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ELECTROMAGNETIC WAVES MAY
DETECT AND TREAT CANCER

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ATLANTA, GA....Physicians one day may detect and treat cancer with electromagnetic radiation.

Electromagnetic waves are the same radiant energy which beams television signals, tracks missiles and heats food. Georgia Tech biomedical engineers expect to use them to "burn up" cancerous tissues without the harmful side effects of chemotherapy.

"All things, including tissues in the human body, have varying capacities to absorb electromagnetic radiation," said James C. Toler of Tech's Electronics Technology Laboratory. "Whatever radiation they absorb is converted into heat.

"Cancerous tumors get rid of absorbed heat far less easily than normal tissues and this offers researchers an ideal way to use radiation for cancer therapy," he said.

When exposed to electromagnetic waves, normal tissues expel the heat they accumulate through vascular action -- the blood stream carries it away to other areas of the body. Vascular action in cancerous tissues is poor so tumors cannot rid themselves of heat as efficiently as normal tissues.

"This makes cancerous growths easy to spot, even in the early stages of development," Toler said.

(more)

Toler and colleague Cliff Burdette have experimented with mice, dogs and several human volunteers. So far, their work has been confined to detection of surface turmors. However, a needle-shaped antenna under development will allow the scientists to explore sub-surface tissue without the necessity of surgical operations.

The same antenna also may be an effective tool in future cancer treatment. Doctors or medical technicians could beam electromagnetic radiation into cancerous tumors, literally burning them up while leaving normal surrounding tissues unharmed.

Toler believes that cancer therapists could burn up tumors by applying radiation through antennas places on four different sides of a patient. This radiation would be beamed alternately from each antenna.

"When the normal tissue got pretty hot from exposure to one antenna's radiation we would turn off that antenna and switch another on," Toler said. "In this way, we could heat the tumor from all four directions without overexposing any of the surrounding normal tissues."

The majority of the Georgia Tech research in this field is being done with funding from the National Cancer Institute and the Walter Reed Army Institute of Research.

The Electronics Technology Laboratory is part of Tech's Engineering Experiment Station.

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