

EDITORIAL

SMALL IS CURRENTLY BEAUTIFUL in the evolving genomics industry.

There is less of focus on large-scale projects, public or private. Efforts such as the Human Genome Project and SNP Consortium's have made way for smaller projects. The Human Proteome Organisation is breaking its goals down into smaller projects. Systems biology is similarly being broken down into smaller projects and goals.

Though still impressive in terms of the number of analyses and data, improvements in technologies mean that the scale of these projects in terms of resources employed is less. Of course this shift has largely been determined by the nature of the new challenges themselves.

Pharmaceutical companies are also forming more smaller and focused collaborations targeting particular needs in their R&D programmes, which is providing opportunities for smaller partners who can more readily adapt their own work to suit their larger partners' needs.

In the tools industry, many companies have, as has been well documented, been forced to drastically resize and consolidate. With this, though, has come an increased focus and sharpening of business models that may yet lead at least some of them to success. Elsewhere, companies such as Advalytix (see page 3) and Nanofilm (page 2) are demonstrating that staying small and focused is one way to develop a successful business in the genomic tools area. Applied Biosystems and Amersham dominated the DNA sequencer market, but the diversity of technologies needed for functional genomics, proteomics *et al* means there is plenty of room for smaller players to take a lead role. *AJS*

CombiMatrix signs semicon partner

Biochip technology developer **CombiMatrix Corp** (Seattle, WA) has raised \$4.9 million in a private placement of common stock shares, only days after entering into a "multi-year strategic alliance" with Japanese semiconductor company **Toppan Printing Co Ltd** (Tokyo, Japan). Under the Toppan agreement, designed to develop microarrays for the drug development and diagnostics tools markets, CombiMatrix will receive an upfront fee of \$1 million, in addition to development and milestone payments.

CombiMatrix' president and CEO, Dr Amit Kumar, told *Genomika* that the two companies would jointly develop a chip-based detection technology for the existing matrixarray chip platform, with CombiMatrix concentrating on developing the biological content and Toppan bringing into play its engineering and manufacturing expertise. Toppan will license technology from CombiMatrix, enabling it to further use jointly developed IP for further moves into the life sciences market. A settlement of patent litigation with Nanogen (see

Genomika 3 (19) 1) covered technology principles also used in the Toppan agreement, though Kumar stressed that the "platforms built around these principles are quite different".

CombiMatrix' microarray technology enables *in-situ* oligonucleotide synthesis using integrated circuits. The parallel synthesis process reduces the production time and price for custom-made microarrays, while also increasing spot homogeneity and production quality, thereby reducing the need for elaborate QC instrumentation. The planned electrochemical detection technology would not require optical reader systems and at the same time allowed for real-time, dynamic measurements with increased sensitivity and dynamic range, Kumar explained.

CombiMatrix' director of applied science, Dr Andy McShea, talking to *Genomika* during IBC's EuroBiochip conference in London last week, stressed that CombiMatrix had decided to address high volume manufacturing, as well as sales and support, in partnership

... continued on back page

EC funds alternative splicing database

ExonHit Therapeutics (Paris, France), a drug discovery company employing proprietary technology to understand RNA splicing, has joined with a number of European research centres to start an Alternative Splicing Database (ASD) project. The European project consists of seven members from five European countries with complementary expertise. The EU has provided 70% of the €3.5 million (\$3.8 million at \$1.08 = €1) funding for the three-year project.

The project aims to build a database of alternatively spliced genes to develop new diagnostics for diseases such as cancer, neurodegeneration and infertility. DNA microarrays containing cDNAs of

all the splicing regulatory proteins and their isoforms, along with chips that incorporate a number of disease relevant genomic signatures, are also being developed. These chips will be used to test an individual's predisposition to a variety of diseases and for diagnosis.

Laurent Bracco, executive VP of technology at ExonHit, said: "Recent studies show that 60% of human genes and defects in alternative splicing are recognised as the cause of many human diseases. The growing recognition of alternative splicing's role, is a key factor in driving the European ASD project, which we believe will make a major contribution in the post-genomics area". *COB*

TECHNOLOGY

Non-destructive microarray QC in ascendance

Nanofilm Technologie GmbH (Göttingen, Germany), a provider of ellipsometry systems, has launched its EP³ instrument, a third-generation imaging ellipsometer for label-free detection in biochip and proteomics research (see *Genomika* 3 (9) 5). The technology, generally used for the measurement of film thickness in material sciences research, found its way into the microarray QC market in 2000. The EP³ can be fitted with an SPR module, opening up the technology for HTS kinetic measurements of protein binding events.

"About 100 of EP³'s predecessors have been sold into the market, and even the new instrument has in the month since its launch already found three buyers," Stephan Ferneding, Nanofilm's MD, told *Genomika* at last week's EuroBiochip conference in London. Increasing demand for this non-destructive way of biochip quality control has allowed the company to open an US sales office in Menlo Park, California and establish a distributor network in seven Asian countries, with an additional application laboratory based in Japan. The 25-strong company reached revenues of €1.5 million (\$1.5 at \$1.01 = €1) in 2002, a result that Ferneding expects to double in the running year. *SF*

In brief

► **Promega Corp** (Madison, WI) has been selected by **Abbott Laboratories** (Abbott Park, IL) to manufacture an automated system for extracting viral RNA from patient samples using Abbott's magnetic particle technology. The sample preparation will be launched in 2003 and distributed by Abbott. The companies said that it would "provide a new level of automation for molecular diagnostic laboratories ... particularly in testing for patient samples and monitoring patient therapy".

► **Agencourt Bioscience Corp** (Beverly, MA) has been appointed as the exclusive distributor in North America for the DNA cloning kits produced by **Lucigen Corp** (Middleton, WI). Lucigen claims that its CloneSmart kits overcome some of the difficulties inherent to cloning individual genes or complete genomes. The low-background vectors are suited to shotgun library construction, high-throughput sequencing, cloning toxic genes and cDNA libraries, according to Lucigen, which retains the right to sell the products directly to the region. As part of the agreement, Lucigen has also transferred to Agencourt rights to certain Single Cell Genomics gene discovery libraries in return for genomic sequencing services.

► **Sidec Technologies AB** (Stockholm, Sweden), which has developed an electron tomography-based 3D imaging and analysis platform for protein analysis (see *Genomika* 3 (2) 5), has announced that the Swedish Industrial Development Fund (Industrifonden) has taken a 14% ownership stake in the company for an injection of SEK10 million (\$1.1 million at SEK9.27 = \$1). Sidec offers its technology through contract research collaborations and said that the fund obtained through the sale of the stake would help "establish the method in Europe and the USA, as well as to develop the business strategy and future products". Gosta Sjöholm, CEO of Sidec, added that Industrifonden's network of contacts would be "extremely valuable". Sidec claims its technology is the only method that can visualise and analyse proteins and macromolecules in their biological context, such as in the cell membrane.

► Lab-on-chip developer, **Aclara Biosciences Inc** (Mountain View, CA) has signed an antibody supply agreement with **Research & Diagnostic Systems Inc** (Minneapolis, MA). ACLARA will resell reagents from the company, including cytokines, related proteins and antibodies, with its eTag Assay System™.

Genomika

...tracking the business of genome research

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TECHNOLOGY

Advalytix expects early break-even next year

Advalytix AG (Brunnthal, Germany), a company working on nanolitre liquid-handling technology, expects to reach break-even point early next year, on the back of greater than expected interest for its ArrayBooster™ hybridisation system, "so 2004 could already be profitable". Dr Christoph Gauer, CEO of Advalytix, told *Genomika* during IBC's EuroBiochips conference in London last week, that the company is also in the process of developing a non-contact mixing platform for microtitre plates, while expanding its international distributor network.

"We had much more interest for our ArrayBooster than we were expecting, especially so soon after the launch. This meant that we had to find distributors in Europe – a market we initially wanted to cover ourselves – in addition to partners in the USA, Japan, Australia and Singapore," Gauer explained. The system, which speeds up the hybridisation process by enabling rapid mixing using Surface Acoustic Wave (SAW) technology, was launched in September last year (see *Genomika* 3 (18) 4).

The acoustic microtitre plate agitator, expected for launch at the end of 2003, could potentially see an even higher demand, considering that microtitre plates are used far more frequently in life science research than microarrays, Gauer enthused. The microarray hybridisation market is estimated by Gauer at \$50-60 million. A washer facility for the ArrayBooster, a tool that would aid automation of microarray experiments, is planned for launch at the end of 2004, in response to customer feedback. The 30-strong company continues its two-pronged strategy working with integration partners and OEM customers, and delivering stand-alone systems to the life science market. *SF*

Isotope labelling back in trend

Biomolex (Oslo, Norway), a company developing reader technology for isotope-labeled microarrays, has launched its first product and hopes to set up a distributor network in Germany and the UK later this year. Petter Ronning, marketing and sales director of the five-strong company, told *Genomika* that 10-15% of nucleic acid microarray experiments could not be measured with fluorescence-labelling technology, "a percentage that is even bigger for protein arrays".

The Biomolex reader system enables the simultaneous, real-time detection of nucleic acids or proteins labeled with different radioactive isotopes. It also exploits the greater dynamic range of radioactive detection over other labelling techniques.

The system has a launch price of €49,000 (\$56,000 at \$1.15 = €1), which will rise to €99,000 in 2004. "While we have evidence that there is an increasing demand for this technology – isotope providers have seen rises in their sales into the life science field – we wanted to create an extra incentive," explained Ronning. Biomolex is jointly owned by the Norwegian Radium Hospital and IDEAS ASA (Oslo, Norway), a 10-year old engineering company with a mission to improve the detection and imaging of radiation. *SF*

In brief

► **GeneScan AG** (Freiburg, Germany) has stopped financial support for its 25-strong subsidiary **BioChip Technologies GmbH**. The unit suffered cuts in its R&D programme in January this year (see *Genomika* 4 (4) 3), and has not generated any revenues for the already launched microarray products since. **Eurofins Scientific** (Nantes, France), a testing-laboratory company that has signed a take-over agreement with GeneScan, now holds more than 57% of the company, a Genescan spokeswoman told *Genomika*. The fate of the TopSpot microarray printing technology is still undecided.

► **Lynx Therapeutics Inc** (Hayward, CA) has entered into three further agreements involving its Massively Parallel Signature Sequencing (MPSS™) technology for gene expression analysis. The agreement with the **Institute of Systems Biology** (Seattle, Washington) extends an existing one in the field of prostate cancer (see *Genomika* 3 (11) 4), while the cooperations with **Millennium Pharmaceuticals Inc** (Cambridge, MA) and the **International Livestock Research Institute** in Nairobi, Kenya are first agreements between the respective partners. Caused by its worsening financial situation, Lynx discontinued work on its Protein Profiler™ earlier this year (*Genomika* 4 (2) 2). Separately, after falling below the Nasdaq's minimum shareholders equity requirement, Lynx has transferred listing of its common stock to the Nasdaq SmallCap market. Lynx will continue to trade under the ticker symbol LYNX.

► **Tecan Group Ltd** (Männedorf, Switzerland) has launched the HS 400 Hybridization Station, a lower-throughput version of its HS 4800 system introduced last year. The workstation is designed for researchers with moderate throughput requirements, enabling the automated hybridisation of four microarray slides, compared to 48 with the HS 4800. The instrument was meeting "the growing need for reproducible microarray processing of smaller industrial and academic laboratories", according to the company. Another instrument introduction for the medium throughput market is the Aquarius 96- and 384-well automated multi-channel pipetting system. The instrument can handle volumes between 50 microlitres to 200 nanolitres and combines, on a small footprint, three lanes and nine overall pipetting positions, operated by two pipetting heads. It has a capacity of 300 plates.

► **Pamgene International BV** (Den Bosch, The Netherlands) has granted further rights pertaining to its flow-through microarray technology to **Olympus Optical Co Ltd** (Kyoto, Japan). The additional agreement gives Olympus the non-exclusive worldwide right to sell the FD10 system for four arrays, an instrument engineered by Olympus for low to medium throughput applications, into the markets for pharmaceutical and biotech R&D, diagnostics and diagnostic testing. According to Pamgene, Olympus has now paid approximately €6 million for access to Pamgene's technology. Pamgene is concentrating on the development of a 96-well version for HTS applications and its PamChip® biomarker arrays.

FEATURE

Metabolomics interest grows

One of the latest 'omics' to garner industry wide interest is metabolomics. As pharmaceutical and biotechnology companies are beginning to look to the technique for the next level of data beyond genomics and proteomics, technology providers are turning to address some of the different problems. "There are huge opportunities from an analytical point of view, with an estimation of this 'omic' increasing five-fold in the next four years", Beverly Kenney, Metabonomics project manager at Waters Corp told *Genomika*. "We estimate that the market stands today at \$20 million and could reach \$100 million by 2006," she said.

Metabolomics is defined as the multiparametric measurement of metabolites such as lipids, carbohydrates and vitamins in simple cell systems. Metabonomics, meanwhile, generally refers to studies of the changes in the metabolic profiles of higher organisms in response to extracellular environments. Metabonomics is an end point measure of what is happening in a system. Just because a gene is expressed, it does not show what it is doing. However, if you look at the proteome of an animal for lethal doses of toxic chemicals, such as cyanide, it is no different before and after. Whereas, every change is reflected in metabolism and the study of metabolic pathways and reactions could lead to definitive disease biomarkers.

Many companies believe metabolomics studies are the next step after genomics and proteomics, as it can pull together masses of information and measure changes in physiology that would otherwise not be detected. There are a number of technological hurdles to clear first that are unique to metabonomics. The two main problems to overcome are sample complexity and automation, and although comprehensive solutions are still some way off, new technologies are beginning to take strides according to Kenney. "Like proteomics, there is a huge amount of data, but the problem is how to handle and analyse it," Kenney continued. The chemical diversity of metabolomic samples is very high, as there is a whole raft of

compounds that are highly polar and lipophilic, making analysis difficult.

The two approaches being used currently are mass spectrometry and NMR. "It is a similar platform to those used in proteomics and genomics, but the software and sample preparation are different. With metabolomics you do not require sample preparation ahead of time. You can simply inject the sample for analysis," she said. The problem is that the software is designed to ask what a specific molecule is, so what is now needed is software to locate a number of molecules.

Two of the companies leading the technical approaches in metabolomic technology are **Waters Corp** (Milford, MA) and **Bruker Inc** (Madison, WI). A recent three-year collaboration between Waters and **Metabometrix Ltd** (London, England) aims for them to share IP and look for ways to combine proprietary technologies. One of the first results of this collaboration, a new LC-MS platform designed for metabolomics, will be launched by Waters next month. The company claims that it will allow the detection of lower concentration biomarkers, sometimes masked using NMR data, and can analyse samples every 10-12 minutes, amassing up to 100 samples per day. Bruker on the other hand is one step ahead and has launched an integrated system that generates fast-throughput, Manfred Spraul at Bruker told *Genomika*. Spraul claims: "Our system takes one minute, dependent on measurement conditions, to analyse a sample." There are currently 30 spectrometers on the market for metabolomic studies, a number, which Spraul believes will grow rapidly, with the number of instruments doubling over the next two years.

Despite growing interest, it remains very early days for metabolomics. According to John Hamer, CSO at Paradigm Genetics: "It is still being investigated as to what metabolomics is useful for in terms of disease, we need to find key markers for diagnosing conditions or toxicity by screening large amounts of samples and gradually narrowing it down." At the moment, toxicology is the main field in which metabolomics is used, but Hamer thinks he can see a shift

in application to studying target tissue to find disease markers. There is also scope to look at peripheral fluids, such as urine, blood and cerebral spinal fluid. The original interest in this platform is from pharmaceutical companies for safety assessment and drug discovery, but proteomics and genomics companies should not be far behind for use in systems biology.

While genomics and proteomics were led in the early days by academia, metabolomics is being driven by the need in the pharmaceutical industry to increase the attrition rate at the early stages of the drug development process, rather than the end, so that R&D costs can be kept relatively low.

One consequence of this is that much of the data being generated is likely to be kept proprietary by the industry. "It has now been realised that this data resource is valuable and so the information is not released, as companies have a commercial advantage by having and securing that knowledge," David Grace at Waters said. Hamer added: "Paradigm's main focus is to put the emphasis on data processing and technology. Every company will have a raw data file, it is how that data is processed that is company-specific. I do not see companies sharing proprietary data and Paradigm does not intend to freely share it." One nonprofit organisation, **SRI International** (Menlo Park, CA), has constructed a database called MetaCyc containing metabolites and metabolic pathways from literature and has now created an algorithm, which scans the sequence for the presence of gene homologues to predict pathways. The database will be available freely on the web, but the software used will be licensed. It is unlikely, however, that there will be any large scale consortia for metabolomics, like those seen for genomics, SNP analysis and proteomics.

Tempered by the current economic environment and the investments already being made in genomics and proteomics, the rise in metabolomics may be slower and of a lower profile than previous 'omics'. However, it can be expected that there will be a steady rise in metabolomic studies and the number of solutions targeting this area. *COB*

APPLIED GENOMICS

Genaera has a number of disease targets in pipeline

Biopharmaceutical company **Genaera Corp** (Plymouth Meeting, PA) has announced a number of drug targets entering Phase I and II clinical trials. The programmes focus on developing medicines from natural products on the basis of genomics of various cancers, respiratory diseases and anti-angiogenesis. "For a small company with limited investment, we are progressing rapidly into developing viable targets for a large variety of serious diseases," Roy Levitt, CEO of Genaera, told *Genomika*.

Levitt said: "We have discovered our first product in the area of angiogenesis for a molecule called squalamine, generated in the liver of sharks, which we discovered while looking for anti-infectors." Although there are many fat-soluble steroids from sharks, "this is the first water-soluble one with anti-angiogenesis action for treating lung cancer, and we are expecting clinical data later this year", he told *Genomika*.

On the genomics side of the business, Genaera utilised subtraction-hybridisation technology to discover IL-9 in collaboration with the **Ludwig Institute** (Melbourne, Australia). The company owns the IL-9 patent, which they believe controls the inflammation response in allergies, such as asthma. The company signed a \$55 million milestone agreement with MedImmune Inc (Gaithersburg, MA) for IL-9 in April 2001, to be initiated when the clinical programme begins in the second half of this year. Another programme has found an early stage genomics target for respiratory conditions such as bronchitis, sinusitis and cystic fibrosis (CF). "We are the first company to patent a channel involved in the blocking of mucus production called the HCLCI channel, which is entering Phase II and we expect data later this year," Levitt told *Genomika*.

Genaera is looking to partner with large pharmaceutical companies for the CF programme and hopes to create a next generation product as a high potency pill or antibody. Other ongoing programmes are in prostate cancer following a \$1.1 million grant from the US government, with Phase II results expected in mid 2004, and age-related macular degeneration in Phase I, due this year. Genaera currently has 18 employees, with \$9.5 million in the bank and a burn rate of \$500,000 per month, Levitt noted. *COB*

In brief

► Biotechnology company **AnGes MG Inc** (Tokyo, Japan) is developing the first human genome-based drug for arterial disease. The company recently obtained FDA approval to conduct the second phase of clinical trials for a Hepatocyte Growth Factor drug in America and Japan. **Daiichi Pharmaceuticals Co Ltd** (Tokyo, Japan) has acquired the global sales and marketing rights to the drug and is funding the research. AnGes plans to launch its first product onto the Japanese market by 2006, followed by the US and Europe in 2008. In a separate deal, AnGes has formed a collaboration with **Shimadzu Corp** (Tokyo, Japan) and Osaka University to use a HJV envelope vector to develop a high-speed method for studying gene activity and function. The partners will share IP rights.

► **Human Genome Sciences Inc** (Rockville, MD) has acquired a license from **Abgenix Inc** (Fremont, CA) to develop a fully-human monoclonal antibody to the CCR5 receptor for HIV. The company also announced it is advancing a number of products to the next stage of clinical development and expects to file up to three investigational new drug applications for novel compounds by the end of the year.

► **Roche Diagnostics** (Pleasanton, CA) has found its TaqScreen™ assay for detecting West Nile virus in blood can also detect other members of the Japanese encephalitis family. Roche has received US approval to begin clinical trials for West Nile virus detection and is the first and only company to introduce a fully automated testing system under an Investigational New Drug application into the blood screening market.

► **Ingenium Pharmaceuticals AG** (Munich, Germany) has discovered the underlying genetic and molecular basis in Motor Neurone Disease (MND) with an international coalition of German and British research centres. The research project identified two specific mutations in the same gene to produce a mammalian model of MND and discover the pathogenic link between gene mutations and progressive degeneration of motor neurons. The results are published in the journal *Science*.

► Pharmaceutical company **Prometheus Laboratories Inc** (San Diego, CA) announced it has launched the first genetic test that allows physicians to identify the cause of lactose intolerance. The PRO-GenoLogix™ Lactose Intolerance test identifies patients with a specific marker associated with lower than normal levels of the lactase enzyme. The company claims this will "allow physicians to individualise treatment of their patients by discerning whether they have a genetic basis for lactose intolerance," according to James Schoeneck, president and CEO of Prometheus. The blood test was due to be launched at Digestive Disease Week in Orlando, Florida this month.

► **Genomic Profiling Systems Inc** (Bedford, MA) has received a Phase I research grant worth almost \$120,000 from the US National Institute of Health to develop its MultiPath™ test. The test will scan for multiple biowarfare agents, such as smallpox, anthrax and botulinum toxin, at levels below existing tests. The MultiPath is a handheld device for point-of-care detection of multiple targets (see *Genomika* 3 (22) 2). Robert Linke, CEO of GPS, said: "In the future, this technology could fill an important healthcare need by bringing sensitive clinical tests into doctors' offices and other [point-of-care settings] for more immediate diagnosis and patient treatment."

► **Gen-Probe Inc** (San Diego, CA) has initiated a clinical trial to evaluate the performance of its TIGRIS™ system for clinical diagnostic testing. The trial will use Gen-Probe's APTIMA® Combo 2™ Assay, an amplified nucleic acid test, to detect sexually transmitted diseases, such as Chlamydia and Gonorrhoea, using clinical specimens.

APPLIED GENOMICS

ChondroGene to acquire GeneNews

Genomics based disease discovery and development company, **ChondroGene Ltd** (Toronto, Canada) is in negotiations to acquire **GeneNews Inc** (Ontario, Canada). In 2000, ChondroGene licensed in the osteoarthritis (OA) area GeneNews' technology for the detection of changes in gene expression in cartilage using a blood test. ChondroGene now believes the technology is important for pharmacogenomic and personalised medicine approaches to other disease areas. "We felt it is a very significant technology and have filed a patent for using it in OA. We are also in the process of filing patents for the platform encompassing a broader range of diseases," Bruno Maruzzo, corporate development at ChondroGene told *Genomika*. The technology was developed by Dr Choong-Chin Liew, founder of GeneNews and co-founder of ChondroGene.

"We hope to develop the technology either by ourselves or in collaboration with a biotechnology or pharmaceutical company," he told *Genomika*. The proposed buying price for GeneNews is C\$100,000 payable in cash and C\$2 million payable by the issuance of common shares. According to Mazurro, negotiations began in January this year should be completed soon after a shareholders meeting on June 16th. ChondroGene has recently closed a C\$2 million investment through private placement from existing and new investors.

ChondroGene's main collaboration to date is a two-year deal with Pfizer worth C\$7.5 million to identify and develop anti-arthritic compounds. ChondroGene also claims to have developed the first human cartilage specific cDNA microarray, ChondroChip™, to assess patterns in gene expression and identify biomarkers and therapeutic targets. *COB*

Panacea establishes diagnostics subsidiary

Genomic-based biopharmaceutical company **Panacea Pharmaceuticals Inc** (Gaithersburg, MD) has announced the formation of **Proteus Diagnostics Inc** to develop and commercialise in vitro diagnostics, including pharmacogenomic and pharmacoproteomic tools for cancer. "This new subsidiary will give us the flexibility to focus on product development along with allowing more pliability in securing partnerships down the road" Larry Glass, chief strategy officer of Panacea told *Genomika*.

Panacea has been developing products based on the enzyme human asparaginyl beta-hydroxylase (HAAH), which has been known to be over-expressed in 99% of 1,000 human cancer samples for the past four years. Following an agreement with MedImmune Inc (Gaithersburg, MD) in April 2002 to develop HAAH-based therapeutic agents for a variety of cancers, it was decided to create a separate division to carry the diagnostic programme forward, according to Kasra Ghanbari, president of Panacea. He claims the good thing about the MedImmune deal is that any data generated from it can also be used at Proteus. Ghanbari claimed that the company is "pretty far along" with the development of four diagnostic products. The first, a test for the detection HAAH in tissues, is ready for commercial

development, and will be followed by an ELISA test, an RNA assay and *in-vivo* imaging project.

For the moment Proteus will be indistinguishable from Panacea. "Separate companies emerging is dependent on financing aspects and interest from the industry. We hope to build up a product development team in Proteus by recruiting and will accommodate for space if needed" Ghanbari told *Genomika*.

Over the next two to four years Panacea intends to launch various commercial applications. "We are looking to complete our series C placement with the Cosmos Alliance and intend to move our diagnostics programme into the product development phase. We also plan to raise additional funds from equity financing, with the potential to enter into co-development or strategic partnerships for HAAH and other therapeutic programmes" Ghanbari concluded. Along with the oncology R&D area, areas in neurodegenerative diseases and Parkinson's are progressing and Panacea expects to have defined at least one compound candidate in both programmes by the end of the year along with having several promising candidates, pending pharmacological review.

"If we do go for FDA approval we would like to do it in conjunction with a manufacturing partner and intend to have another collaboration for the oncology programme by the end of the year" said Glass. At the moment Panacea has collaborations with Brown University, cancer researchers in South Africa and is in discussions with M.D Anderson Cancer Centre for lung cancer. The company also recently signed a one year renewable agreement with Olympus for validation of the MF20 molecular interaction analysis instrument. *COB*

In brief

► **Genaissance Pharmaceuticals Inc** (New Haven, CT) has announced the expansion of an agreement to license rights for a thiopurine S-methyltransferase (TPMT) diagnostic test to **Prometheus Laboratories Inc** (San Diego, CA). The expansion broadens Prometheus' exclusive rights from use in the thiopurine class of drugs for autoimmune and inflammatory diseases to a broader field of use. Genaissance acquired the technology through the closing of its acquisition of DNA Sciences (see *Genomika* 4 (7) 1). In addition, Genaissance and Prometheus are to collaborate on the identification of HAP™ markers in Prometheus' disease areas, which includes gastrointestinal, autoimmune and inflammatory disorders, with the aim of developing diagnostic tests for commercialisation by Prometheus.

► **Structural Bioinformatics Inc** (San Diego, CA) and **Geneformatics Inc** (San Diego, CA) have completed their previously announced merger and renamed the new organisation as **Cengent Therapeutics**. Ed Maggio, formerly CEO of SBI and now CEO of Cengent, told *Genomika*: "Essentially all of the technologies [of the previous businesses] are intact and functioning in the new company. We have expanded our external products and service offerings somewhat as a result of the combination, for example adding high-field NMR and automated proteome annotation services. Certain other technologies have been focussed upon our ongoing drug discovery programmes in diabetes, cancer and infectious diseases."

APPLIED GENOMICS

In brief

► **Seattle Genetics Inc** (Bothell, WA) has entered into an agreement to sell \$40 million of series A convertible preferred stock. The purchasers are JPMorgan Partners, LLC and Baker Brothers Investments, with additional money from Delphi Ventures and BA Venture Partners. Clay Siegall, president and CEO of Seattle, said: "The investment will provide us with additional capital to advance our ongoing clinical trials in SGN-30 and SGN-15, move our preclinical product candidate SGN-40 into the clinic and intensify our research and development initiatives."

► Toxicogenomic company **Phase-1 Molecular Toxicology Inc** (Laurel, MD) has entered into an agreement with **Affymetrix Inc** (Santa Clara, CA) to become a service provider for Affymetrix' GeneChip® microarray technology. Albert Li, CEO and president of Phase-1, said: "Adding service and support for Affymetrix' platform will enhance our business, allowing Phase-1 to be a comprehensive provider of genomics services to our clients."

► **Paradigm Genetics Inc** (Research Triangle Park, NC) has been issued a US patent for its Transposon-Arrayed Gene Knock-out® technology (TAG-KO). The platform provides methods for the rapid and systematic mutation of pathogenic fungi, enabling the identification of anti-fungal and fungicide targets along with biosynthetic and degradation pathways. This technology may lead to the development of new fungicides, human anti-fungal products and industrial products. John Hamer, CSO at Paradigm, said: "As the sequencing of more fungal genomes is completed, there is a growing need for versatile target validation, and we believe TAG-KO® is the best technology for these organisms."

► Molecular diagnostic company **Digene Corp** (Gaithersburg, MD) has announced the publication of the use of its Hybrid Capture® high-risk HPV DNA test™ technology in the British Journal of Cancer. A study in Germany combined Digene's test and a conventional Pap smear and found the former to have 100% sensitivity and 100% negative predictive value for screening cervical cancer. According to the study, a negative HPV test result, even in combination with a positive Pap result, virtually excluded any risk of underlying disease. However, a single negative Pap smear missed more than 50% of cases. Atilla Lorincz, CSO and senior VP of R&D at Digene said: "In a country like Germany, which has a high incidence of cervical cancer, using this test as a front-line screen for women aged 30 and over, gives clinicians the opportunity to potentially lower the prevalence of cervical cancer."

► **Genome Therapeutics** (Waltham, MA) and **BioMerieux SA** (Chemin de L'Orme, France) have announced the identification of genetic markers specific to 700 bacterial species. The companies started the joint research in 1999 for the development of infectious disease diagnostics and bioMerieux will use the information to develop assays for identifying medically-relevant bacteria. The findings were reported at this month's 103rd General Meeting of the American Society for Microbiology in Washington.

► Functional genomics company **Xantos Biomedicine AG** (Munich, Germany) has entered into an agreement with **Ardais Corp** (Lexington, MA) to access the Ardais BGR™ library of tissue samples for target validation. Xantos will use Ardais' tissue based products and services to validate targets for inflammatory and degenerative diseases using its XantoScreen™ technology.

► Biotechnology company **Oxagen Ltd** (Abingdon, England) has completed the analysis of DNA taken from over 2000 volunteers as part of the Procardis Consortium's study on the genetics of heart disease. The consortium was set up in 1999 to identify genetic loci that increase the risk of heart disease targets for cardiovascular medicines. The consortium is coordinated by the Department of Cardiovascular medicine at the Wellcome Trust Centre for Human Genetics, the University of Münster (Germany), Karolinska Institutet (Sweden), the Instituto Ricerche Farmacologiche Mario Negri (Italy), and research partners Oxagen and AstraZeneca. "At this stage the project is a database of nearly 3 million genetic fingerprints connected to the metabolic status and history of cardiovascular disease of each volunteer," said Mark Payton, CEO at Oxagen. The consortium has set a five-year timeline to complete blood collection, preparation of DNA samples, and the mapping, data analysis and interpretation of results from 2000 sibling pairs.

► **Sequitur Inc** (Natick, MA) has extended an agreement with **Proctor & Gamble Pharmaceuticals** (Cincinnati, OH) to access its functional genomics technology. Sequitur will perform biological screening and supply its proprietary antisense/RNAi compounds and methods to P&G for use in target validation studies as part of the multi-year agreement. The agreement will now include additional, undisclosed therapeutic areas.

► **Proteome Systems Ltd** (Sydney, Australia) is collaborating in a proteomics and glycomics research programme with clinical research firm **Iberica Co** (Kurume, Japan). Proteome systems will study proteoglycan changes associated with the progression and treatment of osteoarthritis on samples provided by Iberica.

► **Paradigm Genetics Inc** (Research Triangle Park, NC) has analysed genes set to enter the corn and soybean R&D testing pipeline at food biotechnology company, **Monsanto Company** (St Louis, MO). Using its Arabidopsisthaliana GeneFunction™ platform, Paradigm has identified genes that may affect agronomic traits, such as growth rate and stress resistance and expects to strengthen its relationship with Monsanto as a result.

► **GeneProt Inc** (Geneva, Switzerland) has announced the licensing of one therapeutic protein through a collaboration with **Novartis Pharma AG** (Basel, Switzerland). The protein is the first to be licensed by Novartis after it selected six further studies at the end of 2001. Financial terms were not disclosed.

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Start-up develops programmable lab-on-a-chip

Silicon Biosystems srl (Bologna, Italy), a company using its expertise in micro-electronics to develop microarrays for cell-biology applications, is seeking partners in the instrument industry to develop marketable products. "We are also looking to start a technology access programme for partners in the biotechnology and pharmaceutical industry, willing to pioneer the unique possibilities opened by this technology in cell-biology and single-cell handling," Dr Nicolò Manaresi, Silicon Biosystems' CEO, told *Genomika* during EuroBiochips 2003 last week.

The technology uses dielectrophoresis (DEP), a phenomenon that allows for the movement of neutral particles in response to a non-uniform electrical field, to control the movement of up to 10,000 particles individually

without the use of a fluid medium. A DEP 'cage' surrounds the particle, which can be moved under software control over a microarray containing over 100,000 embedded micro-sites that act as sensors or actuators. "We can move the cells without friction or collision and therefore avoid cell adhesion, and because we are not using any capillaries, there is no clogging of passages," explained Manaresi. He expects applications for the technology in cell sorting, drug screening and diagnostics.

"We hope to close our first financing round at the end of this year – having previously been funded via private sources – targeting a sum of about €3-4 million, and would like to introduce our first prototype during 2004," said Manaresi. The company currently employs eight people. *SF*

CombiMatrix

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with well established players in various markets, while concentrating on the R&D process and in-house drug development programmes.

A non-exclusive deal with Roche Diagnostics (see *Genomika* 2 (12) 1) covers the matriXarray Chip system in combination with an optical detection system, focused on the research market. "The Toppan agreement will benefit not only us, but potentially all of our partners. It will supply us with expertise how to adjust technologies into a high-throughput production process," said McShea.

McShea explained that it was in the interest of semiconductor manufacturers to make use of excess capacities, caused by the rapid development of new generation computer technologies, to amortise initial investment. "In addition, diversification – such as a move into the life science market – further reduces risk," he said. CombiMatrix has already established academic and industrial collaborations in Japan and runs its own office based in Tokyo. The company, which currently holds \$17 million of cash reserves, employs 71 people – four based in Japan – and "hopes to increase its presence in Europe", Kumar concluded. *SF*

People

► **EMILE SUTCLIFFE** has been released from his duties as CEO of **Tecan AG** (Männedorf, Switzerland) with immediate effect. The reasons for the departure were not disclosed. Michael Baronian, chairman of the Board, has assumed operative management of the company, until the appointment of a new CEO.

► **Orchid BioSciences Inc** (Princeton, NJ) has appointed **PAUL KELLY** as CEO, following the resignation of Dr **DALE PFOST** in December last year. Kelly previously co-founded Gemini Genomics.

► **MICHAEL FITZGERALD** has resigned from the Board of Directors of **Sequenom Inc** (San Diego, CA), highlighting the Board's failure to properly exercise its oversight function and to challenge management as a main reason for his departure.

► Dr **SANDRA STEINER** has assumed the position of R&D director at **Proteome Sciences plc** (Cobham, England).

► **JOE DONAHUE**, formerly VP of global life sciences and chemicals markets at **Spotfire Inc** (Cambridge, MA), has been appointed president of **LION bioscience Inc**, the US subsidiary of **LION bioscience AG** (Heidelberg, Germany).

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