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Biogenetics: help or horror?

Experts debate science's future

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Eating pork won't lower your cholesterol, but the fact that genetic research could make it possible is enough to make any barbecue lover hungry.

"If we understand the genetics of pigs, we can then develop pigs that ... will be more suitable for your health," said Dr. David Allison, professor of biostatistics at the University of Alabama at Birmingham. "You might actually develop pork that would be beneficial for your heart."

While such medical miracles aren't on the drawing board yet, they are only part of the many opportunities genetic research may one day offer, he said.

"This is an incredibly exciting time to be in genetics. We are now producing data on a massive scale," he said.

Allison, head of the section on statistical genetics at UAB, on Monday moderated a daylong symposium on plant and animal genetics, focusing on ways scientists are learning to handle the flood of data.

The symposium's keynote speaker was Dr. Christopher Haley, director of genetics and biometry at the Roslin Institute in Edinburgh, Scotland, where the now-famous sheep Dolly was cloned in 1997.

A recent genetic research study on Meishan pigs, compiled from studies around the globe, points to the increasingly important role genetics will play in modern medicine, Haley said.

"To begin with, we hope to one day create organs in animals such as these that resemble human organs," which would greatly increase the ability to conduct organ transplants, he said. Genetics could also be used to create replacement tissue in donor animals, he said.

In addition to transplants, knowledge of the genetic material could allow the prediction of certain diseases and the pathways in which those diseases function in the body, Allison said. From that knowledge could come medicines to prevent diseases before they strike, he said.

Haley

But the idea of tampering with

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the genetic code has created a huge ethical debate that is not likely to end soon, said Dr. Alfred L. GeorgeJr., director of the division of genetic medicine at Vanderbilt University.

"It's still a field that's ripe with moral controversies," he said.

While many of the more fanciful fears of armies of genetically modified, superhuman clones taking over the world have largely been discounted, real fears exist, he said.

To begin with, studies have shown cloning can produce serious deformities and complications, which would make testing on humans problematic, if not wrong, George said. Since genetic studies began in the early '80s, the knowledge and consent of the patient in such studies has already become a serious issue, he said.

George said Congress has already taken steps to handle one of the worst fears of the new research: genetic discrimination by insurance companies who won't give insurance to a family with a history of a particular disease. The Health Insurance Portability and Accountability Act of 1996 protects customers from being discriminated against for various conditions, including genetic susceptibility.

"Can an insurance company take genetic information and use it to prioritize who they want to insure? A lot of people are concerned about this. Those are uncharted waters," he said.

The debate could to heat up in January if the world's first cloned baby is born. A controversial Italian fertility doctor, Severino Antinori, claims such a birth will occur, but most biogeneticists discount his claims.

George said most doctors are hesitant to unlock Mother Nature's secrets, especially since scientists know so little about the complexity of genetic materiel.

"I think there's a general sense in the scientific community that one should not tamper with the germ line (the genetic information passed from one generation to the next). We're not sure of the implications of tampering with it," he said.

Allison said the success of the Human Genome Project, which is close to its goal of identifying all the near-30,000 genes in human DNA and determining the sequences of the 3 billion components of DNA, has opened up a new world of genetic research, specifically in his field of statistics.

"There is now this deluge of exciting data, and we're just now learning how to use it. Statistical genetics is becoming ... one of the most important fields of our time, because how else are we going to deal with this flood of data?"

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