

REGENERATIVE MEDICINE

Rebuilding the Injured Warrior

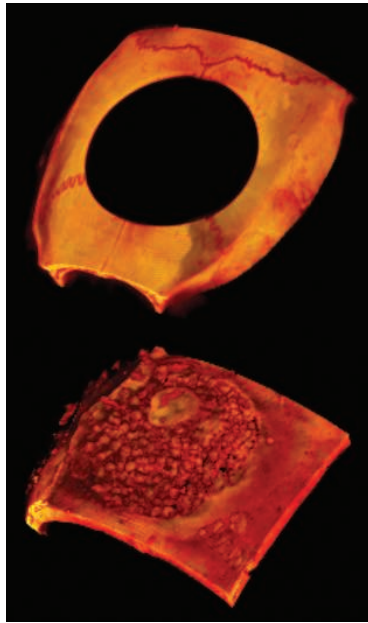
In an initiative to speed treatments for wounded soldiers, the U.S. Department of Defense (DOD) is entering the fast-growing field of regenerative medicine. Over the next 5 years, at least \$250 million will be funneled into two university-led consortia that compose the new Armed Forces Institute of Regenerative Medicine (AFIRM), DOD announced last week.

AFIRM will focus on regrowing severed fingers, recreating shattered bones, reconstructing mutilated faces, and covering burn victims with genetically matched skin. “We hope to get products into patients within 5 years,” says tissue engineer Anthony Atala of Wake Forest University Baptist Medical Center in Winston-Salem, North Carolina, co-director of one consortium led by Wake Forest and the University of Pittsburgh in Pennsylvania.

Last year, Atala reported isolating from amniotic fluid highly versatile stem cells (*Science*, 12 January 2007, p. 170), which are likely to figure prominently in the new technologies. Embryonic stem cells or their equivalents aren’t in the mix here. Rather, says Atala, the focus is on getting rapidly to the clinic, using cells that can get quick Food and Drug Administration approval.

DOD decided 2 years ago that it was time to make a major commitment to regenerative medicine treatments, largely at the instigation of dental researcher **Robert Vandre**, director of combat casualty care research at the U.S. Army Medical Research and Materiel Command at Fort Detrick, Maryland. Vandre says he originally managed to round up a commitment for \$8.5 million a year, including \$500,000 a year from the U.S. National Institutes of Health (NIH). Then **after receiving competitive** proposals for a single consortium, he got **a call “out of the blue” from the White House**, which ended up telling DOD to double the funding from \$42.5 million to \$85 million over

5 years. That made it possible to fund two consortia that had come in neck-and-neck in the competition. Vandre, who is AFIRM’s DOD manager, says the 5-year total should top \$265 million, including \$80 million in public and private funds to match DOD’s



Bridging the gap. Defective rat skull (top) shows bone formation 12 weeks after implant of scaffold with bone growth factors (bottom).

input and some \$100 million in NIH grants already held by researchers in the consortia’s 28 research groups.

A top priority will be engineered skin that can be quickly grown to treat burn victims. Atala points out that at present there is “no real skin replacement” because skin grafts from cadavers are prone to rejection; supply is also short. One of the earliest fruits of the venture may be a method to grow a patient’s own skin rapidly enough to use as a graft for life-threatening burns. Ultimately, says chemist Joachim Kohn of Rutgers University in New Brunswick, New Jersey, co-head of the other consortium, led by Rutgers and the Cleveland Clinic

in Ohio, “you could take a skin sample from every soldier in danger zones and store it” so that the moment a soldier is injured, people back at the Army medical center in San Antonio, Texas, could start growing a graft.

Another major focus is on “compartment syndrome”: internal muscle trauma from blast or other injuries that results in rapid swelling of arm or leg tissues so they compress nerves and blood vessels. If not treated swiftly, muscles die, and amputation is often necessary, says Kohn, who adds that so far the Iraq war has resulted in about 800 amputations. Other high priorities are wound healing, cranial-facial reconstruction, and regrowing severed fingers and toes.

“I’m fighting the perception that we will regrow limbs and heads and arms,” says Kohn. Rather, “what we want to do is take our ability to grow 2 inches of bone and extend it into 6 inches of bone. ... We are pushing the border of where limbs can be salvaged further and further out.”

—CONSTANCE HOLDEN

Grass-Roots Malaria Funding

Even small donors can now support malaria research using a new Web site that connects them with African scientists. The site, MalariaEngage.org, provides descriptions of research projects. Donors can contribute as little as \$10 to a specific project and follow its progress online.

Peter Singer and Abdallah Daar of the McLaughlin-Rotman Centre for Global Health in Toronto, Canada, teamed up with Tom Hadfield, a successful entrepreneur and Harvard University undergraduate, to create the site with \$200,000 from Genome Canada and the Bill and Melinda Gates Foundation. Scientists at the National Institute for Medical Research in Dar es Salaam, Tanzania, selected the first seven featured projects and will oversee the donations. Singer says the goal is to ensure that good ideas “aren’t flushed down the drain for lack of capital.”

—ELSA YOUNGSTEADT

A Step Too Far Ahead?

Japan is planning to vaccinate 6000 health care and quarantine workers against the deadly H5N1 virus. The workers will get one of two killed, adjuvanted vaccines derived from different strains in a pilot project that, if successful, could lead to the vaccine being given to 10 million people considered at risk of exposure to a pandemic virus.

The scientific community is split on the idea of vaccinating before a strain emerges. Peter Palese, a virologist at Mount Sinai School of Medicine in New York City, supports more research but adds that “vaccinating humans with a vaccine against a disease which might never materialize in humans is probably not appropriate.”

—DENNIS NORMILE

A NIFty Idea

A coalition of science policy wonks has proposed a federally funded National Innovation Foundation (NIF) to bring order and leadership to current efforts. “There’s nobody in the government who wakes up every morning and says, ‘My job is to drive innovation in the U.S. economy,’” says Robert Atkinson of the Information Technology & Innovation Foundation in Washington, D.C., who co-authored a paper with the Brookings Institution’s Howard Wial that is offered as advice to the next Administration.

The \$1-billion-a-year entity, modeled perhaps on the National Science Foundation, could also provide one-stop shopping for states, says Ray Scheppach, executive director of the National Governors Association in Washington, D.C.

—JEFFREY MERVIS