**Advanced Cell Analysis Service Center**

The Department of Cancer Biology houses the Advanced Cell Analysis Service Center (ACASC) which offers microscope and flow cytometry equipment for researchers. Facility Manager: Birgit Ehmer, Cancer Biology.

**Equipment**

1. Microscopy:
2. **Confocal Microscope:** A Zeiss Axio Observer Z1 inverted microscope is connected to a Zeiss LSM710 confocal. The available laser lines are 405, 458, 488, 514, 561 and 633nm. With the availability of a near UV laser this confocal can visualize DAPI. In addition to the confocal images a DIC image can be acquired. Stage and objective heaters are available to aid live cell imaging.
3. **Structured Illumination Microscope:** A Nikon Ti2e fully motorized inverted microscope with a LED based epifluorescence system ((DAPI, FITC, TRITC cubes) allows for super-resolution microscopy through structured illumination. The available laser lines are 488, 561, and 640nm. In addition to the capability for super-resolution the system can also acquire traditional widefield images with a Hamamatsu Orca Flash 4.0 CMOS camera. Images are acquired with Nikon NIS-Elements Software, which can also be used for analysis if needed. An anti-vibration table ensures vibration free performance of the microscopy system.
4. **Widefield microscopy:** A Zeiss Axioplan Imaging 2e infinity-corrected upright scope with DIC and epifluorescence can be used for general image acquisition. A Color Zeiss Axiocam is available for brightfield imaging, or a B&W Zeiss Axiocam can be used for fluorescence. Filter cubes are for DAPI, FITC, TRITC, Texas Red and Cy5 like fluorescent dyes.
5. **Widefield inverted microscopy:** An inverted Axiovert100TV microscope equipped for phase, brightfield, and fluorescence microscopy can be used for imaging tissue culture plates. The filter cubes are suitable for fluorescein (GFP), rhodamine, and DAPI like dyes. The available objectives are 1.25x, 5x, 10x and a 32x long working distance objective.
6. **Long-term live-cell microscopy:** An Incucyte Zoom (Essen Biosciences) live-cell imaging system is available for short and long-term time lapse microscopy. The system resides within the controlled environment of a standard cell incubator and can process up to six plates in parallel. It supports high-definition phase-contrast and 2-color (red and green) fluorescence image acquisition. The instrument scans up to 384-well cell plates according to a user defined schedule and can automatically acquire up to 2000 images per hour.
7. Flow Cytometry:
8. **Flow cytometry:** A BD Fortessa flow cytometric analyzer is equipped with four lasers with the excitation lines of 405nm, 488nm, 561nm and 640nm and can collect up to 16 different fluorescence parameters plus forward and side scatter allowing for even more flexibility than our BD Aria. It is designed for both the excitation optics and collection optics to reduce excitation losses and improve light collection efficiency. Sample acquisition and analysis is done using FACSDiva software for both instruments.
9. **Cell sorting:** A BD Aria III housed in a Baker BioProtect IV biosafety hood for aerosol management is approved for biosafety level 2 use. The flow cytometer is a high-speed multi-laser droplet cell sorter. Our system is fitted with four lasers with the excitation lines of 407nm, 488nm, 561nm, and 633nm. It can collect up to 13 different fluorescent parameters plus forward and side scatter. Due to the wide range of excitation wavelengths, many available fluorescent probes utilized in flow cytometry can be accommodated. The Aria has four-way and single-cell sorting capabilities and is equipped with an Automated Cell Deposition Unit allowing for plate (6, 24, 48, 96 and 384 wells) sorting.
10. FACSDiva software (v9.4) as well as FlowJo (v.10.8.1) are also available to analyze flow cytometry data on a separate workstation.