

Conference Report Editor: Samantha Barton
ddt@elsevier.com

conference report

The trend is innovation

Steven Bodovitz, bodovitzs@bioperspectives.com

A wide range of technological innovations was on display at the BioTrends 2005 conference, which was held on 6–8 June 2005 in Munich, Germany. The innovations roughly fit into three categories: nanotechnology; biochips; and pathways and systems. Specific topics covered were drug delivery, wound healing, DNA and protein biochips, laboratory-on-a-chip technologies, tissue arrays, high-throughput antibody production, biomarkers, pharmacogenomics, toxicogenomics and metabonomics, translational research, high-content profiling and transgenic mouse models. The breadth of topics resulted in interesting cross-disciplinary exchanges, such as new applications for current and new technologies.

The conference opened with a discussion on the interface between nanotechnology and biotechnology. Rainer H. Müller, from PharmaSol in Berlin, Germany, demonstrated how one could achieve dramatic gains in solubility and bioavailability arising from formulating drugs into nanocrystals. Jackie Yi-Ru Ying, from the Institute of Bioengineering and Nanotechnology in Singapore, presented a range of cutting-edge technologies, including a glucose-sensitive polymer that releases insulin, a non-viral gene delivery vector, a nanocomposite scaffold for regenerating bone tissue and luminescent SiO₂-coated quantum dots. Alberto Bianco, from the Institut de Biologie Moléculaire et Cellulaire in Strasbourg, France, gave a presentation on the preparation and characterization of

functionalized carbon nanotubes and their abilities to enter cells and deliver plasmid DNA. The morning session concluded with a presentation by Bernhard Sabel, from the University of Magdeburg in Germany, during which he showed the potential of delivering drugs across the blood–brain barrier by adsorbing and encapsulating them in (and on) nanoparticles. In addition, on the following day, Rudolf Schulze Vohren, from BBM VOHREN in Warendorf, Germany, presented the technology platform at MagnaMedics, also from Warendorf, Germany, where magnetic beads are used to encapsulate drugs and then release them *in vivo* following inductive heating to 40°C.

In the afternoon of the first day, I had the opportunity to present my analysis of the trend towards translational research. The current drug development model of handing results from one silo to the next (from discovery to validation, to lead generation, to lead optimization, to preclinical testing and finally to clinical testing) is clearly broken. Costs are increasing and successes are decreasing and, as a result of this, translational research is gaining momentum and drug developers are beginning to emphasize the assembly of clues found from across basic research, drug screening, preclinical and clinical trials. For example, biomarkers from patient samples could be analyzed with compound selectivity data and information about the target pathway of a drug, to understand more clearly the molecular etiology of the disease and/or to improve the therapeutic index of the

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treatment under development. The challenge is to translate these clues into a clear course of action and crucial go or no-go decisions. Success will require researchers and technologies capable of assembling, testing and ranking previously disparate types of data.

The discussion continued along this theme, with different disciplines becoming integrated within the sessions, accentuating the similarities and the differences of various technologies. In the category of biochips, Jens Malte Baron, from the University of Aachen, Germany, discussed his research using protein microarrays for diagnosing inflammatory diseases and tumors of the skin, as well as allergies. Christian Oste, from Nimblegen Systems in Madison, Wisconsin, gave a presentation on the integration of chromosome, methylation, promoter, gene expression and microRNA analyses using his company's portfolio of DNA microarray services. Rainer Hintsche, from the Fraunhofer Institute for Silicon Technology in Itzehoe, Germany, discussed fully-electrical microarray technology based on redox recycling, which can be used for protein, nucleic acid and small-molecule detection. Uwe Janssen, from Memorec Biotech in Cologne, Germany, gave a presentation on his company's gene-expression analysis platform, where all of the steps (from sample handling to microarray processing) have been automated. Mike Schutkowski, from JPT Peptide Technologies in Berlin, Germany, demonstrated the applications of his company's peptide microarrays for analyzing kinase,

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phosphatase and protease substrates and their specificities. In addition, Richard Gilbert, from e2v technologies in Chelmsford, Essex, UK, gave a presentation on the laboratory-on-a-chip technology that incorporates Raman spectroscopy and that can be used as a self-contained blood analyzer, needing only 20 nanoliters of sample for analysis. Furthermore, Peter Nilsson, from the Royal Institute of Technology (KTH) in Stockholm, Sweden, introduced an ambitious program that generates an antibody for a representative protein from every gene locus (currently estimated to be 22,221 loci) and that uses the antibodies on tissue arrays to assemble a pathological protein-atlas for normal and disease tissues.

In the category of pathways and systems, Len Pagliaro from BiImage in Soeborg,

Denmark, discussed his company's high-content screening assays based on intracellular signaling as a result of protein translocation. Kristina Busch from metanomics Health in Berlin, Germany, described her company's large-scale metabolite profiling services – capable of >400,000 analyses per 24 h – with particular expertise in plant science. Brian Dron, from Ingenuity Systems in Mountain View, California, gave a presentation on their interactive database of molecular and pathway information taken from published studies in the 32 top journals. Peter Kluge, from EPIDAUROS Biotechnologie in Bernried, Germany, presented details about the value of incorporating pharmacogenetics into drug development to reduce adverse events and increase efficacy. In addition, Paul Rounding, from Artemis Pharmaceuticals in Cologne,

Germany, discussed the ArteMice platform, which enables rapid development of mice with inducible gene deletions or knockdowns.

The breadth of emerging technologies suggested many possible synergies. For example, the potential to move quickly from molecular studies to pathways and animal models (even to therapies and diagnostics) was especially intriguing. Possibly the most important trend in 2005 for biotechnology will be the integration of technologies.

Steven Bodovitz

Principal, BioPerspectives,
2040 Hyde Street,
San Francisco,
CA 94109, USA
e-mail: bodovitzs@bioperspectives.com

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A time for reflection: reviewing objectives and revising strategy

This is an appropriate title because, as the most observant of you should have noticed, my affiliation has recently changed. I have recently retired from AstraZeneca after thirty-one years in Drug Development surviving both a demerger (ICI to Zeneca) and a merger (Zeneca to AstraZeneca). In addition, this is my fiftieth article for *Drug Discovery Today* and its sister journal *Pharmaceutical Science and Technology Today*, now defunct. I first started writing guest editorials in 1998 and in 2000 was given a column. Hence, in accordance with good management practice, it should be time for me to review my progress towards my original aims and objectives and revise my future strategy if necessary.

Early objectives

In a nutshell, to use a well-known idiom, my early objective was to provide an antidote to the serious and scholarly articles in the journal and to write a personalized, light-hearted comment on subject matter of interest to all scientists working in drug discovery and development. I would also use a format that included humor, quotations, poetry (including doggerels and limericks) and cartoons not normally associated with scientific communication in order to stimulate thought, broaden perspective and, above all, raise a smile.

It would appear from feedback from readers in the form of direct correspondence and monthly full text downloads on BioMedNet

A thought-provoking tonic on the lighter side

Column by Raymond C. Rowe, Intelligensys

Please note that these are the personal opinions of the author and do not necessarily represent those of Intelligensys.



(many of my articles appeared in the top ten of the monthly downloads and several achieved the coveted top position) that I have achieved my aim. More people appear to be reading my subjective comments on topics from fortifying the over forties, chewing gum and mnemonics to limericks, cleriehews and songs than ever read my objective conclusions on science and technology in my scientific papers. One article even resulted in an