Bioproduction/Separation

umass.edu/ials/bioproduction-separation

Located in the Life Science Laboratories (LSL-5th floor) the Bioproduction/Separation facility houses instruments at a variety of scales, that enable parallel high-throughput culturing for optimizing conditions. Mid-scale production is also available for synthesizing larger quantities of biomolecules. Protein separation units and a tangential flow filtration unit are available to purify and formulate the molecules of interest.

The facility accepts samples and will perform requested analysis. We offer training to users to conduct experimentation for use on a fee for service basis to both internal and external researchers, academic or industry based. Following an initial consultation, covering experimental parameters training and access is arranged through the director.

ACCESS

To request access, training, or additional information please contact *umasscores@umass.edu*. Our rates are competitive and tiered based on needs and usage. Visit our website at *umass.edu/ials/bioproduction-separation* for current listing.

TRAINING

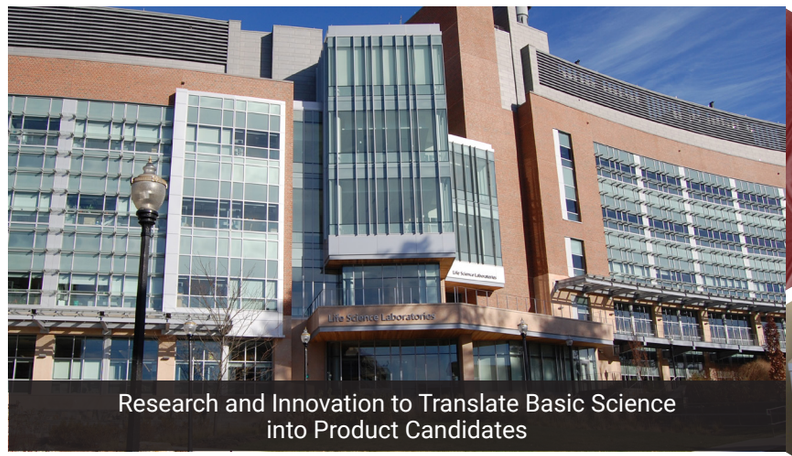
Training for new users consists of:

- lab safety training,
- operation of the instrument and associated software,
- use of data analysis software,
- exporting or presenting data,
- clean up and shutdown of the instrumentation.

Once the training is complete, researchers may schedule their experiments online through CORUM at *corum.umass.edu*

UMassAmherst | Core Facilities

Institute for Applied Life Sciences
University of Massachusetts Amherst
Life Science Laboratories
240 Thatcher Road
Amherst, MA 01003



Research and Innovation to Translate Basic Science into Product Candidates

PARTNER WITH US!

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umass.edu/ials/core-facilities

Revision (03/29/23)

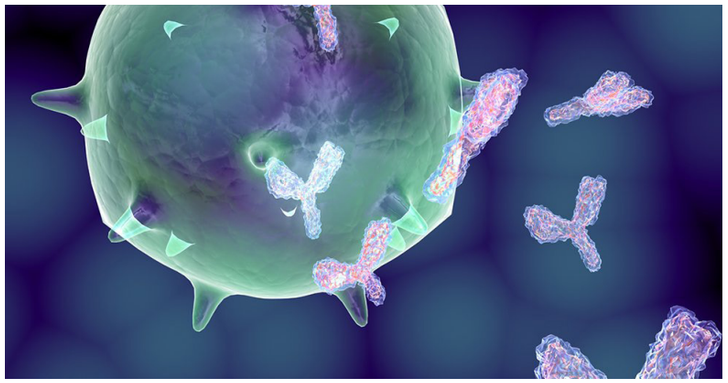
UMassAmherst | Core Facilities

Bioproduction/ Separation

Institute for Applied Life Sciences
University of Massachusetts Amherst

State-of-the-art Facilities for Fermentation and Separation/Purification of Biomolecules

RESEARCH CAPABILITIES



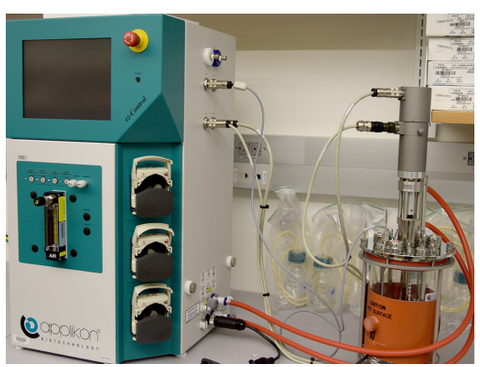
Production of biologics-based therapeutic drugs including protein-based therapeutics, vaccines, gene therapies as well as cell therapies; drugs so complex they can only be made in living systems or indeed are a living system (cell therapies).

EQUIPMENT

Applikon Mini Bioreactors

The lab has five 500 mL MiniBio bioreactors that represents a scale down model of laboratory bioreactors. The MiniBio systems have the same flexibility and controls as the laboratory scale bioreactors. This means that the MiniBio systems can be customized to fit the demands of any process. The small volume reduces medium costs and reduces the use of expensive bench space. These small units are perfect for:

- Screening studies
- Media optimization
- Process optimization
- Microbial and Cell culture



Applikon Bioreactor

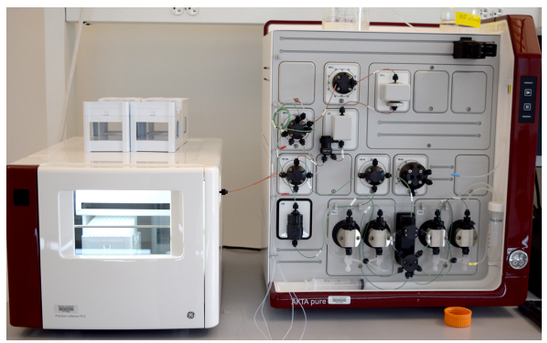
Applikon 3L and 15L Bioreactors

The lab has a 3L and a 15L bioreactor controlled by Applikon's ez controllers. The ez-Control is an easy to use system for bioreactors and fermenters that accurately controls for pH, temperature, Dissolved Oxygen (DO), Foam/Level and Agitation. The color touch screen interface guides the user through the operation. The adaptive control features allow the user to focus on the process while the controller keeps tight control on the important process parameters.

Sorvall Lynx 6000 Centrifuge

The lab has a Thermo Scientific™ Sorvall™ LYNX 6000 Superspeed Centrifuge for high-speed separations. The Lynx has a maximum speed of 29,000 rpm (100k xg) with a temperature range of -20 to 40°C. There are 2 fixed angle carbon fiber rotors that allow volumes from 14x50 mL conical tubes up to 6x1 liter to be processed. A swinging bucket rotor allows for up to 4x1 L volumes.

AKTA Pure 25M and 25L with Fraction Collectors



AKTA Pure Fraction Collector

ÄKTA pure is a flexible and intuitive chromatography system for fast purification of proteins, peptides, and nucleic acids from microgram to gram levels of target product.

- Modular system design with a large range of options to allow flexibility in purification of proteins and peptides.
- Customizable system that is easy to upgrade as your research needs develop.
- Reliable system with components and integrated features based on the proven design of ÄKTA avant.
- UNICORN software simplifies your work by providing simple, intuitive, and flexible total system control including drag-and-drop method creation.
- Predefined method settings for all GE Healthcare lab-scale chromatography columns.

AKTA Flux 6

ÄKTA flux is a versatile cross flow filtration system for sample concentration and diafiltration as well as cell harvest and clarification.

- Low working and hold-up volumes to support a wide range of concentration factors,
- Automated end-point control and data logging,
- Flexible handling of both hollow fiber cartridges and cassettes,
- Versatile design enables use in both ultra- and microfiltration applications,
- Easy-to-use operator interface.

The ÄKTA flux system allows effortless filtrations using cassettes and hollow fiber filter cartridges. It is available in two versions: ÄKTA flux s for research and filter screenings, and ÄKTA flux 6 for process development and scale-up experiments.

The ÄKTA flux filtration system is well-suited for use in protein purification workflows as a complement to the ÄKTA chromatography systems.

Constant Systems CF Range Cell Disruptor

The CF cell disruptor in the core is a "French press" type system to lyse cells and extract expressed proteins. Once a sample is drawn into our high pressure cylinder, pressure is built until it reaches the value set by the user. Then a piston forces the sample through a fixed orifice at high velocity before it impacts on a cooled heat exchange surface, and then flows through an outlet for collection.

2x25L GE WAVE Bioreactors

The single-use ReadyToProcess WAVE 25 bioreactor system is a reliable and intuitive cell culture device for working volumes in the 0.3 to 25 L range. Designed to meet the demands of a regulated environment, the system offers reliable performance, accurate process control, and ease-of-use.

The ReadyToProcess WAVE 25 system consists of a rocker (ReadyToProcess WAVE 25 Rocker), control units (ReadyToProcess CBCU), and pumps (ReadyToProcess Pump 25), all operated by UNICORN software installed on a client computer.

Massachusetts LIFE SCIENCES CENTER

A significant portion of core equipment has been purchased through MLSC grant funding support.