

# Relax! Slip on an electric vest to knead away stress

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This vest, which gently gives a massage to reduce harmful stress in the body, was designed by students who are seeking a patent.

Anxiety? No problem. An electric vest can rub away your stress-filled

day. Three Cornell students have developed a garment – embedded with piezoelectric cells and tiny motors – that gently massages the back and shoulders, mimicking a human touch.

"It's like someone stroking you really lightly, like a mother soothing a kid who just woke up from a nightmare," said Marina Gaeta '14, a biology and society student. Gaeta developed the functional apparel with fiber science and apparel design student Eric Beaudette '16 and Hadi Hosseinzadegan, Ph.D. '13, a graduate student in the field of electrical and computer engineering. The team, working with Amit Lal, professor of electrical and computer engineering, and Huiju Park, assistant professor of fiber science and apparel design, filed for a patent for the technology last week.

The body produces cortisol under stress. Prolonged release of cortisol is linked to serious [health problems](#), including obesity, depression, [heart disease](#), hypertension and a compromised immune system. "We find that in our modern way of life a lot of people have unnaturally and chronically elevated levels of cortisol," Gaeta said, citing one estimated cost of job stress in the United States at \$300 billion annually.

The initial impulse for developing the vest came from Mary Maida, a molecular neuroscientist whose company, the Medingen Group in Rochester, N.Y., seeks to foster medical innovations. Maida approached Lal, Gaeta and Hosseinzadegan to make a stress-reducing prototype: a store-bought vest to which they adhered actuators and tiny motors.

Melding form and function into an attractive piece of clothing, however, required the expertise of Park and Beaudette. "Functional apparel design incorporates the latest technologies into layers of fabric to provide more convenient function and a comfortable interface," Park said.

Beaudette and Park created another prototype using a combination of

elastic and rigid fabrics to better accommodate body movement and a wide range of sizes. A built-in neoprene panel muffles motor noise and acts as a buffer against chafing from technical parts.

"This unique design approach ensured a better fit to different body types," Park said.

Last spring, the team's invention earned one of two \$10,000 Innovation Awards from Cornell's School of Electrical and Computer Engineering.

With the prize money, Hosseinzadegan is working on a flexible circuit that will join more smoothly with the fabric of the vest, into which Beaudette is incorporating Lycra spandex for a better fit.

Gaeta, meanwhile, will test the vest's physiological effects through human trials this fall.

"We're marketing the vest as a piece of clothing that doesn't look like a medical device and can just be worn anywhere," Beaudette said. "And with our small company we're looking at adding these piezoelectric cells to other products, as well."

Provided by Cornell University

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