



Health Sciences Research Center

R&D Unit of the
Instituto Superior de Ciências da Saúde – Norte
CESPU, cri

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1. Introduction

The Health Sciences Research Center (CICS) was created in 2007 to strengthen research within the “Instituto Superior de Ciências da Saúde – Norte (ISCS-N)”, through the integration of individual groups which previously developed their research activities, in a more or less independent manner, inside and outside the ISCS-N. This grouping aimed to favor interactions between researchers from diverse scientific formations and skills, to allow for the emergence of new research projects based on a multidisciplinary approach. Most of CICS researchers came from and continue to collaborate with outstanding national research institutions such as IBMC, IPATIMUP, CIIMAR, and Faculty of Pharmacy of the University of Porto.

2. Objectives

The main mission of CICS is to foster high quality research and training, in accordance with the mission of the ISCS-N, namely:

- To develop original research lines;
- To promote multidisciplinary research involving health professionals of all levels, through a harmonious interaction between basic, translational, and clinical research;
- To promote the internationalization of research through collaboration with national and foreign institutions;
- To divulge and to publish the obtained results;
- To promote appropriate links between teaching and research in order to provide a research-based teaching and learning environment, especially for postgraduate students;
- To promote the participation of undergraduate and postgraduate students in the ongoing research projects.

3. Organization

The organization of CICS follows that of FCT-certified R&D units. The CICS governing bodies are:

- **Director:** Promotes and fosters the research activities, presides the directive board and the scientific council, and fulfils their respective decisions;
- **Directive Board:** is coordinated by the CICS Director and integrates the Coordinator of each Research Group. The activities are centered on monitoring the ongoing activities, establishing the operating rules, determining the sharing of running expenses and planning the CICS funding;

- **Scientific Council:** includes PhD members of the CICS and focuses its activities on the planning, development and evaluation of the research activities.

4. Research activities

The CICS is organized into three research groups and one FCT-registered R&D unit. We will next briefly summarize the present teams and the research lines within each research group.

4.1. Molecular and Cellular Biology Group

- 5 Principal Investigators (PIs)
- 4 Post-docs
- 2 Master students
- 6 graduate researchers
- 1 Research Technician

4.1.1. Objectives

This group focuses its activities on three research lines with high public health impact: i) Mitosis and Cancer Biology; ii) Human Molecular Immunology; and iii) Microbiology and Biotechnology. The first research line is focused on functional aspects, both at cellular and molecular levels, of the kinetochores during chromosome segregation, and their implication in aneuploidy aetiology. The second research line is focused on the role of external factors in the differentiation and the function of T cells, and their clinical implications in autoimmune diseases like arthropathies. The third research line is focused on the study of fundamental physiology of non-pathogenic bacteria and their possible application to bioproduction and bioremediation.

4.1.2. Ongoing research projects

- Identifying new functions of the mitotic checkpoint genes during mitosis.
- Identifying new functions for the Aurora B protein kinase during mitosis.
- Gene expression during mitotic slippage.
- Expression profile of mitotic checkpoint genes in a panel of tumor cell lines.
- Differentiation of human T cell into a NK(T) phenotype.
- Characterization of segregated cytokine from differentiated CD8+T cells in the presence of IL-15.
- Lactate production from an engineered *Saccharomyces cerevisiae* strain with improved ability to use glycerol.
- Non-classical targeting and regulation of expression of GAPDH1 from *K. marxianus*.

4.2. Chemical and Pharmaceutical Sciences Group

- 7 PIs
- 5 Post-docs
- 3 PhD students
- 5 Master students

5 Graduate researchers
1 Research Technician

4.2.1. Objectives

This group focus its research activities on Analytical Chemistry, and Pharmaceutical Technology and Biotechnology. i) The research in analytical chemistry involves the development and application of methodologies for analysis of organic and inorganic compounds on a variety of matrixes such as environmental, pharmaceutical, food and biological fluids. ii) In pharmaceutical technology the research involves development of new drug delivery systems and microencapsulation of bioactive compounds, evaluation of the efficacy of cosmetic products and development of formulations of dermopharmaceutical products. The biotechnology is related to food/pharmaceutical and leads to synthesis of bioactive compounds by microorganisms and bioencapsulation of probiotics.

4.2.2. Ongoing research projects

- Formulation approaches for overcoming therapeutic proteins instability assessed by Fourier Transform Infrared spectroscopy.
- Metal environmental contamination monitorization in water, fish and sediments of Douro Estuary.
- Pesticide monitorization in sediments and superficial waters from River Douro, Portugal.
- Strategies to overcome mononuclear phagocyte system phagocytosis of nanoparticles containing therapeutic proteins.
- Improvement of stability and functionality of probiotics through their microencapsulation.
- Therapeutic conjugate polymer targeted as specific delivery of gene-based anticancer agents for non-small lung cancer.
- Antioxidant/pro-oxidant behaviour of polyphenolic acids: structure-properties-activity relationships.
- Decitabine drug delivery systems in acute myeloid leukemia.
- Determination of antibiotics in WWTP and the degree of degradation in the treatment process.
- Efficacy evaluation of anti-wrinkle cosmetics.
- Chiral xanthenes derivatives: synthesis, enantiomeric resolution, anti-inflammatory and antioxidant evaluations.

4.3. Dental Sciences Group

5 PIs
5 Post-docs
10 PhD students
11 Master students
8 Graduate researchers

4.3.1. Objectives

Members of the Dental Sciences Group are involved in clinical, histopathological and basic research in two broad interdisciplinary fields: i) oral and maxillofacial pathology and ii) craniofacial morphogenesis. The former research line activities include teeth, periodontal diseases, the salivary glands, tumors in the oral cavity, and biomaterials. The latter research line activities include the genetic and developmental causes of craniofacial disorders, malocclusion, masticatory dysfunction, speech alteration and esthetical problems. To this end, our Scientists combine their understanding of cell and molecular biology, embryology, developmental biology, clinical investigation and epidemiology to answer fundamental questions with great impact on human health.

4.3.2. Ongoing research projects

- Clinical study and mutational of AXIN2 gene in Portuguese families with maxillary lateral incisor agenesis.
- The apex diameter influence in the MTA (white and grey) sealing ability - Apexification model.
- Evaluation of *Aggregatibacter actinomycetemcomitans* and *Prevotella intermedia* in saliva from Portuguese students from high dentistry school with real time PCR.
- Analysis of mitotic checkpoint gene expression in oral squamous cell carcinoma.
- Analysis of control cell cycle related proteins expression in oral carcinogenesis.
- Morphological characterization of odontogenic keratocystic tumours - a true benign cystic neoplasms?
- Nonvital dental bleaching - efficacy comparison of 15% and 35% hydrogen peroxide.
- Comparative Study of the capacity of remoción smear layer to the root canals by two techniques of preparation.
- Adapataion of three obturation systems to the root canal walls.
- Clinical and Microbiological effectiveness of the periodontal disease.
- Influence of convencional periodontal treatment on change the levels of pro-inflammatory markers in saliva and crevicular fluid in subjects with periodontitis.
- Scale of the health oral design. Analysis of the clinical and microbiological impact.

4.4. Psychology and Health Research Unit (UnIPSa)

5 PIs

3 Post-docs

15 Master students

4 Graduate students

4.4.1. Objectives

The UnIPSa unit focuses its research activities on two areas: Risk and Resilience; and Psychobiology. Research lines include cognitive, experimental, forensic and health psychology, using as analysis instruments: assessment, prevention, and intervention in diverse health problems.

4.4.2. Ongoing research projects

- Syndrome of parental alienation. Representations and psychological impact in the child.

- Study of the risk profiles of risk of offensive young people.
- Grief Narrative Reconstruction: for a better understanding of Trauma and Human Resilience.
- Risk, resilience and related constructs: Construct operationalization and translation, adaptation and aferition of evaluation instruments to portuguese samples.
- Impact of the domestic violence in the psychological functioning of the victims.
- Effectiveness of an e-therapy program.
- Study of the risk profiles of risk of offensive adult people.
- Evaluation of an emotional intelligence program in high school students.
- Exhaustion Emotional in the personnel of care of the cancerous patients – Effectiveness of an intervention in group.
- Dynamic net for competitiveness in academic and professional performance.
- Psychosocial status and quality of life of adolescents and young adult with congenital heart disease, with and without surgical repair.
- Emotional manipulation in virtual reality environments: Methodological validation.
- Psychosocial and hormonal variables in postnatal depression and the consequences of depression in the couple in physical morbidity and cognitive.

5. Collaborations

The CICS scientists keep a close collaboration with the research institutions where they had carried out their master, PhD, or post-doc works. The CICS is aware of the importance of these collaborations to its development strategy of becoming an outstanding research unit. To this regard, the main objective is to strengthen the existing collaborations and to extend these contributions to other institutions.

At the moment, the CICS collaborates in research programs with the following institutions:

5.1. National Institutions

- University of Porto
 - IBMC
 - IPATIMUP
 - CIIMAR
 - Faculty of Sciences
 - Faculty of Pharmacy
 - CEQUIMED
 - REQUIMTE/FARMA
 - REQUIMTE/Departamento de Química-Física
 - Faculty of Engineering of Porto
 - CEFT – Transport Phenomena Research Center
- IPO – Portuguese Institute for Oncology of Porto
- University of Minho
 - ICVS – Institute for Life and Health Sciences
 - Department of Biology
 - Department of Textile Engineering

- Portuguese Catholic University
ESB – High School of Biotechnology
Biotechnology and Fine Chemistry Center
- University of Coimbra
- University of Lisbon
Faculty of Pharmacy
- University of Algarve
Molecular and Structural Biomedicine Center
- Hospital Geral de Santo António
- Centro Hospitalar Vila Nova de Gaia

5.1. Foreign Institutions

- Department of Biochemistry, University of Cambridge, UK
- Faculty of Pharmacy, University of Copenhagen, Denmark
- Faculty of Pharmacy, University of Helsinki, Finland
- University of San Francisco, California, USA
- Faculty of Pharmacy, University of Santiago de Compostela, Spain
- Faculty of Pharmacy, University of Pavia, Italy
- Federal University of Bahia – Brazil
- Department of Chemical Engineering, Queen’s University, Kingston, Canada
- Department of Pharmaceutical Sciences, Northeastern University, Boston, USA
- Department of Chemistry, Federal University of São Carlos

6. Financial Resources

The CICS financing is guaranteed by CESPU, through a budget allocated annually, and is articulated and supervised by the Coordinator for R&D Activities (GID).

Thus, the GID discusses annually the budget to be attributed to the CESPU research centers, which includes funding for equipment to be acquired, projects to be supported, and other activities of administrative nature as well as communication and/or representation expenditures.

6.1. Own funding (since 2005)

The CESPU, srl., assigns 1% of its global budget to research activities, namely to support research projects in strategic scientific fields considered of high priority. These activities were directly coordinated by GID until the end of 2007. Since the CICS creation, in October 2007, the functional management of the budget is proposed by the CICS to the GID, whom submits it to CESPU for approval.

The CESPU increased budget allocated to R&D activities from 1% to 2% since the budgetary exercise for 2009.

In this context, the following projects, cited in a decreasing chronological form, had had financing:

- 01/GBMC/CICS/09 - Non-classical targeting and regulation of expression of GAPDH1 from *K. marxianus*.
Investigador Responsável: Roxana Moreira
1 year, 5.000,00 €
- 02/GBMC/CICS/09 - Characterization of segregated cytokine from differentiated CD8+T cells in the presence of IL-15.
PI: Elsa Cardoso
1 year, 5.000,00 €
- 03/GBMC/CICS/09 - Lactate production from an engineered *Saccharomyces cerevisiae* strain with improved ability to use glycerol.
Investigador Responsável: Odília Queirós
1 ano, 5.000,00 €
- 04/GBMC/CICS/09 - Expression profile of mitotic checkpoint genes in a panel of tumor cell lines.
Investigador Responsável: Hassan Bousbaa
1 year, 5.000,00 €
- 01/GCQF/CICS/09 - Monitorização da contaminação ambiental por metais em águas, sedimentos e peixes no estuário do rio Douro.
Investigador Responsável: Cristina Couto
1 year, 3.000,00 €
- 02/GCQF/CICS/09 - Strategies to overcome mononuclear phagocyte system phagocytosis of nanoparticles containing therapeutic proteins.
Investigador Responsável: Vitor Seabra
1 year, 5.000,00 €
- 03/GCQF/CICS/09 - Improvement of stability and functionality of probiotics through their microencapsulation.
Investigador Responsável: José Carlso Andrade
1 year, 3.000,00 €
- 04/GCQF/CICS/09 - Pesticide monitorization in sediments and superficial waters from River Douro, Portugal.
Investigador Responsável: Maria João Rocha
1 year, 4.500,00 €
- 05/GCQF/CICS/09 - Therapeutic conjugate polymer targeted as specific delivery of gene-based anticancer agents for non-small lung cancer.
Investigador Responsável: Bruno Sarmento
1 year, 5.000,00 €
- 06/GCQF/CICS/09 - Antioxidant/pro-oxidant behaviour of polyphenolic acids: structure-properties-activity relationships.
Investigador Responsável: Francisco Silva
1 year, 5.000,00 €
- 07/GCQF/CICS/09 - Decitabine drug delivery systems in acute myeloid leukemia.
Investigador Responsável: Maribel Teixeira
1 year, 3.500,00 €
- 08/GCQF/CICS/09 - Efficacy evaluation of anti-wrinkle cosmetics.
Investigador Responsável: Maribel Teixeira
1 year, 1.500,00 €
- 09/GCQF/CICS/09 - Determination of antibiotics in WWTP and the degree of degradation in the treatment process.
Investigador Responsável: Elizabeth Tiritan

- 1 year, 4.000,00 €
- 10/GCQF/CICS/09 - Chiral xanthenes derivatives: synthesis, enantiomeric resolution, anti-inflammatory and antioxidant evaluations.
Investigador Responsável: Elizabeth Tiritan
1 year, 1.500,00 €
 - 01/GCD/CICS/09 - Analysis of control cell cycle related proteins expression in oral carcinogenesis.
PI: Luis Monteiro
1 year, 2.000,00 €
 - 02/GCD/CICS/09 - Morphological characterization of odontogenic keratocystic tumours - a true benign cystic neoplasms?
PI: Luis Monteiro
1 year, 2.000,00 €
 - 03/GCD/CICS/09 - Clinical and Microbiological effectiveness of the periodontal disease.
PI: Corsina Henriques
1 year, 3.000,00 €
 - 04/GCD/CICS/09 - Scale of the health oral design. Analysis of the clinical and microbiological impact.
PI: Corsina Henriques
1 year, 3.200,00 €
 - 05/GCD/CICS/09 - Evaluation of *Aggregatibacter actinomycetemcomitans* and *Prevotella intermedia* in saliva from Portuguese students from high dentistry school with real time PCR.
PI: Filomena Salazar
1 year, 3.000,00 €
 - 06/GCD/CICS/09 - Influence of conventional periodontal treatment on change the levels of pro-inflammatory markers in saliva and crevicular fluid in subjects with periodontitis.
PI: Fernando ferreira
1 year, 3.000,00 €
 - 07/GCD/CICS/09 - Clinical study and mutational of AXIN2 gene in Portuguese families with maxillary lateral incisor agenesis.
PI: Teresa Pinho
1 year, 3.000,00 €
 - 08/GCD/CICS/09 - Adaptation of three obturation systems to the root canal walls.
PI: Rui madureira
1 year, 1.000,00 €
 - 09/GCD/CICS/09 - The apex diameter influence in the MTA (white and grey) sealing ability - Apexification model.
PI: Rui madureira
1 year, 1.000,00 €
 - 10/GCD/CICS/09 - Nonvital dental bleaching - efficacy comparasion of 15% and 35% hydrogen peroxide.
PI: Rui madureira
1 year, 1.000,00 €
 - 01/UnIPSa/CICS/09 - Síndrome de Alienação Parental. Representações e Impacto Psicológico na Criança.
PI: Alexandra Serra
1 year, 2.000,00 €
 - 02/UnIPSa/CICS/09 - Estudo dos perfis de risco de ofensores adultos.
PI: Alexandra Serra

- 1 year, 5.000,00 €
- 03/UnIPSa/CICS/09 - Grief Narrative Reconstruction: for a better understanding of Trauma and Human Resilience.
PI: José Carlos Rocha
1 year, 2.960,00 €
- 04/UnIPSa/CICS/09 - Risk, resilience and related constructs: Construct operationalization and translation, adaptation and aferition of evaluation instruments to portuguese samples.
PI: José Carlos Caldas
1 year, 2.960,00 €
- 05/UnIPSa/CICS/09 - Psychosocial status and quality of life of adolescents and young adult with congenital heart disease, with and without surgical repair.
PI: Maria Emília Areias
1 year, 5.000,00 €
- 06/UnIPSa/CICS/09 - Impacto da violência doméstica no funcionamento psicológico das vítimas.
PI: Alexandra Serra
1 ao, 2.000,00 €
- 07/UnIPSa/CICS/09 - Estudo dos perfis de risco de ofensores adultos.
PI: Ernesto Fonseca
1 year, 4.000,00 €
- 08/UnIPSa/CICS/09 - Avaliação de um programa de inteligência emocional em estudantes universitários.
PI: Vera Almeida
1 year, 1.500,00 €
- 09/UnIPSa/CICS/09 - Exaustão emocional nos Cuidadores de Doentes Oncológicos- Eficácia de uma Intervenção em Grupo.
PI: Vera Almeida
1 year, 1.500,00 €
- 10/UnIPSa/CICS/09 – Dynamic net for competitiveness in academic and professional performance.
PI: Roxana Moreira
1 year, 3.000,00 €
- 11/UnIPSa/CICS/09 - Emotional Manipulation in Virtual Reality Environments: Methodological Validation.
PI: Bruno Peixoto
1 year, 4.900,00 €
- 11/GCD/CICS/09 - Comparative Study of the capacity of remoción smear layer to the root canals by two techniques of preparation.
PI: Rui madureira
1 year, 1.000,00 €
- 1F/03/2005/CESPU - Estudo clínico – microbiológico das doenças periodontais no Norte de Portugal.
PI: Corsina Velazco Henriques
1 year, 3.500,00 €
- 2F/02/2006/CESPU - Avaliação do nível de xenoestrogénios de origem natural e industrial nas águas do estuário do Rio Douro por GC-MS.
PI: Maria João Rocha
1 year, 3.500,00 €
- 2F/03/2006/CESPU – Averiguar o envolvimento da apresentação da IL-15 em trans por células de hepatoma na proliferação de células T CD8+.

- PI: Elsa Cardoso
1 year, 3.500,00 €
- 2F/04/2006/CESPU - Analysis of the effects of siRNA-mediated depletion of the APC tumour suppressor gene on spindle checkpoint function and chromosome stability.
PI: Hassan Bousbaa
1 year, 3.500,00 €
 - 2F/07/2006/CESPU - Estudo da função do gene supressor tumoral apc (Adenomatous Polyposis Coli) durante a mitose. Análise fenotípica de perda-de-função induzida por RNA de interferência.
PI: Hassan Bousbaa
1 year, 3.500,00 €
 - 2F/09/2006/CESPU - “Avaliação Empírica da Eficácia de uma Intervenção Psicológica no Processo de Luto”.
PI: José Carlos Rocha
1 year, 3.500,00 €
 - 1F/04/2005/CESPU - Avaliação da poluição e monitorização de metais pesados nas águas e na tainha (*Mugil cephalus*) capturada em diferentes pontos no estuário do Rio Douro, Portugal.
PI: Maria Elizabeth Tiritan
1 year, 3.500,00 €
 - 1F/05/2005/CESPU - Estudo do papel da apresentação da IL-15 em transpor células de hepatoma na expressão de novo de receptores NK em células T CD8+.
PI: Elsa Cardoso
1 year, 3.500,00 €
 - 1F/06/2005/CESPU - Analysis of molecular mechanisms that coordinate microtubule-kinetochore interactions with spindle checkpoint signaling.
PI: Elsa Logarinho
1 year, 3.500,00 €
 - 1F/08/2005/CESPU - Instabilidade cromossómica associada ao silenciamento do gene Bub3 em células humanas: análise funcional.
PI: Hassan Bousbaa
1 year, 3.500,00 €
 - 1F/10/2005/CESPU - Microencapsulation of probiotic bacteria to enhance survival during upper gastrointestinal tract passage
PI: António José Ribeiro
1 year, 3.500,00 €
 - 1F/11/2005/CESPU – “Validação neuroanatômica da “Behavioural Assessment of the Dysexecutive Syndrome”.
PI: Bruno Peixoto
1 year, 3.500,00 €
 - 1F/13/2005/CESPU - Xenoestrogénios de origem farmacêutica e industrial nas águas e no plasma da tainha (*Mugil cephalus*) capturadas em diferentes pontos do estuário do Rio Douro, Portugal.
PI: Maria João Rocha
1 year, 3.500,00 €
 - 1F/15/2005/CESPU - “Aspectos Psicossociais e Neuro-Humorais da Depressão Pós Natal na mulher e seu cônjuge”.
PI: Maria Emília Areias
1 year, 3.500,00 €
 - 1F/19/2005/CESPU - Ausências Dentárias Congénitas: Estudo Clínico e Molecular.

Teresa Pinho

1 year, 3.500,00 €

- 1F/21/2005/CESPU - Role of human polymorphisms in acute lymphoblastic leukaemic patients treated with methotrexate as potential predictors of toxic effects and therapeutic outcome.

PI: Vítor Seabra

1 year, 3.500,00 €

6.1. External funding (since 2004)

The CICS researchers are highly encouraged to submit research projects for external financing, namely for the FCT financing. The CICS researchers are PIs or participants in the following projects that were approved for financing by the FCT, and where CESPU is a proponent or a participant institution:

- Projecto: Bioremediation of organic pollution in soil by augmentation with robust methylotrophic bacteria
PI: Paolo De Marco (IBMC)
Investigador participante do CICS: Paolo De Marco
2005 – 2008
54.238,00 €
FCT (POCI/AMB/57353/2004)
- Projecto: Genes involved in the mitotic checkpoint in *Drosophila melanogaster*
PI: Hassan Bousbaa
2004 - 2007
75,000 €
FCT (POCTI/BCI/42341/2001)
- Projecto: Study and optimisation of the production of BIOchemicAL compounds by indiGenous species from the portuguese coAst and lagoons
PI: Eric Arnold Fredrik Oxelfelt (IBMC)
Investigador participante do CICS: Paolo De Marco
2004 – 2007
60.000,00 €
FCT (POCTI/CTA/44600/2002)
- Projecto: Study of insulin intestinal absorption mechanisms using a new in vitro human intestine versus in vivo diabetic animal models.
Investigador participante do CICS: Bruno Sarmento
Bolsa de Pós-doutoramento
FCT (SFRH/BPD/35996/2007)
- Projecto: In vivo/In vitro correlation of intestinal absorption of proteins using animal models and Caco-2 based co-culture cell lines.
PI: Domingos de Carvalho Ferreira (FFUP)
Investigador participante do CICS: Bruno Sarmento
36 Meses
13.8000 Euros
FCT (PTDC/SAU-FCF/70651/2006)
- Projecto: Analysis of pharmaceuticals pollutants in River water estuarine and biological assay effects with zebra fish as an experimental model.
PI: Maria Elizabeth Tiritan
PhD Fellowship
FCT (SFRH/BD/31382/2006)

- Projecto: Salivary proteins as dental caries protection.
PI: Francisco Amado (Chemistry Department, University of Aveiro, Portugal)
Investigador participante do CICS: Maria João Calheiros-Lobo
36 Meses
55.000,00 €
FCT (POCI/QUI/5890/2004)
- Projecto: Improvement of insulin oral availability through encapsulation in polyelectrolyte complex nanoparticles.
PI: António Ribeiro
36 Meses
85.000,00 €
FCT (POCI/SAU-FCF/59940/2004)
- Projecto: Improvement of insulin oral availability through encapsulation in polyelectrolyte complex nanoparticles
Investigador participante do CICS: Bruno Sarmiento
36 Meses
8.5000 Euros
FCT (POCI/SAU-FCF/59940/2004)
- Projecto: Monitorization of xenoestrogens in Portuguese estuaries – the influence on the synthetic path of sexual steroids on the reproductive cycle of the Nile Tilapia (*Oreochromis niloticus*)".
PI: Maria João Rocha
PhD Fellowship
FCT (SFRH/BD/18231/2004/2SLU) and CESPU

7. Available research tools

- Bioinformatics
- Cell culture
- Cell cycle analysis
- Genetic engineering
- Flow cytometry
- Immunofluorescence
- Immunohistochemistry
- Multichannel fluorescence imaging + transmission imaging
- Multidimensional imaging and deconvolution
- in vivo time-lapse experiments
- Image processing and analysis
- Immunoprecipitation
- Conventional PCR
- qRT-PCR (Real-time)
- Phylogenetics/Molecular classification
- RNA interference (RNAi)
- Western Blotting
- Atomic Absorption Spectroscopy

- Electronic microscopy (TEM, SEM, Confocal)
- Fourier Transform Infrared Spectroscopy (FTIR)
- Gas Chromatography - Mass Spectrometry (GC-MS)
- High Performance Liquid Chromatography with Diode Array Detector (HPLC-DAD)
- In vitro cell models for oral absorption of peptidic drugs
- In vivo assays of oral bioavailability of peptidic drugs (diabetic animal model)
- Liquid Chromatography-Mass Spectrometry (LC-MS)
- Nano and microencapsulation methods
- Solid Phase Extraction (SPE)
- Techniques of calorimetry
- Circular Dichroism
- UV-VIS Spectroscopy
- Bacteriological culture: Quantitative and Qualitative methods
- Microbial morphology: light, phase contrast and dark field microscope
- Microbial identification tests
- Antibiotic sensibility test
- Epidemiological analysis
- Molecular biology techniques
- Familial and clinical study
- Panoramic and lateral radiography
- Measurements of craniofacial features associated with tooth anomalies
- DNA bank for maxillary lateral superior agenesis
- SSCP (Single Strand Conformation Polymorphism)
- DHPLC

8. Infrastructures and equipments

8.1. Facilities

The CICS has to its exclusive usage three laboratories that accommodate the existing research groups, as well as several other rooms that serve to them as support, namely one room of instruments, one room for washing and drying material.

Some equipments (EAA and GC/MS) were installed in a laboratory, whose installation of necessary infrastructures of gases to its functioning is previous to the constitution of the groups of the CICS, and by this reason, is shared with practical classes that soon will be relocated.

Recently, an animal facility was built, with capacity to accommodate experimental animals of small size (namely rodents), with 1 quarantine room, 4 rooms to lodge animals, 1 laboratory for experimentation, 1 room for cleaned materials and cages, 1 room for dirties and washing/sterilization proposes and adequate sanitary installations for personnel. This infrastructure will allow the prosecution of broader research scopes, namely those involving animal models.

The UnIPSA group has for its exclusive usage two dedicated rooms to accommodate the activities of its investigators.

8.2. Available Equipment

8.2.1. Cell Cultures

- 2 CO2 Cell Incubators (Heraeus, Hera Cell)
- 2 laminar flow hoods (Heraeus, Hera Safe)
- 1 inverted microscope (Olympus)
- 2 heated water bath (VWR)
- 2 Liquide nitrogen storage recipients (AirLiquide, TR21 e GT21)
- 1 refrigerated centrifuge (Heraeus, Biofuge Primo R)
- 1 Micro centrífuga Biofuge pico Heraeus
- Flow cytometer (Beckman Coulter, EPICS XL-MCL)

8.2.2. Advanced light microscopy

- 1 Inverted widefield microscope (Zeiss, Axio Observer Z) for multichannel fluorescence imaging and transmission imaging, multidimensional imaging and deconvolution, in vivo time-lapse experiments.
- 1Bio-Inverted and Fluorescence microscope with digital imaging equipment (Nikon Eclipse TE2000)

8.2.3. Gene expression

- 1 Real-Time PCR Detection Systems + Software (Bio-Rad, CFX96)
- Gradient Thermal Cycler (Bio-Rad, MJ Mini PTC-1148)
- Molecular Imager Documentation System (Bio-Rad, Gel Doc XRS 170-8170)
- 6 Nucleic acid electrophoresis systems (Bio-Rad)
- 6 SDS-PAGE electrophoresis systems (Bio-Rad)
- 1 Mini centrifuge C1301 Biorad

8.2.4. Analysis instruments

- 1 Atomic Absorption SensAA dual GBC
- 1 Centrifuge Labofuge 200 Heraeus
- Conductivimeter GLP31 Crison
- 1 Digestor 2006 Tecator
- 1 Spectrophotometer UV-VIS Cintra 10e GBC
- 1 Spectrophotometer UV-VIS UV2 Unicam
- 1 Evaporador rotativo R114 Buchi
- Evaporator R200 Buchi
- 1 FTIR Spectrum RXI Perkin Elmer
- 1 GC-MS/MS Detector – Saturn 2200; Forno de coluna - CP 3800
- 1 HPLC (Interface – D7000; Detector DAD – L7455) Lachrom; Merck – Hitachi
- 1 Köepler Microscope (302101 Leica)
- 1 Polarimeter Polax 2L ATAGO
- 1 Refractometer DR-A1 ATAGO
- 1 Multiparametric analyzer: pH, ion,mV, conductivity, resistivity, salinity, TDS, oxygen and temperature C863 Consort

8.2.5. Assessment, prevention, and intervention instruments

- Test tools
- Informatique tools
- Programas de análise de dados
- Statistical softwares

9. Publications (since 2004)

Since 2004, the CICS scientists have published, as authors or co-authors, 137 papers, most of them in international journals, and have participated in 141 scientific events, most of them of international hearing. We will first summarize the journal impact factor and the number of papers published per year (see 9.1.), and then, in 9.2. and 9.3., we will cite the papers and communications, respectively.

9.1. Impact factor of the published papers

In terms of the impact factor of the CICS publications (see table below), one can conclude that:

- Of the 137 papers, 96 were published in indexed international journals;
- The average impact factor is **3,74** for the 96 listed publications;
- Of the 96 listed papers:
 - 34 were published in journal with impact factor between **3,002** and **7,293**;
 - 52 were published in journals with impact factor between 1,022 and 2,949;
 - only 10 papers were published in journals with impact factor lesser that 1;
- The publication years of the papers with the highest impact factor coincide with the period during which CESPÚ invested heavily in R&D, creating appropriate conditions to do research.
- If we remember that it is very difficult today to publish in journal with impact factor above 3, then one may consider that 35% of the 96 listed papers are of HIGH IMPACT in their specific field, 54% of reasonable impact and 11% of week impact.
- The list of the CICS publications is close to that of many FCT-certified R&D units that were recently classified as “Good” or even “Very Good”.

Impact Factor (IF), number of international papers published per year(n). *(To simplify, we used the 2007 JCR, independently of the publication year)*

Journal	IF	n	Year
DEVELOPMENT	7.293	1	2005
DRUG DISCOV TODAY	6.761	1	2007
J HEPATOL	6.642	1	2004
J CELL SCI	6.383	1	2004
MOL BIOL CELL	6.028	2	2008 2007
PROTEOMICS	5.479	1	2004
BIOMACROMOLECULES	4.169	1	2007
BIOCHEM PHARMACOL	4.006	1	2008

APPL ENVIRON MICROB	4.004	1	2006
EXPERT REV PROTEOMIC	3.650	1	2005
J CHROMATOGR A	3.641	1	2006
ANALYST	3.553	1	2004
CHEM RES TOXICOL	3.508	2	2006 2004
METAB ENG	3.444	1	2005
FEBS J	3.396	1	2005
TALANTA	3.374	3	2005 2004 2004
NEUROSCIENCE	3.352	3	2007 2006 2005
PHYS CHEM CHEM PHYS	3.343	1	2004
CELL CYCLE	3.314	1	2008
BIOL CONSERV	3.296	1	2007
ANAL CHIM ACTA	3.186	4	2007 2007 2007 2007
CLIN GENET	3.181	1	2006
ANAL BIOCHEM	3.002	3	2007 2006 2005
ELECTROANAL	2.949	1	2005
J PHARM SCI	2.942	2	2008 2005
ANAL BIOANAL CHEM	2.867	3	2006 2006 2005
TOXICOL LETT	2.826	1	2006
J PHARMACEUT BIOMED	2.761	3	2007 2006 2004
BIOCHEM BIOPH RES CO	2.749	1	2004
PHARM RES	2.678	1	2007
BIOORGAN MED CHEM	2.662	3	2008 2006 2004
EUR J PHARM BIOPHARM	2.611	2	2007 2005
MICROB ECOL	2.558	1	2008
BLOOD CELL MOL DIS	2.555	1	2004
J NAT PROD	2.551	2	2004 2004
CURR GENET	2.507	1	2007
CHIRALITY	2.436	1	2004
INT J SYST EVOL MICR	2.384	2	2008 2006
EUR J PHARMACOL	2.376	1	2004
EUR J MED CHEM	2.301	1	2006
FEMS MICROBIOL LETT	2.274	1	2004
LIFE SCI	2.257	1	2005
BRAIN RES	2.218	1	2004
J BIOMOL SCREEN	2.148	1	2007
COLLOID SURFACE B	2.109	1	2006
NEUROSCI LETT	2.085	1	2006
EUR J ORAL SCI	2.071	1	2006
J DRUG TARGET	2.030	1	2005
J NANOSCI NANOTECHNO	1.987	1	2007
MAR ENVIRON RES	1.930	1	2004
PLANTA MED	1.848	1	2005
ARCH MICROBIOL	1.838	1	2008
CARBOHYD POLYM	1.782	2	2007 2006
J IND MICROBIOL BIOT	1.681	2	2005 2004
BIOMED CHROMATOGR	1.663	4	2007 2006 2005 2004
MICROSC RES TECHNIQ	1.644	1	2007

J BRAZIL CHEM SOC	1.539	1	2004
PEDIATR ANESTH	1.461	1	2004
ANAL LETT	1.362	1	2006
EUR J ORTHODONT	1.022	1	2005
J LIQ CHROMATOGR R T	0.977	1	2007
INT J PEPT RES THER	0.971	1	2006
ENVIRON MONIT ASSESS	0.885	1	<i>in press</i>
J CHROMATOGR SCI	0.869	1	<i>in press</i>
SPECTROSC LETT	0.817	1	2007
PHARMAZIE	0.775	1	2004
COMMUNITY DENT HLTH	0.736	1	2008
INT J NANOMED	0.618	2	2007 2007
MICROBIOLOGY	0.597	1	2004
J ENVIRON BIOL	0.480	1	<i>in press</i>

9.2. Papers

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9.3.3. Dental Sciences Group

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70. Câmara MI. A implantologia e a ortodontia. XVII Congresso da Ordem dos Médicos Dentistas. 20 de Novembro de 2008. Santa Maria da Feira (Forum multidisciplinar de Ortodontia)
71. Câmara MI. Enxerto em seio maxilar atrófico. Congresso Anual da Defcon. 6 de Junho de 2008. Málaga. (Cirurgia em directo)
72. Câmara MI. Técnica de pressão negativa em enxertos de seio maxilar. VI Congresso Nacional de la Sociedade Española de Cirugia Bucal e Portugal Implantologia 2008. 25 de Outubro de 2008. Santiago de Compostela. (Conferência)
73. Câmara MI. Técnicas cirúrgicas e aplicações clínicas em enxertos subantrais. Apresentação de casos clínicos. Congresso Anual da Defcon. 6 de Junho de 2008. Málaga. (Conferência)
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75. Figueira F. Cheque dentário - que valias? I Congresso de Medicina Dentária Hospitalar. 17 de Maio de 2008 -Exponor -Matosinhos (Mesa Redonda).

76. Figueira F. Medicina Dentária e Estomatologia-atividade Hospitalar. I Congresso de Medicina Dentária Hospitalar. 17 de Maio de 2008-Exponor-Matosinhos (Mesa Redonda)
77. Reis C, Vinhas AS, Cardoso R, Mendes JM, Mouzinho J. Mesiodentes - a propósito de um caso clínico. Congresso da Ordem dos Médicos Dentistas. 20 a 22 de Novembro de 2008. Santa Maria da Feira. (poster)
78. Reis C, Vinhas AS, Mendes JM, Cardoso R. Implante como ancoragem ortodôntica. I Congresso Orto-Perio. 10 a 12 de Abril de 2008. Porto (poster) Relvas M, Corsina V, Coelho C, Fraga S, Ramos E. Níveis de *Streptococcus mutans* e *Lactobacillus spp* na saliva e saúde oral em adolescentes. VI Congresso de Epidemiologia. 23 e 24 de Outubro de 2008. Universidade Portucalense. Porto (poster)
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81. Vinhas AS. Controlo mecânico da placa pelo doente. XVII Congresso da Ordem dos Médicos Dentistas. 21 de Novembro de 2008. Santa Maria da Feira, Portugal (Fórum de Periodontologia)
82. Zenha M, Madeira H, Mendes JM, Salazar F. Técnicas de retracção gengival em prótese fixa sem impacto periodontal. Revisão da literatura. XXVIII Congresso da SPEMD. 17 e 18 de Outubro de 2008. Coimbra (Poster)
83. Alfaiate D, Lavall A, Palmeira E, Pacheco JJ, Pinho T. Considerações estéticas periodontais em Ortodontia. 1º Congresso Nacional de Orto-Perio – 10, 11 e 12 de Abril de 2008 - Porto. (Comunicação oral).
84. Amorim A - Adesivos de Ionómero de Vidro em Dentisteria Operatória” XXVII Congresso da Sociedade Portuguesa de Estomatologia e Medicina Dentária, 19 e 20 de Outubro de 2007 Porto (Comunicação oral).
85. Amorim A, Costa M. “Discoloración de un incisivo mandibular. Resolución de un caso clínico” Congresso OMD, 22, 23 e 24 de Novembro de 2007, Lisboa (Comunicação oral).
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91. Costa M. “Estudio comparativo de la filtración de dos cimentos selladores”, Congresso OMD, 22, 23 e 24 de Novembro de 2007, Lisboa (Comunicação oral).
92. Costa M, Madureira R. Estudio comparativo de la filtración apical de dos cimentos endodóncicos”, Congresso SEOC (Sociedad Española de Odontología Conservadora) 15 a 17 Maio 2008 Valencia, España (Comunicação oral).

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105. Cabral J, Cabral CT, Salazar F, Pacheco JJ, Leitão H Erupção passiva alterada: conceito, relação Ortodontia/periodontologia. 1º Congresso Nacional de Orto-Perio – 10, 11 e 12 de Abril de 2008 – Porto. (Poster).
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- 111.Vale T, Sousa-Santos P, Ustrell JM, J. « Hygiène orale versus carie dentaire chez des enfants en denture mixte » 52ème Congrès GIRSO. 09 de Maio 2008, Bruxelles, Belgique (Poster).
- 112.Angeja AM, Coelho JA, Mendes JM, Pinto JC, Manzanares C. Awareness of oral cancer risk factors and diagnostic procedures by Portuguese dental and prosthodontic students: A pilot study. 51ème Congrès GIRSO. 27 de Abril 2007, Portimão, Portugal (Comunicação oral).
- 113.Angeja AM, Coelho JA, Mendes JM, Pinto JC, Ustrell JM. Unusual case of temporomandibular dysfunction: Gardner's syndrome. 51ème Congrès GIRSO, 26-28 de Abril 2007. Portimão, Portugal (Poster).
- 114.Angeja AM, Miller PC, Coelho JA, Mendes JM, Pinto JC. Gingival recession after elective placement of labial piercing device: Case report. 51ème Congrès GIRSO, 26-28 de Abril 2007, Portimão, Portugal (Poster).
- 115.Bezerra D, Mouzinho J, Costa H, Mendes JM, Pinto AC. Réhabilitation orale avec prothèse obturatrice en situation de coadjuvant chirurgical d'une hémimaxillectomie. 51ème Congrès GIRSO, 26-28 de Abril 2007, Portimão, Portugal (Poster).
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- 118.Velazco C, Pacheco JJ, Salazar F, Coelho C Caractérisation clinique et microbiologique de patients porteur de parodontites du Nord de Portugal – Étude préliminaire, Congresso do GIRSO, 27 de Abril de 2007, Portimão.
- 119.Alfaiate D, Palmeira E, Velazco C, Coelho C, Pacheco J, Salazar F. Perspective microbiologique dans l'étude des écosystèmes buccaux chez un sujet sain et un porteur de parodontite: D - Un écosystème alternative à la plaque sous-gingivale pour l'examen microbiologique en Parodontologie, Congresso do GIRSO, 27 de Abril de 2007, Portimão.
- 120.Campos P, Ferreira I, Velazco C, Coelho C, Pacheco J Perspective microbiologique dans l'étude des écosystèmes buccaux chez un sujet sain et un porteur de parodontite: C - L'importance de l'utilisation simultanée de trois méthodes de diagnostic microbiologique pour l'examen clinique parodontal, Congresso do GIRSO, 27 de Abril de 2007, Portimão.
- 121.Cardoso R, Pinhal P, Velazco C, Coelho C, Pacheco J, Salazar F. Perspective microbiologique dans l'étude des écosystèmes buccaux chez un sujet sain et un porteur de parodontite: A- Les techniques de prélèvement pour l'étude d'écosystèmes oraux. Congresso do GIRSO, 27 de Abril de 2007, Portimão.
- 122.Pires C, Rodrigues P, Velazco C, Coelho C, Pacheco J, Salazar F Perspective microbiologique dans l'étude des écosystèmes buccaux chez un sujet sain et un porteur de parodontite: B - Microflore orale d'écosystèmes chez un sujet sain et un patient atteint de parodontite, Congresso do GIRSO, 27 de Abril de 2007, Portimão.

9.3.4. Psychology and Health Research Unit

- 123.Andrade, A.S, Afonso, F., Pacheco, D., Frade, B., Castanheira, C., Fonseca, E., Rocha, J. (2008). O Luto no Ciclo de Vida: para uma compreensão aprofundada do fenómeno no contexto da Saúde. XV Congresso Internacional INFAD– Psicologia e relações interpessoais no ciclo de vida, Évora
- 124.Afonso, F., Andrade, A.S, Pacheco, D., Frade, B., Castanheira, C., Fonseca, E., Rocha, J. (2008). Significação do trauma: Como materializar e torná-lo palpável? XV Congresso Internacional

- INFAD – Psicologia e relações interpessoais no ciclo de vida, Évora Leite, M. (2008). Antecipação do luto nos cuidadores do doente de Alzheimer. 7º Congresso Nacional de Psicologia da Saúde. Porto: 1 Fevereiro.
125. Mendes, D., Costa, L. e Quintas, J. (2008). Diferenças de Género em Toxicodependentes: Traços de Personalidade, Situações de Risco e Relação entre Ambos. IX Jornadas de Psicologia Clínica, “Psicologia Forense e da Transgressão”, organizadas pelo Núcleo de Psicologia Clínica da AE do ISCSN, na Alfândega do Porto, nos dias 18 e 19 de Abril.
126. Quintas, J. (2008). Criminalisation et Decriminalisation de la Consommation des Drogues au Portugal. 2º Seminário do Workpackage 3 (WP3) Criminalisation, vector drogas, da acção coordenada CRIMPREV – Assessing Deviance, Crime and Prevention in Europe, designado “L’Usage et la Détention de Stupéfiants, entre Criminalisation et Décriminalisation, organizado pelo CLERSÉ de Lille e pela Universidade Católica de Louvain, em Lille, nos dias 7 e 8 de Março.
127. Santos, C., Costa, M., Martinho, S., & Almeida, V. (2008). Proposta de uma intervenção em grupo na fibromialgia. 7º Congresso Nacional de Psicologia da Saúde. Porto, 1 de Fevereiro.
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129. Rocha JC (2008). Risco, experiências adversas e resiliência na gravidez. VII Congresso Nacional de Psicologia da Saúde, Porto, 1 de Fevereiro.
130. Peixoto B. 2007. Executive functions in the spectre of hepatic dysfunctions. International Neuropsychological Society: Mid-year Meeting. Bibao. (Comunicação Oral).
131. Almeida V, Machado P.A cognitive-narrative intervention for somatizers in primary care. Comunicação apresentada na *Xth European Congress of Psychology*, da EFPA, Julho 2007, Praga, República Checa.
132. Castanheira C, Vieira V, Glória A, Afonso A & Rocha JC. Impact of Event Scale - Revised (IES-R): Portuguese Validation. European Congress of Traumatic Stress, 5-9 de Junho de 2007, Opatija, Croácia
133. Leite M., Prista Guerra M & Garrett C. A importância da saúde mental do cuidador para a prestação de cuidados. 17th Alzheimer Europe Conference. 9-11, Maio de 2007. Estoril.
134. Rocha JC, Vieira V, Castanheira C, Leonardo A, Correia M & Paúl C. A cognitive-narrative approach for prevention of depressive symptoms after prenatal loss: randomized controlled trial. European Congress of Traumatic Stress, 7 de Junho de 2007, Opatija, Croácia.
135. Rocha JC. An approach to explore meaning construction in the context of genetic Counselling. 20th annual conference of the International Society of Nurses in Genetics (ISONG). 20 de Maio de 2007 Bristol.
136. Teixeira F, Gonçalves MP, Areias ME & Pais-Ribeiro JL Postnatal depression in women and men: the contribution of hormonal variables and previous psychiatric history. 10th European Congress of Psychology. 3-6/07/07 Praga.
137. Ledo, S. (poster). “Psychological impact of a carrier result from pre-symptomatic genetic testing for Familial Amyloidotic Neuropathy”. European Meeting of Psychosocial Aspects in Genetic, Munique, Junho de 2004.
138. Bruno, P. (poster). “Membro Fantasma ou o Mistério das Sensações”. X Congresso Luso-Brasileiro de Anatomia, Porto, Outubro de 2004.
139. Rocha J, Leonardo A, Fernandes M, Cruz C, Correia M, Sequeiros J, Paul C (2004) Generating narratives after na adverse result from prenatal diagnosis: Program evaluation. *Eur J Hum Genet*, 12 (S1):351.
140. Rocha J, Leonardo A, Fernandes M, Correia M, Godinho C, Sequeiros J, Paul C (2004) *Coping* and emotional difficulties after termination of pregnancy (TOP). *Eur J Hum Genet*, 12 (S1):365.

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10. Scientific Activity Spreading Actions

The culture of the spreading of science was instituted in the CICS since 2008 through: i) the “CICS Seminars” program that consists of regular seminars, of biweekly regularity, given by internal and external scientists and ii) annual workshop where the investigators of all groups present their research results, in a context of exchange and promotion of interdisciplinary synergies. Our objective is to turn these seminars and workshops more frequent, and attract scientist from other fields and institutions.

We next present the list of previous and programmed seminars (Until April 2009):

- Abril de 2008
 - Immunihistochemical Characterization of the Distribution of the Adenosine Receptors in the cardiovascular system in normal rats and in rats with hypertension.
Sandra Leal, Molecular and Cellular Biology Group, CICS
- Maio de 2008
 - The use of liposome as biomembrane models in assessing and quantifying anti-inflammatory activities.
Helena Ferreira, Chemical and Pharmaceutical Sciences Group, CICS
 - Periodontopathogenic bactérias isolated from clinical cases of periodontite and their importance in the treatment.
José Lopes, Dental Sciences Group, CICS
 - Clinical and pathological study of the immunoexpression of the EGFR and DNA content in malignant neoplasias of salivary glands.
Luís Monteiro, Dental Sciences Group, CICS
 - Modifications of endogenous control system of pain during acute and chronic pain processes.
Marta Pinto, Molecular and Cellular Biology Group, CICS
 - The importance of metabolite synthesis to the evaluation of the biological activity of organic components.
Nuno Milhazes, Chemical and Pharmaceutical Sciences Group, CICS
- 24 de Julho de 2008
- 1º Workshop CICS-UnIPSA-CITS entitled “Research lines”
Janeiro de 2009
 - Polymeric nanoparticles of xanthone derivatives.
Maribel Teixeira, Chemical and Pharmaceutical Sciences Group, CICS
 - The peroxisomes and the life sciences.
Carla Batista Pinto, CIIMAR, UP
- Fevereiro de 2009
 - European Experiences on Bereavement Research and Practice

Brigite Wagner and Daan Westerink, Psychopathology and Clinical Intervention Department, Zurich University, Research Institute for Psychology and Health, Utrecht University

- Continuous flux systems based on new concepts of fluid management.
Marta Ribeiro, Chemical and Pharmaceutical Sciences Group, CICS
- Março de 2009
- Clinical, genetic, and molecular study of the agenesis of the lateral superior incisors.
Teresa Pinho, Dental Sciences Group, CICS
- Search for anti-tumoral activity of natural and synthetic components.
Madalena Pedro, Molecular and Cellular Biology Group, CICS
- Abril de 2009
- Chitosan-based Nanomedicines for Delivery of Biopharmaceutics
Bruno Sarmento, Chemical and Pharmaceutical Sciences Group, CICS
- Julho de 2009
II^o Workshop CICS-UnIPSA-CITS

Beside the CICS seminars, members of each research group discuss each week the ongoing works and recent papers of interest, in the “lab meetings”. Also, the CICS participates in the “Opened to public Day” of the ISCS-N.

11. IINFACTS, *European Economic Interest Grouping*

The CICS, as the R&D of the ISCS-N, is engaged in the creation of a European Grouping of Economic interest with headquarters in Penafiel and that congregates, at this phase of foundation, the following institutions:

- CICS, CESPU, crl, Portugal
- CIBIO – Biodiversity Research Center, Portugal
- Câmara Municipal de Penafiel, Portugal
- Hospital Center of Tâmega e Sousa, Portugal
- University of Santiago de Compostela, Spain
- University of Barcelona, Spain
- University of Valencia, Spain
- University of Cluj, Romania

The main objectives of this grouping are:

- To develop research in the health area, using the human, material and technical resources of the grouping members;
- To create and make available the “know-how” to the community (population, hospitals, health institutions, industry, and public and private organisms);
- To provide specialized formation to the community;
- To render services, directly or through the internal structures of the parts, directed to the community;
- To render services of consulting to the community.

The grouping is named **IINFACTS** – Research, Innovation, and Advanced formation in Health Sciences and Technologies. The IINFACTS will develop its research activities in the context of sharing of resources and skills that improve the scientific productivity of its members.

12. Research and Education

Research and education are closely intertwined at the ISCS-N, where research completes and supports the educational mission. Various methods/techniques used in research by the CICS groups and units, are incorporated in the practice lesson programs of some courses at ISCS-N. Also, a research initiation program, funded by CESPU, exists that promotes the integration of undergraduate students into ongoing research projects within a CICS team, under the orientation of a Senior Investigator. The main goal of this program is to stimulate, through hand-on activities, the young students' initiation into research. Since 2005, CESPU has assigned nearly 30.000,00€ to support 38 research projects that involves some 100 undergraduate students. It was with much satisfaction that we saw this model adopted, since 2008, by the FCT, through the creation of Initiation to Research Fellowships (BII).

13. Toward a FCT-certified R&D Unit, *that promotes high quality research ...*

The CICS research groups are involved in basic, translational and clinical research projects, in technological development and innovation, and in fundamental research. Interests within these groups range from mitosis and cancer biology, T lymphocyte biology, analytical chemistry, new drug delivery systems, pharmaceutical biotechnology, oral pathology, and clinical psychology. These diverse groups provide a rich array of research at an international level with interdisciplinary collaborative projects within the institute and with external institutions. This multidisciplinary at CICS enables the integration of knowledge from molecular and cellular biology, biochemistry, biotechnology, bioinformatics, and social sciences to study both normal and pathological processes. The integration of medical teams working in hospital environments provides the Center with the necessary clinical research expertise as well as the required biological materials

The main mission of CICS is a search for excellence both in education and in research, through fostering research at highest international level and promoting teaching and learning in real research environment. The CICS aims to turn out a real contributor to sciences by fostering internationally competitive research lines.

With the results reached by its researchers, in a regular and sustained way, before and since its creation in 2007, with the dynamism and motivation of its team members, and with the determination of the CESPU and the ISCS-N directive boards, the CICS sees its research activities consolidated, namely in the areas of biological, chemical and

pharmaceutical sciences, and assumes itself as a R&D unit satisfying the prerequisites required to request the certification of the FCT in the near future.