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| **Activity 3.1.4: Student Response Sheet** |

Part I: DNA Microarray Virtual Lab

1. Why are tissue samples from healthy and cancer cells taken from the same patient?

Because genes are expressed differently in different people, so if they took it from two different people, then the results would be invalid.

1. Describe the process used to isolate mRNA from the other types of RNA.

There are tiny beads in which have t tails because mRNA has a tails, and when you pour all the RNA in the beads, the a tail attach to the t tails, while tRNA and rRNA continue to drain out.

1. Why is it necessary to make a cDNA copy? Why is mRNA not used?

Because genes are expressed more so on DNA than RNA. They also add florescent DNA so you can analyze more effiecently.

1. Look elsewhere.
2. What happens once you apply the DNA from the two samples to the DNA microarray?

They can bind and unbind and rebind to each other. Two cDNA from different sources can pair with one another which is called hybridization.

1. What does the red color indicate?

Cancer

1. What does the green color indicate?

Healthy Cells

1. What does the yellow color indicate?

The two merged together

1. What conclusions can you make from microarray data?

Which genes are turned up or down or are affected by the cancer.

1. What are the limitations of DNA microarray technology?

You cannot diagnosis nor treat anybody with it.

Part II: Lung Cancer Microarray Wet Lab

1. Use colored pencils or markers to draw what you observed in the microarray experiment.
2. Which gene(s) were expressed more in Grandpa Joe’s lung cells? How do you know?

Gene A and gene C should have been the only ones that shown up. We know this after analyzing the microarray.

1. Which gene(s) were expressed less in Grandpa Joe’s lung cells? How do you know?

There is less of gene A that shows up. This is because the colors of gene A are not popping up as much as they do in standardized settings.

1. Were there any genes not expressed in either cell type? Explain why a gene would not be expressed in either cell.

B and D did not show up. Because the gene may or may not be needed in that specific area.

1. Explain what it might mean for a gene to be expressed the same in both Grandpa Joe’s lung cell and a non-smoker’s lung cell.

That tobacco does not effect the gene.

1. Which genes may play a role in causing cancer in lung cells? Explain your choices.

Gene A, the more chance of getting it has a higher ratio with gene A.

1. Record your gene expression ratios for your microarray:

1= 3:1

2= 1:8

3= 1:4

4= 0:0

5= 2:1

6= 1:4