



## Targeting Cathepsin K to Facilitate Wound Healing

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**Patent Status:** Patent Pending

### Description of Technology

Impaired wound healing is a serious complication in people with diabetes. Wounds not healing in diabetic patients leads to 70,000 amputations annually in the United States. Of these amputations, 85% of these could have been averted with better prevention of wound recurrences.

One critical part of wound healing is collagen, which is a main structural protein in connective tissues. Decreased collagen in a wound has been associated with impaired wound healing. In order to introduce more collagen to improve wound healing, one approach has been to use collagen wound dressings to increase levels in the wound. The main problem with this strategy is that the introduced extra collagen is still degraded the same as the internal collagen. Another method to improve wound healing is a drug called Becaplermin. This drug is the only FDA approved drug for treating diabetic ulcers and works by improving the collagen synthesis. The limitation to this treatment is an increased the risk of cancerous tumors.

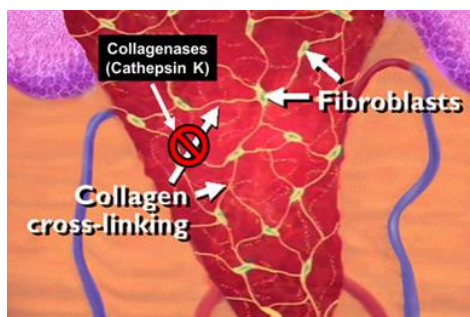
Researchers at the University of Wyoming have been analyzing wound healing and have found that cathepsin K, a major enzyme, degrades proteins such as collagen. Since collagen is a major factor in wound healing, its degradation adversely affects wound healing. The researchers have invented a way to target and stop cathepsin K in specific locations around a wound. This would stop cathepsin K from degrading collagen so it could still heal the wound effectively. This invention could save many diabetic patients from hospitalization and amputations.

### Applications

More than 100 million adults in the US are living with diabetes. Of that, there 70,000 amputations annually that are caused by diabetes. These amputations are caused by wounds that are not able to heal correctly which then grow and become infected. 85% of the amputations caused by diabetes could have been prevented. This technology creates a way to aid wound healing in diabetic patients to prevent the amputations. It can be applied in any diabetes treatment center or hospital and cut down on a majority of the amputations that take place.

### Features & Benefits

- Suppresses the degradation of proteins
- Improves wound healing in diabetic patients
- Presents a new therapeutic option for healing pressure ulcers, infections, and burns



**Figure:** A part of the process of wound healing includes developing cross-links between collagen molecules, giving strength to collagen and the scar. Endogenous collagenase such as cathepsin K breaks down collagen molecules, which may delay wound healing

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