



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

“PhD Training: New Prospects”

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Chair, FEBS Education Committee



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

“Breakfast of Champions”

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 Eylul 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

Nerad M, Heggelund M (eds): *Toward a Global PhD*, Univ Washington Press 2008

PhD: international degree

(In Latin, *doctore* : “teach”

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



PhD's – “New generation scientists”

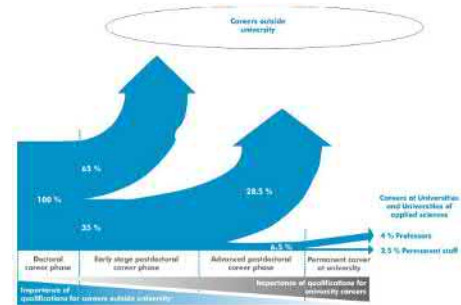


Independent Researchers



nurturing innovative ideas

Career Paths After the PhD- (Germany)



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

Zahide Cavdar, Cevval Ulman, Güldal Kirkali, 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.

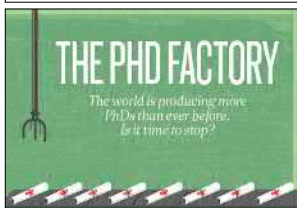
Fix the PhD

No longer a guaranteed ticket to an academic career, the PhD system needs a serious rethink.

The world has many problems and it will take a lot of bright educated people to solve them. So, in the face of it it seems like a good thing for more and more people to earn PhDs in science, technology and engineering. Most countries, convinced that higher education and scientific research are key to economic growth and prosperity, are expanding doctoral education in science.

Editorial

Nature; 472: 259–260 (21 April 2011)



Nature 2011; 472: 276-279

RETHINKING PHDS

Fix it, overhaul it or skip it completely – institutions and individuals are taking innovative approaches to postgraduate science training.

WORLD VIEW

A personal take on events



Reform the PhD system or close it down

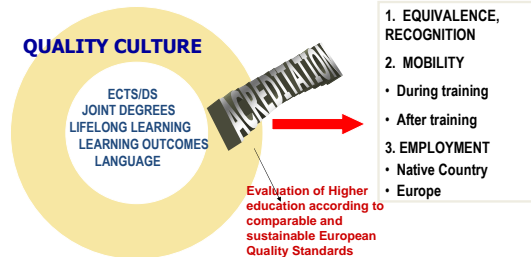
There are too many doctoral programmes, producing too many PhDs for the job market. Shut some and change the rest, says Mark C. Taylor.

Projects on PhD Education



- “PhD Standards” Project
International Union of Biochemistry (1989)
(and Molecular Biology) (2000)
- “Bologna Declaration”(1999) + Berlin (2003)
- “Doctoral Project”(2006) of the European University Association (EUA)
- “Setting Standards for PhD Education”
ORPHEUS (2009-)
- “Best Practices”, Council of Graduate Schools, USA

BOLOGNA PROCESS : QUALITY ASSURANCE & ACCREDITATION



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**



• EUA (European Universities Association)

“Doctoral education is a major priority for European universities and for EUA. It forms the first phase of young researchers’ careers and is thus central to the drive to create a Europe of knowledge, as more researchers need to be trained than ever before if the ambitious objectives concerning enhanced research capacity, innovation and economic growth are to be met.”

EUA in Doctoral Education:

From Berlin (2003) to Lausanne (2008)

- Berlin Communiqué (2003):
(Doctoral Programmes defined as the “third cycle”)
- EUA Doctoral Programmes Project 1 (2004-2005)
- EUA Project 2: “Doctoral Programmes in Europe” (2005 – 2007)
- London Communiqué (2007)
- Lausanne (June 2008):
- Launch of the “EUA - Council for Doctoral Education” (EUA-CDE)

Best Practice documents

Document	number of words
Salzburg I: Bologna Seminar on “Doctoral Programmes for the European Knowledge Society”, 2005	850
Salzburg II: Implementing the Salzburg Principles, 2010	1,700
EU Commission: Principles for Innovative Doctoral Training, 2011	700
The Quality Assurance Agency for Higher Education Doctoral degree characteristics in UK, 2011	17,000
League of European Research Universities, LERU: Good Practice Elements in Doctoral Training, 2014	18,500
ORPHEUS Best Practices	4,500



ORPHEUS

ORganization for PhD Education in Biomedicine and Health Sciences in the EUropean System

Founded in Zagreb in 2005 by
Prof. Zdravko LACKOVIC

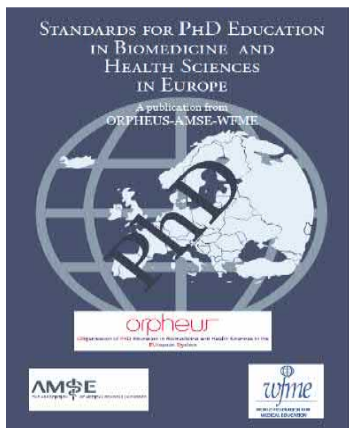
- <http://www.orpheus-med.org>
- **Mission:** To elevate the quality of PhD training to the highest levels
- **Aims:** To develop standards for PhD education, to safeguard PhD as a research degree, strengthening career opportunities for PhD graduates, to promote collaboration.....

orpheur Project: Developing Best Practices

orpheur is a network of higher institutions aiming to promote PhD Training all over the world...

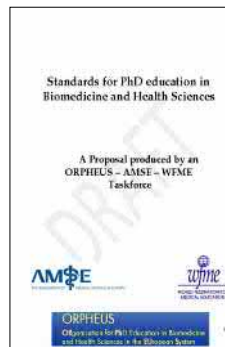


ORPHEUS konferansı	sayı		
	delegeter	kurumlar	ülkeler
2004, Zagreb	53	25	16
2005, Zagreb	71	33	21
2007, Helsinki	80	43	26
2009, Aarhus	165	72	33
2010, Vienna	196	114	39
2011, Izmir	250	98	42
2012, Bergen	195	156	36
2013, Prague	181		40
2014, Lausanne	300	100	40
2015, Belgrade	135	79	35
2016, Cologne	ca. 200	ca. 100	ca. 35
2017, Klaipeda	150	Ca.100	30



Purpose of Best Practices in PhD education

- Ensuring that the PhD remains a research degree
- Maintaining and raising quality despite increased quantity
- Providing a secure basis for mobility of PhD graduates
- Providing governments with information about the content of PhD programmes and their contribution in the development of knowledge societies
- Safeguarding the reputation of the PhD and strengthening career opportunities for those with PhD degrees



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



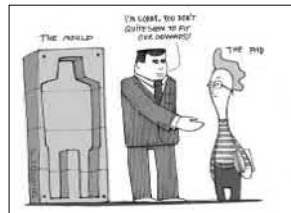
- Strong research environment
- Facilities offered must be compatible with the requirements
- Research must be consistent with international ethical standards

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

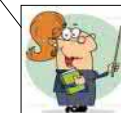
- Ability to conceive, design, implement and adapt a substantial process of original research
- with scholarly integrity
- at a level that merits international refereed publication

knowledge of field
hypothesis
project conception
protocol
methodology
execution
documentation
interpretation

Competences required from a PhD programme

2. Communication skills

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



Competences required from a PhD programme

3. Management competences

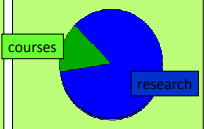
- Project management
- Ability to work in a team
- Ability to supervise technicians and research students
- Ability to apply (and obtain) grants
- Ability to network
- Ability to plan career



ORPHEUS recommendations for PhD courses

- ethics,
- safety
- research methodology
- statistics
- elective discipline specific components to support candidates in their scientific research
- transferable 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.

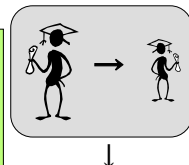
Courses: 15% of total project



5. Supervision

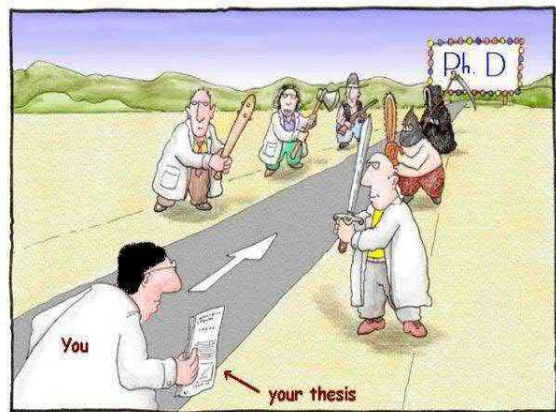
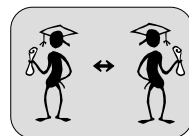
Participants in supervision courses

- Junior supervisors
- Senior supervisors – as advisers
- Students



Content

- Matching expectations
- Use of case studies

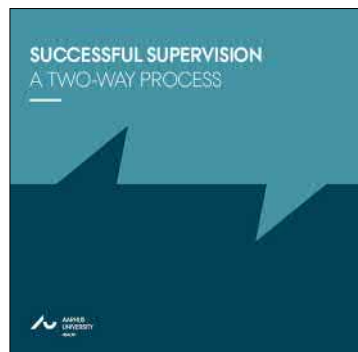


Mandatory course for supervisors at Aarhus University, Health

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.

Mandatory course for supervisors at Aarhus University, Health



Text-book

http://phd.au.dk/fileadmin/grads.au.dk/HE/PhD_studies/Successful_Supervision_WWW_FINAL.pdf



- **PhD Thesis**
 - **6. Quality of Thesis**
 - **7. Thesis Assessment**

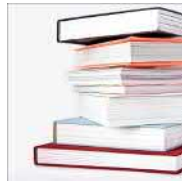
IUBMB Projects on PhD Education



- “PhD Standards” Project International Union of Biochemistry (1989) (and Molecular Biology) (2000)
- “Bologna Declaration”(1999) + Berlin (2003)
- “Doctoral Project”(2006) of the European University Association (EUA)
- ORPHEUS Meetings (2009-2012) “Setting Standards for PhD Education”

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.



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.



STANDARDS- 3

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



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

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- Erasmus Mundus: <http://europa.eu.int/comm/education/programmes/mundus.htm>
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- Quality assessment and accreditation (see <http://www.qaa.ac.uk>)
- Barbara Evans. Recent developments in enhancing doctoral supervision Canada, the US and Australia Unica masterclass, Dubrovnik, 28.08-01.09.2011

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FEBS Education Platform:

www.febs-edu.eu



Thank-you!