

Piano nazionale di ripresa e Resilienza - Missione 4 Istruzione e Ricerca
Bando Prin 2022 PNRR - Settore ERC PE11 "Materials Engineering"



“BIO-COATCH”

*Novel sustainable BIOactive COATings
to preserve metal surfaces in Cultural
heritage and Healthcare*

Scan Me!



AIM of the Project

Bacterial contamination is a challenging issue that affects many aspects of modern society and drives the search for solutions applicable to different fields including cultural heritage (CH) conservation, where bacterial colonization can lead to biodeterioration and healthcare (H) safety where bacterial contamination is the cause of healthcare-associated infections.

Development and study of new generation safe bioactive coatings to be applied on metal substrates characterized by:

- anticorrosion protection
- antibacterial and antibiofilm activity
- biocompatibility
- environmental sustainability

EXPERIMENTAL APPROACHES

COATINGS PRODUCTION

a) Toxic-solvent-free coatings

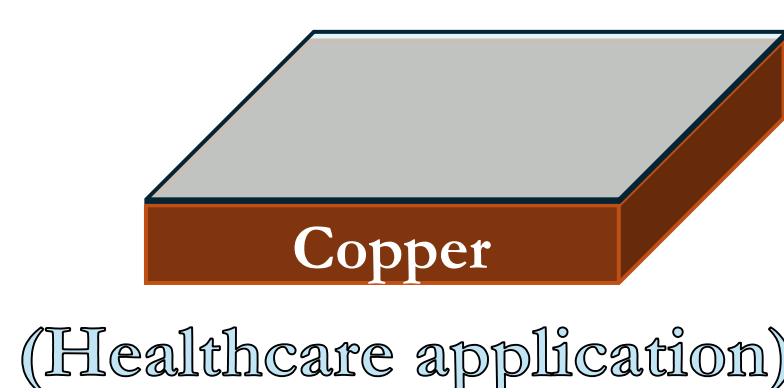


b) Biobased coatings derived from food waste

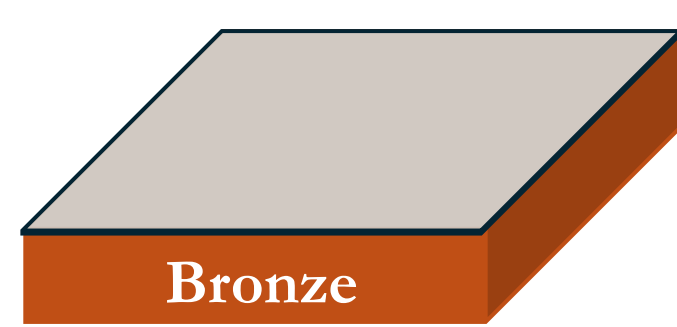


FUNCTIONALISATION

Ag & Zn
nanoparticles



(Healthcare application)



(Cultural Heritage application)

ANALYSES AND TECHNIQUES

1. Optimisation of the coatings formulation via Design of Experiment (DoE)
2. Durability of the coatings assessed by natural and artificial ageing conditions
3. Antibacterial and antibiofilm activity + microbial response to the new generation coatings and metal nanoparticles
4. Biocompatibility assays using human cell lines to test the cytotoxicity of the coatings
5. Assessment of the sustainability of the best formulations production compared to the commercial alternative products via LCA

Project Partners

**Università degli Studi di Ferrara; Università di Bologna; IBBC – CNR Istituto di Biochimica e Biologia Cellulare
CNR**