



Lt. Gen. Eric B. Schoomaker, the U.S. Army surgeon general, explains during a Pentagon press conference in April how researchers are growing a new ear for a badly burned Marine using stem cells from his own body.

R.D. WARD/U.S. Department of Defense

Repairing Wounded Warriors

By GERRY J. GILMORE

The U.S. Department of Defense has launched a five-year, Army-led effort to use cutting-edge medical technology to assist service members who have suffered severe, disfiguring wounds during wartime.

Established in April, the Armed Forces Institute of Regenerative Medicine will serve as the U.S. military's operational agency for the effort, says Dr. S. Ward Casscells, the assistant secretary of defense for health affairs.

A key component of the initiative is to harness stem cell research and technology in finding innovative ways to use a patient's natural cellular structure to reconstruct new skin, muscles and tendons, even ears, noses and fingers, Casscells says.

More than 900 U.S. armed forces members have undergone amputations of some kind due to injuries suffered in wartime service in Afghanistan or Iraq, Casscells says. Other troops have been badly burned or suffered spinal cord injuries or significant vision loss.

"Getting these people up to where they are functioning and reintegrated, employed, able to help their families and be fully participating members of society" is the task in which the institute will play a major role, says Casscells.

"The cells that we're talking about actually exist in our bodies today," says Lt. Gen. Eric B. Schoomaker, the Army's surgeon general. "We, even as adults, possess in our bodies small quantities of cells which have the potential, under the right kind of stimulation, to become any one of a number of different kinds of cells."

Salamanders can regrow lost tails or limbs. Why can't a mammal do the same thing?

For example, Schoomaker says, the human body routinely regenerates bone marrow or liver cells.

The institute will have an overall budget of about \$250 million for the initial five-year period, of which about \$85 million will be provided by the Defense Department, Schoomaker says. Other program funding will be provided by the National Institutes of Health, in Bethesda, Maryland; the Department of Veterans Affairs, and local public and private matching funding.

Rutgers University, in New Jersey; Wake Forest University, in North Carolina; and the University of Pittsburgh in Pennsylvania will also participate in the initiative.

"All the parts of your body, tissues and organs, have a natural repository of cells that are ready to replicate when an injury occurs," says Dr. Anthony Atala, a surgeon and director of the Institute for Regenerative Medicine at Wake Forest. Atala's current research focuses on growing human cells and tissue.

Medical technicians can now select cells from human donors and, through a series of scientific processes, "regrow" new tissue, Atala says. "Then, you can plant that (regenerated tissue) back into the same patient, thus avoiding rejection."

Special techniques are being developed to employ regrown tissue in the fabrication of new muscles and tendons, Atala says, or for the repair and replacement of damaged or missing extremities such as noses, ears and fingers.

Continued advancement in regenerative medicine would greatly benefit service members and veterans who've been severely scarred by war, Schoomaker says.

He cites animals like salamanders that can regrow lost tails or limbs. "Why can't a mammal do the same thing?" he asks.

The institute will fall under the auspices of the U.S. Army Medical Research and Materiel Command, based at Fort Detrick, Maryland, and will also work with the U.S. Army Institute of Surgical Research in San Antonio, Texas.

Gerry J. Gilmore is a writer with the American Forces Press Service.

For more information:

Regenerative medicine
<http://www.defenselink.mil/news/newsarticle.aspx?id=49610/>

Stem cell basics
<http://stemcells.nih.gov/info/basics/>

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