Soft-Tissue Solutions from The Collagen Expert

Geistlich Mucograft®
Geistlich Mucograft® Seal
Geistlich Fibro-Gide®
Documented
More than 1,000 publications

Reliable
More than 30 years of clinical experience

Experienced
More than 165 years of Geistlich collagen competence
The Softer Side of Geistlich Innovation

Our superior solutions make predictable soft-tissue regeneration an open and closed case.

At Geistlich, our pioneering path from biomaterial developer to market leader has been built firmly upon science. Beyond our dedicated scientific team, we collaborate with more than 100 universities as well as leading surgeons throughout the world.

After thorough development and documentation, we manufacture with the highest quality and safety standards, resulting in three interconnected product lines – Bone Substitutes, Membranes and Matrices. Our growing soft-tissue portfolio includes a selection of matrices to expand your treatment options in both open and closed healing situations.

Geistlich Mucograft® is an ideal matrix for recession defects and gain of keratinized tissue where open healing is required. Add to that our latest breakthrough, Geistlich Fibro-Gide®, the first volume-stable collagen matrix designed to increase soft-tissue volume when closed healing is necessary.

Addressing all of your soft-tissue treatment needs can be a challenge but Geistlich Biomaterials partners with you to achieve regenerative success from every side – including the softer side.

Our product lines include:

Matrices
› Geistlich Mucograft®
› Geistlich Mucograft® Seal
› Geistlich Fibro-Gide®

Bone Substitutes
› Geistlich Bio-Oss®
› Geistlich Bio-Oss Collagen®
› Geistlich Bio-Oss Pen®

Membranes
› Geistlich Bio-Gide®
› Geistlich Bio-Gide® Compressed
› Geistlich Bio-Gide® Shape
› Geistlich Bio-Gide® Perio

Combination Products
› Geistlich Combi-Kit Collagen
› Geistlich Perio-System
› Combi-Pack

The Ideal Biomaterials for Regeneration

These proven and reliable products provide a foundation for long-term clinical success in regenerative dentistry.
Redefining the Soft-Tissue Matrix

For nearly a decade, Geistlich Mucograft® and its combination of intact and fragmented fibrillar collagen, has created an optimal healing matrix.

The unique clot stabilizing macro-structure along with a cell signaling micro-structure results in organized and vascularized regenerative healing.

Geistlich Mucograft® is designed to provide a requisite, reinforcing matrix and a signaling source for regenerative wound healing. Fibroblasts respond to the collagen by attaching, orienting and producing new collagen integration.

Collagen research suggests that in such scaffolds, endothelial progenitor cells are activated for angiogenesis and the intact collagen fibrils serve as conduits for endothelial cells and the formation of vascular channels of nutrition. These vascular channels are surrounded with perivascular mesenchymal stem cells with anti-inflammatory properties.1-4

Due to these properties, the clinical result observed with Geistlich Mucograft® is optimal soft-tissue regeneration rather than soft-tissue repair.5-8
Key Factors for Success

Collagen Structure:
› Geistlich Mucograft® consists of specially processed collagen which supports optimal ingrowth for healthy bone formation.

Easy Vascularization:
› Histology showing early vascularization of Geistlich Mucograft® 15 days after implantation (mouse model). Arrow indicates the formation of a blood vessel. Circles show soft-tissue cells in the matrix.6

Cell Ingrowth:
› Histology 30 days after implantation (mouse model), showing soft-tissue cell ingrowth into Geistlich Mucograft®.

Integration/Regeneration:
› Complete soft-tissue integration of Geistlich Mucograft® within human connective tissue 6 weeks after clinical implantation, without any signs of foreign body reaction. Circles show soft-tissue cells in the matrix.6

For extraction socket cases where both a soft-tissue regeneration and additional bone volume are needed, Geistlich Bio-Oss Collagen® is a natural companion to Geistlich Mucograft® Seal.*

* Additional information regarding indications for Geistlich Matrices can be found on the back panel of this brochure.

Biofunctionality in a Predictable Matrix
Geistlich Mucograft® is a collagen matrix specifically designed for soft-tissue regeneration.
The matrix was developed using the free gingival graft as a model and is uniquely processed to encourage immediate blood clot stabilization, making it the ideal solution for gaining keratinized tissue in open healing situations.

This leads to early vascularization,5,7 facilitates soft-tissue cell ingrowth6 and excellent integration of the matrix with the surrounding tissues.6,7

Clinical Efficacy and Ease of Use
Geistlich Mucograft® is indicated for recession defects and increasing the zone of keratinized tissue, as illustrated in the image below.

Case courtesy of Dr. Michael K. McGuire and Dr. E. T. Scheyer | Houston, TX, USA.

Geistlich Mucograft®
Unique Collagen Matrix¹

Blood Clot Stabilization and Early Vascularization²,³
Significant Soft-Tissue Cell Ingrowth Leading to Integration$^{2,3}$

Soft-Tissue Regeneration and Clinical Long-Term Success$^{2-4}$

Recession Coverage Treatment with Geistlich Mucograft®

**Objective:** Achieve root coverage combining Geistlich Mucograft® with coronally advanced flap (CAF) without the morbidity of a soft-tissue graft harvest.

**Conclusion:** Recession coverage with Geistlich Mucograft® and CAF provides an acceptable option to connective tissue graft and CAF.

1. Pre-operative image showing the recession defect on tooth #6.
2. After elevation of a partial thickness flap, the interdental papillae are de-epithelialized.
3. Geistlich Mucograft® is placed over the defect and sutured to the papillae.
4. The flap is coronally advanced and sutured completely covering the matrix.
5. Healing of the surgical site 1 week after treatment.
6. Post-operative situation after 4 weeks.
7. Surgical site 3 months post-operative.
8. Optimal outcome 6 months post-operative. Note the natural appearance of the soft-tissue achieved with Geistlich Mucograft®.
Objective: Increase the width of keratinized tissue around implants with Geistlich Mucograft®, while also achieving vestibule creation and improved access for oral hygiene.

Conclusion: Geistlich Mucograft® can be used as an alternative to significantly increase the zone of keratinized and attached tissue around existing implants.

1 Pre-operative view. A small band of keratinized gingiva is present.

2 The band of keratinized gingiva is split and a split-thickness flap is elevated exposing connective.

3 Geistlich Mucograft® is sutured to the recipient bed and left exposed.

4 Underneath the fibrin clot, the area appears to granulate 1 week post-operative.

5 Excellent wound healing 4 weeks after surgery.

6 Post-operative follow-up after 2 months

7 Surgical site view 3 months post-operative.

8 Lugol’s iodine staining delineating keratinized tissue at 6 months.

9 Mucogingival appearance (4 mm of keratinized tissue) 6 months post-surgery.
Soft-Tissue Management Following Tooth Extraction

Ridge preservation with Geistlich Mucograft® Seal and Geistlich Bio-Oss Collagen® minimizes ridge resorption in extraction sockets with preserved alveolar buccal walls. Soft-tissue quality and maturation after 8–10 weeks provides an ideal contour for early implant placement.¹

Geistlich Mucograft® Seal and Geistlich Bio-Oss Collagen® preserve significantly more bone volume than spontaneous healing.¹

Clinical Benefits
› Faster wound healing¹² and tissue integration¹³
› Natural color and texture adaptation¹³
› Simple application and shorter procedure times
› Ideal when paired with Geistlich Bio-Oss Collagen® for early implant placement
Insufficient Soft-Tissue Thickness in a Single Tooth Gap in the Anterior Maxilla

Dr. Ken Akimoto | Issaquah, WA, USA

Objective: Minimize alveolar ridge remodeling and natural soft-tissue appearance following tooth extraction for early implant placement in the esthetic zone.

Conclusion: The use of biomaterials post-extraction resulted in minimizing alveolar ridge volume reduction and maximizing soft-tissue healing.2,3

1 Pre-operative situation, tooth #7 with periapical infection and horizontal fracture.

2 CT Scan showing tooth #7 with significant bone loss.

3 Occlusal view of the clinical situation prior to extraction of tooth #7.

4 Extraction socket with Geistlich Bio-Oss Collagen® in place.

5 Geistlich Mucograft® Seal is placed over the extraction socket and secured with single interrupted sutures.

6 Soft-tissue healing at the time of implant placement, 3 months following tooth extraction.

7 Buccal view showing excellent soft-tissue healing and keratinized tissue.

8 Buccal view at 5 months post-implant placement.

9 Final restoration in place, 2 years post-extraction.


2 Geistlich Mucograft® Seal report on the meeting of the Advisory Committee, data on file

Introducing the Alternative Soft-Tissue Graft

After years of development and thousands of prototypes, Geistlich Fibro-Gide® brings new volume to the Geistlich treatment expertise.

Geistlich's experience in collagen processing played a significant role in the development of Geistlich Fibro-Gide®. The proprietary purification and separation processes used in the development of Geistlich Bio-Gide® resulted in the first resorbable collagen membrane that did not illicit a foreign body response, with excellent handling characteristics. Geistlich continued to find new possibilities to handle collagen fibers, maintaining vital native characteristics in order to produce products with the desired properties.

By utilizing new techniques and adding an additional collagen assembly processing step, Geistlich Mucograft® was developed.

Collagen Expertise

Geistlich Fibro-Gide® design features support soft-tissue regeneration and volume stability.

The product was designed for soft-tissue regeneration – specifically to increase keratinized tissue and enable open healing.

Geistlich Fibro-Gide® was developed to meet the clinician's need for soft-tissue volume. To accomplish this, Geistlich first perfected a process called smart cross-linking to create the desired product properties without adversely impacting acceptance and integration within the body. With its highly porous structure, Geistlich Fibro-Gide® supports blood clot stabilization and features a majority of pores, specifically sized, to allow the ingrowth of cells for optimal soft-tissue formation.

Porous structure of Geistlich Fibro-Gide®

Histologic slide showing the formation of blood vessels in the collagen matrix after 2 weeks of grafting (white arrows).

Histology by University of Zurich
Zurich, Switzerland.
From Concept to Reality

Screening:
› Geistlich developed a bioreactor to test the properties of Geistlich Fibro-Gide®.
› Best prototypes selected based on cell proliferation and volume stability.¹

Mechanical Testing:
› Remaining prototypes endured rigorous testing with repeated cycles of mechanical force.
› The best prototypes retained 70-80% of their volume and remained stable after application of the forces.¹

Selecting for Soft-Tissue Integration:
› Testing the remaining prototypes for soft-tissue integration, remodeling and vascularization was conducted with different degrees of cross-linkage.
› The Geistlich smart cross-linking process, balances mechanical volume stability with cell compatibility and tissue integration.²⁻⁴

An Ideal Alternative to Connective Tissue Grafts
Geistlich Fibro-Gide® is a volume-stable collagen matrix, specifically designed to meet your clinical need for soft-tissue regeneration.

The porous network of the matrix supports angiogenesis, formation of new connective tissue and stability of the collagen network in submerged healing situations.²⁻⁵

Clinical Use
Geistlich Fibro-Gide® is ideally suited for soft-tissue augmentation around natural teeth and implants, as a submerged scaffold where an increase in soft-tissue thickness is clinically desired.

Case courtesy of Dr. Otto Zuhr Munich, Germany

Insufficient Soft-Tissue Thickness in a Single Tooth Gap in the Anterior Maxilla

“Geistlich Fibro-Gide® is one of the major innovations in regenerative dentistry in the last 20 years.”

PD Dr. Daniel Thoma | Zurich, Switzerland

**Objective:** Gain in soft-tissue thickness in the esthetic area with Geistlich Fibro-Gide®.

**Conclusion:** After 6 months, the final restorations were placed. The natural look of the augmented soft-tissue can be appreciated, and no implant translucency is visible.

1. Baseline frontal view: missing central incisor. Implant visible through mucosa due to thin biotype.
2. Baseline occlusal view: soft-tissue deficit in the buccal and occlusal area.
3. Flap elevation on the buccal side using a full flap crestally and a split flap buccally.
4. Adaptation of a 15x20x6mm Geistlich Fibro-Gide® to the defect size.
5. Prepared a palatal island flap to allow for tension-free wound closure. Geistlich Fibro-Gide® in situ, immobilized with a mattress suture.
6. Tension-free wound closure using single interrupted sutures (Dafilon 5-0, Braun).
7. Suture removal 7 days post-surgery.
8. Abutment connection.
9. 6 months follow-up: final crown in place.
Insufficient Soft-Tissue Thickness in a Single Tooth Gap in the Anterior Maxilla

Objective: Gain in soft-tissue around a single implant in the esthetic area with Geistlich Fibro-Gide®.

Conclusion: The use of Geistlich Fibro-Gide® gave successfully esthetic results, providing the missing thickness of soft-tissue.

1. Occlusal view: missing left central incisor with labial soft-tissue deficiency 3 months after implant placement.
2. Labial flap preparation with a microsurgical tunneling knife.
3. Trimming Geistlich Fibro-Gide® in a wet state to fit the size of the defect.
4. Insertion of Geistlich Fibro-Gide® into the desired area.
5. Tension-free wound closure performed with double sling and single interrupted sutures.
6. Occlusal perspective after wound closure.
7. Situation before suture removal 7 days post-surgery.
8. Situation 4 months after soft-tissue augmentation.
9. 6 months follow-up with the final implant restoration in place.
Real Benefits for Patients

Both of our unique matrices have been specifically designed for soft-tissue regeneration procedures, each with the ideal characteristics for their intended indications. Your patients will appreciate the outstanding benefits that both products provide, as well as the excellent clinical outcomes.

**Fewer Surgical Procedures:**
› Eliminates need to harvest an autologous graft.

**Less Pain and Morbidity:**
› Absence of a donor site significantly reduces post-operative pain.$^{1,2}$

**Faster / Complication Free Soft-Tissue Healing:**
› Early healing of a surgical wound in open healing situations is significantly faster when covered with Geistlich Mucograft® than in spontaneous healing.$^3$
› No increase in post-surgical complications were observed with Geistlich Fibro-Gide® vs. a Connective Tissue Graft.$^2$

**Natural Soft-Tissue Color and Good Integration:**
› Natural texture and color match to surrounding native tissues resulting in improved esthetics after treatment with Geistlich Mucograft$^4,5$.
› Geistlich Fibro-Gide® shows good integration into the surrounding soft-tissues while maintaining stability.$^6$

Our solutions put patients first.
<table>
<thead>
<tr>
<th>Geistlich Mucograft®</th>
<th>Geistlich Fibro-Gide®</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compact and spongy layer</td>
<td>Porous layer</td>
</tr>
<tr>
<td>Reconstituted collagen – no cross-linking</td>
<td>Reconstituted collagen – smart cross-linking</td>
</tr>
<tr>
<td>Reduced volume stability</td>
<td>Good volume stability</td>
</tr>
<tr>
<td>Open and submerged healing</td>
<td>Submerged healing</td>
</tr>
<tr>
<td>Gain of keratinized tissue</td>
<td>Soft-tissue volume augmentation around implants and natural teeth, and under pontics</td>
</tr>
<tr>
<td>Socket Seal</td>
<td>Recession Coverage</td>
</tr>
<tr>
<td>Vestibuloplasty</td>
<td></td>
</tr>
<tr>
<td>Recession Coverage</td>
<td></td>
</tr>
</tbody>
</table>

FGG Vs. Geistlich Mucograft®

Courtesy of Dr. D. Thoma.

Geistlich Mucograft®

Geistlich Pharma AG, Wolhusen, Switzerland.

CTG Vs. Geistlich Fibro-Gide®

University of Zurich, Switzerland.

Product Range by Therapeutic Area

Our matrices are essential components in the treatment of a broad range of therapeutic areas and are available in a variety of options to meet your handling and delivery needs.

<table>
<thead>
<tr>
<th>Matrices Products</th>
<th>Extraction Socket Management</th>
<th>Minor Bone Augmentation</th>
<th>Soft-Tissue Regeneration</th>
<th>Major Bone Augmentation</th>
<th>Sinus Floor Elevation</th>
<th>Periodontal Regeneration</th>
<th>Peri-Implantitis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geistlich Mucograft®</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Geistlich Mucograft® Seal</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Geistlich Fibro-Gide®</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

At Geistlich Biomaterials, we are committed to developing treatments that are uniquely matched to the clinical situations you see every day. That's why we do more than bring you a family of products – we provide proven solutions in specific therapeutic areas.

What Nature Inspires, Geistlich Engineers

The intentional design of Geistlich biomaterials makes them the perfect combination for your regenerative portfolio.
## Matrices Product Range

<table>
<thead>
<tr>
<th>Product</th>
<th>Sizes</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Geistlich Mucograft®</strong></td>
<td>15x20mm, 20x30mm</td>
<td>Collagen Matrix designed specifically for soft-tissue regeneration.</td>
</tr>
<tr>
<td><strong>Geistlich Mucograft® Seal</strong></td>
<td>8mm in diameter</td>
<td>Collagen Matrix designed specifically for extraction socket management.</td>
</tr>
<tr>
<td><strong>Geistlich Fibro-Gide®</strong></td>
<td>15x20x6mm, 20x40x6mm</td>
<td>Volume-Stable Collagen Matrix designed specifically for connective tissue grafts.</td>
</tr>
</tbody>
</table>
CAUTION: Federal law restricts these devices to sale by or on the order of a dentist or physician.

Indications:
Geistlich Mucograft® and Geistlich Mucograft® Seal are indicated for the following uses: Covering of implants placed in immediate or delayed extraction sockets, localized gingival augmentation to increase keratinized tissue (KT) around teeth and implants, alveolar ridge reconstruction for prosthetic treatment, recession defects for root coverage.

WARNINGS:
As Geistlich Mucograft® and Geistlich Mucograft® Seal are collagen products, allergic reactions may not be totally excluded. Possible complications which may occur with any surgery include swelling at the surgical site, flap sloughing, bleeding, dehiscence, hematoma, increased sensitivity and pain, redness and local inflammation.

Indications:
Geistlich Fibro-Gide® is indicated for soft-tissue augmentation including:
- Localized gingival augmentation to increase keratinized tissue (KT) around teeth and implants, alveolar ridge reconstruction for prosthetic treatment, and recession defect for root coverage.

WARNINGS:
As Geistlich Fibro-Gide® is a collagen product, allergic reactions may not be totally excluded. Possible complications which may occur with any surgery include swelling at the surgical site, flap sloughing, bleeding, dehiscence, hematoma, increased sensitivity and pain, redness and local inflammation.

Indications:
Geistlich Bio-Oss Collagen® is indicated for the following uses:
- Augmentation or reconstructive treatment of the alveolar ridge;
- Filling of periodontal defects;
- Filling of defects after root resection, apicoectomy, and cystectomy;
- Filling of extraction sockets to enhance preservation of the alveolar ridge;
- Elevation of the maxillary sinus floor;
- Filling of periodontal defects in conjunction with products intended for Guided Tissue Regeneration (GTR) and Guided Bone Regeneration (GBR); and
- Filling of peri-implant defects in conjunction with products intended for GBR.

WARNINGS:
Possible complications which may occur with any surgery include swelling at the surgical site, flap sloughing, bleeding, local inflammation, bone loss, infection or pain. As Geistlich Bio-Oss Collagen® contains collagen, in very rare circumstances cases of allergic reactions may occur.

For more information on contraindications, precautions, and directions for use, please refer to the Geistlich Biomaterials Instructions for Use at: www.geistlich-na.com/ifu