

**Jaron Liu, Lynne Turnbull, Leanna Ferrand**  
**GE Healthcare Life Sciences**  
**1 Maritime Square #13-01 HarbourFront Centre**  
**Singapore 099253, Singapore**  
**E-mail: [jaron.liu@ge.com](mailto:jaron.liu@ge.com)**

**KEY WORDS:** HCA, HCS, HTS, IN Cell Analyzer, High Content Imaging, Drug Discovery, Widwfield Deconvolution, Multi-parameter, Productivity, Automation, Laser Line Scanning Confocal, 3D Spheroids Biology, High-Speed Frame Rates

### **High content cellular imaging in biological discovery**

Recent developments in image-based high content analysis (HCA) using widefield deconvolution, line scan confocal and transmitted light imaging modalities have enabled user demands of greater flexibility and catered to the growing requirements of assays involving complex cellular disease models such as 3D spheroids or microtissues. 3D models are increasingly popular for translational research because they are a more reflective model of in vivo cell morphology, gene expression, and differentiation but more importantly 3D models more closely recapitulate in vivo responses to drug treatment particularly drug resistance. Cutting edge hardware platforms use class leading laser line confocal technology in concert with sensitive and powerful image analysis platforms to give the user the statistical power to address biological questions in cell biology that previously lay out of reach. Results on the microscopic scales ranging from tissues, cell populations down to single cells, investigating molecular organization of individual cells in even the most sensitive of live samples. It can be expected that democratization of such HCA imaging systems will play a critical and analytical role in biological screening and discovery labs and we will illustrate this with several technical applications. Finally, we will present GE Healthcare's latest integrated IN Cell Analyzer platforms with our new easy-to-use IN Carta analysis software package that allow users to automate image acquisition processes and quickly and confidently extract multi-parameter data from these images regardless of prior experience levels.