

White light spectroscopy for monitoring and quality control of CAR-T cells production: an old/new technique

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Abstract

Advanced Therapy Medicinal Products (ATMPs) are particularly effective against cancer, but they remain costly and impossible to sterilise due to their reliance on genetically modified T cells. Contamination during production is a major concern, as traditional quality control methods involve sampling, which can introduce contaminants themselves. Therefore, it is necessary to develop methods for detecting contamination without sampling, and ideally in real time. White light spectroscopy has the potential to fulfil these requirements. While this technique is not new, recent ultra-miniaturised spectrometers and continuously increasing signal processing capabilities of embedded devices make it possible to extend the use of these methods beyond the laboratory.

This conference will present proofs of concept for using white light spectroscopy to monitor CAR-T cell production. Results concerning T cell concentration measurements and the ability to evaluate the quality of T cell cultures will be presented. We will also present the use of white light spectroscopy to measure bacterial concentrations. We will then demonstrate how it is possible to simultaneously measure the concentrations of both species in cell-bacteria co-culture experiments. Building on these findings, we will propose a method for detecting contamination during CAR-T cell production in real time without sampling.

Biography

Bruno Wacogne is Research Director at the FEMTO-ST Institute. He received his Ph.D. in 1993 from Franche-Comté University. He worked 3 years at the Optoelectronics Research Center at Southampton University and at the Applied Optics Group at the University of KENT (both in the UK) before being recruited at the CNRS. After several years of working in the telecommunications domain, he now works in the field of biomedical translational research. In 2010, he obtained a supplementary position at the Clinical Investigation Center of Besançon University. He is regularly chairman of international conferences. He was the general program Chairman of the Biodevices conference in 2021. He has been awarded several times: Gold Micron at the International MICRONORA Workshop in 2006, Best Poster Award International Conference on Bio-sensing Technology in 2011, and Best Paper Award (with co-authors) at the International Conference on Biomedical Electronics and Devices in 2020. He is co-author of over 230 papers, conferences (over 30 invited) and patents.