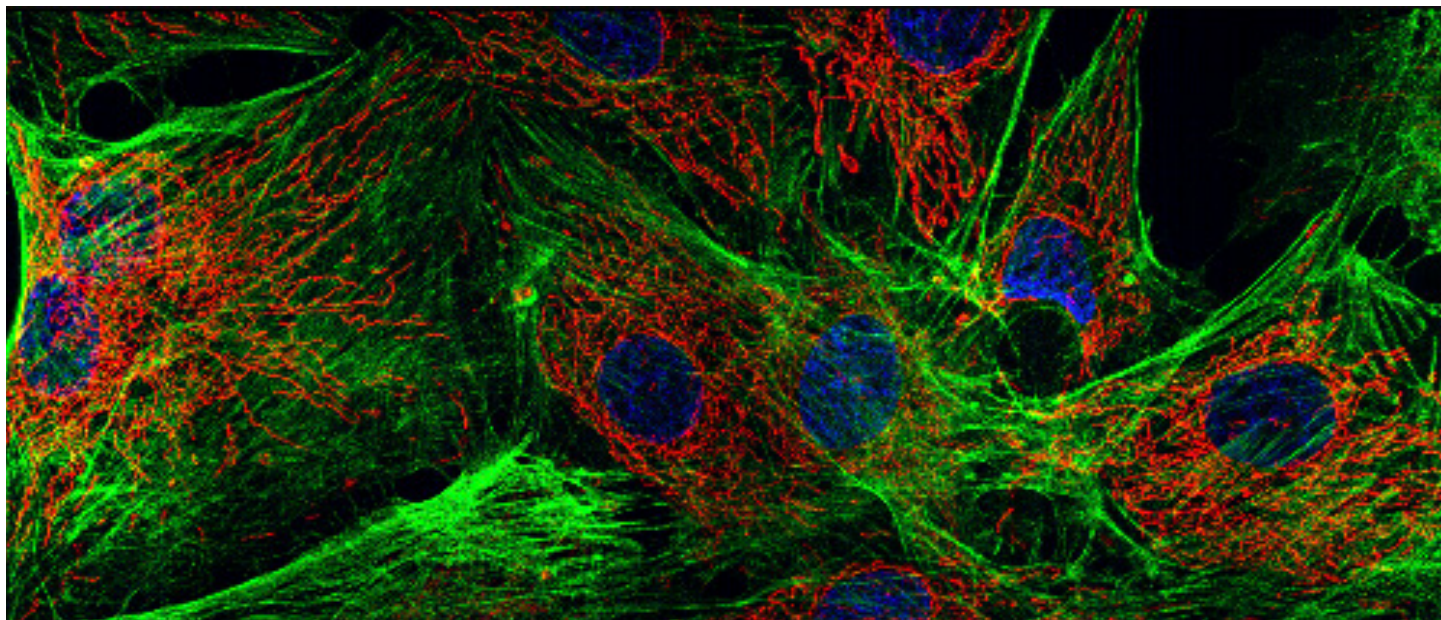


Advanced Imaging Core

A University of Tennessee Health Science Center Institutional Core



MISSION

The mission of the Advanced Imaging Core (AIC) is to accelerate research progress at UTHSC and surrounding institutions by providing super-resolution microscopy imaging services through its state-of-the-art equipment and expertise.

INTRODUCTION AND SERVICES

The AIC is an exciting new addition to the UTHSC family of institutional cores. The AIC houses light-sheet fluorescence, wide-field fluorescence and super-resolution microscopy imaging equipment, enabling researchers to capture subcellular structures and to identify protein localization patterns with high accuracy in both 2D and 3D. These cutting-edge technologies minimize sample photodamage during imaging. Live imaging on the Elyra 7 system allows users to track fast cellular processes such as vesicle movement, and to observe different signaling events.

In addition to maintaining these specialized instruments, the AIC offers expert technical assistance to investigators, including experimental design/consultation, microscope training, assistance with imaging, and post-acquisition data analysis.

EQUIPMENT AND CAPABILITIES

SUPER RESOLUTION MICROSCOPY (SRM) UNIT

Zeiss Elyra 7 equipped with 4 Laser lines (405, 488, 561, 642) and 4 Objective lenses:

- EC-Plan Neofluar 10x/0.30 M27
- Plan-Aprochromat 40x/1.4 Oil DIC M27
- Plan-Aprochromat 63x/1.4 Oil DIC M27
- alpha Plan-Aprochromat 63x/1.46 Oil Corr M27

The Zeiss Elyra is capable of 2D and 3D wide-field microscopy, Lattice Structured Illumination Microscopy (SIM), Total Internal Reflectance Fluorescence Microscopy (TIRFM), and Single-Molecule Localization Microscopy (SMLM).

Lattice SIM allows very light-efficient imaging resulting in less photodamage to cells. Key features include:

- 2D imaging speeds up to 255 fps
- Image up to 4 channels at a time
- Resolution down to 120 nm laterally, 300 nm axially

SMLM utilizes photo-switchable fluorescent dyes and proteins to induce spontaneous “blinking” of single fluorophores. This allows investigation of subcellular structures and single molecules in both fixed and live cells. Key features include:

- Dual camera capability to image two different fluorophores at once
- Resolution down to 20nm laterally and 50 nm axially

EQUIPMENT AND CAPABILITIES (CONT.)

LIGHT-SHEET FLUORESCENCE MICROSCOPY (LSFM) UNIT

LaVision Biotec (now Miltenyi Biosystems)

Ultramicroscope II equipped with an Andor Neo sCMOS camera, parfocal objective (.63x-6.3x) + Olympus MV PLAPO 2XC (total mag.= 1.26x-12.6x) , and a white light laser with 4 filter sets:

- Ex.472/30nm - Em.525/50nm
- Ex.560/40nm - Em.620/60nm
- Ex.617/73nm - Em.680/30nm
- Ex.710/75nm - Em.845/55nm

Second generation selective plane illumination microscope for 3D imaging of cleared samples (model# LV SY UMBA2).

NKT Photonics SuperK Extreme EXW-12 white light laser light source

NOTE: Only pre-cleared, prepared specimens can be imaged in the AIC. Investigators should have optimized sample clearing conditions before providing specimens to AIC for imaging.

HOURS

10:00am-6:00pm,
or after hours by appointment only

STAFF

Rachel E. Helms, PhD, Microscopy Manager

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UTHSC RESEARCH CORES AND SHARED RESOURCES

UTHSC Institutional Cores are dedicated to the success of your project. We serve the UTHSC research community by providing access to state-of-the-art equipment and to expert consultation services.

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For more information:

Advanced Imaging Core (AIC)

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