

Expression of Interest



Contact Person/Scientist in Charge

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University CEU Cardenal Herrera

Department / Institute / Centre

- **Name:** Universidad CEU Cardenal Herrera (CEU UCH)
- **Address:** Avd. Seminario S/N 46113 Montcada
- **Province:** Valencia

Research Area

- Life Sciences (LIF)

Brief description of the institution:

CEU Cardenal Herrera University belongs to the CEU San Pablo University Foundation which is a non-profit charitable educational institution with over 75 years' worth of experience in the field of education. In the context of the European framework in which we find ourselves, the internationalisation of the Research in our University is one of our main objectives.

Brief description of the Centre/Research Group (including URL if applicable):

Our University belongs to the San Pablo-CEU Foundation, the most important private education organization in Spain, having more than 26,000 students and 24 centers in all educative levels, among those three Universities in Madrid, Barcelona and Valencia.

CEU-UCH is among the top four Spanish private universities in research rankings (Shanghai Ranking Expanded, IUNE, international ranking SCIMAGO), being the best positioned in Valencia.

The university has a clear commitment to research (+3 million euros of investment and more than 40 projects) as a basis to develop academic excellence that benefits our students and society.

Project description:

Dental caries is a behavioural, lifestyle disease with a bacterial component, affecting the dental hard tissues. Acid-etching procedures is another major reason for dentine demineralisation. Indeed, the formation of resin-dentin bonds is accomplished predominantly by micromechanical retention via resin penetration and entanglement of exposed collagen fibrils in the partially or completely demineralized dentin. Unfortunately, bonding to dentine still suffers from long-term interfacial failure. This is due to the use of synthetic, bio-incompatible materials placed in a hostile biological environment subsequent to ultra-conservative caries excavation, without using therapeutic and biomimetic methods to bond and maintain, or even improve, the repaired tissue.

Classis ion-releasing restorative materials may only recover a small part of the biomechanical functionality of the carious dentine due to poor mineral association at the intrafibrillar level. The total re-establishment of biomechanical dentine functionality is only possible after intrafibrillar biomimetic remineralisation.

Our project is to use high-impact *In Situ* bio-engineered concepts for bio-mineralise and restoring large cavities in teeth, overcoming existing problems that cannot be adequately addressed during the restoration of large carious dentine cavities with minimally invasive procedures. This will improve the quality of dental restorations in routine practice, promoting cost-effective care. The main aims of this research group focus on the generation of revolutionary techniques based on *In Situ* dental tissue engineering concepts and using smart resin-based biomaterials able to re-establish the biomechanical properties of mineral-depleted dental hard tissues in conjunction with minimally invasive dentistry.

Applications

Please send CV and motivation letter.