Figure X. Second degree burns in patient with Skin Type VI (left). Seven days after application of Prism Exos (middle). Sixty days after application of Prism Exos (right), with no scarring or abnormal pigmentation.

Exosomes

Powerful regenerative message in an extremely small packages...

Exosomes are nano-scale extracellular vesicles – very small packages of signaling information one thousandth the size of a cell. They are produced by virtually every cell type as a means of intercellular communication. This natural paracrine signaling system allows a healthy body to run like a well-oiled machine.

Exosomes contain proteins such as growth factors, enzymes, receptors, transcription factors and matrix proteins that govern cell structure, function and signaling. They also contain messenger RNA (mRNA), the blueprint for protein production, and micro RNA (miRNA), an important intracellular signaling mediator. Having the same type of membrane as their parent cells, **exosomes** protect these exosomal proteins and miRNA from degradation until they are delivered to the target cell.

When **exosomes** deliver their contents to target cells, exosomal proteins can have direct effects on intracellular processes and signaling. Exosomal mRNA may be translated by the target cell to produce numerous copies of regenerative protein. Exosomal miRNA influences target cell protein production by interfering with specific endogenous protein production.Exosomal signaling can also alter target cell exosome loading for cascading effects and a more sustained effect than the type of proteins in PRP or amniotic fluid alone could achieve.

FAQ

What is an exosome?

Exosomes are extracellular vesicles ranging between 30-150 nm that are produced by virtually every cell type as a means of intercellular communication They contain proteins (growth factors), mRNA (blueprint for protein production) and micro RNA (on-off switch for specific protein production), all contained within a membrane similar to their parent cells that protects exosomal proteins and RNA from degradation until they are delivered to the target cell.

Does the parent cell type of the exosome matter?

Yes, the cargo of the exosomes varies significantly according to the specific parent cell type. In this case, these MSC exosomes carry the developmental message of peri-natal mesenchymal stem cells, which are progenitor cells of the connective tissue lineage, meaning that they are involved in development of tissues like skin, hair, bones, muscle and cartilage.

How does Prism Exos compare to amniotic fluid?

Amniotic fluid has a significantly different protein profile than Prism Exos and lacks key proteins like TGF-β3, which is and important modulator of inflammation and immune function. Also, the exosomes present in amniotic fluid are primarly of maternal epithelial cell origin, which means that their cargo is substantially different than that of an MSC exosome.

How does Prism Exos compare to "stem cell" products often referred to as umbilical cord blood, Wharton's jelly or biologic allograft?

After thawing these frozen "stem cell" products, the viability of these allogeneic cells approaches zero, meaning that their effects are dependent on the growth factors and the low concentration of exosomes present in the product. Unlike Prism Exos, which has a very high concentration of MSC exosomes, these growth factors are not protected by the liposomal membrane.

How does this compare to bonemarrow derived exosome products?

Bone-marrow derived exosomes originate primarily from hematopoietic stem cells (HSCs) rather than mesenchymal stem cells, which are the source of the exosomes in Prism Exos.These HSCs are progenitor cells of the blood cell lineage, not the connective tissue lineage, and so their exosomal cargo is much different from that of MSC exosomes.

prismexos.com

PRISM MED
Medical Testing Made Easy

Prism Exos

Purified MSC Exosomes

Info@pmhservices.com

Prism Exos®

Prism Exos® is a purified mesenchymal stem cell (MSC)-derived exosome product that contains a multitude of growth factors that can enhance the coordinated cascade of cellular and biochemical events involved in natural wound healing and skin rejuvenation/regeneration.

The physiologic effects of the exosomal growth factors in **Prism Exos®** can be used to stimulate healing of acute and chronic wounds, regenerate collagen in aging and damaged skin and reduce inflammation. **Prism Exos®** has the potential to accelerate wound healing, improve skin texture, reduce scarring, stimulate hair growth and shorten recovery time after cosmetic procedures.

Prism Exos® is a cell-free isolate of MSC exosomes. This concentrated biologic product is sterile-filtered and re-suspended in [0.9%] normal saline. Each milliliter of **Prism Exos®** contains 20 billion MSC exosomes.

	Amniotic Fluid	Bone Marrow	Prism Exos ®
Parent Cell	Epithelial	Hematopoietic	Mesenchymal
Age	Peri-Natal	Adult, Variable	Peri-Natal
Donors	Multiple	Multiple	Single
Mean Size	Not Tested	70 nm	120 nm

Figure 1. Characterization of exosomes from different sources

Mesenchymal Stem Cell Exosomes

This very unique type of exosomes are produced by stem cells of the connective tissue lineage – the origin of skin, hair, bone, muscle, cartilage etc. **MSC exosomes** are very different than exosomes found in adult bone marrow, which has a preponderance of hematopoietic stem cell exosomes, or amniotic fluid, which has primarily maternal epithelial cell exosomes. The distinct ability of **MSC exosomes** to induce connective tissue synthesis may be the basis of many of the remarkable clinical benefits that have been observed with stem cell therapy.

Advantages of Young Progenitor Cells

As we age, the number and function of the MSCs in our tissues declines sharply. Aged autologous progenitor cells produce about 30% of the cytokines and significantly different miRNAs compared with peri-natal MSCs. This substantial difference in secretome confers a significant advantage of peri-natal **MSC exosomes** over exosomes from aged autologous or allogeneic progenitor cells.

Effects of MSC exosomes on Skin

- Stimulate fibroblast proliferation and migration;
- Promote angiogenesis in acute and chronic wounds;
- Increase collagen extracellular matrix production/ depo sition;
- Modulate inflammation and immune response;
- Regulate tissue remodeling to reduce scarring;
- Increase the number of hair follicles in the growth phase;
- Regenerate dermal papilla cells of hair follicle.

Figure 2. Second degree burn one week after injury (left). Seven days after application of **Prism Exos®** (middle). Four weeks after application of **Prism Exos®** (right). **Courtesy of Gregory Chernoff MD.**

Anti-Inflammatory

By down-regulating inflammatory proteins and upregulating anti-inflammatory proteins, **MSC exosomes** can reduce inflammation, which is a central mechanism of many autoimmune, inflammatory and degenerative conditions, as well as scarring.

Figure 3. Rosacea (left), two days after application of **Prism Exos®** (right).

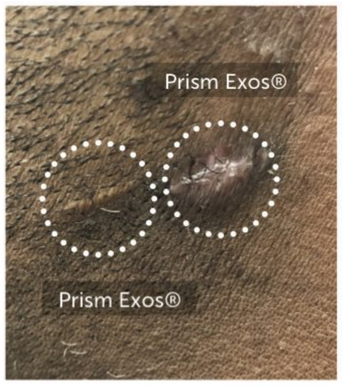

Figure 4. Healed incisions after keloid excisions with (left) and without (right) application of **Prism Exos®. Gregory Chernoff MD**

Regenerative

MSC exosomes stimulate the proliferation and migration of cells such as fibroblasts, endothelial cells, keratinocytes and specific endogenous progenitor cells that are involved in healing damaged tissues to increase angiogenesis (new blood vessel formation), improve survival of damaged tissues, accelerate wound healing and skin regeneration, and reduce scarring.

Tissue Regeneration & Remodeling

Exosomes derived from mesenchymal stem cells have been shown to reduce apoptosis (programmed cell death), which could lead to less tissue damage in response to disease or injury. **MSC Exosomes** have the capacity to enhance tissue remodeling by promoting a normal lattice-structure of collagen fibers for reduced scarring and more normal healing.

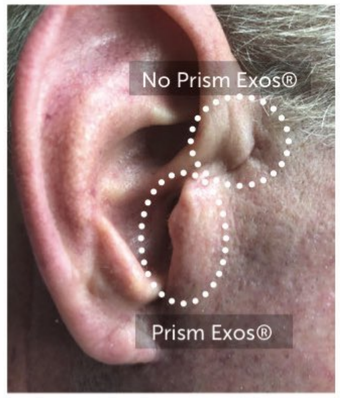

Figure 5. Healed incision after face lift with application **Prism Exos®** (lower) and without application of **Prism Exos®** (upper).