

HKU project funded under the NSFC/RGC Joint Research Scheme

The Investigation of Biodegradable Zinc-lithium-magnesium Alloy as a Novel Implant to Promote Osteogenesis through the Stimulation of the Bone-brain Axis

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Project Summary:

Every year, millions of patients suffer from complex bone fractures or deformities that necessitate surgical interventions involving the placement of internal or external fixation implants. In recent years, various biodegradable implants have been developed to replace the traditionally used non-degradable implants. However, the therapeutic outcomes of these implants, particularly in load-bearing areas, have proven unsatisfactory due to inadequate mechanical properties or limited osteogenic potential. Based on our prior studies on magnesium and zinc-based alloys and their effects on bone regeneration through the bone-brain axis, we aim to develop a novel ternary Zn-Li-Mg alloy system to be used as an internal fixation for bone healing in the load-bearing area. We believe that the successful implementation of this project will contribute to a revolutionary biodegradable implant system, offering a more effective and patient-friendly solution for complex bone fractures or deformities.

港大「聯合科研資助基金計劃」項目

可生物降解鋅 - 鋰 - 鎂合金作為新型植體通過刺激骨 - 腦軸促成骨的機制研究

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項目簡介:

每年都有數百萬患者遭受複雜的骨折或骨畸形困擾，需要通過植入內/外固定裝置進行手術干預。近年來，各種可降解植入物已被開發用於取代傳統的不可降解植入物。然而，由於機械性能不足或骨生成潛能有限，這些植入物的治療效果，尤其是在負重區域，尚無法令人滿意。基於我們之前關於基於鎂金屬和鋅金屬合金及其通過骨-腦軸對骨再生的作用的研究，我們將開發一種新型的三元鋅-鋰-鎂合金系統，用於在負重區域作為骨癒合的內部固定裝置。我們相信，這個項目的成功實施將為可降解骨植入物帶來革命性變革，為複雜骨折或骨畸形提供更有效和患者友好的治療方案。