代理 Integrated Bio 捷昇生物科技有限公司 × nippi MATRIXOME

iMatrix-511 silk

2018

An innovative technology brings cells and ECM molecules together

ECM再生醫學研討會

Invitation

4/10 (Tue)
中央研究院
Time:
14:00-16:00
(13:30報到)

4/11 (Wed)
國家衛生研究院
Time:
10:00-12:00
(09:30報到)

4/10 台北場 AGENDA

13:30 - 14:00	Registration
14:00 - 14:05	Opening
14:05 - 14:50	**Dr. Yamamoto**
14:50 - 15:00	Q&A
15:00 - 15:50	**Dr. Shunji Hattori**
15:50 - 16:00	Q&A & Closing

4/11 苗栗場 AGENDA

09:30 - 10:00	Registration
10:00 - 10:05	Opening
10:05 - 10:50	**Dr. Yamamoto**
10:50 - 11:00	Q&A
11:00 - 11:50	**Dr. Shunji Hattori**
11:50 - 12:00	Q&A & Closing

Topic Laminin-E8 fragments are the best substrate for cell culture, based on the 'Matrixome' research

Key Speaker
Dr. Takuji Yamamoto
CEO Matrixome, Inc.

Matrixome Inc. was established in 2015 as a company researching for 'MATRIXOME' and selling reagents related to 'MATRIXOME'. MATRIXOME is propounded by Prof. Sekiguchi (Osaka Univ.), that expresses the cross-interaction between cell and cell, cell and Extra Cellular Matrix (ECM), and ECM and ECM. Matrixome information is obtained by comprehensive immune-histochemical survey of more than 40 basement membrane proteins including all isoforms of laminins in mouse embryo. The results showed that basement membrane compositions are indeed customized for individual cell types and become increasingly diversified as embryonic development proceeds, while the composition in early mouse embryos is rather uniform and comprised of a defined set of proteins, of which laminin-511 is a major isoform of laminin.

The iMatrix-511, which is consisted of Laminin511-E8 fragment, was developed based on that research of MATRIXOME. The result shows that the iMatrix-511 is the best substrate for culturing ES/iPS/epithelial cells. It was confirmed in many institutes that iMatrix-511 is the best substrate for feeder-free, xeno-free and single passaging culturing of ES/ iPS cells. Recently Dr. Miyazaki (Kyoto Univ.) was published a new paper using iMatrix-511, in which it is described that novel method of stem cell culturing using iMatrix-511 without pre-coating on the culture dish. This simple method provides stem cell researchers with low-cost and time-saving cell culturing protocol. Furthermore, it is said that the iMatrix-511 is very useful for inducing various types of cells including dopaminergic neurons, retinal pigment epithelial cells, and corneal epithelial cells.

Now we have launched two types of laminin-E8 fragment, laminin221-E8 fragment (iMatrix-221) and laminin411-E8 fragment (iMtrix-411). iMatrix221 is useful substrate for cardiomyocyte culture, and iMatrix411 is useful for vascular endothelial cell culture.

Topics:

- Matrixome from Mouse Basement Membrane Bodymap
- iMatrix-511 is de facto standard in Japan for ES/ iPS cell culture
- Innovative stem cell culturing method using iMatrix-511 without pre-coating
- Matrixome for various cell culture

Topic Collagen as a scaffold for tissue engineering

Guest Speaker
Dr. Shunji Hattori
Director of Nippi Institute of Biomatrix
Visiting Professor of Tokyo University of Agriculture and Technology

Collagen is the major protein of the extracellular matrix (ECM) and is the most abundant protein found in mammals, comprising approximately 30% of the total protein. At present, 28 types of collagen have been identified in human, and types I, II, and III are the main types of fibril forming collagen found in connective tissue. Collagen exists in mammalian body as bundles called collagen fibers and has great tensile strength to maintain the architecture of skin, bone, cartilage, tendon and others. In addition to supporting most tissues, collagen has a physiological activity through interactions with receptors (integrin and DDR) on the surfaces of cells. Collagen can be extracted and purified from a variety of sources such as animal species and tissues, and offers low immunogenicity, biocompatibility and biodegradability.

Collagen scaffold has been widely used in tissue engineering due to these excellent properties. In most cases, collagen solution is used as a starting material and processed into gel, sponge, film, sheet and so on. However, their collagen density is low so that collagen scaffold may present poor mechanical property and structural stability. We have focused on the reconstituted collagen fibers as a starting material and have developed a novel high-density collagen scaffold (HDCS) using a method like paper-making process. HDCS has an appropriate density (50~500 mg/cm3 is available) similar to a living body and shows physical strength due to dense collagen fiber networks. Also, it has many 20 μm pores among fibril networks to provide cells with space for migration, growth and production of newly ECM. This collagen-based device is ideal for tissue engineering since it mimics the environment of mammalian body in terms of its structure and density. I will introduce promising applications of collagen-based bone formation system combined with collagen binding-bFGF. I will also talk about recent application of gelatin which is denatured collagen in the medical device.

Topics:

- What is collagen? Touch and feel collagen.
- Structure of collagen molecule and collagen fibril.
- Physiological function of collagen as a substrate for cell growth.
- Example of collagen molding for application to regenerative medicine.
- Usage of collagen degradation enzyme for cell isolation from tissue.

交通資訊

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