

Researchers to apply facial skin regeneration technology for battlefield injuries

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Southwest Research Institute (SwRI) will develop new technologies to treat facial injuries as part of the Armed Forces Institute of Regenerative Medicine (AFIRM) II, known collectively as the Warrior Restoration Consortium.

The \$75 million, five-year AFIRM II consortium led by Wake Forest Institute for Regenerative Medicine focuses on improved technologies to treat soldiers injured on the battlefield and to advance medical care for the public. It comprises more than 30 academic and industry institutions applying [regenerative medicine](#) for injuries to specific areas of the body.

XingGuo Cheng, Ph.D., a senior research scientist in SwRI's Chemistry and Chemical Engineering Division, is the principal investigator for a project to generate a "biomask" of full-thickness skin as a potential repair for combat-related facial burns and trauma.

"Facial injuries resulting from explosives, gunshot wounds and burns are common among combat soldiers and represent one of the greatest challenges in wound care," Cheng said.

The topography of the human face has many compound curves that are difficult to cover effectively with flat, cut-to-fit skin grafts. Stitching the grafts onto the face to cover burns and injuries often leads to scarring, according to Cheng. "We will be using a contoured skin-graft material that mimics the facial architecture and also promotes healing," he said.

Besides SwRI, the project team includes the U.S. Army Institute of Surgical Research (USAISR) at Fort Sam Houston, the Walter Reed National Military Medical Center at Bethesda, Md., and Rochal Industries LLP in San Antonio. The project's goal is to achieve high-quality, full-thickness skin restoration through a combination of the sequential application of 3-D custom negative-pressure wound therapy, custom facial neodermis or collagen-based artificial skin, and cell-based therapy using epithelium and stem-cell-enriched fatty tissue.

The outcome would be translatable to [skin](#) restoration, not only for the face, but hands and feet as well. The SwRI-led project, "Biomask for Skin Regeneration," is to receive at least \$1 million under AFIRM II.

"The surgeons at USAISR are passionate about finding novel treatments of maxillofacial injuries," Cheng said. "Our project might lead to a technology or product that accelerates functional healing while also reducing scarring."

Provided by Southwest Research Institute

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