

Development of A Collagen Hydrogel Dressing

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Project Objective: Diabetic ulcers or pressure ulcers are common for patients with diabetes and spinal cord injuries. Without proper management, such wounds often lead to infections such as osteomyelitis or sepsis, resulting in high mortality and morbidity. In addition to bacterial infection, diabetic patients are also more susceptible to cutaneous fungal infections. Advanced wound dressings and advanced wound therapies should be applied to ease the severity of infection occurring in diabetic ulcer or even pressure ulcer. This project developed novel collagen-based biomaterial medical devices which can be used in skin wound healing, especially in challenging diabetic skin wound healing. The collagen-hydrogels dressing was registered a trade name "Collagenized Dressing". The product was developed by Dynamic Entropy Technology LLC, located at 1028 W Nixon St., Pasco, WA 99301.

Methods: Collagen (bovine) was purchased from commercial sources. All the other chemicals were purchased from Aldrich or Fisher Scientific.

Table 1 lists the main components of the dressing. In a typical procedure, to a 6cm diameter plastic dish, 10 wt% collagen (6 grams) was added together with 1.2 wt% agarose and 0.5 wt% gelatin as gelling agent, and 1 mL of 0.015 M antibacterial agent A or B (trade secret), the mixture was solidified in air after 2 hours.

Conclusions: A collagen hydrogel dressing was developed and was capable of anti-bacteria, especially inhibiting E coli for 6 months. Economic analysis shows that the dressing cost is \$0.22 per square inch.



Collagen dressing samples developed (freeze-dried in right)

Collagen	Gelling agent	Anti-bacteria agent
10 wt%	1.2 wt% agarose	none
10 wt%	1.2 wt% agarose	A, 0.015 M
10 wt%	0.5 wt% gelatin, 1.2 wt% agarose	A, 0.015 M
10 wt%	1.2 wt% agarose	B, 0.015 M
10 wt%	0.5 wt% gelatin, 1.2 wt% agarose	B, 0.015 M

Reference: [1] <https://reporter.nih.gov/project-details/9909142>.

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