TITLE: **Thymosin β4, a Novel Biologic Therapy for Post-traumatic Osteoarthritis**

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RESEARCH PROJECT DESCRIPTION

Thymosin β4 (tb4) is a protein that, when inside cells, regulates the shape and crawling behavior of cells. When secreted outside of cells, tb4 demonstrates remarkable functions in that it promotes the repair of tissue and inhibits inflammation. As a therapy for promotion of tissue repair, tb4 is currently in trials to promote the healing of wounds in the skin and cornea. Both of these tissues optimally heal when there is no significant scarring, which is one of the properties of tb4. Even more remarkable studies have been published as lead articles in Nature that show that tb4 can promote the healing of the heart, again without scarring, after an experimentally-induced heart attack in rats. Because osteoarthritis (OA) is another disease in which healing of the joint surface needs to occur without excessive scar, the use of tb4 as a treatment for OA is appealing. Moreover, OA that develops after an injury, for example, post-traumatic knee OA, represents a perfect use for tb4, as the drug could be injected directly into affected joints. In this project we will evaluate the efficacy of tb4 in preventing OA in a mouse model of OA in which damage is caused to a joint by surgical destabilization of the knee. This model has been shown to be very similar to the OA that patients might get after injuring a joint. If efficacious in the mouse, and later in human studies, then tb4 could become the first approved medication that changes the natural history of OA.
ROLE OF MEDICAL STUDENT – Will be involved in analysis and interpretation of data, and publication of results.
FUNDING SOURCE – US Dept. Veterans Affairs
RELEVANT PUBLICATIONS – Pipes G.T. and Yang J. Cardioprotection by Thymosin Beta 4. Vitam Horm. 2016;102:209-26.