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**Assisting Developing Countries to Develop their own Scientific and  
Industrial Capabilities**

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## **1. Introduction**

The International Centre for Genetic Engineering and Biotechnology is an intergovernmental organization, established within the United Nations system to provide the developing world with a centre of excellence for research and training in genetic engineering and biotechnology, focused on solving some of the major problems affecting health, nutrition, agriculture and industrial development. The ICGEB operates since 1987 through its two original Components located in Trieste (Italy) and New Delhi (India). A third ICGEB Component was inaugurated in 2007 and is now fully operational in Cape Town (South Africa), focusing on the most pressing needs of the African continent. The ICGEB Statutes, i.e. the international treaty establishing the Organization, have been signed by 85 Governments and ratified by 63 Member States. In just over twenty years of operation, the ICGEB has acquired a solid scientific reputation world-wide and its potentialities have been acknowledged by the UN General Assembly which, through Resolution A/RES/60/205 approved in December 2005, recognized the contribution of ICGEB in the area of biotechnology, encouraging it to enhance effectiveness in the implementation of programmes designed to assist developing countries in building capacity in all areas of biotechnology.

## **2. The Activities of ICGEB and benefits to Member States** (please also refer to the ICGEB website: <http://www.icgeb.org>)

**Research Programmes:** scientific activity focused on advanced projects in current research implemented at the Trieste, New Delhi and Cape Town Components. Research projects include: basic science projects (control of gene expression, DNA replication, DNA repair, RNA processing), study of human viruses (such as HIV, HPV, rotavirus, malaria, hepatitis and dengue), molecular immunology, neurobiology, molecular genetics, experimental hematology (at the ICGEB Outstation in Monterotondo, Rome) and human gene therapy. Other Groups focus on technologies for production of biopharmaceuticals; other groups address experimental issues in the field of plant virology and bacteriology, including crop improvement and plant adaptation in response to biotic and abiotic stresses (drought, high salinity in the soil, etc), biosafety and risk assessment of genetically modified organisms. At present, almost 500 researchers representing over 30 nationalities are working in the laboratories in Trieste and New Delhi Components. The Cape Town Component develops its

research and training activities on subjects of major impact for the African continent, including infectious and chronic diseases and staple crop development. In the period from 1988 to April 2012, the quality of the research activity of ICGEB has produced some 2,480 publications in peer-reviewed international journals and 60 ongoing patent applications to protect the intellectual property rights of ICGEB Member States.

**Long Term Training:** Pre- and Postdoctoral Fellowship Programmes, established in 1989 and 1991, have funded 785 fellows from 50 Member States over the past twenty years. Postdoctoral fellows train for an average period of two-three years during which they actively participate in the ongoing research projects of the laboratories located in the three ICGEB Components. A PhD course is also implemented in Trieste, New Delhi and Cape Town, in collaboration with local and international universities. PhD "Sandwich" programmes are also being activated.

**Short Term Training:** practical and theoretical courses and workshops are organized in the three Components as well as in Research Institutes located in Member States. The courses are conducted by internationally recognized scientists and cover a variety of aspects of the most advanced research, including genome mapping techniques, proliferation of normal and cancer cells, risks and benefits of transgenic organisms and biocomputing. The Centre funds an average of 20 such activities, training some 1,500 scientists every year.

**Collaborative Research Programme:** during the period 1988-2011 more than 400 research grants were issued to the ICGEB Affiliated Centres, which are national research laboratories located in developing countries and whose research activity is co-ordinated with and partially funded by the ICGEB, aiming in particular at solving specific problems afflicting the country where they are implemented. The ICGEB has already invested € 16 million for collaborative research programmes implemented in Member States.

**Technology Transfer:** fostering the relationship between ICGEB and the industrial sector is among the objectives of the Centre and has been enshrined in its Statutes. To date the ICGEB has signed over eighty agreements with industrial partners in Member States for the transfer of the know-how related to the production of biopharmaceuticals and other biotechnology derived products. The agreements have resulted into products based on ICGEB-developed technologies, which are now present on the market in various Member States.

**Scientific and Institutional Services:** the ICGEB offers consultation for scientific programmes and a bioinformatics network which provides Member States with up to date biological databases. It also provides a Biosafety Reference database, containing updated scientific information on the issue and playing an important role in assisting Member States to fully implement the Cartagena Protocol to the Convention on Biological Diversity. The ICGEB has been recognized as a key player at the international level in the field of biosafety and has recently started the second phase of a project, funded by the Bill and Melinda Gates Foundation, aimed at building technical and scientific capabilities in sub-Saharan Africa for the effective regulation of biotechnology in agriculture, while it plays an active role in the implementation of the international scientific cooperation activities foreseen by the

Biological Weapons Convention. Furthermore, the ICGEB provides its constituency with assistance on several topics relevant to biotechnology and at the threshold between science and science policy, such as bioethics, intellectual property and codes of conduct for scientists.