

Development of bioreactor system for generating three dimensional (3D) tissue engineering

Abstract

This study, perfusion bioreactor has been employed for generating a three dimensional (3D) tissue engineering. In flow perfusion culture, the culture medium is forced through the internal porous network of the scaffold. This can mitigate internal diffusional limitations present in 3D scaffold to enhance nutrient delivery and waste removal from the cultured cells. In order to validate this design, a fluid flow analysis has been conducted to show that it has a uniform flow distribution value for cell cultured conditions. This bioreactor system also equip with the temperature controller system to ensure the bioreactor temperature is always at 37 °C in order to mimic human body temperature.

Keywords — 3D scaffold, ANSYS FLUENT, flow perfusion bioreactor, temperature control system, tissue engineering.