Expansible and Microporous Polyurethane Hydrophilic Foam for Wound Dressing: *In Vitro* and *In Vivo* Evaluation

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Wound management is a significant clinical and economic problem. Modern dressings are designed to facilitate the function of wound rather than just to cover it. Dressing fulfilled a number of functions: cosmesis, haemostasis, protection, support, comfort and absorption. The ideal dressing must be easy to apply, painless to remove and require fewer changes. Therefore we want to find a kind of dressing characteristic with good biocompatibility, permeability, absorption and not sticks to wound.

We compared four groups with different component and function of PU foam porous wound dressings that to investigate their wound healing capability. We used opsite (Tegaderm®) as control group. The four groups are including (i) multi-layer PU foam (multi-PU), (ii) Silicon+PU (Si-PU), (iii) Microfiber+PU (fiber-PU) (iv) glycerin+PU (G-PU). The *In vitro* behaviors were evaluated by cytotoxicity test using Hs68 fibroblast cells. The all groups have good biocompatibility than Control group. However, in the multi-PU and Si-PU groups had better cell proliferation ability than fiber-PU and G-PU groups.

Full-thickness excision wound were created on the back of male mice. Wounds were covered with either the multi-PU, Si-PU, fiber-PU, G-PU or controls. In the H&E staining found that the wounds covered with multi-PU and Si-PU had a complete epidermal and dermal formation. Using Masson’s trichrome staining to observe consists rate with collagen 1 and collagen 3 to examine the relationship between scar formation and dressing function.