

EMERGING TRENDS AND TECHNOLOGIES: STEM CELL RECRUIT-

By Yula Indeyeva, MD

Desire for beautiful, healthy skin dates back to ancient times. As our population's life-span increases with the advances in modern medicine, so does the demand for restoration of youthful appearance. Addressing age-related changes of the skin is among the higher-prioritized items on my patients' "rejuvenation agenda." Perhaps, this is due to an abundance of minimally invasive technologies that promise cosmetically pleasing results, short downtime, and have a relatively cost-permissive nature.



Energy-based microneedling has been the workhorse in my skin rejuvenation armamentarium. I consider it a cost-effective treatment with little down time and satisfactory results. I believe in the concurrent utilization of biological agents to enhance clinical outcomes, and initially used blood biologies as my agents of choice: platelet-rich plasma (PRP) and platelet-rich fibrin (PRF). I was happy enough with the results. But as I got busier, I realized that these modalities required substantial time, effort, and expense. Furthermore, it is well known that the preparation and product quality vary widely, and influenced by patient factors, such as platelet quality and age, as well as vendor-specific factors, like proprietary techniques of extraction. Hence, I began my search for a regenerative medicine alternative that would be as effective, but more predictable and less labor-intensive than PRP/PRF.

Regenerative medicine was defined by Daar and Greenwood in 2007 as "interdisciplinary field of research and clinical applications focused on the repair,

replacement or regeneration of cells, tissues or organs to restore impaired function resulting from any cause." It encompasses cells, signaling molecules, and biomaterial in its arsenal. For several years now, regenerative medicine applications have been utilized in many medical specialties, including orthopedics, pain management, cardiac surgery, and urology. Recently, the aesthetic field has also become captivated by its rejuvenating potential.

Stem-cell based therapies are emerging as capable of generating biological substitutes and improving tissue functions. Stem cells are distinct population of cells with self-renewal and cellular differentiation properties, divided into two main groups: embryonic and adult stem cells.

Embryonic stem cells (ESCs) are derived from the inner cell mass of a blastocyst. They are pluripotent, with capacity to renew indefinitely and differentiate towards all three germ layers. ESC clinical use is limited due to these factors: 1) Safety concerns over non-immunocompatibility and tumorigenicity and 2) Ethical considerations concerning their obtainment from human embryos.

Adult stem cells are multipotent and can be isolated from adult tissue and are less likely to pose moral, ethical, or safety dilemmas. Among the adult stem cells, Mesenchymal Stem Cells (MSCs) are used most actively because of their feasibility and safety, ability to be isolated from adipose, bone marrow, Wharton's jelly, umbilical cord blood, and amniotic fluid.

SHOWN HERE IS A 71 YEAR-OLD FEMALE WITH PERIORAL SKIN LAXITY AND JOWLING. YOU SEE HER BEFORE AND THREE WEEKS AFTER HER SECOND TREATMENT SESSION WITH STEM CELL RECRUITMENT FACIAL CONCURRENT WITH MICRONEEDLING/RADIOFREQUENCY. NOTE THE SIGNIFICANT IMPROVEMENT IN RHYTIDS, LAXITY, AND OVERALL SMOOTHING OF THE PERIORAL SKIN.

Originally, it was believed that isolated/cultured stem cells were responsible for the beneficial effects in reparative processes, but recent body of literature supports the notion that the major mechanisms of stem cell participation in tissue repair are related to their paracrine activity. This is when the topic of stem cell secretome began to intrigue me. Secretome is a rich source of proteins secreted and shed from the stem cell surface, including cytokines, chemokines, proteases, and growth factors. As it relates to rejuvenation, secretome-induced cellular cascades result in various mechanisms. They include:

- 1) Recruitment of endogenous stem cells, and their subsequent differentiation
- 2) Mitigation of inflammation
- 3) Induction of angiogenesis
- 4) Increased synthesis of collagen and elastin
- 5) Suppression of advanced glycation end products (AGEs) (modified proteins and lipids after exposure to sugars that are consistently implicated in skin aging).



MENT THERAPY...TAKING SKIN REJUVENATION TO THE NEXT LEVEL

Collectively, these mediators promote tissue repair and create a regenerative microenvironment. Secretome-based therapy seemed the most feasible to me, as I wished to utilize the regenerative power of stem cells without the potential implications of patients' negative perception, as stem cell use is still greatly misunderstood and controversial among the general population. I elected to pursue acellular amniotic fluid product (DermaFlo; manufactured by Russell Health) as my agent of choice. The amniotic fluid is collected at the time of live C-section birth to a mother who has given consent to donate. It undergoes FDA-regulated testing,

processing, and storage in 1cc and 2cc vials, ready to draw up and use.

I established my own multi-step protocol, now patented as Stem Cell Recruitment Facial for skin rejuvenation. The protocol involves the use of acellular amniotic fluid (DermaFlo; Russell Health) concurrently with microneedling/radiofrequency. I begin with one pass of microneedling/RF (Pixel-8; Rohrer Aesthetics), followed by intradermal injections of the amniotic fluid, and subsequent second pass with the microneedling device at an increased depth of needle penetration. Lastly, the remainder of the amniotic fluid is

applied topically and allowed to absorb through microchannels in the skin surface. The treatment course consists of two sessions separated by three to four weeks, then an annual "maintenance" treatment.

The Stem Cell Recruitment Facial harnesses the power of stem cell secretome in conjunction with microneedling/RF technology, without the ethical and financial limitations of using cellular-based therapy. Since implementing this protocol, I've observed shortened preparation times, and improved standardization of minimally invasive skin rejuvenation, more reliable comparison of results between patients. My clinical results have been superior to PRP, in terms of improvement in skin tone, texture, skin laxity, appearance of pores, decrease in rhytids, and increased patient satisfaction. The preparation time is greatly reduced, as the product comes ready to administer. I consider it a safe and more effective alternative to PRP/PRF for managing skin rejuvenation and scarring with added benefits of reduced handling that blood-based biologics require. Secretome-based therapy is the future of aesthetics, and I am thrilled to be on the forefront of its clinical research.

The Emerging Trends column is designed to share innovations in treatment, surgical procedures, implants, and other devices, as well as successful practice management examples, for review and consideration by the reader within the context of his or her own practice. The views expressed are those of the author(s). The AAFPRS does not necessarily endorse any of the products or services mentioned in this article. Comments and questions can be directed to the author Dr. Indeyeva at yulaindeyeva@gmail.com.

Dear OFPSA members,

Let me start off by saying, I hope everyone is staying healthy during this COVID-19 pandemic! What a weird time it is and such a horrific virus!

As of now, our meeting in Boston is still on.

Location: John B. Hynes Veterans Memorial Convention Center

Dates: September 10-12, 2020

Host Hotel: Sheraton Boston Hotel

39 Dalton Street, Boston, MA 02199

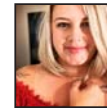
There are room blocks at the Sheraton Boston, which is connected to the Hynes Convention Center, where most of the meetings will be held.

If you haven't already done so, renew your OFPSA membership today. The cost is \$180.00 for the entire office. Your membership will get you a reduced registration fee for the meeting.

We have some exciting things lined up for the OFPSA. We just confirmed an office tour and a Zumba dance session!

At this time, I'm looking to fill up the OFPSA agenda with some topics that the OFPSA members would like to hear. If you or someone you know would like to give a talk, let me know. I want to build this program around what the OFPSA members want. I would love for you to leave the conference with more knowledge to take back to your offices. Let's make this the best meeting yet! Please email your suggestions to me directly at amladineo@stanfordhealthcare.org.

The OFPSA is also looking for an IT coordinator. If you or anyone you know might be interested, please reach out to me ASAP!



Respectfully,
Amy Mladineo, OFPSA President