

MICROFABRICATION & MICROFLUIDICS CORE

157 Multidisciplinary Research Building

2030 Becker Drive, Lawrence, KS 66047

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<http://microfab.ku.edu>

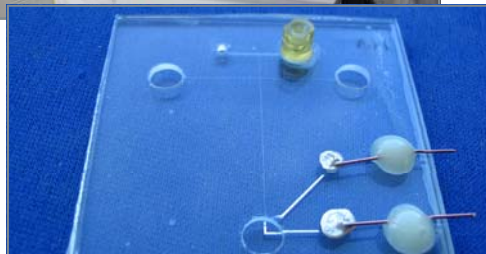
The Ralph N. Adams Institute Microfabrication Facility is a 2400 ft² ISO Class 5 and 6 facility that specializes in the manufacture of microfluidic devices. Our equipment versatility can also be utilized for the manufacture and evaluation of a variety of micro-scale devices and materials. We offer our services to KU research groups, as well as research groups from other universities and private institutions.

Services Offered

- Microfluidic Device Fabrication
 - ⇒ Material availability: soda-lime and borosilicate glass, PMMA, and PDMS
 - ⇒ Embedded electrodes: carbon, platinum, nickel, copper, chromium
- Device and material evaluation: step profiling, ellipsometry, image capture
- Consultation
- Photomask design
- Limited open access
 - ⇒ Includes training and support
 - ⇒ Multiple rates available to suit users' needs

Key Equipment

- Amray 1810 Tungsten Filament Scanning Electron Microscope
- Thermionics VE-100 E-beam evaporator
- Lesker DC magnetron sputterer with three Torus guns
- Oxford Plasmalab 80 Plus Plasma-Enhanced Chemical Vapor Deposition System: Silicon Dioxide and Silicon Nitride deposition currently available
- Oxford Plasma Plasmalab System 100 Inductively-Coupled Plasma Reactive Ion Etch System
- HORIBA Jobin Yvon UVISSEL Spectroscopic Ellipsometer
- ABM, Inc. i-line UV flood source and mask aligner
- WABECO 3-Axis CNC Mill



KU CENTER FOR
MOLECULAR ANALYSIS
OF DISEASE PATHWAYS
The University of Kansas

AN NIH CENTER OF BIOMEDICAL RESEARCH EXCELLENCE (COBRE)

CORE LABORATORIES

Genome Sequencing Core

Next-generation DNA sequencing technologies
Experimental design and analysis of sequence data

Synthetic Chemical Biology Core

Design and synthesis of molecular probes of biological systems
Bioassays in cell culture and zebrafish models

Microfabrication and Microfluidics Core

Production of unique microfabricated devices for studying
genetically modified organisms and biological pathways

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<http://cmadp.cobre.ku.edu>

GENOME SEQUENCING CORE

1030 Haworth Hall

1200 Sunnyside Avenue, Lawrence, KS 66045

Erik A. Lundquist, Ph.D., Core Leader, erikl@ku.edu (785) 864-5853

Jennifer Hackett, M.S., Core Director, jhackett@ku.edu, (785) 864-7023

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<http://gsc.ku.edu>

The GSC offers next generation DNA sequencing services for researchers at KU and other institutions. As opposed to “standard” Sanger sequencing, next generation sequencing has astronomically higher throughput (billions of reads and hundreds of Gbs of data), allowing whole genome sequencing in a single run and allowing deep, quantitative analysis of genome-wide gene expression (transcriptomics), among others.

Services Offered

- Genome re-sequencing:
 - ⇒ Mutant identification (model organisms, human syndromes)
 - ⇒ Evolutionary comparisons
 - ⇒ Disease tissue sequencing (e.g. cancer)
- Genotyping: single nucleotide polymorphisms (SNPs), copy number variations (CNVs), genome-wide association studies (GWAS), & linkage analysis
- De novo genome assembly: new un-sequenced species
- Expression analysis (transcriptomics): cDNA sequencing (RNA-Seq) for deep and quantitative analysis of genome-wide gene expression
- Epigenomic & gene regulation analyses
 - ⇒ Chromatin immunoprecipitation sequencing (ChIP-Seq) to find binding sites of transcription factors or other DNA-interacting proteins
 - ⇒ Methylated DNA sequencing (Methyl-Seq) to identify methylated regions of the genome
 - ⇒ Small RNA discovery and analysis



Key Equipment

Illumina HiSeq 2500

Next Generation Sequencer

- Normal mode (more data, more time)
 - ⇒ 3-6 billion reads of 100 bp per run of two eight-lane flow cells (600Gb data)
 - ⇒ Single reads or paired end reads (both ends of the DNA fragment)
 - ⇒ ~5-11 day run time
- Rapid Mode (less data, less time)
 - ⇒ 1.2 billion reads of 150 bp per run on two two-lane flow cells (120 Gb data)



SYNTHETIC CHEMICAL BIOLOGY CORE

1070 Structural Biology Center

2034 Becker Drive, Lawrence, KS 66047

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Chamani Perera, Ph.D., Core Director, chamani@ku.edu, (785) 864-1435

<http://scb.ku.edu>

The SCBC offers expert design of molecular probes and synthesis of both small molecules and peptides, with an emphasis on the generation of fluorescent and other tagged molecules, as well as bioassays of molecular probes, including *in vitro* whole cell assays and *in vivo* assays using zebrafish. In addition to fluorescent probes, the SCBC can synthesize known but commercially unavailable compounds necessary for biochemical studies.

Services Offered

- Novel and commercially unavailable small molecule synthesis
- Fluorescent probes for studies of biology and models of disease
- Peptide synthesis
- Design and synthesis of novel molecular probes
- Quality control and analysis of compounds
- Structure-activity relationship studies based on HTS campaigns
- Housing of adult zebrafish and zebrafish embryos

Key Equipment

- CEM LibertyBlue microwave synthesizer equipped with an automated resin handler
- Teledyne-Isco Combiflash EZ prep System
- Zeiss Axio Zoom.VI6 stereo zoom microscope (11x-412x magnification) equipped with a Hamamatsu Orca Flash 4.0 CMOS camera and Sutter DG4 fast filter switching illumination system
- Multiple LC/MS systems for purification and analysis
- Leica VT1000 S Vibrating blade microtome
- Pentair Aquatic Habitats ZF0601 zebrafish habitat system
- Bohdan MiniBlock system

