means implementing new concepts, strategies and workflows in order to address today's most urgent challenge: to deliver information-rich, high-quality scientific data in rapid succession in order to endure in a competitive research environment while also guaranteeing robust and reliable results. This especially holds true, when using an in vitro cell-based assay system. Implementing state-of-the-art microplate formats and assay miniaturisation allows for a much better identification of potential assay weaknesses and gives the researcher the opportunity to carefully address the "way too many" individual and interrelated effects of parameters affecting the final assay results (by permitting to systematically address these topics upfront and in a timely manner). Thus, taking the scientific challenge and transforming low-throughput benchtop formats into miniaturised, microtitre plate assays will – in most of the cases – result in the setting up of a more robust and reliable test systems, which in conjunction with the appropriate controls ensure and increase the confidence in the statistical significance of the actual data generated, something almost per se justifying the initial, quite high investments in the essential labware, i.e. electronic multichannel pipettes and dispensers as well as microplate-format compatible readers.

Once implemented, however, the increasing costs for consumables have to and can usually be balanced with the significantly reduced, actual costs per well. And although a continuous increase in the amount of datapoints generated has to be expected and taken seriously from the cost perspective, the value of high-quality data readily obtained from miniaturised, robust cell-based assay systems certainly warrants heading into this direction.

3 Working with Cells in a Miniaturised Format

Whenever using cells cultured for microplate-based assays in vitro, it is of utmost importance to keep in mind that both routine cell culture and assay (culture) workflows considerably influence the final microplate assay results. Thus, one is well advised to at least double-check the net effects of even subtle changes in both of these two processes and revise them if necessary – starting from the existing protocols of course.

4 Routine Cell Culture

Aside from special cases, where cells have to be grown and tested under non-proliferative conditions, actively proliferating cells are considered the most appropriate source for assaying. However, each cell line has a different seeding density, plating efficiency and doubling time. As this specific growth behaviour usually doesn't fit the regular working day, the experimenter quite often finds himself/herself in a cell supply bottleneck situation when it comes to having to grow and harvest a certain number of cells in time for assaying – making cell provision a limiting factor both with regard to quality and throughput. Thus, when it comes to routine subculturing, it may be helpful to evaluate whether splitting the