

# Fast Trak™ training and education

CELL1

## 바이오의약품 생산을 위한 배양 기본 과정

기간: 3.5일

### 코스 소개

Fast Trak CELL1 코스에서는 싱글유즈 (Single-use) 장비를 이용한 바이오 리액터 세포 배양 및 업스트림 공정 개발 전략을 다룹니다. 공정 최적화 및 스케일-업을 위한 중요 변수 전반에 대해 학습할 수 있습니다. 또한, GMP 시설에 적합한 유효성 검사 및 공정 디자인 고려사항에 대해 함께 토론합니다.

실습 과정에서는 실제 동물세포를 이용하여 바이오리액터 접종 및 배양 결과에 대한 평가를 수행합니다. 학습자는 세포 대사작용 (cell metabolism)에 근거하여 배양 전략을 이해하고, 공정 변수 조절을 통한 변화를 관찰하여, 배양 공정 전반에 대한 이해도를 높입니다.

- 세포 배양 기술의 심화된 트레이닝
- 배지 최적화 및 개발 사례 공유
- 동물 세포 배양의 공정 개발 및 평가
- 스케일-업

### 코스 일정

- 날짜: 진행 예정 없음
- 장소: Cytiva APAC Fast Trak 센터
- 주소: 인천광역시 연수구 송도미래로 9 BRC 2동 2층
- 식사: 점심식사 제공

### 수강 대상

R&D 연구원, 프로세스 엔지니어, 제조 기술자

### 등록 방법

APAC Fast Trak 웹사이트([bit.ly/fasttrak-kor](https://bit.ly/fasttrak-kor))를 통해 직접등록 또는 Cytiva 카카오톡채널을 통해 연락주시기 바랍니다.

### 코스 금액 (2024년 기준)

Fast Trak Center	List Price	Product Code
Korea, Songdo	4,178,000 (KRW)	29244576

### 강의 내용

아래를 포함한 17가지 강의 주제

- From cell culture to bioreactor
- Determine mixing time and kLa
- Process control in bioreactors
- Inoculate fed-batch and perfusion cultures
- Development of cell culture media
- Process evaluation
- Process optimization
- Culture scale up
- Harvest culture



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## Advanced bioreactor cultivation technology

*Duration: 3.5 days*

### Course description

This course covers bioreactor cultivation and upstream process development strategy using single-use equipment. You will learn how to optimize processes and monitor critical parameters for scale-up.

We also discuss validation and process design considerations for good manufacturing practice (GMP).

Practical sessions include bioreactor inoculation and evaluation of cell culture performance using analytical techniques. You will develop a medium and feed strategy based on cell metabolism and scale it up using key engineering principles.

- In-depth training on cell culture technology
- Optimization and development of medium
- Process development and evaluation, scale-up, and bioengineering in an animal cell culture

### Who should attend?

This training course will be useful for research and development scientists, process engineers, and manufacturing technicians. A basic understanding of cell culture and corresponding techniques is required for this course.

### After the course, you will be able to:

- Have a detailed theoretical background about process control strategies in bioreactors and culture scale up
- Be trained in controlling and evaluating fed-batch and perfusion cultures
- Know how to perform basic characterization of a bioreactor and interpret the results
- Have an overview of strategies used for process optimization

### Topics covered

- From cell culture to bioreactor
- Determine mixing time and  $k_La$
- Aseptic fluid transfer
- Process control in bioreactors
- Inoculate fed-batch and perfusion cultures
- Development of cell culture media
- Cell metabolism
- Inoculate a micro-carrier culture
- Process evaluation
- Calculate cell specific nutrient consumption and design a feed concentrate
- Process optimization
- Culture scale up
- Validation of cell culture based processes
- Cell separation
- Analysis of product concentration
- Scale up of filtration-based methods
- Harvest culture

## General course information

Fast Trak™ Education is one means by which Cytiva provides application training in the various aspects of bioprocessing.

The courses are designed to provide a learning experience for process development and manufacturing staff.

There are hands-on training courses on column packing, basic chromatography, optimization and scale-up for both pilot and production scales. Courses on validation issues and chromatography theory are also given. The courses are run at our regional Fast Trak centers or customized at your premises.

### Cancellation policy

In case you need to cancel your registration, the following charges will apply:

- 30 to 21 days prior to course: 50% of course fee
- 20 to 8 days prior to course: 80% of course fee
- 7 days or less prior to course: 100% of course fee

If you are unable to attend after registered, you may send a colleague in your place or attend another course.

Cytiva reserves the right to modify course location, course material, substitute speakers, or to cancel the course. If the course is cancelled, registrants will be notified as soon as possible and will receive a full refund of paid fees. Cytiva will not be responsible for airfare penalties or other costs incurred due to a course cancellation.

### Course certificate

Upon completion of the course, each participant receives a course certificate in which course name and course date is stated.

### Course evaluation

At the end of each course, you will be asked to fill in a course evaluation form. We value your opinion of the course, the speakers, the material, and presentations and use this feedback to continuously improve the courses and their contents.

## **Travel and hotel costs**

Travel and hotel costs are not included in the course price.

## **Language**

Standard courses are held in English at Fast Trak Centers in USA, Sweden, Turkey, India, Singapore and Korea, unless otherwise specified. In China, most courses are in Chinese with occasional courses in English. The courses in Germany are held in German and courses in Japan are held in Japanese. Customized courses can be presented in other languages. Please contact the Fast Trak center for more information.

## **Lunches**

All lunches during course days are included in the course prices.

## **Material in binders**

Each course participant will receive the lectures and other relevant material in a binder.

## **Requirements for safety level S1 (L1) laboratories**

Every course participant who enters our laboratories for the practical sessions must comply with certain safety requirements. Please notice that open-toe shoes are not allowed in the lab. Obligatory protective clothing and safety devices will be provided.

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