

Natick Investigates Self-Healing Protective Clothing

Jane Benson

Army researcher Quoc Truong wants to fill in the gaps in Soldier protective clothing — literally. Truong is a physical scientist at the U.S. Army Natick Soldier Research, Development and Engineering Center (NSRDEC). He is collaborating with other researchers at NSRDEC, the University of Massachusetts Lowell, and Triton Systems, Inc., on the technical development of self-healing coatings that contain micro-capsules of healing fluid, which will be used to mend chemical biological, or CB, protective clothing.

“When Soldiers are wearing a chem-bio protective garment, they are basically isolating themselves from their environment and any harmful agents, such as nerve gases, viruses, and bacteria,” Truong said.

“Soldiers are very active and can encounter thorny bushes or other things that could result in pin-hole-sized damage to their chem-bio garment while carrying out their missions. The damage may not be visible to the human eye, but it is there.”

The self-healing technologies will enable cuts, tears and punctures in fabrics to quickly repair themselves. This means that the protective qualities of the garments will be far less apt to become compromised by tears and punctures. The technology will be incorporated into both the Joint Service Lightweight Integrated Suit Technology (JSLIST) garment, and the Joint Protective Aircrew Ensemble, or JPACE, garment.

“The self-healing coatings can be a spray-on coating or a continuous coating — depending on the type of protective clothing they are applied on,” Truong said. “The idea is just like when a scratch breaks open the skin. Our body has the ability to heal and mend, make a scab and heal. The same idea applies to the self-mending fabric; when the fabric containing these self-healing materials gets cut, it comes back together and heals. It forms something very much like a scab on the skin except it is on the fabric.”

The technology combines innovative approaches to gap-closure with healing micro-capsules that are activated when torn to repair cuts and punctures. The self-healing layer contains reactive agents to deactivate dangerous threats, including deadly chemicals, and also acts to reform the physical barrier to bacteria and viruses.

Read more at:

www.army.mil/article/158769/On_the_mend___Natick_investigates_self_healing_protective_clothing.

(Jane Benson works for the NSRDEC Public Affairs Office.)