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A novel toolbox with chromatogram fingerprints for lysis monitoring in *E.coli* bioprocesses

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The bacterium *Escherichia coli* is a well-studied recombinant host organism with a plethora of applications in biotechnology. High valuable biopharmaceuticals, such as antibody fragments and growth factors, are currently being produced in *E. coli*. However, the high metabolic burden during recombinant protein production can lead to cell death, consequent lysis and undesired product loss. Thus, fast and precise analyzers to monitor *E. coli* bioprocesses and to retrieve key process information, such as the optimal time point of harvest, are needed. However, such reliable monitoring tools are still scarce to date. In this study, we cultivated a recombinant *E. coli* strain producing a recombinant single chain antibody fragment (scFv) in the cytoplasm. In bioreactor cultivations, we purposely triggered cell lysis by pH ramps. We developed a novel toolbox using UV chromatogram fingerprints and chemometric techniques to monitor these lysis events and used flow cytometry (FCM) as reference method to quantify viability offline. Furthermore, we tested the applicability of the novel toolbox for monitoring other *E. coli* bioprocesses. We are convinced that this toolbox will not only facilitate *E. coli* bioprocess monitoring, but will also allow enhanced process control in the future.

Biography

Vignesh Rajamanickam procured his Master of Science in Pharmaceutical Biotechnology from Hamburg University of Applied Sciences, Germany and, Bachelor of Technology in Biotechnology from Anna University, India. He started his PhD on March 2014 in Biochemical Engineering from Vienna University of Technology (VUT), Austria. Currently, he is working as a Project Assistant for developing a novel PAT tool for bioprocess monitoring and control in Christian Doppler laboratory for mechanistic and physiological methods for improved bioprocesses, VUT, Austria.

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