

# OSLO BIO UPDATE

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

**IN THIS ISSUE:** VIEWPOINT page 2 • BUSINESS NEWS page 4 • BIO 2011 page 7 • OSLO CANCER CLUSTER page 12  
BLUE GREEN page 14 • OSLO SCENE page 18 • ONE TO WATCH page 20



Photo: Thea Thømmesen, Oslo University Hospital

Algeta has drawn on longstanding expertise at the Radium Hospital - now the Oslo University Hospital - to bring radiopharmaceuticals to the forefront of modern cancer treatment with Alpharadin.

## LEADING LIGHTS ALGETA AND PHOTOCURE SHINE

In the run-up to BIO in Washington, two of the leading lights of Norwegian biotech announced major breakthroughs. First Algeta, announced that an independent ethical committee recommended ending its Phase III trial of Aphaadin for advanced prostate cancer because the results were so good - median survival of 14 months - that it was unethical to deny the treatment to placebo patients.

*Continued on page 3*



"We have a glimpse of greatness in the Norwegian Life Science industry," believes Jostein Dalland of Inven2.

Photo: StudioF2

## PROMISE FOR THE FUTURE

**Jostein Dalland is the CEO of the new "super tech transfer office" Inven2. With a strong background in international business, he is well placed to judge the real potential of Norwegian life sciences.**

There are few challenges more fundamental than the future of our health care and an increasingly ageing population. This we can all agree to. However, how we take on this challenge is still much dependent on our actions. Above all we need to focus our efforts on life science research and development, to significantly improve our ability to innovate and to bring Life Sciences, Physical Sciences, Mathematics and Computer Science together to develop solutions for the future. This should be a national priority for Norway.

In Inven2 we actively use commercial routes to transfer new technology and knowledge from both the University of Oslo and Oslo University Hospital. Inven2 is the result of the merger of the former TTOs Birkeland Innovasjon and Medinnova, and is now the largest technology and knowledge transfer organization in Norway. Through the merger we now have one company which focuses upon bringing top science from

the university and hospital into products. Our innovation projects are stemming from the life, physical, mathematics and computer sciences and we see an increase in intellectual cross-pollination in and between the projects. Innovation is truly booming when researchers with different knowledge bases come together to find solutions on market needs. This we need to prioritize much more.

Last year we experienced an increase of over 40% in innovation activity and so far this year the growth rate is accelerating. We filed 60 patents, established 5 new technology start-ups and licensed 17 new technologies in 2010, a level of activity second to none in Norway. Over the last couple of years we have licensed technologies and scientific knowledge to 16 nations ranging from India, China, and Korea in the East to Silicon Valley and Massachusetts in the West, in addition to a range of European nations. As such, the demand and interest for science and technology stemming from the Oslo region is truly global and we are proud to have a part of this rapidly developing global innovation arena.

So do we have a thriving life science industry in Norway? The answer is not yet. We have glimpse of greatness from actors such as Algeta, Aker BioMarine, Clavis Pharma, Photocure and PCI Biotech. There is also a significant growth in second generation companies such as Ultimovacs, Nordic Nanovector, OstoMycure, and Setred to mention just a few. In addition the three Oslo based Life Science clusters – Oslo Cancer Cluster, Oslo Medtech and Nansen Neuroscience Network all aid in the development and increase in innovation, from advances in microbiology to computer sciences. However, we are in need of a thorough understanding of the necessary innovation ecosystem, to build a competitive and leading life science community, and above all we are in need of competent investor management which has access to public as well as private risk capital. It is time to develop and implement a coordinated strategy between the key public agencies and departments to further strengthen this development, and to have a strategic push to make noticeable breakthrough.

However, the level and sophistication of Life Science innovation, including its convergence with other sciences, will continue to grow rapidly in the Oslo region. Our high level activity to develop a local knowledge based industry, while at the same time welcoming international partners, will continue with increasing strength. Despite some clouds on the horizon, the future for life science innovation in Oslo looks bright, and we hope that national as well as international actors will contact us next time they are in Oslo.

You find us at [www.inven2.com](http://www.inven2.com), or just drop by Oslo Innovation Center at Blindern, Oslo.



Photo: Algeta

Alpharadin uses bone targeted Radium-223 isotopes to kill cancer cells by alpha radiation, and also has a short life making it ideal for targeted cancer treatment.

### LEADING LIGHTS ALGETA AND PHOTOCURE SHINE

*Continued from page 1*

Dr Chris Parker, from the Royal Marsden Hospital, and Principal Investigator of ALSYMPCA, said: "Advanced prostate cancer has a poor prognosis, and treatment options are limited. Based on the observed survival benefit and its safety profile, Alpharadin may become an important treatment for patients with bone metastases from advanced prostate cancer".

Algeta also swiftly followed this with positive news from a second Phase IIa study of Alpharadin in breast cancer patients with bone metastases which led to Algeta mania in the Norwegian press! The hope now is that discussions with regulatory authorities will accelerate the drug's road to market.

Not to be outdone, Photocure, pioneer of photodynamic therapy, appears ready to start a new chapter of success with

the first commercial sale of Allumera, billed as the first "photodynamic cosmetic".

Allumera is a topical cream representing the first in a new class of photodynamic cosmetics which has been clinically proven to improve the overall appearance of skin, visibly reduce the outward signs of aging and reduce the appearance of pores. According to CEO Kjetil Hestdal, in the US, Allumera will compete in the growing market of cosmetic dermatology procedures, currently valued at an estimated \$4B. Allumera will be sold to aesthetic dermatology practices across the US at a price per unit of \$120, which establishes it as an attractive addition to the cosmetic armamentarium available to dermatologists today."

A promising start to the year for a whole range of companies, including, Affitech, Axis-Shield, Biotec Pharmacon, Clavis Pharma, Coremine, iSentio Lytix Biopharma, Nextera, Photocure, Smerud and Vaccibody as well as a new hub opening in Tromsø.



ECCP continues to grow in importance from year to year and in 2011 will feature the ABC Oncology Showcase.

#### ALGETA, PCI AND CLAVIS ALL WINNERS IN LATEST GRANT FUNDING ROUND

The Norwegian Research Council (NRC) have granted Algeta, Clavis and PCI support for their R&D projects through the NRC-programme "User-driven Research based Innovation". NRC received in total 162 applications and have awarded 38 of them with funding.

PCI Biotech got a grant for NOK 10.8 million (USD 2.02 million) for investigating local treatment of metastatic cancer and Clavis Pharma NOK 14 million (USD 2.62 million) to develop an hENT1 biomarker assay for targeted therapy of AML patients. [www.rcn.no](http://www.rcn.no)

#### CLAVIS PHARMA ELECTS ROBERT J. SPIEGEL TO BOARD OF DIRECTORS

Clavis Pharma ASA (OSE: CLAVIS) has appointed Robert J. Spiegel, MD to its Board of Directors. Dr. Spiegel has gained extensive experience in the biotechnology and pharmaceutical industry in a career spanning over 30 years, including Schering-Plough, New York University and the National Cancer Institute. He is also an Advisor to private equity firm Warburg Pincus and serves on the Boards of Geron Corporation, Capstone Therapeutics and Talon Therapeutics. [www.clavispharma.com](http://www.clavispharma.com)

#### PATHOGEN DETECTION SPECIALIST ISENTIO OPENS US OFFICE

Following a successful funding round at the end of 2010, iSentio AS has continued its expansion plans by opening an office in Sunnyvale, California in the midst of one of the key life sciences hubs in the US. The office will be headed up by founder and former CEO, Bjarte Karlsen, with marketing director Camilla Huse Bondesson stepping up to CEO. The company's flagship product is RipSeq software for rapid bacterial detection. [www.isentio.com](http://www.isentio.com)

#### AFFITECH A/S SIGNS KEY AGREEMENTS IN UK AND US

Affitech A/S, (NASDAQ OMX: AFFI) has signed two key deals in the first half of 2011. This first is a license agreement with Cancer Research Technology (CRT), the commercial arm of Cancer Research UK, granting Affitech exclusive rights to a CRT patent application and relevant know how to develop and use therapeutic antibodies that recognize and block the function of CCR. This protein is found on certain tumors - including early and late stage cervical cancer and esophageal cancer. The second is a sponsored research agreement with another leading investigator, Dr. Rolf Brekken at the University of Texas Southwestern Medical Center, Dallas, USA to further understand the mechanism and potential differentiation of Affitech's lead antibody drug candidate AT001/r84. [www.affitech.com](http://www.affitech.com)



Photo: Photocure

#### PHOTOCURE HIRES GE VETERAN

Photocure (OSE:PHO), has hired Kathleen Deardorff, as Chief Operating Officer to lead business development and alliance management/strategic partner relationship functions. She will also play a key role in strategy development and execution as well as corporate communications. Her most recent position was Head of Global Marketing at GE Healthcare, encompassing strategy development and global execution for both marketed and pipeline products for the contrast media and radiopharmaceutical franchise. [www.photocure.no](http://www.photocure.no)

#### BIOTECH AT THE TOP OF WORLD

Norway's minister of trade and industry Mr Trond Giske opened Tromsø's new biotechnology centre, Barents Bio-Centre in May. Located far above the Arctic Circle in Tromsø Science Park, close to Tromsø University, the marine bioprospecting centre MabCent and the national marine biobank Marbank, Barents BioCentre plans to add a further impetus to this rapidly growing biotech cluster which has already spawned successful companies such as Lytix Biopharma, Calanus and Biotec Pharmacon. <http://biotech.nfr.no>



Trade and Industry Minister Trond Giske dons a lab coat to perform the opening experiment at the new Barents BioCentre with Norut CEO Ivan Burkow.

#### LIEN TIMES FOR BIOTEC PHARMACON

Under the leadership of former Axis-Shield CEO Svein Lien, Biotec Pharmacon have published interim results for the first quarter 2011. The company has grown strongly, with sales revenue up 67% from Q1 2010. A grant of NOK 7.2 million (USD 1.35 million) from the Research Council of Norway for development of marine enzymes will increase the research and development capacity and strengthen the product pipeline. Biotec Pharmacon has also entered into new supply agreement for the proprietary HL-dsDNase enzyme with a large customer, for use in new kits for contamination control in qPCR. [www.biotec.no](http://www.biotec.no)

#### ECCP2011 TO FEATURE ABC SHOWCASE

Joint organisers Oslo Cancer Cluster have announced that ECCP2011 in Toulouse will feature the "cream of European oncology biotechs" following a special agreement with Medicon Valley to host the ABC Europe Technology Showcase in Oncology. As part of the ABC Europe initiative this showcase will feature innovative companies and academic centres from leading European Biotech Clusters. Organised around oral presentations and poster sessions focusing on:

- Bio Imaging (technology and clinic)
- Molecular Diagnostics and Personalized Medicine
- Emerging Therapeutic Concepts

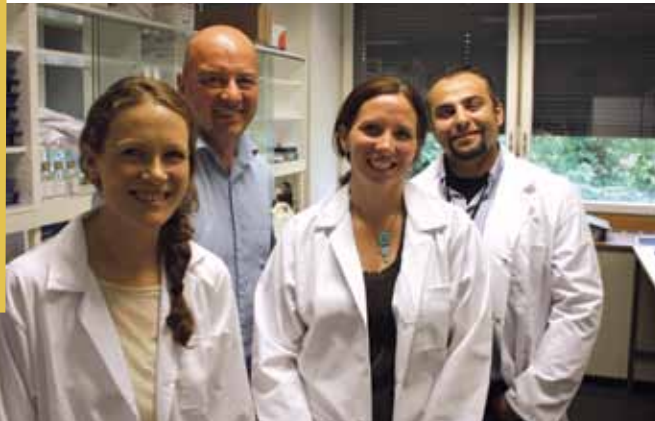
[www.ecc-partnering.com](http://www.ecc-partnering.com)

#### SMERUD CRO WINS EUROSARS GRANT FOR CLINICAL TRIALS

To speed up translation of research into new medicines in areas neglected by big pharma, the EU is now looking to directly fund clinical trials for the first time through its Eurostars programme. As a result, leading Oslo-based contract research organisation, Smerud Medical Research International AS has managed to secure two large monetary grants for clinical trial work conducted by Smerud on behalf of biotech clients and university clinic partners. The first is for a new Mucosal Patch Technology to be used as a diagnostic for IBS and the second for a new drug against IgA nephropathy, an important kidney disease.

Knut T Smerud, SMERUD's founder and CEO, commented: "We are very proud to be the coordinator of both of these successful applications, as we have worked very hard to convince the peer reviewers that also clinical trials deserve public co-funding through this programme. We believe this is an important route to secure more funding into the clinical trial market in Norway in particular, but also the Nordic area in general." [www.smerud.com](http://www.smerud.com)

*"We believe this is an important route to secure more funding into the clinical trial market in Norway in particular, but also the Nordic area in general."*



The Vaccibody team is leading a new crop of vaccine innovators in Norway.

### VACCIBODY TARGETS HPV

Vaccibody's progress on developing a therapeutic vaccine addressing HPV (Human Papilloma Virus)-induced cancers such as precancerous lesions of cervical cancer and head and neck cancers is attracting increasing interest. To the extent that CEO Dr. Ole Henrik Brekke has been invited to present a keynote lecture at the 13th annual World Vaccine Congress in Lyon. In further recognition of this next generation of vaccine companies to emerge from Norway, Vaccibody has also become a partner in the major EU Framework 7 Programme "Advanced Immunization Technologies" (ADITEC). The scope of the project which has both European and US partners is to produce the knowledge necessary to develop novel and powerful immunization technologies for the next generation of human vaccines. [www.vaccibody.com](http://www.vaccibody.com)

### AXIS-SHIELD JOINS NOK 1 BILLION CLUB

Axis-Shield posted record revenues of over NOK 1 billion (USD 190 million) in 2010, mainly boosted by growth in its Point of Care division which saw both the old (Nyocard) and new (Afinion) systems increase their installed base worldwide. Axis-Shield has been one of the success stories internationally in the in vitro diagnostics industry since the merger of UK Shield Diagnostics and Norwegian Axis Biochemicals. [www.axis-shield.com](http://www.axis-shield.com)

### OPTINOSE WINS INNOVATION AWARD

OptiNose has won the Oslo regional finals of the DnB NOR Innovation Award for its novel, bi-directional nasal drug delivery technology. The Company was awarded 200,000 NOK (approximately \$36,000 US), and is now eligible for the Norwegian national finals in September, which carries a one million NOK prize. [www.optinose.com](http://www.optinose.com)

### NEXTERA SECURES FURTHER INVESTMENT ROUND

Autoimmune therapeutic specialists Nextera AS has received a second round of investment from Birk Venture AS to continue their target identification program of the drug discovery company Nextera AS. The company uses a proprietary phage display technology and was formed in 2009 by the investment company Bio-Medisinsk Innovasjon AS (BMI), the inventors and Inven2. [www.nextera.no](http://www.nextera.no)

### LYTIX BIOPHARMA CARRIES FIGHT TO SUPER BUGS

With concern growing about the poverty of the pharma industry's antibiotic pipeline, Lytix Biopharma provided welcome news recently with the successful completion of two Phase I/IIa studies with the topical antimicrobial drug Lytixar™ (LTX-109) – one for nasal decolonisation of MRSA / MSSA (methicillin-resistant and methicillin-sensitive *Staphylococcus aureus*) bacteria and one for treatment of Gram+ skin infections. [www.lytixbiopharma.com](http://www.lytixbiopharma.com)

### NEW NOVOZYMES BLOCKBUSTER MADE IN OSLO

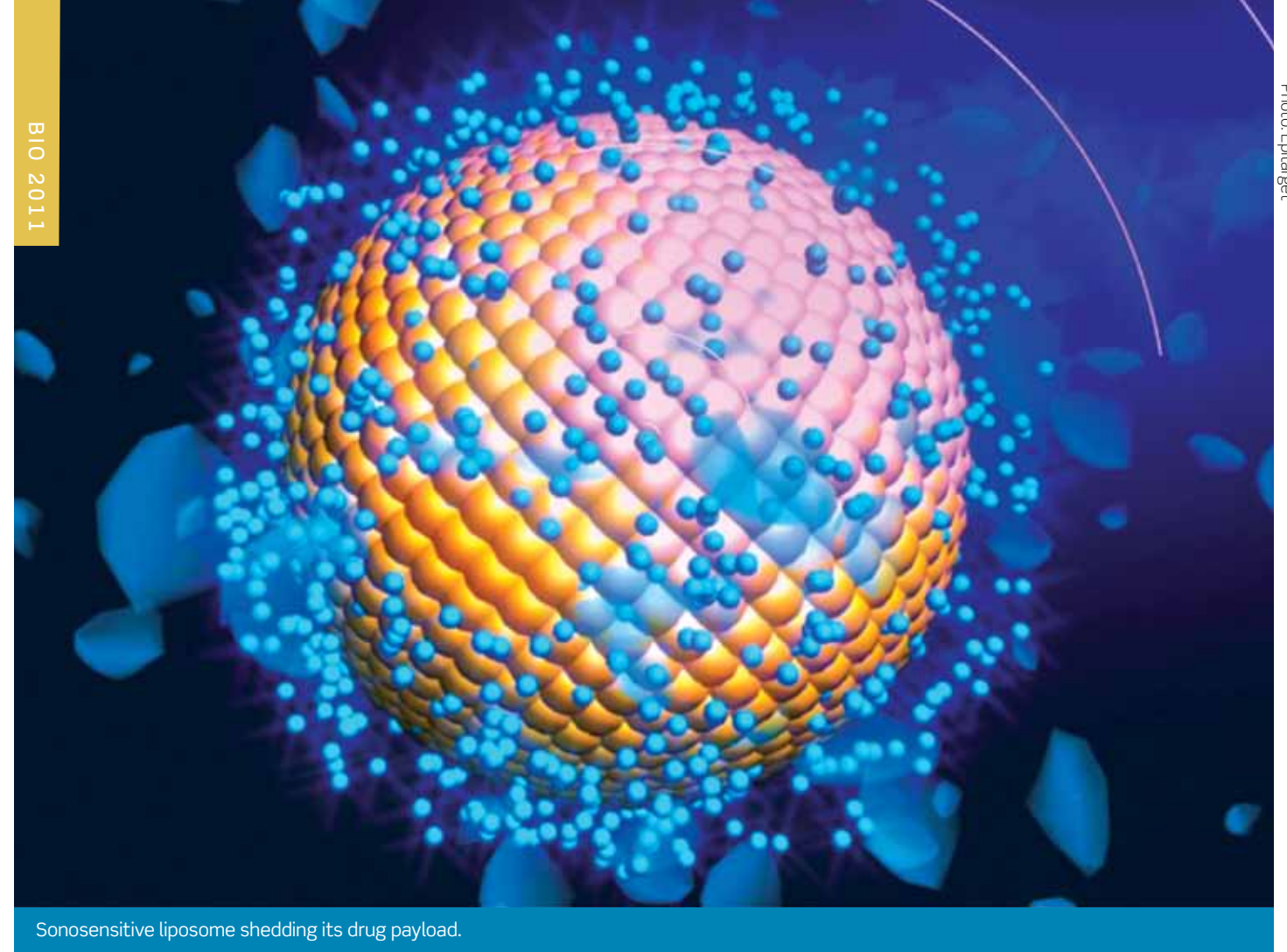
Next-generation albumin technology developed in Oslo University and "brokered" by Inven2 forms the basis of a new potential blockbuster product recently launched by Novozymes Biopharma. Albufuse Flex enables drug developers to adapt and control the pharmacokinetics of their target proteins or peptides and thus improve bioavailability. [www.inven2.com](http://www.inven2.com)

### MEDICAL MIND-MAP SITE GOES LIVE

June 16th saw the Coremine Medical website go live at [www.coremine.com](http://www.coremine.com). Search and navigation features from the beta site have been improved to enable users to interactively build their own biomedical mind-maps, set alerts on key medical terms, store the mind-maps and share them with others. Social network features are included. International promotion will start at the end of the month under the direction of new CEO; Odd Arild Lehne, who was previously the managing director of the leading Nordic consultancy company Devoteam daVinci AS.



Photo: Coremine Medical



Sonosensitive liposome shedding its drug payload.

## NORWAY AT BIO2011

**With over 24 companies and organizations attending, BIO 2011 sees the largest Norwegian delegation ever. Here we profile the leading lights, from well established biopharmas to exciting new start-ups, together with the key support organisations and networks.**

### ONCOLOGY

**Where to start? The Norwegian biotech sector contains a range of oncology companies as diverse as possible - and many of the leading players will be present at BIO.**

**Photocure** is a world-leading speciality pharma company exploiting proprietary photodynamic technology based on initial research at the Radium Hospital in Oslo. Photocure has already developed 2 FDA approved drugs including Hexvix® (marketed by GE Healthcare as Cysview™ in the US) to improve the detection of tumors in the bladder. Using Hexvix the urologist can improve tumor detection with red fluorescence during illumination. In addition to improving detection and visualisation during cystoscopy (bladder inspection), Hexvix may help the

urologist perform a more complete local surgery by better removal of the tumors with limited impact on healthy tissue. Another product Cevira for treatment of HPV/CIN1-2 is in Phase I/II and available for outlicensing.

Photocure is currently developing a pipeline of follow-on products for both medical and recently cosmetic dermatology indications – aiming to launch Allumera for skin treatment in the US in June. [www.photocure.com](http://www.photocure.com)  
BIO contact – Kjetil Widerberg

Spun out of Photocure, but now a leading light in its own right, **PCI Biotech** has been almost constantly in the news over the last year with astonishing trial results in the UK for its topical head and neck cancer treatment PC-All. Using a technique



Among the stars in Inven2's portfolio is Setred with a breakthrough 3D brain imaging system.

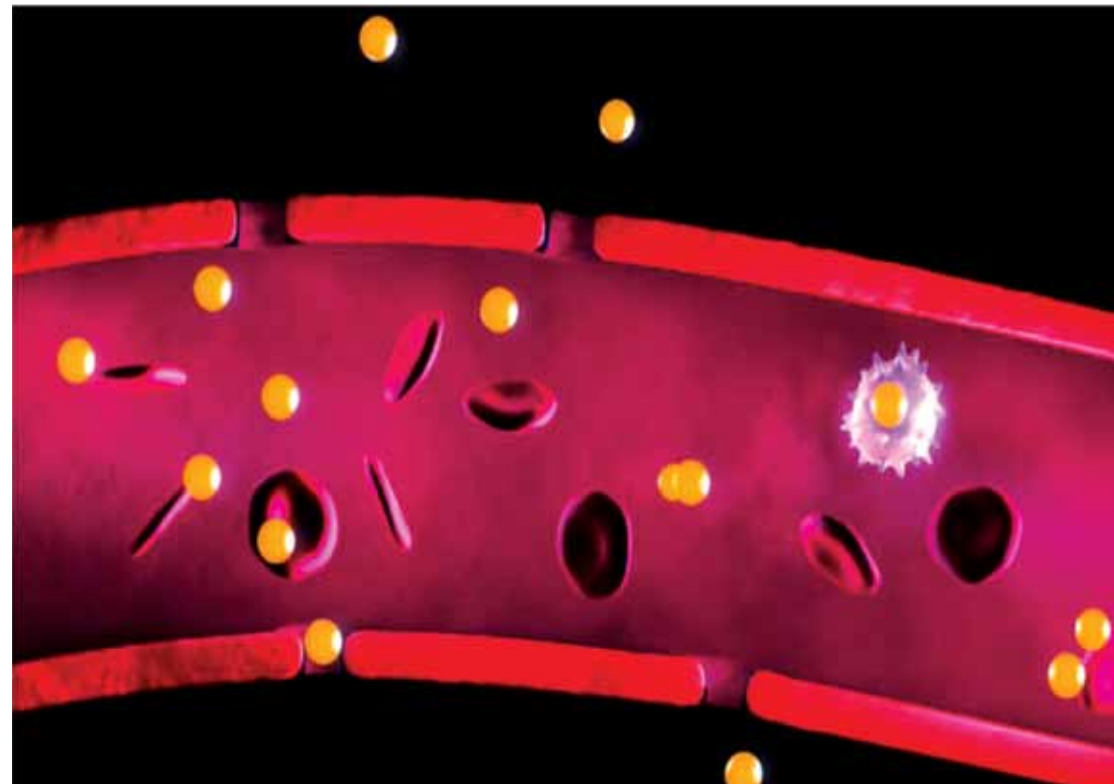


Photo: Epitarget

Once injected into the patient Epitarget's ultrasound-sensitive liposomes accumulate in significant numbers in tumors due to "leaky" vasculature.



Photo: Photocure

PDT pioneers Photocure are set to launch its first cosmetic product Allumera in the US in June.

known as Photo Chemical Internalisation, this involves first injecting a proprietary photosensitizer, Amphinex, followed by a cytotoxic such as bleomycin. Activation by a laser results in uptake of the drug by endocytosis into the cancer cells and their destruction. The UCH Phase II trials have resulted in the complete disappearance of previously inoperable tumours. PCI Biotech is planning to start the next clinical trial with PC-A11 in 2011, for treatment of recurrent head and neck cancer.

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 and the company is now looking at other possible indications. [www.pci-biotech.no](http://www.pci-biotech.no)

BIO contact – Per Walday

From light to sound, and we come to **Epitarget** which is pioneering ultrasound mediated therapy, involving local release of drugs by means of ultrasound. Here, therapeutically active substances encapsulated within nanosized liposomes are administered to the patient and efficiently released in the tumor by exposure to a targeted ultrasound field.

Epitarget's technology allows cytotoxic drugs to be administered at higher concentrations without exposing the body to the active drug thereby minimizing unwanted systemic toxic effects whilst maximizing drug efficacy, while unstable drugs, like siRNA and peptides, may be protected from degra-

dation en route to the tumour and later activated only in the tumour. Finally, by including an array of substances into the nanoparticles, cancer tumors can be attacked by several treatment modes simultaneously. [www.epitarget.com](http://www.epitarget.com)

BIO Contact – Esben Nilssen

When it comes to zapping tumours, **Lytix Biopharma** seem to be in class of their own as can be seen in a dramatic real time video that caused a stir two BIO's ago. Their synthetic lytic peptides lyse tumours with great efficiency and also appear to have an immunising effect. Phase I trials of Oncopore, their lead product are now underway to demonstrate reproducible efficacy in solid tumours, as well as a co-trial with KAEL-GemVax using Oncopore as an adjuvant for their GV-001 pancreatic cancer immunotherapy. In parallel, Lytix has just successfully completed two Phase I/IIa studies with a similarly lytic-peptide-based topical antimicrobial drug Lytixar™ (LTX-109) – one for nasal decolonisation of MRSA / MSSA (methicillin-resistant and methicillin-sensitive Staphylococcus aureus) bacteria and one for treatment of Gram+ skin infections.

[www.lytixbiopharma.com](http://www.lytixbiopharma.com)

BIO contact - Anders Fugelli

Along with Algeta, Clavis is one of the flagship biopharmas in not just Norway, but Scandinavia. At the end of 2010 the company sealed a major collaboration with Clovis in the US

for further developing its portfolio of novel anti-cancer therapeutics based on advanced lipid vector delivery technology. Lead candidates, currently in pivotal Phase II and III trials include elacytarabine for AML and CP-412 for pancreatic cancer.

[www.clavispharma.com](http://www.clavispharma.com)

BIO contact – Olav Hellebø

No review would be complete without **Affitech**. Formed by some of the original antibody research pioneers at the German Cancer Centre in Heidelberg, Affitech has built a substantial pipeline of early stage fully human antibody therapeutic drug candidates using the MBAS and CBAS methods and targeting VEGF (Vascular Endothelial Growth Factor) and GPCR (G-protein coupled receptors). Hopes are high for its lead product, a novel anti-VEGF antibody AT001/r84 with a unique specificity that may offer improved anti-angiogenesis therapy. Indeed initial studies have shown improved efficacy over the blockbuster Avastin! The company has a wide range of collaborations, including NTS PLUS in Russia, Roche and Peregrine Pharmaceuticals. [www.affitech.com](http://www.affitech.com)

BIO contact – Martin Welschhof

**VACCINES**

**Immunology is also a strong basic area of research in Norway and led to the formation of several innovative vaccine companies such as GemVax, Bionor Immuno and Vaccibody.**

Latest in the line, **Targovax** starts out by debuting at BIO2011. This time the target is RAS positive cancers, with lead candidate TG01 entering Phase I/II studies in 2012.

[www.targovax.com](http://www.targovax.com)

BIO contact – Hanne Mette Kristensen

Last but not least, **BergenBio** is rapidly expanding from a highly successful service company offering RNAi based screening into a fully fledged biopharma with its own pipeline. In particular, the company is applying ground breaking research at Bergen University into the role of EMT (Epithelial-mesenchymal transition) in metastasis. Lead candidate BGB001 is a monoclonal antibody therapeutic against a novel receptor Tyrosine Kinase. This target is indicated in many metastatic cancers particularly ones with an EMT activity. [www.bergenbio.com](http://www.bergenbio.com)

BIO contact: Richard Godfrey

**INNOVATION**

**A good idea of the next generation of companies coming through in Norway can be gained from looking at the portfolios of BMI, Inven2 and Bergen TTO.**

**BMI** offer collaborators and investors the opportunity to get involved both before and after proof of concept stage as evidenced by their current portfolio:

Nextera – Proprietary phage display technology, focus on

new therapies for autoimmune diseases. A platform for new targets and drug candidates.

Vaccibody – A targeted vaccine platform inducing high T cell responses. Focus on cancer immunotherapy. Stage: Preclinical  
Serodus – Innovative approaches in cardiovascular diseases. Stage: Phase II.

Otivio – Treatment solutions and instruments that maintain optimal body core temperature in stroke patients, improving patient survival and recovery rates. [www.bmioslo.no](http://www.bmioslo.no)

BIO contact – Hanne-Mette Kristensen

**Inven2** is the technology transfer office of the University of Oslo, Oslo University Hospital, and all the hospitals in the south-eastern region of Norway. As of today, Inven2 has a portfolio of 24 technology start-ups and a range of licensing agreements, with the discovery of the biomarker NT-proBNP as the biggest commercial success at present.

[www.inven2.com](http://www.inven2.com).

Key companies include:

- Ultimovacs AS – peptide based cancer vaccine
- Nordic Nanovector AS – unique radiotherapy for lymphomas
- Qotics AS – treatment of multiresistant E-coli with viral vectors
- Odin AS – treatment of cancer stem cells with wnt-inhibitors
- Serodus AS - treatment of patients with isolated systolic hypertension
- Ostomy cure AS - proprietary solution for evacuating of fluids from the intestines using a titanium implant
- Setred AS – Imaging technology which displays CT, MR and ultrasound data in 3D significantly increasing information usage and accuracy in interpretation
- Simsurgery AS – Sophisticated surgical simulation (3D-real time) for training of surgical skills and procedures

[www.inven2.com](http://www.inven2.com)

BIO contact – Benedicte Bakke

Along with Trondheim and Tromsø, Bergen is another thriving hub of biotech in Norway, and Bergen TO has a strong track record of launching companies such as BergenBio and Unitargeting. At BIO they have two particular projects looking for collaboration on new diagnostic pathways and treatment of selected diseases. [www.bergento.no](http://www.bergento.no)

BIO contact – Torsten Porwol



Otivio's new device maintains optimal body core temperature in patients, and thereby improves survival and recovery rates.

Photo: BMI

#### INSTRUMENTATION

**Skannex™** builds on a long tradition of diagnostic instrumentation in Norway by offering easy to use reader systems based on standard scanner and camera technology. Skannex instruments can analyze lateral flow devices using any mix of qualitative and quantitative assays. The key to Skannex software is a proprietary barcode which contains all information required to “process” the cassette. Skannex has a growing customer base worldwide, including clinical, food/feed, drugs of abuse and environmental laboratories. Two new models will be on show at BIO including a fully mobile version for point of care work. [www.skannex.com](http://www.skannex.com)

BIO contact: Siri Olsen

“A good idea of the next generation of companies coming through from Norway can be gained by looking at the portfolios of BMI, Inven2 and Bergen TO”

**Nordiag** has developed the Arrow and Bullet range of instrumentation of automated DNA sample preparation in both research and routine laboratories. [www.nordiag.com](http://www.nordiag.com)

BIO contact – Jan Wiksten

#### PHARMA SERVICES

The growth of a biopharma sector has also led to a flourishing of pharmaceutical services companies in Norway, including leading CRO Smerud and the **Norwegian Institute of Public Health**. Their production unit functions as an independent CMO for biologics, pharmaceuticals and medical devices.

[www.fhi.no/biopharma](http://www.fhi.no/biopharma)

BIO contact – Truls Simensen

Scandinavia in general is ideal for Phase I/II clinical trials and Nexus Oncology has completed over 350 studies in solid tumours and hematological malignancies.

[www.nexusoncology.com](http://www.nexusoncology.com)

BIO contact – Andrea Cotton-Berry

#### SUPPORT NETWORKS

Oslo Cancer Cluster has had major impact internationally since its foundation in 2006 with the aim of accelerating translational research in oncology. Bringing together companies, research centres, hospitals and other stakeholders, the OCC model has stimulated cooperation internationally with major partners across Europe, the US and China. These collaborations range from a multinational Phase I/II trial network to the European Cancer Cluster Partnering conference held annually.

[www.oslocancercluster.no](http://www.oslocancercluster.no)

BIO contact – Tone Yrvum

Encouraged by the success of the Oslo Cancer Cluster, **the Nansen Neuroscience Network** aims to build on a long tradition of internationally recognised neuroscience research in Norway. Nansen himself as well as being a famous arctic explorer and humanitarian, was a pioneering neurologist correctly predicting the existence of the synaptic cleft. Formed two years ago, the Network is an independent organization bringing together

industry, academic research groups and clinicians which aims to accelerate translational research. Potential international collaborators will find a diverse range of expertise and resources – gene expression diagnostics, water channel research, use of omega 3 and other marine oils as supplements and patient cohorts. [www.nansenneuro.net](http://www.nansenneuro.net)

BIO contact – Stein-Lorentzen Lund

As befits a country with such a strong maritime tradition, **MareLife** is a Norwegian marine innovation network that believes passionately that life science tools and approaches provide the keys to sustainable marine resource exploitation. The organisation concentrates on three areas – aquaculture, fisheries and marine by-products – and is gaining increasing recognition and members worldwide. [www.marelife.no](http://www.marelife.no)

BIO contact – Maria Christensen

The Norwegian Bioindustry Association (NBA) was established in Autumn 2001 by representatives of Norwegian biotech companies and the Confederation of Norwegian Business and Industry (NHO). The NBA has over 60 members and publishes a major pipeline report annually. [www.biotekforum.no](http://www.biotekforum.no)

BIO contact – Thor Amlie

**Innovation Norway** promotes national industrial development in Norway through a network of offices worldwide and is your gateway to the Norwegian life science industry via its websites [www.norbiobase.no](http://www.norbiobase.no) and [www.indbiotech.no](http://www.indbiotech.no)

BIO contact – Ole Jorgen Marvik

**Oslo Teknopol** is the Oslo's non-profit development agency and your key to the Oslo region. The agency acts as the secretariat for Oslo Bio, MareLife, MedCoast Scandinavia and cooperates closely with Oslo Cancer Cluster, Oslo Medtech and Nansen Neuroscience Network. As such they can provide information and support to investors considering the region as a possible location for future activities.

[www.oslo.teknopol.no](http://www.oslo.teknopol.no)

BIO Contact – Susanne Werner



Tone Yrvum aims to guide Oslo Cancer Cluster through its next exciting phase of development.

## YRVUM TAKES THE HELM AT OSLO CANCER CLUSTER

Along with Algeta, Clavis, Photocure and others, the great success story of recent years has been the Oslo Cancer Cluster. Now following a successful independent review and renewed funding, a new CEO is taking the reigns – Tone Yrvum.

### What interested you in the role of OCC CEO?

I have watched Oslo Cancer Cluster's progress with both fascination and admiration from the beginning, seeing how their concept really is making a difference in attitudes and practices in translational medicine. When the position became vacant, I did not hesitate for a second before applying – opportunities like this only arise once in a lifetime!

### What do you think you bring to the job?

Firstly, passion because of my own fight against cancer and strong belief that translational medicine is the key to providing solutions because of my original background as a researcher. Secondly, vision and leadership to take the Cluster forward as a result I hope of my broad range of experience in both research and industry.

### Tell us more about your background?

I am a molecular biologist by training and was part of the Norwegian team contributing the Human Genome project. Because of my interest in business I also completed an MBA. Since leaving the lab bench, I worked first as a global product manager in Dynal Biotech (now Invitrogen) for nine years and then in 2005, satisfied a longheld ambition by co-founding Mole Genetics, which rapidly grew from start-up into a fully-fledged biotech instrumentation company.

### What are the immediate priorities in cancer?

We need improved diagnostic methods and more targeted therapy with better effect and fewer side effects. Norway already has some interesting initiatives in these areas and

more are in the pipeline. Through my work in Oslo Cancer Cluster, and I hope to make a difference.

### What do you see as the role of Oslo Cancer Cluster

To begin with, I believe that Norway has a lot to offer in the bio field, and I feel strongly that Oslo Cancer Cluster can help this potential be realised. To do this I aim to use my networks and experience to help strengthen the Cluster through local collaborations and international partnerships; help member companies attract more capital; create an efficient clinical trials network to shorten development timelines and eventually bridge research, biopharm and education in the eagerly awaited new Innovation Park. In particular, the Innovation Park will not only serve as a window to the world, but at the same time, provide education for future researchers and an incubator for the next generation of Norwegian biotech. We have to ensure our current success continues and is sustainable".

### Finally your immediate aims at BIO?

Already in just a short space of time, OCC's model has attracted a number of exciting overseas collaborations, such as with the Hamner Institute in the US and the Shanghai Center for Disease Control. BIO will give me the opportunity to both catch up with them and hopefully forge new relationships. And then of course we have European Cancer Clustering Partnering Conference, which we jointly organise with our longstanding collaborators Cancer-Bio-Santé in Toulouse in September. There I can talk further with our strong European network, which also includes Heidelberg, Barcelona, Copenhagen and Lund.

*"I believe Norway has a lot to offer in the bio field, and I feel strongly that Oslo Cancer Cluster can help this potential be realized"*

From fishing and forestry to face cream and silk

## – NORWAY IN THE BIOECONOMY

Norway intends to be a significant global player in the emerging bioeconomy. This is high on the political agenda and we now have an imminent National Strategy programme encompassing five ministries. Norwegian Industrial Biotechnology Network is operating under the auspices of Innovation Norway's sector programmes, e.g. marine, agriculture, energy and environment and medicine. Its main objective is to stimulate cooperation across geography, research disciplines and market areas with a primary focus on high value chemicals, nutraceuticals, feed and personal care markets. Government agencies are increasing their efforts in this area to align with the government strategy.

A primary objective for Innovation Norway is to foster international collaboration, and in February 2011, a memorandum of understanding was signed between Innovation Norway and British Technology Strategy Board, aiming to stimulate bilateral partnerships between industry and research institutions in the area of industrial biotechnology and biorefining. A report has now been prepared for different areas of partnership.

Drawing on Norway's traditional expertise, we can offer excellence in the biorefining of lignocellulose and marine-based raw materials – from fishing to forestry, but with a difference!

Norway has by tradition a large paper and pulp industry with key centres of excellence closely linked to the University of Science and Technology in Trondheim. One of our companies, Borregaard, with operations in 20 countries, has been converting the cellulose and lignin fractions into fine chemicals for decades and offers leading technologies for utilisation of these fractions. A whole raft of different products can be refined from the biomass – for uses varying from concrete to food flavourings – and we now even export artificial silk to China!

Norway has a leading market position on marine oils, as by-products from the fish processing industry as well as from

plankton such as krill and calanus, producing over a half of the global market. The fish and aquaculture industry is also engaged in advanced exploitation of marine protein. These could be a valuable source of higher value bioactive compounds for a wide range of food, cosmetic, and biomedical applications – raising the possibility of face cream from fish oil!

There are a number of Norwegian initiatives on both microalgae and seaweeds with feasibility and pilot studies being

*“Drawing on Norway’s traditional expertise, we can offer excellence in the biorefining of lignocellulose and marine-based raw materials – from fishing to forestry, but with a difference!”*

Norway's expertise in biofermentation is increasingly in demand worldwide for production of feed stocks and other products.

initiated by R&D institutions. The Norwegian salmon industry needs marine lipids for feed production and is involved in feasibility studies where oil producing microalgae is utilising CO<sub>2</sub> and excess heat from, for example the ferrosilicon and oil refining plants. Norway's expertise in seaweeds for alginate production is now forming the basis of pilot studies on bioenergy.

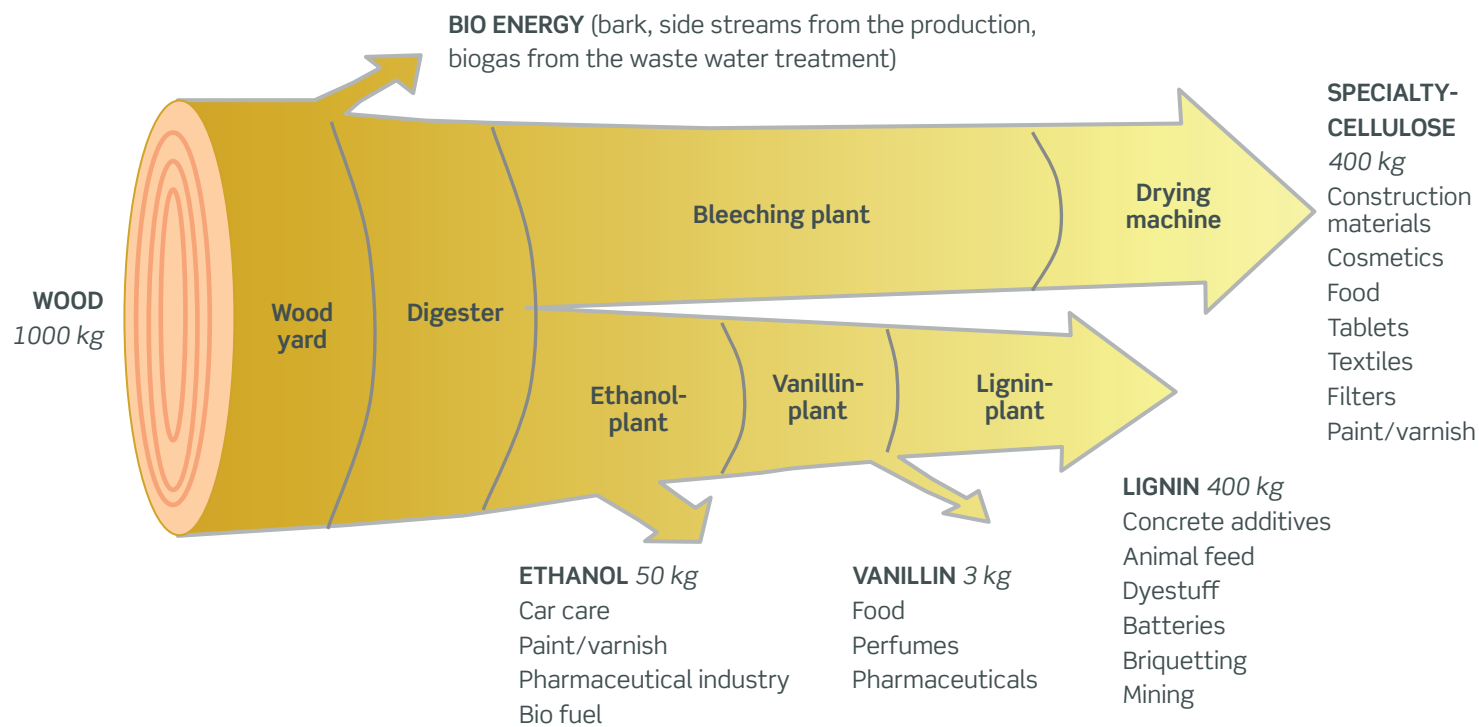
A national programme of marine bioprospecting in cold water regions has led to the discovery of novel enzymes and

bioactive compounds. In addition, the Norwegian petroleum activities provide access to extremophilic microorganisms from the deep sub-sea oil reservoirs and thermal vents. These unique enzymes from both cold water and heat-adapted extremophilic microorganisms are extremely useful in biorefining.

And Norway is now exporting its fermentation technology to the rest of the world. Stavanger-based company BioProtein Engineering AS is aiming to sign a collaboration with Malaysia

## Borregaard Wood based chemicals in an integrated concept

Illustration: Borregaard



actually during this year's BIO in Washington on technology for the production of single cell protein derived from microorganisms grown on natural gas for the use in aquaculture and life stock animals. [www.indbiotech.no](http://www.indbiotech.no)

### AlgArena takes up microalgae commercialization challenge

If the population reaches 9 billion by 2050, there has to be strong growth in food supply from the ocean on a global basis. However we are only at the starting line in our efforts to put the "blue field" on a par with land-based production. One of the biggest bottlenecks is the supply of marine lipids. Both salmon and people need the polyunsaturated lipids DHA and EPA in order to stay healthy. Microalgae are regarded as a potential future solution. Norwegian commentator Berit Solli has repeatedly pointed out the need to bring research and industry together on specific development projects and commercialization efforts.

The price of algae-based production of marine oils (omega-3

etc) for feed and human consumption is still relatively high, but technological developments may make such production competitive over a relatively short time. Microalgae also take sustainability to new levels in that they are not only auto trophic (manufacture nutrients from inorganic materials), but also very cost-effective energy sources(light) and carbon storage vehicles.

MareLife and Marine Forum have now together taken up this challenge established an algae forum, called AlgArena, together with several institutions and commercial firms. As a first step they will present a "state of the art" study on the status of algae as an alternative source of essential fatty acids at Marine Forum's seminar in August in Trondheim during the Aqua Nor conference.

### From fish farm to operating theatre

More than half of the world's anticoagulant heparin is produced in China from pig intestines. The raw product is purified in the



Photo: Morten Flaten

Science is on the agenda at the annual North Atlantic Seafood Forum in Oslo where delegates grapple with finding ways to ensure sustainability of marine resources under increasing pressure of demand.

pharmaceutical industry and is extremely valuable in human medicine and in laboratories to prevent the clotting of blood. Starting with the firm belief that there is no waste in the salmon industry, only new raw materials yet to be exposed to creative scientists, Hepmarin picked up the Processing category award for its research into the use of salmon intestines as an alternative source. [www.hepmarin.com](http://www.hepmarin.com)

### Putting science on the main marine menu

Recently the international biomarine network MareLife formed the joint venture company NASF AS together with Jørgen Lund, founder and director of North Atlantic Seafood Forum (NASF), and the leading broker house in Norway, Pareto Securities to take NASF forward.

"For next years' conference, our intention to improve visibility of our growing portfolio of Innovative Cases and major scientific achievements prior, during and after the annual conference," states Øystein Lie, executive director of MareLife.

*"Norway is taking up the challenge of finding alternative sources such as microalgae for producing life-essential marine oils"*

We believe that bio-marine innovation should be an ongoing process where strong communication and match-making are essential. We're also looking into ways of stimulating delegates to involve the next generation of experts. It's essential to engage students into this growing arena for bio-marine innovation"

The 7th Annual North Atlantic Seafood Forum will be in March 2012, in Oslo, Norway. For more information see [www.marelife.no/events/nasf](http://www.marelife.no/events/nasf)

## TRAINING FOR THE FUTURE

Oslo Cancer Cluster's Bio Accelerator programme aims to create a new generation of biotech entrepreneurs. Hanna and Loic were among 32 students from 12 nations who took part in the programme at the Centre for Entrepreneurship, University of Oslo, where students get the chance to act as consultants for real companies, helping them solve a specific business case. According to Anders Tuv from OCC who has designed the course in conjunction with CANCER-BIO-SANTE in Toulouse and the Center, the programme will help both specific companies and the Norwegian biotech sector in general by creating a growing pool of biotech talent.

### How did you hear about the Bio Accelerator course and why did you apply?

**Hanna:** Last September in Toulouse, we started the first year of our Master degrees by attending a presentation from the previous year's students about their internships. Five of them had been in Oslo. At this time, I was just ending my internship in a laboratory, and I knew that I did not want to work in the laboratory every day, so I was looking for a solution that would enable me to work in industry, but more on the marketing or management side, than on the clinical trials side."

**Loic:** Last year five French students from my university went in Oslo to follow this course and presented to us what they did. They explained the content of the course and the opportunity to participate in a real project for a pharmaceutical company. Normally an internship is required in a laboratory, but to improve my English level and also to develop different skills in order to be a manager, I choose to apply for this course.

### What did you do on the course?

**Hanna:** During this course, we attended classes based on specific literature we had to study beforehand. Then, we had a group project to complete, with the help of the knowledge learned during the lectures, and the support of the teachers and two Clavis Pharma employees.

**Loic:** First we attended some classes on innovation and new product development strategies. Then we had a case suggested



Loic and Hanna found the BioAccelerator course for budding biotech entrepreneurs in Oslo more than met their expectations.

Photo: Private

*"Actually, if I have the opportunity to work in Norway, I would not hesitate long before coming to settle."*

by Clavis Pharma, where we could apply our new knowledge. We thus acted as "real" consultants for a company and solved an actual business case. We ended by delivering a report and an oral presentation

### What was the Clavis project and how did you deliver it?

**Loic:** Clavis Pharma is aiming to develop a new product against MLS disease (Myelodysplastic syndromes), affecting blood cells. In fact the product is an improvement of a drug present on the market, using the LVT (Lipid vector delivery technology) in combination with the parent drug. Clavis Pharma wants to commercialize a successful drug, and thus we had to answer 2 questions: a) should we take cancer drug x from pre-clinic into clinic and through to the market? b) should we develop the drug to be administered orally or by using IV?

After just over a month, with the help of the lecturer from the Centre for Entrepreneurship, members of Oslo Cancer Cluster and Clavis Pharma's staff, we delivered a report advising Clavis Pharma to pursue the development of the product.

### Was the course useful and what are your future plans?

**Hanna:** Yes, the course was useful. It was a completely new topic for me, so a little bit harder than for people already studying business before this semester. I learned a lot about business, and saw what can be done outside the laboratory, but with laboratory outcomes. During this course, I also learnt, that working with people from different backgrounds and cultures is not easy, but mixing the skills and capabilities of each other improves the quality of work and efficiency.

I now hope to find a Masters degree programme linking biology and business to end in France what I started in Norway.

**Loic:** First of all, I study only biology in France, so it was a great experience for me to learn how to study a market, develop a business plan etc..., but also in the Clavis Project using all my background in biology. It was really a great experience where I learnt many things.

Next year I have to finish my Masters degree in Bioengineering in Toulouse. But after my successful experience with

## EVENT CALENDAR 2011

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

### JUNE

27 - 30 Scandinavia Pavilion, Bio International Convention 2011, Washington, USA  
[www.bio2010.org](http://www.bio2010.org)

### AUGUST

28 -31 MIE 2011, XXIII International Conference of the European Federation for Medical Informatics, Oslo, Norway  
[www.mie2011.org](http://www.mie2011.org)

### SEPTEMBER

5-8 Norwegian Cancer Symposia, Growth and proliferation: Molecular Regulators of Cancer, Oslo, Norway  
[www.cancersymposia.no](http://www.cancersymposia.no)

8 Oslo Medtech at Medtech Investment Day Scandinavia, Stockholm, Sweden  
[www.medtechinvestmentday.com](http://www.medtechinvestmentday.com)

14-16 ECCP2011, European Cancer Cluster Partnering by Oslo Cancer Cluster/Cancer Bio-Santé, Toulouse, France  
[www.ecc-partnering.com](http://www.ecc-partnering.com)

the Bio Accelerator course I am thinking about doing another year in a Business school to learn more about business, marketing and entrepreneurship, and work afterwards in a Pharmaceutical company with a Masters in the two fields.

### What were your impressions of Norway and would you recommend the course/working in Norway?

**Hanna:** Norway is a welcoming and peaceful country. Oslo is extremely different from Toulouse, the place where I live. Oslo is close to nature; there are forests, lakes, and rivers close to the city centre. Yes I would recommend the course in Norway, and I also would recommend working in Norway. Actually, if I have the opportunity to work in Norway, I would not hesitate long before coming to settle.

**Loic:** My five months in Norway were absolutely amazing. Norway is a beautiful country, very natural even in the capital Oslo, winter with snow, summer with sea it is perfect. In addition I recommend students to follow the course, it was a successful experience for me, and I recommend especially this course to biologists to acquire a new competence, in order one day maybe to create their own company.

## SCANDINAVIAN DERMAL INNOVATIONS

Ever since it was noticed that fisheries workers tended to have excellent skin, there has been a growing interest in Norway in the dermatological potential of marine ingredients. Scandinavian Dermal Innovations AS aims to realise this by developing high-end cosmeceutical ingredients in cooperation with researchers at the University of Tromsø.

### BUSINESS IDEA

To discover and market unique bio-active cosmeceutical ingredients only found in the arctic climate.

### PROGRESS TO DATE

In collaboration with Bioforsk and Marbio, the company has discovered a unique ingredient that it is currently running a small clinical trial and patenting processes around.

### KEY PERSONNEL

Geir Håvard Kvalheim, CEO; Tage Skotvold, Project manager; Jacek Bartosik; Dermatologist

### IP

Currently building portfolio



Photo: Thomas Olsen

SDI could be the latest in a long line of dermatological companies to originate in Norway according to CEO Geir Håvard Kvalheim.

### COLLABORATORS

Scandinavian Dermal Group  
Aqua Bio Technology  
MarBio  
BioForsk

For more information contact: [geir@scandiderma.com](mailto:geir@scandiderma.com)

## 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 contact:  
Oslo Teknopol at [info@oslo.teknopol.no](mailto:info@oslo.teknopol.no)

