### Integrated Cellular Imaging Core - FACILITIES AND RESOURCES

**FACILITIES & OTHER RESOURCES**

**Updated: April 2023**

**Fields Relevant for the Integrated Cellular Imaging Core (ICI) Users**

**INTEGRATED CELLULAR IMAGING CORE (ICI)**

The **Integrated Cellular Imaging Core (ICI)**, one of the **Emory Integrated Core Facilities (EICF)**, is housed in five main locations within the central research and clinical area of Emory’s campus the ICI hosts 21 microscopes and 5 workstations in approx. 3400 sq ft of scope room, wet space, and bench space.  Each location requires either keycard or physical key entry to ensure only ICI trained users have access to the equipment. Each location has available wet space for basic preparations, in addition to being located within close proximity to multiple lab spaces, allowing for easy access to researchers own preparation areas. We house 21 different microscopes ranging from basic widefield setups to the more advanced and cutting edge.  These include confocal, spinning disk, multiphoton, super-resolution (SIM and STED), and light sheet (including a 3i lattice light sheet and Miltenyi Blaze LFOV), with 13 systems (including at least from each modality) equipped for live cell conditions.

Service: The ICI team assists researchers with fluorescence experiments from an extremely broad range of scientific areas, from physics and chemistry to basic biology and translational research. Services range from experimental education and consultations, assisting and advising on sample prep, to optimizing data acquisition and subsequent analyses. The ICI supports investigators from start to finish, from bench to publication, at any point that assistance is needed. While using the microscope is the central part of our process, we are keenly aware that pre- and post-acquisition are equally important and are strongly emphasized during consultations. We help mold scientific questions to the right microscope, data set and analysis, and ultimately to researchers’ answers.

Data Collection, Management, and Analysis: All microscope acquisition data is automatically synced each night to an Emory Library and Information Technology Services (LITS) server to ensure redundancy. Data analysis can then be performed on either user located machines or ICI workstation locations. We advise, assist, and train users with data access and quantitative analyses as required. In addition to standard analysis and 3D visualizations, we provide custom Fiji macros and plugins, Imaris XTensions, and video sequencing (see NoPhotonLeftBehind YouTube channel).

Education: ICI holds periodic educational seminars and journal clubs. To advance our educational mission beyond the walls, we have a range of bite-sized YouTube tutorials on simple data analyses for Fiji, CellProfiler and Imaris, viewed by over 150k views and approaching 600 subscribers.

**ICI Technical Support Team:**

*Adam Marcus, PhD – ICI Scientific Director*

Dr. Marcus is an Winship 5K Research Professor in the Department of Hematology and Medical Oncology at Emory University School of Medicine. Dr. Marcus serves as Deputy Director for Winship Cancer Institute of Emory University, leading the integration of the research, clinical, and educational components within Winship Cancer Institute of Emory University. He also serves as Associate Vice President for Research in Emory University's Woodruff Health Sciences Center, and Associate Dean for Novel Technology and Research Cores leading the Emory Integrated Core Facilities and Division of Animal Resources. He provides strategic and operational oversight as well as scientific direction for the Emory Integrated Core Facilities. Marcus is also Scientific Director of the Emory Integrated Cell Imaging Core (ICI), a jointly managed shared resource of Winship Cancer Institute and Emory University School of Medicine. His laboratory has been focused on the cell and molecular biology of lung cancer invasion for the last 14 years. In particular, investigating how cells invade into 3-D microenvironments using a combination of live cell imaging approaches, 3D models, and standard molecular biology. Dr. Marcus developed and applies an image-guided genomics technique termed spatiotemporal genomic and cellular analysis (SaGA), utilizing photoactivated cell-specific selection for probing the biology of phenotypically heterogenous cells within a larger cancer cell population. In addition, Dr. Marcus’ lab is focused on STEM based learning in Georgia schools. In this role, he co-directs a 5-year NIH-funded, K-12 STEM outreach program (citizensciencehd.com) to promote diversity in STEM. This establishes a unique Citizen Science based curriculum in Georgia schools and has a full evaluation and outcomes component.

*Laura Fox-Goharioon – ICI Core Director*

Ms. Fox-Goharioon is the Director and reports directly to the Assistant Dean of Research and the oversight committee for the ICI. She is an experienced microscopist with over 37 years of cell biology and imaging experience at Emory University at the Whitehead location. She has over 13 publications focused on cell biology and imaging and has taken courses in super-resolution imaging and advanced image analysis, including the Analytical and Quantitative Light Microscopy course in Woods Hole, MA. She joined ICI at its inception and directly oversees the day-to-day operations of the core as well as six microscopes including live cell, confocal, super resolution, and multiphoton imaging.

*April Reedy, PhD – ICI Assistant Scientist*

Dr. Reedy is an Assistant Scientist with the School of Medicine with 15 years of applied microscopy experience in genetics and molecular biology, developmental biology and model systems. In her PhD in genetics and molecular biology she made numerous discoveries into the pathophysiology of Duchenne’s Muscular Dystrophy (DMD) in C. elegans. She has advanced confocal experience applied to C. elegans and Drosophila, including electrophysiology-based calcium imaging and ratiometric ROS imaging. Dr. Reedy also has immunofluorescence, pathology-based immunohistochemistry, and immuno-EM and cryo-sectioning experience. In addition to her extensive applied microscopy experience, Dr. Reedy has become a huge resource to investigators regarding experimental design.

*Austin Worden, PhD – ICI Assistant Scientist*

Dr. Worden is a Biomedical Scientist who completed his graduate work at the University of South Carolina School of Medicine, utilizing multiple forms of microscopy in his work. He first received his master’s degree concentrated in applied biotechnology where he worked on the creation of a novel three-dimensional cell culture model for the analysis of cellular interactions. He then completed his PhD concentrated in cellular and molecular biology where he focused on the role of the microenvironment in the molecular signaling of adipose-derived stem cells with implications in regenerative medicine, early embryonic development, and cancer metastasis.  Austin has taught both undergraduate and graduate level courses as a teaching assistant, including a graduate microscopic analysis course. He has always been fascinated by microscopes and the microanalysis of the everyday world.

*Stoyan Ivanov, M.Sc. – ICI Research Specialist*

Mr. Ivanov is a Physicist who completed his undergraduate and master’s degrees at the Georgia Institute of Technology. His graduate work focused on the interaction between Mercury’s magnetic field and the incident Solar wind during Coronal Mass Ejections that passed through the near-Mercury environment under Dr. Carol Paty. He studied how these plasma conditions affected the incidence of ion precipitation on the surface and how that relates to surface weathering. Stoyan has had experience in a wide range of fields including radioastronomy at the Jet Propulsion Laboratory, space plasma modeling during his graduate work, and biomedical engineering at Sorrento Therapeutics Inc. He is excited to apply his previous experiences to the cell imaging work of the core, help other researchers with their studies and imaging, and learn a great deal along the way.

*Hunter Hakimian, PhD – ICI Assistant Scientist*

Hunter is a Neurobiologist who, after receiving his undergraduate degree in Physics from the Georgia Institute of Technology in Atlanta, received his PhD at the University of Florida in the J Crayton Pruitt Family Department of Biomedical Engineering in the Neuroprostheses Research Lab under Kevin J. Otto as well as the Department of Pathology under Clive Wasserfall where he studied novel intracortical microstimulation techniques and the persistence of single beta cells in type 1 diabetes patients, for which he employed automated computer vision techniques and big data processing. He also made use of big data techniques for the UF HuBMAP chapter, where he formatted and uploaded large human microscopy datasets to both UF’s local supercluster and the global HuBMAP Atlas. He has extensive experience with machine learning, cloud data sharing and neural engineering and looks forward to sharing that knowledge in pursuing the development and facilitation of biological research methods with the diverse users of the ICI core.