by Laura Vroman

STUDENTS CELEBRATE DNA DAY

Strawberries and Ziploc bags anchor this science lesson.

Ten high school students at the Rosebud Indian Reservation near St. Francis, S.D., mash berries, mix them in a Palmolive soap solution and strain them through a coffee filter into a plastic cup.

"We're going to leave here with some DNA," Maurice Godfrey, Ph.D., tells the teens.

With no formal greeting between instructor and students, Dr. Godfrey begins the presentation on the basics of DNA, genes and chromosomes – or the language of life.

Students took the strawberry solution at the bottom of the cup and poured it into cold, 70 percent isopropanol and ta-da – DNA.

Sticky, it resembled the runny portion of an egg white, the students said.

It's DNA Day at Rosebud, thanks to Dr. Godfrey, who received a $10,000 grant from the National Human Genome Research Institute to help Indian students become excited about science.

He decided to hold it in March, close to important milestones in DNA history. In April 1953, the DNA double helix was first described in a science journal and April 2003 marked the successful completion of the Human Genome Project.

DNA Day is one of several projects initiated by Dr. Godfrey, associate professor of pediatrics at UNMC, and Roxanna Jokela, director of UNMC's Rural Health Education Network, to strengthen the science curriculum of American Indian youths on reservations in Nebraska and South Dakota.

To help achieve that goal, they were awarded a five-year, $1.3 million grant in 2006 from the National Center for Research Resources to develop UNMC's Science Education Partnership Award (SEPA) program. Through this program, Dr. Godfrey has established relationships with 15 schools on six reservations in two states.

To assist him with teaching, Dr. Godfrey brought in DNA Day Ambassador Katherine Szarama, a graduate student from the National Institutes of Health. Szarama, a member of the Ottawa and Chippewa tribes of Michigan, explained the basics of DNA, genes and chromosomes.

In the language of DNA, there are only four letters – A, C, T and G – that make up the three letter "words" used for the 20 or so amino acids in one's DNA.

"We all have 23 pairs or 46 chromosomes," Dr. Godfrey said. "All are jam-packed into the nucleus of the cell. If your DNA were lined up end-to-end, it would go to the moon and back 260 times. That's a long chain."

During the day, students learned about genotype-phenotypes and how they relate to the combination of genes inherited from mom and dad. They built Reebop, an imaginary creature of marshmallows, thumbtacks and pushpins, to understand how chromosomes are shared between parents. They explored their senses and learned that receptors on the tongue detect a food's salty, sweet, sour, bitter or savory tastes.

By mid-April, Dr. Godfrey had shared his passion for DNA at six additional American Indian schools.

"If we make science interesting and accessible, we'll have more Native Americans entering health or science professions," he said.

Through the SEPA program, teachers from the reservation also attend workshops at UNMC to learn how to make science fun and engaging. In addition, resources are made available to them on the reservation.

Middle school students also visited UNMC in July for a three-day camp, during which they extracted DNA, explored physics and chemistry and toured the campus.

"When less than 1 percent of the nation's health professionals are Native Indian, something has to be done to get students interested in science," Dr. Godfrey said.

The UNMC SEPA team has been developing role model posters to create enthusiasm among students. One of the posters is of Anpo Wicahpi Charging Thunder, M.D., a 2008 UNMC College of Medicine graduate.

He said the SEPA program is making a difference.

"In research, it takes a long time, sometimes years, before you receive gratification from your work. But when working with kids, you get gratification right away. One student at Rosebud was very proud of his DNA experiment. After class, he shook my hand and thanked me for coming.

"That was an instant home run."

Top: Dr. Maurice Godfrey loves to excite students about science.

Middle: David Wilson, Ph.D., post-doc fellow from the National Institutes of Health, helps (right to left) Dominique Diaz, Marty, S.D., Mindy Blackfish, Winnabego, and Tyresha Wolfe, Winnabego, make their 3D image of a human cell. The middle school students did this exercise at UNMC using large round sugar cookies, frosting and candies.

The DNA of strawberries