An automated, high-throughput platform for gene assembly, amplification, transformation, strain growth, and metabolite analysis enables the production of bio-based monomers and polymers with precise repeat units, domains and chirality directly from microorganisms. By providing an equipment set focused on automation, control, and high-throughput pathway assembly at the gene level and metabolite detection at the cellular level, the Living Bioreactor will enable biosynthetic manufacturing of commodity monomers and polymers.

The capabilities of the Living Biofoundry Facility are supplemented by: (1) a Thermo Fisher TSQ Altis inline triple quadrupole mass spectrometer coupled with an ultra-high-performance liquid chromatograph (UHPLC/MS/MS) for separation and analysis of synthesized bio-derived monomers, (2) Agilent Technologies 7890A gas chromatography system, and (3) BIOFLO CELLIGEN 310 fermenter/bioreactor for scale-up microbial culture.

Fluent Liquid Handler

ThermoFisher Laboratory Automation System

The ThermoFisher Laboratory Automation System (LAS) serves as the cornerstone technology for the facility, enabling execution of automated customized synthetic biology and workflows at >500 samples-per-week. The LAS is equipped with over of over 10 functional instrumental components, including: a state-of-the-art SpinnakerTM microplate robot, automated incubators, reagent dispensers, thermal cyclers, plate sealer, and carousels/racks that are seamlessly integrated through the MOMENTUMTM application programming interface that is fully-compatible with laboratory information management systems (LIMS).

ThermoFisher TSQ Altis Triple Quadrupole Mass Spectrometer coupled with an Ultra-High-Performance

Liquid Chromatograph (UPHLC/MS/MS)

SciRobotics Pickolo Colony Picker

Fisher Scientific BTX Gemini X2 Electroporation System