

## The Scientific Committee on Genetic Experimentation (COGENE)

### General report

The Scientific Committee on Genetic Experimentation (COGENE) was created by the 16th General Assembly in October 1976 and celebrated therefore its 15th anniversary last year. The Committee was established to serve as a source of advice concerning recombinant DNA activities. Among its purposes were (i) to review, evaluate and make available information on the practical and scientific benefits, safeguards, containment facilities and other technical matters; (ii) to consider environmental, health-related and other consequences of any disposal of biological agents constructed by recombinant DNA techniques ; (iii) to foster opportunities for training and international exchange; and (iv) to provide a forum through which interested national, regional and other international bodies may communicate.

Fifteen years after its foundation, it is clear that the tasks originally assigned to COGENE were fulfilled. (i) In March 1979, the *Working Group on Recombinant DNA Guidelines* presented a report, and the Committee organized the first *COGENE Symposium on Recombinant DNA and Genetic Experimentation* in Wye, U.K. These actions played an important role in downgrading the excessively stringent containment conditions which were imposed until then. More generally, the Committee worked towards the goal of a rationalization of such conditions. (ii) In July 1991, the *Working Group on Risk Assessment* presented a report, which was taken into consideration by other international agencies. Along the same line, in 1987 COGENE organized, together with SCOPE, the *Scientific Committee on Problems of the Environment*, a *Workshop on Genetically designed organisms into the environment*. The statement issued at the end of the Workshop received a wide acceptance. (iii) COGENE has organized a series of biennial Symposia on problems in the general area of genetics. In recent years, the main topics concerned environmental issues and genome research. In several cases, Symposia proceedings were published as books. (iv) COGENE was very active since its beginnings and until present in organizing training Courses, both theoretical and practical, in developing countries. Every year at least one Course was organized. The subjects have evolved from cloning and recombinant DNA technology to molecular genetics, genome research, and non-radioactive labelling

of nucleic acids. These activities were very frequently organized in collaboration with IBN, the *International Biosciences Network*, ICRO, the *International Cell Research Organization* and other International Agencies. In recent years, Courses were run in Nairobi (Kenya) 1985; Rio de Janeiro (Brazil) 1986; Cairo (Egypt) 1987; Ho-Chi-Mihn-Ville (Vietnam) 1988; Harare (Zimbabwe) 1989; Bangkok (Thailand) 1990; Fez (Morocco) 1991.

In general, these course have dealt with fundamental science, stressing, however, subjects of local interest, which have ranged from molecular parasitology to plant genetics. The success of these courses has been very important and its impact has been measured not only from the update of information and knowledge that the participants have gathered from the lectures given by active scientists in the forefront of their field, but also from the transfer of key technologies adapted to the local needs and environment.

The audience of the *theoretical courses* was regional, and was kept to a relatively small number of participants, usually 40 to 60, with less than 50 % participants from the host country. The practical part concerned a smaller number of participants, usually 12 to 20, depending on local facilities, with no more than 25% of local participants.

The *practical courses* concerned non-radioactive labelling of nucleic acids. Detecting specific nucleic acid sequences using radio-labelled probes, is one of the most useful techniques in molecular biology research. Its interest comes not only from its usefulness as a basic research tool, but also from its use as a powerful diagnostic tool in many systems.

The standard radioactive labelling of the identifying sequence, the probe, is not practical in a number of Countries, because of the cost of radioactive precursors used in labelling and/or of the problems with the delivery of such short-lived materials (half life is 14 days in the usual case of  $^{32}\text{P}$ ).

The advent of non-radioactive labelling of nucleic acid sequences has marked, therefore, the beginning of a new era for a number of Countries. The original technique used as a precursor a nucleotide labelled with biotin. Surprisingly enough, such biotinylated nucleotide is incorporated into nucleic acid sequences without any problem. Detection of the biotin moiety of the labelled nucleotide can then be done using a number of ways. Since their beginning, almost ten years ago, non-radioactive labelling has gone through a number of improvements. Suffice here to say, that the present sensitivity of chemiluminescent probes is as high as that of radioactive labelling.

Over the years, COGENE has developed a rather distinctive style. Members are very frequently in contact with each other and form a close-knit group; this accounts for the informality and friendliness of business meetings, for the fact that these Meetings are regularly attended by all Members, and for the participation of Members in most COGENE activities. COGENE is extremely open to collaboration with other ICSU bodies and other Agencies, as witnessed by the number of joint ventures. Finally, COGENE has been able to evolve and to adapt to the changing environment of Science. From its beginnings in which it concentrated on the recombinant DNA problems, COGENE has moved into the issues associated with the impact of the new genetics on environment and society. The irresistible rise of molecular genetics suggests that COGENE will be very busy and active for many years to come and will play a most useful role for ICSU. In fact, one can foresee an expansion of COGENE activities in the future.

## COGENE Membership

The current Membership of COGENE is the following :

Chairman :	G. BERNARDI, Institut Jacques Monod, 2 Place Jussieu, 75251 Paris Cedex 05 Tel. (33-1) 4329 5824	
Vice Chairman :	A.M. SKALKA	(Philadelphia)
ICSU Members :	S.N. COHEN	(Stanford)
	N. ZINDER	(Rockefeller)
	P. STARLINGER	(Cologne)
IUB :	A.A. BAYEV	(Moscow)
IUBS :	P.R. DAY	(Rutgers)
	V. SGARAMELLA	(Pavia)
IUMS :	S.W. GLOVER	(Newcastle)
IUIS :	-	
IUPAB :	W. ARBER	(Basel)
IUPAC :	L. FOX	(Naperville)
IUPS :	W.F.H.M. MOMMAERTS	(Los Angeles)
IUPHAR :	A.M. SKALKA	(Philadelphia)
Observers :		
UNESCO	S. MATSUI	(Paris)
ICRO	G.N. COHEN	(Paris)

## Activities 1989

An IBN-COGENE Course on "*Non-radioactive labelling of nucleic acids*" was organized at the University of Zimbabwe, Harare, Zimbabwe, between January 10-15, 1989. This practical Course was preceded (January 5-9, 1989) by a theoretical Course "*Frontiers in Molecular Genetics*" which was patterned on the previous Courses. The theoretical Course was co-sponsored by FEBS, the Federation of European Biochemical Societies.

COGENE participated in two Meetings on the "*Human Genome*" organized by UNESCO. The first one took place in Paris on February 10, the second one in Moscow on June 26-27, 1989.

A Round Table on *Genome Research* was organized by COGENE on July 4, 1989 during the FEBS Meeting held in Rome, Italy.

The COGENE Business Meeting was held at the Rockefeller Institute in New York on March 14, 1989.

### Activities 1990

A COGENE Symposium on *Human Genome Research* was held in Paris at UNESCO Headquarters between January 28-31, 1990. This Symposium was co-sponsored by UNESCO, CEE and FEBS and was attended by about 300 participants (including six Nobel laureates).

An IBN-COGENE Course on *Non-radioactive labelling of Nucleic Acids* took place at Mahidol University, Bangkok, Thailand between October 28 and November 4, 1990. The Course was attended by 20 participants from several South-East Asian Countries and was preceded by two general lectures on "*Genome organization and evolution*". The laboratory manual is available upon request.

COGENE also participated in the second Meeting on *International Cooperation for the Human Genome Project*, Valencia, Spain, November 12-14, 1990.

### Activities 1991

A Round Table on *Genetic Diseases and Gene Therapy* was organized by COGENE during the Miami Biotechnology Symposium, Miami, Florida, January 1991. The COGENE Business Meeting was held in conjunction with this Round Table.

COGENE participated in the Ninth International Conference on *General Impacts of Applied Microbiology and Biotechnology* which took place in Malta in September 1991.

A theoretical and practical Course "*Frontiers in Genome Research*" organized in collaboration with IBN took place at the University of Fez, Morocco. The theoretical Course was held between 21-25 October 1991, the practical Course between 28 October-1 November, 1991. For the first time, at the request of the local organizers, the Courses were held in French. The practical Course was focused on the "*Non-radioactive labelling of nucleic acids*".

### Observers and detailed reports

Concerning COGENE's major activities of 1989-91, two Members of the Reviewing Board, Drs. M. Singer and H. Zachau took part in the 1990 COGENE Symposium, and Dr. H. Feldmann took part in the Zimbabwe Course of 1989. As for the Bangkok Course of 1990 and the Morocco Course of 1991, detailed reports are available upon request.

## Perspectives

Even if, strictly speaking, a presentation of future activities is outside the scope of the present report, these will be mentioned here in order to give an idea of COGENE perspectives.

In 1992, the main activity will be a theoretical-practical Course "Frontiers in Genome Research" which will be held between August 10-25 in San José, Costa Rica. This Course will be co-sponsored by IBN, ICRO and UNESCO.

In 1993, the COGENE Symposium entitled "*From the Double Helix to the Human Genome : 40 years of Molecular Genetics*" will celebrate the 40th anniversary of the discovery of the double helix (with the participation of both Francis Crick and Jim Watson and some 12 more Nobel Laureates), by surveying the achievements in Molecular Genetics and discussing the future perspectives. The Symposium will take place at UNESCO Headquarters in Paris and will be mainly sponsored by UNESCO and the European Community.

As far as other activities are concerned, COGENE intends to take an active role in some legal, ethical and social problems associated with genome research.

## Conclusions

To sum up this brief review of the last three years of COGENE activities, one can say that each year at least one major activity was carried out and some minor ones. It can be easily seen that the financial costs of such activities were well above the 20,000 US Dollars yearly budget of COGENE. In other words, COGENE was able to obtain substantial amounts of money from a number of co-sponsors. In spite of this situation, COGENE kept full control and full responsibility for its activities.

As far as the two main activities of COGENE over the past few years are concerned, the Symposia were consistently excellent. On the other hand, COGENE training Courses, both theoretical and practical, had a really dramatic impact on Molecular Genetics in the countries where such activities took place and obviously this impact extended to much under regions because of the international participations (a rule in all COGENE Courses).

Last but not least, it should be acknowledged that COGENE's success is largely due to its cooperation with IBN and to its strong backing by ICSU.