

Interdisciplinary innovations are key to effective use of quantitative biological information

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This volume marks the second special issue of *MBoC* devoted to Quantitative Cell Biology (QCB). QCB is a rapidly expanding field within cell biology that draws on new technologies to quantify cellular processes. Whether using advanced microscopes to track molecules as they diffuse within cells, sensitive probes to measure cellular forces, or next-generation sequencing technologies to compare genomes, QCB is yielding an astounding amount of new cell biological information. This, in turn, is profoundly transforming the world within which cell biology is practiced. It is also posing new challenges.

Perhaps the most serious challenge is that, as technology generates data at unprecedented volumes and speeds,



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researchers are increasingly becoming “data rich but discovery poor.” The biological information collected is proving more complicated to assess than initially assumed, and researchers are finding they are gathering more information than they can analyze in a meaningful way. Overcoming this problem is not easy. However, innovative approaches are being developed, particularly with the help of computer scientists, physicists, and mathematicians, for extracting meaning from this data deluge (Dolinski and Troyanskaya, 2015). Interdisciplinary collaborations are providing attractive solutions for integrating and analyzing quantitative data and offering new strategies for effectively sharing and archiving information. For example, the use of distributed file systems, cloud computing, and algorithms for efficient data-intensive computa-

tion across multiple machines is proving valuable in overcoming many critical bottlenecks in distributing data across the biological community and overcoming the growing problem of data sets too big to download.

To continue making progress in coping with the abundance of new data, we need to recognize the contribution of experts in a variety of fields. That is one of the principal goals of the current issue of *MBoC*, along with the dissemination of some of the successes to date. At the same time, as cell biologists, we have the responsibility to decide which of these technologies and methods are best equipped to address the questions unique to cell biology. As can be seen in the various Perspectives and Research Articles in this *MBoC* volume, there will be much to choose from,

making QCB a powerful and compelling approach to understanding cell biology.

REFERENCE

Dolinski K, Troyanskaya OG (2015). Implications of Big Data for cell biology. *Mol Biol Cell* 26, 2575–2578.

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