

UT News

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**** New treatment is successful
in skin wound healing.

DALLAS--Researchers at The University of Texas Health Science Center at Dallas have recently discovered that fibronectin, a protein that attaches cells to their tissue matrix, significantly reduces the size of chronic skin ulcers. Chronic ulcers are cutaneous (on the surface of the skin) wounds. They are usually located on the extremities, especially the legs, and these ulcers are thought to be the result of poor blood flow. They range in size from a quarter of an inch to five inches long and are usually not more than a quarter of an inch deep.

Chronic ulcers of the leg are relatively common in people with vascular disease; however, historically these wounds have been difficult to manage. For years chronic ulcers were treated by several different methods such as Unna boots, debridement, hydrotherapy, aloe vera gel, helium-neon laser therapy, wet-to-dry dressings and ultraviolet therapy. For some patients, these treatments did not result in healing of the ulcers. In 1979 the total cost to treat chronic ulcers was nearly \$300 million.

Health science center researcher Dr. Fred Grinnell, professor of cell biology and anatomy, in collaboration with Dr. Paul Bergstresser, chairman of dermatology, Dr. Charles Baxter, professor of surgery and burn specialist, and Dr. Annette Wysocki, senior research associate, initiated a clinical study of chronic ulcers using a protein that had been successful in healing ulcers in the eye. This protein, fibronectin, functions normally as an adhesive between cells and their extracellular matrix. The fibronectin used in health science center studies is supplied by the New York Blood Center.

During the initial three-week pilot study, the investigators noticed only marginal improvement in the patients. One elderly woman, however, felt that her treated ulcer was improved enough so that she wished to continue fibronectin treatment. "We decided to continue applying fibronectin to her wounds," Wysocki says, "and they improved dramatically. After about two months of treatment, one

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ulcer had reduced more than 90 percent. This wound, which is now completely healed, had been treated unsuccessfully with other methods for more than five years."

Fibronectin is applied directly to the infected area via a soaked gauze bandage and becomes incorporated into the exposed matrix. When fibronectin is applied directly to the wound, it "glues" or bonds the cells together again; therefore, the outermost layer begins to seal.

"Our research is aimed at understanding the role of fibronectin in wound healing. In vitro studies have shown that when fibronectin is absent in infected tissue, the epidermal (sealing) cells migrate slowly; if fibronectin is present, the cells move to the surface and seal quickly. Applying that research directly to human chronic ulcers is difficult because of the complexity of the wound healing; however, we think the fibronectin action is similar," Grinnell says.

The clinical phase of this study, which is now in progress, is looking at the healing process of fibronectin. For the first part of the study half the patients have their wounds exposed to fibronectin and half the patients are acting as a control group. After this initial period, all will be treated with fibronectin. "We are treating people now until they get better or stop improving," Grinnell says. The amount of time needed for healing depends on the size of the wound.

Wysocki says that, although the current clinical research is focused on patients with vascular disease, the potential recipients of fibronectin treatment could include burn patients, patients with diabetic foot ulcers and others with chronic open wounds.

The research with fibronectin at the health science center is in preliminary stages, and Wysocki says more patients are needed for current clinical trials. Wysocki, along with Dr. Bergstresser, is seeing patients in the Aston Center and Parkland Hospital Outpatient Clinic. Individuals who would like to participate in this study should contact Dr. Wysocki at 214/688-2203.

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Note: The University of Texas Health Science Center at Dallas comprises Southwestern Medical School, Southwestern Graduate School of Biomedical Sciences and the School of Allied Health Sciences.