MAYO CLINIC

Pharmacogenomics: Your Own Prescription

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Richard Weinshilboum, M.D.: Well what we've been doing for decades is that my research group and I have been trying to understand variations among individuals and their response to drugs. The drugs we have available today really can do amazing things, but because of that, they're actually quite dangerous unless they're used properly.

And what we really want to do is individualize drug therapy, and the way we're trying to do that is to take advantage of genetic differences among people.

So this is a field of pharmacogenetics, and in this post-Human Genome Project era, it's become pharmacogenomics, meaning that we don't just focus in on a single gene; we now have the technical ability to scan the whole genome and try and understand which genes make all of us respond slightly differently to these wonderful drugs that the physicians have available to treat all kinds of diseases that we couldn't treat before.

So one of the critical factors with regard to our ability to use this amazing new science is for us to collaborate with each other, both across the United States and increasingly across national boundaries, and I'll give you a concrete example.

The Pharmacogenetics Research Network was established by the NIH to enhance collaboration within the United States, and that actually is happening. But what is amazing to me is the extent to which we now are collaborating with our colleagues in Japan at RIKEN, which is their genome project, where they have the ability to do very high-quality genotyping, that is, these markers across the genome so we can find genes.

And just here at Mayo we have four studies of breast cancer that involve thousands of samples and, therefore, millions of dollars' worth of genotyping, which they are doing for free in order to collaborate with the NIH to achieve our scientific goals.

In fact, the head of a German group that does all of their breast cancer research was here in Rochester, Minn., and 3,484 samples of DNA from breast cancer patients in Germany are in Olmsted County, Rochester, Minn., where we are collaborating with them.

In today's world, we really can't afford to compete with each other. We have to collaborate with each other and when that happens, it means we can take better care of patients with breast cancer, with childhood leukemia and with all of these terrible diseases that we've invented these drugs to combat.