

Microscopic Imaging Core Facility

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Overview

MISSION: To provide microscopic instruments and training that enhance the research and educational opportunities in the Biology department at Wake Forest University.

PHILOSOPHY: Humans are visually-oriented creatures who rely on sight to navigate, understand, and interact with the world. In scientific inquiry, whether molecular biology or ecology, image instrumentation is critical to successful research projects. Images are the medium for data collection, archiving, analysis, and dissemination.

DESCRIPTION: The facility is a five room suite dedicated to light and electron microscopic imaging, sample preparation, and image processing and analysis. The major imaging systems are described in the following sections.

Inverted Image Restoration System

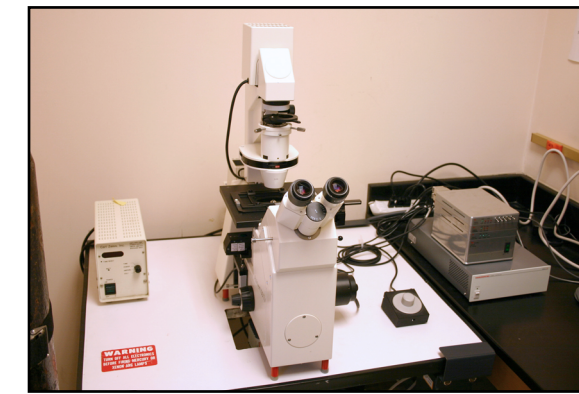
ZEISS AXIOVERT 100 INVERTED MICROSCOPE

Features:

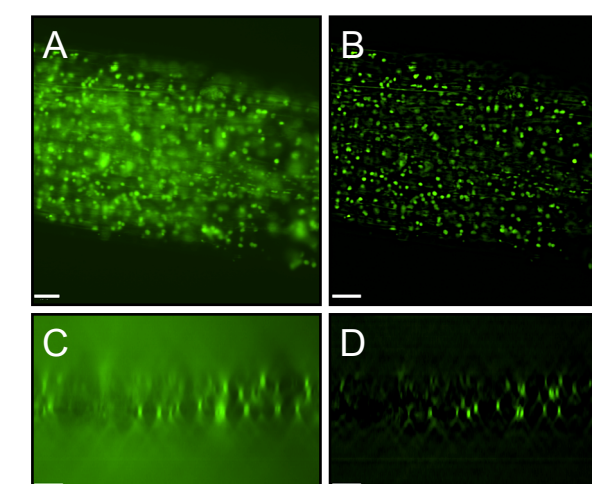
- inverted light microscope
- transmitted, fluorescence
- motorized z-stage and shutter
- 3-D b/w digital image capture
- UV, FITC, GFP, YFP, TRITC, Cy5
- deconvolution, reconstruction

Applications:

- pollen grain identification
- neural plasticity in olfaction
- dendritic plasticity
- cellular GFP:fusion localization
- neuropeptides/receptors



Examples.



Chloroplasts in *Arabidopsis thaliana*. Scale bars: 32 μm

Scanning Electron Imaging System

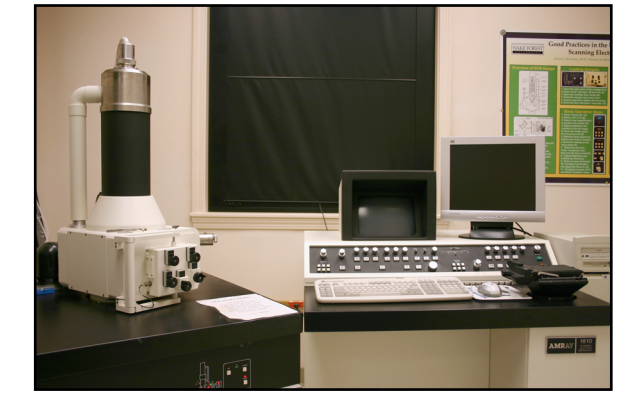
AMRAY 1810 MICROSCOPE

Features:

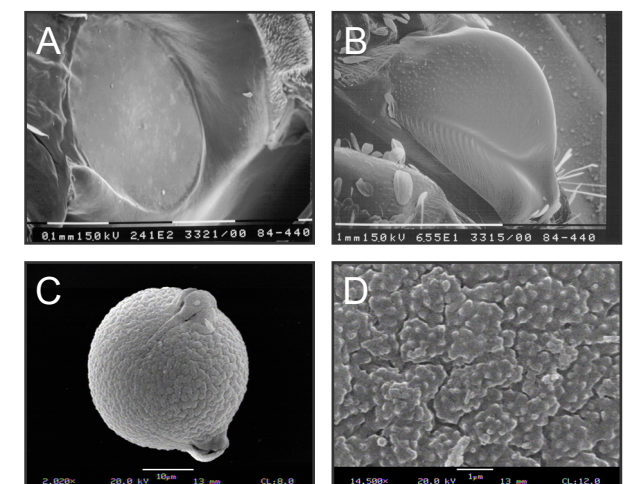
- scanning electron microscope
- up to 200,000x magnification
- 50 angstrom resolution
- real-time image processing
- digital image capture

Applications:

- insect sound systems (A, B)
- mussel gill morphology
- nanotube structure
- pollen grain identification (C, D)
- appendage modifications



Examples.

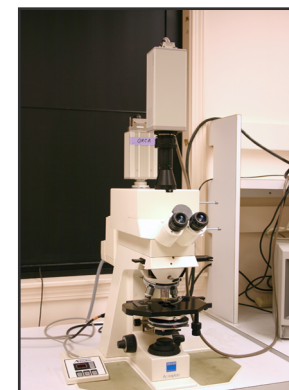


Multi-Mode Upright Imaging System

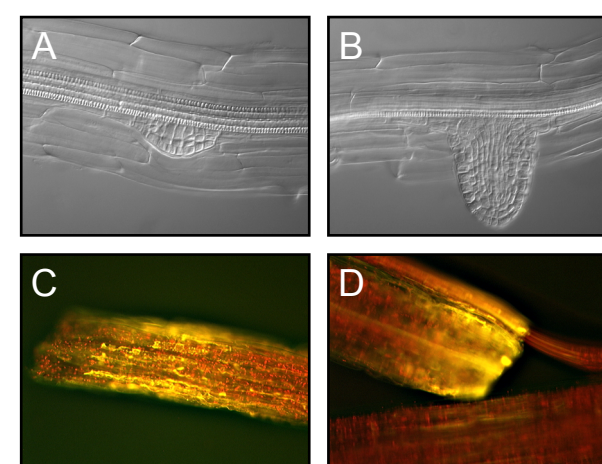
ZEISS AXIOPLAN UPRIGHT MICROSCOPE

Features:

- upright light microscope
- transmitted, fluorescence
- DIC, phase contrast, and darkfield
- UV, FITC, GFP, YFP, TRITC, Cy5
- color and b/w digital image capture
- Adobe Photoshop, Image Pro Plus



Examples.



Applications:

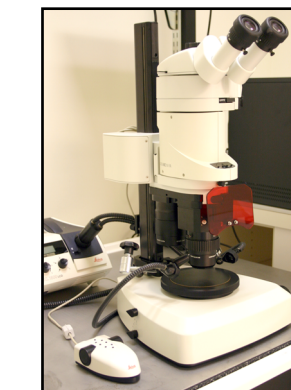
- lateral root development (A, B)
- flavonoid localization (C, D)
- dendritic plasticity
- cholinergic receptor expression
- functional leaf morphology

Fluorescent Stereoscope System

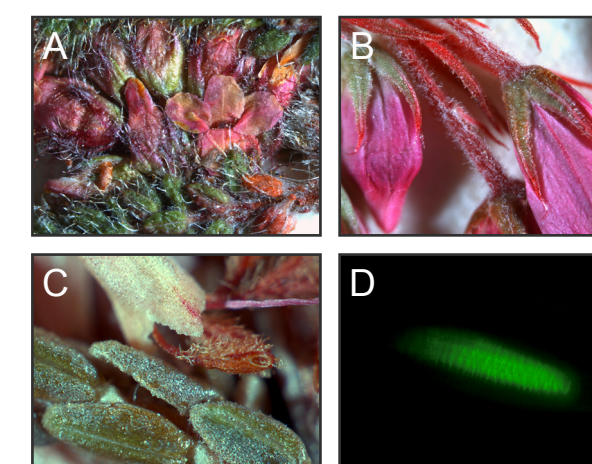
LEICA MZ16 FA STEREOMICROSCOPE

Features:

- fully motorized stereomicroscope
- transmitted, reflected, fluorescence
- 16:1 zoom; .63x, 1.6x, 4x objectives
- UV, GFP, TRITC filters
- color and b/w digital image capture
- Adobe Photoshop, Image Pro Plus



Examples.



Applications:

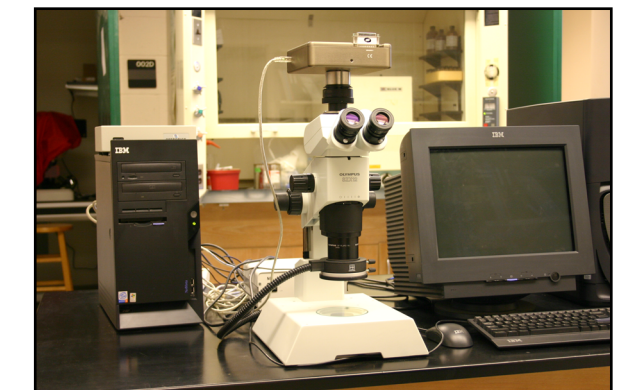
- plant systematics (A-C)
- juvenile mussel particle capture
- dendritic plasticity
- reporter construct screening (D)
- fluorescent muscle-fiber typing

Video/Still Stereoscope System

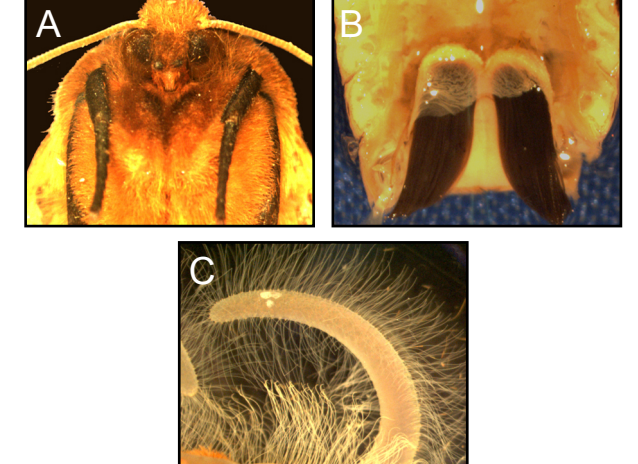
OLYMPUS SZX 12 STEREOMICROSCOPE

Features:

- transmitted and reflected light
- 12:1 zoom range
- ring-light to eliminate shadows
- analyzer to eliminate glare
- color still digital images
- video capture



Examples.



Applications:

- insect biomechanics (A-C)
- sample preparation
- time-lapse imaging