Chapter 9
Conclusion

The detection and response of the cells of the human body to a load induced stimulus (i.e., stretching), is critical for the response of their internal environment to any changes from the external environment. As mentioned in previous sections, many aspects of cellular physiology are integrated with this reaction. The molecular pathway(s) by which the magnitude of any mechanical perturbation is transmitted, and associated with changes in skeletal muscle, involves adhesion molecules (dystroglycan, integrin, etc.), and the extracellular matrix. In addition, involvement of the molecules and structures of the contractile apparatus (thick and thin filaments, M-and Z-discs, titin, obscurin etc.), the sarcolemma, and the cytoskeleton also occur. The reaction to a mechanical force or load throughout the hierarchies of structures, from the macroscopic to the microscopic, and how this force is transduced into a biochemical and functional response, alludes to the concept mechanotransduction.

Stretching intensity within this manuscript references a mechanotransducive mechanism responsible for evoking a mechanoresponse from the cells of the muscle and connective tissue to the load or force induced by stretching. The magnitude of stretching intensity (low, moderate, and high) was investigated to determine if it is a stimulus for acute inflammation as well as for recovery from muscle damage. Results from the primary and secondary statistical analysis suggest that high-intensity passive static stretching was likely responsible for acute inflammation, as suggested by increases in hsCRP levels compared to control condition (study one), and to low- (30% maximum ROM) and moderate (60% maximum ROM) (study two) stretching intensity, as well as prolonging recovery (study three). In contrast, low-intensity passive static stretching was not observed to be associated with inflammation (study two) while at the same time promoting quicker recovery from unaccustomed eccentric exercise, as measured by perceived muscle soreness and muscle function (eccentric and isometric peak torque). However, some limitations pertaining to the methodological design of the three individual studies of the project do not allow definitive conclusions to be drawn. Given that low-intensity passive static stretching may have significant beneficial practical applications in both sport and rehabilitation, further research is required in this area.

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