



II JORNADAS CIENTÍFICAS DO CECA – ICETA  
**PROGRAMA**

- 9.00 Sessão de abertura:  
José Luís Costa Lima – Presidente do ICETA  
Carlos Cunha Pinto – Director do CSPGF do INSA, I.P.  
Nuno Canada – Director do LNIV / INRB, I.P.  
José Manuel Correia da Costa – INSA, e CC do CECA
- 9.30 “Investigação Veterinária - A perspectiva de um Laboratório de Estado”  
Nuno Canada – LNIV / INRB, I.P.
- 10.00 “Aportaciones al conocimiento de las protozoosis y helmintosis de importancia económica en ruminantes en Galicia”  
Mercedes Mezo – INGACAL, Centro de Investigacións Agrarias de Mabegondo (Xunta de Galicia)
- 10.30 “Achievements and future perspectives of research on Reproductive Biology”  
António Rocha, Graça Lopes, Tiago Guimarães – CECA e ICBAS
- 11.00 “Extra-fetal tissues used in Tissue Engineering of peripheral nerve”  
Ana Colette Maurício – CECA e ICBAS
- 11.20 “Development of a skeletal muscular tissue regeneration model”  
Tiago Pereira – CECA e ICBAS
- 11.40 “Biomaterials for bone Regeneration Medicine: *in vivo* studies and clinical trials for future applications”  
Luís Atayde – CECA e ICBAS
- 12.00 “Bonelike® and surgical-grade calcium sulfate for bone regeneration in cortical defects in sheep”  
Paulo Cortez – CECA e ICBAS
- 12.20 “Application of artificial vascular polyvinyl alcohol hydrogel grafts in sheep – our experience to date”  
Nuno Alexandre & Ana Lúcia Luís – CECA, ICBAS e Universidade de Évora
- 14.00 “Doenças Emergentes e Zoonóticas”  
José Manuel Correia da Costa – INSA e CECA
- 14.20 “A água como factor estruturante e essencial na Saúde Humana e Animal”  
André Almeida & Carla Mendonça – CECA
- 15.00 “Development of new Biotechnological tools”  
António Castro – INSA e CECA
- 15.20 “A novel fusion system for soluble over-expression of recombinant proteins in *Escherichia coli*”  
Sofia Costa – INSA e UM
- 15.40 “Schistosomes and estrogen: an old tale with new characters”  
Mónica Botelho – INSA e CECA
- 16.00 “*Salmonella* in swine: prevalence, antimicrobial resistance and genetic characterization”  
Eduarda Neves – ICBAS e CECA
- 16.20 “Toxoplasmose”  
Susana Sousa – IBMC e CECA
- 16.40 “Saúde ambiental”  
João Paulo Teixeira – INSA e CECA
- 17.00 “Poluentes emergentes”  
Catarina Mansilha – INSA e REQUIMTE
- 17.20 “El agua como vehículo de transmisión de la cryptosporidiosis y giardiosis”  
José António Castro Hermida – INGACAL, Centro de Investigacións Agrarias de Mabegondo (Xunta de Galicia)
- 17.40 “Chlorine dioxide based products for water treatment”  
Iwan Zatterquist (presentation by JM Correia da Costa)
- 18.00 Debate, Conclusões, Recomendações e Encerramento

scaffold for bone regeneration as it achieved synchronization of the in-growing bone with biomaterials resorption and subsequent preservation of the bone graft initial volume. Therefore, our results indicate that surgical-grade calcium sulfate is an effective vehicle for Bonelike® granules as it facilitates their application and does not interfere with their proven highly osteoconductive properties. In the opposite way, the incorporation of Bonelike® improves the bone regeneration capabilities of surgical-grade calcium sulfate.

## **Biomaterials for Bone Regenerative Medicine: In vivo studies and clinical trials for future applications.**

**Luís Miguel Atayde<sup>a,b</sup>, Paulo Pegado Cortez<sup>a,b</sup>, Tiago Pereira<sup>a,b</sup>, José Domingos Santos<sup>c</sup>, Ana Colette Maurício<sup>a,b</sup>**

<sup>a</sup> *Centro de Estudos de Ciência Animal (CECA), Instituto de Ciências e Tecnologias Agrárias e Agro-Alimentares (ICETA), Universidade do Porto (UP), Portugal.*

<sup>b</sup> *Departamento de Clínicas Veterinárias, Instituto de Ciências Biomédicas Abel Salazar (ICBAS), Universidade do Porto (UP), Portugal.*

<sup>c</sup> *Faculdade de Engenharia da Universidade do Porto, FEUP, Portugal*

In this work we test a bonegraft, with a patent formulation called Bonelike®, prepared with a new spherical formulation with 2 distinct sizes (250-500µm and 500-1000µm). To this bonegraft, we also associate bioresorbable polymers and hidrogels, like chitosan, chitosan-silicate hybrid gel and dextrin to promote bone regeneration and making local application easier. Adding these substances to Bonelike® allows controlled release of therapeutically agents and microelements, such as bone morphogenetic proteins (BMPs), with significant improvement in new bone formation and bone regeneration.

This study will be carried out with *in vitro* and *in vivo* tests using a sheep model. For the *in vivo* study, the two sizes of spherical bonelike® are implanted in the sheep's femur either associated with bioresorbable polymers and hidrogels or with blood. We will do a radiological exam on the day of the surgery and every 30 days. The different sheep are euthanized on different periods of time and a post mortem exam is performed, using macroscopic and microscopic analyzes.

Bonelike® is also being tested as a bone growth promotor on arthrodesis surgeries. Before the clinical application of Bonelike® on arthrodesis surgeries, a test is done on a sheep model, by doing an arthrodesis on tarso-metatarsal joints of both hind limbs: in one of the joints we only use the convectional technique of arthrodesis, serving as a control, and on the other limb in addition to this technique we add Bonelike® in the joint space. We proceed with a radiological exam on the surgery day and then every 30 days. The different sheep are euthanized on different periods of time and a post mortem exam is performed, using macroscopic and microscopic analyzes. We also have clinical trials on various clinical cases of arthrodesis.

## **Application of artificial vascular polyvinyl alcohol hydrogel grafts in sheep - our experience to date.**

**Nuno Alexandre<sup>d</sup>, Andrea Gärtner<sup>a</sup>, Irina Amorim<sup>c</sup>, José D Santos<sup>e</sup>, MA Lopes<sup>e</sup>, Ana C Maurício<sup>a,b</sup>, Ana L Luís<sup>a,b</sup>.**

<sup>a</sup> *Centro de Estudos de Ciência Animal (CECA), Instituto de Ciências e Tecnologias Agrárias e Agro-Alimentares (ICETA), Universidade do Porto (UP), Portugal.*

<sup>b</sup> *Departamento de Clínicas Veterinárias, Instituto de Ciências Biomédicas Abel Salazar (ICBAS), Universidade do Porto (UP), Portugal.*

<sup>c</sup> *Departamento de Patologia e Imunologia Molecular, Instituto de Ciências Biomédicas Abel Salazar (ICBAS), Universidade do Porto (UP), Portugal.*

<sup>d</sup> *Departamento de Zootecnia, Universidade de Évora (UE), Portugal*

<sup>e</sup> *Faculdade de Engenharia da Universidade do Porto (FEUP), Porto, Portugal.*

Researchers developed this project according with the tasks originally planned, so far focusing their research activities in the biocompatibility and functionality of vascular implants. The biocompatibility was studied by following the ISO standard 10993-6 for evaluation of medical devices through the evaluation and grading of inflammation caused by implants placed subcutaneously. The implants were placed in sheep

and collected randomly at different time points of the experimental period and subsequently processed histologically and classified according to Annex E to the standard mentioned above. The functionality of vascular implants has been evaluated to date by replacement of segments of the carotid by ePTFE implants with 5 cm long and 4 mm in diameter, coated or not with cultured stem cells. The deployment of these prostheses has been performed in carotid arteries of sheep and their functional performance measured by vascular ultrasound in Doppler and B mode by measuring parameters such as: peak systolic / diastolic blood flow velocity, vascular diameters at implantation and at the periphery of these. These measurements are performed at various time points of the experiment were followed by euthanasia of sheep and immediately sample collection for the implementation of techniques like immunohistochemistry, morphometry and scanning electronic microscopy. Complications were observed throughout the experimental period include the formation of thrombi after at the transition implant-carotid region and vascular dilatation as the most frequent, respectively, in periods of short-and long-term experiment.

