

NCTM

NATIONAL CENTER FOR
THERAPEUTICS MANUFACTURING



Texas A&M Engineering
Experiment Station

PERFORMANCE REPORT

2024

*Advancing workforce education and applied
research for the biopharmaceutical industry*

"2024 was a year of growth and new opportunities for the NCTM team. We continued our internationally recognized training programs, attracting participants from across the globe in our hands-on training facility through our industry short courses and a new addition: a semester-long course offered through the College of Engineering at Texas A&M. Additionally, NCTM was the recipient of awards from the National Science Foundation (NSF) and The National Institute for Innovation in Manufacturing Biopharmaceuticals (NIIMBL) to create novel workforce development programs for the United States. Most notably, NCTM secured funding to open a satellite campus in Dallas' Pegasus Park, which will be collaboratively operated with the University of Texas at Arlington, to continue to lead workforce development efforts for the region. This center, dubbed NCTM2, is slated to open in fall 2025.

I am thrilled to report that NCTM's contract research services have grown exponentially in 2024, serving eight clients across a broad range of projects and diversifying the center's sources of revenue. NCTM's unique resources have proven to be an invaluable asset to academics and startup companies alike, and we are excited to continue to expand our client base in the coming year.

I am exceedingly grateful to work with such a talented and dedicated team, and together, we look forward to continuing to serve training participants and clients through NCTM's multifaceted programs."

- Baley Reeves, PhD, NCTM Director

ABOUT OUR CENTER

The National Center for Therapeutics Manufacturing (NCTM) is an interdisciplinary workforce education and research center serving the global biopharmaceutical and vaccine manufacturing industries. A member of the Texas A&M Engineering Experiment Station (TEES), the NCTM develops and delivers customizable instructor-led, computer-based, and hands-on learning to expose the student to various aspects of cell culture and basic molecular biology, aseptic processes and microbiology, upstream and downstream processing of biological materials including viruses, monoclonal antibodies and other recombinant proteins, as well as industrial bioanalytical methods.

NCTM also provides enabling technologies to academic and industrial researchers ranging from media screening to improve cell line productivity through protein expression and purification. We offer a variety of expression systems including bacteria, yeast, mammalian, and insect lines and can perform process development and optimization, as well as analytical methods development and characterization.

2024



A female scientist wearing a black hijab, safety glasses, and a white lab coat is working in a laboratory. She is focused on adjusting a piece of glassware, possibly a distillation column or a chromatography column, which is part of a larger experimental setup. The setup includes various tubes, valves, and a large glass vessel. The background shows a typical laboratory environment with shelves and equipment. The image has a dark red overlay on the left side.

MAJOR MILESTONES

148 TRAINEES

consisting of industry professionals, students, governmental representatives, and biomanufacturing educators completed NCTM's online and hands-on training courses.

>\$12.5M in AWARDS

were granted in 2024. These grants will cover novel workforce development programs for the biomanufacturing industry, revitalization of current content, and the establishment of the NCTM2 satellite campus at Pegasus Park in Dallas.

2 NEW COURSES

Advanced Upstream is a 5 day hands-on course focusing on upstream process development. Participants learn about principles of scale up, feeding strategies, PID control loops, and receive hands-on training with bioreactors and a continuous flow disc stack centrifuge. This course has emphasis on both microbial and mammalian cell platforms.

BIOT 689 - Special Topics In: Biomanufacturing Operations is a 2 credit hour laboratory course for master of biotechnology (MBIOT) students at Texas A&M University. This course provides students with hands-on experience operating pilot-scale equipment including the 125L bioreactor, disk-stack centrifuge skid, and 100L mixers, as well as opportunities to perform quality control assays including ddPCR and SDS-PAGE.

OUR VISION FOR 2025

NCTM will continue to offer customizable training modules to fit any company's needs, from technical onboarding programs to advanced continuing education courses. Our curricula provides hands-on experience in every unit operation from cell culture to purification, for several therapeutic modalities. We will be launching a new quality control (QC) industry short course in 2025, and will be expanding the content of our Hands-On mRNA Manufacturing short course.

We will also be expanding workforce development efforts in the state by launching the Texas Regional Industrial Biomanufacturing Education Certification (TRIBEC) and hosting the first cohort of our newly registered Biomanufacturing Technician Apprenticeship. Together these programs will offer more pathways allowing Texas students to enter into the biomanufacturing industry and an expanded pipeline of talent for the biomanufacturing industry. We are collaborating with community colleges and universities across the state to bring TRIBEC to fruition and will be working directly with industry partners for the apprenticeship.



**PROGRAMS
& ACTIVITIES**

RETURNING PROGRAM

The BioFORCE Summer Camp for high school students also made a return in 2024 following a hiatus during the COVID-19 pandemic. The revamped program has a heavier emphasis on biomanufacturing, teaching students skills such as cleanroom gowning, aseptic technique in the biosafety cabinet, and following a batch production record (BPR). NCTM aims to license the program to other locations to further educate the future biomanufacturing workforce.

COLLABORATION

NCTM is proud to be the curriculum provider for the new BioTC training lab in Oklahoma City. The BioTC is the latest site to license NCTM curriculum to fast-track their training offerings. NCTM provides bespoke, customizable services to aid in facility design, equipment procurement, and curriculum development to drastically reduce start up time for new training facilities.

RESEARCH & INNOVATION

Our major 2024 research projects included:

- Fermentation scale-up for the manufacture of a bioindustrial product
- Fermentation optimization for a startup company
- Purification optimization for a novel purification modality
- Cell line development for the production of toxic products
- Core facility equipment usage and support

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The National Center for Therapeutics Manufacturing is a member of the Texas A&M Engineering Experiment Station (TEES). TEES is a state research agency that solves problems through applied engineering research and development and collaboration with industry, government and academia. As part of The Texas A&M University System, TEES is connected with world-class researchers and facilities throughout the Texas A&M System.



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