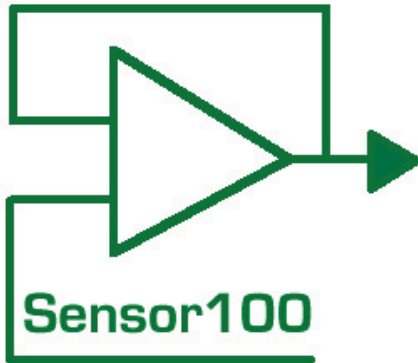


February 2016

Sensor100

The International Bio-sensor and Chemo-sensor Network

Linking academic, clinical and
commercial worlds



**News and views from the
Sensor100 community**

**Edited by:
Michael Brand PhD SM
FRSC**

**Sensor100's eNewsletter
is published by:**

Captum Capital Limited
Cumberland House
35 Park Row
Nottingham NG1 6EE
United Kingdom

**Visit the Sensor100 home
page: www.sensor100.com**

**Join the *Mail List* for this
free eNewsletter**

See our *Advertising Rates*

**Contact us at:
info@sensor100.com**

© 2016 Captum Capital Limited. All worldwide rights reserved

Table of contents

Editorial	4
Company Profile: Profusa	5
Sensor100 Events	8

Departments

Coming Events	11
---------------	----

Agriculture	16
-------------	----

Environment	18
-------------	----

Healthcare	21
------------	----

Technology	28
------------	----

See **Sensor100** on social media



Sensor100



Sensor100 Group



@Sensor100AgTech



@Captum_Capital

From the Editor

Readership of this editorial showed a marked increase in January - usually this is the least read page in the Newsletter. I'm not sure why as those who are regular readers, and there are some, will know that I just rattle on about whatever is in my mind, often the weather or how much work is involved in running **Sensor100**. Possibly the new design attracted some interest, and my thanks to those of you have emailed us with compliments and suggestions for (minor) improvements. What is encouraging is that this month people have referred to this publication as not just an eNewsletter, but an eMagazine. Seems like we are slowly making progress.

Lots of information inside about our own conference program, and those of several partners. We have finally settled on a date and venue for **Sensors for Cancer Diagnosis**, and we are about to start building what we think is the most important activity we have undertaken yet. Please support this effort, if you can.

To return to my usual grumpy stance, this month has been the month from hell. Our email service was acquired by another company, which has caused endless problems. My apologies to those of you have received bounce-backs to emails. Your emails did reach us, but you also got a message they didn't. I'm still not sure the problem is totally fixed. Then, last week, following its automatic monthly self test, my PC advised that its hard drive was about to crash. I am deeply suspicious of the IT gurus who tell me it is straightforward to replace the hard drive; nothing connected with IT is straightforward.

Last month, my son, who was having his own problems in life, tweeted "This 2016 thing isn't working. Maybe we should start over." The tweet went viral. I can see the point.

Kind regards

Michael
michael@sensor100.com



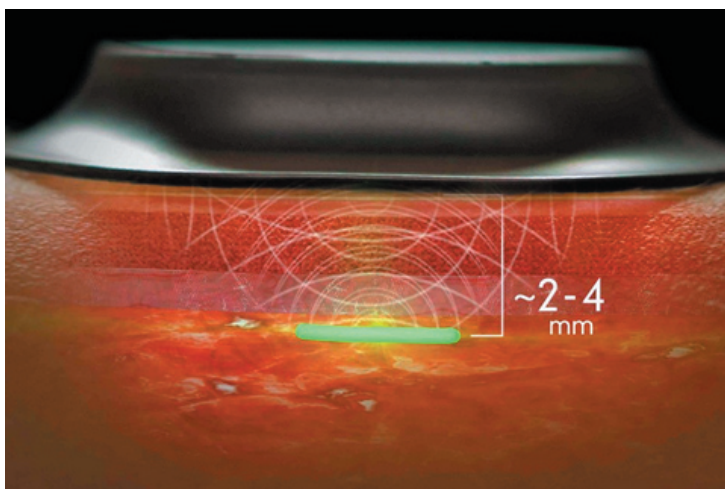
Company Profile:

Profusa Inc.



Profusa Unveils First Biointegrated Sensors for Long-term Continuous Monitoring of Body Chemistry

At the Consumer Electronics Show in January, South San Francisco based Profusa showed off an upcoming injectable sensor that can be used to continuously monitor oxygen levels in tissue. Measuring only 3-5 millimeters long and a tiny 500 microns in diameter, the biosensor can be injected into tissue



with just a hypodermic needle. It consists of a soft hydrogel scaffold that allows it to be biologically compatible with the surrounding tissue without any foreign body response. The sensor also contains a special chemical marker that changes fluorescence depending on the amount of oxygen that reacts with it. An optical reader placed on the skin measures the fluorescence and relays the data to a smartphone. The biosensor can last as long as two years (at which point the chemical marker begins to lose its potency), and because it contains no electronics and is completely biocompatible there's no need to remove it.

[Over...]

Profusa Inc...

“In between annual physicals we really don’t know what’s going on in our body,” explained **Ben Hwang, Ph.D.**, Profusa’s CEO. “While fitness trackers and other wearables provide insights into our heart rate, respiration and other physical measures, they don’t provide information on the most important aspect of our health: our body’s chemistry. What if there was a better way of knowing how you’re doing — how you’re really doing?”



According to Dr. Hwang, the company’s biosensors will have applications for consumer health and wellness, as well as the management of chronic diseases such as Peripheral Artery Disease (PAD), diabetes, and Chronic Obstructive Pulmonary Disease (COPD). “Aimed at being a leading force in the digital disruption of medicine, Profusa’s real-time biosensors are poised to revolutionize healthcare, yielding significantly more insights into one’s overall health status and performance than tracking physical parameters alone.”



[Click to view Profusa’s presentation @ Digital Health Summit CES 2016](#)

About Profusa

Founded: 2009

Company size: 11-50 employees

Type: Privately held

Industry: Medical Devices

Headquarters: 345 Allerton Ave South San Francisco, CA 94080
United States

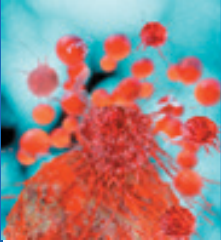
Chairman & CEO: Dr. Ben Hwang

Finance: \$13.2m in Series B finance announced Dec 2015, bringing total investment to \$30m

Website: www.profusa.com



Images by permission of Profusa Inc.



Sensors for Cancer Diagnosis



27 - 28 June 2016 Charles Hotel Cambridge, MA USA

This unique conference will bring together academic researchers, clinicians and the commercial world to explore opportunities for the application of sensor technology in the early diagnosis of cancer.

Early diagnosis of cancer can significantly improve the outcome of treatment; sensors represent a viable approach to this problem. Despite a significant research effort, relatively little of this technology has yet reached the clinic. **Sensors for Cancer Diagnosis** will explore the current state and future opportunities for the biosensor diagnosis of cancer, and will feature:

- ▶ Invited and contributed papers
- ▶ Poster competition
- ▶ Exhibits of sensor technology
- ▶ Panel discussion: barriers to adopting new technology
- ▶ Networking reception

Call for Papers: Oral and Poster Presentations
(Deadline: 13 May)

Early Registration
(Closes: 27th May)

www.sensor100.com/SfDC



21 - 22 September 2016
Ron Cooke Hub, University of York

The Conference will feature:

- ▶ Invited and contributed papers
- ▶ Poster competition
- ▶ Exhibits of monitoring technology
- ▶ Panel discussion
- ▶ Networking reception

Plenary Session: How and Why of Environmental Monitoring
Technical Sessions: Pollution Assessment in the Urban Environment
Sensors for Water Monitoring
Air Monitoring for Health

Call for Papers and early **Registration** now open

www.sensor100.com/IEM2016



Organised by



Sensors in Medicine 2016

12 - 13 October 2016

Double Tree Docklands, London UK

Open for:
Call for Papers (Deadline 26 August)
Expression of Interest

www.sensor100.com/SIM16

Sensors in Medicine 2016

Linking academic clinical and commercial worlds

Sensors in Food and Agriculture 2016

29 - 30 November 2016

Møller Centre, Cambridge UK

Open for:
Call for Papers (Deadline 16 September)
Expression of Interest

www.sensor100.com/SIFAA16



**Sensors in Food and
Agriculture**



**MEMS & Sensors
Technical Congress®
2016** 7 - 8 MARCH 2016 • MUNICH, GERMANY



LAB-ON-A-CHIP & MICROFLUIDICS 2016
MADRID, MARCH 15 - 16, 2016

3 FOR 2 on delegate passes
8th Annual



POINT-OF-CARE DIAGNOSTICS
MADRID, MARCH 15 - 16, 2016

4th Annual
3 FOR 2 on delegate passes

Sensors 2016: Wearable Smart Sensors and Technologies
21 June, The Royal Society of Chemistry, London

Call for Papers now open - Deadline 20th April 2016

5th International Symposium on Sensor Science



5th International Symposium
on Sensor Science

17 - 22 July 2016, University of New Hampshire, USA

The Emerging Technologies Competition 2016

The Royal Society of Chemistry's annual innovation competition is open for entries until 14 March 2016. This is a chance for small companies and academic entrepreneurs to win bespoke support in commercialising their technologies.



The winners of the Emerging Technologies Competition will receive on-going support from the competition's partners: leading multinational companies, drawn from wide range of specialisms. Their support, tailored to the needs of the winner, has previously ranged from backing funding proposals and providing funding for chemicals, to assisting with strategy reviews and helping clarify market opportunities. With this help, the seven 2013-1014 winners have already gone on to raise over £16 million in investment, obtained commercial contracts and are continuing to increase their number of employees.

Winners of the competition are also given multiple PR opportunities and up to £20,000 to develop their idea. All shortlisted entrants now receive a day of specialised business training and an exhibition stand at the Royal Society of Chemistry's flagship industry event – Chemistry Means Business.

The competition welcomes disruptive technologies in the fields of: health & wellbeing, energy & environment, food & drink, and materials. Find out more and apply [here](#)

The Competition Partners

AkzoNobel, Aramco, AstraZeneca, Croda, GE Healthcare, GlaxoSmithKline, Procter & Gamble, Schlumberger, Pfizer and Unilever.



Deadline for 2016 Entries

14 March 2016

2105 Competition Winners

Image: @ Royal Society of Chemistry /
MMP Image Creation



EUROPT(R)ODE XIII 2016 in Graz, Austria covers all aspects related to the research, development and application of optical chemical sensors and biosensors.

MAIN TOPICS:

- Sensor Materials
- Novel Sensing Principles
- Applications of Optical Sensors
- Devices and Instrumentation
- Smart Sensor Production Technologies

**ONLINE
REGISTRATION
DEADLINE**

March 6, 2016

[www.europtrode2016.eu/
registration](http://www.europtrode2016.eu/registration)



Organizers:



BIOSENSORS 2016

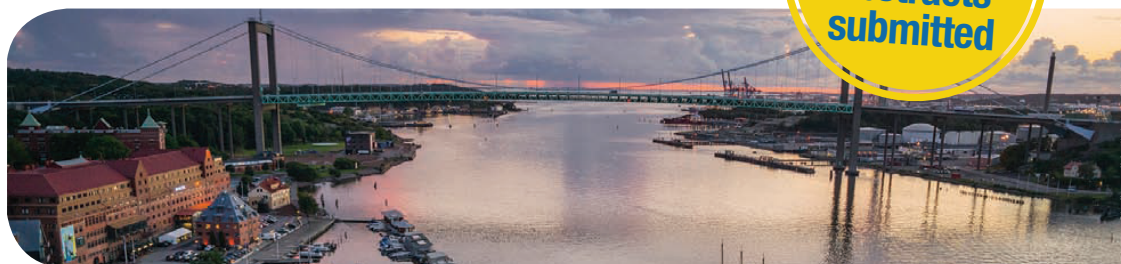
25–27 MAY 2016 | GOTHENBURG, SWEDEN

Come to the 26th Anniversary World Congress on Biosensors



Register now for the largest biosensors event in the world

More than
1500
abstracts
submitted



This **premier event for the biosensors community** – the largest in the field – celebrates its **26th anniversary** with another excellent line-up of plenary speakers:

- **Anja Boisen**, *Technical University of Denmark, Denmark*
Integrated nanomechanical sensor systems
- **Francis Ho**, *Samsung, USA*
Personal monitoring: Simband and beyond
- **Fredrik Höök**, *Chalmers University of Technology, Sweden*
Lab on a chip meets biosensors.
- **Lanqun Mao**, *Chinese Academy of Sciences, China*
Biosensors and biogenerators for in vivo analysis.
- **Shelley D. Minteer**, *University of Utah, USA*
Nano structured fuel-cells and electrochemical biodevices
- **Aydogan Ozcan**, *UCLA, USA*
Holograms and sensing

Biosensors 2016 Congress Chair

Anthony P F Turner, *Linköping University, Sweden*

SATELLITE EVENTS

Biosensors 2016 Summer School on Mobile Diagnostics

Tuesday 24 May 2016

Post-Congress Symposium in Cancer Diagnostics

Saturday 28 May 2016

Main sponsor



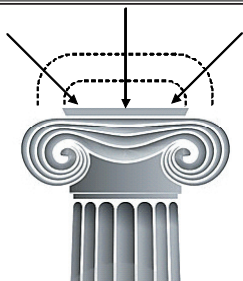
#biosensors2016

Register now at:

www.biosensors-congress.elsevier.com

Organised and sponsored by





ESEAC MMXVI

16TH INTERNATIONAL CONFERENCE ON ELECTROANALYSIS
12TH -16TH JUNE 2016
THE ASSEMBLY ROOMS, BATH, UK

Invitation

The University of the West of England cordially invites you to the historic Roman city of Bath for the 16th meeting of ESEAC. As well as promoting excellent science, ESEAC 2016 will continue a tradition of hosting the very best social and cultural activities.



Plenary speakers

Prof. Richard Van Duyn

Northwestern University, USA
RSC Theophilus Redwood Award recipient 2015

Prof. Robert Forster

Dublin City University, Ireland

Prof. Gordon Wallace

University of Wollongong, Australia

Prof. Galina Tsirlina

Moscow State University, Russia

Important dates

31st January 2016 Deadline for abstract submission
31st January 2016 Deadline for ESEAC Award lecture
1st February 2016 Deadline for DropSens award
1st April 2016 Notification of abstract acceptance
3rd April 2016 Deadline for early registration
1st August 2016 Deadline for Electroanalysis SI

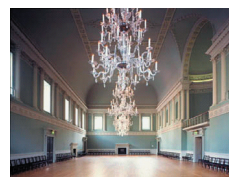
Registration

- Conference registration is open.
- Early registration will close on 3rd April 2016
- Payment of registration for inclusion in the book of abstracts will close on 30th April 2016
- Registration will close on 15th May 2016

Please go to www.eseac2016.com to register.

Location and venue

Bath is a city of unparalleled historical significance. It is situated in a beautiful region of South West England which boasts many other sites of historical and cultural interest. It is readily accessible by road, rail and air from London and Bristol. ESEAC will be held at the magnificent Assembly Rooms.



Keynote speakers

Dr. Ritu Katakya Durham University, UK

Prof. Elena Ferapontova Aarhus University, Denmark

Prof. Martin Pumera, Nanyang University, Singapore

Prof. Sue Lunte, Kansas University, USA

Prof. Christine Kranz, University of Ulm, Germany

Prof. Ioannis Ieropoulos, UWE, UK

Early Registration	Until 3rd April 2016
Reduced fee	£450
Reduced student fee*	£300
Reduced Accompanying Person fee	£250
Registration	After 3rd April 2016
Full fee	£550
Student fee*	£350
Accompanying Person fee	£300

Agri-Tech in China Newton Network+



Science & Technology
Facilities Council



University of
Reading



Rothamsted Research, the University of Reading and SRUC, together with the University of East Anglia and Edinburgh University, have secured £2.5M from STFC to support UK organizations looking to apply their capabilities on satellite imaging, remote sensing, smart sensors and modelling to address challenges faced by the agricultural sector in China.

The Agri-Tech in China Newton Network+ will support:

- Fact-finding and networking missions to China
- Feasibility studies
- Proof of concept work
- R&D projects
- Bi-directional exchange visits
- Knowledge exchange and capacity building workshops

The great majority of China's farms are smallholder properties with insufficient productivity to support farmers in rural communities on their own. A number of forces including soil degradation, pollution of soils and chemical residues in crop plants, unsustainable water use and polluted water, and inefficient use of inputs threaten agriculture on these properties. The Agri-Tech in China Network+ has been set up to coordinate the networking, capacity building and innovation activities to support farming in China.

See the [Pre-Launch event](#) for more information

New Technology Developed at University of Connecticut Detects Organophosphates in Food

As pesticides or lethal chemical weapons, organophosphates (OPs) are deadly compounds regardless of their intended target; they comprise 40 percent of the pesticides used worldwide. The new sensor developed by Profs. Lei and Hou utilizes a plant-based esterase, or PLaE, which can be extracted from wheat flour, soy, or corn. The new sensor is a thoughtfully engineered matrix: Chitosan, a plentiful compound derived from the shells of crustaceans such as shrimp, acts like a glue to hold the components of the sensor together and also binds the sample, ensuring everything is in close contact; Gold nanoparticles are added to aid in electrical conductivity and electron transfer without interacting with or altering the sample itself.; Graphene nanosheets are included to ensure that components are all interconnected, in order to increase conductivity and durability. Last but not least, the matrix includes the plant-based esterase as the bio-recognition element to interact with organophosphates. It is the enzyme activity change in the plant-based esterase that is monitored by the sensor, and read using a meter.



A sensor that can detect toxic chemicals is connected to a cable in the lab.
(Peter Morenus/UConn Photo)

University of Connecticut [Press Release](#) 23 February

THE KNOWLEDGE FOUNDATION'S SECOND ANNUAL

BIODEFENSE WORLD SUMMIT 2016

June 27-30, 2016 | Baltimore, MD

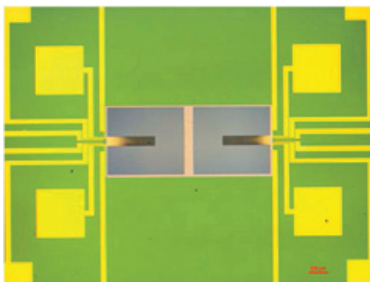
The 24th International Biodetection Technologies: Biothreat and Pathogen Detection is an internationally recognized meeting for experts in detection & identification of biological threats. This conference will address hot topics in pathogen detection, strategies and cutting edge assays and technologies for detection & identification of global biological threats and translational gaps in bringing technologies from lab to field. The conference takes place on June 27 - 28 2016.

This event is followed by Knowledge Foundation's Biodetection Technologies: Point-of-Care for Biodefense being held from June 28-29, 2016. Together, these two events will provide three full days of comprehensive programming around biodetection technologies in biodefense.

Conference details [here](#)

Real-time Monitoring and Sensing of Atmospheric Explosive Vapors

Multimodal sensors enhance chemical selectivity and reduce false-positive/negative signals in explosive vapor detection.



Optical image of the microelectromechanical sensing device.

Prof. Seonghwan Kim, University of Calgary CA, has developed a multimodal sensing system for explosive vapors that uses a microthermometer/microheater device and a widely tunable quantum cascade laser

Reported in **SPIE**. 24 February
 SPIE. is the international society for optics and photonics

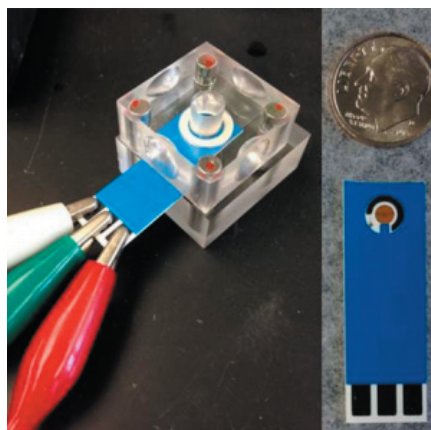
Hand-held Biosensor Uses a Component of DNA to Detect Traces of Gold in Water

The gold sensor is the latest in a series of metal-detecting biosensors under development by Rebecca Lai, an associate professor of chemistry at the University of Nebraska-Lincoln. Other sensors at various stages of development detect mercury, silver or platinum. A primary purpose for the sensors would be to detect water contaminants, Lai said.

DNA, the carrier of genetic information in nearly all living organisms, might seem an unlikely method to detect gold and other metals. Lai's research, however, exploits long-observed interactions between metal ions and the four basic building blocks of DNA: adenine, cytosine, guanine and thymine. The gold sensor, for example, is based on gold ions' interactions with adenine.

Lai's sensor works by measuring electric current passing from an electrode to a tracer molecule, methylene blue in this case. In the absence of Au(III), the observed current is high, because the oligoadenine probes are highly flexible and the electron transfer between the electrode and the tracer molecule is efficient. But upon binding to Au(III) in the sample, the flexibility of the oligoadenine DNA probes is hindered, resulting in a large reduction in the current from the tracer molecule. The extent of the change in current is used to determine the concentration of AU(III) in the sample.

University of Nebraska [News Release](#) 17 February



The DNA probe is immobilized on a gold electrode contained within the circle. A water sample as small as 10 microliters is applied to the sensor through the center of the crystal cube. The white, green and red leads attached to the contact pads connect to a handheld power source.

With New Sensors, A Clearer View Of Air Quality

High-resolution air pollution sensor networks and wearable sensors that give real-time data on common air pollutants could usher in a new generation of air quality studies.



That's what Prof. Drew Gentner is aiming for with a project that begins at the Yale Center for Engineering Innovation & Design (CEID) this semester. With students, he will design and build about 50 stationary air sensors, each smaller than the size of a shoebox. They will also design and build about 15 portable units. These sensors, similar in size to smartphones, will be worn by volunteers in Baltimore as they go about their daily routines.

When the portable sensors are complete, people will be able to wear them for days at a time. The stationary sensors will be located in representative locations around the city: roads, schools and other places where people spend a lot of time. "With these networks we'll have real time measurements, 24 hours a day of the fine spatial, temporal, and chemical resolution on the air pollutants responsible for detrimental effects on human health and climate," said Gentner, Assistant Professor of Chemical & Environmental Engineering, who is also associated with the School of Forestry & Environmental Studies.

Baltimore was the chosen site for sensors partly because of the proximity to SEARCH partner Johns Hopkins University and for the availability of participants from a wide range

of backgrounds. Gentner said the portable sensors should be ready for use in 2017. "We'll be collecting the data for about two years and our subsequent analyses will look at how individual and broader policy choices affect air pollution and human exposure."



Portable and stationary sensors made at the CEID will monitor the air quality in Baltimore, MD

Yale School of Engineering and Applied Science February 3

Cancer MoonShot 2020

No one whose life has been touched by cancer, and that means almost everyone as statistically one in two of us will be diagnosed with the disease, can fail to support the concerted effort to find a cure by 2020.



The Project Moonshot 2020 name reportedly came from a speech Vice President Biden made in the Rose Garden in October 2015, promising a “moonshot” to cure cancer. The speech itself was triggered by the death of Biden’s son to cancer.

By pooling the resources of a handful of pharmaceutical companies, the project’s stated goal is to aggressively focus on rapidly developing new treatments for the disease. Some cancer specialists have expressed optimism that science has entered a “new era with the ability to rapidly determine the sequences of genes in tumor cells, searching for mutations that may be driving the cancer’s growth.” Others call it “unrealistic.” (New York Times Jan 13, 2016).

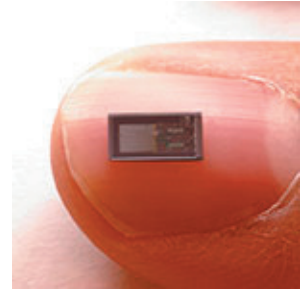
Cancer therapy had made enormous advances in the past decade and more people are passing that magic hurdle of 5 years post-treatment. Bringing the concerted resources of the US scientific community to bear on the problem can only be beneficial in so many ways.

Meanwhile, **Sensor100** will be fighting its corner for better, faster, cheaper and more effective diagnostic tools, up to our conference, **Sensors for Cancer Diagnosis** and beyond.

www.cancermoonshot2020.org

Wireless, dissolvable sensors to monitor brain

A team of neurosurgeons and engineers has developed wireless brain sensors that monitor intracranial pressure and temperature and then are absorbed by the body, negating the need for surgery to remove the devices. These implants, developed by scientists at Washington University School of Medicine in St. Louis and engineers at the University of Illinois at Urbana-Champaign, potentially could be used to monitor patients with traumatic brain injuries, but the researchers believe they can build similar absorbable sensors to monitor activity in organ systems throughout the body. Their findings were published online in the journal *Nature*.



News release, Washington University
School of Medicine, 18 January

Abbott Labs to Acquire Alere

Abbott Labs and Alere Inc. have announced a definitive agreement for Abbott to acquire Alere, significantly advancing Abbott's global diagnostics presence and leadership. Under the terms of the agreement, Abbott will pay \$56 per common share at a total expected equity value of \$5.8 billion. Once the transaction is completed, Abbott will become the leading diagnostics provider of point of care testing. Abbott's total diagnostics sales will exceed \$7 billion after the close.

“The demand for point-of-care testing is accelerating as health care providers and consumers look for better ways to get fast, accurate and actionable information to guide decision making that improves patient care and reduces unnecessary health care” spending, Abbott's CEO said.

The medical device sector has been consolidating in the face of pressure from hospitals and health systems to cut costs. Last year, there were 1,007 pending or completed deals in the industry, worth a total of \$58.9 billion, according to data compiled by Bloomberg.

Reported by **BloombergBusiness** February 1

CALL FOR PAPERS: WORKSHOP

Wearable and Ambient Sensor Technology in Geriatric Medicine and Rehabilitation - examples, challenges and lessons learned

Demographic change with rising numbers in co-morbidity leads to an increased demand in clinical geriatric expertise as well as in geriatric research. In order to alleviate the effects that aging will have on our societies in terms of increased functional deficits, waning possibilities for participation and communication and a potential risk of emergencies, supportive technical solutions are frequently proposed. Such technologies may comprise a wide range of solutions including e.g. wearable sensor-based systems, ambient assisted living systems for personal environments or communication support tools. To make sure that the rapidly advancing field of research in technologies for the elderly meets the demands of the persons in need, research efforts should be interdisciplinary. Evaluation in controlled clinical trials or field experiments is extremely valuable and therefore highly commended.

The intended workshop will be submitted to the **HEC2016 conference in Munich** to address research in such technologies. Specifically, the workshop aims to address the following topics:

- Systems (ambient, wearable, or both) for geriatric resp. elderly care, supporting e.g. Rehabilitation (progress) monitoring and support/ advice
- Emergency detection and alarm
- Chronic disease management
- Health consultation and feedback
- Support for activities of daily life
- Communication, education, social interaction and entertainment
- Clinical trials or field experiments with a comprehensive evaluation methodology using such systems, e.g. to support geriatric rehabilitation
- Cost-benefit studies of such systems
- Experiences, pitfalls, lessons learned

High quality, original **abstracts** dealing with this domain are solicited (**max. 150 words**). All abstracts submitted will be peer-reviewed. Please send your abstract as an email attachment to Michael.marschollek@plri.de.

Submission Deadline: March 15, 2016

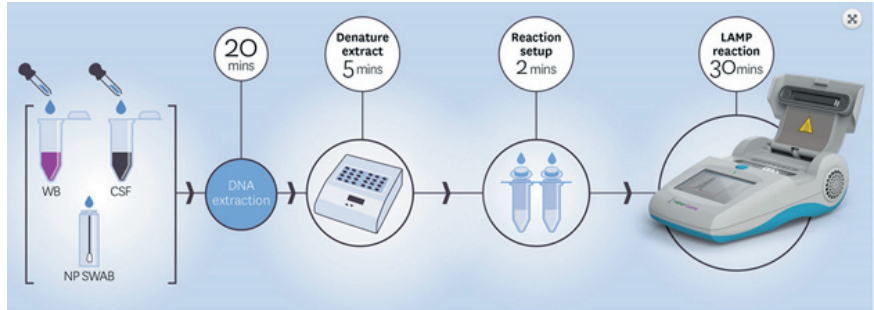
Contributed by: **Michael Marschollek, Nigel Lovell, Stephen Redmond**

HiberGene Meningitis Test

Dublin based HiberGene has announced that it has obtained the CE mark for its meningitis test.

The HG Meningococcus assay was designed to target a consensus nucleic acid sequence which is conserved among *Neisseria meningitidis* strains

responsible for invasive disease. The assay has been shown to amplify DNA from *N. meningitidis* serogroups A, B, C, 29E, W135, X, Y, Z and it gives highly sensitive, specific results from whole blood, cerebrospinal fluid (CSF) and nasopharyngeal swab samples in less than 60 minutes.



[Read more...](#)

Now Your Smartphone Can Help You Clean Your Teeth

Oral-B's latest electric toothbrush, the Genius 9000, connects to an app on your smartphone via Bluetooth to help track your brushing and teach you better technique.



Connect your phone to the toothbrush and fire up the app. Stick your phone on your bathroom mirror at eye level with the screen facing you (a mount with a suction cup is included). The app will help you line up your face with the view from the front facing camera. Once you start brushing, the app uses the camera to judge the position of the toothbrush in your mouth in order to gauge how much time you're spending brushing each zone of your teeth.

The Genius 9000 is due to hit shops in the UK and the rest of Europe in July, and the US in December. Prices are expected to be somewhere between \$200 and \$300 (which converts to around £145 to £215).

Reported by [C|Net](#) 25 February

NIH to Launch Health Tech Center for Precision Medicine Initiative This Summer

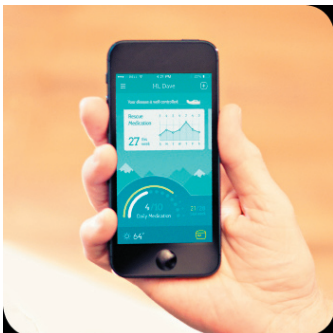
This summer, National Institutes of Health (NIH) will launch a Participant Technologies Center to test and maintain connected sensor technologies as part of the White House's Precision Medicine Initiative (PMI), NIH Director Francis Collins announced at the Precision Medicine Summit. Vanderbilt University, with help from Verily (formerly known as Google Live Sciences) as advisors, will conduct a pilot to prototype a set of technologies and experiments, which would help the NIH understand how to successfully work with the large cohort.

There are at least four other healthcare organizations that have announced precision medicine projects that use digital health technologies and are aligned with the White House's initiative. These groups aren't necessarily integrated with any of the federal government's specific PMI projects, but their work is also furthering the overall goal of PMI.

Reported by [MobileHealthNews](#) 25 February

Propeller Health Partners with Global Drug Delivery Systems Provider Aptar Pharma for Development of a Next-Generation, Integrated, Connected Metered Dose Inhaler

Under the terms of the agreement, Propeller and Aptar will jointly develop the world's first integrated cMDI, with an integrated sensor and a novel electronic dose counter. The device is currently available for licensing and is expected to enter clinical studies later this year. The new inhaler will combine Aptar MDI components and sensor technology with Propeller electronics directly into the inhaler housing, allowing for accurate and reliable monitoring of when each patient uses their inhaled medication. Leveraging existing apps, emails, text messages and other feedback, patients are able to learn more about their disease, how to better manage it, and how to stay on track with their prescribed dosing instructions. In addition, physicians can identify individuals who need more help controlling symptoms, and care managers can efficiently focus on higher risk patients who need more personalized attention.



Propeller Health [Press Release](#) 25 February

Philips to introduce next-generation monitoring solution enabled by wearable biosensors



Royal Philips announced that it will introduce a next-generation monitoring solution for at-risk patients in low acuity hospital settings, such as the general ward. As an industry-first, the new medical-grade biosensor enabled solution demonstrates Philips' continuing commitment to better addressing clinicians' and patients' needs through monitoring. Unlike fitness trackers and consumer focused wearables, the new medical-grade, connected biosensor automatically

and continuously measures clinically relevant vital signs including heart rate, respiratory rate, skin temperature and more. The biosensor then transmits the data it collects to a connected clinical decision support software application, where the software can be configured to promptly notify the appropriate caregiver or clinician when preset limits are exceeded.

PRNewswire 22 February

Astraeus Technologies wins MIT \$100K Accelerate with new lung cancer test

Astraeus Technologies won both the \$10,000 Danny Lewin Grand Prize and the \$3,000 Founders.org Audience Choice Prize Feb. 10 with a device, the L-Card, that can detect lung cancer through a single breath. The L-Card, slightly larger than a postage stamp, detects chemicals in human breath. The card is then read by a smart phone application that indicates high levels of cancer indicators. The Astraeus team said the single-use cards can be manufactured for about \$1, and may be as much as 10 times more accurate than CT scans.



MIT Sloan Newsroom | 11 February

Roche MDx Sales Grow 7 Percent in 2015

Roche reported a 7 percent increase in molecular diagnostics sales for 2015, driven by its molecular and sequencing businesses.

Roche's Diagnostics division had sales of CHF 10.81 billion for the year, approximately flat compared to last year's CHF 10.77 billion. At constant exchange rates, diagnostic sales were up 6 percent, driven primarily by professional diagnostics and in particular immunodiagnostic products.

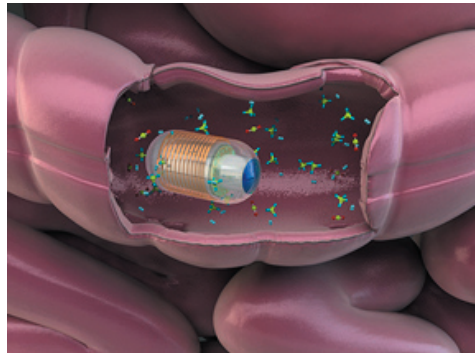
The company said it launched seven diagnostic tests and eight instruments in 2015, including the Cobas 6800 and Cobas 8800 systems for molecular diagnostics, and the Ventana HE 600 system for tissue diagnostics.

It also acquired four companies in 2015 — Ariosa Diagnostics, Signature Diagnostics, CAPP Medical, and Kapa Biosystems — that it said will complement its activities to build a next-generation sequencing portfolio.

Reported by [genomeweb](#) 28 January

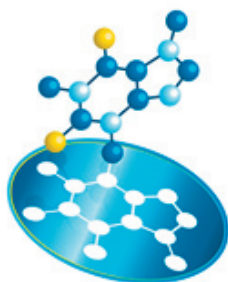
Human Life Is a Gas

Researchers at RMIT University in Melbourne, Australia, have designed and custom-manufactured indigestible capsules that can measure the concentration of different gases during digestion in the gut of animals and humans—a world's first, they claim. The capsules meet the standards necessary for such testing, and after conducting a series of trials on pigs, the researchers have begun recruiting human volunteers on which to test the next version of the pill. An electronic capsule is composed of: an indigestible cladding; a gas-permeable membrane covering a sensor for detecting hydrogen, methane or carbon dioxide; a microcontroller; a 433-megahertz wireless transmitter; and four silver oxide batteries.



[IEEE Spectrum](#) January 15

Company Profile

**MIP** Diagnostics Ltd

MIP Diagnostics is the leader in the manufacture of Molecularly Imprinted Polymer nanoparticles (nanoMIPs) by solid-phase imprinting. NanoMIPs, sometimes called “plastic antibodies”, are nanostructured polymer particles containing a binding site for their target molecule and capable of selectively recognising the said target. Thanks to their small size and the possibility to tailor their surface chemistry, nanoMIPs are soluble and can be easily integrated in sensors. Furthermore, their robust nature (being plastics) allows them to be used in harsh chemical environments, such as extremes of pH, seawater or high concentrations of organic solvents. NanoMIPs specific for all major target classes (from small molecules, such as drugs or pesticides, to peptides and proteins) have been developed and used as diagnostic tools both in sensors and assays. Using our proprietary solid-phase approach which circumvents the drawbacks of traditional manufacturing methods, MIP Diagnostics can provide a bespoke and proven nanoMIP within as little as two weeks from receiving the target, without any requirement for animal testing. In addition, MIP Diagnostics provides other MIP formats, such as cartridges, microparticles or films for separation and sensor applications.

www.mip-dx.com

*This Company Profile will now appear in Sensor100's **Organization Directory**. You can add your own organization's profile by completing the **Registration Form**, and returning by email. There is a nominal one-time fee of £50+VAT for companies, waived for academic institutions.*

Graphene Engineering Innovation Centre

The University of Manchester is to build a £60m Graphene Engineering Innovation Centre (GEIC). The facility will be critical in the development of commercial applications and in maintaining the UK's world-leading position in graphene and related 2-D materials. The GEIC will be partially funded by £15m from the Higher Education Funding Council for England's UK Research Partnership Investment Fund (UKRPIF), £5m from the Technology Strategy Board and by £30m from Masdar, the Abu Dhabi-based renewable energy company owned by Mubadala which focuses on advancing the development, commercialisation and deployment of clean technologies and solutions.

Graphene was first isolated by Prof Andre Geim and Prof Kostya Novoselov at the University of Manchester, who were awarded the Nobel Prize for Physics in 2010 for their work.

Regretably, neither they nor the University of Manchester patented the discovery. Prof. Geim stated:

'We considered patenting; we prepared a patent and it was nearly filed. Then I had an interaction with a big, multinational electronics company. I approached a guy at a conference and said, "We've got this patent coming up, would you be interested in sponsoring it over the years?" It's quite expensive to keep a patent alive for 20 years.

The guy told me, "We are looking at graphene, and it might have a future in the long term. If after ten years we find it's really as good as it promises, we will put a hundred patent lawyers on it to write a hundred patents a day, and you will spend the rest of your life, and the gross domestic product of your little island, suing us." That's a direct quote.'

University of Manchester News

MIT Technology Review: 10 Breakthrough Technologies

Tech Review's Annual List - challenge: how do sensors interact with each?

Immune Engineering

Precise Gene Editing in Plants

Conversational Interfaces

Reusable Rockets

Robots that Teach Each Other

(Your) DNA App Store

Solar City's Gigafactory

Slack (a service built for the era of mobile phones and short text messages)

Tesla Autopilot

Power from the Air

Technology Review February 2016

Fluorescent biosensors light up high-throughput metabolic engineering

Synthetic biologists are learning to turn microbes and unicellular organisms into highly productive factories by re-engineering their metabolism to produce valued commodities such as fine chemicals, therapeutics and biofuels. To speed up identification of the most efficient producers, researchers at Harvard's Wyss Institute for Biologically Inspired Engineering describe new approaches to this process and demonstrate how genetically encoded fluorescent biosensors can enable the generation and testing of billions of individual variants of a metabolic pathway in record time.

“Our fluorescent biosensors are built around specialized proteins that directly sense commercially valuable metabolites. These sensor proteins switch on the expression of a fluorescent reporter protein, resulting in cellular brightness that is proportional to the amount of chemical produced within the engineered cells. We can literally watch the biological production of valuable chemicals in real-time as the synthesis occurs and isolate the highest producers out of cultures with billions of candidates,” said Jameson Rogers, who was named one of Forbes’ “30 Under 30” in Science for opening new perspectives in bioengineering.

Reported by: [EurekaAlert!](#) 17 February

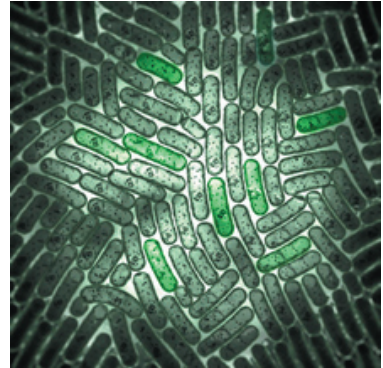


IMAGE: Genetically encoded fluorescent biosensors allow researchers to follow product accumulation in individual bacteria in real time and to filter the best producers out of cultures with billions of bacteria

Credit: Wyss Institute at Harvard University.

Sensor100
Cumberland House
35 Park Row
Nottingham NG1 6EE
United Kingdom

