

## High content imaging of cells and 3D in vitro tissues

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As the field of regenerative and personalized medicine matures, the need for novel enabling technologies to characterize cells and engineered constructs (i.e. cells/tissue combined with biomaterials and three-dimensional (3D) scaffolds) as well as their individual components in a more insightful, quantitative and preferably non-invasive manner becomes imperative. Raman microspectroscopy and imaging as well as fluorescence lifetime imaging (FLIM) are emerging techniques that allow the assessment of molecular interactions and the biochemical structure of a sample in a non-invasive, marker-independent manner. Specifically for tissue engineering applications, it has been proven to allow determining biochemical information on cells, tissues and/or material-cell tissue constructs without the need for labels. The presentation aims to show the applicability of Raman technologies and FLIM for regenerative and personalized medicine applications, and to discuss the added value of the generated data for tissue engineering construct design optimization and preclinical as well as clinical applications.

### Biography

Professor Schenke-Layland's main research interests revolve around the role of the extracellular matrix in tissue engineering and regenerative medicine, the translation of human developmental biological data into therapeutic strategies, and the non-invasive monitoring of biological processes. Prof. Katja Schenke-Layland currently holds a dual appointment as a full professor (W3) at the University Women's Hospital and as Director of the Natural and Medical Sciences Institute (NMI) Reutlingen in Germany. She is also affiliated with the Department of

Medicine/Cardiology at the University of California in Los Angeles, USA. She is an executive editor for *Advanced Drug Delivery Reviews*, which is one of the top journals in the field of advanced gene and drug delivery, and co-editor-in-chief of *Tissue Engineering, Part B*. To date, she has secured more than in 11.8 Mio € individual research funding as PI, has published 129 peer-reviewed manuscripts with more than 4600 citations<sup>Scopus</sup> and has an h-Index of 39<sup>Scopus</sup>.

