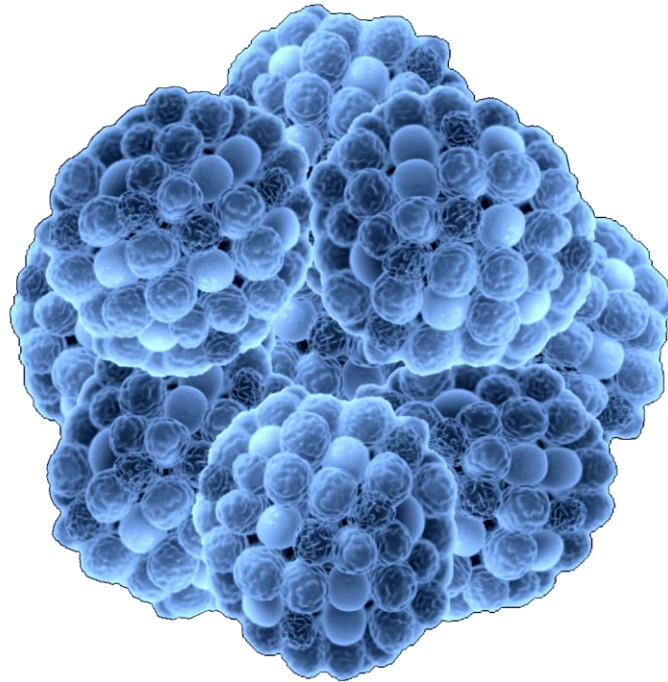


MediGraft

A new therapeutic solution in regenerative medicine
«**Tissue Micro Cluster**»



MediGraft

Medigraft™ is a disposable procedural kit based on an innovative technology that allows to obtain tissue micro grafts with a high regenerative potential.

Medicons are the devices present in the kits which, through a mechanical disgregation, micro-fragmented the tissue taken from the patient by a simple bioptic sampling.

Medicons



Medicons



History of Medicons

The idea of the project start in 1989; the first prototype was born in 1990, to be marketed in 1993.

Medicons is a device used in Flow Cytometry from the beginning of '90 in the biologic research, to obtain an high vitality cell suspension. This device was produced by **CTSV Srl**.



1990



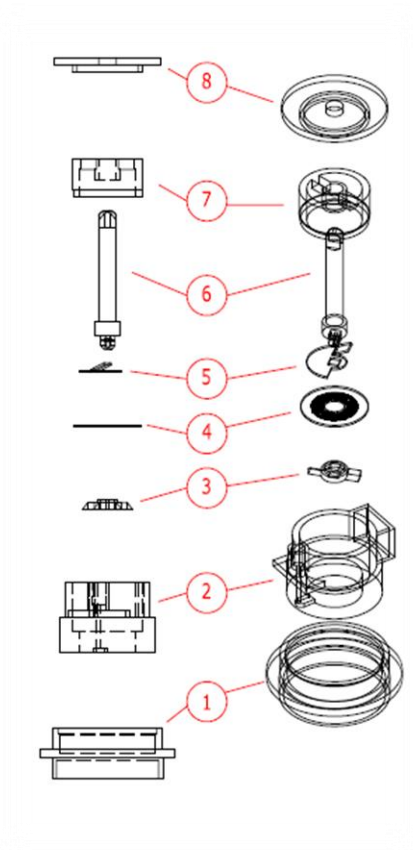
1992



1991

History of Medicons

Medicons in production from **1993**, distributed by **BD** for diagnostic



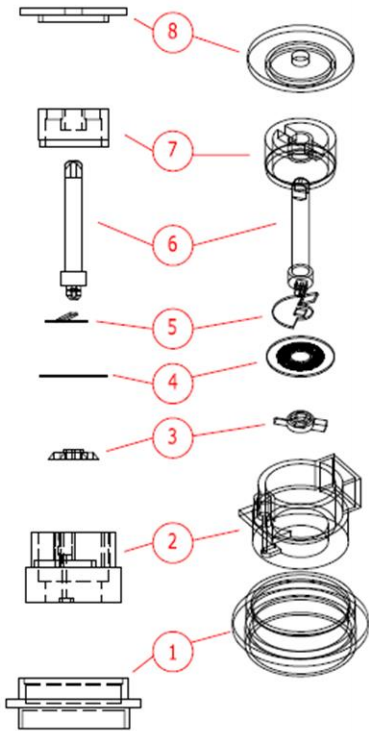
Registered as Medical device in 2012

History of Medicons

Medicons-W Medical Device from 2012

Medicons-P Medical Device from 2019

Medicons-P e -W worldwide distribution by DIAL ATM Srl from 2022



Medicons-W



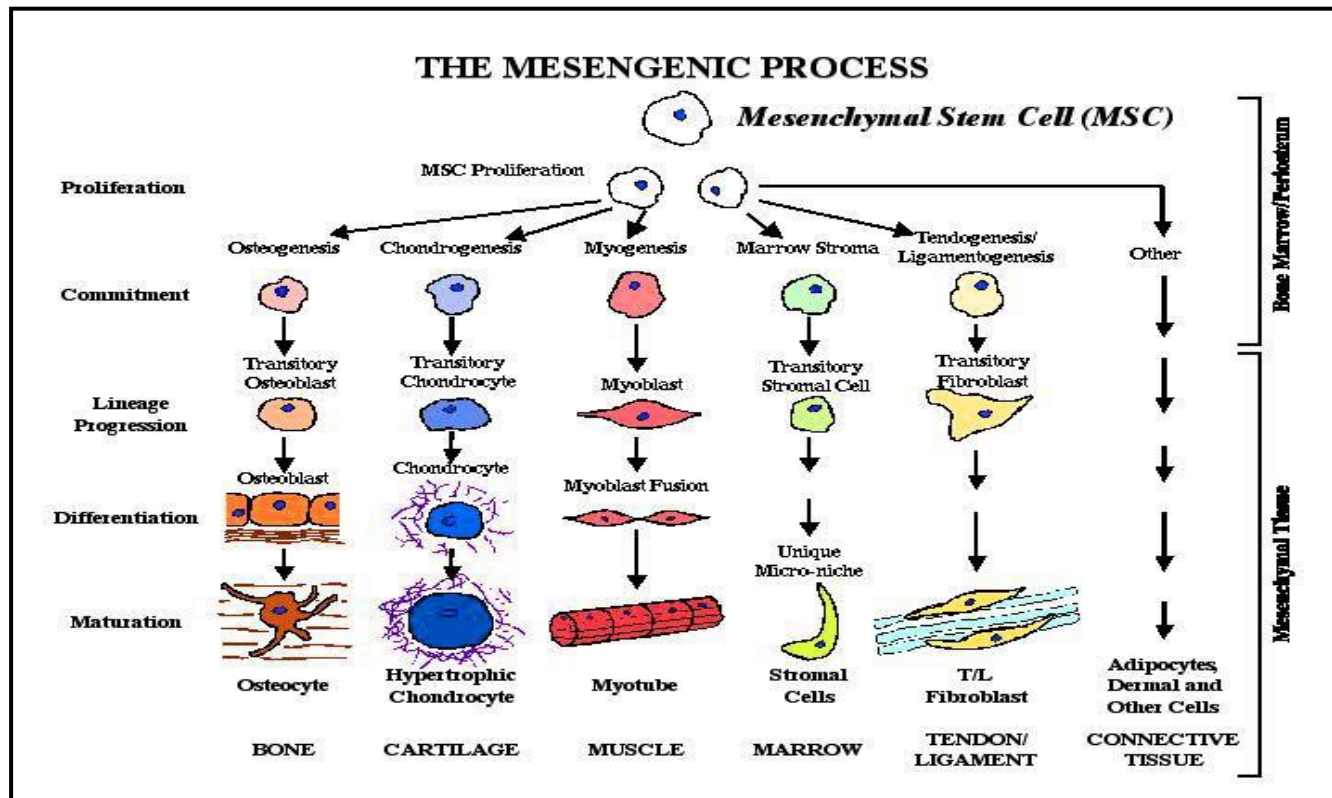
Medicons-W
internal metal grid



Medicons-P

Medicons-P
Internal grid in plastic
polymer

Mesenchymal Stem Cells

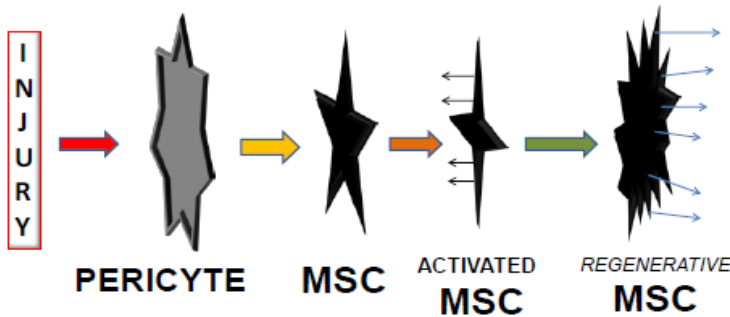


Mesenchymal stem cells are pluripotent progenitor cells capable of differentiating into different cell lineages

Mesenchymal Stem Cells

- ✓ IN ALMOST EVERY TISSUE – MSC ARE “PERICYTES”
- ✓ NOT ONLY MULTIPOTENCY PROPERTIES

A. PROPOSED SEQUENCE OF CHANGE DUE TO INJURY:

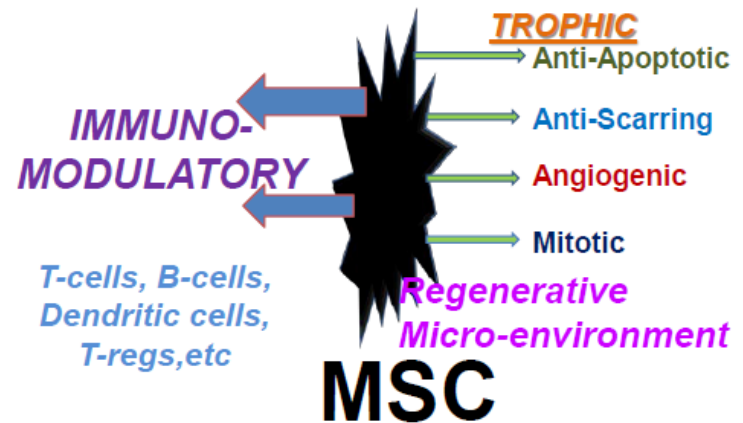


- ✓ SECRETE MASSIVE LEVEL OF BIOACTIVE AGENTS

↓
IMMUNOMODULATORY

↓
TROPIC

B. INJURY RESPONSE

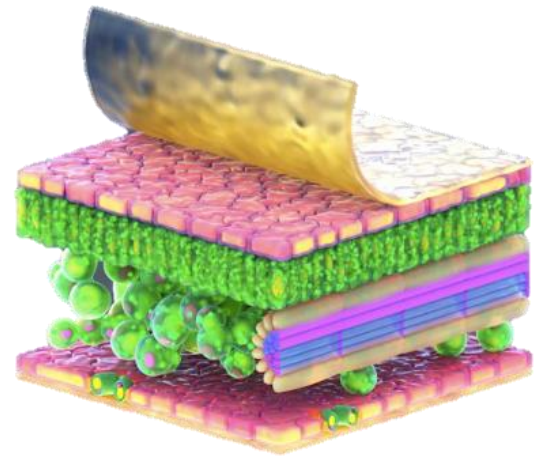


POWERFUL SITE-REGULATED
“DRUG STORES”

MSCs =
“MEDICINAL SIGNALING CELLS”

A new concept

Tissue regeneration through the grafting of
Skin Tissue Micro Clusters?



Scientifica Rationale

Human tissue source	Native CFU-F concentration range per ML of fluid/liquid	MSCs frequency range (CFU-F/10 ⁶ nucleated cells)
Bone marrow aspirate	109-664	10-83
Adipose/lipoaspirate	2.058-9.650	205-51.000
Dermis	Nd	74.000-157.000
Peripheal blood	0	0-2
Synovial fluid	4-14	2-250
Amniotic fluid	3	9.2

REVIEW

Experimental & Molecular Medicine (2013) 45, e54; doi:10.1038/emm.2013.94
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www.nature.com/emm



Mesenchymal stem cells: environmentally responsive therapeutics for regenerative medicine

Matthew B Murphy¹, Kathryn Moncivais¹ and Arnold I Caplan²

Scientific Publications



Hindawi

Hindawi
Stem Cells International
Volume 2018, Article ID 8637812, 11 pages
<https://doi.org/10.1155/2018/8637812>

Review Article

The Human Skin-Derived Precursors for Regenerative Medicine: Current State, Challenges, and Perspectives

Ru Dai^{1,2}, Wei Hua¹, Heng Xie¹, Wei Chen¹, Lidan Xiong¹ and Li Li¹

¹Department of Dermatology, West China Hospital, Sichuan University, No. 37, Guo Xue Xiang, Chengdu, Sichuan 610041, China

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Stem Cells Transl Med, 2015 Oct, 4(10): 1187–1198.
Published online 2015 Aug 7. doi: [10.5966/sctm.2015-0084](https://doi.org/10.5966/sctm.2015-0084)

PMCID: PMC4572907
PMID: [26253713](https://pubmed.ncbi.nlm.nih.gov/26253713/)

Concise Review: Human Dermis as an Autologous Source of Stem Cells for Tissue Engineering and Regenerative Medicine

Natalia Vapniarsky^a, Boaz Arzi^b, Jerry C. Hu^a, Jan A. Nolte^{c,d} and Kyriacos A. Athanasiou^{d,e}

Cell Transplantation, Vol. 24, pp. 1485–1422, 2015
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0963-6897/15 \$90.00 + .00
DOI: <http://dx.doi.org/10.3727/0963689143082431>
E-ISSN 1555-3892
www.cognizantcommunication.com

Review

Therapeutic Implications of Newly Identified Stem Cell Populations From the Skin Dermis

Zelin Chen, Yu Wang, and Chunmeng Shi

Institute of Combined Injury, State Key Laboratory of Trauma, Burns and Combined Injury, Chongqing Engineering Research Center for Nanomedicine, College of Preventive Medicine, Third Military Medical University, Chongqing, China

Hindawi
Stem Cells International
Volume 2019, Article ID 4541797, 13 pages
<https://doi.org/10.1155/2019/4541797>

Research Article

Mesenchymal Stromal Cells from the Epidermis and Dermis of Psoriasis Patients: Morphology, Immunophenotype, Differentiation Patterns, and Regulation of T Cell Proliferation

M. E. Castro-Manrreza¹, L. Bonifaz², O. Castro-Escamilla², A. Monroy-García³, A. Cortés-Morales⁴, E. Hernández-Estévez⁴, J. Hernández-Cristino⁴, H. Mayani⁵ and J. J. Montesinos⁴

Human Dermis Harbors Distinct Mesenchymal Stromal Cell Subsets

Christine Vaculik¹, Christopher Schuster¹, Wolfgang Bauer¹, Nousheen Iram¹, Karin Pfisterer², Gero Kramer¹, Andreas Reinisch⁴, Dirk Strunk^{3,5} and Adelheid Elbe-Bürger²

REVIEW

Stem cells in the skin: waste not, Wnt not

Laura Alonso and Elaine Fuchs¹

Howard Hughes Medical Institute, Laboratory of Mammalian Cell Biology and Development, The Rockefeller University, New York, New York 10021, USA

RESEARCH ARTICLE

Tissue engineering potential of human dermis-isolated adult stem cells from multiple anatomical locations

Heenam Kwon^{1*}, Anne K. Haudenschild^{1*}, Wendy E. Brown¹, Natalia Vapniarsky¹, Nikolaos K. Paschos², Boaz Arzi³, Jerry C. Hu¹, Kyriacos A. Athanasiou^{1,4*}

¹ Department of Biomedical Engineering, University of California, Davis, CA, United States of America, ² Department of Orthopaedic Surgery, Penn Sports Medicine, University of Pennsylvania Health System, Philadelphia, PA, United States of America, ³ Department of Surgical and Radiological Sciences, School of Veterinary Medicine, University of California Davis, Davis, CA, United States of America, ⁴ Department of Orthopaedic Surgery, University of California Davis Medical Center, Sacramento, CA, United States of America

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Scientific Publications

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Review

Therapeutic Implications of Newly Identified Stem Cell Populations From the Skin Dermis

Zelin Chen, Yu Wang, and Chunmeng Shi

Institute of Combined Injury, State Key Laboratory of Trauma, Burns and Combined Injury,
Chongqing Engineering Research Center for Nanomedicine, College of Preventive Medicine,
Third Military Medical University, Chongqing, China

[Cell Mol Life Sci](#), Author manuscript; available in PMC 2013 Aug 1.

PMCID: PMC3449145

Published in final edited form as:

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[Cell Mol Life Sci](#). 2012 Aug; 69(15): 2573-2582.

PMID: 22410738

Published online 2012 Mar 13. doi: [10.1007/s00018-012-0943-3](https://doi.org/10.1007/s00018-012-0943-3)

Home Sweet Home: Skin Stem Cell Niches

Jill Goldstein² and Valerie Horsley^{1,2}

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²Yale University, Molecular Cell Biology, Genetics and Development Program

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Article

Characterization of Dermal Stem Cells of Diabetic Patients

Letizia Ferroni^{1,2}, Chiara Gardin^{1,2}, Luca Dalla Paola¹, Gianluca Campo^{1,2}, Paolo Cimaglia¹,
Gloria Bellin^{1,2}, Paolo Pinton^{1,3} and Barbara Zavan^{1,2,*}

¹ Maria Cecilia Hospital, GVM Care & Research, 48033 Cotignola (RA), Italy

² Department of Medical Sciences, University of Ferrara, via Fossato di Mortara 70, 44121 Ferrara, Italy

³ Department of Morphology, Surgery and Experimental Medicine, Section of Pathology, Oncology and Experimental Biology and Laboratory for Technologies of Advanced Therapies (LTTA), University of Ferrara, 44121 Ferrara, Italy

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Hindawi
Stem Cells International
Volume 2019, Article ID 5043518, 10 pages
<https://doi.org/10.1155/2019/5043518>



Clinical Study

A Multicentre Study: The Use of Micrografts in the Reconstruction of Full-Thickness Posttraumatic Skin Defects of the Limbs—A Whole Innovative Concept in Regenerative Surgery

Michele Riccio,¹ Andrea Marchesini,¹ Nicola Zingaretti², Sara Carella,³ Letizia Senesi,¹
Maria Giuseppina Onesti,³ Pier Camillo Parodi,² Diego Ribuffo,³ Luca Valentini,⁴
and Francesco De Francesco¹

Journal of Cosmetics, Dermatological Sciences and Applications, 2014, 4, 268-274
Published Online September 2014 in SciRes, <http://www.scirp.org/journal/jocda>
<http://dx.doi.org/10.4236/jocda.2014.44036>



Adipose Derived Stem Cells and Growth Factors Applied on Hair Transplantation. Follow-Up of Clinical Outcome

Federica Zanzottera^{1*}, Emilio Lavezzari¹, Letizia Trovato¹, Alessandro Icardi¹,
Antonio Graziano²

¹Hair Transplantation Surgery, Studio Dr. Lavezzari, Como, Italy

²HBW Srl, Torino, Italy

Email: federica.zanzottera@hotmail.it

Stem Cell Rev and Rep (2013) 9:33-43
DOI 10.1007/s12015-012-8945-8

Human Stromal (Mesenchymal) Stem Cells from Bone Marrow, Adipose Tissue and Skin Exhibit Differences in Molecular Phenotype and Differentiation Potential

May Al-Nabaheen · Radhakrishnan Vishnubalaji ·
Dalla Ali · Amel Bouslimi · Fawzi Al-Jassir ·
Matthias Megges · Alessandro Prigione ·
James Adjaye · Moustapha Kassem ·
Abdulrah Aldhamsah

Hindawi
Stem Cells International
Volume 2019, Article ID 4541797, 13 pages
<https://doi.org/10.1155/2019/4541797>

Research Article

Mesenchymal Stromal Cells from the Epidermis and Dermis of Psoriasis Patients: Morphology, Immunophenotype, Differentiation Patterns, and Regulation of T Cell Proliferation

M. E. Castro-Manreza¹, L. Bonifaz², O. Castro-Escamilla², A. Monroy-García³,
A. Cortés-Morales⁴, E. Hernández-Estévez⁴, J. Hernández-Cristino⁵, H. Mayani⁵,
and J. J. Montesinos⁴

The dermis

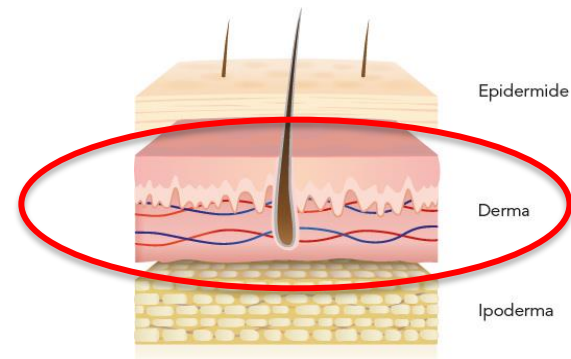
The dermis is a layer of connective tissue which, unlike the epidermis, is richly vascularized and innervated

From the histological point of view, **fibroblasts** are the most abundant cells in the dermis

In physiological conditions, fibroblasts proliferate and this allow cell turnover, reduce inflammation and improve wound healing.

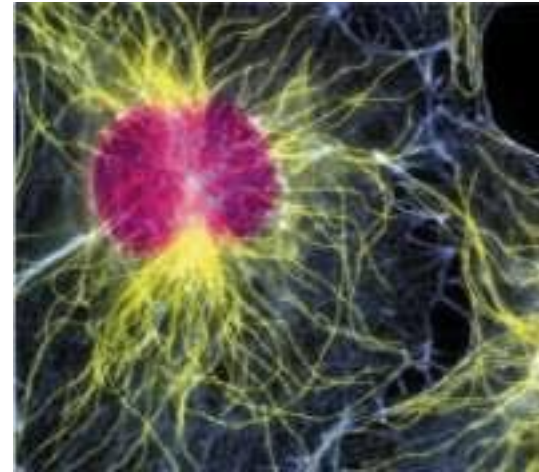
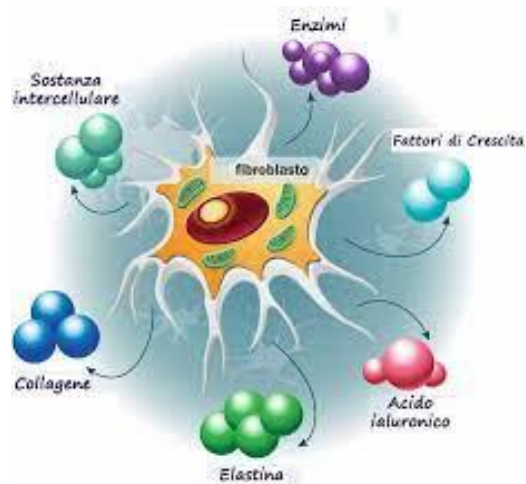
Properties of fibroblasts:

- Improved blood supply
- Angiogenetic action
- Reduction of inflammatory processes



The dermis, thanks to the presence of blood vessels, is also rich in **pericytes**
Source of Mesenchymal Stem Cells → **Regenerative activity**

Proprietà dei fibroblasti



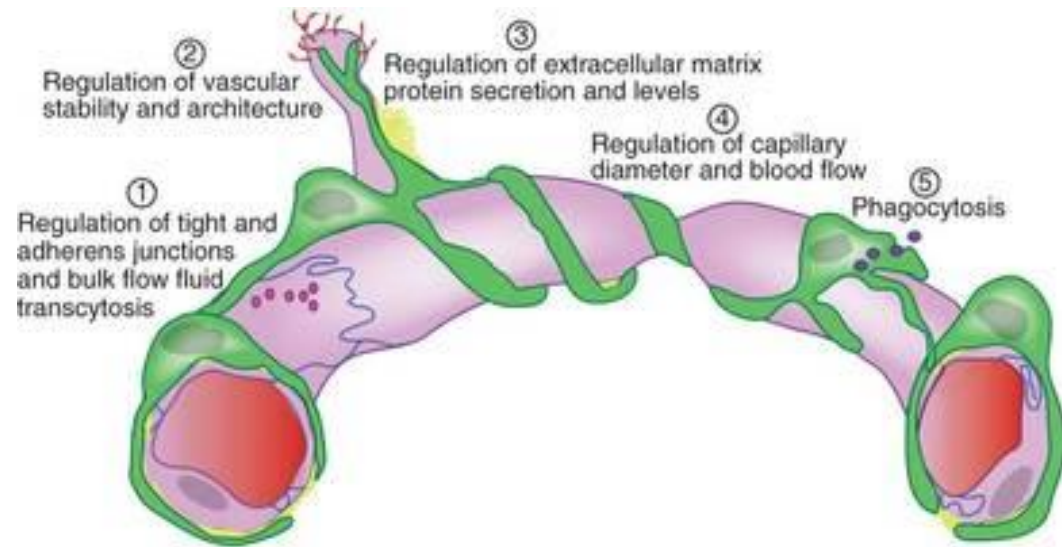
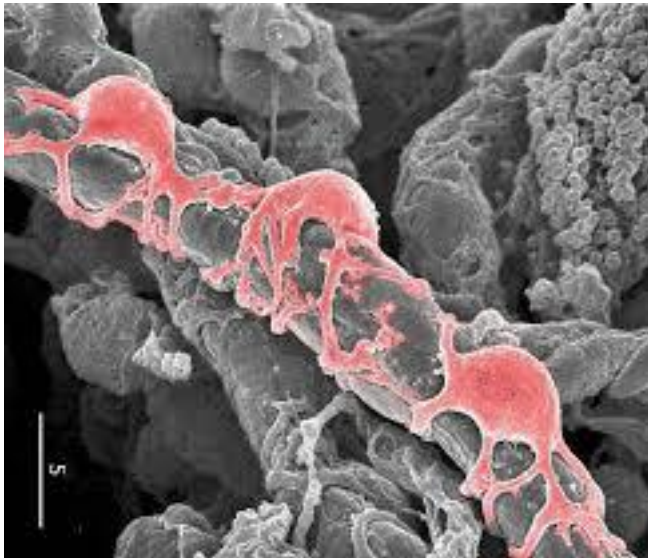
Angiogenic action with a better blood supply to the graft site

Production of collagen and elastin

They stimulate the production of HA to hydrate the skin and make it softer

Reduction of inflammatory processes with increased anabolic activity

Pericyte like MSCs



Cell Stem Cell Previews

All MSCs Are Pericytes?

Arnold I. Caplan^{1,*}

¹Department of Biology, Skeletal Research Center, Case Western Reserve University, Cleveland, OH 44106-7080, USA

*Correspondence: arnold.caplan@case.edu

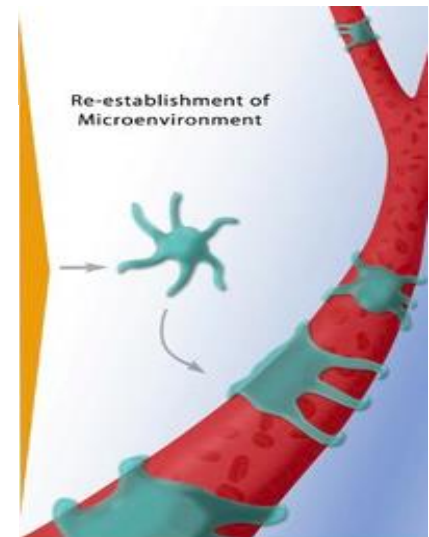
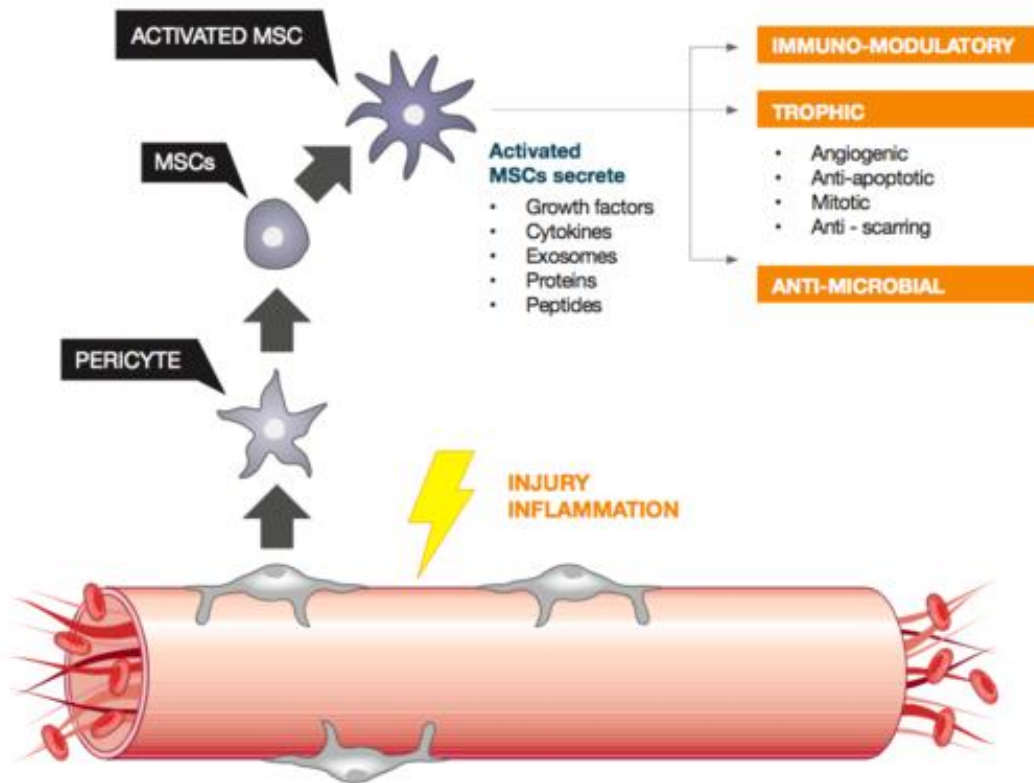
DOI 10.1016/j.stem.2008.08.008

Cell Stem Cell Article

A Perivascular Origin for Mesenchymal Stem Cells in Multiple Human Organs

Mihaela Crisan,^{1,2} Solomon Yap,^{1,2} Louis Castella,^{1,2,4} Chien-Wen Chen,^{1,2,8} Mirko Corselli,^{1,2,8} Tea Soon Park,^{1,2,8} Gabriella Andriolo,^{3,8} Bin Sun,^{1,2} Bo Zheng,^{1,2} Li Zhang,⁵ Cyrille Norotte,^{1,2} Pang-Ning Teng,^{1,2} Jeremy T maas,⁶ Rebecca Schugar,^{1,2} Bridget M. Deasy,^{1,2} Stephen Badyaluk,⁵ Hans-Jörg Bühring,⁷ Jean-Paul Jacobino,^{1,2} Lorenza Lazzari,³ Johnny Huard,^{1,2} and Bruno Péault^{1,2,5,*}

Pericyte like MSCs



Kit composition



1 Tray 27x14x2,5cm



1 Bioptic punch 4mm



1 Scalpel



1 Plastic plier



1 Nonwoven cover TNT 60x60cm

1 TNT/PE 60x90cm



1 Steril strep 6x10mm:



1 Syringe 2,5ml

MediGraft



MediGraft

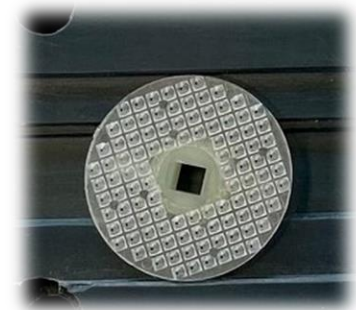
Internal metal grid consisting of 100 holes with pyramidal section micro blades on a hexagonal base designed to cut **all type of tissue, even bone and cartilage** with a cell viability of 90%



MediGraft



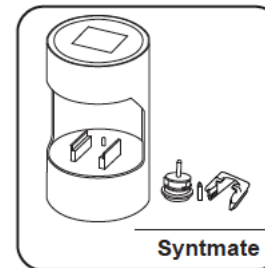
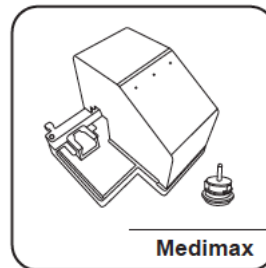
INNOVATION:
GRID IN PLASTIC POLYMER



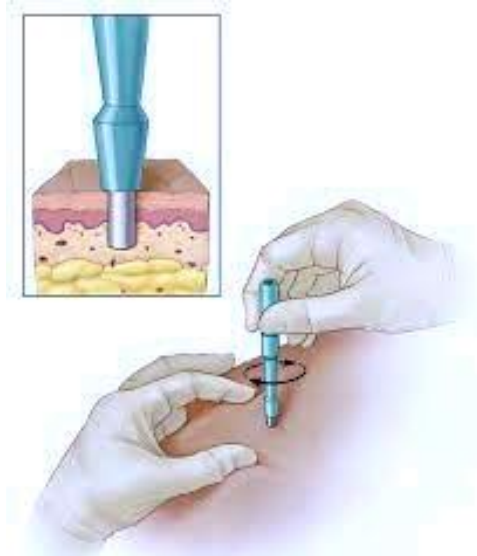
This long-studied innovation serves to improve the quality of the cells obtained (more delicate cut) and to eliminate the risk (albeit minimal) of releasing metallic residues..

The evolution of Medicons - P aims to further improve cell viability, as demonstrated by flow cytometric analyzes which report a value of 93% cell viability.

Automated dedicated hardware

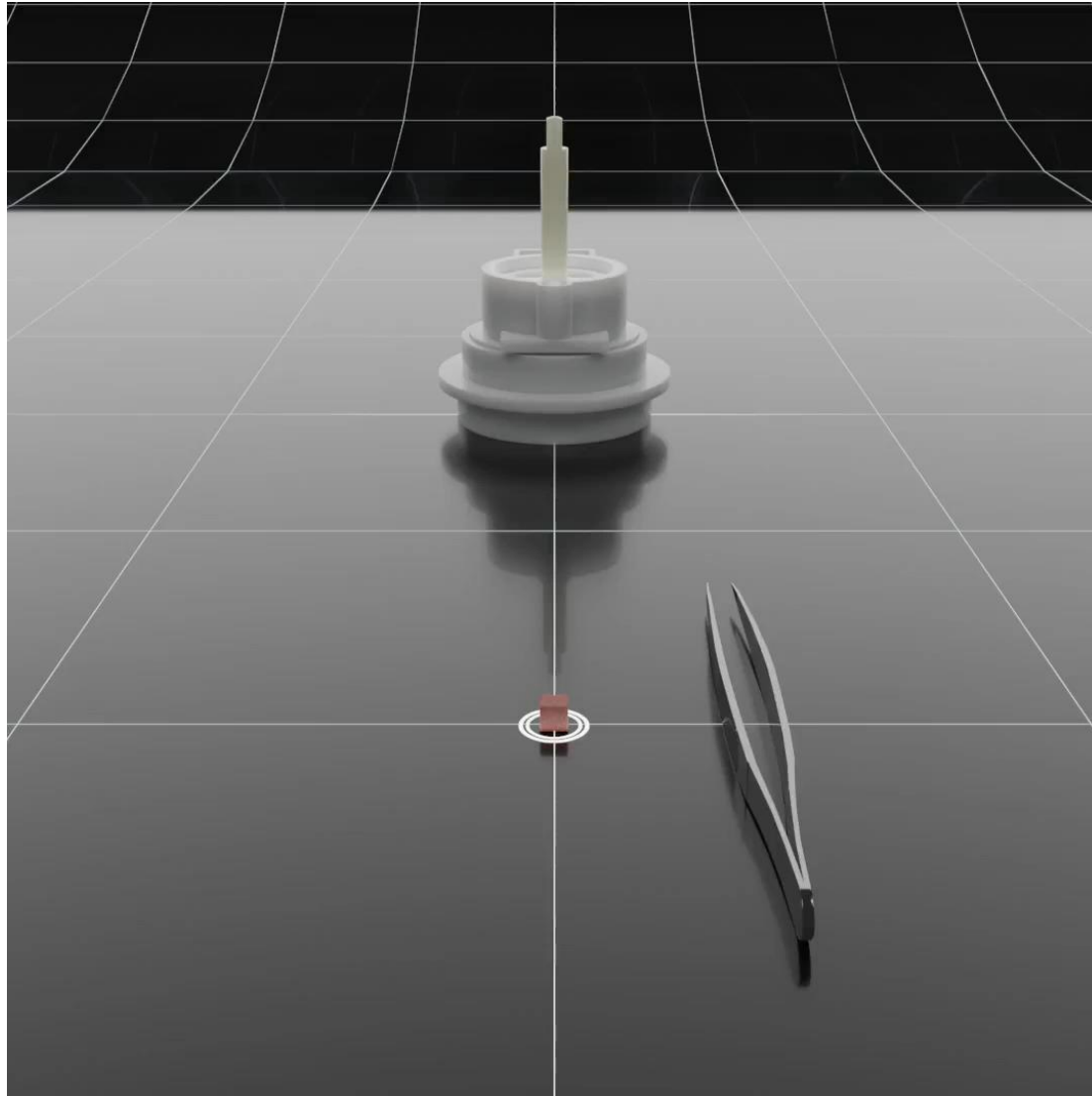


Surgical Technique

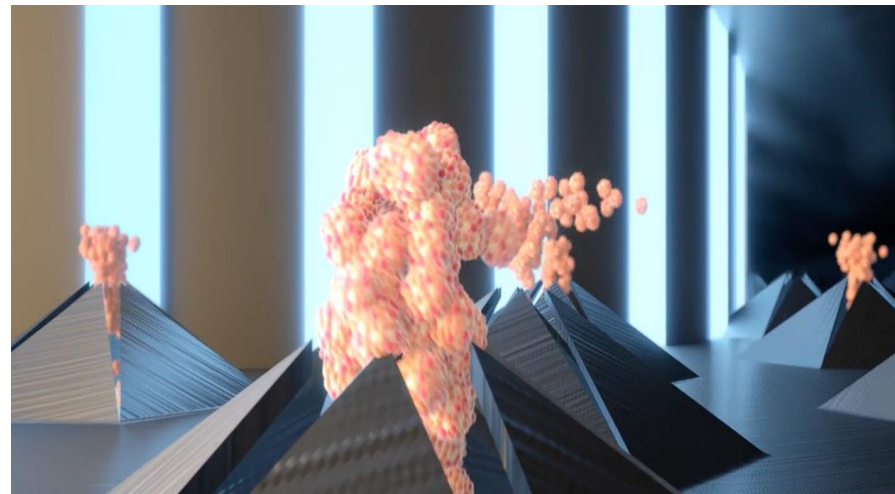
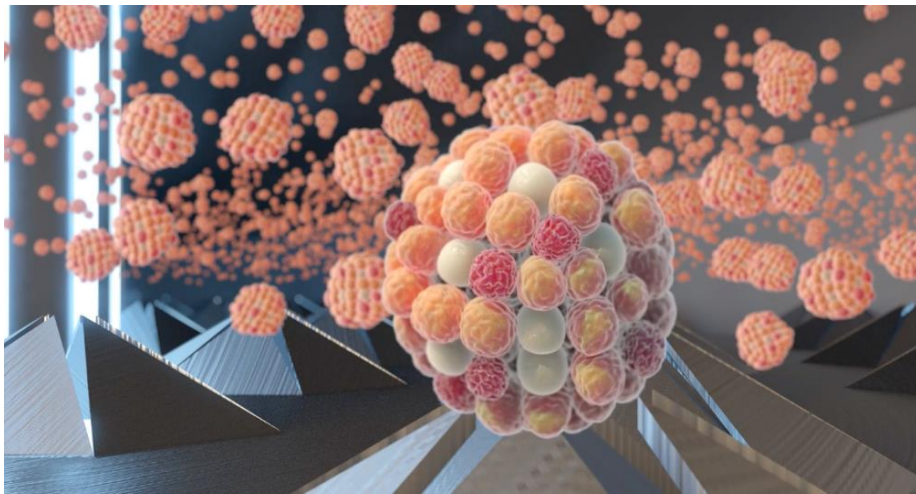
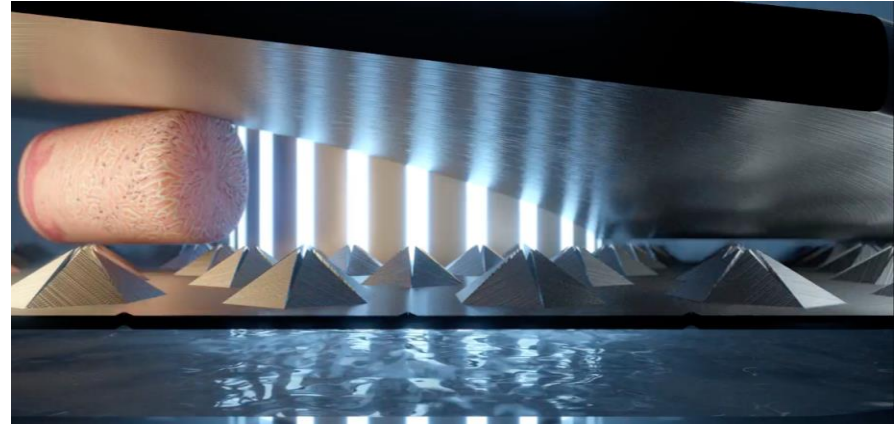
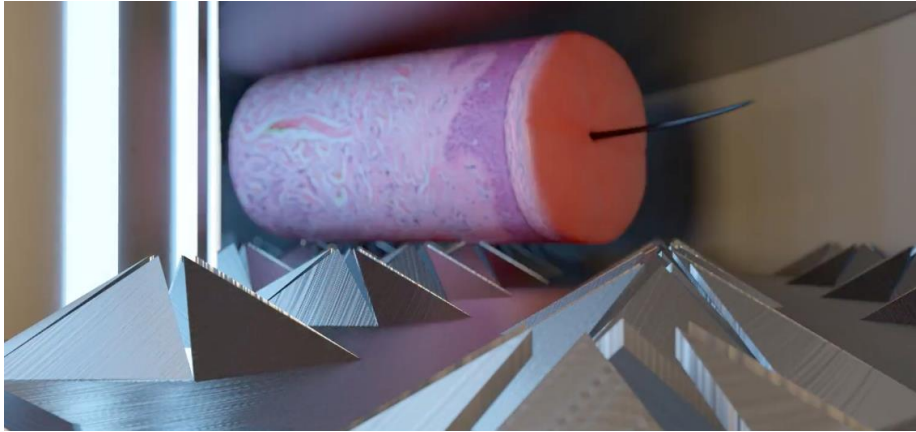


- Take one or more tissue samples using the 4 mm biopsy punch or the scalpel based on the size of the lesion to be treated.
- Introduce the tissue samples into the processing chamber, taking care to place the sample on the top of the grid and add 1.2 ml of physiological solution through the hole (syringe fitting) using a syringe without needle

MediGraft



Surgical Technique



Surgical Technique



- At the end of the processing time (about 90 seconds, depending on the type of sample), the device is ready to be removed from the machine



- Remove the lid, insert the 2.5 ml syringe, included in the kit, into the side syringe fitting of the device and tilt slightly towards the syringe and withdraw the suspension.



- Remove the syringe from the device. The product is ready to use

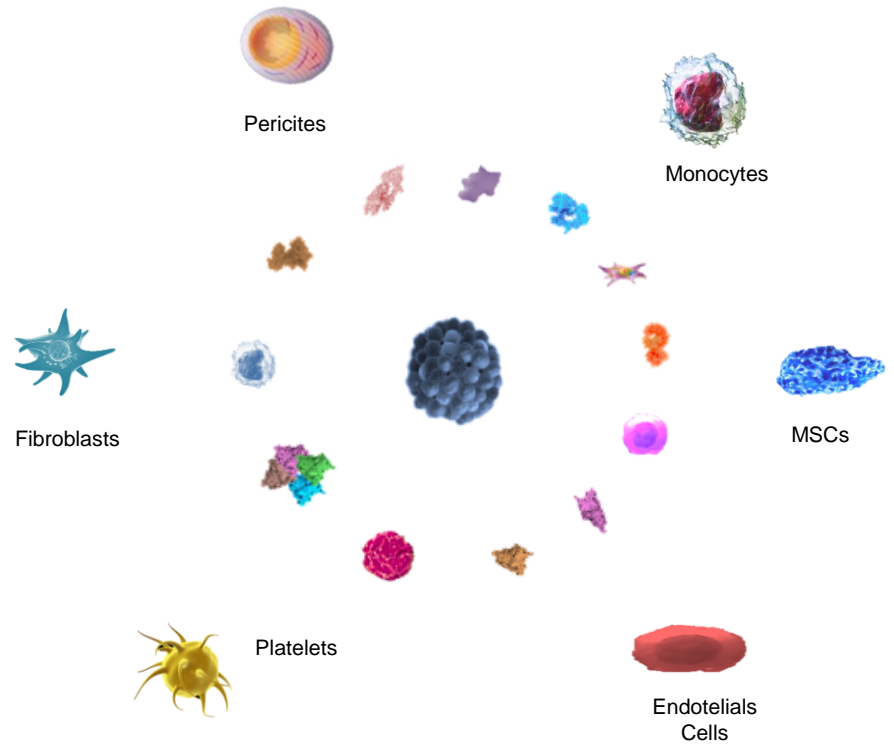
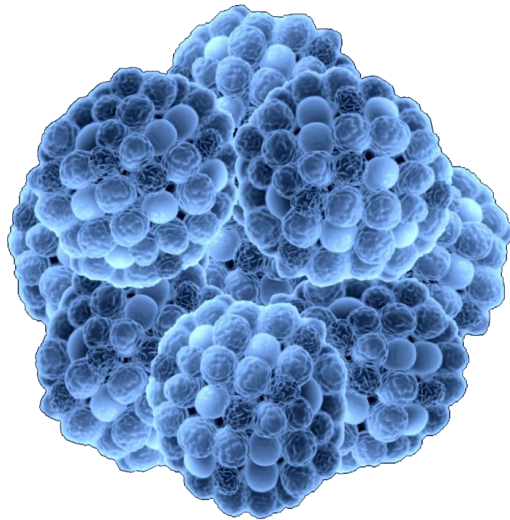


TISSUE MICRO CLUSTER

in suspension with physiological solution

MediGraft

High quantity of Tissue Micro Clusters in suspension



MediGraft

- ❖ Withdrawal with 4 mm bioptic punch
- ❖ Quantity of Clusters per withdrawal 70,000-80,000 units
- ❖ Average Cluster Size 50-70 microns
- ❖ Simple and automated procedure - non-operator dependent
- ❖ Processing time 90 seconds
- ❖ High average cell viability above 90%
- ❖ Can be used in the operating room and / or in the clinic

Indications

❖ **MAXILLO-FACIAL SURGERY AND DENTISTRY**

Bone and soft tissue regeneration

❖ **PLASTIC SURGERY AND AESTHETIC MEDICINE**

Scars, wound healing, biological fillers and alopecia

❖ **ORTHO & SPORT MEDICINE**

Bone, tendon, cartilage and muscle injuries

❖ **VULNOLOGY AND VASCULAR SURGERY**

Complex skin lesions and ulcers

❖ **DERMATOLOGY**

Scars, keloids and pigmentation disorders

Protocols and applications

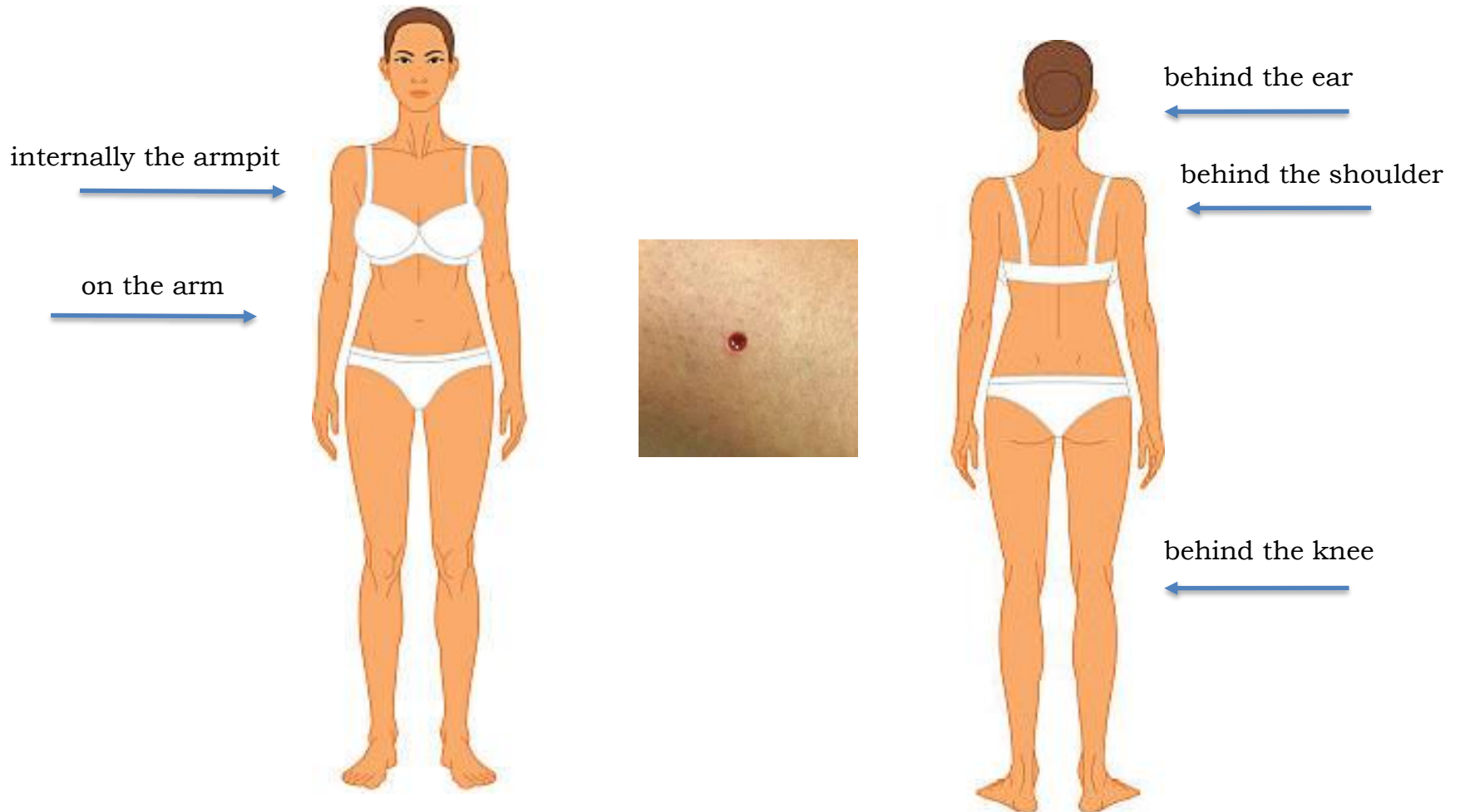


The applications of Medigraft supported by the literature in the field of **AESTHETIC MEDICINE** are:

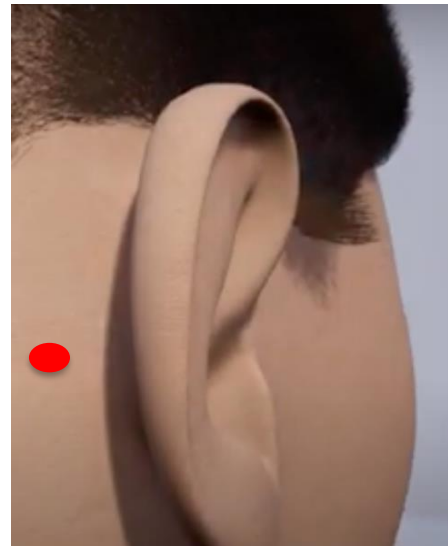
- Face rejuvenation;
- Treatment of expression lines;
- Treatment of scarring;
- Treatment of alopecia areata and androgenetic with or without transplantation;

Bioptic Sampling Area

Sampling with 4 mm bioptic punch

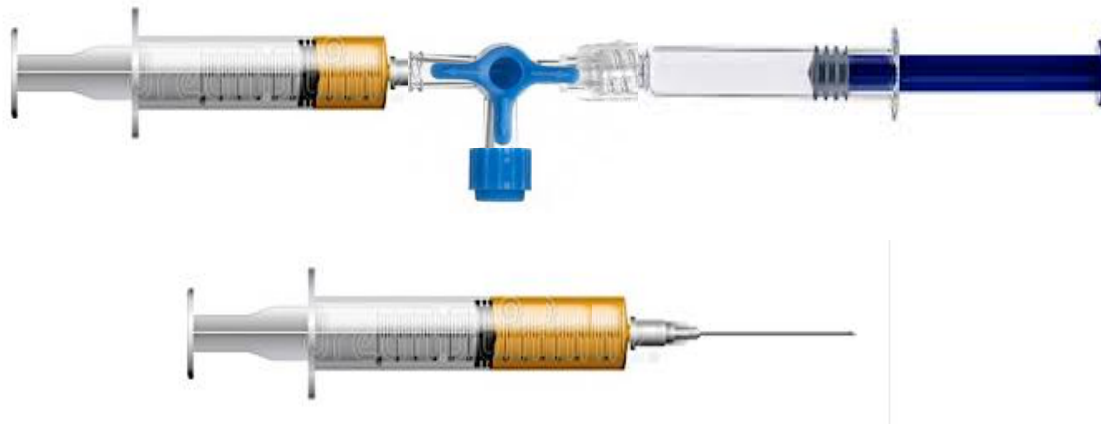


Bioptic Sampling Area



Medigraft e HA

After the sampling, introduce the tissue into the Medicon's processing chamber and add 1.2 ml of physiological solution to facilitate the disgregation and facilitate the recovery of the final product in cell suspension. The cell suspension obtained is mixed with **linear hyaluronic acid** in a 1:1 ratio, transferred into 1 cc syringes, and injected into the subcutaneous tissue.



Facial Rejuvenation

Facial rejuvenation with Medigraft is an effective anti-aging treatment, able to toning the deep dermis of the face and décolleté, smoothing out forehead wrinkles, expression lines, mouth wrinkles, glabellar lines and reducing eye bags.

- Cell turnover and production of collagen, elastin and hyaluronic acid
- Anti-oxidant effect, counteracts the action of free radicals
- Moisturizing action, as it stimulates the recall of water in the tissues,



For a facial rejuvenation and biorevitalization of the décolleté, one sample (1 punch) is sufficient, which added to 1.2 cc of physiologic solution and 1 cc of linear HA allows to obtain about 2.5 cc of product ready to use.

Case 1
Facial Rejuvenation

Facial Rejuvenation

Case 2

Biorevitalization of the décolleté



Case 3

Local vitiligo



Expression lines

The local infiltration of biorevitalizing agents such as the Tissue Micro Cluster obtained with Medigraft, determines three main beneficial effects:

- Hydration
- Contrast of free radicals, real "ageing agents"
- Stimulation of fibroblasts to produce collagen and elastin

Case 1

Naso-labial folds



Notes: For the treatment of expression lines, one sample (1 punch) is sufficient, which added to 1.2 cc of physiological solution and 1 cc of linear HA allows to obtain about 2.5 cc of product ready for injections.

Expression lines

Case 2

Forehead wrinkles



Notes: For the treatment of expression lines, one sample (1 punch) is sufficient, which added to 1.2 cc of physiological solution and 1 cc of linear HA allows to obtain about 2.5 cc of product ready for injections.

Acne and scarring

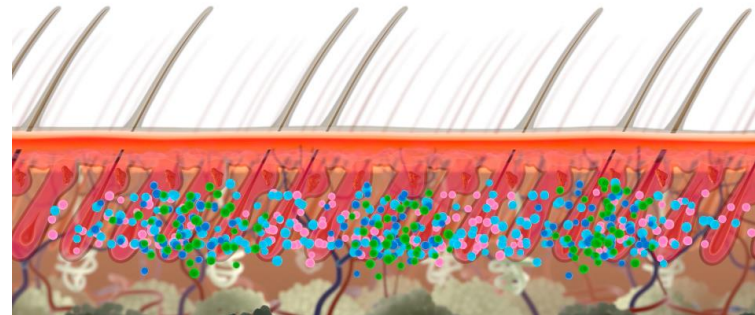
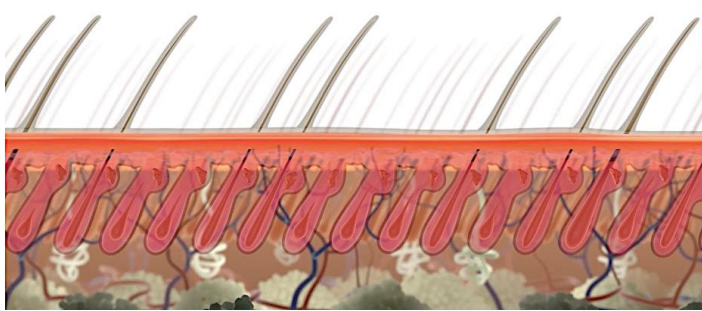
The use of biological fillers in the treatment of scars has recently established as one of the reference techniques for improving these blemishes.



The main benefits of Medigraft for the treatment of scars are:

- Reducing the size of the scar;
- Improvement of skin discolorations;

Hair Alopecia



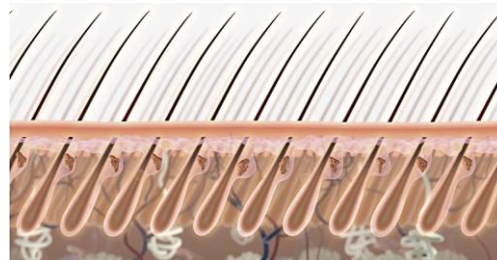
Reverse the miniaturization process by restoring the hair to be healthy, thick and pigmented



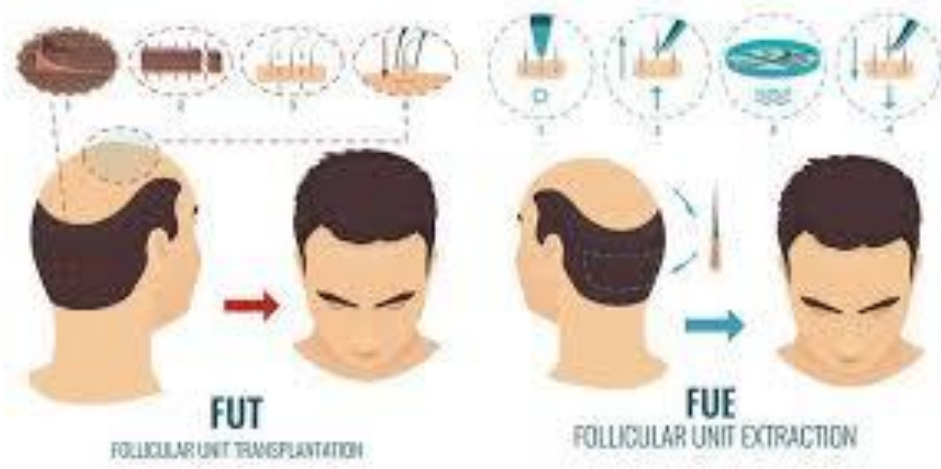
Angiogenesis and
extinguish inflammation

Increased anabolic activity
Trophic action
immune modulating action

Regeneration on receptive and non-atrophic follicles



Hair Transplantation



Other applications in aesthetics...

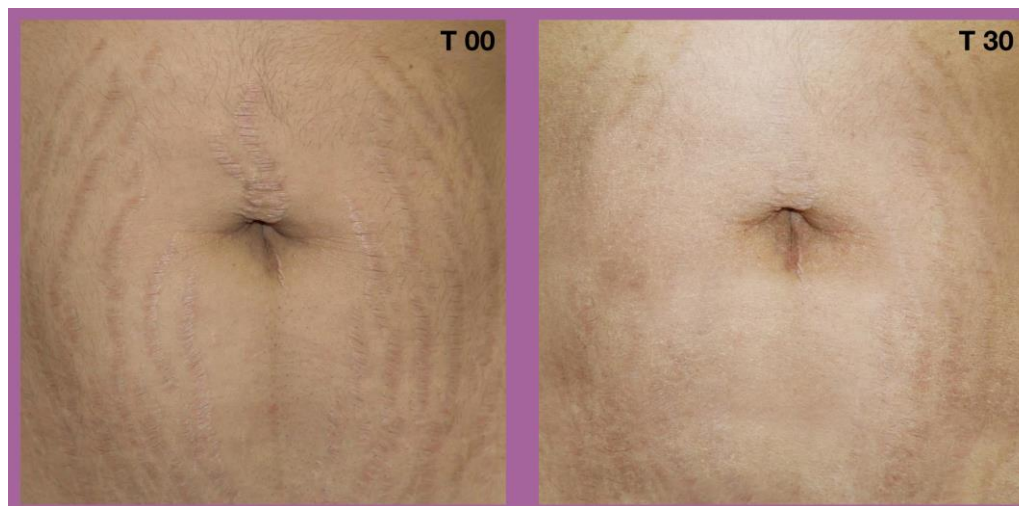
Case 1

Keloid scars



Case 2

stretch marks



Other applications in aesthetics ...

Case 3

Burn



Case 3

Hand vitiligo

