



**The Chinese University of Hong Kong**  
**Non-confidential Abstract of Technology Disclosure**

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**Title:**

**Novel Bioactive Compound Icariin for Prevention and Treatment of Steroid-associated Osteonecrosis**

**CUHK Ref. No.:**

08/MED/295/ITF

**Patent Status:**

US Patent Pending

**Inventor(s):**

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**Non-confidential abstract:**

Steroid-associated osteonecrosis accounts for more than 30% of non-traumatic osteonecrosis, and has worse prognosis even after surgical interventions. So prevention is one of the important strategies for intervention of steroid-associated osteonecrosis. However, there are few available candidates for this prevention strategy due to the poor understanding on the mechanisms of the steroid-associated osteonecrosis.

Based on our previous studies, the systemic vessel inflammation in the osteonecrosis vulnerable patients such as SLE patients the local enhanced adipogenesis of mesenchymal stem cells in bone marrow after steroids administration are the important pathogenesis of steroid-associated osteonecrosis. So the potential compounds with the features of protecting vascular endothelial cells from inflammation injury and inhibiting adipogenesis of mesenchymal stem cells have great potential for R&D for prevention of steroid-associated osteonecrosis.

Herbal Epimedium-Derived flavonoids formula is traditionally used in China for prevention and treatment of osteoporosis, osteonecrosis and other bone-related diseases for thousands of years. This formula has also been proved to be effective for prevention of steroid-associated osteonecrosis. HPLC analysis showed there are mainly seven compounds in this formula. Icariin occupy more than 70% of the formula.

Our in vitro study showed that Icariin could effectively protect vascular endothelial cells from inflammation injuries and greatly inhibit adipogenesis of mesenchymal stem cells. The in vivo rabbit model study also confirmed that Icariin could prevent steroid-associated osteonecrosis development with both protection of vascular endothelial cells from inflammation injuries and inhibition of adipogenesis of mesenchymal stem cells.

We believe that a novel active compound Icariin developed by the applicants targeting at both intravascular and extravascular pathogenic events in effective prevention of steroid associated osteonecrosis.

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