Drug developed holds promise for treatment of wounds

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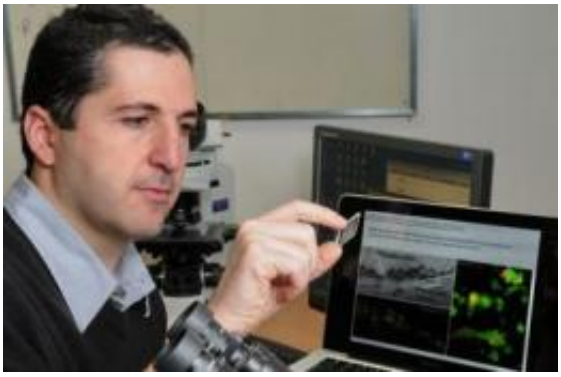

Dr. Yaakov Nahmias is head of the Center for Bioengineering in the Service of Humanity at the Hebrew University of Jerusalem. Credit: The Hebrew University of Jerusalem

A low cost, nanometer-sized drug to treat chronic wounds, such as diabetic foot ulcers or burns, has been developed by a group of scientists from the Hebrew University of Jerusalem, Harvard Medical School and others in the U.S. and Japan.

Diabetes is a rapidly growing medical problem affecting close to 3 percent of the world's population. Poor blood circulation arising from diabetes often results in skin wounds which do not heal, causing pain, infection and at times amputation of limbs.

Several proteins, called growth factors, have been found to speed up the

healing process, however purifying these growth factor proteins is very expensive, and they do not last long on the injured site.

Now, scientists at the Hebrew University and Harvard involved in the project have used genetic engineering to produce a "robotic" growth factor protein that responds to temperature. Increasing the temperature causes dozens of these proteins to fold together into a nanoparticle that is more than 200 times smaller than a single hair.

This behavior greatly simplifies protein purification, making it very inexpensive to produce. It also enables the growth factor to be confined and to remain at the burn or wound site. The scientists refer to their discovery as robotic, since just as robots are machines that respond to their environment by carrying out a specific activity, so too this protein they have developed responds and reacts to heat.

The experimental drug, which ha been developed by the research group as a topical ointment, has been patented and thus far has been used to treat chronic wounds in diabetic mice, dramatically increasing the healing rate. The goal is to proceed to human clinical trials at some future date after future tests and refinements.

More information: An article on the project has been published online in *PNAS* (*Proceedings of the National Academy of Sciences*).

Provided by Hebrew University of Jerusalem