



# NovoMatrix™

## Reconstructive Tissue Matrix

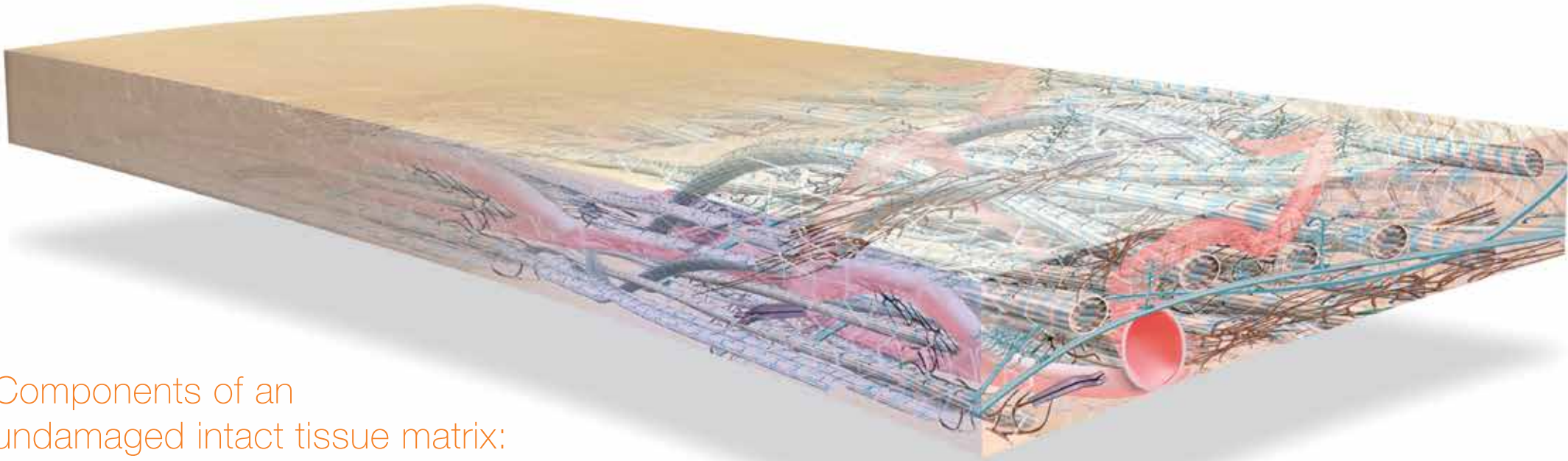
From the pioneers in regenerative tissue matrices, NovoMatrix is the next generation soft tissue augmentation material



**BIOHORIZONS**  
SCIENCE • INNOVATION • SERVICE



# NovoMatrix proprietary tissue processing maintains tissue integrity



Maintenance of graft integrity is essential to achieving successful biological outcomes. NovoMatrix is minimally manipulated and processed gently to ensure it retains components critical to maintaining the biochemical and biomechanical integrity of the tissue.

## Components of an undamaged intact tissue matrix:



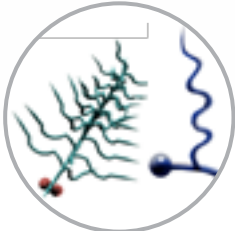
### Vascular Channel<sup>2</sup>

Vessels that provide blood flow throughout the matrix, enabling initial revascularization



### Fibronectin<sup>7</sup>

Complex proteins that mediate a variety of cellular interactions; responsible for modulating cell adhesion, migration, growth and differentiation



### Large & Small Proteoglycans<sup>6</sup>

Large and small macromolecules that guide revascularization and cell repopulation and regulate extracellular matrix structure through assembly and construction



### Fibrillar Collagen & Collagen VI<sup>8</sup>

Triple-stranded proteins that assemble into fibril complexes to provide structure and tensile strength



### Elastin<sup>8</sup>

Fibers that function in close association with collagen to provide elasticity and recoil



### Hyaluronan<sup>8</sup>

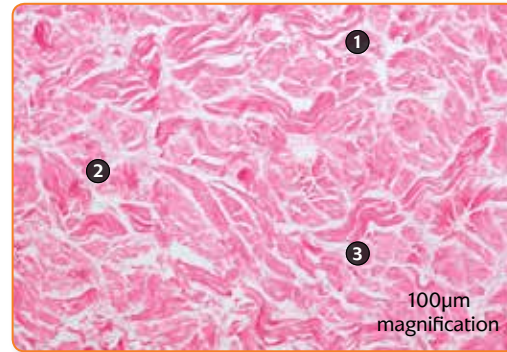
High molecular weight polysaccharide molecules that control tissue hydration, driving water transport and maintaining the elastoviscosity of connective tissues throughout the body

With more than 2.5 million grafts to date, 25 years of experience in tissue processing, and an ongoing commitment to innovation, Allergan has joined forces with BioHorizons and Camlog to bring NovoMatrix, the next generation soft-tissue augmentation material to dentistry.

- 2019 **NovoMatrix™**  
Reconstructive Tissue Matrix  
for soft tissue applications in dentistry
- 2011 AlloDerm™ RTM **Ready to Use**
- 2010 Strattice™ RTM BPS for hernia repair
- 2008 Strattice™ RTM EU for breast reconstruction
- 2007 Strattice™ Reconstructive Tissue Matrix (RTM)  
for abdominal wall reconstruction
- 2006 AlloDerm™ RTM for breast reconstruction
- 2005 AlloDerm™ RTM for guided bone regeneration (GBR)
- 2004 AlloDerm™ RTM for complex hernia repair
- 2000 BioHorizons begins distribution  
of AlloDerm™ RTM for dentistry
- 1998 AlloDerm™ RTM for head and neck reconstruction
- 1994 AlloDerm™ RTM for burn treatment
- 1986 LifeCell™ Corporation formed

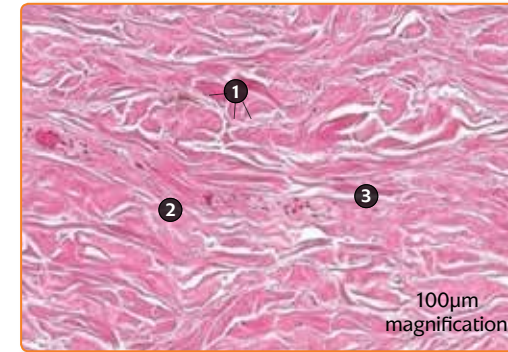
# When it comes to maintaining graft integrity, not all processing is the same

The structure of NovoMatrix most resembles native dermis<sup>3,4,5</sup>



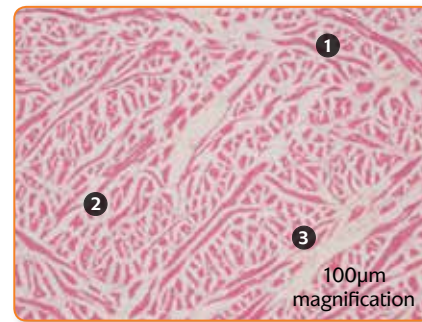
**NovoMatrix**

- 1) Natural spacing between dermal collagen fibers
- 2) Acellular porcine collagen matrix
- 3) Native fibrillar collagen structure



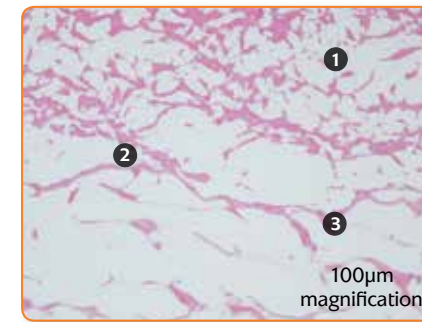
**Human Dermis**

- 1) Cell presence within collagen fibers
- 2) Natural spacing between dermal collagen fibers
- 3) Native fibrillar collagen structure



**Mucoderm®**

- 1) Altered spacing between dermal collagen fibers
- 2) Acellular porcine collagen matrix
- 3) Modified condensed collagen structure



**Mucograft®**

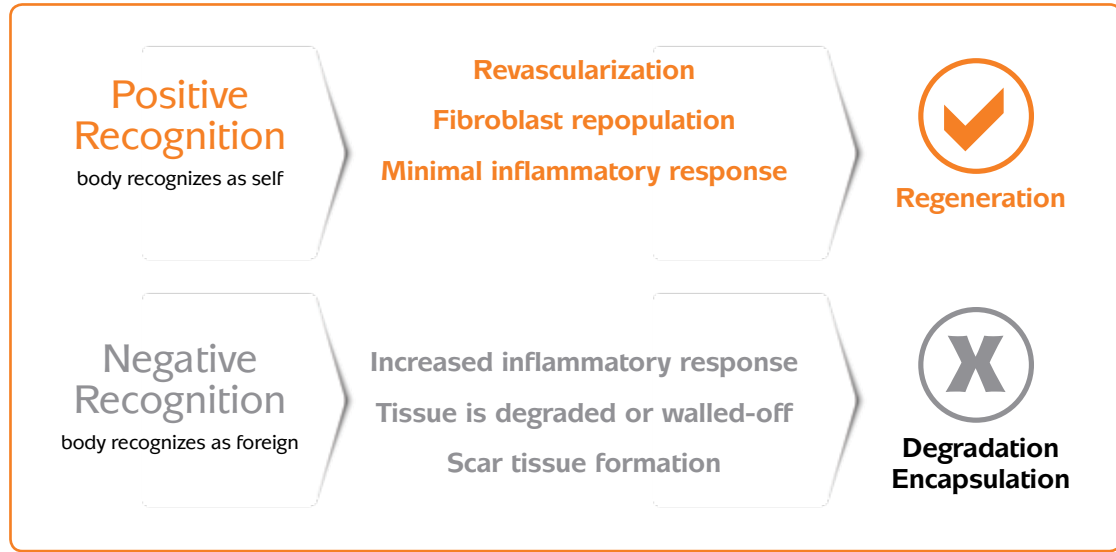
- 1) Significant spacing between collagen fibers in non-native sponge structure
- 2) Acellular porcine collagen matrix
- 3) Modified condensed collagen structure

The LifeCell tissue process is designed to retain the biomechanical integrity of the tissue, which is critical for optimal regeneration

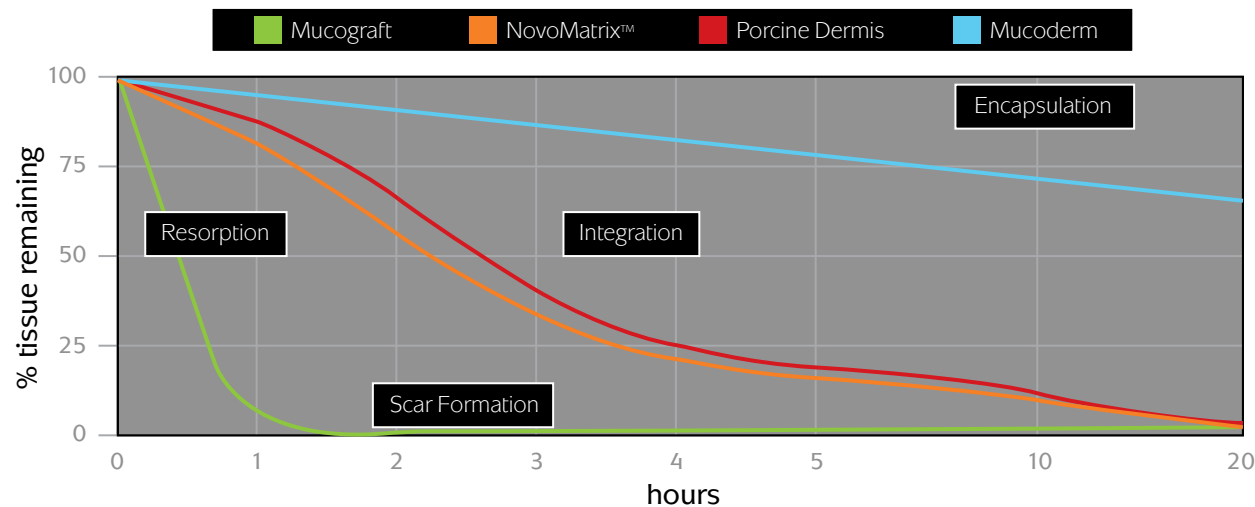
- 1 **tissue selection**  
Manufactured from targeted porcine tissue for **desired mechanical and handling properties**
- 2 **dermis isolation**  
Non-chemical based method that removes all non-dermal tissue **retaining the structural integrity of the matrix**
- 3 **microbial neutralization**  
Proprietary process removes 99.9% of pathogens leading to **a less damaging process**
- 4 **decellularization & enzyme treatment**  
Maintains natural collagen structure while extracting porcine alpha-gal antigen as well as cellular and DNA components to **minimize the xenogenic immune response**
- 5 **matrix preservation**  
Stabilizes key matrix proteins and further protects the integrity of the acellular dermal matrix which creates a **platform for tissue regeneration**
- 6 **sterilization**  
Optimized sterilization process designed to minimize damage, **preserving the regenerative properties of the acellular dermal matrix**
- 7 **NovoMatrix**  
An undamaged, intact acellular dermal matrix derived from porcine tissue, where critical biochemical components are preserved, that **supports a positive immunologic response and regeneration**<sup>3,4,5</sup>

# An ADM is recognized either positively or negatively

How tissue is processed and sterilized can determine the body's immunologic response and mechanism of actions. The patient's body recognizes implanted tissue as either self or foreign.<sup>2,6</sup>



## ADM mechanism of action<sup>11</sup>



## NovoMatrix root coverage case #1



## NovoMatrix root coverage case #2



NovoMatrix case images courtesy of Dr. Edward P. Allen



*"NovoMatrix has uniform physical characteristics and great surgical handling, enhancing its ease of use in the tunneling technique. This results in an excellent clinical outcome with minimal post-operative swelling and inflammation."*

**Edward P. Allen, DDS, PhD**

Before use, physicians should review all risk information, which can be found in the NovoMatrix Instructions for Use.

# surgical technique

## Tunnel Technique

as described by Edward P. Allen, DDS, PhD

Treating multiple tooth recession defects traditionally requires a significant palatal tissue harvest to adequately supply enough donor material to successfully treat the defect. This often can lead to undesired surgical and post-surgical sequelae for both the surgeon and the patient. NovoMatrix can be used as an effective alternative to palatal tissue in a wide variety of intraoral applications.<sup>12</sup> The following is an example of a suggested surgical technique for treating recession defects around teeth. This technique can be modified for similar clinical presentations.

This content is only intended as a reference. Proper surgical procedures and techniques are the sole responsibility of the dental professional. Each surgeon must evaluate the appropriateness of the techniques based on his or her own dental training and expertise.

For more details about this technique, please refer to:  
Subpapillary continuous sling suturing method for soft tissue grafting with the tunneling technique.  
Allen EP. *Int J Periodontics Restorative Dent.* 2010 Oct;30(5):479-85.

Dr. Allen is a consultant for BioHorizons.

### 1) pre-op

This technique will demonstrate the Tunnel Technique for root coverage grafting with NovoMatrix.

This case is a typical Miller Class I or II recession defect which includes a gingival recession involving 4 maxillary teeth - left lateral incisor through left second premolar. There is no loss of interdental bone or soft tissue fill.



### 2) intrasulcular incisions

Using an End-Cutting Intrasulcular Knife or similar microsurgical instrument, make intrasulcular incisions facially and proximally around each tooth with recession defects, as well as one additional tooth anterior and posterior to the teeth with recession.



### 3) blunt dissection

A microsurgical elevator is used to elevate a mucoperiosteal pouch 4-5mm apical to the mucogingival junction at each tooth with recession, as well as an additional tooth mesially and distally to facilitate tissue mobilization. Extend the blunt dissection under the papillae facially.



### 4) sharp dissection

Using a Modified Orban Knife, sharp dissect immediately supraperiosteally to mobilize and extend the tunnel 12-15mm apical to the gingival margin at each tooth with recession, as well as an additional tooth mesially and distally. **Stay in contact with the bone to ensure a proper tunnel.**



# surgical technique

## 5) elevate papillae interdentally

Detach the papillae from the interdental bone crest using a Younger-Good curette or similar instrument. Extend this blunt (subperiosteal) elevation to the palatal line angles.



## 6) NovoMatrix insertion

Trim the graft to extend from the distal of the central incisor to the mesial of the molar, with a vertical dimension of 8mm. The graft is inserted into the sulcus of a terminal tooth with recession and passed through the tunnel using a Younger-Good curette or similar instrument.



## 7) NovoMatrix alignment

The graft should be positioned to extend from the distal of the central incisor to the mesial of the molar so that it lies completely under the papillae mesial and distal to the teeth with recession.



## 8) preparation for suturing

Displace the graft within the tunnel so that the coronal border of the graft is level with the tissue margin in preparation for simultaneous coronal advancement of the graft with the overlying tissue.



**NOTE:** A continuous sling suture or interrupted sling sutures may be used.

## 9a) continuous sling suture

Penetrate the overlying tissue and graft at the distal root line angle of the second premolar, 4mm apical to the tissue margin. Exit through the sulcus and pass the needle through the distal embrasure, around the palatal aspect and back to the facial through the mesial embrasure.



## 9b) continuous sling suture

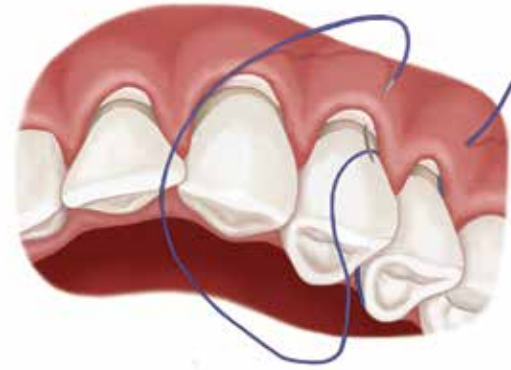
Pass under the papilla from the second premolar toward the first premolar.



# surgical technique

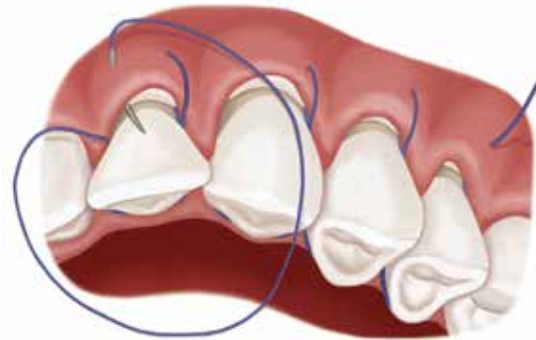
## 9c) continuous sling suture

Penetrate the overlying tissue and graft at the distal root line angle of the first premolar and repeat the previous steps until reaching the lateral incisor.



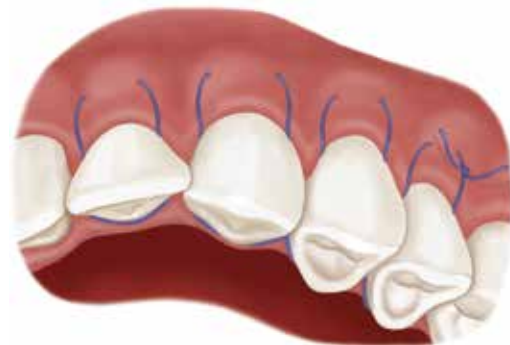
## 9d) continuous sling suture

After passing around the palatal of the lateral incisor and returning to the facial through the mesial embrasure, penetrate the overlying tissue and graft at the mesial root line angle.



## 9e) continuous sling suture

Work back to the starting point, always passing under the papillae. The suture will be tied only at the distal of the second premolar.



## 10) interrupted sling sutures

Penetrate the overlying tissue and graft at the distal root line angle of the second premolar, 4mm apical to the tissue margin. Exit through the sulcus and pass the needle through the distal embrasure, around the palatal aspect and back to the facial through the mesial embrasure. Penetrate the overlying tissue and graft at the mesial root line angle of the second premolar 4mm apical to the tissue margin, pass through the mesial embrasure around the palatal aspect of the second premolar and return to the facial through the distal embrasure. Tie the suture and repeat the process for each tooth.



## 11) post-op - suture removal

Sutures are removed at 2 months. Complete root coverage should be achieved for Miller Class I and II recession with an increase in marginal tissue thickness and stability.



## Hu-Friedy® Sutures

- 300 Series Stainless Steel, the ideal alloy for dental suture needles, ensures a strong sharp needle pass after pass
- Manufactured from a stronger alloy composition, increasing ductile strength - if the needle does bend, it is less likely to break when reshaping
- Finer point geometry for smooth tissue penetration, requiring up to 20% less force<sup>11</sup> than other suture needles
- Laser-drilled needles for reduced tissue disruption

Dr. Edward P. Allen's Recommended Suture



12mm  
3/8 Circle Reverse Cut

**HF-PSN8384P**

For use in oral plastic surgery procedures

**Perma Sharp® Suture**

6-0 Polypropylene 18", C-17.

Finer point geometry for smoother penetration.





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