The HyperCube™ will transform your microscope into a high resolution spectral imaging system, opening new research perspectives in biological imaging. Designed to fit commercial microscopes, cameras and a vast variety of excitation modules, The HyperCube™ gives access to the detailed composition of your sample.

**TECHNICAL SPECIFICATIONS**

| Spectral Range | 400 - 1000 nm / 900 - 1620 nm / 400 - 1620 nm  
| Spectral Resolution | < 2 nm (400 - 1000 nm) < 4 nm (900 - 1620 nm)  
| Spatial Resolution | Limited by the microscope objective N.A  
| Microscope | Provided by customer - Brand and model need to be approved  
| Objectives | Provided by customer  
| Camera | Provided by customer - Brand and model need to be approved  
| Epifluorescence Filter | Provided by customer  
| Illumination Lamp | HBO or XBO 100 (Provided by customer)  
| Darkfield Module | Provided by customer  
| Wavelength Absolute Accuracy | 0.25 nm  
| Preprocessing | Spatial filtering, statistical tools, spectrum extraction, data normalization, spectral calibration  
| Hyperspectral Data Format | FITS, HDF5  
| Single Image Data Format | JPG, PNG, TIFF, CSV, PDF, SGV  
| Software | PHySpec™ control and analysis software included  
| Dimensions | ≈ 55 cm (adjustable) 30 cm x 45 cm  
| Weight | ≈ 18.5 kg  

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1. MULTIPLEXING

Spectral and spatial identification of CNT

False color fluorescence image of SDC-suspended HiPco carbon nanotubes on a glass surface. Each color (17 species) corresponds to a spectrum, as shown below.

REF.: Roxbury D. et al. DOI 10.1038/srep14167 (2015)

2. INHOMOGENEITY – DEFECTS MAPPING

Absolute luminescence mapping of perovskite devices

The top image represents absolute mapping of the quasi-Fermi level splitting derived from EL, for perovskite cells using C60 as the ETL. The lower image represents mapping of the current transport efficiency fT.


3. DEGRADATION - SAMPLE FORMATION

Photoluminescence mapping of perovskite crystals

Black and white - PL image extracted at 770 nm, Colored image - false color map of the PL central wavelength, Side image - two PL spectra extracted from the hyperspectral data – see corresponding targets.

REF.: Samples provided by Mercouri Kanatzidis (Northwestern Univ.) and David Cooke (McGill).

4. CELL LABELLING

Dark-field imaging of gold nanoparticles

A) Dark-field image of human breast cancer cells tagged with gold nanoparticles (60 nm size), B) monochromatic image at 550 nm, GNP marked in green after PCA, C) magnification of a breast cancer cell, D) and spectra of GNP in different areas. Peaks at 550 nm confirm the presence of single 60 nm NPs. The absence of strongly red-shifted peaks confirm the absence of aggregated NPs. The hyperspectral camera did not detect any GNP in the areas between the cells.

REF.: Results kindly provided by: David Roux, Eric Bergeron and Michel Meunier, at École Polytechnique of Montreal, Quebec, Canada.

KEY POINTS - SPECTRAL AND SPATIAL IMAGING

» Imaging of multiplexed emitters
» Identification of defects, grain boundaries and phase segregation
» Study of sample formation, degradation and identification of deficient areas
» Mapping of spectral heterogeneities
» Access to the second biological window (900 - 1600 nm)
» Fast imaging – 1.4 million spectra in minutes
» Large area – hundreds of µm² up to a few mm² with fast stitching