

Polymerase Chain Reaction (PCR) and Microarray

Student Activity

1. What do the initials PCR stand for?

- a) polymerization chain reactor
- b) polymerase chain reaction
- c) polymerization containing reaction
- d) polymerase chain reading

2. Who invented PCR?

- a) Francis Crick
- b) Rosalind Franklin
- c) Albert Einstein
- d) Kary B Mullis

3. What is the purpose for which PCR is used?

- a) to amplify DNA
- b) to isolate DNA
- c) to study the function of DNA
- d) to observe the expression of DNA

4. Which of the following best describes the mixture placed in a PCR vial at the beginning of the PCR procedure?

- a) the original DNA sample, Ribonuclease, primers and buffer solution
- b) the original DNA sample, PCR enzyme, the four nucleotide bases and primers
- c) the original DNA sample, DNA polymerase, the four nucleotide bases and primers
- d) the original DNA sample, DNA polymerase, buffer

5. What happens to the DNA when we heat it to 90-95°C for 30 seconds in the first step of the PCR procedure?

- a) the DNA strands separate
- b) the primers bind to the single DNA strands
- c) DNA polymerase extends the new strand by adding bases to the primer segments that are already attached
- d) the PCR process repeats itself

6. What is the optimum temperature for the enzyme DNA polymerase used in the PCR process?

- a) 40°C
- b) 55°C
- c) 72°C
- d) 90°C

7. How many copies of a single original DNA strand would you expect to find after about 30 cycles of the PCR process?

- a) 100,000
- b) 1,000,000
- c) 10,000,000
- d) 1,000,000,000

8. A microarray is:

- a) a collection of microbes
- b) an array of microscopic holes
- c) a regular array of genic DNA attached to a glass, silicon or nylon chip
- d) a type of microscope

9. What is "gene expression"?

- a) DNA that is known to contain genes that can be expressed
- b) the sequence of DNA that is related to a gene

- c) the production of mRNA and proteins that occurs when a gene is transcribed at certain times in the life of the cell
- d) the movement of genes from one cell to the other

10. How do we see the hybridized spots on an array?

- a) the spots are just big enough for us to see
- b) the cDNA or mRNA probe has been labeled with a fluorescent tag that the computer can detect
- c) the spots turn orange
- d) only the hybridized spots stay on the chip

11. Can we determine how much mRNA is expressed in the cell?

- a) Yes, because the computer is able to analyze each hybridized spot and calculate how much is present from the amount of fluorescence it detects
- b) No, there is way too much mRNA for us to see any differences
- c) No, mRNA amounts cannot be quantified
- d) Yes, because we can see how much brighter the spots are than ones that are not hybridized

Adapted from: <http://www.abpischools.org.uk/res/coResourceImport/resources/poster-series/pcr/quiz.cfm>