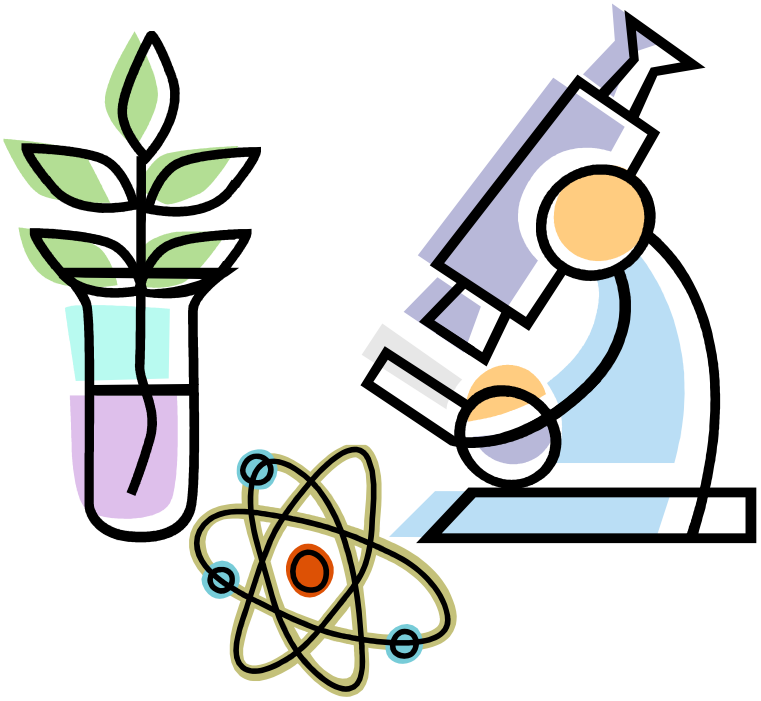
BCIT 2018 Biotechnology Career Awareness Program



This package contains:

- Program Overview
- Summary of Events
- Criteria
- Workshop Descriptions
- Career options
- Application form

Program Overview

Welcome to the fifteen year of the Biotechnology Career Awareness Program. The program is directed at Grade 10, 11 and 12 students with an interest in science and is built on a partnership between BCIT, Life Sciences BC, local biotechnology companies and participating school districts.

The program consists of a series of integrated elements:

- A student application and selection process
- Laboratory workshops at BCIT
- Industry visit

There will be **24** openings for the workshops and industry visits. The program assigns a student quota to each district and every effort will be made to accommodate interested students if district quotas are not filled.

Districts can be responsible for student selection ensuring that students meet the selection criteria (please see Selection Criteria).

The program will provide bus transportation (when applicable) between the laboratory and the industry site. The Biotechnology Career Awareness Program instructors endeavors to improve the program each year. We welcome your feedback on any part of the program at any time.

Thank you for helping make the program the success it has become.

The Program Planning Committee

Getting Started

- ✓ District coordinator, teacher, school representative OR qualified students send application forms to **biotech@bcit.ca** BCIT Biotechnology department by **NOVEMBER 2, 2018**.

NOTE TO DISTRICT COORDINATORS/TEACHERS/FACILITATORS/
If possible, please submit completed forms as soon as they are received to secure seat bookings. Applications are accepted from September to November and workshop placements are on a **first-come first-served** basis.

Please note that the domestic student course fee is 211.99$
International student course fee is (2.5X domestic) 529.98$
Due to the high number of cancellations for Workshop B (end of April) in previous years, we may be **recruiting for Workshop B in January/February 2019**.

Application and acceptance process for
WORKSHOP A: **December 10-14, 2018.**

1. Applicant creates BCIT student number **https://secure.bcit.ca/sis/reg/** and **INCLUDES NUMBER ON APPLICATION FORM** (required field).

2. Accepted students will be notified via email the week of **November 12th, 2018** and directed to make payment **http://www.bcit.ca/study/courses/biot0001**

3. **In order to confirm seat, each student fee payment MUST be made to BCIT no** later than **FRIDAY NOVEMBER 16, 2018.** If payment does not occur by the deadline, seat will be offered to applicants on the waiting list**.**

Information for Accepted Students

PAYMENT OPTIONS

BCIT offers a variety of convenient payment options for tuition and related student fees:

- ✓ Online banking (bill payment)
- ✓ In-person – cash, debit card, cheque, bank draft, money order

Please note, BCIT **does not accept credit cards** for payment of tuition and related student fees or for rent.

1. **Online banking (bill payment):** BCIT accepts payment from Canadian banks and credit unions and it is the **recommended method** for paying your fees. Payments can be made quickly and at your convenience through your bank's online services using your home computer, tablet or smartphone.

   Canadian financial institutions have two payment options: Tuition and Rent. Find the bill payments section on your institutions' website and add "BCIT – Tuition Payments" as a PAYEE to pay for your courses. **DO NOT** use the rent option to pay for tuition as this could result in you being dropped from courses for non-payment. Find the bill payments section on your institutions' website and add **"BCIT – Tuition Payments"** as a PAYEE. **Your nine (9) digit student ID (A########) is your account number**. If the student ID is not present, the funds will be returned to your financial institution.

   Please note there may be a delay of up to 48 hours from when you make your payment to when the payment reaches BCIT, so ensure you schedule sufficient time before your payment deadline. **You can view your BCIT receipt in your myBCIT account to confirm payment has been received by BCIT**. View instructions

2. **In-person (Student Information and Enrolment Services):**

   Customers can choose from a variety of in-person payment options including:

   - Cash
   - Debit card – please keep in mind your daily transaction limit
   - Cheque – please ensure the cheque is made payable to BCIT and includes your student ID
   - Bank draft
   - Money order

Selection Criteria

Eligible students must:

- ✓ Have an expressed interest in science-related curriculum, be enthusiastic about scientific research and lab work, and be interested in learning about careers related to biotechnology
- ✓ Be a Grade 10, 11 or 12 student
- ✓ Actively participate in the lab-based workshops and attend all sessions
- ✓ Be able to initiate and maintain conversation with practicing professionals at an industry site concerning occupational information and scientific focus

Student Sponsorship

- ✓ If a school/district would like to fund their students, BCIT can send an invoice to the sponsoring organization. Payment can then be made by cheque or electronic funds transfer. BCIT's payment terms for sponsorship invoices are net 20 days.

Refunds

- ✓ Refunds for students who cancel their participation in the Program will be reviewed under BCIT's part time studies refund guidelines and ultimately determined by the staff in BCIT's School of Health Sciences.
- ✓ **Two (2) weeks' notice** for cancellation is required in order for student to receive refund.

Please contact **Program Manager** for further information.

604-432-8831
biotech@bcit.ca

BCIT Workshop Description

Monday Lecture AM	What is biotechnology? ▪ Renaissance or Revolution ▪ The component technologies ▪ Applications of Biotechnology Basic Biotechnology Principles ▪ Cell theory ▪ The role of Protein ▪ How genes are turned into proteins ▪ Extra-chromosomal DNA Part 2:The Component Technologies ▪ Selective breeding ▪ Selective mutation ▪ Recombinant DNA technology
Lab PM	Lab1: Use of Micropipettors and Spectrophotometers Lab 2: Preparation of culture Lab 5: The growth of mammalian cells
Tuesday Lecture AM	Cell Culture Theory ▪ Defining Cell Culture ▪ Animal Cell culture ▪ Plant Cell culture Cell Fusion Technology ▪ What is cell fusion? ▪ Gene transfer by cell fusion ▪ The monoclonal antibody Fermentation Technology ▪ What is an enzyme? ▪ Bioreactors Enzyme Technology ▪ What is an enzyme ▪ Uses of enzymes Immobilization Technology ▪ Definition ▪ Uses
Lab PM	Lab 3: Plasmid Preparation Lab 6: Plant and Cell Culture

Wednesday Lecture AM Lab PM	Application of Biotechnology Applications in Health Care ▪ Diagnosis of disease ▪ Treatment of disease Applications in Plant agriculture ▪ Genetic engineering in plants ▪ Micropropagation of plants ▪ Biological Fertilizers Applications in Animal Agriculture ▪ Animal health ▪ Reproductive manipulation in animals Lab 4: Restriction digests and gel electrophoresis
Thursday Lecture AM Lab PM	Application of Forestry ▪ Genetics enhancement of trees ▪ Disease control ▪ Seedling productions ▪ Forest products biotechnology Food Biotechnology ▪ Bioprocessing ▪ Fermentation ▪ Single Cell Protein Environmental Applications ▪ Sewage treatment ▪ Bioremediation ▪ Biological mining Mining Biotechnology ▪ Bioprospecting the seas ▪ Aquaculture Lab 8: ELISA Lab 7: DNA fingerprinting
Friday Lecture AM PM	Ethics in Biotechnology ▪ Biomedical ethics ▪ Environmental release ▪ Food safety and quality ▪ Animal well being ▪ Social and economic consequences ▪ Intellectual property Industry Visits

✯ Schedule subject to change

Examples of Careers in Biotechnology

In Research & Development

Research Scientist

- Responsible for initiating, directing and executing all preclinical scientific research and/or development strategies for a company through the research staff or individual studies which are critical.
- Typically requires a PhD in a scientific discipline.

Research Associate

- Responsible for research and/or development in collaboration with others for projects.
- Typically requires a B.Sc. or a M.Sc. in related field.

Laboratory Assistant

- Responsible for performing a wide variety of research and/or development, laboratory tasks and experiments.
- Requires a high school diploma or some laboratory experience.

Quality Control Analyst

- Responsible for conducting routine and non-routine analysis of raw materials, in process, and finished formulations according to standard operating procedures.
- Typically requires a B.Sc.

Quality Assurance Associate

- Responsible for performing a wide variety of activities pertaining to assuring compliance with applicable regulatory requirements by conducting audits, training programs, data and documentation reviews and analysis.
- Typically requires a B.Sc.

In Regulatory Affairs

Regulatory Affairs Associate

- Responsible for the coordination and preparation of document packages for regulatory submissions to regulatory bodies, such as the Food and Drug Administration (FDA) in the US and the Therapeutic Drug Program in Canada,
- Performs internal audits and inspections.
- Typically requires a B.Sc.

Manufacturing Associate

- Responsible for the implementation of production and large scale manufacturing
- Procedures to optimize processes and regulatory requirements.
- Typically requires a B.Sc.

Process Development Scientist

- Responsible for the development of methods for the production, purification, fermentation and testing of new process formulas, technologies and products.
- Typically requires a PhD in a scientific discipline.

In Clinical Research

Medical Director

- Responsible for managing the direction, planning, execution, and interpretation of clinical trials (clinical trials are research involving humans) and the data collection activities.
- Typically requires a MD or PhD.

Medical Writer

- Responsible for researching, writing, and editing clinical reports, summarizing data from clinical studies for submissions to the FDA and for publication and/or presentation.
- Typically requires a B.Sc. or M.Sc.

Clinical Research Associate

- Responsible for the design, planning, implementation and overall direction of clinical research projects.
- Typically requires a B.Sc., RN or BSN degree.

Biostatistician

- Responsible for the design, development, modification and evaluation of a technical infrastructure to expedite conducting and evaluation of clinical trials.
- Typically requires a M.Sc. or PhD.

WORKSHOP A December 10-14, 2018
BIOTECHNOLOGY CAREER AWARENESS PROGRAM
E-mail application form to:
biotech@bcit.ca

BCIT Student Number: **A01**:_____ (required field)

No student number? Create one here: **https://secure.bcit.ca/sis/reg/**

Applicants Last Name: _____First Name: _____

City: _____

Telephone: _____Email:_____

Gender: _____

Grade: _____ School:_____ District #:_____

Teacher's Name: _____ Teacher's e-mail_____

Did you apply to this program in 2017/18? ☐ Yes ☐ No

BCIT will possibly be using photographs of participating students for promotional material for this program. Parental permission is needed.

My personal information (photographic/video image only) may be collected under the Authority of the Institute Act (RSBC 1996, Ch.225) for the purposes of instruction or promotion. I hereby authorize BCIT exclusive permission to use this information for purposes of promotion of BCIT programs and graduates and marketing in any published or displayed media format for no charge.

Participant Name:_____
Parent Name:_____
Parent Signature:_____

- ✓ **Location and schedule details will be sent 2 weeks before program start date.**
- ✓ Students not selected for Workshop A will be notified when recruit for **Workshop B April 29-May 3 2019** begins and offered an opportunity to attend if still interested.