

On-line and sampling free monitoring and quality control of CAR-T cells production using simple spectrometry methods

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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.

What will audience learn from your presentation?

- Modeling of absorption spectra of cells and bacteria
- Integrating spectroscopy in a closed-loop system for real-time and sampling-less measurements
- Improving the production of CAR T-cell production

Biography of presenting author (should not exceed 100 words)

Bruno Wacogne is a Research Director at the FEMTO-ST Institute and earned his Ph.D. from Franche-Comté University in 1993. After working at the Optoelectronics Research Center in Southampton and the Applied Optics Group at the University of Kent, he joined the CNRS. Initially focused on telecommunications, he later shifted to biomedical translational research. Since 2010, he has also held a position at the Clinical Investigation Center of Besançon University. He regularly chairs international conferences, serving as General Program Chairman of Biodevices 2021. His awards include the 2006 Gold Micron and multiple conference distinctions. He has co-authored over 230 communications and patents.

Details of presenting author to be mentioned in certificate:

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