

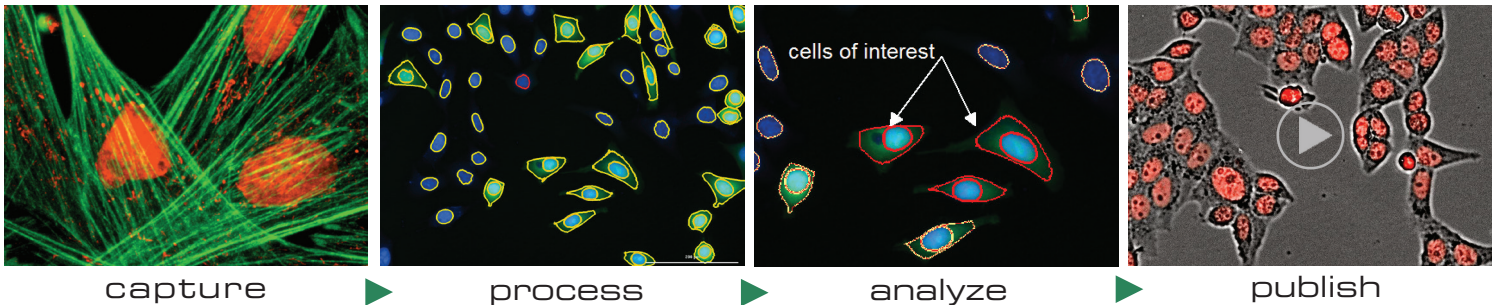
# Lionheart™ FX Automated Microscope

Laboratory for Infectious  
Disease Research (LIDR)  
University of Missouri

Lionheart™ FX Automated Microscope is a compact, inclusive microscopy system for a broad range of imaging workflows. It offers 4x, 20x, 40x, and 60x air magnification, with fluorescence, brightfield, color brightfield, and phase contrast channels for maximum application reach. An environment control cover provides incubation to 40 °C and effective containment for CO<sub>2</sub>/O<sub>2</sub>

control, a humidity chamber optimizes conditions for long-term live cell imaging applications.

Lionheart FX and Gen5 together comprise Augmented Microscopy™ - the automation of image capture, processing, analysis and development of publication-ready images and data.



## Features:

- Automated digital microscopy with 4x, 20x, 40x, and 60x magnification for whole organism to sub-cellular imaging
- Brightfield, color brightfield, phase contrast and fluorescence with image auto focus to meet a wide range of imaging applications.
- Powerful Gen5 3.0 software with seamless image capture, annotation, analysis and movie making. Requires no extensive training.
- Automated kinetic live cell assays, with temperature, CO<sub>2</sub>/O<sub>2</sub> and humidity control.
- Auto Focus, Auto Exposure, Auto LED Intensity
- Fully integrated and compact design offers quick installation and setup, no extensive training required.
- Label-free cell counting for cell proliferation assays.



**BioTek Lionheart™ FX Automated Microscope**  
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## Typical Applications:

- Live cell imaging
- Cell culture QC
- Cell proliferation
- Apoptosis
- 3D cell culture
- Tumor invasion
- Signal transduction
- Stem cell differentiation
- Phenotypic assays
- Cell migration and invasion
- Calcium flux
- Translocation
- Cytotoxicity
- Cell viability
- Wound healing
- Phagocytosis
- Slide scanning
- H & E imaging
- Label-free live cell assays
- Label-free cell counting

## Configurations:

**LFX:** Lionheart FX Automated Microscope. Fluorescence, brightfield, color brightfield and phase contrast imaging capability. Includes Gen5 3.0 Software and Imaging System Controller. Objectives, filter/LED cubes, accessories and software upgrades sold separately.

## Accessories:

- Environment Control Cover. For temperature control to 40 °C, CO<sub>2</sub>/O<sub>2</sub> control module support and "darkroom" fluorescence
- Humidity Chamber with rapid gas re-charge
- Gen5 Image+ and Image Prime Software for advanced image analysis
- Vessel adapters (T25, T75, 35 and 60 mm dishes, slides)

See [www.biotek.com](http://www.biotek.com) for complete list of accessories.



Easy access to filter/LED cubes and objectives.

## Specifications:

### General

Labware type:	Imaging: 6- to 1536-well plates
Other labware:	Microscope slides, Petri and cell culture dishes, cell culture flasks (T25, T75), counting chambers, chamber slides
Temperature control:	Support for labware up to 1.5" tall 4-Zone™ incubation to 40 °C with Condensation Control™ With environmental control cover
CO <sub>2</sub> and O <sub>2</sub> control:	0 – 20% CO <sub>2</sub> control and 1 – 19% O <sub>2</sub> control with Gas Controller
Environment control cover:	Top cover for light tight imaging and incubation control High resolution lead screw driven stage with open access Humidity chamber with rapid gas recharge (option)
Stage control:	
Humidity control:	
Software:	Gen5™ 3.0 Microplate Reader and Imager Software included; Gen5 Image+ and Image Prime software for advanced image analysis

### Imaging

Imaging modes:	Fluorescence, brightfield, phase contrast, color brightfield
Imaging methods:	Single color, multi-color, montage, time lapse, Z-stacking, burst mode
Light source:	High power LEDs (available wavelengths: 365 nm, 465 nm, 523 nm, 590 nm, 623 nm, 655 nm, 740 nm)
Camera:	
Camera binning:	16-bit gray scale, Sony CCD, 1.25 megapixel
Camera exposure range:	Optional 2x2 binning for focus and/or image capture
Image outputs available:	5 milliseconds – 4 seconds
	Raw Images: 16-bit TIFF Saved Images: TIF, JPG, BMP, PNG, EMF, GIF Movies: MP4, WMV
Filter cube capacity:	4 user-replaceable fluorescence cubes plus brightfield channel
Colors available:	DAPI, GFP, RFP, Texas Red, CY5, CY7, Acridine Orange, Phycoerythrin (PE), Propidium Iodide, CY5.5, GFP (Ex)-CY6 (Em), RFP (Ex)-CY5 (Em)
Objective capacity:	6 onboard user-replaceable objectives
Available objectives:	<b>Fluorescence:</b>  <b>Air:</b> 4x, 10x, 40x, and 60x  <b>Phase contrast:</b> 4x, 20x, and 40x  Image collection rate: Single Well Fastest Frame Rate Capture:  *Full Resolution: up to 10 frames per second for single color images *2x2 Binning: up to 20 frames per second for single color images
Automated functions:	Autofocus, user-trained autofocus, autoexposure, auto-LED intensity
Autofocus method:	
Microscope stage control:	Image-based autofocus Laser autofocus option  Gen5 Software Control

### Physical Characteristics

Power:	250 Watts max.
Dimensions:	With environment control cover closed or without cover: 18.3" D x 17.9" W x 14.1" H (46.5 cm x 45.5 cm x 35.8 cm) With environment control cover fully open: 18.3" D x 17.9" W x 27.5" H (46.5 cm x 45.5 cm x 69.8 cm)
Weight:	Without environmental control cover: 51 lbs (23.1 kg) With environmental control cover: 58 lbs (26.3 kg)

### Regulatory

CE and TUV marked. RoHS compliant. Configurations for In Vitro Diagnostic use are available.

Performance values represent the average observed factory test values.

\*Specifications subject to change.



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**Filter / LED Cubes**

**Lionheart™ FX Automated Microscope**



Laboratory for Infectious Disease Research (LIDR)  
http://rbl.missouri.edu

LED/Filter Cube	Dye	Peak Excitation (nm)	Peak Emission (nm)
<b>365 nm LED</b> (PN 1225007)  <b>DAPI</b> EX 377/50, EM 447/60 (PN 1225100)	7-Hydroxy-4-methylcoumarine	360	449
	Alexa Fluor 405	402	421
	Alexa Fluor® 350	346	442
	DAPI	358	461
	DyLight 405	398	420
	DyLight™ 350	353	432
	EBFP	380	440
	Hoechst 33342	352	455
	Hoechst 34580	392	440
	Hoechst® 33258	352	455
	LysoSensor™ Blue	373	425
	Marina Blue	363	461
	Pacific Blue	404	455
<b>465 nm LED</b> (PN 1225001)  <b>GFP</b> EX 469/35, EM 525/39 (PN 1225101)	5-FAM (5-Carboxyfluorescein)	492	518
	Alexa Fluor 488	495	519
	BCECF (pH 5.5)	481	518
	BODIPY FL	505	513
	Calcein	494	517
	Cy2	489	506
	Dendra2 (Green)	491	507
	DiO	475	500
	DyLight™ 488	493	518
	EGFP	484	507
	Fluo-4	494	516
	Fluorescein (FITC)	494	518
	LysoTracker® Green	504	511
	MitoTracker® Green	490	516
	mWasabi	493	509
	Oregon Green™ 488	496	524
	Rhodamine 110	498	521
	Rhodamine Green	500	525
	roGFP2 (Reduced State)	489	510
	SYBRTM Green I	497	520
	YO-PRO™-1	491	509
	YOYO™-1	491	509
	<b>523 nm LED</b> (PN 1225003)  <b>RFP</b> EX 531/40, EM 593/40 (PN 1225103)	5-TAMRA	542
AlamarBlue™		560	590
Alexa Fluor 546		556	573
Alexa Fluor 555		555	565
AsRed2		576	592
Calcium Orange™		549	576
Cy3		550	570
Cy3.5		581	596
Dil		549	565
DsRed		558	583
dTomato		554	581
DyLight® 549		553	569
Ethidium bromide		518	603
LysoTracker Red		577	592
MitoTracker Orange		551	576
mOrange		548	562
Nile Red		549	628
PO-PRO-3		539	567
POPO-3		534	570
RFP		555	584
Rhod-2		552	578
Rhodamine phalloidin	570	590	
SYTOX Orange	547	570	
TRITC	557	576	

Think Possible



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LED/Filter Cube	Dye	Peak Excitation (nm)	Peak Emission (nm)
<b>590 nm LED</b> (PN 1225002)  <b>Texas Red</b> EX 586/15, EM 647/57 (PN 1225102)	5-ROX	576	602
	Alexa Fluor 568	578	603
	Alexa Fluor 594	590	617
	DyLight 594	593	618
	mCherry	587	610
	MitoTracker Red	579	599
	SpectrumRed	587	615
	Texas Red	596	615
<b>623 nm LED</b> (PN 1225005)  <b>Cy5</b> EX 628/40, EM 685/40 (PN 1225105)	Alexa Fluor 633	632	647
	Alexa Fluor 647	650	668
	Alexa Fluor 660	663	691
	Allophycocyanin (APC)	650	660
	Cy5	650	670
	DiD (DiLC18(5)) Lipophilic	648	670
	DyLight 633	638	658
	DyLight 649	651	673
	SpectrumFRed	650	681
	TO-PRO™-3	642	660
TOTO™-3	642	660	
<b>655 nm LED</b> (PN 1225008)  <b>Cy5.5</b> EX 647/57, EM 794/160 (PN 1225114)	Alexa Fluor 680	679	702
	Alexa Fluor 700	702	723
	Cy5.5	675	694
	DyLight 680	676	705
<b>740 nm LED</b> (PN 1225006)  <b>Cy7</b> EX 716/40, EM 809/81 (PN 1225106)	Alexa Fluor 750	751	776
	Cy7	743	767
	DiR	750	782
	DyLight 750	751	778
Specialty Cubes	Dye	Peak Excitation (nm)	Peak Emission (nm)
<b>465 nm LED</b> (PN 1225001)  <b>AO (+RNA)</b> EX 469/35, EM 647/57 (PN 1225109)	Acridine Orange (+RNA)	470	650
<b>523 nm LED</b> (PN 1225003)  <b>PI</b> EX 531/40, EM 647/57 (PN 1225111)	PerCP	490	677
	Propidium Iodide (PI)	535	617
<b>465 nm LED</b> (PN 1225001)  <b>469/593</b> EX 469/35, EM 593/40 (PN 1225113)	JC-1	498	595
	Phycoerythrin (PE)	545	575

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