CENTRO DE INVESTIGACIÓN, TECNOLOGÍA E INNOVACIÓN UNIVERSIDAD DE SEVILLA

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Vicechancer of Research

UNIVERSIDAD DE SEVILLA

ANDALUCÍA TECH
Campus de Excelencia Internacional
Campus of International Excellence

- Resources in Advanced Analytical Instrumentation

- Sustained effort by Universidad de Sevilla (USE)
  - ✓ Public Funding, FEDER Funds
  - ✓ Research Groups

- Central Research Facilities
  - Availability for
    - Research Groups
    - Public Research Institutes
    - Industries

- Strategical Project: CITIUS

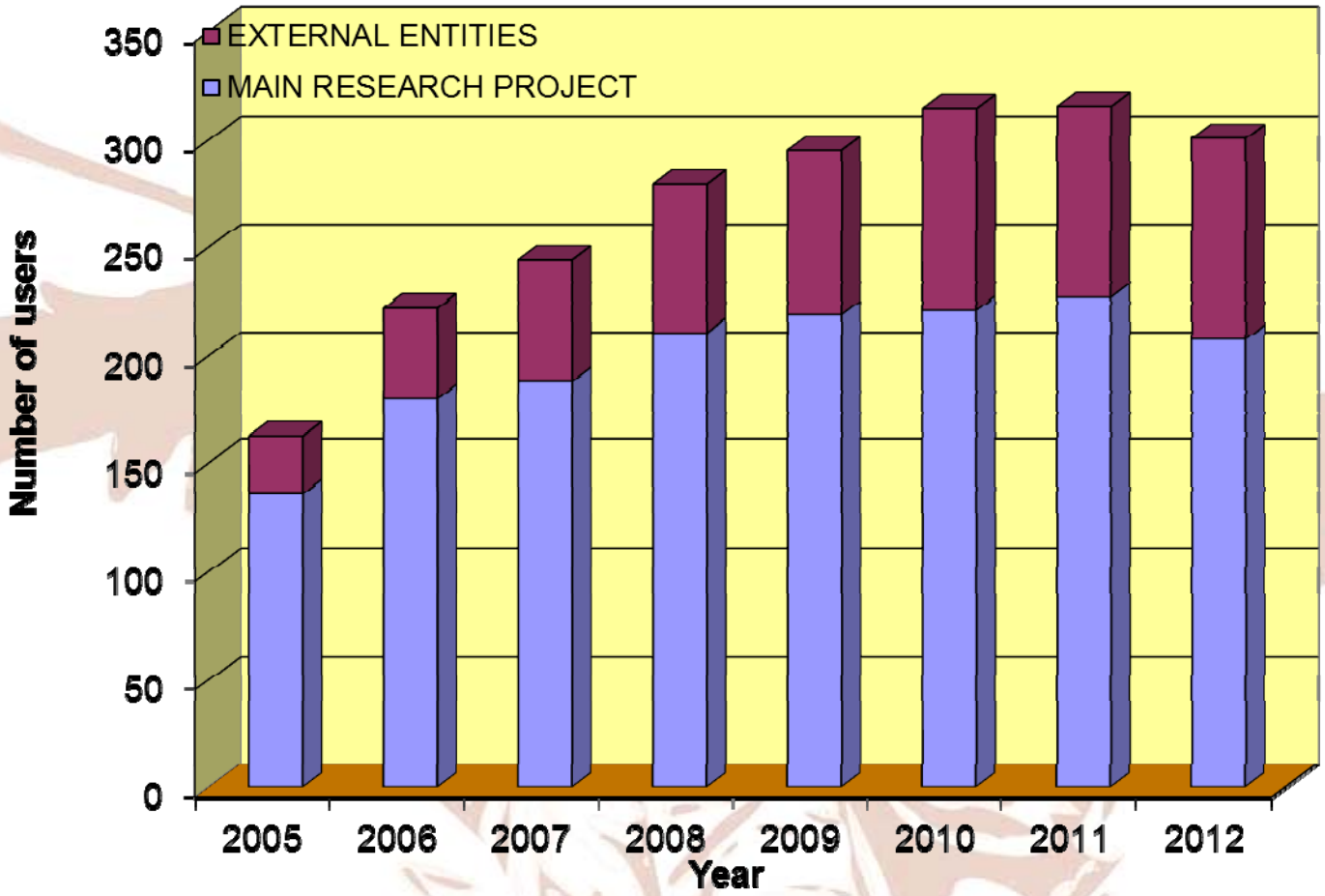
- Objective:
  - For Research Groups: Excelence
  - Science-Industry-Society Technology Transfer
  - For Industries: Quality

- By means of:
  - Proper Infrastructure
  - Centralized Managing
  - Synergy Effects
  - Quality and Traceability

Building (2004)	5000 m^2
Funding	4.5 M€
Instrumental facilities	>15 M€

Instrumental facilities 2010 ~ 9 M€
Instrumental facilities 2012-13 ~ 12 M€

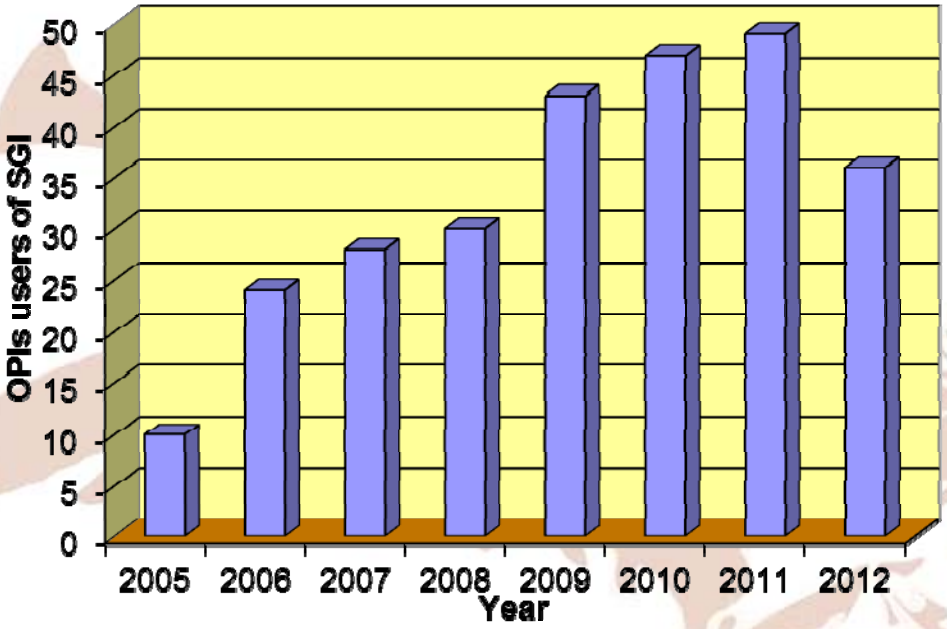
USERS

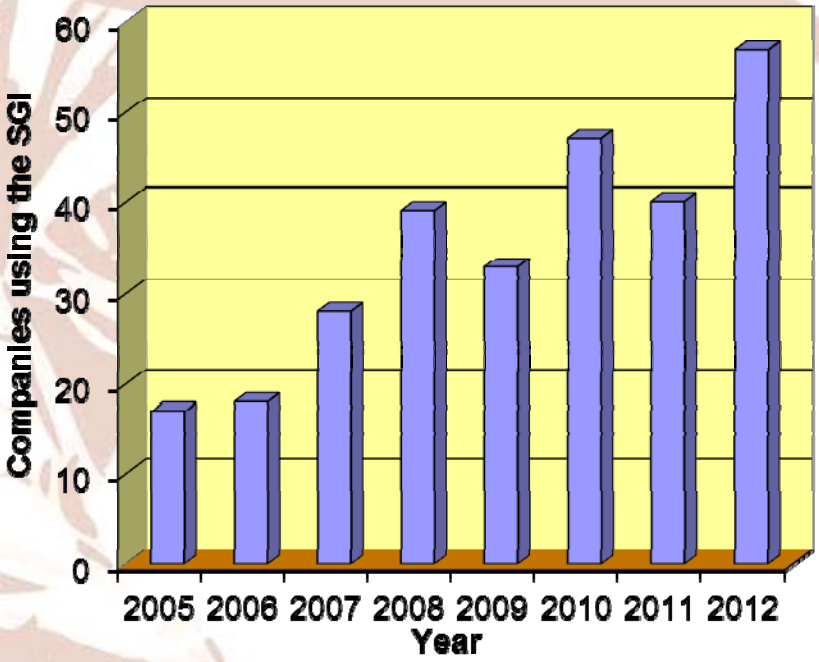


208 Research groups
93 external companies/institutions

Almost all research groups are scientific-technical users of SGI

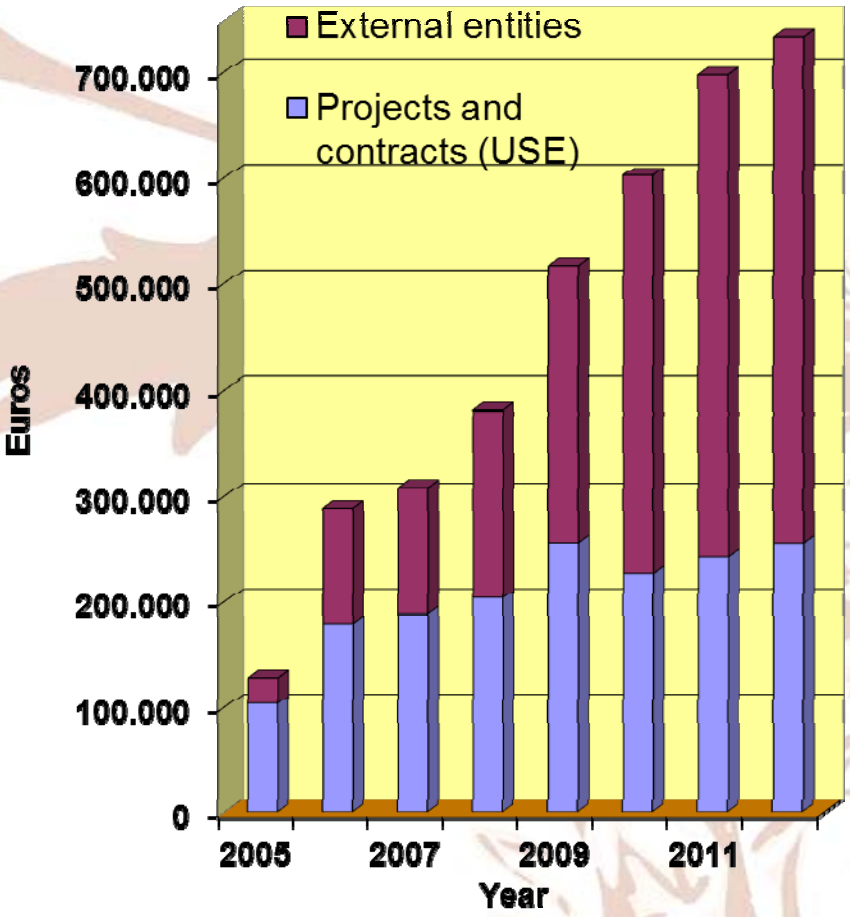
USERS





Growth trend that has been developing since the creation of CITIUS

INCOME



2008 - 380.000 €
2009 - 517.000 €
2010 - 602.000 €
2011 - 695.000 €
2012 - 734,000 €
(5,61 % annual increase)

Self-financing
2008 - 40%
2009 - 48%,
2010 - 53%
2011 - 60%
2012 – 88%

COMPANIES WITH R+D DEPARTMENT IN CITIUS

❖ABENGOA NEW TECHNOLOGIES

Objective: bioethanol production from biomass.

❖ENDESA INGENIERIA

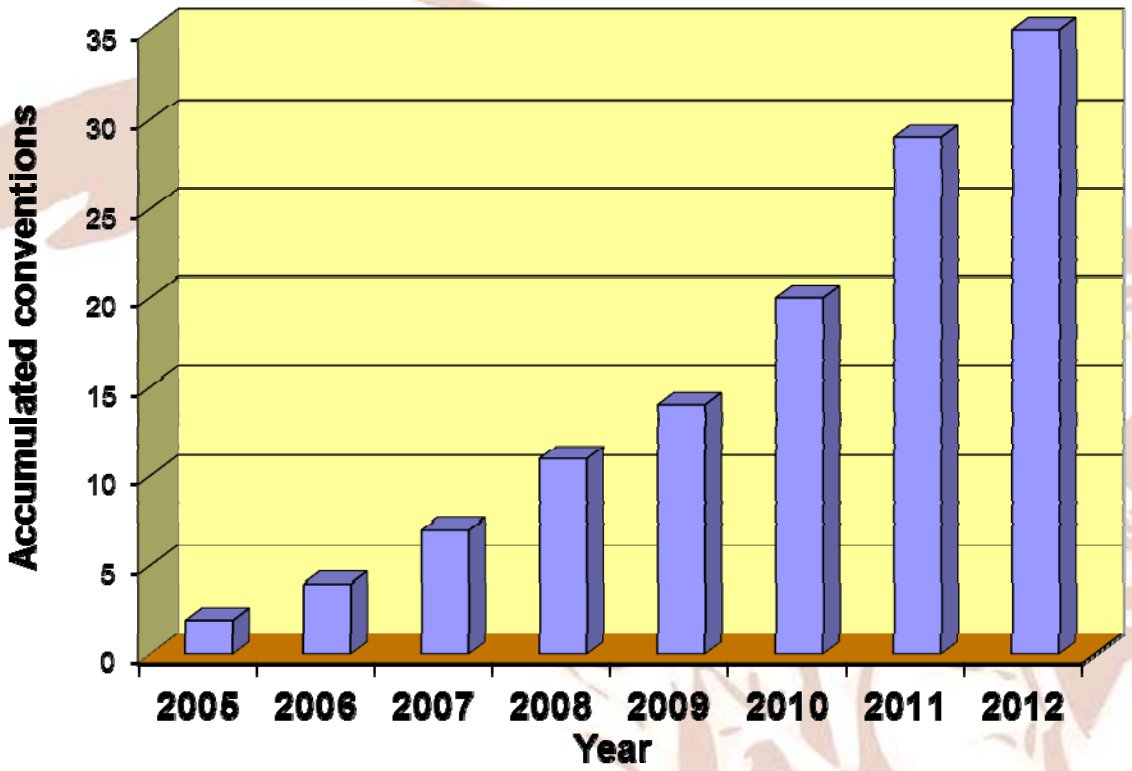
Objective: implementation of predictive maintenance techniques of dielectric fluids in electrical transformers.

SPIN-OFF Companies

❖RESBIOAGRO

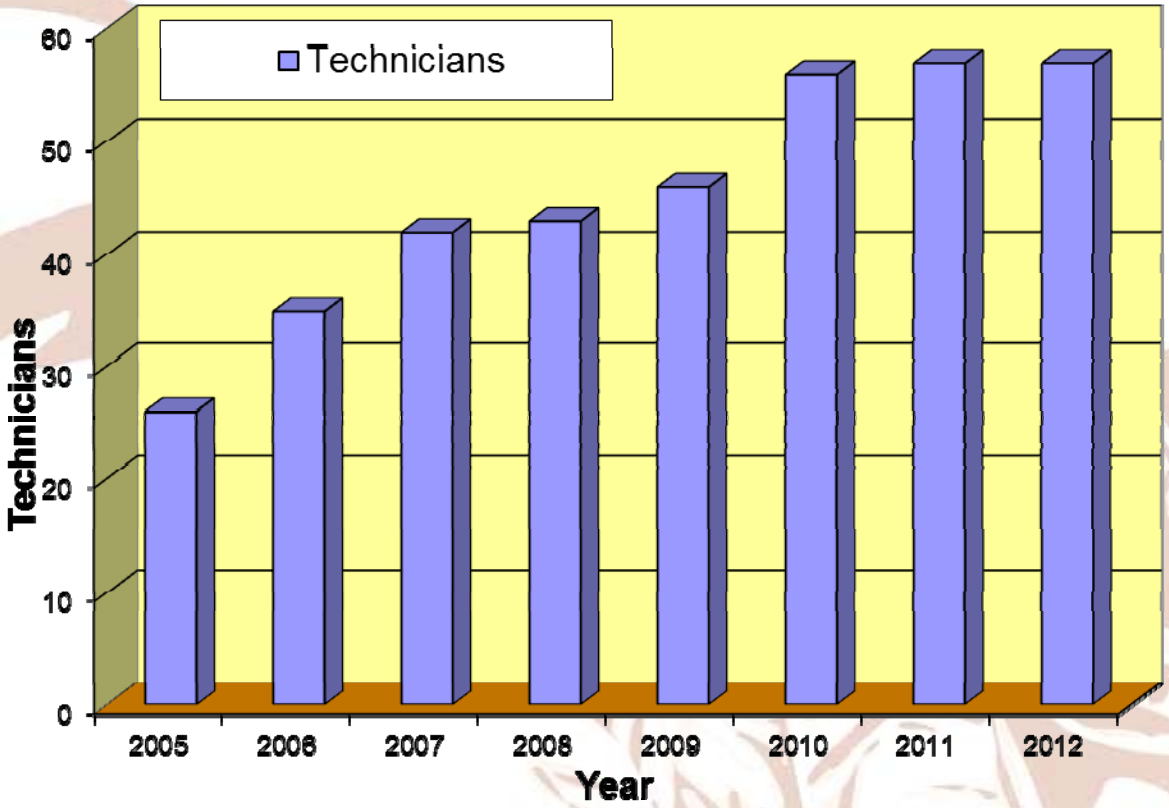
Objective: use of microorganisms as effective partners to provide solutions to food and agriculture biotechnology, energy and environment through quality products and services that respect the environment.

AGREEMENTS WITH COMPANIES



- DOSBIO
- ABENGOA BIOENERGÍA NUEVAS TECNOLOGÍAS (ABNT)
- RESBIOAGRO
- LABS & TECHNOLOGICAL SERVICES AGQ
- AGENCIA ESTATAL CONSEJO SUPERIOR DE INVESTIGACIONES CIENTÍFICAS

SPECIALIZED THECNICAL PERSONEL



The total staff of technicians is 57, plus 5 members of staff management. Two thirds of these technicians are graduates, and half of them Ph D.

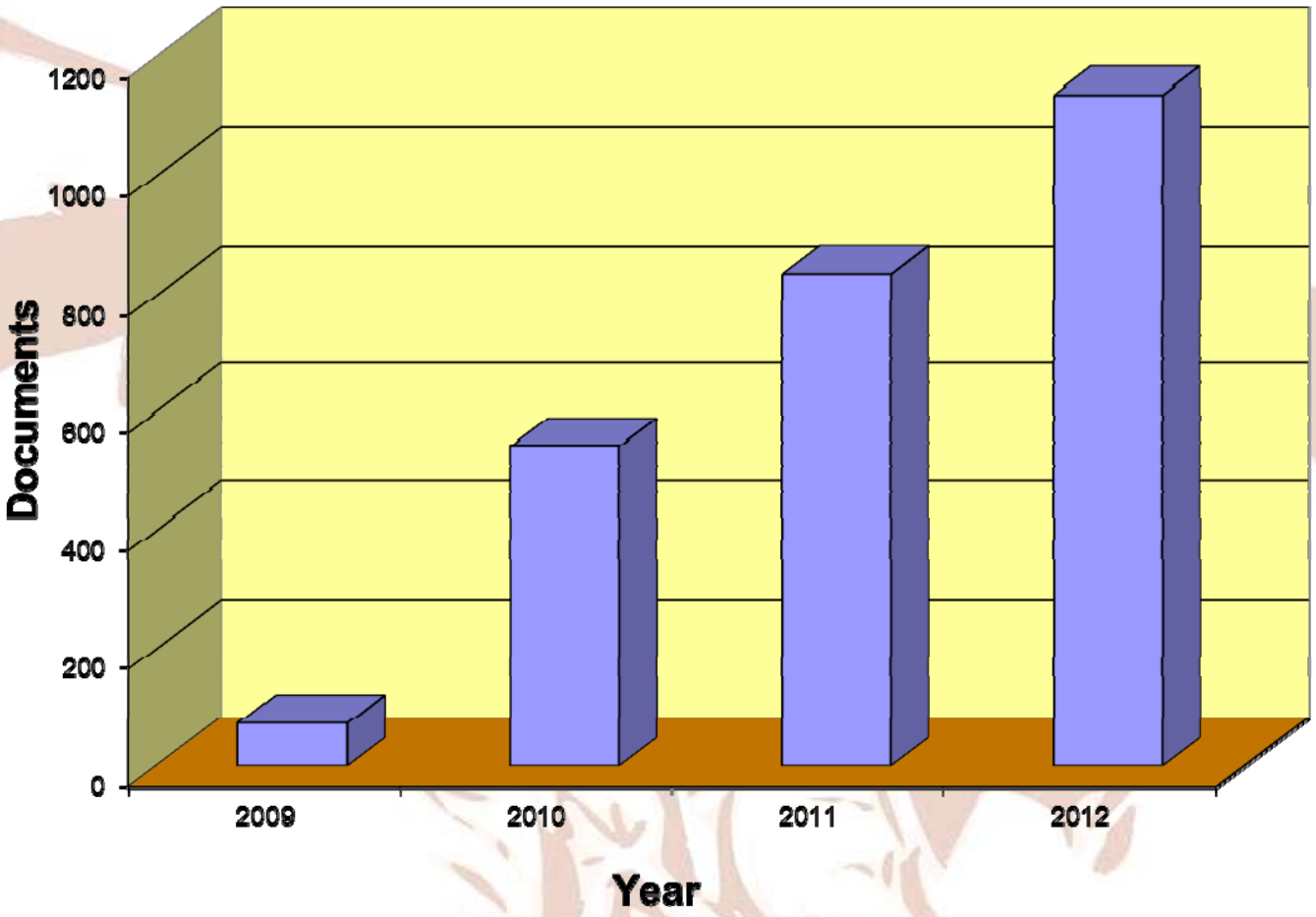
QUALITY MANAGEMENT

The SGI held from 2011 certification by the national certification body AENOR in the Guidelines:

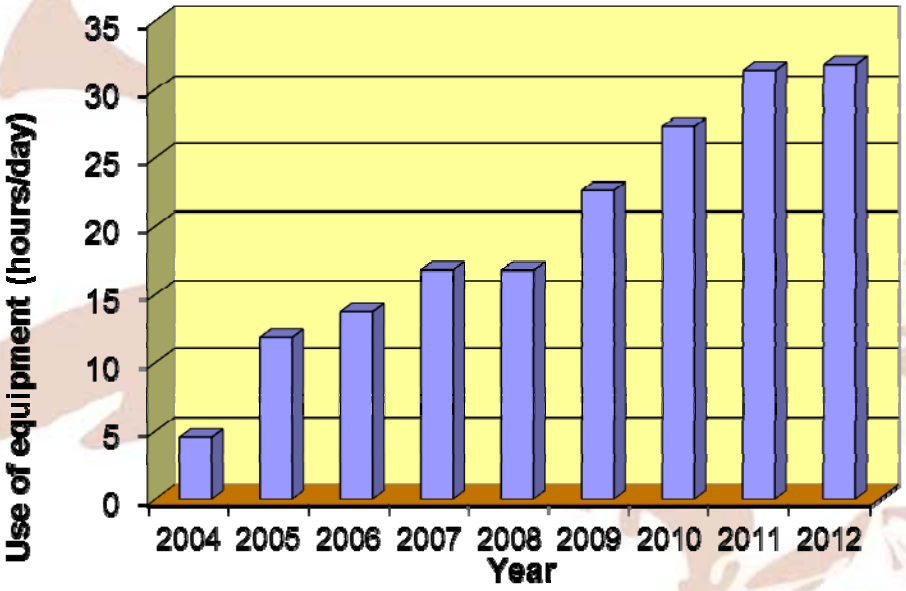
- ✓ISO 9001:2008, Sistemas de Gestión de la Calidad.
- ✓ISO 14001:2004, Sistemas de Gestión Ambiental.

In 2011, along with the rest of the University of Seville, CITIUS reaches the seal "Norma BS OHSAS 18001:2007, Sistema de Gestión de Seguridad y Salud Ocupacional. Requisitos".

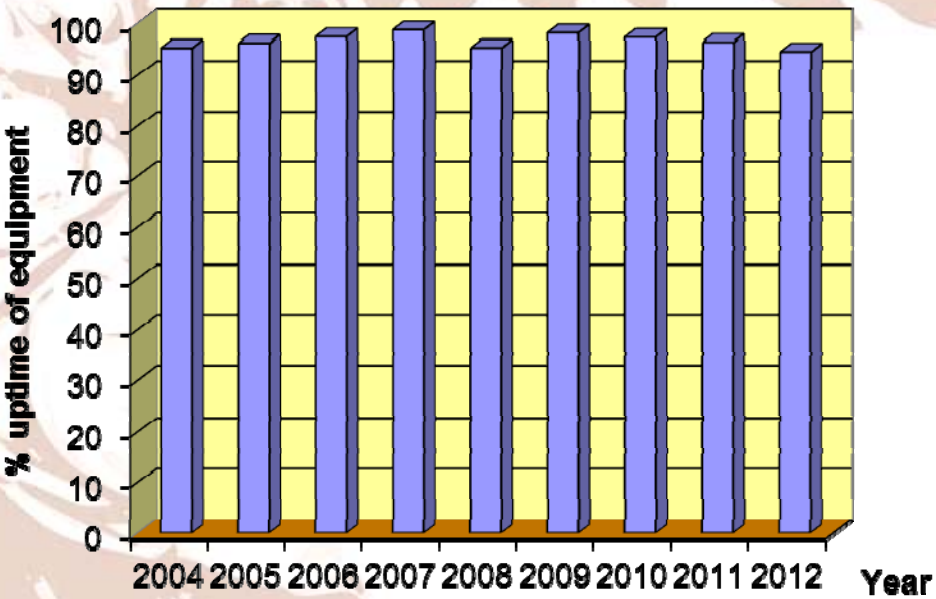
QUALITY MANAGEMENT



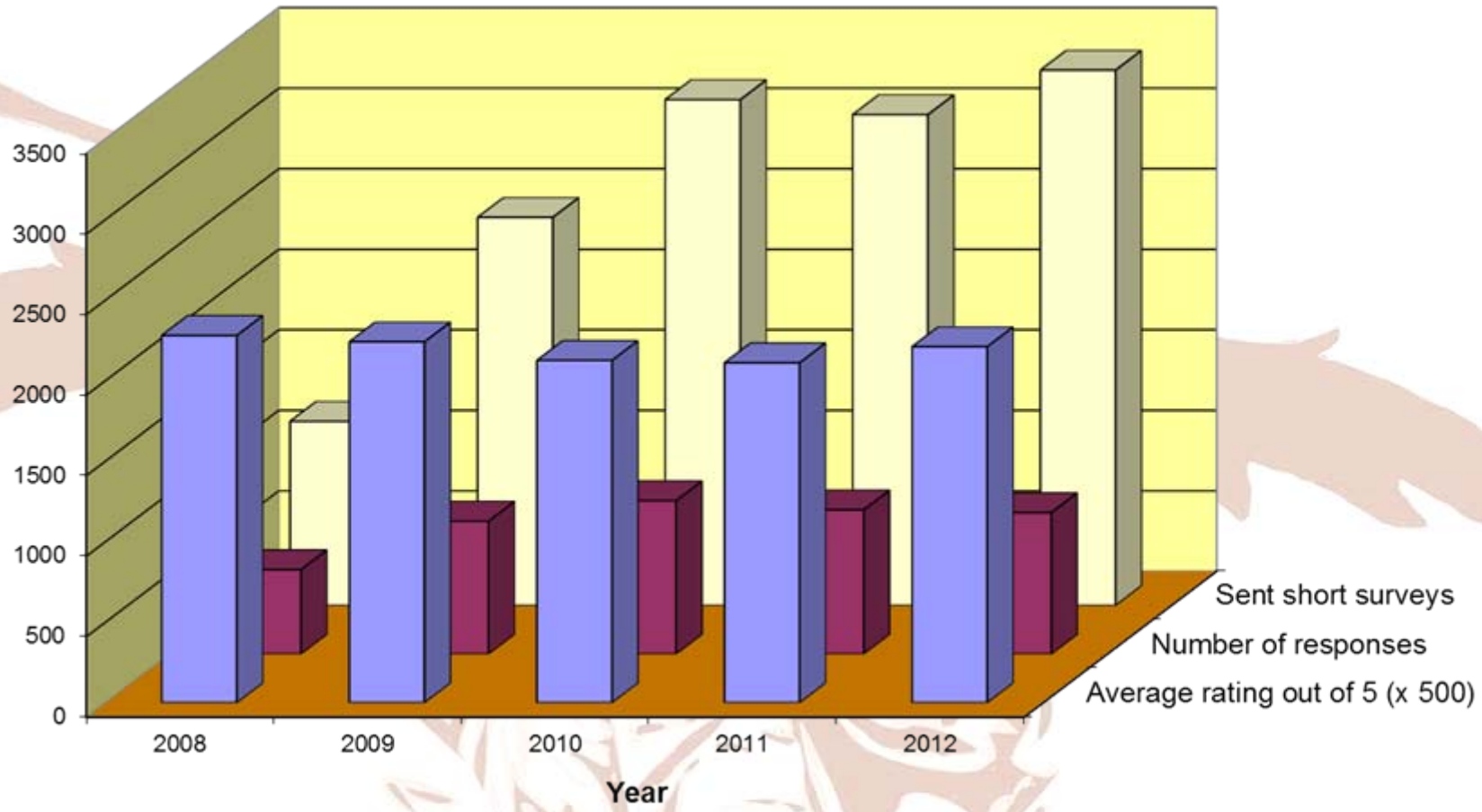
QUALITY MANAGEMENT



The use of equipment increases significantly each year, an average use of 7,66 hours per day being reaching . And, the percentage of time of the equipment operation has maintained above 94,52%.

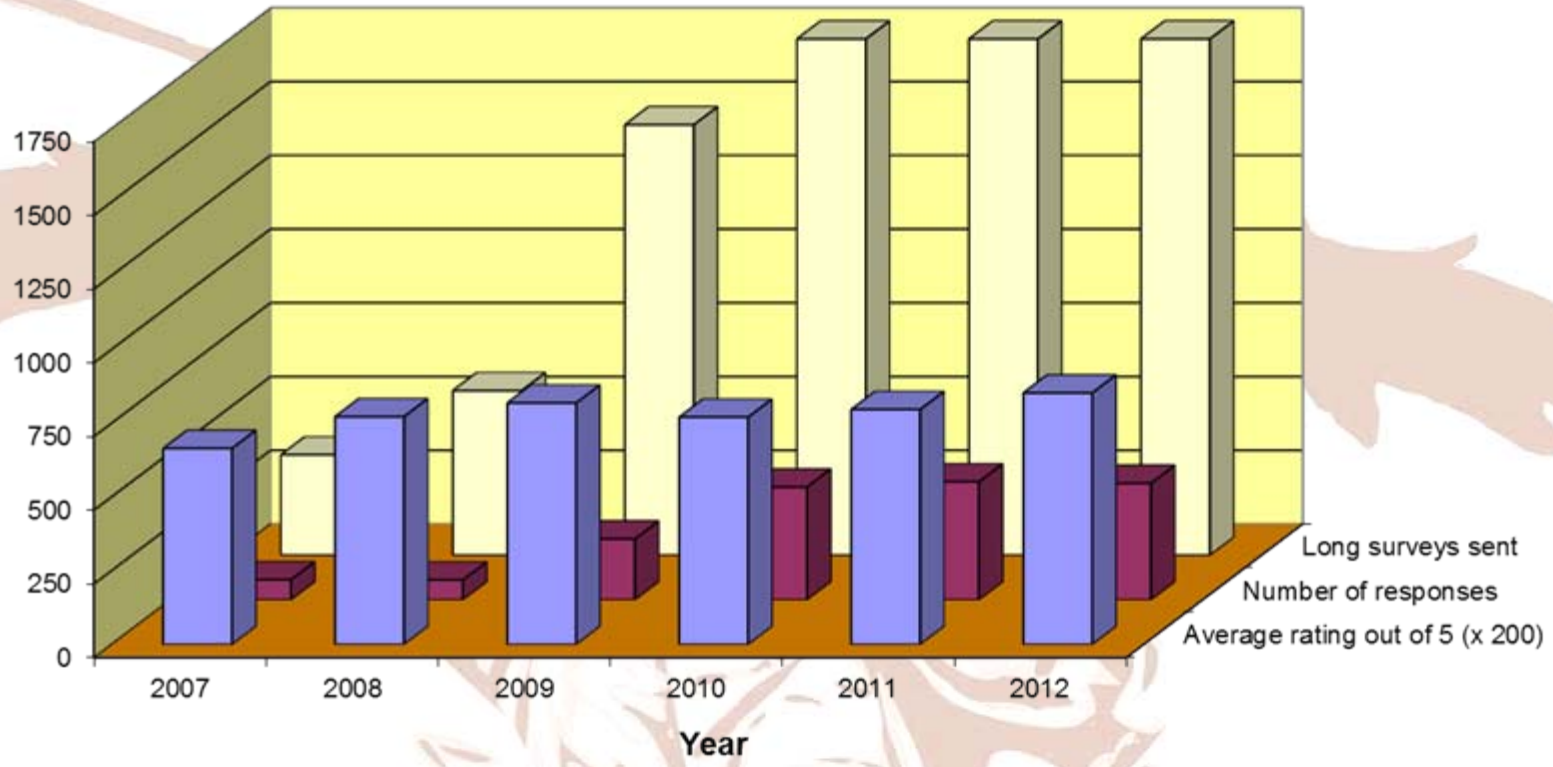


QUALITY MANAGEMENT



The half note for short surveys is stabilized around 4.42 out of 5.

QUALITY MANAGEMENT



The half note for long surveys is stabilized around 4,26 out of 5.

Internal Services CITIUS

Microanalysis

Microscopy

HR Mass Spectrometry

Radio-isotopes

NMR

X Rays

Biology

XPS/ESCA

Functional Characterization

External Services CITIUS

Agricultural Research

Photographic Laboratory

Liquid Nitrogen

Herbarium

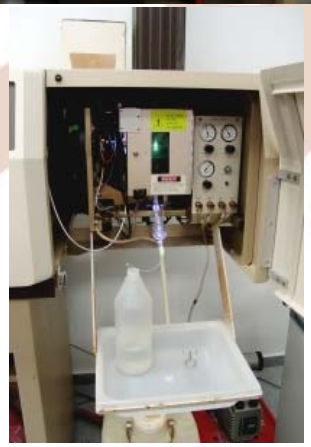
Greenhouse

Animal Research

SGI

Servicios Generales de Investigación
Vicerrectorado de Investigación

Microanalysis



<u>OBJECTIVE</u>

Determination and quantification of chemical elements
(1ppm, 1ppb)

<u>TECHNIQUES</u>

- Combustion (C,H,N,S)
- ICP-OES

(70 elements simultaneously)

- Capilar Electrophoresis
- Two-dimensional GC olfactometer

- Sample Preparation Laboratory

Microscopy

<u>OBJECTIVE</u>

Microstructural morphology and composition of organic and inorganic materials

<u>TECHNIQUES</u>

- Electron Microscopy
  - SEM and TEM
  - EDX Chemical Analysis
  - EBDS Phase Analysis
- Optical Microscopy
  - Laser Confocal
  - Epifluorescence
- Atomic Force Microcopy

- Sample Preparation Laboratories

Nuclear Magnetic Resonance

OBJECTIVE

- Non-destructive spectroscopy technique
- Energy absortion by magnetic activa nucleus
- Structural and stereochemical information

TECHNIQUES

- Spec. Bruker Avance-500,
- Spec. Bruker AMX-500,
- Spec. Bruker Avance-300,
- Spec. Bruker AMX-300 (CP-MAS)
- Reverse multinuclear probe
- Direct QNP probe
- Solid NMR 60 MHz

- Sample Preparation Laboratory

High-Resolution Mass Spectrometry

OBJECTIVE

- Analysis of molecular formulae
- Proteomics
- Ions in electromagnetic fields

TECHNIQUES

- AUTOSPEC-Q: High-Resolution Spec. Chromatographic Separation
- TOFSPEC: Time-of-Flight Spec.
- KRATOS MS80-RFA: Mass Spec.
- Q-TRAP: LC/MS/MS Hibrid system

- Sample Preparation Laboratory

Radioisotopes

OBJECTIVE

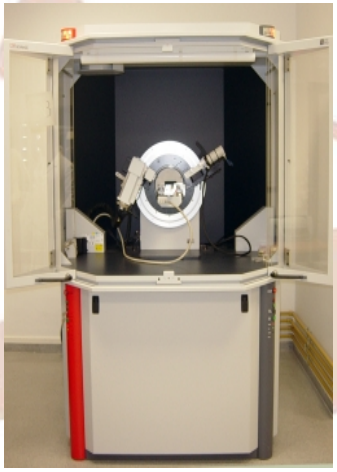
- Radioisotopes and high-energy photons
- Basic research and environmental radiological control

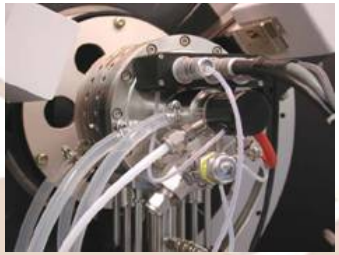
TECHNIQUES

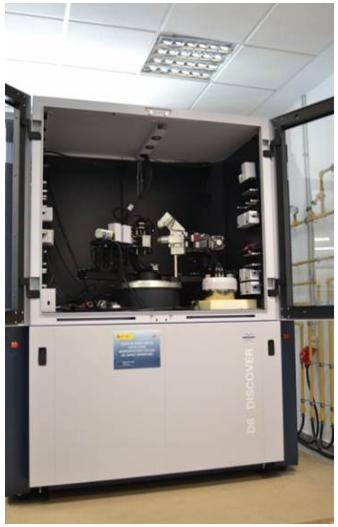
- CANBERRA Gamma Spec. (also in-situ)
- CANBERRA Alpha Spec.
- QUANTULUS 1220 Liquid Scintilator
- BERTHOLD 770 Gas-flow detector
- Body radiation monitorization
- ICP-MS

- Sample Preparation Laboratory

X Ray Laboratory







OBJECTIVE

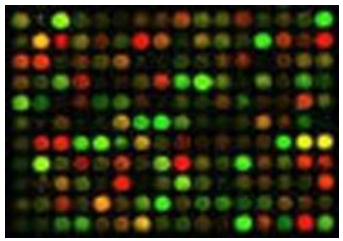
- Diffraction and fluorescence
- Crystalline phases characterization
- XRF Elemental analysis
- Non destructive analysis

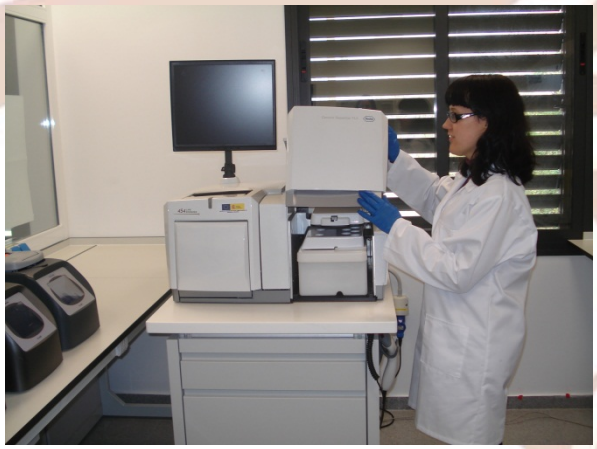
TECHNIQUES

- Powder XRD
- Environmental XRD
- X Ray microfluorescence (spatial resolution)
- X Ray fluorescence
- Microdiffraction and study of layers and surfaces
- Complete system X-ray diffraction single crystal with three radiation sources

- Sample Preparation Laboratory

Biology Laboratory





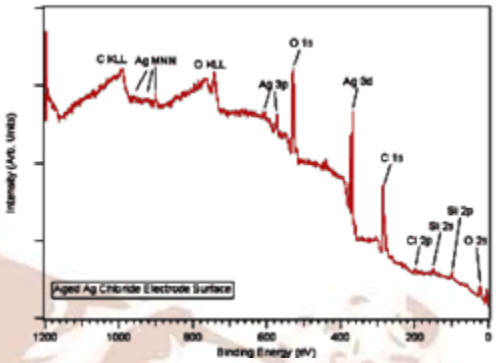
OBJECTIVE

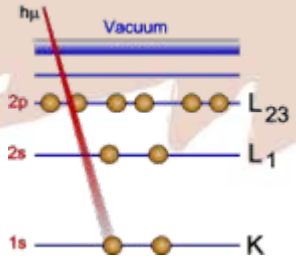
The Biology Laboratotory offers versatile analytical instrumentation for research in Life Sciences.

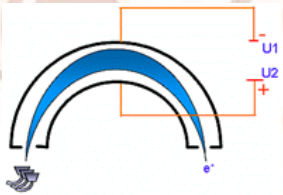
TECHNIQUES

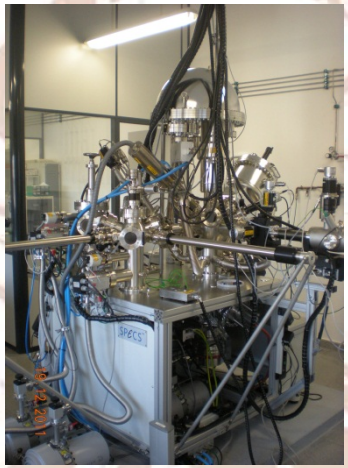
- P2 biosafety laboratories
- Cell cultures laboratory
- Bioinformatics
- Flow Cytometry
- DNA chips
- Quantitative PCR
- Ultracooling system
- Betascopes
- Pyrosequencer Genome
- Roche 454 FLX System Sequencer

XPS/ESCA









OBJECTIVE

- Non destructive quantitative analysis of solid surfaces (20-30 Å).
- Chemical, Physical and Electrical properties.

TECHNIQUES

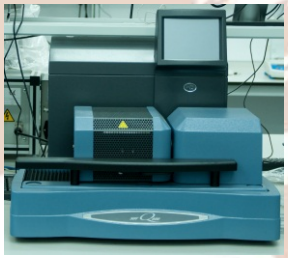
- XPS/ESCA "Leybold-Hereus" LHS-10/20. Detection limit 0.5% at.
- XPS/ESCA “PHOIBOS 150 9MCD”.
- Ultra-high vacuum.
- Surface Technology maximum 30Å.

- Sample Preparation Laboratory.

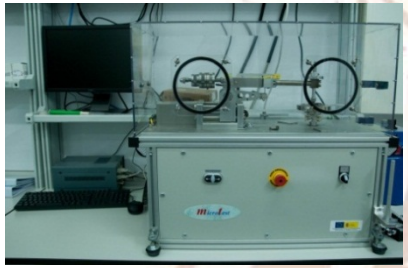
Functional Characterization









OBJECTIVE

Characterization of materials in different scientific fields.

TECHNIQUES

Texture Analysis:

- Physisorption
- Chemisorption
- Mercury Porosimetry
- Helium Pycnometer

Thermal analysis methods:

- Differential scanning calorimetry
- Thermogravimetry

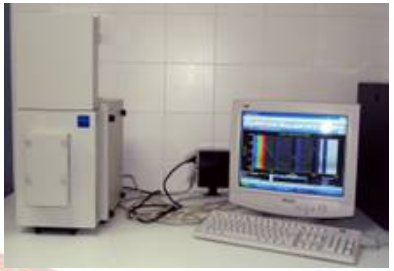
Particle size analyzer by laser techniques.

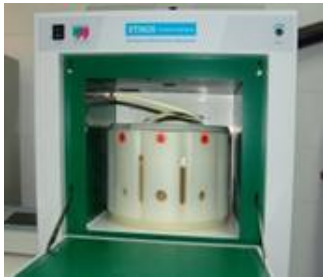
Mechanical properties:

- Tribology
- Striped and microindentation

Heat treatments in vacuum and controlled atmosphere.

Agricultural Research Laboratory





<u>OBJECTIVE</u>

Research in agricultural and food sciences

<u>TECHNIQUES</u>

- Multielemental and isotopic analysis by ICP-MS
- Near-Infrarred Reflectance Analysis NIR
- CNS Macrosamples
- Fitotron
- PCR

Liquid Nitrogen

OBJECTIVE

Ensure immediate supply of liquid nitrogen.

TECHNIQUES

Storage Unit Air Liquide liquid nitrogen, model TV 2000 with capacity of 2000 liters. Electronic scales and accessories.

Herbarium

OBJECTIVE

Loan and consultation herbal material for study.

TECHNIQUES

Herbarium Room (90m 2):

- Storage cabinet.
- Press room, and poisoned out of plants (12m 2).
- Dryer - vertical flow of hot air (dryer work on the wall of the room).
- 3 presses desktop.
- Gas-hood.

Plant preparation room (90 m 2): labeling, mounted, signed:

- Computers.
- Freezer: Liebherr 409L GT 4402 for.

Instrumental light: magnifying glasses and microscopes.

Greenhouse

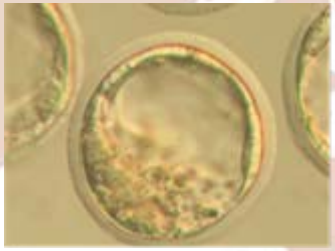
OBJECTIVE

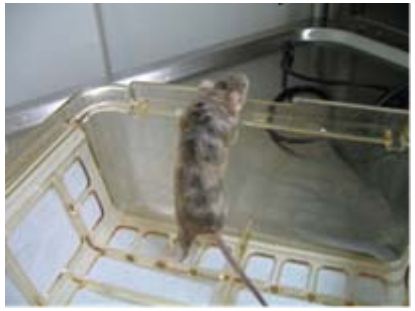
Provision of material resources, support and advice for the development of plant biology research.

TECHNIQUES

- Binocular microscope Leyca GZ 6.
- Cold light source Intraluz 5000-1.
- Photodocumentation equipment comprising:
  - Yashica 109 camera MultiProgram
  - Adapter for photomicrography Leyca
  - Objective 75-200/5.4 macro Yashica
  - Tripod Velbon
- Instrumental office equipment.
- LI-250 radiometer th.
- Portable photosynthesis measurement ADC.
- Peristaltic pump.
- Water purification equipment, precision scales, refrigerator, freezer at -20 ° C, with magnetic stirrers without heating, GLP-22 pH meter CRISOM.

Animal Research





OBJECTIVE

Production and housing of animals used in research.

TECHNIQUES

- Service production of genetically modified animals:
  - Transgenic overexpression.
  - Knock in / out.
- Service production of polyclonal antibodies.
- Maintenance of laboratory animals.
- Service production of laboratory animals.
- Service production of fish species.
- Shipping and transportation.
- Other services: training, counseling, etc.

Photographic Laboratory

OBJECTIVE

Disclosure of your photo collections, allowing the consultation of all scanned images to date, and request playback.

TECHNIQUES

- Inventory and cataloging photographic collections.
- Preservation and storage of the photographic collection.
- Documentation and management of digital collections.
- Digitization of photographic collections.
- Dissemination of the photographic collection.

ORGANIZATION CHART SCISI