

mutual recognition of qualifications for professional purposes. While within the terms of the General Directive no effort is made to harmonise the content and duration of professional training across the Member States, it is considered likely that one of the practical effects of the Directive will be to stimulate a convergence in the training for particular professions. The commission will also endorse efforts developed by representative European professional organisations who work towards that goal.

It is evident that a broad field of action offers itself here to the European societies actively engaged in the field of cancer care. If they want to upgrade the standards of professional practice within the whole of the ever widening "European Space" it will be up to them to develop adequate initiatives.

In the next issue of this special EJC section, some initiatives

taken by the European Society for Therapeutic Radiology and Oncology (ESTRO) will be examined indicating how the wide range of possibilities offered by the European educational programmes can be used in this context.

Memorandum on Higher Education in the European Community, Communication from the Commission to the Council on 5 November 1991 (COM (91) 349 final).

Commission of the European Communities, Annual report 1991, ERASMUS Programme, SEC (92) 796 final.

Commission of the European Communities, Proposal for a Council Decision adopting a Cooperation Scheme for Higher Education (1994-1998), COM (92) 407 final.

Antoni Kuklinsky, keynote speech at TEMPUS Conference on "The Role of Higher Education in the Reform Processes in Central and Eastern Europe, Brussels 1 & 2 October 1992.

Eur J Cancer, Vol. 29A, No. 11, p. 1648, 1993.
Printed in Great Britain

0964-1947/93 \$6.00 + 0.00
Pergamon Press Ltd

Molecular Biology for Clinicians

MOLECULAR BIOLOGY is the key to understanding cancer today and to mastering all the new techniques available in diagnosis, prognosis and soon, treatment.

Sixty young clinicians spent 3 days studying the basics of the cell cycle and the myriad of steps and controls involved in cancer development and progression. The course, *An Introduction to the Molecular Biology of Cancer for Clinicians*, was the first of its kind run by the European School of Oncology.

"We believe that advances in oncology will not be empirical", said Prof. Alan Horwich, of the Royal Marsden Hospital and Institute of Cancer Research in London, chairman of the ESO course. "They're likely to be determined from an increased understanding of carcinogenesis, the basis of which is the molecular genetics of cancer".

"The structure of the meeting was designed to go all the way from an introductory phase, defining techniques and applications, to looking at the potential uses in oncology, which are not yet fully exploited," he added.

First, the techniques used to view the biological processes that govern cell behaviour were explained, followed by application of molecular techniques to monitor therapeutic responses to radiation and chemotherapy.

All the teaching faculty were clinicians. "Rather than going for teachers who are basic scientists, we've gone for those with one foot in the clinical camp, who can communicate the relevance at a level clinicians will understand," Horwich said.

Instructors attempted to provide students with solid ground for understanding the complex issues appearing today in medical journals and at cancer congresses. Cell cycle regulation, apoptosis, programmed cell death, DNA repair, growth regulation, viruses, and biology of radiation and multidrug resistance were all laid out in detail.

In the cell cycle, instructors explained the relationship between the family of cyclins and the cyclin-dependent kinases (Cdc2) responsible for triggering and halting mitosis. Researchers are trying to determine why cancer cells continue to cycle under conditions in which normal cells do not, showing their independence of growth regulatory processes.

Illustrating how fast the field is moving, Dr. Jonas Bergh from Uppsala University, Sweden, said there are 70 oncogenes described today, with a new oncogene named every 3 weeks.

A strong focus was the p53 gene, called the 'guardian of the genome' because it is present in normal cells and mutations of this gene are known to occur in a growing number of tumours. In breast cancer, p53 has been found to be useful prognostically. Another gene in which clinical usefulness has been shown is N-myc, according to Bergh. Stronger amplification of the N-myc gene occurs with later stages of human neuroblastoma.

Horwich explained what is known about the role of viruses in cancer causation, such as the Epstein-Barr virus, which affects 90% of the world's population; papilloma viruses, linked epidemiologically with certain cancers (cervical, vulvar, laryngeal papillomas); and HTLV-1 and its connection with adult T-cell leukaemia.

Other instructors went through the molecular techniques being used to determine which genes are important in oncogenesis and mapped the search for more specific DNA-damaging drugs and efforts to evade chemotherapy resistance in cancer cells.

The course ended by covering the molecular genetics of colorectal, breast and lung cancers, as well as non-Hodgkin lymphomas. Bergh concluded that human SCLC and non-SCLC is characterised by an inactivation of tumour suppressor genes, activation of oncogenes, and aberrant expression of growth factors, and that he expects the precise sequence and timing of these changes to be answered within the coming decade using molecular biological techniques.

The European School of Oncology holds courses throughout Europe for oncologists, cancer nurses, and other medical professionals to disseminate up-to-date information on cancer cause, diagnosis, and treatment. Courses focus on specific cancer sites, as well as treatments, technologies, and psychosocial issues.

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