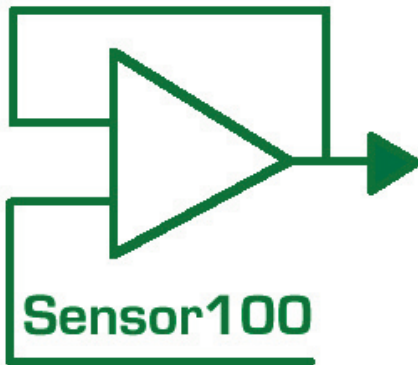


February 2017

# 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**

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See **Sensor I00** on social media



**Sensor I00**



**Sensor I00 Group**



**@SensorI00AgTech**



**@Captum\_Capital**

## From the Editor

When we started Sensor100 in mid 2011, it was a short one page email, in which we included a few sensor related news items. This rather quickly grew to several pages, requiring conversion to the current “Flip-book” format, although there is continued debate in our office from someone nameless who thinks it should be a pdf file.

Then we started our conference series, back in 2013, which has grown from one event to four this year. Running conferences in this Brexit/Trump era has a high level of uncertainty as to what the attendance will be, so please do support our events. We work very hard to make them relevant to our core objective of facilitating transfer of technology from lab to marketplace.

Moving into 2017, we seem to have become lobbyists. We have pitched to Cancer Research UK, Innovate UK, the House of Commons Select Committee on Science and Technology, and the Biotechnology and Biological Sciences Research Council. None of this activity seems to have got us very far, but I understand these things all take time.

No adverse comments on the beard, except from Suzanne, so I think I will keep it for a while.

Kind regards

Michael  
michael@sensor100.com





# Emerging Technologies Competition 2017

Each year, the Royal Society of Chemistry invites 40 shortlisted entrants to present their technologies to panels of industry experts at Chemistry Means Business, the Royal Society of Chemistry's flagship event for the chemistry-using industry. The competition welcomes disruptive technologies in the fields of:

**Health, | Energy & Environment | Food & Water | Materials**

Find out more at <http://rsc.li/etc3>

## Winners receive:

- Tailored support from multinational companies
- Support with media coverage and publicity
- Financial mentoring and guidance from KPMG
- Business training at the Judge Business School
- £10,000 of non-dilutive funding

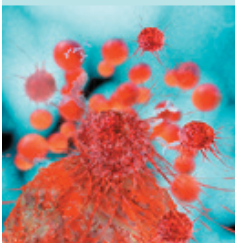
## Enter the Competition

**Deadline for Entries: 13 March 2017**

## Competition Partners

AstraZeneca | GE Healthcare | Johnson Matthey | Schlumberger  
Unilever | Croda | GSK | Pfizer | AkzoNobel | Mondelez  
Diageo | University of Cambridge Judge Business School

# Sensors for Cancer Diagnosis



Royal College of Obstetricians and Gynaecologists

4 - 5 April 2017

London

Developing more effective, earlier stage, diagnostic tools for cancer is among the world's leading technology challenges. One in two of us will be diagnosed with the disease - the earlier the diagnosis is made, the greater the chance of a cure.

Following Sensor100's Workshop on **Biosensors for Cancer Diagnosis** in July 2016, we are now planning a 2-day conference to explore this issue and the opportunities for sensor technology in more depth.

You are invited to submit an Abstract for Oral Presentation at the conference on any of the topics below.

- Sensors for molecular, protein, cellular biomarkers
- Sensors for VOC biomarkers in breath, urine
- Biomarkers for cancer: what we know and need to know
- Alternative early diagnostic technology: liquid biopsies; cancer screening; CTCs
- Barriers to adoption of sensor technology
- The future outlook: screening; monitoring of pre-diagnosed disease; diagnosis; diagnosis of pre-symptomatic disease; companion diagnostics
- The role of the Cancer Diagnostic Network

Abstracts should conform to the **Guidelines**

**Closing date March 10th**

# Sensors for Cancer Diagnosis

Do sensors have a role in cancer diagnosis?

What is the current state of the art?

What competing technologies are there?

Will sensors ever be sensitive and selective enough for early diagnosis?

## Who Should Participate?

Cancer biologists | sensor researchers | biomedical engineers | oncologists  
medical device companies | oncology pharmaceutical companies

**Join the Discussion: is this the biggest opportunity for biosensors?**

## Registration

Delegate	Fee
Academic/clinical/not-for-profit	£420
Commercial	£525
Student	£150

20% VAT will be added to all registration fees

Members of the **Cancer Diagnostic Network** receive a £100 discount

Registration at:

## Sensors for Cancer Diagnosis



### Royal College of Obstetricians and Gynaecologists

27 Sussex Place

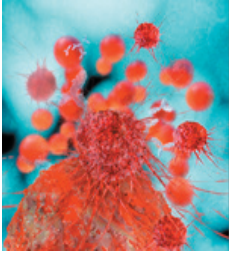
Regent's Park

London NW1 4RG

Tel: +44 20 7772 6200

### Directions

Parking is **NOT** available at the RCOG



# Cancer Diagnostic Network

- ✓ Are you developing biosensors for cancer diagnosis?
- ✓ Do you think early diagnosis needs more recognition?
- ✓ Would it help to know who else is working on this?
- ✓ Do we need better early stage diagnostic tools?
- ✓ Can improved diagnosis enhance cancer therapy?

If you identify with any or all of these questions, join the **Cancer Diagnostic Network**, now being formed as one outcome from Sensor100's Workshop "Biosensors for Cancer Diagnosis" held in July 2016.

## What will the Network do?

It will evolve as the membership grows, but to start:

- Quarterly newsletter
- One or two conferences a year, with reduced fees for members
- Help raise funds for an Innovation Challenge Platform to identify the most promising early stage diagnostic tools

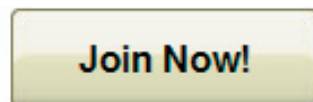
One in two of us will be diagnosed with cancer. Most diagnoses are made at the later stages when the chance of a cure is significantly lower, *CRUK*



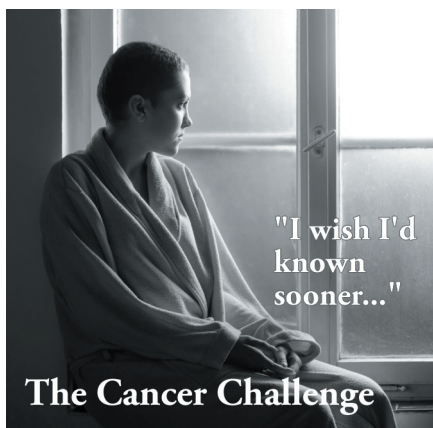
# How to Join The Network?

## Annual Fees

Individuals & Pre-revenue companies	£100
Charities, SMEs, & universities	£250
Companies	£1000



Note: 20% VAT added to all Membership fees



Development of low cost rapid diagnostic tools for early stage cancer must be the greatest humanitarian challenge facing biosensor technology - and one which has the potential for the greatest commercial return, significantly larger than the market for glucose sensors. #cancerdiagnostics

“We spend most of our money in treating, rather than investing in diagnostics to know what we’re treating”  
Professor Lord Ara Darzi, Imperial College London  
Kings Fund report: The Future is Now (2015)

## Microsystems Engineer Wins Award for Dissertation on Multiplatform Biosensors for Diagnosing Diseases

### **Dr.-Ing. Can Dincer**

Head of the Nanosensors group  
University of Freiburg



Dr.-Ing. Can Dincer is currently group leader at the Department of Microsystems Engineering (IMTEK) at the University of Freiburg and leads the working group Nanosensors at the Laboratory for Sensors since 2013.

Having completed his studies in microsystems engineering, Dr. Dincer graduated from the Technical Faculty of the University of Freiburg. He received his PhD degree with honors in 2016 through his work on the topic “Electrochemical microfluidic multiplexed biosensor platform for point-of-care testing”.

Dr. Dincer has been awarded the second place in Gips-Schüle Young Scientist Award for his dissertation on the optimization of biosensor systems for diagnosing diseases. The Gips-Schüle Foundation held the competition for outstanding dissertations in the so-called STEM fields (science, technology, engineering, and mathematics) for the second time. First prize is rewarded with 10,000 euros, second prize 5,000 euros, and third prize 2,500 euros.

### **[Dr. Dincer's CV](#)**

# Practicalities of Developing and Manufacturing Quantitative Assays

## Lateral Flow Workshop

May 9-11, 2017 | Zaragoza, Spain

### DESCRIPTION

This 3-day practical workshop, co-hosted by BioDot and OPERON, brings to life the steps between research and commercialization of quantitative assays. Lateral flow technologies are being pushed ever harder to deliver end-user benefits. This workshop keeps practitioners up-to-date.

- Learn from component and technology suppliers
- Network with fellow developers and manufacturers
- Keep up-to-date with current industry developments
- Produce a working hCG test

### TOPICS

- Reagents
- Materials
- Conjugation
- Lamination
- Cutting
- Readers
- Advances in Quantification
- Troubleshooting
- Hands on Lateral Flow Practical

*Produce A Working hCG Test  
Dispensing, Laminating, Cutting and Testing  
against +ve and -ve controls*

### Fee:

£740/€850/\$915

### Includes:

- Presentations
- Practicals
- Materials for the production of a working lateral flow test
- Course book
- Conference dinner
- Lunches/refreshment breaks

### Where:

Hotel Palafox  
Marques de Casa Jiménez, s/n.  
CP. 50004 Zaragoza (Spain)  
Phone + 34 976 23 77 00  
dircom@palafoxhoteles.com  
mention "BioDot Workshop"

### Questions:

Please contact Trish Morley  
+44 (1243) 542831

### Registration:

<https://goo.gl/2KP9YW>



### Register Soon...

Registration Deadline ... April 25th

### Exhibiting/Sponsorship spaces are available.

Contact: John Witton +44 (7808) 255256



## Sensor100 Conferences Uniquely Bridge the Research to Application Gap

To submit an Abstract please follow our [GUIDELINES](#)

Exhibitor enquires: email [info@sensor100.com](mailto:info@sensor100.com)



### Call for Papers

- Air, soil and water monitoring
- Sensor technology platforms
- IoT, data analysis, models
- The environment and health
- Ethical & regulatory issues



### Sensors in Medicine 2017 will be limited to sensors in diabetic care and infectious disease diagnosis

#### Call for Papers

- Sensors for glucose monitoring
- Sensors for infectious diseases



### Call for Papers

- Sensors for crop production
- Sensors for animal welfare
- IoT, data analysis, models
- PoC technology for food contaminants, pathogens
- Regulatory issues
- Commercial adoption of sensor technology



**Berkeley Sensor & Actuator Center**  
**Research Review & IAB Meeting**  
*Tutorials Energy Harvesting*

March 8 - 10  
2017 UC BERKELEY



[Register](#)



5th INTERNATIONAL CONFERENCE ON  
**BIO-SENSING TECHNOLOGY**

7-10 MAY  
**2017**  
RIVA DEL GARDA  
ITALY

## **Medical Informatics World's Inaugural** **Sensors for Medical Applications**

Sensor Design, Engineering & Manufacturing for Integrated  
Healthcare Devices

May 22-23 | Boston MA USA

### **2017 Events Calendar**

[Requires pdf reader]

Send details of events to be included in the Calendar to:  
[info@sensor100.com](mailto:info@sensor100.com)

# 5th INTERNATIONAL CONFERENCE ON **BIO-SENSING** TECHNOLOGY

7 - 10 May 2017 | Riva del Garda (on Lake Garda), Italy

This conference will provide a forum for accessing the most up-to-date and authoritative knowledge from both commercial and academic worlds, sharing best practice in the field as well as learning about case studies of successfully integrated bio-sensing technologies. The meeting will provide an opportunity to highlight recent developments and to identify emerging and future areas of growth in this exciting field.

## The conference will include:

- Presentations from leading specialists highlighting new opportunities in bio-sensing technologies
- An opportunity to share best practice in the integration of technologies for bio-sensing
- An exhibition of leading-edge, commercial technology
- A poster forum for unveiling new research ideas and concepts
- Networking opportunities
- A strong industry focus with companies presenting their technologies

## Conference Chairman

**Professor Richard Luxton**

*Institute of Bio-Sensing Technology, UWE Bristol, UK*

**Register  
Now!**

## Organised by



## Supporting Publications



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

# sensors expo & conference

## JUNE 27-29 2017

McENERY CONVENTION CENTER / SAN JOSE / CALIFORNIA

EXHIBIT DATES: JUNE 28-29, 2017

### The sensors industry is moving at lightning fast speed.

Experience this change firsthand at the industry's premier event for sensor technical training. The 2017 Sensors Expo & Conference will feature over three days of **Keynotes, Symposia, Case Studies, Technical Sessions, Hands-on Workshops, Networking Parties, and more.**



#### Conference Tracks & Topics Include:

- EMERGING TECHNOLOGIES
- ENERGY HARVESTING & POWER
- FLEXIBLE & WEARABLES TECH
- IOT & WIRELESS
- MEASUREMENT & DETECTION
- MEMS & SENSORS
- NOVEL SENSOR APPLICATIONS
- OPTICAL SENSING & DETECTION
- SENSOR DATA
- SENSORS & EMBEDDED SYSTEMS DESIGN

"Overall, I found the Sensors Expo event a worthwhile and informative event, effectively structured to enable attendees a variety of experiences, from large keynotes, time to explore the exhibition, technical talks and networking time."  
- LEO KENNY, PLANET SINGULAR

**REGISTER TODAY**  
and join 6,000+ of your closest colleagues!

Use code **SENSOR100** when registering for \$100 off a Gold or Main Conference Pass!\*



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

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\*Discount is off currently published rates. Cannot be combined with other offers or applied to previous registrations.

## Fraunhofer and Döhler Looking at Microfluidics for Beverage Safety

Fraunhofer and Döhler are working together to develop a microbiological detection method based on microfluidics.

By Joe Whitworth, 22-Feb-2017

[FoodQualityNews.com](http://FoodQualityNews.com)

## Special Report: Making Sense Of Sensors In Agriculture

For agriculture service providers, evolving sensor technology is viewed with a sense of endless possibilities, mixed with a bit of trepidation. Sensors can seemingly do about anything on the farm. Measure soil characteristics with electrical current? Check. Monitor soil moisture and irrigation activity? Check. Track rainfall, wind, and other weather conditions? Check. Transmit data points 24/7 to a central database for deep analysis? Check. Report on planting, application, and harvesting efficiency? Check. Ride on a drone or a satellite and provide in-season feedback on crop and farm conditions? Check.



Become one of the farmer's trusted advisers? Uh, not so fast. Sensor capabilities are robust and growing, but not likely to replace "boots on the ground," at least for the foreseeable future.

Download the [Full Report](#) 31 January



## Weed Sensors: Technology Targeting Weeds and Reducing Chemical Usage



WEEDS, particularly the irksome fleabane, skeleton and feathertop Rhodes grass, can make or break a business as big as Robin Schaefer's. Robin has a 10,500ha cropping operation at Bulla Burra, in South Australia's Loxton district, and spraying weeds that are hell-bent on destroying his paddocks used to be a never-ending chore.

About four years ago, Robin bit the bullet and bought an Optical Spray Technology system, called WEEDit, which is a boom sprayer that uses near infrared (NIR) and red light sensing technology to locate weeds in a fallow paddock.

He reports that there are five lenses controlling five nozzles and when the sensors detect chlorophyll, the chemical substance that makes weeds green, it sprays. Because this eliminates the more traditional method of blanket spraying a fallow paddock, the use of chemicals is drastically reduced.

Reported by: [The Weekly Times](#) 19 February



## Market Research Report: Global Environmental Sensing and Monitoring Technologies Industry

This report analyzes the worldwide markets for Environmental Sensing and Monitoring Technologies in US\$ Million by the following Segments: Air Monitoring, Water Monitoring, Soil Monitoring, and Noise Monitoring. The report provides separate comprehensive analytics for the US, Canada, Japan, Europe, Asia-Pacific, Latin America, and Rest of World.

By [PRNewsWire](#) Febraury 23

## New Biosensor Could Help Search for Nuclear Activity

Nicole Martinez and her team at Clemson University are beginning to lay the groundwork for a biosensor that could help determine whether the radiation is natural or manmade and peaceful or weapons grade. It could help investigators search for labs amid concerns a nation or group could illicitly develop weapons of mass destruction.

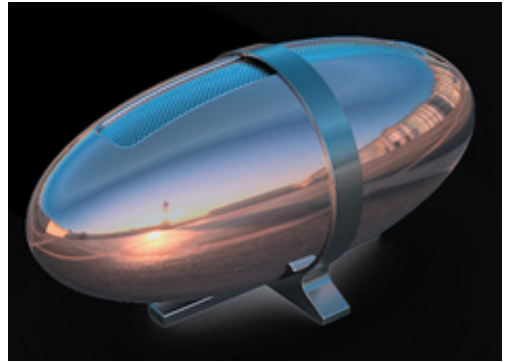
If the biosensor functions as hoped, it could be the first based on how bacteria and yeast change DNA to RNA, a process called transcription.

Reported by Clemson: [The Newsstand](#) Febraury 16

## White Lab Wins MassChallengeUK's Top Prize for AIR Monitor

The business has developed a smart indoors allergen and air quality tracker that helps people improve the air they breathe. It could offer crucial help to allergy and asthma sufferers.

“Our unique and patented sensor uses bio-chemistry and nanotechnology to identify allergens in the air. Sensio AIR is the only smart air quality that monitors dust mites, pollen, mold and pet dander to help you find the source of your allergies and asthma indoors.



The device monitors:

Allergens pollen, mold, house dust mites, pet dander...

Harmful gases and irritants commonly found indoor (VOC, CO, Ozone)

Environmental parameters affecting well-being such as temperature, humidity and light intensity

Smoke detection

[Read more...](#)

## House of Commons Select Committee Hears Evidence on Sensors for Cancer Diagnosis



House of Commons  
Science and Technology  
Committee

The UK Parliament Select Committee on Science and Technology has the responsibility to ensure that Government policy and decision-making are based on good scientific and engineering advice and evidence. There are eleven members of the Committee drawn from cross parties; one is a medical doctor, one has a doctorate in social science, the remainder have some, or none, science background.

In 2016, the Committee issued an invitation to submit ideas for it to take forward “My Science Inquiry”. Over 70 ideas were submitted, of which nine were selected for presentation at a “Dragons Den” style meeting of the Committee on 1st February. **Sensor100** was among the nine selected submissions on the topic of “**Early Stage Cancer Diagnosis**”



Click [HERE](#) to view *Sensor100's* evidence before the Committee - under AGENDA on the right hand side Click on: 10:58:42 Witnesses Michael Brand *Sensor100*

The Committee selected two presentations for further inquiry: “Algorithms” and “Hydrogen and Fuel Cells”. It further decided that it will follow up “Early Stage Cancer Diagnosis” as part of its regular sessions with the UK Chief Medical Officer, Dame Sally Davies.

Read the Committee’s [Full Report](#)

### Acknowledgements:

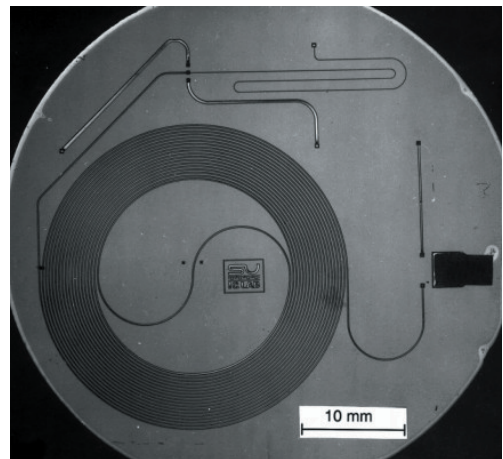
**Sensor100** was advised by: Imperial College Department of Bioengineering; KTN Electronics, Sensors, Photonics; QuantumDx; Siemens Healthcare; University of Bath. Statistics from Cancer Research UK.

## Review

# Microfluidics technology: future prospects for molecular diagnostics

The features of microfluidics, such as short analysis time, reduction in fabrication costs, and low sample/reagent consumption, make it a natural fit for the development of new diagnostic instruments. Herein, selected work is highlighted to provide a snapshot of microfluidic devices developed for molecular diagnostics in the past 5 years, specifically focusing on their applications for the detection of agents clinically relevant to cancers, cardiac conditions, and infectious diseases, and an outlook on how microfluidics technology can be further advanced for applications in this area.

**Dovepress** 13 January



## Imperial has started construction works for a pioneering research facility, the Michael Uren Biomedical Engineering Research Hub at White City

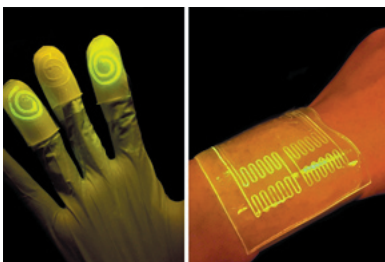
The launch of construction works for the new facility was marked with a groundbreaking ceremony at the White City Campus on Monday 9 January. The event was attended by Imperial alumnus Sir Michael Uren OBE and trustees of his foundation, whose £40 million gift has made the construction of the new hub possible. The donation is the largest ever made to a London university by an alumnus, and one of the largest in the history of any UK higher education institution.



“The Michael Uren Biomedical Engineering Research Hub... will take our existing success in biomedical engineering to a scale and a level that will bring real health benefits to individuals and society.” Professor Jeff Magee, Dean of the Faculty of Engineering.

[Imperial College News](#) 18 January

## Living sensors at your fingertips



Engineers and biologists at MIT have teamed up to design a new “living material” — a tough, stretchy, biocompatible sheet of hydrogel injected with live cells that are genetically programmed to light up in the presence of certain chemicals. Xuanhe Zhao, the Robert N. Noyce Career Development associate professor of mechanical engineering at MIT, says the group’s living material design may be

adapted to sense other chemicals and contaminants, for uses ranging from crime scene investigation and forensic science, to pollution monitoring and medical diagnostics.

[MIT News](#) 15 February

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**United Kingdom**

