

European PhD Programmes in Biomedicine and Health Sciences

Editors: Zdravko Lacković and Jadranka Božikov

Proceedings of the Second European Conference on Harmonisation of PhD Programmes in Biomedicine and Health Sciences

- Final version -

Zagreb, Croatia, April 22–24, 2005

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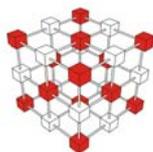


UNIVERSITY OF ZAGREB - MEDICAL SCHOOL

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PREFACE

This monograph represents proceedings of the *Second European Conference on Harmonisation of PhD Programmes in Medicine and Health Sciences* held in Zagreb, April 22-24, 2005. The monograph was published prior to the Conference and the underlying final version includes "*Guidelines for Organisation of PhD Programmes in Biomedicine and Health Sciences*" convened during the Conference as well as the letter, both sent to the Ministerial Conference in Bergen immediately after the Conference. We would like to thank all the contributors including those who sent us their contributions although they were not able to attend the Conference in Zagreb.

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*Professor Zdravko Lacković, MD, PhD
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Zagreb, June 17, 2005

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Professor **Vito Starc**, MD, PhD – University of Ljubljana Medical School, Slovenia (Co-author to Professor K. Breskvar)

Medical School University of Zagreb is deeply honoured to be the host of the first (2004) and now of the *Second European conference on harmonisation of PhD programmes in biomedicine and health sciences*. The idea was born in Zagreb with the aim to improve our own PhD programme, but we have found out that many other medical schools in different European countries share our dilemmas. Representatives of more than 30 medical schools from 23 European countries will come together in Zagreb. We are honoured and happy to have received support of most renowned European associations in this field, and that we were able to put together scientific and organizing committee consisting of prominent European scholars.

Many new events took place in a short time since the last Conference in April 2004, which make gatherings of PhD programmes representatives in 2005 even more important:

- The messages from the Berlin Communiqué of Ministers 2003 and the Salzburg seminar “Doctoral Programmes for the European Knowledge Society” (3-5 February 2005) will have a significant impact on medical schools and schools of public health. The new

recommendations have been created for the Ministers' meeting in Bergen 2005. It is reasonable to assume that the Bergen Conference is going to propose the PhD programmes, a third cycle of higher education, as a necessary step in the process of the attainment of doctoral degree. Eventually, the doctoral degree will be a prerequisite for academic and scientific career in all countries of the European Union, those seeking the membership, and those trying to have comparable system of high education.

- Despite of the educational diversity in Europe, some mutual schemes were recognized in Salzburg. At the First European conference on harmonisation of PhD programmes in biomedicine and health sciences in Zagreb it was clearly stated that in the process of the doctoral degree attainment the emphasis must be placed on the advancement of scientific research.
- The increased number of doctoral candidates is expected, which might lead to the advancement of science all across the Europe. On the other hand, if the implementation of PhD programmes and studies is not meaningfully organized and funded, the number and the quality of the programmes will go down. This situation may perpetuate the status quo, or even worse, it can lead towards the lowering of the existing criteria. Consequently, these negative effects may lower the critical mass of good quality scientists.
- Establishing of PhD programmes as mandatory third cycle of higher education in all fields of medicine and medical specialisations is a new task for our universities, quite different from some voluntary PhD programmes and international networks seeking for scientific excellence in some very narrow fields. Now, starting from the need of necessary reproduction of academic staff at our universities, we have to make quality programmes in all fields of medicine and medical specialisations. The need for such broad programme (or so many different programmes) may lead to a lack of the knowledgeable experts and supervisors in some European countries, particularly in some medical fields. Greater cooperation among PhD programmes through the formation of wide international networks all across Europe might be one of the solutions.
- The important aim of the Conference is to gather in one place the representatives of European universities participating in PhD programmes in biomedicine and health sciences, who can give an insight into their own experiences and the experiences of their countries, as well as try to propose the best way of mutual harmonisation, and creation or transformation of PhD programmes into "third circle of "Bologna process". Even if the only one outcome would be the extended publication of PhD programmes in Europe, and some general recommendations based on first Zagreb Conference and Salzburg seminar it would still be an important guideline for many universities in creating or reshaping their PhD programmes. Additionally, the proposal of certain recommendations and start of the initiatives for mutual cooperation might be reached and would represent a significant achievement. With more ambitions, timing of the Conference between Salzburg Seminar (January 2005) and Ministers' meeting in Bergen (May 19-20, 2005) allows us to send our suggestions to Bergen Conference where important decisions will take place.
- The aims and objectives of the Second European conference on harmonisation of PhD programmes in biomedicine and health sciences are very much similar to that of the First conference and could be seen as their upgrade after Zagreb Declaration and Salzburg Recommendations: analysis of the obstacles and recommendations for quality improvement of PhD programmes. Thus essential topics are: PhD programmes in biomedicine and health sciences in front of challenges of Bologna process. How to develop quality programmes in each field within European medicine and health sciences? Enabling mobility through networking. Establishing minimal quality criteria for PhD thesis, supervisors and PhD programmes. In short it is expected that a document "*Guidelines for Organisation of PhD Programmes in Biomedicine and Health Sciences*" will be accepted by the Conference.

PRELIMINARY PROGRAM

In general, Conference will work in sessions, chaired by several members of Scientific and Organising Committee. Committee will prepare written Conference proposals for discussion. We believe that the exchange of experiences and ideas and the discussion with the invited lecturers will lead us towards the following consensus documents:

1. Guidelines for the Organisation of PhD Programmes in Biomedicine and Health Sciences
2. Letter to the Bergen Ministers Conference
3. Proposal on future activities

FRIDAY, April 22, 2004

University of Zagreb Medical School

15.00 – 16.00 REGISTRATION

Čačković Hall at University of Zagreb Medical School

OPENING CEREMONY AND KEYNOTE LECTURE

Chair: Professor Helena Jasna Mencer, Professor Nada Čikeš and Professor Zdravko Lacković

16.00 – 16.30 **Opening ceremony**

16.30 – 17.15 *Professor Arthur Mettinger:*
The Bologna process from the basic idea to the “third cycle”

17.15 – 18.15 **Welcome cocktail**

Komedija Theatre, Kaptol 9

20.00 – **Chicago Musical (Komedija Theatre)**

SATURDAY, April 23, 2005

University of Zagreb Medical School

9.00 – 9.30 REGISTRATION

Čačković Hall at University of Zagreb Medical School

INTRODUCTION

Chair: Professor Petr Hach, Professor Osman Sinanović and Professor Hans Joachim Seitz

9.30 – 10.00 *Professor Zdravko Lacković on behalf of the Scientific and Organising Committee:*
Resumé of the First Conference and the aims of the Second Conference on harmonisation of PhD programmes in biomedicine and health sciences

SESSION 1. CHALLENGES OF THE BOLOGNA PROCESS

Chair: Professor László Vécsei, Professor Seppo Meri and Professor Jadranka Božikov

10.00 – 10.30 *Professor Jadwiga Mirecka:*
Where is medicine within the Bologna Process?

- 10.30 – 11.00 *Dr Vincenzo Costigliola and Professor Colette Creusy:*
DEBOMED: the impact of the Bologna process on medical schools
- 11.00 – 11.15 *Professor Vitaliy Fedorovych Moskalenko and Professor Olesya Hulchiy:*
International cooperation in the context of Bologna process: new aims and content
- 11.15 – 11.30 *Professor Katja Breskvar and Professor Vito Starc:*
The EUA project on doctoral programmes (Network 4): The impact on Restructuring of Doctoral Programme Biomedicine at University of Ljubljana
- 11.30 – 12.00 Coffee break
- 12.00 – 12.30 *Professor David Gordon:*
PhD Programmes in UK and the challenges of the Bologna Process
- 12.30 – 12.45 *Professor Nada Čikeš:*
PhD Programmes in Croatia and the challenges of the Bologna Process
- 12.45 – 13.30 Discussion
- 13.30 – 15.00 Lunch (*University of Zagreb Medical School*)

SESSION 2. ACCREDITATION, NETWORKING AND FUTURE ACTIVITIES

Chair: *Professor David Gordon, Professor Helena Jasna Mencer, Professor Zdravko Lacković and Professor Margarita Barón Maldonado*

- 15.00 – 15.30 *Professor Luka Kovačić and Professor Charles Normand:*
Accreditation experience of ASPHER
- 15.30 – 16.00 *Dr. Cees C. Leibbrandt:*
Accreditation experience of UEMS
- 16.00 – 17.00 Discussion on future activities

Restaurant Kaptolska klet, Kaptol 5

- 20.00 – 23.00 Dinner given by Dean of the Zagreb University Medical School
Professor Nada Čikeš (Restaurant *Kaptolska klet*, dinner with live music *Kraljevi ulice*)

SUNDAY, April 24, 2005

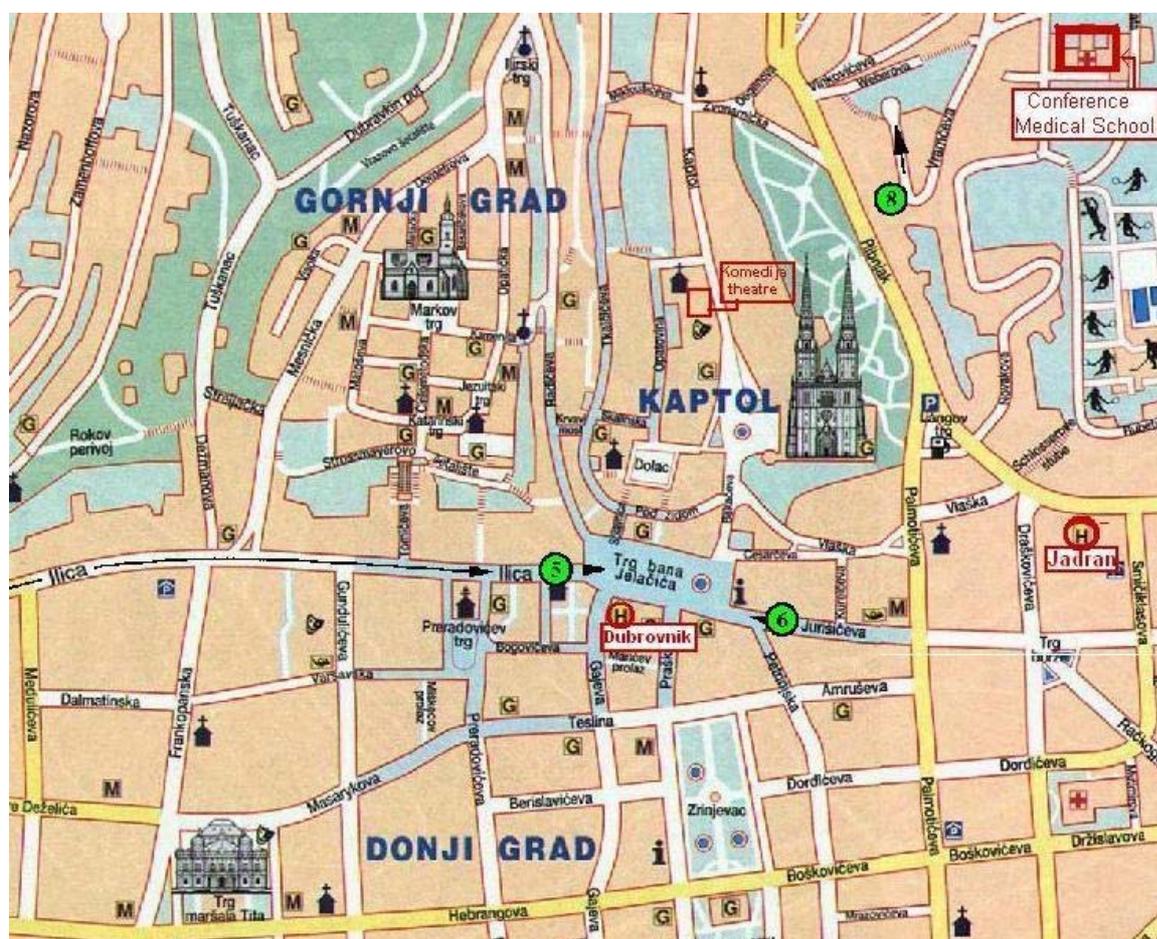
SESSION 3. GUIDELINES FOR ORGANISATION OF PHD PROGRAMMES IN BIOMEDICINE AND HEALTH SCIENCES

Chair: *Professor Irena Miseviciene, Professor Jadranka Božikov, Dr. Vincenzo Costigliola and Professor Luka Kovačić*

- 9.30 – 10.30 Presentation and discussion on Guidelines for the Organisation of PhD Programmes in Biomedicine and Health Sciences
Part I. Criteria for Advisors and Criteria for Institutions (on behalf of the Scientific and Organising Committee the Guideline will be presented by *Professor Irena Miseviciene*)
- 10.30 – 11.00 Coffee break

- 11.00 – 12.00 Presentation and discussion on Guidelines for the Organisation of PhD Programmes in Biomedicine and Health Sciences
Part II. Structure and Organisation of PhD Programme (on behalf of the Scientific and Organising Committee the Guidelines will be presented by *Professor Jadranka Božikov*)
- 12.00 – 12.45 *Professor David Gordon:*
Letter to the Conference of Ministers in Bergen
Discussion and acceptance of the letter
- 12.45 – 13.00 *Professor Zdravko Lacković:*
Conclusions about future activities and closing of the Conference
- 13.00 – 14.00 Lunch (*University of Zagreb Medical School*)

TRANSPORT: Transfer from/to airport on arrival/departure day is organised for all participants who booked the hotels and provided their arrival/departure time to the travel agency O-Tours. Transfer from hotels Dubrovnik and Jadran to the Conference venue (Zagreb University Medical School) and back will be organised every day. All the transfers are provided by O-Tours free of charge.



CONFERENCE FEE: there is no fee for the representatives of European universities, medical schools, research institutes and schools of public health. They are our guests. All registered participants will receive conference material and will be participate in social programme free of charge.

SOCIAL PROGRAMME: Social programme includes: **Welcome cocktail** on Friday 5.15-6.15 p.m., visit to Komedija theatre where **Chicago musical** will be performed on

Friday at 8 p.m. and **Conference dinner** in a restaurant *Kaptolska klet* on Saturday evening at 8 p.m. All the registered participants are kindly invited to participate in social programme sponsored by the Zagreb University Medical School and particularly to be hosted by the Dean, professor Nada Čikeš, at Saturday evening dinner in a relaxing atmosphere with live music performed by the band named *Kraljevi ulice (Kings of the street)*.

Lunches, coffees and refreshments will be served on Saturday and Sunday on the second floor in front of the *Čačković Hall* and are free for all participants.

ASSISTANCE: Miss **Branka Frleta B.A.**, PhD Programme Secretary, will give the assistance and information to participants during the Conference. Internet connection will be available in the computer room.

TRAVEL AND ACCOMODATION: Official travel and accommodation agency:

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INSTRUCTION FOR PREPARATION OF MANUSCRIPT TO BE PUBLISHED IN EXTENSO IN EXTENDED MONOGRAPH: EUROPEAN PHD PROGRAMS IN BIOMEDICINE AND HEALTH SCIENCES

One of the important goals of the Conference is to collect data on what PhD programs in medicine and health sciences currently look like in Europe. We think that extended, more comprehensive publication with some introductory articles by our invited speakers might contribute to harmonization and development of these programs. It is thus very important to collect such data from as many European universities as possible. We kindly ask even those universities which will not be able to attend the conference to send us manuscripts about their programs. In return all first authors and all institutions will receive one copy of a monograph free of charge.

Preparing the manuscript please follow rules outlined bellow.

All manuscripts should be sent as attachment to the e-mail address of the Conference Secretary: Professor Jadranka Božikov: jbozikov@snz.hr.

To have a monograph printed at the time of the conference all manuscripts must be received before April 20th.

Manuscripts should be written using most common fonts like Times New Roman. If you want to use figures and pictures please incorporate them in the text in .jpg or .gif format. They will be reproduced in black and white.

Try to organize the manuscript as follows.

TITLE:

Name, surname, titles and academic function of all authors.

Address.

Text

References (if you use them please use Vancouver rules, yr;vol: pp). We recommend that all manuscript be prepared in UK English.

Writing the manuscript please try to answer the questions outlined bellow:

1. Do you already have a PhD program at your Medical School, School of Public Health or Research Institute?
2. If the answer to the question above is yes, does it cover only a certain, more or less narrow field (i.e. neuroscience, public health etc)? If you have more than a one programme please provide a list.
3. Please provide a web address of your PhD programme (regardless of the languages in which it is written).
4. How many PhD students (PhD candidates) do you have in your programme
5. How many PhD students do you enrol per year? In case when a PhD programmes is not mandatory what is the substitute for it in a scientific/academic career: habilitation (please give us a short description), published papers (is it a quantitative criterion), experience (is it quantitative), something else?
6. How is your PhD programme organized: (a) as a research under the guidance of a supervisor only or (b) as a combination of research and organized courses?
7. If your answer to the previous question was (b): is the study divided into the fields (disciplines), are the students allowed to choose courses regardless of disciplines, duration of the PhD study (years).

8. Is there an intermediate degree (for example Master of Science, licentiate) before or during attaining the PhD and, if so, state the name of the degree
9. The conditions for enrolment into the PhD study: MD degree only or other degrees (which?). What is the required grade point average; is a supervisor required?
10. The conditions for the approval of PhD dissertation: the number of accumulated credits, the number of published papers, other.
11. Are foreign experts involved in the evaluation of PhD dissertation? How often?
12. The appearance of the PhD dissertation: does it contain published papers or not
13. Is the attainment of the PhD degree a prerequisite for academic career (for being recognized as an assistant/ associate professor or equivalent)?

A much broader overview of the PhD programmes will be welcomed because certain countries or regions may have specific procedures for obtaining a PhD degree, independently from the questions mentioned above (for example, the Baltic countries traditionally have a credit system different from the ECTS).

Manuscript should not exceed 4-5 pages (single spacing, font 10, Times New Roman).



SECOND EUROPEAN CONFERENCE ON HARMONISATION OF PhD PROGRAMMES IN BIOMEDICINE AND HEALTH SCIENCES

University of Zagreb – Medical School, Zagreb, Croatia, April 22 - 24, 2005

GUIDELINES FOR ORGANISATION OF PHD PROGRAMMES IN BIOMEDICINE AND HEALTH SCIENCES

Foreword

This document is based on:

1. The Declaration of the European Conference on Harmonisation of PhD Programmes in Biomedicine and Health Sciences, that was adopted in Zagreb on April 25, 2004. The participants of the Zagreb Conference, who were representatives of 25 universities from 16 European countries, have agreed on the important issues concerning the obtaining of the PhD degree in Biomedicine and Health Sciences.
2. Conclusions and recommendation of the Bologna seminar on «Doctoral Programmes for the European Knowledge Society» held in Salzburg, 3-5 February 2005, Berlin Communiqué and other main documents of the Bologna Process
3. Irish and British National guidelines on PhD programmes
4. Contributions published in the proceedings of the first and second Zagreb Conference on Harmonisation of PhD Programmes in Biomedicine and Health Sciences i.e. experiences of other countries.

After extensive discussion and exchange of ideas and experiences among participants coming from 33 universities and from 21 European countries having different schemes for obtaining the PhD degree in biomedicine and health sciences regarding both, form and the way of evaluation, ranging from monograph and evaluation within the same university to high standards of PhD thesis containing four or more papers published in internationally recognized peer reviewed journals, often with high impact factor and the inclusion of evaluators from abroad, the participants of the Second European Conference on Harmonisation of PhD Programmes in Biomedicine and Health Sciences (hereafter referred to as the «Zagreb Conference») have agreed on the following:

Introduction

European higher education is facing the challenges of implementation of the Bologna principles. Within the European Union and among other signatories of the Bologna process, mobility of students and staff should be ensured. In addition, higher education institutions should foster diverse but compatible curricula.

The idea of a two-cycled structure (bachelor and master) and ECTS as a measure of the workload has enabled international and inter-institutional mobility with current results demonstrating over a million students participating in exchange programmes.

In contrast to the undergraduate and graduate education, serious discussions on PhD programme as a third cycle started only two years ago.

The Bologna seminar, held in February 2005, in Salzburg, was the first one which brought together representatives from European universities with the aim to primarily exchange ideas and views on doctoral education and it is expected that similar discussions will be continued at the Ministers' conference in Bergen, in May 2005.

In Salzburg it was agreed that doctoral programmes should be tailored to include training (advanced learning) and scientific research and their interaction.

The participants of the first Conference on Harmonisation of the PhD Programmes in Biomedicine and Health Sciences held in Zagreb in 2004 agreed on the necessity of firm scientific standards for obtaining a PhD degree. The Zagreb Declaration represents a reached consensus on what a PhD thesis should be (equivalent of at least three *in extenso*, paper in internationally recognized journals) and the agreed proposal for the countries which had achieved such standards to continue with them, and those with less advanced criteria to strive towards achieving this goal.

As already accepted by the Zagreb Declaration, the *PhD programme is intended to enable individuals, after completing and defending their PhD thesis, to carry out independent, original and scientifically significant research and to critically evaluate the work done by others.* To ensure the above, the participants of the Second Zagreb Conference reached a consensus about the general principles of good practice in organising PhD programmes, from admission criteria, organisation of the study, and role of the PhD candidate, adviser and university.

Admission criteria

Universities have autonomy and authority in the organisation of PhD programmes, research training and have the right to select PhD applicants on the basis of a competitive (internationally) open process. This process must be fair and transparent.

The basic principles of admission criteria for enrolment of students into PhD programmes are that each candidate having a Master's degree, MD, or an equivalent degree will be able to carry out original, independent and good quality research (i.e. carry out the research leading toward PhD thesis as described in Zagreb Declaration) and to complete a dissertation in a given time period.

In order to have realistic expectations that each candidate has a potential and conditions to achieve this goal, several requirements regarding (i) the abilities of candidate, (ii) his or her mentor/adviser and (iii) setting in which the research will be done, need to be fulfilled. At the admission the PhD candidate should demonstrate proven competence (or at least a high motivation in scientific research) is probably the most important criteria.

Arrangements for supervision and assessment should be based on transparent contractual framework of shared responsibilities between PhD candidate, mentor/advisor and the institution.

Criteria for the Advisers

Critical selection of advisers is probably the most important and difficult task that must be done by the university.

1. Advisers should have a PhD or the highest required degree, be an active scholar and preferably a research project leader with good records of achievement i.e. publications and citations in internationally indexed peer-reviewed journals.
2. Advisers must be able to stimulate, collaborate and follow up the candidate's research and scientific activities including publication of research results required for achievement of the PhD degree. Therefore one person can be an adviser only to a limited number of PhD candidates.

Criteria for the Institution/University

In addition to competent adviser(s) who are specialist(s) in the field of research, the support of other professionals/experts and availability of settings, rules, procedures and expertise must be ensured to enable the candidate to complete successfully each particular task and phase of work within the expected time period. Adequate level of funding and support facilities (such as computer, library and laboratory services) must be ensured.

Structure and Organization of PhD Programme

The PhD programme is intended to enable individuals, after completing and defending their PhD thesis, to carry out independent, original and scientifically significant research and to critically evaluate the work done by others (definition given in Article 1 of the Zagreb Declaration). To achieve that goal, the PhD programme should be comprised of two major parts:

1. Organised education: acquisition of generic skills, specific technical skills and critical knowledge necessary for understanding the scientific process through courses which occupy no more than 20% of the candidate workload. Organised education might include field-related courses.
2. Original research done by the candidate (Criteria defined in Zagreb Declaration).

The recommendations of the Salzburg meeting indicate that the PhD candidates might be full time students (candidates) and part time students (candidates). Especially in clinical medicine it might be expected that most of the PhD candidates will be part time students. In line with that, the PhD programmes should be organized in a non-rigid way to allow the research work of the candidate or his/her attendance to be stopped and resumed when possible. However, the candidate should be aware of a possible risk of losing priority or even actuality in scientific discovery. In this sense

expectations of candidate and adviser and/or project leader should be cleared at the beginning of the candidate's programme.

In line with the high requirements for a PhD thesis, no university should enrol more PhD students than it can provide with adequate services. Especially for smaller universities, but in some fields of biomedicine and health sciences even for some larger universities establishment of a network with other universities might be the only way to establish and maintain high standards in all fields. Ideally the doors of all European universities i.e. laboratories, research facilities, and advisers should be open to all young scientists as much as possible. In line with that goal:

It is recommended to national and international authorities create specific funds which would specifically facilitate the mobility and co-operation in the PhD programmes.

It is recommended that all European medical schools and schools of public health create a pan-European network to enable the mobility of the candidates.

Joint advisership should be encouraged. Possible local regulations, which restrict scientists from other countries to be acknowledged as advisers, should be abandoned.

In line with the need for international cooperation, all universities should allow the presentation of the PhD thesis not only in national languages but also in other European languages understood by most participants in such public presentations.

The PhD candidates (Students)

The PhD programmes participants, i.e. PhD candidates (term put in use by EURODOC), in contrast to a bachelor and master level students, are not only recipients of the knowledge which has been discovered and synthesised by others, but are also active contributors to the generation of new knowledge. Their status should be established accordingly.

It is a goal that the PhD candidates should be employed with full benefits including social security, health insurance and salary for their scientifically useful work.

All PhD candidates at the same University should have equal opportunities to complete the PhD programme and to develop their research talent.



SECOND EUROPEAN CONFERENCE ON HARMONISATION OF PhD PROGRAMMES IN BIOMEDICINE AND HEALTH SCIENCES

University of Zagreb – Medical School, Zagreb, Croatia, April 22 - 24, 2005

May 2nd, 2005

TO THE MINISTERS RESPONSIBLE FOR HIGHER EDUCATION ATTENDING MINISTERIAL CONFERENCE IN BERGEN 19-20 MAY 2005

The Second European Conference on Harmonisation of PhD programmes in Biomedicine and Health Sciences was held in Zagreb on 22 – 24. This Conference was attended by high-level representatives from the medical faculties of 33 universities from 21 countries, as well as the representatives of four major pan-European bodies concerned with issues relating to academic biomedicine and health sciences. It followed the First Conference, held in April 2004, the outcome of which was the Zagreb Declaration, attached to this paper.

The Conference warmly endorsed the principles underlying the Bologna Declaration and successor documents: the development of increased collaboration, enhanced mobility and common practices and standards, with the objective of creating a Europe-wide higher education area, to the benefit of students, as well as the people and the economy of Europe. In biomedicine and health sciences, the benefits to the economy, to the development of science and education, and in improved health-care are likely to be high.

The Conference also agreed that development of high quality PhD programmes, and the setting of uniform criteria for PhD degrees in Europe, as the Third Degree Cycle within the Bologna framework, is essential. Much of the work of the Conference was devoted to the essential academic procedures and developments to promote this object.

The covering letter from the participants in the Conference draws to the attention of Ministers the salient outcomes of the Conference.

One outcome was a consensus on the need for funding to develop both existing and new programmes, including in the development of national and Europe-wide systems of validation and accreditation of programmes.

Another outcome was the need for further agreement on the common features of the Third (PhD) Cycle within the Bologna Area. Many of these common features are academic ones (matters such as examination requirements, publication in academic journals, mentoring of doctoral students, and the like), and, as such, not the immediate concern of Ministers. Political agreement is required on the minimum requirements of PhD programmes, and on the range of duration that is acceptable.

The Conference also noted two additional matters which, while not directly part of the discussion relating to the working of the Third Cycle, are highly relevant in PhD programmes in biomedicine.

Many PhD candidates in biomedicine will have a qualification in a clinical discipline, particularly in medicine, and will need to complete postgraduate training in their discipline before, during or after completing the PhD programme. It is not simple to combine research training (the PhD) and higher clinical training, and in order to enhance Europe's performance the Conference believes that it is highly desirable for the management and content of higher clinical training in health-care disciplines to be closely linked to the relevant university departments.

Second, while the Conference welcomed the opportunities afforded to medicine (in particular) and to biomedicine (in general) in Europe by the proposals for the Third Cycle, and (as noted above) warmly endorsed the principles underlying the Bologna Declaration, it noted that the proposals that all subjects in universities be studied in two distinct cycles (Bachelor and Master degrees) cannot apply to medicine and some of the related subjects, such as dentistry and veterinary medicine. Modern educational practice is for medicine to be taught as a coherent programme extending normally over six years: to attempt to break this into two separate cycles is not practicable or educationally desirable, and in any event such an attempt could conflict with the requirements in law set out in EC directive 93/16/CEE, which requires (*inter alia*) that the medical course consist of at least six years and 5,500 hours of instruction.

On the behalf of the participants of
the Second European Conference on the Harmonisation of
PhD programmes in Biomedicine and Health Sciences



Professor Zdravko Lacković, MD, PhD
President of Scientific & Organising Committee and
ORPHEUS – **OR**ganisation of **PhD** Education in Biomedicine and Health Sciences in the
EUropean **S**ystem (association in the process of initiation)



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SECOND EUROPEAN CONFERENCE ON HARMONISATION OF PhD PROGRAMMES IN BIOMEDICINE AND HEALTH SCIENCES

University of Zagreb – Medical School, Zagreb, Croatia, April 22 - 24, 2005

May 2nd, 2005

TO THE MINISTERS RESPONSIBLE FOR HIGHER EDUCATION ATTENDING BERGEN CONFERENCE (19-20 MAY 2005)

This letter is addressed to Ministers attending the Bergen Conference, from the participants in the Second European Conference on the Harmonisation of PhD programmes in Biomedicine and Health Sciences, held in Zagreb on 22 – 24 April 2005. The background to, and membership of, the Conference are set out in the Annex.

This letter draws to the attention of Ministers those matters which, in the opinion of the Conference, require support and action at the level of National Governments and the European Union.

First, it is essential that the need for enhancement of PhD programmes in biomedicine and health sciences be recognised.

Second, government and EU funds – a new EU programme - are required to develop both existing and new programmes, including the development of national and Europe-wide systems of validation and accreditation of programmes. Priority areas for support include collaborative programmes, programmes that are in hitherto neglected areas of biomedicine, or areas showing particular scientific or clinical promise.

In relation to almost all other Europe-wide activities that require funding, the sums of money needed to support this recommendation are relatively modest. The likely ratio of benefit to cost is high: the risks to the future of health-care of failing to provide adequate support are also high, and the political cost of failure in this area should be a matter of concern to Ministers.

Third, there needs to be agreement on the minimum requirements of PhD programmes, and on the range of duration that is acceptable. This Conference commends the recommendations of the Salzburg Conference of February 2005 on this point.

The Conference also believes that Ministers should explicitly support the principle that universities continue to have the right to select PhD applicants on the basis of a competitive open process, which must be accessible internationally. Ministers must acknowledge the autonomy and authority of universities in academic matters relating to PhD degrees.



Professor Zdravko Lacković, MD, PhD President of Scientific & Organising Committee
and
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EUropean System (association in the process of initiation)



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INTRODUCTION

Professor Zdravko Lacković, MD, PhD.

*President of Scientific and Organising Committee of the Second European
Conference on Harmonisation of PhD Programmes in Medicine and Health Sciences
PhD Program Director and Deputy Dean for Postgraduate Education
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*Doctoral programmes should seek to achieve critical mass and should draw
on different types of innovative practice being introduced in universities
across Europe, bearing in mind that different solutions may be appropriate to
different contexts and in particular across larger and smaller European
countries (Salzburg Bologna seminar, February 2005).*

Uniting Europe and forming of the European Union has resulted in the need for harmonization of the higher education. The process has begun with the meeting of Rectors in 1988 at the University in Bologna, one of the oldest universities in Europe, who have reached a mutual understanding regarding the European higher education with the document called the Magna Charta. Universitatum. The next year, a ministerial conference was called at which the Bologna Declaration was brought, which aims at harmonizing the European higher education and should provide certain basic principles of the EU, such as free movement of people, goods and services, as well as free movement of students and teachers. In this sense, the ministers have agreed on harmonizing comparable degrees and implementation of the diploma supplement as well as on introducing the European Credit Transfer System (ECTS) as a measure for workload, which is needed for achieving certain educational input. The Bologna Declaration was signed by more and more European countries no matter whether they were an integral part of the EU or not. (Details about “Bologna process” can be found together with materials of most recent Berlin conference 2003 on following web address <http://www.bologna-berlin2003.de>.) Croatia has also signed it and we are expecting to achieve great changes in our education system, which are well underway at the moment.

*Table 1. The usual scheme of higher education in the way which “Bologna process”
is perceived*

Type of Study	Duration	Title
Undergraduate Study	3-4 years	Bachelor
Graduate Study	+ 1-2 years (total 5-6 years total)	Master
Postgraduate Study	+3-4 years (total 8-10 years)	PhD

Table 2. Specificity of medicine

Type of Study	Duration	Title
Undergraduate Study Graduate Study	Not universally accepted 5-7 years	Bachelor MD
Postgraduate Studies PhD program Specialisation	+3-4 years (total 9-12 years) + 4-6 years (total 10-12 years)	PhD Specialist

The scheme of comparable university degrees: Bachelor of Arts (BA), Master and PhD are presented in the above table. By finishing undergraduate study, the duration of which is usually 3 to 4 years, one achieves BA degree, with the additional 2-3 years, one is awarded the degree of Master of Arts or Master of Sciences (MA/MS), and usually with another 3-4 years one obtains their PhD, traditionally in many countries called Doctor of Sciences (D.Sc.) degree. However, in former USSR, today in Russia and some other countries D.Sc. is a higher degree than PhD, awarded by academy of science or government bodies, usually at the end of academic carrier. Medical studies and public health studies have certain specific characteristics that make them difficult to adjust to the general scheme of university degrees. Firstly, the study of medicine has a cumulative character and regardless of the fact that we have tried to implement the horizontal and vertical integration of lectures; one can not attend surgery courses until one has already passed the anatomy course.

For this reason division within Bachelor and Master Degree in medicine is introduced only in few universities at the moment, while others are waiting to see the results. In most European countries the study of medicine lasts 5-6 years, with the internship of 1-2 years. By finishing a medical faculty, one acquires the title of MD, which corresponds to Master's Degree in other academic fields of education. Postgraduate study in medicine can be found in most European countries in 2 forms:

1. one is specialization lasting 4 or more years,
2. the other is producing one's PhD thesis which is in many European countries represented by an intermediate degree called "Magisterium of Science" (Mr.sc.), or "Licenciate" in some other countries, for which one needs to produce a scientific thesis. Since it can be obtained after a 5-6 year of the study of medicine, it should not be regarded as the degree called MS (or MA) in the higher education of Europe (in our scheme).

In adapting to the Bologna process, the harmonization resulted in abolishing the above "Magisterium of Science" or "Licenciate" degree, while the degree which one acquires by specialization has not yet been recognized in the general scheme. Should such intermediate degrees be abolished, represents a delicate issue, esp. in the case of public health. Namely, postgraduate studies, which end with an intermediate degree, are generally enrolled by doctors, sociologists and lawyers because of the need for interdisciplinary experts. In countries which have not adapted their educational system to the Bologna process, such postgraduate courses are enrolled by Bachelors of Art as well as Medical Doctors which are equivalent to Master's Degrees. Should such cases be still regarded as postgraduate studies and should we try to make them more adequate by specialization in medicine or should they become Master studies, so that for some this will mean the end of their studies, while other will achieve their second Master's Degree. The problems of PhD studies were discussed in Cordova in 2002 and partially in some other conferences. At Berlin Ministerial meeting in September 2003, doctoral programmes have been included as the 'third cycle' in the Bologna process and constitute the crucial link between European Higher Education (EHE) and Research Areas (ERA). After that in 2004 European University Association (EUA) launched a Socrates funded Doctoral Programmes Project to analyse key issues related to structure and organisation, financing, quality and innovative practice in doctoral programmes. 49 Universities from 25 countries are involved in this project with the aims:

- “to identify essential conditions for successful doctoral programmes across Europe taking account of the changing environment;
- to identify and exchange good practices in various organisational, administrative, educational and qualitative aspects of doctoral programmes;
- to contribute to the enhancement of the universities participating in the project;
- to promote cooperation and mutual learning in the development of joint doctoral programmes at European level.

The project aims to draw together and analyse information and to prepare recommendations targeted at a wide range of groups, principally:

- European universities and other academic institutions training young researchers
- Employers of PhD graduates
- PhD candidates and young post-docs
- Higher education and research policy-makers at national and European levels.

The project will examine in detail following aspects of doctoral programmes through work done in six different networks:

- (1) Structure and organisation of doctoral programmes
- (2) Financing of doctoral programmes
- (3) Quality of doctoral programmes
- (4) Innovative practice for doctoral programmes
- (5) Comparative overview of all these aspects (“control network”)
- (6) Joint doctoral programmes established between different universities (“network of networks”)

(cited from <http://www.eua.be/eua/en/Project%20Objectives.jsp>)

In February 2005 in Salzburg Bologna seminar “Doctoral Programme for the European Knowledge Society” took place. 7. According to preliminary document “From the discussions in Salzburg a consensus emerged on a **set of** ten basic principles as follows:

1. **The core component of doctoral training is the advancement of research knowledge.** At the same time it is recognised that doctoral training must increasingly meet the needs of a wider employment market than academia.
2. **Embedding in institutional strategies and policies:** universities as institutions need to assume responsibility for ensuring that the doctoral programmes and research training they offer are designed to meet new challenges and include appropriate professional career development opportunities.
3. **The importance of diversity:** a rich diversity of doctoral programmes in Europe, based on quality and sound practice, is a strength.
4. **Doctoral candidates as early stage researchers:** should be recognized as professionals who make a key contribution to the creation of new knowledge.
5. **The crucial role of supervision and assessment:** in respect of individual doctoral candidates, arrangements for supervision and assessment should be based on a contractual framework of shared responsibilities between doctoral candidates, supervisors and the institution (and where appropriate including other partners).
6. **Achieving critical mass:** Doctoral programmes should seek to achieve critical mass and should draw on different types of innovative practice being introduced in universities across Europe, bearing in mind that different solutions may be appropriate to different contexts and in particular across larger and smaller European countries.

These range from graduate schools in major universities to regional collaboration between universities.

7. **Duration:** doctoral programmes should operate within an appropriate time duration (three to four years, as a rule).
8. **The promotion of innovative structures:** to meet the challenge of interdisciplinary and generic skills development training
9. **Increasing mobility:** Doctoral programmes should offer mobility and international collaboration within an integrated framework of cooperation between universities and other partners.
10. **Ensuring appropriate funding:** the development of quality doctoral programmes and the successful completion by doctoral candidates requires appropriate funding.

In May 2005 PhD programme (or study), as a “third cycle” of Bologna process in Bergen, is going to be discussed for the first time at the level of Ministers. At the mentioned conferences we have no knowledge that the problems of medicine have been fully stressed and receive the separate place in the discussion.

The first European conference on harmonization of PhD programs in medicine and health sciences was held at the Medical School, University of Zagreb, April 24 -25, 2004. The conference was organized by the PhD study of the University of Zagreb Medical School, with an aim to further international cooperation and to enhance the exchange of mutual experiences.

The PhD program of University of Zagreb Medical School went underway in the academic year 1997/1998 as a master’s degree but was intended from the start to lead to PhD. After Croatia has officially joined the Bologna process promoting greater harmonization among Europe’s diverse system of higher education, the study program has seen a change of name in the academic year 2002/2003 and is now called *Doctoral Study in Biomedicine and Health Sciences*. In the same year *Scientific Work and Higher Education Act* repealed master’s degree, and incorporated some provisions anticipated by our program, which was the first in Croatia to introduce ETCS (European Credit Transfer System)

From the beginning in 1998 we tried to develop the program which would be comparable to the similar programs in more developed countries. Unfortunately our extensive research on the web sites of medical schools in Europe, presented at the conference has shown that very few medical schools have accessible and informative web sites on their PhD programs. What we know so far is that in the field of medicine in Europe there are huge differences. Some countries traditionally do not have PhD studies in medicine (i.e. Germany, Austria) and pressured by the Bologna processes are adopting them. The programs in some countries are being dominated by research, or are consisting only of research. On the other hand, some have a double doctorate PhD and DSc, for instance, Hungary which program without thorough explanation is not easy to understand. Some faculties i.e. Wuerzburg in Germany have adopted the American parallel MD/PhD program which ties study of medicine with a scientific work and ends up with the attainment of both degrees. It is quite obvious that in Europe terms “PhD” and “PhD program” may have very different meanings. Under such circumstances it is a difficult to establish a program which is going to be harmonized with the Bologna process. In Europe there were very few discussion regarding the topic, especially very few in the field of medicine and health. For these reason it was not complicated to gather internationally renowned organizing and scientific committee and to organize European conference.

At the conference named “The Declaration of European Conference on Harmonisation of PhD Programmes in Medicine and Health Sciences” there were participants (mainly the Vice-deans and the PhD program directors) from 25 universities and 15 European countries. There were also representatives from 4 major associations.

- Association of Medical Schools in Europe
- Association of Schools of Public Health in the European Region

- European Medical Association
- Association for Medical Education in Europe

The main conclusions are included in a document shortly called “Zagreb declaration”. The additional conclusion was that a mandate to organize the second conference in order to see what kind of improvements has been accomplished, and to start up discussions on the accreditation of PhD studies at the universities, medical schools and the schools of public health are left up to the members of present scientific and organizing committee along with the members from Bosnia and Herzegovina (Professor Osman Sinović) and Finland (Professor Seppo Meri).

The certain conclusions of the “Zagreb declaration” appear self-explanatory, however, at many universities there might appear almost “revolutionary”:

- For the first time there was an international agreement on what the PhD and PhD program are, apparently, not the beginning of scientific work but neither its “crown”, (such is the case in the specific system in Russia, where the PhD degree is a already proof of the independent and scientific research).
- On international level it was said for the first time that for the procedure of dissertation assessment the same criteria pertain as for the peer review of any scientific paper, project, position, etc. Understandably, to many small and autarkic countries the achievement of such a goal would not be easily accomplished.
- That the published papers must be the most important proof of the successfulness of dissertation and its constitutive part –is the most original conclusion of the conference by which a model traditionally present in the Scandinavian countries, already applied in Hungary and in the numerous countries, is recommended.

Even tough Zagreb declaration relates to the PhD programs in biomedicine and health sciences, it is necessary to notice how the certain concussions pertain to all other areas. This is also the message of the international conference of regional universities held in Žilina (“Professional and social aspects of PhD study”, Slovakia, September 14-16, 2004). Adopting mentioned or similar criteria would result in easing up not only international mobility, as well as in improvement of cooperation in Croatia among similar faculties at our universities. In scientifically small communities like Croatia, where a PhD degree is a prerogative for a scholarly or academic career, regardless of the field, the domestic and international cooperation are the only way of to improve the quality PhD programs. According to Zagreb declaration the PhD degree should be the first proof of capability to do independent and relevant research and if such a goal would be achieved, the overall performance of science in less developed countries could be improved.

PhD programs in medicine in Europe can reflect the fact that one can know very little about them, which is to say that it is difficult too obtain data on them. In one of the following texts prepared for Zagreb Conference in 2004, two PhD students from Croatia and the Czech Republic have analyzed the Internet pages of 88 European universities and have found a small number of those to be sufficiently informative. Obviously, a detailed survey is necessary for final conclusion.

If one analyzes PhD studies in Europe by analyzing web pages or polls we have made prior to the first Zagreb’s Conference, we can see that there are three modalities:

1. The countries where PhD program in the field of medicine does not exist. Germany is probably the best known example where PhD thesis are replaced by habilitation (usually with very high criteria);
2. The programs of other countries are being dominated by research or are consisting only of research;
3. The third are dominated by different forms of advanced learning, e.g. where one has to have one’s scientific papers published to the programs where certain forms of advanced learning dominate and where successful scientific research is not of such

great importance. That this is the case we can see in the PhD theses which are published in small numbers are not much read either. Elements of such PhD programs could be traced in the past in Croatia as well as in other countries of the former Yugoslavia. PhD studies consisted of the above intermediate degrees and were followed by the bulk of lessons composed of several hundred hours and would usually end with producing a Master of Science Thesis. After that, scientific research would continue and end with PhD thesis.

In the extensive development of science at certain universities in the former Yugoslavia, and Zagreb is no exception, a significant number of doctors who have obtained their PhD in medicine and public health have been promoted while publishing not one single scientific research paper. In many countries, there is an issue concerning whether the PhD is the beginning of scientific career or its crown. In some countries, e.g. Hungary, there are PhD programs parallel to serious criteria as well as Doctor of Science (D.Sc.) which is a crown in one's academic career, and is discussed publicly in the Hungarian Academy of Science and Art. If internationally recognized research should be the basis, how is one to organize good PhD programs in countries with a "small scientific community" (and a small scientific output)? Probably no country in Europe can meet the highest standards in all fields of current medical research on its own. Following formally Bologna requirements, is there a danger to create a much diversified output? Is there a proper solution to these problems? Is it possible to reach a consensus on what exactly a PhD program should be, or perhaps even to offer certain recommendations for basic organizational and scientific requirements? 2004 Conference in Zagreb achieved exactly that (see "Zagreb Declaration" in these Proceedings).

The solution to some of the above mentioned problems could be achieved by creating a regional i.e. international network(s) which would enable an increased fluctuation of students and academic staff, the exchange of new achievements and a wider range of subjects. Along with an improvement of quality, the aim of international cooperation is the broadening of contents, in order to be as close as possible to the dissertation topic of each individual attendant of the doctoral study. Therefore, this kind of network(s) represents an indispensable way of cooperation. Is it possible to reach a consensus about that? Let us at least start such discussion in 2005 Conference.

Along with the difficulties of adapting to the Bologna Process and different awareness that we all have of the PhD program and of its organization, one can probably not achieve much at a two-day conference, but it is possible for the first time in one place to discuss the differences regarding our PhD programs as well as to see if we can reach consensus on certain basic issues. The Medical School in Zagreb would like to further its PhD studies and for this reason has felt a need to discuss the issue with others. We have already discussed it in 2003 in Prague, at the AMSE Annual Conference and saw that others were also troubled by the same issues. With more than 50 participants from 26 Universities coming from 15 European countries, the University of Zagreb Medical Faculty had the honour of tackling the beginning of the discussion on European PhD programs in medicine and public health. With a Second European Conference on Harmonization of PhD programs in Biomedicine and Health Sciences let us Continue this Effort and let us find the basic principles in organization of PhD programmes which will provide at least a guarantee that European standards written in "Zagreb Declaration" will have a real chance to become reality which will improve science and practice in European biomedicine and health sciences.

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Accreditation and mutual recognition of medical diplomas in the European Union and beyond

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Key words: Mutual recognition of diplomas in Europe
Harmonisation of quality of training in Europe
Quality of medical practice

Treaty of Rome:

In 1957 France, Italy, Germany and the BENELUX countries signed the Treaty of Rome. In this Treaty the participating countries agreed to establish a common market with free exchange of merchandise, capital, people and services. In article 57, which specifically mentions the medical professions, the mutual recognition of diplomas is announced. The Medical Directive, which actually is an implementation order, was issued only in 1975, but since that time legal mutual recognition of diplomas between the countries of the European Union and associated countries (Norway, Iceland, Liechtenstein and Switzerland) is a fact. The Directive (present designation 1993/16/EC with amendments) only relates to citizens of one of these countries and to diplomas that have been obtained in these countries. In all other cases national regulations of the host country prevail.

The Medical Directive is one of several sectoral directives, valid for specific professions. In many other cases the general directives apply. In the general system exchange of diplomas is regulated with quality control by the host country.

The Medical Directive:

The Medical Directive falls within the remit of the Directorate Internal Market. This signifies that the primary objective of the Directive is the free exchange of people and services. However, mutual recognition of diplomas also implies harmonization of the quality of training. This was the reason that already in 1958 the national associations of medical specialists founded the Union Européenne des Médecins Spécialistes (UEMS), an umbrella organisation of the national associations, structured with sections for the separate specialties. The UEMS together with its Specialist Sections has been formulating recommendations for the European Commission in the field of quality of medical specialist practice ever since. These recommendations were channelled by way of the statutory Advisory Committee on Medical Training (ACMT) of the EU Directorate Internal Market. This committee consisted of delegates of the profession, the universities and the Ministries of Health of the EU member states.

Right from the start the European Commission and the medical profession have had different views on the Medical Directive. The Commission views the Directive as a tool for free exchange, the medical profession wanted to use the Directive as a tool in quality policy. This relates to paragraph 3 of article 57 of the Treaty of Rome, which postulates that the gradual raising of limitations of exchange will be dependent on coordination of the requirements for exercise of the professions in the separate member states.

In the Directive this can be found back in the minimum duration of training. These minimum durations have been determined in 1975, partly following the professional recommendations. These minima are low; nevertheless on national level these requirements are not being met in

all instances. It should be noted that member states are free to require longer training duration on national level.

In 2001 the European Union Directorate Internal Market proposed changes and simplification of the system of the Sectoral Directives. The system of Advisory Committees has been unwieldy and mostly ineffective in the past. However, no contribution to quality of training and practice was made in the proposal of the Commission. The proposal has subsequently been rejected by the European Parliament. Presently a new proposal is being developed.

The professional advisory process:

Throughout the years the UEMS has advocated updating of these minimum training durations. Together with the Specialist Sections the UEMS issued in 1996 a report with the professional recommendations on this issue. These were taken over to a considerable extent in the 4th Report and Recommendations of the European Union Advisory Committee on Medical Training (ACMT) in 1996 (the Salvatore report) and also in the draft 5th Report and Recommendations in 2001 (the Twomey report).

Unfortunately the recommendations of the ACMT are not being implemented in the Directive. This is being blocked by the Council of Ministers (Internal Market, the ministers of economic affairs). The Council of Ministers takes decisions on the basis of consensus. Due to economic considerations it appears not to be possible to reach consensus. The European Commission is not concerned; it takes the view that the medical profession is well enough organised to implement quality policy on European level on its own. The ACMT has been suspended in fact by withdrawal of the budget of the committee.

A new development is the increasing weight of the Committee of Senior Officials Public Health (CSOPH). This is also a statutory Committee of the Directorate Internal Market with participation by delegates of the national Ministries of Health. The profession is not represented in this committee. The CSOPH has obtained the qualification to update the lists of national recognition of specialties in the Directive. This is much quicker and more effective than the procedure with approval by the Council of Ministers. However, updating of training durations and adding new specialties remains the remit of the Council of Ministers (Internal Market).

European Court of Justice:

Another new development is the growing influence of the European Court of Justice in Luxembourg. Colleagues have complained before the ECJ because of refusal of recognition of their diplomas by host countries in the EU in the case of migration. The ECJ takes the position that the Treaty of Rome prevails and that the implementation orders, the Directives, have to be interpreted in a broad sense. This has led to favourable verdicts of the ECJ for colleagues with training not completely within the European Union and for colleagues with diplomas in specialties not recognized in each of the EU member states.

Remarkably soon this has led to an update of the Medical Directive with the amendment 2001/19/EC. In this amendment member states are required in these cases to evaluate training and diploma and to take a motivated decision. This decision can be challenged in Court. The European Court of Justice has the last word. In view of the present position of the ECJ in these matters it can be expected that recognition of diplomas by migrating citizens of the EU will become easier. Future verdicts of the ECJ will clarify this issue.

Directorate Health and Consumer Protection:

Rather new also is the European Union Directorate of Health and Consumer Protection (SANCO). This Directorate is increasingly involved in public health matters in the European Union. Its tasks has been defined (Health Strategy Plan 2000) as follows:

- Improving health information and knowledge
- Responding rapidly to health threats

- Addressing health determinants

The remit of this Directorate is Public Health. It does not consider quality of training and health care to be within its domain. The European Commission adheres to the principle of subsidiarity, which makes quality of training and health care a national responsibility. So this Directorate is not involved in the Medical Directives at all.

References:

Further information is available on the website of the UEMS (Avenue de la Couronne 20, 1050 Brussels): www.uems.net

The text of the Treaties and Directives is available on the website of the Official Journal of the European Union: <http://europa.eu.int/eur-lex/en/index.html>

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EUA Project on Doctoral Programmes (Network 4): The Impact on Restructuring of Doctoral Programme Biomedicine at University of Ljubljana

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University of Ljubljana (UL) was founded as the first Slovenian University in 1919 consisting of five founding member faculties. University has been gradually growing to the present size and complexity. Today UL is a large comprehensive traditional European type and research oriented university consisting of 26 member schools: 22 faculties covering social, natural, technical and medical sciences, 3 art academies and a college for health care. In addition to numerous undergraduate programmes UL traditionally offers postgraduate education in many fields. In the year 2003 UL offered 93 postgraduate study programmes which can be completed either at masters or doctoral levels. At present most doctoral programmes at UL are carried out primarily at member faculties, however, some of the postgraduate study programmes surpass this traditional organization. In 1999 the university senate confirmed the first postgraduate study programme organized at university level. Until today UL has launched three such programmes. All of them are structured in accordance with ECTS and are open to international collaboration. Many foreign experts are involved in the programmes and international exchange of students and professors is stimulated.

In year 2004 EUA launched a Socrates founded Doctoral Programmes Project with the aim to analyse key issues related to structure and organization, financing, quality and innovative practice in doctoral programmes at European universities. A number of European universities were interested in cooperation in the project thus demonstrating their commitment to contribute to this important issue by their experience. University of Ljubljana was selected to cooperate in the discussion on some aspects of good practices and innovative approaches for doctoral programmes- a theme proposed for Network 4 of the project. The group forming Network 4 consisted of representatives of 10 European universities coordinated by Prof. Rune Nilsen from University of Bergen. The group addressed numerous topics such as institutional arrangements, research environments, supervisory arrangements, appropriate funding, international mobility, language issues, interinstitutional partnerships, transferable skills and others. Series of profound discussions of the group on institutional reports and their respective SWOT analyses resulted in identification of some important innovative elements in doctoral studies. As the result of the project several recommendations were formed which were further presented at EUA meetings in Salzburg (February 2005) and in Glasgow (April 2005).

The main contribution of UL to the Network 4 discussion was presentation of several interdisciplinary programmes formed at and coordinated by university. One of them is postgraduate programme BIOMEDICINE which was launched in 1999 as the first postgraduate study programme at UL organized at university level. After running the programme for several years many positive influences on doctoral studies in general can be identified. The programme created stronger links among university departments and formed additional links with other research institutions in Slovenia. The basic aim of this study programme is to offer students postgraduate education in several areas of biomedical science. The programme is interdisciplinary and provides a high level of knowledge in selected fields imparted in the most rational way. It leads to acquisition of the titles of Master of Science and Doctor of Science in seven biomedical scientific fields.

The renovation of university programmes according to the Bologna process is intensively taking place at European universities. Among many other changes it also involves modified structure of doctoral programmes. At UL we have already made some essential decisions concerning the renovation of our doctoral programmes. By preparing the new proposals to the university senate the doctoral committee took into account all the new approaches and good practices and the conclusions of Doctoral Programmes Project. The programme BIOMEDICINE will be transformed into 3 year doctoral programme. Special care will be taken in respecting set of 10 basic principles agreed upon at Salzburg meeting and good practice examples and innovative approaches as identified in the Doctoral Programmes Project-Network 4.

The Current Status of PhD Studies at the Charles University, First Faculty of Medicine in Prague, Czech Republic.

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The post – gradual (scientific) education has a long tradition in Czech Republic (formerly Czechoslovakia). The Soviet model was introduced in 1953 and since that time a systematic post-gradual education has been performed at all universities of our country and at the Academy of Sciences which was given the authority to give rules of post-gradual scientific education and to make decisions of degrees in two – step system (CSc. = Scientiarum Candidatus / Dr.Sc. = Scientiarum Doctor). The changes caused by so called Velvet Revolution in 1989 touched all possible details of academic life and resulted also in basic reorganisation of post-gradual studies. The post-gradual scientific education took over the universities as an integral and the highest part of 3 – step system of university education and the only title – PhD has been introduced. The scientific and research institutions existing outside universities used the possibility to join universities and to create corporate system. The international co-operation became an integral constituent of this new system.

The details of running PhD programs differ from one University to the other, but all of them must be accredited, according to the Czech University Law. There is a great space for effective co-operation among different subjects providing the post-gradual scientific education.

In Prague, the corporate system of PhD studies in Biomedicine (named Post-gradual Doctoral Studies in Biomedicine in abbreviation PDSB) has been created by 4 Faculties of Medicine of the Charles University, Faculty of Sciences, Faculty of Physical Training as well as by the biomedically oriented Institutes of the Academy of Sciences and Research Institutes of Ministry of Health. The students can be enrolled to 18 fields of studies and the Specialists Boards are specifying the details of the curriculum. The enrolment does not prevent the clinical training for obtaining qualification running parallel to the research education.

Fields of Study :

4. Molecular Biology, Genetics and Virology
5. Cell Biology and Pathology
6. Developmental Biology
7. Biochemistry and Pathobiochemistry
8. Human Physiology and Pathophysiology
9. Immunology
10. Medical Microbiology
11. Neurosciences
12. Pharmacology and Toxicology
13. Experimental Surgery
14. Preventive Medicine
15. Biomedical Informatics
16. Gerontology
17. Medical Biophysics
18. Parasitology
19. Psychology – Medical Psychology and Psychopathology
20. Medical Ethics
21. History of Medicine.

All of these fields are evaluated by the Accreditation Commission of the Czech Republic and accredited as an integral part of Czech Educational System (the term of validity of the Accreditation is 6 – 8 years and the re – accreditation is necessary).

Detailed information both in Czech and in English could be found at the web – sites of co-operating Faculties, namely: www.lf1.cuni.cz; www.lf2.cuni.cz; www.lf3.cuni.cz; www.lfp.cuni.cz; www.natur.cuni.cz; or of the Academy of Sciences www.cas.cz.

Students are enrolled in one of participating Faculties even if they are working at Academy or Research Institute and there. We can give only the numbers of our Faculty, the greatest Partner in PDSB.

In this academic year (2004 / 5) 837 students of our Faculty are enrolled in all fields of PDSB. Every year, 180 – 230 students are enrolled.

PhD degree is necessary for academic promotion and for the professional career at Academy of Sciences or Research Institutes. For this reason the candidates are recruiting of all participating Partners of PDSB and also the managements of these institutions supports all the activities combined with PDSB (courses, research projects for young researchers, etc.).

Our PhD programmes are organized in principle as a combination of research and organized courses. For the doktorandi, a wide variety of basic courses organised for the whole system with theoretical or practical (laboratory) bias are available both obligatory (cca 30%) and facultative (cca 70 %). Minimal amount of credits is necessary for successful yearly evaluation. Every student has his own research project and works under guidance of supervisor(s). It is expected that every student will write and publish couple of communications in peer reviewed journals. These communications are necessary for the Thesis.

The studies may be implemented on a full-time or part-time (combined) basis. Full-time course lasts for 3 years as a minimum, part-time (combined) for 4 years as minimum. The studies must not exceed 8 years. The full-time students have the status of students with all juridical and social consequences and for 3 year are given a stipend (regulated by Ministry of Education). The prolongation of one year is possible according to the result of evaluation made by Specialists Board.

There is no intermediate degree before attaining the PhD.

Enrolment is open for any Czech or foreign university graduate (the second step of university degree is necessary – in Czech it means MUDr, MVDr, Mgr. or ing. title). The candidates must pass the enrolment procedure (examination of basic knowledge in the chosen field, evaluation of scientific project prepared in co-operation with the supervisor/s). The language of instruction is Czech (in this case free of charge) or English (the scholar fee is to be paid according to the Faculty rules)

There are two different obligations closing the PhD studies : a) The state doctoral examination in the chosen field (for which a number of credits and the obligatory examinations are necessary) and b) the Thesis compiled on the basis of own published papers. Evaluation of the Thesis by two external referees and the discussion before the Specialists Board is necessary for the successful defence.

The foreign experts are welcome in every step of PhD and they are involved in the evaluation more or less frequently, according to the field.

The attainment of the PhD degree is according to the Czech University Law a prerequisite for academic career (welcome for assistant, obligatory for associated or full professors) and more or less for the professional career in Research Institutes of Ministry of Health and Academy of Sciences (this is why the co-operate with the Charles University in the PDSB - corporate system of PhD studies in Biomedicine).

PhD Programmes at the Faculty of Medicine, Palacký University, Olomouc, Czech Republic

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INTRODUCTION

The doctoral study programme (PhD programme) at our Faculty of Medicine, Palacký University is focused on a scientific research work and independent creative activity within the scientific research and development. Admission to the study programme is conditioned by a due completion of a graduate study programme in medical or natural science branch. The study is offered either in a full-time attendance or in a combined form, and always proceeds according to an individual study plan under the guidance of a supervisor appointed by the Dean of the faculty.

Standard duration of the doctoral study both in full-time and combined forms spans over three years (credit system study). The study programme is duly concluded by a state doctoral exam and by a defence of a thesis proving student's competence and readiness for an unsupervised independent activity within the research a development. Graduates of PhD programmes are conferred an academical degree "Doctor" (in short "Ph.D.", written after the name). The Ph.D. degree is the prerequisite for the academic career.

During the past three years, around 250 students studied in doctoral programmes at the Faculty of Medicine both in full-time and combined forms in each academic year. More than 100 of those students attended theoretical and pre-clinical fields.

For the academic year 2005/2006 the Faculty of Medicine, Palacký University announced a quota of 101 positions for the following PhD programmes:

- *Anatomy, Histology and Embryology*
- *Physiology and Pathological physiology*
- *Gynaecology and Obstetric*
- *Hygiene, Prophylactic medicine and Epidemiology*
- *Surgery*
- *Medical biophysics*
- *Medical biology*
- *Medical pharmacology*
- *Medical genetics*
- *Medical chemistry and biochemistry*
- *Medical immunology*
- *Medical microbiology*
- *Neurology*
- *Otorhinolaryngology and Surgery of the Head and Neck*
- *Pathological anatomy and Forensic medicine*
- *Paediatrics*
- *Psychiatry*
- *Social medicine*

- *Dental medicine*
- *Internal diseases*
- *Depictive methods*

For each domain of PhD programmes at the Faculty of Medicine, Palacký University a Board for the field of study is constituted acting as an expert guarantee for the proper progress and quality of PhD study programmes, and also monitoring and evaluating a standard of the study.

ADMISSION TO DOCTORAL STUDY PROGRAMME

Faculty of Medicine, Palacký University announces at least four months in advance topics of individual doctoral domains, into which applicants will be admitted to the study at the Faculty in the given year, and releases information and conditions for the admission, as well as forms of verification of stated conditions observance.

When applying to the PhD study programme, one has to submit a graduation certificate along with evidence proving his/her professional experience, a list of lectures and published professional works. At this point, the applicant also decides on a field and form of the study and chooses a topic of his/her thesis. The applicant to the PhD programme has to pass an entrance examination in front of the examining board that issues a result report and submits it to the Dean of the Faculty. The Dean then announces the final decision on applicant's admission to the study.

PROGRESS OF STUDY

In the course of study the student fulfils all prescribed duties of his/her study plan, possibly participates in pedagogic activity as well. The individual plan for each student is put together based on the credit system, and is drawn up by the student's supervisor together with the Head of Department, and approved by the Dean. The study plan contains a list of subjects in categories A – compulsory, B – compulsorily facultative, and C – freely facultative / complementary, from which the student of PhD programme must take an examination. Passed exam remains in validity for 5 years.

The study plan also covers lectures, seminars, colloquiums, individual consultations, inland research fellowship and placement abroad and in particular a systematic solution of concrete scientific problem concluded by elaboration and defence of dissertation work. As a part of the study plan, also the topic of thesis is defined, and possibly the student's pedagogic activity as well. The supervisor keeps a record of student's fulfilment of prescribed obligations and periodically performs his/her assessment. At the end of each academic year the student elaborates an annual report on results of his/her professional activity which becomes an integral part of all data for his/her overall assessment. In case of positive assessment the student may enrol for the next academic year.

Credit system

Minimum required number of credits over the whole duration of doctoral study is 180.

Minimum number of credits necessary to move forward to the next academic year is:

1. 40 in fulltime form of study
2. 30 in combined form of study

Category A – compulsory subjects (number of credits)

The student of PhD programme is obliged to complete following subjects:

Basic exam in chosen field (20), Language exam – English, German, Czech (10), Participation in Grant project (15 for the solution), Review article on the topic of his/her study filed (8), Pedagogic experience – one semester and one tutorial (10), State doctoral examination and Thesis (elaboration and defence).

Category B – compulsorily facultative subjects (number of credits)

The student of PhD programme is obliged to pass an examination in the chosen subject (15) and completes the Essential introductory course (2 per seminar – min 8).

Category C – facultative subjects (number of credits)

The student enrolls and completes as many subjects as to accumulate minimum of 180 credits till the end of his/her study.

Seminars of inceptors (5 per seminar), Independent research work (60), Research fellowship – 3 months abroad (15), Original scientific publication – journal with IF (10), Original scientific publication – journal without IF (8), Specialised extension course (10), Lecture on a topic (2), Lecture with an abstract (4), Grant project – Medical Faculty UP (5), Grant project – other (10).

Starting with the forthcoming academic year 2005/2006, the Faculty of Medicine, Palacky University is going to innovate and extend the current PhD programme by introducing a set of module-arranged courses of ‘Common methodical and knowledge-based fundamentals of biomedical sciences’ determined as an Essential introductory course (compulsorily facultative course in category B of the current credit system) and ‘Associated applied disciplines’ as a Specialised extension course (facultative course in category C of the current credit system). This extending programme sets itself a target not only to increase students’ qualification thanks to methodical comprehensiveness of the modules, but also to facilitate for greater flexibility of graduates and easier assertion at the labour market throughout biomedical sciences, particularly within laboratory medicine and related services, as the emphasis is placed especially onto the interdisciplinary nature of the courses.

ESSENTIAL INTRODUCTORY COURSE

The essential introductory course will comprise lectures and interactive seminars in total extent of 39 hours. During this course students will participate in following subject areas classified as the category B – compulsorily facultative subjects.

- *Retrieval of Information from Literature (4 hours)*
- *Research Project and Its Funding (4 hours)*
- *General Rules, Ethics and Science Legislative (4 hours)*
- *Statistics in Biomedicine (5 hours)*
- *Good Clinical Praxis (Clinical studies) (4 hours)*
- *Evidence Based Medicine (4 hours)*
- *Methods in Molecular Biology in Biomedicine (2 + 4 hours)*
- *Stem Cells in Biomedicine (2 hours)*
- *Selected Methods of Experimental Toxicology and Pharmacology (2 hours)*
- *Presentation and Publication of Results (4 hours)*

SPECIALISED EXTENSION COURSE

Teaching of the following facultative subjects of category C will proceed in a form of practical classes with only a few students in each class conducted at individual guaranteeing workplaces in total extent of 32 hours. After the lead-in theoretical stage of the course students under the guidance of experts commence the actual research work, possibly also demonstrations of some more sophisticated techniques. Students solve the assigned task from its experimental phase applying the latest instrumentation and continue through the experiment evaluation process up to its documentation. The course also includes practical lessons of software used for molecular biology, particularly for practically-oriented genomics.

- *Molecular Biology Methods in Biomedicine (13 hours)*
- *Selected Cell Technologies in Biomedicine (4 hours)*
- *Molecular Basis of Disease and Future of Gene Therapy (9 + 2 hours)*

- *Selected Methods of Experimental Toxicology and Pharmacology (4 hours)*

COMPLETION OF STUDY

The study of doctoral programme is completed by passing the state doctoral examination and defending thesis. On the day when the student passes the state doctoral examination and defences thesis, he/she becomes the graduate of PhD study programme.

State doctoral examination

The state doctoral examination is held in front of the examining board that also assesses the accomplished examination. Subject topics of doctoral state examination (max 5) are defined by the Dean of the Faculty. The student approaches the state doctoral examination only after passing the exams in all prescribed subjects, in a world language and the introductory course. At the time of state doctoral examination all prescribed exams must be valid.

Thesis

The student's thesis is a result of concrete scientific task solution and it must contain all original and published results. The actual content of the thesis and its form follow the same rules as standard publications of scientific results within the given field and requirements of the board for the filed of study.

Defence of thesis

The student of doctoral study programme asks the Dean of the Faculty for the permission to defend his/her thesis. Along with the application the student submits all prescribed documents, among others a report confirming the pass in state doctoral examination, if not held at the same time as the defence, the thesis, a list of all his/her existing scientific publications and the statement on study. Another necessary condition for obtaining the defence approval is the publication of at least two original scientific papers (1 x main author, 1 x co-author) in reviewed journals on the same subject as the thesis in the CC indexed publication. The student defends his thesis in front of the Board for the Defence of the Doctoral Dissertation appointed by the Dean of the Faculty upon the recommendation of the Specialist Board and following the approval of the Scientific Board of the Faculty. The tutor is a member with an advisory capacity. The Board must have at least five members with the casting vote. The Board consists of its head, deputy head and other outstanding academics and scientists of the faculty, university and other institutions of higher education or scientific institutions, or perhaps other prominent experts from outside the academic community. The Head of the Board appoints minimally two reviewers from different universities including foreign institutions who are experts in the given subject area. The reviewers pass judgement on the PhD thesis and recommend it for the defence approval. The defence itself takes place in front of the Board which evaluates and then passes decision in a secret voting. The Head of the Board finally announces the result of PhD thesis defence and the student acknowledges the result by his/her signature. On the course of the defence procedure and its result a report is elaborated and undersigned by all present Board members. The defence of a student's doctoral dissertation is open to the public.

Documents on study, Academic degree

All documents proving the study and completion of the PhD programme are stated by the § 57 of the Law No. 111/1998 Dig. Study graduates are conferred an academical degree "doctor" (in short "Ph.D.", written after the name), acc. to the § 47 of the Law No. 111/1998 Dig.

One of the magazines for review articles recommended to students of the PhD programmes sure is the journal published by the Faculty of Medicine, entitled Biomedical Papers <http://biomed.papers.upol.cz>, which is presently going through the evaluation procedure at THOMSON ISI Publication processing for the Impact Factor. This journal crystallized as a

publication forum for review primarily of PhD programme students. Full versions of articles published in this journal are available on-line in PubMed database.

Further information can be obtained from

<http://www.upol.cz> (only in Czech) and

http://oldwww.upol.cz/UP_En/ (in English)

Note: The English version provides slightly modified information that applies to foreign students only.

PhD Study at Faculty of Medicine, Comenius University, Bratislava

Assoc. Prof. Marián Bernadič, MD, PhD. and Prof. Pavel Traubner, MD., PhD.

Faculty of Medicine, Comenius University, Bratislava, Slovakia

Faculty of Medicine, Comenius University

The Faculty of Medicine of Comenius University was the first faculty of the largest and oldest University in Slovakia. Faculty of Medicine was opened in 1919. Today, regarding its educational profile, Faculty of Medicine has two branches - General Medicine and Dentistry – comprising 17 preclinical and 35 clinical departments, and 14 additional clinical and research laboratories. Our teaching and research staff consists of 60 professors, 103 associate professors, 312 assistant professors and 43 senior scientific advisers and senior research associates. Up today, 19 283 students has graduated at Faculty of Medicine. In average, there are 2100 students at Faculty of Medicine. The study lasts 12 semesters and is divided into 6 years, with total more than 5000 hours of theoretical and practical study. Summer holiday practice in Slovak and foreign health institutes is the part of the study.

The Faculty of Medicine seeks to educate students by promoting their intellectual development and gradual accumulation of competence in the art of medicine. Although the primary goal of the Faculty of Medicine is to educate medical students, an equally important aim is the scientific research, targeted at new discoveries.

Our research community has established close ties with other European scientific centers. Many members of the Faculty of Medicine were educated at European and American Universities. Most of our leading scientists and teachers have been working as Research or Clinical Fellows in leading health care centers; they regularly attend international congresses and symposia, bringing our research into an international arena. The Faculty of Medicine welcomes and regularly receives Guest-Lecturers and Research Fellows.

Postgraduate training

After completing the Doctor of Medicine Program, those who want to pursue the postgraduate training at the Faculty of Medicine in Bratislava, can choose the Ph.D. Training Program or the Residency Training Program.

PhD - Training Program

Faculty of Medicine, Comenius University, accepts Ph.D. students in major scientific fields of medicine and dentistry (see table 1). Ph.D. students are selected through an admission examination procedure. Annually, 50-80 students are admitted (tab. 2). Duration of scientific training is 3 years. During this time, participants are expected to gain credit points from compulsory and elective courses given either in Slovak or English language. Through the research work, participants have to attest their ability and creativity in the respective scientific field. Ph.D. students are required to participate in practical teaching of undergraduate courses. Ph.D. theses are written in Slovak, Czech or English languages. Publication of the scientific results, preferably in journals with high impact factor, is a fundamental requirement.

Ph.D. Program - as the third degree University education, is related to long- term tradition of scientific training (since 1951). During 3-5 year scientific training, postgraduate was working under the guidance of supervisor, passing examination from specific subjects, concentrating

on own research, presenting results at local and foreign scientific congresses, writing publications in scientific journals and, finally, submitting dissertation for processing. After successful dissertation processing, the postgraduate was awarded the title CSc (candidate of science). The next step of this scientific process was the title DrSc. (doctor of science). The first candidates of science justified their dissertations in 1951. Till 1975, approximately 500 candidates of science were awarded. Later, after 1980, predominantly the external form of scientific training accelerated. After 1991, the postgraduate study form of scientific training gradually transformed to Ph.D. study. The number of PhD students at Faculty of Medicine of Comenius University in Bratislava on 21.3.2005 is following:

- Internal form 67
- external form 341
- foreign PhD students 18

The study lasts 3 years in internal form and 5 years in external form. Students, participating in PhD study in scientific fields, have to finish their study at least till 2010. From academic year 2005/2006, the PhD study is transforming to study programs in study fields. The credit system will be implemented. The average number is approximately 50 PhD graduates per year; 20 PhD students do not finish their study or move to other institutes (abroad or to health care delivery).

For a PhD study in theoretical disciplines, a graduate from non-medical faculty may also be enrolled (natural sciences, genetics, biochemistry...). For study programs in clinical departments, only graduates from Faculty of Medicine are accepted. During the PhD study, the student cannot receive another title. Only docent or professor from local or foreign institute may be the supervisor. Supervisor – specialist (at least PhD) may be present. Each dissertation and self-report include the list of publications related to presented dissertation.

A prerequisite for PhD graduating are 3 scientific lectures related to topic at scientific congresses and 2 full text articles published in indexed journal, with PhD student being the first author (3 publications in external form).

The organization of PhD study, admission rules and the course of PhD study, scholarships, list of topics, list of supervisors a teaching departments, and more information is available at home page of the Faculty of Medicine and Comenius University in Slovak and English language. A special department for science and research, participating in organization and administrative guide of PhD study, is established.

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Web page: www.fmed.uniba.sk

Table 1. Fields of study

14-10-9	biochemistry
15-10-9	microbiology
15-14-9	oncology
15-15-9	immunology
51-01-9	normal anatomy, histology and embryology
51-02-9	normal and pathological physiology
51-04-9	pharmacology
51-05-9	internal medicine
51-06-9	epidemiology

51-07-9 hygiene
51-08-9 surgery – specializations: urology and orthopedics
51-09-9 X-ray and radiology
51-10-9 gynecology and obstetrics
51-11-9 pediatry
51-12-9 neurology
51-13-9 psychiatry
51-14-9 dermatology
51-16-9 ophthalmology
51-17-9 dentistry
51-19-9 otorhinolaryngology
51-21-9 sports medicine
51-27-9 clinical pharmacology
51-44-9 social medicine
51-49-9 anesthesiology and resuscitation
51-55-9 pathological anatomy, forensic medicine

Table 2. List of study programs in study fields of PhD study on Faculty of Medicine, CU, Bratislava

-
- biochemistry
 - biochemistry
 - molecular biology
 - immunology
 - anatomy, histology and embryology
 - normal and pathological physiology
 - internal medicine
 - surgery
 - gynecology and obstetrics
 - pediatry
 - neurology
 - dermatology
 - ophthalmology
 - oncology
 - otorhinolaryngology
 - toxicology
 - anesthesiology and resuscitation
 - pathological anatomy, forensic medicine
 - orthopedics
 - urology
 - physiatrics, balneology and rehabilitation
 - dentistry
 - nursing
 - health service
 - clinical pharmacology
-

PhD Programs in Biomedicine and Health Sciences in Kaunas University of Medicine, Lithuania

Professor Irena Misevičienė, MD, PhD and Ingrida Ulozienė*, MD

Professor, Vice-rector for research of Kaunas University of Medicine, Lithuania
**Researcher, Institute for Biomedical Research of Kaunas University of Medicine,
Lithuania*

PhD programme is an essential component of the training of a scientist, as it offers challenges and rewards very different from those of undergraduate study. This is true all over Europe and certainly in Lithuania, in which most university degrees in scientific disciplines may offer a high standard of education but generally fail to prepare students to the challenges of scientific research, i.e. the challenges of contributing to the advancement of human knowledge using cutting-edge technological tools and a rigorous experimental approach. For this reason, PhD programs are the best opportunity to provide to the students a combination of research and higher education standards, both of which can only be offered by an academic environment of excellence. A PhD student explores one field in depth, will gain mastery of a specialized subject matter, and will learn to communicate his knowledge to other scientists. In addition to that, a PhD student will have to acquire the professional skills that are required to develop a career in research.

Doctoral education is one of the most distinctive and important activities of the contemporary university (1). Doctoral studies in Lithuania are included as the third cycle according the Bologna process (2). The Kaunas University of Medicine in Lithuania offers a choice of 7 PhD programs related to many aspects of biomedical sciences, they are as follows: on medicine, odontology, pharmacy, nursing, public health, biology and biophysics. The web address of the programs is <http://www.kmu.lt>. The institutional structures in support of PhD programmes cover all sectors of the university, are effective and are suited to planned developments. There is university officer (Vice-rector for the research) which is responsible for the control of PhD programs, studies, preparation of PhD dissertation as well as coordination of overall research projects within and off the university. Also the Research Affairs Department takes care of the PhD studies, i.e. monitors the admissions and progression of students etc. Procedures connected with PhD programme's performance are in place for the assurance of standards and quality, including: periodic reviews that focus on studies and research activities of PhD studies, periodic satisfaction surveys of research students, the compilation and publication of completion times and rates, and other general data that can be broken down to show performance by any relevant academic unit.

Preliminary arrangements

There is a written administrative operational procedure for each step in research student's progress from application to graduation- this is called Regulation of Doctoral Studies in Kaunas University of Medicine. There are clear, concise and easily completed forms that facilitate the student, the supervisor and administrators at each major stage. All these forms are available on the university website. "Time out" for periods longer than a set minimum, that are associated with long term sickness, compassionate leave and other defined circumstances, can be granted to a student who makes the formal application which is supported by his/her supervisor. All basic documentation is routinely and readily available on the university website.

The Supervisor(s)

The requirements for the qualification of the supervisor and other scientists involved in the PhD programmes and graduation are strictly defined by the Lithuanian Government regulations. First and foremost, postgraduate research supervisors should be active scholars and researchers with good records of the achievement and publications. Existing regulations defining suitability insist that PhD supervisors themselves have a PhD in a suitable academic area; they must be in a professor's position and have international and national publications in peer-reviewed journals (for the period of the last 5 years not less than 2 publications in ISI journals and not less than 3 in Lithuanian peer-reviewed journals). Every student has one supervisor (the principal supervisor) who is the member of staff of the university and an active and successful scholar in the relevant research area, who takes full responsibility for the overall management and supervision of the student's work and progress. There might be also the associate supervisors (up to 2) and they have to meet the same suitability criteria as the principal supervisors. The primary supervisor is allowed to take not more than 5 PhD students at the same time. The associate supervisors (called consultants) do not have any limitations in the number of PhD students.

The Student

Suitability criteria are defined for students applying to enter a PhD research degree programme. There is no intermediate degree before or during attaining the PhD. Conditions for the enrolment into the PhD study are as follows: master degree or equivalent degree, completed residency programme for those applying for the PhD programmes in medicine or odontology, average of all exams not less than 8 points (in the 10 point score) or equivalent, recommendations from the departments where the research project is planned, publications of the candidates, evaluation of interview in the admission board.

All PhD students whose positions are financed by the government get the fixed stipends. Supplemental income may be also obtained from the teaching or other activities of the student (for example working as physicians) because PhD students could be not full time students. Every research student has a dedicated writing space and sufficient access to computer hardware and the Internet, laboratory, field infrastructure and librarian facilities.

The Research Project

Ethical approval is obtained for relevant projects and there is a mechanism to ensure that such projects are identified and receive approval. The safety aspects of the projects are considered and taken into account.

Induction and professional development

The strength of the PhD is that it provides for critical analysis and an original contribution in a specific area. Successfully achieved, this is an invaluable preparation for continued explorations in related areas and a good preparation for the most high-level careers. During the PhD studies a student acquires a core of professional knowledge before embarking on a specific research path. From the total of 4 years PhD studies one or two years student follows a structured training programme with courses in research methods, various skills. There are a total number of 97 different courses in Kaunas University of Medicine which student from different research areas may choose. The regulations fix that not less than 4 courses of total 20 credits (1 credit is 40 study hours) are mandatory taken by every student.

The participation in the conferences and seminars' attendance and research mobility is an essential part of PhD training and development. Research students are encouraged to present their work at national and international conferences. Supervisors act to ensure that the work carried out by the research student is published in peer-reviewed journals as quickly as possible.

Monitoring of the studies' progress

Careful yearly monitoring of the progress is essential to maintain standards and support completion, to ensure good completion times. Relevant regulations facilitate periodic yearly formal reviews, each with a range of possible decisions and recommendations that could see students unsuited to research to the level of a PhD: for example exit before they have invested too much time. Regular research group/department presentations of interim results are required for the students; the supervisors must agree that the student has made sufficient progress before she/he may proceed to final write up and submission of the dissertation. Specialised doctoral commissions at University level provide the monitoring of PhD studies in different research areas.

The dissertation

Norms for thesis format is clearly defined by the Lithuanian regulations. Thesis consists of the aim and tasks of the research, description of the novelty, review of the literature, methodology of the research carried out, description of the results, conclusions, list of references, list of the student's publications. Minimum requirements for the latter are set as for 2 peer-reviewed publications from the obtained results. Printed dissertation is also accompanied by the detailed summary published in a foreign language.

The graduation

The doctoral degree is awarded for the student after the student has completed the 20 credit specialised studies of selected courses, has published the results of the research in not less than 2 publications in peer-reviewed journals, has got the formal approval of the completion of the research project by the supervisor and the department's scientists, has got the formal approval by the special commission of the doctoral studies of the university and successfully defended dissertation in the research board of the university. The research board consists of 5 researchers, i.e. 3 internal (members) and 2 external (members). Two opponents - one internal and one external - evaluate the dissertation. There are strictly defined criteria for the selection, approval and appointment of the internal and external research board members and opponents. The format of the defending of the dissertation is that of "public defence", with a above described panel of the research board members, opponents and also researchers from the department where the thesis were prepared and other departments interested in the topic of thesis, other students etc. The invited guests, including family members of PhD student, participate in the defence of thesis.

Evaluation of the Effectiveness of PhD programmes

Kaunas University of Medicine uses a formal definition of completion rate. It is defined as the percentage of those PhD students who having been registered as PhD students are subsequently awarded a PhD. Completion time is understood as being the time between the initial registration of the student and the time when the completed thesis has been approved by the relevant research board. It is 4 years period of research and not longer than 1 year after it till the defending of the dissertation in the research board.

Every year total number of about 50-60 students enrolls into the PhD studies in Kaunas University of Medicine in different PhD programs, for example there were 56 enrolled students in the year 2004 (Table 1).

Table 1. Number of enrolled PhD students in Kaunas University of Medicine according PhD programmes in 2004.

PhD programme (code)	Number of students
Biology (01B)	2
Biophysics (02B)	-
Medicine (07B)	27
Odontology (08B)	-
Pharmacy (09B)	3
Public Health (10B)	9
Nursing (11B)	15
Total	56

During the year 2004 more than 200 PhD students studied in Kaunas University of Medicine (Table 2). The greatest number is in the program of medicine. It is important to outline that most of the PhD students in this program are physician-scientists, they are individuals with medical training who spend most or all their time engaged in basic, disease-oriented or patient-oriented research. Much has been written over the past two decades regarding the importance of physician-scientist, and the problems faced by those entering this career track (3-6).

Table 2. Number of PhD students in different PhD programmes in Kaunas University of Medicine during the year 2004.

Code	PhD programme	Number of students
01B	Biology	15
02B	Biophysics	4
07B	Medicine	116
08B	Odontology	9
09B	Pharmacy	12
10B	Public health	36
11B	Nursing	29
Total		220

The completion rate of PhD students is rather high in Kaunas University of Medicine. As an example the data about the students who studied in the PhD programmes during the period of 1999-2003 is presented in the table 3.

Table 3. Completion rate of the PhD students, who were enrolled in the PhD programmes for the period of 1999-2003.

	Number of students
Enrolled in the year 1999	49
Doctoral degree awarded till the year 2004	40
Had not completed the research till 2003	7
Completion deadline postponed due to maternity leave	1
Completion rate (in percent)	83.3

The Kaunas University of Medicine claims the merit of having interpreted successful approach to biomedical research, in which basic and clinical researchers and physicians operate side by side, with the goal of improving the translation of basic research into medical practice. “All truths are easy to understand once they are discovered: the point is to discover them” (Galileo Galilei).

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PhD Studies at the Medical Faculty, Vilnius University, Lithuania

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Introduction

The development of medical sciences in Lithuania originated from the establishment of Vilnius University in 1579 – the oldest high school of eastern part of Europe. The official date for the establishment of the Medical Faculty at Vilnius University is November 24th, 1781. Since then foundations for fundamental and clinical sciences were laid. During soviet time fundamental sciences were not supported, and more applied research, also works of clinical medicine dominated. After the reestablishment of Lithuanian's independence in 1990 Medical Faculty was essentially reformed, new scientific priorities have emerged and actual in the whole word scientific areas have flourished: human and medical genetics, transplantation of organs, research works of atherosclerosis, studies of life quality and environment, research of psychical health, bioethics and health policy, searching for new methods of diagnostics, treatment, prevention and rehabilitation. Recently medical sciences of Vilnius University were perfectly integrated into several international projects: for example, FP5, FP6, EUREKA, PHARE, ERASMUS, STOP II, NATO and to the others (in total different Departments of Medical Faculty at present time are participating in 22 International scientific projects). Currently Medical Faculty is carrying out scientific investigations in five main research trends:

1. Human Genome Diversity, Its Origin and Phenotypic Realisation.
2. Human and Public Health, Quality of Life and Environment: Scientific and Applied Research.
3. Health of Mother and Child: Physiological and Social Aspects and Research on Natural Development of an Individual.
4. Bioethics, Health Politics, Application of New Technologies.
5. Etiopathogenesis, Diagnostics, Treatment, Rehabilitation and Prevention of Diseases: Fundamental and Clinical Research.

During the last 15 years PhD studies at Medical Faculty, as well as in the whole Vilnius University, were reformed several times. The last reorganisation was started few years before entering the European Union – in 2002-2003. At present time doctoral studies in Medical Faculty are organized according to the general regulations approved for doctoral studies at Vilnius University (the information is available on website of Vilnius University (<http://www.vu.lt>)). Medical Faculty have PhD programmes in two main scientific directions (sub-areas) that belong to the scientific area of **Biomedical Science**:

1. **Medicine** sub-area;
2. **Public health** sub-area.

Admission potentials and requirements

The number of places for doctoral studies at the Medical Faculty, as well as in other Faculties of Vilnius University, is planned in accordance with the funds allocated by the Government of the Republic of Lithuania, later being distributed by the Senate among the Faculties of the University. Candidates eligible for doctoral studies should have obtained a Master's degree (for example, public health students) or a Diploma of Higher Education (in the case of a one-stage study system, for example, medical students). Admission to the doctoral study programmes is carried out on a competitive basis within the frame of Medical Faculty and different Departments of the Faculty. As usually, admission takes place in September. Students have to pass the entrance exams according to chosen scientific branch of scientific area (sub-area). Examinations are held under supervision of an Examination Commission that are organised by the Faculty and validated by Rector.

Candidates who have not passed the competition may be admitted to a doctoral study programme on a basis of a contract with Vilnius University paying a fee and a grant assigned by the Senate. Sponsoring of doctoral studies by certain organizations is possible. At present time (April of 2005) there are 63 full-time doctoral students at the Faculty of Medicine (54 in the sub-area of Medicine and 9 – in Public health). Each year Vilnius University enrol about 15-17 doctoral students to the sub-area of Medicine and 2-4 doctoral students – to Public health. Besides of full-time doctoral students, each year Medical Faculty receives applications from different specialists of medicine and public health to start procedure of consideration, approval and defending PhD thesis prepared and written in an extramural manner under supervision of scientists from Vilnius University: in total 10-15 persons per year defend thesis at Medical Faculty in a such way.

Application and admission procedure for the International Students

Foreign applicants for Doctoral studies must submit to the Office of Doctoral Studies by 1st of May the following documents:

- Request to the Rector to be admitted on a Doctoral Study;
- Copies of documents certifying the obtained Master's degree or other similar Diploma of Higher Education;
- Title and summary of Master's thesis;
- Preliminary project of research;
- Curriculum Vitae;
- Letters of Recommendation from two scientists (referees must send recommendations directly to the University).

All enumerated documents must be written in one of following languages: English, French, German, Russian, or Lithuanian.

All requests from foreign applicants will be forwarded to Medical Faculty and considered on an individual basis. Enrolment may vary according to the area of study and research. The final decision on the admission is made by the Faculty by the 1st of July. Prospective foreign candidates do not have to pass any entrance exam.

EU citizens are accepted to doctoral studies according to the same procedure as Lithuanian citizens, while non European Union students admitted to the Doctoral studies at the Biomedical sciences are expected to pay the fees.

Description of PhD studies

The duration of Doctoral studies in both sub-areas of doctoral studies at the Medical Faculty is **four years** and is the same as in the other areas and sub-areas of doctoral studies at Vilnius University. There are **two stages** in PhD studies:

1. Theoretical studies according to certain field and kind of research (first 1-2 years). A doctoral student must take up at least three subjects (courses) from the selected area of research (at least one subject should be from some other area of science). Total largeness of studies – not less than 20 credits (one credit compounds at least of 40 hours of lectures, seminars, individual consultations, hands-on works). Every subject course is at least 45 lecture hours and is completed by an examination.
2. Preparing and defending of a doctoral thesis (study of literature, master of methodology, gathering the material or fulfilling of experiment, writing thesis and at least presentation of the work at the Department).

The responsibility for doctoral studies at the University is taken by different Departments of Medical Faculty that together with the Supervisor (seldom two supervisors) for whom certain qualification definite by the Government of the Republic of Lithuania is mandatory: at least 5 peer-reviewed research articles of certain scientific branch must be published during the last 5 years (at least 2 or 3 of them must be published in ISI register), also at least PhD, doctorate degree obtained in the Republic of Lithuania or equivalent degree obtained abroad is obligatory. Supervisors of the doctoral student coordinate and control the doctoral studies and scientific research as well as accept the students' reports. For every doctoral student an individual study and research programme is compiled and scheduled, and approved by the Medical Faculty Council, also the mode of study for each subject course is planed, as well as the theme for the doctoral dissertation. Doctoral students have to report on the progress of their studies and research to the Department they are attached to on a regular basis – as usually at least once a year. Doctoral students have an opportunity to develop their research skills by continuing their doctoral studies at foreign universities or carrying out integrated, common projects. Doctoral supervisory committees may accept relevant examinations (not more than two) passed while following a doctoral programme at a foreign university.

Regarding certain courses of PhD studies, a wide range of various subjects is lectured at present time within the frame of Medical Faculty: in total 187 courses for Medicine and 20 courses for Public health sub-area. Subjects suggested for doctoral studies at Medical Faculty of Vilnius University cover all main branches of general and clinical medicine, as well as public health sciences:

- clinical and medical genetics,
- clinical and medical biology,
- clinical chemistry,
- clinical physics, radiology,
- cytology, cell biology,
- oncology,
- microbiology,
- anatomy, histology, morphology,
- human development and embryology,
- physical anthropology,
- physiology, biochemistry,
- endocrinology,
- haematology,
- immunology, serology, transplantaology
- infections,
- general pathology,
- cardiovascular system,
- respiratory system,
- gastroenterology,
- urology, nephrology,
- obstetrics, gynaecology, andrology, reproductive system,

- skeletal system, muscular system, joints,
- anaesthesiology, intensive care,
- surgery, orthopaedics, traumathology,
- otorhinolaryngology, audiology, speech,
- ophthalmology,
- dermatology,
- sexually transmitted disease,
- neurology, neuropsychology, neurophysiology,
- psychiatrics, clinical psychology,
- paediatrics,
- gerontology,
- rehabilitation, kinesitherapy,
- forensic medicine,
- diagnostic methods and instruments,
- general practise,
- epidemiology, environmental health,
- social medicine,
- health service management,
- occupational medicine,
- preventive medicine, psychosocial care,
- nutrition, dietetics,
- bioinformatics, biostatistics, biometry,
- medical philosophy, history, bioethics.

Requirements and defending of doctoral thesis

A doctoral thesis must be an original work in that scientific area and meet the requirements for scholarly work. It must summarise the research carried out by the doctoral student in order to solve a problem in a certain field (sub-field) of science. The thesis must review previous research carried out on this theme worldwide, give a description of research methodology applied by the author, obtained results, their reliability in relation to the newest data obtained by other researchers. The author's conclusions must be presented in a separate chapter. The thesis could be written in Lithuanian or foreign language (English, German, French, Russian). The candidate must produce a thesis of up to 4 - 10 quires (1 quire - 40 000 characters).

The thesis must be written in a standard language. It should comprise the lists of sources used, bibliography and scientific publications produced by the candidate on the topic of research. A doctoral student has to publicize in local or international publications at least two peer-reviewed research articles announcing the main results of his/her research work. The candidate must prepare a summary of the dissertation. The summary is up to 1 quire (40 000 characters). If dissertation is written in Lithuanian language, the summary should be in foreign language and vice versa.

The thesis is defended publicly at the meeting of specially compiled Doctoral defence Board. The Board consists of 5 members (chairperson and 4 members) that should have no common publications with doctoral student. At least two members of the Board should be from the other institution (extramural of Vilnius University). Scientists from foreign Universities often are invited to the defence Board. Board Members must satisfy certain qualification definite by the Government of the Republic of Lithuania is mandatory: at least 5 peer-reviewed research articles of certain scientific branch must be published during the last 5 years (at least 2 or 3 of them must be published in ISI register), also at least PhD, doctorate degree obtained in the Republic of Lithuania or equivalent degree obtained abroad is obligatory.

PhD thesis is mandatory in a scientific carrier. Regarding carrier of practitioners of clinical medicine, PhD is also desirable and has an advantage. In accordance with the Regulations on

Awarding Scientific Research Degrees and Academic Titles, the Statute of Vilnius University and the regulations for awarding scientific degrees and academic titles at Vilnius University, Vilnius University awards the scientific degrees of a doctor and a habilitated doctor, as well as academic titles. PhD is mandatory also in receiving academic title, but academic title of docent (assoc.prof.) without PhD and the title of professor without the habilitation could be granted seldom (under special circumstances).

The PhD-degree in Denmark, in particular the PhD-degree in health sciences at the University of Aarhus

Professor Michael J. Mulvany, PhD

*Director of PhD-studies, Faculty of Health Sciences, University of Aarhus,
Professor of Cardiovascular Pharmacology
Aarhus, Denmark*

This report provides information about the regulations for the PhD-degree in Denmark, as well as the manner in which these are implemented at the Faculty of Health Sciences at the University of Aarhus.

The Danish PhD-degree

The Danish PhD-degree was established in 1993, and the basic regulations are similar for all subjects. These state that: "The programme leading to the PhD degree is set up with the purpose of training researchers at an international level in interplay with the international research world. The PhD programme provides mainly active research training under supervision." The PhD-programme is planned to be of 3 years duration, including a half-year of course-work as well as up to a half-year of teaching duties. Extension can be granted under certain circumstances. It is also intended that the PhD-programme should include time in another laboratory, preferably abroad. Admission to a PhD-programme requires an MD (or a masters) degree and approval by the Faculty concerned. The programme is performed under the guidance of at least two supervisors and is concluded by the submission of a thesis. The thesis may be a monograph, but more usually is based on a number of articles, submitted manuscripts or manuscripts ready for submission, together with a review. The review should provide an overview of the field, a critical assessment of the methods used, and should put the articles/manuscripts into the perspective of the current literature. The thesis is evaluated by a three-man assessment committee, of which two of the members are from outside the Faculty concerned. In most cases one of the non-Faculty members will be from abroad. If the committee finds the thesis to be satisfactory, the candidate has to defend his/her thesis in public. At this defence, the candidate gives a lecture on a topic defined by the assessment committee, after which the candidate has to answer questions from the committee members; the whole defence usually lasts about 2 hours. If the committee finds the defence to be satisfactory, the Faculty then will award the PhD-degree.

During the PhD-study, Danish PhD-students are generally salaried at a level corresponding roughly to what they would earn as employed academics.

University of Aarhus Graduate School of Health Sciences

The University of Aarhus Graduate School of Health Sciences was established in 1996, and was based on a tradition of providing quality postgraduate courses started in the 1970s. The School has currently over 300 PhD-students enrolled, with over 100 being enrolled each year. The School is part of the Faculty of Health Sciences, which has four broad divisions: biomedical sciences, clinical sciences, public health and odontology. The clinical faculty members have joint appointments in the Aarhus University Hospital. The Faculty has a total of about 300 professors and associate professors; the current intake of medical students is about 350 per year.

The University of Aarhus Graduate School of Health Sciences provides PhD-training in all aspects of health sciences within the national PhD-regulations as described above. Here

details concerning the practical implementation of these will be provided. Broadly similar programmes are provided by the other Danish health science faculties in Copenhagen and Odense.

Administration

The School is lead by a Director of PhD-studies who is responsible to the Faculty Research Training Committee chaired by the Dean of the Faculty. The Director works with the PhD-administrator and the staff of the PhD-office.

Scope of the PhD-programme

- completion of an independent research project under supervision (PhD project),
- preparation of a thesis on the basis of the PhD project,
- satisfactory completion of PhD courses. The number of courses should correspond to about 25 ECTS points,
- participation in an active scientific environment, including a stay if possible at other, primarily foreign scientific institutions or in other ways, for which up to 5 ECTS points are given,
- attainment of teaching experience in one form or another.

Enrolment

Applications for enrolment provide details about the proposed project, the course work to be followed, the financial arrangements which will provide salary, and the supervisors under whom the applicant will work. Applications are assessed by two members of the Faculty, one of whom is a member of the Research Training Committee. On the basis of their assessments, the Research Training Committee makes recommendation concerning enrolment to the PhD-programme.

Supervision

The main supervisor is always a member of the Faculty (professor or associate professor); other supervisors may have purely clinical appointments or be members of other faculties or institutions. There is normally a maximum of three supervisors. All supervisors are active researchers. Supervisors have responsibility for ensuring that the approved PhD-study programme is followed, that the PhD-student has the requisite support to allow this, and to provide scientific input. The main supervisor makes a report to the Director of PhD-studies every six months. The student has the responsibility to keep supervisors informed about the progress of their studies. Supervisors and students are required to hold regular meetings. The Faculty provides an information sheet for supervisors and students about these responsibilities.

The PhD-project

The PhD-project will normally be within the research interest of the supervisors, and will be based on the project described in the application. The project will have a number of clear hypotheses or aims, with a clear plan. The project will be designed so that it should be possible to complete it within the stipulated three years. Substantial changes to the plan have to be approved by the Director of PhD-studies, possibly after consultation with the Research Training Committee.

The course programme

The course programme consists of an obligatory part and an elective part. The obligatory part consists of

- a basic 3-day course which provides an introduction to health science research in all its aspects,
- a 3-5-day course in a specific aspect of health science research (biomedicine, clinic, epidemiology, qualitative research) according to the student's field,
- a 6-day course in basic statistics followed by a 4-day course in a particular aspect of biostatistics (e.g. linear regression).

The elective part consists of

- specialist courses in particular areas (e.g. flow cytometry),
- courses in presentation (e.g. medical English),
- computer courses,
- pregraduate medical courses for students with non-medical masters degrees.

A preparatory course is also provided for those considering applying for enrolment to the PhD-programme.

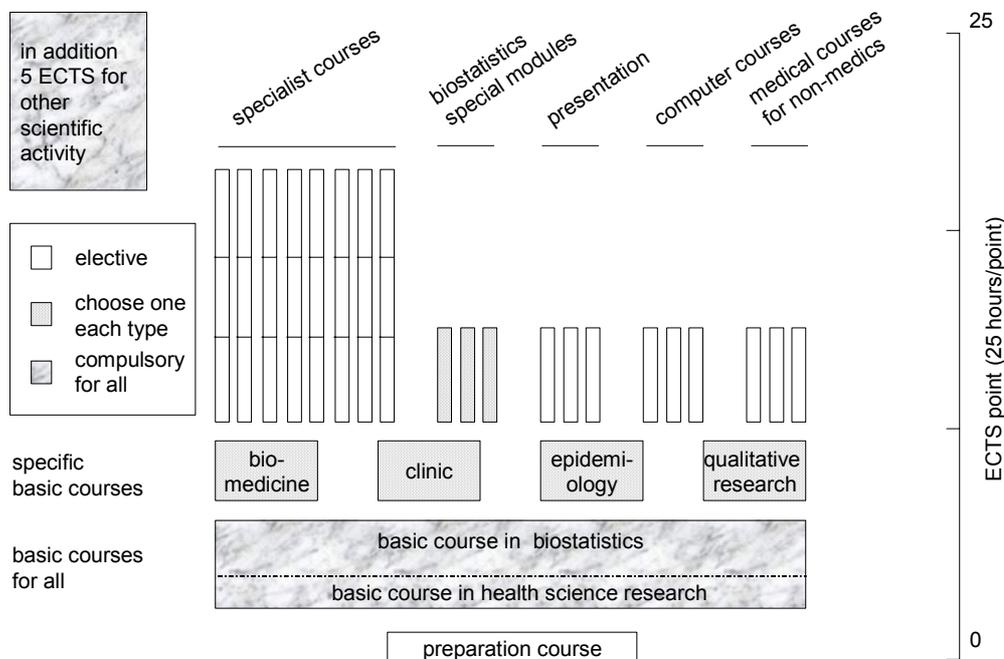


Fig. 1. The Ph.D-course plan

All courses are assessed concerning the number of ECTS points to be allocated. This assessment is based on the number of contact hours and the amount of preparation. Preparation is determined as “general preparation” equal to one half of the contact hours, and “specific preparation” which is the course leader’s estimate of the amount of time needed to read any literature given or to do home exercises, to the extent that these form part of the course. Time for any examinations is also taken into account. The total number of hours thus calculated is then divided by 25, on the basis that 1 ECTS point equals 25 hours (as indicated in the current EU directive, February 2005).

Students are required to obtain 25 ECTS points from the course work, and 5 ECTS points which are awarded for other scientific activity, as documented in the portfolio (see below).

Participation in an active scientific environment

It is expected that all PhD students are members of a journal club or similar activity. The PhD student should also participate in institute/department seminars. In addition it is expected that PhD students attend international congresses including presentation posters or lectures. Instruction of research students would be appropriate, as well as to a certain degree teaching pregraduate students of the institution/department, typically one or two lectures per semester. Documentation for this activity is provided by the School's electronic portfolio maintained by the student and attested by the main supervisor.

Experience at another laboratory

If possible, students are encouraged to spend a few months at another laboratory, preferably outside Denmark. In practice, given the time limitations of the PhD-degree, this is only possible for a minority of students.

The PhD-thesis

The PhD thesis should document that the PhD student has been able to complete a scientific project with independent use of appropriate methods and has thereby contributed to the advancement of research at a level corresponding to the international standard for PhD degrees in the area of health sciences. The thesis must be written in English, unless dispensation has been given. The format of the thesis should consist of a number of published articles or articles ready for publication accompanied by a comprehensive review, or a monograph. The Faculty strongly recommends the first format, to ensure that the results of the PhD project are published internationally and that the PhD student has learned this essential process. The comprehensive review will normally include: a review of the relevant literature leading to a formulation of the problem and the experiments' purpose/hypotheses; a short presentation of the methods employed and the most important results; a concise and thorough discussion of the results of the study seen in the light of a critical evaluation of the basic theories and the methods employed and in relation to previously published findings (this discussion is considered the central part of the total work); and future prospects. The Faculty also encourages individual PhD students as an alternative to the comprehensive review to publish a review in an international journal. For this the PhD-student must be the sole author of this review article. Statements from any co-authors must document the contribution of the PhD-student to the work described in the thesis.

The thesis is evaluated by an assessment committee that is appointed by the Faculty on the advice of the Research Training Committee, according to the Danish regulations outlined above. The assessment committee makes its recommendation to the Research Training Committee within two months. If the thesis is approved, the public defence will normally take place within a further two months. If the thesis is not approved, the PhD-student may be given the opportunity to revise the thesis and resubmit.

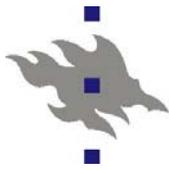
The PhD-degree

Following the public defence, if the assessment committee gives its approval, the PhD-degree in health sciences is then awarded by the Faculty.

Further information

Please see <http://www.health.au.dk/forskeruddannelse>

12 April 2005



HELSINGIN YLIOPISTO
HELSINGFORS UNIVERSITET
UNIVERSITY OF HELSINKI

Postgraduate Studies in Helsinki, Finland

Prepared by: **Professor Seppo Meri, MD, PhD.**

University of Helsinki, Helsinki, Finland

Postgraduate Studies at the Faculty of Medicine

The Faculty of Medicine is a research-oriented faculty, where the annual ca. 120 postgraduate degrees outnumber medical and dental basic degrees. Students with a medical or dental basic education are granted Doctor of Medical Sciences or Doctor of Dental Sciences degrees, and students with a natural sciences background Doctor of Philosophy degrees. In addition, the faculty has a M.D., Ph.D. program, which is organized in collaboration with the Helsinki Biomedical Graduate School.

Postgraduate education is coordinated through the Research Council and a postgraduate education workgroup at the faculty. Earning a doctoral degree requires a combination of organized education and research training by qualified supervisors, and typically takes 4-6 years to complete. Organized education is provided mostly through the graduate schools affiliated with the Faculty of Medicine. Theses comprise typically 3-5 original research papers, in which the student has a significant contribution in, and as a whole these papers form a very significant part of all research published at the Faculty of Medicine.

The seven graduate schools on campus are funded by direct allocation of 4-year postgraduate fellowships from the Ministry of Education as well as by the research groups and the University of Helsinki. Helsinki Biomedical Graduate School is the largest of these and the only school housed entirely on the Meilahti Campus. Postgraduate education is strongly moving towards stronger international networking through e.g. joint Ph.D. programs and graduate school exchange.

Ministry of Education Graduate Schools affiliated with the Faculty of Medicine:

Helsinki Biomedical Graduate School
National Graduate School of Clinical Investigation
Doctoral Programs in Public Health
Finnish Graduate School of Neuroscience
Helsinki Graduate School in Biotechnology and Molecular Biology
Clinical Drug Trials Graduate School
National Biomaterial Graduate School
www.med.helsinki.fi

Helsinki Biomedical Graduate School (HBGS)

50 Affiliated research groups
60 Full-time graduate students

60 M.D., Ph.D. Students

Four programs:
Molecular Cell Biology
Molecular Medicine
Functional Genomics M.D.,
Ph.D. Program

The Helsinki Biomedical Graduate School (HBGS) is affiliated with the University of Helsinki. Our students are affiliated with research groups mostly located on the Meilahti Medical Campus. Research topics are related to a wide spectrum of questions related to biomedical sciences.

Students enrolled in the Molecular Cell Biology, Molecular Medicine, and Functional Genomics programs take part in a 4-year Ph.D. Program, which normally leads to a thesis defense at the Medical Faculty of the University of Helsinki. Theses typically consist of 3-4 articles published in peer-reviewed journals and in which the student has a significant

www.hbgs.helsinki.fi
hbgs-office@helsinki.fi

contribution.

The MD/PhD Program is a joint program between the Biomedical Graduate School and the Faculty of Medicine. The students are selected from first year M.D. Students, and they start their graduate education by doing rotations in research groups during their first two summers, including one clinical rotation. Following this the students choose their host group and thesis project and continue doing their research side by side with their medical studies for about three years. Having finished their M.D. Degree, the students continue with full-time research for a period of up to two years at which time they are expected to defend their thesis. Thus the MD/PhD students generally graduate from the program not later than 8-8.5 years after commencing their studies in Medical School at an average age of 28 years.

Helsinki Biomedical Graduate School organizes a wide variety of practical training courses, seminar series, and scientific symposia for the students. In addition, together with the Helsinki Life Sciences Graduate School Network it offers various types of adjunct studies. These form the curriculum the students are required to take in addition to their own research in order to defend their thesis.

Follow-up of students is arranged through thesis committees, which convene once a year. The Thesis Committee includes the student, the supervisor (s), and at least two senior members outside the research group. In addition, each MD/PhD student class has tutors, which aid students in e.g. Rotation group selections.

Helsinki Biomedical Graduate school is funded by Ministry of Education, Finnish Academy, Biocentrum Helsinki, Faculty of Medicine, the departments within the faculty, and the affiliated research groups. The official **language** of the school is English.

PhD Programme at the Faculty of Medicine, University of Iceland

Professor Helga M. Ögmundsdóttir

Chair of Committee for Post-Graduate Studies at Faculties of Medicine, Dentistry and Pharmacy, University of Iceland

1. Post-Graduate studies at the masters and doctoral level are managed jointly for the Faculties of Medicine, Dentistry and Pharmacy at the University of Iceland. A M.Sc. course in biomedical sciences was started in 1992 and a Ph.D. programme established in 1995.
2. The post-graduate programme covers the biomedical sciences in the broadest sense. Our students are engaged in research projects ranging from molecular and cellular biology of human diseases, control of bacterial infections in fish, animal models of human infections to analyses of physiotherapy and rehabilitation. The students also come from a highly varied background, the majority have a first degree in biological sciences, but a large proportion of the doctoral students have completed the Icelandic medical course leading to the Cand.Med degree after 6 years of study.
3. <http://www.hi.is/nam/laek/Kennsla/Rannsoknartengtnam.htm>
4. There are currently 47 Ph.D. students enrolled, of these two are with Faculty of Dentistry and three with the Faculty of Pharmacy.
5. Since our Ph.D. programme is only ten years old we are still in the expansion phase. Giving a figure for enrolment per year is therefore neither easy nor meaningful. In the last twelve months 9 Ph.D. students enrolled and 4 graduated. In terms of an academic career at the University of Iceland, a doctoral degree is mandatory for the position of docent (equivalent to associate professor).
6. The Ph.D. course is 3 years, 90 Credit Units, equivalent to 180 ECTS, for candidates who already hold a M.Sc. degree or Cand. Med. degree, but 5 years, 150 Credit Units (300 ECTS) when starting with a B.Sc. degree (see also #9). a maximum of 15 Credit Units, may consist of course work, seminars and reading courses, the mandatory courses are weekly research seminars (3 Credit Units) and courses on statistic and scientific methods (4 Credit Units). The main emphasis is thus on a major original research project under the guidance of a supervisor.
7. The study is not divided into fields or disciplines.
8. There is no intermediate degree. Students who have enrolled for a M.Sc. can decide after two years to expand their project into a doctorate (total 5 years), following submission of a full report of studies completed and detailed plan for the remaining three years. Such candidates are called for an interview with the Committee for Post-Graduate Studies.
9. Conditions for enrolment for a three-year (90 Credit Units) Ph.D. course are a M.Sc. degree, Cand. Med. or equivalent. Candidates with a B.Sc. degree are enrolled for a five-year doctoral course (150 Credit Units). For each student a doctoral committee of three to five specialists is appointed. The committee is composed of the supervisor, who is a permanent faculty member, one or two additional advisors (optional) and usually two other members. Contact with a foreign university is usually practised and will become mandatory. This can take the form of course work or bench work. Most

- Ph.D. committees have one foreign member. The required point grade average is 7.25 (out of 10), 1st class.
10. On submission of the Ph.D. dissertation the doctoral committee delivers a detailed report on the candidate and the dissertation. The candidate shall have fulfilled all requirements for accumulated credits, see #6. The dissertation is normally based on at least three papers that have been published or accepted for publication in international peer-reviewed journals. The option of a monograph only is currently under discussion, as the rules for the Ph.D. programme are being revised.
 11. The Ph.D. dissertation is judged by an evaluation committee, consisting of one opponent, and one member each nominated by the candidate's Ph.D. committee and the Committee for Post-Graduate Studies. The evaluation committee delivers a detailed report on the quality and originality of the dissertation. After approval by the evaluation committee the candidate is examined in public defence by one or usually two opponents, one of whom shall be from outside the home faculty, preferably from a foreign university, while the other one can be a faculty member.
 12. The Ph.D. dissertation is usually based on already published or accepted papers (see #10). The published papers form part of the dissertation, are bound at the end. They are preceded by a detailed review essay, which includes introduction, material & methods, results and global discussion of the whole work.
 13. As mentioned in #5, a doctoral degree is mandatory for the position of docent (equivalent to associate professor) at the University of Iceland.
 14. The majority of Icelandic medical doctors obtain part or most of their clinical specialist training abroad. Some of them engage in research at this stage without completing a doctoral degree. Such candidates can apply to be accepted into the Ph.D. programme. A supervisor and a PhD Committee is then appointed. The PhD Committee evaluates the experience, research work and published writings of the PhD candidate as partial or even full credit towards a PhD degree. The Ph.D. dissertation is then presented in the usual format as described in #12.
 15. Future aims: One important future aim is to create a link between Ph.D. studies and clinical specialist training. Clinical specialist training is currently being developed at the National University Hospital. We envisage that doctoral studies conducted part-time can be integrated with clinical specialist training for candidates with academic ambitions. Another possibility worth considering is the option for medical students to start their Ph.D. studies after completion of the three pre-clinical years. Such students would enrol for a five-year Ph.D. and would then be able to return to their medical course and complete the three clinical years. Although this type of intercalated Ph.D. has been practised in Finland and Sweden it is doubtful that this would be an attractive option for Icelandic students. Part-time enrolment for Ph.D. studies alongside clinical medical studies with the Cand. Med. degree obtained during this period and then a final full-time year of doctoral studies is more likely to be accepted. These future aims take account of the recognized need for better recruitment of scientists with MD-PhD degrees in bio-medical research in Europe.

PhD Programmes at National O. Bohomolets Medical University, Kiev, Ukraine

Professor Olesya Hulchiy, MD, Dr.PH.

*Vice-Rector for International Relations
National O. Bohomolets Medical University, Kiev, Ukraine*

1. Ph.D programmes in 38 specialities
2. List of Ph.D programmes :
 - Obstetrics and Gynecology
 - Internal Diseases
 - Surgery
 - Neurosurgery
 - Urology
 - Oncology (medical sciences)
 - Pediatric Surgery
 - Pediatrics
 - Cardiology
 - Rheumatology
 - Infectious Diseases
 - Endocrinology
 - Nervous Diseases
 - Psychiatrics
 - Eye Diseases
 - Ear, Nose, Throat Diseases
 - Skin and Venereal Diseases
 - Traumatology and Orthopedics
 - Dentistry
 - Radiative Diagnostics and Radiative Therapy
 - Physical Therapy
 - Forensic Medicine
 - Phthisiology
 - Pulmonology
 - Clinical Pharmacology
 - Anesthesiology and Intensive Care
 - Hygiene
 - Epidemiology
 - Social Medicine
 - General Anatomy
 - Normal Physiology
 - Pathologic Anatomy
 - Pathologic Physiology

3. A web address of the University : <http://www.nmu.edu.ua>
4. More than 70 students.
5. In average 80 per year
6. Ph.D. programmes in general are mandatory for a scientific / academic career. Although at the very beginning of scientific / academic career as a substitute might be a M.D. diploma, certificate of internatura (residence) and at least 2 years of experience.
7. As a research under the guidance of a supervisor and exams in speciality, foreign language and philosophy.
8. Master in certain speciality, which is not mandatory for PhD. attaining.
9. M.D. diploma, certificate of internatura (residence) and at least 2 years of experience or M.D. diploma and certificate of Master in certain speciality.
10. Number of published papers – at least 3 in the internationally recognized journals.
11. For PhD students, who obtain the degree in the frames of Agreement between the National O.Bohomolets Medical University and foreign University.
12. It does not contain a copy of published papers, but the data from published papers are shown in the dissertation.
13. In general the attainment of PhD is a prerequisite, but at the very beginning of the academic career it might a combination of a part time Ph.D. student and position of assistant.

PhD Programs in Medicine and Pharmacy at Lviv National Medical University

Martha Servetnyk, MD, PhD, Vice-Dean for Postgraduate Education of Foreign Students, Eugene Varyvoda, MD, PhD, Vice-Rector for International Affairs and Dean of Foreign Students, Alexander Lutsyk, MD, PhD, Vice-Rector for Research, Irene Nechyporenko, Managing Officer of PhD Programs

National Medical University, Lviv, Ukraine

Lviv National Medical University (LNMU) is one of the oldest and largest schools of medicine and pharmacy in Ukraine. Currently it is subdivided into eight Faculties: two Faculties of General Medicine; Faculty of Dentistry; Faculty of Pharmacy; Faculty of Nursing; Faculty of Foreign Students; Faculty of Postgraduate Education. In 78 Departments, at the Institute of Clinical Pathology, in Central Research Laboratories are occupied about 1100 scientists: 90 Full Professors, 350 Associate Professors, 540 Assistant Professors, including around 600 PhD and 110 DSci Degree holders. The University is teaching Medicine, Dentistry and Pharmacy for more than 5,000 graduate students. Annually it is providing postgraduate specialization to 800 postgraduate students and upgrading more than 7,000 doctors.

Postgraduate education in Ukraine exists in two main forms – as a specialization in certain practical area of Medicine, Dentistry or Pharmacy (internship or residency) and in the form of research projects (PhD programs). After completing internship graduates are awarded the title of MD-specialist. After completing research project graduates are awarded PhD degree in different areas of Medicine, Dentistry or Pharmacy. In Ukraine the arrangement of PhD and DSci programs is regulated by the Governmental Rules. Consequently, in all University Schools of Medicine, Dentistry or Pharmacy in Ukraine authorized to organize PhD and DSci programs, the structure of such programs is very similar. Doctor of Sciences course is available only for those, who has already accomplished PhD program and were awarded a PhD degree.

Postgraduate specialization is one of the main directions in the LNMU research activity and includes Master's, PhD and DSci programs. In order to be eligible for PhD programs, candidates must pass three admission exams including philosophy, foreign language and special subject. PhD programs in LNMU are available in the following fields of Medicine, Dentistry and Pharmacy: Anaesthesiology and Intensive Care; Biochemistry; Cardiology; Dentistry; Endocrinology; Epidemiology; Histology and Embryology; Human Anatomy; Hygiene; Immunology and Allergology; Infectious Diseases; Internal Medicine; Microbiology; Neurology; Pathological Anatomy; Pathological Physiology; Pediatrics; Pediatric Surgery; Pharmaceutical Chemistry and Pharmacognosy; Pharmacology; Psychiatry; Pulmonology; Obstetrics and Gynecology; Oncology; Otorhynolaringology; Surgery; Technology of Drug Preparation and Organization of Pharmaceutical Affairs; Traumatology and Orthopaedics; Tuberculosis; Urology.

The number of PhD fellowships in LNMU is established each year by the Ministry of Health care. Information concerning PhD programs is presented on the University Web-site at – <http://www.meduniv.lviv.ua>.

Currently there are existing three forms of PhD programs arrangement: (1) for PhD students with full attendance, who are working full time on their project and who are supposed to complete their research in three years; (2) for PhD students with partial attendance, who are doing their research alongside with the main occupation work and who are supposed to

complete their project in four years; (3) for PhD competitors, who are working part time on their project and whose time for getting PhD degree is unlimited.

Each year around 30-40 PhD and 5-8 DSci degrees are conferred in the University. The annual number of students enrolled into PhD programs with full and partial attendance is approximately 16-20: 9-12 students usually are admitted into the full attendance course and 5-8 into the partial attendance course. Currently the total number of PhD students in the LNMU is 80 (out of which 50 belong to full attendance course and 30 – to partial attendance course). There are also around 100 PhD competitors, involved in completing research for getting PhD degree. On the whole, about 180 PhD and 50 DSci programs are on track in LNMU.

PhD research must be accomplished under the supervision of scientific advisor. Regularly it is Professor or DSci, approved by the Faculty Council. In some cases, as an exception, scientific supervisor can be Associate Professor or PhD. In this case supervisor must be approved by the University Council.

In LNMU PhD programs are organized as a combination of research work and obligatory courses. During the 1st year it is necessary to attend “Methodology of Research”, “Medical Informatics”, “Philosophy” and “Foreign Language” course, during 2nd year a PhD candidate must attend “Medical Psychology” course. Also it is obligatory to pass three exams while completing PhD program. These include philosophy, foreign language and special subject, related to the research project.

Although Mastership program is believed to give a good preparatory basis for completing PhD program in clinical sciences, currently it is not quite obligatory: prerequisite for enrollment to PhD program is MD, DDS or Master of Pharmacy Degree.

However, since for the admission to PhD program in clinical subjects PhD students must have not less than two years of experience in practical work after residency, Master’s course is giving advantage for immediate admission. For PhD students, some forms of work, accomplished within the Master’s program (examinations, scientific reports) can be considered valid as equivalent to certain PhD program activities.

Currently there is no credit system to assess potential prerequisites for obtaining the right to defend a PhD thesis. However, it is obligatory to attend a given number of courses, as well as to pass a set of exams mentioned above and to deliver several scientific reports and at least three articles published in Highest Attestation Commission (HAC) of Ukraine approved journals during the preparatory period. Also it is recommended to prepare several brief reports on the implementation of the results of the scientific research into the medical practice.

Dissertation defence is a public event. There are two official experts for each PhD work, appointed by Specialized Scientific Council (SSC). As a rule, foreign experts are not involved into the evaluation of PhD dissertation.

Scientific thesis must be presented as a manuscript with well-defined structure, including introduction, background, material and methods, results, discussion, conclusions, bibliography. It must contain material, which was previously published in HAC approved journals. A set of SSC approved by HAC, exists in LNMU, as well as in other Medical Universities of Ukraine. PhD candidate can support his/her thesis either in home University or other Medical University in Ukraine.

The thesis is supported in session of the SSC. Members of the SSC are approved by HAC of Ukraine. The debate during the session consists of the presentation of thesis and of the results obtained during research, as well as presentation of the evaluation reports accomplished by official experts. A procedure usually involves questions from members of SSC and answers of the PhD candidate, as well as final discussion on the topic.

In Ukraine, PhD degree is a prerequisite for getting tenure track position as an Assistant Professor and for being eligible for the position of an Associated Professor. For Full Professorship position it is obligatory to possess DSci degree.

PhD Programme at University of Hamburg Graduate School

Prof. Dr. H. J. Seitz

Medical Faculty, University of Hamburg

1. Do you already have a PhD program at your Medical School, School of Public Health or Research Institute?

Yes, for medical doctors plus graduates from natural sciences (chemistry, biochemistry, biology, biophysics)

2. If the answer to the question above is yes, does it cover only a certain, more or less narrow field (i.e. neuroscience, public health etc)? If you have more than a one programme please provide a list.

Graduate School in medical/biomedical science in Hamburg

- **Biochemistry and Pathology of Brain Signaltransduction**
- **Molecular Endocrinology**
- **Glykoconjugates: Biochemistry and Function**

3. Please provide a web address of your PhD programme (regardless of the languages in which it is written).

www.uke.uni-hamburg.de/forschung/graduiertenkollegs

4. How many PhD students (PhD candidates) do you have in your programme

Max. 30/each program

5. How many PhD students do you enrol per year? In case when a PhD programmes is not mandatory what is the substitute for it in a scientific/academic career: (habilitation /please give us a short description), published papers (is it a quantitative criterion), experience (is it quantitative), something else?

About 10/year each graduate school

6. How is your PhD programme organized: (a) as a research under the guidance of a supervisor only or (b) as a combination of research and organized courses?

Mainly research under guidance and organized courses (not more than 4 hrs/week)

7. If your answer to the previous question was (b): is the study divided into the fields (disciplines), are the students allowed to choose courses regardless of disciplines, duration of the PhD study (years).

They have to follow the course program, however, free attendance for others

8. Is there an intermediate degree (for example Master of Science, licentiate) before or during attaining the PhD and, if so, state the name of the degree

No

9. The conditions for enrolment into the PhD study: MD degree only or other degrees (which?). What is the required grade point average; is a supervisor required?

Medical doctors, first exam (after 2 years)

10. The conditions for the approval of PhD dissertation: the number of accumulated credits, the number of published papers, other.

Internat. Paper plus excellent thesis

11. Are foreign experts involved in the evaluation of PhD dissertation? How often?

Natural sciences: local and german

12. The appearance of the PhD dissertation: does it contain published papers or not

Thesis is often based on internat. Paper, however, the thesis has to be complete in itself

13. Is the attainment of the PhD degree a prerequisite for academic career (for being recognized as an assistant/ associate professor or equivalent)?

Without PhD there is no career, neither in industry nor in medical society.

Medical Doctors: Habilitation (example Hamburg)

See: [www.unke.uni-hamburg.de/ärzte-wissenschaftler/promotion, habilitation](http://www.unke.uni-hamburg.de/ärzte-wissenschaftler/promotion,habilitation)

- Attachment to group/group leader/Head of Department (Professor)
- Habilitation only possible after examination for specialisation (e.g. internat. Medicine)
- No University program for Habilitation, however, must: broad experience, Facharzt, teaching expert
- Ca. 50 Habilitations/year
- Habilitation requires to Dr. med.
- For evaluation: external national or international experts (2)
- Habilitation Thesis: Minimum summarizing the papers (ca. 20 pages) plus paper; or thesis (ca. 100 pages plus papers)
- Minimum 11 papers, 2 TOP internat., 5 good internat. 4 average internat., several times first (leading) or last (leading) author
- Minimum: 5 posters and/or invited speaker.

DFG – GRADUATE – SCHOOL THE HAMBURG EXPERIENCE

Elements of a DFG funded Graduate School are the following

- A clear topic not to small, not to large, max. 9 years
- Ca. 10 projects, lead by scientific qualified leaders
- Ca. 20 Graduates funded by DFG (€ 1.000,-/month) and other sources (private Sponsorship)
- The Graduate must be under 30 years old, excellent exams, diplomas
- Max. 3 years PhD time (absolute deadline)

Community of scientific excellence – cooperate identity

Molecular Endocrinology - Molecular Metabolism

Elements of a DFG funded Graduate School are the following

- 18 Graduates from Medicine, Biology, Biochemistry, Chemistry, Veterinary Medicine
- Germany and Graduates from Alexandria, Athens, Barcelona, Belgrade, Budapest, Helsinki, Kiev, Odessa, Sofia, St. Petersburg, Teheran, Zagreb
- 15 Projects mainly lead by young PhD

The Graduate College offers a specialist training program for the young scientist. This includes:

- Colloquia on molecular methods.
- Workshops and courses on topics in all fields of endocrinology and metabolism.
- Colloquia on clinical endocrinology with special emphasis on cellular and molecular aspects.
- Weekly seminars in endocrinology and signal transduction.
- Colloquia with invited guests from in- and outside Hamburg.
- Courses in molecular biology (once a year for two weeks) and bench practica.
- Financial support to attend national and international meetings for presenting research results.
- Financial support to invite other scientists as guests to the laboratories in Hamburg and for visits by Graduate College Members to Centers of Excellence outside of Hamburg.
- Excellent lab-networking within and between the participating research groups.

Elements:

- Clear projects, aim: one paper in international journal, 2 posters
- Working plan, € 5.000,- running expenses/year, free access to library with all journals full text from med line.
- Brech-practical courses, offered by each project
- Endocrinological colloquia 20/year, lectures most national/international
- Methods/Workshops 20/year, lectures most national/international
- Systematic lectures 28/year project leader

In summary: not more than 2 events/week; free for lab work

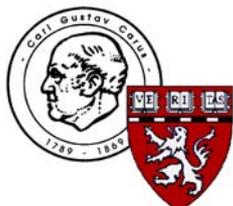
- Colloquia organized by graduates 14/year
- Weekend-meeting (Friday till Sunday) 1/year; each project presents results (must)
- Sending to international Meetings (paid, low budget) 2x/ graduate
- Visit/Cooperation with external lab (\approx . 2 weeks /year) (paid)

Quality Control

- Every three years, external anonymous review with international reviewers (e.g. Netherlands, Switzerland, others)
- Log book (graduates)
- Thesis (best!)

Money

- Financing in total: ca. 300.000,- €/year



Medizinische Fakultät Carl Gustav Carus

Reformfakultät des Stifterverbandes
für die Deutsche Wissenschaft
Harvard Medical International Associated Institution

PhD Programmes at the Medical Faculty Carl Gustav Carus, Dresden University of Technology, Dresden, Germany

Thorsten Liebers, Ph.D.

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The Dresden University of Technology (TUD) has over 9,000 members of staff, including 800 professors and senior lecturers ensuring the high standards of teaching and research. That have established the TUD's reputation and attracted 30,000 students - 3,000 of them are international ones from about 100 different countries. TUD is one of the top universities in Germany and is justifiably proud of its fine tradition in education and the state of the art facilities that resulted from the modernization after the German reunification in 1990. The ratio between staff and students is fortunate and this makes for a more personal atmosphere and excellent studying conditions. New faculties have been added to the traditional faculties of sciences and engineering including economics, humanities, social sciences and medicine. As a result the range of research possibilities and courses now offered by the TUD is broad and well suited for interdisciplinary graduate studies, e.g. Master and innovative PhD programmes. The Medical Faculty, offering standardised studies in Human Medicine, in Dental Medicine (both based on DIPOL, a modified Problem-Based Learning system), and in Public Health, is highly integrated into these programmes.

In the following a short review of two master programmes, one in Molecular Bioengineering and one in Medical Physics, and of three PhD programmes, one in Molecular Cell Biology and Bioengineering, one in Metabolism and Endothelium, and one in Radiation Sciences, is given. The language of all the Programme is English.

The Master course on Molecular Bioengineering brings a novel combination of biology, biochemistry, biophysics, materials science, medical science, bioinformatics and nanotechnology together. It aims to teach students the fundamentals in biomedicine and bio-nanotechnology combining biology and technology, which are linked in two ways: On the one hand, biological knowledge on cells is applied to develop the notion of molecular factories. On the other hand, nano-technology and bioinformatics are enabling technologies applicable to engineer biomaterials for medical applications. The course is hosted by the Biotechnological Centre of TUD and the professors of the centre and further teachers from several institutes of the university and the Max Planck Institute of Molecular Cell Biology and Genetics (MPI-CBG) teach the course. All modules taught in the first three semesters fall into the categories biomedicine and technology. After covering these modules the students devote the last of the four semesters to their Master thesis.

A Master and a PhD programme will be offered by the new established Centre of Innovation and Competence OncoRay. It is funded by the BMBF (German Federal Ministry of Education and Research) and a highly ranked research centre of the Medical Faculty Dresden in the field

of Radiation Research in Oncology. There will be the possibility for graduate students in physics, biology, chemistry, and medicine to join a Master programme in Medical Physics and a PhD programme in Radiation Sciences.

The PhD programme of the International Max Planck Research School for Molecular Cell Biology and Bioengineering (IMPRS-MCBB) is a joint programme of the MPI-CBG and the TUD to further the commitment of both institutions towards integrating eastern European countries with the main European scientific community. It provides interdisciplinary training and research opportunities for university graduates who wish to work towards a PhD in the fields of molecular cell biology, bioengineering, developmental biology, genetics, biophysics, neurobiology, and bioinformatics. The IMPRS-MCBB co-operates with the Graduiertenkolleg "Molecular Cell Biology and Bioengineering" (GK 864), which is sponsored by Deutsche Forschungsgemeinschaft (the German NRF). The IMPRS-MCBB and the GK 864 together form the International PhD Programme for Molecular Cell Biology and Bioengineering Dresden. PhD students have a primary affiliation with one of the research groups of the MPI-CBG or with one of the participating research groups of the TUD.

A third PhD programme of the Medical Faculty in the field of Metabolism and Endothelium is in preparation and will start recruiting students in June 2005. Students will work on interdisciplinary projects with two advisors, one at least coming from a clinical department. The programme supported and funded by the BMBF will be running for three years. The formal curriculum will include seminars teaching the students in specific topics in the field and practica in the laboratories of the participating departments. The specific curriculum for each participating student will be organised in a highly individual approach taking the prerequisites of the student (basic predoctoral education) and the requirements of the PhD thesis into account. Complementary teaching / educational offers include participation in journal club and attention of invited lectures, e.g. in the specific fields of Vascular Endothelium and Microcirculation, Experimental Diabetology, Endothelial Cell Biology, Metabolic Dysfunction in Neurology, Clinical Sensing and Monitoring.

The Medical Faculty Carl Gustav Carus will attract by offering several such Master and PhD programmes highly motivated and educated students and will reach a leading position in the competitive area of medical education and research.

Postgraduate Studies and Scientific Education at the Faculty of Medicine in Skopje, Macedonia

Doncho Donev, MD, PhD, Professor, Institute of Social Medicine, Joint Institutes
Vesela Maleska-Ivanovska, MD, PhD, Associate Professor, Vice-dean for science
Magdalena Žanteva-Naumoska, MD, PhD, Professor, Dean
Ljubica Georgievska-Ismail, MD, PhD, Associate Professor, Vice-dean for education

Ss Cyril and Methodius University Faculty of Medicine in Skopje, Skopje, Macedonia

Republic of Macedonia officially became a part of the Bologna process for redesigning the curricula/ study programs for higher education in September 2003, when the Minister for education and science of Macedonia signed the Declaration adopted at the Bologna conference in 1999. Activities within the University "Ss. Cyril and Methodius" in Skopje for modernizing the study programs and educational process started in November 2001 when the Rectorate Administration adopted some basic documents for introducing the credit system/ European Credit Transfer System (ECTS) in the university education (1,2). Faculty of Medicine joined these processes and we are expecting to achieve fundamental changes in medical educational programs and process, both undergraduate and postgraduate. Actually, some changes are well underway at the moment.

Organization of the postgraduate education

Postgraduate studies at the Faculty of Medicine in Skopje are organized as postgraduate scientific studies (Master of Medical Science and Master of Public Health), postgraduate professional/ specialist studies, and a program/ procedure for acquiring the Doctor of Science (D.Sc.) or Philosophy Doctor (Ph.D.) degree (3).

Postgraduate scientific studies (Master of Science) at the Faculty of Medicine in Skopje are organized within four semesters and approximately 60 candidates enroll annually in master's programs in all specialties of medical sciences. In addition, Master of Public Health (MPH) Program at the Faculty of Medicine in Skopje started two years ago, in December 2003, and about 25 students per year were enrolled for the first two generations of MPH students.

Postgraduate specialized studies (for acquiring specialization, with duration from 6 to 10 semesters, and sub-specialization, with duration from 3 to 4 semesters) are based on programs for specialized studies in particular fields of medicine, with duration of 9 months (one semester teaching and three months preparing a final specialist report), (3). This kind of studies are organized and continuously carried out within the Faculty of Medicine from 1975, and the program was revised in 1992. In average, 350 candidates specialize each year in more than 30 specialties, prescribed by the Law (4).

Before attaining the DSc/PhD degree at the Faculty of Medicine in Skopje there is an intermediate degree called Master of Science (and Master of Public Health). Master of Science and Master of Public Health studies are organized as combination of organized courses and research for the master thesis, in duration of two years. Master of science program is aimed to provide students with the understanding of research process and its methods, to enable their independent critical use of scientific literature in a respective field and to apply the methods of scientific work, as well as to provide them with profound knowledge from certain scientific and professional disciplines. By completing postgraduate studies and presenting/ defending master thesis publicly, the candidate is awarded the degree of Master of Arts or Master of Sciences and Master of Public Health.

DSc/PhD program at the Faculty of Medicine in Skopje is organized as a research under the supervision/ guidance of a supervisor/ mentor of the DSc/PhD thesis only (3).

Study regime of the postgraduate studies

Postgraduate studies at the Faculty of Medicine in Skopje are based on an elective model. Having attended the basic subject lessons in the first semester, students select one of the *five offered study courses*. Each course consists of *core subjects, elective subjects, and project/practice in research laboratories*. The studies are organized in four semesters, as follows (5):

I Semester: *Introductory subjects*. Each subject is verified by passing the exam;

II Semester. *Choosing a course*. Students attend three subjects (study lessons each) and a laboratory project. In each course there is a list of three subjects, which constitute the *course core*. The student should choose at least two subjects from the core. The third subject can be chosen from the core or from the list of elective subjects. Passing the exam is a method of knowledge verification. The laboratory project is carried out in at least two research laboratories, with minimum 30 and maximum 60 study hours;

III Semester. *Choosing master's thesis research area*. Students have to attend a total of 60 study hours, 20 of which are given by the mentor and 40 by other teachers from the chosen research area. The subjects and teachers are chosen in consultation with the mentor. Knowledge verification consists of one exam, in front of examination consortium consisting of all chosen teachers;

IV Semester. *Working on the master's thesis*. The mentor participation is 30 study classes. As a result of this work, the student completes/ publishes a paper from the chosen subject. Verification of paper publication can be either a copy of the paper or the notification from the journal or conference where the paper has been accepted for publication. After presenting such a document, the student is eligible to formally submit for endorsement his master's thesis.

The postgraduate studies are carried out by the Medical Department teaching staff, as well as by the adjunct professors from other departments of the University Ss "Cyril and Methodius". There is a responsible teacher for each subject. The subject could be taught by several teachers under the coordination of lecturer in charge (responsible lecturer) for that subject.

Curriculum of the postgraduate studies

I. First Semester: Introductory subjects

- 1.1. General principles of scientific and research work
- 1.2. Introduction to the clinical research work and ethical issues
- 1.3. Medical informatics in scientific and research work
- 1.4. Medical statistics in scientific and research work

II. Second Semester: Elective study courses and subjects

Course II.1. *Cell and molecular biology*

- II.1.1 Molecular biology and genetics
- II.1.2 Cell physiology
- II.1.3 Clinical genetics
- II.1.4 Elective subject
- II.1.5 Laboratory project

Course II.2. *Basic, applicative and clinical morphology*

- II.2.1 Anatomical and pathological changes of specific systems
- II.2.2 Clinical morphology
- II.2.3 Rö Anatomy of tissues and Rö macro-morphology of diseases
- II.2.4 Elective subject
- II.2.5 Laboratory project

Course II.3. *Basic, applicative, and clinical physiology of nervous system*

- II.3.1 Basic physiology of the nervous system
- II.3.2 Clinical physiology of the nervous system

II.3.3 Neuro-physiological aspects of cognitive processes

II.3.4 Elective subject

II.3.5 Laboratory project

Course II.4. Basic, applicative, and clinical physiology of human body systems

II.4.1 Basic, applicative, and clinical physiology of the respiration and circulation

II.4.2 Basic, applicative, and clinical physiology of the kidneys and body fluids

II.4.3 Basic, applicative, and clinical physiology of the metabolism and hormones

II.4.4 Elective subject

II.4.5 Laboratory project

Course II.5. Preventive medicine

II.5.1 Scientific approach to epidemiological research

II.5.2 Social medicine and scientific basis of health care organization

II.5.3 Scientific basis of medical ecology

II.5.4 Elective subject

II.5.5 Laboratory project

III. Third Semester: Master's thesis research area

Study in the research area from which the master's thesis has been chosen. The teaching plan is chosen by the student in accordance with the study regime.

IV. Fourth Semester: Working on the master's thesis.

Conditions for enrollment into the Master of Science and DSc/PhD program

The undergraduate program at the Faculty of Medicine in Skopje lasts for 6 years (12 semesters) and upon graduation the student acquire a diploma for a completed high education (VII/I degree) with professional title "Doctor of Medicine" or "Medical Doctor" (MD degree) (3).

The conditions for enrolment into the Master of Science Program at the Faculty of Medicine in Skopje are MD degree and average grade at least 8,00. Eligible candidates for enrollment into the Master of Science Program are also some other graduates from the medicine related fundamental fields (3, 6,7).

The current internal criteria at the Faculty of Medicine in Skopje for enrollment into the DSc/PhD Program i.e. submitting Doctoral/PhD Thesis for endorsement were adopted on April 21, 1991, and modified on April 22, 1999, with intention to and implemented into practice on January 1, 2000.

A candidate could apply for enrollment into the PhD Program at the Faculty of Medicine in Skopje if he/she has previously acquired the title Master of Science and, at least, 6 papers published in extenso in biomedical journals, out of which 4 papers with the candidate being the first author (the master thesis is recognized as equivalent to one published paper). Scientific papers should be published in peer reviewed biomedical journals, still not necessarily journals indexed in Current Content (CC) database. PhD thesis proposal should be supported by copy of the published papers.

Eligible candidates for enrollment into the PhD Program might also be candidates with completed specialization in the field of medicine and presented a Specialist Report on research results in solving certain problem, which is equivalent to master thesis.

Existence of a supervisor/ mentor and his recommendation for the Doctoral/PhD Thesis proposal, at the Faculty of Medicine is required. The mentor is appointed by the Educational and Scientific Council of the Faculty of Medicine in Skopje upon proposal by the PhD candidate and written agreement signed by the mentor (3,6,7).

The average number of the students enrolled in Postgraduate studies Program at the Faculty of Medicine in Skopje within the period between 2000 and 2004 is about 62 and the average number of presented/ defended masters' thesis about 19. Within the same period about 15 candidates per year were enrolled in DSc/PhD Program, and about 19 doctoral dissertations per year were presented/ defended at the Faculty of Medicine in Skopje (Table 1).

Table 1. *Enrolled candidates into the Master of Science Studies and DSc/PhD Program, and presented/ defended master thesis and doctoral dissertations at the Faculty of Medicine in Skopje, Macedonia, in the period from 2000 to 2004*

YEAR	Master of Science Study Program		Doctor of Science/ PhD Program	
	Enrolled students	Presented/ defended master thesis	Endorsed DSc/PhD thesis	Presented/ defended DSc/PhD dissertations
2000	63	10	34	26
2001	58	17	9	8
2002	59	28	11	31
2003	76	23	5	17
2004	56	18	14	15
Total	312	96	73	97

Source: Dean's Office at the Faculty of Medicine in Skopje

Procedure for approval and evaluation of the PhD thesis/ dissertation

Doctoral dissertation should represent the final product of an independent, original and scientifically significant research of the PhD candidate, with contribution to the development of the certain scientific field.

The final version/appearance of the Doctoral/ PhD dissertation should contain copies of incorporated four previously published papers related to the PhD thesis field, out of which one paper should be published in CC journal.

Evaluation and presentation/ defense of the doctoral dissertation should follow within the period of five years, but not less than two years after approval of PhD thesis by the Educational and Scientific Council of the Faculty of Medicine in Skopje. The members of the PhD thesis/ dissertation evaluating body (Three-member Commission) are university professors, experts in the field, from the Faculty of Medicine in Skopje, in most of the cases. At least, one expert should be from some other Chair within the Faculty of Medicine in Skopje or from some other Department within the "Ss Cyril and Methodius" University in Skopje. Rarely, foreign experts (professors from abroad) might be included in the Body (Commission) for evaluation of the PhD dissertation.

The mentor of the PhD candidate could not be a member of the three-member commission for evaluation of the PhD dissertation, but should be included in the five-member commission for assessing the publicly presenting/ defending of the PhD dissertation.

By successful presentation of the doctoral dissertation publicly, the candidate is awarded the PhD degree, traditionally called Doctor of Medical Sciences (3,6,8).

The attainment of the DSc/PhD degree is a prerequisite for academic career i.e. for being recognized as a lecturer or assistant professor (docent). There is no substitute for DSc/PhD degree in scientific or academic career.

Future developments of scientific education

Republic of Macedonia is a small country with a "small scientific community" and a "small scientific output". In compliance with the Bologna Declaration the process of reform of the curriculum and postgraduate education programs at the Faculty of Medicine in Skopje, followed by introducing ECTS, has already started (2).

Following formally Bologna requirements, the Educational and Scientific Council adopted a Decision, in May 2004, for Doctoral Studies to be organized in duration of at least two years, out of which two semesters for teaching and the remaining period for scientific research in the field of the Doctoral/PhD thesis (8). Doctoral studies should be realized in accordance with

the study plans and programmes, which should be created for each candidate separately, by the candidate and his mentor, consisting of obligatory and elective courses at the Faculty of Medicine in Skopje or other schools/ university departments in the Republic of Macedonia or schools from abroad, which have signed agreements for cooperation with the Faculty of Medicine in Skopje. The candidate should acquire at least 50% of the credits, coming from the organized teaching programs at the Faculty of Medicine in Skopje.

There are three credit groups: the first one is consisted of obligatory subjects representing an introduction to the research methodology and scientific work; the second credit group is consisted of obligatory and elective, field-related, courses; and, the third credit group related to scientific and professional activities (publication of articles in peer reviewed and in internationally indexed journals, contributions to scientific meetings/ conferences, scientific and professional presentations etc.) (8).

It is expected, from the academic year 2005/2006, the Faculty of Medicine in Skopje to organize a new PhD study program, which will be a combination of organized courses and research for PhD thesis, in accordance with the European standards and recommendations (9).

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PhD Programmes at the University of Medicine - Pleven, Bulgaria

Professor Maria Simeonova MD, PhD

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The University of Medicine – Pleven, established in 1974, is a recognized and authoritative state higher educational institution for study in the field of Medicine, Medical Rehabilitation and Public Health. The current number of students in Medicine is 477, of whom 273 are international students. More than 780 young physicians, including 117 foreigners, are undertaking post graduate courses in the specialized clinics of the University's Hospital. At the present there are about 60 PhD-Students.

The introduction of ECTS at the University of Medicine – Pleven started in 1999, with the signing of the first bilateral agreements with European universities for student exchange and other activities aimed at improvement of quality of education in the framework of Socrates/Erasmus Programme. Partners in this Programme are the Free University of Brussels, the Humboldt University, Berlin, the Atlantic University of Barcarena, Portugal, the Medical Faculty of the Vilnius University, Lithuania on the basis of Bilateral Agreements for students, including PhD students and teaching staff mobility.

In Bulgaria, there are two scientific degrees - “Doctor” (PhD) and “Doctor of Sciences” (DSc), which are prerequisites for acquiring two ranks of academic status, respectively: “Associate Professor” (Docent) and “Professor”. The organization of PhD and DSc programmes is regulated by the Law of Higher Education and the Law of Scientific Degrees and Academic Ranks. The accredited Higher education institutions are authorized to organize PhD and DSc programmes in compliance with the above mentioned Laws. The Council of Ministers certifies the state requirements for acceptance and tuition of PhD students. The number of places available within a full-time/part-time PhD programme is established every year by the Ministry of Education. In order to enroll in the PhD programmes, students must pass an entrance exam organized annually by every institution developing PhD programmes.

The University of Medicine – Pleven (UM - Pleven) admits and educates students in educational and scientific degree PhD on 48 accredited specialties in the field of Medical Science. A list of accredited specialties is supplemented at the university's web-site: www.vmi-pl.bg.

PhD programmes are organized as a research for doctoral thesis (dissertation) under a guidance of scientific supervisor and additionally some modules of lectures, practicals and courses are included into the study programmes. The students are allowed to choose courses and modules regardless of disciplines.

Appropriate applicants for the PhD programmes are Bulgarian and foreign citizens who hold a Master degree in Medicine.

The process of admitting and training of PhD students is based on state requirements written in the Ordinance on admittance and training of PhD students. They are also in accordance with the interior regulations of UM – Pleven established by the Academic Council of the University and in compliance with the Law of Higher Education.

The Ministry of Education and Science announces and runs annually vacancies for sending PhD students who are Bulgarian citizens abroad to study in a PhD programme under conditions and additional requirements, written in contracts for educational, cultural and scientific exchange between the Bulgarian Government and governments of other countries.

Foreign citizens can apply and study in a PhD programme:

1. according to the regulations of a contract for educational, cultural and scientific exchange between governments;
2. according to acts issued by the Council of Ministers;
3. under the conditions and requirements of the Law of Higher Education, Art. 95, paragraphs 6 and 7.

University of Medicine – Pleven provides PhD students with materials and means necessary to conduct their PhD research.

The PhD students are entitled to apply for a scholarship from the state budget, UM – Pleven and other legal entities, organizations and/or institutions.

The PhD students have the right to be trained against payment according to the Law of Higher Education.

The forms of training of PhD students are the following:

1. Full-time PhD programme – a minimum period of 3 years for acquiring a PhD degree after Master degree in Medicine;
2. Part-time PhD programme – a minimum period of 4 years for acquiring a PhD degree after Master degree;
3. PhD programme based on student's self-preparation – the education provided is in accordance with the other forms of PhD training; the minimum period for acquiring a PhD degree is established by the Faculty Council.

At present, at the UM – Pleven there are 52 PhD students, 25 in the full-time, 13 in the part-time and 14 in self preparation form of the PhD study.

The Faculty Council of the main unit which conducts the training of the PhD student selects his scientific advisor, approves his curriculum and gives attestation to the student annually.

PhD students' training at UM – Pleven is coordinated and organized by the Students' Education and Scientific Office and takes place in the departments and clinical centers of the University Hospital – Pleven which have signed contracts with the Rector of UM – Pleven.

The conditions for enrollment into the full-and part-time PhD study are MD degree, a very good mark at the entrance exam (a foreign Language test and an exam in the specific medical discipline), two references by professors and a decision of the Academic Council of the University. The entrance examination is taken in front of a commission appointed by the Rector, including the scientific supervisor and two other professors.

An intermediate degree (Master of Science) is not required before or during obtaining the PhD.

Training of PhD students is conducted on individual curriculum. The individual curriculum is prepared by the PhD student and his scientific supervisor, presented for discussion in the main department and approved by the Academic Council.

The individual curriculum establishes:

1. the title of the PhD thesis;
2. the periods for sitting for doctoral exam;
3. attending of given modules of lectures and practices, courses, seminars, conferences and other public scientific presentations;
4. the periods and deadlines for preparation of PhD thesis.

PhD students sit for the doctoral exam on their scientific specialty planned in the individual curriculum in front of commissions established by the Rector, consisting of at least 3 professors including the student's scientific supervisor.

The conditions of due completion of PhD study are the passing of dissertation examination and the defense of a thesis (dissertation).

Currently, there is no credit system to assess potential prerequisites for obtaining the right to defend a PhD thesis.

The dissertation is a volume of about 120 pages with a defined structure: Contents, Introduction, Current knowledge in the field, Personal contributions, References. In addition, the author prepares a 30 page booklet, which is a short version of the dissertation including a list of research publications and conference abstracts lying in the basis of the dissertation.

The dissertation should in it self present an original contribution to science. It should also prove that the PhD candidate has profound theoretical knowledge in the given specialty and a capacity for independent scientific research work. Thus, the PhD is the first step for a future scientific career.

In order for a PhD thesis to be accepted for evaluation by the State Specialized Scientific Commission (Jury) the PhD student must have published at least 3 scientific papers in the field of research of the thesis in outstanding national (international) reviews.

The defense of the dissertation is carried out in front of the constant State Specialized Scientific Council (Jury), which consists of 21-23 professors in the given scientific specialty from different Universities and scientific institutions in Bulgaria. The dissertation is defended in a public meeting. The public discussion consist of the presentation of the dissertation as well as of the presentation by the official two reviewers, determined by the state Specialized Scientific Council. The public defense also involves questions of the jury and other experts attending the meeting and answers of the PhD student.

The attainment of the PhD degree or “Doctor” is a prerequisite for acquiring an academic rank and status of “Associate Professor” or “Docent”.

Current State of PhD Programs at School of Medicine, University of Belgrade

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Currently, typical structured PhD program in medical and health science does not exist at the School of Medicine, University of Belgrade, despite the fact that the law allows for such studies (the only formal PhD studies at the University of Belgrade are university multidisciplinary studies). This can be attributed to the fact that in late nineteen-sixties Master of Sciences degree (*Magister*) was introduced, with formally structured teachings, and later it was made prerequisite for applying for Doctor of Sciences thesis. Formal structure of two-year *Magister* studies and its content made it mote to have PhD-like doctoral program. Thus, *Doctor of Sciences* title was obtained after (typically) 2-3 years of *magister* studies that included exams in general scientific methodologies as well as those related to the specific research field, followed by three years of individual, mentored, research work, culminating with the defense of a written thesis.

In the field of medicine this led to great overload for those who aimed towards an academic career: six years of MD-degree studies, three- to four years of medical specialization, two to three years of *magister* studies, and additional three to four years of research that would allow for writing of *doctor of sciences* thesis.

Additional disadvantage of the system is that it is very difficult to develop and carry out meaningful research programs in all fields of clinical medicine.

It should be noted that School of Medicine Assistant position requires *magister* title (*plus* appropriate specialization) and teacher's position in addition presumes *doctor of sciences* title.

New *Law on High Education* that is to be approved by Serbian Parliament allows for two types of *Doctor of Sciences* theses in medicine: one that results from typical structured PhD studies and one that stems from work published in recognized scientific or professional journals. New *Law* will abolish *magister* requirement for assistant position.

Currently we are developing three- to four-years (180 to 240 ECTS) PhD programs in *Experimental Medicine, Therapies and Diagnostic Procedures Developments, and Public Health*. It is envisaged that 60-90 ECTS credits will be gained through structured teaching, and the rest through mentored research work. All programs will be compatible with European University Association (EUA) proposals and will follow *Dublin Descriptors*. Discussions are underway to make PhD studies *Joint Degree Studies* with our partner universities/faculties either through joint diploma or double-diploma (co-toutelle).

It is still unclear how the financing of the PhD studies in Serbia will be carried out: up to now, state education budget covered *magister* theses tuition fees, while *doctor of sciences* theses were in gray area – indirectly financed mostly through research project by the Ministry of Sciences. Introduction of formal lecturing structure into PhD studies requires financing of teaching, and it is not clear whether it will be financed through Ministry of Education and Sports or Ministry of Science and Environment Protection. Additional concern is status of

PhD candidates – students or employees. Recent EUA conference on doctoral studies (Salzburg, Austria) proposed employee status for PhD candidates, thus making them under current Serbian system non-eligible for Ministry of Education and Sports funding. On the other hand, there are several instruments by the Ministry of Science and Environment Protection that would allow temporary employee status for PhD candidates.

The other option for obtaining *doctor of science* title – thesis based on publications – obviously poses no problems in respect to the candidate position, as it implies clinical position, while funding may be obtained through Ministry of Sciences grants or (more desirably) through Ministry of Health grants. Naturally, support from internationally funded projects is to be sought after.

The following data describe recent and current statistics regarding *magister* degree studies and *doctor of sciences* theses:

Magister of Sciences topics (two-year studies, ending with magister thesis defence):

1. Citology, histochemistry, electronic microscopy and embryology
2. Clinical and experimental bacteriology
3. Immunology
4. Experimental pharmacology
5. Experimental physiology and pathologic physiology
6. Forensic pathology and expertise diagnostic
7. Social medicine
8. Neonatology
9. Statistics in laboratory and clinical experiment
10. Medical genetics
11. Human reproduction
12. Surgical anatomy
13. Hygiene and medical ecology
14. Nutrition
15. School hygiene for physiology of growth and development
16. Epidemiology
17. Neurology
18. Neuropsychology
19. Social psychiatry
20. Psychotherapy
21. Cardiology
22. Endocrinology, metabolism and enzymology
23. Hematology
24. Clinical biochemistry
25. Digestive system
26. Pulmology
27. Nephrology
28. Rheumatology
29. Clinical transfusiology
30. Urology
31. Dermatovenerology
32. Radiology
33. Radiology protection
34. Nuclear medicine
35. Occupational medicine
36. Sport medicine
37. Orthopedics
38. Oncology
39. Occupational physiology
40. Otorinolaryngology
41. Ophthalmology
42. Physical medicine and rehabilitation
43. Biologic psychiatry
44. Vascular surgery with angiology
45. Digestive surgery with endoscopy
46. Neurosurgery
47. Economics and health organization
48. Clinical and practice anatomy
49. Emergency surgery
50. Clinical pharmacology and therapy
51. Children's surgery
52. Clinical and experimental parasitology

Table 1. Number of registered and granted magister of sciences titles 1994-2003

Year	Registered	Granted
1994	238	93
1995	349	129
1996	290	98
1997	317	106
1998	329	128
1999	369	111
2000	297	131
2001	143	121
2002	153	86
2003	219	98
2004 until 01.12.2004.	201	88
Total	2905	1189

Table 2. Number of approved and granted Doctor of Sciences degrees at the School of Medicine, University of Belgrade:

Year	Approved	Granted
2002	45	48
2003	26	52
2004	41	42
2005 until this present	27	7
Total	139	149

Appendix

Formal requirements for obtaining title *Doctor of Sciences in Medicine*:

1. Right to apply for *Doctor of Sciences* dissertation has:
 - A. Person which has accomplished PhD studies (currently non-existent at the School of Medicine)
 - B. Person which has academic title *Magister of Sciences* of medical science

A person who successfully defends doctoral dissertation obtains the scientific degree *Doctor of Medical Sciences*.

2. Candidate who applies doctoral dissertation must have at the least one paper published in extenso in the journal indexed in Current Contents and/or in Science Citation Index, or two papers in journals that are indexed on Medline. Candidate should be the senior author or second author.
3. When all formal conditions for applying the thesis are fulfilled and appropriate explanation in written obtained, Scientific Council appoints commission for evaluation of feasibility of the topic and fitness of the candidate.
4. Commission submits report to the Scientific Council together with Ethic Committee approval.
5. Candidate must submit finished doctoral dissertation within five years from the day of approval.

The Procedure of Earning PhD Degree at University of Niš Medical School

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Postgraduate education and training in medical sciences represents the highest level of scientific-research education and career and it should fulfill the highest standards. In view of the general tendency in the European Union towards harmonisation, accreditation of the education system (through the ECTS system), as well as the candidate mobility in accordance with the scientific justification of needs, the Bologna process includes the reform of medical curricula for PhD studies too. Since developing countries have much more pronounced need to utilize technological benefits and advancements that exist in developed countries, the tendency towards a unique system of PhD studies is a task of high priority. It would contribute to quality equivalence and higher success rate of PhD studies. A uniform approach would enable and warrant equivalent quality criteria, recognizability and compatibility of the acquired title and make the preconditions for possible diploma accreditation.

At the Faculty of Medicine, University of Niš, PhD studies consist at the present of research work/project completed with the PhD thesis preparation. Master of science degree is usually an intermediate degree as the prerequisite of PhD studies. Postgraduate two-year master studies are devised to offer a relatively high level of knowledge and understanding of the research process and methods and currently about 30 disciplines are covered. Initial knowledge and skills are acquired in the first semester when general methodologic courses are attended and passed: Biologic mechanisms of regulation (module of preclinical and clinical disciplines, module of preventive medicine, module of surgical sciences, module of dental medicine), Introduction into scientific-research work, Ethics of scientific-research work, General and special methodology of scientific-research work, Medical informatics, Medical statistics and English language. The attended first semester together with the passed exams carries 30 ECTS points and is the prerequisite of further study. The second and third semesters consist of the courses directly associated with the chosen topic of study, after which the candidate can start preparing his master thesis, defend it and acquires the Master of science degree. Before starting to prepare his PhD dissertation, a master of science should qualify as scientifically appropriate, ie. he should be actively engaged in scientific-research work (which is documented by his published papers indexed in some relevant data base – Medline, Current Contents or equivalent). Before thesis preparation, a candidate should pass the procedure which consists of the application of PhD thesis with clearly stated objectives, working hypothesis and expected results. The hypothesis should be original, based on scientific facts and supported by the data from the relevant literature. Scientific-research biography and thesis justification are submitted by the candidate to the Board for PhD Studies and Educational-scientific Assembly of the Faculty of Medicine for approval. At the meeting of the Board for PhD Studies, on behalf of the suggested commission the supervisor has a task to explain the subject and aims of the study, suggested working hypothesis and expected results. After the decision on the appropriateness of the candidate and suggested topic, the proposal is being directed to the Educational-Scientific Assembly of the University for verification. After the positive opinion on the candidate and thesis has been adopted by the University, a PhD candidate can assume further experimental work, writing and preparation of PhD thesis defense. Completed PhD thesis in 10 copies and hardbacked is being submitted by the candidate since it should be made available to the scientific community. The PhD thesis may contain published papers related to proposed methodology. The precondition to evaluate the PhD thesis is that the Commission of 5 members

(out of which one is not from the Medical Faculty in question) gives its positive opinion. Foreign experts may be involved as the additional honorific members. Formal and essential fulfillment of the conditions is verified by the Board for PhD studies, Educational-scientific Assembly of the Faculty of Medicine and, finally, by the Educational-Scientific Assembly of the University. After that the candidate schedules the 45 minutes' public defense of the thesis; the defense consists of two parts: in the first part the candidate presents the aim, material and methods and results of his work, and accuracy of his opinions he supports with up-to-date literature data. Creativity, ability to scientifically devise the study, logical approach to result interpretation, knowledge of the available literature, familiarity with the applied methodology and practical skills, is demonstrated through the appropriate comments. In the second part of his defense the PhD candidate has to answer the questions asked by the commission members. After that the Commission puts forward its final decision; if positive, the candidate acquires the PhD degree in Medical Sciences, as well as all the rights guaranteed by the law on that account. The attainment of the PhD degree is a prerequisite for the academic career starting from the position of assistant professor.

Up to now, a total of 466 PhD theses were defended at the Faculty of Medicine, University of Niš. Table 1. gives the number of submitted and defended PhD theses for last few years.

Table 1. The number of submitted and defended PhD theses for last few years at the Faculty of Medicine, University of Niš

School year	Number of PhD theses	
	Submitted	Defended
2000/2001	24	27
2001/2002	12	13
2002/2003	15	9
2003/2004	14	15

In Serbia, modifications of the Law on University are on the way; the new law will contain the key elements which would formulate the way to realise PhD studies (introduction of the ECTS system, duration of studies, teaching methods at PhD studies). Our opinion is that the present approach may be a good starting point for PhD studies reform, where of crucial importance will be the experience of the countries which already entered the Bologna process.

PhD Program at the Faculty of Medicine Novi Sad

Professor Nevena Sečen, MD, PhD

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PhD degree at the Faculty of Medicine in Novi Sad is obtained according specific procedure, which is somewhat different from the PhD studies at most European Universities.

PhD program at the Faculty of Medicine in Novi Sad was established in 1962 and graduated its first students in 1964, in the field of Internal Medicine. Until nowadays, we have graduated 530 students with PhD degree. At the moment Faculty of Medicine has 70 PhD candidates in the fields of medicine (mostly clinical disciplines) and dentistry.

PhD studies are offered in numerous fields, depending on student's primary area of research interest. The degree candidate, under supervision of the thesis advisor - mentor, is engaged in the research and is obliged to prepare, defend and publish a dissertation in order to graduate. Aside from the mentorship-based research, experience and published papers are criterions for completing the PhD program. Duration of PhD study is not limited and students are allowed to plan their individualized programs according to the thesis requirement. The PhD program is conducted at the Faculty of Medicine and at clinics and centers that present the educational basis of the Faculty (Clinical Center Novi Sad, Institute for Oncology, Pulmonary and Cardiovascular Diseases in Sremska Kamenica, Institute of Public Health Novi Sad, regional health centers.)

To enter into the PhD program students must have a MD degree with an average grade point min. 8,00 and the Master degree. Graduate studies, leading to the master's degree and title of Master of Medical Science, last two years. They consist of all fundamental, clinical and preventive branches of medicine providing students with competence in methodology for research in a certain scientific field. In clinical disciplines specialization studies usually precede PhD, but it is not mandatory for the approval of doctoral dissertation.

Conditions for the approval of PhD dissertation are as following:

- Five scientific papers published “in extenso” in peer-reviewed national journals in the field of PhD research interest or
- Two papers in the field of PhD research interest published in a journal with importance index (impact factor) or
- One paper published “in extenso” in a journal with impact and three papers published “in extenso” in peer-reviewed national journals

The PhD degree is essential for the academic career; however it is not the only condition. Recognizing as an assistant / associate professor requires also minimum 5 years of teaching experience.

For the time being, postgraduate studies leading to the Master's and PhD degree as well as all other postgraduate programs undergo reform in order to be harmonized with the European academic environment. From the school year 2005/06 a three-year PhD program will be adapted to the new Law on University of the Republic of Serbia.

Organisation of PhD Programme in Medical School, University of Tuzla

Professor Osman Sinanović, MD, PhD

*Director for Education, Research and Internatioanl Affair, University Clinical Center Tuzla; Head of Postgraduate Study, Medical School, University of Tuzla
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The Medical School University of Tuzla was established in 1976, Postgraduate study for Master Degree in 1978, and since then 182 postgraduate students get a Master Degree (since 1995 – 115).

First PhD examination was held on December 15, 1978, and since then 107 students get PhD degree (since 1995 – 49). PhD programme is only one, covering biomedical science and public health. We enrol, in average, five students per year, in last several years. PhD programme is organized as a research under the guidance of a supervisor.

The condition for the enrolment into the PhD study is Master Degree and three research papers. Before acceptance, the PhD research project should be defendet in front of opponnet and with presence of supervisor, and Head of Postgraduate study or/and Vice-Dean for Science. After that board of three members (inculding supervisor) appointed by University senate (on proposal of School senate) gives written opinion of student condition for enrolment into the PhD study and research project itself. Etical approval is obligatory to obtain for relevant projects. This oppinion should goes through School and University senate again for fainal approval and formal nomination of supervisor.

An integral thesis «written in whole» is obligatory. Supervisor should give written agreement that thesis can be evaluated. It is made by three memebbers (including supervisor) appointed by University senate (on School senate proposal). Members could be the same from very beginning or others but always supervisor is on of them. Commonly all memebbers are from the University of Tuzla, but it is also not rare to have memebbers from other University in Bosnia and Herzegovina, and nowadays also from neighbourhood countries. Board oppinion, as one paper, should goes again through School and University senate for fainal approval, and than these bodies nominated PhD examinaion board for oral examination of PhD candidate. Usualy this board is the same as previous one. Disertation does not contain published papers.

The attainment of the PhD degree is a prerequisite for academic career – for being recognized as an assistant professor.

PhD programmes at Karolinska Institutet in Stockholm, Sweden.

Raffaella Öckinger, MD

Chairperson, The Graduate Students' Association at Karolinska Institutet

Karolinska Institutet (KI) is a medical university hosting not only nineteen different undergraduate programmes but also several PhD programmes.

A PhD candidate at KI can then take a PhD degree in the following subjects:

Biomedical ecology, cell and tumour biology, immunobiology, infection biology, clinical microbiology, infectious disease control, medical biophysics, medical biochemistry, allergy science, physiology and pharmacology, neuroscience, medical microbial ecology, cell and molecular biology, epidemiology, environmental medicine, molecular genetics, molecular toxicology, toxicology, humanistic medicine, ethics in medicine, medical informatics, medical managements, educational development in medicine, medical statistics, biostatistics, functional genomics, general surgery, anaesthesiology and intensive care, internal medicine, clinical physiology, medical radiology, obstetrics and gynaecology, nursing science, orthopaedics, psychiatry, rehabilitation medicine, general medicine, occupational therapy, dementias and cognitive disorders, epidemiologic aging research, experimental psychiatry, clinical aging research, neuroscience with focus on neurodegeneration, neuroendocrinology, neuroscience with focus on molecular pharmacology, gerontological nursing, psychotherapy, physiotherapy, bioorganic chemistry, cancer biology, immunology, molecular endocrinology, molecular epidemiology, structural biology and biophysics, allogenic stem cell transplantation research, biomedical laboratory science, bio analysis, physiology, clinical bacteriology, clinical pharmacology, clinical immunology, clinical chemistry, clinical virology, medical engineering, molecular medicine, neurophysiology, pathology, transfusion medicine, dermatovenerology, experimental medicine, cardiology, gastroenterology and haepatology, haematology, medicine with focus on health economics, infectious diseases, pulmonary medicine and allergology, obesity and other eating disorders, oncology, rheumatology, medical nutrition, public health with focus on general medicine, public health with focus on migration medicine, phoniatics, speech pathology, renal medicine, oto-rhino-laryngology with audiology, paediatrics, cardiothoracic surgery, transplantation surgery, urologic surgery, psychiatric nursing science, medical genetics, clinical epidemiology, clinical immunology, allergy and transfusion medicine, cardiovascular medicine, nephrology, sports medicine, clinical chemistry and coagulation research, clinical pain research, plastic surgery, urology, paediatric surgery, child and adolescent psychiatry and allied professions, reproductive health, reproductive and perinatal health care research, immunobiology including tumour immunology, medical radiation biology, medical radiation physics, oncology and experimental oncology, pathology cytology and experimental pathology, forensic medicine, clinical alcohol and drug addiction, neurosurgery, neuroradiology, neurology, ophtalmiatrics, optometry, injury prevention, health promotion, health systems research, international health, psychosocial medicine, social medicine, occupational medicine, oral science, internal medicine, medicine and media.

KI runs even more structured research schools: the national research school in health care, the company research school in biotechnology, and the research school in medical bioinformatics.

The minimum request to enter a PhD programme in general is a minimum of 120 Swedish credits regardless of degree.

Every PhD programme has then its own requests to enter it which are specific for the subject.

The duration of a PhD programme at KI and in Sweden in general is four years full time studies, that is to say 160 Swedish credits.

The PhD programmes at KI are organised as a combination of research and organised courses, the research part being supervised by one or more supervisors. The main supervisor has to have at least the academic title of Associate Professor (docent) and the other(s) supervisor(s) have to have at least a PhD degree.

The PhD candidate has even to attend organised courses for a minimum of 20 Swedish credits and 5 of them are of compulsory choice in the following fields:

- Philosophy of science and ethics
- Pedagogic/presentation technology
- Information technology
- Medical information retrieval
- How to write a scientific paper
- Medical statistics
- Laboratory animal science
- Good laboratory practice
- Good clinical practice
- Bioinformatics

At KI and in Sweden in general it is possible to take a shorter, intermediate degree, a licentiate degree. The new rules dictated by the KI rector are though very restrictive according the enrolling of students for a licentiate degree.

Karolinska Institutet has a large amount of PhD students in relation to its undergraduate students.

A more precise statistics of the PhD students enrolled during year 2001, 2002, 2003 and 2004 is listed below.

	2001	2002	2003	2004
New students	396	389	459	449
- with already a licentiate degree	-	77	69	170
Active ($\geq 1\%$)	2038	2057	2133	2147
Licentiate degree	57	57	52	62
PhD degree	253	294	304	360
-with already a licentiate degree	21	33	33	44

The PhD thesis has to contain at least 4 original papers (no review paper is accepted), and at least half of them must have been accepted for publication. In at least 2 papers the PhD students has to be quoted as the first name.

The thesis has even to contain a part with a general introduction, results and discussion part in order to demonstrate that the papers have a connection to each other and there being a consistent objective of the project.

The PhD candidate has even to undergo a half-time control after two years have passed.

To be allowed to perform the half-time review, the student must have fulfilled 5 credit points of postgraduate courses according to the study plan for the study subject, and 5 credit points of basic general science courses (this only applies to students registered July 1, 1998 or later).

The student should write a short (approx. 2 pages) summary of the project. In addition, the student should present the achieved results and a plan for the future orally, preferably in the form of a seminar.

The half-time review/seminar is obligatory for all students applying for a doctoral qualification (PhD). A licentiate degree (Licentiatexamen) within the same study subject, excludes the necessity for a half-time review.

The department should take the initiative for the halftime seminar and appoint three people with competence in the research field (preferably assistant or full professors).

The student supplies the reviewers with the written summary and all published articles and manuscripts planned to be used in the thesis.

After the seminar, the three reviewers discuss the project with the student and the supervisor(s) and give comments and suggestions for possible improvements. It is important to also review the postgraduate training within the study subject, i.e. courses taken, etc. It is also important to check that all parts of the research project are covered by valid ethical permits.

The reviewers then compose a written report and the half-time review is then registered by the postgraduate student administrator at the department.

The thesis is prereviewed by an Examination Board. After the preview the Examination Board decides whether or not to recommend a public defence.

After the public defence, the Examination Board meets to decide whether the thesis has been successfully defended.

The opponent has to have a PhD degree and preferably not coming from KI but from other universities or from abroad.

The attainment of a PhD degree is definitely a prerequisite for academic career.

For more information please visit the website http://edu.ki.se/research/index_en.html



The Declaration of the European Conference on Harmonisation of PhD Programmes in Medicine and Health Sciences

Convened in Zagreb on April 24 – 25, 2004

(hereafter referred to as the «Zagreb Declaration»)

After extensive discussion and exchange of ideas and experiences among participants coming from 25 universities and from 16 European countries having different schemes for obtaining PhD degree in medicine and health sciences regarding both form and the way of evaluation, ranging from monograph and evaluation within the same university to high standards of PhD thesis containing four or more papers published in internationally recognized peer reviewed journals, often with high impact factor and the inclusion of evaluators from abroad, the participants of the European Conference on Harmonisation of PhD Programmes in Medicine and Health Sciences (hereafter referred to as the «Zagreb Conference» or the «Conference») have agreed on the following:

Article 1

PhD programme is intended to enable individuals, after completing and defending their PhD thesis, to carry out independent, original and scientifically significant research and critically evaluate work done by others. To assure the above, the participants of the Conference reached consensus on the following:

Article 2

As in any kind of scientific peer review process, the reviewers of PhD thesis should be competent and independent from the PhD thesis, candidates and supervisor. In this sense, the participants of the Conference would like to encourage the inclusion of reviewers from other universities and countries.

Article 3

The Conference agreed that a suitable benchmark to describe the necessary achievement is a PhD thesis based on original *in extenso* publications in internationally recognized scientific-medical journals. The independent contribution of the candidate should be clearly demonstrated (for example the candidate being the first author). The Conference recommends that the minimal requirement for the PhD thesis in medicine and health sciences should be the equivalent of at least three *in extenso* papers published in internationally recognized journals. In addition to the papers presented the candidate should provide a full review of the literature relevant to the themes in the papers, and, where necessary, a fuller account of the research methods and results. Where the PhD research is presented in other formats, such as the single monograph, reviewers should demonstrate that the contribution is at least equivalent to this benchmark, and should encourage inclusion of publication from the research.

Article 4

While the main demonstration of the achievement should be the thesis and published papers, PhD programmes should include theoretical basis as well as development of technical research skills in taught courses where appropriate.

Article 5

The Conference recommends to all universities to make their PhD programmes publicly available to students, lecturers and tutors from other universities and countries. All medical schools are recommended to create their web pages and written material about PhD programmes in English and to make their programs open to candidates from other universities and countries. The Conference encourages the development of joint PhD programmes in order to enhance the link between the European Higher Education Area and the European Research Area with a view to ensure higher quality and enable joint degree recognition.

Article 6

The development of well-designed and high-quality PhD programmes requires substantial support by medical faculties, universities, national governments, the European Commission or private sponsors and other institutions in order to engage the best medical students into scientific research so as not to lose our future in medicine and public health.

The Zagreb Declaration was adopted unanimously on April 25, 2004 at 2:00 P.M. by:

Conference participants

Representatives of international and Croatian professional/academic associations and governmental institutions (in alphabetical order)

Association of Medical Education in Europe (AMEE)

Prof. Jadwiga Mirecka, MD, PhD, Executive Committee member

Association of Medical Schools in Europe (AMSE)

Prof. Petr Hach, MD, PhD, President

Association of Schools of Public Health in the European Region (ASPHER)

Prof. Charles Normand, BA, DPhil, FFPHM, President

Croatian Medical Association

Prof. Ivan Bakran, MD, PhD, Vice-President

European Medical Association (EMA)

Vincenzo Costigliola, MD, President

German Academic Exchange Service (DAAD), South-Eastern European Cooperation, Curriculum Reform in Medicine

Prof. Hans Joachim Seitz, MD,

Ministry of Health and Social Welfare of the Republic of Croatia

Prof. Velimir Božikov, MD, PhD, State Secretary for Health

Ministry of Science, Education and Sports of the Republic of Croatia

Prof. Pavo Barišić, PhD, Assistant Minister

University of Zagreb, Croatia

Prof. Aleksa Bjeliš, PhD, Vice-Rector

Prof. Helena Jasna Mencer, PhD, Rector

Representatives of medical schools and schools of public health (in alphabetical order by country name)

University of Mostar, Medical School, Mostar, Bosnia and Herzegovina

Prof. Filip Čulo, MD, PhD, Dean

Prof. Mirna Saraga-Babić, MD, PhD, Vice-Dean for Science

University of Sarajevo, Medical School, Sarajevo, Bosnia and Herzegovina

Prof. Jadranka Dizdarević, MD, PhD, Vice-Dean for Undergraduate Studies

Prof. Benjamin Vojniković, MD, PhD, Secretary General of the Medical School

University of Tuzla, Medical School, Tuzla, Bosnia and Herzegovina

Prof. Lejla Begić, MD, PhD, Vice-Dean for Science

Prof. Osman Sinanović, MD, PhD, PhD Programme Director

Prof. Husref Tahirović, MD, PhD, Dean

Higher Medical Institute of Pleven, Pleven, Bulgaria

Prof. Maria Simeonova, MD, PhD, Head of Medical Genetics Department

J. J. Strossmayer University, Medical School, Osijek, Croatia

Asst. Prof. Gordan Lauc, MD, PhD, Vice-Dean for Education

Asst. Professor Ante Tvrdeić, MD, PhD, Vice-Dean for Postgraduate Studies

University of Rijeka, Medical School, Rijeka, Croatia

Prof. Anđelka Radojčić Badovinac, MD, PhD, Vice-Dean for Postgraduate Studies

Prof. Dragica Bobinac, MD, PhD, Vice-Dean for Graduated Studies

Asst. Prof. Zlatko Trobonjača, MD, PhD

Prof. Luka Zaputović, MD, PhD, Vice-Dean for Science

University of Split, Medical School, Split, Croatia

Prof. Mladen Boban, MD, PhD, Dean

Prof. Željko Dujić, MD, PhD, Coordinator of Postgraduate Studies

Prof. Stjepan Gamulin, MD, PhD, Head of Postgraduate Studies Committee

Prof. Marijan Saraga, MD, PhD, Vice-Dean for Science

University of Zagreb, Medical School, Zagreb, Croatia

Prof. Nada Čikeš, MD, PhD, ECTS Coordinator

Prof. Marija Dominis, MD, PhD, Vice-Dean for Postgraduate Studies

Prof. Boris Labar, MD, PhD, Dean

Prof. Zdravko Lacković, MD, PhD, PhD Programme Director, Deputy Dean for Postgraduate Studies

University of Zagreb, Medical School, Andrija Štampar School of Public Health, Zagreb, Croatia

Prof. Jadranka Božikov, PhD, PhD Programme Deputy Director

Prof. Luka Kovačić, MD, PhD Deputy Director

Prof. Stjepan Orešković, PhD, Director

Charles University in Prague, First Faculty of Medicine, Prague, Czech Republic

Prof. MUDr. Stanislav Štípek, DrSc., Vice-Dean for Pedagogical Affairs

University of Helsinki, Faculty of Medicine, Finland

Prof. Seppo Meri, MD, PhD, Head, Committee for Postgraduate Scientific Studies in Medicine

University of Hamburg-Eppendorf, Germany

Prof. Dr. Hans Joachim Seitz, MD, Director of the Institute for Biochemistry and Molecular Biology III - Biochemical Endocrinology

University of Szeged, Albert Szent-Gyorgyi Medical and Pharmaceutical Centre, Faculty of General Medicine, Szeged, Hungary

Prof. László Vécsei, MD, PhD, DSc, Director of the Experimental and Clinical Neuroscience PhD Programme

University of Dublin, Trinity College, Dublin, Ireland

Prof. Charles Normand, BA, DPhil, FFPHM, Edward Kennedy Professor of Health Policy and Management

University of Pavia, Faculty of Medicine and Surgery, Pavia, Italy

Prof. Alberto Calligaro, Deputy Dean

University "St. Cyril and Methodius", Medical School, Skopje, R. Macedonia

Prof. Magdalena Žanteva-Naumoska, MD, PhD, Vice-Dean for Postgraduate Studies

Prof. Ljubica Georgijevski-Ismail, MD, PhD, FESC, Member of the Postgraduate Studies Committee

Norwegian University of Science and Technology (NTNU), Faculty of Medicine, Trondheim, Norway

Anne Britt Storeng, Senior Executive Officer, Research Administration

Prof. Alf O. Brubakk, Professor of Environmental Physiology

University of Oslo, Faculty of Medicine, Oslo, Norway

Sigrud Bergseng, Senior Executive Officer and Head of PhD Programme University Administration

Medical Centre of Postgraduate Education, Warsaw, Poland

Zbigniew Wegrzyn, MD, Department of Education and Quality Assessment

Jagellonian University, University Medical College, Kraków, Poland

Prof. Jadwiga Mirecka, MD, PhD, Head of the Department of Medical Education

Poznan University of Medical Sciences, Poznan, Poland

Prof. Maciej Zabel, PhD, Head of PhD Program

Iuliu Hatieganu University of Medicine and Pharmacy, Cluj-Napoca, Romania

Prof. Petru Adrian Mircea, Vice-President of the University

University of Niš, School of Medicine, Niš, Serbia and Montenegro

Prof. Goran Nikolić, MD, Vice-Dean

University of Novi Sad, Faculty of Medicine, Novi Sad, Serbia and Montenegro

Prof. Nevena Sečen, MD, PhD, Vice-Dean for Foreign Communication and Foreign Students

Comenius University, Jessenius Faculty of Medicine, Slovak Republic

Prof. Kamil Javorka, MD, DSc, Vice-Dean for PhD Study

University of Navarra, Medical School, Navarra, Spain

Prof. Alfonso Sánchez Ibarrola, MD, PhD, member of University PhD Committee

List of other invited lecturers not listed above (in alphabetical order):

Tina Dušek, MD, PhD student, University of Zagreb Medical School, Croatia

Dr. Guy Haug, Expert on the European Higher Education Area (Bologna Process), Bruxelles

Alena Kavalírová, graduated pharmacist, PhD student, Faculty of Pharmacy in Hradec Králové, Charles University in Prague

Dr. Cees C. Leibbrandt, MD, Former Secretary General (1999–2002) of the European Union of Medical Specialists (UEMS)

List of observers (in alphabetical order)

Sandra Belko, BA (English), PhD Programme Secretary, Medical School, University of Zagreb;

Kristina Fišter, MD, Research Fellow, Andrija Štampar School of Public Health, Medical School, University of Zagreb; **Asst. Prof. Ileana Linčir**, MD, PhD, Vice-Dean for Postgraduate Education, University of Zagreb School of Stomatology; **Prof. Josip Madić**, DVM, PhD, Vice-Dean of Science and International Cooperation, Faculty of Veterinary Medicine, University of Zagreb; **Prof. Albert Marinculić**, DVM, PhD, Vice-Dean of Education, Faculty of Veterinary Medicine, University of Zagreb; **Anita Putrić**, BA (Political Science), Senior Executive Officer of PhD Programme Administration, Medical School, University of Zagreb; **Marita Mimica**, BA (psychologist), Head of Postgraduate Studies Department, Medical School, University of Split, **Miroslav Sabolek**, BA (economy), Head of PhD Programme Administration, Medical School, University of Zagreb; Assoc. Prof. **Velimir Sušić** DVM, PhD, ECTS Coordinator, Faculty of Veterinary Medicine, University of Zagreb; **Tea Vukušić Rukavina**, MD, Research Fellow, Andrija Štampar School of Public Health, Medical School, University of Zagreb.

Editors

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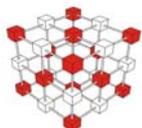
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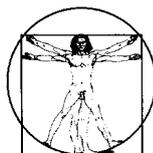


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