

# Science fiction isn't clone's only home

by Lynn Falco  
Battalion Reporter

Cloning is often thought of as an experiment in science fiction, but the head of Texas A&M's medical biochemistry department says cloning is just a word describing a fundamental technique used in genetic engineering research.

Dr. Garret M. Ihler, head of the medical biochemistry department, said: "Within five years or so, there won't be a biologist anywhere that doesn't, in some way or another, use cloning or gene transfer."

Ihler has been studying the question of gene transfer — how to introduce genes that have been isolated back into living cells and have them be functional. He's concerned with the medical aspect of cloning, for example, the transfer of a certain type of DNA molecule into the bone marrow cells of a person with sickle cell anemia.

Although it has not been done yet, Ihler said the process will involve cloning certain DNA molecules and putting them in red blood cells. The red blood cells would then fuse with bone marrow cells and the DNA then would be introduced into the cell, he said.

Until recently, immunization was the only way to prevent disease. Now, through the use of cloning and gene transfer, other methods can be researched. Ihler said Texas A&M is patenting the process of putting DNA into "artificial cells," or liposomes. These cells are often used in gene transfer because once the DNA is in the artificial cell, it can't get out, nor can anything get in.

Dr. Ry Young, assistant professor of medical biochemistry, said he primarily works with the cloning of bacteria.

"The main thrust in cloning in my laboratory right now is to create bacteria that will break open spontaneously," he said.



Bacteria are commonly used for cloning because they grow rapidly and divide every half hour.

Young said the most successful cloning that has been done so far has been with human insulin. Insulin patients have been using horse and pig insulin which has been causing long-term side effects, he said. Scientists can now take a human insulin gene and put it in a bacterial cell, which in turn produces large amounts of insulin. The problem is that they haven't found an effective way to break open the cell to get the insulin back out, Young said.

A technique that is being used to break open the cell is called mechanical lysis, but the process is too harsh and a large part of the cell is demolished, he said. A solution has been discovered but has not been perfected yet. This process, called autolysis, involves using a virus gene that can

break open a cell at the end of its infecting cycle after being turned on by some kind of temperature or chemical signal, Young said.

At the Texas A&M School of Veterinary Medicine, another type of cloning research is going on. Dr. Duane Kraemer, professor of veterinary physiology and pharmacology, is involved in the possibility of cloning offspring. This type of cloning involves producing genes that are injected into embryos to transform or change their genetic makeup so they can be used for research purposes.

Kraemer said the department has been producing identical offspring of domestic animals by splitting the embryos into halves or quarters and then studying a series of pairs. He said the veterinary school research department is preparing to use the method of taking the nuclei out of embryonic cells and transferring them into denucleated eggs to produce multiple identicals that way.

Clones are used because they are powerful tools for research, Kraemer said, and can be used to obtain basic information about how embryo cells are organized. Other researchers throughout the world have found in working with mice that the genetic makeup of animals can be altered by putting foreign genes in the cell nucleus, he said.

With several sets of identical twins, a research scientist can study environmental causes of certain diseases by using control groups and treatment groups, Kraemer said.

"We want to do with cattle what scientists have done with mice," he said.

# Engine add-on aids cars using gasohol

by David Hatch  
Battalion Reporter

Gasohol, a mixture of alcohol and gasoline, has been in use for several years, but has had problems which Texas A&M University researchers are trying to solve.

Dr. William Harris and Dr. R.R. Davison, chemical engineering professors, have developed an add-on system for engines to be used with alcohol and gasoline which is economically feasible, easy to maintain and which eliminates many of the serious problems with using alcohol fuels.

The key to the new system is that it does not mix alcohol directly with gasoline.

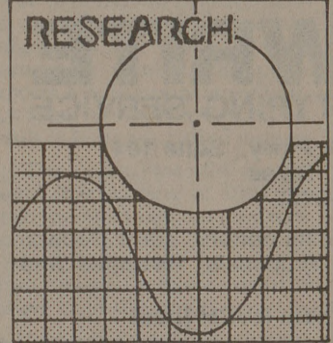
"Tunnel vision was the main problem with the past fuel research," Harris said. "Just because fuel has always been injected into a motor as a liquid made many researchers think that was the only way fuel could be injected into a motor."

In the new system, the engine is started with gasoline, eliminating the cold weather problems encountered with pure alcohol. The engine then runs on gasoline until an alcohol vaporizer, which is heated by the engine's exhaust, gets hot enough to send alcohol into the engine. When

the engine begins to receive alcohol, the gasoline fuel system is shut off.

The major modification with the system is the need for two fuel tanks.

"The vaporization system is an add-on system which is



adaptable to any gasoline engine," Harris said. "It is easily understood and makes the future production of alcohol-only cars unnecessary."

"Also, there is no longer the problem of fuel not being available, as the driver of the car can turn off the vaporization system at will and return to a gasoline-only system."

Harris said the United States has plenty of sources of alcohol, making it a possible mass source

of fuel.

The United States has the world's largest lignite coal reserves, which can be converted to alcohol.

"If alcohol can be accepted as a fuel, and produced quickly and safely enough, it would then be our best bet to help stem our present energy problems," Harris said.

He said two types of alcohol can be used for fuel: ethanol, which is made by the fermentation of organic compounds; and methanol, which can be produced by the burning of any material which is mainly composed of carbon. Both can be used in gasohol.

However, methanol, which can be produced from paper, garbage, trees and lignite coal, is the alcohol favored for fuel use.

"The technology needed for conversion has been well known for many years," Harris said. "The supply of raw materials and the ease of conversion have made methanol the favorite choice for an alternative fuel, either by itself or in a mixture."

Fuels containing methanol, however, have not been trouble-free. A small amount of water will cause methanol and gasoline to separate, which can prevent the car from starting.

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