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student's biology project captures attention of world-renowned scientists

staff report

HAMDEN - The attention of most school students at this time of the year turns away from classrooms and books to summer fun and vacations. But, for nine classmates who attend Sacred Heart Academy in Hamden, summer included a trip to Indianapolis, Ind. where they had an opportunity to present their scientific study in poster form before the world's top medical experts in mitochondrial medicine.

The United Mitochondrial Disease Foundation, a Pittsburgh-based organization that promotes research and education for the treatment and cure of mitochondrial diseases, brought together hundreds of physicians, researchers, and clinicians for its annual symposium "INDY 2008 - Setting the Pace in Mitochondrial Medicine," held over four days beginning June 25. During the symposium, scientists were invited to present their research findings to the various medical and research professionals in attendance.

"Every year, my honors level Biotechnology Research Project class decides on a study and must complete it before the end of the year and they present a poster at a scientific meeting," said Sister Mary Jane Paolella, of Sacred Heart Academy. Her students had just finished a 3-year study on osteoporosis in which the girls sequenced five of the genes most implicated in the disease using bovine DNA. The girls attended the International Symposium on Osteoporosis last April and presented their work to the clinicians and researchers there.

After the students completed that study, Paolella was approached by a scientist at the University of New Haven who asked if they were interested in studying the horseshoe crab of Long Island Sound due to its medicinal value of the species. "The blue blood of the horseshoe crab is very costly because it contains a protein which is used to test for bacterial endotoxins which is the only test for spinal meningitis, among other diseases. The crab is an endangered species on Long Island Sound and one needs a license to draw its blood. So, the girls became interested."

Paolella reports that the students found that the mitochondrial DNA of the crab contains a gene that might show some variation: the cytochrome oxidase gene (COX1 or CO1). A mutation of this gene in humans causes tumor formation, particularly breast, colon, and prostate tumors. The students began a project to see if they could find any variation in the COX gene of the horseshoe crab while at the same time, trying to see if those variations are related to SNPs (single nucleotide polymorphisms) in the human mtDNA COX gene.

The students who conducted the study are: Francesca A. Carlisle, Meghan C. Crosby, Nicole A. DeLauro, Kelley E. Durham, Alessandra Fiallos, Elena E. Jackson, Erin M. Laskowski, Jennifer A. Limauro, and Andrea L. Wagner.

"While they were immersed in their studies, the girls were looking for a scientific meeting in which they would be allowed to present and they asked the UMDF", Paolella added.

For the UMDF, this was a first. The organization has never been approached by high school students with a desire to exhibit. "Our symposium course chairs, who represent the very best in mitochondrial disease medicine, reviewed the abstract from Sacred Heart Academy. Needless to say, they were very impressed with the project and were excited to hear the students were planning to present their poster in Indianapolis," said Chuck Mohan, executive director and CEO of the UMDF.

"We must encourage young people in these types of scientific efforts. One of these students may come away from this conference with a desire to study mitochondrial medicine and, hopefully in our future, discover a cure to this debilitating disease."