

Method Development for Detection of Collagen and Low Abundance Proteins in Decellularized Porcine Small Intestinal Submucosa Matrix

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Abstract:

Acellular matrix (ACM) has great application potential in tissue engineering and regenerative medicine. The mechanical properties and physiological function of ACM are associated with the original composition and architecture of extracellular matrix (ECM). The molecular composition and 3D-structure of ACM may provide an ideal microenvironment for cell proliferation. Immune properties of protein is the main concern for when ACM was used in clinical practice.

Collagens are the main components in ECM and show low antigenicity and immunogenicity. Collagen content and the ratio of different type change with tissues and animal ages, which affect the ACM mechanical property. Non-collagen proteins in ACM are mainly fibronectin, elastin, integrin, growth factors and cytokines. These proteins show less abundance compared with collagens. Their immunogenicity is a potential risk, which is related to its abundance in ACM and the original animal from which ACM is prepared. Thus, for quality control of ACM, profiling of total proteins is necessary.

We developed a method for quantitative detection of collagen with different types in porcine small intestinal submucosa based ACM. For non-collagen proteins, a method for quantitative analysis of FN, TGF, EGF, FGF, etc, was also investigated.

Biography:

Dr. Guifeng Zhang is a professor of biochemical engineering in State Key Lab of Biochemical Engineering, Institute of Process Engineering, Chinese Academy of Sciences.

Dr. Zhang has extensive experience in the collagen-based biomaterials. He has developed several new technologies to prepare collagen sponge, hydrogel, and membranes. He has established three pilots producing collagen for medical application, collagen peptides for functional food, and undenatured collagen type II suitable for RA patients.

In recent years, Dr. Zhang focus on preparation of acellular matrix and its quality control. These technologies promise to be commercialized, and are currently advertised to attract private funding by commercialisation entity.

Research Interests:

- *Preparation of collagen-coated materials and its application as bioartificial liver support.*
- *Preparation of polysacchride-protein composite to be used as haemostatic materials.*
- *Decellularization of extracellular matrix of liver to be used as cell scaffold.*

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Suggestions of colleagues/Professors/scholars to send invitation (if any)

Suggestions of Sessions to the conference (if any)
Track 12 Biomaterials