

## EPIC Members Event Report

### EPIC Biophotonics Workshop on Optimizing the Road to Clinical Products

Maastricht UMC+ Hospital, The Netherlands

27-28 November 2013

Event sponsored by:



Article originally submitted to

**electro**  
optics

[http://www.electrooptics.com/news/news\\_story.php?news\\_id=2012](http://www.electrooptics.com/news/news_story.php?news_id=2012)



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### About the EPIC Members Event Reports

Initiated by the founder of EPIC Dr. Thomas Pearsall in 2003, these reports are prepared by members of EPIC to the benefit of the wider community. If you did not have a chance to attend the event but would like to know some key highlight, this report is for you. Emphasis is placed on exploring technical and business opportunities for the members of EPIC.



**“Optimizing the Road to Clinical Products”**, such slogan paved the way for a slightly growing number of workshops devoted to Biophotonics technologies in the last months. However, what has not increased is the number of practitioners involved in such events. As an example, one week before the Maastricht workshop, the info-day in the European R&D funding program for Biophotonics was attended by less than 5 doctors, among more than 100 people. If “unmet needs” are such a key issues in Biophotonics for a long time, it should most likely be because “the right people” do not meet.

It was then a real surprise and a daring bet from EPIC to hold such a workshop in the heart of the Maastricht hospital and it allowed the practitioners to speak about their own expectations and to talk directly with the promoters of these photonics technologies about the next generation of photonics devices, without spending one whole day far from their usual business (curing people)... Hats off to the EPIC director for this smart idea and his perseverance to make this meeting happen.



To optimize the road to clinical products, as for a journey to holiday's destination, you need a starting point and an end-point, a map, some stations along the road to make the journey more funny and fuel to go ahead. More or less, it was the same with the 4 kinds of intervention : smart and fruitful R&D in light & tissues interactions, main expectation from the healthcare community representatives, buildings blocks to transfer the R&D into clinical products and money to catch in development phase and in future sales.



In the first session, about prospective R&D, Prof. Francesca Cordeiro (UCL Institute of Ophthalmology) explained how the eyes' analysis will allow in the next years non-invasive examination of the brain. The eye is a window to the brain, as it is extended towards the retina through the optic nerve. The retina, being part of the brain, is also affected by neurodegenerative diseases. Laser techniques for image analysis allow resolutions up to 1  $\mu\text{m}$ , more or less the diameter of the optic nerve. The latest advances use spectroscopy techniques for molecular imaging that will allow to identify changes in the composition of neurons even before morphological changes appear. Even it seems like science fiction, let's not forget the tremendous progress in OCT, from a basic science 20 years ago, to numerous commercial products today and to bright perspective in structural in vivo real-time analysis in the coming years. Should it be available in 5, 10 or 20 years, no idea at this time but the “end-point” is quite amazing.



The second session was about the definition of next generation of products, needed for the daily improvement of healthcare systems and patients monitoring (from operating room to the home). Depending of the end-user, key issues will go from real-time highly robust data for surgeons in the operating room to

wearable and SmartPhone compatible devices for elderly people. Prof. Kooman (nephrologist at the Maastricht Hospital) presented one design his team is working on: a LIBS system to detect the presence in human serums of Sodium & Potassium. If the device is still a shoebox's size, fruitful discussion about pen-size nanosecond high beam quality lasers, initiated by a Lithuanian company in the attendees, gave all the assembly a "hands-on training" about "meeting unmet needs". Dr. Rutger Schols (MUMC) and Dries Hettinga (Dutch Diabetes Foundation) presented in the same ways, the requirements and expectation in Endoscopic Surgery and Blood Glucose Monitoring.

The third session highlighted some required technologies (photonics and non-photonics) to allow such developments. The first part dealt with systems development and prototyping with a speech from Prof. Santiago Royo from UPC-CD6 in Barcelona and two presentations of devices targeting specific disease from DIAFIR (France) and Multitel (Belgium). Second part was oriented towards building blocks development in Microfluidic (M. Schmieder from Fraunhofer IWS presented a state-of-the-art "Lab on Chip Systems for Substance Testing in Cell Based Assays", integrated devices with contribution from CSEM (Switzerland), ePixFab (European project), 3S photonics (Germany), enhanced database for read-out of Light-Tissue interaction from ICFO (Spain).



*The EPIC workshop facilitated interaction between industrial companies and medical doctors.*



*Ample networking opportunities throughout the event allowed the participants to engage in fruitful discussions*



*A visit of the hospital allowed to see photonics technologies incorporated into medical equipment*

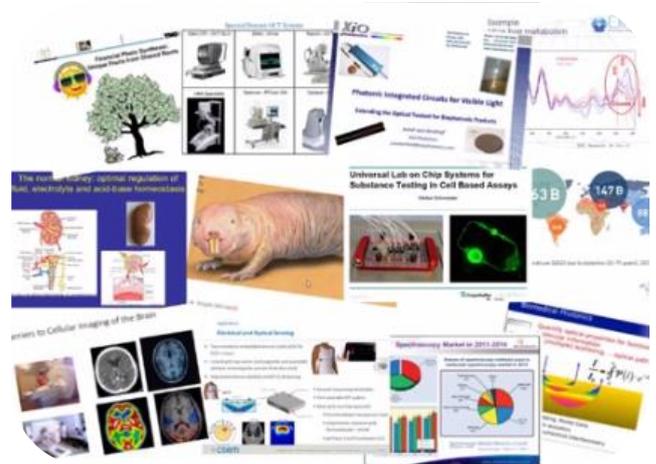


The last session was about fueling the development and getting the money back. Dr. Fokko Wieringa (TNO van't Hoff program and co-organizer of the workshop), described a new way to fund research in medical photonics, implemented in the Dutch environment. Through a mutualisation of Research funds from Academia, Health Foundations, Leading Hospitals and Industry, the program aims to reach a critical mass to put Science into devices in a very efficient way. In this open innovation scheme, the transformation from devices to marketable products is still at the charge of the Industry but with lower commercial risks as products fulfilling the needs formulated by Health Foundations have a very good prognosis for reimbursement and adding true value to the society. To sum-up the different contributions, Jacques Cochard from TEMATYS presented the results of an EPIC study about Biophotonics, and the ways to introduce products in these strongly regulated markets. Market introduction and deployment is a long task, and heavier when dealing with drugs, fluorophores, any other consumable needed for enhanced imaging or improved therapies. But on the other hand, as a part of these homologation has still been done, it allows now faster entry in components (miniaturized light sources, faster scanning method (spatial or frequency)) ... even it is for less final value. Beyond this trade-off (required investments and expected money back), the next big thing will be the deployment in homecare and well-being applications, and it will be a game changer for all the players. Will this deployment be implemented by the most established ones (like Zeiss, Philips, GE, Toshiba, Horiba, Thermo...), newcomers well suited to mass market business models (Procter & Gamble, Danone, Roche, Google...), Mass-manufacturers most suited to solve industrial problems linked to Biophotonics chip integration (Samsung, Intel, LG...)? The question stays open; we are still writing the first pages of the Biophotonic story.



A video of the event is available on <http://www.youtube.com/watch?v=8yDrd24Um4I>

**EXTRA: AVAILABLE TO MEMBERS OF EPIC**



The 26 presentations made at the workshop, and all events organized by EPIC, are available at no cost to the members



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The "Biophotonics Technologies and Market Analysis" report is available at no cost to EPIC members (value: 5990 EUR)

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#### **135 EPIC Members (1 February 2014)**

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