The future of *Physiological Genomics*

In an introductory editorial published in 1999 (4), we envisioned *Physiological Genomics* as “a one-stop shop while serving as a bridge linking genome sequencing and mapping to integrative physiology and clinical medicine.” On the cusp of the so-called postgenomic era, the goal was to found a journal pioneering an emerging multidisciplinary field that encompassed genomics, proteomics, classical genetics, clinical research, and the broad spectrum of physiology research. One of the most frequently encountered questions we have been asked over the last four years has been for a specific definition of physiological genomics. Indeed, over the course of managing this journal, we learned that because physiological genomics is a work in progress, the essential key to self-definition has been to find the least common denominator in the research we publish. At its heart, the field of physiological genomics involves the study of the mechanisms at the gene and molecular levels which mediate an organism’s response to disease, the environment, and its own inheritance. Understandably, this is a tall order, and our greatest challenge has been to set limits around this definition in order to best define work suitable for the Journal.

We have not sought to publish detailed explorations of the structure of genes and chromosomes, which differentiates us from other “genomics” journals. At the same time, we have insisted of our authors that their research investigate the underlying heritable component of observed physiological response. While this practice is rapidly becoming commonplace and expected in every physiology journal, *Physiological Genomics* has attempted to position itself as a leader in the field. Not only, then, is this journal intended to be a repository of the newest research in genetic physiology, it is also meant to be the place for the best research.

One measurement of our success to date is the makeup of our readership. *Physiological Genomics* is read with interest by researchers in both academic medicine and the biopharmaceutical industry. Because of the breadth of papers that we publish, we are relevant to researchers in a number of fields, particularly those whose research is multidisciplinary by definition. Many universities and research institutions have founded multidisciplinary institutes and centers recently to bridge genetics and medicine, and the joint professorships, research agendas, and training programs created as a result are an ideal platform for the Journal. For example, recently Harvard University Medical School, in conjunction with Partners Healthcare, created the Harvard-Partners Center for Genetics and Genomics (http://www.hpegg.org/), and recently Harvard, the Massachusetts Institute of Technology, and the Whitehead Institute announced a new collaborative research institute, the Broad Institute, dedicated to the study of postgenomic human genetics and medicine (http://www.wi.mit.edu/nap/features/nap_feature_broadinstitute.html). In addition, our journal’s strength in a variety of fields has served to attract new readership from diverse disciplines.

Throughout the first four years of this journal’s existence, we have striven to keep the quality of manuscripts high. One benchmark of this success, though by no means the only account, is our continued improvement in the ISI Impact Factor for the last three years in a row (1.353 in 2000; 3.352 in 2001; 4.667 in 2002). Another gauge of success is the publication of important papers in a variety of fields. We have published a number of “firsts,” especially pioneering the use of microarray expression profiling to identify a particular physiological state. These papers have been extensively referenced and cited by the scientific community. For example, in work by Carmel et al. (3), researchers employed expression profiling to describe those RNAs abundant in the spinal cord of rats following acute injury. The resulting picture, which helps to delineate the inflammatory response, may be useful in designing therapy tailored to specific gene targets.

Other papers have provided technological advances to the field. One such example is the work of Yang et al. (8), who described a statistical normalization method that highlights weak signals from particular spots on microarrays. Butz and Davison (2) developed an implantable telemetric device for recording heart rate and blood pressure suitable even for use in pregnant mice since it does not interfere with infrarenal blood flow.

We have also published insightful review articles in important research areas. An article by Turchin and Kohane (7), for example, details online gene homology databases and summarizes their utility to the scientist. A review by Barr (1) describes the characteristics that make a particular animal a good “model organism,” and it provides useful summaries of the genome size, available online resources, and groundbreaking research carried out in a number of organisms including *Caenorhabditis elegans* and *Saccharomyces cerevisiae*.

*Physiological Genomics* has also been a journal of record for a number of research conferences, including a meeting on the physiological genomics of cardiovascular disease (5) and another on mouse cardiovascular phenotyping (6). We intend to continue this practice of association with scientific meetings of interest to our readership, including an October 2003 APS-sponsored meeting on cardiorenal physiology.

As the field of physiological genomics research matures, so will the Journal. The best way that we can accomplish this is to remain flexible by publishing research from a variety of disciplines as they relate to the genome, while maintaining the high standards made possible by our rapid online peer review process and skilled editorial board. There are a number of nascent fields which have received funding through the National Heart, Lung, and Blood Institute’s Programs for Genomic Applications (http://www.nhlbi.nih.gov/resources/...
pga/index.htm) and which we expect to have a great impact on the study of genomics, physiology, and medicine in the future. These will include systems biology, which will emphasize an integrated approach, informed by digital technology, to the spectrum of physiology and genetics related fields. Advances in imaging from the molecular to the physiological level will generate useful data but also will create challenges in data storage and management. High-throughput research methodologies that can be used from gene expression profiling to model organism mutagenesis to pharmacogenomics will become more affordable and accessible and will transform basic research. Lastly, the important connecting path between genetics and physiology will extend into translational physiology; in keeping with the other journals of the American Physiological Society, Physiological Genomics will remain committed to publishing papers in this area.

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REFERENCES