

Checking Up on Genes

You are oncologists specializing in breast cancer and will be conducting a microarray analysis on one of two newly diagnosed breast cancer patients, Mrs. Jones and Mrs. Brown. You will be adding a solution to each spot on the array that represents the complementary DNA (cDNA) of your patient to determine her gene expression profile. After you complete your microanalysis, you will decide on her course of treatment.

Procedure

- 1 Read your "How DNA Microarrays Work" student handout to learn what microarrays are used for and how they work.
- 2 The plastic grid your teacher will give you represents the microarray for your patient. Each spot represents one gene. The solution represents the cDNA of a cancer patient. Using the solution your teacher has given you, use a pipette to add three drops in each spot on the microarray for your patient.
- 3 Once all the spots have been treated, use the key on your "Gene Locations on Array" handout to interpret your results. Then record the result for your patient under each gene name on the same handout.
- 4 After you have interpreted the results, use your "Cancer Therapy Options" handout, which describes several treatments for breast cancer. Use the results of your microarray analysis to determine which therapies might be indicated for your patient. Then answer the questions on this page.



Questions

Write your answers on a separate piece of paper.

- 1 Which treatment or treatments would you recommend for your patient?
- 2 Some genes, such as ERB-B2 and ESR1, have been found to be associated with particular diseases or conditions such as cancer. Other genes, such as the ABC-B2 gene, are not associated with a disease but are involved in resistance to certain drugs or treatments. Why would it be useful to test for the expressions of genes like the ABC-B2 gene on a microarray?