Editorial Notes

The Age of Coulter

As we set stride into the 21st century, it is hard imagine where human health would be without the technological advances made possible by Biomedical Engineering. Often times however, it feels as if the rapid growth of this field has even outpaced society's understanding of what a biomedical engineer is and how they impact every aspect of health, fitness, and wellness. Fortunately, this dichotomy is quickly shrinking. In October of 2012, CNN Money called Biomedical Engineering the Best Job in America.¹ Meanwhile, academic institutions continue to add undergraduate and graduate biomedical degrees to meet this societal demand. One might even argue that Biomedical Engineering has reached its initial maturity as a discipline and a career. But how did this happen and what forces have helped to make this the “career of the future”?

The acceleration of medical and technical advances has been fueled for decades by millions of dollars from countless sources. Foundations, government and private entities, prominent individuals, institutions, and societies have led this charge, leaving their lasting impact on the growth and promise of Biomedical Engineering. Certainly one cannot overlook the early support from foundations such as Whitaker and Wallace H. Coulter that had a significant impact on the growth of the field through support of the development of new academic departments and then giving them the resources to become research and teaching centers of innovation.^{2,3,5}

Today, a number of factors contribute to an increased focus on translation of research to commercial products. Even the National Science Foundation has new initiatives, such as Innovation Corps (I-Corps), a set of programs to prepare engineers and scientists to extend their focus beyond the laboratory. New academic programs, from professional science masters degrees to paid fellowships, are emerging across the globe with a focus on innovation and translation of biomedical technology. This “bench to bedside” emphasis has been positively disruptive to Biomedical Engineering.

In this special section of the *Annals of Biomedical Engineering*, a step outside the box is taken to highlight design, innovation, and translation. Beyond the borders of the discipline, the name Wallace H. Coulter may not be as recognized as Thomas Edison, Marie Curie, or Jonas Salk. Yet Coulter shares equivalent accolades, such as the prestigious *John Scott Award for Scientific*

Achievement.⁴ To many of us in Biomedical Engineering however, the name Coulter is a beacon for discovery and translation. There is no doubt that support provided by the Wallace H. Coulter Foundation has been transformative, not only to scientific discovery and innovation, but to the field of study of Biomedical Engineering itself.

This year marks the 100th anniversary of the birth of Wallace H. Coulter. In this, *The Age of Coulter*, we hope that this special section is a sneak preview into the many processes and programs in Biomedical Design, Innovation and Translation. In these pages are highlights from top US institutions, emerging programs, international efforts, corporate practices, and global health endeavors. Brinton and colleagues lead this special section highlighting the twelve-year history of the Stanford Biodesign process. A view into the walls of industry reveals a process described by de Ana and colleagues. Yadzi and Acharya round out the process-focused manuscripts with a novel approach refined at Johns Hopkins. Bruzzi and Linehan shift gears into an international methodology to entrepreneurship. Malkin and Beer, Hamner and colleagues, and Spiegel and colleagues explore issues related to designing for low resource environments. Allen and colleagues, and Goldberg and Pearlman discuss best practices in design instruction. The special section wraps up with insider perspectives and case studies from Lehman, Mittal and colleagues, Banes, and Sejdic and colleagues.

These thirteen manuscripts only scratch the surface of best practices in the forum of Biomedical Design, Innovation and Translation. Practices and procedures are constantly growing and changing in college classrooms, labs, and corporate conference rooms worldwide. We hope that capturing this snapshot will expose and cata-

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lyze many more endeavors and lead to a discussion of best practices in Biomedical Technology Innovation.

The fuse for this special section was assembled at the annual Biomedical Engineering Society meeting and during the BME-IDEA (Innovation, Design and Entrepreneurship Alliance) workshop in Hartford, CT, two years ago. That fuse was ignited by the generous support of the Wallace H. Coulter Foundation.

We would be remiss not to acknowledge all of those who have made this special section possible, especially the authors who accepted our invitations and took a gamble to write manuscripts outside the norm for the Annals. To the ABME Editorial Board, staff, and reviewers who welcomed this venture. To the BME-IDEA, a subsection of the National Collegiate Inventors and Innovators Alliance (NCIIA) for their networking and promotion. To the Biomedical Engineering Society and the Wallace H. Coulter Foundation for their support.

Thank you!

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