

# CytoViva HSI System

## Specifications - Standard

CytoViva Hyperspectral Imaging System (400 nm – 1,000 nm)

CytoViva's Hyperspectral Imaging technology was specifically designed to provide quantitative spectral analysis of nanoscale materials imaged with the patented CytoViva Enhanced Darkfield Microscopy or with other microscopy modalities. This can include spectral analysis of both biological and materials-based nanoscale samples, which may be isolated or integrated in cells, tissue or other materials-based matrices.

### Specifications

#### SPECTROPHOTOMETER

Type	Transmission Grating
Spectral Range	400 nm – 1,000 nm
Spectral Resolution	2.8 nm (with 30µm Slit)
Bending of Spatial Lines Across Spatial Axis	Smile < 1.5µm
Bending of Spectral Lines Across Spectral Axis	Keystone < 1µm
Maximum Spatial Scan Width	896µm @ 10X Magnification

#### SPECTROPHOTOMETER INTEGRATED CCD

Type	CCD
Pixel Size	6.45µm x 6.45µm
Pixel Count	1.3M Pixels
Exposure Time Range	5µs – 60 sec.
Resolution	1,392 x 1,040
Frame Rate (Full Resolution)	7.3 fps @ Full Binning, 13.5 fps @ 2 x 2 Binning
Dynamic Range A/D	14 bit
Camera Control	USB
Binning	1 x 1, 2 x 2

#### COMPUTING

Computer	Dell Precision Tower 3620 XCTO Base, 8GB RAM
Operating System	Windows 7, AMD Firewire Pro 2GB Video Card

#### LIGHT SOURCE

Lamp Type	Quartz Halogen Aluminum Reflector
Wavelength	400 nm - 2,500 nm
Power	150 watts

#### IMAGE ANALYSIS

Image Analysis Software	ENVI 4.8 (IDL Available)
Spectral Image Display	Real Time Display of Recreated RGB Image of Spectral Data
Spectral Identification	Spectral Mapping using Spectral Angle Mapper
Data Size (Spectra Cube*)	~ 500 MB (*Dependent on Image Scanned)
Image File Options	Up to 16 File Output Options Including GIF, JPEG 2000, TIF
Spectral Delineation	Real Time Display of Pixel Level Spectral
Spectral Library Data Capture	Single/Multiple Pixel Spectral Libraries
ROI Spectral Data Presentation	ROIs can be Created with up to Five Different Techniques
Spectral Data Statistical Computation	Mean, Min, Max (+) and (-) Standard Deviation and Eigenvalues

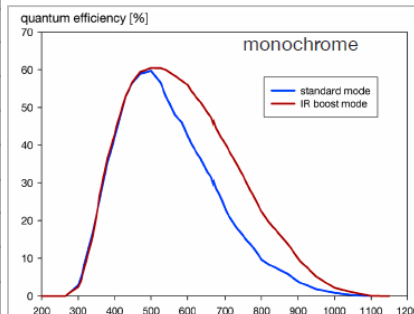
#### AUTOMATED STAGE

Scan Resolution	10 nm Step Size
Repeatability	Worst Case 0.30µm
Travel Range	114 mm x 75 mm

### Application Examples

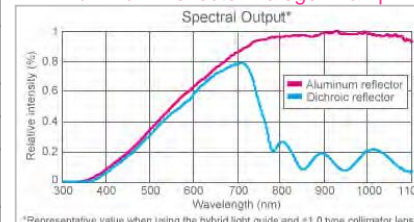
- Nanotoxicology
- Cancer Research
- Nanoparticle Characterization
- Drug Delivery

### CCD Detector Quantum Efficiency



### Illumination Spectral Output

Aluminum Reflector Halogen Lamp



\*Representative value when using the hybrid light guide and <math>\pm 1.0</math> type collimator lens.

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