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## Irradiated carboxymethyl sago pulp hydrogel disc for ophthalmic sustained drug delivery: Ciprofloxacin uptake and release from pre cross-linked discs

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Recently, we have reported ciprofloxacin loaded radiation cross-linked hydrogel for sustained drug delivery. To avoid radiation-induced degradation during formulation, the present study focuses on loading drug in pre-irradiated and sterilized material for extemporaneous use. Carboxymethyl sago pulp (CMSP) was synthesized using classical Williamson etherification. The degrees of substitution, intrinsic viscosity and molecular weight of synthesized CMSP were determined as 0.4, 184.33 dl/g and 75974 g/mol, respectively. 10 and 20% w/v solution of CMSP was irradiated at 10, 20, 25 and 30 kGy to form hydrogels and evaluated by % gel fraction. 10% w/v CMSP solutions produced 2.41-2.61 % of gel fraction irrespective of the irradiation dose. In contrast, 20% w/v CMSP solution produced hydrogels whose gel fraction inversely proportional to applied irradiation dose. Irradiation dose of 10 kGy has produced the highest average gel fraction of 9.05% (range of 8.31 to 10.05 %) and further increase in irradiation dose actually reduce the % gel fraction. Hydrogel with gel fraction of 10.05% were cut into discs (thickness of  $2 \pm 0.2$  mm and diameter of  $4 \pm 0.4$  mm) and loaded with ciprofloxacin hydrochloride by immersing in the drug solution. Differential scanning calorimetry (DSC) confirmed the transformation of ciprofloxacin hydrochloride into ciprofloxacin during the loading process. DSC along with scanning electron microscopy revealed the crystalline nature of loaded drug. CMSP disc loaded with ciprofloxacin sustained the drug release over 24 h. The release was diffusion controlled and followed first-order kinetics.

### Biography

Saravanan Muniyandy has completed his Masters in Pharmaceutics and PhD from Chennai, India. He has also completed GCHE at Monash University. He has nearly 20 years of experience in teaching pharmacy graduates and supervising research students. Presently, he is the Deputy Head of School of Pharmacy, Monash University, Malaysia. He has published more than 30 research papers in reputed journals and has been serving as peer reviewer for several high-quality journals. He is also an Editorial Board Member of reputed journals.

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