



compelling. While they are being used to treat medical conditions such as leukemia and lymphoma and even breast reconstruction in cancer patients, there is also considerable interest in their anti-aging potential. Young skin remains firm and undamaged because stem cells are continually replenishing the epidermis, but as we age, these cells become damaged by stress and UV exposure and no longer regenerate as effectively as they once did.

## ABOUT-FACE

**STEM-CELL** *facelifts* are being touted as the new anti-aging breakthrough. Do they live up to the HYPE?

TEXT: AMBER NASRULLA

Since the late '70s, Dr. Richard Ellenbogen has been transplanting fat from places we don't want it (love handles and chunky-monkey thighs) to places where we might (our faces). While injections of fat, or adipose, can dramatically plump up the face and lessen the appearance of wrinkles, they're not foolproof; success is largely dependent upon the surgeon's technique. But even if the doctor is highly skilled—and there are no telltale lumps and bumps—up to 50 percent of the fat tends to be absorbed by the body within three months to three years, depending on the source of the fat and how it was prepared and the patient's metabolism. Attempting to improve upon that outcome, Ellenbogen employs an approach to fat grafting that uses three spectrums of laser light to activate dormant stem cells.

The medical world has been taken with stem cells since two Canadian researchers at the University of Toronto discovered them in 1961. These cells, which are found in fat, bone marrow and blood, are, under the right conditions, able to morph into other cells. That's why their potential use for regeneration and repair is so

Although the laser-activated stem-cell treatment is still considered unproven and experimental, Ellenbogen, a Beverly Hills-

based plastic surgeon, has been offering it to A-listers and regular folk for three years. Like the traditional fat-grafting procedure, he uses liposuction to collect fat. After centrifuging the fat, he separates the stem cells from it using a time-consuming, multi-step process. Next, he zaps these cells with three different laser light spectrums to "activate" the dormant stem cells. Finally, these cells are returned to the fat that was collected earlier. (He also adds growth factors, which he has extracted from the plasma in the patient's blood, to the mix.) After performing a standard facelift, he then injects the anti-aging concoction into the patient's cheeks, lips and upper eyelids. Ellenbogen says that initially you won't notice any difference between the method he uses and regular fat grafting, but he has observed that the incisions at the two-week mark appear as healed as they would typically at six weeks. In the long term, it is hoped that the lift will last longer because the stem cells will increase tissue renewal and regeneration. (The price for this procedure ranges from \$10,000 to \$25,000, depending on how extensive the additional facial surgical procedures are.) Ellenbogen candidly acknowledges that he doesn't know why there has been an improvement, but he speculates that the stem cells stimulate the formation of new blood vessels that supply oxygen to the transplanted fat cells, which helps them survive. "I hope that the stem cells increase the survival of the transplanted fat and boost the skin's rejuvenating potential," he says. "That's why I do it."

According to Dr. J. Peter Rubin, co-director of the Adipose Stem Cell Center and chief of plastic and reconstructive surgery at the University of Pittsburgh Medical Center, there is some evidence in animal studies that injected stem cells can create collagen and blood vessels. "I believe in the potential for stem-cell therapies to play a role in anti-aging, but evidence is needed to back up these claims," says Rubin. "Many current marketing claims ▷



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touting the power of stem-cell therapies to improve appearance are simply not justified by scientific evidence in 2011.” Dr. Jeffrey Kenkel, president of the American Society for Aesthetic Plastic Surgery, is also cautious. “The use of the term ‘stem cell’ is in vogue now, and it’s a very strong marketing tool. The reality is that we just don’t have a lot of information about the utility of stem cells in facial rejuvenation or breast rejuvenation. We need well-controlled studies to validate the claims being made today.”

A quick Google search will highlight any number of surgeons who take issue with Ellenbogen and other

cells to fat that has been extracted to bump up the concentration of regenerative cells. This fat is then injected into patients’ cheeks and temples. “By subjective estimates, not scientific measurements, my impression is that 50 to 80 percent of the fat is surviving in patients at the one-year point,” says Cohen. “I am optimistic that we will see benefits from adult-stem-cell and regenerative-cell therapy in a variety of wound-healing problems, cardiac conditions and breast reconstruction. It’s still a little early to say about outcomes in aesthetic applications. Some things may not pan out: By that, I mean fat may be equivalent to cell-enriched fat

*“The use of the term ‘stem cell’ is in vogue now, and it’s a very strong marketing tool.”*

transfer in some areas, but there may be some home-run applications in other areas—female hair loss, for instance—which we are evaluating.”

Dr. Freda Miller, senior scientist in the

doctors in the world who offer stem-cell facelifts. For example, Dr. Randal Haworth, a Beverly Hills-based plastic surgeon, notes on his blog: “Stem-cell facelifts are basically high-priced fat transfers that are supposedly enriched with stem cells. Those that claim they have the magic mix or snake elixir because they utilize stem cells in their fat transfers are essentially taking credit for the sky being blue.” Dr. Thomas Fiala, a plastic surgeon from Orlando, Fla., writes on his blog: “So far, we have no evidence—zip, zilch, nada—that there is any actual regenerative effect on the skin when the turbo-charged fat is added to the face.”

It’s precisely for this reason that Dr. Steven Cohen, medical director at Faces+ Plastic Surgery, Skin and Laser Center and clinical professor at the University of California, San Diego, is monitoring 50 patients through an institutional review board. Cohen performs what he calls “cell-enriched fat transfers.” This involves adding stem

Developmental & Stem Cell Biology program at the Hospital for Sick Children Research Institute in Toronto, is skeptical about these treatments because there’s no standardized method and no evidence that it’s not just the fat that is making the skin look younger and plumper. “Until doctors do clinical trials, there’s no way of knowing what is actually happening in patients’ faces,” she says. Meanwhile, Miller is studying molecules that may “promote and wake up stem cells in the skin.” She’s currently working with mice, but perhaps one day, cosmetics companies will grab hold of these molecules and formulate them into powerful—and profitable—anti-aging creams. But don’t look for these miracle creams at the cosmetics counter in the near future; scientific breakthroughs take time. “If we could explain to them how far we’ve come in such a short time, maybe they would be a little more patient,” says Miller. “The progress has been tremendous.” □