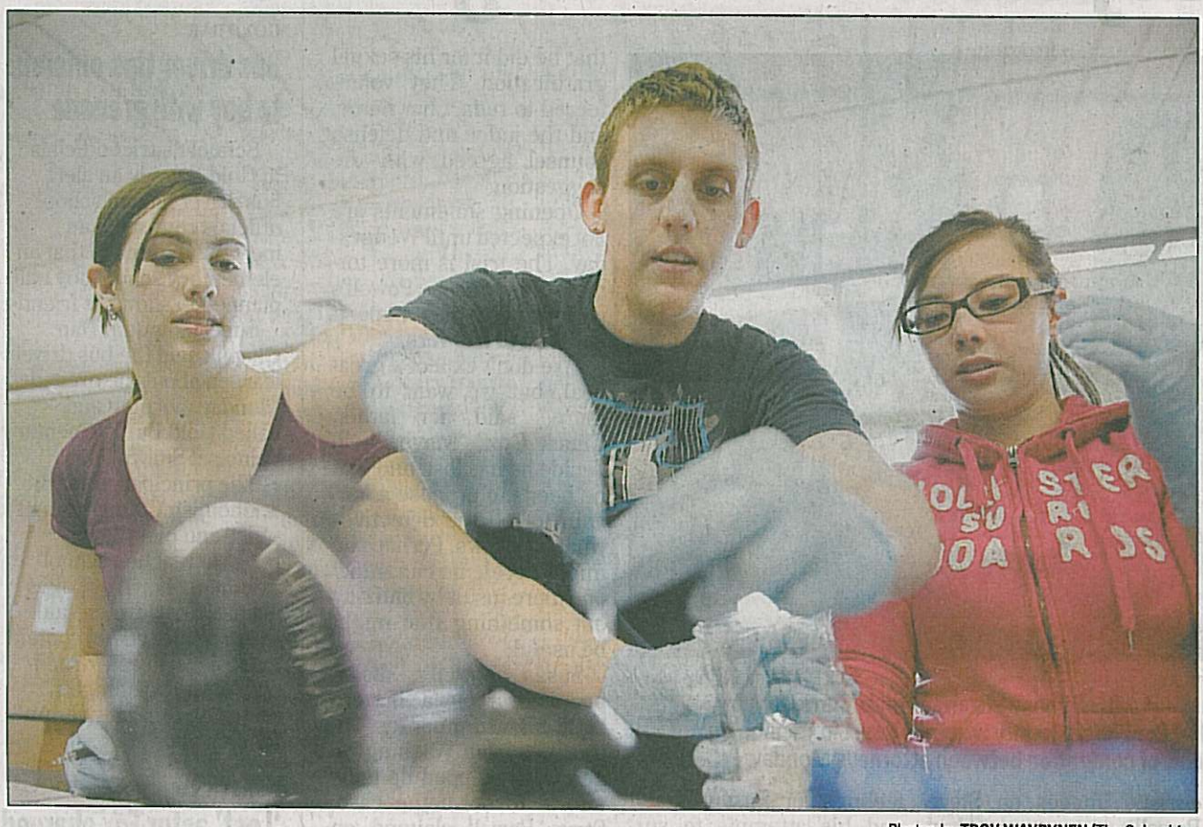
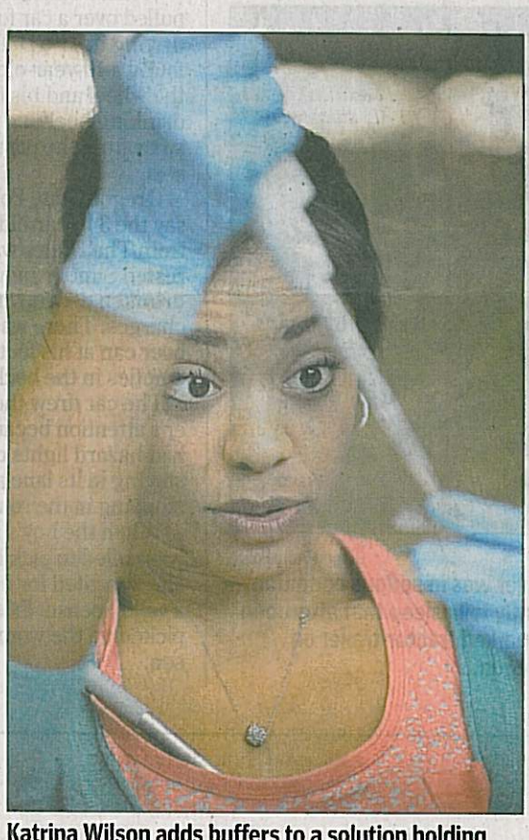


Photos by TROY WAYRYNEN/The Columbian

Yvette Leggewie, from left, Jonathan Clement and Katie Martin, use a centrifuge to isolate an antibiotic that fights a wheat-killing fungus.

Fungus FIGHTERS

Clark College students part of research aimed at helping wheat farmers



Katrina Wilson adds buffers to a solution holding E.coli bacteria to break down the bacteria's cell walls, which will release an antibiotic.

By JACQUES VON LUNEN
Columbian staff writer

In a lab in east Vancouver, researchers stooped over small containers holding clear fluids. Centrifuges sat on counters.

The white board held scribbled instructions, including a drawing of something labeled "DNA."

The 21 men and women working at the benches are helping preserve the world's food supply — and studying up for their associate's degrees in the process.

Phil Jones
Clark College instructor

The cell and molecular biology class at Clark College is part of a statewide grant program that brings real-life research into community college classrooms in Bellevue, Tacoma and Vancouver. The program, called the Community College Genomics Research Initiative, or COMGEN, seeks to find a better way to fight a fungus that's wiping out wheat crops around the world.

The fungus is called Take All, because that's what it does — it takes entire wheat fields, no matter how large. It's one of the reasons why few farmers west of the Cascades grow wheat anymore, said Phil Jones, the instructor of the class at Clark. The fungus loves moist soil.

Researchers have found a way to battle the fungus — a bacterium that produces an antibiotic that fights the fungus. One species of bacteria is particularly effective at producing that antibiotic. It's called Pseudomonas fluorecens and companies have mechanically coated wheat seed with the bacteria, Jones said.

FUNGUS, *Page C3*

Fungus

From Page C1

That method is beating back the fungus, but it's expensive and out of reach for growers in poor countries.

That's why researchers are working on the next step, sequencing the genome of the antibiotic, trying to find strains that work even better. That means they're mapping the DNA — the genetic building blocks — of the antibiotic.

And that's where the college students come in. This work takes a lot of time, Jones said. Scientists aren't manipulating the DNA — they're letting the bacteria reproduce naturally and are looking for variations in the resulting antibiotic that might be better suited for fighting the fungus.

That means looking at millions of variations.

The work is being split among many groups around the globe. And thanks to the efforts of a Bellevue professor, one such group is made up of Washington community college students.

Gita Bangera, the lead investigator for COMGEN and chair of the life sciences department at Bellevue College, wrote a grant application to the National Science Foundation six years ago. In the fall of 2007, students at Bellevue began the sequencing work.

It is very unusual for undergraduate students, let alone community college students, to get involved in real-life research. But letting them be involved can raise a new generation of scientists, Bangera said.

She compared science education to a young kid learning to play basketball in school. Teachers explain some very basic rules of the game and then give the kids a ball to have fun on the court. Only after it's established that playing basketball is fun are the children asked to go through drills, learn to dribble or shoot free throws.

"But in biology, we tell everybody to do the hard and not so exciting part first, that they'll get to do the fun stuff later," Bangera said.

The "fun stuff" being the work that actually helps society.

By letting college sophomores do real research, the students learn how to ask the right questions and get comfortable with the kind of ambiguous answers that real scientists have to deal with, she said.

"You get away from just looking up answers in textbooks," Bangera said.

That was evident in Jones' class.

Clark has been given about 50 different bacteria cultures to process, said Jones, the instructor. The students grow the bacteria cultures, extract the antibiotic's DNA and analyze the variations. Second-term students are doing this work. A class taught by instructor Steven Clark started the process last quarter.

On Wednesday, students were breaking up cell walls of a nontoxic strain of E.coli bacteria, which is used to grow the antibiotic in the lab. Pseudomonas fluorecens has proven to be too difficult to grow in the lab and scientists have managed to isolate the antibiotic so it can be implanted into other bacteria, Jones said.

The students appreciated being part of the greater research effort.

"We're not just going for a grade, we're producing results," said Andrew Ramey, a sophomore.

Raychel O'Hare already has a bachelor's degree and is at Clark to get the prerequisites to go to graduate school for biology. She was happy to see a lab class offered that let her do real research. It prepares her perfectly for the work she'll be expected to do as a grad student. And it makes her feel good about what she's doing in school.

"I'm from Washington," O'Hare said. "I'd like to help out farmers."

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