

BIOPHARMICA LIMITED

Bridging Biotechnology Borders

Chairman's Letter

Our business strategy is to commercialise breakthrough biomedical research developed in universities, medical institutes and hospitals. Our portfolio approach offers shareholders exposure to a company with a portfolio of biomedical products, as we believe this markedly increases the opportunity for sustained share price performance.

BioPharmica is working to commercialise cancer research developed by Professor Peter Klinken and his team at the internationally recognised Western Australian Institute for Medical Research (WAIMR). The Institute is a venture involving the Royal Perth Hospital, Sir Charles Gairdner Hospital, Fremantle Hospital and the University of Western Australia. We intend to commercialise research into HLSS, a candidate tumour suppressor gene (a gene that allows cancer cells to grow uncontrolled when it is switched off or mutated). In recognition of it's potential in detecting and treating cancer, HLSS has previously attracted over \$1M in research funding.

BioPharmica is also partnered with Dr Benjamin Fry and Dr Viraj Nawagamuwa from Diagnostic Array Systems Pty Ltd (DAS) who are both world leaders in understanding the genetic structure of bacteria. BioPharmica is working with DAS to commercialise biotechnology that identifies which specific bacterium is causing a disease by using the genetic structure (DNA) of bacteria. In using bacterial DNA the testing process can be faster and much more accurate. Treatment is then more effective as drugs are prescribed sooner and for the specific bacterium causing the disease.

BioPharmica has been assessing a small number of biomedical applications since our listing and have now expanded our

portfolio. BioPharmica is also working with Swinburne University of Technology to develop a fibre optic probe to be used in biosensors for diagnostic testing and drug development. The SERS Probe technology is being developed to enable biosensors to use light as a method to detect and monitor biological and chemical targets on the microscopic tip of an optical fibre.

The company has also entered into an agreement with Cortical Dynamics Pty Ltd and Dr David Liley to develop new methods for monitoring the effects of drugs on the brain through brain electrical activity (EEG). Potential biomedical applications are in monitoring of patients under anaesthesia or sedation, drug development and neuro-diagnostics. Postoperative recall is a serious issue for patient care and anaesthetist liability. Reports indicate about 0.1% of patients undergoing general anaesthesia (20,000 in Australia last year) have some recall of the operation, ranging from doctors comments through to surgical manipulations or even pain.

BioPharmica is working to commercialise biomedical research developed by some of Australia's most highly skilled scientists.

Yours Sincerely,

D L Breeze
Executive Chairman



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"BioPharmica Outlines Commercial Directions"

Graeme O'Neill, Australian Biotechnology News

After raising AUD\$2.6 million from its August float, new Perth biomedical company BioPharmica (ASX:BPH) has been busy trawling Australian research waters for new intellectual property.

To date, BioPharmica had netted itself partnerships in a new electroencephalographic (EEG) tool to monitor the effects of drugs and anaesthetics on the brain, and a revolutionary new laser-based biosensor for diagnostic testing, drug development and environmental monitoring.

BioPharmica will have first call on a monoclonal antibody test for a promising new protein marker of breast, prostate and colorectal cancer, being developed by researchers at the University of Western Australia (UWA) and the Western Australian Institute for Medical Research (WAIMR).

The company's first commercial agreement was with a project with Diagnostic Array Systems (DAS) in Melbourne, to develop new, rapid DNA tests for differential diagnoses of dangerous bacterial infections with similar symptoms, such as pneumonia and Legionnaire's disease.

The tests, which are being developed by DAS founders Dr Benjamin Fry and Dr Viraj Nawagamuwa, both experts in bacterial genomics, will allow earlier diagnosis of and appropriate antibiotic treatment of potentially life-threatening bacterial infections.

The UWA-WAIMR cancer project involves a gene called HL55, identified by Prof Peter Klinken, of WAIMR's laboratory for cancer medicine, which appears to have tumour-suppressor activity.

The gene is down-regulated in some forms of breast, prostate and colorectal cancer, so the HL55 protein is a promising tool for diagnosing and characterising these cancers. Researchers are now searching international gene databases to determine if the HL55 gene is involved in other forms of cancer.

The project is developing a HL55 knockout mouse to determine whether loss of the gene results in increased susceptibility to cancer -- because loss of the gene is embryonically lethal, the mouse will be a conditional knockout.

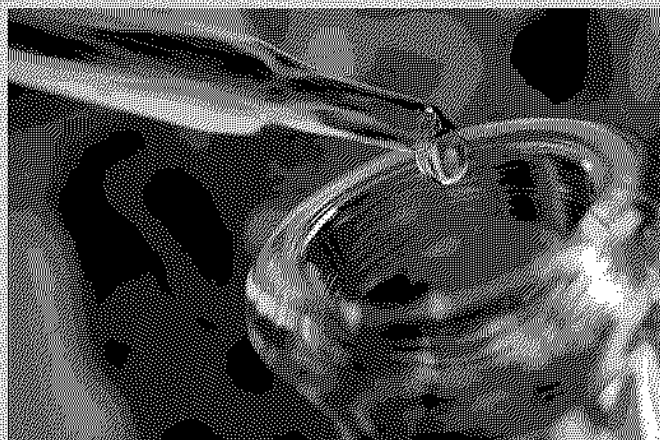
Late in September, BioPharmica signed a partnership with Melbourne's Swinburne University of Technology to commercialise an optical probe developed by Dr Paul Stoddart, of the university's Centre for Imaging and Applied Optics.

Stoddart's SERS (Surface Enhanced Raman Spectroscopy) sensor identifies inorganic and organic molecules, including proteins, from their unique patterns of vibrational emissions when they are energised by low-power laser light directed down an optical fibre.

Stoddart says that the SERS sensor is not limited by the specificity of conventional antibody-based biosensors, which detect only one target antigen. The SERS sensor can identify any molecule whose Raman-emission 'fingerprint' is stored in its database, and is potentially capable of identifying substances down to femtomolar concentrations.

The tip of the optical fibre is treated to adsorb and concentrate the analyte onto its surface, where it can be irradiated with laser light to induce Raman emissions.

"The major obstacle to the technology has been finding an efficient way to build sensitised surfaces on the tip of the optical fibre," Stoddart said.



"We're talking about a surface that is about 100 microns in diameter. It's very difficult to fabricate precise nanoscopic structures on such a tiny platform - many approaches have been proposed over the years, and failed.

"We've developed a simple fabrication technique that doesn't rely on the type of expensive lithographic equipment used in the microelectronics industry. It's simple and cost-effective, and we believe our solution will also resolve the problem of reproducibility, which has been a major barrier to implementing Raman spectroscopy.

"We have a potentially very flexible tool that could be used to probe a wide range of liquid or gaseous analytes.

Stoddart said the SERS sensor could find application in fields as diverse as forensics, water-quality monitoring, in vivo drug detection and monitoring, biosecurity and homeland security.

"We think that arrays of these sensors could also be used for drug discovery, or even in proteomics, as an alternative to mass spectrometry," he said.

BioPharmica will provide funding via a joint venture or company to further develop and commercialise the SERS sensor in partnership with Swinburne University, for which it will own up to a 52 per cent interest in the technology, as well as first and last rights over future funding.

The fourth of BioPharmica's partnerships is with another Swinburne spin-off, Cortical Dynamics, to develop its Brain Anaesthesia Response (BAR) Monitor, a new type of electroencephalograph that monitors and analyses the brain's electrical activity during anaesthesia, or after administration of sedative drugs such as opioids and benzodiazepines.

The BAR Monitor uses a new method of modelling brain waves to calculate a brain activity response (BAR) index, which indicates to a surgeon or anaesthetist how deeply a surgical patient is anaesthetised.

According to the company's press release to the ASX, globally, some 50 million surgical operations a year require general anaesthesia. About 0.1 per cent of patients -- equivalent to 20,000 in Australia last year -- have some recall of the operation, ranging from doctors' comments, through to surgical manipulations and even pain.

The BAR monitor will help anaesthetists maintain patients at the right level of unconsciousness, optimising the use of anaesthetics or drugs to reducing wake-up time and nausea, while minimising the risk of long-term, detrimental side-effects on cognition and memory.

BioPharmica is helping to fund the development of the BAR monitor, and hospital trials to validate its effectiveness.

"Swinburne Uni and BioPharmica Biotech Agreement"

ASX Release

BioPharmica has entered into an agreement with Swinburne University of Technology and Dr Paul Stoddart from the Centre for Imaging and Applied Optics to develop a fibre optic probe to be used in biosensors for diagnostic testing and drug development. The SERS Probe technology is being developed to enable biosensors to use light as a method to detect and monitor biological and chemical targets on the microscopic tip of an optical fibre.

- SERS (Surface Enhanced Raman Spectroscopy) results in reflections of laser light from a target containing vibrational energies unique to each compound in a sample, enabling scientists to identify the material.
- A biosensor is a device that detects, records, and transmits information regarding a physiological change or the presence of chemical or biological materials. Biosensors integrate a biological component with an electronic component to yield a measurable signal.

Biosensor device manufacturers have seen rapid growth with the 2003 worldwide market for biosensors at US \$ 7.3 billion. Analysts project ongoing growth with the market projected at US \$10.8 billion in 2007.

The commercial potential of SERS is recognised in its promise to revolutionize the biosensor industry, as its light scattering technique to detect and analyse at molecular levels makes it far more selective and accurate than conventional competing technologies.

Global attempts to develop a SERS capable fibre optic probe to be used in biosensors (such as the SERS Probe technology) have faced critical hurdles in commercialisation due to reproducibility (repeatability) issues and high cost of production.

When manufactured in high volumes SERS capable optical fibres have not been able to be produced with well-defined and uniform features, with the variation between microscopic fibres being too great. This creates a low level of reproducibility, which is unacceptable in manufacturing complex biosensors.

With increasing competition product cost has become a critical success factor, even for companies with high-quality items. Current processes to create fibre optics capable of acting as a SERS probe have a high cost of production and thus translate into a much more expensive end product.

The SERS Probe technology being developed by Dr Stoddart and his team at the Centre for Imaging and Applied Optics has the potential to overcome these critical issues and enable biomedical device manufacturers to rapidly expand their product development pipeline using SERS capable fibre optic probes.

At the outset BioPharmica has entered into an agreement to provide an initial \$130,000 in funding and assist in the development of the SERS Probe technology. Swinburne University will provide infrastructure and patent administration with Dr Stoddart leading technical development of the technology.

Subject to BioPharmica's satisfaction with progress of the SERS Probe project, funding will be provided into a joint venture or company structure to further develop and commercialise the technology. For its funding and development assistance BioPharmica will earn up to a 52% interest in the technology and will have first and last rights over future funding.

Managing Director David Breeze said, "Swinburne University of Technology has a long history and involvement in photonics and optical technologies, areas which underpin the discovery made by Dr Stoddart. Swinburne is an important player in Australian photonics and the Centre for Imaging and Applied Optics has a specialist focus on fibre sensors and optical materials."

The SERS Probe technology has a myriad of biomedical applications with the potential to provide biosensor companies with the capacity to rapidly grow and expand what is already an extremely large market.

Upon Dr Stoddart and his team creating the required data needed to prove the technologies reproducibility, biosensor companies can be approached to form alliances and partnerships for commercialisation.



"BioPharmica Debuts Creating Senior USA Links"

ASX Release



BioPharmica is pleased to announce that it has attracted senior United States business mentor and advisor, Mr Richard O'Connor to its advisory board.

Mr O'Connor has held executive roles for Alcoa Inc. Director – Corporate Development, Westinghouse Electric Director – Corporate Finance and PPG Industries Inc. Director - Corporate Development. In early 2003, Mr O'Connor worked with the Australian Federal Treasury on matters relating to proposed corporate governance legislation.

Mr O'Connor is also experienced in venture capital and high technology start-ups and had a successful early career in commercial and investment banking. He has led over \$1 billion in international acquisitions. In recent years, Mr O'Connor has provided strategic and mentoring roles to promising start-up companies based in the United States. He was a board member and general counsellor to the University of Pennsylvania technology start-up Scitefair International and a general counsellor to John Hopkins University start-up Reactive Nano Technologies.

Mr O'Connor was also an ad hoc consultant to the State of Maryland and the Maryland Technology Development Corporation reviewing government investment proposals including biotechnology (tissue engineering), microelectric components and specialty chemicals. For over 20 years, Mr O'Connor was a regular invited speaker at Merger and Acquisitions seminars conducted by KPMG/Peat Marwick.

Managing Director David Breeze said, "Mr O'Connor has corporate experience and networks within the United States of the highest calibre and we feel honoured that he has chosen to join BioPharmica's advisory board".

"Our company has a strong belief in the capability of the scientists working on our projects. We are very focused on building a strong multi-national team of Directors, management and advisory panel members to support and commercialise their innovations".

The company has also confirmed its intention for an options plan two months after the date of the listing enabling shareholders to purchase one option for every two shares held for a price of half a cent each, with a right to convert those options to normal shares for 20 cents (regardless of the share price) at any time over three years.

"BioPharmica Cancer Gene Progress"

ASX Release

A review of the HLSS Cancer Gene project being conducted with the University of Western Australia and the Western Australian Institute for Medical Research has recently been completed.

Recent research data has shown that HLSS potentially plays a role in the development of cancers other than breast, prostate and colorectal cancer. Data mining of global genetic databases and analysis work has commenced to define the different types of cancer where HLSS is down regulated.

The HLSS team is also seeking a monoclonal antibody to the HLSS protein, which will allow probing of the HLSS gene product. The monoclonal antibody will be a key achievement, as it will form the basis of a diagnostic tool for the HLSS protein.

Also in development at the Laboratory for Cancer Medicine (Western Australian Institute for Medical Research) are methods to enable an in-house screening program to define the correlation between HLSS levels and cancer.

In addition a screening program of cancer samples for the HLSS gene with other research institutions or commercial partners is being investigated.

The HLSS team has initiated the production of 'knockout mice' in conjunction with an Australian specialist in this area. These 'knockout mice' will have the HLSS gene artificially removed and will be bred to provide offspring that can be analysed to detect the impact of the presence/absence of the HLSS gene on the development of cancer-- it is suggested that mice lacking the HLSS gene will be more susceptible to the onset of cancers.

The first step of the process for generating the 'knockout mice' has been completed and our provider will submit updates at regular intervals. Although recognising the difficulties inherent in this process, the team is seeking to show that these genes can be 'knocked out' and result in viable offspring for analysis.

A further appointment strengthening the research capacity of the HLSS team has been made at the Laboratory for Cancer Medicine at WAIMR with an additional researcher assisting Professor Peter Klinken.

Managing Director David Breeze said, "The team is working to complete the research and produce the corresponding data required to define HLSS as a tumour suppressor gene and clearly outline its role in the development of cancer.

The Laboratory for Cancer Medicine is globally recognised for their expertise in cancer research and we are exceptionally pleased to be working with the research team led by a scientist such as Professor Peter Klinken."

"Brain Science Company Signs with BioPharmica"

ASX Release



Biomedical commercialisation business BioPharmica Ltd (ASX: BPH) has completed its second agreement since listing thereby expanding its portfolio of biomedical projects to a total of four.

BioPharmica has signed an agreement with Cortical Dynamics Pty Ltd and Dr David Liley to develop new methods for monitoring the effects of drugs on the brain through brain electrical activity (EEG). The technology has applications in the monitoring of patients under anaesthesia or sedation, drug development and neuro-diagnostics.

The launch product, the BAR Monitor, collects EEG signals and analyses brain electrical activity using a new method of modelling brain waves. The EEG signals are then used to calculate a BAR index which indicates to a surgeon how deeply anaesthetized a patient is. Surgical operations that require general anaesthesia is a large growing market, globally 50 million operations occur each year giving a recurrent market value of \$500M pa.

BioPharmica Managing Director David Breeze said, "BioPharmica has a portfolio approach to business strategy and is developing a number of biomedical products with a range of different markets and applications. As a listed commercialisation business BioPharmica intends to create value from licensing, profit share and trade sale agreements or IPO on an appropriate stock exchange. We have continued to assess a small number of biomedical opportunities introduced prior to our listing".

"Cortical Dynamics is an excellent addition to our portfolio with a full international patent pending, near term trials at a Royal Melbourne Hospital and the capacity to make an expedited FDA application".

Cortical Dynamics Managing Director Louis Delacretaz said, "Postoperative recall is a serious issue for patient care and anaesthetist liability. Reports indicate about 0.1% of patients undergoing general anaesthesia (20,000 in Australia last year) have some recall of the operation, ranging from doctors comments through to surgical manipulations or even pain. For many of the extreme cases the experience produces long term detrimental effects.

"The Brain Anesthesia Response Monitor is being developed to assist an anesthetist to maintain patients at the right level of unconsciousness. It helps doctors to fine tune the amount of drugs applied, to ensure patients do not wake up unexpectedly whilst minimizing side effects from excessive drug use during the operation and reducing recovery time and its possible nausea."

The BAR Monitor has been successfully validated in the laboratory with a sedative dose (1mg of Xanax – alprazolam) and data from typical operations using sevoflurane, nitrous oxide and opioids. Cortical Dynamic's scientists

have experimentally verified an important mechanism linking the site of benzodiazepine drug action in the nervous system to the subsequent changes in the brain's activity.

BioPharmica will provide assistance and funding for product development and the completion of hospital trials to validate the effectiveness of the BAR Monitor. Ethics approval has been received for an initial trial to be conducted at Royal Melbourne Hospital. The trials will be focused on anaesthetic agents that competitive products cannot detect properly.

The technology was invented by Dr David Liley, a researcher and senior lecturer in Biophysics and deputy director of the Centre for Intelligent Systems and Complex Processes at Swinburne University of Technology. The BAR index developed by Dr Liley operates through detailed understanding of the physiological mechanisms that generate EEG. This creates potential for the BAR Monitor to display data in one-second intervals as opposed to thirty seconds and to be far more sensitive and accurate than current systems.

Preliminary tests have shown that unlike competitive products, the BAR Index is able to detect the effect of all classes of agents and works on all subjects.

The BAR Monitor is one of four potential applications of the technology. The intellectual property also has potential biomedical applications in drug discovery and evaluation, intensive care monitoring and neuro-diagnostics.

BioPharmica has the right to earn up to 52.50% equity in the Cortical Dynamics through several stages. An initial \$275,000 in funding will assist a validation trial at Royal Melbourne Hospital and to gain FDA approval in the United States. Subject to BioPharmica's satisfaction with progress it has the right to provide or procure up to a further \$675,000 to commence domestic product sales and conduct hospital trials in the United States. The agreement is subject to BioPharmica's satisfaction with due diligence.

Dr Liley will lead development of the technology whilst Mr Louis Delacretaz will oversee business operations and serve as a Director to the board. Additional directors will be Dr Ian Smart, a Deputy Director of Information City, and Dr Bruce Whan, CEO of Swinburne Ventures and chairman of INNOVIC (both shareholders in Cortical). Mr David Breeze from BioPharmica will be appointed Chairman of the company.

Dr Liley has been involved for many years in developing theoretical models that attempt to describe the underlying basis of rhythmicity in the electroencephalogram. His work has been reported on widely in the specialist and popular media, which have included ABC Quantum, New Scientist and the American Institute of Physics Science News Update. He is registered as a medical practitioner within the State of Victoria and has a PhD in Psychiatry and Applied Mathematics. Dr Liley has a number of ongoing research collaborations including brain imaging techniques with the Department of Radiology at UCSF and the mechanisms of anaesthesia with the Department of Anaesthesia at Royal Melbourne hospital and EG) measures of brain activity was topic chair for Computational Modelling within the Neuroengineering track at the World Congress on Medical Physics and Biomedical Engineering.

Louis Delacretaz has extensive skills in successfully managing small to medium high technology companies. His 25 years experience has included a broad range of firms from electronic manufacturing to telecommunications infrastructure providers. Mr Delacretaz has successfully converted a number of R&D projects into commercial products and is experienced in supplying products into highly regulated markets.

Mr Delacretaz said, "Cortical Dynamics looks forward to working with the team at BioPharmica to commercialise this current and future applications"

"BioPharmica Prototype and Pilot Test" ASX Release

Development of the DAS biotechnology has advanced to the prototype and pilot testing and commercialisation stage milestone for the company.



The biotechnology is being developed with Dr Fry and Dr Nawagamuwa from Diagnostic Array Systems Pty Ltd (DAS) to diagnose infectious diseases in a patient's sample using the DNA of bacteria.

Dr Fry said, "we have now completed laboratory work showing a capability to enable faster and much more effective diagnosis of diseases caused by bacteria. We are now ready to complete the product prototype and commence pilot testing with pathology laboratories".

"Current methods of diagnosing a patient with a disease caused by bacteria are notoriously unreliable. Pathology laboratories have great difficulties in identifying bacterial pathogens for Doctors and therefore the most effective treatment cannot be prescribed".

"Our aim is to improve the treatment of patients with infectious diseases by providing pathology laboratories and hospitals with effective diagnostic tools that incorporate our DAS biotechnology".

DAS intends to commence prototype and pilot testing once funding and laboratory agreements have been finalised over the next few weeks and program scale is determined.

The first product release of the DAS biotechnology will be a diagnostic test for lung disease, a leading cause of death.

It is not anticipated that either FDA approval in the United States or TGA registration in Australia will be required for the DAS lung disease diagnostic, providing the opportunity for an expedited entry into the market.

Upon completion of prototype and pilot testing the company intends to fine tune the product and commercialise through licensing, direct sales or distributorships.

The DAS biotechnology is targeted towards solving critical deficiencies in the diagnosis of human diseases caused by bacteria. Current diagnostic methods limit the ability of pathology laboratories to provide doctors with timely and clinically relevant information. Products are being developed as diagnostic tools to detect bacteria by its DNA rather than by growing culture, therefore results are far more accurate and reliable and can be provided in hours rather than days or weeks.

BioPharmica Managing Director David Breeze said, "The prototype and pilot test will provide feedback of the product in commercial settings, thus the development of the DAS biotechnology has advanced to a very critical stage".

"Antibiotic resistance and the limitations of current methods are impacting heavily on patient treatment and costs to the health system. Dr Fry and Dr Nawagamuwa should be commended on their research into the genetic structure of bacteria as their discovery has the potential to dramatically improve the diagnosis and treatment of people with infectious diseases."

"Although diagnosing lung diseases is the first application, the product range can potentially be expanded quite quickly to a wide range of infectious diseases," said Mr Breeze.



About BioPharmica Ltd

BioPharmica is a biomedical commercialisation business partnering with universities, medical institutes and hospitals and is listed on the ASX under the (Code: BPH).

Project Portfolio

Cancer Detection and Treatment

Bacterial DNA Diagnostics

Optical Fibre Diagnostics

Patient Monitoring During Surgery

Collaborators

WAIMR Laboratory for Cancer Medicine
& University of Western Australia

Diagnostic Array Systems & Dr Fry,
Dr Nawagamuwa

Swinburne University of Technology

Cortical Dynamics & Dr Liley

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