

**INTERNATIONAL DOCTORATE PROGRAM IN QUANTITATIVE DIAGNOSTIC
PATHOLOGY**

Piero TOSI

Institute of Pathological Anatomy and Histology
University of Siena, Via delle Scotte, 53100 Siena,
Italy

ABSTRACT

Plans and background for an international doctorate program in quantitative diagnostic pathology are described.

Key words: quantitative diagnostic pathology, doctorate program.

PREMISE

Bearing in mind the benefits to be drawn from a) international didactic and scientific research collaboration programs and b) exchanges between professors (belonging to university teaching bodies) and students (enrolled in international didactic programs), it would be advantageous to set up an international doctorate program in Diagnostic Quantitative Pathology under the support of the Committee on Diagnostic Quantitative Pathology, once the working group of the European Society of Pathology.

STEPS TO BE TAKEN

Initially the contracting universities should institute their own doctorate and undertake financial expenses connected to that doctorate program. The doctorate should then be unified and extended internationally.

Meetings between the Rectors of the various participating universities should then be organized in order to discuss a) the curriculum b) the examination board c) funding d) mutual and official acknowledgement of the doctorate, title and rights d) the potential collaborating universities.

PRESENT SITUATION

The doctoral theses in different countries differ slightly. The differences between Italy and Holland seem minimal and should not form a major obstacle. On the other hand, the British curriculum for a MD doctoral thesis is completely incompatible with the Italian.

However, this is not true for the British Ph.D thesis which would thus give a British candidate the possibility of participate in the Eurodoctorate. The same is possible for a German candidate. In Italy, the *Doctor in Research* institution was established in 1985 (e.g. in rheumatic diseases, oncology, and so on). There are no strict rules and the number can be expanded. If a new research doctorate is accepted, financial support is guaranteed for the candidate by the Ministry of Education. It is a fulltime job, lasts for 4 years, extra financial support is available (14 million Italian lire/year in 1991; plus a maximum of 9 million lire/year for travelling expenses and congress visits); 1 million lire is approx. DM 1400, British £450.00, Hfl 1500.

In 1989, a Diagnostic Quantitative Pathology (DQP) doctorate was established and coordinated by Prof. Tosi from Siena. Two DQP places have been assigned so far by the Ministry of Education. The council of teachers (Prof. Tosi, Siena; Prof. Mariuzzi, Ancona; Prof. Olivetti, Parma; Prof. Anversa, New York) guides the study and forms the examination board.

In Holland basic training lasts 5 years after which the candidate is awarded the title "doctorandus". A doctorate study can be done by any "doctorandus". About 1% of all the "doctorandi" do a doctorate; candidates for a doctorate study are usually selected from the best medical students with an obvious research mentality. Doctorate education is supervised by a professor. The contents are not specified; and may vary from one Faculty to another and even within the same school. Writing a Ph.D. thesis is usually a full-time job lasting at least three years. At the end there is a formal public examination. The examination committee consists of the promotor and 5 independent members. If the doctorandus passes his Ph.D. examination, the promotor and candidate sign a diploma. He is then formally a "doctor" but neither the doctor's title, nor the suffix have any official value. However a doctor's title is very prestigious and an academic career without a doctorate is virtually impossible. The Ph.D. training may be done outside the university although this is not usual and financial support may come from within the university or from other sources.

In the U.K. a Ph.D. thesis has the following features: it is supervised by a professor, can be done at any university and by a non-medically trained person, has an examination board and the candidate can spend a maximum of 25% of his thesis education time abroad.

In Germany after medical training a candidate may do a doctoral thesis. He has to show the ability to work independently in a special field of medical research. The subject has to be discussed with a professor or a Ph.D. of the medical school where the candidate intends to acquire the doctoral degree. Any doctor with a provisional or a full graduation can acquire the doctoral degree, provided that the doctoral thesis is accepted. A doctoral thesis is a prerequisite for a Ph.D. thesis. The decision concerning the admission for a Ph.D. thesis is made by the medical school itself (Senat of Professors and Ph.Ds). The subject must pertain to a scientific field which is represented at the medical school. The procedure for reaching the Ph.D thesis

is similar to the doctoral thesis. Other European countries have similar procedures.

PROPOSALS FOR THE INTERNATIONAL DOCTORATE PROGRAM IN DIAGNOSTIC QUANTITATIVE PATHOLOGY

The teaching body of the doctorate program should be made up of professors belonging to the participating universities. As the quantization of pathological findings has been a problem in the medical field for many years, the research program in quantitative diagnostic pathology should aim to train researchers who are involved in the quantization of lesions in the field of pathological anatomy. Morphometric methods are to be applied with the aim of making diagnosis and finding useful parameters for prognosis.

The Research Doctorate Program in Quantitative Diagnostic Pathology, lasting four years, could be organised along the following lines:

1st Year: Definition of subject, title and articles. Planning and execution of morphometrical studies. Analytical geometry and mathematical morphology. Computers studies. PC computers. Morphometrical language and symbolism. Organization of a morphometrical laboratory. Basic knowledge of equipment used for interactive and automatic measurements. Study of methods for random sampling and organization of tissues and objects. Minimum sampling. Collection of data. Statistical principles for data classification. one month abroad. First article.

2nd Year: Physical optics. Principles of image processing analysis. Study of errors in image analysis. Factors influencing results. Densitometry. Studies and its applications. Two months abroad. Second article.

3rd Year: Basic knowledge for creating expert systems in pathology. Creation of elementary AI (expert systems - DBMS; image; storage + retrieval; voice recognition; text retrieval; automatic reporter), 3D; CLSM, Cytofluorimetry. Three months abroad. Third and fourth article.

4th Year: 3-6 months abroad. 5th article; PhD thesis writing. Examination.