Institute of Biomaterials and Bioengineering

第204回 IBBセミナー

Fabrication of Hierarchically Designed Nano, Micro, Multiscale Fibrous Scaffolds for Enhanced Cell Responsiveness

演者：Jayakumar Rangasamy先生

Centre for Nanosciences and Molecular Medicine, Amrita Institute of Medical Sciences and Research Centre

日時：2018年3月26日(月) 14：00~14:45

場所：22号館1階 第2会議室

Abstract

One of the most promising scaffold developments from biomechanical and biocompatible point of view would be based on biomimetic strategy. The physicochemical and biological properties of cells are further controlled by cell-material interaction of which fiber scale and alignment are key factors. Enhanced cell attachment is observed in nanoscale fibrous structures due to higher surface area to volume ratio. Cell infiltration is further enhanced in multiscale architecture due to the increased porosity. In an effort to optimize tissue regeneration the use of multiple scales in scaffold has been investigated for obtaining innovative property combinations not otherwise attainable with a single fiber scale. Electrospun multiscale fibrous scaffolds containing a combination of micro- and nanoscale fibers have attracted a lot of attention in the tissue engineering field. The multiscale concept is inspired by the hierarchical structure of native tissues. In view of developing extracellular matrix (ECM) mimicking vascularized scaffold for efficient tissue regeneration multiscale architectures have been found to be favourable. The fiber alignments in different layers also help in the simultaneous regeneration of different cell layers of vascular tissue. Modification in architecture and functionalization of multiscale fibers provide additional synergistic properties to enhance cell responsiveness and enhance regeneration of various tissues. This includes hydrogel coating, layering, plasma treatment, incorporation of nano/bioactive materials etc for skin, bone, tendon/ligament regeneration and wound healing applications. Various designs of micro, nano and multiscale scaffolds fabrication and subsequent modifications based on their applications in regenerative medicine are discussed during the presentation.

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第204回 IBBセミナー

Modelling of Minimal Residual Disease in Acute Myeloid Leukemia

演者：Ullas Mony先生

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日時：2018年3月26日(月) 14：45~15:30

場所：22号館1階 第2会議室

Abstract

Acute myeloid leukemia (AML) is a heterogeneous clonal disorder marked by the accumulation of undifferentiated myeloid blasts. AML is thought to arise from a continuously replenishing rare and functionally distinct leukemic stem and progenitor cell (LSPC) population characterized by its capacity of self-renewal and generation of leukemic progenitors. The bone marrow microenvironment provides a highly favorable site for the growth, differentiation and survival of hematopoietic cells. Relapse in AML is mediated by survival of leukemic stem cells in the bone marrow, following remission-induction chemotherapy. Those residual leukemic cells that remain in the patient after chemotherapy is minimal residual disease (MRD). It would therefore be useful to identify therapeutic agents that target leukemic stem cells. Our study focused on developing a defined bone marrow microenvironment followed by the chemo sensitivity assays to enumerate viable LSPCs. Thus we focus to develop an in vitro MRD in AML. Development of such assays can be used to investigate the LSPCs response to various novel therapeutic agents in AML.

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