

nature cell biology

The importance of technological advances

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There is no doubt that scientific advances depend not only on new ideas, conceptual leaps and paradigm shifts, but also to a large extent on technological advances that make these steps possible. The discovery of the green fluorescent protein (GFP), increasingly sophisticated microscopes, and the development of *in vitro* assays that faithfully reproduce cellular functions are just a few examples of technical advances that have spurred on many areas of cell biology. Technologies that are easily adapted to simple and affordable everyday use in the laboratory have certainly changed the speed of scientific progress. The polymerase chain reaction (PCR) technology, for example — the simple elegance of which made many of us regret not having thought of it ourselves — has quickly evolved to the point where PCR machines are part of the standard laboratory equipment without which many experiments would be immensely time-consuming or simply not possible. The importance of access to technological know-how is also reflected in the job market. Researchers who can bring new techniques to an institute are well sought after, just as the availability of techniques and service facilities makes a research institute more attractive to scientists.

And it moves

It is perhaps modern imaging technologies that have had the biggest impact on the field of cell biology, and will unquestionably continue to do so. The trend is to label and monitor cells, organelles and molecules and their interactions, using increasingly sophisticated tools, in real time. Not a meeting goes by without someone presenting a movie of their favourite protein dashing around a cell (sometimes even screened along with matching music), and these images are beginning to change our views of the dynamic nature of some of the most fundamental cell biological processes (see, for example, page 156 of this issue).

Because of the importance of technical advances across subdisciplines, *Nature Cell Biology* has recently introduced a new section, comprising Technology Review articles, which has so far included reviews of *in vivo* electroporation (*Nature Cell Biol.* 1, E203–E207; 1999) and double-stranded RNA interference (RNAi) (*Nature Cell Biol.* 2, E31–E36; 2000). This section is dedicated to reviewing technological advances that have already contributed to an increasing understanding of many fields of cell biology, and are expected to continue to do so. These articles provide sufficient technical details to allow a deeper understanding of the techniques described, and give insight into current and possible future applications. We will continue to keep our readers abreast of new technological advances, and future Technology Reviews will cover a wide range of topics, including quantitative GFP technology.

From time to time, you will also find original research papers in the journal that represent an outstanding technological development. A paper on page 168 of this issue, for example, takes single-molecule-imaging technology one step further — into living cells — opening up new avenues for monitoring protein–protein interactions in real time. An Article published last month showed that RNAi can be used to investigate developmental processes in mammalian embryos (*Nature Cell Biol.* 2, 70–75; 2000). We hope that both our Technology Reviews and the original articles will contribute to the dissemination of information about technological advances that are of interest to all cell biologists.