

# Noninvasive tool for optical online monitoring of individual biomass concentrations in a defined coculture.

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## Abstract

Co-cultures bear great potential in the conversion of complex substrates and process intensification, as well as, in the formation of unique components only available due to inter species interactions. Dynamic data of co-culture composition is necessary for understanding and optimizing co-culture systems. However, most standard online determined parameters measure the sum of all species in the reactor system. The kinetic behavior of the individual species remains unknown. Up to now, different offline methods are available to determine the culture composition, as well as the online measurement of fluorescence of genetically modified organisms. To avoid any genetic modification, a non-invasive online monitoring tool based on the scattered light spectrum was developed for microtiter plate cultivations. To demonstrate the potential, a co-culture consisting of the bacterium *Lactococcus lactis* and the yeast *Kluyveromyces marxianus* was cultivated. Via partial least squares regression of scattered light spectra, the online determination

of the individual biomass concentrations without further sampling and analyses is possible. The results were successfully validated by a Coulter counter-analysis, taking advantage of the different cell sizes of both organisms. The findings prove the applicability of the new method to follow in detail the dynamics of a co-culture.

## Involved units

[Bio Pilot Plant](#) [Miriam Agler-Rosenbaum](#) [Read more](#)

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