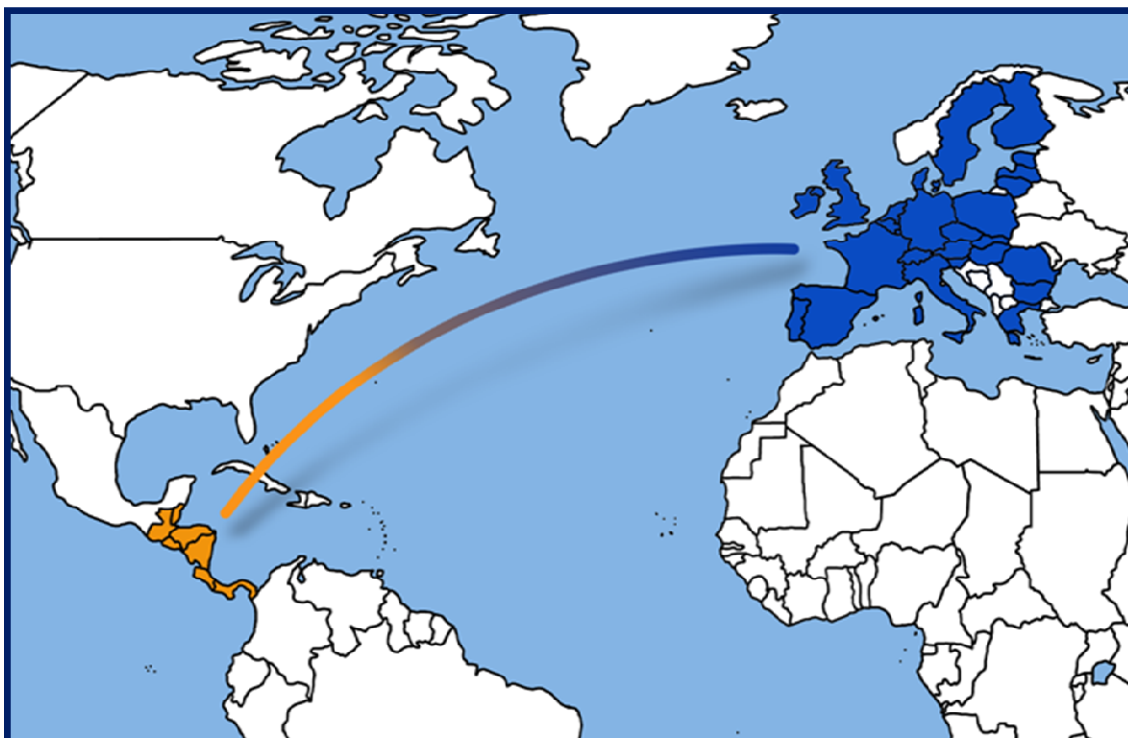


ENLACE

Enhancing Scientific Cooperation  
between the European Union and  
Central America



Directory on High-Quality Research  
Institutions in Central America

First version, June 2010

Funded by the European Commission's Directorate-General for Research  
7th Framework Programme (FP7)

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<http://www.enlace-project.eu/>

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## **What is the purpose of the ENLACE directory?**

The ENLACE directory serves as an instrument to enhance the participation of Research and Development (R&D) institutions from Central America (CA) in the activities of the Seventh Framework Programme for Research and Technological Development (FP7) of the European Union (EU). Its purpose is the promotion of participation of a number of high-quality research organisations in collaborative research projects, such as for example the specific international co-operation actions (SICAs) that address specific thematic areas or challenges in the European Community's international Science and Technology (S&T) co-operation with International Co-operation Partner Countries (ICPCs). An important focus of the Seventh Framework Programme is the enhancement of co-operative relations with those third countries that have already an S&T co-operation agreement. However, the participation of third countries and regions that have no S&T agreement with the EU is explicitly encouraged in all calls in the different work programmes of FP7. This directory, which includes R&D institutions from Central America, will be used as a strategic instrument to involve particularly institutions from this region.

## **How will the directory make a contribution to enhancing the participation of CA research organisations in FP7?**

The directory will make a strong contribution to the promotion of R&D institutions from Central American countries in FP7. The information about the selected institutions will be disseminated mainly among European scientific communities. The directory provides systematic information about the scientific fields of a selected number of high-quality Central American research organisations and will thus generate awareness among European scientific and non-scientific stakeholder communities.

## **How were the institutions in the directory identified and selected?**

Based on a set of previously agreed criteria, which can be deployed for the measurement of high-quality standards across different fields of scientific research, an online directory for Latin American and Caribbean R&D institutions was designed during the project LAC-ACCESS (see: <http://www.lac-database.eu/>) in order to allow for the evaluation of these institutions against the defined criteria.

The Central American partner institutions of the project ENLACE as well as the Central American ONCYTs (Organismos Nacionales de Ciencia y Tecnología/National Organ on Science and Technology) helped in identifying research institutions in CA. Hence, 280 Central American research institutions were invited to participate and promote their profile information in the online directory.

Chart 1 (p. 6) provides an overview on the available number of institutions by country that have been invited to participate in the survey.

Regarding the response to the dissemination activities, chart 2 (p. 6) provides information about the number of Central American institutions that inserted their profile information in the online directory on [www.lac-database.eu](http://www.lac-database.eu) (new entries since April 2010: 34; former entries: 19).

The entries of the ENLACE directory are based on the online directory. The first version of the ENLACE directory contains information by FP7 topic on 10 research institutions/organizations which gave a description on their principal activities and services as well as a short description of their R&D activities. Out of the 53 entries on [www.lac-database.eu](http://www.lac-database.eu) 6 new and 4 former institutions filled in the registration form completely and therefore are included in the ENLACE directory. Table 1 shows the distribution by country:

*Table 1: Number of R&D institutions in the ENLACE directory by country*

Belize	1
El Salvador	0
Honduras	1
Panama	0
Nicaragua	0
Guatemala	3
Costa Rica	5

## **S&T capacities of the institutions in the ENLACE directory: a summary**

Table 2 (p. 6) presents an overview on the S&T capacities of the research organisations that have been included in the first version of the ENLACE directory. It indicates the revealed research excellence of the institutions. The stated number does not match the total number of selected institutions because some institutions have a revealed strength in several S&T fields.

During the next months until the end of the project ENLACE in November 2013 efforts will be made to encourage more Central American research institutions to insert their profile information in the online directory. A final version of the ENLACE directory will be published in November 2013.

Chart 1: Dissemination activity: number of addressed research institutions by country

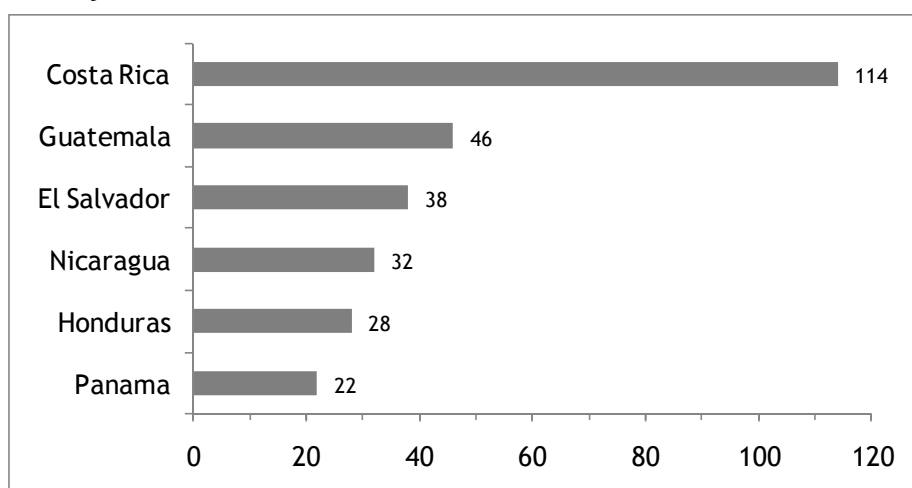


Chart 2: Entries on www.lac-database.eu (new entries since April 2010)

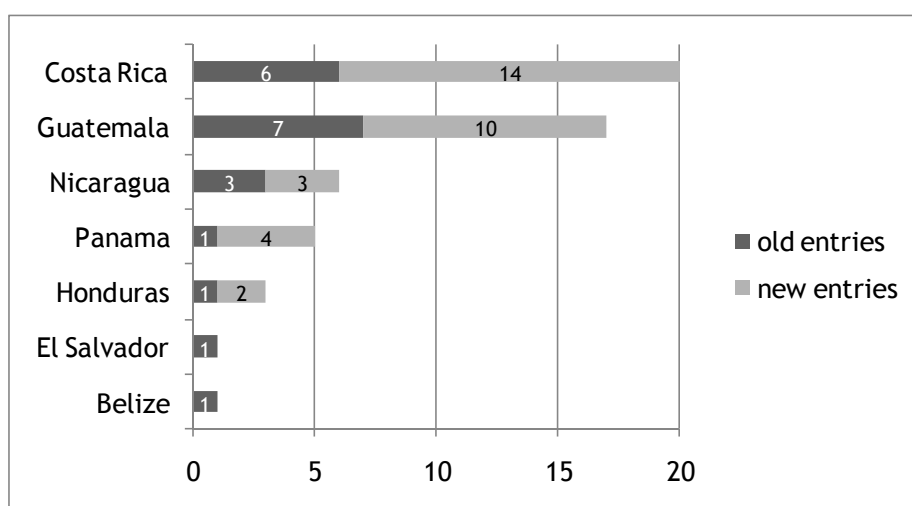


Table 2: S&T capacities of the R&D institutions

	Belize	Costa Rica	El Salvador	Guatemala	Honduras	Nicaragua	Panama	TOTAL
Health	0	2	0	0	1	0	0	3
Food, Agriculture and Fisheries, Biotechnology	0	2	0	2	0	0	0	4
Information & Communication Technologies	1	2	0	0	0	0	0	4
Nanosciences, Nanotechnologies, Materials & New Production Technologies	0	2	0	0	0	0	0	3
Energy	0	2	0	1	0	0	0	3
Environment (including Climate Change)	0	2	0	2	0	0	0	4
Transport (including Aeronautics)	0	0	0	0	0	0	0	0
Socio-economic Sciences and the Humanities	0	0	0	0	0	0	0	0
Space	0	0	0	0	0	0	0	0
Security	0	0	0	0	0	0	0	0
<b>TOTAL</b>	<b>1</b>	<b>12</b>	<b>0</b>	<b>5</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>19</b>

## COSTA RICA

<i>Organization</i>	<i>Contact person</i>
<p><i>Organization Name:</i> Costa Rica Institute of Technology (ITCR)</p> <p><i>Department:</i> Centro de Investigación en Biotecnología (CIB)</p> <p><i>Organization type:</i> University</p> <p><i>Website:</i> www.tec.ac.cr</p> <p><i>Country:</i> Costa Rica</p> <p><i>Postal Address:</i> Los Angeles, 59-705 Cartago, Central</p>	<p><i>Title:</i> Dr.</p> <p><i>First Name:</i> Miguel</p> <p><i>Last Name:</i> Rojas</p> <p><i>Position:</i> Research and Docent</p> <p><i>Phone:</i> (506) 2550-2285</p> <p><i>E-Mail:</i> mirojas@itcr.ac.cr</p>

### *Principal activities and services of your organization*

The Biotechnology Research Center (CIB) was founded in 1993 and works rather closely with the Biotechnology Engineering Course. The CIB contributes with regional and global strategies for the conservation of phylogenetic resources. Another goal is to increase the efficiency in several processes related to environmental biotechnology, plant biotechnology, biomedical biotech and ecological microbiology. The CIB combines different areas of biotechnology under the same roof, contributing with integral solutions to the fields of agriculture, food industry, forestry and environment.

### *Short description of R&D activities*

Tissue Engineering for skin grafting through several projects, for example the cultivation and grafting of cultivated keratinocytes, the establishment of a tissue bank in Costa Rica, the production of scaffolds from shrimp and tilapia for patient with epidermal diseases and validation by molecular methods of human keratinocytes cultures to optimize production in vitro for therapeutic purposes in Costa Rica.

Other topics of interest: Search for financial assistance for new biotechnological companies funded by graduated of the Biotechnology Engineering Course.

*Keywords describing the field of research:* cultivated keratinocytes, extra cellular matrices, scaffolds, burns

### *Principal activity*

Research	x
Technology development	

## COSTA RICA

<i>Organization</i>	<i>Contact person</i>
<p><i>Organization Name:</i> Costa Rica Institute of Technology (ITCR)</p> <p><i>Department:</i> Escuela de Ingeniería en Producción Industrial</p> <p><i>Organization type:</i> University</p> <p><i>Website:</i> www.tec.ac.cr</p> <p><i>Country:</i> Costa Rica</p> <p><i>Postal Address:</i> Cartago, Main Campus</p>	<p><i>Title:</i> Engineer</p> <p><i>First Name:</i> Carmen</p> <p><i>Last Name:</i> Madriz</p> <p><i>Position:</i> Professor</p> <p><i>Phone:</i> (506) 2550-2301</p> <p><i>E-Mail:</i> cmadriz@itcr.ac.cr</p>

### *Principal activities and services of your organization*

The Technological Institute of Costa Rica (ITCR) is a national autonomous institution of higher education devoted to teaching, research and extension of technology and science linked to the development of Costa Rica. It was created through law number 4777 on June 10, 1971. Since its establishment, the ITCR considers that it is critical to support technological development in the national and regional productive sector and therefore enhances the generation and transfer of technology.

### *Short description of R&D activities*

Development of an anthropometric data base for Central America in order to design work stations, houses, services places and so on.

*Keywords describing the field of research:* ergonomics; occupational health; mental load

### *Principal activity*

Research	x
Technology development	

## HONDURAS

<i>Organization</i>	<i>Contact person</i>
<p><i>Organization Name:</i> Universiad Nacional Autónoma de Honduras</p> <p><i>Department:</i> Postgrado en Salud Pública (POSAP)</p> <p><i>Organization type:</i> University</p> <p><i>Website:</i></p> <p><i>Country:</i> Honduras</p> <p><i>Postal Address:</i> Boulevard Suyapa, atras Hospital Escuela, 333 Tegucigalpa</p>	<p><i>Title:</i></p> <p><i>First Name:</i> Emilia</p> <p><i>Last Name:</i> Alduvin</p> <p><i>Position:</i> Professor</p> <p><i>Phone:</i> (504) 239-1977</p> <p><i>E-Mail:</i> ealduvin@gmail.com</p>

### *Principal activities and services of your organization*

POSAP is the leader institution for education in public health resources at postgraduate level in Honduras. It was founded in 1992. POSAP accomplished to locate many of its graduates in higher positions both in governmental institutions and multilateral agencies. The mission of POSAP is training of public health professionals at the highest level, with technic competences and social conscience, based on a transdisciplinary pedagogical approach, aiming to generate sounded knowledge, fostering team work, and seeking for the transformation of the health conditions in Honduras.

Based at the Autonomous University of Honduras its main activities and services are: teaching, research and community linkages on public health

### *Short description of R&D activities*

*Keywords describing the field of research:* health policies from a right to health perspective; health systems and services within the health reform process; human resources on health; health problems with an equity perspective

#### *Principal activity*

Research	x
Technology development	

## COSTA RICA

<i>Organization</i>	<i>Contact person</i>
<p><i>Organization Name:</i> Costa Rica Institute of Technology (ITCR)</p> <p><i>Department:</i> Centro de Investigación en Biotecnología (CIB)</p> <p><i>Organization type:</i> University</p> <p><i>Website:</i> www.tec.ac.cr</p> <p><i>Country:</i> Costa Rica</p> <p><i>Postal Address:</i> Los Angeles, 59-705 Cartago, Central</p>	<p><i>Title:</i> Dr.</p> <p><i>First Name:</i> Miguel</p> <p><i>Last Name:</i> Rojas</p> <p><i>Position:</i> Research and Docent</p> <p><i>Phone:</i> (506) 2550-2285</p> <p><i>E-Mail:</i> mirojas@itcr.ac.cr</p>

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### *Short description of R&D activities*

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Other topics of interest: Search for financial assistance for new biotechnological companies funded by graduated of the Biotechnology Engineering Course.

*Keywords describing the field of research:* cultivated keratinocytes; extra cellular matrices; scaffolds; burns

### *Principal activity*

Research	x
Technology development	

## COSTA RICA

<i>Organization</i>	<i>Contact person</i>
<p><i>Organization Name:</i> Instituto Nacional de Innovación y Transferencia en Tecnología Agropecuaria</p> <p><i>Department:</i> Dirección de Proyectos y Gestión de Recursos</p> <p><i>Organization type:</i> Research Institute (non-university)</p> <p><i>Website:</i></p> <p><i>Country:</i> Costa Rica</p> <p><i>Postal Address:</i> Pop`'s Sabana 800 m Oeste, 1000 San José</p>	<p><i>Title:</i> MGA.</p> <p><i>First Name:</i> Enrique</p> <p><i>Last Name:</i> Martínez Vargas</p> <p><i>Position:</i> Director Gestión Proyectos y Recursos</p> <p><i>Phone:</i> (506) 22200369</p> <p><i>E-Mail:</i> emartinez@inta.go.cr</p>

### *Principal activities and services of your organization*

Generation of technology mainly in food security items such as rice, maize, beans, potatoes, tropical roots (cassava, tiquizque, yams, sweet potatoes), vegetables, fruit, cattle and swine; transfer of technology especially for small and medium producers; advice to farmers in the area of jurisdiction; analysis and laboratories diagnosis in areas such as plant pathology, nematology, entomology, microbiology, animal feed and fodder, soil and water; studies of soil and capacity of land use; soil mapping; production and supply of high quality seeds of basic grains, roots, musa, tubers and tropical fruits to the productive sector

### *Short description of R&D activities*

INTA transfers research results to users of technology through the Agricultural Extension Service of the state and other extension services to ensure public and private technology transfer to small and medium farmers and therefore enhance agricultural production and ensure its sustainability. It promotes participation of the users in field days, workshops, courses, exchanges, forums, demonstration plots. INTA also addresses the demand of tech agribusiness or groups of farmers through direct funding by the latter and promotes the development of technology to provide greater added value through product differentiation as a mechanism to access niche markets and obtain better prices.

*Keywords describing the field of research:* innovation; transfer; food safety; technology; pathology; nematology; entomology; microbiology; climate change; crops; animals; cattle; swine; safety; postharvest; good agricultural practices; transformation; sustainable agriculture; environmental impact; small farmers; biotechnology; manufactura best practices; organic agriculture; participatory research; gender; nutrition; irrigation

### *Principal activity*

Research	x
Technology development	

## GUATEMALA

<i>Organization</i>	<i>Contact person</i>
<p><i>Organization Name:</i> Instituto de Ciencia y Tecnología Agrícolas</p> <p><i>Department:</i></p> <p><i>Organization type:</i> Governmental organisation</p> <p><i>Website:</i> www.icta.gob.gt</p> <p><i>Country:</i> Guatemala</p> <p><i>Postal Address:</i> Km 21.5 Carretera al Pacífico, 01064 Villa Nueva</p>	<p><i>Title:</i> PhD</p> <p><i>First Name:</i> Max Myrol</p> <p><i>Last Name:</i> González Salán</p> <p><i>Position:</i> General Manager</p> <p><i>Phone:</i> (502) 6629 7899</p> <p><i>E-Mail:</i> biotecnologia@icta.gob.gt, ggeneral@icta.gob.gt</p>

### *Principal activities and services of your organization*

ICTA is the government institute for agricultural research and technology development. It was created in 1973 and the main activities are related to plant breeding. Most of the improved varieties of maize, beans, rice, sesame and wheat currently used in Guatemala were produced by ICTA. ICTA's mission is to generate and promote agricultural science and technology in Guatemala, its principal activities and services are agricultural research, technology transference, seed production and process.

### *Short description of R&D activities*

Developing cultivars, pest management programs and good agricultural practices for the main beneficiaries of poor producers; molecular characterization of plants in garlic, maize, jatropha, and common beans; molecular assisted selection in common beans and maize; plant breeding (common beans); micropropagation of banana, malanga, potato, garlic and other species.

*Keywords describing the field of research:* breeding, agronomy, integrated pest management in Grains and cereals (maize, beans, sorghum, rice and vegetables, mainly: potatoes, manihot and ipomea).

### *Principal activity*

Research	
Technology development	x

## BELIZE

<i>Organization</i>	<i>Contact person</i>
<p><i>Organization Name:</i> University of Belize</p> <p><i>Department:</i> Department of Information Technology</p> <p><i>Organization type:</i> University</p> <p><i>Website:</i> <a href="http://it.ub.edu.bz/">http://it.ub.edu.bz/</a></p> <p><i>Country:</i> Belize</p> <p><i>Postal Address:</i> Hummingbird Highway, PO Box 340, Cayo D - Belmopan</p>	<p><i>Title:</i> Dr.</p> <p><i>First Name:</i> Tamas</p> <p><i>Last Name:</i> Lengyel</p> <p><i>Position:</i> Chair of department</p> <p><i>Phone:</i> (501) 822-1000 ex 301</p> <p><i>E-Mail:</i> <a href="mailto:tlengyel@ub.edu.bz">tlengyel@ub.edu.bz</a></p>

<i>Principal activities and services of your organization</i>
<p>The University of Belize was established in August 2000 as an amalgamation of five tertiary-level institutions: Bliss School of Nursing, Belize Technical College, Belize Teachers College, University College of Belize, Belize School of Agriculture. The University of Belize is a national, autonomous and multi-location institution committed to excellence in higher education, research and service for national development. As a catalyst of change it provides relevant, affordable and accessible educational and training programs that address national needs based on principles of academic freedom, equity, transparency, merit and accountability.</p> <p>The Department of Information Technology is offering Associate and Bachelor Degrees in Information Technology (formerly Computer Science).</p>

<i>Short description of R&amp;D activities</i>
<p>Being a very young institution, the Department of Information Technology has been operating in teaching mode and is moving into research mode, therefore searching for partners in any ICT related research activities.</p> <p><i>Keywords describing the field of research:</i> Software Engineering, Network Engineering, Web Development, Database Management, Telecommunication Systems, E-learning</p>

<i>Principal activity</i>	
Research	
Technology development	

## COSTA RICA

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Development of an anthropometric data base for Central America in order to design work stations, houses, services places and so on.

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### *Principal activity*

Research	x
Technology development	

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### *Principal activity*

Research	x
Technology development	

## COSTA RICA

<i>Organization</i>	<i>Contact person</i>
<p><i>Organization Name:</i> Universidad de Costa Rica</p> <p><i>Department:</i> Centro de Investigacion en Ciencia e Ingenieria de Materiales (CICIMA)</p> <p><i>Organization type:</i> University</p> <p><i>Website:</i> www.cicima.fisica.ucr.ac.cr/</p> <p><i>Country:</i> Costa Rica</p> <p><i>Postal Address:</i> Edificio de Fisicomatematicas, Of. 110FM, 11501 - San Pedro, Montes de Oca</p>	<p><i>Title:</i> Dr.</p> <p><i>First Name:</i> Arturo</p> <p><i>Last Name:</i> Ramirez-Porras</p> <p><i>Position:</i> Director</p> <p><i>Phone:</i> (506) 2511-4705</p> <p><i>E-Mail:</i> cicima@ucr.ac.cr</p>

### *Principal activities and services of your organization*

CICIMA was founded in 1990 as a dependent research center of the Research Office (Vicerrectoría de Docencia) of the Universidad de Costa Rica. The full name in spanish is Centro de Investigación en Ciencia e Ingeniería de Materiales (Materials Science and Engineering Research Center).

The mission of CICIMA is to develop the basic and applied science of low dimensional new and advanced materials (nanomaterials included) for possible engineering and industry applications such as electronics, biomedical applications, energy, among others.

Principal activities and services are: (a) Research projects dependent of the university research office; (b) Publication of articles in internationally recognized technical journals; (c) Materials characterization for industry, including: electronic microscopy, atomic force microscopy, elemental analysis, micromechanical characterization, optical properties determination.

### *Short description of R&D activities*

The center develops scientific research on novel materials to improve the life quality as, for example, new energy sources, new data storage devices, affordable sensors for contaminant detection on air and water, materials for medical applications, etc. The possible impact is in development of new patented devices.

*Keywords describing the field of research:* advanced materials, nanomaterials, hydrogen, magnetic materials, semiconductors, soft matter, polymers, biomaterials, materials science, materials characterization, optical properties.

### *Principal activity*

Research	x
Technology development	

## COSTA RICA

<i>Organization</i>	<i>Contact person</i>
<p><i>Organization Name:</i> Instituto Tecnológico de Costa Rica</p> <p><i>Department:</i> Electronics Engineering School</p> <p><i>Organization type:</i> University</p> <p><i>Website:</i> www.itcr.ac.cr</p> <p><i>Country:</i> Costa Rica</p> <p><i>Postal Address:</i> POBOX 159, CR30101 - Cartago</p>	<p><i>Title:</i> Dr.-Ing.</p> <p><i>First Name:</i> Paola</p> <p><i>Last Name:</i> Vega-Castillo</p> <p><i>Position:</i> Research and Outreach Council</p> <p><i>Phone:</i> (506)25509248</p> <p><i>E-Mail:</i> pvega@itcr.ac.cr</p>

### *Principal activities and services of your organization*

In 1971 the Legislative Assembly approved law #4777, thus creating the Instituto Tecnológico de Costa Rica. The Institute became the country's first and only technological university, oriented towards the modernization and improvement of the productive sector and technology transfer for the transformation of the Costa Rican society. In 2009, Instituto Tecnológico de Costa Rica created the Nanotechnology Research Program and declared it as an institutional priority.

The mission is to provide qualified workforce for Costa Rica, technology transfer, technology development and research in order to contribute to the development of the country. Principal activities and services are: higher education, research, technology transfer, outreach.

### *Short description of R&D activities*

From the social point of view, research activities are oriented to solving problems affecting the country such as clean water, clean energy, public health and technology transfer to the less privileged sectors of the society, to stimulate small and medium enterprises. The research activities are oriented to the attraction of research and development centers and companies to our country, and making the costarican companies more competitive by means of technology transfer, development and research.

*Keywords describing the field of research:* Nanotechnology, water resources, energy, biotechnology

### *Principal activity*

Research	x
Technology development	

## COSTA RICA

<b>Organization</b>	<b>Contact person</b>
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### **Principal activities and services of your organization**

CICIMA was founded in 1990 as a dependent research center of the Research Office (Vicerrectoría de Docencia) of the Universidad de Costa Rica. The full name in spanish is Centro de Investigación en Ciencia e Ingeniería de Materiales (Materials Science and Engineering Research Center).

The mission of CICIMA is to develop the basic and applied science of low dimensional new and advanced materials (nanomaterials included) for possible engineering and industry applications such as electronics, biomedical applications, energy, among others.

Principal activities and services are: (a) Research projects dependent of the university research office; (b) Publication of articles in internationally recognized technical journals; (c) Materials characterization for industry, including: electronic microscopy, atomic force microscopy, elemental analysis, micromechanical characterization, optical properties determination.

### **Short description of R&D activities**

The center develops scientific research on novel materials to improve the life quality as, for example, new energy sources, new data storage devices, affordable sensors for contaminant detection on air and water, materials for medical applications, etc. The possible impact is in development of new patented devices.

*Keywords describing the field of research:* advanced materials, nanomaterials, hydrogen, magnetic materials, semiconductors, soft matter, polymers, biomaterials, materials science, materials characterization, optical properties.

### **Principal activity**

Research	x
Technology development	

## COSTA RICA

<b>Organization</b>	<b>Contact person</b>
<p><i>Organization Name:</i> Instituto Tecnológico de Costa Rica</p> <p><i>Department:</i> Electronics Engineering School</p> <p><i>Organization type:</i> University</p> <p><i>Website:</i> www.itcr.ac.cr</p> <p><i>Country:</i> Costa Rica</p> <p><i>Postal Address:</i> POBOX 159, CR30101 - Cartago</p>	<p><i>Title:</i> Dr.-Ing.</p> <p><i>First Name:</i> Paola</p> <p><i>Last Name:</i> Vega-Castillo</p> <p><i>Position:</i> Research and Outreach Council</p> <p><i>Phone:</i> (506)25509248</p> <p><i>E-Mail:</i> pvega@itcr.ac.cr</p>

### **Principal activities and services of your organization**

In 1971 the Legislative Assembly approved law #4777, thus creating the Instituto Tecnológico de Costa Rica. The Institute became the country's first and only technological university, oriented towards the modernization and improvement of the productive sector and technology transfer for the transformation of the Costa Rican society. In 2009, Instituto Tecnológico de Costa Rica created the Nanotechnology Research Program and declared it as an institutional priority.

The mission is to provide qualified workforce for Costa Rica, technology transfer, technology development and research in order to contribute to the development of the country. Principal activities and services are: higher education, research, technology transfer, outreach.

### **Short description of R&D activities**

From the social point of view, research activities are oriented to solving problems affecting the country such as clean water, clean energy, public health and technology transfer to the less privileged sectors of the society, to stimulate small and medium enterprises. The research activities are oriented to the attraction of research and development centers and companies to our country, and making the costarican companies more competitive by means of technology transfer, development and research.

*Keywords describing the field of research:* Nanotechnology, water resources, energy, biotechnology

### **Principal activity**

Research	x
Technology development	

## GUATEMALA

<i>Organization</i>	<i>Contact person</i>
<p><i>Organization Name:</i> Centro Universitario de Occidente (Universidad de San Carlos)</p> <p><i>Department:</i> Departamento de Investigaciones Económicas y Sociales</p> <p><i>Organization type:</i> University</p> <p><i>Website:</i> www.cunoc.usac.edu.gt</p> <p><i>Country:</i> Guatemala</p> <p><i>Postal Address:</i> Calle Rodolfo Robles 29-99 Zona 1, 09001 - Quetzaltenango</p>	<p><i>Title:</i> Engineer</p> <p><i>First Name:</i> Erick</p> <p><i>Last Name:</i> Gonzalez</p> <p><i>Position:</i> Director of department</p> <p><i>Phone:</i> (502) 78730000</p> <p><i>E-Mail:</i> gonzalezerick@yahoo.com</p>

### *Principal activities and services of your organization*

The western University Center is part of the University of San Carlos de Guatemala. The center was created in 1971 as an experimental center, and is splitted in six divisions: sciences on health, sciences of engineering, humanistic division, sciences of economics, sciences of agriculture and division of lawyers. The maximum authority is the directorate council. The main manager is the general director. There is also a department on social and economic research.

Principal activities and services: research, teaching and services to the communities, especially to the poorest ones.

### *Short description of R&D activities*

The main impact of the research activity is on health for management of diseases in hospitals and rural communities. Regarding energy the main focus lies on cost reduction of operations of community new alliance, and rural communities using renewable energy: solar, hydro, biodiesel. The industrial impacts of the RTD activities in the area of energy are: improvements of productions in new alliance community with biodiesel (research of plants by students of engineering); improvement of the equipment for process macadamia nut with the use of hydropower plant.

#### *Principal activity*

Research	
Technology development	x

## COSTA RICA

<i>Organization</i>	<i>Contact person</i>
<p><i>Organization Name:</i> Instituto Tecnológico de Costa Rica</p> <p><i>Department:</i> Electronics Engineering School</p> <p><i>Organization type:</i> University</p> <p><i>Website:</i> www.itcr.ac.cr</p> <p><i>Country:</i> Costa Rica</p> <p><i>Postal Address:</i> POBOX 159, CR30101 - Cartago</p>	<p><i>Title:</i> Dr.-Ing.</p> <p><i>First Name:</i> Paola</p> <p><i>Last Name:</i> Vega-Castillo</p> <p><i>Position:</i> Research and Outreach Council</p> <p><i>Phone:</i> (506)25509248</p> <p><i>E-Mail:</i> pvega@itcr.ac.cr</p>

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*Keywords describing the field of research:* Nanotechnology, water resources, energy, biotechnology

### *Principal activity*

Research	x
Technology development	

## COSTA RICA

<i>Organization</i>	<i>Contact person</i>
<p><i>Organization Name:</i> Instituto Nacional de Innovación y Transferencia en Tecnología Agropecuaria</p> <p><i>Department:</i> Dirección de Proyectos y Gestión de Recursos</p> <p><i>Organization type:</i> Research Institute (non-university)</p> <p><i>Website:</i></p> <p><i>Country:</i> Costa Rica</p> <p><i>Postal Address:</i> Pop`'s Sabana 800 m Oeste, 1000 San José</p>	<p><i>Title:</i> MGA.</p> <p><i>First Name:</i> Enrique</p> <p><i>Last Name:</i> Martínez Vargas</p> <p><i>Position:</i> Director Gestión Proyectos y Recursos</p> <p><i>Phone:</i> (506) 22200369</p> <p><i>E-Mail:</i> emartinez@inta.go.cr</p>

### *Principal activities and services of your organization*

Generation of technology mainly in food security items such as rice, maize, beans, potatoes, tropical roots (cassava, tiquizque, yams, sweet potatoes), vegetables, fruit, cattle and swine; transfer of technology especially for small and medium producers; advice to farmers in the area of jurisdiction; analysis and laboratories diagnosis in areas such as plant pathology, nematology, entomology, microbiology, animal feed and fodder, soil and water; studies of soil and capacity of land use; soil mapping; production and supply of high quality seeds of basic grains, roots, musa, tubers and tropical fruits to the productive sector

### *Short description of R&D activities*

INTA transfers research results to users of technology through the Agricultural Extension Service of the state and other extension services to ensure public and private technology transfer to small and medium farmers and therefore enhance agricultural production and ensure its sustainability. It promotes participation of the users in field days, workshops, courses, exchanges, forums, demonstration plots. INTA also addresses the demand of tech agribusiness or groups of farmers through direct funding by the latter and promotes the development of technology to provide greater added value through product differentiation as a mechanism to access niche markets and obtain better prices.

*Keywords describing the field of research:* innovation; transfer; food safety; technology; pathology; nematology; entomology; microbiology; climate change; crops; animals; cattle; swine; safety; postharvest; good agricultural practices; transformation; sustainable agriculture; environmental impact; small farmers; biotechnology; manufactura best practices; organic agriculture; participatory research; gender; nutrition; irrigation

### *Principal activity*

Research	x
Technology development	

## GUATEMALA

<i>Organization</i>	<i>Contact person</i>
<p><i>Organization Name:</i> Centro Universitario de Occidente (Universidad de San Carlos)</p> <p><i>Department:</i> Departamento de Investigaciones Económicas y Sociales</p> <p><i>Organization type:</i> University</p> <p><i>Website:</i> www.cunoc.usac.edu.gt</p> <p><i>Country:</i> Guatemala</p> <p><i>Postal Address:</i> Calle Rodolfo Robles 29-99 Zona 1, 09001 - Quetzaltenango</p>	<p><i>Title:</i> Engineer</p> <p><i>First Name:</i> Erick</p> <p><i>Last Name:</i> Gonzalez</p> <p><i>Position:</i> Director of department</p> <p><i>Phone:</i> (502) 78730000</p> <p><i>E-Mail:</i> gonzalezerick@yahoo.com</p>

<i>Principal activities and services of your organization</i>
<p>The western University Center is part of the University of San Carlos de Guatemala. The center was created in 1971 as an experimental center, and is splitted in six divisions: sciences on health, sciences of engineering, humanistic division, sciences of economics, sciences of agriculture and division of lawyers. The maximum authority is the directorate council. The main manager is the general director. There is also a department on social and economic research.</p> <p>Principal activities and services: research, teaching and services to the communities, especially to the poorest ones.</p>

<i>Short description of R&amp;D activities</i>
<p>The main impact of the research activity is on health for management of diseases in hospitals and rural communities. Regarding energy the main focus lies on cost reduction of operations of community new alliance, and rural communities using renewable energy: solar, hydro, biodiesel. The industrial impacts of the RTD activities in the area of energy are: improvements of productions in new alliance community with biodiesel (research of plants by students of engineering); improvement of the equipment for process macadamia nut with the use of hydropower plant.</p>

<i>Principal activity</i>	
Research	
Technology development	x

## GUATEMALA

<b>Organization</b>	<b>Contact person</b>
<p><i>Organization Name:</i> Instituto de Ciencia y Tecnología Agrícolas</p> <p><i>Department:</i></p> <p><i>Organization type:</i> Governmental organisation</p> <p><i>Website:</i> www.icta.gob.gt</p> <p><i>Country:</i> Guatemala</p> <p><i>Postal Address:</i> Km 21.5 Carretera al Pacífico, 01064 Villa Nueva</p>	<p><i>Title:</i> PhD</p> <p><i>First Name:</i> Max Myrol</p> <p><i>Last Name:</i> González Salán</p> <p><i>Position:</i> General Manager</p> <p><i>Phone:</i> (502) 6629 7899</p> <p><i>E-Mail:</i> biotecnologia@icta.gob.gt, ggeneral@icta.gob.gt</p>

### **Principal activities and services of your organization**

ICTA is the government institute for agricultural research and technology development. It was created in 1973 and the main activities are related to plant breeding. Most of the improved varieties of maize, beans, rice, sesame and wheat currently used in Guatemala were produced by ICTA. ICTA's mission is to generate and promote agricultural science and technology in Guatemala, its principal activities and services are agricultural research, technology transference, seed production and process.

### **Short description of R&D activities**

Developing cultivars, pest management programs and good agricultural practices for the main beneficiaries of poor producers; molecular characterization of plants in garlic, maize, jatropha, and common beans; molecular assisted selection in common beans and maize; plant breeding (common beans); micropropagation of banana, malanga, potato, garlic and other species.

*Keywords describing the field of research:* breeding, agronomy, integrated pest management in Grains and cereals (maize, beans, sorghum, rice and vegetables, mainly: potatoes, manihot and ipomea).

### **Principal activity**

Research	
Technology development	x