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“Brain Science Company Signs with BioPharmica”

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 Anaesthesia Response Monitor* is being developed to assist an anaesthetist 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 electro-encephalogram. 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"

David Breeze

Managing Director
BioPharmica Ltd

About BioPharmica Ltd

BioPharmica is a biomedical commercialisation business partnering with universities, medical institutes and hospitals. Existing product development is targeted at the billion dollar markets for the detection and treatment of breast, prostate and colorectal cancers, the effective diagnosis of infectious diseases caused by bacteria and biosensors for diagnostic testing and drug development.

The Company is working with the University of Western Australia and Professor Peter Klinken from the Laboratory for Cancer Medicine at the Western Australian Institute for Medical Research. The Institute combines the Royal Perth Hospital, Sir Charles Gairdner Hospital, Fremantle Hospital and the University of Western Australia.

BioPharmica is also partnered with Dr Benjamin Fry and Dr Viraj Nawagamuwa from Diagnostic Array Systems Pty Ltd who are both world leaders in the genetic structure of bacteria. Products are being developed to identify which specific bacterium is causing an infectious disease (such as pneumonia or legionnaires 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.

The company is also working 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 a biosensor using light as a method to detect and monitor biological and chemical targets on the microscopic tip of an optical fibre. The *SERS Probe* technology has the potential to enable biomedical device manufacturers to rapidly expand their product development pipeline using SERS capable fibre optic probes.