




Η Χρήση της Τεχνολογίας στην Αισθητική

Γρηγόρης Σταύρου



“Βασικός μας στόχος και σκοπός,
πάντοτε ήταν να προσφέρουμε ότι
καλύτερο στον τομέα μας και πιο
ειδικά στο πεδίο της αντιγήρανσης
και στο χάσιμο τοπικού πάχους”

THE PAST



THE PRESENT

- Galvanic with ampoules
- Faradic
- Steamer
- Vacuum
- Brushes
- Micro-needling
- Thermal stimulation
- Pressotherapy
- Chemical peels
- IPL and Laser
- Products

Electroporation

Mono and Bipolar RF

MDA, new mild AHA

Endomassage

MDA, mild AHA

Fractional RF

Mono and Bipolar RF

Remains unbeatable

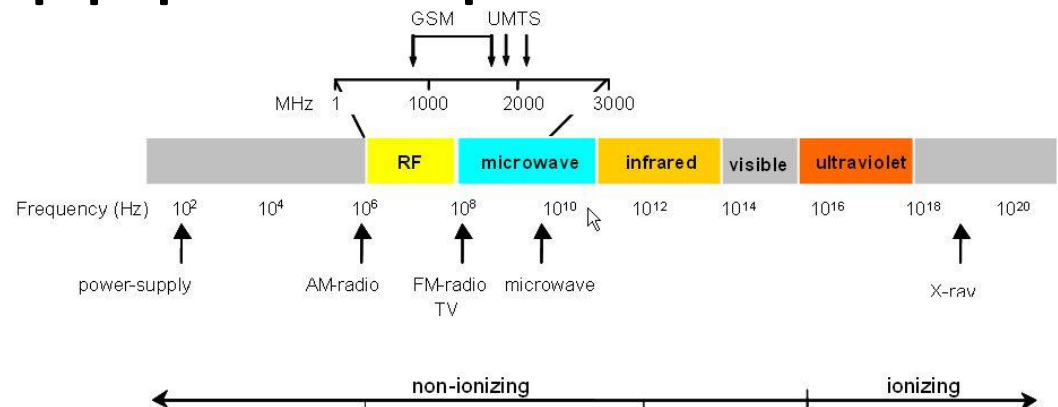
New mild AHA, MDA

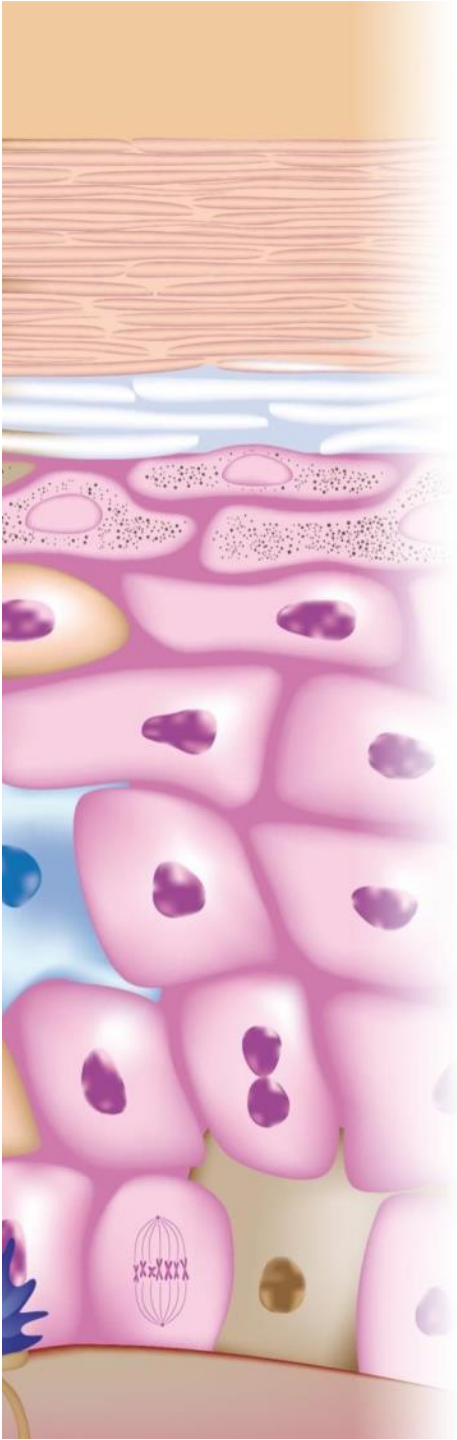
CPL and new wavelengths

New nano ingredients

ΡΑΔΙΟΣΥΧΝΟΤΗΤΕΣ (RF)

Ραδιοσυχνότητα είναι μια ταλάντωση που μεταδίδεται με την ταχύτητα του φωτός, στην μορφή εναλλασσόμενου ηλεκτρικού και μαγνητικού πεδίου. Επειδή πρόκειται για μη ιονίζουσα ακτινοβολία οι ραδιοσυχνότητες δεν προκαλούν γενετικές μεταλλάξεις και δεν παρουσιάζουν αθροιστικά φαινόμενα. Οι συσκευές ραδιοσυχνοτήτων εκπέμπουν ραδιοκύματα μέσω ηλεκτροδίων με αποτέλεσμα την αύξηση της θερμοκρασίας του ιστού και την συστολή και αναδόμηση του κολλαγόνου.





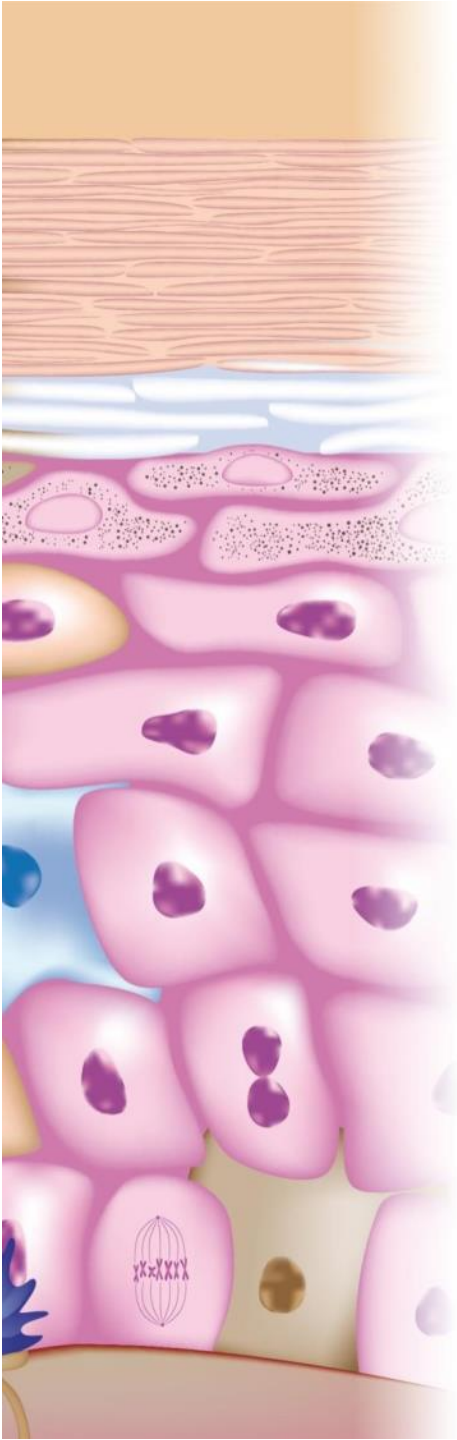
BIOCHEMICAL EFFECT

CELL METHABOLISM Improvement

OXIGEN RICH BLOOD increase

BLOOD FLOW increase

DRAINAGE



MECHANICAL EFFECT

LIQUID FLOW SPEED UP

LYMPH DRAINAGE

TONING of BLOOD VESSEL WALLS

THERMAL EFFECT

How does it work?

The biophysic of thermal remodelling of collagen

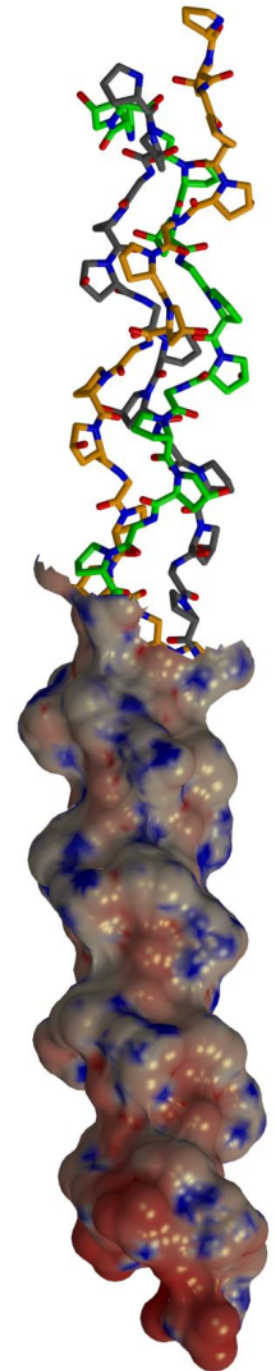
The **thermal contraction** of collagen results in a **lifting effect**.

Collagen fibers consist of **triple helices** molecules which deteriorate with age.

The application of **thermal energy** for a specific time **shrinks** and **strengthens** the collagen fibers.

The **ideal temperature** to achieve the desired effect (contraction of collagen) ranges between **57 ° and 61 ° C**.

To achieve a proper lifting effect the radio frequency signal has to reach a **depth of about 1-2 mm**.



RF: OPERATIVE MODE



MONOPOLAR RF



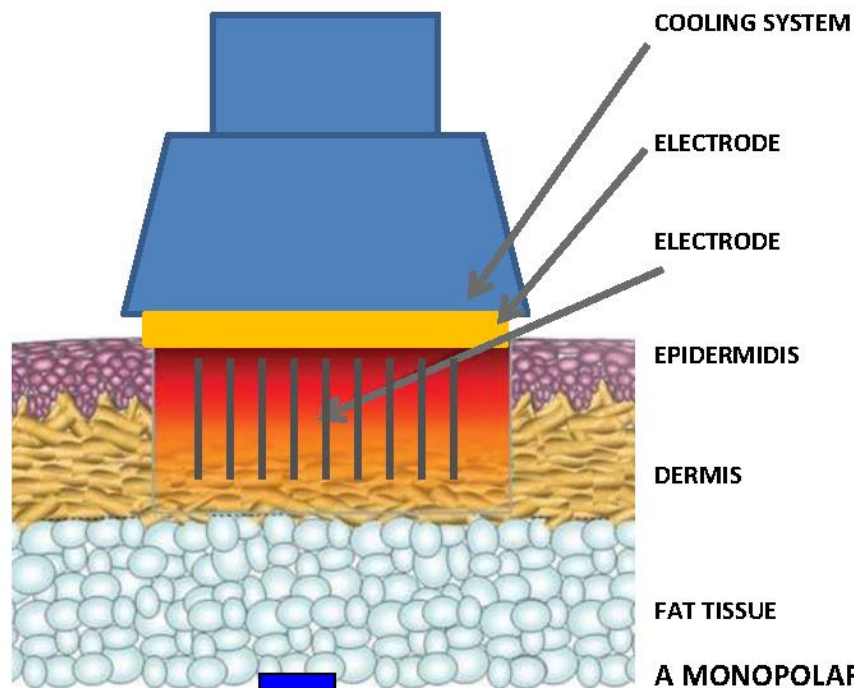
BIPOLAR RF

MONOPOLAR RF

MONOPOLAR

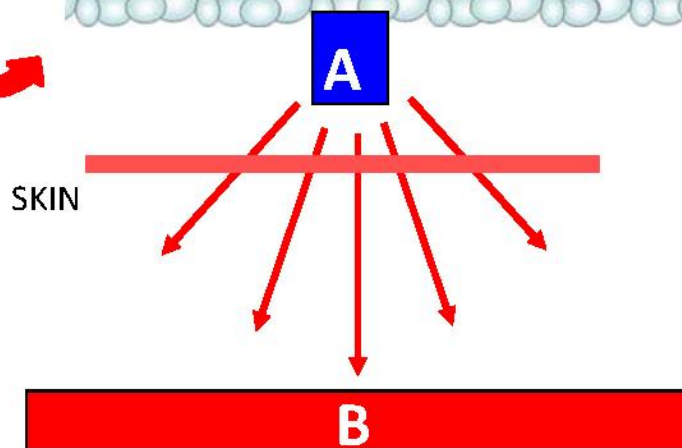


BIPOLAR



A MONOPOLAR SYSTEM consists of:

- an EMITTING ELECTRODE (A)
- a RECEIVING ELECTRODE (B),
- a COOLING SYSTEM to prevent epidermis burning.



RADIOFREQUENCY: MECHANISM OF ACTION

Is it effective?

Histological studies

METALLOPROTEINASES ACTIVATION

HEAT SHOCK PROTEINS ACTIVATION

INFLAMMATION MEDIATORS

TROPOELASTIN, FIBRILLIN, PROCOLLAGEN 1 AND 3
SYNTHESIS

COLLAGEN FIBER CONTRACTION

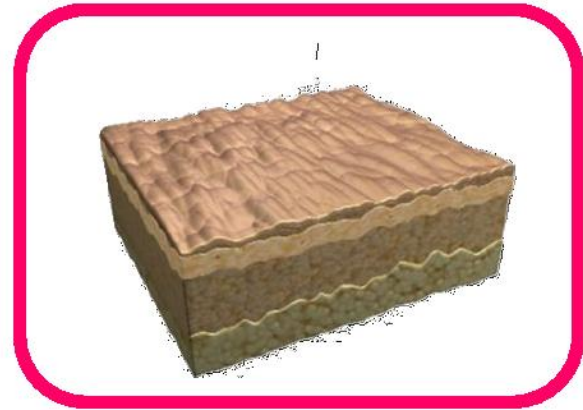


DERMIS DENSIFICATION



EFFECT: SIGNIFICATIVE IMPROVEMENT OF WRINKLES AND SKIN LAXITY

Basil M. Hantash et al. Lasers in Surgery and Medicine 41:1–9 (2009)



RF: EFFECTS ON COLLAGEN

1- SHORT TERM EFFECT:

The bonds between the different chains are sensitive to heat; they initially open inducing a change of the three-dimensional structure of collagen, from a highly organized CRYSTALLINE structure to GEL.

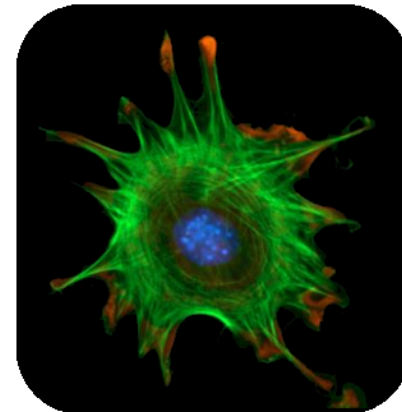
It is not a total liquefaction, it is a partial denaturation resulting in a **CONTRACTION**.



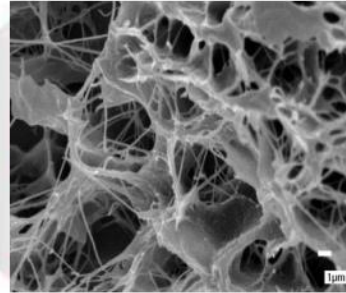
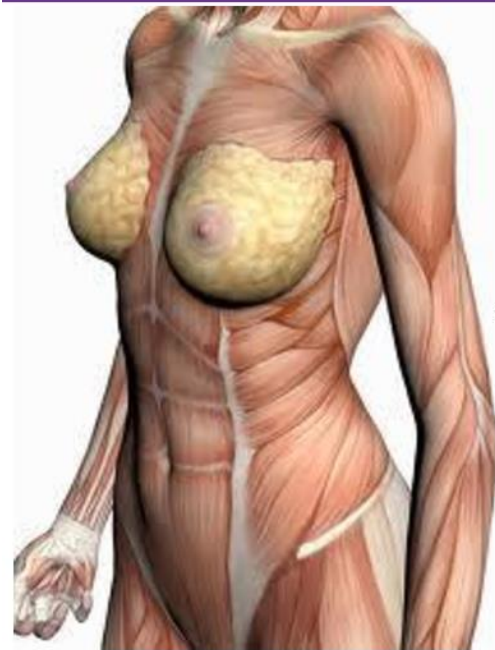
2- LONG TERM EFFECT:

Production of new collagen by fibroblasts.

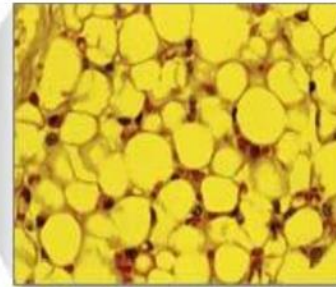
Fibroblasts undergo the thermal damage as a common mechanical damage, thus providing the synthesis of new collagen and elastin.



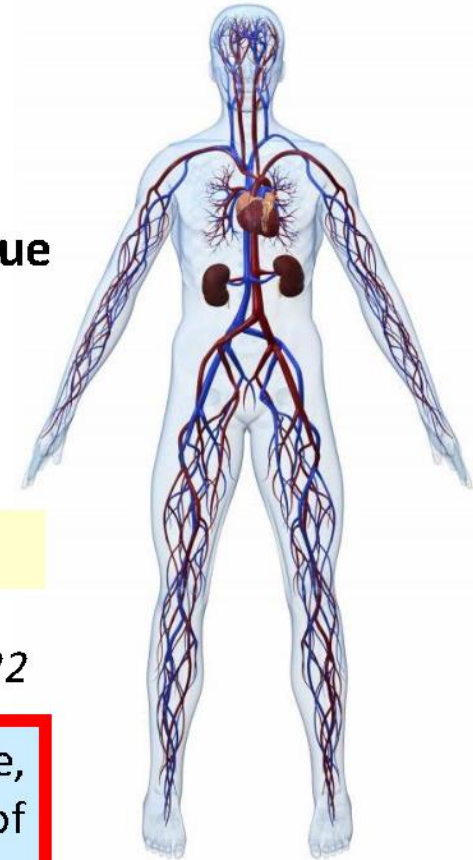
RF: OTHER TARGETS



**Collagen:
Dermis**



Fat tissue



**Blood
circulation**

FAT TISSUE REDUCTION with low frequencies (300-500 KHz)

J Drugs Dermatol. 2006 Sep;5(8):714-22

It has been shown that RF, especially if used in the PULSED mode, stimulates the angiogenic process, leading to neovascularization of the tissue (MOST NUTRITION = ANTI-AGEING)

Plast Reconstr Surg 2000;105:1371-1374



Clinical endpoint

The use of an infrared thermometer allows to confirm a surface skin temperature of **40- 42° C**

Which corresponds to about **60-70** in the dermis, the ideal temperature to obtain the desired effects.

Heat shock protein release

Electroporation – Μη ενέσιμη μεσοθεραπεία

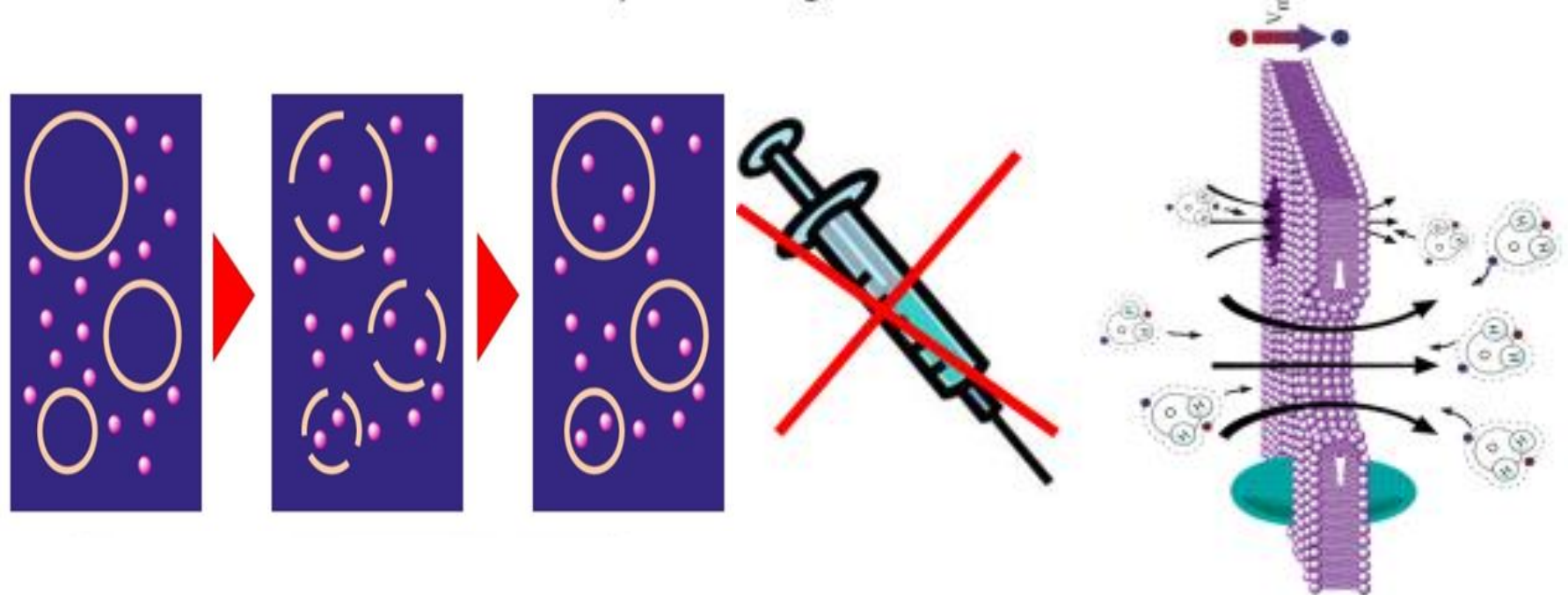
Η ηλεκτροδιάτρηση ή η ηλεκτροπερατότητα είναι μια τεχνική κατά την οποία ένα εναλλασώμενο ηλεκτρικό πεδίο, εφαρμόζεται στα κύτταρα προκειμένου να αυξηθεί η διαπερατότητα της κυτταρικής μεμβράνης, επιτρέποντας την εισαγωγή χημικών ουσιών, φαρμάκων ή DNA στο κύτταρο.

Αθερμικά, ατραυματικά και αναστρέψιμα.



ELECTROPORATION

ELECTROPORATION is a technique that involves the application of **SHORT, INTENSE LOCAL ELECTRICAL IMPULSES** that reversibly increase cell **MEMBRANES PERMEABILITY**, creating **ELECTROPORES** and therefore facilitating the entry of active substances in the cells by enhancing the effect of the substances themselves.



Consequently, depending on what a person needs, the technique can be used to convey **ACTIVE INGREDIENTS WITH DIFFERENT ACTIONS**: **TONING** (eg amino acids), **ANTIOXIDANT** (VITAMINS), etc..

Σπηλαιώση ή Cavitation

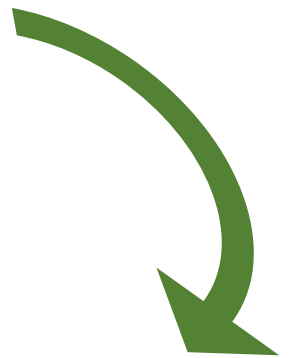
Η θεραπεία **Cavitation** χρησιμοποιεί υπερήχους και υγροποιεί το παγιδευμένο λίπος που στη συνέχεια απομακρύνεται με το λεμφικό σύστημα, μέσω ενός φυσικού φαινομένου, γνωστού ως **σπηλαιώση**. Μέσω της δράσης των υπερήχων στην θεραπεία, δημιουργούνται μικρές φυσαλίδες αέρα μέσα στα λιποκύτταρα, οι οποίες συνενώνονται και σπάζουν, προκαλώντας λύση του λιποκυττάρου. Με το φαινόμενο της σπηλαιώσης δημιουργούνται μικρές περιοχές υποπίεσης στο εσωτερικό τους, οπότε και διαρρηγνύεται η μεμβράνη των λιποκυττάρων από τα οποία αποτελούνται οι λιπώδεις ιστοί. Έτσι επιτυγχάνεται η στοχευμένη λιπόλυση και η λιπογλυπτική. Το περιεχόμενο των λιποκυττάρων στη συνέχεια παροχετεύεται με τη λεμφική κυκλοφορία. Η θεραπεία **Cavitation** εφαρμόζεται σε μηρούς, γλουτούς, χέρια, μέση και κοιλιά.



LOW FREQUENCY ULTRASOUND (CAVITATION)

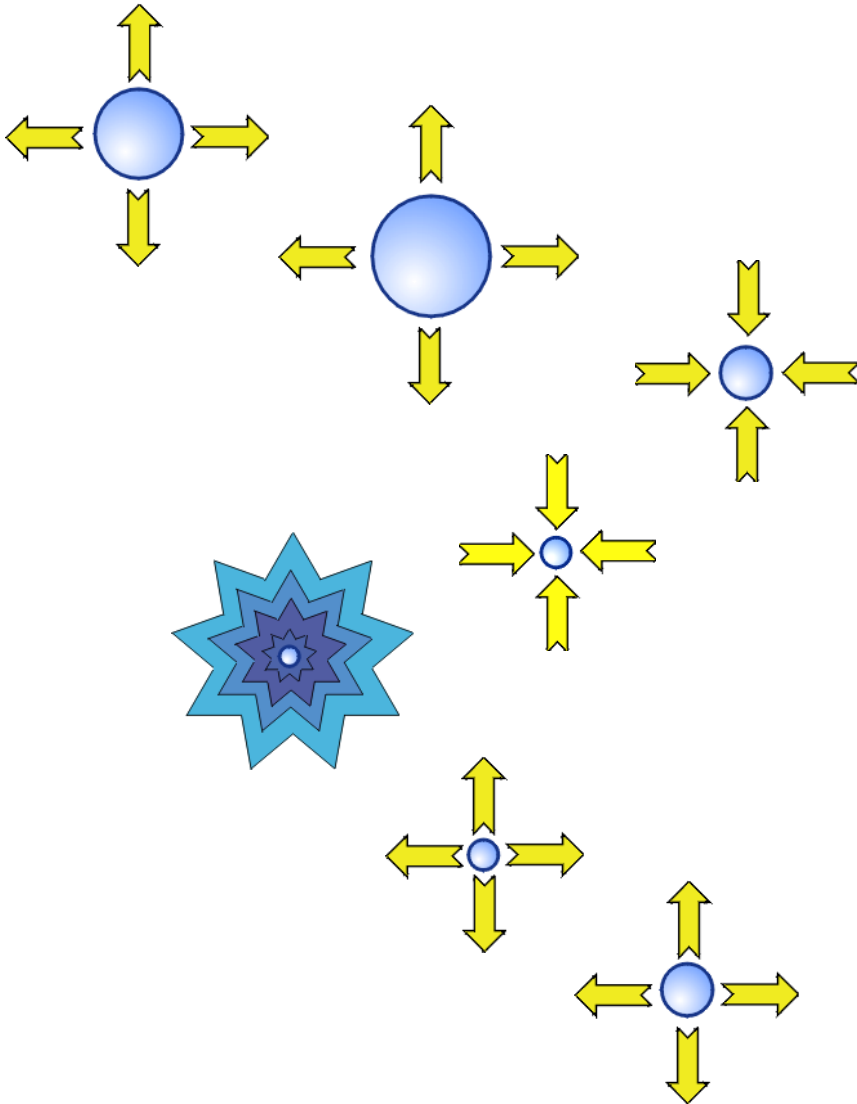
The sound can be considered as a succession of **compressions and rarefactions of molecules and particles in a medium.**

ULTRASOUNDS



CAVITATION

Cavitation principle



Cavitation consists in the formation of gas bubbles in a liquid:

Depression phase
Compression phase

Bubbles form during a negative pressure phase

They get bigger and bigger during this phase.

The great pressure exerted on the just expanded bubble, compress the bubble, thus leading to a great increase on the gas temperature in them contained.

The bubble collapses on itself, imploding, with consequent release of impact energy (sudden change in pressure and temperature in the affected area).

ULTRASOUND CAVITATIONAL EFFECT

Low Frequency Ultrasound (+28 KHZ not higher than 40 KHZ)

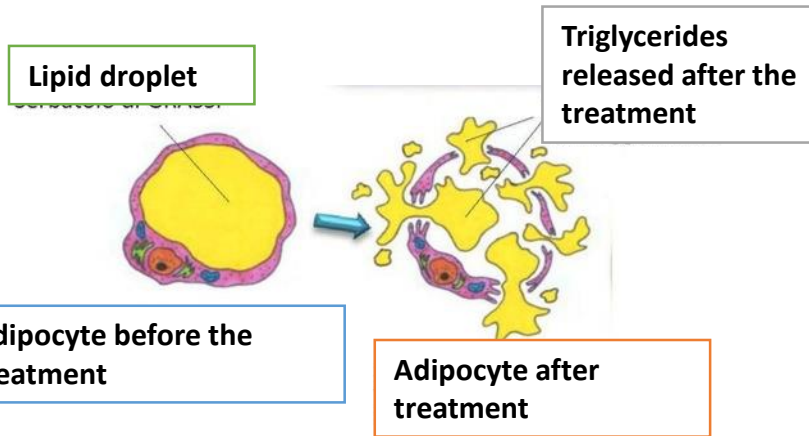
BIGGER BUBBLES

BIGGER AMOUNT OF
RELEASED ENERGY

RUPTURE OF ADIPOCYTE
MEMBRANE

LOCALIZED ADIPOSITY

DEPTH: POTENTIALLY INFINITE



High Frequency Ultrasound (MHz)

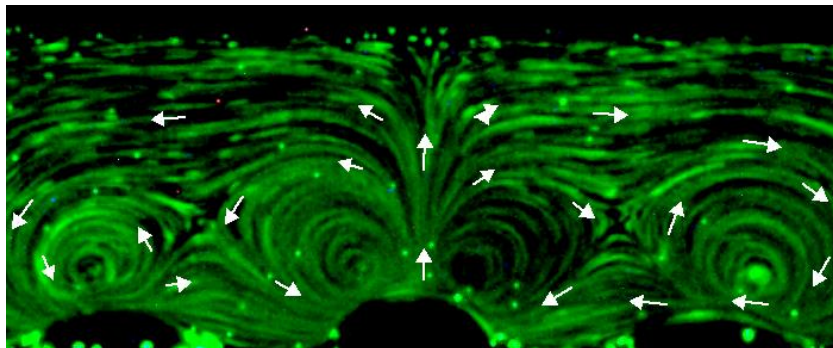
SMALLER BUBBLES

SMALLER AMOUNT OF
RELEASED ENERGY

MICROSTREAMING
EFFECT

TISSUE TEXTURE IMPROVEMENT

DEPTH for a 3 MHz Ultrasound:
1,5 -2 cm



WATER IN ADIPOSE TISSUE

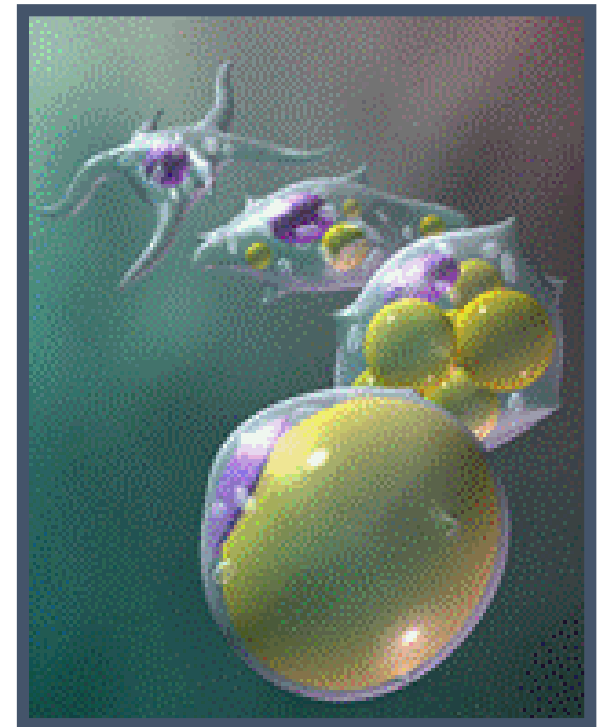
PHYSIOLOGICAL CONTENT OF WATER IN THE INTERCELLULAR SPACE (where the cavitation phenomenon takes place) AT THE FAT TISSUE LEVEL

10-16%



**TARGET OF CAVITATION:
HYPERTROPHIC ADIPOCYTES**

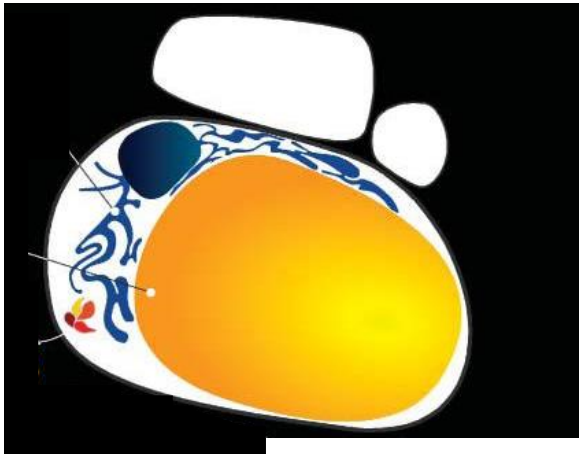
***THE VOLUME OF
ADIPOCYTES IS A
DETERMINANT FACTOR,
BEING HYPERTROPHIC
CELLS MORE SENSITIVE
THAN THE OTHERS***



TRIGLYCERIDES ELIMINATION

Once the triglycerides are out of the adipocytes, they are collected from the lymph system and, once they reach the blood circulation, they can follow three different pathways:

1- Eliminated through the **kidneys** (lipiduria up to 36 hours after the treatment);



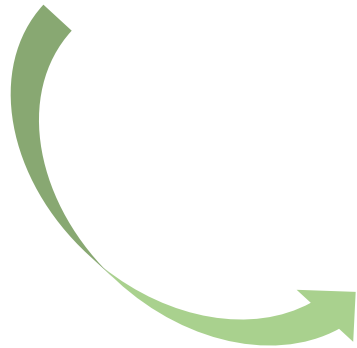
2- conjugated at the **liver** level, to form lipoprotein (VLDL, LDL, HDL);

3- hydrolyzed at different levels: **capillaries endothelium, muscle and fat tissue.**

COMBINED TREATMENT

RADIOFREQUENCY + CAVITATION

SKIN TIGHTENING
FAT DISSOLVING



TARGETS:

CELLULITE

ADIPOSE TISSUE

OEDEMA

LOCALIZED ADIPOSITY

HIFU – High Intensity Focused Ultrasound

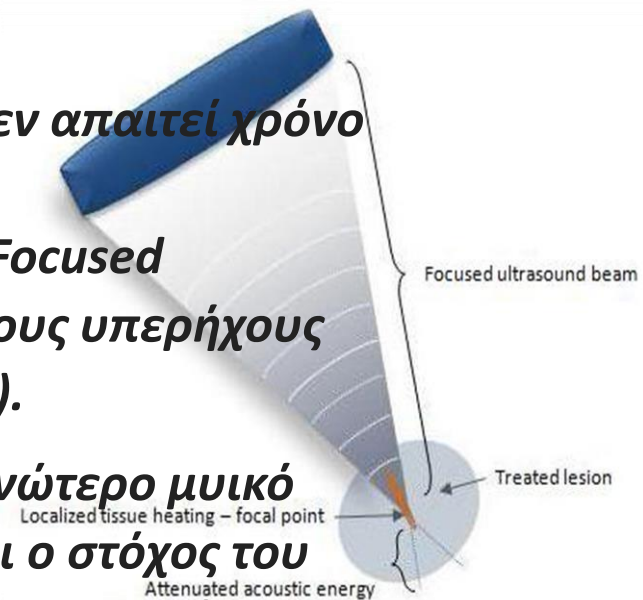
Πρόκειται για μια μοναδική μέθοδο μη χειρουργικού *lift*.

Είναι μη-επεμβατική διαδικασία που χρησιμοποιεί εστιασμένους υπέρηχους για *lifting* και τόνωση του χαλαρού δέρματος σε πρόσωπο και σώμα.

Η θεραπεία είναι ασφαλής, χωρίς επιπλοκές και δεν απαιτεί χρόνο ανάρρωσης.

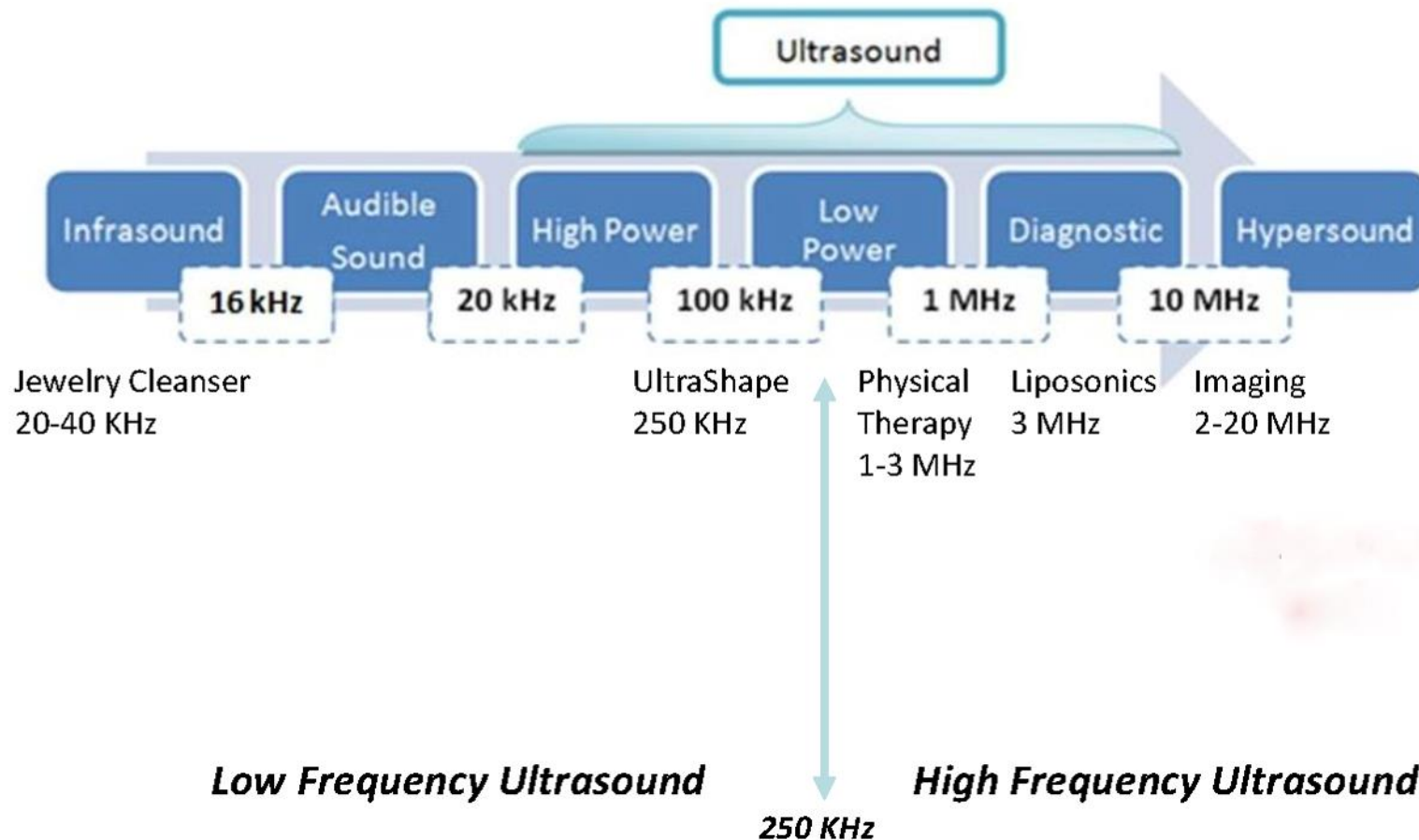
Χρησιμοποιεί την τεχνολογία HIFU (High Intensity Focused Ultrasound), δηλαδή υψηλής ενέργειας εστιασμένους υπερήχους (περίπου ίδιας συχνότητας με τους διαγνωστικούς).

Οι υπέρηχοι στοχεύουν στον ιστό γνωστό σαν, « ανώτερο μυικό απονευρωτικό σύστημα (SMAS)», η οποία είναι και ο στόχος του χειρουργικού *lifting*, αυξάνοντας τη θερμοκρασία στο σημείο εστίασης και προκαλώντας έτσι μια ελεγχόμενη θερμοπηξία, η οποία οδηγεί τον οργανισμό σε νεο-κολλαγονογένεση, αύξηση τοπικά της ελαστίνης και ανάπλαση.

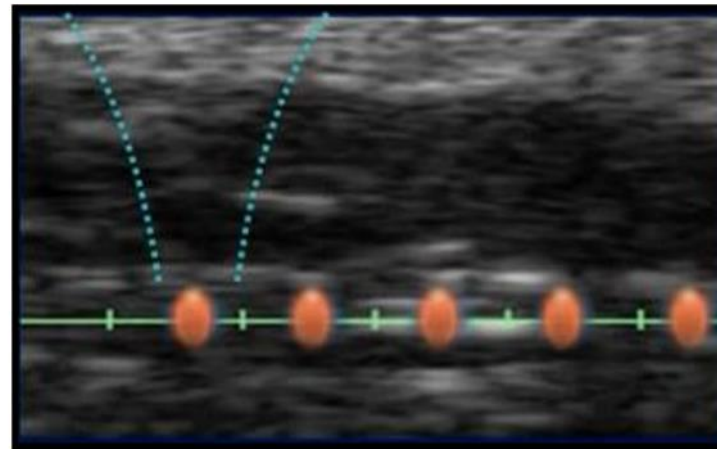


Aesthetic Ultrasound

Ultrasound is sound at frequencies higher than those detected by human hearing (at least 18 kHz or 18,000 cycles per second)



Aesthetic Ultrasound



Derms
Sub-cutaneous
tissue
← Fibro-muscular
tissue



Focused Ultrasound

Micro-Focused Ultrasound with Visualization



White et al. J Am Acad Dermatol 2010 Feb;62(2):262-9

CFU: the inspiration

High-Intensity Focused Ultrasound (HIFU, or sometimes FUS for Focused Ultrasound) is a highly precise medical procedure that applies high-intensity focused sonic energy to ***locally heat and destroy diseased or damaged tissue through ablation.***

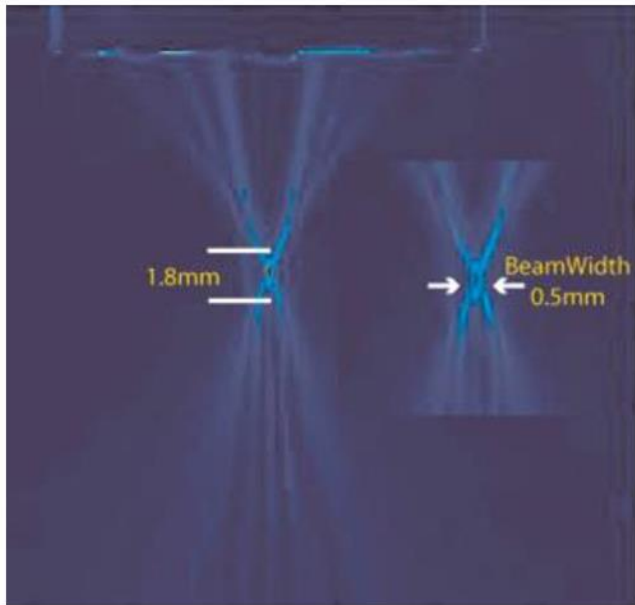
cysts and tumors (benign or malignant, ex prostate cancer)

break up **kidney stones**

Jácome-Pita, F; Sánchez-Salas, R; Barret, E; Amaruch, N; Gonzalez-Enguita, C; Cathelineau, X (2014). "Focal therapy in prostate cancer: the current situation." Ecancermedicalscience 8:435. doi:10.3332/ecancer.2014.435 PMID 24944577

'Cautious Optimism' for HIFU in Prostate Cancer. May 2016

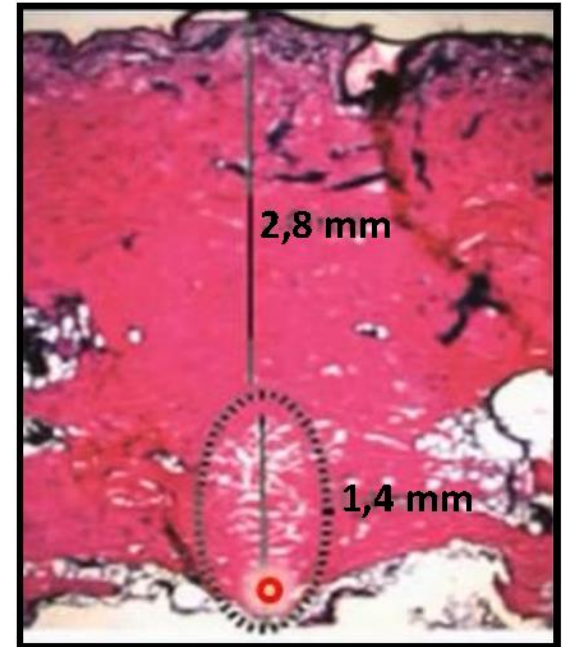
CFU



The geometrically focused energy is very precisely administered.

1,8 mm height x 0,5 mm width.

95% of the energy will be focused on this region

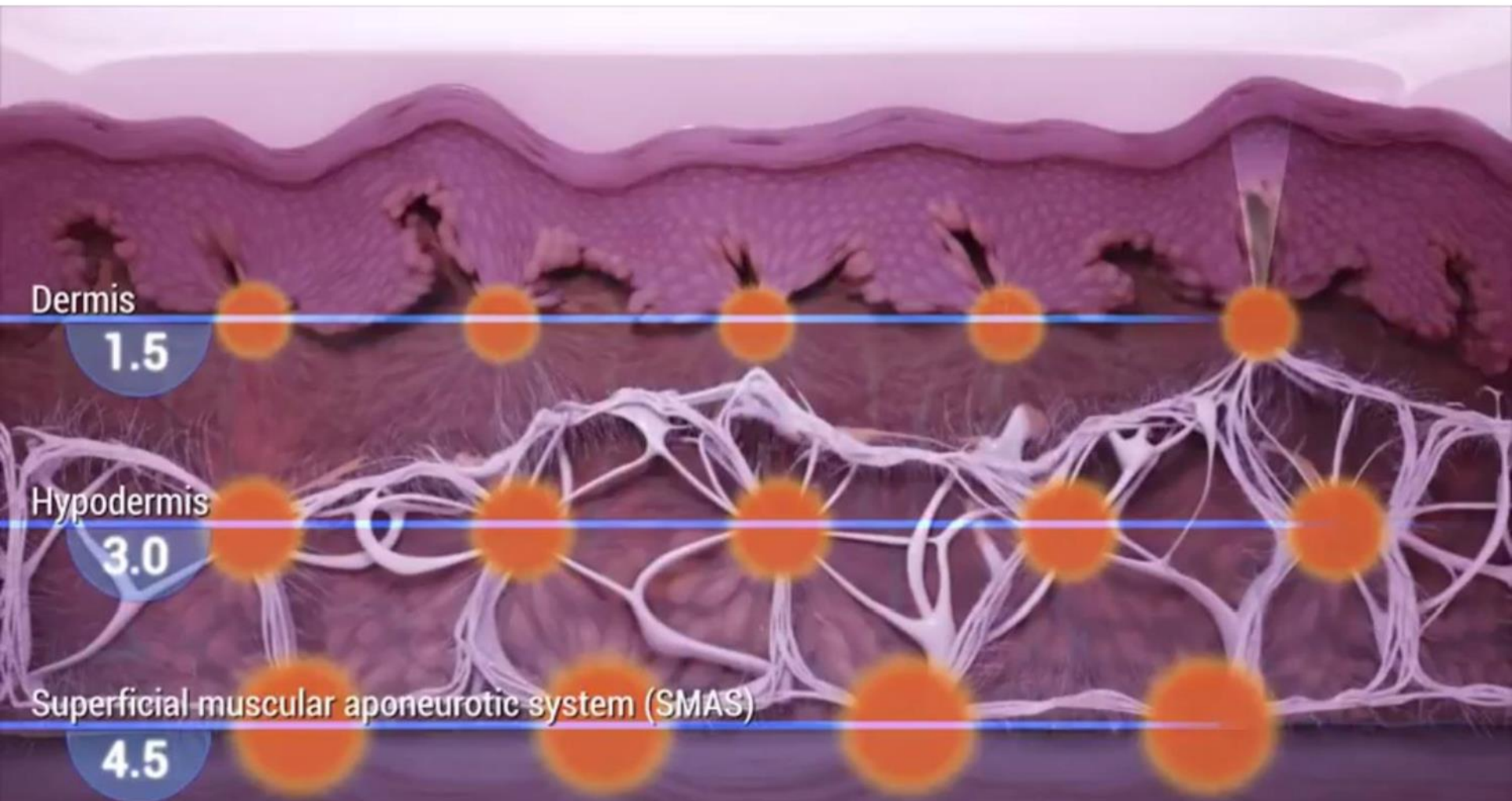


Histology using the device on pig skin shows a very precise deep injury

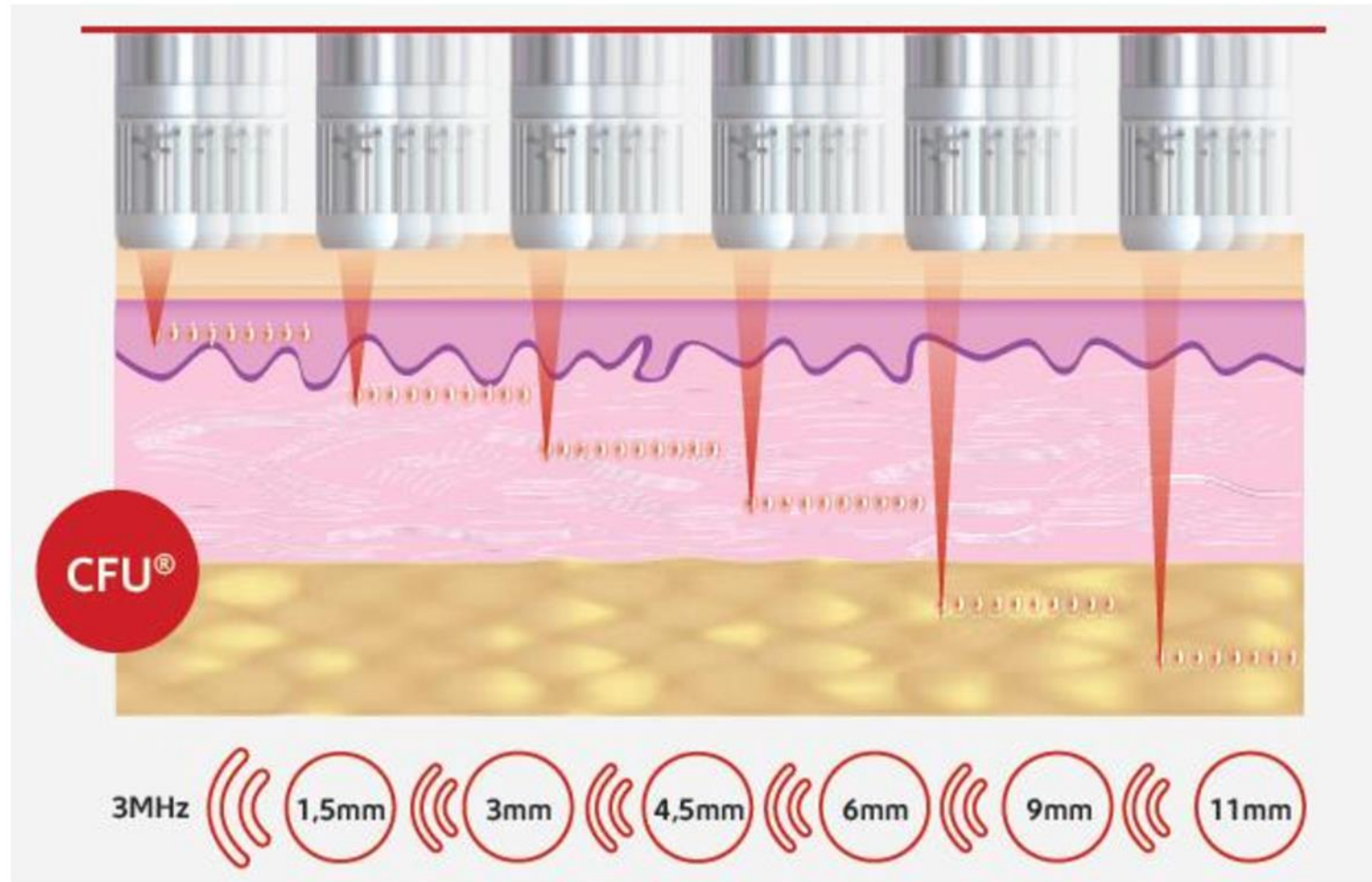
2,8 mm below the surface of the skin and 1,4 mm in length

White et al. Lasers in surgery and Medicine **2009**; 40: 67-75
Laubach H. et al. Dermatologic Surgery **2008**; 34: 729-734

Face



Face and Body






**THE THERMIC SHOCK THAT SHAPES
THE SILHOUETTE**

Cryoliposculpt !

**The non-invasive method that
allows localized obesity reduction**

CRYOLIPOLYSIS - FAT FREEZING

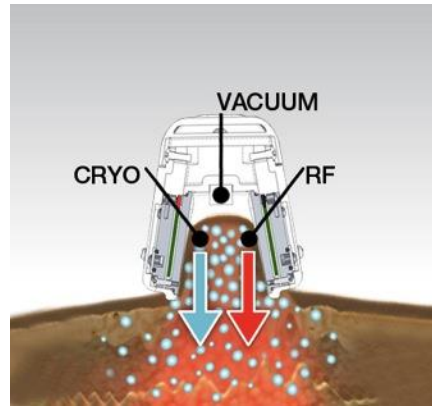
Starting Theory

- When babies suck on cold dummies and using popsicle for too long they lose fat from their cheeks (popsicle panniculitis)
 - Butter (fat) hardens/freezes much more quickly than skin or anything else.
 - Freezing the fat doesn't take too long (about 50 to 60min each area)
 - Once the fat cells are frozen, apoptosis occurs
- 

The Science

- **Cryo = cold, lipo = fat, lysis = breakdown**, is a Greek medical term which literally means fat breakdown through cold.
- Research has shown that fat cells are more sensitive to cold temperatures than surrounding tissue.
- Using advanced cooling (cryo) technology, the device safely targets the fat layer and slowly crystallizes the fat cell contents.
- This process causes the breakdown (lysis) of the cells. During the following two months, the melted fat is gradually eliminated via natural metabolic processes.

LIPOSHOCK PROCEDURE



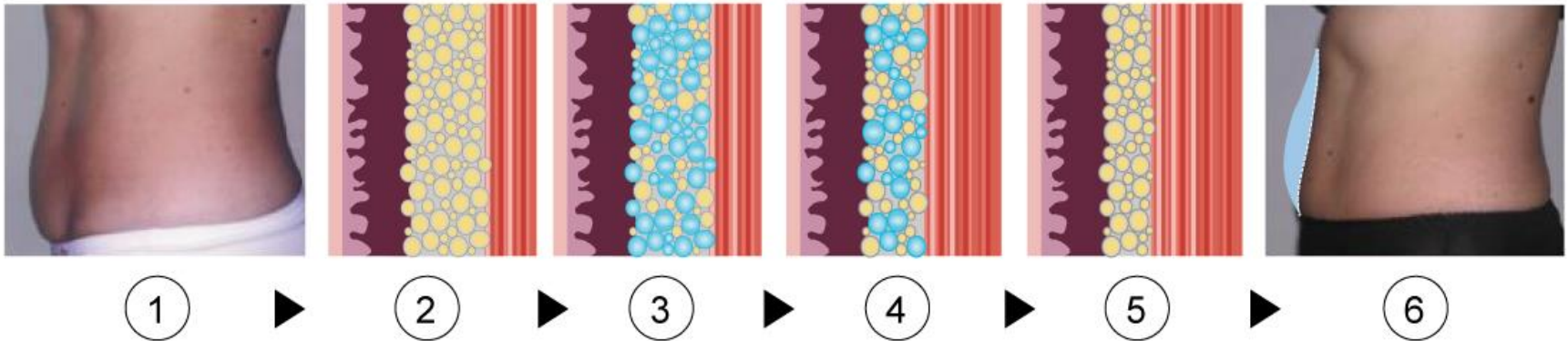
- Area to be treated sucked into the handpieces
- A cycle of 50-60 min and intense -10° C begins
- Subcutaneous fat cells in the area are frozen to -10° C
- Overlying skin is not damaged as a protective membrane is placed on the skin
- Cooled fat cells begin a process called apoptosis
- Fat cells are destroyed and excreted from the body by natural mechanisms
- Every fat freezing procedure may take upto 90days to get rid off the apoptotic cells.

The Indication

- For small to moderately full fat bulges resistant to diet and exercise.
- The procedure is considered safe for all skin types. **However, on treating the darkest skin types caution must be taken because skin is naturally more cold sensitive.**



LIPOSHOCK PROCEDURE



1 – Mother Nature, Lifestyle or gravity. Lead to bulges of stubborn fat.

2 – Those unwanted bulges contain fat cells which can be resistant to diet and exercise

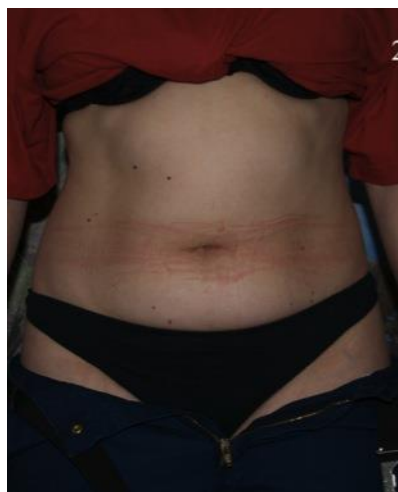
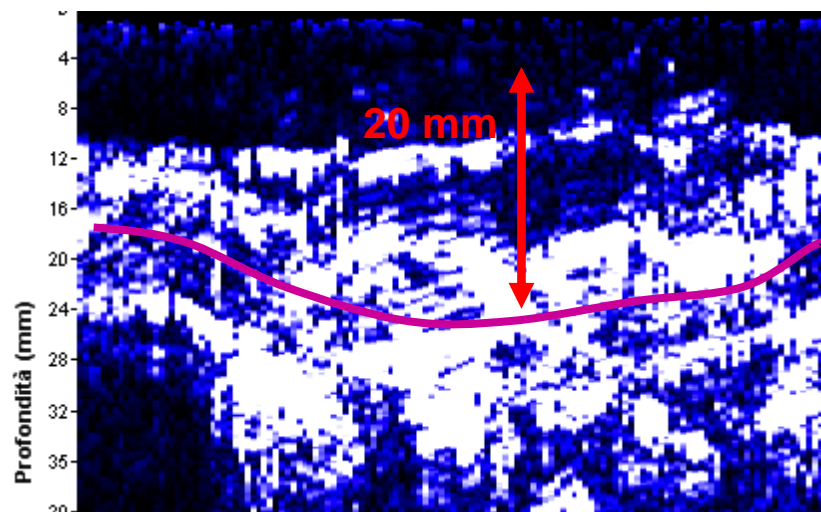
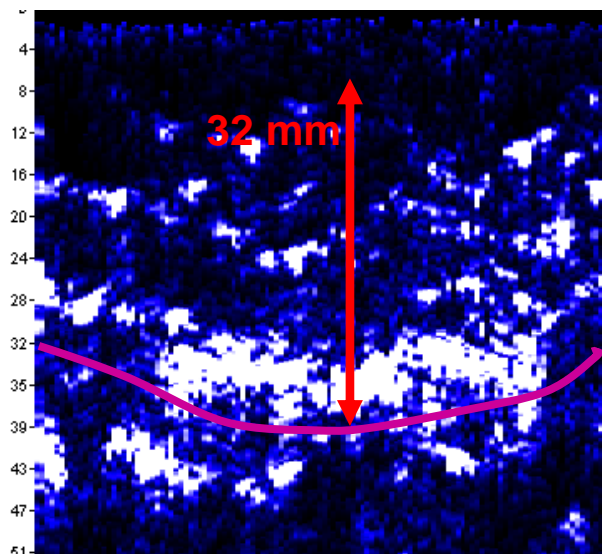
3 – Liposhock uses controlled cooling to target and crystallize fat cells

4 – Crystallized fat cells gradually die off, then are naturally eliminated from your body

5 – In the weeks and the months following treatment, remaining fat cells condense, reducing the fat layer

6 – Results after Liposhock procedure

ULTRASOUND SCAN



Under belly
32 – 20 =
12 mm loss

**Reduction of fat
layer thickness**

Before

HOW MANY TREATMENTS? HOW OFTEN?

The treatments are performed 2 times per area spaced 3 months apart

Lipo Freezing can be associated to complementary treatments (cavitation, radiofrequency)



Спасибо Gracías شكر Obrigado Спасибо Dank U
Grazie Ευχαριστώ Danke
Dziękuję Merci Thank You Ngiyabonga Dank U
Danke Diolch Thank You Ngiyabonga Tack
Grazie Tack
Dziękuję Danke Diolch Tack
Diolch Gracías Merci Dank U Terima Kasih Diolch
Dank U Grazie Tack
Tack Ευχαριστώ