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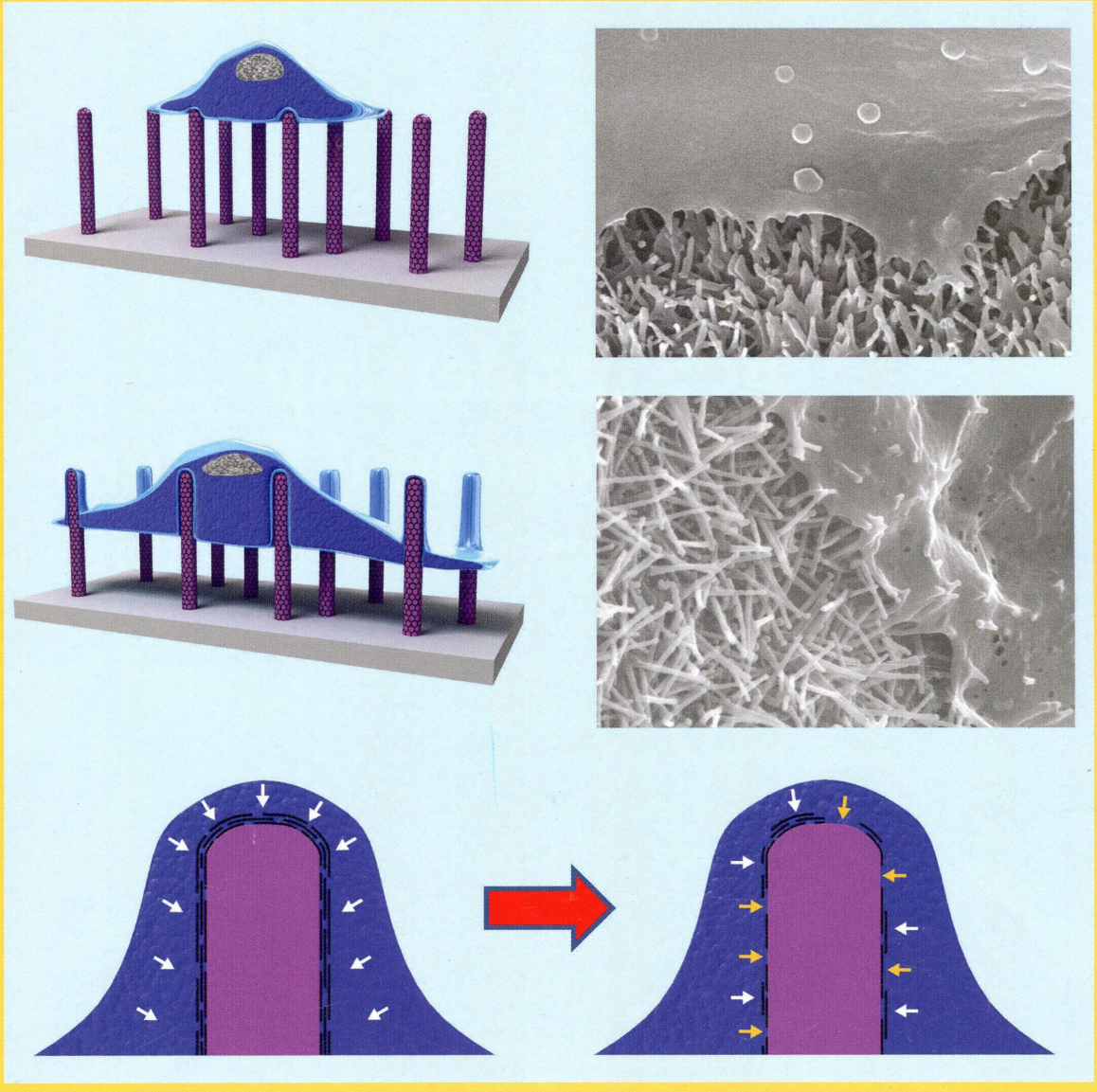

Programmed Smart Behavior of SANGs with a Unique Core–Shell Nanostructure for Osteogenesis (see page 13849)

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ON THE COVER: The promotion of osteogenesis by single-crystal apatite nanowires sheathed in graphitic layers (SANGs) is specific to their unique nanotopographic surface chemistry. SANG scaffolds with graphitic layers provided a significantly better supportive structure for the differentiation of human mesenchymal stem cells (hMSCs) into osteoblasts than did single-crystal apatite nanowire (SAN) scaffolds with an apatite surface. The nanotopographic surface structure of SANGs reproduces the conditions in bone tissue, which presents a more alkaline environment rich in ceramic/mineral components. Therefore, the SANG surface graphitic structure is beneficial for the initial growth and differentiation of hMSCs, which would be followed by degradation of graphitic shells, and the bare apatite core would provide a biologically compatible environment for the later stages of osteogenesis. We believe that our SANGs with a unique core−shell nanostructure provide a useful scaffolding material for hMSC-based tissue engineering strategies because they reflect the dynamic nature of many biological processes.

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