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ABSTRACT BOOK

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Abstracts

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(ICACC-S5-016-2025) Self-assembling, antibacterial hybrid calcium phosphate-based composites

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Self-assembling materials have emerged as a groundbreaking solution in tissue engineering, offering innovative strategies to combat bacterial infections. Special attention is given to the hybrid granules. Our research focuses on self-assembling, antibacterial hybrid granules composed of hydroxyapatite, methylcellulose, and/or chitosan. These granules were produced via modified wet-chemical method and enriched with ions or nanoparticles (Cu^{2+}, CuONPs). The chemical and phase compositions (XRF, XRD, FT-IR, Raman), compressive strength, thermal properties and microstructure were analyzed. Additionally, their bioactivity in simulated body fluid and antibacterial effectiveness against E. coli and S. aureus were tested. The obtained results are particularly promising as hybrids showed high mechanical strength, biocompatibility and antibacterial properties. Granules may be applied independently or as components of innovative biocomposites. Supported by the programme "Excellence initiative – research university" for the AGH University of Science and Technology and the AGH Faculty of Materials Science and Ceramics (No. 16.16.160.557). This research was funded in whole or in part by National Science Centre, Poland (Project MINIATURA7 No. 2023/07/X/ST11/00705).

Self-assembling, antibacterial hybrid calcium phosphate-based composites

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