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The Design of a Bone Interface Microfluidic Cell Culture Platform for the Evaluation of Potential Drugs for Bone Diseases

Through this project we want to evaluate the potential of modified alginate membrane for use in cell culture with osteoblasts and endothelial cells. Through the past years we have been working on developing a membrane that can promote the growth and proliferation of osteoblasts, with the aim on producing a scaffold that has the ability of regenerating bone tissue. We have observed that membranes made by different polymers and nanocomposites have promoted the growth of osteoblasts. One of the drawbacks of the tissue engineering field is the difficulty of producing vascularized tissue, a process governed by endothelial cells. If our membrane can provide the ideal environment for the growth of osteoblasts and endothelial cells, we will co-culture them in a 3-D microfluidic device that will be designed to imitate the bone anatomical interface. With this device we will be mimicking *in vivo* behavior of bone biology to provide a platform for potential bone disease drug evaluation; this might result in accelerating the time involved in the approval process of a new clinical drug.