



ILSE

INSTITUTE FOR LIFE
SCIENCE ENTREPRENEURSHIP



Institute for Lifescience Entrepreneurship (ILSE) focuses on advancing human health by providing innovative solutions through research, tools, and services in microbiology, genomics and the microbiome.

1000 Morris Ave. STEM Bldg. 5-13 Union, NJ 07083 USA



ABOUT US

Institute for Life Science Entrepreneurship (ILSE), offers a variety of services to its partners, incubator labs, startup companies and small to large life-science, biotech and pharmaceutical companies.

ILSE is focused on developing next generation tools and services through research in microbiology, industrial microbiology, genomics and the microbiome, and antibiotic drug discovery.

We offer a comprehensive range of cutting-edge research and proprietary capabilities to academic and life-science companies with research-programs in the microbiology space. We perform client-sponsored research at the study, project and program level on a fee-for service basis and as a subcontractor on SBIR and other public and private grants.

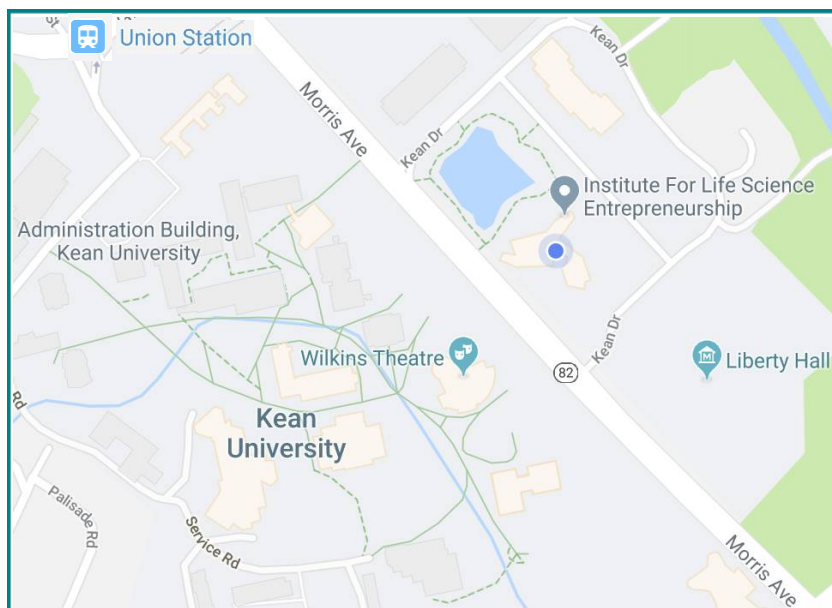
Our combination of proprietary tools and expertise enables deep investigation into microbiology and microbial genomics for our internal research programs, partners and clients.

HISTORY

In 2014, ILSE entered into an alliance with the American Type Culture Collection (ATCC) to form the Center for Translational Microbiology to advance microbiology R&D, tools development, and contract services to antibiotic and microbiome product developers. The Center has been active in developing for ATCC several new products offerings in microbiome standards and MDR pathogen panels, in addition to other products in development.

Since that time, we have established an outstanding track record both as a CRO with a host of over twenty clients ranging from startup biotechnology companies to large multinationals with diverse product lines, and as an antibiotic company accelerator providing services to startups housed at ILSE and around the globe.

ILSE is a boutique service provider with the agility to work closely with clients in custom microbiological and genomic R&D studies.



LOCATION

- On Kean University Campus in Union, NJ
- 20-25 min. to NYC via NJ Transit
- 15 min. to Newark International Airport

INNOVATIVE RESEARCH SOLUTIONS

ILSE offers a wide variety of services to its partners, incubator labs, startup companies and small to large life-science, biotech and pharmaceutical companies.

Services are focused in the areas of microbiology and microbiome research, specifically, in antibiotic drug discovery and antibiotic resistance, microbial genomics and bioinformatics, and clinical microbiology, with the goal of supporting clients in their R&D programs.

MICROBIAL GENOME SEQUENCING, ANNOTATION & ANALYSES

- | | |
|-----------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none">• Bacterial• Fungal• Other• Eukaryotes• Viral | <ul style="list-style-type: none">• Genomics• Metagenomics• Microbiomics• Transcriptomics• Epigenomics |
|-----------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|

INDUSTRIAL MICROBIOLOGY SOLUTIONS

- Bio-catalysis Screening Panels
- Early, Small Scale Bio-process Development
- Material Production via Semi-Prep Chromatography

PRECLINICAL AND CLINICAL MICROBIOME IMPACT STUDIES

- Microbiome / Metagenome Data Generation & Analysis
- Cultivation and Characterization of Target Organisms
- Microbiome Repository and Database
- Microbiome-based Clinical Diagnosis
- Minipig Animal Models

ANTIBIOTIC DISCOVERY & DEVELOPMENT STUDIES

- Broth or Agar Based MIC & MBC Determination
- Bactericidal/Bacteriostatic Assessment
- Kill-Curve Studies
- Post-Antibiotic Effect
- Bacterial Persistence Studies
- Antibacterial Synergy/Antagonism Studies
- Minimum Biofilm Inhibitory Concentration Studies
- Adhesion/Invasion Assays
- Sporocidal Assay

RESISTANCE DEVELOPMENT STUDIES

- Spontaneous Mutation Frequency
- Serial Transfer/Passage
- Phenotypic Drug Resistance Characterization
- WGS Drug Resistance Characterization

CUSTOM SERVICES

- Custom Synthesis of Tagged Bacterial
- Clinical Isolate Repository
- Mock Community Construction and Validation
- Microbiome Sample Preparation and QC
- Mock Community Construction & Validation
- Ex-vivo bacterial seeded tissue assay
- Spore Preparation

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RESISTANCE DETERMINATION / MECHANISM OF ACTIVITY STUDIES



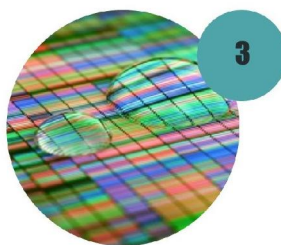
Receive & Validate Compounds / Strains

- Receive Sponsor Compounds / Strains
- Confirm MIC of Experimental Compound



Resistant Mutant Characterization

- Raise Resistant Mutants
- Phenotypically Confirm Mutants



Sequencing & Analysis

- Whole Genome Sequence of Resistant Mutants
- Assemble, Annotate and Analyze Sequence Data
- Perform Mutational Analysis against the Parental / Reference Strain



Reporting & Delivery

- Deliver Final Report (including all experimental and QC data, raw and assembled sequence data)
- Provide all Resistant Isolates

Mutation Analysis Services Workflow

This study provides for the selection and characterization of bacterial isolates from recent clinical strains that have reduced susceptibility against a sponsor's compound.

Isolates can be obtained spontaneously or after prolonged passage under sub-inhibitory concentrations of study compounds.

Studies can also include cross-resistance assessment to comparator antibiotics and mutational fitness evaluation through individual or co-culture growth analysis.

Fully customizable workflows and experimental design. Final reports, including all experimental and QC data, raw and assembled sequence data and derived resistant isolates will be provided at study completion.

Validate Your Proof-of-Concept Through Customizable Workflows. Collective Expertise of Industry Stalwarts Enables Cost-Effective Validation.

**Jump start
your resistance research**

**Reports as soon as 60 days
from study initiation**

**Custom design can add
desired micro panel**

**Proven robust study design
oriented for discovery**

Illumina® WGS & Analysis

MICROBIOME AND METAGENOMIC STUDIES

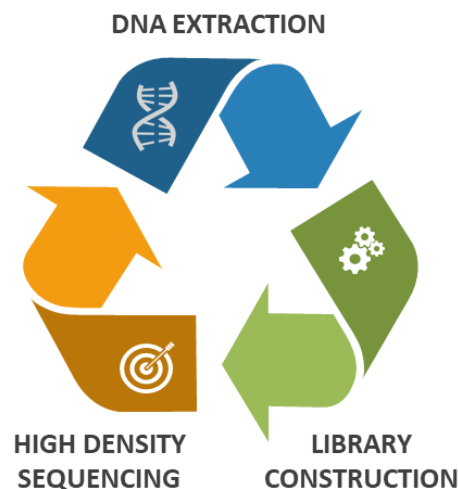
Services include DNA extraction from biological samples, high-density sequence generation and standard or customized data analysis. Studies can include analysis of clients provided samples, in vitro impact studies utilizing mock microbiome communities, preclinical & clinical microbiome impact studies and translational animal model development.

Microbial Whole Genome and 16S Sequencing

- Bacterial, fungal, other eukaryotes, viral

Annotation and Bioinformatics Analysis

- Genomic, metagenomic & 16S, pathway analysis, population analysis



Preclinical & Clinical Microbiome Impact Studies

- Study design
- Microbiome/metagenome data generation & analysis
- Cultivation, characterization and repository / database of target organisms

Custom Services

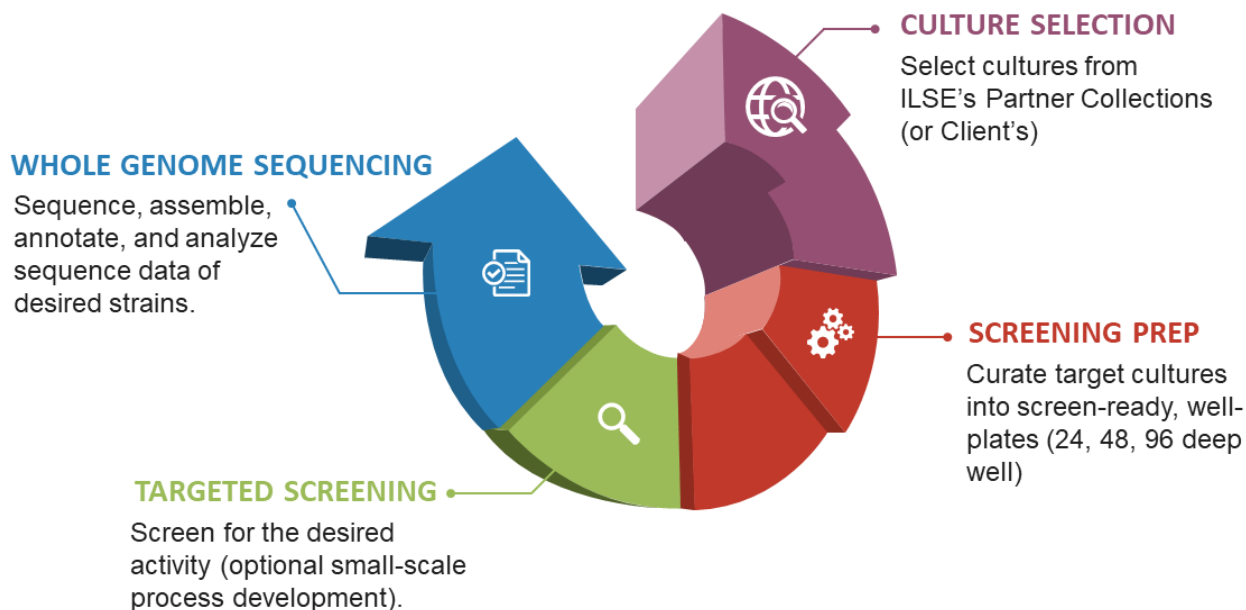
- Custom tagged strains, custom mock communities, anaerobic microbiology, microbiome sample preparation, clinical isolate libraries/databases

Mini-pig Model Development: For investigation of microbiome impact on inflammatory bowel disease, atherosclerosis, obesity and fatty liver disease.

The Mock Community Program: developing and assembling external controls for QC, and utilizing our working model for a synthetic fecal matrix for *in vitro* microbiome impact studies.

ILSE Collaboration Network: Comprised of outstanding academic and industrial organizations and thought leaders supporting translational animal model development and clinical development.

INDUSTRIAL MICROBIOLOGY SOLUTIONS FOR BIO-CATALYSIS, ENZYMES, AND NATURAL PRODUCTS



KETO-REDUCTASE SCREENING

The first in a series of bio-catalysis screening panels, we have assembled a keto-reductase screening panel of ATCC cultures with proven activity against structurally different ketone substrates. Microgenomx will screen this panel for conversion of your ketone substrate to the corresponding alcohol.

Illumina® Whole Genome Sequencing of panel organisms will allow for rapid, subsequent identification of the target activity.

EARLY-PHASE BIOPROCESS DEVELOPMENT AND MATERIAL DELIVERY

We can carry out small-scale, bioprocess development during a project's proof-of-concept stage and generate small quantities of material key for early stage studies.

ADVANTAGES OF BIO-CATALYSIS

HIGH SELECTIVITY & REACTION SPECIFICITY

MILDER REACTION CONDITIONS

HIGHER REACTION RATE POTENTIAL

PATHWAY OPTIMIZATION

POTENTIAL SHORTER SYNTHETIC ROUTES

TEAM WORK AND PROJECT MANAGEMENT



Institute for Life Science Entrepreneurship, its Center of Excellence in Translational Microbiology and Neuroscience, and ILSE's **network of consultants** and **lab network partners** can work together to offer an exceptional level of integrated and tailored expertise, and a breadth of services and research collaborations to the academic and industrial microbiology community.

ILSE CONSULTING NETWORK PARTNERS

- ▶ SYNERGY PARTNERS R&D SOLUTIONS
- ▶ THE RESEARCH NETWORK
- ▶ NOVATEUR

ILSE CORE LAB NETWORK PARTNERS

- ▶ PHRI
- ▶ BIOASTER
- ▶ FUNDACION MEDINA
- ▶ ISOMERASE THERAPEUTICS
- ▶ ADESIS
- ▶ NEW PATH MOLECULAR
- ▶ ATCC
- ▶ IHMA

- ▶ LINNAEUS BIOSCIENCE
- ▶ MBCOI
- ▶ EVOTEC
- ▶ EUROFINS PHARMA
- ▶ COVANCE
- ▶ SOUTHERN RESEARCH INSTITUTE
- ▶ JOHNS HOPKINS HEALTH CARE SOLUTIONS

HIGHLIGHTS

- ✓ Expert Consulting Services
- ✓ Integrated Research Programs (FTE or Study Based)
- ✓ Early Stage/Pilot Program Support
- ✓ CRO Project Management Services
- ✓ Discovery and Preclinical Service Provider Network



<https://www.ilsebio.com/core-research-services/>

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For partnering opportunities, please contact:

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For general inquiries, please contact ILSE:

<https://ilsebio.com/contact-us>