Hemostatic and Wound Healing Compositions
Tech ID: 20747 / UC Case 2005-388-0

BRIEF DESCRIPTION
A method to control the amount of heat generated upon application of silaceous oxide to a wound, allowing for the intentional cauterization of traumatic wounds while minimizing heat generation.

BACKGROUND
Treatment of severely bleeding wounds can require immediate attention to bring the bleeding under control. Severe bleeding poses a very real risk of death to the casualty if not treated quickly. When a laceration or penetrating trauma (e.g., knife or gun wound) is severe enough or involves critical arteries or veins, the bleeding must be slowed immediately or irreversible damage to organs and mortality can result. In recent years, scientists have attempted to reduce blood flow by applying dehydrated zeolite material to the bleeding site in order to induce hemostasis through dehydration of the wounded area and induction of a blood clot formation. The major disadvantage of this technique is the excessive heat generated at the injured site. There is an urgent need to minimize the heat generated by the hemostatic materials upon contact with blood. Of particular interest are such hemostatic compositions that can be rapidly and safely applied in an emergency situation, such as on the battlefield or at the scene of an accident, without the need for intense training or equipment.

DESCRIPTION
Researchers at UC Santa Barbara have developed a method to control the amount of heat generated upon application of silaceous oxide to a wound, allowing for the intentional cauterization of traumatic wounds while minimizing heat generation. The peak temperature was reduced from 190°F to 90°F, eliminating the risk of burns. In addition to the dry bound zeolite, UCSB researchers have also developed hemostatic compositions using mesocellular oxide foam. The use of foam permits a rapid initiation of blood clotting, reduces adverse side effects, and allows the release of antibiotics and anti-inflammatory to the wound during the application of the hemostatic agent. The compounds have been approved by FDA for temporary external use to control traumatic bleeding.


- UC Case No. 2007-313: "Hemostatic Compositions and Methods of Use" Wet layered clays used as hemostatic agent to promote blood clotting. U.S. Patent Application No. 12/030,779

- UC Case No. 2008-196: "Mesocellular Oxide Foams as Hemostatic Compositions and Methods of Use" Mesocellular
foams used as hemostatic agents to facilitate clotting, wound healing, and reduce the risk of infection. It can be provided in combination with antibiotics, ions, or anti-inflammatory agents. *U.S. Patent Application No. 12/191,257*

**ADVANTAGES**

- Reduced amount of heat generated by the hemostatic agent
- Improved blood-clotting efficiency (it is able to stop an arterial hemorrhage)
- Easy to apply, even in an emergency situation
- The hemostatic agents can be packaged in a medical gauze, providing a simple and cost effective device

**PATENT STATUS**

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<th>Country</th>
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<th>Dated</th>
<th>Case</th>
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**ADDITIONAL TECHNOLOGIES BY THESE INVENTORS**

- Tough, Self-Healing Silicone Materials
- Hybrid Supercapacitor and Battery System
- Nanoparticle Assembled Hollow Spheres
- Hierarchically Ordered Porous Oxides
- Hemostatic Compositions And Methods Of Use
- Inorganic Copolymer-Dye Composites and Dye-Doped Mesoporous Materials
- Oxides for Wound Healing and Body Repair
- Thermally and Chemically-Stable Core-Shell Silver Nanowires with SnOx Coating
- Supercapacitors for Rechargeable Batteries with Longer Lifetimes (2012-657)
- Mesocellular Oxide Foams as Hemostatic Compositions and Methods of Use