A tale of two startup companies answering two pains with value propositions to detect and cure ailments using the electrolateral flow immunosensor and quorum sensing inhibitors

Robert Steven Marks

Department of Biotechnology Engineering, Ben Gurion University of the Negev, Beer Sheva, Israel

E-mail address: rsmarks@bgu.ac.il.

Disease requires proper detection and cure. The first pain is that diagnostics are laboratory based and the market requires point-of-care tests. The pain here is that even though the convenient lateral flow immunoassay fulfils most requirements of a diagnostic, it cannot provide quantitation. Our value proposition is a proprietary device that combines the abilities of the lateral flow with that of electrochemistry, together with a patented nanoparticle formulation, thus providing a hybrid system enabling quantitation and a one-step point-of-care test. A start-up company in Singapore took upon itself the mission to provide such a device (www.biosensorix.com). Once the ailment has been found and if it is a bacterial infection, that is known to cause biofilms, then another value proposition has been to help antibiotic therapy is needed. Preventing biofilms which utilize quorum sensing to build their structures, can be done via inhibitors of such bacterial communication. We discovered potent natural molecules in the Red Sea, among the ecologically active resident microflora strugglers of corals. Animal studies of these molecules were conducted, and these were found to boost antibiotic activity, therefore, another start-up was created to help bring these molecules to market (Life Matters, Ltd, Israel).

https://doi.org/10.1016/j.jbiotec.2018.06.313

Shedding new light on spinal cord injury

Michel Salzet[1,*], Jusal Quanico[1], Dasa Cizkova[2], Melodie Anne Karnoub[1], Zarha Laouby[1], Celine Mériaux[1], Adriana Natalia Murgoci[1], Franck Rodet[1], Isabelle Fournier[1]

[1] *Inserm U-1192, Laboratory of Proteomics, Inflammatory Response, Mass Spectrometry, University Lille 1, Scientific City, France*
[2] *Neuroimmunology, Slovak Academy of Sciences Centre of Excellence Slovak Academy of Sciences, Bratislava, Slovakia*

E-mail address: michel.salzet@univ-lille.fr (M. Salzet).

Spinal cord injury (SCI) belongs to currently incurable disorders of the CNS and is accompanied by permanent health consequences-disability. Shot-gun proteomic was used to identify proteins in each spinal cord segment-derived conditioned medium along the rostral-caudal axis after SCI with time course. 4D MALDI Imaging, lipidomics, tissue microproteomics were undertaken combined with confocal imaging. In-vitro and in-vivo tests were realized. Stem Cells, functionalized biomaterial, Rho A inhibitor cells have been tested in pre-clinical way to develop a smart biomaterial. We determined the spatial and temporal events occurring in acute phase after SCI. The data obtained allow a better understanding of regeneration induced above and below the lesion site. We then validate our results by *in vivo* proteomic studies along the spinal cord segments. We established a novel origin of IgG, their role in neurites outgrowth modulation, and developed a smart biomaterial for treating SCI. Taken together, we shed new light on SCI.

https://doi.org/10.1016/j.jbiotec.2018.06.314

Can real time molecular analyses change the paradigm of dog sarcoma diagnosis and classification?

Isabelle Fournier[1,*], Philippe Saudemont[1], Jusal Quanico[1], Benoit Fatou[1], Kevin Minier[3], Melissa Pottier[3], Emmanuel Bouchaert[2], Quentin Pascal[2], Cristian Focsa[4], Michael Ziskind[4], Dominique Tierny[2], Michel Salzet[1]

[1] *Inserm U-1192, Laboratory of Proteomics, Inflammatory Response, Mass Spectrometry, University Lille 1, Scientific City, France*
[2] *OCR, Parc Eurasante Lille Metropole, Loos, France*
[3] *Oncovet – Avenue Paul Langevin Villeneuve d'Ascq, France*
[4] *University of Lille, Physics of Lasers Atoms and Molecules, Villeneuve d'Ascq Cedex, France*

E-mail address: isabelle.fournier@univ-lille.fr (I. Fournier).

Because surgery often remains the first line treatment for solid tumor and it tightly related to the patient evolution and survival, there is an important challenge to help and guide the patrician during the surgery. Despite the advances in technologies, finding the resection margins or obtaining a fast and reliable diagnosis remains difficult under intraoperative conditions. To fill this gap, we have been developing a new technology, so-called SpiderMass, based on Mass Spectrometry which uses non-targeted molecular signatures of tissues to give real-time analysis and diagnostic. SpiderMass instrument is designed with a remote microprobe allowing microsampling of tissues by IR-MALDI using endogenous water of tissues as matrix, and a transmission line connected to the mass analyser for transport and analysis of the produced ions. We have demonstrated that SpiderMass is of low invasiveness and painless by monitoring in real-time the human skin. It is also able to discriminate between different types of tumors. By developing classification models from tissue banks of dog sarcoma we have therefore demonstrated the possible use for real-time diagnosis and classification according to grades or subtypes. The instrument can also be used for other applications including bacterial and is paving the way for in-vivo real-time proteomics.

https://doi.org/10.1016/j.jbiotec.2018.06.315

Sexed semen and the reproductive management of a dairy farm

Dana Tapaloaga[1,*], Paul Rodian Tapaloaga[2]

[1] *Department of Animal Production and Public Health, Faculty of Veterinary Medicine, University of Agronomical Sciences and Veterinary Medicine, Bucharest, Romania*
[2] *Department of Animal reproduction, Faculty of Animal Sciences, University of Agronomical Sciences and Veterinary Medicine, Bucharest, Romania*

E-mail address: drtapaloaga@yahoo.com (D. Tapaloaga).

Sexed semen contributes to increased profitability of dairy cattle production in a variety of ways. Commercial dairy farmers use conventional semen, but also sexed semen to produce replacement daughters from genetically superior cows. In the fertilization process, it is the bull's sperm cell that determines the gender of the resulting offspring. The process of sex-sorting semen involves a flow-cytometer to detect the difference in DNA content between sperm cells carrying the X chromosome and cells carrying the Y chromosome. The X (female) bearing sperm contains approxi-