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Grounding students in biotech
Johns Hopkins hopes courses in other areas help in facing change; Uniting business, science; Financial implications of boom are important factors, officials say

By Karen Nitkin
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Students studying biotechnology at the Johns Hopkins University are taking courses intended to help them feel as comfortable in business suits as they are in lab coats.

Just as colleges and universities began offering courses in the 1990s on business and the Internet, Hopkins officials hope the classes in marketing, ethics, law and management can help students understand the financial implications of the rapidly changing world of biotechnology.

"Twenty years ago, if you were a scientist with a Ph.D., your reputation was your research," said Lynn Langer, whose courses - "Marketing Aspects of Biotechnology" and "Managing Biotech Professionals" - are part of the biotechnology enterprise program.

"Working for a company was considered selling out. ... Now, industry is promoting the science just as much as the government."

And Hopkins officials say that, in that new environment, students will need training in more than pure science to cope with challenges posed by the biotechnology boom.

Among them:

- How to persuade venture capitalists to invest in products that take a decade or more to reach the market.
- How to sell these new products, whether to pharmaceutical companies, universities, the general public or all three.
- The ethical implications of these products, which could lead to everything from a cure for baldness or nearsightedness to "designer babies" or cloned pets.
- The intricacies of patent law and how it applies to something such as the code for a gene.

The now-famous human genome story is an example of how business is driving some of the most significant research in the biotechnology field.

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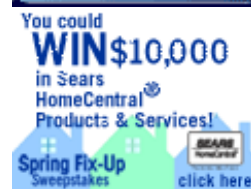
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In 1998, J. Craig Venter started Celera Genomics in Rockville to compete with the government-funded Human Genome Project. A bitter rivalry developed as the two organizations raced to finish the project first.

The competition ended in a photo finish last summer, when both organizations accepted praise for completing the map. Both were in the news again recently when their findings were published in competing journals.

The genome project has made a big splash with the public. But issues related to genetic engineering date to Gregor Mendel, the 19th-century monk and botanist who discovered the principles of genetics, said Debbie Cebula, special assistant to the dean of arts and sciences.

Genetically modified food and cloning are two of the issues that have raised public anxiety. Scientists need to know how to educate the public, Cebula said.

"For many years, scientists felt they only needed to talk among themselves," she said.

And the Hopkins educators emphasize that even those who intend to spend their careers focused on research can benefit from firm grounding in business matters, such as marketing and finance.

That view appears to be taking hold among the latest generation of scientists. Of the 600 students enrolled in the master's level biotechnology program at Johns Hopkins, 120 are taking enterprise courses, said Patrick Cummings, associate program chairman for biotechnology.

There are two enterprise programs. One is a concentration for students earning a master's degree in biotechnology. The other is a certificate program intended for students who want a good understanding of the business aspects of biotechnology without completing the master's degree program.

Five students are in the certificate program, which has been offered since last spring, Cummings said.

Students take four classes for the enterprise concentration, six for the certificate. Biotechnology classes are offered at night and on weekends, so the program attracts scientists working in the field.

The need for courses about the business aspect of biotechnology became apparent five or six years ago, said Langer.

Langer also is managing partner of BioPlan Associates, founded in 1989, which helps biotechnology and health care organizations with their marketing and management.

As far as she knows, the classes are unique to Hopkins. "A few years ago, when I developed the marketing course, I couldn't find another course like it," she said.

"It's clearly something we're pegging our future on," Cebula said of the enterprise classes.

"We've watched the whole genomics thing just explode," she said, adding that the Maryland-Washington region is one of the top biotechnology centers in the world.

Said Langer: "One personal goal of mine is to get the scientists and the business people to understand each other. ... We at Hopkins are working to tear down that wall."

Joyce Fuhrmann and Philip Caramanica said they're glad they took concentrations in biotechnology enterprise when they earned their biotechnology master's degrees at Johns Hopkins. Both earned undergraduate degrees in biology, and both are in product management.

Fuhrmann, 28, of Germantown, is a product manager at Celera, the Rockville company that recently published its version of the human genome.

Caramanica works in product development for American Type Culture Collection in Manassas, Va., a nonprofit organization that provides biological products, technical services and educational programs to government, industry and academic organizations.

The Johns Hopkins program has "helped me a lot," Fuhrmann said. "Now I'm working in product development, so it's nice to have a combination of a technical background with some business skills."

Celera offers databases on its pioneering gene work. Companies and universities pay subscription fees for access to the cutting-edge information. As product manager, Fuhrmann looks at "how people will use the information and then tries to turn that into a product."

She earned her degree from Johns Hopkins in 1999, taking classes part-time while she worked. "There are lots of pieces that have been really helpful," she said of the enterprise program.

Caramanica agrees. The 26-year-old says courses in marketing and management help in his product-development role.

His company, ATCC, breeds cells for study much the way other scientists breed rats. Caramanica's "mycoplasma detection kit" uses a technology known as PCR (polymerase chain reaction) to detect the presence of contaminants in cell cultures and other biological samples.

"The classes helped me by giving me the scientific background to optimize the methodology behind the kit, while at the same time giving me the business background to improve the marketing and advertising of the kit," he said.

Perhaps more important, his biotechnology degree with an enterprise concentration, which he just completed, allows him to keep his options open, he said. Maybe he'll earn his doctorate and become a professor. Or maybe he'll earn a law degree and work on biotechnology patents.

As the field of biotechnology changes, he likes feeling that he's equipped to keep pace.

"There are less people doing research for the sake of research," he said. "Now, I feel there has to be some justification for the research that's done, in terms of money."

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