BioX@Science Park

28 April 2008 (Monday)

0930 Registration

0940 Welcoming Remarks

0945-1100 Therapeutics Sessions

0945 Production, Applications and Commercialization of Recombinant Human Epidermal Growth Factor [(1)] – by WK Wong

1000 Production of Biologically Active Human Recombinant Insulin-like Growth Factor-I and Human Insulin-like Binding Protein-3 in Transgenic Rice for the Management of Diabetes, Obesity, Cancer and their Related Diseases [(2)] – by Peter CY Tong

1015 Development of a Small-molecule as a Cancer Drug for Management of Liver Cancer [(3)] – by John WS Ho

1030 Design, Synthesis and Characterization of Flavonoid Dimer in Reversing Drug Resistance in Cancer [(4)] – by Larry Chow

1045 Biomedical Innovations from the Applied Genomics Centre of HKUST [(5)] – by Hannah Xue

1100-1115 Commercialization Successful Case Sharing

"Bringing DNA Diagnostic Technology to Society" - by Lawrence Tzang, Genetel Pharmaceuticals Ltd

1115-1130 Tea Break and One-to-One meetings (presentations 1-5) till 1315

1130-1145 Venture Capital Leadership Presentations – by Bill Guo, Venturepharm Laboratories Ltd

1145-1300 Medical Devices and Diagnostics Sessions

1145 Smart Metallic Materials for Novel Spinal Implant [(6)] – by Kelvin Yeung

1200 Zebrafish Research Spurs Drug Development [(7)] – SH Cheng

1215 Use of SCN2A Gene Polymorphisms to Predict Anti-epileptic Drug Response [(8)] – by Patrick Kwan

1230 PolyJbot – An Interactive Therapeutic Robotic System [(9)] – by Wallace Leung

1245 Smart Therapy [(10)] – by Wallace Leung

1300-1315 Commercialization Successful Case Sharing

"Hong Kong DNA Limited – A Case Study" - by Paul Cheung, Technology Transfer Office, The University of Hong Kong

1315-1415 Lunch and One-to-One meetings (presentations 6-10) till 1545

Organizer: Hong Kong 香港科技園 Science & Technology Parks

Co-organizers:

1415-1430 Venture Capital Leadership Presentations – by Ren Jun, NewSummit Biopharma

1430-1545 Regenerative Medicine and Chinese Medicine Sessions

1430 Novel Approach for Normal Cell Expansion [11] – by CK Choo
1445 Hematopoietic Stem Cell-based Blood Bioreactor [12] – by YY Wang
1500 The Intersection of Nanotechnology and Healthcare - CNS Regeneration, Hemostasis and the Future of Nanomedicine [13] – by KF So
1515 Cell and Biomaterial-based Technologies for Regenerative Medicine [14] – by Barbara Chan
1530 Rhizoma Chuangxiong Extracts and Methods of Using the Same [15] – by Ge Lin

1545-1700 Tea Break and One-to-One meetings (presentations 11-15) till 1700

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Venture Capital Leadership Speakers

Dr. Bill Guo

Venturepharm Laboratories Ltd
Chairman and CEO

Venturepharm is the largest global provider of pharmaceutical development service in China. Venturepharm provides full service of drug discovery and development that take new drugs from "Idea to patients". These include API (Active Pharmaceutical Ingredient), formulation development, clinical trial, product registration, marketing & sales to pharmaceutical distributors and patients in China and overseas.

Listed as a Hong Kong public company (8225), Venturepharm (China) has experienced dramatic success since its inception in 1999. Powered with 7 of VSmart® technology platforms, it has over 400 non-patent infringed products approved, or pending. In addition, 6 of NCEs (new chemical entities) are at preclinical stage. These products encompass over 13 major therapeutic areas.

In 2004, Venturepharm was valued by FORTUNE magazine as one of the five most promising companies in China. Since 2000, Venturepharm has achieved revenue CAGR of 133% and EPS CAGR of 383% annually.

Dr. Ren Jun

NewSummit Biopharma
President

NewSummit Biopharma is an innovative biopharmaceutical R&D group consisting of following member companies:

- The Delaware US-based Newsummit Holding Company
- Shanghai Newsummit Biopharma R&D Co., Ltd.
- Shanghai Newsummit Biopharma Co., Ltd.
- Shanghai Urban Newsummit Pharma Co., Ltd.
- Dalian Newsummit Biophama Technology Services Co., Ltd.

Newsummit is currently seeking public listing on the NYSE, which will help the Company launch an international biopharmaceutical R&D services platform aiming at a global outreach.

Newsummit positions itself as a CRO+ organization i.e. a CRO service provider with project-based investment function. The Company not only provides professional CRO (Contract Research Organization) services, but also invests in and conducts joint biopharmaceutical R&D projects with its collaboration partners.

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Commercialization Successful Case Speaker

Dr. Lawrence Tzang

Genetel Pharmaceuticals Ltd.
Business Development Manager

"Bringing DNA Diagnostic Technology to Society"

The Applied Research Centre for Genomic Technologies of City University of Hong Kong, under the leadership of Professor Michael Yang, has broken new grounds in the fast screening of cervical cancer and detection of the *Human Papillomavirus* (HPV) DNA using a proprietary DNA diagnostic technology SNIPER™ platform. Adopting HPV testing as the cost-effective new standard for cervical cancer screening, Professor Yang's technologies have made its way to local and overseas hospitals, government organizations, insurance and other healthcare providers. His achievements have received ample recognition as evidenced by the numerous awards he has won, for instance, the 2006 Hong Kong Awards for Industries (Technological Achievement Grand Award), and the Bid Awarding Notice of Guangdong-Hong Kong Joint Key Technologies. The DNA-based diagnostic products are commercialized and registered in SFDA of China and with CE mark through a CityU's spin-off company known as Genetel. Professor Yang has generated an intellectual property portfolio of 32 patents / patent filings in China and USA. Dr. Lawrence Tzang will present on behalf of Prof. Michael Yang in BioX@Science Park.

Dr Paul Cheung

Technology Transfer Office of the University of Hong Kong
Director

"Hong Kong DNA Limited – A Case Study"

Details are to be confirmed.

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Technology Information

1. Production, Applications and Commercialization of Recombinant Human Epidermal Growth Factor

Medically important biomolecules such as human growth factors and industrial enzymes including cellulases are examples of valuable proteins that are produced as naturally secreted products. Since these proteins usually exist in small quantities in their native environments, purification of them for commercial applications is not economically feasible. The advent of recombinant DNA technology and the availability of novel approaches to gene expression have enabled cost-effective production of these proteins in bacterial hosts on a large scale. The group at the Hong Kong University of Science and Technology has been interested in the production and applications of recombinant growth factors in cosmetic and skincare industries. We have focused our efforts on large-scale production of human epidermal growth factor (hEGF) and human basic fibroblast growth factor, which are important proteins promoting cell growth of our skin. However, the expensive prices of these proteins, each of which amounts to millions of HK$ for a gram, have discouraged their prevalent applications. In attempting to produce these proteins at affordable prices, we have developed novel microbial systems to efficiently express these proteins as extracellular recombinant products. Production of heterologous proteins by extracellular production (excretion) has many advantages over the traditional intracellular approach, including reduction of proteolysis, decrease in contamination by host proteins and formation of biologically active products. In this presentation, an Escherichia coli excretion system engineered for efficient production of hEGF will be discussed. In addition, commercial applications of the recombinant hEGF resulting from the E. coli extracellular approach will be introduced.

For more information, please contact Dr Rocky Law, Technology Transfer Center of The Hong Kong University of Science and Technology (T: (852)2358-7906; Email: rockylaw@ust.hk)

2. Production of Biologically Active Human Recombinant Insulin-like Growth Factor-I and Human Insulin-like Binding Protein-3 in Transgenic Rice for the Management of Diabetes, Obesity, Cancer and their Related Diseases

Diabetes mellitus is a common chronic disease affecting more than 10% of our population and will lead to devastating complications. Abnormal growth hormone/ insulin-like growth factor-I regulation contributes to the deterioration in glycaemic control in patients with insulin deficiency. Treatment with recombinant human insulin-like growth factor I (rhIGF-I) has been shown to reduce plasma glucose and insulin doses in both type 1 and type 2 diabetic patients. Recently, it has been demonstrated that co-administration of rhIGF-I with recombinant IGF Binding Protein 3 (rhIGFBP-3) can reduce the side effects without affecting the therapeutic efficacy. In addition to its high-binding activity to IGFs, IGFBP-3 has been found to negatively regulate cell proliferation and induce apoptosis in an IGF-independent manner. This may be an attractive feature in the potential development of IGFBP-3 as an anticancer agent. An efficient bioreactor platform for mass production of rhIGF-I and rhIGFBP-3 in transgenic rice has been identified. Results showed that transgenic plants can be developed as bioreactor for the synthesis of hIGF-I and hIGFBP-3 and the plant-produced recombinant proteins were biologically active.

For more information, please contact Mr Billy Lam, Technology Licensing Office of The Chinese University of Hong Kong (T: (852)2609-8882; Email: billylam@cuhk.edu.hk)

3. Development of a Small-molecule as a Cancer Drug for Management of Liver Cancer

One of the major glucosinolates that is present in seeds of a herbal medicine showed unmatched anti-cancer properties in liver cancer in rats. Our study involved investigation of their potential therapeutic benefits both in vitro in human normal liver and cancer cell lines. In vivo study with rats with liver cancers was studied after treatment of rats via oral administration of the compound for two years. In vitro treatments of HepG2, Clone 9 and WRL-68 cell lines with the compound were performed in a time-course study. Results showed that the small-molecule inhibited the growth of the cancer cell line but showed almost no toxicity to the normal cells. Cell cycle analysis demonstrated that the growth of treated HepG2 cells were inhibited by G0/G1 phase arrest mechanism, and DNA fragmentation confirmed the apoptotic event. The present findings clearly showed that some of the small-molecules identified can inhibit cancer cell growth by inducing G0/G1 phase arrest and subsequently apoptosis. It has protective and therapeutic benefits to the liver in vivo.

For more information, please contact Mr Billy Lam, Technology Licensing Office of The Chinese University of Hong Kong (T: (852)2609-8882; Email: billylam@cuhk.edu.hk)

4. Design, Synthesis and Characterization of Flavonoid Dimer in Reversing Drug Resistance in Cancer

Multidrug resistance (MDR) mediated by P-gp is a major problem in cancer chemotherapy. We are interested in developing an effective and safe MDR modulator that can be used clinically to reverse MDR in cancer patients. A promising family of compounds as MDR modulators is the flavonoids because flavonoids have generally low toxicity. We have synthesized a series of novel flavonoid dimers and demonstrated that they can reverse MDR in human cancer cells in vitro. Several compounds have an EC50 at nanomolar range, which is comparable to that of the most potent MDR reversing agents available.

For more information, please contact Ms Idy To, Partnership Development Office of The Hong Kong Polytechnic University (T: (852) 3400-2808; Email: pdidy@inet.polyu.edu.hk)

5. Biomedical Innovations from the Applied Genomics Centre of HKUST

GABA-A receptor based disease gene and drug discoveries relating to neuropsychiatric disorders as the foundation for biotech development.

For more information, please contact Dr Rocky Law, Technology Transfer Center of The Hong Kong University of Science and Technology (T: (852)2358-7906; Email: rockylaw@ust.hk)

6. Smart Metallic Materials for Novel Spinal Implant

A medical condition that causes sideways curving of the spine, scoliosis presents a serious health threat to patients, who must undergo spinal correction surgery that may lead to bone fractures and muscle injury. In spinal correction surgery, vertebrae are re-aligned manually and the spine is held in place by titanium-nickel or steel implants. However, the peripheral spinal tissues may be torn if the correction force exceeds the malleability of the tissues. Another threat is that nickel, the raw material of spinal implants, is toxic, and may leak into patients' bodies. Dr Kelvin Yeung, alongside his research team, has revolutionized spinal correction surgery by introducing a novel implant material that makes the surgery safer and more effective. A super-elastic alloy is developed that can achieve an impression 90 percent correction without damaging the spinal tissues. To deal with the problem of nickel leakage, Dr Yeung uses plasma surface modification technology that can "seal in" the toxic substances inside the titanium-nickel implants. The technology has filed four patents with one granted.

For more information, please contact Dr Eric Chan, Technology Transfer Office of The City University of Hong Kong (T: (852)3442-6822; Email: eric.thechan@cityu.edu.hk)

7. Zebrafish Research Spurs Drug Development

Drug screening and development is extremely costly and, therefore, it is essential to screen out possible side effects of drug leads at the pre-clinical stage. One possible solution is to introduce in vivo whole-organism screening tests as early as possible. Transparent zebrafish embryos, easy to reproduce inexpensively, provide a suitable environment for early in vivo screening tests. The amount of substance to be administered in this fish assay is minuscule, compared with those of mouse and fruit flies. In addition, scientists can manipulate the embryos physiologically or genetically in order to assess the potency of the drug leads applied. The use of zebrafish embryos not only lowers costs, but also spurs the development of drugs that can cure cardiovascular diseases and cancer. For instance, to develop drugs capable of curing cardiac diseases and cancer, Dr Cheng tested more than 1500 agents on their efficacy to inhibit or promote the formation of new blood vessels using fish embryos. Various leads have been identified.

For more information, please contact Dr Eric Chan, Technology Transfer Office of The City University of Hong Kong (T: (852)3442-6822; Email: eric.thechan@cityu.edu.hk)

8. Use of SCN2A Gene Polymorphisms to Predict Anti-epileptic Drug Response

Anti-epileptic drugs (AEDs) are currently the mainstay of treatment of epilepsy. There are a variety of AEDs, which can often very effectively prevent seizures. However, many patients only respond to some AEDs but not to others, and it is difficult to predict which AEDs will work for which patients on an individual level, drugs must often be tested one-after-another in each patient until an effective AED is found. This trial-and-error process exposes patients to the risk of side effects which each drug possesses, and extends the period during which patients risk suffering seizures. AEDs act via different mechanisms of action to enhance attenuation of excitation and/or facilitation of inhibition of neurotransmission. One class of AEDs is believed to act by blocking the repetitive firing of neuronal voltage-gated sodium channels, which are responsible for the upstroke of the neuronal action potential and ultimately control the intrinsic excitability of the nervous system. We have discovered associations of SCN2A polymorphisms with effectiveness of the above class of AEDs in epilepsy patients. A test which genotypes these or associated polymorphisms in epilepsy patients could help doctors decide whether or not to prescribe this class of AEDs in each patient.

For more information, please contact Mr Billy Lam, Technology Licensing Office of The Chinese University of Hong Kong (T: (852)2609-8882; Email: billylam@cuhk.edu.hk)

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9. PolyJbot – An Interactive Therapeutic Robotic System

A newly developed interactive robotic system uses the measured EMG signal as an indication of intent of patient to drive the robot in effectively rehabilitation training for post-stroke patients. The robot can train either upper limb (arm or wrist) or lower limb (knee or ankle). Changing from arm to wrist or knee to ankle, and vice versa can be effect by a switch. The interface with user is further enhanced through interactive computer gaming. Patients with 20 training sessions have proven to regain their strength, flexibility, and plasticity. This new unit, which is ready for licensing, can be implemented in physiotherapy in hospitals, elderly home, fitness centre (for sports-injured).

For more information, please contact Ms Idy To, Partnership Development Office of The Hong Kong Polytechnic University (T: (852) 3400-2808; Email: pdidy@inet.polyu.edu.hk)

10. Smart Therapy

The smart therapy device, ready for licensing, uses the latest sensing technologies to profile the temperature, pressure and muscle swollenness as an indication on pain and inflammation so that electrical stimulation can be applied ahead of time to reduce pain intensity and duration. Further the optimal stimulus is better than conventional electrical stimulus devices available in the market. The light-weight portable Smart Therapy can be applied to back/neck pain, shoulder pain, chronic pain, aching joints, arthritis and sports injuries. A new drug-release option will be incorporated in the Smart Therapy new version, available later in the year, that releases herbal extract, proven drugs and new drugs in combination with the already superior smart electrical stimulation device.

For more information, please contact Ms Idy To, Partnership Development Office of The Hong Kong Polytechnic University (T: (852) 3400-2808; Email: pdidy@inet.polyu.edu.hk)

11. Novel Approach for Normal Cell Expansion

Cell-based research, cell therapy and tissue engineering have become a reality in modern medicine today; however large volume of normal cells is needed for these purposes. Normal cells have a finite lifespan in culture and cannot be propagated in culture for extended period of time to achieve the desire quantity, hence, limiting their feasibility in these applications. The Company has developed a patent pending technology that can scale up the production of various somatic and stem cells in feasible quantities. Market intelligence estimated that the worldwide market for cell-based research to be around US$2 billion, and the market for cell therapy and tissue engineering to be around US$110 billion in year 2010. The Company is planning on entering into this market by licensing its technology to biotech companies that are already in the cell-based research, cell therapy and tissue engineering sectors. It needs US$5 million capital infusion to conduct more experiments to broaden its claims in the patent, and the commercialization of the technology in the next 3 years. Revenue will be generated through upfront payments, yearly licensing fees and royalty from sales of the licensee companies. The Company is expected to have a net income of US$5 million, US$11 million, and US$31 million in year 3, 4 and 5 respectively.

For more information, please contact Dr CK Choo of Immocell Ltd (T: (852)3621-1399; Email: ck_choodr@yahoo.com)

12. Hematopoietic Stem Cell-based Blood Bioreactor

The demand of therapeutic recombinant proteins is keep growing fast. However, the global pharmaceutical manufacturers show severe shortage of recombinant protein production capacity in some hard-expressed and translationally modified proteins. The shortage of production capacity and the high costs in the current platforms result in the high price of these protein products (for example, the yield of recombinant coagulation factor VIII is only ~1mg/L in cell culture fermentor, which results in the price over US$4000000/gram), the medicines usually are unaffordable for most of patients.

Bikophy Gene Engineering Co. Ltd's leading technology is a hematopoietic stem cell-based blood (red cell) bioreactor, particularly well suited to enabling cost effective development of recombinant proteins in a shorter development time and low cost. We can use this cost effective manufacturing to produce the therapeutic and non-therapeutic recombinant proteins in an industry scales with a competitive price.

For more information, please contact Ms Carly Chan of Bikophy Gene Engineering Co. Ltd (T: (852) 9177-8353; Email: In_bikophy@hotmail.com)

13. The Intersection of Nanotechnology and Healthcare - CNS Regeneration, Hemostasis and the Future of Nanomedicine

Nanotechnology is often associated with materials fabrication, microelectronics, and microfluidics. The intersection of nanotechnology and healthcare is rapidly taking center stage, and the fruits of this marriage are on the visible horizon. While nano biomedicine has led to wildly futuristic promises, it has also presented real breakthroughs in drug research, development and formulation, as well as in the field of diagnostics. We will explore two very different breakthroughs: the first is the use of nanotechnology to repair the brain and show return of function. In order to achieve axonal regeneration after injury in the central nervous system several formidable barriers must be overcome, such as scar tissue formation after tissue injury; gaps in nervous tissue formed during phagocytosis of dying cells after injury and the failure of many adult neurons to initiate axonal extension. Using the mammalian visual system as a model, we report that a designed self-assembling peptide nanofiber scaffold creates a permissive environment not only for axons to regenerate through the site of an acute injury, but also to knit the brain tissue together. In experiments using a severed optic tract in the hamster, we show that regenerated axons reconnect to target tissues with sufficient density to promote functional return of vision, as evidenced by visually elicited orienting behavior. The peptide nanofiber scaffold not only represents a new nanobiomedical technology for tissue repair and restoration, but also raises the possibility of effective treatment of central nervous system and other tissue or organ trauma. The second is the creation of a nano hemostatic agent that promptly stops bleeding. Both of these developments represent significant nanobiomedical advances that hold great promise in treating human conditions in the foreseeable future.

For more information, please contact Dr Andrew Chan, Technology Transfer Office of The University of Hong Kong (T: (852)2299-0155; Email: andrew@versitech.hku.hk)

14. Cell and Biomaterial-based Technologies for Regenerative Medicine

Details are to be confirmed.

For more information, please contact Dr Andrew Chan, Technology Transfer Office of The University of Hong Kong (T: (852)2299-0155; Email: andrew@versitech.hku.hk)

15. Rhizoma Chuangxiong Extracts and Methods of Using the Same

This invention encompasses the identification of the principle components of Rhizoma Chuanxiong that are responsible for the vasodilatory, anti-platelet and anti-thrombotic effects. Its synergistic actions in these areas are explored and a proper dosage, with predetermined ratios of these ingredients, is designed for the treatment and prevention of angina pectoris and other related cardiovascular diseases. An extraction method is custom designed to maximally extract the active components from the herb. A sublingual dosage form is prepared to deliver this herbal extract to an animal or a human subject.

For more information, please contact Mr Billy Lam, Technology Licensing Office of The Chinese University of Hong Kong (T: (852)2609-8882; Email: billylam@cuhk.edu.hk)