





ΕΛΛΗΝΙΚΗ ΔΗΜΟΚΡΑΤΙΑ  
**Α.ΔΙ.Π.**  
 ΑΡΧΗ ΔΙΑΣΦΑΛΙΣΗΣ ΚΑΙ  
 ΠΙΣΤΟΠΟΙΗΣΗΣ ΤΗΣ ΠΟΙΟΤΗΤΑΣ  
 ΣΤΗΝ ΑΝΩΤΑΤΗ ΕΚΠΑΙΔΕΥΣΗ

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

## EXTERNAL EVALUATION REPORT

DEPARTMENT ...**Biology**.....

UNIVERSITY /TEI... **University of Athens**.....



### **External Evaluation Committee**

The Committee responsible for the External Evaluation of the Department .....of Biology..... of the University of .....Athens ..... consisted of the following three (3) expert evaluators drawn from the Registry constituted by the HQAA in accordance with Law 3374/2005 :

- 1. Professor Sophia Kathariou** (President)  
**North Carolina State University, USA**
  
- 2. Professor Spyros N. Agathos**  
**Université Catholique de Louvain, Belgium**
  
- 3. Professor George K. Christophides**  
**Imperial College London, UK**

*The structure of the “Format” proposed for the External Evaluation Report is dictated by the requirements of Law 3374/2005 and corresponds generally to the structure of the Internal Evaluation Report submitted by the Department.*

*The length of text in each box is free. Moreover, the various questions may not be answered separately; they only provide a general idea about specific matters that should be addressed by the Committee when formulating its comments.*

## ***Introduction***

### **Dates and brief account of the visit**

#### ***Sunday December 01***

Meeting of two External Evaluation committee (EEC) members, S. Kathariou and S. Agathos, with Prof. M. Lazaridou of HQAA (ADIP) at Electra Palace Hotel, to discuss general aspects and procedures of the external evaluation process.

#### ***Monday December 02***

PLEASE NOTE: In the period following the site visit, the Department of Biology has been renamed “Faculty of Biology”, but it will be herein designated as “Department”.

Meeting of the EEC with:

- (a) The Department’s OMEA;
- (b) Members of the MODIP (neither the vice-rector nor the MODIP chair were available; two MODIP members were present);
- (c) Department Head (Prof. Emmanouel Fragoulis);
- (d) The heads of five (5) graduate programs;
- (e) Other faculty of the Department;
- (f) Two students who served as elected representatives of the student body.

This initial meeting and all subsequent meetings of the EEC were held at the ADIP offices on Syngrou Avenue. Altogether, 25 individuals were present in the morning meeting.

During the meeting, a general overview of the Department was presented. The general meeting and introduction of the Department was followed by presentations on the programs, activities and related metrics associated with the seven individual Divisions within the Department (later renamed to “Departments”, herein designated

as “Divisions”).

The EEC visit took place at an inopportune time when the National Kapodistrian University of Athens (EKPA) was closed in response to political events. Regrettably, therefore, the EEC was unable to visit key facilities (laboratories, classrooms, library etc.).

***Tuesday December 03***

The EEC interviewed, in separate meetings and in the order listed, the following groups of stakeholders:

- (a) A total of 18 undergraduate students;
- (b) A total of 36 postgraduate students (Ph.D. and MS candidates);
- (c) Six (6) postdocs;
- (d) Two (2) members ETEP (Specialized Technical Educational Staff);
- (e) Two (2) members EEDP (Specialized Laboratory Instructional Staff);
- (f) A total of 26 staff IDAX (staff with advanced degrees, employed on an indefinite basis)
- (g) A total of 24 Assistant Professors and six (6) lecturers
- (h) A total of 12 Associate Professors
- (i) Eight (8) full professors

The EEC noted absence of two major events that normally serve important functions in in such evaluations.

- (i) No opportunity or venue was provided for the EEC to brief the Department on its findings upon the completion of the visit.
- (ii) There were no meetings of the EEC with University administrators, e.g. Rector or Vice-Rector(s) that would be able to provide to the EEC their current assessment of the Department or their vision for the Department’s evolution and role within the University.

***Wednesday December 04***

OMEA members brought to Electra Palace Hotel materials requested by the EEC including examples of Diploma Theses, representative exams and books written by faculty of the Department. The EEC examined these materials, which were picked up by the OMEA later on the same day.

Meeting of the EEC at the Electra Palace Hotel to discuss overall conclusions and the plan for the EEC report.

The EEC also met at the Electra Palace Hotel with Prof. M. Lazaridou and delivered to her the preliminary report.

**Whom did the committee meet?**

All the individuals with whom the EEC met are listed in the above outline of the visit.

**Reports, documents and other data examined by the committee**

- 1) The internal evaluation report and associated documents, including updates when relevant, providing details regarding the metrics of the Department
- 2) The Study Guide of the Department of Biology of EKPA.
- 3) Printed materials on postgraduate programs.
- 4) Presentation of the metrics of the Department by Prof. Fragoulis and selected faculty and postgraduate program chairs.
- 5) Faculty CVs, lists of peer-reviewed publications and Departmental involvement in Research programs (funding source, amount, participants, research focus and duration).
- 6) Several documents and memos prepared by the OMEA and focusing on current initiatives and concerns of the Department, including
  - (i) “Strategy of the Department”;
  - (ii) “Measures to reduce the average length of studies time to graduation at the Department” (dated February 02, 2012 and addressed to the Committee for Student Academic Issues and Study Guide);
  - (iii) “Improvement of the education program at the Department” (dated February 02, 2012 and addressed to the Department head);
  - (iv) “Memorandum to the EEC” (dated September 09, 2013 and addressed to the EEC). This memorandum requests EEC input on specific challenges of the Department, identified by the OMEA.

**Facilities visited by the External Evaluation Committee**

The EEC was not given access to any facilities at the Department or the University.

**General comments**

The Department is unusually large and multifaceted, and by its nature (Biology) any evaluation would be deemed incomplete and inaccurate without assessments of laboratories, classrooms and research facilities. The EEC met with often large groups of individuals in the constricted space of the ADIP offices. Such conditions were not conducive to effective transfer of information or to good discussions. In addition, not all Division chairs were equally prepared for the meeting with the EEC and the material presented to the EEC was often of uneven format and informational quality. Nonetheless, the EEC appreciates the fact that the OMEA and many other stakeholders of the Department did in fact prepare for the EEC visit with relevant materials and presentations. The EEC also appreciates the fact that numerous Department stakeholders participated in the interviews.

The EEC regrets the fact that the Department did not present an opportunity for a briefing by the EEC at the completion of the EEC visit on the EEC's key findings and trends, to be followed by discussion of major points. It is also regrettable that nobody from the higher administration overseeing this and other EKPA Departments (Rector or Vice-Rector) was available for feedback related to the current state of the Department and its place in the University.

The EEC considered the members of the OMEA most helpful and thanks them for their attentiveness and prompt responses to specific requests for materials and information related to the evaluation.

The EEC considers that two days of a site visit for a Department of this size and complexity is insufficient for an adequate review. Even in the absence of site visits to labs, classrooms, libraries etc., the time required for adequate interviews was longer than expected resulting in days that were unusually long and demanding for all involved. This was further aggravated by the lack of adequate preparation and organization on the part of the Department's leadership.

## ***A. Curriculum***

### **APPROACH**

The overall aims of the curriculum are to:

- Promote biological sciences through high-level research and teaching;

- Produce new knowledge - both basic and applied - in almost all fields of Biology; and
- Meet the needs of today's society for appropriately educated, trained and qualified scientists.

To achieve these aims a curriculum has been established to provide high quality training in all aspects of Biology from molecular and cellular biology to ecosystems, offered at three levels: a generic undergraduate degree, specialized postgraduate programs offering Master's degrees, and a generic postgraduate program offering a doctoral degree.

The specific educational and research objectives of these programs, as listed in the department's website, include:

- Sufficient preparation of students by providing them with knowledge and skills to successfully meet professional and societal demands.
- Provision of specialized and technical education without neglecting broader intellectual advancement.
- Early familiarization of students with the research process.
- Development of critical and analytical thinking and the capacity to collect, process and analyze scientific data and specialized information.
- Preparing and familiarizing students for employment in real world settings.
- Rapid adaptation to new circumstances and demands in order to ensure the competitiveness of graduates.
- Promotion and facilitation of research collaborations within the Department and with other research and academic institutions in Greece and abroad.
- Responsiveness of education and research to societal needs and trends in the economy.

## **IMPLEMENTATION**

### ***Undergraduate degree***

The undergraduate curriculum spans the entire spectrum of Biology and aims at a generic Biology degree. Each semester includes 13 weeks of 30 ECTS (60 ECTS every year). There are mandatory courses but no required time sequence between mandatory and elective courses or prerequisites between elective courses.

Decisions for types of courses were mostly made by the initial faculty based on the dogma whereby courses match the expertise of the instructor, and vice versa.



There are laboratory practicals associated with almost every offered course, the number of which often matches the number of weeks during which the course is offered, i.e. up to 13 practicals per course or 1 every week.

Work for a diploma thesis takes place usually during the fourth year and it can be within the Department or in research institutions; in the latter cases it is monitored by a faculty member. The diploma thesis is a heavily weighted (34 ECTS) component of the final grade.

### ***Postgraduate Master's and PhD programs***

There are 6 postgraduate Master's programs managed by the Department, which appear to be widely thematic. Three of these are interdepartmental: Applications of Biology in Medicine, Clinical Biochemistry and Oceanography. The other three are Bioinformatics, Microbial Biotechnology and Modern Trends in the Teaching of Biology with the Aid of New Technologies. It is noticed that there are no postgraduate programs in Plant or Animal Sciences and Ecology.

## **RESULTS**

### ***Undergraduate degree***

The curriculum aims for a strong foundation in the diverse aspects of Biology, but in its current form it is old and outdated and does not sufficiently include courses in relatively new fields such as systems biology, integrative and synthetic biology, neurosciences and cognitive biology, genomics, global climate change, conservation etc. The syllabus of many courses is largely outdated, generic and logistically heavy. Even when new faculty inherit a course, updates of the syllabus seem limited. For example, the EEC considers Botany to be too content and detail-heavy, and similar assessments were made for Genetics and the various Physiology courses.

In practice, each Division has its own part of the teaching curriculum, which when put together contribute to a highly unstructured and repetitive curriculum. Students sometimes have the same or highly similar lectures in up to 6 different courses. This highlights two major issues: (i) lack of coordination between Divisions and instructors and (ii) a non-unified curriculum in need of coordination. These issues reflect the substantial thematic overlaps among Divisions and at the same time the administrative boundaries which have major impact on how education and training is structured. However, there are substantial overlaps even between courses taught by faculty in the same Division (the two Zoology courses are just one example). Several courses could be merged.

The number of laboratory practicals is also unduly high. Students must often be at the University from 8am to 7pm to cope with the very heavy course load, and since practicals are compulsory they often skip the morning lectures with undesirable effects on their performance.

#### ***Postgraduate Master's and PhD programs***

Students are required to take a great number of courses, but most PhD candidates appear to lack specific knowledge about how to write a scientific article or a grant application. Courses or doctoral seminar series in laboratory health and safety, work with experimental animals and entrepreneurship are also missing.

Postgraduate students, including Master's and PhD candidates, lack opportunities to develop presentation skills. They do not get the chance to present in front of more experienced audiences, e.g. faculty members, senior postgraduate students or other experienced researchers.

### **IMPROVEMENT**

#### ***Undergraduate degree***

The Department clearly makes strong efforts to provide its students, both undergraduate and postgraduate, with a strong foundational basis for the various aspects of Biology as a discipline. With the advent of new tools, perspectives and sub-disciplines (e.g. advances in Neuroscience, Biodiversity and Conservation, Synthetic Biology, Systems Biology) and in the face of important trends directly impacting biological systems (global and climate change, trends in conservation etc.) an effective Biology curriculum must respond accordingly. Recommendations for continued excellence and improvement of the curriculum are as follows:

**Recommendation A1.** A major revision of the curriculum and of the syllabus of individual courses is needed. The aim must be to:

- Unify the curriculum so that it is not a mixture of curricula, each defined by respective Divisions, but represents the vision and objectives of the Department as a whole.
- Reduce the number of courses and critically revise the contents of each course with a view to reduce overlaps.
- Introduce new elective courses that would address current scientific trends and societal needs, including neuroscience and cognitive biology, genomics, systems

biology, synthetic biology, global climate change etc.

**Recommendation A2.** The EEC recommends that the generic character of the curriculum must be revisited; it does not serve the objectives of the educational mission of the Department as these are articulated in the website, especially in meeting the needs of modern society and in providing specialized and technical knowledge. Most of all it does not contribute to increasing the competitiveness of Biology graduates in an open European market and also does not promote entrepreneurship in times when this is critically needed in Greece.

**Recommendation A3.** The number of laboratory practicals must be reduced substantially. Such reduction can be achieved by smart rationalization of practicals without undue costs to the content, since there are many overlaps. For example, the Animal Physiology and Immunology practicals are particularly heavy and could be reduced significantly.

**Recommendation A4.** Seminars must be organized whereby PhD candidates and Master's students can present their work and in this way acquire experience and receive feedback from faculty and other experienced researchers, both on their research and on their presentation skills. A seminar course can be included in the curriculum at least once in each student's program, with the student receiving satisfactory grade for attendance and delivery of a seminar. Journal clubs where students critically analyze and present key research papers can be also valuable to career development.

**Recommendation A5.** A course which will aim to train Master's students and PhD candidates in scientific writing, in formulating and designing a research project and in writing a grant proposal must be introduced in all postgraduate programs. Such a course can be based on assignments, essays and tutorials and can be structured as a sequence of modules that could be taught by different faculty. This, in conjunction with training in identifying funding opportunities, it is essential for developing the new generation of research leaders. An additional course on entrepreneurship will also be important. It is worthy of note that the postgraduate students expressed strong interest in such a course during their interview with the EEC.

**Recommendation A6.** Short, frequently updated courses (or modules) on health and safety in biological research and on research ethics, including the welfare of experimental animals must be also introduced for undergraduate and especially for postgraduate students.

## ***B. Teaching***

### **APPROACH**

The Department has a well-defined and unified pedagogic policy regarding teaching approaches and methodologies and takes its teaching mission quite seriously. Teaching loads are typically heavy, and faculty routinely invest long hours in classroom and laboratory instruction. This was reflected by the comments of students interviewed by the EEC, as well as by input of faculty and support staff with teaching responsibilities. Students overall expressed satisfaction with the accessibility and expertise of their instructors.

Teaching methods appear to be conventional, i.e. traditional lectures and PowerPoint presentations. Electronic platforms such as e-class are utilized by most faculty, and those who do not still make the class materials available to students (e.g. via copies, transparencies).

The grade assignment system continues to largely depend on a single final exam.

### **IMPLEMENTATION**

Teaching procedures are conventional. They can be improved by inclusion of alternative methodologies, as suggested below. Textbooks and other resources appear up to date and adequate for the level of the classes. Textbooks are provided to the students at no cost. Other resources (e.g. suggested or required readings outside of textbooks) are available, and their usefulness would be enhanced by prompt posting on electronic platforms (e.g. e-class).

Undergraduate classes are developed and taught with apparently little communication or coordination among the faculty. During the interviews, undergraduate (and, albeit to a lesser extent, postgraduate) students repeatedly noted that classes frequently overlap, that similar material is taught in several required classes and that coordination to avoid redundancies would be extremely desirable and useful.

Research and teaching appear to be linked occasionally, in some but not all classes. Instructors are encouraged to design venues that would promote such linkages, e.g. via the inclusion of case studies in the lecture classes. Postgraduate students

expressed strong interest in tutorials on how to do literature reviews, how to write manuscripts, and especially how to write a good grant proposal.

There is substantial mobility both for academic staff and for students. However, it can be enhanced to the benefit of both faculty and students. Faculty would update their skills and toolkits, while students would become exposed to alternative teaching and research cultures and infrastructures. This can be especially useful in the context of the required year-long diploma research project. Part of this (e.g. one semester) can be pursued at another university, e.g. through support by the Erasmus Program, assisting the student in timely completion of the Diploma work while leading to enhanced research productivity and collaboration networks for the faculty.

Classes are evaluated by student questionnaires. However, the EEC obtained the impression that the student feedback is not taken into account. Furthermore, the teaching committee meets very rarely.

A common teaching schedule is 8am-1pm for lecture courses plus 1pm-4pm and 4pm-7pm for laboratory practicals. This is a very long day for both students and instructors.

The number of students has drastically increased in recent years from 80 that the department requested to 146 in the 2013 admissions. This together with the decreasing number of instructors and staff creates big challenges. Yet, the biggest issue is new admissions through student transfers from other departments in the country.

## **RESULTS**

The Department clearly exhibits dedication to the pursuit of its teaching mission. However, even though the faculty members individually appear to be serious and dedicated educators, the lack of coordination and connectivity among the faculty is compromising the overall teaching effort, with similar material being taught in multiple required courses. This, together with the heavy emphasis on encyclopedic coverage of material and memorization reduces excitement and enthusiasm; memorization compromises development of critical thinking skills.

The average time to graduation is unduly long, i.e. 6-8 years. The reasons are multiple and complex, but specific strategies can be pursued to address this, especially since the Department recognizes (as indicated in the OMEA

memorandum) the correlations between long time to graduation, high complexity of the program of studies, and high rate of failing to pass courses (as discussed below).

The daily schedule for both students and staff is exhausting, and it is not surprising that the participation in lecture courses is often poor. Both the student workload and the number of lecture courses and laboratory practicals are unduly high, while at the same time there is substantial overlap among lecture courses and laboratory practicals, as already noted.

The average degree grade, 6.73, is low for national standards, which makes it unfair for students of this Department. Indeed the average grade of the course component is even lower, i.e. 6.31, and it is only because of the very high average mark of the diploma thesis, i.e. 9.78, that the final grade is somewhat increased. There seemed to be two issues: low marks for lecture classes and laboratory practicals and very high marks for the diploma thesis for which they may serve more like a bonus rather than an evaluated assignment. The Department is keenly interested in investigating and resolving such apparent discrepancies.

The Department is understandably a highly desirable destination for those of its graduates who wish to pursue postgraduate programs. As a result, a significant number of M.S. and pre-doctoral students originate from the Department itself. Nonetheless, an estimated 33% of the PhDs awarded during 2009-2014 were to students from other universities in Greece or elsewhere. This proportion, though not as high as it could be, indicates a serious commitment of the Department towards diversification of the postgraduate student body. During their interview, undergraduate students also indicated their wish for the Department to more strongly promote its graduates to postgraduate programs elsewhere in the country and abroad.

### **IMPROVEMENT**

The Department exhibits numerous important strengths in its teaching efforts. Faculty are dedicated educators who take teaching quite seriously, both at the undergraduate and postgraduate levels. They strive for excellence in their teaching mission and possess demonstrated expertise in their course subjects. Recommendations for continued excellence and improvement are as follows:

**Recommendation B1.** For large introductory courses (e.g. Introductory Botany), more guidance on key elements would be welcomed, based on feedback by the

undergraduate students during their interview with the EEC.

**Recommendation B2.** Teaching methodologies for both undergraduate and postgraduate courses are largely conventional (lectures and PowerPoint presentations). In an international climate of increasing evidence for the usefulness of novel, alternative methodologies to promote student learning, the EEC encourages considerations of the latter. Such tools can include case studies, participatory learning, group exercises, class discussions and other activities, and can complement traditional lecture-based approaches. Information technologies already available to the Department can be utilized in the development and implementation of such methodologies.

**Recommendation B3.** It is evident from memoranda prepared by OMEA and made available to the EEC that interest exists among the faculty in monitoring student attendance in lecture courses to better assess correlations between low attendance and class failure rate; the latter directly influences time to graduation. It was proposed by the OMEA that four courses (one course for each year of studies) are thus monitored for attendance and course success rate, on a pilot basis. The EEC supports such efforts but further recommends that faculty keep track of student attendance for all courses that they teach, so that more data become available that might prompt development of strategies to improve attendance.

**Recommendation B4.** It was proposed by the OMEA that electronic grade submissions will facilitate analysis of data related to student performance in various courses. The EEC supports this proposal as well.

**Recommendation B5.** Grade assignments are largely based on student performance in a single final exam. Alternative grading schemes may improve attendance, especially in lecture courses, and may promote learning by providing multiple incentives to review and process the material. This may also enhance the rate at which students complete the class in a satisfactory way. Alternative grading schemes may include a variety of course assessments, e.g. mid-term exams (e.g. 2-3 exams/course, including the final exam), in-class presentations and class discussions. This will be fairer to students as it will target different skills and abilities and at the same time it will address the serious issue of extreme reliance on memorization.

**Recommendation B6.** There needs to be reduced focus on encyclopedic coverage and memorization of material and more effort on development of critical and analytical

abilities, synthesis of concepts and on conveying the excitement of today's Biology as a discipline. This would better prepare the students for today's scientific and professional realities, including the workplace. The EEC's opinion on this issue was also clearly reflected in comments repeatedly articulated by the undergraduate and postgraduate students during their interview with the EEC.

**RecommendationB7.** An area where there is tremendous room for improvement concerns faculty connectivity and coordination to prevent or at least reduce redundancies in the material taught in various required classes. Better streamlining of the curriculum will also enhance the teaching effort and outcomes, generating more enthusiasm and motivation among the students.

**RecommendationB8.** The Department expressed genuine concern about the great length of time required for graduation. The OMEA memorandum to this effect indicates the preparation of specific proposals (to the Department Head) to address this issue, but specific information on such proposals, initiatives or ideas was not provided. Nonetheless, the OMEA memorandum clearly indicates an intimate relationship between duration of studies and (i) course success rate and (ii) the structure and complexity of the program of studies in the Department. Such understanding is valuable but concrete steps need to be taken to address the challenges.

One of the proposed strategies involved time limits and improved guidelines for the diploma work. The faculty are open to Erasmus and other initiatives that would facilitate the performance of portions of the diploma work, but may need to show much stronger interest in promoting such programs and providing relevant feedback to students. The EEC recommends that the diploma thesis takes place at a time when students are not required to take any courses and practicals. The EEC also recommends that the length for the Diploma work should be determined in the context of the corresponding ECTS credits; 34 ECTS credits are commensurate with 9 months, and a 6-month long Diploma work would correspond to fewer ECTS credits. The diploma thesis must be carefully structured, involving well defined milestones and deliverables. The prompt and satisfactory completion of the Diploma work will be also promoted by a class or teaching module/tutorial on effective literature searches, and on how to prepare an effective manuscript, report or presentation.



**RecommendationB9.** The Department should provide feedback to students and faculty following the analysis of the class evaluation data by the student questionnaires. The Teaching Committee which exists on paper must meet at least twice every year to analyze the results and suggest improvements. The EEC also encourages the Department to implement peer review of teaching approach and methodology, whereby 2-3 faculty in the Department periodically (e.g. once every 3 years) attend 1-2 selected lectures or lab sessions of a specific class and provide assessments and recommendations for improvement.

**RecommendationB10.** The document titled “Strategy of the Department” indicates as one of the strategic goals the delivery of courses in English for the postgraduate students, with the aim to attract students from the Balkans and elsewhere outside of Greece. The EEC considers this a valid option for the future.

**RecommendationB11.** With regards to the low average grades, the EEC encourages the Department to continue its efforts to address the issues related to low exam and high diploma thesis marks. Some possible measures include grading of exams by a second faculty member, followed by moderation of disparate grades, and presentation (defense) of the diploma thesis after which the separate grades for the research portion, written component and presentation are appropriately weighted to derive the final grade. The EEC encourages the involvement of external examiners from other Biology Departments in the evaluation of the diploma thesis and also believes that this could promote harmonization of grades across the country.

**RecommendationB12.** Teaching facilities (lecture auditorium, laboratories etc.) should be unified and centrally managed by the Department rather than separately by each Division.

The EEC much wished to discuss the faculty’s opinions about possible improvements in teaching methodologies, curriculum development and streamlining at the completion of the visit. However, as mentioned above, no such opportunities for synthesis of the EEC visit findings were provided to the EEC by the Department’s leadership.

### **C. Research**

#### **APPROACH**

Research in the Department aims to cover the entire spectrum of current Biology at the molecular, cellular, organismal and ecological levels by fostering primarily fundamental investigations. In addition to this basic research orientation the Department is consciously oriented towards the study, assessment and exploitation of biological resources and biotopes and has set itself the goal to promote the development of innovative and cutting-edge topics to meet both contemporary societal needs as well as modern scientific and technological challenges. Based on the Department's organization in the seven aforementioned Divisions of Animal & Human Physiology, Biochemistry & Molecular Biology, Botany, Cell Biology & Biophysics, Ecology & Systematics, Genetics and Biotechnology, and Zoology - Marine Biology, the research specialties of each Division's faculty dictate to a certain extent the Department's research orientations and priorities (with many exceptions, since the development and staffing of these Divisions is not always rational but the result of historical circumstances). Thus, the Department overall does not have a comprehensive research strategy -- what could be seen loosely as its factual research strategy is a reflection of the topics developed by the faculty members of the various Divisions and, moreover, there is no formal mechanism for monitoring the implementation of this loose research strategy. The various research activities are pursued by faculty members, their postgraduate and Ph.D. students and occasional postdoctoral or external collaborators as well as final-year diploma thesis students. The results appear in scientific publications in journals, conference proceedings and books as well as scientific communications via a variety of venues.

#### **IMPLEMENTATION**

The research output is to be found in the individual websites of faculty members and Divisions that are updated regularly both in Greek and in English. In addition, the sum of the research output generated is collected every five years in the Department's Scientific Chronicle (*Επιστημονική Επετηρίδα*). In addition to the usual ways of publications and conferences, further dissemination of research is carried out by faculty lectures and seminars in Greece and internationally, and, within Greece, through Greek conference series organized on an annual or biennial

basis by various scientific societies. Also, faculty members publish on scientific topics in the popular press and discuss relevant issues through mass media outlets (radio, TV etc.).

The Department's OMEA uses internationally established metrics to report research productivity, such as the number of peer-reviewed publications generated and citations received, the number and amounts of grants, as well as indices of recognition (prizes, awards, service on editorial boards, etc.). These data serve also for each faculty member's evaluation during their promotion process. The latter, together with recognition by the scientific community, constitute key drivers motivating faculty towards consistent research productivity.

As stated previously, the EEC was not able to assess the quality and adequacy of the research infrastructure because there was no access to the facilities.

The number of peer-reviewed publications and citations during the 5-year evaluation period (2005-2010) and the updated numbers for 2011 and 2012 are adequate and relatively flat in time, but the performance is uneven among individual faculty. It is of concern that the best performance is exhibited mostly by senior faculty several of whom are either retired by now or will retire in the next couple of years.

A fraction of the faculty is very active with writing competitive grants in response to calls for proposals by both EU and national funding agencies such as the General Secretariat for Research and Technology (GSRT, ΓΓΕΤ). During the period of evaluation there have been very few calls for funding by the Greek state and overall national funding remains erratic with the result that only few fellowships are available through competitive grants for MSc and PhD students. This could jeopardize the quality of the research and contribute to brain drain for Greece in the near future.

Research collaborations are encouraged in principle, but in practice they are set up mostly with research groups from other institutions in Greece and abroad. There appeared to be limited collaborations between Divisions within the Department and even within some Divisions there is a worrisome lack of collaboration between faculty members with similar or complementary expertise.

As in many academic departments in Greece, there is no start-up package program for new faculty members. In addition, there is no established mentoring procedure

for junior faculty, who are not well integrated and do not receive the appropriate career development prospects. On the contrary, some Divisions are still dominated by a few powerful senior faculty members that seem to stifle the junior ones.

## **RESULTS**

The Department has established a strong reputation and expertise in a number of areas, including, Microbiology (both basic and applied aspects), Bioinformatics, Biochemistry, Genetics, Molecular and Cell Biology and Biomedical Sciences. It also includes large and productive Botany (and Plant Physiology) and Ecology programs and a strongly equipped and promising program in Immunology and Animal Physiology. There is, however, a pronounced variability in research productivity. Some Divisions and individual faculty members have been highly productive and innovative and have achieved international recognition, while others are clearly not sufficiently competitive.

Research is carried out under the direction of individual faculty members and PhD students, Master's students, postdocs, external collaborators or former PhDs that have now become permanent staff (IDAX) and, finally with contributions by the undergraduate students through their diploma thesis. The numbers of peer-reviewed publications reached 724 (this number drops to 602 when joint works between faculty members are excluded) over the evaluation period 2005-2009 or 793 for the updated period 2007-2011. The citations over the same 5-year periods of evaluation were 30670 (without excluding joint papers) or 10730 (according to IntEval 2011 Annex 1 – TABLES; Table 13), respectively, or even 12634 (according to IntEval 2009 CONCLUSIONS & TABLES) or 14768 (2007-2011). If these data are seen from the point of view of mean performance per faculty member, the number of publications per year and faculty member in peer-reviewed journals was, on average, 1.91 for the Department. The individual Divisions varied from as high as 2.68 papers per faculty and year for Biochemistry & Molecular Biology to as low as 1.31 for Botany over the period 2005-2009. These metrics are indicative of uneven performance reflecting a nucleus of active research faculty members co-existing with many others who could do better. Some of the former are either seasoned senior faculty members or recently hired lecturers and assistant professors who are highly productive and on the way to national and international excellence. On the other

hand, the EEC expresses concerns about mid-career and other faculty members whose research output appears stagnant.

The totality of competitive research grants received by Biology faculty members over the 5-year evaluation period from international and national funding agencies exceeded 3 million EURO. Although this level of external fundraising is borderline satisfactory, the capacity of a > 50-member strong department to obtain research funding should increase, as is also acknowledged by the internal evaluation.

Museums and gardens: The department is also responsible for two museums (Zoological and Botanical) and two Botanical gardens.

The international visibility of the Department's faculty members is documented by participations in editorial boards, invited lectures in international conferences, visiting professorships abroad and by international research awards and honors.

### **IMPROVEMENT**

The Department has a number of strong research programs. Recommendations for continued excellence and improvement are as follows:

**Recommendation C1.** The Department is aware of the delicate situation in which it will find itself over the next few years, not only because of the economic crisis that is affecting all Higher Education institutions in Greece, but also because of the demographics of its faculty with a significant number of senior professors that will retire imminently (about 10 in the next couple of years). If these faculty members are not replaced by new appointments, the Department will be reduced by 20% over the next 2-3 years. The EEC recommends the initiation of procedures for hiring talented new faculty especially in research subjects that are missing or underrepresented in the Department (e.g. Bioinformatics, with the departure of Prof. Hamodrakas).

**Recommendation C2.** The EEC encourages the Department to avoid the temptation to replace each retiring faculty member with a new faculty in the same exact subject to cover teaching needs. Instead, the Department must take radical steps about restructuring the Divisions that are currently dysfunctional as stated elsewhere in this report.

**Recommendation C3.** There is substantial inbreeding as most of the support staff and some of the more junior faculty are PhD graduates of the Department. For the

new hires advocated above the Department should strongly consider the substantial pool of highly trained Greek scientists of the diaspora. It is encouraging that this is also mentioned in the “Strategy of the Department” memorandum.

**Recommendation C4.** A mentoring scheme should be established, with senior and successful faculty coaching junior ones until the latter can establish their own program and receive sustainable funding. This could also be expanded to include progress assessment with specific milestones set by the mentor.

**Recommendation C5.** The Department is also aware of the need to enhance collaborations and partnerships within itself but also with other research groups both domestically and abroad, starting from the research institutes that are in its vicinity in the greater Athens region. The EEC agrees and encourages this initiative not only to meet the interdisciplinarity requirements of today’s biological research but also to increase the Department’s capacity to attract research funds.

**Recommendation C6.** The need for centralized core facilities was pointed out by the internal evaluation and by individual faculty, and the EEC concurs. Currently, it appears that there is no coordination in equipment purchases and this results in extensive duplication and waste. The Department should attempt to obtain competitive funding for infrastructures from regional and EU funds and formulate proposals that could assure the allocation of matching funds.

**Recommendation C7.** Until now, Greek state funding has been erratic and this undermines the sustainability of cutting-edge research efforts. Funding by the EU is increasingly competitive and difficult to secure. The faculty members should make a greater effort to attract EU and other international grants by increasing collaborations with colleagues in Europe and elsewhere. Similarly, domestic sources of funding must be pursued vigorously. On both of these fronts, a proactive attitude of the Department should be complemented by effective administrative support from the University Research Committee. There is clearly significant room for improvement at the level of attracting research funding and producing an increased number of high quality research publications.

**Recommendation C8.** Two research-related strategic goals listed in the “Strategy of the Department” memorandum were the creation of (1) research institutes and (2) start-up companies to promote technology transfer. The EEC recommends further

sustained discussions on how to pursue these goals.

Elaborations on the above plus additional suggested actions are given in Section F, Final Conclusions and Recommendations.

#### ***D. All Other Services***

##### **APPROACH**

The Department considers itself under-equipped and under-funded for the various administrative and technical services that it is expected to deliver, particularly with the high number of undergraduate students. The Department's administrative services are implemented by faculty, designated staff (e.g. secretariat) and other staff (e.g. IDAX) who have been assigned administrative duties by their supervisor.

Certain highly successful initiatives by specific faculty within the Department address technical needs outside of the University and provide services on a fee-per-service basis.

##### **IMPLEMENTATION**

The Department has two permanent clerical staff and a similarly small number of specialized instructional and technical staff. However, it has numerous individuals in other appointments (e.g. highly trained IDAX staff hired on an indefinite basis) who assist in various aspects of instruction, especially with the laboratory courses. Attention is needed on important labor issues that appear to confront some of the IDAX staff: it was indicated that work hours frequently exceeded what was expected, especially for evening classes, without any extra compensation. The duties of these staff need to be carefully defined by the Department's leadership; currently, it appears that duties vary and can change at will by the heads of the Divisions, with little if any coordination. Such coordination will be critical to ensure that staff are matched with needs for which they have the appropriate background and skills and that areas of most need are adequately addressed. In spite of their apparently important instructional and administrative functions, IDAX staff appear to have no voice in departmental affairs, have few prospects for further career development, and their CVs or publications were not even included in the OMEA report.

It appears that electronic platforms for classes are quite adequate, with students

having access to the material from their home. Student registration and similar administrative matters appear to be adequately handled, as also evidenced by the lack of complaints along these lines during the student interviews. However, student stipends often are seriously delayed, apparently due to government bureaucracy.

## **RESULTS**

Clerical staff are reduced from 7 to 2 due to layoffs and retirements. This is a massive reduction for such a large Department with over 400 active students and close to 1200 registered students and has not been accompanied by automation and streamlining of administrative procedures related to admissions, class registration, grade submission and graduation. The Department is aware of this difficult situation but no concrete measures have been proposed, with the exception of the consideration of an electronic system for grade submission. The EEC believes that the issue cannot be resolved without better coordination towards optimal use of available manpower.

Successful initiatives for offering services on a fee-per-service basis have been instituted, but only by a few faculty. Such initiatives address needs in the research/professional community outside EKPA, utilize faculty expertise, promote the image of the Department and enhance the financial support basis for the Department. However, no indications were provided as to what the Department or EKPA does to promote innovation and support entrepreneurship. Both the Department and EKPA must identify means and establish a roadmap to promote such issues amongst both faculty and students.

As the University was closed during the EEC visit, the EEC was prevented from accessing infrastructure facilities such as the library, computer rooms, dining halls and dormitories.

## **IMPROVEMENTS**

**Recommendation D1.** The Department needs to make serious efforts for better coordination among its different Divisions and faculty in order to maximize the use of the available human and physical resources and avoid redundancy and waste. This will streamline administrative functions and improve overall effectiveness. Equipment within the Department will be better utilized and maintained by better coordination, including a system that allows faculty and students to know which



types of equipment are available within the Department, and by having designated individuals responsible for equipment maintenance and oversight.

**Recommendation D2.** The Department should reward and promote faculty initiatives to contribute to local and regional development through efforts such as the technical services mentioned above and outreach efforts discussed in the following section.

### **Collaboration with social, cultural and production organizations**

The museums, botanical gardens, collections, books of national and international interest, e.g. those with focus on endangered plants in Greece, are important contributions of the Department, with significant impact historically and expected to continue for the future. In addition, as mentioned above, certain faculty and units have excelled in providing services to the commercial sector on a fee-per-service basis. Several members of the faculty have strong international reputations and many serve as expert evaluators for peer-reviewed manuscripts and for national or international research programs. In its internal evaluation report, the Department recognizes its capacity to provide a multitude of services to society regionally, nation-wide and internationally.

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

The evaluation took place at a time when the state and the universities were in great turmoil. The economic recession dictated that state funding to the universities is drastically reduced; new appointments are largely frozen. Many faculty members are expected to retire in the next 1-3 years. Even though this is a large Department, it cannot afford the loss of faculty in certain areas, e.g. Bioinformatics. In addition, other areas need to be strategically introduced or strengthened, and new faculty will therefore need to be recruited. New faculty will need start-up funds and adequate, nurturing mentorship in order to survive and excel. This can be best achieved in a Department that works actively and creatively to break down the existing silos

among the various units, to enhance faculty connectivity and well-being, promote professional development for faculty and staff and streamline curricular, administrative and instructional functions. The Department head acknowledged that the current time (at the time of the EEC visit) was the hardest one in his long tenure at EKPA. Certain faculty were, to their credit, able to articulate alternative plans that were discussed with the EEC, but more coordinated action is needed. The EEC strongly believes that the Department should make imminent and radical strategic decisions to enhance the likelihood that it will continue to serve a key educational and research role in Greece, and internationally. Specific recommendations are made in section F.

### ***F. Conclusions:***

#### **An overall assessment of the Biology Department at EKPA**

1. **Leadership:** The Department has several strong research units and is endowed with talented and dedicated faculty, both in the senior ranks and among those recruited relatively recently. A common long-term vision needs to be articulated and established through a rigorous Strategic Planning process that includes all faculty. Leadership must promote efforts for faculty mentorship and inter-connectedness, identifying measures to reduce silos among the different focus areas and groups. Leadership should institute and encourage a regular departmental seminar series for the entire Department and regular faculty meetings, encouraging participation of all faculty in the Department. Leadership is strongly encouraged to identify and try additional creative initiatives to enhance faculty connectivity.
2. **Management structure:** There is a strong need for re-organization and restructuring. Current structure into Divisions (tomeis) or new Departments under the currently recognized Faculty of Biology (sxoli) is obsolete and out of step with trends in modern, cutting edge Biology Departments. Unfortunate outcomes of such a structure are duplication and overlaps in curriculum and in equipment and human resources. The Divisions fracture the unit, whether it is called Department of Biology or Faculty of Biology, along artificial lines and reduce cohesiveness and communication. There are various models that the Department can adopt towards such restructuring, which nevertheless has to be radical, follow a comprehensive review exercise, and take into account national and international frameworks in which this Department is asked to operate. An effective model must consider, in addition to the expertise available in the Department, societal needs and particular strengths and weaknesses of the Department compared to

equivalent departments in Greece and elsewhere. It is recommended that Divisions are suspended until the comprehensive review is finished and until new dynamics fully develop, including retirement of a number of senior faculty. With this flat interim structure, this multifaceted group of faculty members should be unified under one Department managed by a widely accepted Leadership with various committees instituted to assist such management, including strategic planning, teaching, curriculum, tenure and promotion, health and safety etc. Classrooms and teaching laboratories should be managed centrally and not by each Division as currently done.

3. Curriculum: The curriculum needs to be rigorously assessed and revised with a concerted effort to align it to the Bologna Reform (3+2). The EEC suggests to (i) strategically reduce the amount of current material both in lecture courses and in laboratories while updating these courses to make them more appealing and modern, (ii) minimize redundancy in course offerings and course content, and (iii) add new courses in cutting edge areas such as Biodiversity, Systems Biology or Neuroscience. There is currently unduly heavy emphasis on memorization-based, encyclopedic knowledge of plant and animal structure and diversity. This revised curriculum must be managed centrally by the Department.
4. Teaching: Instructors are experts in their fields and admirably dedicated to their duties, with heavy teaching loads and long hours of teaching commitments during the academic year. Most courses retain a conventional single-exam format and place heavy emphasis on memorization. Alternative modalities need to be sought and implemented. The EEC strongly recommends further adoption of diverse teaching and assessment approaches that encourage critical thinking among the students and rely less on memorization.
5. Research: The Department is known for some strong, internationally recognized research teams led by both senior faculty and more junior colleagues. However, sustained, coordinated efforts must be made to enhance research productivity and faculty willingness to compete for external funding, improve grantsmanship and enhance the funding success rate. It may be worthy of note to mention here a comment articulated by postgraduate students during their interview with the EEC, to the effect that the faculty were excellent scientists and educators but should be less timid or shy about competing for funds. The EEC strongly recommends that the Department leadership invests in efforts to familiarize faculty with grant opportunities and to assist with grant preparation logistics (e.g. by assigning relevant duties to one of the extant support staff). In its Strategic Plan the Department must rigorously discuss and identify research areas that should be mostly enhanced and promoted through resource allocation and recruitment of new faculty,

when such recruitments become possible. A culture of research engagement and exchange must be promoted, e.g. through a seminar series from faculty within and outside of the Department.

6. Faculty: Faculty, both senior professors and junior colleagues, are a strength of the Department and a source of confidence for survival and success as the Department continues to strive for excellence and the pursuit of its mission in increasingly difficult times. As also discussed earlier, faculty are active in research, committed to their teaching mission and accessible to students. However, overall research productivity across the entire Department is modest by international standards and the number of faculty with international reputations is rather small, especially considering the large size of the Department and the high caliber of students who are admitted each year. In today's research climate that relies on multidisciplinary efforts and complementing areas of expertise this suggests a serious need for an increase in sustained efforts by faculty to network within and outside the Department so that new, competitive research collaborations become initiated and cultivated. More advantage should be taken of potential collaborations with state-of-the art research institutes such as Fleming and Pasteur, with relatively easy regional access to faculty and other researchers. In its strategic plan the Department should consider a systematic assessment of opportunities and initiatives for new research partnerships with other institutions. Enhanced faculty mobility (e.g. sabbaticals) would make positive contributions in this regard.

Enhanced cohesiveness and interactions within the Department will enhance competitiveness for extramural funding while maximizing resources and reducing redundancies in curriculum and equipment. Seminars and an annual retreat where faculty present their research activities, plans and vision would be good steps in this direction.

To maximize the chances of success of junior faculty, it is critical that new faculty are provided with start-up funds and adequate lab facilities. Faculty mentorship and guidance is critically needed. The importance and long-term value of a departmental culture that nurtures, guides, protects and supports junior faculty cannot be overemphasized. This will be critical for the ability of the Department to thrive in the future.

7. Support staff: There is a great number of talented support staff (including ETEP, IDAX) who are invariably well trained and accomplished researchers with PhD degrees involved in generic activities that often do not match their training. Due to lack of leadership and coordination between Divisions, these people often have overlapping *ad hoc* responsibilities, usually assigned by the head of the Division. It is recommended that support staff do not defer to each Division but to the Department and that job descriptions are redefined

following a comprehensive review. This current inconsistency between job description and actual work performed brings potentially big problems concerning occupational safety, benefits and wages, especially for IDAX. In addition, the great majority of these staff are graduates of the Department, received their PhD from the Department and worked on research projects directed by their advisor and current supervisor before becoming IDAX (or ETEP). This creates a massive problem of inbreeding and lack of new ideas, which is likely to affect the Department adversely for many years to come. Future recruitments must aim to rectify this anomaly.

8. Undergraduate students: Course schedule is strong but exhausting (7:00 am to 7:00 pm schedules being routine), commonly resulting in poor class attendance. There is heavy emphasis on memorization. Curriculum needs to be revised and modernized to include areas of major current interest and growth in Biology. It also needs to be streamlined to minimize repetitions and overlaps. Current average time-to-graduation is extremely long, and the EEC urges the Department to consider this issue in its Strategic Plan. Courses with unusually high failure rate need to be carefully examined to adequately assess the underlying reasons. Higher student attendance for a smaller number of carefully designed courses will result in better-prepared students with lower class failure rates. Student mobility, e.g. through Erasmus needs to be encouraged and facilitated, e.g. by promoting such involvement as part of the Diploma work.
9. Postgraduate students (Masters and pre-doctoral students). Students appeared to be engaged and dedicated. Enhanced student preparedness should include exposure to the critical analysis of the literature and familiarization with procedures and skills associated with the writing of manuscripts and grant proposals. Students should also have more experience in presenting their own research, e.g. in seminars within the Department. The Department should have greater oversight over teaching obligations of its postgraduate students. Department-wide attention is needed for better and more consistent preparation of graduate students in the areas of laboratory safety (hazardous chemicals, radioactivity) and welfare of experimental laboratory animals. Most Master's students do not receive any stipends, whereas pre-doctoral student stipends are often low and erratic. Graduate student stipends need to be routinely included in the budgets of competitive applications for external funding. Participation and presentation of student research in conferences needs to be further encouraged and financially supported, especially for the pre-doctoral students.

The Members of the Committee

**NATIONAL & KAPODISTRIAN UNIVERSITY  
OF ATHENS  
DEPARTMENT OF BIOLOGY**

Name and Surname

Signature

**Prof. Sophia Kathariou**

North Carolina State University, Raleigh, North Carolina, U.S.A.

**Prof. Spyridon Agathos**

Catholic University of Louvain, Louvain, Belgium

**Prof. George Christophides**

Imperial College London, London, United Kingdom