There are multiple ways to categorize different hydrogels. [1] One method is through the difference in their ionic charges, where one can be cationic, another anionic, and another neutral or non ionic. Cation hydrogels usually contain positive ions and respond to changes in external pH changes, anion hydrogels contain negative ions for the greater polymer network which creates stronger intermolecular interactions, and neutral hydrogels contain the same amount of both positive and negative ions and produce similar effects of the other types of hydrogels. [2] They can also be classified through the different types of response (physical, chemical, or biochemical) they form when applied, where physical gels can easily transition from liquid to a gel as a result of a change in an environmental condition, chemical gels use covalent bonding to resist degradation, and biochemical hydrogels' biological agents work together for the process of gelation. [3] Yet another possible way to classify hydrogels is through their structure: amorphous, semicrystalline, crystalline, and hydrocolloid aggregates. Amorphous hydrogel dressings are defined as formulations of water with no direct shape that can maintain a moist healing environment, vital for the proper functioning of hydrogels. Semicrystalline hydrogels on the other hand contain crystalline domains that serve prominent self-healing and memory functions. Crystalline hydrogels, similar to that of semicrystalline ones, are responsible for tissue engineering and regenerative medicine, and finally, hydrocolloid aggregates contain gel-forming agents that serve to moisturize the surface while being waterproof.

There are different classifications of hydrogels each with different monomers consisting of the structure. [1] One type of hydrogels, a homopolymer, consists of three types of monomers: Poly 2-hydroxyethyl methacrylate (PHEMA), 2-Hydroxyethyl methacrylate (HEMA), and Polyethylene glycol (PEG) while Polyethylene glycol dimethacrylate and Triethylene glycol dimethacrylate (TEGDMA) serve as cross-linkers in the system. Such polymers deliver drugs for the wound healing and tissue producing process. [2] Copolymer consists of four monomers: Methacrylic acid (MAA), PEG-PEGMA, Carboxymethyl cellulose (CMC), and Polyvinylpyrrolidone (PVP), cross-linked with Tetra dimethacrylate, where it serves to be hydrogel's dressing material. [3,4] Two of the next networks of hydrogels serve for the same function: drug delivery. Both semi-interpenetrating and interpenetrating networks are connected through N,N' - methylene bisacrylamide cross-linkers. However, the semi-interpenetrating network are formed by Acrylamide/acrylic acid copolymer and Linear cationic poly ammonium chloride while the interprentaring network contains Poly N-isopropylacrylamide (PNIPAM) and Chitosan. [5] Another system of hydrogels, known as the self-assembling peptide systems, help regenerate tissues through monomers of Acrylate-modified PEG and arylate-modified hyaluronic acid, Heparin, and Amine end-functionalized 4-arm star-PEG.