



BABYLUX

Newsletter n° 3

December 2014 / June 2015

News & events

The BabyLux mock-up presented in Barcelona

The wonderful capital of Cataluña was the hometown of the BabyLux mock-up. The tool was presented last October during two important events dedicated to paediatrics.

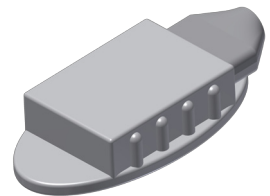
On October 16, ICFO – The Institute of Photonic Sciences – hosted the fifth edition of Light for Health L4H2014. This year’s focus was set on “**LIGHT & PEDIATRICS - PHOTONICS FOR NON-INVASIVE PEDIATRIC MONITORING**”. L4H2014 was dedicated to understanding, discussing and sharing the possibilities and potential that light-based technologies offer to the pediatrics community, bringing together experts in pediatrics and biophotonics.

BabyLux project was widely represented both during the opening speeches and the round table. The mock-up was shown to the attendees in the exhibition arena.

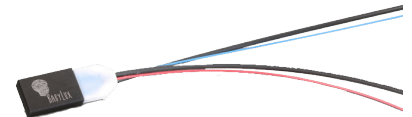


www.babylux-project.eu/multimedia/photo-gallery

On this occasion, we asked people to give us their feedbacks and comments on the both the project and the tool. Here follows the opinion of a renown paediatric neurologist and Director of the Neurovascular Imaging Lab at The Children’s Hospital of Philadelphia, Daniel Licht. The interview is accompanied by the words of our partner, Turgut Durduran, Medical Optics Group Leader and Professor at ICFO, who organized the event.



Scheme of the sensor with disposable cover, dimensions and weight 40x20x8mm, ca. 10g



Prototype of the TRS/DCS hybrid sensor



People



DANIEL LICHT
Pediatric Neurology
Children’s Hospital
Philadelphia

Professor Daniel Licht, what do you think about the BabyLux project?

Babylux is potentially going to revolutionize how we measure aspects of cerebral physiology in new-born babies. When babies are very sick and we have difficulty understanding how the brain is working during their care, and we need to do better in protecting the brain. If we have more information about how the brain is using oxygen during medical care, we will be better able to adjust our delivery of medical care to better meet the brain’s metabolic needs.

Are there any existing limitations and drawbacks in the optical systems you are using? For example maximum power and bulkiness?

The current system that I’m using in my research works on frequency domain NIRS and the major drawbacks are that it is not simple to get data back. The calculations you need to do to retrieve data are not push button technology. The instrument is the size of a small refrigerator but on wheels it is ok. The power output of DCS is a little problem and we have always to think about how much energy and heat we are putting into the skin. With our current instrument absolute time-series measurements aren’t impossible, but challenging. If we are going to use the instrument in clinical care, looking at changes over



This project is partially funded under the ICT Policy Support Programme (ICT PSP) as part of the Competitiveness and Innovation Framework Programme by the European Community.
Grant agreement n. 620996



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time or trends is very important, and if we look at trends we can be a little bit less precise. If you are making measurement before and after an intervention we want to be very precise about the measurements.

The value of the flow measurement...

The flow measurements are essential. If you just have oxygen saturation measurements you don't necessarily know if the tissue is using less oxygen or if it is using more oxygen. There is a link between the blood flow and the oxygen consumption. If the cell is using more oxygen, it will demand more blood flow and by measuring both you can understand that, if the blood flow goes up, the oxygen saturation goes down and the tissue is actually using more oxygen.

What do you think about the mock-up?

It has a nice display and a very simple front-end where the optics go. We can easily see where the connections are and there should be no mistakes where you place the optical fibres. It seems very simple to use, I like the wheels that you can bring right up to the babies rather than bringing the babies to the instrument.



TURGUT DURDURAN
Medical Optics ICFO

In Barcelona, we saw the mock-up of the Babylux project. How did you produce this first device?

I would describe various steps. First, we have identified the correct optical technology: DCS (diffuse correlation spectroscopy) and TRS (time resolved near-infrared spectroscopy). Then we have combined partners' suggestions: measurement of oxygen, blood flow and metabolism from clinical partners; and the development, combination of the two photonic technologies from technical partners.

How does it work?

It works with two optical technologies. DCS: we use laser speckles which are the dark and light dots that it creates and they fluctuate in time. We use these fluctuations to measure blood flow in the brain with fibre optics. TRS: it sends in a pulse of light, in multiple wavelengths and it detects the broadening of this pulse as it travels through the tissue. Then it calculates the amount of oxy and de-oxy haemoglobin in the brain to measure blood oxygenation and blood volume.

What are the next steps?

The next step is to bring the optical components inside the mock-up and consequently transform it into a real system. After testing it on tissue simulating phantoms, which are materials whose properties can be precisely controlled, we will move it to two hospitals (Milano and Copenhagen).



BABYLUX Talks

Episode #2

Watch the extended video interview

www.youtube.com/watch?v=9k0wKSBiiBA&feature=youtu.be

Babylux was also among the "EAPS 2014" exhibitors. EAPS is the Congress of the European Academy of Paediatric Societies, an international meeting that brings together paediatric professionals from around the world. The event took place in Barcelona, from October 17 to October 21.

People visiting our booth accepted to fill in a questionnaire, expressing their views, opinions, and expectations about the mock-up. Most of them considered design, screen display, and screen quality as appropriate; size, weight, and flexibility have been also positively judged. Whereas fibres stiffness has been identified as a potential critical issue.

Since end-users' feedbacks and outlooks are essential to implement the tool and fulfil the expectations, we would truly appreciate if you could help us in answering some simple questions via an [online survey](#). We ask you to spend a few minutes of your time to help us do a better job.

Thank you!

Online survey



<https://it.surveymonkey.com/s/395565T>

see attachment for mock-up technical details



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