The 2018 Young Innovators of Cellular and Molecular Bioengineering

We are pleased to present to you this year's ten Young Innovators of Cellular and Molecular Bioengineering, whose original research is featured in this October issue. It is now the fifth year of the Young Innovators competition, and this year we received many more self-nominations than ever before. All potential authors who hold the rank of Assistant Professor (or equivalent) at the time of nomination are eligible for selection, and while many of the authors are active members of the Biomedical Engineering Society (BMES), membership in BMES is not a requirement for inclusion. The awardees will present the papers in this issue in a special, two-part invited platform session on Friday, October 19 at the 2018 Annual Meeting of BMES in Atlanta, Georgia. This year's conference has special significance, as the BMES is marking its 50th anniversary with special celebrations, as is the Department of Biomedical Engineering at Vanderbilt University where the journal is based. The articles in this issue represent some of the most innovative and impactful bioengineering studies carried out by junior faculty in our field. Four of this year's Young Innovators are women, and all are being recognized as rising stars in their field.

Five of this year's Young Innovator articles are focused on aspects of mechanobiology, and other multiscale studies to gain a basic understanding of molecular and cellular processes. Jason Leghorn and colleagues explore the role of the mechanosensitive ion channel TRPV4 in regulating morphogenesis in the lung. Arghya Paul et al. have examined mechanical stimulation of human adipose-derived stem cells for improved tissue engineering in cardiovascular applications. Megan McCain and colleagues show how elements of the cardiac tissue microenvironment such as tissue alignment, matrix elasticity and matrix topography affect the propagation velocity of action potentials and calcium waves, of particular relevance to cardiac arrhythmia. Tamara Kinzer-Ursem and coworkers compare two computational models of calcium/calmodulin-dependent protein signaling and shed light on mechanisms of synaptic plasticity. Cheemeng Tan et al. engineer synthetic aggregation of bacterial cells, revealing a method to resist biocidal environmental conditions.

Five more of this year's articles are focused on nanoparticle and microtechnology-based biomedical applications. Emily Day and colleagues describe the use of layer-by-layer assembled nanoshells to deliver an miRNA-based therapeutic. Yizhao Dong and coworkers incorporate different polymers into lipid-polymer hybrid nanoparticles to achieve more efficient mRNA delivery. Tzahi Cohen-Karni et al. describe a transparent and biocompatible graphene-based microelectrode system, and use it to interrogate cellular processes in human embryonic stem cell-derived cardiomyocytes. Mehdi Nikkhah and coworkers developed a high-density 3D microengineered tumor model to study the role of cancer-associated fibroblasts in drug sensitivity. Finally, Ariella Shikanov and colleagues encapsulated early-stage ovarian follicles in alginate and investigated the mechanisms of paracrine signaling over 12 days of culture.

We hope that you will enjoy reading this impressive collection of research articles and that you will encourage your eligible colleagues to nominate themselves for next year's CMBE Young Innovator competition. Self-nominations are due on November 9, 2018, with selected authors notified by December 14, 2018, and full manuscripts due on February 15, 2019. Interested researchers who hold a position at the rank of Assistant Professor (or equivalent) are invited to submit a 250-word structured abstract and an NIH-style biosketch to Editor-in-Chief Michael King at mike.king@vanderbilt.edu. You are invited to engage with us via social media on Twitter ([www.twitter.com/CMBEjournal](https://twitter.com/CMBEjournal)) and Facebook (www.facebook.com/CMBEjournal). We hope to see you in Atlanta at the 2018 BMES Annual Meeting, at the 2019 CMBE Conference in San Diego, and online!

MICHAEL R. KING

Department of Biomedical Engineering
Vanderbilt University
5824 Stevenson Center
Nashville, TN 37235, USA
Electronic mail: mike.king@vanderbilt.edu

WILLIAM E. BENTLEY

Fischell Department of Bioengineering
University of Maryland
5102 A. James Clark Hall
College Park, MD 20742, USA

LOLA ENIOLA-ADEFESO

Department of Chemical Engineering
University of Michigan
2800 Plymouth Road
Ann Arbor, MI 48109, USA