***Muscle Stretch Activation and Elastic Protein: Bioinformatics Analysis of the Insect Protein Projectin***

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**Background and Objective:** Stretch activation is a general property of striated muscles, but is only physiologically relevant in cardiac muscles and some insect flight muscles. Stretch activation allows muscle to develop more force at each contraction cycle. Giant elastic proteins such as vertebrate titin and insect projectin are essential components by providing muscles with high resting stiffness and elasticity.
**Methods:** Bioinformatics analysis of data from genome projects and molecular biology tools led to the characterization of the projectin gene in several insects.
**Results:** The gene structure analysis, including the exon-intron pattern is completed in seven insect species . The protein is approximately 1, 000 kDa in size and consists mainly of conserved domains, except for a unique amino acid region called the PEVK domain, which is thought to be responsible for the protein's elasticity. A comparison of this domain across insects reveals a lack of amino acid sequence conservation. However, other parameters such as its size and its unusual amino acid composition are maintained, allowing for similar secondary folding without primary sequence conservation.
**Discussion and Conclusion:** The divergence of the PEVK domains within different projectin proteins sheds new understanding on the forces driving protein evolution. In some cases, selection might not act at the protein primary structure level, but only at the secondary or tertiary levels.