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21118

Course on "Applications of Proteins in Biotechnology and Pharmaceutical Production. Characterization of the Compounds".

FINAL REPORT

The course was held from March 13 to 24, 1995 and we consider that all of the aims were successfully achieved.

The Latinamerican participants arrived to Havana between March 11 and 12.

Each participant received a pamphlet containing the practical experiments with a brief theoretical introduction and the expected results for each experiment (chromatograms, spectra, etc.).

In the case of experiments for manual Edman sequencing, we practiced two different methodologies: double coupling (described in the pamphlet) and the known Dansyl chloride method, implemented and guided by Dr. A. Aitken.

A leaflet, describing the latter methodology was supplied to the participants and is also appended here.

The 15 participants were placed into three groups to allow the individual work during the practical experiments and to achieve a better communication with the team of professors, researchers and technicians.

Practical work was very hard and in some days, the experiments extended up to 10 pm.

Conferences:

- 1-Overview of protein chemistry (March 13, 14:30)
- 2-Protein purification: chromatography (March 14, 11:30)
- 3-Electrophoresis and techniques for reverse staining and double staining (March 15, 10:00)
- 4-Bidimensional electrophoresis (March 15, 10:00)
- 5-Aminoacid analysis (March 16, 8:30)
- 6-Sample preparation for protein sequencing (March 17, 15:30)
- 7-Protein sequencing (March 20, 11:00)
- 8-Mass spectrometry of proteins (March 21, 15:00)
- 9-Post-translational modifications of proteins (March 22, 8:30)
- 10-Techniques for glycoprotein structure analysis (March 23, 8:30)
- 11-Protein sequencing by linked-scan (given to each group at the Lab)

On Friday 24 a Round Table was held for a detailed discussion of applications of all of these techniques to quality control and validation aspects in the production of recombinant proteins.

Round Table: "Protein chemistry in pharmaceutical and biotechnological industries" (March 24, 8:30)

Themes presented:

- Validation of chromatographic process.
- Validation of analytical methods.

- Protein chemistry in quality control.
 - Mass spectrometry in quality control of recombinant proteins.
 - Documents for sanitary registration: aspects from protein chemistry.
 - General discussion.
- Finally, results obtained from an anonymous survey were commented.
On Sunday 19, we organized a tour to characteristic places.

Participants:

Invited Professor: Dr. Alastair Aitken, National Institute for Medical Research, MRC, London.

- 1-Maria Isabel Soto Cruz. Fac. Estudios Superiores, Univ. Nacional Autónoma de México
- 2-Marcelo Damario Gomes, Inst. Butantan, Brasil
- 3-Marta Cecilia del C. Bunster Ballochi, Univ. de Concepción, Chile
- 4-Eduardo Patricio Mayorga LLerena, Fac. de Ciencias Químicas, Univ. Central del Ecuador.
- 5-Maria Mercedes Bravo Hernández, Inst. Nacional de Cancerología, Colombia
- 6-Victor Hugo Villacrés Ortiz, Instituto de Ciencias Naturales, Ecuador
- 7-Paula Maria Toninc, Univ. Central de Venezuela
- 8-Fanny Guzmán Quimbayo, Inst. de Inmunología, Hosp. San Juan de Dios
- 9-Enrique García Hernández, Depto. de Química Univ. Autónoma Metropolitana, México
- 10-Silvia Irene Medeot, Inst. Virología, Fac. Ciencias Médicas, Univ. Nacional de Córdoba, Argentina
- 11-Eloy Daniel Alvarez Guerra, Centro de Biofísica Médica, Santiago de Cuba, Cuba
- 12-Beatriz García, Fac. de Biología, Univ. de La Habana, Cuba
- 13-Dina Tleugabulova, Centro Nacional de Biopreparados, La Habana, Cuba
- 14-Minerva Fernández Mallo, Centro de Inmunología Molecular, La Habana, Cuba
- 15-Pedro Rogelio Estévez Fernández, Instituto Finlay, La Habana, Cuba

Participation by country:

Cuba	5
México	2
Ecuador	2
Colombia	2
Brazil	1
Argentina	1
Chile	1
Venezuela	1

Recommendations:

An anonymous survey among participants was carried out in order to know about the quality and utility of the conferences, organization of the course, practical classes and housing.

Related to housing and meals, all the participants coincided that they were very good. They also had the same opinion about conferences and practical classes.

Some aspects were underlined as very useful, like:

1-Information received on bidimensional electrophoresis, because of its relatively low price and high resolution, allowing its introduction in their institutes.

2-Information received on manual sequencing, because it allows cheaper N-terminal sequencing of peptides and proteins, with possibilities of introduction in their institutes.

3-Integrity of the course, because it allowed a global vision on the most modern techniques in protein micro-characterization.

4-Information received on real examples of characterization and quality control of recombinant proteins.

Some other aspects should be considered or improved to further courses, like:

1-To perform all the conferences early in the morning.

2-To reduce the time for some experimental practices or to extend the course.

3- The inclusion of peptide synthesis.

The team of professors, who participates in the course, agree with these opinions and recommendations and only would like to add three other considerations:

1-The course was useful, not only in the educational and scientific aspects, but also because of the possibilities it has open with different latinamerican institutions for real cooperation. Particularly, our division agreed to open collaboration projects with UAM (Mexico), University of Concepcion (Chile), Central University of Ecuador (Ecuador) and Butantan Institute (Brazil). Other groups in our center were also interested in collaborations with participants of Venezuela, Argentina and Colombia.

2-This course about characterization of proteins was well received for the scientific community of the area, therefore it should be held again in 1996 or 1997. Applicants for this course were three times the available capacities.

3-It was almost unanimous within participants the necessity of their institutions to attend courses similar to this one, concerning synthesis, analysis, characterization and applications of peptides. Therefore they encourage us to organize a course about peptides, considering the results that we have in this field.

In that sense, we recommend and, at the same time, we offered our disposition to organize a course on "peptide: chemistry and applications", for 1996 or 1997.

Expenses covered by the Project

1-Lodging and Meals: 14 days

Invited professor: 800 USD

10 Latinamerican participants: 35 USD/daily 4900

Subtotal 5700 USD

2-Materials and Reagents:

Chromatography columns (analytical and microbore), HPLC microanalytical UV cell, mini electrophoresis cell, electrophoresis reagents and accesories, sequencing grade reagents and enzymes, spare parts for automatic sequencer and general reagents, solvents and consumables

Subtotal 7500* USD.

3-Printing materials

Subtotal 1350 USD

4-Transportation

Transportation from aeroport, and to social activity

Subtotal 450 USD

TOTAL 15000 USD

* Note: Materials and Reagents have exceeded these amount. The difference was covered by CIGB