In recent years, scientists and doctors have been becoming more excited about personalized medicine in which doctors can prescribe the best available medicine to their patients based on the results of a genetic test. Currently, there is a fair amount of guesswork in deciding which specific medicines to prescribe to a patient. Often a doctor will prescribe one medicine and ask the patient to take it for a few weeks. If the patient does not get better, the doctor would prescribe a different medicine instead. The idea behind personalized medicine is that doctors would no longer have to choose amongst a dozen different medicines to treat the same condition as the doctor would have more personalized information available about a patient in order to tailor medication and treatment.

A new field of study has emerged to address personalized medicine. This is called “pharmacogenomics.” Pharmacogenomics incorporates scientific information from drugs and pharmacology (“pharmaco-”) with genomic information (“-genomics”) that comes from a DNA test that looks at all of a person’s genetic sequence information. Pharmacogenomics is a new and emerging field incorporating genetic information with pharmaceutical information with the goal of using a person’s “genotype” (that comes from DNA) information to prescribe drugs that will provide the most therapeutic benefit and least negative side effects to the patient. To date, most studies in pharmacogenomics involve individuals of European descent, and very few people from ethnic minority backgrounds have participated in or benefited from these studies.

Pharmacogenomics research is “focused on improving drug safety and efficacy” for people, so it is more likely to offer “a more immediate potential for benefit” compared to other types of genetic research that are not directly related to human health (Boyer, Dillard et al. 2011). The inclusion of ethnically diverse populations, including American Indian/Alaska Native communities, is very important in pharmacogenomics research to ensure that genetic tests are designed that are relevant for these populations. It is also becoming important for American Indian/Alaska Native communities to be involved in implementing these genetic tests for the purposes of providing drug prescriptions and treatment in order to benefit from pharmacogenomic studies (Boyer, Dillard et al., 2011). Scientists and community members must find ways to work with each other in a respectful and collaborative manner to ensure maximum benefit for all. One case of a successful pharmacogenomics collaboration is in South Dakota, where American Indian cancer patients were given tailored cancer treatment based on testing for a specific genetic marker. If a patient had the genetic marker, the doctors could adjust the dosage of the cancer treatment and the patient had better care and less side effects.

**Discussion Questions:**

1. If your tribe participated in a genetic research study investigating the best drug treatment for a certain condition and it was shown that the drug was effective, how would you ensure that the drug would be available to your tribe after the study is over?
2. If pharmacogenomic research becomes successful, how would your tribe use the information in a clinical setting? Who would run the genetic tests? Who would interpret the results?