

VUMC Reporter

VANDERBILT UNIVERSITY MEDICAL CENTER'S WEEKLY NEWSPAPER

'Aspirnaut' students conduct experiments at VU remotely

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3/05/2010 - The future of science education is conducting experiments through long distances.

From their "community classroom" in rural Grapevine, Ark., five intermediate and middle school students last week conducted an experiment using sophisticated equipment at Vanderbilt University.

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Conducting scientific research with rural K-12 students via video conferencing is the latest innovation employed by the Aspirnaut Initiative, a three-year-old program launched by Billy Hudson, Ph.D., director of the Vanderbilt Center for Matrix Biology, and Julie Hudson, M.D., assistant vice chancellor for Health Affairs, to improve science education in rural communities.

The successful experiment gave rural Arkansas students an opportunity to interact with real world science. Hudson hoped that the students would remember this experience "as an event that will impact their lives." The NMR experiment was an extension of research that Cody Stothers, a senior at Sheridan High School in Sheridan, and Richard Harris, a senior at KIPP Delta Collegiate High School in Helena-West Helena, began during the Aspirnaut Research Internship Program at Vanderbilt last summer.



High school sophomore Chanel Smith looks in on her Aspirnaut Initiative classmates in Arkansas during the experiment. (photo by Joe Howell)

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"On Feb. 18, Paul Voziyan, Ph.D., research associate professor of Medicine, described how high levels of glucose in the blood, which occurs in diabetes, can damage the kidney. The students also learned about pyridoxamine, a drug currently in clinical trials that may prevent kidney failure in diabetics.

The next week, class was held at the Vanderbilt Small Molecule NMR facility. Don Stec, Ph.D., research assistant professor of Chemistry, described how magnets are used to answer biological questions.



Using video conferencing, members of the Aspirnaut Initiative conduct an experiment at Vanderbilt with their classmates back in Grapevine, Ark. (photo by Joe Howell)

To prepare for last week's experiment, the students attended classes at Vanderbilt on three successive Thursdays through video conferencing. The classes were organized by Aspirnaut associate director Stephanie Zeiger, Ph.D., research assistant professor of Medicine.

On Feb. 4, they helped dissect a cow kidney as Billy Hudson introduced them to the organ's function and structure. After Roy Zent, M.D., Ph.D., associate professor of Medicine, told them what obesity can do to the kidney, they all agreed not to eat fast food anymore even though it tastes good.

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Don Stec, Ph.D., talks with the students in Arkansas about how magnets are used to answer biological questions. (photo by Joe Howell)

The next week, class was held at the Vanderbilt Small Molecule NMR facility. Don Stec, Ph.D., research assistant professor of Chemistry, described how magnets are used to answer biological questions. Then Harris placed a test tube containing a sample in the spectrometer. From Arkansas, Stothers and the students commanded a robotic arm to grab it and place it in a large chrome cylinder containing a superconducting magnet.

As the experiment ran, they watched data accumulate through a computer link and heard the soft rumbling sound of the magnetic field. They could see sharp peaks of the NMR spectrum appear on a computer screen, identifying the various molecules in the sample.

“It looks like the Eiffel Tower!” exclaimed 4th grader Lauren Taylor.

The video conferencing sessions will continue this month at the pilot Grapevine site with a unit on astronomy led in collaboration with Vanderbilt Student Volunteers for Science (VSVS) and the Vanderbilt Astronomy Outreach program.



Billy Hudson, Ph.D., launched the Aspinaut program three years ago with his wife, Julie Hudson, M.D.