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POSTER PRESENTATIONS (CONTINUED)


1046. A Bioengineered 3D Tissue-Mimicking Molecularly Heterogeneous-Based Bone Graft Constructs Repair of Critical-Site Segmental Defects in vivo, C. Krebs*1, M. Bhler, M. Kampf, M. B. Eskele, T. G. C. Glidden, G. Berger, A. Reddy, S. U. Ulloa, K. Adler, K. Krebs; Philipps University Marburg, Marburg, Germany; Humana Leibnitz-Institute for Molecular Pathology, Gießen, Germany; Philipps University, Marburg, Germany, Federal Institute for Materials Research and Testing, Berlin, Germany; European Synchrotron Radiation Facility, Grenoble, France, Mih Shams University, Cairo, Egypt

1051. Hierarchical 3D Scaffolds for Bone Tissue Engineering: Full Factorial Design and Dynamic Cell Culture, A. Yease*1, S. Kooy, J. Powers, J. Li, A. Sampson, P. James, J. Zhang; Miami University - Oxford, OH, USA, Miami University - Oxford, OH, USA

1052. Rheological Characterization of Biomimetic Collagen Gel BMSC Constructs 3D Bioprinting, M. Elterman*1, G. Gollapudi, S. Kooy, J. Ye*1, A. Khalil; Rice University, Houston, TX, USA, Wake Forest Institute for Regenerative Medicine, Winston-Salem, NC, USA

1053. Bioprinting of Three-Dimensional Microtissues to Evaluate Adipocytic Breast Cancer Cells Interactions, S. Chen, A. L. Al-Rabia, C. Goh; University of Chicago, CA, USA


1055. Thermal Inkjet Printed Endothelial Cells Choose Microvasculature Formation in Host Tissues via Heat Shock Protein-Induced Viability Loss, T. Balasundaram, B. Ono, L. Solies, M. Khosla; The University of Texas at El Paso, El Paso, TX, USA, University of South Carolina, Columbia, SC, USA

1057. 3D printing patterned bioink hydrogels to promote angiogenic sprouting, C. Pan*1, G. Calostron, C. Paulson, D. Saxon, B. Giggenbach, J. Miller; Rice University, Houston, TX, USA

1058. Development and Evaluation of a Permeable Self-Assembling Hydrogel System for Prevention in Tissue Engineering, S. Kim*1, C.-C. Chen, T. Yang; Stanford University, Stanford, CA, USA


1060. 3D Printing and Bioengineered Tissues for In Vitro Modeling of Disease Process and Drug Screening


1062. 3D Printing and Solid Deposition for Layer-by-Layer 3D Bioprinting of Various Bone Grafts, T. Burg*1, K. Burg, J. Williams, N. Morris; University of Virginia, Charlottesville, VA, USA

1063. 3D Printables Polymethylacrylate for Hybridized Scaffolding in Building Biomimetic Tissue, M. H. Naim, D. Zaita, M. H. University of Kansas, Lawrence, KS, USA

1064. Fabrication of Artificial Skin Model Using Decellularized Extracellular Matrix Biomimicry, M.-J. Kim*1, J. Jung, S.-J. Shin, W. S. Park; Research Institute of T&R Biotech Co. Ltd., Shuangiang, Republic of Korea, 3D Bioprinting Research Center, Shuangiang, Republic of Korea


ADVANCED FABRICATION APPROACHES FOR MULTISCALE TISSUE ENGINEERING

1066. High and Low Perfusion Microvascular Breast Tumor Mimetic Chip for Anti-Cancer Drug Screening, B. Arlan*, I. Hassani, N. Habib, J. Arnold, B. Prabhakar, K. P. E. U. A. M. I. A. U. A. T., Auburn University, Auburn, AL, USA, Center for Drug Research Corporation, Huntsville, AL, USA, Auburn University, AL, USA
Society For Biomaterials 2019
-Comparison of Human and Porcine Pancreatic Decellularized Extracellular Matrix Bioink using Proteomic Approaches-
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Abstract
To promote various functions of 3D printed tissues, the printable bioink should be selected carefully because it can optimally recapitulate the microenvironment of the target tissue. Decellularized extracellular matrix (dECM) is known as very suitable material to recreate the physiological 3D microenvironment that can maintain the cellular organization and provide appropriate biochemical cues for functional tissue remodeling. Although human tissue can be extracted or get a little amount from tissue bank, the accessibility is pretty much lower than porcine one. Here, we identified the compositional differences between the human and the pig tissue-derived dECM bioink. To evaluate whether the pig-derived dECM bioink can provide the suitable microenvironmental cue for 3D printed functional tissues, we showed comparison of the dECM components using LC-MS/MS and gene expression level from the human insulin producing cells encapsulated in human and pig tissue-derived dECM.

Conclusion
• The validity of porcine derived dECM bioink as an applicable material for 3D bioprinted tissue was demonstrated by analyzing the the human and porcine pancreas treated with the same decellularization process through proteomic analysis.
• The ratios of constituents that organize the pancreatic tissue were explained in detail and the tissue similarity between the human and the porcine was verified.
• By comparing the pdECM components of human and porcine in a variety of ways, it is possible to implement tissue-specific microenvironment of human tissues by controlling the ratio of ECM components using porcine derived materials.

Reference

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