

## Research training between 14 and 18 in Hungary

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### Abstract

The first five years of a new program to organize high-level scientific research training for gifted high school students in Hungary are described. Besides giving unique research opportunities for talented students in their most receptive age, the program already helped the establishment of almost 100 scientific research clubs in Hungarian high schools, provided a focal point for science training of high school teachers and helped regional cooperation in Central-Eastern Europe. © 2000 IUBMB. Published by Elsevier Science Ltd. All rights reserved.

### 1. Introduction

Five years ago a new program has been established in Hungary helping gifted high school students (in the age between 14 and 18) to find mentors who introduce them to scientific research in Hungarian universities or research institutes. The program gained an overwhelmingly positive response from the Hungarian scientific community. Mentors are of highest scientific merit: among them 68 are members of the Hungarian Academy of Sciences, and most are respected professors of their research field. The patrons of the program are Árpád Göncz, the President of the Hungarian Republic and Zoltán Pokorni, Minister of Education. Sponsors of the action include: the Béres Foundation, General Electric-Tungsram, Hungarian Patent Office Journal “World of Nature”, MENSA HungarIQa, Ministry of Education, “Műszaki” Publishers Budapest, National Committee of Research and Development, and the Soros Foundation.

### 2. Mentors and students

In 1995, we started with approximately 300 mentors. The number of scientists devoted to the program doubled

in the last five years. So far four editions of the list of mentors were published in 4000 copies each, and have been sent to each Hungarian high school, to 500 high school teachers who regularly recruit new students and to almost 1000 gifted students personally. Students were selected based on their achievements in various competitions, were student members of MENSA HungarIQa, or authors of scientific papers in the Hungarian Journal “World of Nature”. In the first five years more than 1400 students began their scientific research in this program. 28% were from the capital of Hungary, Budapest; 14% from Hungarian towns with a population larger than 100,000; 32% from smaller towns of Hungary and 23% from villages. Fifty per cent of students worked in life science laboratories, 30% attended to Faculties of Arts, 19% to Faculties of Natural Sciences (life sciences excluded) and there was 1% in economy and law.

### 3. Organizations

In 1998, a Research Student Foundation was established to channel the financial help for the program. In 1999, participating students, mentors, high school teachers and scientific research clubs formed a Research Student Association, which currently has approximately 500 members. The issues of the movement are decided by the student president (currently Ms. Elza Friedländer)

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and by the two deputy presidents (currently Mr. Gábor Abermann and Mr. György Földesi). The president and the deputies are elected each year by the participants of the National Conference. Students are eligible to be a member between age 14 and 20. After passing the age limit, or grade I, at a university they continue their research in the undergraduate research student associations and can apply for being a “student–mentor” of the movement.

#### 4. Annual Conference — Summer camp

From 1997 three national student conferences were organized. In each of these conferences 40 to 80 students participated, and 20–30 scientific presentations were made. The second and third conference was organized as a summer camp in July near the Lake Balaton [1]. Besides the short presentations of students on their own research, successful scientists talked about their approach of science and about their devotion. Psychologists and social-psychologists discussed the possible dangers of being outstanding in a field, and showed how to solve the conflicts, which might arise from this situation. The camps were free for the participants. The major language of the camp is Hungarian. However, almost all participants speak a rather good English, and in case of a significant participation from abroad, we will organize an English program as well.

#### 5. Science clubs in Hungarian high schools

The Research Student Foundation announced a competition for 2500 USD in the fall of 1999 to help the establishment of science clubs in Hungarian high schools. Members of these clubs may be involved in a research project requiring a team-work, or may perform individual studies and inform each other regularly about their progress. Most of the research clubs also invite established scientists to speak about their own experiences in research, or to summarize recent advances in their field. The Foundation received almost a hundred applications from Hungary, and from the neighboring Romania. In these science clubs more than 1000 students are being introduced to scientific research.

#### 6. Organization of high school teachers

During the last five years we established a network of high school teachers who regularly recruit students to work in research laboratories and/or lead science clubs in their own school. In 1999 the first national conference of these teachers was organized. The successful event was a forum to exchange various methods on the establishment of science clubs, local competitions, fundraising, recognizing talented students, etc. The conference also made a possibility for a discussion with government officials on several general issues, such as governmental help to en-

hance research activities in high schools, and to increase the number of Ph.D. studies among high school teachers.

#### 7. International Contacts

The program has many Hungarian speaking students, high school teachers and science clubs from the neighboring countries of Romania, Slovakia and Yugoslavia. Our primary goal in the international scene is to enhance the regional cooperation in this segment of Central-Eastern Europe. As another type of activity, the program already established several contacts with other organizations helping gifted children abroad. Some of these organizations are the following: Belgium: Belgian Foundation for the Gifted, BEKINA; France: ALREP, Association nationale et internationale de Loisirs, de Rencontres et d'Education pour les enfants et adolescents Precoces; European Council for High Ability (ECHA); Germany: Deutsche Schülerakademie, Bildung und Begabung; India: Prism initiative for gifted children; Ireland: The Irish Center for Talented Youth; Israel: Research Program SciTech; The Netherlands: Talent Support Foundation; New Zealand: Students with special abilities in New Zealand; UK: NACE, The National Association for Able Children in Education. The sponsorship of the Deutsche Schülerakademie, Bildung und Begabung made possible to one of our members the participation in their summer camp in 1998 and 1999, and two of our students were invited to the SciTech99 camp in the Weizman Institute in Israel. We also accepted a Belgian student in our summer camp. It is our goal to extend these contacts in the future possibly in the form of mutual exchanges of talented young students.

#### 8. Research portraits

To give an idea about the research projects we list five presentations from the latest conference. The full text of the presentations can be found on the web-site of the initiative (<http://kutdiak.kec.hu>).

- Gergely Halász: Genetical transformation of rice (mentor: Barnabás Jenes)
- Judith Máthé: Viral labeling of synaptically connected neurons (mentors: Miklós Palkovits, Ida Tóth)
- László Mikló and Gábor Jenei: Isolation of mutations in two phosphatase genes of *Drosophila* (mentor: János Szabad)
- Ádám Szekeres and Dániel Solymári: Molecular mechanism of chaperone action (mentor: Péter Csermely)

#### Reference

- [1] P. Csermely, Scientific research training for gifted children in Hungary, *Biochemist* 21 (1999) 28–30 (more information can be found on the web site <http://kutdiak.kec.hu>).