Contribution of AgroBioInstitute (ABI) to the Co-operation in Plant Biotechnology

Elena Marinova, Ph.D.,
Senior Researcher, Scientific Secretary of ABI
1164 Sofia, BULGARIA
8 Dragan Tsankov Blvd.
Tel: +359 2 963 54 11
Fax: +359 2 963 54 08
E-mail: el_marinova@abi.bg

AgroBioInstitute (ABI) has been selected as the second focal point for the implementation of the project **SEE Plant Biology and Plant Biotechnology Network** (SEEPBN) with participating countries Albania, Bosnia & Herzegovina, Bulgaria, Croatia, Greece, Macedonia, Romania and Serbia and Montenegro. The main reason was that ABI has its **EuroScience Equivallence** in: **(i) research management; (ii) current laboratory equipment and techniques; (iii) staff training; research topics and projects; (iiii) contribution to the regional scientific co-operation.**

It was a nice idea of EC to open calls for proposals for Centers of Excellence. ABI has been selected as **Centre of Excellence in Plant Biotechnology** (*EXELLENT PLANT BIOTECH)* (№ ICA1-1999-70003) after the first call in 1999. In the frame of WP1 Research capacity building **twinning research activity** of ABI with other biotech Centers of Excellence: Plant Research International (PRI), Wageningen, The Netherlands; Agricultural Research Institute (ARI), Nicosia, Cyprus; Institute of Biochemistry and Biophysics (IBB), Warsaw, Poland and Biological Research Centre (BRC) of Hungarian Academy of Science, Szeged, Hungary has been realized. WP2 concerning **education and training** contributed to the mobility of young researchers, mainly from the above cited Centers. During 2002 and 2003 6 visiting scientists from ARI, Cyprus; 1 – from IG, Romania; 4 – from IBB, Poland and 1 – from France worked in ABI and from the ABI staff 9 visits in ARI, Cyprus and 1 – one in IBB, Poland were completed. The **co-ordination** of scientific investigations and training in the field of plant biotechnology **on the national and regional level** are also under the responsibility of ABI.

ABI is the only institute in the country, witch activity starting from the foundation in 1985 as Central Laboratory of Genetic Engineering (CLGI) and renamed in 1989 as Institute of Genetic Engineering (IGE) is related to plant biotechnology.

According to the restructuring in 2000 and the recent one (September 2003) AgroBioInstitute is an independent unit in the frame of the National Centre of Agricultural Sciences (NCAS), Ministry of Agriculture and Forestry. The institute consists from three former institutes of Agricultural Academy: (i) Institute of Genetic Engineering - Kostinbrod; (ii) Institute of Ornamental Plants - Negovan and (iii) Potato Experimental Station – Samokov.
Now, research and applied activities in the field of plant biotechnology are accomplished in the new premises of Agro Bio Tech Park Ltd. in Sofia (Fig. 1, Fig. 2) and Tissue culture Lab. in Department of Floriculture – Negovan.

NEW PREMISES – THE AGROBIOTECH PARK Ltd.

ABI

Fig. 1 New premises of AgroBioTech Park Ltd.

AGROBIOTECH PARK Ltd.-VIEW INSIDE

Fig. 2 AgroBioTech Park Ltd. – view inside

The permanent **staff** number of ABI is **97** persons. **Among 42 Researchers 30 are multidisciplinary plant biotech team**. Qualification and training from 1985 to 2002 is summarized as follows:

160 Specializations;
20590 Person/Days;
25 Countries (in leading laboratories):

- EC Member States *(Austria, Belgium, Denmark, Finland, France, Germany, Greece, Italy, Luxemburg, Portugal, Spain, The Netherlands, United Kingdom);*
- New Member States *(Cyprus, Czech Republic, Hungary, Poland);*
- Other European Countries *(Russia, Switzerland, Ukraine)*;
- China, India, Israel, Japan, Canada, USA.

Research management: ABI is the only research institute in Eastern Europe, the work of which is guided by an **International Consultative Council** (ICC). Despite of difficulties of the transition period, starting from 1985 seven meetings of ICC took place in ABI. Milestones for the VIIth ICC (3-5 May 2003) were from Science to Business.

Research experience covers almost all important topics of modern plant biotechnology:

- **Development, adaptation and application of genetic engineering methods for creating and evaluating of new genetic diversities, resistant to diseases, herbicides and stress factors** (tobacco, alfalfa, barley and other crops);

- **Clonal micro-propagation and immunodiagnostics of economically important viruses** (potato, grapes, tobacco, carnation, sugar beet, etc);

- **Development and application of gene mapping system and DNA based markers** for economically important breeding traits (barley, wheat, tomato, sunflower, etc.);

- **Development and application of molecular methods for gene cloning and gene expression in plants;**

- **Establishment of bio-safety regulations, conducting risk assessment and risk management of GM Crop releases, information dissemination about bio-safety;**

- ***In vitro* and classical breeding and cultivation of ornamentals and potatoes.**

 **EC RESEARCH PROJECTS** 

ABI has been successful in the following EC programs:

EC INCO COPERNICUS – 2 Projects
EC INCO 2 - 1 Project *(CENTRE OF EXCELLENCE IN PLANT BIOTECHOLOGY)*
EC FP5 – 5 Projects
EC COST – 6 COST Actions
EC PHARE – 1 Project
EC FP6 – 6 applications (up to now 1 – successful)

EC FP5 Projects of ABI are preferably ECO – Projects:
√ Molecular ecophysiology as tools for the selection of highly stress resistant poplar species for multipurpose forests *(ESTABLISH);*
√ Development of systems to improve phytoremediation of metal contaminated soils through improved phytoaccumulation *(PHYTAC);*
√ Conservation and restoration of European oak woodlands: a unique ecosystem in balance *(CREOAK);*

√ Effective communications and dissemination of bioscience information in Europe *(ECOD-BIO);*
√ The interactive European Network for industrial crops and their applications *(IFORM – IENICA).*

 **EC COST ACTIONS** 

√ COST Action 836 "Integrated research in berries";
√ COST Action 844 "Apoptosis and programmed cell death: Molecular mechanisms and applications in biotechnology and agriculture";
√ COST Action 847 "Textile quality and biotechnology";
√ COST Action 849 "Parasitic plant management in sustainable agriculture";
√ COST Action 851, WG3, "Deployment of gametic embryogenesis";
√ COST Action 853 "Agricultural Biomarkers for micro-array technology".

OTHER RESEARCH PROJECTS 2001/03

INTERNATIONAL ORGANISATIONS:
IAEA – 5 Projects, NATO – 2 Project, UNEP/GEF - 2 Projects, CORESTA – 1 Project, SAMUEL NOBLE FOUNDATION – 1 Project, RIKEN (Japan) – 1 Project
BILATERAL COOPERATIONS - Belgium - 5 Projects, The Netherlands - 2 Projects, USA - 2 Projects
REGIONAL COOPERATIONS - Macedonia – 1 Project, S&M – 1 Project
INTERNATIONAL COMPANIES – Enza Zaden – 1 Project, LSBC – 2 Project, Monsanto – 1 Project, Suntory – 1 Project

NATIONAL FUNDS 
Supervised by NCAS – 12 Projects
Supported by National Organizations – 3 Projects
Contracts with National Companies –5 Projects

ABI is traditionally very active in organization of Training Cources, Workshops, Conferences, and Symposia etc. Most of them are international. It is important to note that among 57 meetings, organized from 1985 to 2003, 1/ 5 (listed bellow) are regional one':

Regional Training Cources, Workshops, Conferences, Symposia etc. organised by AgroBioInstitute (1985 – 2003)

1. Coordination meeting of programm IV-3 "Investigations on eukaryotic genome by somatic hybridisation and gene transfer", 26 – 29 May, 1985, Sofia, Bulgaria
2. IVth Symposium of socialist countries on biotechnology, 26 – 30 May 1986, "Droujba", Varna, Bulgaria
3. First Balkan Seminar "Plant Improvement by Biotechnology, including Genetic Engineering", 3 – 5 July 1995, St. Constantine, Varna, Bulgaria
4. Bulgarian – Serbian Conference on breeding for drought resistance, 15 – 17 September 1997, Albena, near Dobrich, Bulgaria
5. Bulgarian – Turkish Seminar "Genetic Engineering for plant Improvement", 27 –30 April 1998, Lessidren, Bulgaria

6. Bulgarian – Russian Seminar “Application of biotechnology in plant breeding”, 05 – 11 May1998, Kostinbrod, Bulgaria
7. Bulgarian – Romanian Seminar “Application of biotechnology in plant breeding”, 1998, Kostinbrod, Bulgaria
8. International Seminar on the biological safety problems during the application of genetically modified plants (Participants from Albania, Belgium, Bosnia and Herzegovina, Bulgaria, Macedonia, Romania, Russia, Serbia, Turkish, UK, USA), 6 –11 February, 1999, Leeside, Bulgaria
9. EC Seminar “Plant Biotechnology in Cereals” (Participants from Bulgaria, Italy, Turkish, UK, Ukraine)”, 10 – 14 April 1999, Sofia, Bulgaria
10. Bulgarian/Russian/Yugoslavian Joint Seminar "Plant Biotechnology for Crop Improvement", 25 – 29 September, 2000, Sofia, Bulgaria
11. Turkish-Bulgarian Workshop on Plant Biotechnology, 27 - 30 May 2001, TUBITAK, Marmara Research Center, Gebze-Kocaeli, Turkey
12. Bulgarian – Ukrainian Seminar on Plant Biotechnology, 24 – 28 September 2001, Lessidren, Bulgaria
13. IInd Ukrainian – Bulgarian Seminar on Plant Biotechnology, 29 May – 1 June 2002, Yalta, Crimea, Ukraine
14. Ist Hungarian – Bulgarian Bilateral Seminar, 23 – 24 September 2002, Szeged, Hungary
15. Meeting of Steering Committee of Network of GMO Detection Laboratories in EU and CEE Countries, 20 September 2003, Varna, Bulgaria

Between more than 90 Cooperation agreements of ABI (15 – in the last three years), 5 are regional one’. From the 259 visits of foreign scientists, there are visitors from all neibourghood Countries.

PRE-ACCESSION PERIOD – PROBLEMS

BULGARIA pays 17 M € for the participation in FP6, and almost the same sum – for FP6. There are enough successful projects in FP5. The contribution of ABI is good enough, too.

National Funds for Science
The official information from the Bulgarian Ministry of Education and Science is that **Annual Budget for Science is 0.45 % of GDP in 2002.** This is the optimistic information. The realistic is: less than 0.2 %. In this context **Declaration of EC for 3 % of GDP to 2006 looks like utopia for our country.**

State budget for Agricultural Science for 26 Institutes, belonging to NCAS in 2002 was13 M BGL (~7 M €) (Covering: salaries, membership fees, reparations…). In 2003 it was reduced to 9 M BGL (~ 5 M €). Usual situation for the last five years was:

- **Low salaries →non-regularly paid** (even for the staff of such Centre of Excellence as it is ABI, the last payment was at the end of May 2003. There is only 50 US $/person/month advanced payment from May to October 2003). Result from such a politics is: **Science becomes not attractive job for young people**. Two factors are optimistic for the institute – plant biotechnology is an attractive modern discipline and students in biology and agronomy are well motivated. At present 17 PhD students are working on their PhD thesis in ABI. Problem is for the realization of PhD students – not more than 50 % in the country. **“Brain – drain”** and **Gap between generations are the other two problems.**

In the context of the title of this workshop as a pathway for stabilizing of the RTD Potential specializations abroad are very active. It is not a “minus” of a paper to be done in the foreign institute, but is not a solution for young scientists’ life and normal job realization.

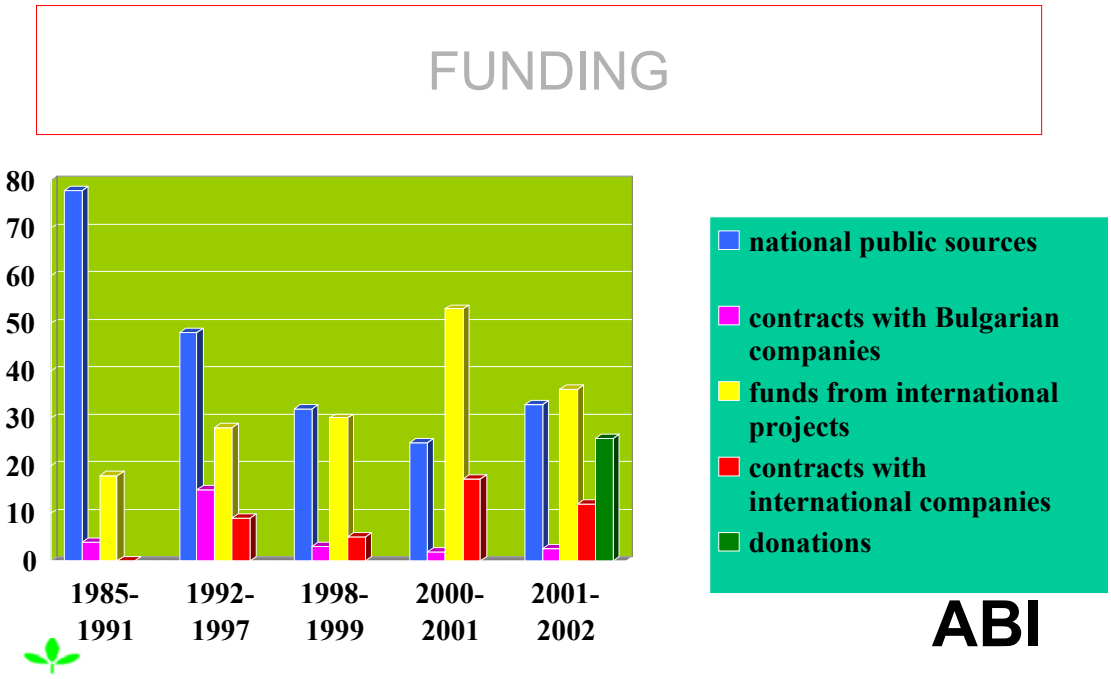

Fig. 3

Budget of AgroBioInstitute (1985 – 2002) is shown in Fig. 3.
Starting from 1985 national public sources decrease and funds from international projects increase. There is no other choice to survive.

SUMMARY

AGROBIOINSTITUTE (ABI) is an attractive focal point for Regional Network on CEE “Plant Biology and Plant Biotechnology”. Research experience covers almost all important topics of modern plant biotechnology. There are new premises of ABI. Equipment for *in vitro* techniques is existent. Molecular markers analyses are routinely used. The experience of ABI in the realization of EC projects, staff training, organization of international and regional scientific meetings, training courses etc. could be useful also in regional aspect. The initiative of UNESCO – ROSTE for the Regional Network is supported by ABI. There are needs of sources for updating of some equipment and for mobility of scientists - for joint research programs, exchange of knowledge, training etc.