



香港資優教育學苑  
The Hong Kong Academy for Gifted Education

香港特別行政區政府教育局資助  
Subvented by the Education Bureau, the Government of the HKSAR

E4BTE002C

(Token- required)

[ **Gifted Programme** ]

# Biotechnology Course (Level IV): DNA Sequencing and Genomics

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**Application Deadline**  
**13 May 2024 12:00 noon**

**Result Release**  
**24 May 2024**

## Intended Learning Outcomes

Upon completion of the gifted programme, gifted students should be able to:

1. recognise the nature of traditional genetics theory and explain the principle of Mendelian first law of genetics and second law of segregation;
2. describe the recombinant DNA technology in the transformed organisms and medical diagnosis using DNA probes and hybridization;
3. explain gene technologies by investigating the non-coding variable number tandem repeats in DNA;
4. perform genomics experiments, e.g. detection of Barr body from epidermal cell, and cloning of antibiotic gene experiment;
5. identify moral issues related to genomics technologies and determine the ethical correctness of biotechnology in human populations.

## ◆ Gifted Programme Introduction

In this course, detail explanations of developmental genetics from traditional Mendelian genetics to modern genomic technologies will be provided. Students can learn concepts of genetics, e.g. mutations, cancers related to genome projects, and recombinant DNA technology. Real-life applications will also be introduced, such as gene probes and medical diagnosis, genetic fingerprinting, regulation of transcription and translation, and stem cell application. Besides, hands-on experiments are designed to demonstrate the techniques in genomics technologies (e.g. detection of Barr body from epidermal cell, cloning of antibiotic gene experiment). To raise students' awareness about related moral issues, topics such as the ethical issues of biotechnological technique applied in human population will be explored.

## ◆ Schedule

Session	Date	Time	Venue
1	6 Jul	10:00 a.m. – 1:00 p.m.	HKAGE (To be confirmed)
2	13 Jul		
3	17 Jul		
4	20 Jul		
5	24 Jul		
6	27 Jul		

## ◆ Suitable for

- S3 to S6 HKAGE student members in 2023/24 school year
- Class size: 30

## ◆ Pre-requisite

- Biology knowledge of S3 or above level is recommended.

## ◆ Medium of Instruction

English with English Handouts

## ◆ Screening

Please answer the screening questions in the online application form.

\*The screening questions are designed to help the applicant understand the course level and the course content. The questions must be answered by the student applicant and it can only be attempted once. The answers cannot be changed once the application is submitted. Selection is based on students' performance in answering the questions. Only students who can demonstrate motivation and knowledge of biotechnology in the screening questions can be enrolled in the programme.

## ◆ Certificate

E-Certificate will be awarded to gifted students who have:

- attended at least 5 sessions; and
- completed all the assignments with satisfactory performance.