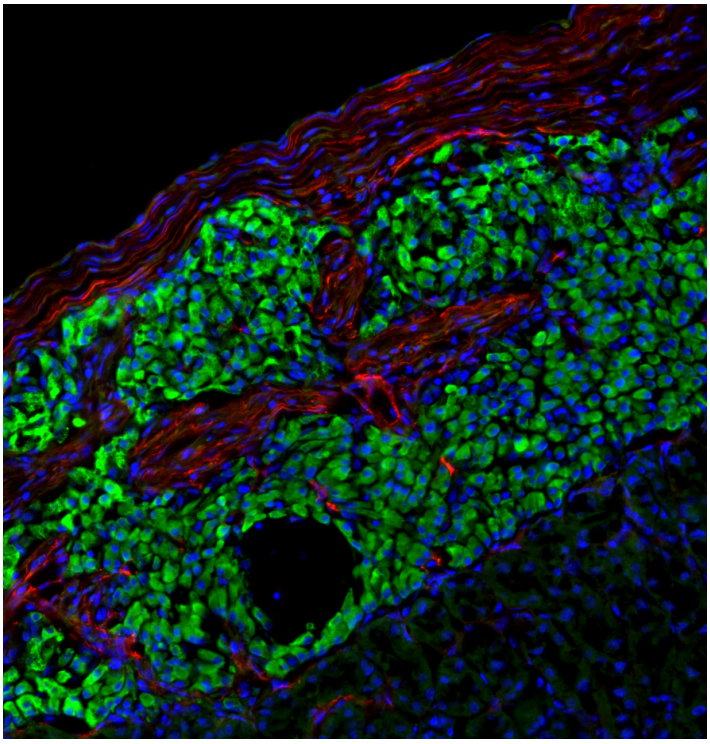


Image by Simon Watkins

CORE Illumination & Imaging Subsystem

Gene expression analysis techniques are based on highly multiplexed measurements with demanding assay performance requirements for precision and sensitivity. In one now broadly adopted strategy, molecular “barcodes” and single molecule imaging are used to detect and count hundreds of unique transcripts in a single reaction. After a decade of practical experience and refinement, this technique is now a widely adopted platform based on highly orchestrated reagent design, automated sample processing and precision instrumentation. Lumencor designed, developed and manufactures the optical hardware that drives the fluorescence excitation and detection for such instruments. Today such strategies are the basis of not only gene expression analysis but screening panels based on immunology, pathology, DNA, mRNA, proteins and more. Moreover, spatial transcriptomics studies are possible, revealing the biological architecture which provides greater understanding of the spatial relationship between cells within normal and diseased tissue.

Lumencor manufactures complete illumination and emission subsystems in a product simply called the CORE. The CORE advances the performance of screening instrumentation in that it embodies illumination and detection systems tailored to meet application-specific requirements.

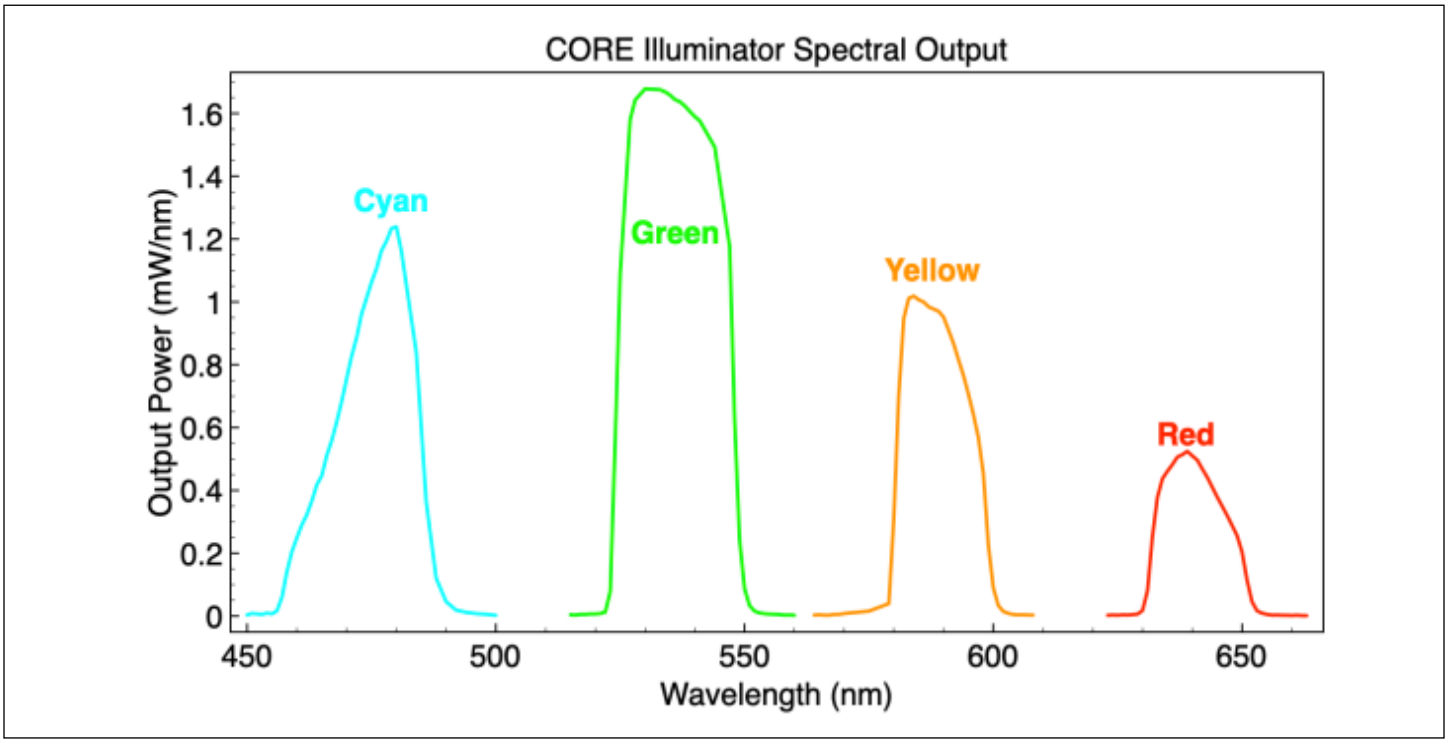
In the case of molecular barcode scanning for gene expression analysis, the CORE provides illumination to the samples, and images the resulting fluorescence emission, with the following key characteristics:

- 4-color solid-state illuminator matched to the spectral characteristics of molecular barcodes
- Customized filters and dichroic for optimum fluorescence signal:noise, (S:N)
- Integration of camera, illuminator and objective autofocus for precise barcode rendition
- Control electronics
- Illumination stability supporting reproducible readout across hundreds of fields of view
- Thermal management of all system components

The design and engineering approach embodied in the CORE streamlines development time and cost for new instruments, improves instrument performance and delivers cost savings to end users and high volume manufacturers, alike.

As with all Lumencor products, OEM customization is available upon request.

For more information on the CORE Optical Train please contact us at info@lumencor.com. To receive a purchase quotation for a CORE Optical Train, please submit our online quotation request form.



Features and Operating Characteristics:

Features	Details
Detection mode	4-color epifluorescence
Objective	40X, 0.95 NA, air
Objective configuration	Inverted
Autofocus	Motorized Z-axis objective positioning
Excitation Sources	Four solid-state light sources with excitation filters
Fluorescence Detection	Quad-band dichroic with single band emission filters
Camera	CCD (1.4 MP, 6.5 µm2 per pixel)
Thermal Management	Fan assisted air cooling
Light Output Control	Independent color controls: RS232 (light on/off and intensity), TTL (light on/off)
Power Supply Requirements	24V DC/5 A DC
Warranty	24 months
Dimensions (W x L x H)	10.5 in x 13.4 in x 10.6 in (266 mm x 339 mm x 269 mm)
Weight	8 lb / 3.6 kg

** Specifications are unique to this case study and may be customized to meet other assay requirements