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Biopolymer Congress 2018: Gelatin-based electro-responsive hydrogel for biomedical applications - Neslihan Alemdar – Marmara University

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Hydrogels are polymeric materials with three dimensional, cross-linked, hydrophilic structure and their water content which is much more advantageous in terms of their use in tissue engineering, biomedical and biotechnological fields compared to other synthetic biocompatible materials due to their porous and soft structure. Intelligent polymers are polymeric materials which show mechanical and physical changes with external stimuli such as pH, temperature, electric, thus they have widespread usage in controlled drug delivery systems that is one of the most important biomedical fields used in the treatment of diseases such as cancer, chronic pain, which require controlled drug.

Gelatin or gelatin is a translucent, colorless and tasteless food ingredient, derived from collagen from parts of animals' bodies. It is brittle when dry and gummy when wet. It can also be called hydrolyzed collagen, collagen hydrolyzate, gelatin hydrolyzate, hydrolyzed gelatin and collagen peptides after undergoing hydrolysis. It is used as a gelling agent in foods, drugs, vitamin and drug capsules, photographic film and paper, and cosmetics. Gelatin is an irreversibly hydrolyzed form of collagen, in which hydrolysis reduces protein fibrils to smaller peptides; According to the physical and chemical methods of denaturation, the molecular weight of the peptides is in a range. Gelatin is in gelatin desserts; most candies and gummy marshmallows; and ice cream, dips and yogurt. Cooking for Gelatin comes in the form of powder, granules and leaves. Instant types can be added to foods as; Others must soak granules and leaves in water beforehand.

If the raw material used in the product is gelatin derived from bones, dilute acid solutions are used to remove calcium and other salts. Hot water or more solvents can be used to reduce fat content, which should not exceed 1% before the main extraction step. If the raw material of skins and skin; size reduction, washing, removing hair from the hides and degreasing the hydrolysis step for the needles and skins. The extraction is carried out with water or acid solutions at appropriate temperatures. All industrial processes are based on neutral or acidic pH values, but alkaline treatments accelerate conversion, and they also promote degradation processes. Acid extraction conditions are widely used in industry, but with varying degrees of acid varies.

H are a three-dimensional crosslinked hydrophilic structure with polymer materials and their water content is a highly porous and flexible structure compared to the fields of tissue, biomedical and biotechnological engineering. Smart polymers are polymeric materials that exhibit mechanical and physical changes with external stimuli such as pH, temperature, electricity, and so on. controlled drug release. Based on this information, we have produced controlled drug administration for gel-sensitive electro-sensitive hydrogels. The hydrogels were obtained by characterizing FT-IR and SEM analyzes. For the release experiments, a model drug was loaded into the hydrogels, then the kinetics of the drug release from the gelatin-based hydrogel were studied under different tension conditions. The results showed that the gelatin-based hydrogel could be a promising electro-sensitive biomaterial for the treatment of cancerous diseases.

This work is partly presented at 8th World Congress on Biopolymers & Bioplastics on June 28-29, 2018 at Berlin, Germany

Hydrogels are crosslinked polymers that are capable of absorbing a large amount of water and solvents in their swollen matrices and providing a sustained distribution of absorbed solutes. The use of various functional biopolymer types as hydrogels in scaffolding materials is not only of great interest but is also an underutilized resource but has been considered as a component for the most potential candidate. hydrogel due to its hydration properties such as swelling and solubility; gelling behavior such as gel formation, texturing, thickening and water binding capacity; and surface behavior such as emulsion and foam formation, stabilization, adhesion and cohesion, protective colloid function and film forming capacity. In addition, its biocompatibility, low toxicity, Antimicrobial activity and biodegradability properties make it possible for diverse biomedical applications. Numerous works have been reported in various scientifically replicated journals and publications in the world which seem to have antimicrobial activity and biodegradability for various biomedical applications.

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