

Molecular Pharmaceutics, a Vision for the Future

The biomedical and pharmaceutical community is buzzing with excitement about the potential novel therapies resulting from the genomic revolution, bioinformatics, stem cell research, cloning, chemical biology, molecular and cell biology, and the basic and clinical implications of pharmacogenomics and pharmacogenetics. If the promises and expectations hold, the researchers in the pharmaceutical field will have, in the foreseeable future, more therapeutic targets than we could have possibly imagined just 10 years ago, and have multiple redundant strategies for identifying and developing drug candidates. The nature of therapeutic agents and delivery strategies that will emerge from all these enterprises will probably keep changing and is likely to be different from what we have seen in the past. In many cases, we will undoubtedly have good ideas regarding their pharmacologic mechanisms upon inception as well as specific locations of action and their therapeutic concentrations. These changes, often viewed as “revolutionary” and labeled as such, certainly give us high hopes for the future. Would they, however, necessarily translate into more and better drug products and therapeutic modalities? There is one thing that is clearly changing: these developments pose a tremendous challenge to “pharmaceutics” or “drug delivery” and at the same time provide accompanying opportunities.

A majority of researchers in modern biomedical research, and in cell and molecular biology in particular, often focus their thinking and efforts primarily on discoveries of so-called “basic” mechanisms, while their share of active contributions to drug development beyond that point tends to abate. To many, when certain therapeutic molecules exhibit good specific activities at relatively low concentrations in a test tube or a cell culture system, they magically become drugs through a long yet mysterious process until they materialize in the clinical setting. It is not entirely clear where this attitude originates, but we still have the inclination, especially in the academic and basic science community, not to soil our pure scientific hands with application-oriented pharmaceutical drug product development. This, I tend to believe, is primarily due to the misconception about the science of pharmaceutics. Perhaps the “black box” of the drug product development process, which certainly includes pharmaceutics, has been viewed until relatively recently as being too

much like engineering in nature and requiring little mechanism-based science.

With the first two issues of *Molecular Pharmaceutics*, one cannot help but appreciate the salient: pharmaceutics or pharmaceutical sciences, the discipline that focuses on transforming the “drug” to a clinically viable therapeutic “drug product”, is indeed multidisciplinary and will become increasingly so. Even after refinement by the addition of the descriptive term molecular to the name, the range of research articles already seen in this journal derive from a multitude of scientific disciplines. With the molecular and mechanistic emphasis, drug delivery and pharmaceutics have been changing conceptually from a rather descriptive science into a logical and mechanism-based science that demands a molecular explanation of how the process works. The pressure is now on the pharmaceutical scientists, during the course of this evolution and revolution, to incorporate into pharmaceutical research the rapidly expanding body of knowledge in the molecular and cellular fields, rather than to focus exclusively in the traditional sense on formulating a delivery strategy for a given drug candidate even with the sacrifice of the molecular understanding of the design. This will undoubtedly force us into more intimate and successful collaboration with a wide range of scientific fields, which inevitably requires educating scientists from all relevant disciplines about the ever-evolving needs and concepts of molecular pharmaceutics. Like other fields in science, pharmaceutical sciences is truly multidisciplinary, and molecular pharmaceutics will be less apt to evolve and progress without collaborative efforts from a wide range of scientific disciplines.

The editorial office and board of *Molecular Pharmaceutics* are pleased with the recognition of the enormous potential of the role provided by this particular forum in meeting the needs of the molecular revolution in pharmaceutics. It is safe to say that we can be excited and optimistic about the future of molecular pharmaceutics.

Kyung-Dall Lee
Associate Editor

MP0400041