

1. INTRODUCTION

This is the first annual report formally presented by the School of Health Sciences following the approval of the internal regulations by the Rector and the appointment of the Steering Committee in January 2001. For this reason, the background for the establishment of this new School and the way it is organised is included in some detail, in addition to the plans and strategies for the past year and the activities in 2001. Some thoughts for the future are also envisaged.

In this way, the report may contribute to record the history of the School of Health Sciences (SHS), particularly in what concerns the very rich period of its launching. Simultaneously, it provides a basic document for the External Advisory Committee to understand and review the on-going plans and activities. As a matter of fact, this is the reason for presenting the report in English.

2. BACKGROUND

2.1 Brief historical note

The action plan adopted in 1974 by the Steering Committee of University of Minho included a very innovative project for a new degree programme on Medical Education, conceived in accordance with the concerns and recommendations of important organisations, namely the World Health Organisation. Although it was regarded as a project of great interest for the University, the Minho region and the country, circumstantial political reasons did not allow for its approval.

The University of Minho resumed the project in 1990, stating that by then all international indicators clearly pointed towards the necessity of a new Medical School in Portugal. In effect, according to a document published by the World Health Organisation, including data from 19 European countries, Portugal was ranked 13th in the number of patients per doctor, 17th in the number of inhabitants per Medical Faculty and 16th in the number of medical doctors per Medical Faculty, i.e., our country was almost last in the group. The University insisted again on the innovative approach in the conception of its proposal, which could help to untie the "gordian knot" hindering classical medical education patterns.

Once again, the political willingness was not yet prepared to give sequence to the University proposal. The negative effects of such a decision became more and more noticeable: lack of physicians in the peripheral regions, engagement of foreign doctors, huge growth of costs within the health system and exaggeratedly high marks required for admission in medical degree programmes.

Only in 1998, faced with the deterioration of the situation, the Government issued the Resolutions 45/98 (March, 28) and 140/98 (December, 4) from the Council of Ministers acknowledging the necessity of a qualitative jump in the development of human resources within the area of health sciences, as well as the shortage of medical doctors to ensure an adequate geographic coverage. So, after waiting for 24 years, University of Minho had finally the go-ahead for its medical degree programme, although under rigorous requirements of innovation, quality and leadership which, in truth, were always central to the project presented by the University. By stating that "in (...) the context of renewal of medical education in Portugal, a contract with the University of Minho for the creation of a medical degree programme is authorised", and by further adding that "it is a project with innovative features, already subjacent to the initial planning of the University, proposed again to the Ministry of Education in 1990 and which was formally created by the Senate on July 13, 1998", the Resolution 140/98 is explicitly recognising the persistence of University of Minho and the innovative and reforming features of its project.

The University promptly reacted to the opportunity. Thus, in April 1998 a Promoting Committee and a Scientific Committee were constituted, to update and conclude the proposal for the medical degree programme to be submitted to the Senate, which was approved in July 1998, as said before. In January 1999 the Rector appointed a preliminary Steering Committee for the establishment of the School of Health Sciences — as an organic unit to support the degree programme — whose first task was to prepare the detailed dossier that was presented to the Government, in May 1999, for the creation of the School.

The proposal was evaluated by an international panel of experts, under the auspices of the "Grupo de Missão para a Saúde" established by Resolution 140/98. The panel issued the following positive review:

"General Comments

In all courses it was apparent to us that there is a real difficulty for modern medical education in the way in which the Universities and the Health Service interact. Jointly agreed policy and planning is essential in producing Doctors for the next century in Portugal.

We also feel that Public Health should have a greater priority in some schools. It is an area of great opportunity and has the potential to produce a good return in terms of health care.

We note the enthusiasm of a number of centres for information technology and believe the government should encourage this activity which is central to modern learning, teaching and research.

In Academic Medical Centres there should be a single career structure for both university and hospital physicians.

All courses require critical evaluation and close monitoring. This should include an international review system, carried out at an agreed frequency. The hospitals and their clinical departments and the health centres associated with the Universities should also be accredited, as part of this process.

The new school at Minho (Braga)

A well considered and well worked-up proposal, which clearly links the proposed school to the rest of the University. There is a clearly structured proposed curriculum. The University has a well established system of management and evaluation of courses, some of which are within the fields of Biology related to medicine. International collaborations are extensive in established disciplines."

As a consequence, the School of Health Sciences was formally approved by the Minister of Education on September 20, 1999. A strategic plan for the development of the new School was negotiated with the Government and a formal contract between the Ministry and the University (*contrato de desenvolvimento*) was signed on February 17, 2000, establishing the agreed goals, time-table and financing for the School and the degree programme on Medicine.

2.2 Mission Statement

The School of Health Sciences is a permanent organic unit of University of Minho, with the mission to ensure undergraduate and postgraduate education, research

and the rendering of special services, including lifelong learning educational services, in the field of Health Sciences and other related areas, in articulation with other units of the University and in accordance to the general principles defined in the University Statutes.

The main role of the School is to support the medical degree programme through innovative approaches both in curriculum development and in educational methodologies. To fulfil such aims, the School is likewise prepared to be innovative in terms of infrastructural and organisational conception, operational and follow-up procedures, and quality assurance mechanisms.

By adopting a lifelong learning concept, the School offers a *continuum* of education and training, targeting different publics ranging from young students in the undergraduate programme to second-chance education, scientific and professional updating, and specialisation.

Higher education is implicitly grounded on scientific research. So, fostering scientific research, in articulation with the Life and Health Sciences Research Institute, and creating a proper research environment to support teaching, is also one of the essential components of the School's mission.

Articulation between Medical Faculties and the Health Services is traditionally very delicate and a source of problems. The School will, therefore, pay great attention to this area. An articulation with the seven Hospitals and the network of Health Centres in the region will be promoted on a contractual basis, through protocols with accredited health services, including cross-representation between the governing bodies of both parts whenever possible.

The articulation with the Health Services must be built and sustained upon mutually beneficial partnerships. In that context, the School will inevitably be summoned to offer medical care and other specialised services to the community, within its available technical and scientific capabilities.

There is still another dimension in the School's mission, which goes beyond the specific goal of a medical degree. It has to do with the universal conscience that *health is a value in itself, worth preserving as such*. The School of Health Sciences, in its privileged contacts with medical doctors and other health professionals within the local and regional health services, shall be in an excellent position to sharpen their sense and pride in their responsibilities as health educators. Also, in cooperation with other Schools and units in the University which are running programmes on teacher training or adult education, the

School shall have the unique opportunity to stimulate the education for healthy life styles. Therefore, it is part of the School's mission to contribute to the planning and unchaining of the "*mobilisation of everybody towards everyone's health*".

2.3 Specific goals

The specific goals for the School of Health Sciences, set up in the contract established with the Government in what concerns the education and training activities, are:

- to enrol up to 600 pregraduation students;
- consequently, to admit 100 new students each academic year, on a stationary situation (due to the high profile of the students and the educational methodologies in use, no significant retentions or drop-outs are expected);
- to admit only 50 students each year in the launching phase of the programme, moving to 100 places as soon as the new buildings are ready and the construction of the new Hospital in Braga is proceeding within a suitable schedule;
- to offer postgraduation programmes and advanced postgraduation courses on a credit-accumulation basis, aiming at enrolling a number of full-time-equivalent postgraduation students of about 10% of pregraduation students;
- to promote continuing education and training activities, in articulation with the health services.

The goals and priorities regarding the research activities are formulated in an autonomous document concerning the *Life and Health Sciences Research Institute*.

2.4 Organisational and management structure

2.4.1 Basic principles and regulations

The model for the organisation and management of the School of Health Sciences follows the matricial framework defined in the Statutes of University of Minho and obeys the statutory general guidelines established for the Schools of the University.

The School has its own specific Regulations, which were adopted by the Steering Committee and approved by the Rector (*Despacho RT-2-A/2001*, January 11, 2001). The organic structure of the School and its operational rules are established in the Regulations, in a way to bolster the innovative features already inherent to the organisational model of the University, which is goal-oriented and based in the matricial interaction and articulation between organic units and projects.

Within the principle of affording an integrated and integrating education, the Regulations avoid the fragmentation of the School in a multiplicity of departments and services. Consequently, the School is organised in four large Departments, related to the main scientific areas of the degree programme:

- Department of Biomedical Sciences;
- Department of Pathology;
- Department of Community Health;
- Department of Clinical Sciences.

Each Department promotes an integrated management of the available material and human resources, in connection with the education, research and extension projects it supports. Other Services within the School are under the direct responsibility of the School Council or, in specific cases, depend directly from a Department, in order to highlight the institutional integration of services with the aim to keep their focus on the School's goals and projects.

The organisational model of the University also assumes the institutional integration of research activities, by setting up comprehensive Research Units that allow all the academic staff to exercise their rights and their duties to carry out research work. The Research Units are part of the "project" dimension of the matricial model, which means that they are entitled to make use of the adequate human and matricial resources available at any of the Schools, besides their own resources. In the field of Health Sciences, the

University has created the *Life and Health Sciences Research Institute*, to operate in close interaction with the School, although keeping links with other relevant Schools. The composition of the School bodies reflects the articulation with the Institute.

The University organisational model also regards degree programmes as "educational projects", with their own objectives and management. Accordingly, the Regulations establish the existence of a *Medical Course Committee* (Conselho de Curso de Medicina) with effective responsibilities in the management of the medical degree programme, namely to act as "curriculum committee". Students have a strong participation in this committee.

In operational terms, a specific service — the Unit of Medical Education — was constituted to provide technical and administrative support to the project pedagogical coordination. The competences of the Unit of Medical Education, subject to the guidelines from the School bodies, are:

- coordination of the educational objectives;
- cooperation in the preparation and production of didactic materials;
- counselling and training in educational methodologies for academic staff and for students;
- implementation of assessment mechanisms related to teaching;
- cooperation in research projects on medical education.

The mechanisms of follow-up and quality assurance are carefully considered in the Regulations, in a way that goes beyond the common practice in other Schools. In effect, besides the mechanisms already taken for granted at University of Minho, such as annual reports and participation in the national system for the evaluation of teaching and research, a special body — the *External Advisory Committee* (Comissão Consultiva Externa) — was constituted for the follow-up of the School activities. Specific competences of the External Advisory Committee are to prepare a statement on the annual reports, by issuing a critical judgement on the activities and performance of the School and its Departments and Services, and to formulate recommendations reputed as pertinent. The role of the Advisory Committee is reinforced by the fact that the annual reports are expected to be not only self-critical and prospective but also they must consider explicitly all the previous recommendations from the Committee.

According to the Statutes of University of Minho, for a School to act in its full statutory rights it must reach a predetermined critical dimension regarding the number and qualification of its academic staff. Therefore, during the launching phase of the School of Health Sciences, a Steering Committee appointed by the Rector undertakes the functions of managing body for the School. However, the Regulations foresee the mechanisms for a gradual transition into the normal functioning of the School's own bodies.

2.4.2 Organic structure

2.4.2.1 Governing bodies

The governing bodies of the School of Health Sciences are:

- the Dean (*Presidente da Escola*);
- The School Council (*Conselho de Escola*);
- The Scientific Committee (*Conselho Científico*);
- The External Advisory Committee (*Comissão Consultiva Externa*).

Dean

The Dean represents the School, chairs the School Council and has the responsibility for the general direction and coordination of all the School's activities. The Dean may nominate up to two Deputy Deans (*Vice-Presidentes*) on whom may delegate some competences.

The Dean is a full Professor, elected within the School for a term of two years, renewable.

School Council

The School Council has the main responsibility to define the general policy for the School. Specific responsibilities are to approve budgets, annual reports and plans of activities, to take the initiative or a main position regarding the creation or extinction of Departments and Services, of degree programmes and of research units, to adopt the

Regulations for the Departments and to establish the general principles and rules for the internal allocation and management of the School's resources.

The composition of the School Council includes the Dean and Deputy Deans, the Directors from the Departments, the coordinators concerning the "project dimension" of the matricial model (the Directors of the Medical Course Committee, of the Life and Health Sciences Research Institute and of the Postgraduation Programmes on Health Sciences) and elected representatives of the School bodies (two representatives of the junior academic staff, one representative of the non-academic staff, one representative of the students in the Medical Course Committee and one representative of the postgraduation students), in a total of 15 members.

The School Council meets on a monthly basis.

During the launching phase, the School Council is replaced by a Steering Committee, nominated by the Rector, and the electoral processes for the Dean, the Directors of the Departments, the Directors of the Course Committee, of the Research Institute and of the Post-graduation Programmes are substituted by nominations made by the Rector on the advice from the School bodies.

The Rector, on the advice from the School, will determine when to extinguish the Steering Committee and proceed to the full instalment of the normal governing bodies. However, the Steering Committee cannot be extended beyond the moment the first group of undergraduate students graduate.

Scientific Council

The Scientific Council defines the scientific policy for the School. As specific competences, the Council decides on the general guidelines for the planning and development of research, teaching and extension activities within the School, on matters concerning the recruitment and promotion of academic staff and on issues relating to the recognition of degrees and qualifications.

The Scientific Council integrates all the academic staff with a doctoral degree. The Council may establish a Standing Committee of 12 members, which must include the Dean, Deputy Deans and Directors of the Departments and of the Research Institute. The remaining elements will be elected by the Plenary of the Scientific Council.

The Scientific Council (as Plenary or Standing Committee) will meet once a month.

External Advisory Committee

The role of the External Advisory Committee is to monitor and give advice on innovation and quality relating to the activities and projects within the School. Its specific responsibilities are to follow up the School activities, to prepare each year a report expressing a critical judgement in those activities, to formulate recommendations and to contribute to the strategic guidance and to guidelines for the recruitment of human resources, in articulation with the School Council (the Steering Committee, in the launching phase).

2.4.2.2 Departments and Services

Each Department has the following bodies responsible for its direction and management:

- the Department Assembly;
- the Director;
- the Department Council.

The Assembly includes all the staff members of the Department (academic and non-academic). Its functions are to elect the Director and to approve the Regulations.

The Director represents the Department, chairs the Assembly and the Council and coordinates the activities in the Department.

The Department Council defines the cultural, scientific and pedagogical policies for the Department and takes decisions on the current affairs. Its composition includes the Director, the academic staff with a doctoral degree, a representative of junior academic staff and a representative of the non-academic staff.

The Department Council of Clinical Sciences will also integrate the Clinical Director from the Nuclear Hospital and a representative from the Nuclear Health Centre.

Services are permanent structures to support the School in pursuing its objectives. In general, services depend from the School Council, although some very specific services may depend directly from Departments.

2.4.3 Management of projects

Undergraduate degree programme

A particular feature of the matricial model adopted by the University of Minho is the existence of autonomous bodies for the coordination and management of degree programmes, which is not traditional in the Portuguese Universities. The coordinating bodies for the undergraduate programme in Medicine are:

- the Medical Course Director;
- the Medical Course Committee;
- the Curricular Area Coordinators;
- the Module Coordinators.

The Medical Course Committee, which acts as "curriculum committee", integrates:

- the Medical Course Director, elected by the Committee, who chairs;
- the Coordinators of the curricular areas:
 - Molecules and Cells
 - Organic and Functional Systems
 - Biopathology
 - Medicine (Hospitalar)
 - Medicine (Community)
- 6 representatives from the students, one from each curricular year.

The competences of the Committee are to guarantee the normal operation of the degree programme and the continuing review of curricula, to propose to the School bodies changes in the curricula, and to adopt the annual report prepared by the Director.

The Area and Module Coordinators are responsible for the dynamization and coordination of the curricular development in the corresponding area or module, in order to assure the accomplishment of the educational strategies and pedagogical methods.

In the initial phase of installation, the general coordination of the degree programme is under the responsibility of the School Scientific Council.

Postgraduation programmes

A Director of the Postgraduate Programmes on Health Sciences oversees the whole postgraduation activities and liaises with the School Council.

Each postgraduation programme has its own Course Director.

Research

The Life and Health Sciences Research Institute has its own governing bodies, accordingly to the rules applying to the research units integrated in the national system of Science and Technology. The Director of the Institute liaises with the School Council and the Scientific Council.

2.4.4 Monitoring and quality assurance

The Regulations establish that the School Council, the Department Councils, the Research Institute, the Medical Course Committee and the Directors of the Postgraduate Programmes must prepare an annual report on their activities.

The annual report must include not only quantitative and qualitative data about the operation of structures and projects, but also a critical (SWOT) analysis. The reports are publicised.

The annual reports are subjected to the scrutiny of the External Advisory Committee, as said before. The reports will always refer explicitly to the actions taken as a result of former recommendations from the External Advisory Committee.

The School and its Departments will participate actively in the national evaluation system regarding teaching and research.

The Regulations also establish that the School will promote a global institutional evaluation on a periodical basis, in ways to be devised by the External Advisory Committee and approved by the University governing bodies, with the agreement of the School Council.

2.5 Articulation with Health Services

As said before, the articulation of the School of Health Sciences with the Health Services will be promoted on a contractual basis, seeking mutual benefits.

The starting conditions for the School of Health Sciences are in principle favourable to the adoption of innovative articulation mechanisms, namely due to:

- the strong experience of University of Minho in cooperating with the community and local development agents;
- the fact that the 7 Hospitals in the Region are articulated in a network (*Carta de Referência InterHospitalar do Minho*) defining complementarities and coordinating their interaction, which in turn articulates with the network of Health Centres;
- a new Hospital is under preparation for construction in Braga, close to the School buildings, with special facilities and conditions to support medical training;
- a new Health Centre is starting operation, also close to the Campus, offering ideal conditions for the interaction with the School.

These two new health services will act as the Nuclear Hospital and Nuclear Centre for the School of Health Sciences.

The articulation with the Health Services will follow a basic principle: the practical clinical and behavioural training of students will mainly be the responsibility of resident doctors in Hospitals and Health Centres, whereas the teaching of the cognitive contents and the design, coordination, supervision and assessment in the area of Clinical Sciences will stay under the responsibility of doctors with the necessary professional and academic qualifications, with the statute of invited University professors. The global coordination of the degree programme will always stay with the School of Health Sciences.

The articulation will be established in the form of protocols that define in a clear way the mutual duties, responsibilities and compensations. Cross representation between the Department of Clinical Sciences and the Nuclear Health Services is envisaged as a mean to facilitate the coordination of the protocols.

3. PLANS AND STRATEGIES FOR 2001

3.1 Organising the School of Health Sciences

The main objective to be fulfilled in 2001 was to prepare all the necessary elements — human resources, facilities, equipments, courseware, ... — to start the undergraduate programme on Medicine in October 2001 complying with the requirements for the innovative approach that was envisaged.

For the effect, the following strategies were adopted:

- to install and make operational the School governing bodies, accordingly to the specific provisions for the launching phase;
- to reinforce the human resources (recruitment, training, development), considering not only the preparation and the teaching activities relating to the first curricular year but also the preparation of the second year;
- to proceed with the planning and design for the new buildings, aiming to finish their construction until the end of 2003;
- to restore the provisional facilities, adapting them to the specific requirements concerning the academic and research activities to be carried out until the end of 2003;
- to acquire and install the computer and laboratory equipments necessary for teaching and research, as well as other necessary material resources;
- to focus on the curricular development for the undergraduate degree programme (definition of objectives, contents and methodologies for each curricular area and the corresponding modules; preparation of learning and supporting materials; setting up the intranet);
- to plan and launch a first set of postgraduation advanced courses, as a front end for future postgraduation degree programmes;
- to define the priority areas for research and to prepare the formal proposal for the creation of the Life and Health Sciences Research Institute as a research unit recognised and financed by the Foundation for Science and Technology (the Portuguese agency for the financing of research, in the Ministry for Science and Technology);
- to install the Services to support the School activities, focusing on the undergraduate programme;
- to widen and deepen the contacts and dialogue with entities in the national health system (Ministry, Regional and Sub-regional Administration, Hospitals, Health Centres).

A brief account on the installation of the governing bodies will now be presented.

3.1.1 The Steering Committee

The Dean and the Steering Committee were appointed by the Rector on the 11th of January 2001. The Committee has the following composition:

- *Sérgio Machado dos Santos*, Dean (former Rector);
- *Joaquim Pinto Machado*, Deputy Dean (Professor Emeritus);
- *Maria Cecília Lemos Pinto Estrela Leão* (Vice-Rector for Research);
- *José Manuel Pereira Vieira* (Vice-Rector for Planning);
- *Carlos Alberto Almeida Valério* (Director of Hospital de São Marcos);
- *José Manuel Barros Guerra* (Coordinator of the Braga Sub-Regional Health Administration)

The Steering Committee met on a monthly basis and concentrated mainly in the planning of the School development in its different dimensions, in monitoring the on-going activities and in the links and protocols with the health services and authorities.

3.1.2 The Scientific Council and the Scientific Committee

As said earlier, a Scientific Committee was established in 1998 with the specific task of preparing a detailed proposal for the curricular structure of the medical degree programme. The Committee integrated five full professors from the Medical Faculty in University of Porto and one from University of Minho.

After the ministerial authorisation from the School of Health Science, the Scientific Committee was re-established with two extra members — one professor from University of Porto and one from University of Minho — with the objective to cooperate in the instalment of the degree programme and to decide on the scientific and pedagogical matters related to it.

Once the degree programme was initiated, in October 2001, the Scientific Council of the School of Health Science was formally installed, integrating all the School academic staff with a doctoral degree. According to the School Regulations, the Scientific Council should include the competences of the former *ad hoc* Scientific Committee. However, since the members of the Scientific Council are mainly related to the areas of biomedical sciences, whereas the Scientific Committee had a strong representation of the medical areas, and also because it was important to keep and re-inforce the links with the

Medical Faculty in University of Porto, it was decided to keep both bodies in operation, with the following split of competences:

- **Scientific Committee**

- prospective global supervision of the degree programme;
- preparation of the curricular areas to be developed at the Hospitals and Health Centres;
- links to the University of Porto.

- **Scientific Council**

- preparation and follow-up of the curricular areas in the field of biomedical sciences;
- strategy, planning and supervision of research activities.

At present, the composition of the Scientific Committee is the following:

- *Joaquim Pinto Machado*, Chairman (University of Minho);
- *Alexandre Sousa Pinto* (University of Porto)
- *Artur Pedrosa Mesquita* (University of Minho)
- *Maria Cecília Lemos Pinto Estrela Leão* (University of Minho)
- *José Agostinho Marques* (University of Porto)
- *Fernando Carlos Schmitt* (University of Porto)
- *José Agostinho Marques* (University of Porto)
- *Maria Isabel Amorim Azevedo* (University of Porto)
- *Manuel Augusto Cardoso de Oliveira* (University of Porto)

and the Scientific Council integrates:

- *Joaquim Pinto Machado*, President
- *Maria Cecília Lemos Pinto Estrela Leão*, Vice-President
- *Armando Alberto Pinto de Almeida*
- *Fernando José dos Santos Rodrigues*
- *Isabel Maria Mestre Palmeirim Esteves*

- *Joana de Almeida Santos Pacheco Palha*
- *Jorge Manuel Rolo Pedrosa*
- *Nuno Jorge Carvalho de Sousa*
- *Alberto Filipe Sansonetty*

The Scientific Committee meets every month and its main activities have been related to the interaction with the Nuclear Health Centre and the Nuclear Hospital, in order to identify the medical staff that will initiate and coordinate the curricular areas of community and clinical medicine and to programme the practical training in a health centre and the area of Introduction to Clinical Medicine.

The Scientific Council meets every fortnight and has been dealing with the supervision of the curricular areas of Introduction to the Degree Programme, Molecules and Cells, and Functional and Organic Systems, with the supervision and programming of post-graduate programmes and with the preparation of the proposals to finance and equip the research laboratories.

3.1.3 The External Advisory Committee

The External Advisory Committee had its first meeting on the 6th of October 2001. The Committee includes the following external members:

- *Arsélio Pato de Carvalho* (University of Coimbra)
- *Júlio Fermoso Garcia* (University of Salamanca)
- *Joseph S. Gonnella* (Thomas Jefferson University)
- *Eduardo Marçal Grilo* (Calouste Gulbenkian Foundation)
- *Miguel Leão* (North Regional Council of *Ordem dos Médicos*)
- *José Alberto Cardoso Marques* (North Regional Health Administration)
- *Walter Friedrich Osswald* (University of Porto)
- *Fernando Lopes da Silva* (University of Amsterdam)
- *Henry Walton* (University of Edinburgh)
- *Alistair Warren* (University of Sheffield)
- *Jean Claude Yernault* (Université Libre de Bruxelles)

The Rector and the Dean are also formal members of the Committee.

As a consequence of the first meeting, the following report was issued by the external members:

"1. The meeting and site visit of the External Advisory Committee at Minho University took place at Braga under the chairmanship of the Rector Professor Licínio Chainho Pereira, who welcomed the EAC and briefed it about the founding of the Medical School. The following members of the External Advisory, Committee (EAC) were present:

Dr. Alistair Warren, Sheffield University
Professor Arsélio Pato de Carvalho, Coimbra University
Professor Fernando Lopes da Silva, Amsterdam University
Professor Henry Walton, Edinburgh University
Professor Joseph Gonnella, Thomas Jefferson University.

2. Presentations by Members of the Faculty to the EAC:

Professor Joaquim Pinto Machado, President of the Scientific Committee, outlined the development of the Medical Faculty at the University of Minho. Professor Sérgio Machado dos Santos, President of the Steering Committee, delineated the main features of the medical curriculum and the activities in progress for starting the new course on Monday 8 October. Four main presentations followed, covering the following themes:

- i. Professor Maria Amélia Ferreira: the medical curriculum;
- ii. Professor Cecília Leão: the Research Institute of Life and Health Sciences;
- iii. Professor José Vieira: the building plans; and
- iv. Dr. José Alberto Marques: relations between the Faculty and the Health Services in Braga and surrounding areas.

During and after these presentations lively discussions took place, enabling the EAC to comment on the organization and perspectives of the Faculty, as indicated in the Recommendations below

3. Laboratories and other facilities at the campus:

The visit to the teaching facilities at Braga enabled the EAC to appreciate the enormous effort by the Faculty to have the laboratories ready for the start of teaching the course very shortly. The opportunity provided for the EAC to get acquainted during the visit with the younger generation of the staff was most important. Their dedication and skills were plain to see.

4. Overall Appraisal:

From the discussions with the senior staff, and the contacts with the junior members, the EAC was convinced that there exists an "esprit de corps" within the Faculty that ensures a good start for the new Faculty. The Faculty is clearly proceeding well in creating an innovative curriculum in a carefully considered way. The EAC was particularly impressed by the thoroughness of the educational framework and by the enthusiasm of the staff. The medical curriculum is novel for Portugal and has the potential of attracting a new generation of strongly motivated staff members and, we expect, of meeting the expectations of the entering students. In addition to these very positive impressions, the EAC has to record a number of reservations, and make recommendations to which the Faculty may wish to pay special attention.

5. General Observations

the EAC emphasized that the Faculty should convey to the whole staff, and of course to the students as well, the *goals and objectives* of the new curriculum, and the methods for assessment of both students and staff. The Faculty needs to adopt as a top priority for its Educational Unit the continuous training and *development of all members of the teaching staff*, full time and part-time, since the success of the innovative curriculum will depend crucially on the expertise of the staff and their commitment to the novel educational program being implemented.

Clinical contact starting in the first year is a key aspect of the curriculum which is strongly approved by the EAC, for example the proposal that each student will follow the health status of a family (see Appendix). However, the EAC stressed that the success of such integration depends essentially on tutors being carefully selected for their educational ability, and on the Faculty providing the *administrative structure* necessary for introducing and maintaining an innovative curriculum

effectively. The EAC emphasized strongly: the need for a strong Dean and an autonomous *curriculum committee* for administering the teaching and learning.

The EAC advises reconsideration of: the duration for the *teaching modules*, at present perhaps too short; specifying more precisely the *intended assessment procedures*; and the creation of *alternative exit pathways* for students failing to meet educational requirements or opting to change to other courses.

6. RECOMMENDATIONS

i. Organization and administration of the curriculum

The EAC advised the Faculty to pay special attention to instituting a specific Curriculum Committee (CC) to manage, assess and, when necessary, adapt the curriculum. This CC should have sufficient autonomy and authority within its own organization, and should have both staff members and student representatives. The EAC is well aware that such an administrative structure is not at present customary in Portugal, but an innovative curriculum cannot succeed without it.

ii. Appointment of teaching staff

Procedures for selecting senior lecturers and professors must be thorough and professional. Such appointment procedures apply for both fulltime University staff and also for appointment of part-time teachers (e.g. clinical teachers with primary appointments as medical doctors in the neighbouring Health Services).

Conferment of academic status and obligations on health service medical teachers has yet to be carried out, and a system for recognition and reward to non-university teaching teachers has yet to be devised. Both processes are of critical importance for the implementation of the curriculum, especially in the clinical years.

iii. Recruitment of teaching staff

The EAC was impressed with the success the Faculty has achieved in recruiting young researchers who will participate mainly in teaching basic subjects. That 172 applications were received for the positions of researchers/lecturers confirms the appeal of these posts. It is important, however, that the Faculty should obtain sufficient financial means to provide these young staff members with adequate working conditions and state-of-the-art research facilities. The recruitment of part-time clinical teachers is urgent, so that such medically qualified teachers can be taken pan in the clinical aspects of integrated teaching now commencing. All teaching staff have to be trained (e.g. in teaching methods, promotion of learning, examination of student progress, and evaluation of courses) for their educational responsibilities to the Faculty and to students.

iv. Clinical teachers

The EAC was concerned about the policy for recruitment of clinical teachers as lecturers/professors. The presentation of the President of the ARS-North demonstrated that his organisation is ready to give its collaboration for creating the necessary conditions enabling of Hospital Departments and Health Community Centres to be partners in implementing the medical curriculum. Appointment of these part-time teaching staff members must always be on the basis of educational ability and commitment to the teaching duties. Therefore the Faculty of Medicine obligatorily should have control of this educational provision by part-time medical teaching staff, be responsible for their appointment, and for monitoring their performance in teaching clinical students. Such responsibility for the entire curriculum, whether realized within or outside the University, is the function of the Faculty.

v. The Educational Unit

This teaching centre is a major asset, both for medical education expertise of the teaching staff and for medical education research. It will be a resource for all teachers, not only for experienced teachers but particularly for development of teaching staff who are new to or uncertain about their educational duties.

vi. Integration of Basic and Clinical Subjects in the Curriculum

The EAC approves the strong scientific research base already operational, and the research-led environment prepared for the entering class. However, the social sciences related to medicine have to be a major component as well (with communication a core emphasis), and clinical aspects have to be included early in the first year, given that the Minho curriculum is committed to integration as a guiding principle.

vii. Core and Options

The Project Modules have to be prepared in advance, and a list of available options presented as a menu from which students can select their preferred option. The EAC raises the reservation that the duration of modules as at present specified seems too short. The examination system must be

congruent with this and other innovatory course content and with the overall objectives of the Faculty.

viii. Data Base on Entrants

The EAC is aware that a centrally determined selection procedure for new students operates in Portugal, based on national rules and habits that prohibits selection by the Minho Faculty of entrants for specific congruence with the goals of the curriculum. In particular, nonintellectual attributes that are accepted worldwide as major determinants of medical educational outcome have not been assessed. Its innovative curriculum obliges the Minho Faculty to obtain these necessary data about the intake, so that both cognitive and nonintellectual aspects of academic progress can be tracked throughout the curriculum. Such a data base on students' characteristics is of course also a necessary component of studies to determine the effectiveness of the Minho teaching programme. Therefore, new students need to be individually seen on entry, using rigorous methods, and their progress followed up to and beyond graduation. The EAC recommends that the Educational Unit (item 6v above), which the Faculty has wisely set up, should develop a research project with the aim of determining the relation between a student's profile on the entry and his or her academic achievement throughout the curriculum.

ix. Student Participation

The curriculum being student-centered, it follows that student opinion will be systematically obtained, with students also represented on relevant committees, and recognized as potential change agents when revision or reorientation of the curriculum is called for.

x. Future meetings of the EAC

The aim of the first site visit was to gather information, meet course organizers, receive presentations from University of Minho staff and see some of the facilities. Consequently there was little time for formal discussion. At future meetings more time should be available for such discussions.

The EAC is to meet twice during the year 2002, the first time at about Easter. It is important for the date and the agenda, with relevant documentation, to be sent to EAC members well in advance, so that most members of the EAC can be present at the site visit. At the next site visit the EAC will appreciate having the opportunity to interview staff members and students, to be able to judge at first-hand how the curriculum is being implemented and experienced by staff and students.

7. Appreciation

The EAC wishes to record its gratitude for the gracious hospitality so generously offered by the Faculty, and for the remarkably facilitating atmosphere created for this first site visit.

8. Appendix: Allocation of a Family to Each Student

Each student is to be allocated a family with a newborn baby. If there is a health visiting programme in Portugal, it will be wise to arrange for the student to accompany the health visitor (or the midwife) on her first postnatal visits as a start to his or her involvement with the family. It will be much better for one student (rather than two) to be assigned to each family. This will help the student to form a really close bond with the family who will then be able to speak of: "my student". This is far less likely to happen if pairs of students are assigned. Two students may also overwhelm the family and be less acceptable to them. Students will need to be carefully oriented about their role: how to introduce themselves; what their functions are: that is, primarily to observe the developing child and his or her impact on family life, as well as to note how families react to illnesses and accidents in the child and other family members and to their socioeconomic circumstances. The students' role is not to give advice for which they are not yet equipped, but they can be helpful to families by acting as mediators between them and the medical services, especially in case of emergencies. It will be essential from the start to ensure that the students do not lose their family.

Individual family assignments will also mean that for supervision by a tutor in small groups of 5 to 6 students, each student will hear about at least 4 to 5 families other than his/her own, and will acquire a far wider range of knowledge about child health, child development and family life.

To require the student to write an annual report is totally inadequate. Students should have regular supervision in small groups, at first quite frequently, then perhaps less often. After each visit a short report should be made by the student taking into account a number of specific items regarding not only health and physical illness, but also physical, psychological and social-emotional development in early childhood. These reports should be presented and discussed in the group. The supervisor

needs to be knowledgeable not only about all these aspects but also about attachment theory and the vicissitudes of mother-infant relationship, especially in the presence of postnatal depression, now known to be so common. Students should visit their family at least every fortnight for six months, when developmental changes are most rapid: then monthly until the child is aged two; then every three months. The family should have their student's telephone number to call if a crisis rises.

24 October 2001"

3.2 Articulation with the National Health System

The strategy concerning the links with the National Health System developed on the following lines:

- 0 The Rector and the internal members of the Steering Committee had a meeting with the Prime Minister, the Minister for Health, the Minister for Education and the Minister for Science and Technology, on the 5th January 2001, to discuss the implementation of the contract for the development of the School of Health Sciences, namely on what concerns the construction of the new Hospital in Braga and the financing of the Research Institute.

The Prime Minister reassured the full support from the Government to the School of Health Sciences. The new Hospital is a priority to the Government and is expected to be operational by the end of 2005. The Foundation for Science and Technology, under the supervision of the Ministry, will support the setting up of the Life and Health Sciences Research Institute.

- 0 Contacts were established with the Regional Health Administration in Porto, concerning the establishment of a protocol for the support from the Nuclear Health Centre, in Gualtar (*Unidade de Saúde de Gualtar*). After some interactions, the protocol was concluded and signed in January 2002.

The protocol sets an innovative scheme, where two elements from the School of Health Sciences will integrate a Technical Committee in the *Unidade de Saúde*, which is responsible for the proposition of procedures and courses of action aiming at the improvement of health care, training of students and the overall performance of the Health Centre. It is also established that the allocation of medical doctors to the Centre will take into consideration the specificities of the required profile due to the double functions to be fulfilled (health care and medical education).

- 0 Within the legal framework concerning the articulation between the Medical Faculties and the Health Services, the School of Health Sciences presented to the Ministries of Health and of Education a proposal for the publication of a legal document to give formal support to the protocols with each relevant Service.

The legal document (Portaria nº 36/2002) was published on 10th January, 2002. It establishes that the School of Health Sciences of University of Minho is institutionally articulated, under the terms established by law, with the following Hospitals and Health Centres:

- Hospital de São Marcos, Braga;
 - Hospital da Senhora de Oliveira, Guimarães;
 - Other Hospitals in the Northern Region, subject to the establishment of a protocol;
 - Health Centres in the Regions North and Centre, under the scope of protocols to be signed with the Regional Health Administration authorities.
- Ø The Dean, Deputy Dean and other members of the Steering Committee have visited the Hospitals of Braga, Guimarães and Famalicão, where they had the opportunity to present the main features of the Medical degree programme to the Clinical Directors and other medical doctors, concentrating on the foreseen articulation with these Hospitals.
- Ø Regular meetings with the members of the Clinical Direction at Hospital de São Marcos, in Braga, are taking place to deal with practical matters concerning the cooperation from the Nuclear Hospital.

Similarly, regular meetings are taking place with the recently installed *Unidade de Saúde de Gualtar* (Nuclear Health Centre), to prepare the period of training of first year students and other matters relating to the clinical training of students.

3.3 Services

In addition to the administrative structure and the ICT team to support the normal operation of the School, particular care was placed in the setting up of the Unit of Medical Education.

The Unit is coordinated by a highly qualified expert on medical education and includes a pedagogical technician with university education, a ICT team and one element for administrative support.

The Unit has been developing its activities in three complementary areas:

- a)** Training of staff and students: training actions for the staff regarding the learning methodologies were conducted in July and September (a third action took already place in January 2002); the students were specifically trained to adapt to the learning methodologies; and several formative meetings with the academic staff were organised regarding the docimologic assessment of examinations and the preparation of the exams.
- b)** Counselling and elaboration of programmes: counselling on the assessment system and learning methods, for staff and students; elaboration of the system to access the academic staff and the programme; cooperation in the elaboration of contents for the Intranet; coordination of the schedules; coordination and revision of the educational objectives relating to the first curricular year.
- c)** Management and administrative support to the pedagogical activities: reception of students; acquisition of pedagogical materials and documentation; administrative process related to teaching assessment, and the students; administrative support to the Scientific Committee and the Scientific Council; elaboration of posters; elaboration of a data base on students; preparation and marking of the examinations, and docimologic analysis; marketing of the degree programme; answers to enquiries on the School or its programmes.

4. ACTIVITIES IN 2001

4.1 Undergraduate programme

After an intensive work to prepare all the necessary elements (recruitment and training of staff, office space, lecture rooms, laboratories, equipments, courseware, ...), the first group of students was admitted into the first curricular year of the undergraduate programme on Medicine, to start the learning process on the 8th of October, 2001. Although the *numerus clausus* was established as 50 places, 52 students were enrolled via the national admission system because the last 3 had precisely the same marks.

The official ceremony for the Inaugural lesson (presented by Prof. Pinto Machado) had a big impact on the media and the community, due to the great expectations,

from long ago, on this new project at University of Minho and also to the presence of the Prime Minister and the Ministers for Education, for Health and for Science and Technology.

The conception of the whole project is presented in detail in a separate document*. A brief summary of the curricular organisation of the first year is presented next, including the main features relating to each of the curricular areas. All the courseware already produced is available in the Intranet, in Portuguese.

Schedule

The schedule for the academic year 2001/2002, down to a weekly detail, is presented in Table 1.

Introductory module

The objectives of the introductory module to the undergraduate degree programme were to present to the students: **(i)** the basic principles behind the conception of the programme, the curriculum and the learning methodologies; **(ii)** the human being, as a bio-psycho-social unit; **(iii)** medicine, in the wide and diversifies context of its intervention; **(iv)** the medical doctor - the clinical, the researcher, the educator; **(iv)** the patient, in its dignity, rights, fragilities and needs.

As a pre-introduction, a brief presentation was given on the university institution and on the principal features of University of Minho.

The assessment of the students was based on two short essays (on the topics "The Human Being" or "Medicine, the Clinical and the Patient", and "Interpersonal Communication"). In each essay the students were asked to present personal thoughts and opinions on the following questions: what was new for you? did you appreciate the points of view presented? accordingly to your personal experience, is there a coincidence between "what should be" and "what is"? in which way what you have learned may or must influence your behaviour as a medical student?

The students have expressed a high opinion on this module. Their evaluation on 8 parameters has shown the following results (scale 0-10): contents (8), didactical material

* *Medical Degree Programme*, School of Health Sciences, University of Minho, September 2001

Table 1
(in a separate file)

(8), methodology (8), interest (8), teachers' pedagogical capacity (9), interaction teacher-students (9), personal valorisation (7), personal change (7).

The Coordinator of this first module presented the following appraisal:

"The results were very positive. The adopted methodologies have shown to be adequate to the objectives in mind, and have stimulated and fostered the relations between the students themselves and their teachers, which was helpful to facilitate the integration of the students in the School and their adaptation to a completely new sociological environment and to exigencies and pedagogical experiences radically different from former personal experiences.

Also, the focus, from the beginning, on nuclear questions relating to the human being, the medicine, the medical doctor and the patient, in a way where the cognitive aspects were mainly considered in the form of the students' own reflections based on the presentation of concrete situations (for example, Mercury maritime pollution in Minamata, terminal AIDS patients, materno-infantile bonding) plunged the students into the ambience of Medicine in its problem, practices and requirements, helping in the understanding of the responsibilities of the medical doctor as to competences, attitudes and values".

Area of Molecules and Cells

For its importance as one of the major curricular areas, the full report from the Area Coordinator is transcribed:

1. Main goals of Learning Area: Molecules and Cells

- To recognize that the future of medicine is linked to a full practice and knowledge of Molecular and Cellular Medicine.
- To understand that genomics, proteomics, metabolomics and cytomics are the basis of Molecular and Cellular Medicine.
- To understand that diseases are caused by biochemical dysfunctions in cellular systems, and therefore a constant updating in Molecular and Cellular Medicine is imperative.
- To be aware that laboratory investigation is essential to Molecular and Cellular Medicine and to acquire practice in new technologies.

2. Structure of the Learning Area: Molecules and Cells

This learning area was structured into 5 modules. One was a week intensive laboratory-training course to develop basic laboratory skills. The remaining four were devoted to the acquisition of theoretical knowledge and more specific practical training in Molecules and Cells. Accordingly, this area was organized into the following modules:

- Module 1: Laboratory Methodologies and Technologies for Studying Biomolecules and Cells;
- Module 2: Biomolecules and Cells;
- Module 3: From Metabolism to Cellular Bioenergetics;
- Module 4: Molecular Genetics Foundations - From Genomics to Metabolomics;
- Module 5: Cell Cycle and Molecular Basis of Cancer.

3. Learning Objectives

Module 1: Laboratory Methodologies and Technologies for Studying Biomolecules and Cells

- To learn basic laboratory safety rules.
- To learn basic laboratory procedures: how to weight substances, adjust concentrations of solutes, measure and adjust the pH of aqueous solutions, calculate the osmolality/osmolarity of an aqueous solution, centrifuge, separate molecules by electrophoresis.
- To learn how to collect, to observe, to identify, to analyze and to purify human cells: how to do qualitative cytology and how to do quantitative or analytical cytology.
- To learn how to identify and analyze some of the methodologies/technologies that presently allow us: to collect, to observe, to identify, to analyze and to purify human cells.
- To learn how to manipulate cells: live human cells in vitro (functional analysis) or preserved (morphological analysis).

Module 2: Biomolecules and Cells

- To analyze how inter-atomic bonds are established and how they are broken.
- To analyze the physical-chemical properties of the most abundant component, either of the intracellular medium or the extracellular medium: the water.
- To analyze the importance of some electrolytes in cell physiology: sodium, potassium, chloride and calcium.
- To distinguish and analyze the main types of biomolecules: glycid, lipids, proteins, nucleic acids and biofactors (oligoelements, vitamins).
- To explain and evaluate the biological importance of two groups of proteins: the enzymes for the catalysis of chemical reactions and the immunoglobulins for human organism defence.
- To identify the cellular diversity: from prokaryotic cells to human eukaryotic cells.
- To explain the sub-cellular organization of human cells: the biomembranes and the compartmentalization of the intracellular space.
- To describe and analyze the function of the organelles of the human cells: autoassembly of supramolecular structures.
- To identify cells as structural and functional units of the multicellular organisms, like the human organism: integration of cells into tissues, tissues into organs, organs into systems, systems into organisms.
- To describe the differentiation of the human cells: cell specialization processes allowing motility communication, defence and secretion.
- To evaluate the cells structure: as dynamic and not static.

Module 3: From Metabolism to Cellular Bioenergetics

- To understand the overall result of cell metabolism – from nutrients to ATP.
- To recognize the nature of high-energy compounds.
- To recognize the role of electron transport and the oxidative phosphorylation in the generation of ATP.
- To understand the reactions of glycolysis.
- To understand the aerobic and anaerobic metabolic fates of pyruvate.
- To understand the relevant reactions of gluconeogenesis and the role of this metabolic pathway during starvation.
- Appreciate the key role of pyruvate and the nature of the pyruvate dehydrogenase reaction.

- To understand the overall process that occurs in the tricarboxilic acid cycle.
- To understand the key steps of the pentose phosphate pathway recognizing its essential role in providing key biosynthetic intermediates.
- To explain the synthesis and degradation of glycogen processes and the regulation of these pathways by cAMP, and hormones.

- To understand the process of fatty acids oxidation and Ketone bodies synthesis emphasizing the role of this last process during starvation.
- To understand the key steps of the fatty acids synthesis pathway.
- To outline the processes of transamination, catalyzed by amino transferases, and deamination in amino acids and proteins.
- To appreciate the major sources of ammonia, its toxicity and the processes of ammonia detoxification – the urea cycle and its relationship to the citric acid cycle.
- To review some key metabolic branch points, control steps in central metabolism developing the concept of anapleurotic reactions.
- To discuss some unifying themes in intermediate metabolism.

Module 4: Molecular Genetics Foundations: From Genomics to Metabolomics

- To present a scheme comparing the nucleic acids organization in eukaryotic and prokaryotic cells.
- To describe the meaning of karyotype, ploidy, centromere, telomere, 3'- and 5'-terminal, intron, exon and q/p arms of chromosomes.
- To describe the replication process outlining the most important proteins involved.
- To describe the transcription process outlining the most important proteins involved and the major differences between eukaryotic and prokaryotic cells.
- To describe the major mechanisms involved in tRNAs, mRNAs and rRNAs processing.
- To describe the translation process outlining the major differences between eukaryotic and prokaryotic cells.
- To explain the Wobble hypothesis.
- To outline the general mechanisms involved in post-translational modifications.
- To explain the importance of post-translational modifications in cellular protein sorting.
- To explain the major mechanisms involved in genetic control in eukaryotic and prokaryotic cells.
- To describe the key structures of mobile DNA elements outlining the mechanisms of mobility.
- To list the most important virus outlining their genome content and mechanisms of replication.
- To describe the mechanisms of DNA repair.
- To explain the role of homologous recombination in DNA repair and new chromosomes rearrangements.
- To explain the different methodologies to clone genes.
- To discuss the different methodologies to analyze gene expression of both a single gene and a genome.
- To explain the different methodologies used to produce and select mutants to study human genetic disorders.
- To explain the different methodologies to map genes in chromosomes.
- To explain the links between genome, transcriptome, proteome and metabolome.

Module 5: Cell Cycle and Molecular Basis of Cancer

Cell cycle

- To overview the cell cycle and its control.
- To analyze the molecular mechanisms for regulating mitotic events.
- To analyze cell-cycle controls in mammalian cells.
- To analyze checkpoints in cell-cycle regulation.
- To draw a model of the eukaryotic cell cycle describing the action of the different proteins that regulates the cycle and how alterations in these proteins affect the cell cycle control.

Molecular Basis of Cancer

- To identify the six essential alterations on cell physiology for cancer development;
- To identify the four main groups of genes involved on mechanisms of cancer development.

- To describe the main oncogenes, their mechanisms of activation and the repercussion on cell physiology.
- To describe the main tumour suppressor genes, their mechanisms of activation and the repercussion on cell physiology.
- To describe the main genes involved on control of programmed cell death and their role in cancer.
- To describe the main genes involved on DNA repair and their role in cancer;

- To explain the relationship between cell senescence and cancer.
- To explain why cancer should be studied as a tissue disease more than a cell disease.
- To identify and describe the main molecular targets for cancer therapy.

Information sources

Textbooks

Molecular Cell Biology (available at the working rooms)
Lodish, Berk, Zipursky, Matsudaria, Baltimore, Darnell
Ed. W H Freeman and Company, New York, NY, 2000

Lehninger Principles of Biochemistry
Nelson, D. L.
(3rd edition) Worth Publishers, 2000

Biochemistry
Stryer, L
(4th edition) WH Freeman and Company, 1995

Entender a Bioquímica (available at the working rooms)
O metabolismo fundamental em animais e plantas
Luís S. Campos
2ª Edição, revista, Escolar Editora, 1999

Other sources

Several sources of information were available including different WebPages and texts written by teaching staff.

Area of Organic and Functional Systems

This curricular area develops in the first two curricular years. The summary prepared by the Area Coordinator includes all the units to be covered in both years and is fully reproduced next:

"In the plan of studies of the Medical Course of the Minho University, the Curricular Area - **ORGANIC AND FUNCTIONAL SYSTEMS (OFS)** constitute a pedagogic unit of the curricular areas in Phase I, distributed throughout the 2nd semester of the 1st year (13 weeks) and along the whole 2nd year (30 weeks).

In OFS the different organic systems - musculoskeletal, skin, cardiovascular, respiratory, digestive, urinary, genital, lymphatic/immunitary, endocrine, nervous, growth, postnatal development and aging - will be developed, in a coordinated and integrated sequence, in a way that morphology (gross and microscopic), biochemistry, physiology and connecting functional intra and intersystems will be displayed together with the active involvement of the allied clinical specialties.

AIM

The aim of the OFS fits the goal pointed in the document "Conception of the Medical Course of the Minho University", as far as it is adapted to the object of the OFS "the aim is to provide the graduates the capability to prosecute a specific program of professional education as well as to provide the basis of long-life learning as physicians".

Objectives

- To provide the students the means to achieve the scientific knowledge, the skills and attitudes in the basic areas of the medical course, identifying its importance towards medical practice;

- To assess in an adequate and correct way, the degree of acquisition of the knowledge, skills and attitudes;
- To provide pedagogical (and personal) support to the students throughout the different units of the OFS;
- To evaluate and develop, in an active and flexible way, the teaching/learning program of the OFS following an action-research methodology.

At the end of the Curricular Area of the OFS the students should acquire

- The basic knowledge (core) of the basic medical sciences that underlie the study of Medicine;
- The knowledge of the biological principles underlying health and its changes in disease, evaluating the meaning of "normal";
- The skills to undertake basic clinical skills;
- The ability to undergo research and to display biomedical data in an integrated way;
- The ability to recognize and use different learning approaches and to establish the individual priorities in learning processes;
- The attitude to recognize the need of multidisciplinary and interdisciplinary approaches in the comprehension and development of Medical subjects.

The acquisition of knowledge, skills and attitudes, consequent to the principles adopted for the organization and thematic development of OFS, should constitute the tools to be used at the end of Phase I:

- As the basis for the understanding of the scientific principles underlying the clinical situations;
- As the basis for the study of preclinical and/or clinical subjects correlating structural and functional data in the understanding of the human body;
- As part of the fundamental tools for the study and diagnosis of clinical situations;
- As the basis for problem resolution in normal and pathological conditions;
- As the basis in the development of the more specific capabilities of inspection and communication.

Structure of SOF

Unit 1 - Support and Movement

- General Introduction to OFS and to the musculoskeletal system (1st year - 2nd semester - 1 week)
- Musculoskeletal system and Skin (1st year - 2nd semester - 6 weeks)

Unit 2 - Maintenance of the Body

- Cardiovascular and Respiratory Systems (1st year - 2nd semester - 6 weeks)
- Digestive System (2nd year - 1st semester - 4 weeks)
- Urinary System (2nd year - 1st semester - 3 weeks)
- Lymphatic and Immunity Systems (2nd year - 1st semester - 2 weeks)

Unit 3 - Continuity of Species

- Reproductive system (2nd year - 1st semester - 3 weeks)
- Development, Postnatal growth and Aging (2nd year - 1st semester - 2 weeks)

Unit 4 - Integration and Coordination

- Nervous System (2nd year - 2nd semester - 8 weeks)
- Endocrine system (2nd year - 2nd semester - 2 weeks)

Unit 5 - Synopsis of the Organic and Functional Systems

(2nd year - 2nd semester - 3 weeks)

UNIT 1 - Support and Movement

Module 1

- **General Introduction to the OFS and to the Musculoskeletal System**

This will be the introductory approach to the organization of the OFS. In a coordinated and sequentially integrated way, the different areas that constitute the OFS will be presented: Anatomy, Histology, Embryology, Physiology and Biochemistry and its integration with the related clinical areas will be focused. As core topics we will consider: the basic organization of the human body, the anatomical terminology, the meaning of "normal", the importance of basic knowledge towards the "clinical reasoning".

- **Musculoskeletal System and Skin**

This module approaches the organization of the musculoskeletal system integrating the macroscopic structure of bones, joints and muscles with the microscopic organization of the tissues, its biochemistry and the way they function "per se" and "in toto". These topics will be integrated in clinical situations regarding the relevant clinical aspects, as far as the normal functioning and important dysfunction of this system are concerned. Physical examination (surface anatomy) and imagiology are nuclear components. The demonstration of the functional anatomy of movement, gait alterations and congenital malformations of the musculoskeletal system are important topics to be considered. The skin, as the more extensive organ of the body, will be considered with a special emphasis in a clinical perspective.

In this module, the peripheral nervous system and the vessels of the limbs will be also considered and integrated with the neurophysiology, electromyography and plastic and reconstructive surgery.

Unit 2 - Maintenance of the Body

Module 2

- **Cardiovascular and respiratory systems**

This module considers, in a coordinated approach, two important systems in the maintenance of the body - the cardiovascular and the respiratory systems. The coordinated approaches of the morphological aspects (gross and microscopic), of physiology and biochemistry will serve as the basis to the integration of clinical aspects of great relevance as cardiac transplantation, cardiovascular imaging, respiratory obstructive syndromes, anatomical variations and congenital malformations in the development of the cardiorespiratory systems.

Module 3

- **Digestive system**

This module approaches the gross and microscopic structure of the digestive system and digestive glands, the mechanism of digestion, gastrointestinal function, nutrition and energy production. The teaching/learning program integrates important clinical aspects relevant for the understating of this system as obesity and diabetes, nutritional needs in pregnancy, growth, aging and its dysfunction. It will also include aspects of hepatic transplantations as an integration of the different areas involved in this module.

Module 4

- **Urinary system**

This module approaches the structure and function of the urinary system, emphasizing the physiologic and biochemical mechanisms of filtration, secretion and tubular absorption in the kidney, and the intrinsic mechanisms for the achievement of the renal function. Clinical aspects as renal transplantation, renal dialysis or ureteral obstructions will be used as topics for clinical cases discussion.

Module 5

- **Lymphatic and Immunity Systems**

This module will have an important clinical input. The integration will be achieved with the structural organization of this system with a close collaboration of Immunology. Ethical aspects will be also related with different examples in the pathology of this system (AIDS).

UNIT 3 - Continuity of Species

Module 6

- **Reproductive System**

This module provides the approach to the organization and functional aspects of the male and female reproductive systems. In the male, integration with clinical aspects will be related with the reproductive mechanisms, sexuality and pathology of the genital organs. In the female, integration with clinical aspects will deal with pregnancy and breast pathology. Artificial fertilization will be also taken into consideration and integrated within the subjects. The pelvis and perineum will be re-visited in an anatomical and imaging perspectives.

Module 7

- **Development, postnatal growth and aging**

Despite the approaches made in each of the previous modules on these subjects, this will be the time to provide a systematic approach of the basic aspects related with development, postnatal growth and aging. This will involve the integration with clinical areas as pediatrics, geriatrics, psychology and genetics.

UNIT 4 - Integration and Coordination

Module 8

- **Nervous System**

This module will deal with the aspects of the nervous system in a multidisciplinary approach. Neuroanatomy, neurophysiology, neurochemistry, and neurology will concur to integrate data needed to understand this complex system. Autonomous nervous system will be also re-visited and systematically considered in this module emphasizing the previous aspects of its importance towards the comprehension of the cardiovascular, respiratory, digestive, urinary and reproductive systems. Developmental neurobiology and aging neurobiology will be considered as important topics in this module.

Module 9

- **Endocrine system**

This system that presents high affinity with the nervous system, deals with the endocrine glands and hormonal physiology. This will be articulated with the nervous system towards the explanation of the homeostasis as a crucial mechanism in the physiology of the organic systems.

UNIT 5 - Synopsis of the Organic and Functional Systems

Module 10

Selecting a problem-based approach the whole organic and functional systems will be re-visited in a regional perspective: head, neck, thorax, abdomen, pelvis, perineum, back and limbs.

Synoptic Organization of OFS

Phase I – 1st year

2nd Semester

Introduction to OFS and to Musculoskeletal System	1 week
Musculoskeletal System/Skin	6 weeks
Cardiovascular and Respiratory Systems	6 weeks
Assessment	

Phase II – 2nd year

1st Semester

Digestive System	4 weeks
Urinary System	3 weeks
Lymphatic and Immunity systems	2 weeks
Reproductive System	3 weeks
Development, postnatal growth and aging	2 weeks
Seminars	1 week
Assessment	

2nd Semester

Nervous System	8 weeks
Endocrine System	2 weeks
Synopsis of OFS	3 weeks
Seminars	2 weeks
Assessment	

Training in a Health Centre

This module of one week provides the students with a first experience on primary health care. The specific objectives are: to understand the role, organisation and importance of the health centres, as providers of integrated primary health care; to understand the characteristics of primary health care and the difficulties in practising it; to perform simple activities of nursing care.

The programme for the module includes the presentation of a health centre, the permanency in its different services, the execution of elementary activities of nursing care and a final meeting for the sharing of experiences and to clear up any doubts.

The assessment of the students will focus on the quality of their participation and will include the usual written examination and a short report.

Emergency Aid

This module aims at the acquisition of specific knowledge, pratics and attitudes which are essential to help somenone who needs urgent assistance due to sudden illness or accident.

The course on emergency aid, with the duration of one week, will be taught by the Emergency Aid Training Centre of the Red Cross in Braga. It includes the following

topics: general principles concerning emergency aid and action plan for the emergency aid provider; examination of a victim; cardio-respiratory emergencies; shock; haemorrhages; sores; burns; sunstrokes; frost-bites and hypothermia; articular, muscular and osseous injuries; traumatisms; alteration of the state of conscientiousness; situation of multiple casualties.

The students will be submitted to a practical assessment, in addition to the usual written examinations.

Follow-up of a family

This curricular area will be initiated by a preliminar programme of one week (15) hours intended to provide the students with the essential cognitive competences which are indispensable for the follow-up of a family.

Project Module

The students can select a project from a list of available options, or present their own ideas for a project, according to their preferences. This is an important component of the educational project, aiming at:

- to motivate the students to reflect about their own wishes and interests and about the experience so far acquired on the degree programme, in the sense to identify questions considered to be important for their personal education but which have not been part of the formal curricular;
- to make the students aware that they must be in control of their own education and training;
- to contribute to an active learning process (which is a core element of the pedagogical strategies);
- to promote the will and the responsibility for everyone to do whenever possible what one really enjoys;
- to offer a diversified experience in areas which are not strictly within the medical area but are important for the education of the medical student.

The project develops for three weeks, which can be considered to be somewhat short when compared with foreign experiences. However, the innovative character of this initiative in Portugal and the lack of experience strongly recommend a cautious approach. So, a careful follow-up will be made and it is possible that in the future a longer optional period may be established.

As for the operational aspects, a survey of the students' wishes was already made, regarding three possible types of options: **(a)** laboratory work; **(b)** to pass a questionnaire in the community; **(c)** short study (descriptive memory). The students will be interviewed personally and the theme and the supervisor will be agreed.

The module will develop in June-July. The criteria for the assessment of the individual reports/memories will be established beforehand.

Assessment procedures

The assessment of the learning process obeys to detailed specifications and criteria which are fully transcribed in a separate document relating to the Medical Degree Programme * and therefore is not repeated here.

The Unit of Medical Education is preparing a detailed report on the marks obtained by the students in the modules of the first semester. A first conclusion to be drawn is that the students are faring quite well, as can be seen from the average marks on the different curricular areas:

Area	Average Marks (scale 0-20)	Negative assessment (number of students)
Introductory Module	16.8	0
Interpersonal Communication	17.6	0
Molecules and Cells	14.5	3

* *Medical Degree Programme*, School of Health Sciences, University of Minho, September 2001 (Chapter VI).

4.2 Postgraduation

The School of Health Sciences established as a high priority the preparation and offer of postgraduation studies, having in mind a two-fold objective:

- to contribute to a highly specialised in-service training of medical doctors under conditions compatible with their normal duties and schedules;
- to extend the opportunities for the acquisition of formal Master or Doctoral degrees in field of life and health sciences.

The 2001 Postgraduation Programme included five intensive international courses and one workshop, targeting medical doctors or clinicians, as well as academic staff, researchers and health related professionals. Credit units were associated to each course, valid for credit accumulation pertraining to postgraduation, master and PhD programmes in the field of Biology and Health Sciences at the University of Minho.

Table 2 summarizes the Postgraduation Programme of 2001.

A questionnaire was passed to all the students, to evaluate the postgraduation activities. The overall evaluation provided the following results: excellent (36%); good (64%); adequate (0%); poor (0%); unsatisfactory (0%).

4.3 Research

Within the research areas of interest for the objectives of the Life and Health Sciences Research Institute, a big effort was made to create in the provisional buildings the appropriate laboratories not only for teaching but also for research. In this way, the academic staff can proceed with their research projects, overcoming in part the usual difficulties of the launching phase of a new School. This approach meant a very strong commitment of the School towards research, since it was necessary to save in every possible way in current expenses, pushing the financial resources to the preparation of the laboratories and the acquisition of equipments. Indeed, the expected financing from the Foundation of Science and Technology will come later, in connection with the new buildings. In 2001, it was possible through internal savings and allocation mechanisms to invest about 1.5 million Euros in computers and laboratory equipments for teaching and research.

Table 2 — Postgraduation Programmes in 2001

Course Title and Dates	Coordinator(s)	Invited Tutor(s)	Course Site(s)	Participants number
From Cell Cycle to Cancer May, 14-25	Week 1 Claudio E. Sunkel IBMC, UP, Portugal	Claudio E. Sunkel IBMC, UP, Portugal	Health Sciences School and Department of Biology, University of Minho, Braga	13
	Week 2 Fernando C. Schmitt IPATIMUP, Portugal	Fernando C. Schmitt IPATIMUP, Portugal Beatriz Carvalho IPATIMUP, Portugal Céu Figueiredo IPATIMUP, Portugal José Carlos Machado IPATIMUP, Portugal José Costa Yale University, USA Luis Filipe Santos-Silva IPATIMUP, Portugal Manuel Sobrinho-Simões IPATIMUP, Portugal Paula Soares IPATIMUP, Portugal Raquel Seruca IPATIMUP, Portugal	IPATIMUP, Porto Institute of Molecular Pathology and Immunology, Porto University	22
Cytometry: Applications in Cellular Biology and Medicine Jun 25-29	Michael G. Ormerod , U.K. John Lawry Institute for Cancer Studies U.K. Filipe Sansonetty IPATIMUP, Portugal Manuela Côrte-Real Dept. of Biology, UM, Portugal	Michael G. Ormerod UK John Lawry Institute for Cancer Studies, U.K. Júlia Almeida Univ. de Salamanca, Spain. Filipe Sansonetty ICVS-ECS, UM, Portugal Maria do Céu Monteiro IPSN, Portugal Maria José Gonçalves ISCSN, Portugal Manuela Côrte-Real Dept. of Biology, UM, Portugal Maria João Sousa Dept. of Biology, UM, Portugal Paula Ludovico Dept. of Biology, UM, Portugal Fernando Rodrigues Dept. of Biology, UM, Portugal	Department of Biology, University of Minho, Braga	37
Analysis of Biological Sequences: Introduction to Bioinformatics July 9-13	Cândida Lucas Dept. of Biology, UM, Portugal	David Philip Judge Univ. of Cambridge, UK Philip Cunningham King's College, UK Pedro Fernandes Gulbenkian Inst. for Science, Portugal Margarida Casal Dept. of Biology, UM, Portugal Raquel Andrade Dept. of Biology, UM, Portugal Sandra Paiva Dept. of Biology, UM, Portugal	Health Sciences School, Computing Centre and Department of Biology, University of Minho, Braga	25
DNA Sequence Analysis July 23-27	Cândida Lucas Dept. of Biology, UM, Portugal	António Martinho. Paulo Santos Univ. of Coimbra, Portugal Cíntia Alves , Luísa Pereira IPATIMUP, Portugal José Paulo Sampaio , Mário Gadanho , Univ. Nova de Lisboa, Portugal Marivi Carretero Applied Biosystems, Spain	Health Sciences School and Department of Biology, University of Minho, Braga	30
Molecular Biology of Bacterial Pathogenesis July 30-August 04	Jorge Pedrosa , Health Science School, UM, Portugal	Dennis Ohman Medical College of Virginia, USA Donald Taylor , Dartmouth Medical School, USA	Health Sciences School and Department of Biology, Univ. of Minho, Braga	35

<p>Aspiration Cytology from Clinical Applications to Research in Oncology</p> <p>Nov. 28-Dec. 01</p>	<p>Fernando C. Schmitt IPATIMUP, UP, Portugal</p>	<p>Ednéia Tani Karolinska Hospital, Sweden Fernanda Milanezi, IPATIMUP, Portugal Fernando C. Schmitt IPATIMUP, Portugal Filipe Sansonetty ICVS-ECS, UM, Portugal</p>	<p>Health Sciences School, University of Minho, Braga</p>	<p>24</p>
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In this way, it was possible for the members of the academic staff to resume research work, or to move research projects to University of Minho, at the end of 2001 and beginning of 2002.

In accordance with the dates established by the Foundation of Science and Technology, three important proposals were prepared to be submitted for the approval of the Ministry of Science and Technology:

- a pre-proposal and later a formal proposal, for the acceptance of the Life and Health Sciences Research Institute as a research unit financed by the Foundation (the pre-proposal was submitted in January 2002 and the formal proposal will be submitted in April);
- a proposal for the financing of equipments for the research laboratories, aiming at the establishment of "Shared Instruments Facilities" in partnership with related areas in Physics and in Biotechnology (submitted in March 2002).

4.4 Human Resources

The School paid careful attention to the recruitment of academic staff, both in quantitative and qualitative terms.

It was soon realised that the recruitment of scientifically qualified staff was not difficult, since the number of potential candidates is very high. However, we are conscious that the specificities of the medical degree programme at University of Minho may not facilitate the integration of scientists/professors used to more traditional ways. So, recruitment was conducted in a careful way, after explaining in detail how the project is expected to work. All the selected candidates are asked to sign a declaration stating that they "know and accept the special innovative conditions for the operation of the medical degree programme, namely in what concerns: **(i)** the perspective of the programme, as a project to be constructed and developed in a participated way within the School; **(ii)** the student-centred learning process, in which the traditional formal lecturing loses most of its significance; **(iii)** the horizontal integration of the curricular contents and the modular organisation of the curriculum, meaning that the coordination competences traditionally associated with individual subjects are transferred to the coordinators of the curricular areas and modules; **(iv)** the role of the Unit of Medical Education, in terms of support, coordination and monitoring in connection with the pursuit of the educational objectives;

(v) the role of research, as a crucial element for a research-based learning process, and the submission of the research projects to the strategic guidelines and priority areas defined for the Research Institute".

In quantitative terms, the maximum number of full time equivalent (FTE) teaching staff is determined by national rules in connection with the number of students enrolled (ratio 1:6). Special provisions are however adopted during the preparation and launching of a new programme, aiming at recruiting the necessary staff on year in advance regarding student enrolment. Thus, considering the admission of 50 new students each year, the standard number of FTE_s for the first 3 years are:

Year 2001/02	:	17 FTE _s
Year 2002/03	:	25 FTE _s
Year 2003/04	:	33 FTE _s

At present the School has a faculty of 18 members, corresponding to 12.1 FTE_s and counts also with 3 regular collaborators from University of Porto (equivalent to 1.2 FTE_s) and several occasional collaborators. Table 3 in the next page lists the full composition of the regular teaching staff, their qualifications, rank and scientific area.

Regarding non-academic staff, the priorities were to recruit qualified personal for the administrative and technical support of the School and its laboratories and services. Table 4 gives details about the present situation.

The training of the staff is particularly important at this initial phase of the school operation. As referred in point 3.3, the Unit of Medical Education has organised two training actions in 2001, where the School members and some collaborators from other Schools have participated.

4.5 Infrastructures

The necessary infrastructures were developed in three concomitant lines: to complete the planning stage for the new buildings, to prepare the provisional academic area and to organise the provisional laboratory area.

Table 3 — Academic Staff

Name	Qualifications	Rank	Area
Joaquim Pinto Machado	MD, PhD, <i>Agregação</i>	<i>Prof. Catedrático Emeritus</i>	Medicine/Anatomy
Jorge Manuel Pedrosa	PhD	<i>Prof. Auxiliar Exc.</i>	Biochemistry/Immunology
Armando Pinto de Almeida	PhD	<i>Prof. Auxiliar Exc.</i>	Human Biology
Fernando dos S. Rodrigues	MD, PhD	<i>Prof. Auxiliar Exc.</i>	Molecular Physiology/Genetics
Nuno Carvalho de Sousa	MD, PhD	<i>Prof. Auxiliar Exc.</i>	Neuroanatomy
Isabel Palmeirim Esteves	MD, PHD	<i>Prof. Auxiliar Exc.</i>	Developmental Biology
Joana Pacheco Palha	PhD	<i>Prof. Auxiliar Exc.</i>	Biochemistry/Genetics
Alberto Filipe Sansonetty	MD	<i>Prof. Auxiliar Exc.</i>	Functional Cytology
Manuel Costa Rodrigues	MD	<i>Assistente Conv. 50%</i>	Oto-rhino-laryngology
Agostinho R. de Almeida	<i>Licenciado</i>	<i>Monitor</i>	Applied Biology
André Filipe Carvalho	MD	<i>Monitor</i>	Medicine/OFS
Isabel Ribeiro Faria	MD	<i>Monitor</i>	Medicine/OFS
José Alberto Beringuer	MD	<i>Monitor</i>	Medicine/OFS
José Miguel Pêgo	MD	<i>Monitor</i>	Medicine/OFS
Luís Miguel Torrão	MD	<i>Monitor</i>	Medicine/OFS
Sérgio Reis Filho	MD	<i>Monitor</i>	Medicine/Pathology
Sónia Manuela Magalhães	MD	<i>Monitor</i>	Medicine/OFS
Vítor Manuel Moreira	MD	<i>Monitor</i>	Medicine/OFS

Regular Collaborators (Univ. Porto)

Maria Amélia Ferreira	MD, PhD, <i>Agregação</i>	<i>Prof. Catedrática</i>	Morphology
Fernando Carlos Schmitt	MD, PhD	<i>Prof. Auxiliar</i>	Pathology
Jorge Correia Pinto	MD	<i>Assistente</i>	Cardiovascular and Dev. Physiology

OFS - Organic and Functional Systems.

Table 4 — Non-academic Staff

Name	Qualifications	Rank	Service
Teresa Alfonso	PhD	<i>Assessoria</i>	UEM
Magda Carlos	<i>Licenciatura</i>	<i>Técnico Superior Laboratório</i>	Laboratories
Cláudia Barreira	<i>Licenciatura</i>	<i>Técnico Superior Administrativo</i>	Secretariat PG & Research
Jorge Freitas	Bachelor	<i>Especialista de Informática Estagiário</i>	ICT/UEM
Domingos Dias	Secondary Education	<i>Técnico de Informática Adjunto</i>	ICT/UEM
Olga Miranda	Secondary Education	<i>Assistente Administrativo</i>	Secretariat
Helena Nascimento	Secondary Education	<i>Assistente Administrativo</i>	Secretariat
Ana Martins	Secondary Education	<i>Assistente Administrativo (Colab.)</i>	UEM
João Malheiro	Basic Education	<i>Auxiliar Técnico</i>	Laboratories

Jorge Paula	Basic Education	<i>Auxiliar Administrativo</i>	Laboratories
Celina Barros	Basic Education	<i>Auxiliar de Manutenção</i>	Laboratories

UEM - Unit of Medical Education **ICT** - Information and Communication Technologies

Regarding the new buildings, the Architects have worked on the construction plans, which are now ready. The call for tenders for the construction phase will follow soon.

The provisional spaces, to operate until the end of 2003, are organised in two different buildings, as explained next (drawings in appendix):

Pedagogical Complex II

In the Pedagogic Complex II of the Gualtar Campus, part of the third floor is occupied by the Health Sciences School. This area, with a floor space of about 1 000 m², comprises self-learning and tutorial classrooms (1), seminar rooms (2) and traditional classrooms (3). In addition, administrative offices and facilities (4), the scientific committee boardroom and school library for both students and instructors (5) and the medical education department (6) are also located in the same floor. The Pedagogic Complex II also provides two more open spaces concept locations for the use of the teaching staff (7), in a collective "open-space" concept.

Both tutorial classrooms presently available have a capacity for 26 students, with one computer per student connected to the internet and the intranet.

Each classroom is equipped with a multimedia projection system, 3 worktables to accommodate groups of up to nine students and one bookcase per group where the pedagogical materials for the academic year are permanently available.

Laboratory facilities

The laboratory facilities of the Health Sciences School/Life and Health Sciences Research Institute occupy an area of 1 500m² and are located about 100 meters from the classrooms of Pedagogical Complex II. The Health Sciences School will use these facilities for the next two years (before and during the construction of the Medical School Building). In the future they will be used as a Post Graduation Centre, servicing several Schools of the University.

The laboratory facilities are divided in two different areas: the academic area and the area dedicated to research, post graduate activities and specialised community services.

Pedagogical Complex II

(Diagram in a separate file)

Lab. Facilities

(Diagram in a separate file)

Academic area

The academic area is composed of four distinct laboratories, as well as of central support facilities. Based on the concept of the integrated learning system, the four distinct laboratorial areas are: Anatomy (1), Biochemistry and Molecular Biology (2), Physiology and Clinical Skills (3) and Histology and Cytology (4) with a accommodation for 26 students each.

The central support facilities include the student locker area (5), a decontamination and material cleaning room (6), a sterilization room (7), a solutions preparation and stock reagents room (8) and, finally, a postgraduation secretariat room (9). All the rooms and the corridors of the academic area provide access to Internet and Intranet using cable/wireless network and all teaching laboratories include a multimedia projection system.

Area for research, postgraduate studies and specialised services

The medical students may have access to the research area to perform specific techniques or to carry on the "Optional Project" under the supervision of the project instructor.

The area for research, for postgraduate studies and for specialised community services is organised into different, functionally specific laboratories, concerning the following areas: Molecular Microbiology (10), Molecular and Cell Biology (11), Cell Culture (12), Microscopy (13), Flow Cytometry (14), Histology and Cytology (15) and, finally, Toxicology and Development (16). These laboratories are shared by both researchers and post graduate students of the Life and Health Sciences Research Institute. Each research group has a 'home base' in the laboratory most closely related to its specialisation.

Furthermore, there are several support rooms: a centrifuge and ultra freezer room (17), an anatomy cadaver preparation room (18), a dark room (19), an embryo explants research room (20), a storage room (21), a 4° C temperature controlled room (22), a 37° C temperature controlled room (23) and a small area for animal experimentation. This animal facility comprises two rooms: a level three security negative pressure area (24) for animal models of infection, and a positive pressure clean area (25) for surgery in animal models as well as for animal models of behaviour studies.

In addition to these support rooms, the laboratory facilities also include two medical consultation offices (26) that could be used to collect materials (or information)

related to community specialised services or be used by medical students in their training of clinical interviews.

There is also a seminar room (27) for internal meetings, as well as for postgraduate seminars. In the research area, it is also possible to access the Internet and Intranet using a cable or wireless network.

5. CONCLUSIONS

5.1 Analytical summary

Looking back at the strategies for 2001 and the corresponding activities, the first conclusions to draw is that all the main objectives were achieved and the enthusiasm and commitment of all School members is one of its principal assets.

Other strengths relate, for example, to the qualification and youth of the staff, the easy of new recruitments, the quality of the students, the standards of the working spaces and equipments, the innovative coordination procedures and the good relations with the Health Services.

The main weakness has to do with the necessary innovation in the clinical training of the students within the Health Services. Although some good links have been established and the enthusiasm of a group of medical doctors, including the Clinical Directors at the Nuclear Hospital, is also great, we are aware that the legal framework and the prevailing traditions are liable to raise some difficulties. This is a point that will deserve a very special attention and care from the School bodies.

The delays in the construction of the new Hospital in Braga also cause some concern. The Government is reaffirming the political priority for this project, but the recent changes in the policies to finance the new Hospital through a public-private partnership bring the need for very careful specifications regarding the support to medical training and will inevitably mean some extra delays.

One other problem is related to the amount of work to prepare all the courseware in the different curricular areas, in parallel to the student-centred approach which is highly demanding on the academic staff. The lack of experience from both teachers and students means extra work at this initial phase and all the personal is overstretched. It

may be necessary, in key areas, to hire some extra staff on a temporary basis, possibly within cooperation agreements with other Schools, to help with the overload connected to the planning stage.

An important window of opportunities was opened by the Foundation of Science and Technology, relating to a new programme to reinforce research infrastructures. The School of Health Sciences, in cooperation with the School of Sciences and Engineering, is presenting an ambitious proposal that will greatly contribute to the acquisition of costly equipments for the research laboratories. Another opportunity is associated with the possibility to get some grants to attract young researchers for doctoral work and so improving the critical mass for research. There are also good expectations to find some post-doctoral fellowships.

To finish this brief SWOT analysis, a reference must be made to a threat which is inherent to all innovative projects: the danger to drift into just one more traditional project. To counteract this latent threat, we count on previous experience of University of Minho in accomplishing innovative educational projects, on the institutional support from the Rector, on strong leadership at all levels within the School and on a permanent monitoring of the project. The role of the External Advisory Committee is essential to this respect.

5.2 Looking into 2002

The dynamics of the School operation is well established and the specific objectives for 2002 are similar to these referred in the present report, with the aim to continue and reinforce the School facilities and projects. The main policies for 2002 are, consequently:

- to finish the preparation of the second curricular year of the undergraduate programme and to start the preparation of the third year;
- to admit a new batch of 50 students in October;
- to proceed with the postgraduation programme;
- to reinforce research, by stabilising the conditions for a steady participation of the academic staff in research projects and by attracting new researchers on fellowship schemes;
- to proceed with the constructions for the new buildings and to prepare extra provisional spaces;

- to recruit and train new staff members;
- to proceed with the contacts and to formalise the links with Health Services;
- to reinforce the operation of the governing bodies, paying special attention to the monitoring and improvement of quality.

5.3 The recommendations from the External Advisory Committee

The recommendations included in the report from the first visit of the External Advisory Committee (EAC) last October will have impact mainly during 2002 and consequently will be dealt with in detail in next year's report. It is possible, however, to advance already some considerations, since most of the recommendations are quite in tune with the principles and philosophy stated for our project from the beginning.

General observations

Two points raised under general observations, with underlying recommendations or advises, deserve a reference:

a) Integration of staff and students into the goals and objectives of the new curriculum: this has been a basic specification of the project since its very beginning. As said before, at the recruiting stage detailed information is given to the applicants and the selected candidates must sign a declaration confirming their knowledge and acceptance of the specificities of the project, explicitly mentioned. Also, all the staff had already to submit to two training actions coordinated by an expert with great experience on medical education. All the participants found the training to be stimulating and of great interest.

As for the students, the first module was obviously to introduce them thoroughly to the University, the programme and the specific learning methodologies.

b) Pedagogical matters: the duration for the teaching modules is a matter of some concern, because it is necessary to find the appropriate balance between the consistency of the learning process and the absence of a culture of self-learning in the students. At the end of the academic year, a specific report on the experience so far will be produced. This is a critical subject, where imported models must be avoided without proper consideration and experimentation.

Organisation and administration of the curriculum

It is true that an administrative structure to manage the curriculum is not customary in Portugal, but that is not the case at University of Minho. Indeed, the existence of a curricular committee is common practice in all degree programmes at this University, which is reinforced at the School of Health Sciences.

Appointment of teaching staff

It is reassuring to perceive that the EAC strongly supports the School views on this subject and the ideas expressed in the documents prepared for the creation of the School.

Recruitment of teaching staff

The recruitment of part-time clinical teachers is already in progress with good results. Very soon, the coordinators for the areas of Community Medicine and Clinical Medicine will be appointed.

Clinical teachers

The remarks from EAC are so obvious that we can not understand the meaning behind the sentence "the EAC was concerned about the policy for recruitment of clinical teachers as lecturers/professors". Indeed, there is a clear policy in the School proposals, which is innovative in Portugal and was based precisely on the same principles as expressed in the EAC's considerations. May be what is meant is concern with the possible difficulties in taking such policies into practice, due to traditions and to the legal framework, but University of Minho is in a particularly good position in this matter, as referred in point 2.5. The good relations with authorities in the National Health System and the results already obtained in relation to the cooperation with the health services are a good omen on this respect.

The Educational Unit

It is true that the Unit of Medical Education is a "major asset", deserving all the institutional support.

Integration of basic and clinical subjects in the curriculum

The integration of the social sciences in the medical curriculum is one of the innovative aspects of the design of the undergraduate programme. There will be a strong emphasis on communication, not as an autonomous subject but as an attitude to be acquired and practised through the learning methodologies in use.

The introduction of clinical aspects early in the first year is a reality, but once again not necessarily as an autonomous subject. Indeed, the horizontal integration of the curriculum potentiates strong relations between the curricular development of the area of Functional and Organic Systems and clinical aspects.

Core and options

Three different questions are raised here. First, regarding the project modules, the interpretation of the EAC coincides exactly with the ideas advanced by the School. The second question, related to the duration of the modules, has already been commented. Finally, the system of assessment is highly innovative and in line with the learning objectives, i.e., it complies with the C³ approach (contents, capacities and capabilities) for graduate skills.

Data base on entrants

In the self assessment of all its degree programmes, University of Minho is following up its graduates to check the effectiveness of teaching in a number of ways. The suggestion of the EAC fits into these procedures, but goes further. The School is very interested in following this track and make full use of the potential inherent to the work of the Unity of Medical Education. An important step into this direction will be given during the next visit of EAC, since Prof. Gonnella has agreed to give a Seminar on the objectives, methodologies and results so far regarding a similar project he is running at his University. We hope to be able to launch the project at this School during the current year.

Student participation

The student opinion is systematically obtained via different paths, both formal and informal.

First, the students are strongly represented in the Course Committee (in parity with the academic staff). They are also represented in the School Council (both undergraduate and postgraduation students) and in the University Academic Council and the University Senate.

Also, the Unit of Medical Education follows very closely and collects the students opinion. In addition, the close contacts of the students with the professors allows for a direct and efficient way to know and feel the students thoughts on the programme.

Future meetings of the EAC

The EAC, at each meeting, should decide on the dates for the following meeting.

Allocation of a family to each student

The practical setting for this component of the curriculum is being prepared, based on our original idea, on some experience already acquired at University of Porto and, obviously, on the suggestions from the EAC.

This is, again, an area highly contextualised, where it is necessary to proceed by steps and "feel" the way. It will involve the health system in an unusual manner, but the first contacts are encourageable. A flexible approach must be kept in mind. Consequently, we strongly believe that, at this stage, nothing should be considered as totally adequate or inadequate regarding possible approaches and procedures.

The School of Health Sciences will put all the necessary efforts, good will and common sense in this innovative area.

A final comment

It is highly reassuring and impelling to verify that the innovative ideas advanced since long ago by the University of Minho in relation to new attitudes and methods in medical education, which are finally being put into practice, are so strongly adopted by the EAC. This raises still higher our expectations that the commitment and enthusiasm of all School members, guided by the advises from the EAC, will catapult the School of Health Sciences in a successful pathway.

A final word is due to recognise the enormous effort made by all the School members who contributed to the preparation of this report, at a particular time of intensive planning and teaching activities, together with the overwhelming task of producing a comprehensive proposal for the creation and financing of the Research Institute. To all of them, my warmest thanks.

Sérgio Machado dos Santos
President of the Steering Committee
March.2002