

## Automated 3D Culture

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### **Abstract**

One of the aims of tissue engineering is to maintain the physiological function of the cells in vitro for a longer period of time than is possible in simple 2-D cultures. To achieve this, the cellular in vivo microenvironment must be closely mimicked in vitro. This includes a sufficient nutrient supply as well as mechanical signals, which vary from tissue to tissue in type and intensity.

Growth conditions, harvesting time, scale-up, storage, and sterility issues all need to be considered and incorporated into design of bioreactors and in concepts for the automated production of human tissues.

However, without a comprehensive understanding of each of the components of a automated production facility, bioreactor design and tissue growth will remain at a relatively rudimentary and limited level. Increased fundamental understanding of the issues can have a dramatic impact on the ability to generate tissue-engineered product safely, economically, and in the numbers that are required to fully address testing for risk assessment using human tissue equivalents or as implants.

During the talk a state of the art review of specific bioreactors and the automatization of singles production steps and whole processes will be provided. A major topic will be the discussion of concepts which are important in the development of reactors and technologies that can be use for production of clinical scale tissue.