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The Role of Nanobiotechnology in the Study of Dystrophin and B-Dystroglycan in Membrane Stability of Aging Skeletal Muscles ASHOK VASEASHTA, OLIVIA BOSKOVIC, ALLISON WEBB, Marshall University — Duchene muscular dystrophy (DMD) is one of nine types of muscular dystrophy, a group of genetic degenerative diseases, primarily affecting voluntary muscles, caused by absence of dystrophin. New experiments on mice with DMD has shown that gene therapy can reverse some symptoms of the disease. The ultimate goal of gene therapy for muscle diseases is improvement of strength and function, which will require treatment in multiple muscles simultaneously. A major limitation to gene therapy until now has been that no one had found a method by which a new gene could be delivered to all the muscles of an adult animal. Recent utilization of nanotechnology to life sciences has shown exciting promises in a wide range of disciplines, showing advances in the ability to manipulate, fabricate and alter tiny subjects at the nanometer scale. In the present investigation, we have employed such techniques to study single motors such as myosin and kinesin, as well elastic proteins viz. titin and nebulin, muscle filaments, cytoskeletal filaments, and receptors in cellular membranes and cellular organelles viz. myofibril, ribosome, and chromatin. Application of AFM to images and measures the elastic properties of single monomeric and oligomeric protein, genetically engineered titin, and nebulin molecules will be presented.

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