## Manipal Journal of Pharmaceutical Sciences

Volume 5 | Issue 1 Article 2

3-1-2019

# Novel pH-sensitive polyvinyl alcohol-grafted-acrylamide microsphere based modified release system of Prednisolone: A chronotherapeutic approach for arthritis

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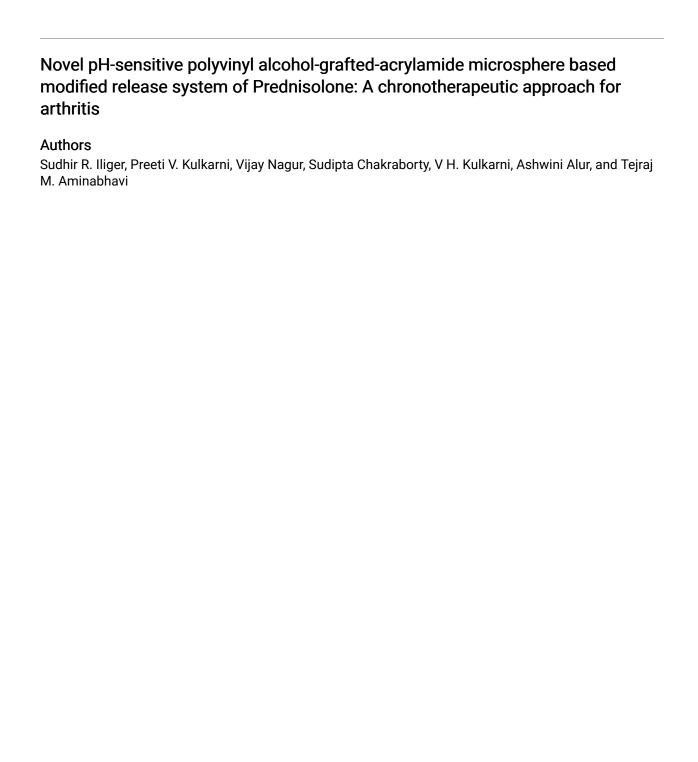
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#### **Recommended Citation**

Iliger, Sudhir R.; Kulkarni, Preeti V.; Nagur, Vijay; Chakraborty, Sudipta; Kulkarni, V H.; Alur, Ashwini; and Aminabhavi, Tejraj M. (2019) "Novel pH-sensitive polyvinyl alcohol-grafted-acrylamide microsphere based modified release system of Prednisolone: A chronotherapeutic approach for arthritis," *Manipal Journal of Pharmaceutical Sciences*: Vol. 5: Iss. 1, Article 2.

Available at: https://impressions.manipal.edu/mjps/vol5/iss1/2

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### Research Article

## Novel pH-sensitive polyvinyl alcohol-grafted-acrylamide microsphere based modified release system of Prednisolone: A chronotherapeutic approach for arthritis

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#### Abstract

Novel Prednisolone sodium phosphate loaded hydrolyzed acrylamide grafted polyvinyl alcohol (Hy-PVA-g-AAm) microspheres were fabricated by using spray drying method. The primary objective of the work was to synthesize Hy-PVA-g-AAm with pH dependent swelling and its microspheres. The microspheres were evaluated by scanning electron microscopy (SEM) as well as fourier-transform infrared spectroscopy (FTIR). The influence of processing conditions on particle size, drug entrapment efficiency and swelling behaviour of the developed microspheres were studied. The microspheres were filled in enteric coated hard gelatine capsules to carry out the dissolution. The average particle size of the microspheres varied between 60-100 µm and the entrapment efficiency ranged between 84 to 94%. The microspheres exhibited pH responsive swelling with appreciably high swelling under colonic pH of 7.4 compared to acidic condition. The microspheres exhibited drug release in pH dependent manner. The cumulative percent drug release was found to be less than 20% in slightly acidic pH 6.8 resembling intestine and comparatively higher drug release in pH 7.4. The formulation followed Korsemeyer-Peppas kinetics with Non-Fickian diffusion after an adequate lag period.

Key words: Microspheres, polyacrylamide, polyvinyl alcohol, Prednisolone sodium phosphate

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Date of Received: 31 Aug 2018, Date of Revised: 23 Feb 2019,

Accepted: 28 Feb 2019

How to cite this article: R Iliger S, V Kulkarni P, Nagur V, Chakraborty S, Kulkarni V H, Alur A, M Aminabhavi T. Novel pHsensitive polyvinyl alcohol-grafted-acrylamide ...... approach for arthritis. MJPS 2018; 5(1): 4-12.

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