

A simple method to produce pectin-honey hydrogels and its characterization as new biomaterial for surgical use

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Background: Novel honey-based membranes have been developed and characterized as a medical device. In this study, a novel, simple and fast method to produce pectin-honey wound dressings is described. An ideal wound dressing is yet to be developed. Ideally, a wound dressing should maintain optimal fluid affinity, permit moisture evaporation, protect the wound from foreign microbes, and have shape-conformability, biocompatibility, and antibacterial activity.

Materials and Method: The properties of these honey-based membranes were systematically investigated with respect to physical and chemical parameters, including swelling ability, water vapour transmission rate, hydrogen peroxide production, methylglyoxal content and antibacterial activity. Furthermore, these membranes were assessed for cytocompatibility by performing a proliferation study using cultured fibroblast cells.

Results: The new membranes may be used as wound dressings as they have a good WVTR and fluid uptake and have no proven cytotoxicity to fibroblasts. The membranes demonstrate good antibacterial activity toward clinically relevant pathogenic microorganisms such as *S. aureus* and *E. coli*.

Conclusion: In conclusion, the honey-based membranes can be applied as a medical device for fabrication of wound dressings. The presence of a natural active component, conformability, and complete resorbability are the characteristics of this new biocompatible biomaterial that respects the pathophysiology of wounds, improves healing, and does not cause pain upon removal. Furthermore, the production of these device is extremely simple and inexpensive.