

**FOR INTERNAL USE ONLY:**

This is an educational presentation by the INTEGRATIVE HEALTH RESEARCH CENTER about ultrasound imaging intended for the dermatological society or other clinical institutions. It showcases the capacity of Dr. Robert Bard's research strategy under his image guided research reporting of FDA cleared products and innovations and is published for informational use only. No brand/product under review is mentioned in this report.

## THE USE OF ULTRASOUND IMAGING ON THE TOPICAL SERUM PERFORMANCE TEST

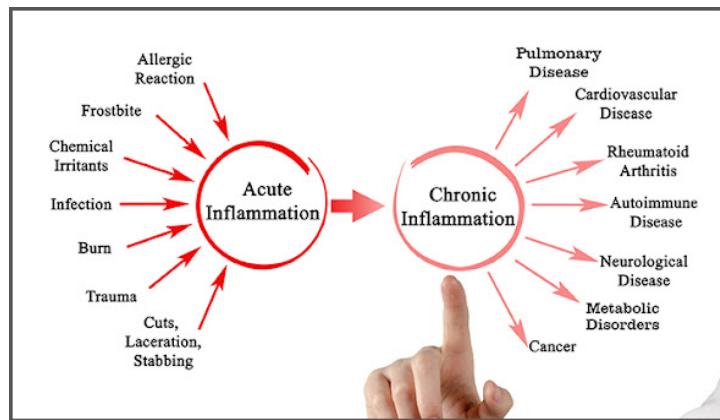
Stem cells, just like every other cell in the human body, release exosomes to communicate with each other. Exosomes are membrane-bound vesicles with a diameter of about 40–160 nm, which are released from cells by an endosomal pathway. In June of 2023, the research team of AngioResearch (501c3) and the Integrative Health Research Center (IHRC) conducted a private and medically supervised academic study using medical-grade ultrasound technology to detect the efficacy of a selected Exosome-based skin conditioning product. As identified in the market, exosome-based products are accepted only in topical form (and not internally induced protocols). The topical product used in this test was marketed to the aesthetics community as a “rejuvenating serum for at-home daily use ...combining nano-encapsulated stem cell growth factors, powerful peptides, and the highest quality skincare ingredients available to support skin health and rejuvenation”. The product was also described to offer faster recovery after skin procedures.

Global interest in the advancement of Exosomes continues to raise significant interest in the research community to explore and confirm findings about this technology as has been raised since the advent of stem cell research (early 1980's). Dr. Robert Bard initiated this “test drive” employing an IMAGE-GUIDED approach to monitor, track and report his findings through the use of advanced ultrasound scanning modalities.

## QUANTITATIVE IMAGING TO MONITOR THERAPEUTIC RESPONSE

By: Dr. Robert L. Bard

One of the most comprehensive ways to confirm the results of any treatment is by clinically tracking the body's physiological response from underneath the skin. Diagnostic imaging captures measurable data about the injured or inflamed area, allowing both clinicians and patients the ability to identify therapeutic progress in real time. Widely preferred scanning modalities include the Doppler Blood Flow Ultrasound (or sonography) and Elastography, both using high-frequency sound waves to view inside the body. Like an internal video camera, these high speed scanning innovations capture actual function of the body's internal organs. This offers a vast amount of biometric information about the patient's condition, in comparison to still images of conventional x-rays. The ultrasound's ability to evaluate abnormalities within the soft tissue in research and clinical trials are widely used in recording evidence-based biomarkers to trace therapeutic efficacy.





**IMAGING IN THE NEWS:** 6/22/2023- Dr. Robert Bard @ Bard Diagnostics in NYC is featured in this special CH11 PIX11 report about the latest innovations in non-invasive therapies for pain and inflammation. This includes the expansion of Bioenergy Therapies like PEMF (Pulsed Electromagnetic Field) and Photobiomodulation (Near Infrared) devices to offer cell regenerative solutions to address a wide set of inflammatory disorders. As a seasoned radiologist, Dr. Bard recognizes the demand for non-invasive solutions in the medical field. Dr. Bard is also introducing the latest advancements in ultrasound and elastographic scanning as part of his "Scan and Treat" protocol for real-time efficacy tracking.

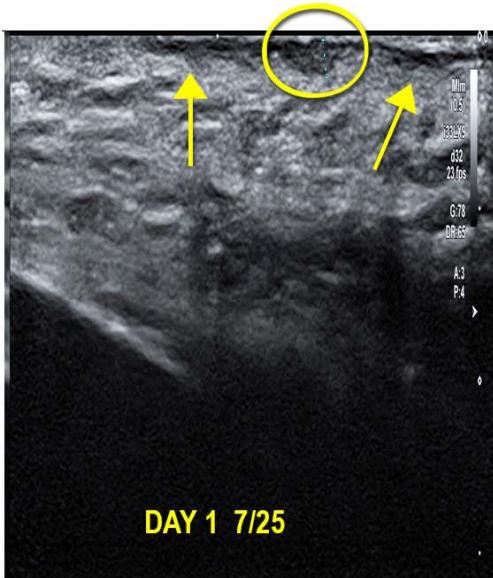
## COMPREHENSIVE PERFORMANCE REPORT OF A TOPICAL SKIN CONDITIONING PRODUCT

The following is an anecdotal performance report from a single academic case study to represent the effects of an unnamed exosome-based topical product. Process and reaction reports collected were from the durations of July 25-August 21 under the strict medical supervision of IHRC/ Bard Diagnostic Imaging Center. Quantitative imaging reports in this review were conducted strictly with the use of 3D Doppler Ultrasound imaging and Elastographic technology and are submitted by Dr. Robert L. Bard.

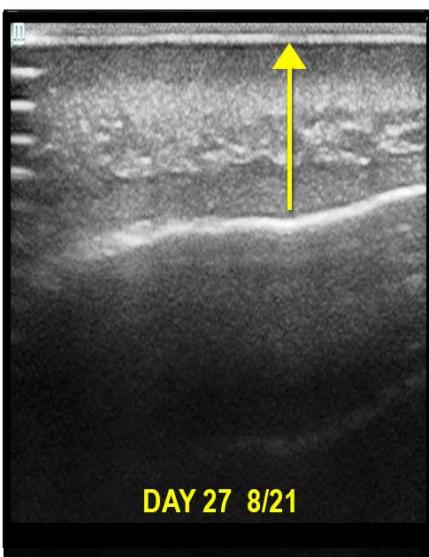
### TOPICAL SERUM EFFICACY PERFORMANCE – RESEARCHER'S LOG



**Exosome topical product applied on glabella to address skin roughness, itchiness and subdermal swelling.**



**DAY 1 7/25**



**DAY 27 8/21**

### OVERVIEW:

In this case study, the test subject happens to be a dermatologist who identified disorders in the glabellar region (the smooth part of the forehead above and between the eyebrows) with skin roughness, itchiness and pigmented protrusions.

We established a base line with a sonogram scan labeled "DAY 1" at high resolution. The two short arrows point to the thickened epidermis, which is normally 200 microns and it is thickened to between 300 and 500 microns- as indicated by the arrows and the circle. Upon review, the tissue appears to be considerably swollen between the epidermis and the bone, and the inhomogeneous echo pattern is filled with dilated subdermal glands. The significance of this is that the surface of a skin lesion in inflammatory diseases is dependent upon the subsurface or subcutaneous pathology, which is often not visible with the naked eye.

In this case, after 27 days of using the product three times a day, we noticed that the arrow at day 27 points to the 200 micron epidermis and the swelling has greatly reduced, and the internal subcutaneous echo pattern is more homogeneous with fewer dilated glandular reasons. From the user's perspective, the volunteer expressed significant satisfaction after one month of progress and is now continuing use of the product with a 2<sup>nd</sup> bottle.

### PROBE TECHNOLOGY & SCAN INTERPRETATION:

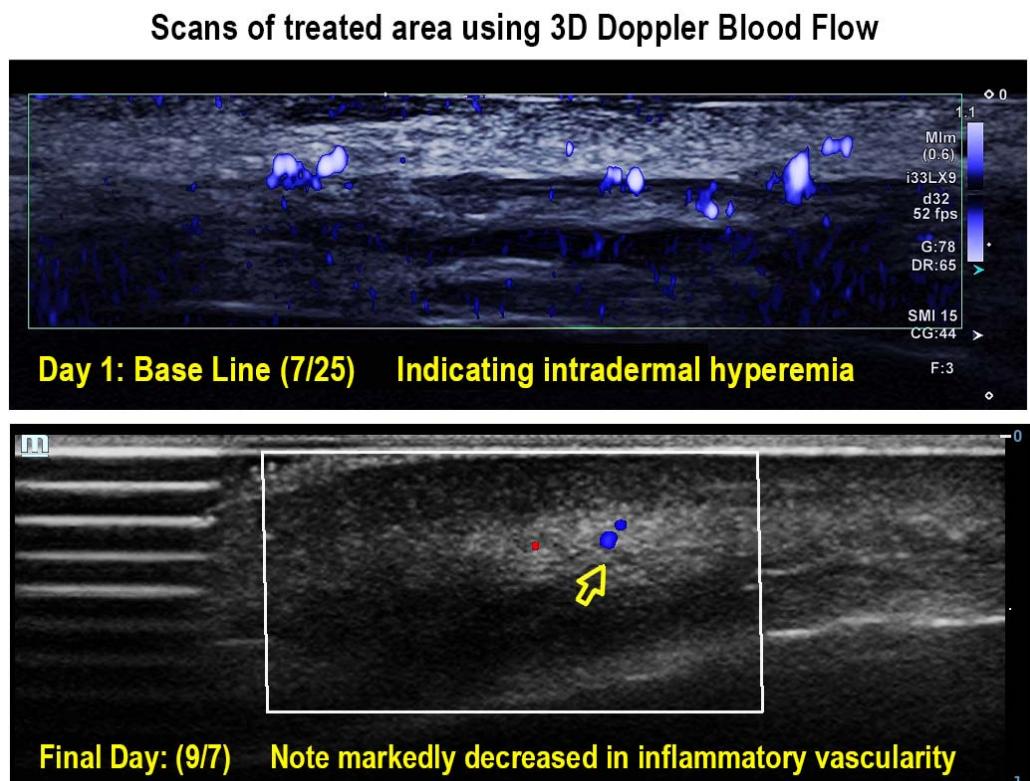
On day #1, we used a 33MHz ultra-high resolution probe. On day #27, because the roughness and puffiness of the skin had reduced, we use a 20MHz probe. What's important is the dermis is clearly seen to have two layers; one is a dark gray layer which is represented by the single arrow that points to the epidermis. Below that is a white layer- which is the bottom layer of the epidermis. This is indicative of a collagen disease or inflammatory disease process and the epidermis, which still continues, but the irregularity in the epidermis and the dilated inflammatory glands have decreased dramatically.

### PART 2:

A supplemental test is to expand this line of research to detect and measure the vascular effects of the inflammation with the 3D Doppler histogram technology. This ultrasound feature is often used to quantify the inflammatory vascularity. In this case study, we are able to detect intradermal hyperemia and inflammatory vascularity.

### STRATEGIC TARGETING OF INFLAMMATION

Most inflammatory diseases are subdermal or dermal and are not visually evident with the unaided eye. Use of the sonogram clearly shows measurable epidermal thickening and irregularity. Our diagnostic scanning indicated subdermal dilated glands and cystic areas which are related to the inflammatory process. While quantitative imaging helps us identify the cosmetic effects of exosomes with this product, confirming this with the patient's reported reduction of itching (or pruritus reduction) aligns with the product's anti-inflammatory effect. This is a conceivable indicator of the depth of penetration of this product from the surface to the subcutaneous tissues, offering potential validation of the therapeutic effects of this product.



For more information on Image Guided performance research studies, visit: [www.Angiofoundation.org](http://www.Angiofoundation.org)

Or contact our research coordinator at Bard Diagnostic Imaging: 212.355.7017

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