
What needs to happen in this industry so that users could take advantage of the best image acquisition, image analysis and data analysis for their assays?

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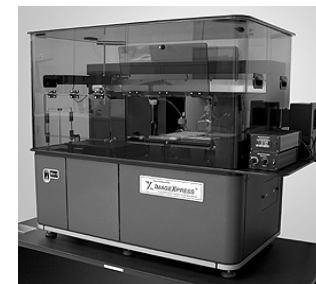
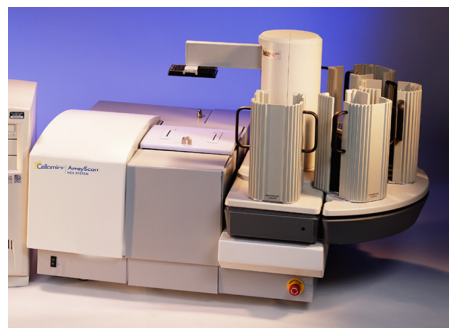
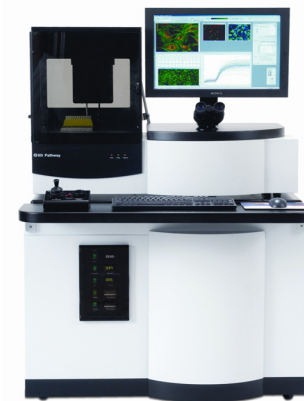
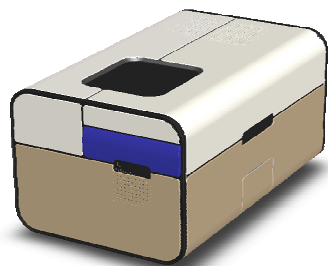
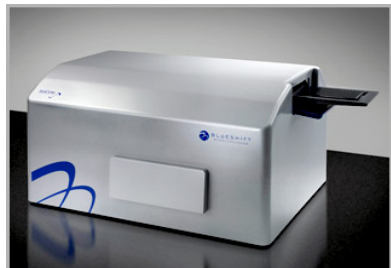
High Content Analysis

- compound capacity is in the one to 1,000s
- requires multi-parametric data from each cell, often from multiple fluorescent colors for characterization
- readout may be kinetic or single endpoint assay performed on live or fixed cells
- high resolution analysis of individual cells or sub-populations in each well
- trend is towards larger data files produced to store all the information for detailed analysis

High Content Screening

- compound capacity is in the 1,000 to 100,000s
- requires binary yes/no answer - only interested in real hits
- readout is fixed endpoint for signal stability and ease of automation
- ideally whole well analysis to account for variations in well
- trend is towards smaller data files which are needed to cope with increased throughput

Automated Imaging Instruments



Roche Discovery Technologies

Priority, Usages & Best-of-all Worlds



- **Mainstream HCA/HCS Use**
 - Multiple modalities
 - “Provided” image analysis applications
 - Z prime, SAR, 1-4 feature parameter analysis, Spotfire, Genedata
- **Specialized or Niche Purposes**
 - Live cell kinetics
 - Image deconvolution, z stacks
 - K-Means, MVA including Clustering & PCA
- **Esoteric functions**
 - Lifetime imaging, Multiphoton Excitation
 - Cellular FRET analysis
 - Data analysis for siRNA genes, SciTegic Pipeline Pilot
- **What is on the horizon?**
 - Multimode optics
 - Hyperspectral image analysis
 - Neural networks and Machine Learning
 - Better existing tools or breakthrough (first generation) tools

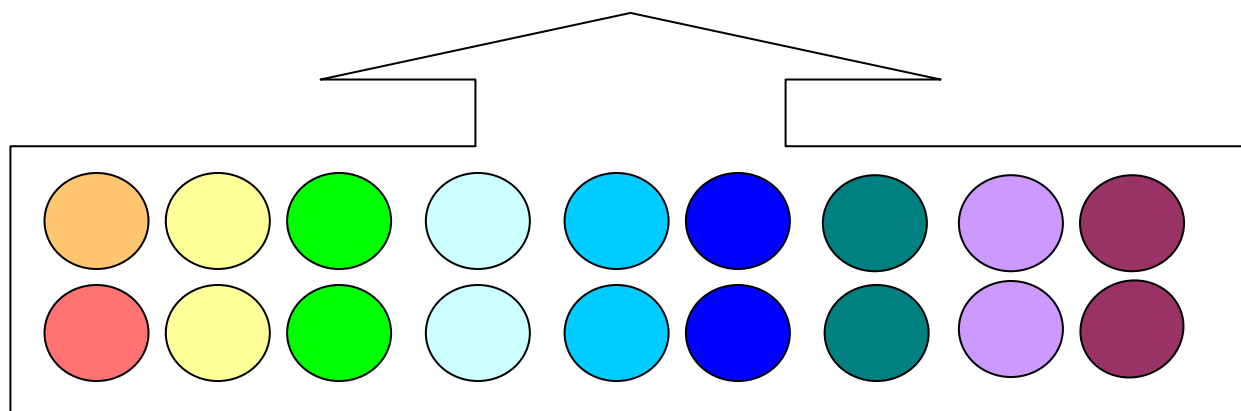
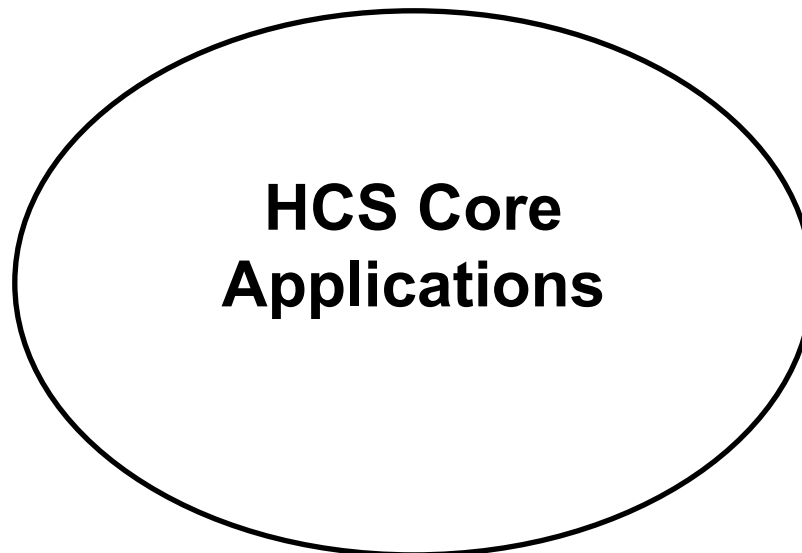
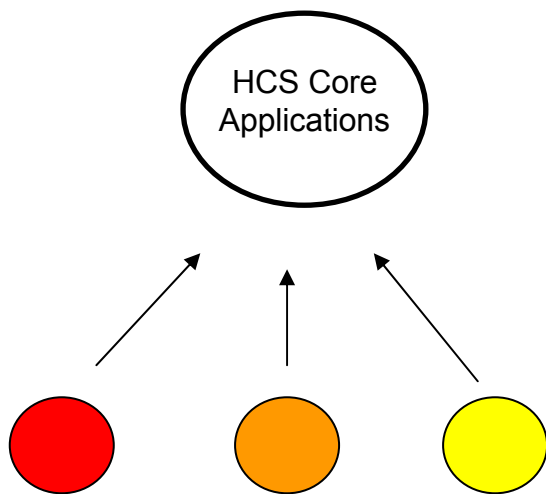
Is there *any one area* that we agree is rate limiting for the evolution of HCS?

Then and Now...

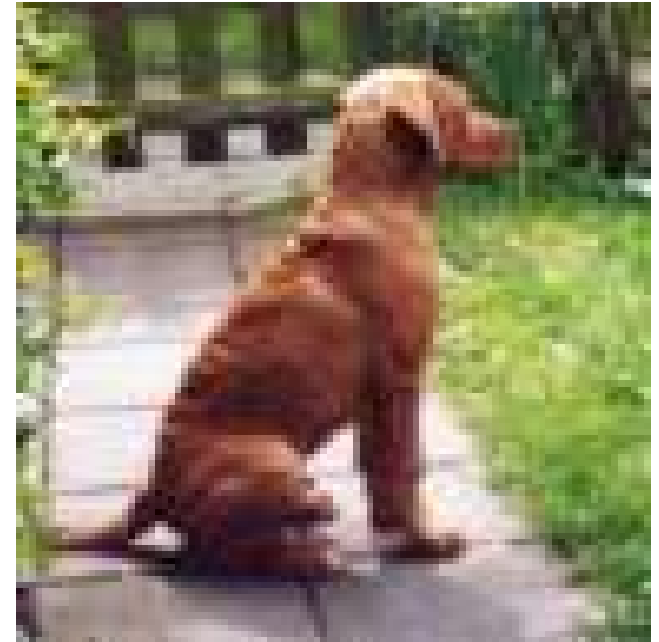
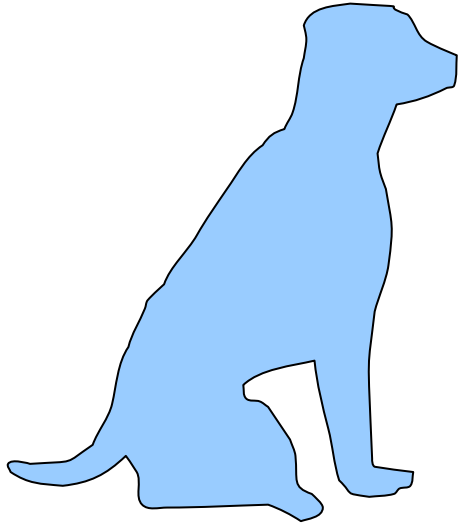


2006

1999



Abstract, Details, Context



What information do you need?
What information do you want?
Is the information being used to make decisions?
Those decisions are valuable!

A WAY FORWARD...



- HCS/HCA Users need to learn what is available amongst all of the instrument and software tools
- HCS/HCA Vendors need to learn who is doing what and to be proactive in seeding their technologies appropriately
- Better access to newly developed fluorescent probes would improve assays and techniques (beyond simple reliance on catalogs and websites)
- Like the mission of the OME, image files need to be portable, allowing access by multiple image analysis software packages
- The successes and failures of interpreting HCS results using MVA, pathway profiling, ML, and classification systems need to be shared in order to advance the field
- The necessity for completeness and versatility of “instruments, import/export, analysis, & storage” has to occur without bottlenecks