



Advanced Tissue Regenerative Membrane for Skin Burns, Wounds and Ulcers

Encoll Corp.
Manufacturing/Technology

How Helicoll is different from other products?

This is an attempt to explore Helicoll, a bio engineered skin substitute product made of high purity Type-I collagen (>97% pure). Helicoll, is designed to accelerate tissue regeneration, repair and healing of skin wounds caused by burn, trauma, diabetes or other chronic bed sore ulcer or venous ulcer. The added advantage is the longer shelf life of up to 3 years in ambient room temperature conditions.

To learn more about Helicoll and for more detailed info visit www.helicoll.com

Differentiating factors of Helicoll:

1. Native un-crosslinked Type-I collagen is the best ideal biomaterial for any biological interactions.
2. Once when the skin substitute product is cross-linked even without knowledge, it loses its bioactivity resulting in delayed healing.
3. Helicoll is the ONLY product made of un-crosslinked, pure Type I collagen (>97% pure) with US patents.
4. Such un-crosslinked collagen in Helicoll helps to minimize the local glycosylation that clears certain obstacles in Diabetic Ulcer healing.
5. Helicoll encourages the attachment of cells and growth factors for faster tissue remodeling.
6. No other comparable products showed cell and blood capillary invasion within 4 to 5 days of application.
7. Wounds healed by Helicoll have a good esthetic result with native pigmentation, lesser scar and also inhibits keloid formation. Also, it has been successfully used on wounds with exposed bones and tendons.
8. Use of Helicoll reduces the treatment cost, as its bioactivity reduces the number of applications and saves Hospital expenses.
9. Helicoll application dramatically reduces pain that is clinically proven.
10. Type-I collagen's bioactivity is further enhanced through phosphorylation to render cell-signal transduction for faster healing.
11. All intact tissue derived de-cellularized membranes (either allografts or xenografts) have immunogenic components like Elastin to delay the healing process.
12. Helicoll, compared to any allograft product, does not render the fear of HIV and other human viral infection possibilities.
13. The product Helicoll, does not require any washing steps to remove the un-wanted preservatives or storage chemicals. Also the overall usage of Helicoll in the clinical environment is quite simple and easy as it can be surgically sutured and stapled.

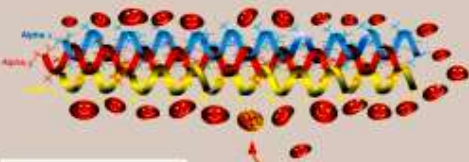
Comparative Characteristics of Collagen (Helicoll vs. Others)

Helicoll



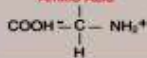
**Ultra-pure Type I Collagen,
Un-crosslinked**

1,000 Reactive sites per strand, totaling 3,000 sites



Amino Acid Structure

Specific reactive site
determining each
Amino Acid

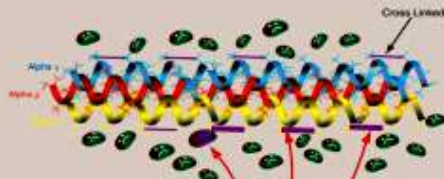


Improved Cell signaling
to produce molecule
for repair and regeneration

Other Products



**Contaminated Type I Collagen,
with unwanted cross links**



Cells are non-responsive and
unhappy because of unwanted
crosslinks and contaminants like:

- Type III Collagen
- GAG's (Glycosaminoglycans)
- Elastin

The following table shows how Helicoll Collagen differs from other Collagen Products

Feature	Helicoll	Fish Collagen Prep.	Cadaver Skin Prep.	Porcine Intestinal Mucosa	XL Collagen Dressings	Amnion based matrix
Pure Type-I	Yes	No	No	No	No	No
Nativity of Collagen	Yes	No	No	No	No	No
Healing Rate	High	Low	Low	Low	Low	Low
Native Attachment Sites	High	Low or None	Low or None	Low or None	Low or None	Low or None
Potential to Buffer Excess Glycosylation	High	Low or None	Low or None	Low or None	Low or None	Low or None
Potential Cell Signaling	High	Low or None	Low or None	Low or None	Low or None	Low or None

***How Helicoll serves as a tissue regenerative scaffold?
(Compared to other products)***

Significance of a tissue regenerative scaffold:

- Provides structural support and shape to construct
- Provides place for cell attachment and growth
- Usually biodegradable and biocompatible

Problems to be addressed:

1. True biocompatibility and potential immunogenicity
2. Intact tissue derived membrane cannot be used as a biocompatible collagen membrane
3. Membranes with unwanted cross-links to reduce the immunogenicity of Type-III collagen, GAG's (Glycos Amino Glycans) and Elastin
4. Cross-linking may potentially block the surface chemistry (See Fig above)

To resolve:

1. Helicoll is biocompatible, non-immunogenic and highly pure
2. Helicoll's type-I collagen is non-cross linked and free of contaminants
3. Helicoll interacts with the underlying cells to trigger an improved cell signaling cascade
4. Helicoll's clinically important features are exposed

Conclusion: Helicoll has ideal tissue regenerative scaffold characteristics like biocompatibility, non-immunogenicity and bioaffinity. It meets the biomedical requirements much essential for the ultimate tissue regeneration and remodeling process.

Helicoll's efficacy: brings new blood capillaries within 4 to 5 days !

Manufacturing/Technology:



4576 Enterprise St., Fremont, CA 94538 USA
Phone: (510)396-8581, Email: guna@encoll.com

For more information, please visit www.helicoll.com
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