exercise or other mechanical stressors and there remains a desire for therapies capable of preventing and treating such pain in humans and other mammals.

SUMMARY ~~OF THE INVENTION~~

[0005a] In a first aspect, there is provided a use of undenatured Type II collagen for the manufacture of a medicament for the treatment of exercise-induced join pain in an arthritis-free mammal in an amount effective to reduce such exercise-induced joint pain.

[0005b] In a second aspect, there is provided a use of undenatured Type II collagen for the manufacture of a medicament for lengthening the period of joint pain free strenuous exercise in an arthritis-free mammal in an amount effective to lengthen the period of strenuous exercise before joint pain is experienced.

[0005c] In a third aspect, there is provided a use of undenatured Type II collagen for the manufacture of a medicament for reducing joint pain during strenuous exercise in arthritis-free mammals in an amount effective to reduce such exercise-induced joint pain.

[0005d] In a fourth aspect, there is provided a use of undenatured Type II collagen for the manufacture of a medicament for speeding recovery from exercise-induced joint pain in arthritis-free mammals in an amount effective to speed the recovery from exercise-induced joint pain.

[0005e] In a fifth aspect, there is provided a use of undenatured Type II collagen for the manufacture of a medicament for treating joint pain in an arthritis-free mammal which is due to a mechanical stressor in an amount effective to reduce such joint pain.

[0006] The present ~~invention~~ disclosure relates to the discovery that the administration of undenatured Type II collagen is effective in treating exercise-induced joint pain in arthritis-free mammals. Specifically, the ~~invention~~ present disclosure provides methods of treating exercise-induced joint pain in arthritis-free mammals comprising administering undenatured Type II collagen in an amount effective to reduce such exercise-induced joint pain. As used herein "arthritis free mammals" are mammals which are free of the clinical signs of arthritis. Arthritis free humans are defined as those who present with either no or an insufficient number of diagnosable markers to classify as arthritic, as outlined by the American College of Rheumatology (ACR) guidelines Aletaha D, Neogi T, Silman AJ, et al.: 2010 rheumatoid arthritis classification criteria: An American college of rheumatology/European league against rheumatism collaborative initiative. Arthritis Rheum 2010, 62:2569-81 and Altman

R, Asch E, Bloch D, et al.: Development of criteria for the classification and reporting of osteoarthritis. Classification of osteoarthritis of the knee. Diagnostic and therapeutic criteria committee of the American rheumatism association. Arthritis Rheum 1986, 29:1039-49.

[0007] Not only does administration of undenatured Type II collagen serve to reduce joint pain during strenuous exercise in arthritis-free subjects but it has also been found that the administration of undenatured Type II collagen is effective in lengthening the period of strenuous exercise in an arthritis-free mammal before joint pain is experienced. Further, the present disclosure ~~invention~~ provides methods of speeding recovery from exercise-induced joint pain in arthritis-free mammals comprising administering undenatured Type II collagen in an amount effective to speed the recovery from exercise-induced joint pain.

[0008] The method of the present disclosure ~~invention~~ is particularly useful in treating exercise induced knee pain which can be evidenced not only by subjective measurements of pain but also by improvements in range of motion including knee joint flexion and knee joint extension.

[0009] More generally, the methods of the present disclosure ~~invention~~ are directed to treating joint pain in an arthritis-free mammal which is due to a mechanical stressor. While strenuous exercise is one such stressor, other stressors which apply mechanical force to a joint can also induce pain in the absence of arthritis. Such stressors thus include acute injury and physical trauma to a

joint such as through an accident. The present disclosure ~~invention~~ thus contemplates treating joint pain resulting from such stressors.

[0010] While the methods of the present disclosure ~~invention~~ are particularly effective in reducing exercise-induced knee pain in arthritis-free humans it is believed that the administration of undenatured Type II collagen will reduce exercise-induced pain in other joints and will be effective in reducing exercise induced pain on other non-arthritic mammals such as dogs and horses.

[0011] The undenatured Type II collagen is preferably administered in oral form but it is contemplated that other enteral modes of administration would be particularly effective. A particularly preferred mode of administration is as a capsule but undenatured Type II collagen may also be readily incorporated into beverages, foods and dietary supplements. Thus, the undenatured Type II collagen may be consumed in the form of a dosage form selected from the group consisting of capsules, tablets, gummy chewables, edible films, lozenges, and powders. Suitable capsules can be solid or liquid filled and suitable tablets can include those which are sublingual, chewable, effervescent, extended release and enteric coated. The undenatured Type II collagen may also be consumed as a beverage and in a syrup or liquid suspension and can also be consumed in the form of an edible supplement. While non-enteral modes of administration are contemplated they would generally not be preferred.

[0012] Undenatured Type II collagen may be administered according to the present disclosure ~~invention~~ in dosages of from 0.1 mg or less up to 5000 mg or more per day with a preferred human dosage ranges being from 1 mg to 200 mg per day with dosages of 5 mg to 40 mg per day being more preferred. It is well within the ordinary skill in the art to empirically determine preferred dosages of undenatured Type II collagen according to the species and size of mammalian subject as well as the severity of non-arthritic pain suffered by the subject.

BRIEF DESCRIPTION OF THE FIGURES

[0013] Fig. 1 depicts knee extension as measured by goniometry. Values are presented as Mean ± SEM. *$p \leq 0.05$ indicates a statistically significant difference versus baseline or placebo. Number of completers: n=24 in undenatured Type II collagen group (n=3 dropouts); n=20 in placebo group (n=6 dropouts; n=2 did not participate in ROM assessment);

WHAT IS CLAIMED IS:

1. Use of ~~A method of treating exercise-induced joint pain in an arthritis-free mammal comprising administering~~ undenatured Type II collagen for the manufacture of a medicament for the treatment of exercise-induced join pain in an arthritis-free mammal in an amount effective to reduce such exercise-induced joint pain.

2. Use of ~~A method of lengthening the period of joint pain free strenuous exercise in an arthritis-free mammal comprising administering~~ undenatured Type II collagen for the manufacture of a medicament for lengthening the period of joint pain free strenuous exercise in an arthritis-free mammal in an amount effective to lengthen the period of strenuous exercise before joint pain is experienced.

3. Use of ~~A method of reducing joint pain during strenuous exercise in arthritis-free mammals comprising administering~~ undenatured Type II collagen for the manufacture of a medicament for reducing joint pain during strenuous exercise in arthritis-free mammals in an amount effective to reduce such exercise-induced joint pain.

4. Use of ~~A method of speeding recovery from exercise-induced joint pain in arthritis-free mammals comprising administering~~ undenatured Type II collagen for the manufacture of a medicament for speeding recovery from exercise-induced joint pain in arthritis-free mammals in an amount effective to speed the recovery from exercise-induced joint pain.

5. Use of ~~A method of treating joint pain in an arthritis-free mammal which is due to a mechanical stressor comprising administering~~ undenatured Type II collagen for the manufacture of a medicament for treating joint pain in an arthritis-free mammal which is due to a mechanical stressor in an amount effective to reduce such joint pain.

6. The use ~~method~~ of claim 5 wherein the mechanical stressor is acute injury.

7. The use ~~method~~ of claim 5 wherein the mechanical stressor is strenuous exercise.

8. The use ~~method~~ of claims 1-5 wherein the joint pain is knee pain.

9. The use ~~method~~ of claim 8 wherein the reduction in knee joint pain is evidenced by improvements in range of motion.

10. The use ~~method~~ of claim 8 wherein the reduction in knee joint pain is evidenced by improvements in knee joint extension.

11. The use ~~method~~ of claims 1-5 wherein the mammal is a human.

12. The use ~~method~~ of claims 1-5 wherein the undenatured Type II collagen is ~~administered~~ in a dosage of from 0.1 mg to 5000 mg per day.

13. The use ~~method~~ of claims 1-5 wherein the undenatured Type II collagen is ~~administered~~ in a dosage of from 1 mg to 200 mg per day.

14. The use ~~method~~ of claims 1-5 wherein the undenatured Type II collagen is ~~administered~~ in a dosage of from 5 mg to 40 mg per day.

15. The use ~~method~~ of claims 1-5 wherein the undenatured Type II collagen is consumed orally.

16. The use ~~method~~ of claims 1-5 wherein the undenatured Type II collagen is consumed in the form of a dosage form selected from the group consisting of capsules, tablets, gummy chewable, lozenge, powder.

17. The use ~~method~~ of claims 1-5 wherein the undenatured Type II collagen is consumed in a syrup or liquid suspension.

18. The use ~~method~~ of claims 1-5 wherein the undenatured Type II collagen is consumed in the form of an edible supplement.