COMPOSITION AND METHOD FOR THE PROTECTION OF ARTICULAR CARTILAGE

BACKGROUND OF THE INVENTION

[Para 001] Field of the invention

[Para 002] The present invention in general pertains to protective compositions and methods thereof for articular cartilage. Specifically, the present invention pertains to the potential of Calebin A to prevent pathological damage to articular cartilage.

[Para 003] Description of prior art

[Para 004] Articular cartilage is a specialized connective tissue that covers the articular surfaces of bones forming a synovial joint. Articular cartilage endows the synovial joints the ability to provide low friction and relatively pain free motion. Articular cartilage structures and functions are prone to damage following trauma (fall or accident), wear and tear and underlying pathological disease conditions. Articular cartilage tissue usually does not regenerate (the process of self repair) after injury or disease leading to loss of tissue and formation of a defect. Reasons attributed to such non-regeneration include (i) Fewer cellular components; (ii) poor metabolism and (iii) the restricted capacity of innate chondrocytes to divide and migrate in the tissue on account of dense matrix fibers. Thus, active principles that are capable of protecting articular cartilage from damage due to trauma and disease constitute important technological areas that offer considerable scope to improve the quality of life of individuals who are prone to such trauma.

[Para 005] It is the principle of the present invention to disclose the potential of Calebin A and compositions thereof to prevent pathological damage to mammalian articular cartilage.

[Para 006] The present invention fulfills the aforesaid objective and provides further related advantages.

SUMMARY OF THE INVENTION

[Para 007] The present invention relates to the potential of Calebin A and compositions thereof to prevent pathological damage to mammalian articular cartilage.

[Para 008] The present invention provides the following advantage.

1. Disclosure of the novel therapeutic potential of Calebin A and compositions thereof to prevent pathological damage to mammalian articular cartilage.

[Para 009] Other features and advantages of the present invention will become apparent from the following more detailed description, taken in conjunction with the accompanying images, which illustrate, by way of example, the principle of the invention.

BRIEF DESCRIPTION OF THE FIGURES

[Para 0010] Fig.1 shows the histopathology of the rat paw tissue section of arthritic control group.

[Para 0011] Fig.2 shows the histopathology of the rat paw tissue section of the group treated with Calebin A (10 mg/kg).

[Para 0012] Fig.3 shows the histopathology of the rat paw tissue section of the group treated with Calebin A (20 mg/kg).

DETAILED DESCRIPTION OF THE MOST PREFERRED EMBODIMENT

(Figs.1, 2 and 3)

[Para 0013] In the most preferred embodiment, the present invention relates to a method of using Calebin A in effective amounts to protect mammalian articular cartilage from pathological damage, said method comprising the step of administering effective dose of Calebin A to mammals in need of said protection.

[Para 0014] In another preferred embodiment, the present invention relates to the method of protecting mammalian articular cartilage from pathological damage, said method comprising the step of administering effective dose of Calebin A to mammals in need of said protection.

[Para 0015] The novel therapeutic potential of Calebin A and compositions thereof to prevent pathological damage to mammalian articular cartilage is clearly enunciated in the illustrative examples discussed herein below.

[Para 0016] Illustrative Example 1

[Para 0017] Pathological damage: Adjuvant induced arthritis in animal models

[Para 0018] Animals used: Albino Wistar rats of either sex

[Para 0019] Weight of the animals: 140-180 grams

[Para 0020] Number of animals/group: 05

[Para 0021] Methodology: Chronic arthritis was induced in rats by the injection of 0.05mL of (0.5% w/v) suspension of killed *Mycobacterium tuberculosis*, homogenized in liquid paraffin in the left hind foot.

Table A
Scheme of work for screening of
Calebin A in *Mycobacterium tuberculosis* (adjuvant) induced arthritis in mammals

Animal Group	Test compound	Treatment
Group 1	Naïve control	Vehicle
Group 2	Arthritic control	Vehicle + 0.5% w/v adjuvant

Group 3	Acetyl salicylic acid (ASA) 100 mg/kg. (per oral)	ASA+0.5% w/v adjuvant
Calebin A		
Group 4	2.5 mg/kg (per oral administration)	Test compound + 0.5% w/v adjuvant
Group 5	5 mg/kg (per oral administration)	Test compound + 0.5% w/v adjuvant
Group 6	10 mg/kg (per oral administration)	Test compound + 0.5% w/v adjuvant
Group 7	20 mg/kg (per oral administration)	Test compound + 0.5% w/v adjuvant

[Para 0022] Histopathology:

[Para 0023] Right ankle joints of the animals in the control and treated groups were separated from the hind paw, weighed and immersed in 10% buffered formalin for 24 hours, followed by decalcification in 10% EDTA. The joints were then dehydrated, processed and paraffin (56C-58C) blocks were prepared, stained (hematoxylin and eosin) and examined under the compound microscope (Patel P, Patel D, Patel N. Experimental investigation of anti-rheumatoid activity of *Pleurotus sajorcaju* in adjuvant-induced arthritic rats. Chinese Journal of Natural Medicines, 2012; 10 (4): 0269-0274.

[Para 0024] Histopathology results:

[Para 0025] The rat paw tissue of the control arthritic group showed (**Fig.1**) focally damaged articular cartilage with synovial tissue (Arrows). The articular cartilage and synovial tissue were replaced by abundant eosinophilic caeseous necrosis with scattered epitheloid cells and there were few poorly formed ill-defined granulomas.

[Para 0026] The rat paw tissue of the group treated with Calebin A (10 mg/kg) [**Fig.2**] showed intact articular cartilage with synovial tissue in the joint. The synovial tissue consisted of congested vascular spaces (Long-Arrows), scattered lymphocytes (Short-Arrow) and intact synovial lining. No granulomas were seen.

[Para 0027] The rat paw tissue of the group treated with Calebin A (20 mg/kg) [**Fig.3**] showed intact articular cartilage with synovial tissue in the joint. The synovial tissue consisted of mild synovial epithelial hyperplasia (Short-Arrow), scattered lymphocytes (Long-Arrow) and intact vascular spaces. No granulomas were seen.

[Para 0028] The histopathological studies of arthritic rats shows dose dependant protection of articular cartilage with Calebin A.

[Para 0029] While the invention has been described with reference to a preferred embodiment, it is to be clearly understood by those skilled in the art that the invention is not limited thereto.

Rather, the scope of the invention is to be interpreted only in conjunction with the appended claims.

We claim

1. The use of Calebin A for the manufacture of a medicament for the preventative treatment of mammalian articular cartilage from necrotic damage following microbial infection.

2. The use of Calebin A according to claim 1 wherein an effective dose of the medicament is based on a body weight of the mammal using Calebin A.

3. The use of Calebin A according to any of claim 1 or 2, wherein the microbial infection is caused by *Mycobacterium tuberculosis* and antigens thereof.