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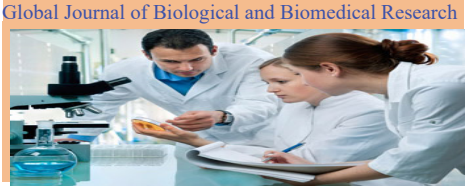

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Investigation of reconstructed human epidermis test methods

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ABOUT THE STUDY

Biopolymers are substances with a natural source. Scientists are looking for biocompatible and biodegradable properties in biopolymers, however "pure" biopolymers are not adequate to suit the requirements of dressings, thus they must be modified. The addition of various chemicals, sometimes known as cross-linkers, constitutes the alterations. These substances create new bonds or interactions with the functional groups already present in the polymer chain (Patel, et al., 2013). It enhances the durability of the biofilm-derived materials and permits their application as biocompatible coatings or layers.

All living things include the organic chemical molecule hyaluronic acid. It is a repeating polymeric D-glucuronic acid disaccharide and is a non-sulfate GAG. The intracellular matrix of the dermis contains the polysaccharide of the glycosaminoglycan group naturally. We observe it as sodium salt in the human body (sodium hyaluronate). Hyaluronic acid has varied densities and amounts of attaching to water molecules depending on the degree of cross-linking it have (Currie, et al., 2008). Hyaluronic acid encourages tissue regeneration, angiogenesis, and cell proliferation as an element of the extracellular matrix.

A class of naturally occurring organic chemical substances is known as tannins. Tannic acid is a representative of tannins. Gallic acid and glucose molecules combine to form tannic acid. Tannic acid is biocompatible and possesses antibacterial and antioxidant effects. Tannic acid has been shown to support skin regeneration, for instance when treating burns. Moreover, biofilm-forming substances such hyaluronic acid, chitosan, collagen, and starch can be effectively cross-linked by tannic acid (Wiersinga, et al., 2006).

A well-known polysaccharide found in many different kinds of biomaterials is hyaluronic acid. It is safe to use in both internal and external applications and is biocompatible. Hyaluronic acid can be combined with another natural substance to provide materials new and improved qualities. Tannic acid is a polyphenolic acid with a reputation for being effective at cross-linking polysaccharides. When a cell interacts with a surface and at the same time, the biocompatibility of materials, surface free energy is a crucial factor to take into account. Tannic acid causes the surface free energy to decrease, which may enhance the contact between the cell and the substance. Surface roughness is a significant factor that affects cell activity. The cellular shape, proliferation, and expression of phenotypes were all significantly influenced by the surface topography (Currie, 2000).

The application aspect of the film depends greatly on the mechanical properties. In our performed nanoindentation research, we discovered that both hardness and Young's modulus are significantly influenced by the composition of films. Due to the Tannic Acid (TA) effect as a cross linker and stabiliser for natural polymers, as seen in earlier studies, an increase in TA content improves these properties, which is likely related to the microstructure alterations of the films. Because dry circumstances slow down the healing processes, it's crucial to avoid doing so for optimal wound healing. Water vapour should be able to pass through material that is applied to the skin. The manufactured film's Water Vapour Permeation Rate (WVPR) increases as hyaluronic acid content rises. A polysaccharide with a very hydrophilic property is known as hyaluronic acid (Moore, et al., 2003).

Water molecules can be bound by it, and once bound, they can pass through the film. These characteristics support the healing process by allowing the wound to retain moisture. Tannic acid is added to give hyaluronic acid-based films new features like antioxidant activity. Tannic acid concentration in the substance increases along with the RSA value. Antioxidant-active materials are beneficial in biomedical applications because they

prevent the free oxygen radicals that are detrimental to humans. Antioxidant-rich materials help heal wounds more effectively and shield body flaws from oxidative damage.

References

Currie BJ (2008). Advances and remaining uncertainties in the epidemiology of Burkholderia pseudomallei and melioidosis. Trans. R. Soc. Trop. Med. Hyg. 102(3):225-227.

Currie BJ, Fisher DA, Anstey NM, Jacups SP (2000). Melioidosis: acute and chronic disease, relapse and re-activation. Trans. R. Soc. Trop. Med. Hyg. 94(3): 301-304.

Moore T, Ekworomadu CO, Eko FO, MacMillan L, Ramey K, Ananaba GA, Patrickson JW, Nagappan PR, Lyn D, Black CM, Igietseme JU (2003). Fc receptor–mediated antibody regulation of T cell immunity against intracellular pathogens. J. Infect. Dis. 188(4):617-624.

Patel N, Conejero L, De Reynal M, Easton A, Bancroft GJ, Titball RW (2011). Development of vaccines against Burkholderia pseudomallei. Front. Microbiol. 2:198.

Wiersinga WJ, Van der Poll T, White NJ, Day NP, Peacock SJ (2006). Melioidosis: insights into the pathogenicity of Burkholderia pseudomallei. Nat. Rev. Microbiol. 4(4): 272-282.