

## **Project Summary**

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**Tribocoroziunea biomaterialelor și a straturilor micro și nanostructurate în medii  
specifice.**

**(Tribocorrosion de biomatériaux et de dépôts micro et nano structurés dans des milieux  
spécifiques).**

**Tribocorrosion of biomaterials and micro and nano-structured composite coatings in  
specific environments.**

**Acronym: *CorrBioMat***

**<http://www.corrbiomat.ugal.ro>**

The collaboration between Prof. Dr. (Ph.D.) Lidia BENEĂ from Dunarea de Jos University of Galati, Competences Center Interfaces - Tribocorrosion and Electrochemical Systems (CC-ITES) and French partner of Ecole Centrale Paris - France, Laboratory Génie des Procédés et Matériaux ( LGPM ) began since 1997 in the research area of electrodeposition of composite coatings to increase the resistance to corrosion and wear of materials . Lidia Benea was invited professor and researcher in the academic years 1997 - 2013 ( at different times ), where he led mini research projects with students of IV engineers, master and doctoral students in the field of coatings tribocorrosion, hard chromium - cobalt alloy and aluminium alloys. French partners participated with Romanian team in a project to improve the Doctoral School in Materials Engineering (2009-2011 ).

The project continued and intensified the research activity in the area of obtaining, development and characterization of properties for biomaterials and nano and microstructured layers in specific environments. Surface modification of biomaterials as obtaining nano and microstructured layers biocoatings) is achieved by electrochemical methods. The use of bio-compatible dispersed phasees (Biopolymers : high molecular weight polyethylene, bio ceramics : CeO<sub>2</sub> , TiO<sub>2</sub> , ZrO<sub>2</sub> ) which are electro-codeposited with metal as biocompatible matrices. There are studied the kinetics and mechanism of surface modification of biomaterials by nano and micro -structured layers.

The complex process of degradation of biomaterials and nano and microstructured coatings by corrosion and wear (tribocorrosion) in specific biological environments is achieved by in-situ electrochemical and ex- situ investigations by advanced techniques such as electron microscopy coupled with X-ray analysis, X-ray diffraction , ultrahigh microtopography 2D and 3D surfaces , atomic force microscopy, etc.

The novelty of the project is to design and develop new composite nano and micro structured as biocoatings, which are important in terms of science and technology, the research domain where the efforts in research and innovation, both at European and International level are very significant.