

“NATURALLY DERIVED FIBERS CONSTRUCTED FROM CENTRIFUGAL FORCE PROCESSING” VCU #13-051

Applications

- Fast-dissolving wafers of well-defined sugar concentrations for use by diabetics
- Wound care bandages to promote healing
- Natural antibiotic delivery system for all surgical procedures
- Potato starch version as an oral insulin delivery system

Advantages

- Uses natural materials for a range of medical applications
- Can tailor the qualities of pharmaceutical drugs or wound care devices based on composition of the natural material being dispersed

Inventors

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Market Need

With increasing studies focused on determining the benefits of natural herbal remedies, there is a rising market need for natural materials as alternatives in medicinal therapeutics. Natural substances such as trehalose, potato starch, and honey have several beneficial attributes that can be applied to ranging applications. For example, trehalose can be useful for preventing disruption of cell organelles during desiccation by forming a gel-like membrane. Potato starch can be applied as both a bulking agent in various foods and for drug delivery systems. Honey has ranging applications either as an alternative for natural and artificial sweeteners or as an antibacterial substance for wound healing. Although these substances have already been implemented in several non-medicinal uses, there is a need to produce a system to control and utilize these characteristics to apply as an alternative for current therapeutics. Specifically there is a need to convert these substances into a fibrous scaffold that can be custom-made for various applications.

Technology Summary

This technology is a device with ranging compositions involving natural materials such as honey, trehalose, and potato starch. The aim of this technology is to provide natural alternatives for traditional medical therapeutics. This device is constructed by implementing a specific process employing a centrifugal force to spin these materials into fibers. Centrifugal force processing is required for spinning fibrous trehalose and potato starch, since other techniques, such as electrospinning, have failed to produce such scaffolds. These fibrous scaffolds improve on existing delivery systems since it instantaneously dissolves when placed into an aqueous environment and disperses into a fine suspension of small particles. This process can also be applied to producing fibrous honey to be used in various applications. In order to transition from a viscous state to a solid state, honey can undergo centrifugal force processing. This solid state appearance can be useful for packaging and applying scaffolds easily. Instead of expending extra time for carefully applying the scaffold to a specific site, this improved delivery system remains a solid until put in contact with a wet surface.

Technology Status

This technology has been prototyped.

Patent pending: U.S. and Foreign Rights available.

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