

Editor's Note: Molecular Pharmacology in the Postgenomic Era

In recent decades, we have witnessed a tremendous evolution in the role that molecular pharmacology plays in the broader biomedical research community. In its beginnings, the field of molecular pharmacology encompassed a relatively narrow discipline, practiced by a small community of scientists operating within the broader discipline of pharmacology. The inaugural issue of this journal was published in 1965, 12 short years after the publication of the structure of the DNA double helix. At that time, the field of pharmacology was strongly influenced by synthetic and analytical chemistry, biochemistry, and studies in complex organ systems and whole animals. The relatively new field of molecular pharmacology, and the journal *Molecular Pharmacology*, represented a powerful but emerging niche that had a relatively limited scope and had not yet enjoyed a major impact on the broader questions of pharmacology. As molecular biology developed and grew in influence through the 1980s, the field of molecular pharmacology also took center stage. With the explosion of cloning of genes encoding multiple receptors, ion channels, regulatory proteins, drug metabolizing enzymes, and proteins involved in other aspects of drug disposition, the field of molecular pharmacology offered powerful tools for understanding mechanisms of drug action and disposition at a molecular level. However, with the drive and progress toward understanding the basic molecular mechanisms of drug action, many of the most pressing questions of molecular pharmacology remained somewhat distinct from the broader questions of how these molecular phenomena functioned in a context of organ systems and whole animal physiology. In addition, with the introduction of molecular approaches for highly targeted manipulation of specific drug targets and regulatory proteins, the fields of analytical and synthetic chemistry and quantitative biology temporarily assumed a less obvious role in answering many of the most important questions of the discipline.

Over the past 2 decades, molecular pharmacology and biomedical research in general have continued to mature and develop in directions that would have been difficult to predict during the early days of our discipline. We have witnessed unparalleled advances in our understanding of basic biological processes as well as human disorders from the cellular to systems levels. Technological gains have allowed identification of a broad range of regulatory proteins and complex signaling systems that play critical roles in a variety of normal physiological processes as well as pathological conditions in virtually all major organ systems. The highly celebrated elucidation of the sequence of the human genome and other advances provide unprecedented opportunities for breakthrough discoveries leading to fundamental new insights into the functions of biological systems and create unique opportunities to translate basic science into clinical medicine.

The tools of molecular biology have now permeated every aspect of biomedical science. Molecular pharmacology can no longer be viewed as a niche discipline in the broader pharmacology arena. Molecular tools are now integral to virtually all major aspects of modern pharmacology and drive fundamental breakthroughs that span molecular to complex cellular, organ, and in vivo systems. Many of the most pressing challenges for today's molecular pharmacologists involve placing advances we have made at a molecular level in the context of complex systems.

Along with these advances in understanding of biological systems, new technologies have become available in the fields of chemical biology, systems biology, structural biology, and others. Automated approaches for drug screening, along with technology-enabled synthetic and medicinal chemistry in combination with rigorous and high throughput testing of small molecules in biological systems, provide new opportunities to identify probes for understanding molecular targets in biological systems. New approaches in structural biology are allowing us to refine our understanding of drug interactions with molecular targets and may provide information about how subtle differences in these interactions can influence biological function. Advances in analytical chemistry, along with genetics and systems biology, provide exciting new tools that are being used to integrate molecular advances across multiple levels. Finally, our awareness of the appropriate roles of organ and animal model systems in clarifying the impact of manipulations at a molecular level on intact systems has developed as these systems have returned to the forefront of biomedical science.

As biomedical science and the discipline of molecular pharmacology have matured, *Molecular Pharmacology* as a journal continues to be committed to remaining at the forefront of the field. To do this, we are committed to providing a forum for publication of the highest priority articles that provide fundamental advances in our

understanding of drug action or disposition at a molecular level. However, we also provide a forum for ground-breaking research taking insights gained at a molecular level and placing these in the context of more complex organ and in vivo systems. Innovative approaches or use of novel reagents for developing an understanding of the in vivo impact of manipulation of a potential drug target that is understood at the molecular level fits squarely within the mission of the journal. *Molecular Pharmacology* provides the ideal venue for publication of many of the most exciting advances in the emerging fields of systems biology and chemical biology, whether they take the form of novel ligand discovery, analytical chemistry, advances in structural biology that impact understanding of drug action, or quantitative approaches to understanding drug action in complex biological systems. To facilitate and enhance our impact on these areas, we will begin an expansion of our editorial board to insure strong representation from each of these critical areas. In addition, we will endeavor to highlight advances in molecular pharmacology that encompass these disciplines by publishing Minireviews that focus on advances in many of these areas. Finally, we will publish occasional Mini Symposia, organized by Guest Editors, that include collections of Minireviews centered on common themes that highlight the most far-reaching advances of our discipline.

This is an exciting time for *Molecular Pharmacology*. Our discipline is now center stage in virtually every aspect of the broader field of biomedical science. We look forward to working with you as we endeavor to realize the promise made possible by these tremendous gains achieved over recent decades.

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Editor