**Imaging and Cell Structure Core**

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The mission of the Imaging and Cell Structure Core (‘Imaging Core’) of the Einstein-Mount Sinai Center for Liver Disease Research (ES-CLDR) is to provide Center investigators with the reagents, equipment, analytic tools, and expertise to perform state-of-the-art microscopy studies optimized to support their liver-related scientific questions. Training and thoughtful planning of experiments are important functions of this Core. The Imaging Core facilitates access to the Analytical Imaging Facility (at Einstein), and to the Microscopy CoRE (at Mount Sinai), providing expertly maintained top-of-the-line fluorescence and electron microscopes. Importantly, the Imaging Core expedites the use of imaging technologies with procedures that have been tested and optimized for liver research enhancing productivity of Center investigators. All Center members - regardless of their home institution - receive priority access and reduced rates for routine and specialized microscopy technologies, tools and expertise not readily available or financially feasible for use in individual laboratories. Core leadership and personnel innovatively adapt existing technology to imaging developments mainly guided by scientists’ research questions in liver biology, and in doing so, facilitate research and build collaborations with Center investigators in liver research. Working together with researchers on new technology development ensures assessment of the wider utility of techniques early on in developmental stages in the field. The Imaging Core leadership also works closely with the Biophotonics Center leaders at Einstein regarding the imaging needs of Center members and how they can be met with updated equipment and emerging imaging technologies. Thus, the technologies and services available in the Imaging Core include: (1) state-of-the-art light and electron microscopy such as standard fluorescence microscopy, laser scanning confocal microscopy, super resolution microscopy (STORM/SIM/STED; stochastic optical reconstruction microscopy, structured illumination microscopy, and stimulated emission depletion microscopy), multi-photon microscopy, light sheet microscopy, transmission electron microscopy (TEM), scanning electron microscopy (SEM), cryo- electron microscopy (cryo-EM), and correlative light and electron microscopy (CLEM); (2) training and assistance with sample preparation and experimental design on advanced high resolution microscopy techniques applied to liver studies including vesicle tracking, volumetric measurements, ultrastructural sample preparation, single molecule fluorescence in situ hybridization (smFISH), fluorescence recovery after photobleaching (FRAP), fluorescence resonance energy transfer (FRET), and in vivo intravital microscopy (IVM); (3) access to and expertise in a variety of fluorescence labeling technologies such as fluorescent recombinant fusion proteins, antibodies, RNA FISH probes, organelle markers and cell dyes; (4) expertise and assistance with image analysis. Overall, the Imaging Core provides personalized expertise and optimized resources to serve the needs of Center investigators –at both sites– in projects that will significantly enrich and extend our understanding of liver biology and disease research studies.

To fulfill these objectives the Imaging Core focuses on the following specific aims:

1. To facilitate access to and expertise in a variety of leading-edge fluorescence labeling technologies and

reagents that are optimized for liver-specific questions.

2. To advise in the use of state-of-the-art light and electron microscopy techniques relevant to liver studies.

3. To provide training and assistance with sample preparation and experimental design for advanced high resolution microscopy techniques applied to liver studies.

4. To provide expertise and assistance with image analysis.

Overall, the Imaging Core provides personalized expertise and optimized resources to serve the needs of ES-CLDR investigators - at both sites - in projects that will significantly enrich and extend our understanding of liver biology and accelerate scientific progress in the field.