More Stable Collagen Mimetic Peptides for Wound Healing

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The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing a method for creating improved collagen mimetic peptides for tissue repair and other biomedical applications.

Overview

Collagen is the most abundant protein in vertebrates, providing support to virtually every tissue including skin, bone and blood vessel. It is of critical importance in wound healing.

Given its significance, collagen has become a common target for biomaterials engineering, spurring the development of synthetic collagen mimetic peptides (CMPs) that imitate its strong triple helix structure. In current practice, CMPs are linked together using a cysteine-cysteine bridge. However, this can cause strain that disrupts proper structural formation.

The Invention

UW–Madison researchers have developed a superior linkage between CMP strands that substantially improves their structural stability. The new linkage uses homocysteine in place of cysteine in one of the strands. The resulting bond reduces strain and can therefore be used to enhance CMP-based biomaterials and enable previously inaccessible molecular designs.

Applications

- Improved CMPs for chronic and acute wound healing, drug delivery, cell culture scaffolding and other biomedical advancements

Key Benefits

- CMPs with superior structure and stability

Stage of Development

In silico screening of all possible linkages identified the disulfide bridge between homocysteine (Hcy) and cysteine (Cys) as conferring much greater stability than a Cys-Cys bridge when properly installed. The researchers synthesized all four of the Hcy/Cys combinations and found that CMPs validate the present design. Only Hcy-Cys bridges improved triple-helical structure and stability upon disulfide bond formation.

Publications

- Tanrikulu I.C. and Raines R.T. 2014. Optimal Interstrand Bridges for Collagen-Like Biomaterials. J. Am. Chem. Soc. 136, 13490-13493.

Tech Fields

- Medical Devices : Other medical devices

- Therapeutics & Vaccines : Skin & connective tissue

For current licensing status, please contact Rafael Diaz at rdiaz@warf.org or 608-960-9847