



AMHERST

Real-time news for Amherst, Massachusetts

Bacteria bubbling at UMass

by The Republican Newsroom
Sunday January 04, 2009, 6:37 AM

By DIANE LEDERMAN
dlederman@repub.com

AMHERST - A group of University of Massachusetts graduate and undergraduate students is hoping a hungry, electricity-producing bacteria can change the portable toilet experience.

The students recently won \$4,000 at the College of Engineering's Innovation Challenge for the company they call Bug Power.

The first-place award also allows the group to compete for \$50,000 in prize money in May and participate in the Advanced Invention to Venture Workshop this month.

Nikhil S. Malvankar, a doctoral candidate in physics, and his colleagues from the physics and microbiology departments have been looking at the electrical properties of the power-producing bacterium genus *Geobacter* for the last few years.

While physics is often theoretical, Malvankar, a recipient of the Eugene M. Isenberg Award, wanted to look at practical ways of using this bacterium.

In the class at the business school that prepares students for competition, he teamed up with fellow Isenberg Award recipient Xuan Huang, a doctoral student in management science, and seniors Danxiang Li, an electrical engineering and engineering management student, and Mario Dongo, a computer engineering student.

Malvankar, 28, said they had to look at things on a small scale, so they couldn't consider unleashing the bacterium in a wastewater treatment plant, for example.

"We all have been in portable toilets. They could use more light and a fan," said Malvankar. And, he added, "odor is a big problem."

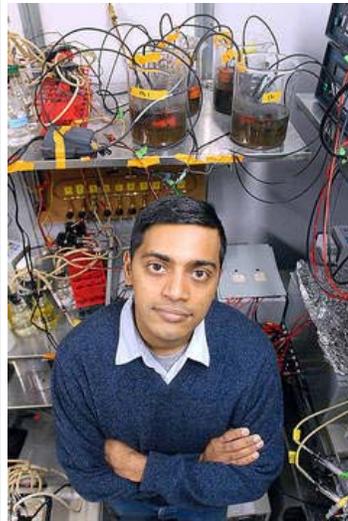
Thus came the idea of using the bacteria there.

As part of their business planning, they called portable toilet providers and ran their idea by company officials to see if they'd be interested in the concept. They also surveyed costs.

It costs the average company \$20 a week to service the toilets that are rented for \$100 a month, so the profit is just \$20 a month, according to Malvankar, a Mumbai native. With the bacteria, they could cut the service nearly in half.

The bacteria can break down waste, which would help eliminate the odor and also produce enough electricity to power both a fan and a light, he said. With the bacteria eating the waste, the toilets would have to be serviced less often.

The group has built a prototype in the lab, but the next thing is to build a prototype to bring to market. There's a big difference between "when you do an experiment in the lab and when you do it in the real world," Malvankar said.



Republican photo: David Molnar

University of Massachusetts graduate student Nikhil S. Malvankar with microbial sediment fuel cells on a shelf above him in the incubator lab at Morrill Science Center. The fuel cells will be used in an upcoming port-potty project.