

A Spark of genius



Shannon Cimino/Aegis staff

Dr. Chris Geddes examines chemicals at a molecular level.



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Dr. Chris Geddes works diligently in his lab at the University of Maryland Biotechnology Institute in Baltimore.

Bel Air doctor in technology race

By Lindsey Robbins

Aegis staff

Cutting edge technology is not nearly fast enough for Dr. Chris Geddes of Bel Air.

But what else would you expect from a 35-year-old who is already a full professor at University of Maryland Biotechnology Institute in Baltimore, where he and his team develop chemical and biological detection technology that reacts within 30 seconds?

For Geddes, the advancement of technology will never be fast enough.

He also has the highest publication rate of anyone his age in the world with 130 scientific publications and 13 books to his credit. He also serves as the editor-in-chief of two peer review scientific journals and has

Geddes gained full professorship at the age of 34, something relatively unheard-of in the scientific field.

While pursuing his scientific education, Geddes worked as a standup comedian in England. He said his friends still say he's a funny guy, although he no longer practices comedy as a trade.

"I think it really helped me to see both sides of the coin," Geddes said. "One of my chief talents as a scientist is the ability to be normal and speak with people. This is good since in my study sessions, everyone around me is older by two years."

Hailing from Yorkshire, England, Geddes was lured to take a position in the U.S. in 2001 after years of coaxing.

"I have always enjoyed science. I see things mathematically and can solve equations in my head. I never took more than five minutes to do a crossword puzzle," Geddes said.

In addition to his other accomplishments, Geddes serves on several federal committees including the National Institute of Health and chairs two study sessions, which review grant money for researchers. He has also sat on advisory committees for Las Alamos, where the atomic bomb was developed.

Geddes was featured on the Discovery Channel last May for his glucose-sensing contact lens.

"I'm in the press a lot these days. Radio, shows, magazines..." Geddes chuckled. "My mother collects all of the clippings. [My parents] are blown away by everything. I'm the only one in science."

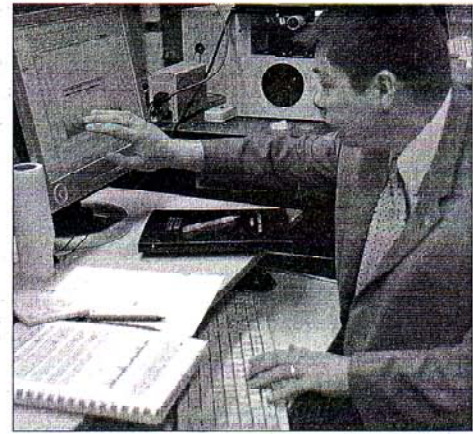
His revolutionary lens offers a painless way for dia-

Please see **GEDDES, AAG**



Shannon Cimino/Aegis staff

Dr. Chris Geddes takes his time while freezing samples with liquid nitrogen.



Shannon Cimino/Aegis staff

Dr. Chris Geddes performs data analysis at his lab in Baltimore.

Bel Air doctor funny, fast-paced

GEDDES, from AA1 betics to track sugar levels in their body, as opposed to the device requiring a self-administered blood test.

Geddes said the lens would be beneficial to diabetics since many suffer from glaucoma and have vision difficulties anyway.

The lens comes with sensors in the visual range so diabetics can access their condition by looking in a mirror or having others look for a change in lens color — clearly showing their glucose status.

Geddes said his goal is to transfer his technology into the marketplace and is negotiating with a company that may release the product within the next 10 years, pending FDA approval.

"There is an enormous amount of redundancy in the technology world with unpublished technology that just stays in the lab. I want these products to be available to people," Geddes said.

He hopes to have the lens out within the next 10 years if not sooner.

Geddes and his team at the university have also worked on developing contacts for clinical assessment of sodium and calorie levels; the latter, he said, would be completed within

three years.

Sparking ideas

The military has expressed interest in Geddes' work, looking for a "universal soldier contact lens," which would monitor exposure to biochemical agents such as cyanide. One of Geddes' other projects includes a fluorescence-based cyanide sensor that he claims is the most sensitive cyanide sensor ever made. He's looking into an anthrax sensor as well.

Geddes explained the fluorescence he studies is microwave-accelerated and metal-enhanced, meaning he uses silver nano-structures, about 20 nanometers across and 10 nanometers wide (a measurement so tiny, the mere definition is hard to grasp), to measure elements in whole blood (blood without serum) and speeds up the reaction process through microwaves.

"This provides ultra-fast, ultra-sensitive clinical assays [tests]," Geddes said.

Geddes thought up the method after witnessing his now 12-year-old stepdaughter, Nicole Atken-Hurst, place a spoon in a microwave, causing it to spark.

"I reasoned that nano-structures would not explode since they were too small to produce the electric strikes from the charge. They'd just get hot and bright," Geddes said.

The size of the nano-structures keeps all interactions among the silver close, increasing the process' sen-

due to all the necessary tests and 20 minutes of preparation work on the blood.

Unlike the lenses, the heart attack test requires no special FDA approval since it doesn't actually come in contact with the body. The test should be available within less than five years, according to Geddes.

He envisioned it being transitioned into a pinprick test, similar to the one used for diabetics.

Geddes said the technology took a year to develop with his colleague, Dr. Kadir Aslan.

It also required many microwaves ovens. He described how, during his initial tests, he had bought every microwave Best Buy had. Geddes later went back a month later and cleared the store of freezers for his project.

Geddes continues to find new ways to use his technology, including tests for DNA-detection that could apply to diseases like anthrax and RNA-detection that could apply to diseases like the avian flu and the ebola virus. He's working on a test to detect anthrax within 20

seconds, the fastest in the world currently being 24 hours.

Beyond science

Although Geddes' research keeps him at his lab for more than 100 hours a week, he still finds time for his wife, Caroleann, and three children, Nicole, Shannon, 3, and 3-week old Dillon.

Like her stepfather, Nicole excels in science and has a passion for marine biology, which her father encourages.

Geddes said Nicole doesn't mind her father being a "science geek."

Shannon helps out with his books and journals, while Geddes does the cooking since to him, it's just another type of chemistry.

Geddes also enjoys mountain climbing at his wife's homeland, Scotland, where he visits whenever he can.

"I have to be able to see trees and wildlife when writing," he said. "Bel Air was a fantastic choice for me five years ago, but things are changing now."

He said lately he's developed a passion for Corvettes, calling their shape fantastic.

"I'm very much down to earth, as much as anyone can be who thinks about anthrax all day," Geddes said.

'I'm very much down to earth, as much as anyone can be who thinks about anthrax all day.'

—Chris Geddes

sitivity and removing unwanted background signals.

Fluorescence was an essential part of another Geddes' project, a test that can detect a heart attack within 20 seconds. Normal methods to detect heart attacks take at least an hour

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