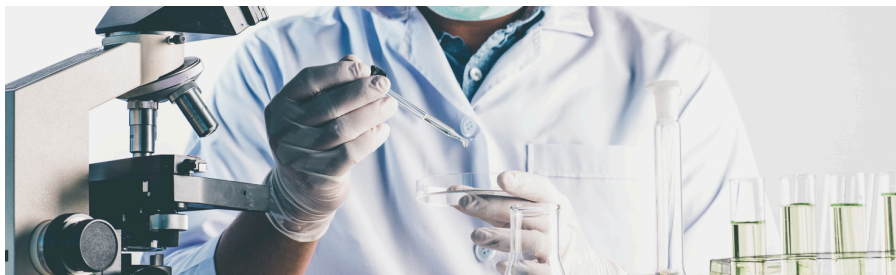
The novelty of this initiative, which is unique in domestic talent management, is that it combines the development experience of professionals working in secondary schools with the expertise of university teaching staff. This makes it possible to introduce a new form of education in which modern scientific content, with the help of the best didactic methods, ensures that hundreds of young, interested pupils can gain insight into the process of cutting-edge biomedical research and those that show some interest can join in as well.

The education plan of the program includes independent knowledge processing, group presentations, related discussions, conference participation, and laboratory experiments which can be carried out in several locations.

The process also includes important evaluation steps, as continuous reflections are necessary for the sake of sustainability. The teachers, therefore, collect the opinions and experiences of the participants after each event. Based on the accumulated information, the education program is reviewed every academic year to ensure its effectiveness by incorporating necessary modifications.



ACTIVITIES



The activities of the Program were designed in such a way as to, as much as possible, achieve the set goals. The activities include theoretical education based on the pupils' independent learning and group work, but great emphasis is placed on the development of practical skills. Some of the activities can be done from home, while other forms of education take place in the Regional or National Education Centres.

The common goal of all activities is to impart valuable knowledge that cannot be obtained within the framework of normal public education, with the help of the most modern pedagogical methods possible. The content of this imparted knowledge will contribute to successful research in the future.

- Lectures (by national and internationally renowned researchers)
- Laboratory experiments, where students will learn to use the following instruments independently:
 - microscopes (recognition and interpretation of histological slides)
 - automatic pipettes
 - dissection instruments (organ dissection)
 - PCR apparatus
 - gel electrophoresis system
 - spectrophotometers
- Preparation of laboratory report
- Independent study material processing
- Preparation of sketches, essays, concept maps
- Group development programs in one of the 7 Regional Education Centres
- Online course material processing
- Hospital "skill lab" sessions
- Participation in the "Meeting of Nobel Laureates and talented students" conference in Szeged

VENUES

National and Regional Education Centres

There are seven National Education Centres within the country: in Debrecen, Gödöllő, Hódmezővásárhely, Pécs, Szeged and Szombathely. In addition to their core activities, these secondary school laboratories act as national centres for theoretical training and complex biological practice sessions for exceptionally talented Szent-Györgyi Pupils from the Regional Education Centres. They also provide in-service training for teachers actively involved in the program, including the methodology of the state-of-the-art molecular biology exercises they carry out with pupils.

The Academy accordingly provides the necessary background for the research and teaching tasks. The laboratories welcome pupils and teachers for several days during the academic year.

The country is currently divided into 24 districts (23 in Hungary and 1 in Romania), each of which is assigned to a specific school called Regional Education Centre. Each centre provides a teacher (Szent-Györgyi Senior Teacher) who, in addition to his or her day-to-day work, is responsible for recruiting talented pupils, maintaining direct contact with them, and organising local professional programs.



TEACHING STAFF

*The mentoring of pupils in the secondary school program is carried out by secondary school teachers with the titles of **Szent-Györgyi Senior Teacher** and **Szent-Györgyi Teacher**.*

A Szent-Györgyi Senior Teacher can be a recognized authority in his region in the field of biology or chemistry education and who has decades of experience in talent development in these subjects. Currently, talent selection is carried out by 29 Senior Teachers covering the 24 districts.

THEIR MAIN TASKS:

- Visiting partner schools in their region and maintaining continuous contact with the Szent-Györgyi Teachers there
- Recruitment of the most talented pupils (in natural sciences) of the given region
- Mentoring pupils within their region
- Organization and conduct of laboratory practices and scientific programs for the Szent-Györgyi Pupils belonging to their area
- Participation in spring and autumn Meetings of Nobel Laureates and Talented Students
- Participation in further trainings organized by the NASE
- Recommending pupils to the National Academy of Scientist Education program, organizing, and assisting their participation

The Academy's priority is to support the talent management process in its natural place, in secondary schools. To this end, it is essential to develop a partnership with teachers of gifted pupils, which includes recognising their achievements and respecting the significant extra work they put in. An important part of this partnership is the fact that pupils are invited to all events with their teachers, as the shared learning experience also creates a mutually motivating situation.

Winning the title of Szent-Györgyi Teacher in itself is a major incentive for high school colleagues, as is participation in conferences and the availability of the teaching materials and methodological guides, the express purpose of which is to support the methodological development of domestic biology education.

TRAININGS

FOR INTERNATIONAL PUPILS



Why Hungary?

● WORLD-CLASS SCIENTIFIC LEGACY

In the heart of Europe, with a legacy of excellence in science and innovation, Hungary offers a unique blend of cutting-edge scientific experiences, rich cultural heritage, and a vibrant academic community.

● RICH CULTURAL EXPERIENCE

Hungary's location in Central Europe makes it an ideal gateway to the rest of the continent. The country is well-connected with Europe, which allows its students to travel and collaborate with other European institutions, enhancing employability and academic prospects.

● CUTTING-EDGE EDUCATION

Hungarian schools and research institutions are renowned for their state-of-the-art laboratories. In these research facilities students are not just passive learners but active participants in groundbreaking projects, making significant contributions to ongoing scientific development. This practical experience is invaluable, providing a strong foundation for future careers in academia, industry, or research.



View of the Lake Balaton

● THE LAND OF NOBEL LAUREATES

Hungary boasts a remarkable history of scientific achievements, with numerous Nobel laureates who have shaped modern science. From Albert Szent-Györgyi, who discovered Vitamin C, to the recently (2023) awarded biochemist, Katalin Karikó and physicist, Ferenc Krausz, Hungarian scientists have been at the forefront of scientific innovation. The country provides students with the opportunity to engage in programs influenced by this rich legacy, gaining insights from institutions that have produced some of the brightest minds in history.

● A WELCOMING AND DIVERSE COMMUNITY

Hungary hosts a diverse student population from all corners of the globe, creating a multicultural environment where ideas and perspectives are freely exchanged. Immersing oneself in the culture, language, and traditions adds a unique dimension to the educational experience.

● WHY HUNGARY?

By choosing Hungary, you are not just investing in your education, but also becoming part of a tradition of discovery and innovation that has shaped the modern world. Embark on your scientific journey in Hungary, and let the land of Nobel laureates and natural beauty inspire your path to success.





The Danube River and the Parliament in Budapest



The Abbey of Tihany

Why the NASE?

VENUES

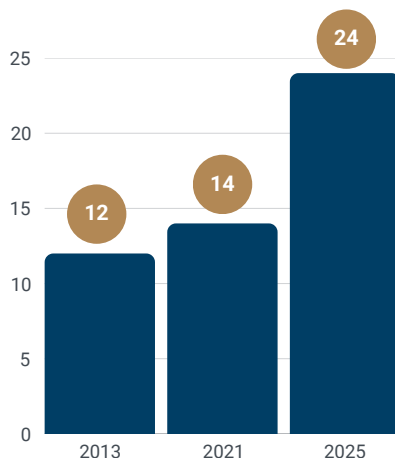
In 2013, when the Szeged Scientists Academy was launched by the Foundation for the Future of Biomedical Sciences in Szeged, the 12 regions, the 3 National Training Centres and the 14 Regional Training Centres of the Secondary School Education Program provided a geographical national coverage regarding the talent management of the pupils in the field of natural sciences.

As a result of the transformation of the Szeged Scientists Academy to the National Academy of Scientist Education in 2021, the number of the regions began to increase within Hungary and, in 2022 also a region beyond the border was involved in Târgu Mureş, Romania.

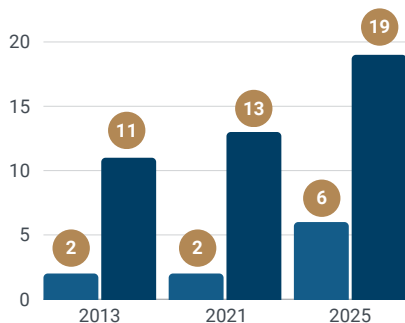


REGIONS

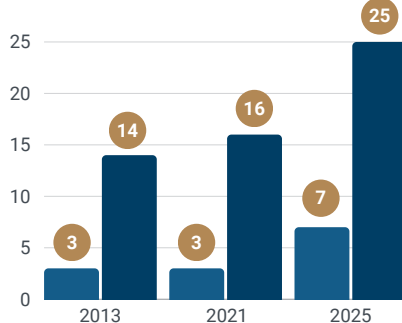
Parallel to the increase in the number of regions, the number of cities and schools involved in the implementation of the program also grew, in order to make the talent management of the pupils even more effective. Consequently, regular teacher trainings and special laboratory practices for advanced pupils can now be carried out in the 7 National Training Centres, while the 23 Regional Training Centres are responsible for the regular theoretical and practical education of the secondary school pupils.



CITIES

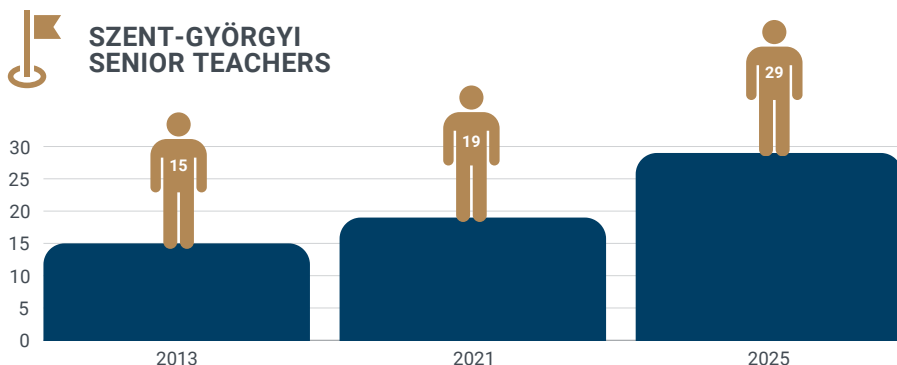


INSTITUTIONS



PARTICIPANTS

Szent-Györgyi Senior Teachers, who are recognized experts within their region in the field of biology or chemistry education, must have decades of experience in talent development in these subjects. From the very beginning, the management of the Academy was determined to involve as many experts as possible, with whom the Secondary School Program could be made even more effective and successful. As the professional work of the regions is led by the Szent-Györgyi Senior Teachers, they play a crucial role in the system.



Secondary school pupils and their teachers can regularly participate in various professional programs. Since 2013, the Academy organizes two major conferences (Meeting of Nobel Laureates and talented students) every year, to which both pupils and teachers are invited. They can also regularly attend trainings in the National and Regional Centres. The diagram below shows the total number of participants throughout the years. The exponential increase in the numbers is an outstanding success for the Academy.





Nobel Laurates who have visited the Academy so far



Bert Sakmann

Medicine, 1991

Visited Hungary:
2012-13, 2016-18, 2020-22



Sir Richard Timothy Hunt

Medicine, 2001

Visited Hungary:
2012, 2015, 2017, 2021, 2025



Eric F. Wieschaus

Medicine, 1995

Visited Hungary:
2012, 2015



Robert Huber

Chemistry, 1988

Visited Hungary:
2012



Aaron Ciechanover

Chemistry, 2004

Visited Hungary:
2012, 2014, 2022



Erwin Neher

Medicine, 1991

Visited Hungary:
2015, 2019, 2022



Ada E. Yonath

Chemistry, 2009

Visited Hungary:
2012, 2014, 2020



Andrew W. Schally

Medicine, 1977

Visited Hungary:
2012



Peter C. Doherty

Medicine, 1996

Visited Hungary:
2012, 2021-22



John E. Walker

Chemistry, 1997

Visited Hungary:
2012



Kurt Wüthrich

Chemistry, 2002

Visited Hungary:
2018, 2022



Bruce A. Beutler

Medicine, 2011

Visited Hungary:
2023



Randy W. Schekman

Medicine, 2013

Visited Hungary:
2023



Thomas C. Südhof

Medicine, 2013

Visited Hungary:
2023



Brian Kobilka

Chemistry, 2012

Visited Hungary:
2024



Martin Chalfie

Chemistry, 2008

Visited Hungary:
2024



Dan Shechtman

Chemistry, 2011

Visited Hungary:
2025



Joachim Frank

Chemistry, 2017

Visited Hungary:
2025



Katalin Karikó

Medicine, 2023

Participated at our event:
2021



Ferenc Krausz

Medicine, 2023

Participated at our event:
2024



What we are offering

WHAT WE'RE OFFERING:

- **7 days** in one of the Regional Education Centres of the National Academy of Scientist Education
- 10-20 participants/occasion
- certificate program
- basic hands-on training
- soft skills training
- professional courses
- social programs
- community building

The official language of the course is **English**.
Registration opens in **fall 2025** via edu-sci.org

COURSE FEE:

2.200 EUR/person, including

- transfer within Hungary
- 7 days of professional training (daily hands-on training, soft skills training)
- full board
- youth accommodation for 8 nights
- social and recreational programs

The one-week training program for international pupils is designed to give them the opportunity to build community, learn about Hungary's culture and gain lifelong experiences in addition to the varied professional training.

For further information, please contact:

info@edu-sci.org



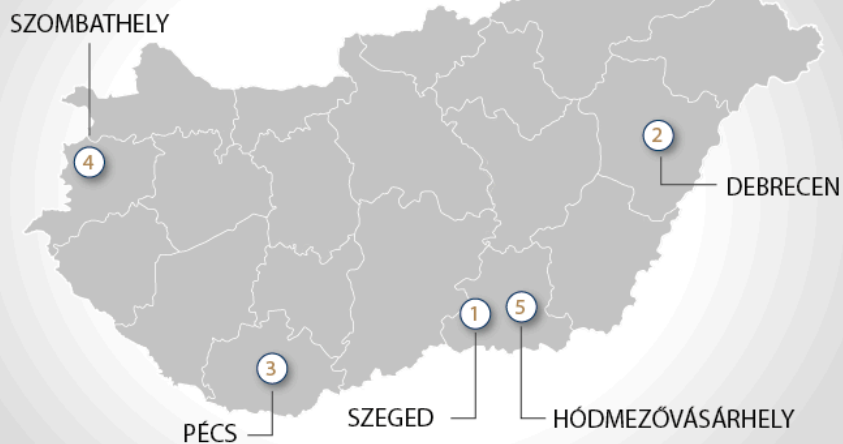
SCHEDULE

SCHEDULE OF THE PROGRAM

	DAY 0	DAY 1 - 6	DAY 7	DAY 8
morning	arrival	professional work: - in the school lab - in the university skill lab - soft skills courses	professional work	departure
afternoon			graduation ceremony (delivering certificates)	
evening	welcome night	social programs	farewell night	



VENUES



Training courses for international pupils will be held at one of the Academy's National Education Centres. All of these locations have excellent infrastructure and staffing conditions to host trainings of the highest quality.

1

SZEGED

Szeged is the third largest city in Hungary, with approximately 180.000 inhabitants. The lively university city is also known as “The City of Sunshine” due to the extreme number of sunshine hours. The charming, cozy county seat lies at the confluence of the Rivers Tisza and Maros. The Mediterranean atmosphere of the city centre, hosting numerous colorful festivals, is so easy to fall in love with, while the surrounding area offers many opportunities for excursions.



The **University of Szeged**, with a history dating back to 1581, is one of the largest universities in Hungary, and the efforts of its 22,000 students and close to 8,000 employees at the 12 university faculties help make the institution the regional centre of knowledge in Hungary and Central Europe.

Outstanding professors and Alumni have worked at the University, including the Nobel Laureate *Albert Szent-Györgyi* (1937), who was the first to isolate Vitamin C, extracting it from Szeged paprika, and the Nobel Laureate *Katalin Karikó* (2023) biochemist who specializes in RNA-mediated mechanisms. Her work greatly assisted in developing a technique also used for COVID-19 vaccines.

The number of international students is constantly increasing, and it reaches 20% of the student body.

Szeged National Education Centre of the NASE

The “Szeged National Education Centre” is located in the **Radnóti Miklós Experimental Grammar School in Szeged**, which is considered one of the three best secondary schools in the country in terms of science talent education. The teaching of mathematics and biology is outstanding. Bacterial transformation, gel electrophoresis, normal and quantitative PCR were carried out at this high school for the first time in the country. A bioinformatics device system is currently being developed to complete the toolbox for practical teaching of molecular biology and biotechnology.



Szent-Györgyi Senior Teacher at the Szeged National Education Centre



ANDREA BORBOLA

Biology teacher at the Radnóti Miklós Experimental Grammar School in Szeged

Pedagogy expert of the Academy



SÁNDOR BÁN

Biology teacher at the Radnóti Miklós Experimental Grammar School in Szeged

THE EQUIPMENT AVAILABLE IN THE LABORATORY ALLOWS:

- practice for the Hungarian A-level, the British A-level, and the US Advanced Placement (AP) in biology, chemistry, and physics practicals
- preparation for international high school biology competitions (e.g.: International Biology Olympiad (IBO), European Olympiad of Experimental Science (EOES), International Avicenna Biology Olympiad)
- design and implementation of iGEM projects

Existing **MOLECULAR BIOLOGY EQUIPMENT** (for experiments with at least 20 students at a time):

- Horizontal and vertical gel electrophoresis and blotting (DNA and protein)
- Spectrophotometers
- Gradient PCR
- Gas chromatograph
- Processing and preparation equipment (centrifuges, vortex, shakers, incubators, Nanodrop, refrigerators (+4 °C; -20 °C; -80 °C), electroporator, etc., sterile cabinets)

SPECIAL EQUIPMENT (under procurement):

- Oxford Nanopore sequencing equipment
- Spectrofluorometer
- Quantitative PCR

2

DEBRECEN

Debrecen is a traditional centre of university and high school education in the North-East of the country. Surrounded by conservation areas, the town is bordered by the Great Plain and large forests. The second largest Hungarian city welcomes thousands of students from all over the world in an attractive natural and cultural environment. In a historical atmosphere, students engage in a lively international community that offers a wide range of scientific education.



The **University of Debrecen** has an uninterrupted history, reaching back almost 500 years, and as such, it is the oldest higher education institution in the country, operating continuously in the same city. Since its foundation, it has been one of the most important centers of Hungarian scholarly research and development, one of the excellent educational centers in the country, and one of the top 500 universities in the world, accepting thousands of foreign students.

Debrecen National Education Centre of the NASE

With its sixty-year-old specialized training in biology and chemistry, **Tóth Árpád Secondary School in Debrecen** is the region's leading training centre and a key supply base for university courses for biologists and doctors.

The school regularly hosts foreign students in the framework of international cooperation programs. For a decade, the school has been operating an International Baccalaureate program in English. Staff are available to teach almost all subjects in English.

The school is a modern, accessible building with 1100 pupils, a canteen, a large gym, a sports ground and a swimming pool. Our physics, chemistry and biology laboratories accommodate students in five laboratories and two lecture rooms. The laboratories can accommodate 20 students each, and the lecture rooms 40 or 70 students. In addition to our own students, we welcome students more than 100 times a year. Visitors aged from 10 to 20 years participate in science sessions, physics, chemistry and biology practicals, classical and molecular biology exercises.



**Szent-Györgyi Senior Teacher at the
Debrecen National Education Centre**



JÓZSEF GŐZ

*Biology and chemistry teacher at the Tóth Árpád
Secondary School in Debrecen*

The **BIOLOGY LABORATORY FACILITIES** are available for practicals of up to 20 students on the following topics:

- phage DNA restriction analysis
- DNA fingerprint analysis
- pGLO bacterial transformation
- ELISA test
- spectrophotometry
- chromatography
- microscopic histology
- zoological dissections (worm, cockroach, fish, chicken, mouse)
- organ dissections (pig heart, larynx, lung, kidney, eye)

AVAILABLE EQUIPMENT:

- micropipettes
- PCR and gel electrophoresis equipment
- centrifuges
- incubators
- spectrophotometers
- light microscopes
- stereomicroscopes
- botanical and zoological (normal and pathological) slides

3

PÉCS

Pécs is the fifth largest city in Hungary. The charming county seat is the cultural centre of the south-western region of Hungary. In addition to numerous Roman and early Christian monuments, the city is also home to modern art (Zsolnay) and is surrounded by several famous wine regions, such as the Villány wine region. The presence of a large number of Hungarian and foreign students, along with the Mediterranean atmosphere, make Pécs a pleasant, bustling, and lively university city.



The history of higher education in Pécs dates back to 1367, when Louis the Great initiated the establishment of a university in the episcopal city of Pécs. As a result of an integration process of several stages, the **University of Pécs** was founded, which has become one of the most famous, prestigious institutions having a leading role in regional education. It has ten faculties which cover the full spectrum of high-quality higher education.

Pécs National Education Centre of the NASE

Nagy Lajos Secondary School of the Cistercian Order in Pécs is one of the oldest schools in Hungary, founded by the Jesuits in 1687. It is located in the main square of Pécs, with 775 students aged 13-19.

The school's aim is to preserve traditions while passing on modern knowledge, with a focus on high-quality education, Christian education and community. Biology and chemistry have special importance in the school.

The two single-bay laboratories, which can accommodate a total of 40 students, a large 120-seat lecture theatre, a 60-seat chemistry laboratory, and a 36-seat chemistry lecture theatre also support science education. The science classes and specialized courses play a key role in talent management and competitive preparation in the region.



**Szent-Györgyi Senior Teacher at the
Pécs National Education Centre**



ZSOLT NYISZTOR

*Biology and chemistry teacher at the Nagy Lajos
Secondary School of the Cistercian Order*

THE LABORATORY PROVIDES students with the opportunity to learn various molecular biology techniques such as:

- PCR
- bacterial transformation
- gel electrophoresis
- spectrophotometry

Further **PROFESSIONAL TRAININGS** include:

- theoretical and practical sessions on human anatomy
- physiology
- neuroanatomy
- theoretical and practical courses in plant and animal biology

AVAILABLE EQUIPMENT:

- 20 binocular learning microscopes
- a number of educational microscopes

4

SZOMBATHELY

Szombathely is the 10th largest city in Hungary. It is the administrative centre of Vas County in the west of the country, located near the border of Austria. Szombathely lies by the streams Perint and Gyöngyös, where Lower Alps mountains meet the Little Hungarian Plain. Szombathely is the oldest recorded city in Hungary, as it was founded by the Romans in 45 AD. **ELTE Savaria University Centre** currently has 6 faculties and has been operating in the city since 1959.



Szombathely National Education Centre of the NASE

The **ELTE Bolyai János Practice Primary and Secondary Grammar School, Szombathely** is one of the most popular educational institutions in Western Hungary, with more than 1000 students. Its main profile is talent management, mathematics and science. The institution has two interconnecting biology laboratories (one for 18 students and one for 20) with a total of 38 work places. It also has a 38-seat lecture hall right next to the laboratories.

The laboratory is also a training centre for the Hungarian team preparing for the IBO.

The school is in direct collaboration with the Department of Biology of the Eötvös Loránd University and the laboratories of the City Hospital, who often provide lecturers, tutors, or material and equipment support.



Szent-Györgyi Senior Teachers at the Szombathely National Education Centre



JÓZSEF BARANYAI

Biology teacher at the ELTE Bolyai János Practice Primary and Secondary Grammar School, Szombathely



BENCE FARKAS SZABÓ

Biology and chemistry teacher at the ELTE Bolyai János Practice Primary and Secondary Grammar School, Szombathely

The **MAIN AREAS** of specialization are:

- anatomy (with Hungarian and Latin-Greek nomenclature)
- dissection
- histology
- physiology

AVAILABLE EQUIPMENT:

- microscopes (stereo and transmitted light binocular)
- fluorescence microscopes for research
- dissection tools
- sections (normal and pathological)
- instruments and materials for histological sectioning (sectioner, fixatives, stains)
- physiological experimental equipment
- molecular biology and biochemistry experimental equipment (PCR, gel electrophoresis, ELISA, spectrophotometry)

5

HÓDMEZŐVÁSÁRHELY

Hódmezővásárhely is a city in the neighborhood of Szeged (25 Km) with the second largest area in the country. There are numerous buildings, villas, residential buildings, and traditional brick buildings under historical or local protection in the centre- and old parts of the city. The town's main square is completely landscaped and thus a favorite resting place for the residents.



Most of the turn-of-the-century buildings surrounding the square were built in an eclectic style, which define the image of the city.

The **Faculty of Agriculture of the University of Szeged** is located here, so the young people who study there also contribute to the lively atmosphere of the city.

Hódmezővásárhely National Education Centre of the NASE

Science education has a long tradition in the **Németh László Secondary and Primary School**. Regular laboratory classes have been provided for the area's elementary and high school pupils for years. The region's pupils present their research work at the Science Student Conference organized at the school every spring.

Many of the school's pupils continue their studies at the medical or veterinary university.

The school's science classrooms are located in a separate part of the building: the 2 laboratories can accommodate 18 people per room, and the lecture hall can accommodate 40 guests. The high-quality work is supported by several additional rooms:

- preparation rooms
- chemical warehouses
- tool warehouses
- changing rooms
- two laboratories



**Szent-Györgyi Senior Teacher at the
Hódmezővásárhely National Education Centre**



EDIT CSALÁNÉ BÖNGYIK

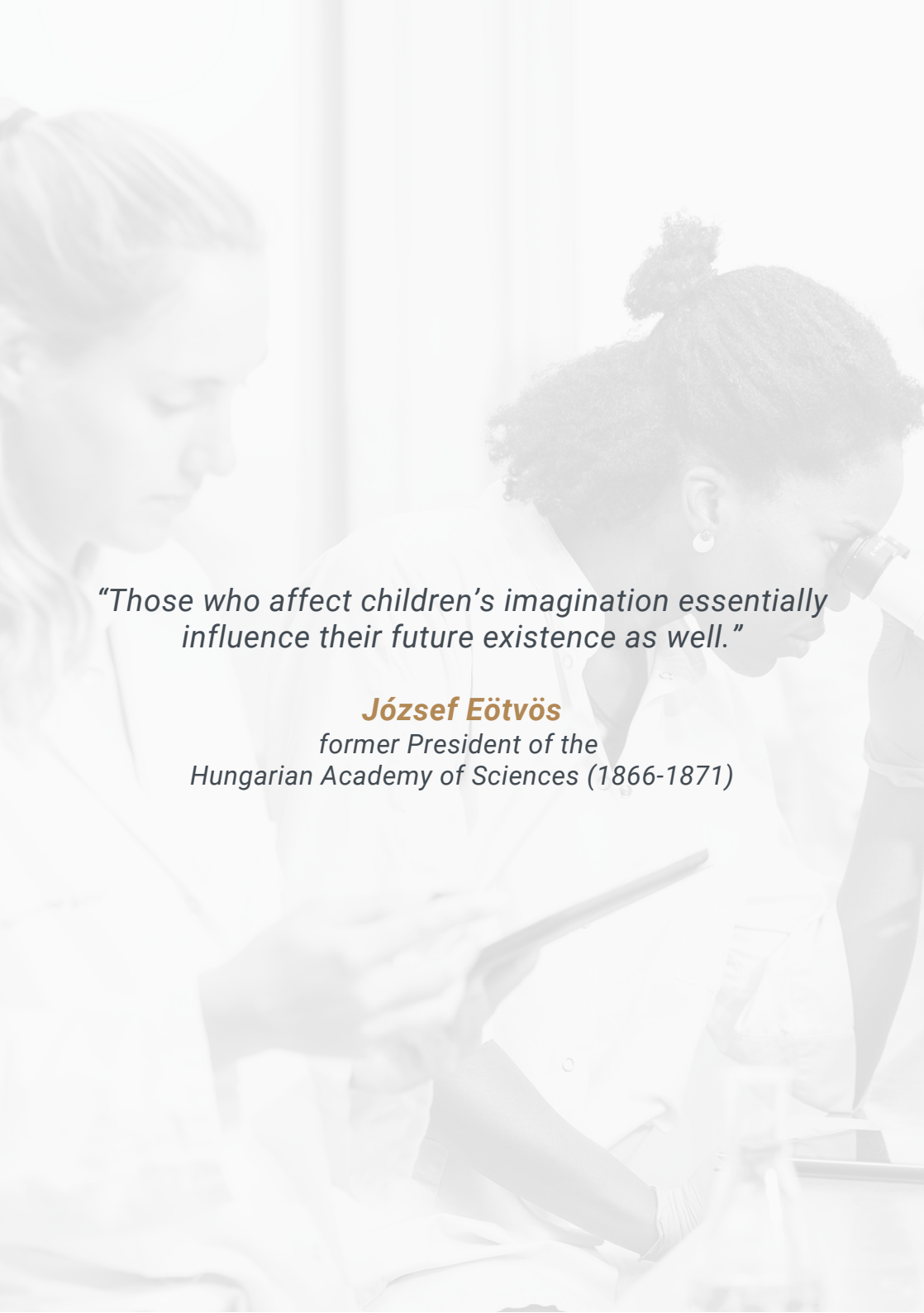
*Biology and chemistry teacher at the Németh László
Secondary and Primary School*

THE LABORATORY PROVIDES students with the opportunity to learn various techniques, such as:

- automatic pipetting
- gel casting, gel pipetting, gel image analysis
- physiological and laboratory tests (blood pressure measurement, heart function monitoring with wiwe device, blood sugar measurement)
- spectrophotometry (protein analysis with Bradford reagent)
- ELISA immunoassay
- dissection exercises:
- pig organs: heart, kidney, lung, larynx, eye
- chicken organs: heart, wing, leg
- dissecting a fish

AVAILABLE EQUIPMENT:

- automatic pipettes
- gel electrophoresis
- PCR
- spectrophotometers
- blood glucose meter
- wiwe device
- thermostat
- spin-dryer
- pen multimeter
- light microscopes
- stereomicroscopes



“Those who affect children’s imagination essentially influence their future existence as well.”

József Eötvös

*former President of the
Hungarian Academy of Sciences (1866-1871)*



*Introduction video
of NASE*



*English website
of NASE*

**NATIONAL ACADEMY OF
SCIENTIST EDUCATION**

For more information, please contact
info@edu-sci.org