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TECH SCIENTISTS DEVELOP

ORGAN THAWING TECHNIQUE

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For Immediate Release

ATLANTA, GA....A patient in an Atlanta hospital loses the use of his kidneys. Doctors telephone a national organ bank 2,000 miles away, where kidneys are kept in cold storage. Technicians select an appropriate replacement and send it by plane to Georgia. The shipment arrives within hours of the initial call, is thawed and successfully transplanted into the patient.

Such a scenario might be possible today were it not for a major technological limitation: researchers have not developed a method to thaw large organs without irreparably damaging them.

A Georgia Tech biomedical research team has completed one year of a two-year study aimed at finding a solution to this problem. Scientists in Tech's Electronics Technology Laboratory hope to prove that heat from electromagnetic radiation can thaw human kidneys effectively.

In the past, researchers have approached the thawing problem in several ways, first by placing frozen organs in warm water baths which successfully thaw eye corneas.

"The water bath technique works for corneas because they are so thin," said the Tech project director, James C. Toler. "But when the method is used on a kidney, the outside tissues of the organ are 'dead' by the time the inner tissues have thawed."

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Scientists subsequently have placed animal test kidneys in microwave ovens, hoping that the uniform rate of heating inner and outer tissue layers would keep the organ "alive" during thawing.

The experiments did not work, Toler said, because kidney tissues have varying electrical properties, giving each section of tissue a different capacity to absorb heat.

The Tech researchers have studied these electrical properties in detail. With the data obtained, they believe it possible to successfully thaw kidneys through application of varying degrees of electromagnetic radiation to the different organ tissues.

Electromagnetic radiation is radiant energy in the form of invisible rays moving through space and matter. It turns to heat when absorbed by an object in its path. Practical uses for electromagnetic radiation have increased since World War II and today range from beaming television signals to tracking missiles to heating food.

Toler's group began their project with experiments on rabbits but switched to dogs because the canine kidney has more similarities to its human counterpart. Working with the group is Dr. Armand Karow of the Medical College of Georgia in Augusta. Karow has sent frozen organs of dogs to Georgia Tech for laboratory testing.

"Our analysis indicates that we now can successfully thaw a dog's kidney," Toler said. "But we can't be sure of our conclusion until one of these organs is successfully implanted into a dog by Dr. Karow and his staff. We hope this will happen within a year."

The Tech project is sponsored by the National Science Foundation. The technical outlook for the study appears favorable. Because of current funding

restrictions, Toler estimates his group will need three to five years to complete its research.

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