Founded in 1999, Purgo Biologics strives to become one of the leading global companies in oral health care with its focus on safe biomaterials for soft tissue and bone regeneration. Based on the specialized experiences accumulated by our outstanding research personnel, Purgo Research and Development Center based in Seoul is thriving to become the best in the world, specifically in the expertise of oral biomaterials for soft tissue and bone regeneration. All members in Research and Development Center are pursuing the optimized technical developments with various clinical studies, cooperative research with the governments, clinicians and educational institutions.

The solutions manufactured by Purgo are gaining fame throughout the world and Purgo’s solutions are widely accepted by global dentists from more than 30 countries.

Our production site is complying with the most international quality standards and regularly inspected by international agencies. Each production stage of our biologics solutions are controlled from the selection of the raw material to the final product.

“Feel the Clinical Freedom on Science and Safety”
We had a desire. A desire to provide Valuable & Worthwhile products for our family. That’s why we are here to let them smile shine and brightly again.

Purgo Biologics
THE Graft™ is a natural, porous bone mineral matrix. It is produced by removal of all organic components from porcine bone. Due to its natural structure the anorganic bone mineral of THE Graft™ likens physical and chemical aspects of mineralized matrix of human bone. When packed into a bone defect, THE Graft™ gradually resorbs and is replaced with bone during the healing process. It is available in cancellous granules packaged in vial. THE Graft™ is sterilized using gamma irradiation.

Unique proprietary manufacturing process removes very effectively potential immunogenic organic elements keeping the natural structure of the matrix.

THE Graft™ quality and safety have been scientifically demonstrated with in-vitro, in-vivo studies, large case study reports and international randomized clinical research. Systematic review and meta-analysis are conducted on THE Graft™ worldwide.

THE Graft™ has established its fame throughout the world, both scientifically and clinically, becoming the favourite bone regeneration material.
### Indications

<table>
<thead>
<tr>
<th>BONE REPLACEMENT MATERIALS</th>
<th>GR/CC</th>
<th>Extraction socket with intact socket</th>
<th>Extraction socket with defective socket</th>
<th>Minor bone augmentation</th>
<th>Major bone augmentation</th>
<th>Sinus floor elevation</th>
<th>Peri-implantitis</th>
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<tr>
<td>THE Graft™ Granules 0,25-1mm</td>
<td>0,25g~0,6cc</td>
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### Specifications

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<tr>
<th>Description</th>
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<td>TG-AS10</td>
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<td>THE Graft (L*) Granule 1.00 - 2.00mm</td>
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<td></td>
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<td>BG-B10</td>
<td>3.60 cc</td>
</tr>
<tr>
<td></td>
<td>TG-BS10</td>
<td>1.00 cc</td>
</tr>
</tbody>
</table>

* S : small / L : large
THE Graft™ Purity

Is THE Graft™ safe material?

Proprietary virus inactivation process technology. Thanks to highly efficient manufacturing process, THE Graft™ is free from any organic components that might be potential causes of infection or immune reaction. This unique process preserves most of the physical properties of the native porcine osseous structure of THE Graft™. A large surface area is a key requirement for graft materials, and not only results in a larger surface region available for osteoblast cells attachment but also facilitates the exchange of nutrients and waste products, it allows greater amounts of blood, proteins, and growth factors to be absorbed onto the scaffold.

THE Graft™ has a high purity.
The analysis result minimal residual protein, soft tissue, and organic bone matrix, proves that THE Graft™ is deproteinized enough for safe use.

Other than THE Graft™, such lower values for organic residues are only found with bone graft material treated at high temperatures which may cause the detriment of the natural bone structure.

Is porcine bone safer than bovine?

THE Graft™ demonstrated a protein content lower than that of the natural bovine bone graft material. Bovine cancellous bone is Not Free of Zoonoses, such as BSE-Bovine Spongiform Encephalopathy. Porcine bone has a relatively low risk of zoonosis.

Less residual organic content for High purity

High purity means low organic matters → High Surface Energy → High hydrophilicity

Ref : Physicochemical characterization of porcine bone-derived grafting material and comparison with bovine xenografts for dental applications. Jung Heon Lee, Gyu Sung Yi, Jin Woong Lee, Deug Joong Kim, School of Advanced Materials Science and Engineering, Sungkyunkwan University, Suwon, Korea 2SKKU Advanced Institute of Nanotechnology, Sungkyunkwan University, Suwon, Korea

REF : Test Report - PP T-16-0027-04(E) : Testing & Development Center for Dental Materials, Kyung Hee University, Seoul, Korea
The Graft™ Biocompatibility

« Getting closer to human bone »

The Graft™ is structurally similar to human bone. It has high possible level of porosity combined with a natural interconnectivity.

Safe & Biocompatible

The combination of porcine origin with the high level of purity enables predictable bone growth without risking an immunogenic reaction. The high biocompatibility of THE Graft™ has been confirmed by an in-vitro cell study. THE Graft™ therefore encourages cell adhesion to the same extent as the established natural DBBM and offers optimal conditions for vital cell growth.

Porosity is an important factor in determining tissue-implant material integration. High porosity leads to a quicker absorption of liquids and cells spreading. THE Graft™ provides the optimized bone architecture for cells adhesions and tissue regeneration.

Ref: Physicochemical characterization of porcine bone-derived grafting material and comparison with bovine xenografts for dental applications - Jung Heon Lee 1,2,*; Gyu Sung Yi 1; Jin Woong Lee 1; Deug Joong Kim 1,* J Periodontal Implant Sci. 2017 Dec;47(6):388-401 https://doi.org/10.5051/jpis.2017.47.6.388 pISSN 2093-2278 eISSN 2093-2286
Ref: Internal test results PURGO data files
THE Graft™ High Porosity

High porosity and early remodelling improve clinical performance.

The High porosity of THE Graft™ means a quicker absorption of liquids (e.g., blood) in comparison with DBBM. This not only facilitates the application of the material but also leads to a quicker post-implantation incorporation.

High level of porosity was demonstrated with particle pore structure test, particle size distribution test and total porosity tests.

THE Graft™ Structure:

1. Macropores (diameter $\rightarrow$ 100 $\mu$m), are necessary to form blood vessels and induce both bone growth and reorganization around the graft material.

2. Micropores (diameter $\leftarrow$ 10 $\mu$m), are required for the penetration of body fluids, ion transportation, the attachment of osteoblasts, and the precipitation of newly formed HA.

3. Nanopores, composed of sub-100-nm grains with a large amount of nanoscale pores present between the grains contrast.

Global porosity analysis:

- Human trabecular bone (79.3%)
- THE Graft™ ~ 78.4%

Ref: Physicochemical characterization of porcine bone-derived grafting material and comparison with bovine xenografts for dental applications. Jung Heon Lee, Gyu Sung Yi, Jin Woong Lee, Deug Joong Kim, School of Advanced Materials Science and Engineering, Sungkyunkwan University, Suwon, Korea 2SKKU Advanced Institute of Nanotechnology, Sungkyunkwan University, Suwon, Korea
THE Graft™ Hydrophilicity

THE Graft™ consists of a unique inter-connection pore system that ensures an efficient fluid intake and permits the migration of cells. This pore system and high surface energy enhances the osteoconduction process.

The wettability of THE Graft™ turned out to be higher than compared existing xenografts, which suggests that THE Graft™ is relatively hydrophilic and can be easily wet by body fluids after implantation. Not only protein adsorption, but also the attachment, growth, and proliferation of various types of cells, including osteoblasts, have been reported to be significantly affected by the wettability of the material surface.

This high wettability of THE Graft™ suggests that it may have advantages in terms of protein adsorption and the resulting cell adhesion and proliferation processes after implantation.

The content of the organic component of THE Graft™ was somewhat lower than compared existing xenografts.

These results show that organic substances, including collagen and other organic compounds, were successfully removed from THE Graft™, which is thus not affected by issues associated with the organic content.

Vital bone

At all time points, THE Graft™ demonstrated an equal or higher proportion of newly formed vital bone than natural DBBM (left). After 8 weeks, the test group with THE Graft™ showed a much better bone quality compared with the control group with DBBM illustrated by a higher proportion of lamellar vs. woven bone (right).

Ref : Internal test results PURGO data files
OpenTex™ Non-Resorbable PTFE Membrane is a pure medical-grade polytetrafluoroethylene (PTFE) sheet with inert biological features and predictable barrier effect. Due to the smooth surface and small pore size, OpenTex™ PTFE Membrane resists the incorporation of bacteria into its structure and eases the removal of the membrane.

Non-resorbable membrane is sustainable for surgical procedure with no primary closure. OpenTex™ Membrane is ideal for space-making feature providing enough space for host cells to adhere to grafting materials. OpenTex™ is supplied sterile for single use only and available in various sizes.

The Evolution of PTFE Membrane

<table>
<thead>
<tr>
<th>1980s</th>
<th>1994</th>
<th>2010</th>
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</thead>
<tbody>
<tr>
<td>1st Generation</td>
<td>2nd Generation</td>
<td>3rd Generation</td>
</tr>
<tr>
<td>1st is considered the gold standard in barrier membranes.</td>
<td>d-PTFE membrane</td>
<td>With its microporosity, OpenTex is considered to be a novel barrier membrane. It is especially suitable for bone regeneration and soft tissue management of an extraction socket after immediate implant placement.</td>
</tr>
</tbody>
</table>
Non-Resorbable PTFE membrane

Indications

**GBR** (Guided Bone Regeneration)

- Simultaneous use of GBR membrane and implants.
- Augmentation around implant placed in immediate extraction sites or delayed extraction sockets.
- Filling of bone defects after root resection, removal of cysts, and removal of retained teeth.

**GTR** (Guided Tissue Regeneration)

Specifications

<table>
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<tr>
<th>Item Nº</th>
<th>Size</th>
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<tbody>
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<tr>
<td>OpenTex_02</td>
<td>17 mm x 25 mm</td>
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</table>
OpenTex™ Main Features

**Non-Resorbable**
- 100% medical grade PTFE membrane.
- Biologically inert and chemically non-reactive.
- Healing procedure is not interfered with membrane absorption.

**Microporous**
- Promote the gingival tissue attachment.
- Enhances ease in the interstitial fluid circulation.
- Resist the bacteria infection and fibroblast cells migration.

**Minimally Invasive**
- Rapid recovery of soft tissue.
- Primary Closure is not necessary.
- Virtually impervious to bacteria.
- Minimum flap reflection or dissection. Safe from bacteria infection, even in the event of the exposure.

**Withstands Exposure**
- Protect the tissue regeneration site.
- Regenerated underlying tissue can be evaluated.
- Provide a proper environment for the growth of blood vessel and osteogenic cells.

OpenTex™ Benefits

- Soft Tissue Obtaining
- Aesthetic Implant Restoration
- Natural Saliva Passage
- Minimally Invasive

OpenTex™ Strengths

1 **Stability**:
Non-resorbable PTFE Membrane offers enough healing time to bone regenerative process.

2 **Biologically Inert**:
PTFE is soft tissue friendly so it is ideal material as a barrier for bone regenerative process.

3 **Withstands to exposure**:
PTFE Membrane withstands to exposure since it is impervious to bacteria due to their barrier function.
Characteristics of OpenTex™

Impervious to Bacteria

Most of Oral Bacteria is larger than 1um. OpenTen™ is micro-porous material that has the pore size small enough to prevent bacterial infiltration.

Biocompatible, OpenTex™ facilitates cell adhesion on the surfaces.

Test performed shows that the surface of OpenTex™ is not toxic causing cells to adhere well on the surface.

24 Hours for five cells adhesion cases on OpenTex™ surface
(SEM : Scanning Electron Microscope)

General Oral Bacteria

The matters is PORE SIZE

General Oral Bacteria

Ref : Internal test results PURGO data on file.
Ref : Clinical Evaluation of Vertical Ridge Augmentation Using Titanium Reinforced PTFE membrane. Department of Periodontology, Dental Hospital, Veterans Health Service Medical Center, Seoul, Korea. The Korean Academy of Oral Maxillofacial Implantology Vol.22, No.1, 2018
Ref : Review of Pore Size effect of OpenTex ™ /OpenTex ™ TR PTFE membrane.
Membrane is composed of 100% polytetrafluoroethylene (PTFE) sheet and grade 1 titanium frame, which are biologically inert and tissue compatible.

OpenTex™-TR Non Resorbable PTFE Membrane with titanium frame is designed to have a suitable surface structure and porosity to prevent integration and passage of bacteria within the interstices of the material, while maintaining space for host cells adhesion to the device.

OpenTex™-TR provides a favorable environment for neovascularization and healing of defects, through repopulating the bone derived cells and protecting the bony defects from migration of the gingival tissue derived cells.

Since the adequate space maintenance is critical to this procedure, the membrane is sufficiently stiff to prevent spontaneous collapse, but also flexible enough to easily conform to tissue contours and reduce perforations of overlying soft tissue.

Make smart decision with smart alternative!
Indications

01. Extraction socket reconstruction

02. Bone regeneration

03. Where primary closure isn’t possible

Primary Closure

Specifications

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OpenTex-TR™ Main Features

- Non-Resorbable
- Minimally Invasive
- Optimal rigidity for space maintenance

OpenTex-TR™ Benefits

1. Optimal rigidity and strength for space making
   OpenTex™-TR is an optimal product which is able to be trimmed easily and is solid enough for space making since it is reinforced with a titanium frame.

2. Diverse embedded titanium frame
   OpenTex™-TR is designed in various shapes to meet surgeon’s demand.

3. Excellent tissue interaction
   Its micro porous structure helps the tissue interaction.

4. Easy of use
   OpenTex™-TR can be trimmed easily and also removed easily.

Ref : Internal test results PURGO data on file.
Membrane can be molded and shaped for tenting and space maintenance.
The rigidity of the membrane is enhanced to be used for space maintenance.
Provides additional stability in large, non-space-making osseous defects.
Provide with little memory of Titanium frame, which enables easy placement of the membrane.
Ability to withstand exposure.
Biotex™ Non-Resorbable PTFE Suture is comprised of a single-arm, non-resorbable monofilament suture with a stainless-steel surgical needle connected to the suture. The suture is uncoated, undyed and sterile for single use only, composed of 100% PTFE.

- SOFT HANDLING
- BIOLOGICALLY INERT
- NO TANGLE
- EASY KNOTTING
Indications

- Bone grafting procedures
- Periodontal surgery
- Guided tissue regeneration
- Ridge augmentation
- Implant surgery
- Soft tissue grafts

Specifications

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<td>1/2</td>
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</tbody>
</table>
Biotex™ Main Features & Benefits

1. Slim reverse cutting needle tip
   - Precisions slim cut triangular needle for small penetration area and smooth suturing
   - Minimize damage to surrounding soft tissue

2. Strong Attachment
   - Advanced technology for strong needle attachment
   - Smooth and firm connection between needle and thread
   - Rapid healing process due to the reduced bleeding from needle insertion

3. Strong Needle
   - 33% higher strengths are required to bend needle in same degree compared to other product.
   - No worry to be bent of needle during the suturing with its high rigidity.

REF: Internal test results PURGO data files
Benefits

- Minimal Pain
- Advanced Tissue Healing
- Superior handling: provides flexibility in the positioning of a square knot. Easy to tie – Easy to remove
- Nonwicking: elimination of bacterial wicking usually associated to monofilament
- Maintains tensile strength
- PFOA free

Needle holding clip
Designed to hold the needle in place, also allows for secure and easy release of the suture needle from its package.

Tab
Allows surgeon to easily grasp and remove the suture needle from its needle holder clip.

‘Race Track’ shape
Designed to prevent suture from entangling, and allows easy release of the suture.

Sturdy & Flexible Transparent Cover
Protect and give clear visibility of suture and needle. Soft and sturdy cover effectively protect the suture.
Adaptable Resorbable Collagen Membrane

BioCover™ is a resorbable collagen membrane consisting porcine tissues which are similar to human collagen phylogenetically. BioCover™ resorbable collagen membrane offers excellent handling, easy adaptation to bone graft materials and less time consumption in surgery.

- FLEXIBLE & ADAPTABLE
- STRONG ENOUGH FOR SUTURE
- CROSSLINKED FOR DESIRED BARRIER DURABILITY
Benefits

- Biocompatible and safe
- Excellent Handling
- Great tissue adhesion
- Cell occlusive
- Strong enough to suture

Specifications

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Indications

BioCover™ is intended for use in periodontal and dental surgery procedures as a material for placement in the area of periodontal defect, dental implant, bone defect or ridge reconstruction to aid in wound healing post surgery. Considering BioCover™ indications and resorption time, it is recommended to combine the membrane with bone graft to new bone healing by osteoconduction [THE Graft™].