Student Speech Contest 2025

Anti-adhesive surface properties of wood-derived hydroxyapatite scaffolds against bacteria.

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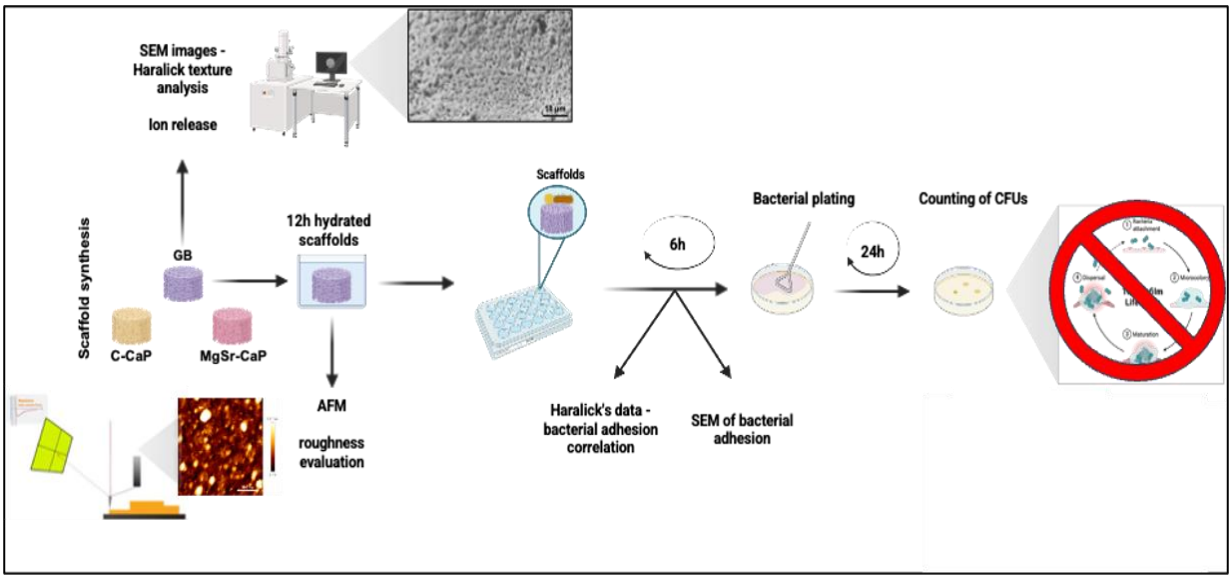
Project: Anti-adhesive surface properties of wood-derived hydroxyapatite scaffolds against bacteria

Topic / keyword: Bone regeneration, Biomaterials, AFM, Haralick's texture analysis, Roughness, Bacteria, Bacterial adhesion.

Abstract.



Calcium-phosphate bone scaffolds with different origins and compositions, including a wood-derived CaP, were fabricated and characterized in terms of surface morphology, topography, texture, and ionic release using SEM, AFM, Haralick's texture analysis, and ICP-OES. The scaffolds were then exposed to Gram-positive and Gram-negative bacteria to evaluate bacterial adhesion through CFU counting, SEM, and time-lapse

imaging. The wood-derived CaP scaffold exhibited a significant reduction in bacterial adhesion, highlighting the key role of surface texture in controlling bacterial–material interactions

References.

[1] G. Lo Bello, Q. Nawaz, P.F. Ferrari, L. Pastorino, R. Raiteri, A.R. Boccaccini, Unlocking the Power of Quercetin-Encapsulated Mesoporous Bioactive Glass Nanoparticles: A Multifunctional Approach to Bone Regeneration, Adv. Eng. Mater. (2025). https://doi.org/10.1002/adem.202500979.