

# Genomics education

## hottest topic on campuses

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CHARLOTTE, N.C. -- Colleges across the nation are pouring millions of dollars into a new field that promises to cure disease and unlock the secrets of evolution.

Genomics, the study of the sequence of chemical instructions that make us who we are, may be the hottest research topic to hit colleges in decades, experts say. Some economists say it may replace information technology as the next economic boom.

"We're seeing genomics centers springing up at universities all over," said Alan Guttmacher, senior clinical adviser at the National Human Genome Research Institute. "This is such an incredibly important part of the future in research, schools know they have to get involved."

At least five campuses in the Carolinas have announced multimillion-dollar genomic initiatives in recent years.

Officials at those institutions say they

### Colleges pouring millions into new field

must become leaders in the field to continue to attract top students and faculty members and to capture research dollars.

Other colleges, even if they have not created formal genomics centers, say genetics have become an essential part of almost every scientific endeavor. Students and faculty members everywhere are grappling with new scientific, ethical, legal, religious and social issues raised by the field.

About a year ago, two competing groups — a public consortium of international scientists and a private U.S. company — completed the colossal task of sequencing the human genome.

While the two groups are still quibbling over details, they agreed on the order of most of the 3 billion "letters" of the biochemical code in the human genome.

Strung together along strands of DNA, those letters contain the basic instructions for building and running a

human body.

The media hailed the discovery as a milestone, but scientists say it is only the beginning.

The database has given researchers the ability to participate in cutting-edge research, said Jeffrey Vance, director of Duke University's Genomic Research Core laboratory.

Before the database, it would take years to produce the same amount of data that now takes only seconds to download, Vance said.

Eventually, researchers say, genomics research will lead to new drugs, better diagnoses of diseases and an improved understanding of human evolution. Doctors probably will treat patients with therapies and medications based on their specific genetic makeup.

The genomics revolution raises ethical and legal questions, however. Critics say insurance companies could discriminate against patients because of their genetic predisposition to disease.

Others question the ethics of allowing parents to choose children's eye color, hair color and gender.

To help with such questions, some institutions have created multidisciplinary genomics centers.

Duke's new \$200 million Institute for Genome Sciences, for example, includes scholars in business, ethics, economics, law, public policy, religion and the environment — in addition to scientists, engineers and physicians.

"Genomics is not just about expanding knowledge of genetics, but what society can and should do with such knowledge," said Duke President Nannerl Keohane.

The National Institutes of Health pumps more than \$20.3 billion into research every year. UNC-Chapel Hill received \$207 million in NIH funding last year, a 20 percent jump from the previous year.

The nation's biotechnology companies raised more than \$30 billion in 2000, three times the amount raised in 1992, according to a report by the Ernst & Young consulting firm.