

	Opera QEHS (classical confocal system)		Opera Phenix (with Synchrony Optics)	
	Sequential/ confocal	Simultaneous/ confocal	Sequential/ confocal	Simultaneous/ confocal
Positive control				
Negative control				

Figure 3. Synchrony Optics reduce spectral crosstalk by up to 98% during simultaneous confocal measurements, as shown in this crosstalk-sensitive epigenetic assay. As in this assay Hoechst stain and FITC signal are both located in the nucleus, bleed-through of Hoechst emission into the green channel is recorded on top of the actual signal. This effect becomes especially apparent in the negative control, which should show no signal. On classical confocal systems such as the Opera QEHS, the negative control is contaminated by Hoechst crosstalk in simultaneous mode. This is effectively suppressed by Synchrony Optics on the Opera Phenix (compare the red boxed images). Also note the 3x larger field of view of the Opera Phenix system.

When comparing the quality of the above mentioned epigenetic assay using the statistical parameter Z' , a dramatic Z' improvement in the simultaneous confocal data obtained with Opera Phenix becomes apparent (Fig. 4). On classical confocal systems, sequential acquisition is required to achieve a comparable Z' value, at the cost of much prolonged acquisition speed.

Conclusions

Today's high-content screening applications are becoming more complex, as more physiologically relevant cell models like live cells, co-cultures and 3D models are being used. To allow detailed phenotypic analysis of these cell models without compromising resolution, throughput or sensitivity, suitable imaging technologies are required. The Opera Phenix High-Content Imaging System combines a unique set of hardware and software features to allow improved imaging and analysis of today's highly demanding cell-based assays. Synchrony Optics, the proprietary optics of the Opera Phenix, are capable of suppressing spectral crosstalk to an absolute minimum thereby significantly improving image quality and assay robustness for crosstalk-sensitive assays. Synchrony Optics are key to unleashing the full power of a multi camera system by enabling parallel acquisition of spectrally close fluorophores with minimal crosstalk.

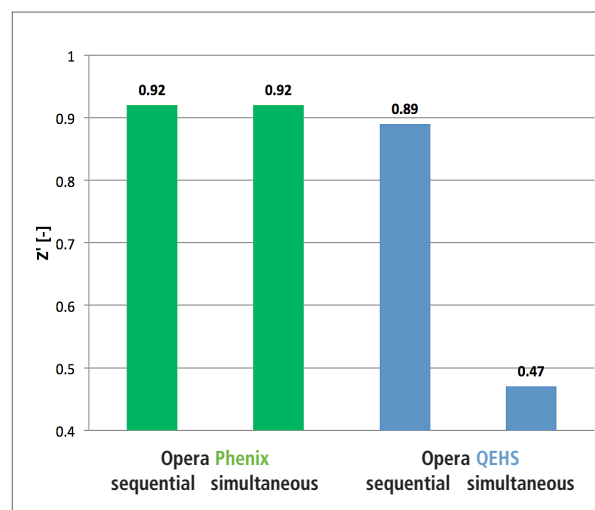


Figure 4. Synchrony Optics improve the Z' value of an epigenetic assay when measured in simultaneous mode. Synchrony Optics on the Opera Phenix system allow simultaneous acquisition with minimal crosstalk, yielding Z' values comparable to sequential acquisition.