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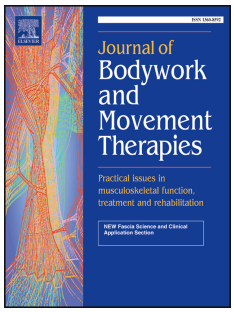

New evidence of a dynamic fascial maintenance and self-repair process

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Leon Chaitow

New evidence of a dynamic fascial maintenance and self-repair process

Dittmore et al (2016) have described experimental evidence that collagen operates a self-healing process involving what they term "*cleavage-vulnerable binding regions*".
These sites are arrayed periodically at ~1µm (one millionth of a meter) intervals, along collagen fibrils.
They note that the triple-helix of fibrillary collagen, in its most common form, assembles into highly organized networks that provide the scaffolding for the extracellular matrix, tendons, bones, and other load-bearing structures.

The essence of the model that emerges from the Dittmore et al experiments is that, when collagen fibrils are in what are termed an '*intact*' phase, molecules are in a straight conformation. This is a '*high-energy*' state, that periodically results in the accumulation of internal strain, relieved by the collagen uncoiling to form 'buckled' molecular configurations (termed 'cleavage sites').
This buckling process exposes the unloaded collagen,allowing enzymes, such as specialized matrix metalloproteinases (MMPs), to bind to it, before initiating proteolysis – followed by subsequent repair and remodeling.
The data provided by Dittmore et al suggests that fibrillar collagen self-regulates its own maintenance in this way - by a constant process of repairing collagen fibrils, on a cellular level.

The importance of tissue tension

Importantly, Dittmore et al also note that tension-dependent stabilization against degradation by MMPs, has been demonstrated in normal tissue.
Others, such as Susilo et al (2016) have also reported that:
"*mechanical loading induces stabilizing changes internal to the fibrils themselves, or in the fibril-fibril interactions.*"
This suggests that the self-repair, remodeling sequence may be delayed (i.e. made less necessary) by the presence of appropriate levels of tension, since, as has been explained