Prof. Gül Güner-Akdoğan
Chair, FEBS Education Committee

"PhD Training: New Prospects"

FEBS Workshop on Molecular Life Sciences Education
Kaunas, 26-27th June, 2017

OUTLINE of TALK

• Background
• Introduction
• Projects on Quality of PhD Training
• ORPHEUS Best Practice Recommendations
• IUBMB Standards for PhD Education
• Conclusions

(MY) BACKGROUND

• 2016- Director of Graduate School of Health Science, Izmir University of Economics
• 1992- Professor of Biochemistry, Dokuz Eylül University (DEU)
• 2000-2010 Director of Graduate School of Health Sciences, DEU
• 2009- Chair of FEBS Education Committee
• 2010-2016 Member of EX-COM (ORPHEUS)
• 2014-2016 General Secretary of ORPHEUS
• 2010-2016 Coordinator of DEU in CDE-EUA

PhD DEGREE

The modern concept of PhD: “research training under supervision”

• has been developed in the 19th century (practiced in the majority of countries)
• The aim: to train a “qualified researcher” which is assessed by the evaluation of a PhD thesis and an oral defence of the thesis

PhD: international degree

(In Latin, doctore: “teach”

1800 Humboldt, Germany
dr. phil.
1861 Yale, USA
1917 Oxford, UK
1947 Whole World

Kurt Vonnegut
Died 2007

"New knowledge is the most valuable commodity on earth. The more truth we have to work with, the richer we become."

“Breakfast of Champions”
PhD’s – “New generation scientists”

Independent Researchers nurturing innovative ideas

“Careers and Research Performance of PhD Program Graduates of Health Sciences in Turkey”

Zahide Cavdar, Cevval Ulman, Güldal Kirkalı, Hakan Baydur, Gül Güner Akdoğan

Turkish Journal of Biochemistry—Turk J Biochem 2013; 38 (1); 118–125

%83 of Doctoral Graduates pursue an academic career in Turkey

PRESENT STATUS

Although the PhD has been the essential basic qualification for over 50 years . . . the standards for its conferral have been more intuitive than objective, and have led to:

great variation in the abilities and skills of emerging postgraduates.
Projects on PhD Education

- "PhD Standards" Project
  (and Molecular Biology) (2000)
- "Doctoral Project" (2006) of the European University Association (EUA)
- "Setting Standards for PhD Education" ORPHEUS (2009-)
- "Best Practices", Council of Graduate Schools, USA

Three Priorities of the Bologna Process

- Introduction of the three cycle system (bachelor /master /doctorate)
- Quality assurance
- Recognition of qualifications and periods of study
- Berlin Communiqué (2003): PhD has been attributed an increasing Significance


- Berlin Communiqué (2003):
  (Doctoral Programmes defined as the “third cycle”)
- EUA Doctoral Programmes Project 1 (2004-2005)
- Lausanne (June 2008):
  - Launch of the "EUA - Council for Doctoral Education" (EUA-CDE)

Best Practice documents

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<thead>
<tr>
<th>Document</th>
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<tr>
<td>Salzburg I: Bologna Seminar on &quot;Doctoral Programmes for the European Knowledge Society&quot;, 2005</td>
<td>850</td>
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<td>Salzburg II: Implementing the Salzburg Principles, 2010</td>
<td>1,700</td>
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<td>The Quality Assurance Agency for Higher Education Doctoral degree characteristics in UK, 2011</td>
<td>17,000</td>
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<td>League of European Research Universities, LERU: Good Practice Elements in Doctoral Training, 2014</td>
<td>18,500</td>
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<td>ORPHEUS Best Practices</td>
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Founded in Zagreb in 2005 by Prof. Zdravko LACKOVIC

- http://www.orpheus-med.org
- Mission: To elevate the quality of PhD training to the highest levels
- Aims: To develop standards for PhD education, to safeguard PhD as a research degree, strengthening career opportunities for PhD graduates, to promote collaboration.....

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<th>ORPHEUS Konferans</th>
<th>Aims</th>
<th>Purpose of Best Practices in PhD education</th>
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<td><strong>2004, Zagreb</strong></td>
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<td>Ensuring that the PhD remains a research degree</td>
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<td>Maintaining and raising quality despite increased quantity</td>
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<td>84</td>
<td>Providing a secure basis for mobility of PhD graduates</td>
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<td>Providing governments with information about the content of PhD programmes and their contribution in the development of knowledge societies</td>
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<td>2007, Verona</td>
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<td>Safeguarding the reputation of the PhD and strengthening career opportunities for those with PhD degrees</td>
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ORPHEUS is a network of higher institutions aiming to promote PhD Training all over the world...

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<td>2017</td>
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Eight Chapters
1. Research Environment
2. Outcomes
3. Admission policy and criteria
4. PhD training programme
5. Supervision
6. PhD thesis
7. Assessment
8. Structure
1. RESEARCH ENVIRONMENT

• Strong research environment
• Facilities offered must be compatible with the requirements
• Research must be consistent with international ethical standards

2. OUTCOMES

• Qualified, independent researcher
• Competences acquired, permitting pursuit of careers outside the academia or clinical research:
  (Solution of complex problems by critical analysis and evaluation, appropriate transfer of new technology and synthesis of new ideas)

3. ADMISSION POLICY and CRITERIA

4. Structuring of PhD Programmes

Competences required from a PhD programme

1. Research competences
   • Ability to conceive, design, implement and adapt a substantial process of original research
   • with scholarly integrity
   • at a level that merits international refereed publication

2. Communication skills
   • Ability to present research
   • ... also to non-academic audiences
   • Ability to teach
   • Linguistic skills

Knowledge of field
hypothesis
project conception
protocol
methodology
execution
documentation
interpretation
1. Management competences

- Project management
- Ability to work in a team
- Ability to supervise technicians and research students
- Ability to apply (and obtain) grants
- Ability to network
- Ability to plan career

3. Management competences

- Ethics
- Safety
- Research methodology
- Statistics
- Elective discipline specific components to support candidates in their scientific research
- Transferrable skills
  - Presentation (oral/poster/papers) to academic and non-academic audiences
  - University teaching
  - Linguistic skills
  - Project management
  - Grant application
  - Critical evaluation of scientific literature
  - Supervision of technicians and research candidates
  - Career development
  - Networking

5. Supervision

Participants in supervision courses
- Junior supervisors
- Senior supervisors - as advisers
- Students

Content
- Matching expectations
- Use of case studies

Mandatory course for supervisors at Aarhus University, Health

3 x 8 hours

- Process management in supervision: identification of typical challenges in supervision such as matching of expectations, ambitions, and responsibilities.
- Supervisor roles and the relationships between supervisor and supervisee: identification of strengths and limitations in different supervisor roles.
- Enhancing research integrity
- The supervision meeting: formal or informal meetings, frequency and content of supervision meetings, the types of questions and phases in these meetings, and intercultural aspects of supervision.
- Text feedback: identification of standards for texts and recommendations for text feedback.
- Talent development: how do we identify a talented student and how do we develop talented students?
- Rules and regulations of the Graduate School of Health.

Textbook

http://phd.au.dk/fileadmin/grads.au.dk/AU/HE/PhD/studies/Succesfull_Supervision_WWW_FINAL.pdf
• **PhD Thesis**
  - 6. Quality of Thesis
  - 7. Thesis Assessment

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**IUBMB Projects on PhD Education**

- “PhD Standards” Project
- “Doctoral Project” (2006) of the European University Association (EUA)
- ORPHEUS Meetings (2009-2012) “Setting Standards for PhD Education”

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**STANDARDS-1**

The candidate should demonstrate a general knowledge of physics, chemistry, biology and cell biology, biochemistry and molecular biology, the particular molecular bioscience, and a detailed knowledge of his or her area of research.

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**STANDARDS-2**

The candidate should be familiar with the research literature of the particular bioscience and should have the ability to keep abreast of major developments and to acquire a working background in any area.

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**STANDARDS-3**

The candidate should demonstrate skill in the recognition of meaningful problems and questions for research in the particular bioscience.

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**STANDARDS-4**

- The candidate should possess technical skill in laboratory manipulation.
STANDARDS- 5

The candidate should demonstrate that oral, written, and visual communication skills have been acquired.

STANDARDS- 6

The candidate should demonstrate skill in designing experimental protocols and in conducting productive self-directed research.

ISSUES

- Outcome of PhD Training
- Research Environment
- Admission Policy
- Supervisor’s responsibilities
- Supervisory committee
- Candidate’s responsibilities
- Integrity in science
- The thesis-its assessment
- Duration of training-training programme
- Funding
- Mobility

The PhD Journey!

“A PhD is a rough journey into the special world of science. The supervisor’s job is to guide the student on their journey and help them reach their destination.”

Anders Baun, 2009

REFERENCES

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- Contact Details:
  gul.guner@deu.edu.tr
- FEBS Education Platform:
  www.febs-edu.eu

Contact Details:
  gul.guner@deu.edu.tr

FEBS Education Platform:
  www.febs-edu.eu
Thank-you!

\[ \text{Image of a group of people skydiving} \]