

A Backgrounder on Nano-Pulse Stimulation Technology

Nano-Pulse Stimulation™ (NPS™) technology is a novel energy modality that has been shown to non-thermally clear common cellular skin lesions associated with many dermatologic conditions.

The NPS Difference: Non-thermal, cell-specific, unique margin control

Nano-Pulse Stimulation technology targets the cellular structures of a lesion and can clear these cellular lesions while sparing surrounding non-cellular dermal tissue – primarily collagen – that makes up the skin's foundation.

NPS technology applies ultrafast, non-thermal energy pulses, with pulse durations from billionths up to a millionth of a second. NPS energy pulses enter cells and are believed to alter the function of internal cellular organelles, including the mitochondria and endoplasmic reticulum, without disrupting the integrity of the outer cell membrane or extracellular tissue, like the dermal tissue.

This unique mechanism of action initiates a cascade of events within the affected cells, leading to regulated cell death (RCD). Microscopic analysis demonstrates that NPS technology non-thermally stimulates a natural cell death that results in a less traumatic inflammatory response¹ than thermal technologies like extreme heat or extreme cold.

Nano-Pulse Stimulation (NPS) technology originated from the groundbreaking research of nanosecond-pulsed technology discovered by leading bioelectric researchers at Old Dominion University and the University of Southern California.



Nano-Pulse Stimulation technology delivers ultrafast energy pulses



These energy pulses cause the creation of tiny pores which allows ions to move within the cell



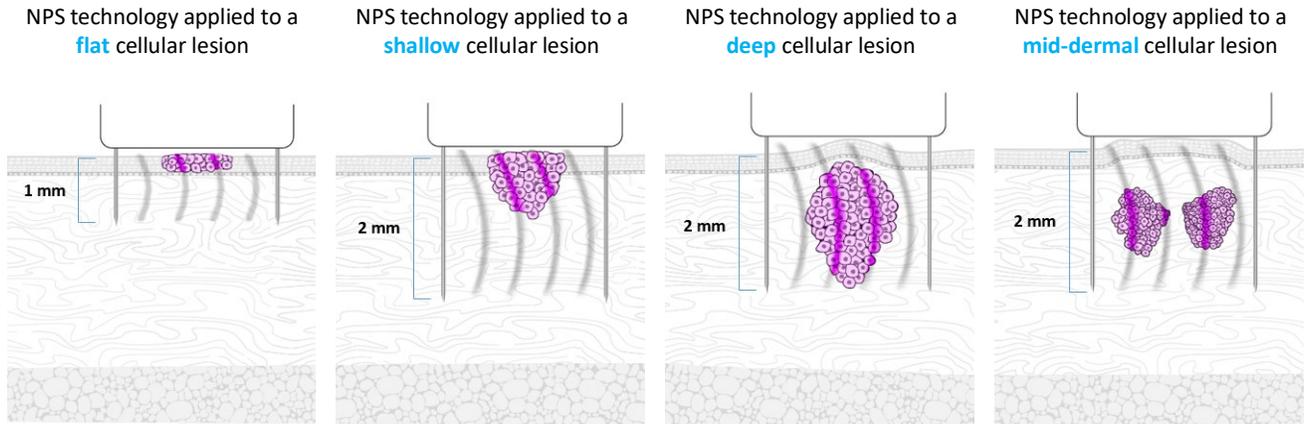
This disruption triggers significant changes deep within cellular organelles leading to regulated cell death (RCD)

NPS technology is **cell-specific** – it affects cells and only cells. Surrounding non-cellular dermal tissue, ie. healthy collagen foundation, remains unaffected.

NPS technology is **non-thermal**, which means it does not generate heat or cold. Traditional lesion-removal technologies typically use extreme heat, extreme cold, or surgery, which often result in unnecessary destruction of the surrounding collagen structure. These traditional modalities can lead to slower recovery times and greater risks of scarring or other permanent damage to the skin.

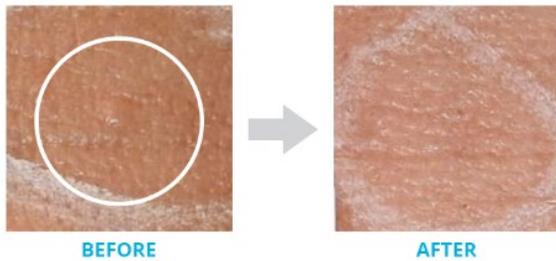
The distinct ability of NPS technology to reach the cellular structures of a lesion while sparing surrounding non-cellular dermal tissue provides aesthetic skin specialists **unique margin control** in clearing skin lesions. Since lesions are made up of cells surrounded by non-cellular collagen structure, cell-specific NPS technology can be an ideal solution for clearing lesions while preserving the collagen foundation.

While a lesion appears at the surface of the skin, most cells of a lesion extend underneath the surface into the layers of the skin (the dermis) and can reside at unknown depths.



Excellent clinical results across multiple difficult-to-treat dermatologic conditions

Sebaceous Hyperplasia²



Cleared SH
at 60-day follow-up

Warts (Non-genital)³



Cleared Wart
at 30-day follow-up

Seborrheic Keratosis⁴



Cleared Raised SK
at 106-day follow-up

What is a skin lesion?

A skin lesion is the medical term for a part of the skin that has an abnormal change or irregular appearance compared to the healthy skin around it. A lesion is typically made up of abnormal cells, caused by malformations of the structure of the skin. On the surface of the skin, a lesion can look like a spot, bump, or growth, can be flat or raised, can have pigment or be clear, and can appear anywhere on the face and body.

Skin lesions are one of the most common reasons patients visit a dermatologist. Because most lesions are benign, the decision to remove them are considered a cosmetic or cash-paying procedure. This is the initial target market for NPS technology.

The future of NPS technology

In early studies of non-melanoma skin cancer, NPS technology has demonstrated an ability to clear nodular basal cell carcinoma (nBCC) cells without damaging surrounding dermis. Assessment of clinical photographs and microscopic analysis of skin samples from this NPS study demonstrate rapid healing and a reduced potential for scar formation compared to surgical excision,⁵ which is the current standard of care for these types of skin cancers.

In addition to the direct elimination of malignant tumor cells, pre-clinical (animal) studies have supported the promise of NPS technology to potentially stimulate an adaptive immune response.^{6,7}

Future clinical studies with a larger population are planned to validate these initial positive findings.

References

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About Pulse Biosciences

Pulse Biosciences is a novel bioelectric medicine company committed to health innovation that has the potential to improve and extend the lives of patients. The CellFX® System is the first commercial product to harness the distinctive advantages of the Company's proprietary Nano-Pulse Stimulation™ (NPS™) technology to treat a variety of applications for which an optimal solution remains unfulfilled. NPS technology delivers nano-second pulses of electrical energy to non-thermally clear cells while sparing adjacent non-cellular tissue. The initial commercial use of the CellFX System is to address a broad range of dermatologic conditions that share high demand among patients and practitioners for improved and durable aesthetic outcomes. Designed as a multi-application platform, the CellFX System offers customer value with a utilization-based revenue model across an expanding spectrum of clinical applications.



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To stay updated on the CellFX System powered by Nano-Pulse Stimulation technology, please visit CellFX.com. More information on Pulse Biosciences can be found at pulsebiosciences.com.

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