

BSBS Core Equipment – Lake Nona

Microscope Systems

Other Imaging Systems: Gel Docs, in vivo

Plate Readers



BSBS Core Microscope Systems – Lake Nona

Confocal

Zeiss 710 Confocal
BBS 107c – Jeremiah Oyer

Nikon A1S1 Confocal
BBS 107A – due to move locations;
epifluorescence in repair

PerkinElmer Ultraview Spinning Disk
BBS 107E – Not functional

Near Confocal

Zeiss B/W, Apotome 3
BBS 340

Micro Confocal - Automation
BBS 557

Inverted Fluorescence

Leica DMI8000
BBS 256

Zeiss – Color Cam
BBS 256

Keyence BZ-X800
BBS 340

Zeiss B/W, Color Cam
BBS 456

Leica DMI6000B
BBS 456

MACSima- Automation
BBS 557

Pico ImageXpress- Automation
BBS 557

IncuCyte SX5- Automation
BBS 557

Upright

Leica DMI2000 - color
BBS 125

Keyence VHX 7000- color
BBS 256

Specialty - 3D

Leica DMI3000B
BBS 456

Zeiss A1 B/W FL
BBS 340

Nikon Eclipse E400 B/W FL
BBS 356

Stereo/Dissection

Leica M125
BBS 153 and 156



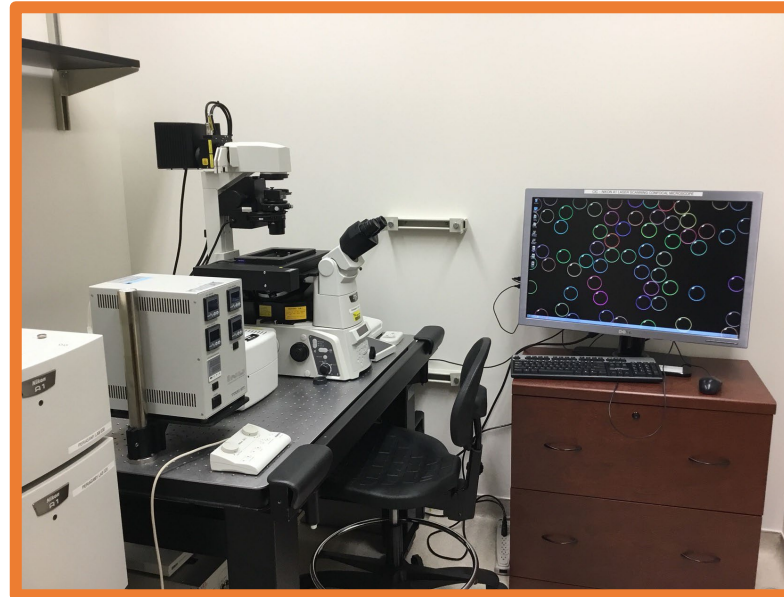
BSBS Core Confocal – Lake Nona



Zeiss 710 Confocal
Microscope BSBS 107c

Best option for building

Fully functional: best for
coverslips



Nikon A1S1 Confocal Microscope
BSBS 107A

To move to main campus
Functional for confocal;
best for coverslips
Difficult to use as the
Epifluorescence filter wheel
broken, new epi light source;
estimated cost ~\$6,000



PerkinElmer Ultraview Spinning
Disk Microscope System BSBS
107E

best for live-cell imaging

Not Working, Not Likely to be Fixed

Near Confocal: Micro Confocal

BBS 557

Automation: single plate, single slide

Fluorescence:

DAPI, GFP, Cy3, TR, Cy5

4, 10, 20 phase and 40 objectives

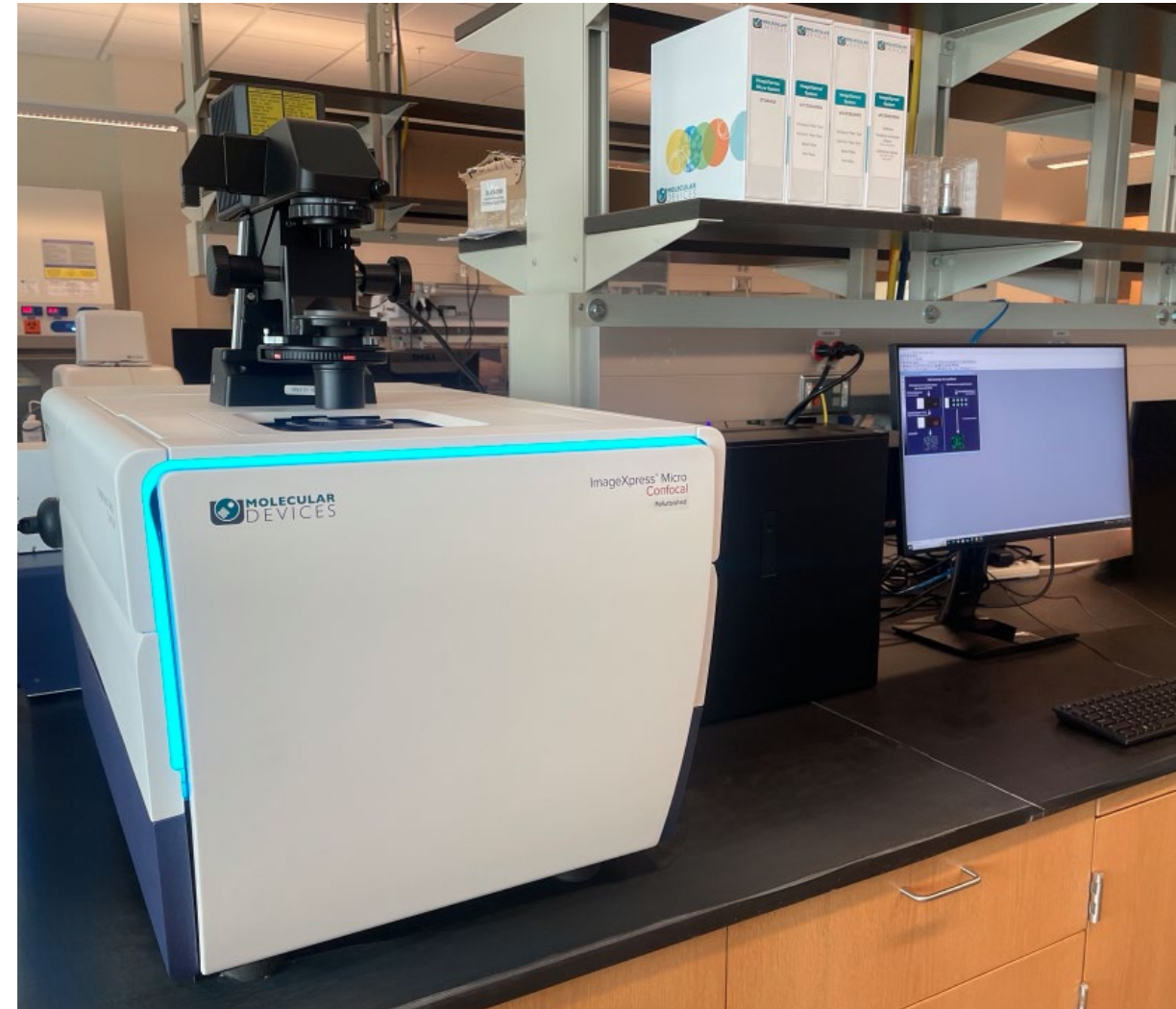
- 20x plan APO objective is available

Cell Culture Plates, Slides

Z-Stack and Sectioning

Stitching

Analysis



Near Confocal: Zeiss Apotome 3

BBS 340

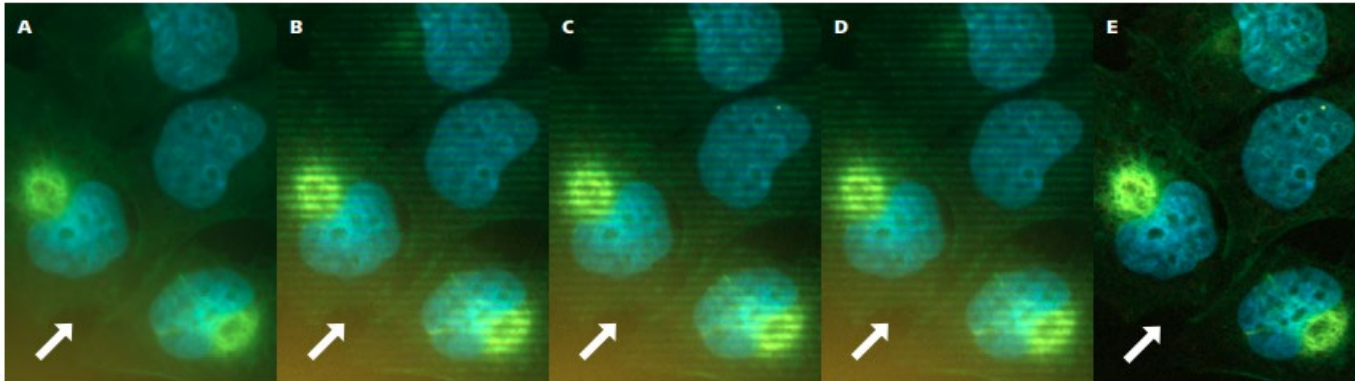
Fluorescence: DAPI, GFP, Cy3, TR, Cy5

2, 10, 20, 40 and 60× objectives

Cell Culture Plates, Slides

Z-Stack, Sectioning and Deconvolution

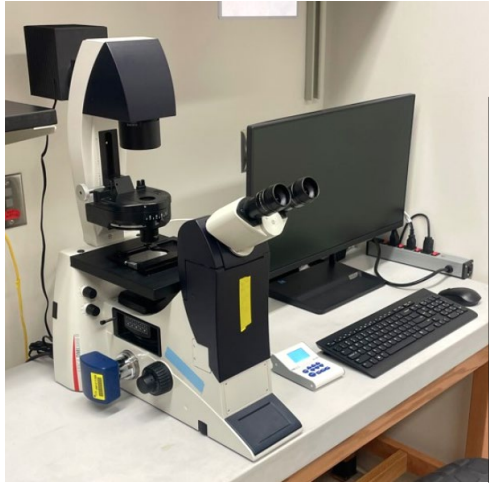
[Video 1](#) , [Video 2](#)



Schematic illustration of the grid projection. A: Widefield image. B – D: raw images with different positions of the grid. E: resulting optical section through the sample. Out of focus light is efficiently removed by the structured illumination (arrow).



Inverted Fluorescent - Basic

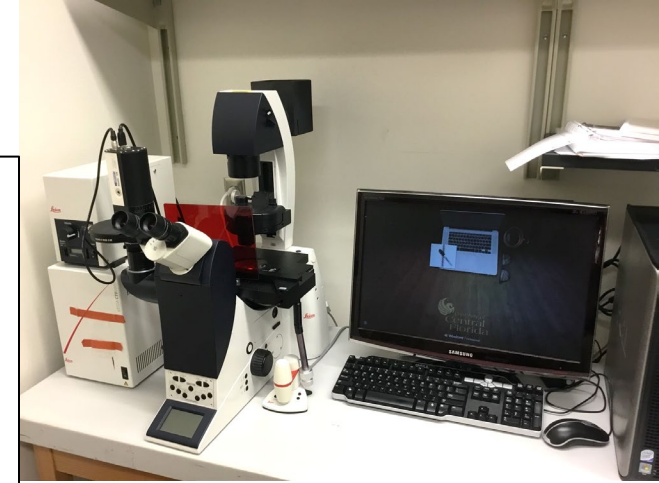


Leica BSBS 256

LED Light Source (FL)
B/W camera
More Objectives available:
4, 10, 20 (0.17 and 1.0
focus rings set), 40, and
100x
DAPI, GFP, TRIC, Phase

Leica BSBS 456

Halogen Light Source (FL)
20min warmup, cool
down
B/W basic camera
4, 10, 20, 40x
DAPI, GFP, TRIC, Phase



Zeiss – Color Cam BSBS 256

Halogen Light Source (FL)
20min warmup, cool
down
Brightfield light fixture
needs replaced
Color & B/W basic
cameras
4, 10, 20, 40x

Zeiss B/W Cam BSBS 456

Halogen Light Source (FL)
20min warmup, cool
down
B/W basic camera
4, 10, 20, 40, 60x
DAPI, GFP, TRIC, Phase



Keyence BZ-X800

BBS 340 – Most User-Friendly & Versatile

Inverted: Brightfield and Fluorescence:

DAPI, GFP, Cy3, TR, Cy5

2, 10, 20, 40 and 60× objectives

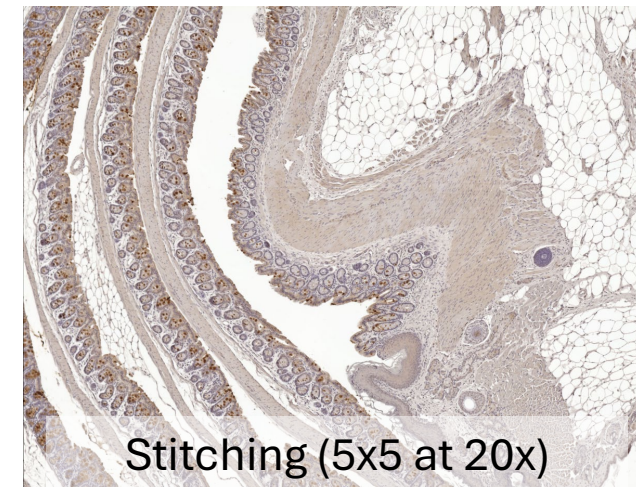
Cell Culture Plates, Slides

Z-Stack and Sectioning; Pinhole light options

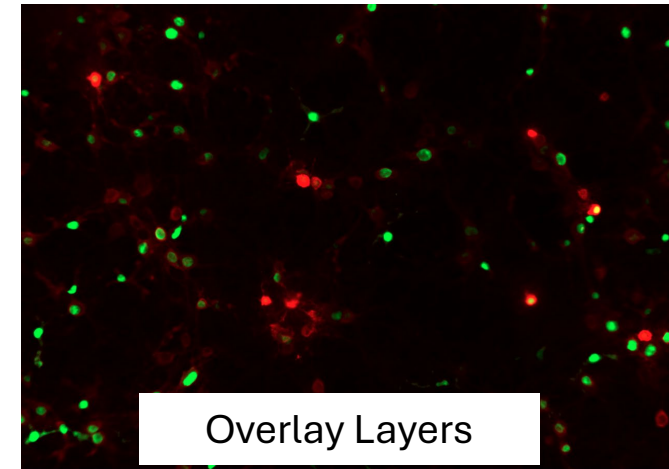
Stitching

Live cell imaging, videos

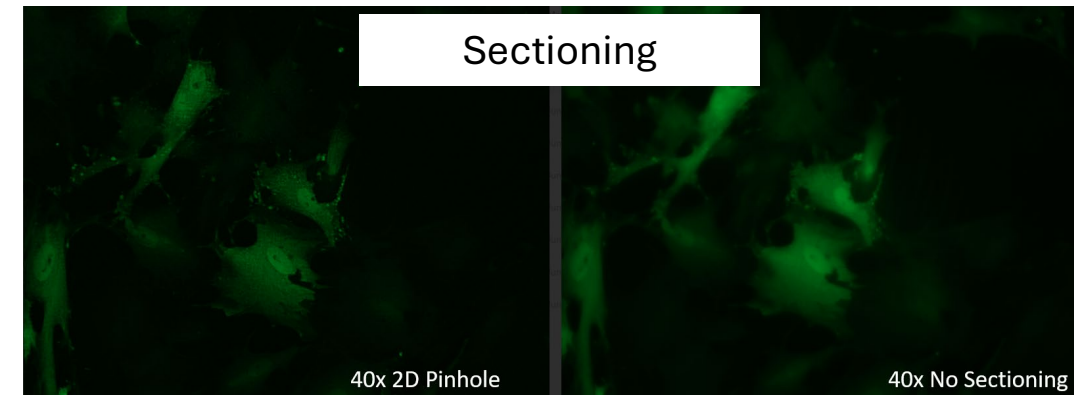
Analysis (decent: cell counts, amount/intensity of colors)



Stitching (5x5 at 20x)



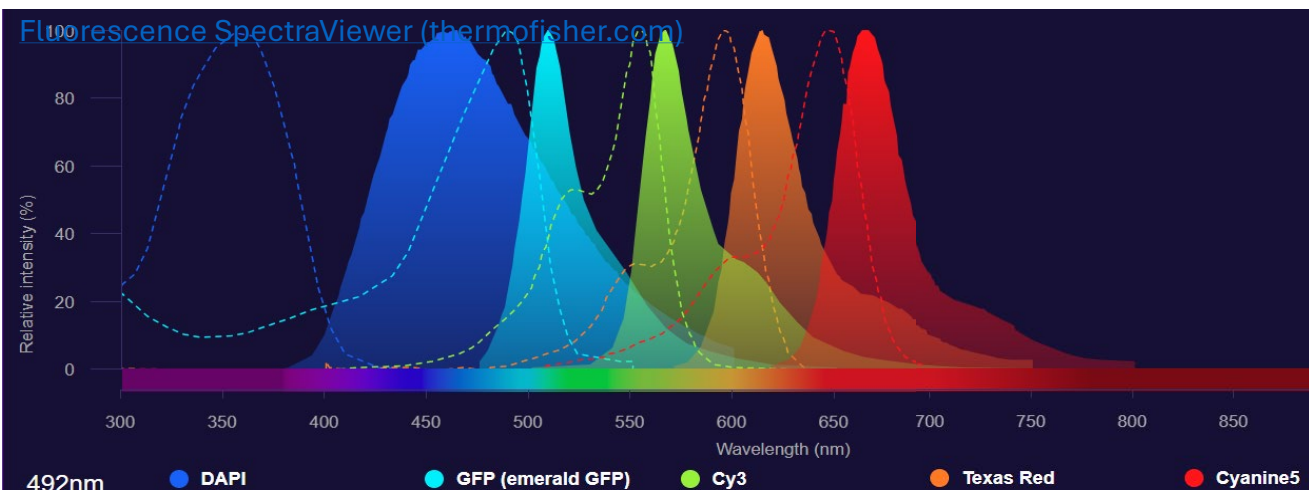
Overlay Layers



Sectioning

40x 2D Pinhole

40x No Sectioning



Pico ImageXpress

BBS 557

Automation: single plate, up to 4 slides

Brightfield (true color) and Fluorescence

DAPI, GFP, TR, Cy5

4, 10, 20, and 40x objectives

40x: dry with correction collar

Cell Culture Plates, Slides

Z-Stacking (no projections- flattens)

Stitching

Time Courses

Temperature controlled; CO2 and humidity if using chamber cassette

Analysis: not perfect, but better than by eye
(mostly): cell counts, amount/intensity of colors



IncuCyte SX5

BBS 557

Automation: 6 plates (6-384-well)

Fluorescence / Phase

3 separate optical modules:

1. Red/Green
2. G/O/NIR
3. Metabolism (NIR)
- 4, 10, and 20× objectives

Time Courses

Analysis

[Sartorius - IncuCyte SX5](#)



MACSima

BBS 557

Ultrahigh-content:
Cyclic stainer and imager
Deep phenotyping, biomarker
research; 5-100+ antibodies
on a single sample, plus:
RNASky

Powerful analysis software:
MACSIQ

Slides and Dishes (specialty)

Validated antibodies for MICS

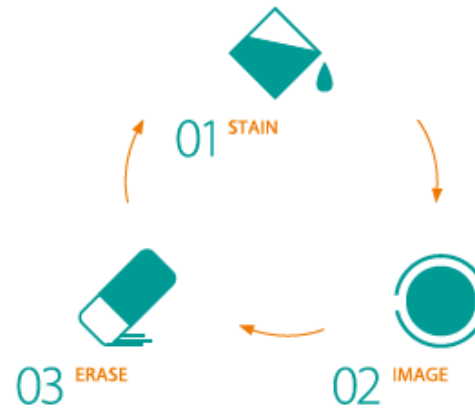
Specific staining – conclusive results

If you want to achieve high reproducibility and error-free analysis, rely on recombinant antibodies.

- World's largest portfolio of antibodies for ultrahigh-content imaging
- Recombinant antibodies specifically validated for MICS technology
- Tested for compatibility with FFPE-, PFA-, or acetone-fixed samples of human or mouse origin
- Lot-consistent and reproducible results due to sophisticated recombinant antibody technologies

The two mechanisms for signal erasure

After staining with fluorochrome-conjugated antibodies (01) and image acquisition of the stained sample (02), the fluorescent signal can be erased by either of the two mechanisms shown below.



The fluorescence signal of samples that were stained with fluorochrome-conjugated antibodies, such as our recombinant REAfinity™ Antibodies coupled to non-photostable fluorochromes, can be erased via photobleaching.



Staining of samples with REA_dye_lease™ and REAlease® Fluorochrome-Conjugated Antibody complexes allows for fast and gentle signal erasure via a controlled release of fluorochromes.



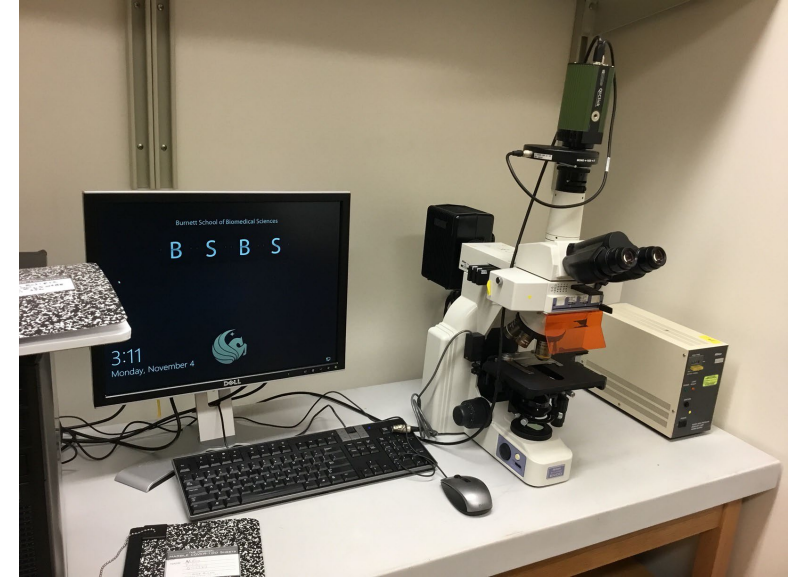
Upright – Basic



Leica DM2000
Brightfield; Upright
BSBS 125
Jenoptiks Camera
5, 10, 20 and 40x



Nikon Eclipse E400
BSBS 340
Fluorescent; Upright
4, 10, 20 and 40x
B/W Camera (FL)



Nikon Eclipse E400
BSBS 356
Fluorescent; Upright
4, 10, 20 and 40x
B/W Camera (FL)

Keyence VHX 7000

BBS 256

Upright Brightfield – 3D Topography

Image objects

Stitching

Measurements

Particle counting

Videos

CAN have Fluorescent attachments
(NightSea) Not purchased

Not Networked; bring drive



Gel Doc Systems – BSBS Lake Nona

Bio-Rad Chemidoc MP



Licor Odyssey M



Thermo iBright



Azure 600



(2) Licor Odyssey units for 700/800 NIR also present
NIR also present

B-R Gel Doc EZ

Feature	ChemiDoc MP	Odyssey M	iBright	Azure 600	Film
Fluorescence*	**	**	**	***	
Chemiluminescence	***	*	**	***	***
User-Friendly	***	**	**	***	*
Speed	***	*	**	**	*
Camera	B/W	B/W	B/W	Color + B/W	NA
Maintenance/ Service	*	*	**	***	on us
Cost	\$37,000	\$80,000		\$34,578	\$\$\$

*Odyssey M and Azure 600 have laser diode scanning for fluorescent imaging

Gel Doc Systems – BSBS Lake Nona

Bio-Rad Chemidoc MP and EZ Doc

EZ: BBS 207

MP: BBS 470:

Chemiluminescence, FL, NIR, UV

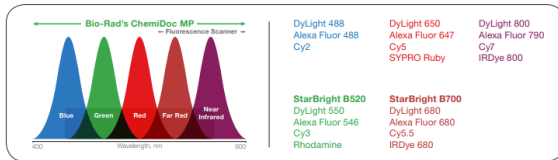


Fluorescent and chemiluminescent blots, stain-free gels/blots, and ethidium bromide, SYPRO Ruby, and other stains.

Coomassie Blue, silver, and other stains.

GelGreen or any SYBR® stains.

Detect up to three proteins in a single experiment with a wide range of supported fluorophore options.



Azure 600

BBS 557

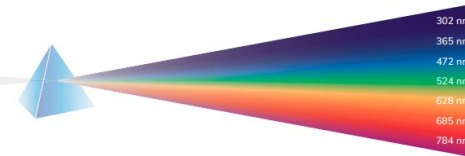
Camera: 9.1mp CCD

In Vivo Imaging



LIGHT SOURCES

The flexibility of Azure Imaging Systems comes from the wide variety of light sources and filters to detect fluorescent dyes up to 832nm.



Licor Odyssey M

Light Sources

- RGB LED (trans-illumination)
- RGB LED (reflective illumination)
- Solid-state diode laser at 488 nm
- Solid-state diode laser at 520 nm
- Solid-state diode laser at 685 nm
- Solid-state diode laser at 785 nm



BBS 557

Licor Odyssey

Camera: ?mp CCD

Laser Diode: 685 and 785nm



BBS 270

BBS 309

MP: Works great when it works. Fails frequently: too many sensors, mirrors
EZ: smaller format

Excellent instrument, no preview with door open; detects Cy3 better than the other instruments here, more versatile.

Slow, analysis software does not work on networked devices (only 1 license key). For FL = good, but not as good as the Azure; worst at chemiluminescence

Gel Doc Systems – BSBS Lake Nona

BBS 371



[Cytiva Typhoon IP](#)

Typhoon IP system:

Storage Phosphor Screen

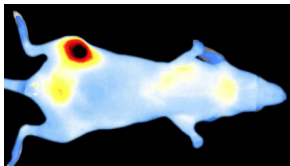
BAS-IP retains energy produced by ionizing radiation from isotopes (^{32}P); ~1/10 exposure compared to film

Imaging Systems – in vivo

IVIS









IVIS: in vivo large format CCD camera; imaging chamber housing, a heated, moveable Platform, filter wheel, LEDs.



Vevo 3100



Ultrasound:
Probes/Transducers:
Small tumors/items: MX250
Pregnancy checks: MX550D

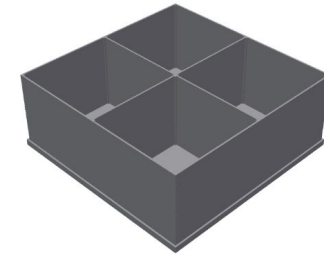
Transducer	Animal	Applications
 MX250 15-30 MHz Axial Resolution: 75 μ m	 	<ul style="list-style-type: none"> Cardiovascular and Abdominal Tumors All MicroMarker contrast applications
 MX550D 25-55 MHz Axial Resolution: 40 μ m	 	<ul style="list-style-type: none"> Abdominal, Reproductive, Cardiovascular, Embryology Tumors

invivoXtreme



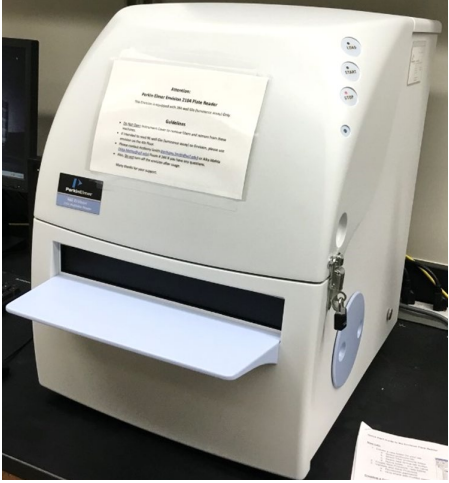
X-Ray; needs work to get it back working. Not straightforward to use

AnyMaze



Software and camera system used for many behavioral set ups, including open field monitoring

Plate Readers



PerkinElmer Envision
BBS 270 and 470
filter based: most accurate
for specific protocols
(narrow bandwidths), no
heat, does shake, special
assays DELFIA,
Alphascreen; least user-
friendly – see quick start
guide.



Biotek Synergy H1M in
BBS270: 230-999nm
monochromator; heat,
shaking



Biotek Synergy NEO2
BBS 557: fast for kinetic
assays (6 vs 30s 96-well
reads): monochromator
230-1000nm; heat,
shaking, injection



SpectraMax iD5
BBS 557: monochromator 230-
1000nm; heat, shaking,
injection
Full-spectrum read out down to
1nm steps; 24-place nanodrop
plate, some filters for specialty
scans

All these plate reader can read Absorbance, Fluorescence and Luminescence