

Biomaterials – Tissue Interactions

Homework #4

You have been hired by a start-up company to help them with their development of cell and biomaterial scaffold products for treating defects in articular cartilage and bone.

1. The CEO is considering the development of cell suspensions to be injected into defects in bone and articular cartilage to facilitate regeneration. What are 2 benefits of using cell-seeded biomaterial scaffolds for implantation into the defects (as an alternative to injecting a cell suspension), which you would propose to her.
2. One of the company's consultants has told the CEO that a biomaterial scaffold alone (without being seeded with cells) should work for small defects in bone, but not for defects in articular cartilage. Do you agree? Explain.
3. Your company is considering merging with another start-up that has developed a procedure for the production of discs of cartilage from bone marrow cells from the patient who is to receive the disc as an implant, to treat defects in the articular cartilage of the joint. You have been asked to participate in the "due diligence" assessment of this product prior to the merger. What are 2 issues that would need to be addressed in determining the potential for success of this product?
4. Write the unit cell process(es) that would apply to the formation of cartilage in a scaffold. No need to name the regulators.

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