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Treatment shows promise in fighting fibrotic disease

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A decade after first identifying serum amyloid P (SAP) as a key protein in human blood that controls routine tissue-related processes from scarring to healing, two Texas A&M University scientists and the biotechnology company they co-founded continue to make encouraging progress in the fight against fibrotic disease, a broad class of chronic conditions associated with an estimated 45 percent of U.S. deaths per year.

Texas A&M biologists Richard Gomer and Darrell Pilling have collaborated in recent years on several SAP-related advances, from establishing Promedior Inc. in 2006 to celebrating its promising preliminary results in early clinical trials involving PRM-151, a recombinant form of SAP.

Gomer notes that in a recent 24-week study of 27 patients with myelofibrosis—a life-threatening scarring of the bone marrow—seven of the patients experienced a 50 percent reduction of symptoms with PRM-151, while five experienced a reduction in fibrosis.

The results, initially revealed by Promedior at the June 2 annual meeting of the American Society of Clinical Oncology in Chicago, have since been presented at additional conferences and symposia.

"More trials are definitely in the future," Gomer said. "As for which of the 62 fibrotic diseases will be involved in the next trial, that's a complicated business decision that depends on potential partners, among

other factors."

Chance encounters

The origins of Gomer and Pilling's breakthrough work in fibrosing disease therapy unfolded on an international stage, albeit a seemingly inconsequential one—a lunch table in a crowded cafeteria in England in 2001. During the interlude of a developmental biology conference, the two scientists—Gomer, then a biochemist at Rice University, and Pilling, a British immunobiologist—discovered they had similar interests and agreed to collaborate on some future protein identification work.

"Unexpectedly, we ended up finding a human blood protein that looked like it might be a therapeutic for fibrosis," Gomer said.

Fibrosis occurs when the body's natural healing mechanism goes haywire and creates dangerously excessive scar tissue in vital organs, resulting in fibrotic diseases. Asthma and cirrhosis are two of the most common fibrotic disorders, and scar tissue in the heart can lead to congestive heart failure.

Regardless of area or system affected, there are common threads among all six dozen related disorders: Each is a painful, debilitating and chronic condition for which neither a cure nor U.S. Food and Drug Administration-approved treatment exists.

"Most of these fibrotic diseases can be fatal," Gomer said. "Collectively, they kill more people than cancer."

From whites to fibrocytes

Armed with their combined knowledge about biomedical science and

related processes in the human body, Gomer and Pilling set out to find the cause by focusing on one of the body's first lines of defense, white blood cells. They began with an initial experiment involving two groups of white blood cells, one in the presence of blood serum and one in a culture without.

Gomer recalls they were fascinated by what they witnessed. Fibrocytes, the long, skinny cells responsible for the formation of scar tissue, quickly developed in the second group. None, however, developed in the group containing serum. By all appearances, something within the serum, later determined to be SAP, was inhibiting fibrocyte activity. They theorized that if getting rid of the SAP in a wound was possible, more scar tissue cells would be available, thus enabling the wound to heal faster.

To test their theory, Gomer and Pilling devised an SAP treatment for lab mice that were given an irritant to cause fibrosis in the lungs. When those tests indicated that SAP treatment inhibited fibrosis, Gomer and Pilling realized they were in possession of a first-of-its-kind, groundbreaking medicinal discovery.

"What seemed to be happening is that the scar tissue cells go away," Gomer said. "We don't know if they die or just round up and leave. It looks like if you can prevent the new scar tissue formation, the old scar tissue will go away, and you can actually reverse fibrosis if it's something you catch early on, which doctors generally do."

A bird in the hand

Faced with the prospect of being able to save thousands of lives, Gomer says he reevaluated his professional priorities, making SAP his primary focus. In the process, he and Pilling both joined the Texas A&M Department of Biology shortly after co-founding Promedior to fast-track

technologies and viable treatment options capable of halting or even eliminating the progression of fibrosis and, as a result, the future of other fibrotic diseases awaiting clinical trials and potential treatments.

"This all started with very basic research," Gomer said. "The punchline is that this work didn't come from deliberately trying to find a therapeutic. We probably never would have found one if that had been the case."

While Promedior plans to conduct additional clinical studies to determine SAP's potential as an anti-fibrotic therapy, Gomer says his work with the blood protein has gone as far as it can at this point—one at which he's content simply to see what the future holds.

"It's almost like a mother bird releasing her hatchling from the nest and seeing where it goes," Gomer said. "Now, we're just looking for more birds to raise."

Provided by Texas A&M University