

Modified Collagen Offers New Treatment Opportunities

Commonly associated with beauty products and lip enhancement, collagen is now being studied for potential health benefits. Materials scientists at Johns Hopkins have mated collagen with a molecular hitchhiker which could pave the way for better infection-fighting bandages and a treatment to block the formation of unwanted scar tissue. Additionally, tissue engineers may be able to use modified collagen in the lab to help control the formation of tiny new blood vessels that can be used to promote the integration of tissue implants in patients.

Michael (Seungju) Yu of the university's Whiting School of Engineering is trying to change some of collagen's biochemical or mechanical properties to give it new medical applications. Traditionally, scientists have altered collagen by using intense heat or chemical reactions, techniques that may damage the protein or limit its safe use in humans. Yu's method, however, requires only physical mixing of collagen with even smaller molecules called collagen mimetic peptides.

This linkup opens the door to new medical treatments, Yu says, because it is easy to attach bioactive agents to the peptides. When the peptides bind with collagen, these attached agents can dramatically change the way collagen behaves in the body. For example, collagen normally attracts cells to close up a wound and form scar tissue. But this property is not always desirable; a clot can be dangerous inside a blood vessel or at certain injury sites, where scar tissue can interfere with the formation of new nerve connections.

"With this process," Yu said, "we can make the collagen that's already found in the human body behave in new ways, including some ways that are not found in nature. Modified collagen can give us great new tool for treating injuries and illnesses."

Information: www.jhu.edu/~matsci [1]

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