The **Biomarker Analytic Resource Core** supports investigators at all stages from planning through implementation of sample acquisition, preservation, secure chain of custody with bar codes, quality analysis and secure data output. Analytical capabilities include 1) state-of-the-art mass spectrometry analysis, in particular stable isotopes, as well as research-grade determination of lipids, and metabolic markers for a variety of human subjects and animal model projects; 2) High throughput robotics for semi-automated high quality sample preparation and analysis by immunoassay and LC/MS; 3) Novel developmental projects featuring applications of LC/MS and two-site bead-based assays; 4) Research quality analysis of metabolites for human and animal samples using an Olympus AU400 autoanalyzer; and 5) Advanced training in analytical chemistry. All samples processed are labeled with barcoded cryolabels for easy identification, and records of samples processed are remotely accessible via the secure Research Database portal of the ICTR. Specific services provided to all investigators include 1) Routine processing and storage, 2) barcoding of specimens using local or sponsor provided labels, 3) secure storage on temporary basis until analyzed, shipped to external or internal research labs, or long term as part of prospective collection within the ICTR Biorepository, 4) shipping/packaging service including internationally, 5) specialty collection tube preparation, 6) specialty processing of samples including procedures for PMBC isolation, DNA pre-extraction, and 7) courier transport between Einstein/Montefiore campuses and Einstein lab facilities.

The **Einstein/Montefiore ICTR Biorepository** has been in continuous operation since 2007, and currently has over 550,000 samples under management. The mission of the Biorepository is to facilitate basic and translational research by providing investigators access to well curated, high quality biospecimens. The Biorepository prospectively collects and stores human derived biosamples, including normal and diseased tissues, blood and other biofluids. The Biorepository distributes these biospecimens to investigators who have IRB approved protocols. All samples are tracked and archived using a secure database providing efficient storage, retrieval and chain of custody information and meeting GLP and FDA Guidelines, including 21 CFR part 11 requirements. The Biorepository supports research from investigators at Einstein and Montefiore focused on basic cell biology, cancer, inflammation, aging, asthma, cardiovascular disease, diabetes/obesity/metabolic syndrome, hematologic disease, inborn errors of metabolism, infectious disease especially HIV and COVID-19, kidney disease, and women’s health.

Biorepository operations comply with the confidentiality, safety and regulatory standards described in the NCI Best Practices for Biospecimen Resources and the International Society for Biological and Environmental Repositories (ISBER) and all institutional, state and federal regulations on the handling and storage of human biospecimens. The Biorepository has grown substantially since its inception in the number of biospecimens collected and distributed, the number of protocols and trials supported and the number of Einstein/Montefiore investigators served. The facility is located in 2,700 sq. feet of space in a secure location reserved for 44 -80°C freezers, ambient temperature sample storage, with access to emergency backup electrical supply by a dedicated generator. Innovative freezer and monitoring technology has been installed for secure, energy-efficient biosample storage. All new freezers are dual compressor models and are configured for emergency liquid nitrogen backup, and monitored remotely 24/7. SOPs are in place to alert staff in the event of freezer malfunction/failure. Innovative tracking technology has been instituted to include radiofrequency identification tags (RFID), in addition to standard barcode labeling, for ultra-secure chain of custody and real-time continuously updated sample locations and tracking of environmental storage conditions.

The Biorepository has supported with sample collections and processing multiple NIH-sponsored COVID-19 therapeutic and vaccine trials. The Biorepository was the coordinating center for the processing, secure storage, and distribution of plasma samples from the NCATS-funded CONTAIN Trial of Convalescent Plasma in Acute COVID-19 hospitalized patients. In total, approximately 10,000 biospecimens from ~2000 patients were collected, including plasma, serum, whole blood, and urine.

The Biorepository also supported the development, clinical translation, and utility of a COVID-19 antibody test with qualitative and quantitative readouts. The Biorepository provided 350 negative control samples from before Nov 2019 to a collaborative institutional effort to develop an in-house immunoassay against full length SARS-COV2 spike protein for IgG and IgA. The negative controls broadly covered the life span from age 6 to 95 and were drawn from a diverse Bronx based community. This assay was validated and provided emergency use authorization by New York State.