

# Skin flaps deliver cancer-fighting therapy, ASPS study reveals

**Using gene therapy, plastic surgeons have delivered cancer fighting proteins through skin flaps placed on cancerous tumors on rats with a 79 percent reduction in tumor volume, according to a study in the May issue of Plastic and Reconstructive Surgery, the official medical journal of the American Society of Plastic Surgeons (ASPS). This new delivery technique, which has yet to be tested in humans, did not cause toxicity in the body of rats; however, administering the same anti-tumor agent intravenously in humans has previously been shown to cause liver damage.**

“This new technique may allow us to reprogram skin flaps, using gene therapy, to provide a blueprint for anti-tumor agents like Interleukin-12 to be produced in the tumor to kill cancer, while avoiding adverse side effects,” said Geoffrey Gurtner, MD, ASPS Member and study senior author. “In this study we took skin flaps in animal models and delivered IL-12 directly to the tumor area with tremendous success. Since skin flaps are used thousands of times each year in cancer patients, this may potentially open up an entirely new area in plastic surgery and bring the specialty, once again, to the center of medicine.”

Gene therapy has been heralded as a new tool to restrain or prevent tumor growth and recurrence in humans, but its use has been limited because of serious side effects and the difficulty in concentrating anti-tumor agents at the site of the cancer.

In the study, skin flaps (a mass of healthy tissue) taken from rats were injected with the gene for IL-12 into the flaps’ blood supply. The flaps were then placed onto cancerous tumors on the rats.

The study found a 79 percent reduction in tumor volume for animals treated with IL-12 compared to control animals. The treatment allowed individual cells within the flap to become encoded with IL-12 and function as “miniature factories” producing the IL-12 protein at very high levels in the tumor site, according to the study.

Additionally, the serious side effects previously documented with systemic use of IL-12 were not found in the treated rats. The liver, lung and spleen remained normal throughout the study. The delivery technique through free flaps did not cause liver toxicity, whereas using IL-12 intravenously in humans has been shown to cause liver damage.

“This could be a major advance for the delivery of a therapeutic agent to diseased parts of the body,” said Dr. Gurtner. “I can see this therapy being used for breast cancer, head and neck cancers, central nervous system malignancies, and somewhere down the line hemophilia, diabetes and infections.”

The study authors concluded that as oncologic reconstructive surgery is a major component of plastic surgery, the delivery of a healing agent precisely to the region where cancer was and where local recurrences are most likely to occur, could add a new dimension to the reconstructive function of free flaps in oncologic and reconstructive plastic surgery.

Source: American Society of Plastic Surgeons

*This document is subject to copyright. Apart from any fair dealing for the purpose of private study, research, no part may be reproduced without the written permission. The content is provided for information purposes only.*