

endoret[®] (prgf[®])

Endogenous Regenerative Technology

MUSCULOSKELETAL SYSTEM



bti.

Human
Technology

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LEADER IN REGENERATIVE MEDICINE

BTI Biotechnology Institute is a Spanish biomedicine company focused on the development of translational research projects (R&D+i). BTI is a world-level scientific leader in regenerative medicine using ENDORET in different fields of medicine.

ENDORET technology has extensive experience in the development of specific protocols for tissue regeneration, and is a pioneering technology manufactured exclusively by BTI Biotechnology Institute.

MORE THAN 150 INDEXED SCIENTIFIC PUBLICATIONS BACK THE EFFECTIVENESS AND BIOSAFETY OF ENDORET®



ENDORET® TECHNOLOGY

WHAT IS IT?

ENDORET® IS A BIOMEDICAL TECHNOLOGY AIMED AT STIMULATING TISSUE REGENERATION BY APPLYING AUTOLOGOUS PROTEINS

in such a way that provides the means necessary for the isolation and concentration of the blood proteins involved in tissue regeneration, as well as its suitable application at the injury site.

ACTIVE SUBSTANCES OF ENDORET®

GROWTH FACTORS

ENDORET stimulates tissue regeneration due to its content in growth factors, in greater concentrations than those of blood.

FIBRIN MATRIX

Enables the balanced and gradual release of a large number of molecules, including growth factors and other proteins.

ADVANTAGES OF ENDORET® TECHNOLOGY

OPTIMUM CONCENTRATION OF PLATELETS

The **right concentration of platelets** affects the final efficacy. ^{(1) (2)}

FREE FORMULATION OF LEUKOCYTES

The inclusion of **leukocytes** increases the pain and inflammation ⁽³⁾ and accelerates the deterioration of the fibrin. ⁽⁴⁾

CONTROLLED ACTIVATION

Enables the formation of the fibrin matrix in situ **and the gradual release of growth factors**, maintaining its efficacy over time. ^{(5) (6)}

AUTOLOGOUS

Taken from the patient's blood, so **there are no side effects**. ⁽⁷⁾

REPRODUCIBLE

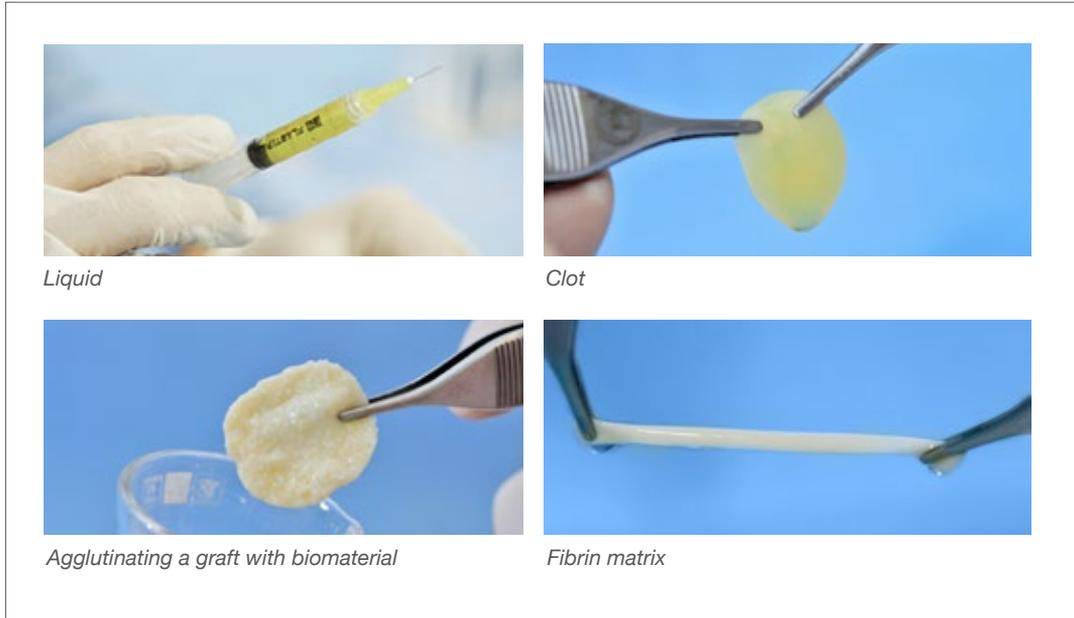
The protocol for the preparation process and its clinical application is strictly defined and tested.

VERSATILE

4 preparations obtained in the same process means we can adapt the product to the patient's clinical needs. ^{(8) (9)}

VERSATILITY

The versatility of ENDORET technology enables it to be adapted to different clinical uses.⁽⁸⁾

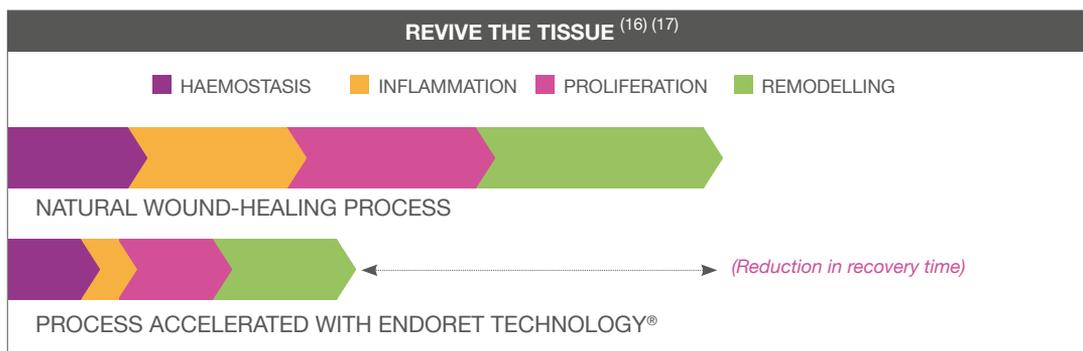


APPLICATION IN THE MUSCULOSKELETAL SYSTEM

The objective of treatment with plasma rich in growth factors is the regeneration of the affected tissues in lesions in:

- **Bones**
- **Muscles**
- **Spine**
- **Tendons**
- **Ligaments**
- **Nerves**

to accelerate recovery times and achieve patient comfort.^{(10) (11) (12) (13) (14) (15)}



EQUIPMENT AND COMPONENTS OF ENDORET TECHNOLOGY®

ENDORET® DISPOSABLE KIT SINGLE-USE KIT

SYSTEM OF BLOOD EXTRACTION

- Extraction tubes
(**EDK1-SCP** · 2 tubes / **EDK1** · 4 tubes / **EDK2** · 8 tubes)
- Winged blood collection set (1)
- Identification labels (5)

SYSTEM OF FRACTIONING

- Fractioning tubes
(**EDK1-SCP** / **EDK1** · 2 tubes / **EDK2** · 4 tubes)
- Plasma Transfer Device PTD2 (1)
- Guide needles
(**EDK1-SCP** · 2 needles / **EDK1** · 4 needles / **EDK2** · 8 needles)
- ACT1 Ampoule of ENDORET ACTIVATOR 1ML. (Calcium chloride). (1)
- Activation syringe 29G (1)



EQUIPMENT

- System V centrifuge.
- Plasmaterm® H furnace
- Activation containers
- Work rack



SAFETY AND REGULATORY ASSURANCE

The application of Endoret technology is a Medicinal Product for Human Use that complies with all the regulations required.



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BTI APP
ENDORET® (PRGF®)
iPhone/smartphone version
iPad/tablet version (exclusive content for clients)

Scientific studies:

(1) Anitua E, Sánchez M, Zalduendo MM, de la Fuente M, Prado R, Orive G, Andia I. Fibroblastic response to treatment with different preparations rich in growth factors. *Cell Prolif.* 2009;42:162-170. / (2) Anitua E, Sanchez M, Prado R, Orive G. The type of platelet-rich plasma may influence the safety of the approach. *Knee Surg Sports Traumatol Arthrosc.* 2014 Jul;22(7):1708-9. / (3) Filardo G, Kon E, Pereira Ruiz MT, Vaccaro F, Guitaldi R, Di Martino A, Cenacchi A, Fornasari PM, Marcacci M. Platelet-rich plasma intra-articular injections for cartilage degeneration and osteoarthritis: single- versus double-spinning approach. *Knee Surg Sports Traumatol Arthrosc.* 2012 Oct;20(10):2082-91. / (4) Anitua E, Zalduendo M, Troya M, Padilla S, Orive G. Leukocyte inclusion within a platelet rich plasma-derived fibrin scaffold stimulates a more pro-inflammatory environment and alters fibrin properties. *PLoS One.* 2015 Mar 30;10(3):e0121713 / (5) Anitua E, Zalduendo MM, Alkhrasat MH, Orive G. Release kinetics of platelet-derived and plasma-derived growth factors from autologous plasma rich in growth factors. *Ann Anat.* 2013 Oct;195(5):461-6. / (6) Anitua E, Sanchez M, Nurden AT, Zalduendo M, de la Fuente M, Orive G, Azofra J, Andia I. Autologous fibrin matrices: a potential source of biological mediators that modulate tendon cell activities. *J Biomed Mater Res A.* 2006;77:285-293. / (7) Anitua E, Sánchez M, Nurden AT, Nurden P, Orive G, Andia I. New insights into and novel applications for platelet-rich fibrin therapies. *Trends Biotechnol.* 2006;24:227-234. / (8) Anitua E, Sánchez M, Orive G, Andia I. The potential impact of the preparation rich in growth factors (PRGF) in different medical fields. *Biomaterals.* 2007;28:4551-4560. / (9) Anitua E, Sánchez M, Orive G. Potential of endogenous regenerative technology for in situ regenerative medicine. *Adv Drug Deliv Rev.* 2010 Jun 15;62(7-8):741-52. (10) Sánchez M, Fiz N, Azofra J, Usabiaga J, Aduriz Recalde E, García Gutiérrez A, Albillos J, Gárate R, Aguirre JJ, Padilla S, Orive G, and Anitua E. A Randomized Clinical Trial Evaluating Plasma Rich in Growth Factors (PRGF-Endoret) Versus Hyaluronic Acid in the Short-Term Treatment of Symptomatic Knee Osteoarthritis. *Arthroscopy.* 2012. Vol 28, No 8 (August): pp 1070-1078. (11) Anitua E, Andia I, Sanchez M, Azofra J, del Mar Zalduendo M, de la Fuente M, Nurden P, Nurden AT. Autologous preparations rich in growth factors promote proliferation and induce VEGF and HGF production by human tendon cells in culture. *J Orthop Res.* 2005;23:281-286. (12) Sánchez M, Anitua E, Lopez-Vidriero E, Andia I. The future: optimizing the healing environment in anterior cruciate ligament reconstruction. *Sports Med Arthrosc.* 2010;18:48-53. (13) Andia I, Sánchez M, Maffulli N. Platelet rich plasma therapies for sports muscle injuries: any evidence behind clinical practice? *Expert Opin Biol Ther.* 2011;11:509-518. (14) Intradiscal and intra-articular facet infiltrations with plasma rich in growth factors reduce pain in patients with chronic low back pain. FERNANDO KIRCHNER, EDUARDO ANITUUA1. *Journal of Craniovertebral Junction and Spine* (15) Platelet-rich plasma, a source of autologous growth factors and biomimetic scaffold for peripheral nerve regeneration. Mikel Sánchez a, Eduardo Anitua b, c, Diego Delgado d, Peio Sanchez d, Roberto Prado b, Gorka Orive b, c, e, f and Sabino Padilla b, c. *EXPERT OPINION ON BIOLOGICAL THERAPY.* 2016 <http://dx.doi.org/10.1080/14712598.2017.1259409> (16) Sánchez M, Anitua E, Azofra J, Andia I, Padilla S, Mujika I. Comparison of surgically repaired Achilles tendon tears using platelet-rich fibrin matrices. *Am J Sports Med.* 2007;35:245-251. (17) Anitua E. Plasma rich in growth factors: preliminary results of use in the preparation of future sites for implants. *Int J Oral Maxillofac Implants.* 1999;14:529-535.