ICGEB International Centre for Genetic Engineering and Biotechnology

Developing Knowledge

80+ Signatory Countries, 60+ Member States, 3 Components:
Trieste (Italy) - New Delhi (India) - CapeTown (South Africa)

The ICGEB mandate

An International Organisation for research, training and technology transfer in Life Sciences to promote sustainable global development

1987-1995
A special project of UNIDO

1995-today
An independent international organisation

ICGEB Director, Arturo Falaschi with UNIDO Director General, Mauricio de Maria y Campos, 20 February 1996, Transfer of Assets UNIDO-ICGEB

Developing Knowledge
The ICGEB instruments of action

- Cutting-edge research in its laboratories in Trieste, New Delhi and Cape Town (6 macro areas)
- Advanced education supported by long- and short-term fellowships for PhD students and post-docs
- Organisation of meetings, courses and workshops at the international level
- Competitive grants for scientists in Member Countries, including Early Career Return Grants
- Technology transfer to industry for the production of biotherapeutics and diagnostics
- Provision of technical assistance and capacity enhancement in the regulation of biotechnology and its products
Meetings and Courses 2018

http://www.icgeb.org/meetings-2018.html

CRP – ICGEB Research Grants
Ongoing Projects (78)
Relationship with Industry Technology Transfers

- ~70 collaboration agreements
- 20 different countries: Argentina, Bangladesh, Brazil, China, Cuba, Egypt, India, Iran, Italy, Jordan, Pakistan, Russia, South Africa, Sri Lanka, Switzerland, Syria, Turkey, United Arab Emirates, Uruguay, Venezuela – where the products are in many cases already on the market
- >100 Scientists trained in our labs in the pharmaceutical production and quality control of Biosimilars
ICGEB New Delhi

*Diagnostic kits*

Research Groups in 2017

Trieste: 18 ~ 200 scientists
New Delhi: 25 ~ 400 scientists
Cape Town: 2 ~ 30 scientists

Total: 45

*Biosafety: 2 additional Groups, 1 in Trieste and 1 in Cape Town*
Our Mandate:

Promotion of Cutting-Edge Research in the Life Sciences with the aim of aiding Research, Development and Capacity Building within our Member Countries, on topics related to health, food security and sustainable development.

Our Research Pillars:

Cancer: There is an ever-growing need for an improved understanding of the mechanisms of cancer development, which in turn will aid better treatment and diagnosis.

Infectious Diseases including Malaria, Dengue, TB, HPV, HIV, Chikungunya, neglected tropical diseases are major health problems often outside their traditional endemic areas, owing to climate change and population movement.

Non-Infectious Diseases are rapidly gaining in prevalence; in an ageing global population Cardiovascular and Neurodegenerative Diseases are major drains on health infrastructures and society. Approaches aiming to understand the causes, development, diagnosis and treatment of these diseases are required.

Food Security: crop improvement and development of methodologies for understanding the interactions between plants and soil bacteria are major objectives. Such activities will aid production of Disease Resistant Crops, expand cultivatable areas and increase crop yields through use of environmentally friendly biofertilisers.

Biofuels are essential for sustainable development. Understanding and developing the optimal methods for second generation biofuel production under diverse global conditions is paramount.
Scientific Output

ICGEB Publications from 2010-2016 include articles in:


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<tr>
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<th>Trieste</th>
<th>New Delhi</th>
<th>Cape Town</th>
<th>Total ICGEB</th>
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</thead>
<tbody>
<tr>
<td>Total publications</td>
<td>610</td>
<td>805</td>
<td>137</td>
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<td>Total IF</td>
<td>3280.2</td>
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<tr>
<td>Publication/year</td>
<td>87.1</td>
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ICGEB Group Leaders are Editors or Editorial Board members on more than 60 international journals

External Research Support

2010-2016 included grants from:

- European Research Council (ERC), EU FP7 and Horizon 2020 Program,
- Wellcome Trust UK, AICR UK, Royal Society UK,
- National Institutes of Health USA, Bill and Melinda Gates Foundation USA,
- Leukemia and Lymphoma Society USA, JDRF USA,
- World Anti-Doping Agency (WADA) Canada, Grand Challenges Canada,
- AXA Research Foundation France, AFM France,
- MRC and National Research Foundation South Africa,
- Telethon Italy, AIRC Italy, AvISLA Italy,
- Italian Ministries of Agriculture, Health, University and Research, Labour and Social Policies

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<tr>
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<th>Cape Town</th>
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<tbody>
<tr>
<td>Total Grants</td>
<td>32</td>
<td>76</td>
<td>11</td>
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<tr>
<td>Total Income</td>
<td>3,655,696</td>
<td>3,110,406</td>
<td>490,124</td>
<td>6,556,696</td>
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International Centre for Genetic Engineering and Biotechnology (ICGEB)
Trieste Component, Italy

18 research groups, >200 scientists

Research programs in:
- Virology (HSV, papillomavirus, rotavirus)
- Human molecular genetics
- Molecular immunology
- Gene therapy
- Recombinant biopharmaceuticals (BDU)
- Cardiovascular disorders
- Neurodegeneration
- Cancer
- Biosafety

Advanced core facilities and services include:
- Facilities for in vivo experimentation
- BL3 safety laboratories
- Viral vector production unit (AAV)
- Advanced microscopy NIKON facility
- Proteomics facility
- Peptide synthesis and chemical modification
- Flow cytometry and cell sorting
- High throughput screening platform – siRNA, miRNA whole genome libraries
- Scientific Services for Member Countries – Biosafety and Biosimilar Production

http://www.icgeb.org

Fluorescence Microscopy Core Facility (FMCF) - www.icgeb.trieste.it/fluorescence-microscopy.html

INSTRUMENTS
- Leica DMLB upright microscope;
- Leica Laser Microdissector LMD;
- Leica DMIRE2 inverted microscope;
- Zeiss LSM510 confocal microscope with lasers 488, 514, 543 nm and 2 PMT + microinjector (Eppendorf); (Purchased 1998 – end of support)
- Zeiss LSM510 META equipped with lasers 458, 477, 488, 514, 543, 633 nm, 2 PMT + META detection module for emission spectra analysis; (Purchased 2004, end of support)

NEW PURCHASES
- Nikon Eclipse Ti-E inverted for live imaging + CMS (Andor) + stage incubator (Okolab) (Purchased 2014)
- Zeiss LSM880 with lasers 405, 458, 488, 514, 543, 633 nm, 3 PMT + Airyscan with 32 GaAsP channels for fast high-resolution fast acquisition (bid finalized 2017)

USERS (no charge)
- ICGEB groups
- External users from neighboring institutions
- FluoMicro@ICGEB Course 2016-2017
- Training of ICGEB short-term research fellows

MANAGEMENT
- Alessandro Marcello GL Molecular Virology
- Paola Massimi – staff Tumor Virology
- Online booking system
- Maintenance and training of users
ICGEB Trieste Core Facilities

- BL3 containment laboratory
- Proteomics and mass spectrometry
- Peptide synthesis and chemical modification
- Advanced optical microscopy
- Flow cytometry and cell sorting
- Animal house
- AAV Vector Unit (AVU)
- Bioinformatics
- High throughput, whole genome siRNA screening
- Technical services and mechanics workshop

HTS Facility

Main Goal:
Perform genome-wide RNA interference screens in human/mouse cells (upgradable for screening of small molecules in the future)

Equipment:
- Liquid handling station
- Automated high-content microscope
- Multimode microplate reader
- Cell washers, liquid dispensers, microplate seals

Libraries:
- Human whole-genome siRNA library (approx. 20,000 genes)
- Mouse whole-genome siRNA library (approx. 18,000 genes)
- Small siRNA sublibraries targeting specific intracellular pathways

ICGEB Core Facilities can be accessed by scientists from all our Member Countries
- supported through the ICGEB Fellowship Programme.
- 39 PhD students, 12 nationalities

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http://www.icgeb.org
Becoming a Member State of ICGEB

1. A country wishing to become a Member State of the ICGEB is required to send a "Letter of Interest" to the ICGEB Director-General.

2. Once the request is approved by the ICGEB Board of Governors, the Government should deposit an "Instrument of Accession" with the Depositary, the UN Secretary General. At this stage the country establishes its consent to be bound by the Statutes and it becomes an ICGEB "Signatory Country".

3. States have to seek preliminary / ex post approval (ratification) of the Statutes by their national, legislative authorities.

4. Entry into force for a country, 30 days after deposit date of its Instrument of Accession. At this point the Country acquires access to all the activities foreseen by the ICGEB Work Programme.

5. Four key steps to become a “Member State”:
   ✓ Assess national situation (legislative and administrative procedures)
   ✓ Identify and contact the authority responsible for signing the Instrument (e.g. Head of State, Prime Minister, Minister of Foreign Affairs)
   ✓ Prepare and sign the instrument of accession, ratification, acceptance as well as the other declarations eventually needed such as the full powers
   ✓ Deposit instrument with the Depositary

ICGEB Board of Governors approved Dominican Republic request of membership during its 11th Session, on 24-25 November, 2004.