


*„Coordinated, practice-oriented, student-friendly modernization of biomedical education in three Hungarian universities (Pécs, Debrecen, Szeged), with focus on the strengthening of international competitiveness”
TÁMOP-4.1.1.C-13/1/KONV-2014-0001*




SETTING RESEARCH PROJECTS THAT INVOLVE UNDERGRADUATE STUDENTS

László Dux MD PhD DSc
Professor of Biochemistry and
Clinical Pathology


Department of Biochemistry,
University of Szeged, Hungary

SZÉCHENYI 2020



HUNGARIAN
GOVERNMENT

European Union
European Social
Fund

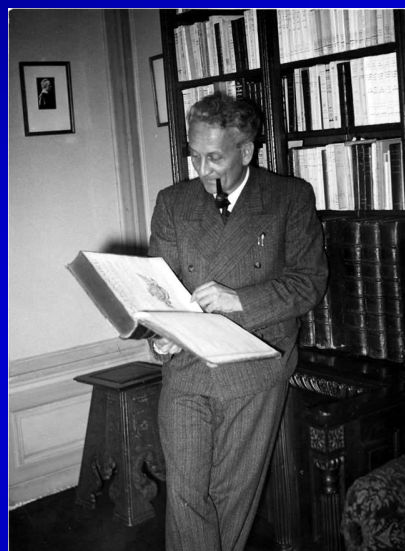


INVESTING IN YOUR FUTURE





ALBERT SZENT-GYÖRGYI
1893-1986



BRUNÓ F. STRAUB **1914 -1996**



Biological Research Center (BRC)



Structure of the Higher Education system in Hungary

- **One tier system**

Medicine, Dentistry, Pharmacy

6 years undergraduate training (MD)

- **Postgraduate training**

A: Scientific 2+2 years (PhD)

B: Residency 4-5 years (specialist)

Structure of the Higher Education System in Hungary

Two tier system:

Natural Sciences, Informatics etc

- BSc 3 years

- MSc 2 years

- Postgraduate training 2+2 years (PhD)

Some challenges we are facing with

- Increasing attractiveness of other professions
- Shortage in competent teachers at the high school level
- Changes in attitude toward learning and work as general
- Traditional teaching methods turning obsolete?
- Emerging new communication technologies
- How to accommodate the needs of professional and research training ?
- The impact of the two tier system „Bolognese all Ungherese”

Undergraduate research in Hungary

- Scientific Students' Associations movement was initiated in the early fifties
- Covers all kinds of disciplines and scientific fields
- Aims to involve undergraduate students in scientific activities
- Voluntary and extracurricular activity
- Based on student – professor (mentor) relationships

Organization of Scientific Students' Associations

- Students join to research groups
- Departmental Scientific Students' Associations
- Councils of Faculty Scientific Students' Associations
- Council of National Scientific Students' Associations (OTDT)

Council of National Scientific Students' Associations

- Founded in 1973
- Co-ordinates faculty and institutional level organisations of students' associations at 16 disciplines and scientific fields
- Responsible for organisation of OTDK
- Recognition of excellence in undergraduate research for both students and supervisors



National Conference of Scientific Students' Associations (OTDK)

- Organized in every second year in 16 sections
- Participation is based on excellence
- Selection of participants at „Local” Conferences at the Institutional (Faculty) level by a scientific jury of experts
- Performance is evaluated and ranked by a jury at the National Conference



Awards of OTDT

- For students: **Pro Scientia Gold Medal**
 - 45 students every second year
 - (5 in medicine, 5 in biology, etc.)
 - Must win a First prize at OTDK
 - Rigorous evaluation
- For mentors: „**Master professor**” award
 - 50 professors every second years (5 in medicine)
 - Excellent tutoring and organisation and support of students' scientific activities



Challenges

- Finding and attracting talented students
- Maintaining their interest
- Trying to keep talented students on a research track
- Financial support and time management

Finding and attracting talented students

- Need to introduce undergraduate research possibilities and achievements in our department: internet, presentations on various forums
- Interpersonal relationships are essential: lectures, seminars, practicals, exams
- Competition between Departments, the earlier the better
- Successful prior undergraduate activities facilitate application of students
- Students may also „walk in from the street”

Undergraduate Research: Motivations of students

- Special interest in certain subject or topics
- Curiosity
- Professional or moral effect of teachers
- Career development (PhD training, residency)
- Competition
- Travel (conferences, research labs)
- Diploma thesis

Motivations of supervisors

- Finding and supporting talented students
- Interpersonal teaching
- Finding and preparing applicants for PhD positions
- Having someone to work in the lab
- Finding the best applicants for the next generation of researchers and teachers
- Involve PhD students in supervising
- Competition
- Basic expectation at most Universities

Márta Julianna Sárközy MD PhD

13th March, 1986, Békéscsaba, Hungary

Education and research position held

- 2004-2010 University of Szeged, Faculty of Medicine, graduated with "*summa cum laude*", as medical doctor
- 2006-2010 - Student research fellow
- 2008-2010 - Student instructor - Dept. of Biochemistry, Faculty of Medicine, Univ. of Szeged
- 2010-2013 - PhD student – Doctoral School of Multidisciplinary Medical Sciences, Dept. of Biochemistry
- 2013-2014 - Postdoctoral Fellow - National Excellence Program "*Jedlik Ányos*" Scholarship
- 2014/15 (4 months) – DAAD and „Dr. Szirmai Endre” Scholarship, Hannover Medical School, IMTTS, Germany
- 2014-2015 - Research Fellow Dept. of Biochemistry, Faculty of Medicine, Univ. of Szeged
- 2015, 01 July - Assistant Professor

Field of scientific interests

Stress adaptation of the myocardium in metabolic diseases
Echocardiography (mice, rat, pig)

Tutorship: 7 participations of medical students
11 topics: **1 First Price** and **3 Special Awards** on the National Students' Scientific Conferences in 2013 and 2015;
2015 - Award of Excellent Tutor of the Faculty of Medicine, Univ. of Szeged

Scientometric dates

Number of full papers in international journals: 9
Cumulative impact factors of referred papers: **28.2**
Total number of citations: **50**
Number of independent citations: **34**;
h-index: 3
Number of oral presentations: **17**
(*international: 3, national: 14*),
Number of poster presentations: **11**
(*international: 10, national: 1*)

Conference Awards

2007 - Third prize
Physiology and Pathophysiology Section, Students' Scientific Conference, Szeged, Hungary

2008 - Second prize - Physiology and Pathophysiology Section, Students' Scientific Conference, Szeged

2009 - Third prize (Physiology and Pathophysiology Section, Students' Scientific Conference, Szeged,
2009 - Bayer-Schering Award (Physiology and Pathophysiology Section, Award of the 29th National Students' Scientific Conference, Pécs, Hungary
2009 - Best Poster Presentation Award (Physiology Section, 20th European Students' Conference, Berlin)
2010 - Second prize and Award of the "Kaáli Nagy Géza" Foundation, (Nephrology Section, Students' Scientific Conference, Szeged, Hungary
2011 - Award of the Society of Pro Scientia Gold Medalists (Nephrology Section, Award of the 30th National Students' Scientific Conference, Debrecen, Hungary



Zoltán Varga MD PhD

28th February, 1985, Tata, Hungary

Education and research position held:

- 2003-2009 University of Szeged, Faculty of Medicine, graduated with "*summa cum laude*", as medical doctor
- 2004-2009 Scientific work as undergraduate student, participations and awards on the national and international Students' Scientific Conferences
- 2005-2009 Student instructor – Dept. of Biochemistry, Fac. of Medicine, Univ. of Szeged
- 2009-2013 PhD student - Doctoral School of Multidisciplinary Medical Sciences, Dept. of Biochemistry
- 2012-2013 Research Associate - Cardiometabolic Research Group, Dept. of Pharmacology and Pharmacotherapy, Semmelweis University, Budapest, Hungary
- 2013 – present - Assistant Professor - Dept. of Pharmacology and Pharmacotherapy, Semmelweis University, Budapest, Hungary
- 2015 – present - Postdoctoral Research Fellow - Laboratory of Physiological Studies, National Institutes of Health, Bethesda, USA

Tutorship 2009 – recently:
Coordination of scientific work of several talented undergraduate students:
3 First Price on National Students' Scientific Conferences
3 of his students received the Pro Scientia Gold Medal in 2011 and 2013

Conference Awards

2006 – Second prize and Third prize as *2nd author* Students' Scientific Conference, Szeged, Hungary
2007 - Third prize and Third prize as *2nd author* Students' Scientific Conference, Szeged, Hungary
2007 – Special Award - 28th National Students' Scientific Conference, Budapest, Hungary
2008 – First prize and First prize as *2nd author* and Basic Research Special Award of *Frigyos Korányi Collegium* Students' Scientific Conference, Szeged, Hungary
2008 – Special Award - International Students' Scientific Conference, Marosvásárhely, Romania
2009 – Poster presentation in Poster Section of 20th European Students' Conference, Berlin, Germany
2009 – 2 lectures in 29th National Students' Scientific Conference, Pécs, Hungary

Scientometric data

Number of full papers in international journals: 17
Cumulative impact factors of referred papers: **71.615**
Total number of citations: 173
h-index: 7
Number of *international* oral presentations: 5



A new model for supporting excellence



- University of Szeged
- Biological Research Centre

<http://www.nobel-szeged.hu>

Szeged Scientist Academy

- Selection starts in the secondary schools
- Selection of students is based on excellence
- Scholarship for Szent-Györgyi Students
- Students are expected to have a publication in 3 years
- Each year the students need to report their progress

<http://www.nobel-szeged.hu>

Szeged Scientist Academy

- The programme has been started in 2013
- Currently there are 5 Szent-Györgyi Students
- Their progress report was presented in May, in the presence of 2 Nobel prize winners



<http://www.nobel-szeged.hu>



Conclusions

- Undergraduate research is useful for both students and mentors
- Successful system
- Severe challenges
- Long term carrier support is essential

**THANK YOU FOR YOUR
ATTENTION!**

This work is supported by the European Union, co-financed by the European Social Fund, within the framework of "Coordinated, practice-oriented, student-friendly modernization of biomedical education in three Hungarian universities (Pécs, Debrecen, Szeged), with focus on the strengthening of international competitiveness" TÁMOP-4.1.1.C-13/1/KONV-2014-0001 project.



SZÉCHENYI 2020

