

Preface



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Guest Editor

There is an ongoing technological revolution marrying integrative computer technology to existing disciplines in the world that permeates all aspects of the economy, including health care. This wave of changes is now starting to affect both Anatomic and Clinical Pathology/Laboratory Medicine, developing to the point where the distinction between the two disciplines is increasingly blurred.

There are two main reasons for this technological revolution: one is due to an ongoing *hardware revolution* that entails the development of increasingly sophisticated machines that allow sample processing and analysis in previously unprecedented modes, from digital imaging pathology to nextgen sequencing and beyond.

The other reason is an ongoing *process revolution* that is deeply intertwined with contemporary advances in information technology.¹ The key change here is that processes that once took place among human beings are now being increasingly executed automatically. They are taking place in an unseen domain that is strictly digital, and that has already created a huge, and largely invisible, second economy. In health care it manifests itself today mostly in the increasingly interconnected information systems within and between medical centers and private practices, but will also increasingly affect both pathology workflow and data analysis.

Some of these changes have happened before, most evidently by the appearance of the automated clinical chemistry lab some 30 years ago. What we witness now, however, is a disruptive (re)appearance of the same trend in the whole of Anatomic Pathology and Laboratory Medicine and to a much deeper level than before. Besides the benefits of these changes, they also represent significant challenges for both the academic and the private pathologist community.

Therefore, the aim of the articles in this issue of the *Clinics in Laboratory Medicine* is to provide an overview of how the larger hardware and process revolution is impacting the whole of pathology, and how the community should prepare itself for the coming storm. In the first section (Technological and process advances), articles describe some of the new hardware platforms that will soon transform cell- and tissue-based diagnostics in anatomic and clinical pathology. They also examine how workflow

reorganization, modern -omic approaches, modeling, and diagnostic decision support will transform pathology. The second section (Educational, practice, and business needs) examines the required changes that will need to take place in resident and fellow training, as well as in the continuing medical education of practicing pathologists. It also envisions the future day-to-day practice of pathology. Finally, it will assess—in the context of a pathologist's career history—the changing relationships between commercial entities and academic medical centers and whether and how smaller private pathology practices can remain competitive in this unfamiliar new practice landscape.

There are a number of other topics that we could have covered in this issue, such as data storage and retrieval issues or various other emerging -omic technologies (that have been covered in part in other recent *Clinics* issues). However, in designing the content of this issue we did not seek to be comprehensive; rather we wished to provide a broader overview that vividly illustrates the coming changes while focusing on those practice aspects that have already been implemented at select institutions. We hope that such a canvas will help both our colleagues and our trainees to start to prepare for this exciting, new world of pathology in the digital age.

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REFERENCE

1. Arthur WB. The second economy. *McKinsey Quarterly*, October 2011.