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Education and Training

Undergraduate and postgraduate teaching programme in basic nuclear medical sciences in Uruguay

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Abstract

The development of an integrated teaching and research programme is described which is based upon a modular structure. A number of different courses, for differing professional groups, may then be given by juxtaposition of the modalities required thus enabling optimal use to be made of the limited facilities available. The importance of "on the spot" help from outside sources is emphasised with particular reference to the application of expertise to local problems with the use of local resources.

Key words: radiopharmacy, radiopharmacology, education, training, HPLC

Introduction

At the National University of Uruguay the teaching of the various sciences which form the basis of Nuclear Medicine has been developed as a collaborative activity involving the Faculty of Chemistry, the Nuclear Medicine Centre and the Centre for Nuclear Research. Support to these groups was given by foreign experts, in a number of subjects, who where seconded by the International Atomic Energy Agency for short term assignments.
Integrated undergraduate and postgraduate courses have been implemented within the structure of existing degree courses and cover radiochemistry, radiopharmacy and radiopharmacology. With these as a foundation the program is being extended to include specialised courses for graduates working in hospitals and industry.

International Atomic Energy Agency

The IAEA has supported the development of this program in a number of essential ways:

1. Visiting Experts

A number of international experts in particular fields were seconded to one or more of the participating departments on short term contracts to support the academic staff. The functions involved seminars for the staff on new developments, advising on the structure and content of theoretical and practical programmes and assisting in the setting up and evaluation of research projects.
Experts were obtained on the following topics:

a) Radiopharmacology/Nuclear Medicine
b) Application of Nuclear Medicine to Pharmaceutical Research

c) Technetium chemistry
d) Autoradiography.

The effectiveness of this aspect of the programme was greatly enhanced by the fact that the experts worked with the staff under local conditions so that they obtained first hand experience of the facilities available. In this way a realistic programme could be developed which made optimal use of what was already available and therefore did not stagnate due to lack of materials or apparatus.

2. Fellowships

By virtue of travel fellowships a number of academic staff members were able to visit foreign centre to gain practical experience of specific techniques such as HPLC prior to their implementation in Montevideo.

3. Research and Development Grants

The Agency also sponsored a number of research projects in basic research and on topics of relevance to the local community. This greatly enhanced the opportunities for the staff to carry out original work and provided a source experiments for the practical sessions of the courses.

Faculty of Chemistry

The Faculty of Chemistry is also responsible for the education of pharmaceutical chemists and in the Department of Radiochemistry the following courses are offered:

1. Undergraduate

4th year of the MSc course as an optional topic. The course consists of two parts which are taught separately in each of two semesters.
Radiochemistry 1. 42 hours of theory and 56 hours of practical. Topics are radiochemistry, applications to analytical chemistry and Technetium chemistry.
Radiochemistry 2. 112 hours research project, mainly on Technetium chemistry due to restrictions in the availability of other nuclides.

2. Postgraduate

Entrants to postgraduate courses are graduate pharmaceutical chemists with a minimum of five years of undergraduate study. This course is part of the requirements for the higher Degree of Doctor in Pharmaceutical Chemistry.
The topics available are:

Applied Radiochemistry
Biochemistry (Clinical Pharmacy)
Biopharmacy
Pharmaceutical Technology.

The Applied Radiochemistry course consists of 36 hours of practical and 27 hours of theory and covers chemistry, statistics, radiation detection, radiation protection, external and internal dosimetry, nuclear reactions and the production and labelling of radioactive substances.
The further treatment of Biochemistry, Biopharmacy and Pharmaceutical Technology involves 20 hours of practical and 15 hours of theory in each case.

3. Extramural Courses

On the basis provided by the formal courses it has been possible to organise a regional international postgraduate training course on the Production and Quality Control of Radiopharmaceuticals. On this course the teaching staff were supplemented by an international panel of lectures with participants from the majority of Latin American countries. The IAEA also provided financial support for this venture.

Nuclear Medicine Centre

The Nuclear Medicine Centre of the University Hospital provides additional education facilities for the training of clinical specialists in Nuclear Medicine (including many foreign graduates) and also for radioisotope technicians.

Nuclear Research Centre

The Nuclear Research Centre offers additional courses in Basic Nuclear Technology for technicians, nuclear medical specialists, Veterinarians, chemists, engineers and agronomists.

Conclusions

By intelligent use of outside experts and the optimum pooling of local resources it has been possible to set up an effective education programme which is closely related to local needs and which is currently being extended to cover the specialised requirements of local industry. The IAEA has played a positive role in the implementation of this programme.

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Congress Report

10. Nuklear-Symposium Hannover „Pathophysiologie und PET"

4.–5. November 1988 an der Medizinischen Hochschule Hannover, BRD

Veranstalter waren im Programmheft ausgewiesen:

- Abteilung Nuklearmedizin und spezielle Biophysik (Prof. Hundeshagen) sowie Abteilung Nuklearmeßtechnik und Strahlenschutz (Prof. Jordan) von der Medizinischen Hochschule Hannover,
- Arbeitsgemeinschaft PET der Deutschen Gesellschaft für Nuklearmedizin,
- Deutsche Gesellschaft für Nuklearmedizin,
- Berufsverband Deutscher Nuklearmediziner.

Die Veranstaltung, an der schätzungsweise 150 Mediziner, Radiochemiker, Nuklearphysiker und Naturwissenschaftler anderer Disziplinen teilnahmen, hatte durch die (z.T. eingeladenen) Vortragenden aus führenden PET-Zentren Belgiens, der Niederlande, Großbritanniens, Kanadas, Frankreichs und den USA einen ausgeprägt internationalen Charakter.
Das Symposium wurde ergänzt durch eine Industrieausstellung.
Das Grußwort der Veranstalter sowie die Eröffnungsansprache durch den niedersächsischen Minister für Wissenschaft und Kunst, Dr. *Cassens*, umreißen die Zielstellung des Symposiums:
PET eröffnet als räumlich hochauflösendes quantitatives Meßverfahren mit physiologischen Tracern eine neue Art diagnostischer Möglichkeiten, rückt deshalb immer mehr in den Bereich klinischen Interesses. Viele Gruppen in der BRD engagieren sich für die Etablierung als diagnostische Methode.