

# “Guided Tissue and Bone Regeneration Membrane”

VCU #13-033

## Applications

- A membrane that can be used to hold a bone graft while promoting healing
- Applications for bone grafts used in dental implants and orthopedics

## Advantages

- Biocompatible and resorbable
- Less acidic during degradation as compared to other devices
- Regulates macrophage response to allow for regeneration instead of inflammation

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## Market Need

Bone resorption can occur in the maxillary and mandibular jaws resulting from tooth loss. This condition of bone degradation affects 40% of the adult population and is anticipated to increase over the next 15 years to more than 200 million individuals. In the event an individual loses a tooth, the bone begins breaking down and loses its structural integrity. Typically, a bone graft is used as a replacement for the degraded bone and a membrane is used to hold the graft in place. Many membranes that are applied during these surgeries succeed in stabilizing the bone graft but fail due to inadequate immune responses. Usually this membrane is composed of materials that can lead to an acidic environment and a frustrated macrophage response resulting in dehiscence and bone resorption. There exists a specific need to compose a membrane that allows both stabilization of the bone graft and an acceptable immune response.

## Technology Summary

This technology solves the problem of previous devices by promoting an immune response that allows regeneration instead of inflammation. By tailoring the surface characteristics of the membrane, macrophages involved in regeneration will increase resulting in an improvement of the membrane's function. Since the membrane maintains its rigidity by using selective materials, osseointegration is supported. Another advantage is that the membrane is significantly less acidic as compared to other devices, which promotes biocompatibility between the implant and the environment. This device is also resorbable, which allows the bone graft to integrate into the environment in a uniform manner. Not only can this device be applied to dental procedures, but also span orthopedics with varying bone graft applications.

## Technology Status

This technology has been prototyped and has been through *in vitro* testing and compression testing. Patent pending: U.S. and Foreign rights available.

This technology is available for licensing to industry for further development and commercialization.