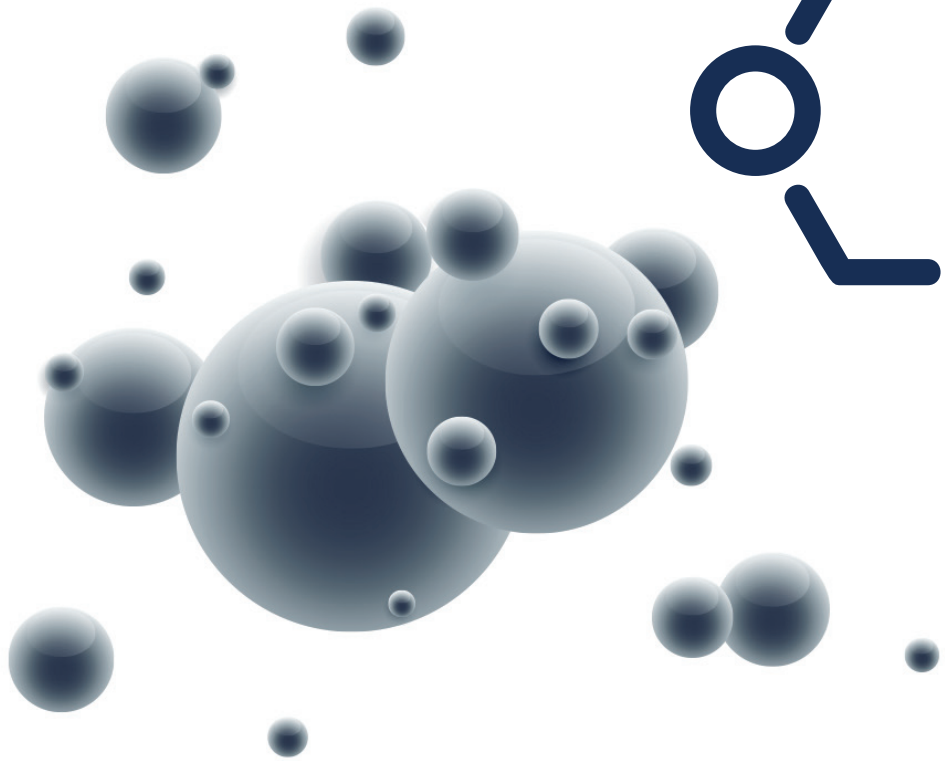
LSMMed

Lipo-Med

Filtration system of lipoaspirate



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INTRODUCTION

Adipose tissue was first used during the First World War to promote the healing of soldiers' wounds.

After a century, researchers have discovered that fat is one of the richest adult tissues in mesenchymal stem cells frequency.

These cells can differentiate into specialized cells, but even more important, they can respond to local stimuli coming from a degenerated tissue and release molecules such as growth factors and anti-inflammatory cytokines to promote healing.

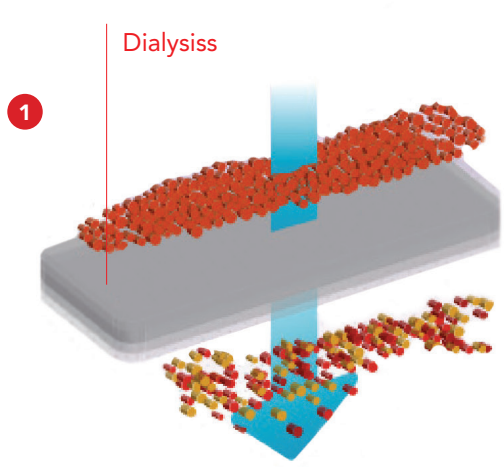
Lipo-Med is a technology able to enhance the biological properties of adipose tissue.

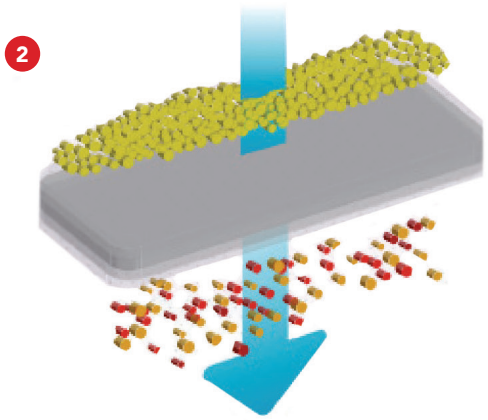
TECHNOLOGY

Lipo-Med is equipped with a semipermeable membrane that separates adipose tissue from waste elements with the help of a continuous irrigation.

The dialysis of the tissue minimizes the stress and trauma to cell and extracellular matrix architecture, removing the blood and oil residues which are pro-inflammatory.

The final product is a purified adipose tissue reduced into clusters.





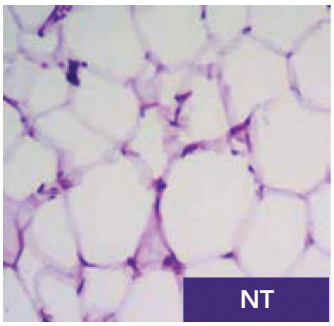
FEATURES

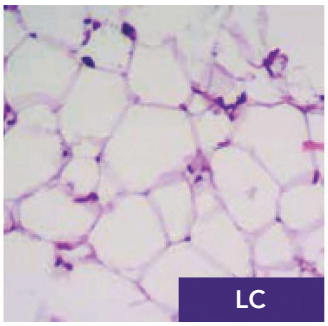
MINIMAL MECHANICAL STRESS
to maintain the biochemical properties of cells and the integrity of extracellular matrix.

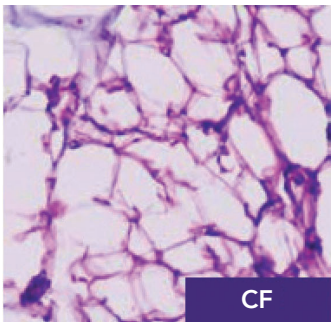
TOTAL PURIFICATION
from blood and oil residues that can possibly lead to inflammation.

MINIMAL MANIPULATION
of the tissue granted by a "point-of-care" technology that performs intraoperatively

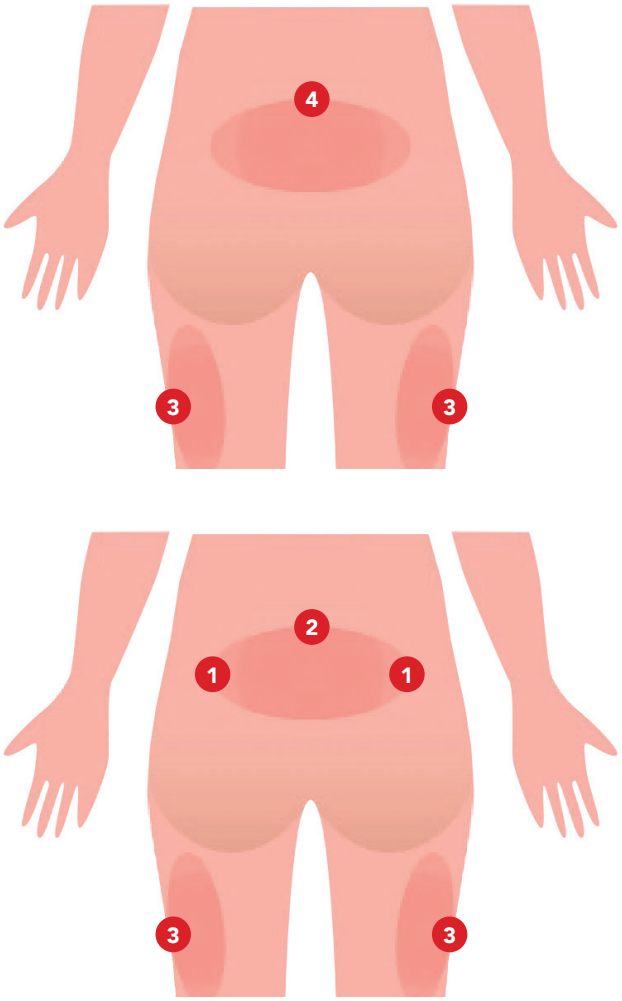
CLOSED-LOOP CIRCUIT
and a procedure completely performed in the sterile field







Histology of untreated adipose tissue (**NT**), **Lipo-Med** processed (**LC**), and centrifuged (**CF**) lipoaspirate centrifugation. The hematoxylin eosin staining shows the maintenance of tissue architecture integrity, see **LC** example.



LIPOSUCTION

Adipose tissue can be harvested with a small liposuction from subcutaneous fat.
In most of the regenerative medicine procedures the necessary final volume of **Lipo-Med** needed varies from 6 o 12 ml, which can be obtained from 60 to 90 ml of lipoaspirate (variability depends on patient characteristics and harvest technique).

The technique can be executed in local anhestesia thanks to the infiltration of Klein solution, however a mild sedation is recommended. The preferrable harvesting area is the abdominal subcutaneous fat.

Patient needs to be in supine position and a symmetric double access is possibile between iliac and lumbar abdominal area (**1**); alternatevely the access can be positioned in the periumbilical area (**2**). Depending on patients' features, it is possible to choose alternative harvesting areas such as trocanterig fat that must be executed bilaterally (**3**) or lumbar fat (**4**).
It is recommended the presence of a plastic surgeon on very thin or sporty people or in the presence of scars and previous abdominal surgeries.

INFILTRATION

KLEIN SOLUTION
- 250 ml saline
- 20 ml lidocaine 2%
- 0,5 ml epinephrine 1mg/ml

*values are indicative and may vary

INFILTRATION

The infiltration aims to prepare for the adipose tissue liposuction. Epinephrine can limit the bleeding during the liposuction thanks to its vasoconstrictory effect, while lidocaine has an aesthetic effect.
The saline, while promoting more vasoconstriction through pressure increase, creates a tumescent area that help the liposuction with the provided aspirating cannulae.

After performing an incision in the illustrated spots, use the infiltration cannula (16G) connected to 60 ml syringes pre-filled with Klein solution. It is very important to perform the infiltration homogeneously during retrograde movements of the cannulla. Avoid transverse movements with the cannulas. After the infiltration
of 150-200 ml, wait 10 minutes. It is possible to perform a digital manipolation of the abdomen to help the distribution of the solution.

ASPIRATION

After 10 minutes, it is possible to connect the aspirating cannula (13G) to the self-blocking syringe.

The lock system, that must be activated while the cannula is inside the subcutaneous adipose panniculus, creates negative pressure inside the syringe.

Moving the syring back and forth the lipoaspirate is harvested from the previously infiltrated areas.
Avoid transverse movements with the cannulas.

Once the needed lipoaspirate is obtained, proceed to the medication. After the procedure it is recommended the use of compressive dressing to limit the occurence of hematomas and bruises. An elastic belly for a week on average will help for this purpose.

Cannulae
(infiltration and aspiration)

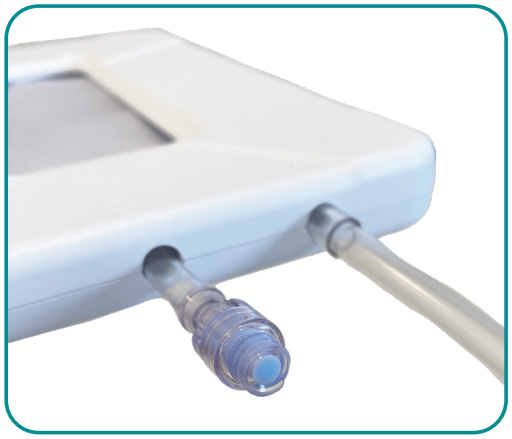
Connect the Lipo-Med device to a washing bag (Ringer Lactate is recommended) with a minimum volume of 500 ml, hanging from a stand. Drop the waste bag instead **Insert** the obtained lipoaspirate through the "IN" luer-lock connection.

Open the irrigation valve and **facilitate** the washing of the tissue. By gently moving and pressing on the bag with the provided spatula. Keep on moving until the tissue becomes tipically yellow and the outflow irrigation is almost trasparent.

Close the irrigation valve and **remove** the excess washing solution with the help of the brush. Connect a 10 ml syringe to the "OUT" luer- lock connection and collect the final product ready-to-use.

It is recommended not to manipulate the tissue and to use it as needed. If the product obtained appears very thick, transfer it into the 2.5 ml syringes supplied with the kit or into smaller luer-lock syringes to facilitate the release of the product during grafting. It is pollible to use the needle in the kit or other needles with a recommended diameter of 18 or 20G.


IN
OUT



HIGH REGENERATIVE POTENTIAL

The atraumatic processing of the tissue limits the cell stress, thus not impairing their trofic and anti- inflammatory activity.

An undisrupted extracellular matrix is able to act as a natural scaffold for cells by improving their vitality and contributing to tissue regeneration.

The removal of blood and oil from adipose tissue limits the stress and inflammation of the tissue hosting the graft

A SIMPLE, EFFECTIVE, AND SAFE PROCEDURE

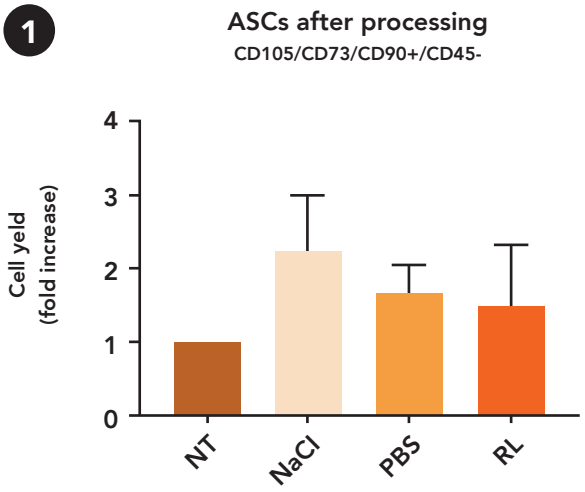
The system is a closed-loop circuit and the procedure is completely performed in the sterile field, minimizing the risk of contaminations.

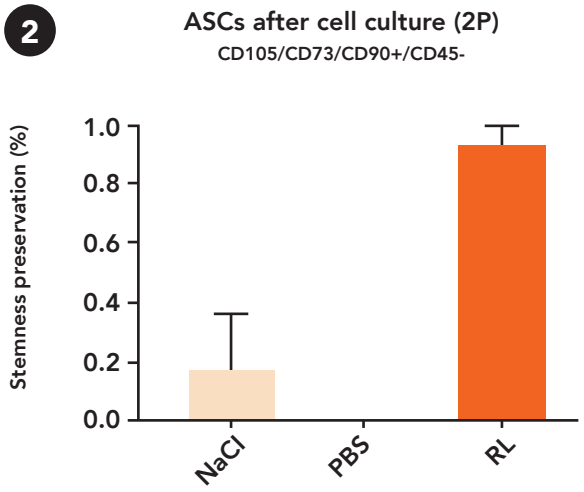
The device fulfills the requirements of cell and tissue minimal manipulation.

The procedure is simple, fast, and reproducible, being versatile in different therapeutic fields.

Lipo-Med processing combined with Ringer Lactate washing completely preserves the stemness potential of adipose tissue's mesenchymal cells.

ASCs were isolated and counted immediately after Lipo-Med processing (**1**) or after cell culture (2 passages) (**2**)
Data show fold increase of cell yield (**1**) and stemness preservation percentage (**2**) over control (untreated lipoaspirate).





Info

LSM-Med Srl
reserves the right to
make changes.

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