

# 2018 HKDSE Biology Paper 2 Section D

Comment on Candidates' Performance



## Q.4(a)

- In general: Poor

Excellent

Average

Poor

## Q.4(a)(i)

- Fair
- About 59% of candidates provided at least one disadvantage of the treatment
- Many gave answers that are medical blunders rather than disadvantages of the treatments itself (e.g. transfusion of the wrong type of blood, contamination)

The effect is short-term that John has to receive blood infusing for many times. ✓

The time to find blood donor is relatively long as the problem of blood group incompatibility has to be dealt with.

## Q.4(a)(ii)(1)

- Fair
- Most answers were incomplete
- Some did not make reference to the case given in the question

ii) Stem cells can differentiate into different type of cells, which more cells can have the normal gene.

ii) Stem cells are capable of undergoing mitotic cell division to multiply themselves  and differentiate into the desired liver ~~cell~~ tissue cells that are able to produce the liver protein.

## Q.4(a)(ii)(2)

- Poorly answered
- Many did not pay attention to the major difference between approaches I and II
  - Simply gave irrelevant answers which only applied to the potential hazards of gene therapy in general



## Q.4(a)(ii)(2)

Secondly, the viral vector may cause rejection when introduced to liver cells in approach I as viral vector is transfer into the liver cell directly, while in approach II the problem can be eliminated by introduce the liver stem cells of the patients which is his own cell.

## Q.4(b)

- In general: Satisfactory



## Q.4(b)(i)

- Very good
- Some wrongly thought that DNA was a protein (DNA denaturation = protein denaturation)

Stage 1 ✓ corresponds to DNA denaturation. It has the highest temperature among the 3 stages at  $93^{\circ}\text{C}$  ✓. The high temperature is required to denature the DNA to separate the two strands into individual strands by breaking hydrogen bonds between complementary bases. ✓



## Q.4(b)(ii)(1)

- About 45% of candidates provided at least one correct primer
- Many did not realize that primer is a short DNA fragment
  - No uracil should be present in Primer I
- Did not pay attention to the direction of the DNA extension
- Did not notice that the base sequence of Primer II should be reversed

Primer I: GCCAUCACCC UAUGCUGCUA

Primer II: CCUU AACACU CGCCUAUUGU

## Q.4(b)(ii)(2)

- Very poor
- Many did not know that the PCR product should include the primer sequence, so they answered 340 base pairs
  - DNA extension: DNA extends from the primer

## Q.4(b)(iii)(1)

- Wrongly thought that plasmid (instead of transformed bacteria) was selected / remained alive
- Wrongly thought that it can select bacteria with recombinant plasmid

iii 1) It selects out the bacteria that is transformed (i.e. takes up the recombinant plasmid), as only transformed bacteria has the recombinant plasmid with ampicillin resistance gene and survive in ampicillin. Those that are not transformed are killed.

## Q.4(b)(iii)(2)

- Poor
- Many mistakenly thought that Z gene was the DNA which was inserted into the plasmid

白色，因為重组質粒有Z基因，能把物質轉化成藍色化合物的酶，使菌落變成藍色，而白色沒有變藍色則證明它沒有該重组質粒。

Thank  
you

