

Technology Trends

Technology: pushing the boundaries of scientific discovery

By any measure, this is a time of unprecedented scientific opportunity; many areas of biomedical research are now being driven by advances made on the technology front. The Human Genome Project itself, which has generated a wealth of data for researchers, drove development of sequencing technology such that the first drafts of the human genome were completed ahead of schedule. Further improvements in sequencing methods led to the recent assembly and publication last month in *Nature* of a high-quality draft of the mouse genome sequence.

Consequently, *Nature Medicine* felt it an opportune time to focus its attention on some of the technologies behind the scientific discoveries—particularly emerging technologies, those undergoing unusually rapid development and those with broad application—so-called platform technologies.

Microarrays (DNA and protein) are an obvious example of a platform technology and are the subject of one of the reviews in this special focus. Another examines the great technical strides made in recent years in antibody engineering, which have reenergized the field and led to a range of antibody-based reagents in clinical trials. The engineering of gene therapy vectors (viral and nonviral) to achieve specificity *in vivo* through the use of various gene-targeting technologies is the subject of another article. Technological advances in the new field of molecular

imaging, which, broadly speaking, provides a window on biological processes at the cellular and molecular level in living animals (and ultimately patients) in real time, are covered in another of the reviews.

In addition to newly commissioned reviews, this special focus features two commentaries: one on advances in needle-free vaccination methods, the other on prospects for new therapies based on cell microencapsulation. Of special note is a historical perspective piece by renowned heart surgeon Denton Cooley, which provides a personal account of efforts to develop the first totally artificial heart—clinical trials of which took place in 2001. Perspective pieces on polychromatic flow cytometry, which allows the study of 'fine' lymphocyte subsets, and on combinatorial chemistry—in particular mixture-based combinatorial libraries—complete the lineup.

The accompanying website, http://www.nature.com/nm/special_focus/new_tech/index.html, also features a list of articles published over the past year or so by the Nature Publishing Group on topics featured in the special issue. These are free to all users for three months.

Looking forward, it is clear that technology (coupled with a healthy dose of scientific ingenuity) will continue to push the boundaries of scientific discovery and shape the practice of medicine.

Diane Gershon, **Assistant Editor**

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