Training **Catalogue** 2025

Canada's National
Biomanufacturing Training Partner

CASTL
adMare Academy Partner


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Table of Contents

CASTL: Canada's Biopharmaceutical Manufacturing Training Partner 4
Why Choose CASTL? 10
Course Offerings 14
Case Study 16
Academic Partnerships 20
State-of-the-Art Training Facilities 22
The CASTL Training Team 24

Available Courses

Open Courses 28
CASTL Online Academy 36
Reskilling and Upskilling Programs 54

Board of Directors 64
Funding Partners 65

CASTL: Canada's biomanufacturing training partner

The **Canadian Alliance for Skills and Training in Life Sciences** (CASTL) delivers essential training to meet the evolving needs of Canada's biomanufacturing sector. Our industry-informed courses are developed for post-secondary students launching new careers in the biosciences, new entrants to the field, as well as experienced industry employees seeking to expand their skills and expertise in biomanufacturing processes and technologies.


CASTL
adMare Academy Parts


CASTL

Penny Walsh-McGuire
CEO

Message from Penny Walsh-McGuire, CEO

A strong and skilled workforce is the foundation of Canada's growing biomanufacturing industry. At CASTL, we're proud to lead this charge as Canada's national biomanufacturing training partner. We are excited to unveil our 2025 Training Catalogue—a comprehensive suite of programs and courses designed to empower both current and future employees to reach new heights in their careers.

Since 2022, CASTL has revolutionized training in biomanufacturing by opening three state-of-the-art GMP-simulated facilities in Prince Edward Island, Quebec, and British Columbia. This coast-to-coast presence has enabled us to deliver technical hands-on training, theoretical knowledge, and flexible e-learning opportunities. Hundreds of trainees across the nation have already benefited from our programs thanks to the collaborations with industry leaders, post-secondary institutions, and government partners who share our vision for a thriving biomanufacturing sector.

As the exclusive Canadian provider of NIBRT-licensed training programs, CASTL stands at the forefront of global innovation. NIBRT, based in Ireland, is renowned for delivering world-class education tailored to the biopharmaceutical manufacturing industry. Through our global network and our connections to Canadian industry, we ensure our curriculum remains responsive to emerging technologies and the evolving needs of the sector.

Together, we're shaping the future of biomanufacturing—one skilled professional at a time. Join us as we continue to prepare and inspire a generation ready to lead in one of the world's most exciting industries.

Sven Ansorge
Director of Technical Training/Site Manager – Montreal

Message from Sven Ansorge, Director of Technical Training

To ensure we meet the ever-evolving demands of the biomanufacturing industry, our training model is centred around several key principles that reflect our training experience:

Our programs are industry informed, and all courses are taught by trainers with real-world industry experience. We use state-of-the-art equipment in world-class facilities, simulating GMP manufacturing environments to provide hands-on, highly interactive and engaging learning experiences. Our flexible delivery model also includes online and on-demand training options for optimal accessibility.

CASTL's training content is designed to be directly applicable to the work environment, with a constant focus on Good Manufacturing Practices (GMP), the backbone of the biomanufacturing sector. We also offer customized training solutions to meet the unique needs of individual organizations.

As the industry continues to advance, we maintain a commitment to continuous improvement, ensuring that our training remains aligned with the latest trends and technologies in the field. Above all, we emphasize the "ultimate why" behind everything we do: ensuring that biomanufacturing processes contribute to the development and delivery of life-saving therapies for patients in need.

Our **Training Model**

CASTL
Canadian Alliance for Skills and Training in Life Sciences
adMare Academy Partner

PRINCE EDWARD ISLAND BioAlliance
collaboration to commercialization
FOUNDING PARTNER

nibrt
GLOBAL PARTNER

adMare Academy
WE BUILD TALENT
NATIONAL LEAD PARTNER

Why Choose CASTL?

To support Canada's growing life sciences sector with a highly skilled biomanufacturing workforce, CASTL provides world-class training. This specialized training equips professionals at all levels, from operators to senior managers, with the technical expertise required to meet evolving industry demands.

Key benefits

Increased productivity

Targeted, role-specific learning aligned with organizational processes is proven to significantly boost productivity and reduce onboarding time.

Agile workforce

Build a resilient workforce with comprehensive biomanufacturing skills to meet evolving industry needs.

Risk mitigation

Reduce operational errors and ensure quality by design (QbD) with a skilled, knowledgeable and confident workforce.

Employee Retention

Providing professional development pathways is proven to increase job satisfaction, loyalty and retention.

Flexible Delivery Model

CASTL offers three training formats adapted to your needs:

- Onsite: Instructor-led training at state-of-the-art GMP-simulated facilities in Montreal, Charlottetown and Vancouver.
- Online: Virtual classrooms for accessible theoretical learning.
- On demand: Self-directed modules available 24/7 through the CASTL Online Academy (COA)

Customizable Training Solutions

Programs tailored to your organizational needs:

- Tailored content: Replicate and integrate your processes for relevant training aligned with your organization's requirements.
- Personalized programs: Closed courses allow you to replicate and integrate proprietary processes, protocols and SOPs.
- Custom scheduling: Arrange sessions around your team's schedules and priorities.

Industry-leading GMP-simulated Environment

CASTL labs and classrooms mirror GMP-compliant biomanufacturing environments to provide your team with realistic, hands-on experience that prepares them to meet the technical and regulatory demands of real-world biomanufacturing.

Trusted Global Curriculum

As Canada's exclusive provider of National Institute of Bioprocessing Research and Training (NIBRT) programs, CASTL offers globally recognized, gold-standard training to equip your workforce with world-class skills. All courses are taught by industry-experienced instructors who bring real-world insights to every program.

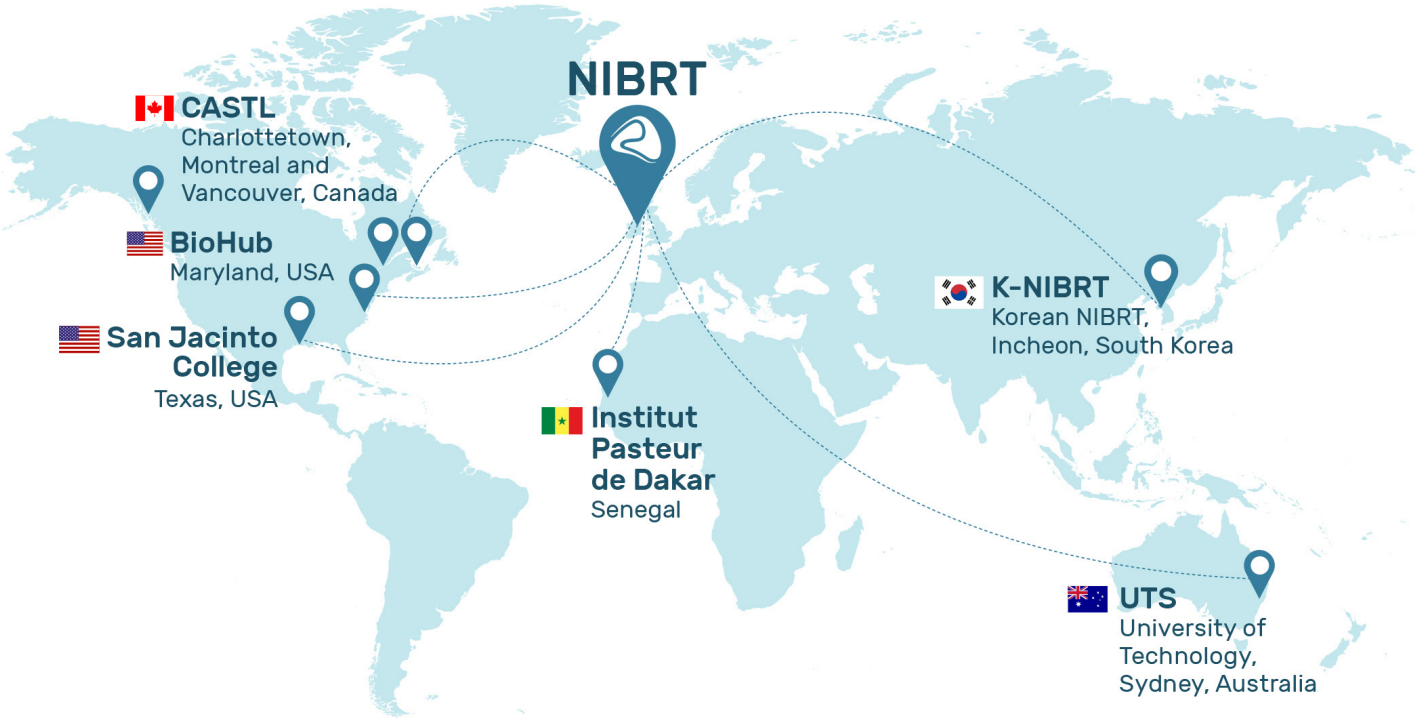
Partners

Global Partner:
National Institute for Bioprocessing Research and Training (NIBRT)

NIBRT is a global centre of excellence whose mission is to help the growth and development of the biopharma manufacturing industry by providing cutting edge training and research solutions.

The Institute is based on an innovative collaboration between Industry, Government and Academia and opened its world class facility in 2011 in Dublin, Ireland.

CASTL is the exclusive provider of the National Institute of Bioprocessing Research and Training (NIBRT) licensed training programs in Canada. NIBRT's curriculum is recognized world-wide as the gold standard for bioprocessing industry training. exclusive provider of the National Institute of Bioprocessing Research and Training (NIBRT) licensed training programs in Canada. NIBRT's curriculum is recognized world-wide as the gold standard for bioprocessing industry training.



Founding Partner:
Prince Edward Island BioAlliance

PEI BioAlliance is a private sector-led not-for-profit organization dedicated to building the bioscience industry in PEI. By working collaboratively with partners from industry, research, and government agencies, we have created an innovation ecosystem that excels in the commercialization of bio-based technologies for global markets.

National Lead Partner:
adMare Academy

The adMare Academy builds talent by training highly-qualified personnel—from undergrads to industry executives—who will drive the growth of the Canadian life sciences industry. Their goal is to ensure that trainees have the knowledge, skills, and network to start or grow their career in the Canadian life sciences sector, and that Canadian companies have the talent they need to succeed today and in the future.

Course Offerings

Open Courses

Short courses covering upstream/ downstream manufacturing, cGMP, and more are available online, in the classroom, or through hands-on workshops.

CASTL **Online** Academy

A comprehensive selection of interactive, on-demand courses is available for individuals at every stage of their career, from recent graduates to entry and mid-level management, through our learning management system.

Customized Training

Training tailored to your organization's unique processes and needs, ensuring relevant and impactful learning outcomes.

"CASTL complements BIOVECTRA's in-house training by helping our newer professionals build the confidence and skills they need to succeed in a biomanufacturing environment. CASTL creates a safe training space for trainees where they can get hands-on experience on the latest technology in a supportive environment with CASTL biopharmaceutical experts, so they are equipped with both practical and theoretical tools they need to be ready for the demands of their roles."

— **Lester Wood,**
VP People and Corporate Culture,
BIOVECTRA

"One of the biggest advantages of training at CASTL is the opportunity to train on actual bioprocess equipment and the fact that the students are allowed to practice and make mistakes, thereby gaining a valuable experience and avoiding costly mistakes upon executing real batches. This is extremely important to those of us who work in GMP manufacturing operations, where learning inexperienced employees on the job may be associated with mistakes or deviations that may impact the quality of the product."

— **Tariq Massad,**
Vice President Biologics,
Eurofins CDMO Alphora

BIOVECTRA
A part of Agilent

Customized Training for BIOVECTRA

The Canadian Alliance for Skills and Training in Life Sciences (CASTL) developed and delivered a customized training program to support BIOVECTRA's recent expansion into pDNA and mRNA vaccine manufacturing. Over the past year (2023–2024), CASTL upskilled 25 members of BIOVECTRA's team in new technologies and processes to support a seamless operational transition at the company's new mRNA biomanufacturing centre (BMC).

BIOVECTRA's Challenges	CASTL's Solution
New subject matter expertise required to provide training	A team of industry-experienced trainers with specific knowledge of bioprocesses for nucleic acid-based therapeutics
Limited space, time, and resources to conduct in-house training	A fully equipped pilot-scale, GMP-simulated biomanufacturing training facility located near BIOVECTRA's operations in Charlottetown
Restricted availability of employees to attend training due to active projects	Modular, small group training sessions delivered as employees completed projects

Collaborative Development, Modular Delivery

The training program was developed through a collaborative process between BIOVECTRA management and CASTL trainers to ensure the curriculum met specific training requirements. This included incorporating BIOVECTRA's proprietary SOPs (under confidentiality agreements). The program featured three modules to cross-train employees with flexible scheduling to meet BIOVECTRA's operational needs. The program incorporated participant feedback for continuous improvement and tailored delivery to participants' experience and knowledge.

Upstream

- Aseptic practices (BSCs)
- Cell expansion and cell counting
- Single-use bioreactors
- Media analysis
- Contamination control
- Environment monitoring

Downstream

- Depth filtration
- Micro filtration
- Ultra filtration
- Diafiltration
- Column unpacking and packing
- Chromatography column qualification and process

Fill-Finish

- Sterile filtration and aseptic transfer
- VHP sterilization
- Vial filler setup and saniitization
- Vial inspection
- Media fill
- Filter integrity testing

> "Having access to a facility where employees can go and learn in a safe environment without having any impact on our own operations and processes is a major asset. Moreover, CASTL's trainers were able to teach the technologies and manufacturing techniques that are outside our experience, providing real-world examples and applications."

— **Lee McKinley**, Director of Organizational Development

Case Study

Trainee Feedback

Among trainees surveyed:

96%
rated the training modules
as **"Very Good to Excellent"**

100%
rated the quality of instruction as
"Very Effective to Extremely Effective"

100%
rated CASTL's Biomanufacturing Training Facility and the standard of equipment
as **"Very Good to Excellent"**

100%
rated their overall satisfaction with
the training as **"Very Good to Excellent"**

"CASTL's training really helped to accelerate my transition from complex chemistry to biologics. While there are some similarities between these areas, many of the techniques are entirely different, so it was really good to get that hands-on experience with the equipment, aseptic practices, etc."

— David Ball,
Upstream Production Manager

"The material was well planned, presented, and demonstrated on the floor. Even with varying skill levels and experience, everyone had something to take away from it. [The training] was definitely more than sufficient to bring people up to speed on the processes they'd be performing in their new roles."

— David Doucette,
Team Lead

Outcomes

Streamlined Transitions

- Immersive learning, through a highly customized curriculum that incorporated client-specific SOPs and was heavily weighted to practical applications, significantly streamlined employees' transition into the new operational environment.
- Pilot-scale, state-of-the-art equipment and using BIOVECTRA's manufacturing floor blueprints in theoretical training enabled participants to undergo training while the BMC was still under construction.

Focused Learning

- Off-site training eliminated workplace distractions for participants and disruptions to normal facility operations.
- Small group learning provided participants with more opportunities for interactions with instructors and hands-on use of equipment.
- "Closed" learning groups allowed participants to freely discuss proprietary information as it related to new operational processes.

Increased Productivity

- CASTL's customized training significantly reduced BIOVECTRA's employee onboarding time.

> "CASTL's training program has had a steep impact on the ability of the team as a whole. For the leadership team and the team leads, it takes weeks off the time needed to get people up to speed on procedures and processes."

— **Jonathan Bethel**,
Production Technician

Future Skills Centre | Centre des Compétences futures

About BIOVECTRA

With operations in Prince Edward Island and Nova Scotia, BIOVECTRA is a CDMO specializing in clinical-to-commercial scale production capabilities for biologics, synthetic small molecules, highly potent APIs, and bioreagents. It has recently expanded operations into pDNA and mRNA vaccine manufacturing. It currently employs 700 people across a variety of roles in science, quality, manufacturing and production, and business administration.

biovectra.com

BIOVECTRA
A part of Agilent

Academic Partnerships

CASTL actively collaborates with post-secondary institutions to offer dynamic learning that is aligned to—and informed by—the latest information and technologies used by Canada's biotechnology and life sciences industry. Our specialized focus on bioprocessing and biomanufacturing equips students with invaluable industry-specific training, empowering them with a competitive edge and the essential credentials to thrive in their careers.

Benefits of Partnership

Partnering with CASTL gives post-secondary institutions a vital advantage in today's competitive academic landscape. Reinforcing academic teachings with applied, industry-based knowledge and skills expands the learner experience, responds to the critical needs of Canada's biomanufacturing sector, and enhances post-graduation outcomes, thus strengthening an institution's position during accreditation processes.

- **Attract more learners** by offering diverse and innovative learning pathways—online, virtual, and in-person—that complement and enhance the teaching curriculum
- **Enrich your syllabus** with up-to-the-minute trends, practices, and protocols from industry experts
- **Optimize the learner experience** and post-graduation employment prospects with practical knowledge and skills that are essential to today's biomanufacturing environments
- **Strengthen learner credentials** with CASTL training certificates and digital badges that are recognized by Canadian biomanufacturing employers

Have Questions?

For more information about academic partnership opportunities, please contact:

Magdalena Mahlstedt, PhD
Director of Academic and Strategic Partnerships
Canadian Alliance for Skills & Training in Life Sciences (CASTL)
magdalena@castlcanada.ca

Academic Partnership Models

Whether selecting training from our existing catalogue of courses or working with us to develop customized content, CASTL is here to help you ensure students are prepared to start their careers in bioprocessing and biomanufacturing.

Extra-Curricular Programming

Integrate turn-key programming into your academic calendar—such as full-semester courses or a series of customized workshops—that is prepared, delivered, and evaluated by CASTL's expert instructors.

Integrated Course Components

Incorporate industry-informed content, such as mini lectures or hands-on lab practicums at a state-of-the-art CASTL training facility, into your academic course offerings.

Credit Course Collaboration

Develop modular micro-credentials, microprograms, or electives at undergraduate and postgraduate levels.

Co-op Integrated Training

Adopt intensive pre-training in GMP industrial bioprocessing and regulated biomanufacturing environments to accelerate workplace on-boarding for work integrated learning terms.

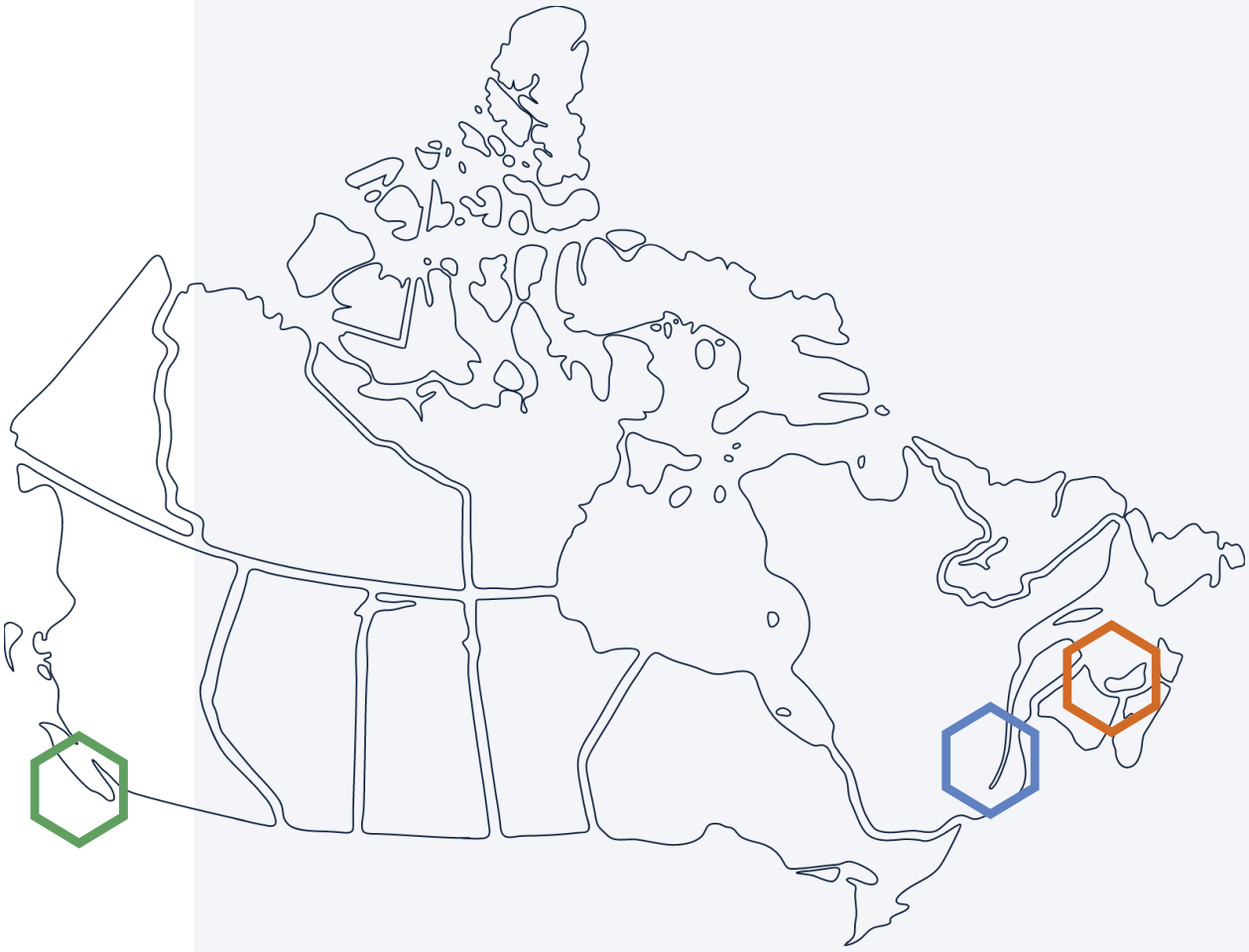
Partnership in Practice: Navigating the Biomanufacturing Landscape for Researchers

By collaborating with CASTL, post-secondary institutions can improve the success of in-house R&D and commercialization initiatives by advancing student researchers':

- Competency in industry literacy and product manufacturing processes
- Understanding of the hurdles associated with regulatory requirements and manufacturing workflows in today's biotech market
- Ability to identify value propositions for conversations with stakeholders
- Capacity to assess and navigate risk during the commercialization process

State-of-the-Art Training Facilities

CASTL operates three Canadian biomanufacturing training facilities furnished with classrooms and laboratories outfitted with state-of-the-art pilot scale bioprocessing equipment. These facilities provide learners with practical, hands-on learning opportunities that are immediately transferrable to real-world workplaces, including the processes and workflows involved in the manufacture of vaccines, viral vectors, monoclonal antibodies, and other cGMP biopharmaceutical products.



Charlottetown, PE

- **Upstream processing equipment:**
  - Single-use bioreactors from seed expansion to large scale production (up to 200 L)
  - Cedex media and metabolite analyzer, Automated cell counter
- **Downstream processing equipment:**
  - Complete line for clarification: Depth filtration, Micro-filtration, and Continuous disk stack centrifuge
  - Downstream single use and re-usable technologies, including small and medium chromatography, from R&D to commercial size ultrafiltration/ diafiltration, filtration and viral reduction
- **Fill-finish equipment:**
  - Complete production scale vial filling line with restricted access barrier system
- **Equipped with the latest technologies for aseptic work, containment, and connection**
  - QC Equipment: HPLC, LC-MS, Spectrophotometer and Turbidity Analysis

Montreal, QC

- **Upstream processing equipment:**
  - Single-use bioreactors from seed expansion to large scale production (up to 200 L)
  - Cedex media and metabolite analyzer, Automated cell counter
- **Downstream processing equipment:**
  - Complete line for clarification: Depth filtration, Micro-filtration, and Continuous disk stack centrifuge
  - Downstream single use and re-usable technologies, including small and medium chromatography, from R&D to commercial size ultrafiltration/diafiltration, filtration and viral reduction
- **Equipped with the latest technologies for aseptic work, containment and connection**

Vancouver, BC

BCIT BRITISH COLUMBIA INSTITUTE OF TECHNOLOGY

- **Upstream processing equipment:**
  - Single-use bioreactors from seed expansion to large scale production (up to 200 L)
- **Cedex media and metabolite analyzer, Automated cell counter**
- **Downstream processing equipment:**
  - Complete line for clarification: Depth filtration, Micro-filtration
  - Downstream single use and re-usable technologies, including small and medium chromatography, from R&D to commercial size ultrafiltration/diafiltration, filtration and viral reduction
- **New therapeutic modalities:**
  - Lipid nanoparticle encapsulation device (Ignite)
  - Cell therapy manufacturing equipment: CliniMACS Prodigy, MACSQuant analyzer
- **QC Equipment:**
  - HPLC, TOC and Flow Cytometer
- **Equipped with the latest technologies for aseptic work, containment and connection**

The CASTL Training Team

CASTL's team of instructors offer exceptional knowledge and experience in all aspects of biomanufacturing from process development and technology transfer to clinical and commercial manufacturing for various biopharmaceutical products and stages of clinical development. As such, they are able to deliver a second-to-none learning experience enriched by examples and lessons learned from real-world work environments.

Sven Ansorge
Director of Technical Training
Site Manager – Montreal

Sidney Reid
Chief Operating Officer

Charlottetown Trainers

Hardik Upadhyay
Site Lead

Aditya Vella
Trainer

Training Administators

Ellen Ross
Charlottetown

Anson Yu
Montréal

Vancouver Trainers

Umesh Ramachandran
Site Lead

Eoin Hagarty
Trainer

Programs/Project Team

Jennifer Lenentine
Project Manager

Kelsey Turner
Program Manager

Elvira Kagoyire Rwasamanzi
Project Manager (RNA)

Montreal Trainers

Barbara Charles
Trainer

Hannah Park
Technician

Eneze Baye
Evaluations & Engagement Manager


CASTL
adMare Academy Partner
Partenaire de l'Académie adMare


CASTL HARDIK

Available Courses

IN-PERSON VIRTUAL ONLINE

Open Courses

Unlock your potential with a comprehensive selection of open training courses that address various aspects of biomanufacturing. These introductory-level courses are delivered through a blend of online, virtual, and in-person sessions to optimize access and learning outcomes.

How to Register

To register for an open course, please visit our website and complete the online registration form for the desired course(s).

Introduction to Upstream Processing

IN-PERSON ONLINE

LEVEL
Introductory

DURATION
2 mornings of theoretical instructor-led online training in virtual classroom
+ 2 days in-person, hands-on training practical at a CASTL biomanufacturing training facility.

Overview

This course includes both hands-on practical and theory components covering cell vial thaw, aseptic techniques, cell counting, metabolic analysis, scale up, and bioreactor operation. Equipment such as biosafety cabinets, cell culture consumables, wave bag reactors, stirred-tank reactors, as well as single-use bioreactors will all be utilized to reflect the current state of biopharmaceutical manufacturing technology.

Audience

Operators, technical staff, engineers, and managers wishing to increase their knowledge of the upstream operations in industrial biomanufacturing.

Key Topics

- Aseptic techniques in biological safety cabinets
- Mammalian cell culture best practices
- Analysis of cell growth and nutrients in culture
- Introduction to bioreactor operations (glass and disposable)
- Aseptically set-up and operate a 200L single-use bioreactor
- Aseptic connections and transfer to single-use bioreactors

Learning Objectives

- Understand the principles of aseptic techniques
- Describe the practice of culturing mammalian cells in an aseptic environment in small scale
- Count cells using both an automated and manual method
- Interpret the nutrient and metabolite levels of cell culture medium
- List the equipment required for scale up mammalian cultures
- Describe the cell expansion and inoculation methods in single-use systems
- Identify the main components of state-of-the-art bioreactor systems
- Aseptically prepare and run a 200L single-use bioreactor

Introduction to Downstream Processing

IN-PERSON

LEVEL
Introductory

DURATION
2 days

Overview

This course includes both hands-on and theory components covering topics including clarification, ultrafiltration/diafiltration, viral clearance, and chromatography. Participants will be introduced to the basics of filtration and chromatography in a theory session before building on this knowledge and performing these operations in the hands-on component.

Audience

Individuals who are new to downstream processing, including operators, technical staff, engineers, and managers who need to enhance their basic knowledge of actual operations in a modern downstream processing biopharmaceutical plant.

Key Topics

- Depth Filtration
- Sterile Filtration
- Tangential Flow Filtration (Ultrafiltration, Diafiltration & Microfiltration)
- Chromatography & Column Packing

Learning Objectives

- Describe the different types of chromatography operations used in a bioprocessing facility
- Pack chromatography column utilizing a flow pack method
- Describe the key operations of ultrafiltration diafiltration
- Perform protein concentration and buffer exchange using UF/DF systems
- Assessment

Introduction to Fill-Finish

IN-PERSON

LEVEL
Introductory

DURATION
2 days

Overview

This course offers an introductory overview to current aseptic techniques related to working in an aseptic filling environment. It provides both an introduction to contamination control, environmental monitoring, filter integrity testing and filling systems, and hands-on interaction with RABs units while conducting glove integrity tests, media fills and troubleshooting.

Audience

Individuals who work or will work in Fill & Finish or those looking to learn and enhance their knowledge about operations in a modern biomanufacturing plant. The hands-on training will demonstrate the filling process and discuss engineering or quality aspects that are relevant to operators, engineers, or quality specialists.

Key Topics

- Aseptic definition, scope, and process simulations (media fills)
- Good aseptic technique
- Basic microbiology, environmental monitoring, and control systems
- Filtration and liquid filter integrity testing
- Glove integrity testing
- Reading and evaluating media fills
- Good documentation practices
- Sterility testing and final product testing
- Use of barrier technology
- Environmental data trending and excursion analysis
- Manual visual inspection
- Facility design, velocity and airflow studies

Learning Objectives

- Demonstrate an increased proficiency of techniques and skills relating to aspect processing in filling activities
- Evaluate environmental monitoring programs to collect appropriate data, identify and interpret trends
- Describe the importance of filter integrity testing when filtering water, gasses, or proteinaceous solutions
- Develop robust media fill protocols including appropriate interventions, observation, and documentation procedures
- Discuss finished product testing requirements
- Correlate basic microbiology concepts and techniques to multiple aspects of aseptic processing

Good Manufacturing Practices (GMP) Workshop

IN-PERSON

LEVEL
Introductory

DURATION
1 day

Overview

This course provides an overview of Good Manufacturing Practices (GMP), including the principles and standards essential for ensuring quality, safety, and efficacy in industrial (bio)pharmaceutical processes. It offers a comprehensive approach to understanding and applying GMP, with particular emphasis on the implementation and monitoring of quality systems, the rigor of documentation, and the importance of investigation management. It is delivered through a combination of theoretical presentations, interactive exercises, and case studies.

Audience

Individuals aspiring to enter the biopharmaceutical/pharmaceutical industry in entry-level positions, as well as for those already in the industry who wish to deepen their knowledge of the principles of good manufacturing practices.

Key Topics

- Principles of GMP, including quality and safety standards that govern the manufacture of high-quality products, ensuring traceability and compliance throughout the production process
- Quality management systems to control manufacturing processes, manage risks and ensure continuous improvement
- Good documentation practices to ensure accurate and compliant documentation to guarantee product traceability and conformity
- Investigation processes, including the identification of a deviation or problem, root cause analysis, implementation of corrective/ preventive actions, and documentation to ensure compliance and avoid the recurrence of incidents

Learning Objectives

- Understand the key components of cGMP, including why they are so critical
- Identify the key building blocks of a pharmaceutical quality system, including its scope and roles and responsibilities of different departments/functions
- Understand the importance of following best practices in deviation handling

Core Lab Skills

IN-PERSON

LEVEL
Introductory

DURATION
1 day

Overview

This course introduces participants to fundamental lab skills required in a cGMP and/or GLP settings. Using a mixture of hands-on practical components at the training facility interspersed with equipment demonstration by the training team, participants will be introduced to general lab instruments and processes such as balances and balance verification checks, good weighing practices, pH and conductivity calibrations, measuring solution pH and conductivity, and preparing solutions at a benchtop scale. It also includes an introduction to pipetting (serological and micropipettes) and use of volumetric measurements in general lab function (use of graduated cylinders).

Audience

Individuals who aspire to enter the bioscience industry at entry-level positions and for those already in the industry who want to gain practical experience with common lab instrumentation and improve their overall understanding of industry best practices.

Key Topics

- Weighing operations using benchtop scale balances and including application of Good Documentation Principles (GDP), best practices when using balances and performing calibration verification checks, and solution preparation process at the benchtop scale
- Using pH and conductivity multimeters, including use of pH standard buffers to perform a 2-point standard calibration check, calculating the percent slope of calibration, and measuring the pH and conductivity of solution samples
- Volumetric measurement of process solutions as well as understanding graduations and menisci in the context of accurate measuring and dispensing
- Pipetting practices for accurate and consistent pipette solutions using both serological pipettes and micropipettes

Learning Objectives

- Recognize the importance of calibration activities for routine operations in GMP (balances, pH, and conductivity multimeters)
- Identify and follow best practices when weighing lab reagents and when measuring and dispensing solutions for use in laboratories
- Demonstrate proper use of micropipettes and serological pipettes for accurate and consistent solution dispensing tasks
- Understand the use of multimeters (pH and conductivity), the process for measuring the pH and conductivity of process solutions or samples, and proper handling and use of pH and conductivity probes
- Understand the process for hydrating a lab reagent and preparing a small volume solution using benchtop equipment

Contamination Control

IN-PERSON

LEVEL
Introductory

DURATION
1 day

Overview

This course is an introduction to the essential methods and practices for preventing, controlling, and managing contamination in an industrial production environment, in compliance with Good Manufacturing Practice (GMP). While emphasizing the importance of traceability and documentation to maintain rigorous quality standards, it addresses key issues such as hygiene, production area management, aseptic techniques and cleanroom behaviour as well as methods for cleaning and disinfecting cleanrooms and equipment, the protective equipment required according to the grade of the area, and environmental monitoring. This course includes a combination of theoretical and practical training.

Audience

Individuals aspiring to enter the biopharmaceutical or pharmaceutical industry in entry-level positions, as well as for those already in the industry who wish to deepen their knowledge of contamination control in industrial production.

Key Topics

- Contamination risk assessment (microbial, chemical, and physical) in the manufacturing process
- Contamination control strategies, including management of sensitive areas, rigorous hygiene, aseptic techniques, validated cleaning, and disinfection techniques.
- Grade-specific dressing to reduce the risk of cross-contamination (i.e., dressing and using appropriate protective clothing according to the requirements of different grades of production areas (e.g. high and low contamination zones)
- Control production environments (i.e., applying environmental control practices—air quality, temperature, humidity, viable and non-viable particle counts—to maintain an optimal manufacturing environment

Learning Objectives

- Understand the fundamental principles of contamination in industrial environments
- Become familiar with contamination prevention and control strategies
- Apply dressing rules according to the grade of production areas
- Understand how to apply rigorous environmental control

Aseptic Transfer Best Practices: Ensuring Sterility in Biomanufacturing

IN-PERSON

LEVEL
Introductory

DURATION
2 days

Overview

Aseptic Transfer Best Practices: Ensuring Sterility in Biomanufacturing" is an intensive workshop designed to equip biomanufacturing professionals with essential skills for maintaining sterility during material transfers. The course covers the fundamentals of aseptic techniques, cleanroom protocols, and step-by-step aseptic transfer procedures. Participants will also learn about handling and sterilizing equipment, troubleshooting contamination issues, and ensuring regulatory compliance. Through a mix of theoretical knowledge and hands-on practice, attendees will be better prepared to uphold sterility standards in biomanufacturing processes.

Audience

This course is ideal for biomanufacturing technicians, operators, and process engineers responsible for aseptic transfers. Quality control and assurance personnel, production supervisors, managers, and regulatory affairs specialists will benefit from understanding aseptic transfer protocols to ensure compliance and process integrity. Additionally, training coordinators and R&D scientists involved in biomanufacturing will gain valuable insights into maintaining sterility.

Key Topics

Theoretical concepts and background:
- Overview of Cleanroom classification and contamination control
- Aseptic processing and Biopharma Regulations

Hands-on practical sessions:
- Contamination control: EM, plates, hand hygiene, equipment sanitization and cleanroom sanitization
- Aseptic Transfer Practical
- Tube Welding

Learning Objectives

- Understand importance of strategies for effective contamination control in cleanroom environments
- Gain knowledge of regulatory requirements and standards governing aseptic processing in the biopharmaceutical industry
- Conduct practical exercises in environmental monitoring (EM), using culture plates, and proper hand hygiene.
- Master equipment and cleanroom sanitization techniques to maintain a sterile environment.
- Perform hands-on practical sessions to execute aseptic transfers with minimal contamination risk.
- Apply best practices and standard operating procedures for aseptic transfers in biomanufacturing.
- Identify potential contamination sources and develop troubleshooting skills to address issues promptly.
- Enhance problem-solving abilities in maintaining aseptic conditions during biomanufacturing processes.

CASTL Online Academy

The CASTL Online Academy (COA) is the gateway to the National Institute for Bioprocessing Research and Training's (NIBRT) award-winning courses. As the exclusive Canadian provider of NIBRT's online catalogue, COA provides easy and affordable access to training on all aspects of biopharmaceutical manufacturing.

Key Benefits

- **On-demand access** to the latest topics in biopharmaceutical manufacturing from COA's extensive course library
- Learning is **delivered in bite-sized chunks** (45-90 minutes) as your schedule allows.
- **Access courses anytime and anywhere** from a computer, tablet, or smartphone
- **Immerse teams in engaging multimedia content** that uses 3D industry-relevant models, animations, and virtual simulations.
- **Support continuous learning** at every stage of career development
- **Unlock group discounts** on bulk course purchases or buy courses individually.

How to Register

Register by visiting our website and completing the registration form. Courses can then be purchased via our online shopping cart.

Introductory-level Courses

Biopharmaceuticals: Overview of the industry

This course is designed to provide learners with a foundational understanding of the biopharmaceutical industry, which will take learners on a journey detailing where biologics come from right through to how they are manufactured. The course serves as a basis for learners to build their knowledge before taking more advanced NOA courses. A highlight of the course will be self-guided 360o tours of NIBRT's training plant which replicates a biologic manufacturing site. While on the 360o tours, learners will engage with interactive elements to gain understanding of the biopharmaceutical manufacturing process.

TOPIC AREA
General Overview

DURATION
60 min

REGISTER

Lab Skills: Essential Lab Skills for Biopharma

This course is designed to provide learners with the basic practical laboratory knowledge and skills related to lab safety, volume measurement, and mass measurement. The course will equip learners with best practices concerning mass measurements using scientific balances and volume measurements using micropipettes. These types of measurements are key day-to-day lab activities and are essential to producing high quality data. Finally, learners will be guided through some of the everyday safety practices while working in a lab.

TOPIC AREA
General Overview

DURATION
80 min

REGISTER

SUT: The application of Single-Use Technologies in Biopharmaceutical Manufacturing

The use of Single Use Technologies (SUT) in biopharmaceutical manufacturing has revolutionized the industry by providing flexibility, reducing cross-contamination, and decreasing capital and operating costs. This online course is designed to provide a comprehensive understanding of the application of SUT in biopharmaceutical manufacturing. The biopharmaceutical manufacturing process broadly consists of distinct "Upstream" and "Downstream" processing areas. Upstream processing involves the cultivation and growth of cells to produce the desired product, while downstream processing involves the isolation, purification, and formulation of the product for final use. In this course the harvest stage will be included in the upstream section. Fill/Finish is out of scope for this course.the biopharmaceutical manufacturing process.

TOPIC AREA
General Overview

DURATION
60 min

REGISTER

Introductory-level Courses

Introduction to Quality Control Testing

This course provides a high-level general overview of the role of quality control testing and its importance in biopharmaceutical production. Quality control testing is a GMP requirement for any type of pharmaceutical production. This course provides the context for this testing in a biopharmaceutical production process, describing the complexity of biopharmaceuticals, potential process sampling points for testing and some of the key regulatory documents concerning quality control testing.

TOPIC AREA
General Overview

DURATION
60 min

REGISTER

Trends in Biopharmaceutical Manufacturing

Biopharmaceutical manufacturing has grown and matured and is no longer a novel area within the larger pharmaceutical landscape. However, it is still an area that is undergoing evolution and the manufacturing methods of yesterday and today, may not be the same tomorrow. This course will look at the current state of biopharmaceutical manufacturing and examine some of the drivers of change. It will also look at how methods and technologies, both in facility and equipment design, are facilitating manufacturing advances.

TOPIC AREA
General Overview

DURATION
45 min

REGISTER

Introduction to Vaccine Manufacturing

This course focuses on vaccine manufacturing in the context of various viral and bacterial vaccine production processes used in biopharma today. It aims to help you build a broad understanding of the complex and varied nature of vaccine manufacturing processes, while exploring specific details for particular vaccine types.

TOPIC AREA
General Overview

DURATION
45 min

REGISTER

Overview of Biopharmaceutical Manufacturing

This course provides an explanation of the principles of biopharmaceutical manufacturing by focusing on the processes typically involved in producing therapeutic proteins. The stages of manufacture from upstream, through downstream, to formulation and fill finish are shown, with explanations of the equipment and processes involved. Key concepts of good manufacturing practice (GMP), environmental control, and cleaning are covered.

TOPIC AREA
General Overview

DURATION
45 min

REGISTER

Introductory-level Courses

Biotechnology and Biopharmaceuticals

This course provides an introduction to biopharmaceuticals and their product characteristics. An explanation of the science of biotechnology that underlies biopharmaceuticals is provided. The content includes the role of DNA and proteins in the body, along with an explanation of Recombinant DNA and Monoclonal Antibody Technologies. The characteristics of biopharmaceutical products are explored and compared to traditional small molecule pharmaceuticals, with the main classes of biopharmaceutical products also being described.

TOPIC AREA
General Overview

DURATION
45 min

REGISTER

Bioreactor Operations

This course provides a description of the operation of a mammalian cell culture bioreactor in the biopharmaceutical industry. The course describes critical parameters and the methods by which they are controlled. This course also deals with various modes of bioreactor operation and the advantages and disadvantages of each.

TOPIC AREA
Upstream Processing

DURATION
90 min

REGISTER

Upstream Processing: Bioreactors in Bioprocessing

This course focuses on vaccine manufacturing in the context of various viral and bacterial vaccine production processes used in biopharma today. It aims to help you build a broad understanding of the complex and varied nature of vaccine manufacturing processes, while exploring specific details for particular vaccine types.

TOPIC AREA
Upstream Processing

DURATION
45 min

REGISTER

Fermentation in Biopharmaceutical Manufacturing

This course provides a description of the application of microbial fermentation in the biopharmaceutical industry. The course describes the importance of controlling the environment during manufacturing operations to promote cell growth and protein production.

TOPIC AREA
Upstream Processing

DURATION
45 min

REGISTER

Introductory-level Courses

Cell Culture in Biopharmaceutical Manufacturing

This course provides a description of the application of mammalian cell culture in the biopharmaceutical industry. The course describes the importance of controlling the cell culture environment during manufacturing operations.

TOPIC AREA
Upstream Processing

DURATION
45 min

REGISTER

Downstream Processing: Ultrafiltration and Diafiltration

This course provides a description of the application of ultrafiltration and diafiltration in downstream processing. The course describes the process considerations of this filtration technique within a protein purification context.

TOPIC AREA
Downstream Processing

DURATION
45 min

REGISTER

Downstream Processing: Protein Purification - Chromatography

This course provides a description of the application of the commonly used chromatographic methods in downstream protein purification including size exclusion, ion exchange, hydrophobic interaction, and affinity chromatographies. The basics of a chromatography set-up are covered along with critical factors affecting protein separation such as column packing, resolution, column capacity, pressure and the chromatography matrix.

TOPIC AREA
Downstream Processing

DURATION
45 min

REGISTER

Downstream Processing: Centrifugation

This course provides a description of centrifugation technology and how it is utilised in the primary clarification phase of biopharmaceutical purification. The focus is on the function and operation of a disk-stack centrifuge, which is commonly employed in industry.

TOPIC AREA
Downstream Processing

DURATION
45 min

REGISTER

Introductory-level Courses

Cleanrooms and Cleanroom Behaviour

There are many possible sources of contamination in a cleanroom. In this course, we will start by defining a “cleanroom” and examine the different classes of cleanrooms. You will also explore the contamination entry routes. In addition, you will analyze the do’s and don’ts when working in a cleanroom with a focus on how personnel can reduce their contamination impact.

TOPIC AREA
Aseptic Processing

DURATION
45 min

REGISTER

Clean In Place

This course provides an overview of the key concepts of Clean in Place (CIP) technology commonly used in the biopharmaceutical industry. It describes in detail the procedures and steps involved in CIP and provides examples of best practices that help ensure reproducible performance of a CIP cycle.

TOPIC AREA
Facility Design and Utilities

DURATION
90 min

REGISTER

Aseptic Processing: Gowning

This course describes the requirements for gowning in various cleanroom classifications that are associated with biopharmaceutical manufacturing. This course also describes the procedures recommended for specific activities such as handwashing and donning of sterile gloves.

TOPIC AREA
Aseptic Processing

DURATION
45 min

REGISTER

Aseptic Processing: Decontamination and Sterilization Technologies

This course defines the terms decontamination and sterilization and provides a description of some typical methods that can be used to decontaminate and sterilize process equipment and products in a biopharmaceutical manufacturing setting. The methods described include hydrogen peroxide vapour, moist-heat, dry-heat, and filtration.

TOPIC AREA
Aseptic Processing

DURATION
45 min

REGISTER

Introductory-level Courses

Aseptic Processing: Contamination Control

This course describes the concept of contamination control within a biopharmaceutical manufacturing process. The course describes the importance of identifying and controlling routes of contamination entry to achieve sterile drug product manufacture.

TOPIC AREA
Aseptic Processing

DURATION
45 min

REGISTER

Aseptic Processing: Concepts and Controls

This course provides an introduction to aseptic processing and its importance in biopharmaceutical manufacturing. The course describes how the risk of microbial contamination can be reduced by using suitable controls and procedures that minimise bioburden in the manufacturing environment such as cleanrooms, gowning, appropriate behaviour of personnel and environmental monitoring.

TOPIC AREA
Aseptic Processing

DURATION
45 min

REGISTER

Aseptic Processing: Cleanrooms and Control Technologies

This course describes the concept of cleanroom design and operation from a contamination control point-of-view including contamination entry-routes, HVAC and HEPA filters, operation of airlocks as well as cleanroom architecture including design and maintenance.

TOPIC AREA
Aseptic Processing

DURATION
45 min

REGISTER

Introduction to Preparative Protein Chromatography

In this course, you will learn about the principles of preparative chromatography for protein purification and how to perform it. You will familiarize yourself with different types of columns and stationary phases and learn more about different types of chromatographic techniques like affinity and size exclusion chromatography. You will explore chromatography performance factors including efficiency and resolution as well as throughput and productivity. This course also covers purification strategies and various modes of chromatographic operations and their practical applications. You will explore the methods used to scale up from a lab to production scale and relevant challenges.

TOPIC AREA
Downstream Processing

DURATION
45 min

REGISTER

Introductory-level Courses

Overview of Host Cells for Bioprocessing

In this course, you will learn about the prevalent host cell types and potential disruptors for biomanufacturing. After completing this introductory course, you will be able to select the right kind of host cell type for production of the protein of your interest.

TOPIC AREA
General Overview

DURATION
45 min

REGISTER

Overview of the Biopharma Industry and Products

In this course, you will acquaint yourself with the current healthcare status and role of biopharma industry. This course states the dynamics of health around the globe and the various biotherapeutics available to treat both communicable and noncommunicable diseases. You will learn about different types of biotherapeutics used to fight disease, ranging from small molecules like insulin to large molecules like monoclonal antibodies. Some examples of blockbuster drugs are also shown.

TOPIC AREA
General Overview

DURATION
45 min

REGISTER

Understanding Filtration in Bioprocessing

In this course, you will understand the principles of filtration. This course also shows how filtration works as a unit operation in the upstream and downstream stages of bioprocessing. You will explore normal and cross flow filtration in detail by familiarizing yourself with the mechanisms of action, classification of filters, process set-up, process parameters, maintenance, and applications for the different filtration modes. This course also delves into the key properties of filters, the factors affecting filters and filtration performance, and how to choose the right kind of filter for your intended applications.

TOPIC AREA
Downstream Processing

DURATION
45 min

REGISTER

Understanding Upstream Bioprocessing

In this course, you will learn the fundamentals of upstream bioprocessing. This course provides an understanding of the underlying principles of good process design required to succeed in upstream biomanufacturing. In this course you'll familiarize yourself with the concept of kinetic modeling, discover the key steps in process modeling, and learn the mass balance variables to optimize your bioreactor appropriately.

TOPIC AREA
Upstream Processing

DURATION
45 min

REGISTER

Introductory-level Courses

Introduction to Gene Therapy

This course provides an overview of the key concepts of gene therapy. It defines the term as well as exploring the differing concepts of gene therapy and gene editing and how they may be achieved. The course also describes the various modification methods such as viral vector or nuclease delivery. The course also looks at the current methods for scaling up the manufacture of these therapies and some ways in which this may be optimised in the future.

TOPIC AREA
Cell and Gene Therapy

DURATION
45 min

REGISTER

Introduction to Cell Therapy

This course provides an overview of the key concepts of cell therapy. It defines the term as well as exploring the major cell therapy modalities. It also looks at the current state of manufacturing of these therapies and looks forward to how this may change in the future to meet the demands of a changing market.

TOPIC AREA
Cell and Gene Therapy

DURATION
45 min

REGISTER

Reliable Data Driving Business Resilience

This short webinar discusses how Data Reliability can enhance long term business resilience. ERA Sciences recognises 4 key data reliability pillars: Data Integrity, Risk Management, Stakeholder Engagement, Application Lifecycle Management. Together these pillars enable reliable data and will be briefly discussed. ERA Sciences will then talk about why it may be time to evaluate existing Application Lifecycle Management (ALM) to ensure that GxP data is working for you and where it's possible to eliminate non-value add activities.

TOPIC AREA
General Overview

DURATION
50 min

REGISTER

The Quantum Leap to GxP 4.0: Labs of the Future

The recorded webinar "The Quantum Leap to GxP 4.0" is designed to provide you with answers to some of these most troubling issues. We present to you some 4.0 solutions that may be familiar to you or completely new, but our aim is unchanging: to make the 4.0 Quantum Leap less daunting! The GxP facilities, both pharma and biopharma, are experiencing a huge trend towards adoption of Industry 4.0 technologies, to optimize our complex, time-consuming, and data-heavy production processes. But, in the GxP world, there are often hurdles we must overcome when introducing new technologies, due to the heavily regulated nature of our industry.

TOPIC AREA
BioPharma Trends

DURATION
1 h 45 min

REGISTER

Introductory-level Courses

The Quantum Leap to GxP 4.0: E-Validation & Tech Transfer

The recorded webinar, “The Quantum Leap to GxP 4.0,” is designed to provide you with answers to some of these most troubling issues. We present to you some 4.0 solutions that may be familiar to you or completely new, but our aim is unchanging: to make the 4.0 Quantum Leap less daunting! The GxP facilities, both pharma and biopharma, are experiencing a huge trend towards adoption of Industry 4.0 technologies, to optimize our complex, time-consuming, and data-heavy production processes. But, in the GxP world, there are often hurdles we must overcome when introducing new technologies, due to the heavily regulated nature of our industry.

TOPIC AREA
BioPharma Trends

DURATION
1 h 45 min

REGISTER

The Quantum Leap to GxP 4.0

The recorded webinar “The Quantum Leap to GxP 4.0” is designed to provide you with answers to some of these most troubling issues. We present to you some 4.0 solutions that may be familiar to you or completely new, but our aim is unchanging; to make the 4.0 Quantum Leap less daunting! The GxP facilities, both pharma and biopharma, are experiencing a huge trend towards adoption of Industry 4.0 technologies, to optimize our complex, time-consuming, and data-heavy production processes. But, in the GxP world, there are often hurdles we must overcome when introducing new technologies, due to the heavily regulated nature of our industry.

TOPIC AREA
BioPharma Trends

DURATION
1 h 45 min

REGISTER

Introduction to Gene Therapy Manufacturing

This webinar focuses on the rapidly developing landscape, interest and recent approvals in Gene Therapy. As recombinant adeno-associated viruses (rAAV’s) are widely used as the viral vector system to deliver therapeutic genes to cells the webinar will particularly focus on this delivery system. Key to the use of rAAVs is an efficient production and purification system that will produce viral vector in sufficient quantity and of requisite quality for clinical applications. This webinar provides an introduction to the current methods employed in the manufacturing of rAAV’s to address the growing demand for this class of therapy.

TOPIC AREA
Cell and Gene Therapy

DURATION
60 min

REGISTER

Bioreactor Operations

This course provides a description of the operation of a mammalian cell culture bioreactor in the biopharmaceutical industry. The course describes critical parameters and the methods by which they are controlled. This course also deals with various modes of bioreactor operation and the advantages and disadvantages of each.

TOPIC AREA
Upstream Processing

DURATION
90 min

REGISTER

Introductory-level Courses

Inoculum and Cell Culture Virtual Reality Beta Version

This immersive virtual reality simulation replicates the process of conducting an aseptic cell vial thaw using a biological safety cabinet (BSC) within a cleanroom environment. The trainee will perform a virtual garbing procedure, where the appropriate protective equipment is put on, before setting up the BSC for the operation. The vial thaw process will then be conducted within this rendered cleanroom setting. Step-by-step instructions are provided to guide the trainees through the processes in a highly detailed virtual environment.

TOPIC AREA
General Overview

DURATION
10 min

REGISTER

Introduction to Cell Therapy Manufacturing

The recorded webinar provides an overview of the general concepts of cell therapy including gene-modified cell therapies, such as CAR-T. The topics covered will firstly provide a definition of cell therapy, gene-modified cell therapy, and ex-vivo gene therapy as there is a lot of cross-over in these areas. In addition, the webinar discusses some of the major therapeutic areas such as CAR-T and stem cells in terms of mechanism of action and manufacturing methods.

TOPIC AREA
Cell and Gene Therapy

DURATION
60 min

REGISTER

Glycan Characterisation

The recorded webinar “Glycan Characterisation” presents invaluable information on your biologics that world leading NIBRT Contract Research provides.

TOPIC AREA
Quality Control

DURATION
30 min

REGISTER

Good Handwashing Technique

This handwashing demonstration video outlines the importance of good handwashing technique in the prevention of the spread of microorganisms. The video includes a demonstration of a thorough handwashing technique using blue paint as a substitute for soap, to demonstrate the maximum soap coverage desired when washing hands.

TOPIC AREA
General Overview

DURATION
5 min

REGISTER

Introductory-level Courses

Vaccine and Immunity

This short e-lesson describes the important role that vaccines play in global health, in the fight against infectious diseases. Topics covered include the basics of what pathogens are and how they cause disease, how our immune systems react to infections and how the use of vaccines can aid help boost immunity. An introductory insight into the different types of vaccines and an overview of production methods will also be provided.

TOPIC AREA
Vaccines

DURATION
20 min

REGISTER

Introduction to Viruses

This course introduces what viruses are, their basic structure, how they can infect cells and looks at the way they can be transmitted from person to person and what measures can be taken to control the spread of viruses. Key topics covered include basic definition of a virus, the abundance of viruses in nature, virus binding, modes of virus transmission, control of virus transmission.

TOPIC AREA
General Overview

DURATION
5 min

REGISTER

Intermediate-level Courses

Cell Biology and Recombinant DNA Technology

This course provides a description of cell biology and recombinant DNA technology as it is applied to the biopharmaceutical industry. The course describes the fundamentals of genetic engineering and how that technique can be used to make therapeutic products.

TOPIC AREA
General Overview

DURATION
45 min

REGISTER

Freeze Drying

This course provides a description of the processes associated with freeze-drying (lyophilisation) of biopharmaceutical products. The course describes the theory behind key concepts associated with temperature control, drying, equipment operation and their impact on product stability.

TOPIC AREA
Formulation and Fill Finish

DURATION
45 min

REGISTER

Formulation in the Biopharmaceutical Industry

This course provides an overview of the principles and practices of formulation and packaging processes in a modern biopharmaceutical manufacturing facility.

TOPIC AREA
Formulation and Fill Finish

DURATION
45 min

REGISTER

Intermediate-level-Courses

Assessment and Certification for Fundamentals of Effective Risk Management

We recommend that you engage fully with each module and the embedded resources before attempting this assessment, but it is not required. You can complete any of the module, in any sequence or none at all, before attempting this assessment. You will receive a certificate of completion at the end of this module.

TOPIC AREA
Quality Risk Management

DURATION
45 min

REGISTER

Module 1: The Fundamentals of Effective Risk Management for Biopharmaceutical Manufacture

After completing this module - you will understand what is meant by biopharmaceutical product risk, be able to explain the importance of examining risk through the lens of the patient, be able to identify and classify different types of product risk, be able to identify the key stakeholders and explain why the patient comes first, embrace the importance of a proactive risk culture and make a personal commitment to always prioritize patient safety.

TOPIC AREA
Quality Risk Management

DURATION
60 min

REGISTER

Module 2: Fundamentals of Risk Management

In this module you will build your awareness of the science and tools of risk management and understand the potential impact of your behaviours on the reduction of risk for your patients and your organization.

TOPIC AREA
Quality Risk Management

DURATION
60 min

REGISTER

Module 3: Regulatory Requirements for Quality Risk Management in the Biopharmaceutical Industry

The focus of this module is to familiarize you with the key regulatory requirements, industry guidance and international standards associated with Risk Management and to make the connection to the underpinning current cGMPs. Armed with this knowledge you should feel confident to contribute to QRM activities.

TOPIC AREA
Quality Risk Management

DURATION
60 min

REGISTER

Intermediate-level-Courses

Module 4: Implementing Effective Risk Control Strategies

In this module you will have the opportunity to familiarize yourself with the typical risk controls in place for products and processes in a biopharmaceutical manufacturing setting.

TOPIC AREA
Quality Risk Management

DURATION
60 min

REGISTER

Module 5: Application of Quality Risk Management Every Day

In this module you will review some examples of the everyday application of Risk Management. After completing this module, you will have an opportunity to review worked examples of everyday QRM examples, participate in a Validation Risk Management Scenario, be able to select appropriate actions or tools for a range of given risk events, describe the importance of involving individuals with a diverse range of skills and perspectives and demonstrate the importance of maintaining vigilance and personal accountability.

TOPIC AREA
Quality Risk Management

DURATION
60 min

REGISTER

Module 6: Your Role in Preventing and Reducing Product and Patient Risk

This module is designed to enable you to reflect on your learning across the course and to reinforce the importance of the role that you play every day in preventing and reducing product and patient risk.

TOPIC AREA
Quality Risk Management

DURATION
60 min

REGISTER

Process Validation 1: Process Design

This course provides an overview of the process design stage of process validation, describing how a biopharmaceutical manufacturing process can be defined using a Quality by Design (QbD) approach that emphasizes accumulated scientific knowledge and Quality Risk Management (QRM).

TOPIC AREA
Facility Design and Utilities

DURATION
45 min

REGISTER

Intermediate-level-Courses

Process Validation 2: Process Qualification and Control

This course provides an overview of the qualification and continuing verification stages of process validation. This course is intended to demonstrate how a biopharmaceutical process must be capable of reproducible commercial manufacturing and to provide ongoing assurance that the process remains in a state of control.

TOPIC AREA
Facility Design and Utilities

DURATION
45 min

REGISTER

Biomanufacturing Process Capability Requirements

In this course, you will learn to identify process capabilities needs to produce the required quality and quantity of biotherapeutics—with patient safety and drug effectiveness in focus. The course describes the role of quality by design as per ICH guidelines in bioprocess development. You will learn about the different stages in biologics production and strategies used to prevent product and process related impurities.

TOPIC AREA
General Overview

DURATION
45 min

REGISTER

Filtration Process Development

In this course, you will explore in detail the operating parameters, their optimization and other key considerations for design and scale-up of an effective filtration process. This course will guide you on maintenance issues and costs related to filtration as a unit operation.

TOPIC AREA
Downstream Processing

DURATION
45 min

REGISTER

Viral Vector Production for Gene Therapy - Full Learning Plan

Viral vectors are fundamental to gene therapy and gene modified cell therapies which are the frontier of modern medicine. This learning plan, delivered in 13 videos, offers an introduction to viral vector production for gene therapy as well as presentations on upstream processes, downstream purification, filling, and quality control.

TOPIC AREA
Cell and Gene Therapy

DURATION
10 h 30 min

REGISTER

Intermediate-level-Courses

Viral Vector Production for Gene Therapy - Upstream

This presentation on the Upstream Process is part of our series of online courses on viral vector production for gene therapy. It contains: A presentation on XDR systems- Fermenters and Bioreactors for scale up of suspension cell culture- By Yasser Kehail (Cytiva); A presentation on iCELLis Bioreactors- Virus Production from Bench to Industrial Scale- By Dr. Dana Pentia (Pall); A practical demonstration: Single Use Rocker Bioreactor Set-Up; A practical demonstration: Single Use Stirred Tank Bioreactor Set-Up; A practical demonstration: Microcarriers.

TOPIC AREA
Cell and Gene Therapy

DURATION
2 h 30 min

REGISTER

Viral Vector Production for Gene Therapy - Quality Control

This presentation on the Quality Control process is part of our series of online courses on viral vector production for gene therapy. It contains: A presentation of analytics for viral vectors - Dr. Åsa Hagner McWhirter (Cytiva); A practical demonstration: SDS-PAGE; A practical demonstration: ELISA; A practical demonstration: HPLC.

TOPIC AREA
Cell and Gene Therapy

DURATION
2 h 30 min

REGISTER

Viral Vector Production for Gene Therapy - Introduction

This introduction presentation in a series of online courses on viral vector production for gene therapy. It contains: An Introduction to Gene Therapy and Current Market Landscape by Dr. Adam Pritchard (NIBRT); A practical demonstration: Cell Culture Start-up; A practical demonstration: Suspension Cell Culture; A practical demonstration: Adherent Cell Culture.

TOPIC AREA
Cell and Gene Therapy

DURATION
2 h

REGISTER

Viral Vector Production for Gene Therapy - Downstream Purification & Filling

This presentation on the purification and filling process is part of our series of online courses on viral vector production for gene therapy. It contains: A presentation on downstream purification of viral vectors - Dr. Dana Pentia (Pall); A presentation on purification of viral vectors - Dr. Åsa Hagner McWhirter (Cytiva); A practical demonstration: Depth Filtration; A practical demonstration: Disposable Chromatography; A practical demonstration: Disposable Ultrafiltration/Diafiltration; A practical demonstration: Filling Overview.

TOPIC AREA
Cell and Gene Therapy

DURATION
3 h 30 min

REGISTER

ATMP Fluid & Cold Chain Management Webinar

During this webinar, you will gain insights into scalable single-use technologies, advantages of automated sterile filling processes for small volumes, and controlled freezing applications down to -80°C or -196°C. You will also learn about shortfalls in current manufacturing processes and how they can cause unnecessary product loss, product quality reduction or other efficiency downfalls. This webinar will provide case studies and an overview of available solutions on the market that can be used to overcome challenges faced in the industry.

TOPIC AREA
General Overview

DURATION
n/a

REGISTER

CASTL ONLINE ACADEMY

Advanced-level Courses

Advanced IEX Chromatography for Bioprocessing

In this course, you'll get a detailed view of ion exchange (IEX) chromatography. This advanced course focuses on process development of IEX chromatography in bioprocessing. This course will help you identify the critical and key process parameters for optimization of IEX chromatography using high-throughput process development (HTPD) techniques.

TOPIC AREA
Downstream Processing

DURATION
45 min

REGISTER

Advanced MM Chromatography for Bioprocessing

In this course, you'll get a detailed view of mixed mode, or multimodal (MM) chromatography. This advanced course focuses on process development of MM chromatography in bioprocessing. This course will help you identify the critical and key process parameters for optimization of MM chromatography using high-throughput process development (HTPD) techniques.

TOPIC AREA
Downstream Processing

DURATION
45 min

REGISTER

Reskilling and Upskilling Programs

IN-PERSON VIRTUAL ONLINE

Elevate Program

Overview

This national program provides a comprehensive introduction for individuals seeking entry-level positions to Canada's biomanufacturing industry. The training curriculum is delivered in a blended format with five weeks of self-directed online and virtual instructor-led sessions followed by one week of hands-on learning at a CASTL training facility. After completing this training, participants will have the skills required for high-demand technician roles in biomanufacturing such as:

- Laboratory Technician
- Manufacturing Technician
- Production Technician
- Process Development Technician
- Upstream Processing Technician
- Other entry level positions in biomanufacturing

Elevate is delivered in partnership with UpSkill Canada powered by Palette and the Government of Canada.

CASTL Elevate
Partenaire de l'Académie adMare
adMare Academy Partner

Upskill Canada POWERED BY palette skills

Canada

Have Questions?

For more information about this program, please contact:

Jennifer Lenentine
Program Manager
jennifer@castlcanada.ca


ONLINE


VIRTUAL


IN-PERSON

LEVEL
Introductory

DURATION
6 weeks

> “[The Elevate program] is a great introduction to the manufacturing industry. It gave me hands-on experience of working in a GMP environment. I will be bringing a wealth of knowledge I can implement directly at my current organisation. Not only that; its also piqued my interest in pursuing a master’s degree in Biomanufacturing in the future (TBD). I think this program is a great fit for anyone curious about the biomanufacturing and biopharmaceuticals industry, and CASTL is well equipped to support you throughout the process.”
>
> **— Sabiha Sultana**

Audience

This program is designed to assist younger workers, new Canadians, diverse populations, and others in recognizing their transferable skills, acquiring new knowledge, and launching a career in Canada’s rapidly growing biomanufacturing sector. Eligible candidates must:

- Be legally allowed to work in Canada
- Work permit holders must have one year remaining on the permit before the start of the program
- Currently reside in Canada
- Have a minimum of 3 years of work experience outside of high school and post-secondary studies (work experience can be outside of Canada, does not need to be 3 consecutive years, can include volunteering, and can be a combination of full- and part-time work)
- Demonstrate English proficiency
- Be able to work independently and safely
- Be committed and ready to transition into the biomanufacturing industry upon program completion
- Have a computer or tablet, reliable internet, web camera and microphone

Key Topics

Technical training sessions address core knowledge and skills for working in biomanufacturing facilities. Topics include:

- Working aseptically
- Following Good Manufacturing Practices (GMP)
- Following Standard Operating Procedures (SOP’s)
- Following Good Documentation Practices (GDP)
- Gowning for work in a biomanufacturing environment
- Cleaning a biomanufacturing environment
- Use of the basic and foundational equipment common in operator roles
- Knowledge and understanding of equipment used in a biomanufacturing environment
- Understanding the various roles and processes in a biomanufacturing environment

The program also includes professional development sessions to enhance participants’ job readiness. Topics include:

- Resume and LinkedIn profile development
- Job search techniques
- Networking skills
- Interview skills
- Understanding individual work styles
- Technology in the job search process

> [The Elevate program] was really an amazing journey. In the space of just two weeks of completing the program, I had a job offer. Two months after that, I got a promotion. The shift from IT to biotechnology has really been a blessing for me. CASTL and the Elevate program are doing great things, helping to fill the talent gap for the sector while also giving individuals a direct path to interesting and stable employment.

— Ehis Otubor

> My time with CASTL was the best educational experience I've ever had. The knowledge and value I received from the Elevate program equipped me with practical and soft skills that have helped me gain the confidence to transition into a new industry. The job readiness portion of the program, in particular, taught me how to network and create stronger job applications. The highlight of the program was definitely the in-person week in Charlottetown for hands-on training. It was an unforgettable experience!

— Rodrigo Noriega

CASTL's Factory School: Part of Quebec's AReNA Hub Initiative

Revolutionizing RNA Therapeutics Production Training in Quebec

The Quebec Consortium for Drug Discovery (CQDM) is a non-profit biopharmaceutical research consortium whose mission is to support and facilitate multi-stakeholder collaborative R&D that accelerates translation of leading-edge discoveries into vaccines, therapeutics and diagnostics addressing unmet medical needs while generating significant benefits for the Canadian economy.

In collaboration with the *Consortium Québécois sur la Découverte du Médicament* (CQDM), CASTL is developing a cutting-edge training program tailored to meet the growing needs of the RNA therapy sector in Quebec: The Factory School (l'École-usine).

Empowering Quebec's RNA Therapy Workforce

With the rapid advancements in RNA therapy and Quebec's strong research expertise, this initiative is designed to equip the sector with a highly skilled workforce ready to meet the demands of this burgeoning industry. The RNA therapies factory-school will provide specialized training programs designed to enhance knowledge and skills for RNA therapeutics production.

A Real-World Training Environment

CASTL's state-of-the-art facility mirrors the reality of RNA therapeutics manufacturing, offering:

- Training in good manufacturing practices (GMP)
- Hands-on experience in a GMP-simulated environment
- Access to cutting-edge equipment for RNA therapeutic manufacturing, including purification and lipid nanoparticle encapsulation
- Integration with existing CASTL facilities, which currently support monoclonal antibody production

Comprehensive Training Programs

The RNA therapies factory-school will offer a blended learning approach combining:

- Classroom-based theoretical instruction
- Virtual training modules
- Programs covering the full professional continuum from DEP to PhD

Key Objectives

Building Strategic Partnerships
CASTL will help establish a robust RNA therapy manufacturing ecosystem in Quebec through strong collaborations with key industry and academic partners. Our goal is to foster an environment that promotes knowledge sharing, talent development, and innovation.

To learn more about this initiative, visit the Quebec AReNA Hub website.

PEI Bioscience Reskilling Program

Overview

The Prince Edward Island-based Reskilling Program is designed to help unemployed PEI residents launch rewarding careers in the biosciences. This fast-paced course introduces learners to the knowledge and skills needed for entry-level positions in the bioscience industry. Designed by CASTL, with input from industry and subject matter experts from the National Institute for Bioprocessing Research and Training (NIBRT), the Reskilling Program is offered as part of select universities' curriculum.

The program curriculum is delivered over six weeks of facilitated learning followed by four weeks of on-the-job training with an industry employer. Participants will be required to complete evening and weekend assignments, and attendance and completion of all coursework is mandatory to obtain the official course certificate.

After completing this training, participants will be eligible to apply to various entry-level positions in biomanufacturing such as:

- Quality Control Technologist
- Production Technician
- Aerosols Technician
- Research Technician
- Process Technician

The PEI Biosciences Reskilling Program is funded by the Prince Edward Island Department of Economic Growth, Tourism and Culture through the Canada-PEI Labour Market Agreements.

Have Questions?

For further information about the Reskilling Program, please contact:

Kelsey Turner
Program Manager
kelsey@castlcanada.ca

IN-PERSON

LEVEL
Introductory

DURATION
10 weeks

“It was a smooth transition. Everything I learned at Reskilling—GMP and GLP principles, laboratory procedures, regulations, etc.—is part of my everyday work. It’s such an advantage when what you learn in the classroom aligns to the real-world workplace.”

— Lobna Eltaher

Audience

Eligible candidates must:

- Be underemployed or unemployed at the time of application (work less than 25 hours per week)
- Have a grade 12 diploma; post-secondary education or relevant work experience would be considered an asset
- Be a Canadian citizen or permanent resident of Canada
- Reside in Prince Edward Island
- Demonstrate English proficiency
- Be able to work independently and safely
- Be able to perform repetitive tasks for extended periods of time
- Have access to reliable transportation as travel to employer sites (required for OJT component of the program)

** Successful applicants may be eligible for a cost-of-living subsidy including childcare and travel-related costs if applicable.*

Key Topics

The training curriculum addresses topics including:

- Overview of the biosciences industry
- Good manufacturing practice/good laboratory practice
- Laboratory science
- Fundamental mathematics
- Instrumentation and data analysis
- Health and safety

CASTL BioWorks Training Program: Upskilling Canada's Biomanufacturing Workforce

Overview

The CASTL BioWorks training program offers Canadian biomanufacturing industry employers the opportunity to save 50% on customized CASTL training programs to upskill or cross-train their employees.

- **Funding period:** December 2024 to March 2026
- **Save 50% on training costs:** Upskill your workforce at a substantial savings.
- **Customizable curriculum:** Training is tailored to the specific needs of each organization.
- **Flexible delivery:** Part-time and/or full time with hands-on technical skills training
- **Convenient scheduling:** Delivery times scheduled to minimize operational disruptions.
- **Comprehensive skill development:** Focus on both technical and professional growth.

Get started today

Contact us at program@castlcanadaca

Eligibility Criteria

Candidates must:

- Reside in Canada and have a minimum of one year remaining on a work permit.
- Possess at least three (3) years of professional, part-time, or volunteer experience.
- Hold a minimum of a high school education.

Key Topics

The training curriculum addresses topics including:

GMP biomanufacturing processes:

- Upstream Processing
- Downstream Processing
- Fill Finish Operations
- Quality Assurance/Validation
- Quality Control
- Emerging Technologies, including vaccine development and specialized medicine

Professional skills training

- Communication
- Team Building
- Leadership
- Essential Management Skills

CASTL BioWorks
adMare Academy Partner

Upskill Canada POWERED BY palette skills

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CASTL

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