

EDITORIAL

THE PLANNED MERGER OF PFIZER and Pharmacia announced this week will create the world's largest pharmaceutical company. The newly-enlarged company is expected to have an annual R&D spend of \$7 billion M&A. More activity is expected with Glaxo-SmithKline tipped as an acquirer.

A spate of consolidation will undoubtedly have some negative effect on suppliers to a pharmaceutical industry already cutting back, particularly on capital equipment purchases. On the other hand, any review of R&D will likely offer opportunities to those who can prove that their technologies will enable efficiency gains in development.

And what likelihood of more M&A in the genomics sector? Investors have struggled to accurately value genomics companies (see page 6). In contrast to the extreme valuations of 2000, many companies are now undervalued. Historically, early-stage drug discovery and technology or content providers have seen their market valuation bottom-out at around two times their cash-per-share values. In March, nearly 30% of firms were estimated to be trading below that level and markets have since deteriorated further.

So, good deals should not be too hard to find. However, pharmaceutical M&A is currently more concerned with building pipelines of new drugs that are close to market. Pharma-biotech acquisitions are always likely to be focused around companies with therapeutic targets and leads, so it is perhaps not surprising there have not been more acquisitions like Merck's purchase of Rosetta in 2001. More biotech mergers, like that of Serono and Genset, and the merging of platform technologies are definitely on the cards though. *AJS*

ABI launches first knowledge products

Applied Biosystems (Foster City, CA) has launched its Assays-on-Demand™ SNP Genotyping and Gene Expression product lines. The products are the first commercial offering from the genomics initiative announced by the company's parent, Applera Corp, in July 2001 and in which it is investing \$100 million.

Dennis Gilbert, VP Genomics for ABI, told *Genomika*: "Given the level of investment you can see we expect big things. We believe the Applied Biosystems Knowledge business [including assays, enzymes and instruments] has greater potential than that which we had with DNA sequencing." The Applied Biosystems Knowledge Business aims to provide research products incorporating high information content. It includes the databases of sister company Celera Genomics, recently taken over by ABI (see *Genomika* 3 (12) 3), and also an Assays-by-Design service, in which customers supply the desired target. Commenting on the strategy, Gilbert said that while it plans to continue supporting the database, "access to raw data is

perhaps one-step removed from what the customer wants".

Assays-on-Demand comprises a large set of off-the-shelf, ready-to-use and functionally validated assays derived from both public genome and SNP databases and Applera's private sequencing efforts. Initially, some 77,000 genotyping assays and 4,400 quantitative gene expression assays are available. Additional assays will be released and the company plans to offer a genome-wide selection of assays for most genes and major splice variants. Gilbert added that assays for other model organisms were also planned. The TaqMan® based assays have a list price of \$210 for 750 reactions and are being shipped from four manufacturing locations across the USA, Europe and Japan.

Applied Biosystems sees the product line as a common standard set of assays that researchers can use, saving the time and money associated with designing and validating their own assays. *AJS*

Schott takes aim at microarray market

Schott Glass Technologies Inc (Duryea, PA), part of the Schott Group headquartered in Mainz, Germany, has expanded its foray into the biochip field through a collaboration with **Glycominds Ltd** (Lod, Israel). The companies have been awarded \$1 million by the Israel-US Binational Industrial Research and Development foundation for the development of a glycan microarray. The collaboration is designed to combine Glycominds proprietary method of *in situ* synthesis of complex sugars with Schott's surface technology to create a unique microarray format for research and diagnostic applications in autoimmune disorders and bacterial

infections. The market introduction of the product is expected for 2004.

A Schott spokeswoman told *Genomika*: "While we have for a long time mass produced the high-quality glass plates for microarray companies, we have only recently developed a microarray surface chemistry in collaboration with a US university. We will build on the expertise gained during the research collaboration and hope to access the growing market for microarrays." She added that in the mid-term Schott might even consider a service unit on the basis of a developed microarray IP portfolio.

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DEALS/COLLABORATIONS

MelTec-headed consortium receives governmental grant

MelTec GmbH (Magdeburg, Germany), a company engaged in topological proteomics, has been awarded a research grant from the German Federal Government of €2.3 million (\$2.4 million at €1.05 = \$1), with which it intends to form a consortium of academic scientists from various backgrounds under the umbrella CELLTEC (cellular eukaryotic proteome-code deciphering technology). The company's COO, Christine Lemke, told *Genomika* that the consortium would concentrate on neurological disorders and oncology, and was initially limited to three years.

"The basis of the work will be our proprietary MELK technology, which enables the quantification and simultaneous mapping of hundreds of proteins and glycostructures at the single cell level. Tracing out protein networks *in situ* turns out to be essential for drug discovery. The platform will be integrated into the experiments of all the different groups to improve current interaction mapping techniques, which are riddled with false-positive results," explained Lemke. "The combination of different expertise in the network of scientists will enable us to develop new algorithms and techniques to enhance the understanding of interaction proteomics," she continued.

The consortium will feed back into MelTec's drug discovery programs. "While some potential applications of our MELK technology are already established in the market place, as a young biotech company we have to rely on partnering with bigger pharmaceutical and biotech companies to leverage our research into the clinic," said Lemke. However, collaborations with smaller companies are also important, such as with MyoContract Pharmaceutical Research Ltd (Basel, Switzerland), which Lemke described as a "perfect example of two smaller drug developers pooling their technologies to do niche developments". *SF*

In brief

► **PerkinElmer Inc** (Boston, MA) has exercised an option with **Orchid Biosciences Inc** (Princeton, NJ) to develop and sell fluorescence-based assays incorporating Orchid's SNP-IT genotyping technology. PerkinElmer obtained exclusive rights to sell fluorescence polarisation-based kits for research applications in December 2000 (see *Genomika* 2 (1) 2), as well as non-exclusive rights for assays used on DNA sequencers.

► Business intelligence software from **SPSS Inc** (Chicago, IL) is to be applied to biotechnology data, such as microarray, combinatorial chemistry and clinical data, through an alliance between SPSS and **Duke Bioinformatics Shared Resource** at Duke University, NC. SPSS will provide DBSR with licences, on-site training and technical support for its enterprise-wide data mining tool Clementine. In return, DBSR will use Clementine and report back on its experience to help SPSS develop Clementine as a bioinformatics tool.

► **Applied Biosystems Group** (Foster City, CA) has signed an agreement with analytic software and services provider **Spotfire® Inc** (Cambridge, MA) to integrate ABI/MDS Sciex' Pro ICAT software with Spotfire's DecisionSite for Functional Genomics™ software. The integrated product will be an application for analysing protein expression data from ICAT™ reagent-based experiments. Spotfire has an agreement to integrate DecisionSite into the Celera Discovery System, now being marketed by ABI.

► Two proteins that play a role in the production of beta-amyloid, the main constituent of the characteristic plaques seen in Alzheimer's disease, have been identified by **Exelixis Inc** (South San Francisco, CA) and **Pharmacia Corp** (Peapack, NJ) in a collaboration that concluded in February.

Genomika

...tracking the business of genome research

Genomika provides the latest market and business information on the fast expanding field of DNA, RNA and protein analysis

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SUBSCRIPTIONS

Genomika is published 22 times a year.
Europe: £340, USA & Canada: US\$615
Japan: ¥87,800 & elsewhere: £380

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Publisher: Dr Philip J Brown

Computer typeset and printed in England ISSN 1469 3232

DEALS/COLLABORATIONS

KREATECH bolsters ULS licensing agreements

Biomolecular labelling company **Kreatech Biotechnology BV** (Amsterdam, the Netherlands) has granted a licence to **PerkinElmer Life Sciences** (Boston, MA) to incorporate its Universal Linkage System (ULS®) technology into PerkinElmer's new Micromax ASAP RNA Labelling kits. This is the first product in the microarray market to use the non-enzymatic labelling technology.

Since switching from end-user sales to a business-to-business approach (see *Genomika* 2 (20) 6), Kreatech has formed agreements with Qiagen, Amersham, Roche and Qbiogene, among others, focusing mainly on the *in situ* hybridisation market. John Kleijne, commercial director at Kreatech, told *Genomika* that the company will focus next on protein labelling, and expected the first deals to be struck in this area by the end of this year. He added: "We have in-house expertise now [and] can make the technology work for any platform." Kleijne said that Kreatech expected to close one or two more deals in microarrays by the end of the summer.

ULS technology is based on platinum complexes with two active sites. One active site has the detection moiety attached, which can be anything from a dye to a bead, and the other site attaches to the major groove N7 position of the DNA, RNA or nucleotide. "It takes 15 minutes at 85 degrees," explained Kleijne. "It has no preference for any RNA molecule, even complex tertiary structures ... and it does not interfere with hybridisation."

Kreatech is a private company with around 45 employees. Revenue is "more or less doubling" every year and Kleijne expects break-even to be halfway through next year. *MG*

Zyomyx places protein chip system

Zyomyx Inc (Hayward, CA) has allied with **Partners Health-Care** (Boston, MA), a leader in conducting basic translational and clinical research, in a three-year programme to apply Zyomyx' Protein Profiling Biochip™ system to clinical research. The agreement sees the establishment of the first facility in an academic setting to use Zyomyx' system. The technology will be applied to identify and validate protein biomarkers for the understanding and diagnosis of complex diseases. Zyomyx has a number of corporate collaborations for both the development and use of its protein chip system.

Larry Cohen, CEO of Zyomyx, told *Genomika* that the company was building up its sales and marketing activities ahead of a commercial launch at the start of 2003. He said Zyomyx had been approached by several companies interested in co-promoting the Protein Profiling Biochip system and that "negotiations are in various stages, from early to quite advanced".

To date, Zyomyx has raised a total of \$64.2 million through four funding rounds. The last of these was in November 2000 and the company is currently "in the final stages of closing another round", Cohen said. *AJS*

OGS in cystic fibrosis proteomics initiative

Oxford GlycoSciences plc (Oxford, England) has entered into a research collaboration with Cystic Fibrosis Foundation Therapeutics Inc (CFFTI), a non-profit affiliate of the US-based Cystic Fibrosis Foundation. OGS will use its industrial-scale proteomics technology to analyse clinical samples to identify serum proteins that predict early CF lung disease. The companies anticipate the markers will be useful for diagnosis of the disease in infants, patient profiling in clinical trials and could help develop new drug targets.

Under the terms of the agreement, OGS will retain exclusive rights to databases, prognostic and diagnostic applications of the biomarkers, and rights on certain applications outside CF. CFFTI retains exclusive rights to CF therapeutics and certain related applications. The value of the agreement could reach \$5.5 million, including an up-front fee, research fees and milestones. Both companies will receive royalties on any sales.

CFFTI initiated a research programme in March with Proteome Systems to discover novel protein targets for CF. CFFTI also has agreements with other proteomics research centres and a commercial agreement with Affinium Pharmaceuticals. *MG*

In brief

► **GeneFormatics Inc** (San Diego, CA) has entered into its first drug discovery agreement, employing its structural and chemoproteomic technologies in an alliance with **Arakis Ltd** (Little Chesterford, England). Together with the speciality pharmaceuticals company, GeneFormatics will aim to find new indications for established drugs, using new drug delivery technologies and chemical modification. GeneFormatics will identify and describe secondary biochemical functional sites, which will be screened against Arakis' database of pharmaceutical products.

► **Galapagos Genomics NV** (Mechelen, Belgium) has expanded its collaboration with **Bayer Biotechnology** (Berkeley, CA). Galapagos will provide Bayer with adenoviral vectors containing human genes selected by Bayer, constructed using its PhenoSelect® gene expression platform, for *in vivo* validation. Galapagos first collaborated in June 2001 with Bayer Yakuin (Japan) in a target validation agreement for asthma; the subject of the enlarged *in vivo* validation studies is not disclosed. The new agreement will last for more than a year and has the potential to be expanded further.

► **High Throughput Genomics Inc** (Tucson, AZ) has initiated an alliance with **Galderma Research & Development SNC** (Sophia Antipolis, France) to incorporate HTG's Multiplexed Molecular Profiling ArrayPlate™ Kits and Omix Imager™ into Galderma's drug discovery process. Galderma, a joint dermatology venture between L'Oréal and Nestlé, will purchase ArrayPlate Kits from HTG, which will include genes linked to specific skin disorders, designated by the French company. HTG has a similar agreement with Psychiatric Genomics (see *Genomika* 3 (3) 1) covering mental disorders.

COMPANIES

STEAG microParts expands biochip production

STEAG microParts GmbH (Dortmund, Germany), a developer and manufacturer of microstructured products, is expanding as "various biochip development projects in diagnostics and HTS for drug discovery move into the mass manufacturing phase in the coming months". Dr Reiner Wechsung, CEO of microParts, told *Genomika* that of its current 220 staff, 40 were involved with biochip R&D, mainly in format and surface chemistry development. Until the end of 2003 recruitment of 60 new employees is planned for this area alone. "The development projects include pilot production of 10,000-100,000 chips per project – as a next step product specific mass production will take place in house, where we have sufficient capacity available to cope with the first wave," he said.

Microparts is employing its fabrication technologies to develop biochips, including microfluidics and surface chemistries, for customers supplying the drug discovery and diagnostics sectors. The company has also developed a microspectrometer technology and micro-nozzles for drug delivery. "The majority of our revenues to date are generated in the drug delivery area, with our partner Boehringer Ingelheim, contributing about €30 million [\$28.6 million at €1.05 = \$1] annually. The other fields are likely to catch up fast," commented Wechsung. The company has been profitable since 1997.

A collaboration with Merlin Diagnostika GmbH (Bornheim-Hersel, Germany) led to the development of the Lilliput Plate and Analyzer for the automated identification and susceptibility testing of bacteria. The plate includes 96 wells, four sample reservoirs and five additional ports for chemicals on an area smaller than a thumb. The analyser is based on microParts' microspectrometer and can measure 12 channels simultaneously. "While we have looked into the possibility to licence the microspectrometer technology out, our main strategy is using the technology available to us for our customers, to functionally improve their product and to reduce costs for them," said Wechsung.

The company was founded in 1992, after a research project at the publicly-funded Kernforschungszentrum Karlsruhe - combining deep etch lithography by synchrotron radiation, electroforming and micromolding, three techniques for the reproduction of micro-dimensional structures – had ended. "Our remit was to realise the commercial potential of the technology. We started very broadly, looking at various industries, and only from 1994 on concentrated on the biotechnology area exclusively," explained Wechsung. *SF*

In brief

► A trial date of mid-January 2003 has been set for the court action between **Ciphergen Inc** (Palo Alto, CA), **LumiCyte Inc** (Fremont, CA) and **Molecular Analytical Systems** (Los Altos, CA). Ciphergen and LumiCyte are in dispute over the scope of their respective licences to SELDI technology from MAS (see *Genomika* 3 (5) 1).

LION concentrates on bioinformatics

Leading bioinformatics provider **Lion Bioscience AG** (Heidelberg, Germany) is considering the fate of its San Diego-based drug development unit, the former Trega Biosciences, in order to reach profitability by the fourth quarter of financial 2004. The company's VP of corporate communications, Dr Andrea Kreiselmeier, told *Genomika*: "Lion will focus more on the life science informatics area and is looking for an investment partner or buyer for Trega's drug development business, as we can't expect short term revenues to be generated in this business unit." The iDEA™ module, a predictive ADME simulation model that was developed at Trega prior to the acquisition in March last year (see *Genomika* 2 (11) 3), will remain within Lion.

With its iD3 information driven drug discovery programme, Lion had expected to provide drug candidates effective against nuclear receptor targets and corresponding leads. To save costs, Lion will now partner or spin-out the iD3 business.

Lion has backed up its decision with data from a market study by The Boston Consulting Group – produced for LION – in which it was concluded that solutions, not products, would drive the company towards profitability. The company's CEO Dr Friedrich von Bohlen und Halbach said that the largest value generation potential in the R&D informatics market, currently worth €4.9 billion (\$4.9 billion at \$1 = €1), was in data integration, requiring "solutions, which include prediction, analysis and decision support capabilities". In addition, he highlighted that while overall bioinformatics spending was rising at 9%, bioinformatics outsourcing was growing at an annual rate of 24%, from its present level of €568 million. According to the study, pharmaceutical companies could save up to \$264 in R&D costs and one year in development time for each new drug by integrating data and information across disciplines, departments, and drugs. *SF*

Sense receives lifeline after postponing funding round

Sense Proteomic Ltd (Cambridge, England) has postponed its planned second round of fundraising (see *Genomika* 3 (2) 5). The functional proteomics and microarray company had been hoping to close a round in the first half of the year to add to its first round of £3.8 million (\$5.9 million at \$1.6 = £1). Business development associate, Dr Rhian Hayward, told *Genomika* that the poor funding climate was to blame. However, the company has been bailed out by its first round investor, Apax Partners, which has provided an additional £3 million as "an extension of the first round", said Hayward.

Although some staff had left the company and had not yet been replaced, Hayward denied there had been any redundancies. There are 22 employees at the company now, she said.

Sense is currently working on a few deals that it hopes to announce shortly, and before the end of the year will release its third product, a cytochrome P450-based microarray for metabolic and toxicology studies. *MG*

COMPANIES

Zymark seeking to marry consumables and robotics

Despite the capital equipment market being tough, **Zymark Corp** (Hopkinton, MA) has met its top- and bottom-line growth targets for the first half of the year and is now looking to expand into a new business area marrying consumables with its robotic workstations.

Dr Mark Roskey, executive VP for worldwide marketing, told *Genomika*: "There has been significant progress around the reagent/chemistry/biology side [of the business]. It'll be exciting in the industry. I think that people will immediately see some nice synergies and be pleasantly surprised at the direction that Zymark is evolving towards." Roskey was unable to provide specific details of the product extensions, but confirmed that a "good portion" of the \$600 million Zymark's parent realised through a sale will be available for the expansion (see *Genomika* 3 (2) 4).

The company has found the current markets tough, although Roskey commented: "I don't think we're suffering as much as other capital purchases ... A good portion of our product line was launched over a year ago ... and the products are starting to mature and be very effective in the market place." Zymark's sales are historically 50% North America, 30% Europe and 20% elsewhere, "but through the first two quarters of 2002, our strongest performance has been coming out of Europe". *MG*

Biotique Systems signs first customers

Biotique Systems Inc (Emeryville, CA) has announced the first three customers for its genomic data integration, analysis and visualisation platform. The initial customers for the Biotique Local Integration Solution (BLIS) are Bristol-Myers Squibb, Berlex biosciences and an undisclosed biochip manufacturer.

Stephen Sanders, Biotique's CEO, explained to *Genomika* that "BLIS integrates information and tools for drug discovery across research groups and global sites, and provides an environment for these groups to not only view and query data, but also generate data and design experiments, such as microarrays, creating a powerful workflow solution". He added that systems are installed behind the customer's fire wall.

"We provide decision support tools and services that allow biotech or pharmaceutical companies to integrate, visualise and analyse multiple sources of disparate public and proprietary genomic information in order to perform drug target discovery and validation. We also provide some contract research services, for instance Chip design."

Biotique was founded in 2001 by CEO Stephen Sanders and president and CSO John Burke, who both previously worked for the now defunct DoubleTwist. Sanders said: "John and I funded the company and have already been paid back our initial investment, running as a profitable corporation in our first year of business. We are growing as our customer revenues permit [and] will stay lean and focused on our customer needs." The company has ten employees. *AJS*

Relab develops diagnostic 'array stick' for oncology

A new format for genetic identity testing has been developed by molecular diagnostics company **Relab AG** (Recklinghausen, Germany) in conjunction with its research arm the Institute for Molecular Nanotechnology (IMNT). The GeneStick® platform, specifically for diagnostic applications, can capture up to 400 different biomolecules, such as DNA, immobilised at the flat front end of a plastic stick, which is then immersed in a closed test tube holding 50 microlitres to 1 ml of sample for the hybridisation reactions.

Dr Andreas Schuetz, chief scientist at the IMNT, told *Genomika*: "The format reduces evaporation loss - important when only small sample volumes are available - and since we are working with chemiluminescence, we avoid nonspecific backgrounds that are common when plastic probes are used for fluorescent measurements." In addition, rather than having to spend \$50,000 on a hybridisation workstation, a simple, standard laboratory thermo-shaker for \$2,000 will provide hybridisation results with high accuracy, said Schuetz.

The platform is already in use in the company's service offering for oncology testing, especially in the gene expression profiling of metastatic cells in the blood and for the detection of lung cancer from sputum samples by promoter hypermethylation analysis. "We sell the GeneStick for oncology testing together with the chemiluminescence detector to medical labs and have had interest to license the technology out," explained Schuetz. The formal launch of the kit is planned for the end of 2002. *SF*

In brief

► **Transgenomic Inc** (Omaha, NE) has announced that it intends to repurchase up to one million shares of its own common stock due to the belief that its current market valuation is "out of line with its intrinsic value and growth prospects". The company's CEO, Colin D'Silva, said: "We believe we will achieve profitability in the near future and our current cash position is sufficient to address operating cash flow needs as well as to execute this buyback programme." Transgenomic shares closed at \$2.61 each on 16th July, compared to more than \$10 each at the beginning of the year. The company also reported that it expected second quarter 2002 revenues to be around \$9.4 million, which is down slightly on the \$9.5 million recorded a year ago. Newly booked orders of \$15 million were the highest in its history, the company added.

► **Korvis Automation Inc** (Seattle, WA), a custom biotech automation design house, is targeting genomics and proteomics companies with its platform, which president Ben Wahlstrom told *Genomika* "incorporates all the required systems to speed development" including motion control, machine vision inspection routines, software expertise and mechanical design experience. "Often companies and institutions will tie up their research teams with engineering tasks", said Wahlstrom. The company's first partner is microarray start-up **GeneXP** (Boston, MA).

FEATURE

Evaluating the genomic revolution

Traditional methods of company valuation by investors are not working in biotechnology, according to *Investing in Biotechnology*, a new publication from Scrip Reports. The complex and novel nature of biotechnology can make it difficult for a lot of potential investors to understand, and the perceived deficit in pharmaceuticals coupled with rapid gene discovery led to an over-valuation of the sector in a 'genomic revolution', comparable to that of the concurrent 'Internet revolution', say the authors.

Like the dot.com boom, the genomics revolution "spawned an emerging industry comprising a host of venture-backed companies with largely untested business models and astronomical valuations". In the same way as Internet infrastructure companies came to be favoured over dot.coms, "so biotechnology 'platform companies' were preferred to pure therapeutic plays," the report notes. But instead of relieving the pharmaceutical industry's bottlenecks, the tools have only served to move the bottlenecks downstream. Old-fashioned wet-lab work is still essential to validate genomic targets, and is still time-consuming. Few people knew the time it would take for new platform technologies to have a significant impact on the pharmaceutical industry, however. This timing runs counter to investor demand for rapid growth. However, the report says: "It is believed that in the near future, virtually all new drug discovery programmes will be genomics based."

Valuation methods

Arguing that the finance industry has, to date, fallen short of accurately valuing biotech companies, the report looks at the various valuation methods available to the investor and tries to explain the characteristics of the different genomics subsectors and the companies therein. Essentially, the biotechnology sector can be divided into three main subsectors: drug discovery; genomic technology; and genomic content/information.

The three subsectors require different valuation methods. The pharmaceutical industry is responsible for the largest investment in R&D and,

therefore, is the largest consumer of genomics. An investor must understand the value that each of the subsectors brings to pharma. However, valuation methods are different from those used when investing in pharma: only the top 30 out of 300 US genomics companies are earnings positive, making it difficult to use any earnings-based predictions.

Technology providers' business models allow for rapid top-line growth, and the fast pace of technology coupled with the many partnership opportunities mean that barriers to entry are low. Companies must build sales quickly as new technology can become commoditised and margins fall. Established companies, have to "remain active on the business development front" to ensure that they are not overtaken by emerging companies.

Conversely, content providers require a lot of capital up-front to generate the information and the barriers to entry are currently quite high. Given the rise in bioinformatics, however, the subsector will become progressively more accessible. Content provision allows companies good 'reach-through rights', adding value in the longer-term in addition to the short-term access rights.

Given the lack of historical numbers, valuations are difficult and must take the high levels of risk into account, requiring both qualitative and quantitative data. The qualitative factors include: SWOT (strengths/weaknesses/opportunities/threats) analysis, identifying a company's position with regard to external factors and, importantly, its relationship to its competitors, all of which require business experience. The company's business model needs to be evaluated in terms of its products, benefits, price, developmental stage, market potential and channels to market. The maturity of the company itself is an important factor, as well as its management, liquidity and cash burn.

Quantitatively, with so few companies making a profit, a discounted cash flow or a net present value (NPV) analysis is useful. These techniques require an estimation of future earnings before tax and interest (EBIT) in different scenarios (best and worst-case) and with different models, and then

discounting the future cash flows to their present value. By examining the different scenarios, the investor is more aware of the potential problems, but the assumptions built into the model, such as steady growth state, are not applicable for all biotechnology companies.

Comparisons

In comparative analysis, the investor looks at the company in relation to its peers. Clearly, no two companies will be identical, and there will be good reasons why a company may trade at a discount or premium to its peers, such as its exceptional growth rate, illiquid stock and size. Alternatively, a takeover or IPO valuation can provide a good point of comparison.

Although traditional valuations such as price/earnings ratios are not so powerful for biotech stocks, growth and cash flow-related indices are significant valuation tools. Technology companies can usefully be rated using the price/cash earnings ratio, a higher value giving a cheaper stock, although an understanding of the sector and national average is important. Dividing the result by the company's growth gives an indication of the value relative to the company's growth rate (a low figure indicating a cheap stock) but is affected by the stage in the company's business cycle.

Many genomics companies have planned for multiple revenue streams from technologies, services and therapeutic products. Recently there have also been many changes in these approaches. The 'real option' approach of evaluating a business, evaluates the management's flexibility, as at any time any particular project can be deferred, expanded or contracted, stopped or changed. Static future cash flows are replaced with a 'bundle of cash flows' – effectively this approach 'quantifies intuition' and is comparable to valuation of call and put options in finance.

The report concludes that there is currently no uniform method available to value biotech companies, which have a long-term, risk-laden revenue and profits outlook – methods used must take into account relative valuation, liquidity, interest rates, market mood and growth. *MG*

FINANCE

Cepheid's sales and costs climb

Cepheid Inc (Sunnyvale, CA) has boosted revenue again with a 60% increase to \$3.2 million for the second quarter of calendar 2002. Product sales of \$2.7 million were the main driver of the rise, up by 82% from \$1.5 million a year ago. Total revenue for the six months ended 30th June was \$5.6 million compared to \$5.4 million last year.

R&D costs associated with bringing its GeneXpert® system for integrated sample preparation, amplification and detection to the market fed through to a similar rise in second quarter net loss, at \$5.5 million compared to \$4.1 million. Half-year net loss was \$10.5 million, up from \$7.3 million in 2001.

The company has stated its intention to increase its direct sales and marketing capability, and hopes to increase the Cepheid sales force to 10 by the year-end. The company has been reorganising its distribution agreements, both in the USA, where it has modified a previously exclusive agreement with Fisher Scientific Inc (Hampton, NH), and in Europe (see *Genomika* 3 (12) 7). *MG*

VGI sinks to new low, despite raising sales

Visible Genetics Inc (Toronto, ON) has hit its lowest share price ever, despite announcing that it expects second quarter revenues to be higher than the first. VGI expects revenues of \$4.5-4.7 million, up 1% on its lower-than-expected first quarter revenues of \$4.3 million (see *Genomika* 3 (11) 1). This is growth of above 20% on the previous year, and is mainly driven by sales of its genotyping kit, but well within the revised 2002 estimate of \$20-25 million. VGI shares are currently languishing at \$1.19 (16th July).

VGI presented at the XI International HIV Drug Resistance Workshop in Seville, Spain last week. The company has reported data from several studies, showing that up to 50% of people infected with HIV may already have drug-resistant strains of the virus, despite never having received treatment. This highlights the need for HIV-resistance testing prior to treatment, said the company. VGI also presented an independent analysis of clinical trial data that showed the interpretation system, part of its Trugene™ HIV-1 Genotyping Kit, predicts patient response to drugs with "a high degree of accuracy". The interpretation system uses GuideLines Rules – version five of which was cleared by the FDA in April (see *Genomika* 3 (9) 3) – and was shown to be "significantly predictive of response to therapy", more so than genotyping, where the virus is tested in a lab environment. *MG*

In brief

► The UK government has announced a 10% real-term increase in its annual budget for science, which it said would fund "both higher volumes and new areas of research, such as proteomics and brain science". The total science budget will grow from £2.0 billion (\$2.9 billion at \$1.47 = £1) in 2002-2003 to £2.9 billion by 2005-2006.

TECHNOLOGY

RecomGenex refolds overexpressed proteins

While Hungary has not made a recognisable contribution to the world's genomics and proteomics market so far, **RecomGenex** (Budapest, Hungary), established this month as a spin-off of discovery chemistry provider ComGenex Inc (Budapest, Hungary), aims to change that. RecombGenex has developed a technology that refolds proteins into their natural state, thereby overcoming problems occurring when overexpressing mammalian genes in bacterial hosts, Dr Geza Ambrus-Aikelin, RecombGenex' CEO, told *Genomika*. The company will offer services that will help researchers express and modify proteins to learn more about the roles of individual proteins. The need for faster, more versatile and more reliable methods to express specific genetic sequences is becoming crucial to increasing the speed and efficiency of the drug discovery process, the company said.

"Mammalian proteins are often produced in *E. coli*, because of the ease of genetic manipulation and higher productivity. The problem is, that because conditions in the bacterial cell are different to the conditions in the compartmentalised eukaryotic cell, proteins tend to come out folded wrongly and therefore lack the right function," explained Ambrus-Aikelin. The company is using a protein renaturation technology, the RefoldAll™, developed by various academic groups at Hungarian universities, that refolds the protein by changing solution characteristics slowly until the original protein function is restored.

RecomGenex holds the exclusive patents for the basic technology, while for each protein a procedure has to be optimised, which in turn will require additional IP, according to Ambrus-Aikelin. Extensions of this technology are the XpressXpert™, a purification technology for recombinant proteins, and the ImprovEnz™ platform, a computer-based protein modification and function prediction program that is currently in development. *SF*

In brief

► **BioForce Nanosciences Inc** (Ames, IA), a developer of nanodimensional biomolecular analysis systems, has received a Phase II SBIR/NIH grant of approximately \$500,000 for the commercial development of the company's NanoArayer™. The instrument is designed to place thousands of molecules on defined locations of a microarray, where it can be reacted with samples and read by BioForce's AFM-based detector technology (see *Genomika* 3 (12) 4).

► **Applied Gene Technologies** (San Diego, CA) has received US National Institutes of Health grants of over \$300,000 to fund development and commercialisation of its Tessara Array Technology™, or TAT™, a non-PCR-based method for genotyping and molecular diagnostics. The company intends to develop its patented stem-loop DNA 'hairpin' probe for the detection of gene mismatches and to develop rapid detection products for tuberculosis, cancer and bio-terrorism agents.

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Quark buys Incyte's microarray facility

Incyte Genomics Inc (Palo Alto, CA) has sold its microarray facility to drug discovery company **Quark Biotech Inc** (Cleveland, OH). At the same time, Incyte has signed up with **Agilent Technologies Inc** (Palo Alto, CA) for the supply of its gene expression technologies, including catalogue and custom microarrays, microarray readers, software and LC-MS instruments.

Incyte pulled out of supplying microarrays in October 2001 (see *Genomika* 2 (21) 1) to focus on drug discovery and licensing. Management at Quark were unreachable for comment, but it is understood that the transfer of microarray manufacturing capability and key personnel operating the facility is intended to bolster its

own research and there are no plans to sell its own microarray products. Equipment and personnel have been transferred to Quark's research facility in Pleasanton, CA.

Quark is employing an Endpoint Driven Drug Development (ED3) programme which starts with defining a desired clinical endpoint in a specified disease and then designing drug candidates to achieve the endpoint. Microarrays are employed for functional profiling of genes and proteins to identify inhibitors or enhancers of function. A novel chemical library microarray then screens key proteins against small molecule libraries and drugs designed to modulate the proteins' function. *AJS*

Schott takes aim

... continued from front page

A group of 20 Schott scientists and engineers is set aside for this specific project.

Glycominds is developing the GlycoChip™ for protein-glycan interactions and a glycan database. While complex carbohydrates are attached to almost 50% of intracellular proteins, they are associated with more than 90% of membrane bound proteins. They have a crucial role in immune reactions, where they are at the beginning of the signaling cascade, and different glycosylation of the same protein drug is known to exert very different effects in patients. Asaf Halevi, Glycominds' director of business development, told *Genomika*: "Glycomics is currently treated as a subsection of proteomics because the nomenclature of sugars is very difficult and has led to various conflicting systems. In addition, the synthesis of sterically defined carbohydrates creates enormous challenges." Glycominds claims to have overcome both barriers. The first with a proprietary algorithm that describes the structure in a consistent manner, and the second with a synthesis technology, which is already available in a microtitre plate-based format.

Schott bought a minority stake in Glycominds last year and the companies are still in negotiations about the right commercialisation model for the array. *SF*

People

► **PerkinElmer Inc** ((Boston, MA) has announced that **PETER COGGINS** is to succeed **JOHN ENGEL** as president of life sciences. Engel has been appointed to executive VP of operations. Coggins was previously executive VP for global sales and marketing at Amersham Biosciences (Piscataway, NJ).

► **DR JOHN HURRELL** has been appointed as president of the **Indiana Proteomics Consortium** (Indianapolis, IN), formed in February 2002 by Indiana and Purdue universities and Eli Lilly & Co to develop new instrumentation and methodologies for proteomics.

► **KLAUS PUELL** has been appointed as CEO and president of **Proligo LLC** (Boulder, CO).

► **DR ROBERT BOOTH**, formerly of Hoffman-La Roche (Basel, Switzerland) has taken the position of senior VP of R&D at **Celera Genomics** (Rockville, MD), effective from August 5th.

► **KEVIN RAKIN** and **JOSEPH KEYES** have been promoted within **Genaisance Pharmaceuticals Inc** (New Haven, CT). Rakin, current president, will assume the additional position of COO and Keyes will be VP and CFO.

► **Human Genome Sciences Inc** (Rockville, MD) has named **ROBERTO CETRULLO** as the company's VP of business development.

Next publication date: 14th August 2002