Characterization of Porcine Decellularized Tissues

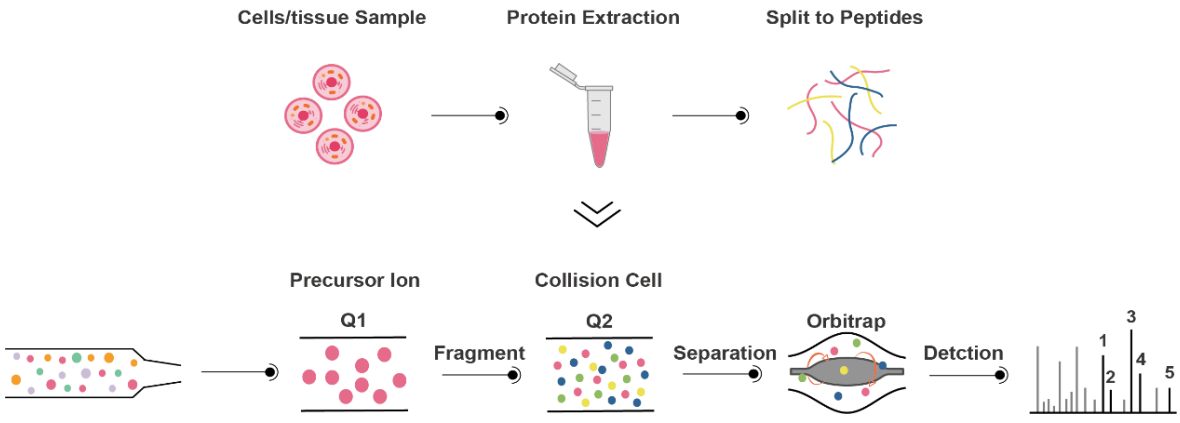
Decellularized extracellular matrix (ECM) hydrogels can be used to recapitulate the in vivo peri-islet niche. Creative Proteomics provides protein characterization services that can qualitatively and quantitively analyze the target protein and its post-translational modification.

Protein Characterization

Organ-on-a-chip platforms are cost-efficient testbeds for screening pharmaceutical agents, mimicking biological systems, and modeling human diseases. In the field of diabetes, the development of an islet-on-a-chip platform would have broad applications on understanding pathology and discovering potential therapies. Leveraging microphysiological systems for the long-term culture of primary pancreatic islets, however, has been limited by poor stability of these cells ex vivo, with the key factor being the disruption of islet-matrix interactions following isolation.

The use of decellularized tissues integrates a diverse spectrum of biochemical and biophysical cues, adapted from natural biomaterials, for the encapsulated cells to be viable and functional. The composition of the ECM can be tailored by selecting the tissue source and the decellularization approach. In order to determine the protein composition of porcine decellularized tissues, protein characterization was performed.

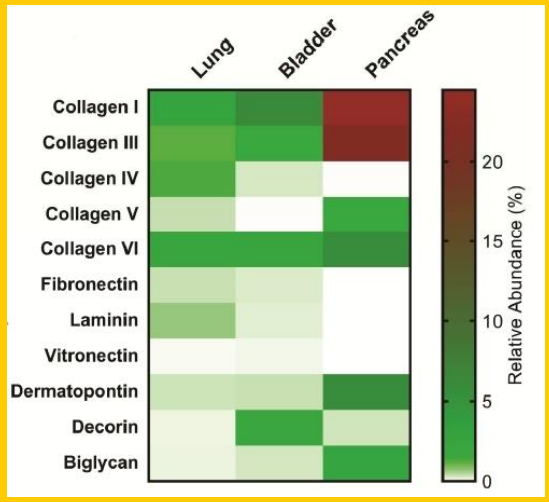
ASSAY OVERVIEW



To characterize protein composition, decellularized tissue samples were analyzed using Dionex Ultimate 3000 Nano LC system coupled with an Orbitrap Q Exactive mass spectrometer.

DATA OVERVIEW

The tissue sample from the pancreas was primarily comprised of collagen I (24.45 ± 3.10%), followed by collagen III, dermatopontin, collagen IV, and biglycan. Compared to the relative composition of the pancreas ECM, bladder tissue sample exhibited less collagen I and collagen III (6.10 ± 0.51%, and 1.69 ± 0.15, respectively). However, the relative contribution from collagen IV was higher (0.18 ± 0.02% for the bladder versus 0.01 ± 0.001% for the pancreas). The bladder sample also contained increased levels of decorin (1.86 ± 0.13%). In contrast, the lowest percentage of the primary collagen was detected in the lung sample, which was 6.89% compared to 10.44% and 50.51% for bladder and pancreas, respectively.



Features

- Fully automatic, high-throughput, one-stop protein characterization service
- Orbitrap Q Exactive mass spectrometer attached to the Dionex Ultimate 3000 Nano LC system
- Quick turnaround time

Applications

- Monoclonal antibodies and protein drug characterization
- Protein therapy research
- Protein discovery
- Protein post-translational modification analysis

Reference:

Jiang K, Chaimov D, Patel S N, *et al*. 3-D physiomimetic extracellular matrix hydrogels provide a supportive microenvironment for rodent and human islet culture. Biomaterials, 2019, 198: 37-48.

Creative Proteomics

Contact Us

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