

## **Healing effect of Vicenin-2 (VCN-2) on Human Dermal Fibroblast (HDF) and development VCN-2 hydrocolloid film based on alginate as potential wound dressing**

### **ABSTRACT**

Chronic wounds represent serious globally health care and economic issues especially for patients with hyperglycemic condition. Wound dressings have a predominant function in wound treatment; however, the dressings for the long-lasting and non-healing wounds are still a significant challenge in the wound care management market. Astonishingly, advanced wound dressing which is embedded with a synthetic drug compound in a natural polymer compound that acts as drug release carrier has brought about promising treatment effect toward injured wound. In the current study, results have shown that Vicenin-2 (VCN-2) compound in low concentration significantly enhanced cell proliferation and migration of HDF. It also regulated the production of pro-inflammatory cytokines such as IL-6, IL-1 $\beta$ , and TNF- $\alpha$  from HDF in wound repair. Treatment of VCN-2 also has facilitated the expression of TGF-1 $\beta$  and VEGF wound healing maker in a dose-dependent manner. A hydrocolloid film based on sodium alginate (SA) incorporated with VCN-2 synthetic compound which targets to promote wound healing particularly in diabetic condition was successfully developed and optimized for its physico-chemical properties. It was discovered that all the fabricated film formulations prepared were smooth, translucent, and good with flexibility. The thickness and weight of the formulations were also found to be uniform. The hydrophilic polymer comprised of VCN-2 were shown to possess desirable wound dressing properties and superior mechanical characteristics. The drug release profiles have revealed hydrocolloid film, which is able to control and sustain the VCN-2 released to wound area. In short, hydrocolloid films consisting of VCN-2 formulations are suitably used as a potential wound dressing to promote restoration of wound injury.