

## Argentina

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## 2.1. ARGENTINA

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### ***Structure and Operation of the National Biotechnology Programme***

The National Programme of Technology (PNB) was created at the end of 1982, even if it only became popular in 1984 with the inauguration of the constitutional government of Doctor Raul R. Alfonsín. The information supplied by this Programme is rich in experience but corresponds to a starting phase. Argentina has a long tradition in biosciences (with three Nobel Prizes) as well as an important pharmaceutical and biochemical industry. In 1984, during the initial phase, there were already numerous high quality research centres in areas linked to the development of biotechnology. Even if the National Programme of Argentinean biotechnology is new, its foundations are solid. The Programme has been organised as an advisory, co-ordinating and financing unity with minimal administration and wide ranging executive powers. The head of the National Department of Science and Technology (SECYT) is directly responsible for the PNB and its management is co-ordinated through the Secretary of Sciences and Technology. The programme has an Executive Committee of four members and an Advisory Committee of twenty members headed by the Honorary President, Dr Luis Federico Leloir, Nobel Prize for Chemistry.

The Advisory Committee represents public and private research centres and State and University Institutes as well as the body linking the industrialists of the biotechnological sector. All the members of the Executive Committee, and nearly all of the members of the Advisory Committee, are specialists in disciplines linked to biotechnology from the various regions of the country. The actual composition of the PNB appears in Appendix A of this report.

### ***R&D Financing in Biotechnology***

One of the basic functions of the PNB is the granting of subsidies for R&D related to biotechnology. The word basic is used because R&D

administrators know that it is a very powerful instrument in the implementation and shaping of policies. The funds are provided from subsidies budgeted by the SECYT and by support from the National Council for Scientific and Technical Research (CONICET) operating in co-ordination with the Programme.

This specific financing is an addition to that granted by other organisations and sectors of the SECYT with similar aims. One can thus mention the support of the CONICET for selective basic and applied research which at least doubles the value of the PNB grants, and the role of the National Institute of Farming Technology (INTA) which has considerable resources and programmes. Other support is offered by National Programmes of the SECYT related to biotechnological aspects of Food Technologies and Non-Conventional Energies, and subsidies granted by the SECYT through 'Apoyo Institucional', in the same way as the PNB.

The financial support of the PNB is mainly directed to the centres and laboratories of the public sector. In all its other activities, such as the interaction between science and production or international co-operation, those depending on private companies and institutions are also included. In this way the PNB is a common point for public and private initiatives whose realisations very often result from a disinterested collaboration of researchers and private industrialists. Subsidies are granted as a function of standards and priorities established for each programme.

Interested parties have to present a Pre-Project for which approval is indispensable to allow detailed examination of the Project. It is advisable to co-ordinate Pre-Projects with similar topics into an Integrated Research Programme. Financial support is organised as far as possible for a maximum period of three years subject to a control of academic and budgetary administration, which is made by the PNB.

The priorities established by the Programme for the distribution of subsidies are based both on the research topics and their connection with the general development of the sector and with the level of technical innovation reached including the socio-economic impact of the Project. For the productive importance of research it is essential that the results are applied in the most direct way to the production of goods or services.

One of the basic objectives of the Programme is to place the scientific work at the service of the productive activities. This is especially

so as Argentina, in its present state of development, cannot afford the luxury of maintaining expensive, non-productive, basic research in a sector such as biotechnology, which historically presents for the country an interesting academic development, and that at the same time offers an enormous productive potential at an international level.

As far as the research topics are concerned, their priority has been established after many long debates and preference has been given to those concerning human health and agricultural livestock production. Productive applications rather than specific research topics have been considered as a determining condition for the approval of a project but this does not exclude a proposal favouring the development of any weakness of the sector.

In particular, priority topics of research are the following: 1) Development of biotechnological processes with special emphasis in the ones which concern the application of advanced biochemical engineering; 2) Biological fixation of nitrogen; 3) Plant biotechnology with special emphasis in molecular biology of plants and cultures of plant tissues; 4) Production of vaccines and biopharmaceutical products; 5) Diagnostic reagents.

Between December 1984 and December 1986, the PNB approved subsidies for a value equivalent to more than US\$1.6 million distributed between more than 90 research projects and various plans for equipment at more than 70 centres and research laboratories throughout the country of which a substantial number are related to biotechnology.

### ***Vocational Training***

Argentina has a rich tradition of professional education in bio-sciences and has trained high level researchers who work on very advanced topics in several parts of the world. However, in order to cope with this challenge of providing a scientific and technical infrastructure capable of supporting the development of production methods incorporating biotechnological advances, an effort is required in training and re-education which implies a qualitative and quantitative change. The PNB is aware of this situation and in co-ordination with the CONICET has developed an intensive plan of external grants which will be valid from 1987 onwards. The support of the European Community will be sought for the development of this plan and the process of promoting an intense horizontal co-operation with Latin-American countries has begun.

The PNB has given its support to this for the last three years by the promotion and financing of various activities directed towards the training and re-education of the researchers such as: intensive theoretical courses, seminars and conferences organised by research centres, university and private institutions which has been able to work with foreign or Argentinean specialists living abroad. International co-operation and a growing emphasis on the activities of CONICET has channelled support towards this goal. The purpose of the programme is to intensify activities linked to training in biotechnology in which international co-operation plays an important role. All methods such as doctorate or postgraduate grants and specialists missions are utilised to gain foreign or external support. In the particular case of Argentina the training must reach all levels of university lecturers as well as all aspects of administration because of the scarcity of specialists capable of dealing with scientific projects of the complexity or the extent required for new technologies.

### ***International Co-operation in Biotechnology***

From its inception, the PNB has given preferential attention to everything which is connected to international co-operation in biotechnology. With the objective of using offers of co-operation from countries of higher scientific technological development, Programmes have allowed the realisation of meetings and scientific seminars which officials, researchers and foreign entrepreneurs have attended. In particular, the French-Argentinean meeting in Buenos Aires in 1986 has brought about an important exchange of ideas and created contacts between the biotechnological enterprises of both countries. The 1986 cooperation agreement with Sweden has included five biotechnological projects which have been completed by Argentinean and Swedish Institutes implying an important economic and technical contribution. In 1984 an agreement was made between the Argentinean Republic and the Kingdom of Belgium which foresees the realisation of twelve joint projects including one on wheat covering aspects linked to biotechnology. Additionally, Italy and the Federal Republic of Germany have expressed intentions for co-operation which are expected to be realised before the end of 1987. To promote regional co-operation, taking into account the integral complementary economic policy of the Argentinean Government, the PNB has allowed joint

meetings of officials, researchers and entrepreneurs linked to biotechnology with other Latin-American countries, especially Brazil.

It has actively taken part in setting up the Regional Programme in biotechnology for Latin-America and the Caribbean patronized by the PNUD, UNESCO and UNIDO and has a large responsibility for commercialisation, which is of great importance for the development of biotechnology. The first director of the Argentinean-Brazilian Centre in Biotechnology (CABBIO) serving a three-year term is a member of the Executive Committee of the PNB.

### ***Models for Internal Co-operation***

The PNB has started a number of interdisciplinary co-operative activities inside Argentina to realise policy.

The fundamental objective of the Programme is to obtain as close a contact as possible between the productive sector and the research centre as well as the various State run or supported laboratories. This inter-relation is established through active participation of representatives of private enterprises and activities promoted by the Programme, either in national or international meetings or in a Commission or Working Group. The Programme also stimulates the activities of the committees of scientific and industrial co-operation which are encouraged by the CONICET. These committees specify agreements, tasks and results of the R&D Centre and the nature and amount of payments made by the company consisting of fixed yearly amounts or sales commissions for a fixed period.

Finally, in order to enlarge the market or to incorporate advanced technology which allows the support of large industries the PNB organises meetings between Argentinean and foreign industrialists such as those bilateral meetings between France and Brazil. An example, involving France at the end of 1986, was the mission linked to the biotechnological sector of the EUREKA plan, during which co-operation between Argentinean and French companies was established.

The link between universities and enterprises is established through agreements created by CONICET when there are R&D centres or university laboratories capable of completing such co-operation. In general, the national universities, particularly the best ones, have experienced a serious

recession because of the political vicissitudes during the decades prior to the present Constitutional Government which provoked a reduction of the teaching and more qualified scientific staff whose real contribution to the development of biotechnology helps consolidate a recuperation process with which the SECYT is deeply involved.

As for the proposed entrepreneurial models, the PNB prefers the actual entrepreneurs to take the initiatives required in each case. On the contrary it has been concerned with the creation of a representative body where both private associations and enterprises as well as public sector centres linked to biotechnology have a say. This is how the Argentinean Forum of Biotechnology was created in October 1986 whose president is also president of one of the main state banks of Argentina and is presently part of the Consulting Committee of the PNB. The SECYT has created a law promoting development and technological innovation in production. The PNB has taken part in these discussions which were presented to the Congress of the Nation in 1986 and which establish the basis of an institutional rule in this field. Three possible modalities for the execution of entrepreneurial technological R&D projects have been established: 1) total execution of the project by a national centre of R&D contracted by the company; 2) execution of the project by the company and a national R&D centre in which each of the parties must realise distinct and complementary tasks and 3) total execution of the project by the company under fixed conditions determined by the law and subject to a technical and accounting verification by the SECYT. The concept of the national R&D centre covers laboratories, professor-ships and state institutions (such as the INTA) and others allowed by the SECYT.

The benefit for the company consists of the delivery of fiscal credit certificates for the payment of national tax equivalent to 60% of the cost of the approved project. This type of benefit is also available to companies of foreign capital established in Argentina and the approval for these projects is given by the SECYT. This is subject to priority criteria fixed by law which takes into consideration the contribution to the national economy and to the promotion of exports.

### *Scientific and Technological Co-operation between Europe and Argentina*

As already mentioned, Argentina has realised co-operation agreements linked to biotechnology with Belgium, France and Sweden and is in a very advanced preparation stage of programmes for which it shows a great interest, with Italy, and the Federal Republic of Germany.

To reinforce the existing co-operation and the permanent flow of information the following is suggested:

- a) The initiation of intensive training, education and coaching of the R&D staff at all levels including the administration of projects within the framework of the plans drawn up by the PNB.
- b) The completion of joint R&D projects in biotechnology on topics considered as priority ones by the PNB with the exchange of specialists and contribution to the technological equipment needed by Argentina.
- c) The establishment of industrial plants which bring advanced technologies and employ local personnel at all levels. They are obliged to dedicate a substantial percentage of profits to R&D for which local professionals trained by investors are responsible and a substantial percentage of production to export.
- d) Association of European companies with Argentinean companies in which the effective transfer of technologies brought by the European side is certain.
- e) Establishment of international services of scientific and technological data bases related to biotechnology which are accessible to public and private entities in Argentina.
- f) Creation of information and documentation committees in European cultural diffusion agencies operating in Argentina.

In particular, support is needed to set up a R&D centre for industrial farming production in the rich damp pampa of Argentina equipped with a system of enormous productive potentiality. The scientific and technological training tasks of the new centre will be closely linked to the production activities of the area characterised by the very interesting

problems of dealing with the natural environment, plant and animal health and productivity.

APPENDIX A: DEPARTMENT OF SCIENCE AND TECHNOLOGY  
NATIONAL BIOTECHNOLOGY PROGRAMME

Secretary of Science and Technology     Dr Manuel SADOSKY  
Co-ordination of the programme             Dra Sara BARTFELD de RIETTI

*Executive Committee*

Dr Oscar BURRONE                             Dr Jose LA TORRE  
Dr Alberto MARCIPAR                         Dr Faustino SINERIZ

*Consulting Committee*

Dr Luis Federico LELOIR, Honorary President.  
Dr Carlos R. ABELEDO, President of the CONICET.  
Dr Israel ALGRANATI, Head Researcher of the CONICET, Institute of biochemical research 'Foundation Campomar', Buenos Aires.  
Dr Diego DE MENDOZA, Director of the Department of Microbiology of the Faculty of Biological and Pharmaceutical Sciences of the U.N. of Rosario.  
Dr Alberto DIAZ, Director of Biosidus SA.  
Dr Rodolfo J. ERTOLA, Director of the Centre of Research in Industrial Fermentations, La Plata.  
Dr Aldo FERRER, President of the Bank of the Province of Buenos Aires and of the Argentinean Forum of Biotechnology.  
Dr Juan GOTTIFREDI, Rector of the U.N. de Salta and Secretary of Sciences and Technology of the National Interuniversity Committee.  
Dr Oscar GRAU, Co-ordinator of the Latin-American Network of Biotechnology.  
Eng Horacio IRAZOQUI, Director of the Institute of Technological Development for the Chemical Industry, Santa Fe.

Eng Agr Guillermo JOANDET, National Director Assistant and Researcher Consultant of the INTA.

Dr Alberto KORNBLIHTT, Assistant Professor, sector of Molecular Genetics, of the Faculty of Exact and Natural Sciences of the University of Buenos Aires.

Eng Agr Carlos LOPEX SAUBIDET, President of the INTA.

Eng Hugo MACCIONI, Independent Researcher of the CONICET. Titulary Teacher, Chair of Biology, Faculty of Medicine, U.N. of Cordoba.

Eng Enrique MARTINEZ, President of the INTI.

Eng Agr Luis MROGINSKI, Independent Researcher of the CONICET. Institute of Botany of the North East, Corrientes.

Dra Elsa SEGURA, Director of the Institute of Research of the Department of Public Health. Director of the Institute of Research for Chagas' illness 'Dr Mario Fatale Chaben'.

Dr Hector TORRES, Director of the Institute of Research in Genetic Engineering and Molecular Biology and Dean of the Faculty of Exact and Natural Sciences of the University of Buenos Aires.

Dr Raul E. TRUCCO, Director of the PROTEP Programme (CONICET-CITEP), Mar del Plata.

Dr Ruben H. VALLEJOS, Director of the Centre of Photosynthetic and Biochemical Studies, Rosario.