2013 BMES Outstanding Contributions

It is my pleasure to present the 2013 BMES Outstanding Contribution papers, that recognize excellence in the field of Cellular and Molecular Bioengineering as presented at the Biomedical Engineering Society Annual Meeting. These papers were nominated by track chairs of the 2013 conference, held September 25–28, 2013 in Seattle, Washington. This year's BMES Outstanding Contribution papers highlight an area of growing interest to the journal: medically- and translationally-relevant applications that also address fundamental concepts at the molecular and cellular level, such as the microscale manipulation of living samples, the mechanics and mechanobiology of cells and molecules, and the analysis of natural and engineered microenvironments.

Interestingly, there are a number of similarities shared between the two BMES Outstanding Contribution papers presented in this issue. Both studies represent collaborations between engineers and biomedical scientists. Both papers describe the development of new methods for the 3-D culture of human cells for tissue engineering applications. Both studies represent careful understanding of molecular and cellular level phenomena, and how to connect these concepts to higher, tissue level scales that are relevant to biomedical engineering applications. Finally, both identify real world challenges associated with the processing of human cell and tissue samples, and demonstrate innovative strategies on how to effectively overcome these challenges.

In the first paper, Yuguo Lei, Daeun Jeong, Jifang Xiao and David Schaffer describe a scalable, good manufacturing practice (GMP) compatible 3D culture system for the expansion and differentiation of human pluripotent stem cells. They characterize a thermoreversible hydrogel that is employed as a 3D scaffold

capable of insulating cells from shear force-induced cell loss. Cells are produced at high density and are shown to differentiate into the ectoderm, mesoderm and endoderm germ layers.

The second BMES Outstanding Contribution paper comes from Darcy Wagner, Spencer Fenn, Nicholas Bonenfant, Elliot Marks, Zachary Borg, Patrick Saunders, Rachael Oldinski, and Daniel Weiss. They present a new decellularization approach to process human lung segments for tissue engineering applications and to study cell-extracellular matrix interactions. By photocrosslinking methacrylated alginate, they produce a mechanically stable pleural coating that can be used to subject cells to cyclic three-dimensional stretch.

I hope that you will enjoy these 2013 BMES Outstanding Contributions, and the collection of regular articles in this issue, including a mini-review article from Mian Long, Muhammad Zaman and colleagues on computational models of stem cell migration. We will be featuring more mini-reviews of this form in coming issues, as a way to bring focused, timely reviews on emerging topics of importance to Cellular and Molecular Bioengineering. Thank you for reading, and I encourage you to keep up with the latest developments in CMBE via our Facebook page (www.facebook.com/CMBEjournal) and through Twitter (www.twitter.com/CMBEjournal).

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