

# science & TECHNOLOGY

THE BATTALION

## Texas A&M professor identifies ways to fight bacterial infections

BY ARUN ARJUNAN  
The Battalion

As the fall semester progresses, many students will begin to suffer from the flu, colds and other commonplace maladies. Many of the illnesses result from bacterial infections and often are passed from one person to another through physical contact. New research shows that viruses can be an effective tool in fighting off bacterial infections.

The body's ability to cope with bacterial illnesses depends on the immune system and its production of antibodies and white blood cells. To supplement the immune system, antibacterial substances, such as antibiotics produced by other organisms are used to control or harmful bacteria. Antibiotics are substances which are produced as a means of competitive advantage over other bacteria.

Dr. David McMurry, a microbiologist at the Texas A&M Health Science Center, said improper use of antibiotics is the primary reason for the prevalence of bacterial illness.

"Antibiotics have been misused," McMurry said. "Either physicians do not prescribe a strong enough dose or patients do not complete the antibiotic treatment, allowing the bacteria to reproduce a tougher, more stubborn generation of pathogenic organisms. The more advanced strains are therefore much more difficult to manage, and their associated physiological effects are harder to

treat." Researchers are concentrating on alternative approaches to traditional antibiotics to fight the resistant strains of bacteria.

Ryland Young, a biochemistry professor at A&M, is studying the reproductive behavior of viral proteins in order to find new antibiotics which will fight the modern generations of bacteria.

Young and his research team have described the protein antibiotics of several viruses already. Young said he hopes these proteins can serve as models for new antibiotic therapies.

"Given the fact that the antibiotics we're using now are becoming less useful everyday because of the amount of resistance, we will need new antibiotics," Young said.

Young said that as an alternative to antibiotics, viruses may be used to kill bacteria.

"When a virus penetrates a host cell, it replicates many times over and subsequently lyses, or breaks open, to release all the replicas," he said.

Young said bacteria are susceptible to viruses because the viral progeny break through the cell wall and cell membrane. An enzyme, endolysin, aids in the destruction of the cell wall, which allows the viruses to be released and attack to any other neighboring cells. Young identified a class

of proteins, known as holins, that burrow a passageway in the membrane.

"The amazing thing about these holins is that they sit in the membrane until exactly the right moment, until enough progeny virions have been assembled, before letting out the endolysin," Young said.

Young said the holins proteins act as makeshift biological timers as soon as the viral mechanism kicks into gear and changes the host's genetic information. He said holins release endolysin as soon as a difference in the gene composition is noticed.

Simple viruses, however, use a simple termination technique and kill the bacterium with a small protein. The protein acts as an antibiotic, poisoning the bacterial cell wall, terminating cell division and effectively killing the cell.

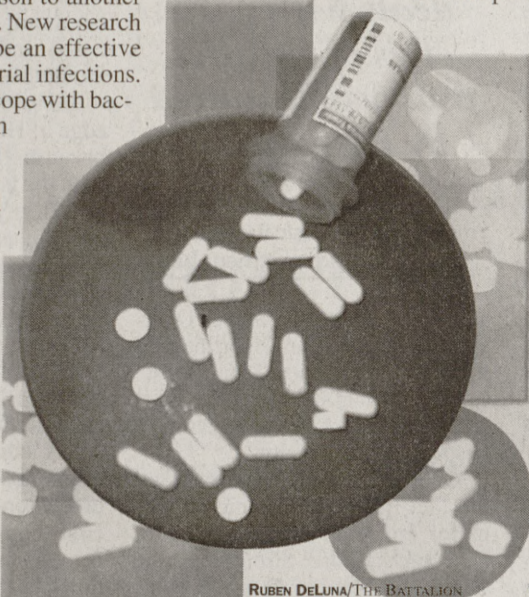
"The good thing about that is if we can figure out what part of the viral polypeptide is essential for stopping cell wall growth," he said, "we can easily change that just by changing the sequence of the DNA. It is important that the viral proteins remain mutable because of bacterial resistance to antibiotics."

He said that as the bacteria eventually gain resistance to the new viral protein antibiotics, the DNA sequence that codes for the protein will be able to produce a newer protein to cope with the resistance of the next generation of bacteria.

"No one has ever found gene-encoded antibiotics before," he said. "It's potentially a whole new way of producing antibiotics rather than relying solely on natural products like penicillin." Other scientists are also looking for other approaches to illnesses other than traditional antibiotics.

Although many researchers are directly investigating new ways to cure illness caused by bacterial pathogens, Young said a more broad-based approach is a better idea.

"Most often, discoveries of practical importance come from fundamental research in the basic science," he said.



RUBEN DELUNA/THE BATTALION

## Evolution education insufficient, report says

WASHINGTON (AP) — In a new chapter of a dispute that pits science against religion, a national organization of scientists gives schools in 19 states unsatisfactory grades for teaching evolution.

The report, commissioned by the Thomas B. Fordham Foundation and released Tuesday at the American Association for the Advancement of Science, grades 49 states and the District of Co-

lumbia on the basis of how well evolution is included in the state science education standards.

California, Connecticut, Indiana, New Jersey, North Carolina and Rhode Island received the highest rank. Kansas, whose standards were described as "disgraceful," got the lowest grade.

Linda Holloway, former chairman of the Kansas State Board of Education, said the report was deceptive and "very unfair."

"Clearly, they have an ax to grind about evolution," she said in a telephone interview.

Kansas last year rekindled the issue of teaching evolution in public schools when the state board of education, lead by Holloway, approved science teaching standards that minimized the importance of evolution and omitted the big-bang theory of the origin of the universe.

Other states have considered similar curriculum changes and some state legislatures have proposed laws that would forbid completely the teaching of evolution in public schools.

Evolution, a theory developed by Charles Darwin and others, holds that the Earth is billions of years old and that all life, including humans, evolved from simple forms through a process of natural selection.

Teaching of evolution has been opposed by people who believe that the universe, the Earth and its creatures were created abruptly by God.

Some proponents of divine creation have organized a concept, called creationism, that they proposed be taught along with evolution. In 1987, the U.S. Supreme Court barred states from requiring the teaching of creationism. Now some of the same proponents support other concepts, such as "abrupt appearance" or "intelligent design," that are linked to divine creation.

Lawrence S. Lerner, who compiled the report for the Thomas B. Fordham Foundation, said that the conflict "is not really about science, but about religion and politics."

He calls creationism "a pseudoscientific rival to evolution that the courts have repeatedly held to be thinly veiled religion."

**"[The conflict] is not really about science, but about religion and politics."**

— Lawrence S. Lerner  
Researcher

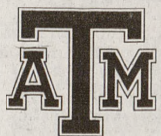
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