

OSLO BIO UPDATE

A newsletter from Oslo Teknopol covering activities in the life science cluster in the Oslo region

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BIONOR OFFERS

RAY OF HOPE IN HIV MARKET

At the recent AIDS2008 conference in Mexico City, one of the few positive pieces of news for the continually growing number of AIDS sufferers worldwide was provided by Oslo-based Bionor Immuno. The company took the opportunity at the world's largest ever AIDS conference with over 27,000 delegates to announce its therapeutic vaccine candidate Vaxx-4 is entering into a pivotal Phase IIb global trial.

With around 345 patients this will be the largest ever and aims to confirm the evidence from previous trials that Vaxx-4 boosts patient immune systems sufficiently to enable them to come off Haart therapy for up to three years. This is important in the developed world because patients with access to Haart therapy are living longer and thus becoming susceptible to other diseases. In the developing world, where access is still limited and compliance difficult, it could be a life saver. It would also help alleviate the still considerable adverse side effects of current drugs, which can include problems with the heart and liver, diarrhea, nausea and fat loss. Furthermore, results from the trial could be available as early as the end of 2009. More at page 6.



Photo: Scanpix

INAUGURAL KAVLI PRIZES AWARDED

In a grand ceremony at the Oslo Concert Hall on 9 September, Norway's Crown Prince Haakon Magnus presented the inaugural Kavli Prizes in nanoscience, neuroscience and astrophysics to seven laureates from three continents. The million-dollar awards recognize fundamental advances in these fast-moving fields. More at page 8.

IMPRESSIONS OF THE LIFE SCIENCES COMMUNITY IN OSLO

Richard Gallager, The Scientist.

I recently took a whirlwind tour of some of the life science enterprises in Oslo. As editor of the publication that claims to be “Magazine of the Life Sciences” I am a biotech enthusiast, almost a junkie - I always get a buzz out of talking to researchers and entrepreneurs. But this trip stood out as being especially exciting. On reflection, it should have been no great surprise to me that Oslo is beginning to have a big impact in the life sciences, especially in areas like cancer diagnostics and therapy. Let me explain why:

When I was a researcher in the late 1980’s, I worked on mucosal immunity at Trinity College in Dublin. The most celebrated scientist in the field was **Per Brandtzæg**, a University of Oslo researcher.

Per was (probably still is) admired around the world for two things: The creativity of his research and his critique of the work of others - he was an invaluable source of advice and criticism for the entire field.

Then, when I moved into publishing, my most enthusiastic competitor was another Osloviaan, **Jacob Natvig**. Jacob had great tenacity, and a real determination to produce an immunology magazine of the highest quality. We eventually became close friends and even, for a while, colleagues.

Two is rather a small sample size I admit, but the qualities displayed by Per and Jacob are exactly the ones needed to build up a life sciences enterprise, in my view. And time after time I saw these same attributes in the people I met at companies, hospitals and research institutes around Oslo. Foremost among these is independent thinking.

When I joined the prestigious scientific journal Science as an editor in 1992, I was given the task of selecting immunology papers for



Photo: OCC - Innovation Park

The new Oslo Cancer Cluster Innovation Park is planned beside the Norwegian Radium Hospital (to the right) behind the new Science Building

OSLO CANCER CLUSTER

INNOVATION PARK

Oslo Cancer Cluster has just signed a deal with the City of Oslo to build a brand new Innovation Park next-door to the Radium Hospital in Oslo.

"The Oslo Cancer Cluster Innovation Park is an innovative co-operation between industry and a high school of a kind never seen before in the world", says Bjarte Reve, CEO of the Oslo Cancer Cluster (OCC). The Innovation Park will open in August 2012, and will integrate the member companies of OCC, world-class cancer research and Ullern High School.

"Our ambition is to become world leading in cancer research, and our Innovation Park with top modern facilities and integrated resources will help us step up into the elite-class," says Reve. The students at Ullern High School can look forward to guest lecturers ranging from top scientists to CEOs from the biotech industry, as well getting "food for thought" from sharing lunch every day with world leading researchers.

Read more at www.oslocancercluster.no

publication. "Ideas are 10-a-penny," I was warned. "We need to see results." That sentiment is now laughable. This year, more scientific data will be collected than was amassed in all the years between 1865, when Gregor Mendel first described the characteristics of heredity, through 2007 combined. Next year, all the accumulated data will again be eclipsed. And so on, for the foreseeable future.

Generating data is now facile. The new currency is: how good was the idea behind this experiment? In other words, how creative was the scientist that thought up this experiment or product? And time after time, what I found in Oslo was strong, independent thinking. Even better, many of the people I met with combined high intellect with a strong streak of practicality - and these are the people that will drive progress.

Last year a European Commission study reported that the factors determining the success of a nation's biotech industry are public R&D spending, favorable political policies, publications and the number of patents granted. Sure, these are all essential factors but, typical of a bureaucracy, intangible personal and interpersonal factors are left off the list, yet these are the keys to success.

Another "people factor" that featured prominently on my visits was outspokenness: the men and women that I met held firm views about their research, their patients, patents, the industry, the economy, the weather, where to eat - on everything, essentially. They expressed themselves in a forceful, enthusiastic fashion without ever being confrontational. And that's exactly what's needed in a complex business like biotechnology. There was a genuine sense of community too, with researchers, CEOs and clinicians at different locations knowledgeably discussing and promoting each other's projects. And another good sign was the obvious enthusiasm for umbrella organizations such as the Oslo Cancer Cluster.

Despite being small and relatively unknown in global terms, there's a quiet confidence in Norway. The numerous small, local start-ups are prepared to tackle big, meaningful problems like cancer diagnosis and therapy, HIV treatment and all manner of technology innovations. Perhaps the economic strength of the country contributes to this confidence. It means that the life sciences community can plan for the long haul, rather than hoping to make a quick buck (which is the approach in certain other countries).

I suspect that this combination of personal and interpersonal characteristics is part of the Norwegian psyche. Maybe the education system encourages independent thinking too, and perhaps outdoor pursuits promote confidence and teamwork. Whatever the explanation, Oslo seems capable of developing into a world class center for life sciences.

Richard Gallagher,
editor and publisher of the Scientist

OSLO CANCER CLUSTER

FORUM 2008

A tradition is taking form as Oslo Cancer Cluster hosts its second Forum during Oslo Innovation Week. The OCC Forum of 2008 takes place at Stratos on 15th October, and judging by the program it is going to be an interesting day: The Minister of Foreign Affairs Jonas Gahr Støre is most probably opening the first half of the day which will be focused on what is being done to make sure that cancer research is translated into new cancer treatments. Leading researchers such as Professors Steinar Aamdal and Stefan Krauss will address both what is going on in the clinical cancer research field in Oslo and how new cancer treatments are targeting cancer stem cells. After the networking lunch, there will be a roundtable event where at least 12 of the most interesting biotech companies involved in cancer R&D in Oslo will present themselves. The number and diversity of these companies shows that the cancer community in Oslo is truly innovative.

Learn more at Oslo Innovation Week's website: www.oiw.no

BØRRESEN-DALE**TAKES OVER AT EACR**

Professor Anne-Lise Børresen-Dale, a world leading expert in breast cancer genetics, commenced her presidency of the European Association for Cancer Research during the recent conference in Lyon.

BMI SET FOR NEW GROWTH

Bio-Medisinsk Innovasjon AS (BMI) is a specialized incubator in Oslo for biomedical start-up companies. The company, founded in 2003, has gradually built a portfolio of ownership in biomedical start-up companies and a corresponding capital base. *“BMI is now ready for expanding its business concept in order to take a leading position as a specialist biomedical incubator. With close links to leading TTO’s and research institutions the company has built a network that can be leveraged in order to develop the most promising business concepts based on biomedical research,”* says Stein Holst Annexstad, the Chairman of the Board.

RADIUM HOSPITAL RESEARCH FOUNDATION PORTFOLIO ACQUIRED

BMI has recently acquired the entire portfolio of unlisted companies and projects from The Norwegian Radium Hospital Research Foundation. CEO Jonas Einarsson commented: *“We are confident that transferring these projects to BMI is the best way to secure a sound development for these companies and projects. We see BMI as a professional business partner for biomedical start-ups in Norway”.* One of the dominant sources of basic and applied biomedical research projects in Norway is Medinnova, the Technology Transfer Office for many of the major hospitals in Norway, e.g. The National Hospital, The Radium Hospital and Ullevål University Hospital. Medinnova and BMI have now established a preferred partner agreement where BMI is given a first right of refusal for investing in these projects. BMI and Medinnova will jointly own the ventures where BMI decides to invest, but day to day responsibility for the commercial development will be transferred to BMI.

“The agreement with BMI formalizes a co-operation with a management team that has a proven track-record and valuable experience in the commercialization of biomedical business opportunities as well as relevant operational experience. I am certain that this will be a large step in the right direction for Medinnova,” says Audun Øksendal the CEO of Medinnova.

STRENGTHENING THE ORGANIZATION AND THE CAPITAL BASE

BMI has also strengthened its resource base by more than doubling the number of employees and by increasing the capital base. The implicit valuation of the company is now NOK 51.5 million.

“These developments are important milestones for developing BMI and make our ambitions realistic,” states Ingrid Alfheim.

More information at www.bmioslo.no

IN THE PIPELINE

Companies:	Projects:	Management:
VAccibody AS siRNAsense AS DNAacos AS	Cardiac Sensor TaggerPhage	Serodus AS

MELEN STEERS STEADY COURSE AT CLAVIS

Having taken over from Tom Pike as CEO, Geir Melen oversaw a steady 2nd quarter for Clavis Pharma. Oral CP-4126 was shown to act as a very efficient pro-drug for gemcitabine (Gemzar®) and is due to become the Company’s third product in clinical development as it enters Phase 1 cancer trials later in the year. ELACYT, the company’s lead candidate also showed positive development with the FDA granting orphan drug status for the treatment of Acute Myeloid Leukemia (AML). Read more at www.clavispharma.com



Photo: Pronova Biopharma

Pronova is benefitting from the increasing use of Omega-3 as a pharmaceutical ingredient.

PRONOVA INTEREST SOARS

Clinical data presented at the European Society of Cardiology showed that GlaxoSmithKline’s Lovaza tablets cut deaths in heart failure patients. Pronova BioPharma supplies the omega-3 oils used as the active ingredient in the drug, leading analysts to speculate that sales could increase if the pill gets approval for heart failure. Read more at www.pronova.com

PROSTATE CANCER TRIALS POSITIVE FOR ALGETA

Algeta’s run of good news continued with the announcement that the primary objective of its BC1-03 Phase II pain palliation study in prostate cancer has been met. The study showed that even single doses of Alpharadin in patients with painful bone metastases could produce increasing clinical benefit with increasing dose. The trial also confirmed Alpharadin’s benign side-effect profile and, importantly for a drug in this clinical setting, no significant bone marrow toxicity was reported.

Read more at www.algeta.no

NAVAMEDIC MAKES GLUCOSAMINE MARKETING CHANGES

Navamedic is to take over UK marketing and distribution of Glucomed. According to CEO Øyvind Brekke Navamedic will also consider appointing a new partner for Alateris in the UK: *“The UK market for glucosamine products represents a very large potential, and this change gives us the possibility to evaluate the market in more depth.”*

More information at www.navamedic.com

DIAGENIC SET FOR INDIAN BREAST CANCER LAUNCH

DiaGenic has cleared the way for an autumn launch of its gene-expression based breast cancer test in India by presenting the results of multicenter study. 742 females were enrolled in the study, including early and late stage cancers in both pre- and postmenopausal females. The results showed high clinical performance in all subgroups, including early cancers and in younger females. Current diagnostic tools, like mammography, are known to have low accuracy in these groups.

Further good news came through in the summer in the shape of a new FP7 research and development grant from the European Commission as part of a project entitled: 'Standardisation and improvement of generic pre-analytical tools and procedures for in vitro diagnostics', (SPIDIA). DiaGenic will be responsible for development of new blood based diagnostic methods implementing new techniques.

For more information visit www.diaogenic.com

FIRST NORDIAG CONTRACT IN US

NorDiag has entered a contract with ARUP in Salt Lake City, US for the purchase of a `Magnatrix 8000 Plus` instrument for automated PCR and Sequencing Cleanup, which includes the use of NorDiag unique particle technology. This is the first instrument sold in the United States by NorDiag. `We are very pleased to have the opportunity to work with the genetic testing laboratory at ARUP. This is a premier reference laboratory for molecular diagnostics` said Nancy Murphy, President of NorDiag Inc. the US subsidiary of NorDiag ASA.

More information on www.nordiag.no

METVIXIA AND AKTILITE APPROVED BY FDA

Photocure ASA has announced that Metvixia(TM) in combination with Aktilite® CL128, the LED based narrow band (630 nm) red light technology device has been approved by US Food and Drug Administration (FDA) for the treatment of actinic keratosis (AK), a pre-cancerous skin lesion.

Read more at www.photocure.no

AXIS-SHIELD PROFITS DESPITE STRONG KRONER

In its 6 monthly report, Axis-Shield reported revenues up 28.8% (17.6% at constant exchange rates) to £42.7 million (H1 2007: £33.1 million) with a gross margin of 50.7% (H1 2007: 51.0%) Although the profit before tax of £1.6 million (H1 2007: £1.1 million) was adversely impacted by strength of Norwegian currency, increased investment in Afinion™ sales and marketing and new Oslo plant, the company remains confident that its fortunes on are on the up. The period also saw the long running Homocysteine patent dispute in the US solved and extended agreements signed with key partner Abbott.

Read more at www.axis-shield.com

OMEROS SIGNS UP WITH AFFITECH

Omeros Corporation, a Seattle-based clinical-stage biopharmaceutical company, is the latest up and coming name to turn to Affitech for its antibody discovery needs. In a new agreement signed in August. Affitech undertook to discover and develop fully human antibodies for Omeros' MASP-2 program. MASP-2, or mannan-binding lectin-associated serine protease-2, mediates activation of the complement system via the lectin pathway and is linked to multiple potential indications across a wide range of inflammatory diseases including macular degeneration, rheumatoid arthritis, transplant rejection and cardiovascular and renal ischemia-reperfusion injury.

...AND APPOINTS KEITH MCCULLAGH CHAIRMAN

In another important move as the company prepares to fully exploit its own pipeline, Affitech also announced it had appointed industry veteran Keith McCullagh as chairman. McCullagh commented: "Affitech has significant potential in the field of human monoclonal antibody therapeutics. Both its cell-based and target antigen screening technology is at the forefront of the industry."

Read more at Affitech's new website, www.affitech.com

PCI BIOTECH GAINS APPROVAL FOR PHASE I AMPHINEX™ TRIAL

The clinical trial application for a Phase 1 study with Amphinex™, PCI Biotech's patented photosensitizer for use with its unique light-directed PCI drug delivery technology, has been approved by the Norwegian Medicines Agency. The primary objective of this study at the Radium Hospital in Oslo is to investigate the safety and tolerability of Amphinex™ in man. In the study Amphinex™ will be used in combination with the cytotoxic agent Bleomycin.

Read more at www.pcibiotech.no

OPTINOSE NASAL MIGRAINE DRUG DELIVERY AS GOOD AS GOLD STANDARD

OptiNose recently presented important new Phase II data at the American Headache Society demonstrating that using its novel nasal drug delivery device with sumatriptan for the treatment of migraines matched the performance of subcutaneous injection.

Read more at www.optinose.no

THERAPEUTIC VACCINE

ALLOWS PRICELESS “DRUG-FREE” HOLIDAYS.

Bionor Immuno is a leading therapeutic vaccine company targeting the HIV market. Here Managing Director Birger Sorensen takes us through the background to the company’s recent announcement at AIDS2008 in Mexico City that its vaccine is entering the largest ever global Phase 11b trial.

PLEASE COULD YOU BRIEFLY DESCRIBE BIONOR IMMUNO?

Bionor Immuno is a synthetic peptide vaccine company based in Oslo, Skien and Washington. Our lead candidate is Vacc-4x, which, if successful, would be the world’s first therapeutic HIV immunization.

We recently announced at the AIDS2008 conference in Mexico that Vacc-4x is entering into a Phase 11b global trial. This randomized, double-blind, placebo-controlled trial aims to build on previous studies and show that immunization could give HIV infected patients “drug-free” breaks from their antiretroviral therapy. Such breaks would give their immune systems invaluable time to recover and improve quality of life.

Bionor is a private company established in 2000 as a spinout from Bionor Laboratories, which develops peptide-based diagnostics for infectious diseases. In June 2008, we completed a third private financing round of around \$8 million to cover the costs of Vacc-4x development. We also have programmes in Influenza, HCV and HPV.

YOU WORK ON STIMULATING CELL MEDIATED IMMUNITY, BUT THIS BEEN REGARDED AS TOO PROBLEMATIC IN THE PAST?

Yes that’s true. Previous efforts made to utilize T-cell stimulation for a peptide-based vaccine have been notoriously challenging, and this is also the reason why there are no such vaccines on the market yet. However, using our proprietary technology and knowhow, we believe we have succeeded in designing synthetic peptides with the levels of efficacy and safety profiles to change this situation.

TELL ME MORE ABOUT VAXX-4.

Vacc-4x is based on the observation that disease progression was delayed in HIV patients showing sustained immune responses to the p24 protein in the HIV virus. We therefore engineered Vacc-4x to comprise 4 modified synthetic peptides, each of which corresponds to a conserved domain of the p24 protein.

Vacc-4x has been tested in two clinical trials exposing the vaccine to 11 and 38 HIV patients, respectively. In both studies the vaccine was found to be safe and well tolerated. In the phase IIa study comprising 38 patients, the primary objective was to measure immune responses to Vacc-4x. Subjects were initially maintained stable on ART (Antiretroviral Therapy) while treated over a period of 26 weeks with a series of Vacc-4x immunizations at a low dose (LD) or high dose (HD). This immunization phase included also an ART-free window during which endogenous antigen stimulation was allowed.

- The majority of subjects experienced a pronounced therapeutic effect allowing them to remain off ART following completion of the study (Week 52). While being off ART the patients CD4+ cell counts remained high above the level they had before they had ART commenced by their treating physician.
- Due to this pronounced clinical response permission was granted to follow the subjects until they resumed ART. The median treatment interruption achieved for all subjects in the Vacc-4x Phase IIa clinical study was 31 months. The duration of treatment interruption was linked to immune responsiveness to the peptides.
- At a follow up 44 months after treatment interruption, 34% of the patients were still not back on ART treatment. For the full appreciation of these unique data it should be noted that previous experience has shown for similar chronically infected HIV patients that ART usually cannot be interrupted for more than 3-4 months.



Left: Dr Barry Peters, Guys and St Thomas, Dr Richard Pollard, UCL Davis - the lead investigators in the trial and Dr Per Bengtsson of Bionor Immuno.

SO THIS NEW STUDY AIMS TO REPRODUCE THESE RESULTS IN A CONTROLLED TRIAL?

Yes. The trial plans to enroll 345 patients worldwide. The inclusion criteria are – age 18-55, HIV-positive for at least a year and stable on ART for the last 6 months. Their documented viral load should be less than 50 copies/mL for the last six months, prestudy CD4 cell count $400 \times 10^6/L$ and nadir (lowest ever) CD4 cell count $200 \times 10^6/L$. The primary efficacy endpoint we are looking for post immunization is the proportion of subjects who are estimated to need resumption of ART between the interruption of ART at Week 28 and the end of the study at Week 52. After the study end patients will be followed up during 1 year as we continue to measure secondary endpoints such as CD4 and CD8 counts, number of HIV-1 RNA copies and delayed Type Hypersensitivity and T-cell response.

DOES TAKING PATIENTS OFF THERAPY REQUIRE EXTRA SAFETY MEASURES?

Yes, we will be monitoring patients closely for adverse events and performing regular clinical laboratory evaluations and physical examinations.

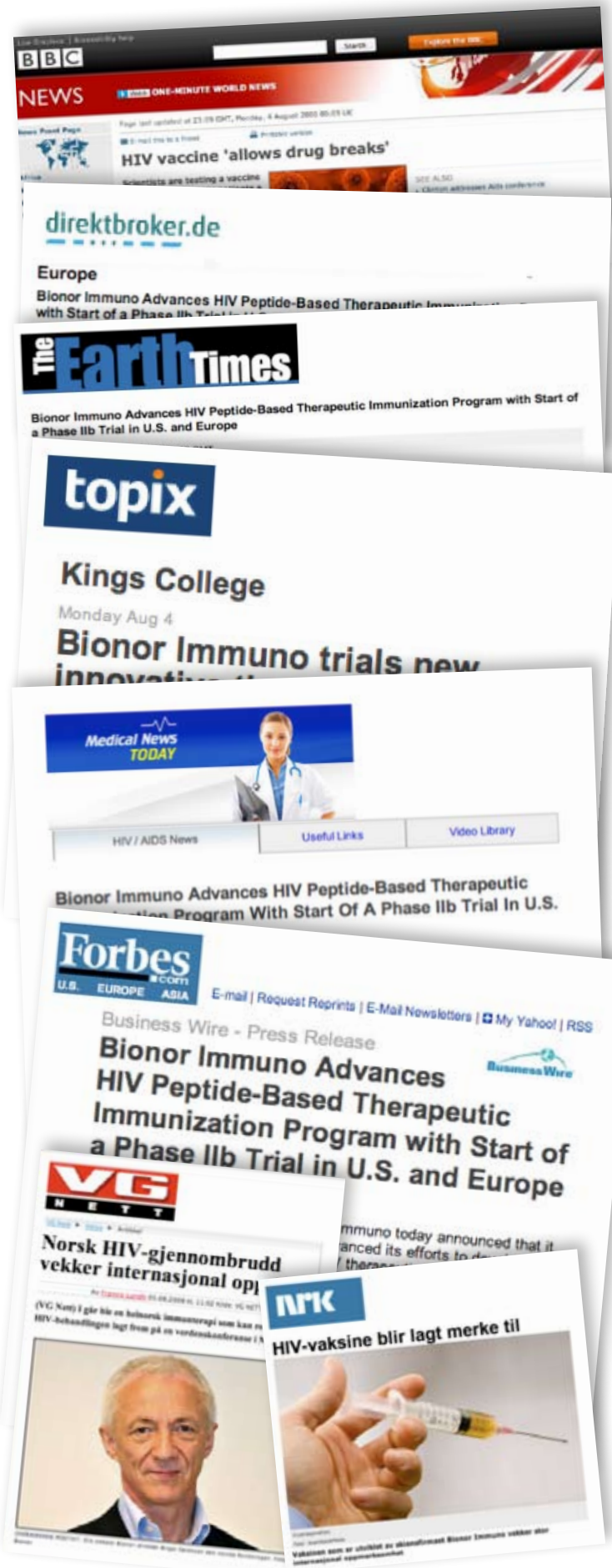
IF SUCCESSFUL, THIS WOULD BE GREAT NEWS FOR HIV PATIENTS?

Together with our lead investigators we believe so. There has been major disappointment over the progress in preventative vaccines, and therefore we had a lot of positive feedback following our Mexico announcement. Dr. Barry Peters, Head of the Academic Unit of HIV & STDs at the Guys & St Thomas' site of Kings College London, is leading the research in the UK and has 20 years of clinical experience of managing people with HIV infection. He says: "A successful immunotherapeutic HIV vaccine would give patients and doctors enormous advantages over current treatments, both in developed and developing countries."

Dr. Richard Pollard, Head of the Infectious Diseases Division at The University of California, Davis Medical School, Sacramento, California is equally optimistic: "this is the largest current therapeutic vaccine trial in the world involving 345 patients. This trial will establish a solid foundation for HIV immune therapies if we can maintain immunogenicity during drug free periods."

WHAT'S NEXT FOR BIONOR IMMUNO?

The first patients have already been recruited and if all goes according to plan we could have the trial completed by early 2110. Meanwhile we are stepping up our partnering activities and are delighted to have secured the services of industry expert Jeff Hackman to head up our new US office. We also expect positive news on our other programmes by the end of this year.



KAVLI PROVIDES MAJOR NEW BOOST FOR SCIENCE

In a grand ceremony in the Oslo Concert Hall on 9 September, Norway's Crown Prince Haakon Magnus presented the inaugural Kavli Prizes in nanoscience, neuroscience and astrophysics to seven laureates from three continents. The million-dollar awards recognize fundamental advances in these fast-moving fields.

2008 marks the first year that the Kavli Prizes have been given. Dubbed the "science prizes for the future," the awards highlight three disciplines that seldom garner such accolades. They are united, however, by common themes. Each of the three award categories recognizes excellence at the extremes of human inquiry - the smallest scales of molecular matter (nanoscience), the most complex natural phenomenon (the brain; neuroscience), the greatest spans of space and time (astrophysics). In

addition, all three fields have seen fundamental advances in recent years thanks to new technology, and all three are ripe for further breakthroughs. According to Fred Kavli, these disciplines "promise remarkable future discoveries and benefits for humanity in the 21st century and beyond."

The nanoscience prize went to Louis E. Brus of Columbia University (USA) and Sumio Iijima of Meijo University (Japan) for their work on carbon nanotubes and "quantum dots," two landmark achievements in the race to understand the nature of matter at the molecular scale. In neuroscience, the three laureates share the prize for their work on key features of neurodevelopment. Thomas Jessell of Columbia University (USA) Sten Grillner of the Karolinska Institute (Sweden) and Pasko Rakic of Yale University School of Medicine (USA).

The Kavli Awards are named after and significantly supported by Fred Kavli, a Norwegian-American engineer who made his fortune in the United States in the field of electronic sensors. He has invested his wealth in support of basic scientific research. See more at www.kavliprize.no.



Fred Kavli and the prize winners in astrophysics...



in neuroscience...



...and in nanoscience.

Photo: Scampix



Ole Petter Ottersen

OLE PETTER OTTERSEN AWARDED MAJOR PRIZE

Professor Ole Petter Ottersen at Centre for Molecular Biology and Neuroscience (CMBN) at the University of Oslo has been granted the Anders Jahres Prize for medicine for 2008 for his outstanding scientific achievements in the research of signal molecules and water channels in the brain. The prize is awarded to young scientists as well, and researcher Mahmood Amiry-Moghaddam, also at CMBN, shares his with Finnish Professor Jussi Taipale. Amiry-Moghaddam is part of Ottersens' research group at CMBN dedicated to the research on aquaporins and brain diseases. The discovery of water channels in humans was granted the Nobel Prize in 2003. Peter Agre, an American Professor with Norwegian heritage that received the Nobel Prize, is also an associate Professor at CMBN. More at www.med.uio.no/jahre

NORWEGIAN SCIENCE WEEK IN WASHINGTON

"Biobanks - Norwegian Gold" and "Cancer Research and Innovation" in focus are the two key themes during a special Norwegian Science Week running October 20-23, 2008, in Washington DC, at the Carnegie Institution for Science and at the National Institutes of Health. The meeting is being organized by the Norwegian Embassy, with the Research Council and Innovation Norway as key partners. Transatlantic cooperation is the main goal. A broader agenda "Health - Energy - and Global Impact" sets the overall theme of the Transatlantic Science Week 2008 in Ottawa and Washington DC.

For more information:

www.norway.org/restech/scienceweek and

www.radium.no/trisc2008

NORWEGIAN-SWEDISH

INNOVATION AND ENTREPRENEURSHIP

UNDER THE SPOTLIGHT AT BIOTECH FORUM 2008

MedCoast Scandinavia will be presented at Northern Europe's largest meeting place for the biomedical sector. This year's event will be held in Copenhagen, Denmark September 23 - 25. Some 20 companies and organizations from Norway and western Sweden will join forces in the MedCoast Scandinavia Pavilion. In particular they will show how world-class academic and applied research from the region can be turned into business through borderless collaboration and early network formation. **Marine biology, nanotech** and **biomaterials** are focus areas.

A luncheon seminar is being held on biomaterials where Rickard Brånemark from the implants company **Integrum** will show how life has changed for amputated patients having received new prosthesis on bone anchored implants. An actual patient will be present to demonstrate the real life benefits.

SINTEF, the largest independent research institute in Scandinavia, is arranging a workshop on "Microtechnology-based Medical Devices" to highlight the services offered through the EU-project www.microbuilder.org by some of Europe's leading silicon microsystem and high precision plastic manufacturers, as well as designers.

NANOBIO IN NORWAY

Nanobio or bionano, the merge of nanotechnology and biotechnology, and to some extent ICT, is a new and exciting field with a lot of potential, but also a number of challenges. Oslo Bio Update has taken a closer look at the nanobio-field in Norway.

Nanotechnology in general is on the agenda in Norway, even though the country is a small contributor internationally. But there are definitely exciting research and developments going on linked to areas where Norway has a strong position, including bionano for cancer and wireless medicine. Small biotechnology companies in the Oslo Cancer Cluster such as PCI Biotech ASA and Epitarget AS are both using nanotechnology to develop new cancer drugs. Research efforts in the field are concentrated at the UiO, UiB, NTNU, SINTEF and Rikshospitalet-Radiumhospitalet University Hospital.

Industry efforts

Among the industry projects funded by NANOMAT, one has been granted to Epitarget AS, formerly CancerCure. They have received funding for developing nano-liposomes that may be used for drug delivery of cancer drugs. A grant for a prestudy has been given to Snøgg AS, whom is developing a band-aid with a nanocoating that accelerates coagulation in a wound. PCI Biotech ASA has received funding from the BIA programme. Skagestad says that NANOMAT has also used Anders Høgseth in PCI Biotech as a lecturer and case study on applied bionano research. The PCI technology is a technology for light-directed drug delivery. PCI can enhance the delivery of all molecules taken into the cell by endocytosis. This includes most types of macromolecules, drugs carried by antibodies or nanoparticles, as well as some small molecule drugs.

MATERA - EU programme

NANOMAT is also participating in the ERA-net MATERA. MATERA is a European network project for organizations funding the field of material science and technology. Among Norwegian projects involved in MATERA is for example a project at SINTEF headed by senior researcher Christian R. Simon, with an overall objective of developing nanosized capsules for targeted drug delivery used in new cancer treatments.

Precautionary research

Nanotechnology is a field with a lot of potential for medical applications among others. Possible long-term effects of nanoparticles and other nanostructures have been questioned, partly due to their ability to live forever, being small and invisible to the human eye and thus possibly eventually becoming living organisms. As a consequence, NANOMAT has funded in total six projects concerned with the ethical, legal, social and environmental/safety implications of nanotechnology. These projects are focusing on nanoparticle toxicity, ethical and precautionary issues, adding up to more than 3% of the total NANOMAT project spending.

For more information see:

www.forskningsradet.no/nanommat



BioTech Forum 23. -25. Sept 2008 takes place in Copenhagen in parallel with ScanLab and Nanotech Northern Europe events.

Exhibitors at the MedCoast Pavilion: Arterion/BBV, Biotec Pharmacon Chalmers Inst. Microtechnology and Nanotechnology, MC2, Gothenburg International Bioscience Business School (GIBBS), Gothenberg BIO, Institute for Biomaterials and Cell Therapy, IBCT, Integrum AB, Mare Life, Mare Novum/Gothenburg University, Norwegian University of Life Sciences (UMB), Oslo Bio, Oslo Cancer Cluster, PeakSearch AB, Polypure AS, Proffice, Promimic, Sahlgrenska Science Park, Samba Sensors, Sintef, University of Oslo/EM-BIO, Centre for Entrepreneurship at the University of Oslo, Wireless Healthcare. For more information: www.medcoast.org or www.biotechforum.org

GETTING PERSONAL

As part of the Wireless Medicine initiative, Oslo is to host the 6th international Workshop on Wearable Micro and Nano Systems for Personalised Health. Key topics include; advanced research in micro and nano sensors, wearable and implantable systems, technological trends in ICT solutions for patient self-management, health and life management and personalized interactions, business vision and experiences, implementation viability. Organizers are SINTEF & Norwegian Centre for Telemedicine. For more information visit: www.phealth2009.com

MED-STORM WINS EUROSTAR GRANT FOR SECOND GENERATION PAIN MONITOR

Hard work and belief is beginning to pay off for medtech newcomers Med Storm. The company has just submitted a 510k application for its PainMonitor device, based on skin conductance, which



Photo: Med-Storm

at last enables hospitals to measure pain and awakening in realtime during anesthesia. Managing this "5th Patient Vital Sign," is a major problem. For example it has been mandatory for over 5,500 US hospitals since 2002, but they have lacked appropriate means to do so. With increasing concerns

about oversedation, particularly in infants, PainMonitor has already gained rapid acceptance amongst opinion leaders in Europe with over 100 units ordered. In fact, the company has just been awarded an EU Eurostar grant to develop a special intensive care version in collaboration with the Karolinska Institute in Stockholm.

Read more at www.med-storm.com

SONITOR NAMED TOP US EMERGING COMPANY

The Frost & Sullivan Award for Emerging Company for 2008 has been presented to Sonitor Technologies, which produces ultrasound-based internal tracking systems for hospitals. The citation reads that Frost & Sullivan selected Sonitor "in recognition of the company's sound technology and product development strategies and the vision in place for future growth and expansion. Leveraging Ultrasound-based technology, Sonitor has pioneered the most accurate and cost effective indoor RTLS solutions that are scalable and are expected to demonstrate immense growth potential in the future."

Commenting on the award, Sonitor CEO Ragnar Bo said: "The fact that multinational players like 3M, IBM and Cerner recently have signed partner agreements with Sonitor gives us a good feeling for the expected development of the company for the years to come. 31 hospital installations and 20 software and implementation partners over the last 17 months confirm the fact that accuracy, price and robustness is key to satisfied customers in healthcare in USA, Europe and Asia."

For more information [visit www.sonitor.com](http://www.sonitor.com)

NEW HP HEALTH CENTRE OF EXCELLENCE ESTABLISHED IN OSLO

HP has opened a new Health Centre of Excellence (HCoE) in Oslo. Working with partners Cisco, Telenor and Microsoft, HP intends to build the HCoE into a state of the art European competence centre to show and demonstrate the latest healthcare technology-solutions. "We are incredibly proud of this centre, which is a clear result of Norway being world leaders in developing digital hospitals. This is now enabling us to display and export our knowledge to other European countries. Our goal is for the centre to be a window to the hospitals of the future", says Roger Moberg, Director of HP's European Health Centre of Excellence.

The centre is equipped like a small hospital, complete with a patient room, watch room and an adjacent demonstration room. New systems for medical filing, advanced electronic warning systems and separate patient terminals containing entertainment and communication, have drawn international attention, and contributed to making every day easier for both doctors and patients.

See more at www.hp.no/HCoE

....AND NEW A-HUS HOSPITAL.

The new Akerhus University Hospital which boasts one of Europe's largest automated analytical laboratories will also open in October. The well known AGV-technology, wireless networks and sensors are all natural parts of the daily operation at the hospital. The AGV-robots shown below find their own path and take the elevators on their own, they will stop and ask you most politely to move if you are in their way. The Hospital will get 20 automatic robots that will carry around driverless wagons with supplies 24 hours a day.

www.nyeahus.no (in Norwegian)



Photo: Bjørn Dufseth, yeahus

FIRST MEDTECH COURSE STARTS AT OSLO UNIVERSITY COLLEGE

Engineering students at **Oslo University College** can now choose a specialist course in medtech in a move that is hoped to provide the blossoming devices and wireless medicine sectors with skilled graduates. The medical technology engineers at Oslo University College will be specially trained to collaborate in a multidisciplinary field to solve technological problems related to biology and medicine. Learning to communicate with other health related professionals makes the medical engineers more flexible to work in a multidisciplinary environment. See more at www.hio.no

MARELIFE

STARTING TO MAKE WAVES

MareLife is a new biomarine innovation network based in Oslo. Its 26 members represent major stakeholders with a primary interest in innovation: trendsetting manufacturers, solution providers, startups and ventures, venture capital, contemporary scientific organizations and public sector facilitators. Its main vision and goal is to advance the biomarine sector to become a knowledge intensive sustainable industry, which has science, diversity and adaptability as major characteristics. The main activities take place in working groups: Aquaculture, Fisheries, Bioactive Substances, Venture Capital and Commercialization and Reputation of Trust. The groups address major challenges and opportunities to the sector and propose actions: innovation structures, public framework, generic projects etc.

MareLife is already attracting international attention, and Executive Manager Øystein Lie has been invited to give a keynote presentation at The 2008 Allerton IV Conference October 25, in the new UIUC (Illinois) Conference Center. He will stress the importance of linking economically significant fish traits to genes for genetic enhancement of fish strains and also scope the intellectual property and commercialization challenges. www.marelife.no



Photo: Nancy Bunde

EVENT CALENDAR

Meet representatives from the Oslo life science sector at the following events:

SEPTEMBER

- 23 - 25 MedCoast Scandinavia Pavilion at Biotech Forum 2008, Copenhagen, Denmark.
www.biotechforum.org
www.nanotech.net
www.scanlab.nu

OCTOBER

- 13 - 17 Oslo Innovation Week (incl. VentureLab Investment Forum, Oslo Cancer Cluster Forum, First Tuesday), Oslo, Norway
www.oiw.no
- 21 - 22 TRISCancer 2008/Science Week, Washington, USA.
www.radium.no/trisc2008

DECEMBER

- 9th - 10 Oslo Cancer Cluster at Genesis Bio Conference, London, UK.
www.genesisconference.com

FEBRUARY 2009

- 24 - 25 Bioprosp 2009, Tromsø, Norway.
www.bioprosp.no

MARCH 2009

- 4 - 5 MareLife at North Atlantic Seafood Forum 2009, Oslo, Norway
www.nor-seafood.com

Omegatri AS

A newcomer in the booming omega-3 market is Omegatri AS, with its unique technology for preparing powders from oil, based on ideas and patent applications from the School of Pharmacy, University of Oslo.

COMPANY FOCUS AND MISSION/BUSINESS CONCEPT

Omegatri AS was founded in 2007 based on a proprietary technology for nano-encapsulation of lipids, believed to represent a cost effective and competitive supplement to existing technology in the market.

The initial focus will be on oil based omega-3 powder and tablets, to develop technology for production of intermediates for the health and food industry. In the longer term, activities will extend into highly purified water soluble omega-3 products, increasing the market potential within the functional food and marine industry.

MANAGEMENT

CEO, Astrid Hilde Myrset, has been in place since June 1, 2008. The inventors, Pål Rongved and Jo Klaveness, are engaged by the company as Research Manager in a 20% position and Consultant, respectively.

COLLABORATIONS

Founded by Birkeland Innovation and originating from the University of Oslo, the company aims to have close collaboration with the School of Pharmacy, University of Oslo. The company will actively be searching for partners within the nutraceutical and

food industries. For applications outside the core business area, such as dermatological applications and regulatory drug development, contact has already been established with potential licensing partners.

INTELLECTUAL PROPERTY

Four patent applications have been filed to protect the technology.

INVESTORS

The company has recently gone through a share issue increasing the capital by NOK 6 million of which SårkornInvest contributed with NOK 5 million. This will enable documentation and further development of the technology. Other significant owners are the University of Oslo through Birkeland Innovation, and the inventors. The company has also applied for funding from the Norwegian Research Council and Innovation Norway.

CURRENT POSITION/ NEXT MILESTONES

Lab-based documentation activities are being initiated September 2008, initially focusing on stability studies of nano-encapsulated marine oils. Data already in place demonstrate that nano-encapsulation protects the poly-unsaturated omega-3 from oxidation, but further studies are needed to properly document this. The planned studies will further aim to define optimal formulations for specific uses, with an initial focus on a collaborative project involving dermal formulations for local administration. A key milestone is planned for Q1, 2009, when the initial documentation data on stability will be available. www.omegatri.no

Oslo Teknopol

- your key to the Oslo region

Oslo Teknopol aims to stimulate innovation and attract foreign investments and talent to Norway's capital region. We offer free assistance and information about business conditions and opportunities within life sciences and other key knowledge-based clusters in the Oslo region:

- Maritime
- Energy and environmental technology
- Information and communication technology
- Life science
- Culture

Oslo Teknopol is a non-profit regional development agency, established by the City of Oslo and Akershus County Council.



Oslo Bio is a collaborative network of stakeholders from the life science cluster. Oslo Bio aims to strengthen the cluster and contribute to long term growth through marketing, initiating and facilitating development projects, and international collaboration. Oslo Teknopol act as the secretariat for Oslo Bio.

For more information or to subscribe to Oslo Bio Update contact Oslo Teknopol at info@oslo.teknopol.no

