

Teens Trace Family Tree to Find Key to Genetics

Lesson plan wins Glen Burnie teacher certification from national network

By Susan Gvozdias | *The Baltimore Sun*

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Science teacher Pam Engel works with senior Candon Norman (left) and sophomore Destani Yates during class. Engel's grant enabled her to work with a Johns Hopkins geneticist to develop a new curriculum to teach genetics. (*Baltimore Sun* photo by Amy Davis / September 25, 2008)

Pam Engel tried something new with her biology students last year at [Glen Burnie High School](#). Instead of talking about how diseases and traits are passed on through family members, she teamed up with a doctor to help students create their own family trees.

Students had to list three generations and include medical conditions such as diabetes and heart disease, along with causes of death. Then they had to act as genetics counselors and predict which conditions might be passed on in their families.

The two-week lesson on genetics helped Engel earn a certification from the Geneticist-Educator Network of Alliances, or GENA. She was part of a pilot project of 13 teachers nationwide who teamed up with geneticists to develop lesson plans for high school students. Two teachers from Baltimore and Towson also were selected.

Engel, who found out about the certificate a few weeks ago, plans to incorporate the genetics lesson into her biology and honors biology classes again this year. She said she applied for the certification because she thought her students weren't grasping the concepts.

"They weren't learning it as well as I thought they should," Engel said.

Her interest in science education fits into the school's plans for becoming a biomedical magnet school in

2010, said Principal Vickie Plitt.

"She's a fabulous teacher, and this certification shows she is on the cutting edge," Plitt said of Engel.

The National Science Foundation provided the grant for the GENA project to improve science education and get more high school students to pursue careers in the field. The American Society of Human Genetics and several partners started the program in 2007.

Since then, 37 more teachers were paired up with geneticists for a three-day summer workshop this year. This fall, the pairs will be finalizing their lesson plans.

In some cases, the geneticist will help teach the class. A third and final workshop for an additional 40 teachers is planned for next summer, said **Michael Dougherty**, director of education for the Bethesda-based **American Society of Human Genetics**. All of the certified teachers will be expected to train colleagues in their school districts.

Engel, who has a master's degree in biology, has taught at Glen Burnie High for 11 years. She is chairwoman of the school's science department.

In the summer of 2007, she was matched with Dr. Julie Hoover-Fong, who works at the McKusick-Nathans Institute of Genetic Medicine at the Johns Hopkins University. She specializes in problems with bone growth.

Each pair had to pick a topic, so Engel and Hoover-Fong decided to focus on inherited traits. Hoover-Fong picked the family tree idea because it is the "cornerstone" of any genetics patient's visit. The trees are important because some family members are carriers and others might show signs of a condition without having it, she said.

The two women met several times during the fall of 2007 to fine-tune a lesson plan. Then in February, Hoover-Fong visited Engel's class several times to help teach lessons. She taught students about the various jobs and backgrounds needed to work in the genetics field.

Their lesson plans and those of the other teachers in the program are posted online for other teachers at the Math and Science Partnership Network at www.mspnet.org.

After this year's lesson, Engel and Hoover-Fong want to look at test scores to see if they have improved since the two have teamed up.

The collaboration is not meant to be a one-way street. Teachers are supposed to show the doctors - who often serve as faculty at medical schools - how to move away from lectures and include more hands-on class projects, Dougherty said.

Hoover-Fong said she already has tweaked her approach in her classes. She presents students with medical cases and gets them to draw their own conclusions, instead of just explaining the causes and outcomes.

"It seems like it sticks a little better that way," Hoover-Fong said.

Even if students don't pursue a career in genetics, there is a growing need for consumers to know about the rapidly changing field, she said. Genetics testing is going to expand for a whole range of illnesses.

"I think it's an important thing that needs to get out to the community," Hoover-Fong said.