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HELLENIC REPUBLIC
H.Q.A.
HELLENIC QUALITY ASSURANCE AND ACCREDITATION AGENCY

EXTERNAL EVALUATION REPORT

DEPARTMENT OF MEDICINE

NATIONAL AND KAPODISTRIAN UNIVERSITY OF ATHENS

Version 2.0
March 2010

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External Evaluation Committee

The Committee responsible for the External Evaluation of the Department of Medicine of the University of Athens consisted of the following four (4) expert evaluators drawn from the Registry constituted by the HQAA in accordance with Law 3374/2005:

1. Professor Vassilis I. Zannis, PhD (President)

Boston University School of Medicine, USA

2. Professor George Kitas MD, PhD, FRCP

Dudley Group NHS Foundation Trust, Dudley and Arthritis Research UK Epidemiology Unit, University of Manchester, United Kingdom

3. Professor Nikolaos Robakis, PhD

Mount Sinai School of Medicine, New York University, USA

4. Professor Othon Iliopoulos, MD

Associate Professor of Medicine, Harvard Medical School and Massachusetts General Hospital Cancer Center, Boston, USA

N.B. *The structure of the "Template" proposed for the External Evaluation Report mirrors the requirements of Law 3374/2005 and corresponds overall to the structure of the Internal Evaluation Report submitted by the Department.*

The length of text in each box is free. Questions included in each box are not exclusive nor should they always be answered separately; they are meant to provide a general outline of matters that should be addressed by the Committee when formulating its comments.

Introduction

I. The External Evaluation Procedure

Dates and Brief account of the site visit.

The External Evaluation Committee (EEC) visited the Medical School of the National Kapodistrian University of Athens from Monday 17th to Friday 21st of February 2014.

List of reports, documents, other data examined by the Committee

The members of the EEC had examined the Internal Evaluation report covering Academic Years 2005 to 2010 and other documents, sent in electronic format a few days prior to the site visit. These documents included details for the 28 graduate (Master's) programs, but very limited information for the Doctorate Program. For several issues, the EEC requested additional or updated information (for example short CVs of the faculty of the Medical School and hard copies of their presentations to the EEC). The administration and the faculty made every possible effort to provide the requested material.

Whom did the committee meet

In the morning of Monday 17/02/2014 the members of the EEC were briefed in the office of ADIP by Professor K. Economou. Following the briefing, the committee was transported to the "Kostis Palamas" building of the National and Kapodistrian University of Athens, where they met with the Medical School leadership for an introduction to the Medical Schools' undergraduate and graduate program. President A. Dimopoulos provided an overview of the history, the facilities and the affiliated hospitals of the Medical School. He also presented an overview of the undergraduate and graduate programs, the teaching, research and clinical responsibilities of the faculty, their performance as well as the short and long term plans for future development of the Medical School. Following Dr. Dimopoulos' presentation, the President of OMEA, Professor C. Stefanadis and the Assistant Professor T. Psaltopoulou, explained the internal evaluation process that generated the internal evaluation report.

Dr. Nikolaos Zografos, Head of Administrative Services of the School, outlined the managerial support for the educational activities of the School. Professor V. Gorgoulis described the pre-clinical training of the medical students. Professor P. Sfikakis described the clinical training of students at the Medical School. Professor A. Tsakris provided an overview of the graduate (Master's and doctorate) programs. Assistant Professor E. Terpos provided detailed information on the overall research activities of the school. Professor C. Spiliopoulou described the sources and amount of research funding of the School. Present in the meeting were also Professor T. Liakakos, deputy Vice Chancellor of the University of Athens who explained the funding of the University by the government and its allocation among the different schools; as well as Professor E. Patsouris, Dean of the newly formed School of Health Sciences, to which the Medical School of Athens has been incorporated, alongside Dentistry, Pharmacy and Nursing. On Tuesday 18th and Wednesday 19th of February, the EEC attended all day presentations (from 8 am to 7 pm) provided by each of the directors or nominated deputies of the 28 Master's programs. Each presentation was followed by a discussion and a question and answer session. The formal presentations of the Master's programs to the EEC were well-prepared and highlighted most of the required information. The discussion that accompanied the presentations addressed several aspects of the graduate program

which will be described in detail in the section reviewing the individual graduate programs

Groups of teaching and administrative staff and students interviewed and Facilities visited by the External Evaluation Committee

Following the presentations on the 18th and the 19th of February, there were one-hour meetings with students of the Master's and doctoral programs. The meetings with students were private, in the absence of faculty. It was followed by one-hour meetings with the directors and faculty of Master's programs in the absence of the students. Due to time limitations, the EEC did not have the opportunity to visit the research and teaching facilities associated with the graduate programs, however it had the opportunity to see research theses and publications that originated from these programs. The faculty members and the graduate students with whom the EEC met fully endorsed the significance and need for both the internal and external evaluation, demonstrating their desire for improvement and attainment of excellence. On the 20th of February the EEC drafted part of the external evaluation report. On the morning of 21st of February, the EEC had a feedback meeting with the School authorities and continued drafting the external evaluation report for the remainder of the 21st and the morning of the 22nd.

The external evaluation was well organized and the leadership, administrative staff and faculty of the graduate programs did their best to facilitate the whole process. The EEC wants to congratulate and thank all involved in the external evaluation for making our work as seamless as possible.

II. The Internal Evaluation Procedure

Comments on the quality and completeness of the documentation provided and on the overall acceptance by the Medical School of and participation in the Quality Assurance procedures.

The Internal Evaluation Report, including detailed records of research ongoing in basic and clinical sections and individual laboratories of the Medical School, was prepared by OMEA and made available at the site visit. CVs of faculty members and scientific staff were also provided. These documents helped the EEC understand the functions and programs of the Medical School and facilitated the conduct of the external evaluation. Overall, the Internal Evaluation report was mainly descriptive. It did not mention goals or objectives and lacked critical interpretation of the data and evaluation of outputs. Important regulatory issues, such as Human Subject Protection, Institutional Review Board, Animal Welfare, Biosafety and Radiation Safety were not adequately addressed. Limited information was provided on the evaluation of the productivity, performance and research funding of the faculty, as well as on criteria for faculty hiring and promotion. Other issues that were not adequately covered were: implementation of modern teaching and research approaches such as problem-based teaching, the future strategic plans of the School and the means for their implementation. Moreover, no evidence was provided that specific actions, resulting from the 2011 internal evaluation, were taken prior to the current external evaluation visit. Given that this is the first time that the Medical School of Athens is evaluated, the EEC recommends to ADIP that the future internal evaluation forms of the Medical School include questions pertinent to: 1) regulatory issues related to research, 2) productivity, performance and research funding of the faculty, and 3) criteria for hiring and promoting the faculty of the Medical School as well as data demonstrating the implementation of these criteria.

These latter important issues were brought to the attention of the leadership of the Medical School, who, in response to it, provided a strategic plan on how to address them. The EEC welcomes the positive response of the Medical School but wants to point out that the process of internal self-evaluation and subsequent external evaluation should be continuous and iterative. Any corrective actions identified during evaluations need to be followed up and implemented in a timely fashion. Despite these limitations (that most likely result from lack of previous experience) overall the EEC found the internal evaluation report satisfactory and informative although unnecessarily long. A much shorter report that summarizes

information essential for the evaluation of the school would have been more productive. For example short CVs containing essential information on the educational, clinical, and research activities of the faculty would have been much easier to follow and evaluate in the time frame available to the EEC members. The EEC wishes to thank Professors Dimopoulos and Stefanadis, as well as the rest of the leadership, the faculty, the students, and the other academic and administrative staff of the Medical School of Athens for the time they devoted to compiling the internal evaluation report and to updating much of the information prior to the visit. Their willingness to comply with the requirements of the internal and external evaluation demonstrates an appreciation and acceptance of the value of the review process and its role in the future development of the Medical School of Athens.

A. Curriculum

To be filled separately for each undergraduate, graduate and doctoral program.

APPROACH

What are the goals and objectives of the Curriculum? What is the plan for achieving them?

There are currently 28 Master's Programs. The majority has 2 years, one has 1 year, two have 1.5 years and one has a 3 year duration. With one exception, all the programs require the dedication of one semester towards the completion of diploma (thesis) work. Each program admits 10-50 students per year. The goals and objectives of each curriculum and the means to implement them differ among the 28 programs. Each program has its own self-described objectives and its own means to achieve them and there are no apparent collaborations among the programs. There is overlap in the courses taught and many faculty members teach in more than one program. There are general similarities among the programs regarding the legal framework, the admission criteria, the structure of the curriculum over the duration of the program, and the textbooks provided to students. During the presentations, the program directors provided information on collaborations with other AEI, ATEI and research institutes both in Greece and abroad and the educational, societal, and economic importance of the programs. Information was also provided on the evaluation of student performance, the evaluation of the program by students and in some programs, the career advancement of the graduates. Prevailing objectives of the program missions were: (a) To provide specialized knowledge that will help the graduates of the program to advance their current careers and to create new job opportunities for specific categories of nurses and other health care professionals, (b) To replenish perceived shortages of trained personnel that exists in clinics, (c) To enable graduates who have the interest and ambition to continue into a PhD level program to do so. The term (PhD level) program is used here and throughout the text to designate high quality doctorate programs that fulfill universally accepted standards of excellence (described on page 18 and section F), (d) To enhance the knowledge and clinical skills of MDs enrolled in Master's program, (e) To introduce students to research in the field covered by the program, and, (f) to mentor, in a few cases, students to find educational and/or career opportunities abroad. Program goals are attained by implementation of the individual curricula and monitoring student satisfaction and success. Criteria for success included student grades, quality of diploma thesis and, in some cases, career outcomes.

How were the objectives decided? Which factors were taken into account? Were they set against appropriate standards? Did the unit consult other stakeholders?

The objectives of each Master's program were decided by the director of the program and the representatives of other universities or technological institutions (ATEI) participating in the program. The programs were approved by the general assembly of the Medical School and published in the Government Gazette. The available information indicates that most programs reflect the conviction of the program directors. The underlying assumption is that the material taught in their Master's programs is not currently addressed by the education and training provided by the AEI and ATEI (i.e. lack of specialized nurses or medical subspecialty training). The majority of the programs employs expanded undergraduate curricula and is structured in a way which is not consistent with existing international

standards. The exceptions to this rule are the programs in biostatistics, medical physics, molecular and applied physiology, clinical neuropsychology, the occupational and environmental health programs that were guided by prolonged international collaborations or advisory boards, and the molecular medicine program which was build on the prototype of MD-PhD programs in North America, Europe and in Crete. No information was provided on the involvement of other stakeholders or students in the initial development of the curricula.

Is the curriculum consistent with the objectives of the Curriculum and the requirements of the society?

Regarding the need to improve the training of health professionals through the Master's programs, the EEC believes that in the long run this may not be the most appropriate and efficient way to deliver such training. Professional retraining and continuous education should be the responsibility of professional societies and institutions in collaboration, when needed, with the Medical School. Nevertheless, at this stage, many of the Master's programs may serve transiently to fill the void left by other institutions entrusted with this task. This activity however may detract from other important and unique functions of the Medical School. Overall, the curriculum of most Master's programs differs drastically from those of international graduate programs designed to prepare new scientists to enter doctorate (PhD level) programs and need to be modified accordingly.

How was the curriculum decided? Were all constituents of the Department, including students and other stakeholders, consulted? Has the unit set a procedure for the revision of the curriculum?

The programs were created in response to competitive calls of the Greek Ministry of Education for creation of new graduate programs. The successful applications were funded.

The curricula were decided by the program directors and representatives of other participating institutions. Students were not involved in initial development of the curriculum, although they have contributed to curriculum refinement via the course evaluation process. From the information provided, it is not known whether other stakeholders or external advisors were consulted on how to develop curriculum.

There is no clear, uniform procedure, guidelines or timeframe for the revision of the curriculum. Most programs indicated that the curriculum is revised at the end of each semester, based on the input of students or the need to incorporate advances of their field. Four programs (Biostatistics, Medical Physics, Interventional Radiology and Environmental Health) incorporate improvements to the curriculum based on the advice of an external advisory committee. Based on the rebuttal of the Medical School, in future years the curricula will be reevaluated by a post-graduate committee with the assistance of invited external experts, the program directors and the faculty and fine-tuned to meet the European and International standards.

IMPLEMENTATION

How effectively is the Department's goal implemented by the curriculum?

The objectives and curricula of individual programs, grouped together based on thematic similarities, are summarized below. The summary describes the methods used by each program for implementing its goals, the specific strengths and weaknesses of each program as well as EEC's comments and recommendations for each program. The purpose of this analysis is to assist the Medical School to develop a comprehensive strategy to harness the power of graduate education and achieve academic excellence. Abbreviations used below **MSc** = Master's of Science (full-time, preferably tuition-free, programs designed to train rigorously doctoral candidates for biomedical research in different fields, in line with internationally established PhD programs. **MCSc**= Master's of Clinical Science, designed to educate and train MDs, nurses and other health care and public health professionals for specialized jobs.

The biostatistics program was established in 1998 and it is directed by Dr. A. Bourneta and Dr. K. Katsouyanni. The program is a well-organized, interdepartmental program that integrates faculty from the Medical School of Athens, the Department of Mathematics of EKPA and the university of Ioannina. The program teaches applied statistics to health science professionals. Statistical knowledge is essential for the collection and analysis of data for clinical research, epidemiology, environmental and behavioural research. The program has a critical mass of well qualified faculty of which twelve percent (12%) have degrees from either Harvard University or the University of London. The program has been evaluated twice by an international advisory committee and has adjusted its curriculum to address the recommendations made by the committee. In addition, advances in the field of biostatistics are surveyed annually and incorporated into the curriculum. Teaching and laboratory facilities, library and IT support are adequate and appropriate for the program. Three of its graduates have completed doctorate degrees (PhD) within the program and 20 others are pursuing doctoral studies in Greece and several other prestigious European and US laboratories. **Comments and Recommendations:** Biostatistics is an excellent and established program that has demonstrated its ability to train new professionals in biostatistics and to generate faculty and researchers for AEI and ATEI. The program should continue its productive work, maintain and strengthen its productive collaborations with Harvard University and the Universities of London and serve as a model for new emerging relevant programs in the department of Hygiene and Epidemiology and other departments of the Medical School. It fulfils the international criteria of MSc leading to Doctorate (PhD level) studies.

A. Programs originating from basic and preclinical departments

The molecular medicine program was established in 2004 and is directed by Dr. N. Anagnou. This program was developed along the lines of a similar program established in 2002 at the Medical School of Crete, based on international standards. These two Greek programs reflect the organization and objectives of the MD-PhD programs that operate in the Medical Schools of North America and Europe. The basic strategy and objectives of these programs is to attract the brightest graduates of the Medical School and biological sciences, provide them with rigorous research training and enable them to become leaders in the medical field of their specialty (e.g. cardiology, paediatrics, oncology, neurosciences, genetics, etc.). The molecular medicine program is a full time, tuition-free program that offers rigorous course work for 6-8 months, based on current literature, two laboratory rotations and wet bench research for two semesters that leads to a Master's degree. The graduates of this program are well trained to pursue doctoral (PhD) studies and obtain an MD-PhD degree, if they had previously graduated from the Medical School, or a PhD, if they had previously graduated from another school. The program engages the surrounding research institutes, including the Biomedical Research Foundation of the Academy of Athens (IIBEAA), to participate in teaching of the Master's students and provide laboratory space and facilities for the research training of the graduate students. As a result of this policy, the program has achieved a critical mass of highly qualified faculty. The program's director presented a road map for future development of post-graduate research training, based on the involvement of the European academic community, the Greek Universities and Greek Research Institutes. **Comments and Recommendations:** This program is well designed to foster integration of the clinical and basic science departments of the Medical School with the Research Institutes. Such integration will facilitate a transfer of new knowledge and research skills to the clinical departments of the Medical School via the trained graduate students. The program fulfils the criteria of MSc leading to Doctorate (PhD level) studies that award PhD and MD-PhD degrees, aligned with international standards. It is recommended that all the courses of the program be taught in English.

The Medical Physics program is a well structured, inter-departmental and trans-university program, established in 1994 that is currently directed by Dr. Georgiou of the Physics department of EKPA. It draws its faculty from Athens Medical School and the department of physics as well as the Medical

Schools of Thessaloniki, Ioannina and Crete. It collaborates with the Greek Atomic Energy commission, the NCRS Democritos and three engineering departments of National Polytechnic School (EMP), thus providing its students with high quality education. Its graduates qualify to obtain license (following an exam) to work as medical and radiation physicists. The curriculum consists of 30% lectures and 70% laboratory training and it requires teaching in small groups of students. The program underwent international evaluation in 2000 and adjusted its curriculum in 2013, based on the European directive EURATOM. The program has produced 31 doctorate degrees and 6 more are in progress. A survey indicated that 72% of the graduates have found employment in the field. **Comments and Recommendations:** The program has been successful in educating, supporting the professional advancement of and providing career opportunities for its graduates. It demonstrates the significance of productive collaborations between the Medical Physics departments of the Medical Schools of Greece, the Basic Science departments and the Research Institutes in Greece. The program revises regularly its curriculum to incorporate advances in the field. It fulfils the criteria of MSc leading to Doctorate (PhD level) studies.

The molecular and applied physiology program was established in 2009 and is directed by Dr M. Koutsilieri. The program admits 35 students annually with background in medicine or life sciences. Its objective is to provide graduate level training in the molecular, cellular and pathophysiological mechanisms that underlie disease states and to promote basic and translational medical research. The program has an international advisory board, a highly qualified team of faculty drawn from basic and clinical departments of the Medical School and other institutions and five visiting faculty from abroad. The collaboration with other faculty of the Basic Science departments and the recent recruitment of a prominent scientist from Fleming Institute add additional strength to the program. Twenty graduates of this program continued for doctorate studies in Greece and 5 others abroad. **Comments and Recommendations:** Similar to the molecular medicine, this program has the potential to bridge the research activities between the basic and clinical departments of the Medical School. The program will benefit by reducing the coursework to two semesters and increasing the laboratory practical training to one year. The program fulfils the criteria of MSc and has strong potential to prepare its graduates for doctorate (PhD level) studies based on international standards.

B. Programs originating from clinical departments.

Cardiology Programs

The Intensive Care cardiology units program was established in 2005 in collaboration with the nursing school and ATEI and is directed by Dr. C. Stefanadis. The objectives of the program are twofold: To train physicians and health care professionals to work in intensive care and cardiology units and to prepare the graduates for doctorate studies. The first objective, which is common with the Emergency/Intensive Care program (see below), is fulfilled by a comprehensive curriculum that is supported by an excellent collection of textbooks as well as clinical and laboratory infrastructure, supported by access to internet. The second objective is partially met by exposure of the students to current literature and clinical research. The program has a great roster of faculty which is very productive in research and provides opportunities to the students for clinical and medical research. Twelve graduates obtained doctorate degrees and 20 other students are pursuing doctorate degrees in Greek and foreign universities. **Comments and Recommendations:** Given the quality of its faculty, the program has the potential to develop into a first rate research oriented graduate program to train the most talented graduates of the Medical School. This will require separation of the program in two components. One component should be directed towards education and training of the nurses and other healthcare professionals in specialized clinical skills. The other component should be directed towards rigorous training of Master's students to pursuit research in cardiovascular diseases, cardiology and other specialties of internal medicine, along the lines of internationally established PhD level programs (See section F). The program in its present form is an excellent MCSc program and its director is encouraged

to develop a parallel MSc program leading to PhD level studies. Based on the rebuttal of the Medical School, these recommendations were adopted and will be implemented by the program director.

The Laboratory and clinical cardiology program was established in 2007 in collaboration with the ATEI of Athens and is currently directed by Dr. I. Lekakis. The program admits on the average 12 students per year (MDs, nurses and other health professional) and provides theoretical, clinical and research training on the subject matter. Student surveys suggested that the program advanced the careers of its trainees and created trained personnel for public or private clinical cardiology units and for private practice. **Comments and Recommendations:** The program fulfils the criteria for MCSc degree. A collaboration of this program with the intensive care cardiology program for the development of a doctorate (PhD level) program will be advantageous.

The Cardiopulmonary Resuscitation program was established in 2007 and is directed by Dr. L. Papademetriou-Papakosta. The program is directed towards medical doctors and other groups of health professionals. It enlists several Greek and 3 international faculty members and admits on average 35 students per year. It employs problem-based learning, teaching based on current literature and experimental work. Classrooms, laboratories and e-learning platforms appear adequate for the fulfillment of the program's objectives. Sixteen of its graduates are pursuing doctorate studies. **Comments and Recommendations:** According to ACLS guidelines training in cardiopulmonary resuscitation is mandatory to any residency program. Cardiopulmonary Resuscitation is covered by a specific course of 2 ECST within the program of Intensive Care Cardiology. Cardiopulmonary resuscitation is important and socially meaningful. However, it would be more appropriate for this program to be incorporated in the near future into the curriculum of the participating ATEI and nursing schools, perhaps in collaboration with Red Cross and other nonprofit organizations. Training that leads to doctorate (PhD level) studies should be carried out in the context of the two cardiology programs described above. Having a separate graduate program for CPR appears to be excessive

The Emergency Nursing/Intensive Care program was established in collaboration with the nursing school and ATEI of Athens in 2006 and is directed by Dr. H. Roussos. It is designed to provide MDs, nurses and other health care professionals with the skills required for staffing intensive care medicine and/or emergency units. According to the program director these units have a shortage in trained personnel. Intensive care unit nursing is the main focus of the program. The program admits 40-45 students per year. The graduates have good prospects for employment and professional advancement. Ten of its graduates continued for a doctorate degree. It has 59 well qualified faculty members from different disciplines. The curriculum utilizes high quality textbooks and access of the students to Scopus database for literature searches. Classrooms, clinical facilities for training and e-learning platforms appear to be adequate. **Comments and Recommendations:** The program in its present form fulfills the requirements for MCSc degree. The program has common goals with the intensive care cardiology units program and will benefit by collaborations with this program in order to avoid duplication of efforts.

Cancer related Programs

The Thoracic Oncology program was established in 2009 and is directed by Dr. K. Syrigos. Approximately 50% of its students hold MD degrees and the remaining are graduates of nursing schools or ATEI. The program is of high quality and is based on international standards. Its main objective is to train students to develop critical thinking in all aspects of the disease. Five of its graduates continued to obtain doctorate degrees and 25 were mentored to continue training abroad using existing collaborations of the program director. Teaching is based on original papers and review articles with emphasis on current literature and critical reviews. **Comments and Recommendations:** The program in its present form fulfils the requirements for MCSc degree. Collaboration with the basic and clinical sciences and research institutes is recommended to establish a strong doctorate (PhD level) program within the department of Internal Medicine based on international prototypes.

The neoplastic disease program was established in 2009 and it is directed by Dr. E. Patsouris. Its

objective is to train physicians and other healthcare professionals on the etiology and laboratory diagnosis of cancer and to channel some of the graduates towards doctorate studies. It has a critical mass of 30 qualified faculty and admits on average 30 students per year. Ten of its graduates are continuing for a doctorate degree and 20 others went abroad. **Comments and Recommendations:** Neoplastic disease is a very active field of medical research. The program has the potential to evolve by dividing it in two components. The first component dealing with education of nurses and other health professionals will lead to a MCSc degree. The second should provide rigorous scientific training of MDs and basic scientists in collaboration with other programs sharing close thematic interests, towards a doctorate (PhD level) degree. Based on the rebuttal of the Medical School, these recommendations have been adopted and will be implemented by the program director

The Supportive care for chronically ill program. Organization and Management of Palliative and Supportive care for chronically ill patients

The program was established in 2009. It is directed by Dr. K. Mystakidou and admits on average 15 students per year, with health science background. The curriculum involves mostly undergraduate level course work, limited 200 hours clinical practice and extensive diploma work that leads to a thesis. Two of its graduates work towards a doctorate degree and others work in private and public hospital units that require personnel with the skills provided by the program. According to the program director education and management of palliative and supportive care services for chronically ill patients are not well established in Greece. **Comments and Recommendations:** This program fulfills a clinical need in Greece and may develop into a MCSc program. Alternatively, palliative care training may be provided by a purely clinical fellowship program, as we suggest for some of the other programs. The EEC recommends to the Ministry of Health and the Greek government that Clinical Fellowship programs are established in the Medical Schools of Greece.

Other Internal medicine programs

Hematology

The Thrombosis and Hemorrhage program was established in 2009 and it is directed by Dr. A. Travlou. The program provides theoretical and practical background to health care professionals and enhances the clinical skills of medical doctors. It also promotes basic science research in the field, in collaboration with IBEAA and other Greek research centers. This three academic quarter program admits on the average 30 students annually (50% MDs and 20% nurses). Four of the graduates continued for doctorate degree. **Comments and Recommendations:** The program falls in the category of MCSc. For the training of medical doctors, the program could best serve its purpose as a clinical fellowship program. For contributing to doctorate studies the program should be intensified and become part of a comprehensive Internal Medicine or Hematology doctorate (PhD level) program along the lines of similar graduate programs that exist in Medical Schools abroad.

Obstetrics and Gynecology Programs

The Complications of Pregnancy/High Risk Pregnancy program was established in 2009. It is directed by Dr. E. Salamelekis and admits on average 55 students per year. It refreshes and advances the theoretical background of the graduates of the Medical School and educates students of ATEI (nurses, midwifes) on the subject matter. The program is carried out in the facilities of the Obstetrics and Gynecology clinic of Attikon Hospital. It is taught by expert clinical faculty, including two visiting professors from Germany, Italy, visiting faculty from all other Medical Schools and two research Greek institutes (IIBEAA and former EIE). The curriculum is based on textbooks and selected scientific articles, access to IT platforms, scientific conferences and student presentations. Two graduates of the program are pursuing doctorate studies. **Comments and Recommendations:** Training of nurses and midwifes can be accomplished following the established curriculum and proper modifications. The program falls in the category of MCSc. The training provided to the MDs could be incorporated into a residency or clinical fellowship program. If the program wishes to develop a future PhD level training curriculum, it should

coordinate its curriculum with the other two related Programs and with Research Institutes that provide basic science training in mechanisms of human reproduction and reproductive endocrinology (see below).
The Reproductive and regenerative medicine program was established in 2009 and is directed by Dr. D. Loutradis. The program admits on average 19 students annually mostly with background in medicine or life sciences. The objectives of this one-year program are to provide theoretical background and hands-on experience in laboratory techniques. The program has short duration and offers a total of 60 credit units including 15 credit units towards diploma work (compared to 90-120 credit units offered by the other programs). It was also noted that the thematic overlap between reproduction and regenerative medicine is limited and the extensive field of regenerative medicine is represented by 3 credit units in the program. Limited information was provided initially on what courses were taught by each faculty of the department and the visiting faculty listed in the program. **Comments and Recommendations:** The program will best serve its mission as residency and/or fellowship program in the department of Obstetrics and Gynecology. This program should strengthen its academic components and increase its length along the lines described in the rebuttal of the Medical School, in order to develop into a MCSc Program. It may be helpful to coordinate its training activities with the two other related programs. Intensification of the program and collaborations with Basic Science Departments and Research Institutes may permit the creation in the near future of a joint PhD level program within the department of Obstetrics and Gynecology (see below).
The Research on Female Reproduction program was established in 2007 and is directed by Dr. G. Mastorakos. The program admits on average 34 students annually and attracts a large number of MDs (43%), midwifes (33%) and biologists (21%). The objective of the program is to provide theoretical background and expose the students to the scientific principles and practical applications in the field of female reproduction. The program has awarded 3 scholarships of three months duration to its best students to carry out their diploma work in collaborating laboratories abroad. An innovation of the program is that starting in the academic year 2013-1014 it will use the internet to broadcast webinars and receive lectures from outside speakers. Little information was provided regarding the 58 faculty and numerous collaborators that teach the different courses and supervise the students. **Comments and Recommendations:** The program upgrades the knowledge of healthcare professionals, has merit and falls in the category of MCSc programs. The director of the program has the qualifications and training to contribute, along with the faculty of the two other related programs, in the creation of a joint PhD level program in the department of Obstetrics and gynecology along established international standards.
The EEC recommends that, should the three existing Master's programs in the field of Obstetrics and Gynecology decide to proceed towards the establishment of a joint PhD level program, they collaborate among themselves as well as with Basic Science departments and Research Institutes and create a common MSc curriculum that prepares students for a PhD level degree.
T**he Clinical Pediatric and Nursing Research program** was established in 2006. It is directed by Dr. G. Chrousos and admits 20-30 students annually. The program updates and expands the knowledge acquired during the pediatric residency and fellowship of MDs. It also trains nurses and other health care professionals to serve in pediatric units in private and public hospitals and to promote research in the field. The curriculum is very broad and covers a large array of topics on pediatrics, including pediatric intensive care and methodology of research. The program has established collaborations with international hospitals at both the educational and research levels and provides the graduate students with the opportunity visit these hospitals annually. A total of 17 textbooks are provided to cover the different courses. A total of 26 graduates of the program continued for doctorate studies. **Comments and Recommendations:** The training of the nurses to provide pediatric health care can be accomplished following the appropriate curriculum. The program in its present form falls in the category of MCSc programs. The program director has an outstanding and internationally recognized expertise in training physicians and other basic scientists for PhD level studies in the field of Pediatric research. The

EEC encourages him to develop an advanced MSc program that leads to a PhD level degree, along international prototypes of similar programs that exist in Medical Schools abroad.

The Stress Management and Health Promotion program started in 2008 and is under the direction of two highly qualified researchers Dr. G. Chroussos and Dr. C. Darvari. The underlining hypothesis is that the risk factors of cardiovascular and other diseases are the result of stress and the program wishes to promote education of health professionals and to promote research in the field of stress. The program admits 25-30 students per year. Nineteen of its graduates continued for a doctorate degree in Greece or abroad. The students receive theoretical background of human conditions associated with stress and are trained to assess the stress in various groups of human subjects using questionnaires and biological markers as well as strategies for intervention in the general populations or specific groups.

Comments and Recommendations: The objectives of the program (which appears to be unique worldwide) is to use a multidisciplinary approach involving epidemiology, molecular and cellular biology, pathophysiology for diagnosis and management of stress and to promote research in the field. According to the program directors, the subject matter is not covered sufficiently at the undergraduate level or the clinical training period. The objective to provide health care professionals with expertise in the field of stress can be accomplished in the context of a MCSc program. Such a program will be strengthened by close collaboration (if integration is not feasible) with the Public Health and Social Medicine programs described below. Although the study of stress is very important for research and public health purposes, the molecular and cellular mechanisms that trigger stress are not known. If the major focus of the program is research designed to elucidate the molecular and cellular mechanisms that contribute to stress, this can be best accomplished by studying stress in the context of programs that study a specific disease. This includes the Cardiology programs where stress has been linked to heart disease through unknown molecular mechanisms, or in the Clinical Pediatrics program directed by Dr Chroussos.

Radiology Program

The interventional radiology program was established in 2003 and it is directed by Dr. D. Kelekis, who is an expert in the field of interventional radiology and committed to training MDs. The program has 29 expert faculty and several supporting scientists. It includes 11 month coursework, 2 months practical training and 11 months of thesis work. The program provides 3 to 5 fellowships per year and is modified each year based on external evaluation. Many students have graduated from the program and 10% of them have become interventional radiologists and 5 work in European universities. **Comments and Recommendations**: The program has trained a large number of graduate students over the past 11 years, has merit and fulfils the criteria of a MCSc degree. In the near future, the field of interventional radiology could be optimally served by the residency program or the establishment of a clinical fellowship program in interventional radiology in the Medical School.

Surgery Programs

The Metabolic Bone Disease program was established in 2007 and is directed by Dr. G. Lyritis. It admits on the average 55 students annually and has a large number of qualified faculty. It provides basic knowledge on metabolic bone disease as well as practical training using the laboratories of KAT. Textbooks and access to electronic platforms are provided. The students are trained to analyze original papers, write reviews and present cases of metabolic bone disease. No information was provided on the careers of the graduates. **Comments and Recommendations**: The program in its present form fulfils the requirements for a MCSc degree. If the program wants to provide a path to PhD level studies it should coordinate its curriculum with applied and molecular physiology, molecular medicine or similar programs to establish first a rigorous MSc program that leads to PhD level studies.

The Minimally Invasive Surgery, Robotic Surgery and Telesurgery program was established in 2005 and is directed by Dr. C. Tsigris. The program admits on average 15 MDs annually and is of good quality. The exposure of the students to hands-on practical experience is seriously limited for such a "technically demanding" training. **Comments and Recommendations**: The program in its present

form fulfils the requirements for a MCSc degree. Although currently the program serves the purpose of providing some training to MDs in Minimally Invasive Surgery, Robotic Surgery and Telesurgery, in the long run it will serve its mission better as a clinical fellowship to be offered by the Department of Surgery.

The Endovascular Techniques program was established in 2009 in collaboration with the University of Milano-Bicocca and is directed by Dr. C. Liapis. The program admits 20-33 specialized surgeons annually and its duration is one year. The program provides theoretical background through courses and e-learning as well as hands-on laboratory practice in simulators and experimental animals, using the surgical laboratories of IIBEA. According to the program director the curriculum of the seven years vascular surgery residency program does not include endovascular techniques. Six students continued for doctoral degrees and twelve continued their training in Europe or USA. **Comments and Recommendations**: This Program's exposes the students to a technically demanding medical specialty and creates opportunities for long term training abroad. The program, when lengthened, will fulfill the requirements for a MCSc degree. In the long run the program could serve its mission better as a clinical fellowship program offered by the Department of Surgery.

General Comments for Surgery Programs: The surgery specialties are encouraged to develop in collaboration with other clinical and basic departments a joint rigorous Master's curriculum that leads to a doctorate (PhD level) degree along existing international prototypes.

Public Health and Social Medicine Programs

The program Environment and Health. Capacity Building for Decision Making was established in 2004 in collaboration with the TEI of Athens and is directed by Dr. Nikolopoulou-Stamati. The program admits on average 35-40 students annually. It focuses on the effects of environmental pollutants on public health through epidemiological studies that monitor changes caused by environmental factors in the DNA of cells and tissues. The program started in response to WHO initiatives for developing skills of professionals in environmental health services in Europe and the European environment and health strategy of 2003. It has several quality control features including internal and international advisory committee and assigns faculty advisors to the students. The curriculum involves courses based on selected textbooks, and is enriched with e-classes, seminars, workshops and a summer school. The program has a critical mass of expert faculty as well as participation of 19 visiting faculty from Europe, USA and India and collaborations with Greek and European Institutes. Three of the graduates are continuing their studies to obtain a doctorate degree. **Comments and Recommendations:** This program has several quality control features listed above. The program is of high quality and in its present form fulfils the requirements for a MCSc or MSc degree. There are some common elements between this program and those of Dr. Linou, Dr. Toundas and Dr Rosenberg, described below. Collaboration and coordination of these Master's programs is required to avoid duplication of efforts and to optimize the outcome. Collaboration among these three programs is also needed to develop one or more graduate programs in the department of Hygiene and Epidemiology based on a rigorous curriculum and a critical mass of Greek and international faculty (as is the case for the Biostatistics and the Environment and Health programs). Such joint programs can prepare the best Master's students for doctorate (PhD level) studies according to international standards. Joint MCSc or MSc programs will allow for an integrated teaching of the overlapping as well as the distinct research methodology, of each program and it will promote faculty collaboration in teaching and research**.**

T**he Occupational and Environmental Health program** was established in 2004 and is directed by Dr. A. Linou of the department of Hygiene, Epidemiology and Medical Statistics of the Medical School. It is interdepartmental and trans-university program that involves the Medical School, the law School of Athens and the AT.E.I. of Crete. The program admits on average 15-20 students every two years and has 60 qualified faculty members, including 7 international faculty from US, Germany, France and Denmark. Two graduates of the program have completed their doctorate thesis and two additional theses are in progress. Twenty-nine of its graduates are currently employed. There are several similar programs in

England, Ireland and the Netherlands. **Comments and Recommendations:** The program in its present form fulfils the requirements for a MCSc or MSc degree. The program has common elements with the program of Dr. G. Toundas and Dr.Nikolopoulou-Stamati of the same department and the program of Dr Rosenberg. See comments above on cooperation with the other public health programs.

The Health Promotion and Education program was established in 2004 in collaboration with the department of Psychology of EKPA and the ATEI of Athens and is directed by Dr. I. Toundas. The program admits on average 12 students annually. The objective of the program is to train new scientists in the planning, execution of public health and epidemiological projects as well in the evaluation of public health programs and associated policies. The curriculum involves courses based on bibliography and reviews, IT and e-learning platforms, educational statistical packages and requires research that leads to a diploma thesis. The laboratory is open to the students on all working days. Out of 101 graduates surveyed, 57 who were public employees improved their professional status and 17 found employments in the field. **Comments and Recommendations:** The program in its present form fulfils the requirements for a MCSc or MSc degree. The program has common elements with the program of Dr. Linou and Dr.Nikolopoulou-Stamati of the same department and the program of Dr Rosenberg. See comments above on cooperation with the other public health programs.

The International Medicine and Management of Health Crises program was established in 2007 and is directed by Dr. T. Rosenberg. The objectives of the program are to provide advanced theoretical knowledge on Disaster Medicine and Medicine in austere settings, travel and tropical medicine, local and international public health and social problems. It also provides practical research tools on how to intervene and alleviate these problems. The program is affiliated with the European Society of Emergency medicine (EUSEM) chapter of Disaster medicine and with the Health Institutes of sub-Saharan countries (Ethiopia, Tanzania). It admits on average 40 students annually. For teaching it uses textbooks as well as e-classes and access to e-libraries for literature searches. It offers seminars and international advanced courses, some taught in developing countries, and require a diploma thesis. It encourages involvement of its students in relevant social issues. The objective is to help the graduates develop skills required for a career in major aid and relief agencies and provide research experience for those further interested in academic career. Five students of the program continued for doctoral degrees. The program enlists in its faculty 30 qualified instructors from Greece and abroad and is participating in Medical School projects that provide salary support to one student and provide travel expenses for field work to ten students in Africa.

Comments and Recommendations: This is an innovative program that has social relevance and in its present form fulfils the requirements for a MCSc degree. The program has overlapping features with the program of Dr. Linou and Dr.Nikolopoulou-Stamati and Dr Toundas of the department of Hygiene and Epidemiology. See comments above on cooperation with the other public health programs.

Clinical Neurosciences Programs

The Clinical Neuropsychology program was established in 2009 by Dr. A. Papanikolaou of the Health Science Center of the University of Texas and is directed by Dr. Evdokimidis. It is a unique three year and high quality program that provides theoretical courses on neurology and neuropsychology followed by one year of clinical training and seminars in Greece or abroad. Every student receives 3 month cost-free training in the US. It has an outstanding faculty that includes experts from Greek universities as well as seven distinguished faculty from the US, Canada and Europe. Five of its graduates have engaged in doctoral studies, two secured scholarships for Europe and 20 are employed in hospitals or the private sector. **Comments and Recommendations**: This is a well conceived and executed graduate program that is based on international collaboration and knowhow. It can be further strengthened by the establishment of an external international advisory committee. The program qualifies for MCSc or MSc degree and can prepare the graduates for a doctorate (PhD level) program along existing international standards.

The Promotion of Mental health program was established in 2009 and is directed by Dr. G. Papadimitriou. Its objectives are to train MDs, psychologist, social workers and other health care professionals in areas pertinent to the prevention and treatment of mental diseases and to teach the research methodologies of the field. The program admits on average 45 students annually. The faculty of the program consists of members of the A Psychiatry Unit of the Medical School, invited speakers from Greece and one from the Institute of Psychiatry of Kings College. Fourteen of the graduates are pursuing doctorate studies. **Comments and Recommendations**: The program is dynamic and socially meaningful and selects students of diverse backgrounds that fit its mission. It is innovative and has strong points. The program was supposed to award 60 ETC in two semesters. For reasons that are not clear, credits were added to those originally approved for the program bringing the total to 90 ETC. Given the fact that this is a part time program, the additional credits make it intense and challenging to meet its objectives in two semesters. The EEC recommends that a third or fourth semester be added to conform to MCSc requirements. The program will also benefit from collaboration with the program of Dr. Papageorgiou as described below.

Liaison Psychiatry: Integrated Care for Physical and Mental Health program. This program was established in 2009 and is directed by Dr. C. Papageorgiou. The program admits on average 20 students annually with background in medicine, psychology, nursing and social work. The objectives of the program are to advance education and research in the field and to enable the graduates to provide high quality psychiatric services mainly in hospitals. Only general information was provided on the role of the Greek and visiting teaching faculty in the program. Few of the graduates pursued career opportunities abroad and the majority found employment in the field. **Comments and Recommendations**: The program in its present form belongs to the MCSc programs. It will be strengthened by integration or strong collaboration with the program of Dr. Papademetriou to. In this context the individual programs will be able to develop common as well as distinct research and training methods that will enable the qualified faculty to cover all different aspects of diagnosis, prevention and care of patients with mental disorders.

General Comment for Neurology and Neurosciences: The neurology, psychiatry and clinical neurosciences departments are encouraged to collaborate with other clinical and basic departments and with IIBEAA, in order to create a strong research oriented MSc program that will prepares the graduates for a doctorate (PhD level) program in Neurosciences along existing international standards.

Doctorate Degree Programs

The description of the process that leads to doctorate degrees was very brief (2 out of 2650 pages) in the internal evaluation report. It appears that there are two pathways that qualify students for admission to the current doctorate programs. The first pathway admits graduates of Master's programs (either those described above or graduates of other programs). The second pathway, referred to as the alternative pathway (or individual doctoral training program) is a direct admission of Medical School graduates to the doctorate program. The details of the mechanisms of admission are described in the internal evaluation document and were included in the oral presentations of the Medical School leadership to the EEC. This pathway does not include additional course work or Master's thesis and the students are supervised by a 3 member advisory committee. Upon completion of her/his thesis the student defends the thesis in a 7 member committee. The minimum time required is 3 years and the thesis work may frequently overlap with residency training. The EEC asked faculty and students of this program to join in the two day discussions. Only a handful of students showed up and explained how the program works. This program admits over 300 students annually. According to the data provided to us there are currently 3650 doctorate candidates and their status is unclear (i.e. several of the students may be inactive). Although some of the graduates of this program may excel during further post-doctoral training abroad the research skills acquired during the doctorate training are limited and depend on the expertise, degree

of involvement and scientific rigorousness of the individual supervisor.
This doctorate degree programs in their current form do not compare to the training offered by rigorous PhD level programs abroad. The EEC considers this program equivalent to the research fellowship training that MDs receive in North America, during the last two years of their specialty training, which does not award any graduate degree but adds to the qualification of the trainee.
Comments and Recommendations: The alternative pathway doctorate program has several flaws that cannot be overlooked and need to be remedied. The problem is not unique to the Medical School of Athens but applies to all Medical Schools of Greece. The program does not provide structured, properly supervised training, advanced courses in science and laboratory training to the doctorate candidate, beyond the courses provided in the undergraduate curriculum of the Medical School. Doctorate research training frequently overlaps with clinical (residency) training. This overlap is a liability, as it compromises the quality of research training, clinical training, as well as patient care and compounds the inadequacy of the program. Selection of the doctorate students is not uniform and transparent and may exclude the majority of other qualified candidates, who might wish to compete for admission. The EEC was informed that the degree obtained through this program is required for an academic faculty position or an attending position in the state health system but it does not correspond to a rigorous PhD program degree. As structured, this program promotes convenience, rather than excellence and fails to capture the enormous potential of the students of the Medical School of Athens who are some of the brightest the country has to offer. It also fails to capture the potential of several faculty members that, given the correct structure and organization of the graduate programs, have the ability to provide internationally competitive PhD level research training. Recommendations on how to upgrade the doctorate programs to reach PhD level international standards are provided above and in section F. The EEC strongly recommends that the current doctorate program is replaced by international MSc and PhD programs, built along international standards. Such programs, will advance the careers of the most qualified Medical School graduates, will promote biomedical research and innovation, will incentivize faculty to perform at the maximum of their ability and will enhance the international reputation of the Medical School of Athens.
How does the curriculum compare with appropriate, universally accepted standards for the specific area of study?
The CVs of the graduate programs' faculty that were presented to EEC indicate that in most cases the programs reflect the expertise and clinical or research interest and training of the program director rather than the collective interests and expertise of a department or a clinic. Based on internationally accepted standards for excellence, the Master's programs in top Medical Schools abroad are organized predominantly in thematic areas by specific basic science departments and in few cases preclinical and clinical departments and reflect the combined expertise of the faculty. Such programs are designed to provide technical skills that will enhance career opportunities for students pursuing a Master's degree and provide rigorous science background to help students pursue a high quality PhD degree. Surveying the graduate programs of top American and European Medical Schools including those of EEC Members (Harvard, Boston University, Mount Sinai, UK) we identified Master's programs in the following areas: Biochemistry, molecular and cell biology, biophysics, physiology, pharmacology, experimental therapeutics, neurosciences, mental health counselling behavioural medicine, bio-imaging, clinical investigation, genetic counselling, healthcare policy, biomedical sciences, emergency management, nutrition and metabolism, and physician assistant. The PhDs are also organized along the basic science departments mentioned above and include programs in biochemistry, molecular and cell biology, biophysics, physiology, pharmacology, neurosciences, anatomy, pathology, immunology, molecular medicine, translational medicine, biostatics, public health, bioinformatics, genetics and genomics, and biomedical sciences. These programs attract top students of the science departments, are full-time and provide financial support to the students. The curriculum consists of a full year graduate level courses,

along with two laboratory rotations, and a second year with few courses along with two laboratory rotations, followed usually by three years of full time research. The most prestigious program is the MD/PhD that is reserved for the top students of a medical class who are trained to become physician scientists. Only few of the 28 Master's programs reviewed by the EEC resemble in aims and objectives the curriculum of American and European Medical Schools Master's programs. There is no resemblance of the doctorate program of the alternative pathway with the PhD degree offered by the -Medical s Schools and the science departments abroad.

Is the structure of the curriculum rational and clearly articulated? Is the curriculum coherent and functional?

Several of the programs try to accomplish two goals: One is to train physicians and health care professionals to work in specialized clinical care jobs and the other is to prepare the graduates for doctorate studies. The first goal is realized by the comprehensive curricula, the textbooks, the e-learning platforms and other teaching methods currently employed as well as by the practical training. The realization of the second goal for the majority of the programs will require a separate curriculum enriched in graduate level science or technology courses and research training for students interested in doctorate studies as described below.

The theoretical curriculum of programs that have as a major objective to train physicians and health care professionals in specialized clinical skills is, generally speaking, coherent and functional. In these programs, it would be more beneficial if the theoretical training is decreased and the emphasis of the curriculum shifts to more extensive practical training.

The programs of biostatistics, medical physics, molecular medicine, clinical neuropsychology, Molecular and applied Physiology and the social medicine and epidemiological programs have coherent and functional Master's curricula. Any deficiencies in the above programs can be easily corrected based on student questionnaires and the input of the internal and external advisory committees. For programs having the additional objective to train the students for doctorate (PhD) studies, a parallel but distinct curriculum should be offered within the same program. This parallel curriculum should be enriched in graduate level science or technology courses for the first year, based on current literature and advances in the field as well as laboratory rotations and a full year of research work for the second year. The best of the students of this parallel curriculum may then be selected for doctorate studies. Simply put, the programs have to develop two separate tracks: training for specialized professional skills and training for scientific doctorate work.

Is the material for each course appropriate and the time offered sufficient? Does the department have the necessary resources and appropriate qualified and trained staff to implement the curriculum?

For programs that have as major objective the training physicians and health care professionals to perform specialized clinical jobs, the textbooks and the e-learning platforms provide sufficient theoretical material for the different courses. The time allocated for each course appears sufficient. Nevertheless, in these programs, it would be more beneficial if the theoretical training is decreased and the center of the curriculum shifts to critical thinking and more extensive practical training. The parallel curriculum designed to train doctorate (PhD) candidates should be enriched in graduate level science or technology courses and include one year of laboratory research work as described above.

The resources required to run the graduate programs are derived from student tuition. The programs that have as their major objective to train physicians and health care professionals to perform specialized clinical jobs are staffed with a large number of qualified clinical faculty to implement the curriculum. There appears to be a shortage of trained faculty for implementation of the parallel curriculum designed to train doctorate (PhD) candidates. The personnel required for this task could be provided in the short-run by mobilization of the faculty members employed in active research and through collaborations with the Research Institutes in Athens or other cities in Greece and abroad. In the long run, trained doctorate

students that will be generated by MSc and PhD level programs can serve as teaching assistants to train the second year Master's students and implement the curriculum.

RESULTS

How well is the implementation achieving the Department's predefined goals and objectives? If not, why is it so? How is this problem dealt with? Does the Department understand why and how it achieved or failed to achieve these results?

The few programs established during the period of 1994 to 2004, which were funded by the Greek Ministry of Education, have clear objectives and to a large degree they achieved their objectives. The subsequent programs (during the period of 2005 to 2009) were created by initiatives of individual faculty in response to calls for establishment of graduate programs by the Ministry of Education of Greece (EPEAK programs). The programs that were funded were subsequently approved by the Medical School. To the best of our understanding, it appears that there was no central planning and policy by the Medical School or individual departments regarding the creation of these subsequent graduate programs. It is the opinion of the EEC that the random creation of such graduate programs may have corrected some perceived deficiencies, but it created new problems that need to be addressed.

Given the fact that the creation of the Master's programs is a new development in the Medical School, the expectation is that the department will use the evaluation of EEC to streamline and reorganize the programs to achieve optimum outcomes. It is the opinion of the EEC that organization of the graduate programs based on well-tested international prototypes will provide the scientific human resources that will elevate the Medical School to a new level of academic excellence in the long-run. (See recommendations in section F).

To the best of our understanding, based on discussions we had, the Medical School welcomes recommendations on how the Master's as well as the doctorate (PhD) programs can be optimized based on international models and standards of excellence. During the discussion, some of the program directors strongly emphasized the role of the programs for training MDs and nurses in specialties that are not covered sufficiently in the Medical or Nursing School curricula or in the medical residency programs. The EEC understands why such a void to be filled in the short run, but strongly recommends that the departments with strong research credentials create a parallel track of Master's programs designed to prepare and train the students for doctoral (PhD level) studies, based on international standards of excellence.

IMPROVEMENT

Does the Department know how the Curriculum should be improved?

The improvement of the curriculum is delegated to individual programs. All the programs evaluate the performance of their instructors based on student questionnaires. The faculty also evaluates the performance of the students and adjusts the curriculum to follow new developments in the field. All programs have internal governing councils. Four programs refer to improvement of the curriculum based on the input of an external advisory committee. The Medical school does not appear to have a central coordinating or regulatory role in curriculum improvement.

Which improvements does the Department plan to introduce?

No central policy was presented to the EEC or discussed in the section "Strategy of Academic Development" of the internal evaluation report. For this reason, the EEC takes the initiative to make recommendations, described at length in the section F. It is expected that these recommendations will help the graduate programs reach their aims and objectives and attain international standards of excellence. To obtain a better understanding of future policies, we also requested at the end of our visit and received from the leadership of the Medical School additional information of their strategic plans pertinent to the graduate programs. It was stated that "the department will support the development of

state-of-the-art innovative doctoral programs capitalizing on the expertise and collaborations of the most accomplished members of its basic and clinical faculty". In parallel, "it will support the development of core facilities for genomics, proteomics, advanced imaging and advanced infrastructure through collaborations with Greek and European consortia". The rebuttal of the Medical School to the external evaluation report indicated that a post-graduate committee will review and fine-tune the curricula of the graduate programs, to make them compatible with European and International standards, using the input of invited external experts, the program directors and the faculty. Whereas these ambitious plans are welcome, more detailed planning is needed in order to translate strategy into practice. Specific timeframes need to be agreed upon, and anticipated outcomes to be projected and monitored.

B. Teaching

APPROACH

Does the Department have a defined pedagogic policy with regard to teaching approach and methodology? Teaching methods used.

There are no universal guidelines for selection of graduate courses and no curriculum committee for most programs. As a result, each program (or laboratory) sets its own course and laboratory or technical training standards for graduation at both Master's and individual doctorate programs. Overall, there seems to be little Medical School supervision over the curriculum and quality control of the graduate programs.

The curriculum involves mandatory courses and some electives that are based on textbooks, e-learning and IT platforms. In some programs current literature is provided, research methodologies are taught and technical training is provided in specific courses. All programs require one semester of diploma work and writing of a review or a thesis based on the results of a research project. There appears to be duplication of effort by many programs. Several faculty members give similar courses for different programs at different times and venues. Cooperation and/or consolidation of thematically similar programs will improve efficiency and maximize outcomes.

Teaching staff/ student ratio:Teacher/student collaboration

In most Master's programs of the Medical School the faculty/student ratio is <1. However, there are great concerns regarding the true teaching staff/student ratio for the 3650 doctoral students. There is a recent rule of <5 doctoral students per faculty member, but it is unclear whether this rule is adhered to and how this is monitored. Based on students' comments the teacher/student collaboration is excellent.

Adequacy of means and resources: Use of information technologies: Examination system.
Textbooks are provided and their cost is covered by the tuition fees, which vary from 500 to 2000 Euros. Only the program of molecular medicine does not impose any tuition. All the programs have access to information technology, e-learning and IT platforms and these are considered adequate. Written and, in few cases, oral exams are given at the end of the course. If a student fails he/she can retake the exam one more time.

IMPLEMENTATION

Quality of teaching procedures: Quality and adequacy of teaching materials and resources: Quality of course material. Is it brought up to date? Linking of research with teaching

Most of the Master's programs have well qualified faculty that has experience in teaching a specific clinical course and have written or translated textbooks that are distributed to their classes. Student questionnaires assign grades in the range 3.5-4.9/5 for teaching in different courses. Textbooks of good quality and other teaching material are provided free of cost for every course. Most of the text books are written by the Greek faculty involved in teaching or they are Greek translations or the English versions of well regarded international textbooks. There is no well-stated, pre-defined timeframe within which

course content and materials are reviewed and renewed. The programs are heavily based on theoretical teaching and to some extent research methodology; research is performed only during the last semester of each program.

Mobility of academic staff and students: Visiting faculty may come from other Greek universities and in few cases from Research Institutes or from abroad. In few cases students go to the labs of the international collaborators. With few exceptions, there is little opportunity for mobility of graduate students during the course of their Master's or doctoral studies. The EEC recommends the establishment of a student office to promote student mobility and exchange (see recommendations in section F).

Evaluation by the students of (a) the teaching and (b) the course content and the study material/resources grades: The study material/resources

Questionnaires are handed to the students at the end of each course to evaluate teaching, course content and study material/resources. Grades in the range of 3.5 to 5/5 are usually awarded in all the categories. In the questionnaires provided, the students expressed satisfaction for the textbooks, the e- learning and IT platforms and the current literature that was provided in different courses.

RESULTS

Efficacy of teaching: Discrepancies in the success/failure percentage between courses and how they are justified: In most courses the teaching program went as planned. In few courses cancellation and rescheduling of classes occurred. Student failure is rare. Grades fluctuate within a narrow range (6.9- 10). The percentage of students with grades greater than 8.5 is 75-80 % in most programs.

Differences between students in (a) the time to graduation, and (b) final degree grades: Whether the Department understands the reasons of such positive or negative results?

Most students graduate within 2 years and the maximum time they can spend in the program is 3 years. Grades of the Master's degree are also high and are usually in the 8.5 to 10 range. There is an extraordinary variance in the duration of doctoral studies. Some appear to finish their studies successfully within 3-4 years but a large proportion of the 3560 doctorate candidates either progress very slowly or is inactive. The department's view is that the efficiency in the completion of the Master's programs and the high grades achieved on graduation reflect the high standards required for student admission, the maturity of the students, the fact that they pay tuition and the fact that many of the students have incentive to succeed in order to improve their professional status. There appears to be no departmental policy by which once a student has registered for a doctorate he/she can be removed from the registry. The EEC recommended that such a policy is established. In response to the EEC recommendations the leadership of the Medical School indicated, in the rebuttal to the external evaluation report, which is taking the necessary steps to address this problem.

GENERAL COMMENTS ON IMPLEMENTATION AND RESULTS OF TEACHING:

Critical mass of graduate faculty: The EEC believes that most of the faculty (including many non-academic clinicians and other professions involved in teaching and training) are highly committed and enthusiastic educators. However, the critical mass of faculty with sufficient training and research skills to teach in doctorate (PhD level) programs is limited. The problem is exacerbated by the limited role of the basic science departments in the establishment and direction of most of the graduate programs. Graduate teaching appears to be occasionally only linked to research, in other cases it may overlap with undergraduate teaching and in several cases with clinical duties.

Recruitment and renewal of graduate faculty: The Medical School has not undergone any substantial renewal of the faculty as a consequence of the 1982 Law for the AEI and the practice of

internal recruitments and promotion. The EEC strongly recommends that whenever new positions are awarded, the Medical School replaces all retiring faculty members by planned, merit based recruitments, of highly qualified candidates from outside the School. Some of the new recruits should be directed towards the strengthening of the graduate programs and spearheading state of the art research. A clear strategy to improve and sustain the research as well as the clinical and educational skills of existing faculty, through sabbatical leaves and career development methods is needed.

Setting priorities for the commitment of the faculty: There is a great need for the Medical School to develop policies and rewards towards an optimum utilization of all existing human and material resources in order to achieve its educational clinical and research objectives. This is particularly important in view of the reduction of human and financial resources due to the current economic crisis of the country. The time required for optimal contribution of the faculty to the graduate programs should not be underestimated. **Monitoring educational outcomes and student success:** There is no established benchmark against which the success of postgraduate courses and doctoral studies can be judged. Records of career outcomes of the graduates were requested but were not available by most programs. The EEC recommends that such records be established to monitor and compare the success of all Master's and PhD programs to similar Greek and International programs.

IMPROVEMENT

Does the Department propose methods and ways for improvement? What initiatives does it take in this direction?

There is no evidence of a central and clear strategy addressing the improvement in teaching. Any improvements appear to be left upon the course organizers. Each program takes whatever initiatives considers necessary in order to improve the educational process, based on student questionnaires, input from the faculty and in few cases from international or external review committees.

C. Research

For each particular matter, please distinguish between under- and post-graduate levels, if necessary.

APPROACH

What is the Department's policy and main objective in research?

The EEC found scant evidence in the internal evaluation report and other material provided during the site visit that a research policy with specific long-term goals and objectives exists. The internal evaluation report indicated that the School promotes both basic and clinical research but this does not appear to be within the context of specified long-term goals or in a coordinated manner. Research activities in each department/laboratory are mainly determined by the laboratory head. It was unclear from the internal evaluation report whether the school had a plan or rationale to concentrate on and excel in selected areas of biomedical research. For this reason the EEC requested and received from the current leadership of the School an addendum describing an overall strategic plan for research.

Following the EEC's visit and on our request the current leadership of the school provided an overall strategic plan for research that revolves around the development of Core Bioresearch Facilities and the Greek Research Infrastructure for Personalized Medicine. According to the school's plan "the department will support the development of core facilities for genomics, proteomics, imaging, and other infrastructure through collaborations with Greek and European consortia (ERSF, EATRIS, ELIXIR, INFRAFRONTIER). It was also stated that the School will capitalize on the expertise and collaborations of the most accomplished members of its basic and clinical faculty and new recruits to create state-of-the-art innovative doctoral programs that will spearhead research including programs in personalized medicine. The School, in its response to the EEC request, stated that it plans to establish required protocols for Animal Welfare Biosafety and Radiation Safety according to European and American standards and create patent and grant offices, compete for research funds and pursue innovation. The EEC fully supports the School's efforts to develop a strategic plan that can also be used as a road map to

measure its future progress and success.

Has the Department set internal standards for assessing research?

In general, the quality of research reflects on the quality of publications, amount of grant money and international recognition attracted by each program. It is unclear whether the school uses additional internal procedures and standards to assess research. The number of publication has increased steadily from 1209 publications in year 2002 to 2100 publications in year 2009, with an average impact factor of 2.73. The average h factor for full professors is 25 and for Associate Professors 17. Twenty six faculty have an h factor greater than 40 and one has an h factor of 130. The EEC commends those faculty for achieving academic excellence in a difficult academic environment. In order to further advance academic excellence and promote research, the leadership of the Medical School indicated, in their rebuttal to the external evaluation report, that they plan to set specified high standards for the qualifications of different ranks of its faculty, to be used for impartial, meritocratic recruitments and promotions. The EEC agrees and strongly encourages implementation of the proposed standards and emphasizes the need to replace retiring faculty by well trained young faculty with strong research and clinical backgrounds.

IMPLEMENTATION

How does the Department promote and support research?

The internal evaluation report did not provide a comprehensive plan for promoting biomedical research, recruiting research oriented faculty and attracting the required financial support. The EEC recognizes that compared to other EU countries the funding of research in Greek academic institutions is very low and irregular. Only 0.6% of the GDP of Greece is allocated to research as opposed to 2% which is the average of the European Union countries. This necessitates that the Medical School develop strategies to attract competitive funds for research.

Based on the existing information, the EEC recommends that the long-term strategic research plan of the Medical School focuses on areas of existing strengths and national and international needs. Such a plan is best developed with the help of a Research Committee, appointed by the dean of the medical school. This committee should identify areas of basic, clinical and translational biomedical research that the School should concentrate on (such as cancer, neuroscience, aging, cardiovascular and other areas of strength, discussed in section A). The committee should explain the factors and rationale supporting their recommendation, and describe potential long-term benefits for the Greek society and economy. The committee should also advise the dean and the Medical School leadership on issues of fundraising, seed support, core research facilities and related matters. Development of such a plan should also act as a catalyst for the Greek state to be more forthcoming towards providing additional support to the school.

To implement the research plan the Medical School should also establish a policy for recruitment of high quality clinical and basic faculty, especially at the junior level, with thorough clinical and research credentials. At the request of the EEC, after completion of its visit, the School leadership presented plans to implement such a policy and enforce the principles laid out in the European Charter for Researchers and the Code of Conduct for the Recruitment of Researchers. Recruitment efforts are facilitated within a well-defined long-term research strategy and by the development of a fundraising policy support and improve research. The exact components of such a strategy and assessment of its success should be stated in future internal evaluation reports and be available for external evaluations.

Quality and adequacy of research infrastructure and support.

At the present time the quality and quantity of the research infrastructure of the Medical School is limited. There is a need for essential instrument core research facilities shared by many laboratories. Creation of core facilities will reduce the overall cost of research that requires expensive instrumentation and will encourage scientific interactions and collaborations. The EEC believes that the school should be better supported financially by the Greek government in order to advance its research objectives. Such support however, should be conditional and linked to funding from competitive sources. Furthermore, government support should be used as start-up funds for new recruits in order to attract exceptional

senior faculty.

With few notable exceptions, the faculty of the Medical School has been recruited from within its departments and this jeopardizes its competitiveness for external research funding. This is an important issue that deserves serious consideration by the leadership and faculty of the Medical School. The EEC acknowledges the fact that due to the financial difficulties of the country, high-ranking faculty hesitates to return to Greece. However, given the opportunity, well qualified younger scientist in the medical field are eager to return. Mechanisms to support and monitor grant applications and awards need to be developed, with regular evaluation of the success of individual faculty members and departments. The information the EEC received on the intend of Medical School for future fundraising and research strategies includes:

1) Development a core bioresearch facility, and infrastructure

2) Supporting research through the following fundraising mechanisms:

i. Structural funds for regional development for the upcoming period (National Strategic Reference Framework 2014-2020)
ii. National funds for Research and Technology development
iii. FP7 and Horizon 2020 funds (e.g. REGPOT-type actions and others)
iv. International competitive research and technology grants
v. Industrial and other private investments and Charity trusts
vi. Income from provision of services to the academic and industrial research community.

The EEC welcomes all these initiatives. Their success and impact, however, need to be monitored and the strategy updated accordingly**.**

The internal evaluation report did not provide information on existing policies and procedures that guarantee health and safety of students and staff; human research subjects; animal welfare; Biosafety and safe disposal of biological materials; radiation safety.

Committees need to be established that approve research protocols and monitor research compliance and training. A training course should be established for all those who perform research using animals and a certificate of successful completion should be a prerequisite to being able to conduct research with animals. At the EEC's request, the Medical School provided plans on how to address these deficiencies, as well as evidence of compliance with the proposed policies in future evaluation reports. We have been informed in the rebuttal letter of the School that all laboratory, clinical, animal and human studies are being approved by either the IRB of the hospital where the study takes place, or the IRB of the Medical School and that a training course for animal use will be established.

Scientific publications: Research projects: Research collaborations

The EEC would like to commend the faculty for good research productivity shown by a large number of publications in peer-reviewed Journals. Some laboratories/departments have reached internationally competitive levels of excellence shown by their external funding and publications. Areas of research activity at the medical school include clinical, social medicine, psychiatry, neurology, obstetrics, gynaecology paediatrics, oncology, cardiovascular, genetics, surgery and pathology. The Medical School participates in about 1800 research programs with the greatest concentration in the department of Internal Medicine. Most research projects are based more on individual efforts than on being part of a strategic research plan of the medical school. Research, especially translational and basic, is an important component that contributes greatly to the international reputation of successful Medical School. Most research activities of the Medical School however, are associated with clinical research and clinical applications rather than translational/basic research. This was perceived by the EEC as an important deficiency. In its rebuttal letter the Medical School made a commitment to address this deficiency.

A major concern for the EEC is the seemingly poor collaboration between laboratories. This situation results in duplication of effort and infrastructure, as often different laboratories perform very similar research using similar instrumentation. The school should implement a policy to encourage collaboration between laboratories. This is in accord with prevailing international norms were collaboration is very

much encouraged as collaborative efforts result in higher productivity and economize efforts and resources.

RESULTS

How successfully were the Department's research objectives implemented?

As indicated in the approach the Medical School promotes good quality of basic and clinical research. The research objectives however are mostly determined by the expertise of individual laboratory heads and are designed to satisfy clinical-procedural-educational requirements of specific laboratories rather than the needs of a well-thought plan for scientific and technological development. It also seems that the school lacks a comprehensive plan for recruitment and promotion of new faculty members. Failure to attract new faculty impacts negatively on the introduction of new research projects and programs. The school should implement a plan with guidelines for recruitment of new faculty members. This should include seed money for research support for an initial period of at least three years until the successful candidates are able to attract competitive research funds.

Research projects: Research collaborations

Based on the internal evaluation report and the additional information we received from the leadership of the Medical School strong research projects have been developed in several basic and clinical departments including physiology, molecular biology, biochemistry, pharmacology, microbiology, pathology, cardiology, oncology, endocrinology, rheumatology, autoimmune and infectious diseases, epidemiology/preventive medicine, biology and molecular epidemiology.

Research in sciences is driven by quality PhD students. In this regard the medical school will benefit significantly from the implementation of well-structured doctoral (PhD and MD/PhD) programs and provide stipends to the student. The programs should have clear competitive criteria for selection of excellent candidates and guidelines for curricula, required courses, qualifying examinations and committees for approval of thesis proposals. Ideally, such programs should be modeled after similar programs in USA, where they have been very successful. (see sections A and F). The EEC recommends the graduate Master's program should closely interact with the PhD program as a means to train rigorously and encourage promising candidates to transition from MSc to the PhD level studies.

Collaboration with other institutes (including IIBEA, EIE, Pasteur, Fleming, Demokritos, etc) in the wider area of Athens in training students and in research leading to dissertation (PhD) is strongly encouraged. Athens Medical School should take advantage of this great opportunity to collaborate with many other institutes on biomedical research, an advantage not as easily available to other Medical School of the country. Collaborative efforts will greatly benefit both the institutes and the Medical School and should contribute substantially to the medical and technological improvement of the country. This relationship can be formalized by instituting joined appointments in the medical school of members of these Institutes and vice versa.

Efficacy of research work. Applied results. Patents etc: Is the School's research acknowledged and visible outside the School? Rewards and awards.

The Medical School needs to establish policies and infrastructures for protection and commercial exploitation of intellectual property. The EEC strongly recommends the development of an office of Patent and Technological Development, modeled after similar offices in almost every major medical center in USA and Europe. Although such an office may be costly to set-up, in the long run will become a great technological resource and a source of income for the Medical School. There is hardly any major Medical School in the North America or Europe without a very active patent office for the protection of technological innovations derived from the school's research.

Some of the School's research activities and the scientific standing of individual faculty members are acknowledged internationally. However, there is a significant variability. The Medical School has the potential to lead developments in many health-related areas in the country. This includes providing guidance on public health needs and policies on optimal health care delivery as well as generation of

original research leading to clinical applications.

IMPROVEMENT

As mentioned in section A, we received from the Medical School's leadership additional information on the strategic plans for research and infrastructure. In addition to details provided above, the Medical School plans to "support the development of core facilities for genomics, proteomics and advanced imaging and advanced infrastructure through collaborations with Greek and European consortia". The Medical School plans to capitalize on the expertise and collaborations of accomplished members of its basic and clinical faculty to create state-of-the-art MSc programs, innovative doctoral (PhD level) programs in areas with critical mass of experts who will spearhead research, including programs in personalized medicine. These statements, along with commitments to meritocratic recruitments and promotions of faculty, were reiterated in the rebuttal to the external evaluation report. The EEC fully supports the Medical School's plans and policies, designed to improve and increase its research activities.

D. All Other Services

For each particular matter, please distinguish between under- and post-graduate levels, if necessary.

APPROACH

How does the Department view the various services provided to the members of the academic community (teaching staff, students)? Does the Department have a policy to simplify administrative procedures? Are most procedures processed electronically? Does the Department have a policy to increase student presence on Campus?

Departmental services and policies are similar for the undergraduate and graduate studies and have been described in the EEC report of the undergraduate program. This includes medical insurance, student restaurant access, coupons for discounted public transportation etc. Both the School and the EEC view these services as excellent, particularly in the current circumstances, which may put several students and their families under enormous financial pressures. Athletic-and cultural activities are open to the graduate students if they wish to participate.

It is not clear how well co-ordinated the various strategies, policies, processes and procedures are between the undergraduate, graduate as well as clinical training activities of the Medical School. There is no obvious policy aiming to simplify administrative procedures. There is however an excellent website with continuously increasing use and reliance on it and the EEC encourages the management and administration in the School to optimize the use of the website to increase its efficiency. The attendance of classes in the graduate program is obligatory and is reported to be 80-100%.

IMPLEMENTATION

Organization and infrastructure of the Department's administration (e.g. secretariat of the Department): Form and function of academic services and infrastructure for students (e.g. library, PCs and free internet access, student counseling, athletic-cultural activity etc.).

Each program has its own administrative support and academic services. The infrastructure varies among the programs and ranges from excellent to above average.

The students have access to the Medical School library, IT platforms and access to internet.

The EEC did not see policies and programs designed to provide individual students with counselling, mentoring or coaching, as they exist in Medical Schools abroad. The EEC recommends that the Medical School establishes such programs (See section F).

RESULTS

Are administrative and other services adequate and functional? : How does the Department view the particular results?

The EEC is concerned that the existing administrative infrastructure of the Medical School is not adequate by international standards. There is a lack of core support staff compared with similar

organizations in other countries (e.g. central support for human resource management, updates for grant opportunities, provision of expertise for grant writing). These limitations may compromise many of the initiatives that the school wishes to take, and are much needed. The school fully appreciates the productivity of existing administrative staff, and their commitment, despite the fact that many of them do not currently have job security and are in risk of losing their positions.

IMPROVEMENTS

Has the Department identified ways and methods to improve the services provided? Initiatives undertaken in this direction.

The Medical School will consider making the required improvements in the services provided when recourses become available.

Collaboration with social, cultural and production organizations

Originality and significance of the Medical School's initiatives.

The partnership of the Medical School with the ATEI and the Nursing School is socially meaningful. This partnership is designed to upgrade the education and training of nurses and other healthcare professionals in cardiology, intensive care, paediatrics and other clinical areas. The various public health and social medicine programs also have the potential to, and do contribute significantly to society. Recommendations are been made in section F on how professional retraining and continuous education should gradually become the responsibility of professional societies and institutions, in collaboration, when needed, with the Medical School. There are also several other areas of interaction with society at large, for example educational programs raising awareness about specific health risks, open to the public. The interactions of the medical school with the private sector (other than commercial pharmaceutical companies through involvement in clinical trials) at the strategic level are much less evident. The interactions of the Medical School with the society have been also addressed in the EEC's report on the undergraduate programs.

E. Strategic Planning, Perspectives for Improvement and Dealing with Potential Inhibiting Factors

For each particular matter, please distinguish between under- and post-graduate levels, if necessary.

Potential inhibiting factors at State, Institutional and Departmental level, and proposals on ways to overcome them: Short-, medium- and long-term goals:

There is only 1 page (p. 2647) of the internal evaluation report on strategic planning. It is stated 'that the primary goal is the projection of the scientific accomplishments and social (medical) services provided by the school'. The school leadership considers the school to be internationally recognised, of the highest quality and request the support of the ministry of education to allocate funds for new faculty positions. No specific goals were provided for the needs of the graduate programs or other issues that concern the Medical School.

Plan and actions for improvement by the Department/Academic Unit: Long-term actions proposed by the Department:

No specific plans or actions were provided in the internal evaluation report**.** The report indicated that the policies of the strategic plans will be implemented by the president and the members of the executive council of the Medical School who are highly experienced in issues pertinent to medical education clinical practice and research.

In the absence of plans for short and long term strategies, the EEC requested and received additional information on strategic planning that may affect the graduate programs. It has been stated that the department of medicine will support the development of state-of-the-art educational programs including innovative doctoral programs capitalizing on the expertise of specialized clinical and basic research

faculty and will accelerate the development of the Medical School's core infrastructure with internal funds and collaborations with Greek and European consortia.

F. Final Conclusions and recommendations of the EEC

For each particular matter, please distinguish between under- and post-graduate level, if necessary.

Conclusions and recommendations of the EEC on:

The development of the Department to this date and its present situation, including explicit comments on good practices and weaknesses identified through the External Evaluation process

Based on the CVs we received, the EEC believes that the critical mass of faculty with sufficient training and research skills to teach in doctorate (PhD level) programs is limited. The problem is exacerbated by the limited role of the basic science departments in the establishment and direction of most of the graduate programs.

According to the international standards a prerequisite for any successful graduate program is the critical mass of expert faculty members (ca: 10-15 per program) that have training and experience in graduate education and are actively engaged in research. Without a critical mass of such faculty the quality of the programs is compromised.

The Department's readiness and capability to change/improve

The president of the Medical School Dr. Dimopoulos and several faculty members expressed pride on what the Medical School of Athens has accomplished in its long history. They also expressed their strong determination to use the external evaluation as a starting point to improve and attain academic excellence. The EEC shares their enthusiasm and applauds them for their attitude and provides guidance bellow how this can be accomplished.

The Department's quality assurance: During the presentations of the department on February 17 the leadership of the Medical School indicated that the internal and external evaluation will serve as mirror that will help them maximize their strengths, correct their weaknesses and help them reach a new level of academic excellence.

Recommendations for improvement

I. Restructuring the Programs of Graduate (Master's and doctorate) Studies

Based on the facts presented above, the EEC recommends the following changes of the programs: The recommended changes are designed to correct existing deficiencies in the training of MDs and health care professionals and at the same time, to provide state -of-the-art graduate (PhD level) education based on international standards.

Based on the detailed evaluation of each program provided above the EEC classifies the Master's programs in three categories: excellent, very good with potential to improve to excellent and average to poor. The first category has proper curriculum, critical mass of Greek and international faculty, proper guidance and outcomes that demonstrate that these programs train well their Master's students and prepare them to proceed to doctorate (PhD level) studies. The second category trains well nurses and other healthcare or public health professionals, but does not provide rigorous training to the students who wish to enter a doctorate (PhD level) program. These programs should be intensified and restructured as recommended below to achieve this objective. The third category contains programs that can best achieve their objectives as components of other programs or provide the desired training in the context of residency or clinical specialty programs of the Medical School.

II. Creation of two types of Master's programs in the Medical School (MCSc and MSc)

The MCSc should be focused towards education and training of Medical School graduates, nurses and other health care or public health professionals who wish to upgrade their professional status. The MSc

should be directed towards rigorous training that prepares the students to enter PhD level doctorate programs. Establishment of such programs will promote medical research in different specialties following international standards that are applied in high quality PhD programs abroad. MCSc exist in prestigious Medical Schools abroad and the EEC recommends to the Council (Symvoulio) of the Medical School and the Ministry of Education that such programs are established.

To the extent that the MCSc programs wish to prepare the students for doctoral (PhD level) studies they should develop a parallel intensified curriculum with course work, taught preferably in English, which should be based predominantly on the state-of-the-art literature and to lesser extent textbooks. They should also include one year of practical training, field work or research thesis. The EEC recommends that all programs review and update their curricula by an expert curriculum committee, continue their operation for the period they have been approved and decide their continuation based on their performance and outcomes. The Master's awarded by these programs are envisioned to advance the professional careers of the graduates and they will be compatible with the Bologna directives.

The Master's in science (MSc) should be designed to prepare the students to enter a doctorate (PhD level) program. The curriculum should be prepared by an expert curriculum committee that contains members with graduate (PhD) training**.** The EEC recommends that such a curriculum should include one-year courses taught in English on topics of biomedical research that are relevant to the specific program based entirely on current literature of the relevant fields. The courses should be taught by experts that work on the field. The students should be trained in critical thinking and presentation of original papers as well as in writing critical reviews on a specific topic. During the first year the students should complete two laboratory rotations. The second year should include exclusively laboratory research and thematic seminars that will lead to a MSc thesis. At the end of the training the students should be fully prepared to enter into a doctorate program that will lead to MD/PhD for the MD graduates or a PhD for the non-MD graduates as it occurs in several international and one Greek Medical School program (at the University of Crete) and is outlined in the Molecular Medicine program. Encouragement of the most qualified Medical School graduates to enrol in the MD/PhD programs will increase their qualifications and will create the next generation of leaders in academic medicine. Furthermore enrolment in such programs will reduce the need to leave the country during the long waiting period required to enter into the residency programs.

III. Use of the restructured Master's programs to train students for doctorate (PhD level) or MD-PhD studies and creation of strong novel PhD level programs with collaboration of the basic and clinical faculty members.

As the revised MSc and MCSc programs grow and generate graduates well trained in research, prepared to enter doctorate studies, the current doctorate program based on the alternate pathway should be phased out and finally discontinued. The additional information we received from the leadership of the Medical School on strategic planning indicates their willingness to pursue the development of state-of-the-art innovative doctoral programs capitalizing on the strengths of its basic and clinical faculty along with the development of the required core facilities and infrastructure. Areas of strength were identified in physiology, molecular biology, biochemistry, pharmacology, microbiology, pathology, cardiology, oncology, endocrinology, rheumatology, autoimmune and infectious diseases, and epidemiology/preventive medicine and to the extent possible in -omic technologies and bioinformatics. In addition to the above, long term investments in the emerging field of basic and clinical neurosciences are warranted. The EEC estimates that restructured MCSc and few MSc programs along with the new programs will be able to provide 100-150 PhD candidates annually to cover the research needs of the Medical School. The proposed changes will provide quality education to the doctorate candidates. In parallel they will transform the research environment, will make the Medical School of Athens a centre of excellence in biomedical research and will increase its international stature. Such a transformation will

attract competitive European funds and possibly international students. Most importantly such changes will create meaningful career opportunities in Greece and abroad for the graduates of the Medical School who elect to pursue comprehensive graduate studies.

IV. Creation of clinical research fellowships to support research in the clinical departments

All clinical departments have currently a large number of trainees who are concomitantly working for a doctoral degree (with the alternative pathway). For this reason the EEC recommends that the current doctorate program be changed into a Clinical Research Fellowship to run in parallel or independently of the residency or subspecialty training. This policy applies to all the Medical Schools of North America and several Medical Schools of Europe. A recommendation is made to the Ministry of Health and the Greek government for the creation of Research Fellowship programs, leading to a title of completion of the Fellowship. The Program will allow exposure of the Medical School residents to research and thus advance the research activities of the clinical departments.

V. Integration of Graduate Programs with Research institutes in Greece and abroad

The graduate programs and the research activities will benefit if they link closely with the research institutes that surround the Medical School of Athens. A new law introduced recently for Research and Technology allows the research institutes to collaborate with universities in order to promote graduate education leading to a doctorate (PhD level) degree. The 2011 law 4009 of the Ministry of Education for the AEI supports such collaborations. Five of the current graduate programs have established international collaborations. Similarly, collaborations are possible with leading European and American Universities and Research Institutes, as well as collaboration with leading Greek scientists abroad. Such collaborations will allow continuous training of faculty and graduate students in emerging new technologies, and will increase the competitiveness of the Greek scientists for European research programs. Greek scientists from abroad may serve as advisors to students of graduate programs, as short term lecturers of graduate courses in areas of their expertise and as mentors of the PhD candidates during their thesis work, as well as during their junior faculty appointments.

VI. Foster interaction and exchanges of the graduate programs

For the above stated purpose, the EEC recommends establishment of an annual or bi-annual conference (symposium) of all graduate programs that includes faculty and students in order to present the programs and discuss their annual achievements. The conference should be open to all faculty and students of the Medical School. Similar two-day long symposia occur annually in many Medical Schools in North America and Europe. In these symposia the students present their work mostly in the form of posters and few selected oral presentations. One or two keynote speakers of international stature are invited to give lectures. These symposia foster collaborations among faculty and students of the graduate programs, promote education and provide the undergdaduate students with information about graduate level research. This latter establishes role models for research careers and it is currently absent from the Medical School undergraduate curriculum

VII. Funding the graduate programs that aim towards doctorate (PhD level) degrees

To attract the best students to the graduate (PhD level) programs it is imperative that the students selected for these programs receive a stipend. This will allow them to devote all their time towards research. Funding for doctoral students could become available, possibly through combination of the following: (a) establishment of competitive graduate training grants by the Ministry of Education; (b) application for doctoral training grants to EU sources (when those exist); (c) include student salaries in research grant applications; (d) applications for individual doctoral training fellowships from IKY and private foundations (e.g. Bodosakis, Onasio, Empirikio, Niarxos Foundation etc); and (e) utilization of University real estate resources if available. The EEC believes that the sustainability of viable doctoral

programs depends on a vibrant research environment (see section C Research). Recommendations are made to the ministry of education and the Greek government to create a competitive funding mechanism to support the top graduate (PhD level) programs and to fund the top students within these programs through internationally established competitive funding mechanisms.

VIII. Renewal of the faculty and start up support for junior faculty

Given the fact that the school has not undergone any substantial renewal of the faculty as a consequence of the law of 1982 for the AEI and the practice of internal recruitment and promotions, there is an imperative need for corrective action. Since a large number of faculty tenured by the law of 1982 will be retiring soon, the EEC strongly recommends that the Medical Schools replaces all retiring faculty members by programmatic and merit based recruitments of highly qualified candidates from outside the School. Some of the new recruits should be directed towards the strengthening of the graduate programs and the functional research groups. The EEC also recommends that newly recruited junior faculty be supported with start-up funds. This is critical for allowing them to establish a strong and competitive research program and contribute to graduate education and research.

To increase recruitments of qualified candidates from outside the school the EEC recommends a policy frequently applied by academic institutions abroad. According to this policy, graduating scientists cannot be hired in faculty positions of the school they obtained their PhD from, unless they have spent at least three years of training in another high quality academic institution.

IX. Research infrastructure, protocols and Biosafety.

The EEC recommends creation of uniform policies required for establishment and approval of research protocols and to monitor research compliance and training. Protocols for animal welfare, Biosafety, radiation safety should be established based on European guidelines. A training course should be established for all those who perform research using animals and a certificate of successful completion should be a prerequisite to being able to conduct research with animals.

X. Quality controls

All programs should establish a curriculum committee to consider periodical curriculum updating as well as an internal and external evaluation committee consisting of national and international experts. The EEC recommends that internal evaluations take place annually and external evaluations occur every 3-5 years. The recommendations of the external evaluation committee should be implemented. All programs should establish records on the career development of the graduates of their Master's and PhD programs to allow comparisons with similar Greek and International programs.

XI. Career opportunities and services for students and graduates of the programs

The EEC recommends that the medical school establishes a student office dedicated to providing students and graduates of Medical School's undergraduate and graduate programs with information on the status of the health professional market, specialty and subspecialty markets, biomedical research markets and fellowship opportunities in Greece and abroad.

The EEC also recommends that the Medical School establishes services, providing individual medical students with counselling, mentoring or coaching. All these services were proven to have tangible benefits for the recipient students.

XII. Administrative streamlining of research, teaching and clinical training activities.

For many of its clinical and teaching activities the Medical School needs to interact with various hospitals. Two of the hospitals belong to the University and the remaining to ESY. The Medical School needs to coordinate undergraduate and graduate education and research as well as postgraduate medical professional specialty training. This is a complex task and priorities in different hospitals may occasionally conflict. It is unclear what the administrative infrastructure is for each of these activities of the Medical School, to what degree these tasks undertaken by the Medical School and the hospitals

overlap and how effectively the executive arms coordinating these tasks communicate with each other. The EEC recommends that the Medical School needs to clarify the administrative responsibility for these diverse functions. These functions are of major operational and financial importance for the sustainability of the Medical School and its ability to provide top quality health care services, education, training and research. It also recommends that the Medical School uses the opportunity to work together with the agencies that contribute to health care delivery in order to combine its educational and research activities with the current and future demands of the health care services in the country. The EEC also recommends creation of patent and grant offices.

XIII. Recommendations to ADIP

1**.** It is important that the internal evaluation becomes available to the EEC members at least two months prior to the site visit.

2. To facilitate the review process it will be important that the main body of the internal evaluation report is much shorter and contains appendices of the required tables, appendices containing short biographical sketches (2-3 pages) along with summaries of research of the faculty members, an appendix of medium and high impact research publications, and if available an appendix of any external evaluations by international committees of undergraduate, graduate or clinical programs. Other appendices that are considered important can be compiled and be available for inspection by the EEC during the site visit.

3. The EEC recommends to ADIP that the future internal evaluation forms of the Medical School include questions pertinent to: 1) regulatory issues related to research, 2) productivity, performance and research funding of the faculty, and 3) criteria for hiring and promoting the faculty of the Medical School as well as data demonstrating the implementation of these criteria.

XIV. Recommendations to the Ministry of Education and the Greek government:

1. Reinstatement of the position of the Dean of graduate studies: The law 4009 of 2011 made provisions for the creation of the position of a Dean of graduate studies, which were deleted upon subsequent revisions. The Dean's role was to coordinate and set procedures and policies for graduate programs. Such positions exist in most universities abroad that have a large number of graduate programs and will be of great value to streamline the programs of the Medical School of Athens.

2 Creation of two types of Master's programs in the Medical Schools, Master's of clinical science(MCSc) and Master's of science (MSc)

The MCSc should be focused towards education and training of Medical School graduates, nurses and other health care or public health professionals who wish to upgrade their professional status. The MSc should be directed towards rigorous training that prepares the students to enter high quality doctorate PhD level programs. The establishment of such programs will promote medical research in different specialties and will be compatible with international standards.

3. Establishment of support mechanisms for the Graduate Programs based on excellence: To achieve excellence in graduate education it is important that graduate students have a minimum of financial support so that devote their full time effort initially to their intense course work and subsequently to their research. This can be accomplished by:

a. Funding top graduate programs with competitive grants provided by the Ministry of Education. This type of support can lead to the creation of centers of excellence in graduate education.

b. Establishment of competitive research fellowships granted by the Ministry of Education to the top graduate (PhD level) students. These fellowships will provide student salaries towards completion of PhD studies, similar to those provided previously by the Heraclitus program.

XV. Recommendations to the Ministry of Education the General Secretariat of Research and Technology and the Greek government:

To promote competitive research, increase research productivity and facilitate short- and long-term project planning the EEC recommends to the above agencies:

a. To increase the budget for research and have regular calls for competitive national grants and simplify the administrative bureaucracy associated with grant management.

b. To support the creation of technology infrastructure

XVI. Recommendations to the Ministry of Health and the Greek government:

1. The EEC believes that the antiquated waiting list method of entry into specialty training (residency) may operate actually as a major "incentive" for qualified Medical School graduates to leave the country. This is counterproductive for the Greek economy, as well as for individuals and institutions striving to achieve excellence within the country. For this reason, the EEC recommends that the waiting list method of selection for residency positions be abolished. Instead, residents should be selected on the basis of national exams taken during the sixth year of the Medical School program or after graduation. This is a ripe idea as a similar proposal was made by the EEC that evaluated the Medical School of Thessaly and similar practices are followed in North America and other European countries.

2. The EEC recommends the establishment of subspecialty fellowship or research fellowship training programs for MDs. These programs will provide training in specific clinical skills, which constitute advanced and focused area of a specialty (examples include interventional radiology, robotic surgery, stroke treatment, bone marrow transplantation etc). These fellowships can be purely clinical subspecialty fellowship, research fellowships or mixed. Such programs exist in all Medical Schools of North America and usually advance the classic specialty programs or provide fellows with the opportunity to participate in research conducted in clinical departments.

The Members of the Committee

Name and Surname Signature

Professor Vassilis I. Zannis (President) _____

Professor George D. Kitas _____

Professor Nikolaos K. Robakis _____

Professor Othon Iliopoulos _____