

Editorial

The Journal of General Physiology continues to evolve; the past year witnessed a major milestone when *The Journal* became accessible on the World Wide Web on 4 August 1997. *The Journal's* articles are now available earlier than before, which will be especially appreciated outside the United States, and reprint-quality copies can be downloaded for off-line reading. The abstracts of most references cited in the text can be accessed via hyperlinks to MedLine; full-text articles will be accessible for some journals.

The Journal also has advanced on more mundane fronts. The interval from the initial receipt of a manuscript to the first decision has been reduced to a median of five to six weeks without affecting the quality of the reviews. Just as important, articles are published as early as three months after submission, as evidenced by an article published in this issue, with a median interval of six to seven months. These advances have come about by keeping the editorial office lean, such that the number of open manuscripts (those under review, in revision, or in press) is ~40% of the number submitted in a year.

These developments would be of modest interest, however, were it not for the fact that *The Journal*, according to the Institute for Scientific Information, is the peer-reviewed physiology journal with highest impact factor. This is gratifying for several reasons, not the least of these being a validation that general physiology is thriving. We would like to take that for granted, but the trend toward an ever increasing specialization in modern science could conflict with *The Journal's* focus on basic biological, chemical, or physical mechanisms of general physiological significance, which go across biological systems. Indeed, the imminent dissolution of the National Institutes of Health's Physiology Study Section, which has been a primary forum for the review of research proposals dealing with problems of general physiology, is cause for concern.

Nevertheless, as recently noted in an editorial in the *Journal of the American Chemical Society*, important discoveries often are made by combining concepts from widely different areas, and by focusing on the underlying generality. This pattern of discovery is likely to become more prevalent in the next generation of biological research. The human genome will be sequenced by 2005, and high-resolution protein structures appear at an increasing pace. Neither development, in itself, provides information about how the proteins in organelles, cells, or tissues establish the coordinated behavior that we associate with normal biological function. These developments, however, set the stage for a new generation of physiological research that will explore the molecular basis of normal function and disease by examining the functional consequences of well-defined molecular defects in genetically engineered animal models. The rate-limiting step is likely to be the development of new instrumentation and data analysis methods, not the engineering of the animal models. It will be necessary to have quantitative measures of function to determine a number that characterizes the function in question, and mechanistic interpretations are likely to depend on the development of appropriate model systems (whether biological or physical).

Given the subtlety of molecular interactions, it will be important to have good measures of function at the single-molecule level to understand the complex behavior of molecular ensembles. Single-channel current measurements, for example, provide deep insights into the basis for channel gating, and for cellular electrophysiology. More generally, single-channel current measurements, with their inherent high time resolution, allow for insights into the dynamics and regulation of single membrane proteins that go beyond what presently can be achieved using soluble, globular proteins. This broader impact of single-channel electrophysiology serves to underline the importance of combining methods and concepts from widely different disciplines.

It also demonstrates that one will need to communicate the importance of the results to a wide readership. That is a challenge for all authors (and editors), but the challenge becomes particularly daunting in the case of journals such as *The Journal of General Physiology*, which strive to reach a wide range of readers. For that reason, authors of manuscripts submitted to *The Journal* should take care to explain the significance of the problem under study, as well as the motivation for their particular approach, in a manner that will be reasonably clear to a wide readership. Decisions on publication will continue to be based on the scientific quality and perceived impact of the work; but the editors will also evaluate how the authors communicate their message.

Olaf Sparre Andersen

Editor

The Journal of General Physiology