XYLANS: BIOCHEMISTRY AND APLICATION IN BIOTECHNOLOGY OF COLON-SPECIFIC DRUG DELIVERY SYSTEMS

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Xylans are the second most abundant biopolymer in the plant kingdom. Such polysaccharide can be hydrolyzed to xylose by xylanases, which are enzymes produced by bacteria resident in human colon. This fact enables the use of xylan to produce colon-specific drug delivery systems (CSDS). This study reports the biochemistry of xylans and a potential method for their use in biotechnology of CSDS. Xylans are composed mainly of ß-1,4-D-xylose units. Besides xylose, xylans may contain arabinose, glucuronic acid, or its 4-*O*-methyl ether. The hypothetical model to degradation of xylan is that endo-xylanases attack the main chains of xylans and ß-xylosidases hydrolyzing xylooligosaccharides to xylose. Our research team developed xylan microcapsules using cross-linking reaction technique. An alkaline solution containing xylan was emulsified in 30mL of the chloroform:cyclohexane [1:4$_{(v/v)}$] containing 5% $_{(w/v)}$ sorbitan triesterate. After 10 min, the interfacial cross-linking reaction was started by adding 40 mL of 5% $_{(w/v)}$ terephthaloyl chloride solution. The reaction was ended by dilution with cyclohexane. Subsequently, microcapsules were separated by centrifugation and washed several times. The results showed that microcapsules presented suitable homogeneity with a smooth surface and mean size of 26.33 ± 11.53µm. *In vitro* test showed that the system presents a resistance to the upper gastrointestinal tract. Concerning this, we can conclude that this system represent an eligible CSDS.

Keywords: xylan, polysaccharide, xylanase, microcapsules, colon.