GENERAL GUIDELINES FOR ETHICAL CONDUCT AT THE LABORATORY OF PHYSIOLOGY AND BIOMEDICAL IMAGING (LBI)

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Preface

The Guidelines for the Ethical Conduct of Research at the Laboratory of Physiology and Biomedical Imaging (LBI) in the Department of Mechanical Engineering at the University of Cyprus build upon the general principles and guidelines listed and practiced in the Intramural Research Program at the National Institutes of Health (Bethesda, MD, USA). Accordingly, the content, structure, and descriptions herein are adopted and accustomed to the published Guidelines set by the Scientific Directors of the Intramural Programs at the NIH (http://www.nih.gov/news/irnews/guidelines.htm). Informed consent and approval for the use and web-posting of such Guidelines has been sought from the Director of the Intramural Program at the National Institutes of Health.

Overall, such guidelines aim to provide strict margins within which students, fellows, staff members, and visiting faculty must stride within, to accomplish their research endeavours, thereby assisting both new and experienced researchers to strive to safeguard the scientific integrity of the research process. In particular, reference is made herein on the responsibilities of research staff for collection, recording, and storage of data, publication practices, authorship determination, the peer review process, confidentiality of information, potential collaborations (within the University setting and outside), human or animal research, and conflicts of interest (financial or intellectual property).

It is important that every member of this lab, who is and will be involved in research read, understand, and endorse the Guidelines into everyday practice.

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Guidelines for the Conduct of Research

All scientists should be committed to the responsible use of the process known as the scientific method to seek new knowledge. While the general principles of the scientific method -- formulation and testing of hypotheses, controlled observations or experiments, analysis and interpretation of data, and oral and written presentation of all of these components to scientific colleagues for discussion and further conclusions -- are universal, their detailed application may differ in different scientific disciplines and in varying circumstances. All research staff in the Intramural Research Programs should maintain exemplary standards of intellectual honesty in formulating, conducting and presenting research as befits the leadership role of the NIH.

These *Guidelines* were developed to promote high ethical standards in the conduct of research by intramural scientists at the NIH. It is the responsibility of each Laboratory or Branch Chief, and successive levels of supervisory individuals (especially Institute, Center and Division Intramural Research Directors), to ensure that each NIH scientist is cognizant of these *Guidelines* and to resolve issues that may arise in their implementation.

These *Guidelines* complement, but are independent of, existing NIH regulations for the conduct of research such as those governing human subjects research, animal use, radiation, chemical and other safety issues, and the Standards of Conduct that apply to all federal employees.

The formulation of these *Guidelines* is not meant to codify a set of rules, but rather to elucidate, increase awareness and stimulate discussion of patterns of scientific practice that have developed over many years and are followed by the vast majority of scientists, and to provide benchmarks when problems arise. Although no set of guidelines, or even explicit rules, can prevent willful scientific misconduct, it is hoped that formulation of these *Guidelines* will contribute to the continued clarification of the application of the scientific method in changing circumstances.

The public will ultimately judge the NIH by its adherence to high intellectual and ethical standards, as well as by its development and application of important new knowledge through scientific creativity.

Supervision of Trainees

Research training is a complex process, the central aspect of which is an extended period of research carried out under the supervision of an experienced scientific mentor. This supervised research experience represents not merely performance of tasks assigned by the supervisor, but rather a process wherein the trainee takes on an increasingly independent role in the selection, conceptualization and execution of research projects. To prepare a young scientist for a successful career as a research investigator, the trainee should be provided with training in the necessary skills. It should be recognized that the trainee has unique needs relevant to career development.

In general a trainee will have a single primary supervisor but may also have other individuals who function as mentors for specific aspects of career development. It is the responsibility of the primary supervisor to provide a research environment in which the trainee has the opportunity to acquire both the conceptual and technical skills of the field. In this setting, the trainee should undertake a significant piece of research, chosen usually as the result of discussions between the mentor and the trainee, which has the potential to yield new knowledge of importance in that field. The mentor should supervise the trainee's progress closely and interact personally with the trainee on a regular basis to make the training experience meaningful. Supervisors should limit the number of trainees in their laboratory to the number for whom they can provide an appropriate experience.

There are certain specific aspects of the mentor-trainee relationship that deserve emphasis. First, training should impart to the trainee appropriate standards of scientific conduct both by instruction and by example. Second, mentors should be particularly diligent to involve trainees in research activities that contribute to their career development. Third, mentors should provide trainees with realistic appraisals of their performance and with advice about career development and opportunities.

Conversely, trainees have responsibilities to their supervisors and to their institutions. These responsibilities include adherence to these *Guidelines*, applicable rules, and programmatic constraints related to the needs of the laboratory and institute. The same standards of professionalism and collegiality apply to trainees as to their supervisors and mentors.

Data Management

Research data, including detailed experimental protocols, all primary data, and procedures of reduction and analysis are the essential components of scientific progress. Scientific integrity is inseparable from meticulous attention to the acquisition and maintenance of these research data.

The results of research should be carefully recorded in a form that will allow continuous access for analysis and review. Attention should be given to annotating and indexing notebooks and documenting computerized information to facilitate detailed review of data. All data, even from observations and experiments not directly leading to publication, should be treated comparably. All research data should be available to scientific collaborators and supervisors for immediate review, consistent with requirements of confidentiality. Investigators should be aware that research data are legal documents for purposes such as establishing patent rights or when the veracity of published results is challenged and the data are subject to subpoena by congressional committees and the courts.

Research data, including the primary experimental results, should be retained for a sufficient period to allow analysis and repetition by others of published material resulting from those data. In some fields, five or seven years are specified as the minimum period of retention but this may vary under different circumstances.

Notebooks, research data and supporting materials, such as unique reagents, belong to the National Institutes of Health, and should be maintained and made available, in general, by the Laboratory in which they were developed. Departing investigators may take copies of notebooks or other data for further work. Under special circumstances, such as when required for continuation of research, departing investigators may take primary data or unique reagents with them if adequate arrangements for their safekeeping and availability to others are documented by the appropriate Institute, Center or Division official.

Data management, including the decision to publish, is the responsibility of the principal investigator. After publication, the research data and any unique reagents that form the basis of that communication should be made available promptly and completely to all responsible scientists seeking further information. Exceptions may be necessary to maintain confidentiality of clinical data or if unique materials were obtained under agreements that preclude their dissemination.

Publication Practices

Publication of results is an integral and essential component of research. Other than presentation at scientific meetings, publication in a scientific journal should normally be the mechanism for the first public disclosure of new findings. Exceptions may be appropriate when serious public health or safety issues are involved. Although appropriately considered the end point of a particular research project, publication is also the beginning of a process in which the scientific community at large can substantiate, correct and further develop any particular set of results.

Timely publication of new and significant results is important for the progress of science, but fragmentary publication of the results of a scientific investigation or multiple publications of the same or similar data are inappropriate. Each publication should make a unique and substantial contribution to its field. As a corollary to this principle, tenure appointments and promotions should be based on the importance of the scientific accomplishments and not on the number of publications in which those accomplishments were reported.

Each paper should contain sufficient information for the informed reader to assess its validity. The principal method of scientific verification, however, is not review of submitted or published papers, but the ability of others to replicate the results. Therefore, each paper should contain all the information that would be necessary for scientific peers of the authors to repeat the experiments. Essential data that are not normally included in the published paper, e.g. nucleic acid and protein sequences and crystallographic information, should be deposited in the appropriate public data base. This principle also requires that any unique materials (e.g. monoclonal antibodies, bacterial strains, mutant cell lines), analytical amounts of scarce reagents and unpublished data (e.g. protein or nucleic acid sequences) that are essential for repetition of the published experiments be made available to other qualified scientists. It is not necessary to provide materials (such as proteins) that others can prepare by published procedures, or materials (such as polyclonal antisera) that may be in limited supply.

Authorship

Authorship refers to the listing of names of participants in all communications, oral and written, of experimental results and their interpretation to scientific colleagues. Authorship is the fulfillment of the responsibility to communicate research results to the scientific community for external evaluation.

Authorship is also the primary mechanism for determining the allocation of credit for scientific advances and thus the primary basis for assessing a scientist's contributions to developing new knowledge. As such, it potentially conveys great benefit, as well as responsibility.

For each individual the privilege of authorship should be based on a significant contribution to the conceptualization, design, execution, and/or interpretation of the research study, as well as a willingness to assume responsibility for the study. Individuals who do not meet these criteria but who have assisted the research by their encouragement and advice or by providing space, financial support, reagents, occasional analyses or patient material should be acknowledged in the text but not be authors.

Because of the variation in detailed practices among disciplines, no universal set of standards can easily be formulated. It is expected, however, that each research group and Laboratory or Branch will freely discuss and resolve questions of authorship before and during the course of a study. Further, each author should review fully material that is to be presented in public forums or submitted (originally or in revision) for publication. Each author should be willing to support the general conclusions of the study.

The submitting author should be considered the primary author with the additional responsibilities of coordinating the completion and submission of the work, satisfying pertinent rules of submission, and coordinating responses of the group to inquiries or challenges. The submitting author should assure that the contributions of all collaborators are appropriately recognized and that each author has reviewed and authorized the submission of the manuscript in its original and revised forms. The recent practice of some journals of requiring approval signatures from each author before publication is an indication of the importance of fulfilling the above.

Peer Review and Privileged Information

Peer review can be defined as expert critique of either a scientific treatise, such as an article prepared or submitted for publication, a research grant proposal, a clinical research protocol, or of an investigator's research program, as in a site visit. Peer review is an essential component of the conduct of science.

Decisions on the funding of research proposals and on the publication of experimental results must be based on thorough, fair and objective evaluations by recognized experts. Therefore, although it is often difficult and time-consuming, scientists have an obligation to participate in the peer review process and, in doing so, they make an important contribution to science.

Peer review requires that the reviewer be expert in the subject under review. The reviewer, however, should avoid any real or perceived conflict of interest that might arise because of a direct competitive, collaborative or other close relationship with one or more of the authors of the material under review. Normally, such a conflict of interest would require a decision not to participate in the review process and to return any material unread.

The review must be objective. It should be based solely on scientific evaluation of the material under review within the context of published information and should not be influenced by scientific information not publicly available.

All material under review is privileged information. It should not be used to the benefit of the reviewer unless it previously has been made public. It should not be shared with anyone unless necessary to the review process, in which case the names of those with whom the information was shared should be made known to those managing the review process. Material under review should not be copied and retained or used in any manner by the reviewer unless specifically permitted by the journal or reviewing organization and the author.

Collaborations

Research collaborations frequently facilitate progress and generally should be encouraged. It is advisable that the ground rules for collaborations, including eventual authorship issues, be discussed openly among all participants from the beginning. Whenever collaborations involve the exchange of materials between scientists and scientists external to the University Material Transfer Agreement (MTA) or other formal written agreements may be necessary. Information about such agreements and other relevant mechanisms, such as licensing or patenting discoveries, may be obtained from each ICD's Technology Development Coordinator or the NIH Office of Technology Transfer.

Human Subjects or Animal Research

Clinical research, for the purposes of these *Guidelines*, is defined as research performed on human subjects or on material or information obtained from human subjects as a part of human experimentation. All of the topics covered in the *Guidelines* also apply to the conduct of clinical research; clinical research, however, entails further responsibilities for investigators.

The preparation of a written research protocol ("Clinical Research Protocol") according to existing guidelines prior to commencing studies is almost always required. By virtue of its various sections governing background; patient eligibility and confidentiality; data to be collected; mechanism of data storage, retrieval, statistical analysis and reporting; and identification of the principal and associate investigators, the Clinical Research Protocol provides a highly codified mechanism covering most of the topics covered elsewhere in the *Guidelines*. The Clinical Research Protocol is generally widely circulated for comment, review and approval. It should be scrupulously adhered to in the conduct of the research. The ideas of the investigators who prepared the protocol should be protected by all who review the document.

Those using materials obtained by others from patients or volunteers are responsible for assuring themselves that the materials have been collected with due regard for principles of informed consent and protection of human subjects from research risk. Normally, this is satisfied by a protocol approved by a human subjects committee of the institution at which the materials were obtained.

The supervision of trainees in the conduct of clinical investigation is complex. Often the trainees are in fellowship training programs leading to specialty or subspecialty certifications as well as in research training programs. Thus, they should be educated in general and specific medical management issues as well in the conduct of research. The process of data gathering, storage, and retention can also be complex in clinical research which sometimes cannot easily be repeated. The principal investigator is responsible for the quality and maintenance of the records and for the training and oversight of all personnel involved in data collection.

Epidemiologic research involves the study of the presence or absence of disease in groups of individuals. Certain aspects of epidemiologic research deserve special mention. Although an epidemiologist does not normally assume responsibility for a patient's care, it is the responsibility of the epidemiologist to ensure that the investigation does not interfere with the clinical care of any patient. Also, data on diseases, habits or behavior should not be published or presented in a way that allows identification of any particular individual, family or community. In addition, even though it is the practice of some journals not to publish research findings that have been partially released to the public, it may be necessary for reasons of immediate public health concerns to report the findings of epidemiologic research to the study participants and to health officials before the study has been completed; the health and safety of the public has precedence.

Development and review of detailed protocols are as important in epidemiologic research as in clinical research and any other health science. However, the time for protocol development and review may be appropriately shortened in circumstances such as the investigation of acute epidemic or outbreak situations where the epidemiologic investigation may provide data of crucial importance to the identification and mitigation of a threat to public health. Nevertheless, even in these situations, systematic planning is of great importance and the investigator should make every attempt to formalize the study design in a written document and have it peer-reviewed before the research is begun.

Financial Conflicts of Interest

Potential conflicts of interest due to financial (or other intellectual property) involvements with commercial institutions may not be recognized by others unless specific information is provided. Therefore, the scientist should disclose all relevant financial relationships, including those of the scientist’s immediate family, to the Institute, Center, or Division during the planning, conducting and reporting of research studies, to funding agencies before participating in peer review of applications for research support, to meeting organizers before presentation of results, to journal editors when submitting or refereeing any material for publication, and in all written communications and oral presentations.

Concluding Statement

These Guidelines are not intended to address issues of misconduct or to establish rules or regulations. Such issues are addressed by published Institutional rules and regulations, with which the reader must familiarize himself. Rather, their purpose is to provide a framework for the fair and open conduct of research without inhibiting scientific freedom and creativity.

3rd Edition
January 1997
Scientific Directors
National Institutes of Health
Bethesda, Maryland
United States

References

[1] Guidelines for the Conduct of Research in the Intramural Research Programs at NIH, 3rd Editions, January 1997, The National Institutes of Health, Bethesda, Maryland, USA. http://www.nih.gov/news/irnews/guidelines.htm

[2] Rules and Guidelines for Responsible Conduct of Research, The Faculty Handbook of the Johns Hopkins University School of Medicine Guidelines of the Joint Committee on Clinical Investigation, Baltimore, Maryland, USA

COLLABORATIVE AGREEMENTS WITH EUROPEAN AND AMERICAN RESEARCH CENTERS, INSTITUTIONS OR UNIVERSITIES

The nature of research work conducted in the Laboratory of Medical Imaging (LMI) necessitates the use of expensive diagnostic equipment and electronics (including but not limited to accessing a Magnetic Resonance Imaging scanner). While such equipment exists in some private clinics and hospitals in Cyprus, nevertheless, the infrastructure and guidelines for the conduct of research are currently lacking. Most importantly, there are no research agreements formulated with any of the major diagnostic equipment vendors (or their local representatives), and as such, there is an imminent need for periodic travel abroad where research experiments are conducted and data collected.

A number of possible research collaborations have been initiated, and those are governed under the auspices of the University and the collaborative Institution or University, according to strict rules of Intellectual Property, set by either or both Institutions.

In particular, contacts have been established with the:

[1] Laboratory of Functional and Molecular Imaging at the National Institute of Neurological Disorders and Stroke (NINDS) at the National Institutes of Health, Maryland, USA
[2] Department of Biomedical Engineering at the Swiss Federal Institute of Technology (ETH) in Zurich, Switzerland
[3] In Vivo Microscopy Laboratory, Duke University School of Medicine, USA

Basic research (on mice and other animals) is intended to be conducted in Cyprus and at Institutions [3] or [1] above, and clinical research at Institutions [3], [2] and Cyprus. Periodically, and given the complexity of the project or the experiment, the Laboratory chief may secure funds to allow a graduate or a post-graduate student to attend (or conduct) experimental work at such institutions. The decision on whether students can be eligible to apply for such internal funding, will depend on the complexity of the project, the student's performance and conduct in the lab, prior publications etc. Should a student receives permission to travel abroad, he/she must familiarize himself/herself with regulations that govern his/her presence in the foreign country, but also with all facets and aspects of research conduct in the foreign institution (including but not limited to Material Transfer Agreements, other collaborative agreements etc.). Issues that pertain to travel and lodge of the visitor, as well as immigration and other issues are best addressed with the laboratory chief and the University's International Office, the Fulbright Commission, or the European Office in Cyprus.

The lack of infrastructure, and expertise in the areas of research in diagnostic imaging, Magnetic Resonance Imaging, mouse physiology and biology, software and hardware design, necessitates the establishment of training programs with established centers of excellence abroad to allow staff and other lab members to develop and acquire the required knowledge and expertise within reasonable time periods. As a result, training programs and applications will be established under existing programs, such as Marie-Curie, Leonardo DaVinci, Fulbright etc.

JOINING AND LEAVING THE LAB

Once a student, staff, or faculty member expresses his/her desire to join the laboratory, the laboratory chief will issue a written offer letter stating the type of affiliation of the employee, the salary, and the time period of engagement. Upon assignment of duties, the lab chief will have an informal discussion with the lab member/employee to explain duties and responsibilities provide written publications on issues of research conduct, and address questions and concerns. Lab space, equipment, keys, access codes, will then be allocated. A separate meeting with the computer administrator will be required to obtain login, passwords, and other relevant information.

During a separate meeting(s), the lab member will discuss with the laboratory chief a clear and concise scientific plan setting deadlines, targets and milestones. The lab chief will ensure that progress is monitored periodically through regular weekly meetings.

Once the work of a lab member completes (or for any other reason for parting from the lab), the lab chief will conduct an exit interview to ensure that all pending requirements are completed, and that the lab member bears no further responsibilities to the lab or the University. An official letter to this effect will be provided by the laboratory chief.

PROGRESS RECORDS AND RECOMMENDATIONS

Occasionally, laboratory members will request written recommendation letters or letters of reference for job applications, awards, scientific competitions etc. It is common laboratory practice to maintain written records of scientific progress for all students, staff, and faculty members and yearly appraisal reports. Maintaining such records aims to provide a track record of performance as a guideline for writing recommendation letters, during the current active employment of the laboratory member, or long after he/she has left the lab. Such records are confidential in nature, and they will be filed in the personal file for each lab member.

LAB ACCESS, USE OF EQUIPMENT, AND COMPUTERS

When laboratory members are physically absent from the lab, laboratory spaces must be kept locked at all times to safeguard the security of stored equipment, personal items, or other belongings. Each lab member will be assigned keys to all laboratory areas upon signature of the appropriate form(s) claiming ownership and responsibility of keys. A log-book, or sign-on and sign-off sheets will be attached on each equipment item and the user is required to sign-on and sign-off at the beginning and at the completion of the use. An electronic scheduling chart will be maintained in a publicly available location to allow lab-members to schedule ahead of time their intention for use of a shared laboratory area or equipment. All laboratory items and equipment are labeled with the University of Cyprus label.

A computer administrator will be responsible for the security, use, software and hardware, and the integrity of the laboratory network. Laboratory members are required to adhere to the rules for the use of the equipment using common-practices. In all cases, concerns on the network or computer equipment must be raised to the computer administrator, seeking his consultation. All laboratory members are highly advised that their work on laboratory computers is University property and thereby governed by University rules and regulations. While all work on computers and digital systems and media should be strictly confined to scientific and laboratory work, the laboratory chief understands and appreciates the need for the thoughtful use of email or the internet for personal purposes.

INTELLECTUAL PROPERTY

The topic of intellectual property is a broad and complex in nature. Albeit deviations from this rule may exist depending on the nature of the engagement, as a general rule, all work completed at the Laboratory premises will be considered as intellectual property that belongs to the laboratory. Laboratory members, including visiting faculty, staff members, collaborating scientists, and students are advised to discuss such

matters with the Laboratory Director at the onset of the engagement process, to avoid any subsequent misunderstandings and allow a common agreement to be reached on sensitive aspects of the work process.

GRIEVANCES

While the conduct of lab members is expected to be congenial at all times, and that lab members adhere to common-practice ethical rules, nevertheless, occasionally there may be grievances among faculty, fellows, students, or staff members. While it is advisable that the grievant(s) involved discuss the matter individually with the laboratory chief, there may be occasions where a formal grievance complaint needs to be submitted and filed. In such cases, the grievant(s) must strictly adhere to the grievance procedure set by the University, always ensuring that the laboratory chief is engaged throughout the process.

CONFERENCES, TRAVEL, AND STUDENT STIPENDS

Students, staff, and faculty are expected and are highly encouraged to publish. To promote best practices in the laboratory, senior lab members are advised to help and support junior or new lab members in their efforts. Conference travel is often and can become very expensive. For the students who have received acceptances for publications in scientific conferences as first authors, the laboratory chief will commit to CYP 500 per student to allow them to cover registration fees, travel and lodging. For lab members who manage to publish their results in peer reviewed journals as first authors, the laboratory chief will commit to CYP 800 per publication, amount that will be allowed to accumulate over the fiscal year, so that the lab member can attend to scientific conferences of interest (or travel to research center abroad to conduct experimental work). Students or other lab members will receive additional benefits and incentives, should they manage to secure stipends or monetary awards as a result of submitted publications.

JOURNAL CLUB AND WEEKLY LAB MEETINGS

Every second Wednesday, during lunch time, the lab will conduct its weekly meeting to discuss important matters, address issues and problems, thereby providing a forum for discussion and problem resolution. On alternative Wednesdays this time will be used to have a journal club meeting or attend to a lecture from a visiting scientist. During the journal club, one of the lab members will present a selected publication that relates to his/her project and a discussion will follow.

JOURNAL SUBSCRIPTIONS AND LIBRARIES

While all students are advised to use the University libraries and public libraries in Cyprus, the electronic libraries of major University or Institutions can also become accessible via the web, interlibrary loan, and the laboratory chief will make every effort to maintain subscriptions to major journals (and important books) that relate to the laboratory's research work. A sign-off sheet will be provided to allow lab members to borrow or use any of the journals or books for reading.

USE OF LABORATORY TELEPHONES

Telephone use is necessary for conducting research work or performing daily activities in the lab. Lab members are encouraged to use the telephones (within reason) to conduct their work, however, lab members are advised to consult with the administrative personnel in the cases of lengthy international or national telephone conversations. Lab members must also exert reason in using laboratory telephones for personal matters.

REPRODUCTION, PHOTOCOPIES, FACSIMILE TRANSMISSIONS

Photocopies, reproductions, or facsimile transmission expenses will be covered under the laboratory budget. For personal matters, the cost for reproduction, photocopies, or other transmissions will be entirely the responsibility of the lab member.

DOCTORATE PROGRAM IN BIOMEDICAL ENGINEERING
Department of Mechanical Engineering
University of Cyprus

PROPOSED COURSE SCHEDULE FOR DOCTORATE STUDENTS IN THE LABORATORY OF PHYSIOLOGY AND BIOMEDICAL IMAGING
GRADUATE BOARD QUALIFIER EXAMS

Thematic Area I: Vibrations, Control, and Dynamic Systems

1. Advanced Mathematics Course
2. Dynamic Systems
3. Acoustics and Vibrations
4. Control Systems
5. Design and Manufacturing
6. Introduction to Robotics

Thematic Area II: Biomedical Engineering

1. Introduction to Medical Diagnostic Modalities
2. Introduction to Magnetic Resonance
3. Medical Ultrasound
4. Sensors
5. Physiology and Bioengineering I
6. Neurophysiology and the Senses
7. Advanced Electromagnetism
8. Image Processing and Analysis
9. Digital Signal Processing
10. Visualization and Image Graphics
11. Biochemistry or Intermediate Biology course
12. Cell Physiology

Thematic Area III: Nanotechnology and Materials

1. Polymers, Tissue Characterization and Medical Applications
2. Continuum Mechanics
3. Finite Elements
4. Material Science (solids)
5. Mechanics and Thermodynamics at the Nanoscale
6. Electronics and Magnetic Oxides

Thematic Area IV: Fluid and Computational Mechanics

1. Advanced Computational Mechanics
2. Fluid Mechanics of Incompressible Media

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ΕΡΓΑΣΤΗΡΙΟ ΦΥΣΙΟΛΟΓΙΑΣ ΚΑΙ ΒΙΟΙΑΤΡΙΚΗΣ ΑΠΕΙΚΟΝΙΣΗΣ
Τμήμα Μηχανικών Μηχανολογίας και Κατασκευαστικής
Πανεπιστήμιο Κύπρου

ΕΠΙΛΟΓΗ ΜΑΘΗΜΑΤΩΝ ΓΙΑ ΜΕΤΑΠΤΥΧΙΑΚΟΥΣ ΦΟΙΤΗΤΕΣ ΤΟΥ ΕΡΓΑΣΤΗΡΙΟΥ ΦΥΣΙΟΛΟΓΙΑΣ ΚΑΙ ΒΙΟΙΑΤΡΙΚΗΣ ΑΠΕΙΚΟΝΙΣΗΣ ΣΤΟ ΠΑΝΕΠΙΣΤΗΜΙΟ ΚΥΠΡΟΥ

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