

Fiber 'Wrap' Preserves Tissue and Encourages Blood Vessels to Open

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Dr. Kenneth Balkus (left) and chemistry student Harvey A. Liu study blue fibers that enhance circulation and make up the flexible bandage or wrap. (Photo courtesy of Chalita Ratanatawanate, UT Dallas doctoral student in chemistry)

(PhysOrg.com) -- Scientists at The University of Texas at Dallas have filed a patent disclosure on a medical device that looks like a blue elastic bandage and acts like a wonder-cloth that helps preserve transplant organs, improve circulation and heal wounds.

Chemistry Professor Kenneth Balkus and Ph.D. student Harvey Liu say Liu's early work on self-healing smart films led to the new, blue bandage that releases a controlled, steady dose of nitric oxide.

Nitric oxide (NO) is known to open blood vessels and keep them relaxed and flexible—key factors in keeping transplant organs viable and

offering hope to diabetic patients who suffer from low blood flow in their extremities, especially the feet.

The development earned Liu a finalist position in the Collegiate Inventors competition, where he competed against other science, mathematics, engineering and technology inventors from universities including Johns Hopkins, Harvard, the University of California at Berkeley and the Massachusetts Institute of Technology.

“This research – and working in the Balkus group at UT Dallas, for that matter – has been an exciting journey,” Liu said.

“We started with nothing but an idea, one that evolved into a tangible product that we could potentially use to help people address ailments ranging from diabetes to hair growth to the preservation of transplant organs,” Liu said. “I’ve found the journey so rewarding.”

Balkus said the bandage’s blue color comes from synthetic zeolite nanoparticles throughout the material.

“The composite papers were fabricated by electrospinning biodegradable polymer fibers that contain zeolites or diazeniumdiolates,” Balkus said. “Upon exposure to moisture, the polymer fibers degrade and the NO is released.”

Wound dressings have evolved dramatically from strips of cloth ripped by hand into antiseptic marvels of modern medicine. Liu said he expects clothing or material to be another way for the zeolite cloth to help people.

“We’re interested in evaluating how well textiles—socks—or wraps made from this material can promote blood flow in the feet of patients with diabetes,” Liu said.

Provided by University of Texas at Dallas

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