

NDIIF COMPREHENSIVE CAPABILITIES & WORKFLOW GUIDE

Cross-Scale Modalities (Ångstroms to Whole Animal) & Core Access Workflows

Notre Dame Integrated Imaging Facility (NDIIF) • Master Resource Guide

The **Notre Dame Integrated Imaging Facility (NDIIF)** operates four specialized cores providing state-of-the-art imaging, histology, and analysis modalities spanning from sub-Ångstrom atomic resolution to non-invasive whole-body animal imaging [cite: 1.2.1, 1.2.3, 1.2.5].

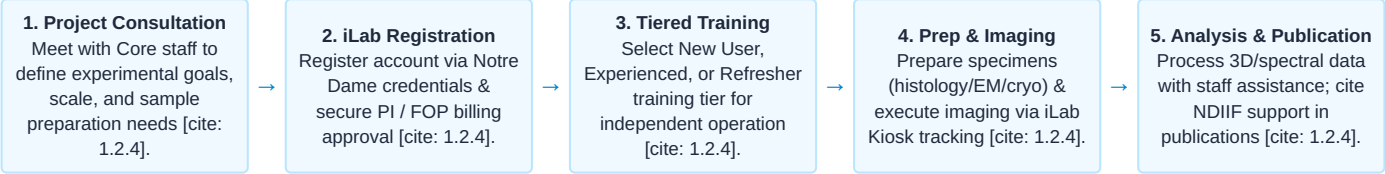
1. Imaging Modalities Across Spatial Scales



Resolution & Scale	Core Facility	Key Instrumentation	Primary Applications & Target Samples
Atomic / Sub-nm (< 0.1 nm – 10 nm)	Electron Microscopy Core	• Spectra 300 (S)TEM [cite: 1.1.2] • Talos F200i TEM/STEM [cite: 1.1.2] • Helios G4 Ux DualBeam FIB [cite: 1.1.2]	Atomic structure lattice imaging, elemental mapping (EDS), 3D atom probe tomography preparation, and cryo-EM vitrified macromolecular complexes [cite: 1.1.2, 1.1.3].
Nanometer (1 nm – 500 nm)	Electron Microscopy Core	• Magellan 400 FESEM [cite: 1.1.2] • Leica EM UC7 Ultramicrotome [cite: 1.1.2] • Plunge Freezer EM GP2 [cite: 1.1.2]	High-resolution surface topography on conductive/non-conductive nanomaterials, biological ultrathin sectioning, and surface characterization [cite: 1.1.2].
Microscopic / Cellular (0.2 µm – 100 µm)	Optical Microscopy Core & Histology Core	• Light-Sheet & Confocal Systems [cite: 1.2.5] • STELLARIS 8 DIVE Multiphoton [cite: 1.2.5] • Cryostat & AutoCUT Microtome [cite: 1.1.2]	3D fluorescence reconstruction, live-cell dynamics, deep intravital tissue imaging (>1 mm), H&E pathology, Masson's Trichrome, and IHC labeling [cite: 1.1.2, 1.1.5, 1.2.5].
Macroscopic / In Vivo (10 µm – Whole Animal)	In Vivo Imaging Core	• Albira PET/SPECT/CT [cite: 1.1.2] • ICON 1T Desktop MRI [cite: 1.1.2] • Scanco VivaCT 80 & EchoMRI [cite: 1.1.2] • MARS Spectral CT [cite: 1.1.2]	Non-invasive longitudinal disease monitoring, anatomical/molecular tracking, small-animal body composition, high-resolution microCT bone/soft tissue scanning [cite: 1.1.2].

2. Facility Access & Experimental Workflow

Standard Research Project Lifecycle at NDIIF



3. Specialized Support & Multi-Modal Integration

Cross-Core Collaboration: NDIIF supports seamless multi-modal workflows where samples can be non-invasively imaged *in vivo* (In Vivo Core), fixed and sectioned (Histology Core), mapped with fluorescence (Optical Core), and examined at atomic dimensions via DualBeam FIB/TEM (EM Core) [cite: 1.1.2, 1.2.1, 1.2.4]. Services are available to ND researchers, CTSI partners, and external academic or industrial clients [cite: 1.2.1].