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The Kanbar Scientific **Equipment Center**

The Goodman Faculty of Life Sciences Bar-Ilan University, ISRAEL

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Metabolomics Unit

The Metabolomics Unit is designed to characterize biological systems by directly measuring the small molecule constituents known as the metabolome. We provide opportunities for research collaborations and make targeted and untargeted metabolomics services available to bothacademia and industry. Our team assists investigators with experimental design, data acquisition, analysis, and interpretation. Our nextgeneration mass spectrometry approaches provide deeper coverage of the metabolome, including polar metabolites, lipids, and isotope tracing. Additionally, we provide non-MS technologies for measuring glucose uptake and lipid droplets in cells.

Equipment:

- Orbitrap Exploris 240 mass spectrometer Quantitative high-resolution, accurate-mass spectrometer (HRAMS) coupled to liquid chromatography (LC-MS) with record-setting performance for untargeted analysis and metabolic profiling. Mass Range: 40 to 6000 m/z, Mass Accuracy: <3 ppm RMS and resolution of 240,000 at m/z 200.
- TSQ Fortis- triple quadrupole mass spectrometer coupled to liquid chromatography (LC-MS) enables confident quantitation of hundreds of samples in complex matrices.
- Precellys bead-based homogenizer with Cryolys cooling system The instrument's unique figure-8 multi-directional motion provides the same high level of energy and homogenization efficiency to each tube, maintaining the desired temperature between 0 and 10°C before and during the tissue homogenization. Suitable for the extraction of metabolites, proteins, and DNA/RNA.

In Vivo Imaging and Histology Unit

The In Vivo Imaging and Histology Unit offers a high standard of services in imaging and histological techniques.

The units provide training and access to the equipment, producing fast and accurate results.

The In Vivo Imaging equipment

- X-RAD 320 Biological X-ray irradiator (PXI)
- Maestro II (CRi) In Vivo optical (fluorescence) imaging system

The Histology services

- Preparation of paraffin-embedded samples
- Sectioning of paraffin-embedded fresh and frozen samples
- Histological staining and immunohistochemical staining of paraffin-embedded and frozen samples

The Histology equipment

- Paraffin embedding machine
- Microtome 2035 Biocut
- Cryostat CM-1950





Located in the center of the country, The Kanbar Scientific Equipment Center of the Faculty of Life Sciences at Bar-Ilan University provides a wide range of services for academic researchers and users from other institutions and industry.

Our center hosts state-of-the-art advanced instrumentation at the forefront of scientific endeavors, which supports the most demanding applications.

Our highly skilled and experienced PhD staff will advise and help guide experiments, operate the equipment, and then process and analyze the results. We also offer training for independent work for longer-term needs.

The center is comprised of six units:

- Light Microscopy
- Genomics and Molecular Biology
- Flow cytometry
- Chromatography and Metabolomics
- In Vivo imaging
- Histology

Light Microscopy Unit

The light microscopy unit is equipped with some of the best microscopes available, encompassing confocal, widefield, and live imaging. We provide A to Z service, training, and assisting users throughout the entire process: project planning, microscope selection and use, image processing, and data analysis.

Equipment:

These microscopes reach high resolution and can perform tomography for 3D visualization.

- Opera Phenix[®] Plus High-Content Screening (HCS) spinning disk confocal
- Leica SP8 Confocal Hyvolution with live imaging
- Leica Confocal STELLARIS 5 for live imaging with lightning
- Leica SP8 confocal with STED super-resolution (white light laser, 4 detectors)
- Leica laser-capture microdissection (LMD
- Incucyte[®] Live-Cell Imaging and Analysis
- Leica Total Internal Reflection Fluorescence (TIRF) system with Infinity Scanner
- Leica M205 stereoscope (with a high-resolution camera, 7x-320x)

Imaging workstations (all licenses current):

- Imaris 3D analysis
- Huygen deconvolution
- Leica LAS X 3D analysis

NGS and Molecular Biology Unit

The NGS and Molecular Biology Unit offers a broad range of services for high-throughput sequencing experiments, including experimental design, library preparation, and sequencing. (Data analysis services are offered by the Bioinformatics Unit).

We have NextSeq and Miseq Illumina sequencers and a Hamilton star liquid handler robot; for up to 96 sample preparation simultaneously. In addition, the unit has complementary equipment such as Covaris, Qubit, Tapestation, digital dPCR, and Real-Time PCRs.

Main Services:

- Library preparation (DNA, RNA, sRNA, etc.)
- Sequencing
- MiSeq 1-25M reads
- NextSeq Up to 400M reads

Flow Cytometry Unit

The Flow Cytometry Unit offers researchers basic and advanced flow cytometric services. Flow cytometry is a popular analytical cell biology technique that utilizes light to count and profile cells in a heterogeneous fluid mixture. This technique can take measurements of cells in solution as they pass by the instrument's lasers at rates of 10,000 cells per second. The sorters are capable of separating cells into tubes or plates according to defined parameters. The unit supports investigators with the crucial experiment planning phase, acquisition and analysis of flow cytometric data, and cell sorting experiments. In addition, our team provides training and consulting for researchers throughout their projects and particularly assists in interpreting data with FlowJo, the most popular flow-cytometry analysis software, accompanied by high dimensional parameters analysis tools.

Equipment:

The unit comprises four types of flow cytometers:

- Cell Sorters FACSAria III with 5 lasers and FACSAria III with 4 lasers (BD).
- ImageStream imaging cell analyzer This instrument is capable of simultaneously imaging multiple brightfield and fluorescence channels together with flow cytometry data, then performing multi-parametric quantification analysis.
- Full spectral flow cytometer Aurora (Cytek)
 4-laser analyzer, with 48 fluorescent channels that enable experiments with 40 different fluorescent markers.
- LSR Fortessa (BD) 4-laser analyzer in addition to the manual, a plate loader for high throughput screening.





Biochemistry & Chromatography Unit

The purpose of the Biochemistry & Chromatography Unit is to support life science, chemical, biochemical, and biophysical analyses.

We provide analytical testing services to meet the research and development challenges for both academia and industry in the fields of Chromatography and Biochemistry.

Our unit provides a wide spectrum of services:

- Bioassay development
- Analytical chromatography
- Preparative chromatography
- Spectrophotometric characterization
- Biomolecular interaction analysis

Our state-of-the-art macromolecular Interaction Facility features highly advanced analytical equipment:

Biacore T100 – Surface Plasmon Resonance (SPR) Biosensor provides analysis of antibody-antigen interactions (affinity constants, association and dissociation kinetics, and epitope mapping) and receptor-ligand interactions.

Monolith NT.115 MST detector complements SPR and is used to measure biomolecular interactions and binding mechanisms. This technique is highly sensitive to any change in molecular properties, allowing for precise quantification of molecular events independent of the size or nature of the interacting partners, capable of measuring dissociation constants down to 1 picomolar.

We also offer advanced chromatography services. Our staff can develop and implement qualitative and quantitative HPLC methods, including RP-HPLC, IEC, HIC, HILIC, and mixed modes. We rapidly achieve robust analytical solutions for customers' most challenging requirements.



Contact Us

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