

Accepted Manuscript

Title: Novel pH sensitive dual drug loaded-gelatin methacrylate/methacrylic acid hydrogel for the controlled release of antibiotics

Authors: Thayyath Sreenivasan Anirudhan, Anila Manasa Mohan



PII: S0141-8130(17)33846-1
DOI: <https://doi.org/10.1016/j.ijbiomac.2018.01.220>
Reference: BIOMAC 9061

To appear in: *International Journal of Biological Macromolecules*

Received date: 5-10-2017
Revised date: 24-1-2018
Accepted date: 25-1-2018

Please cite this article as: Thayyath Sreenivasan Anirudhan, Anila Manasa Mohan, Novel pH sensitive dual drug loaded-gelatin methacrylate/methacrylic acid hydrogel for the controlled release of antibiotics, *International Journal of Biological Macromolecules* <https://doi.org/10.1016/j.ijbiomac.2018.01.220>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

**Novel pH sensitive dual drug loaded-gelatin methacrylate/methacrylic acid hydrogel
for the controlled release of antibiotics**

Thayyath Sreenivasan Anirudhan* and Anila Manasa Mohan

*Department of Chemistry, School of Physical and Mathematical Sciences, University of
Kerala, Kariavattom, Trivandrum 695 581, India*

* Corresponding author

Tel: +914712308682. E-mail: tsani@rediffmail.com, manasamohan42@gmail.com

Abstract:

The aim of the present study was to develop a novel pH sensitive gelatin methacrylate hydrogel for the controlled delivery of Gentamicin (GS) and Ampicillin (Amp). GS and Amp having synergistic activity is effective in killing multi drug resistant bacteria. The hydrogel was well characterized using FTIR, XRD and SEM techniques. The drug loading and encapsulation efficiency were found to be 85.0 and 77.0% for GS, 79.0 and 88.0 % for Amp, respectively. The *invitro* swelling, degradation and release profiles suggest the pH dependent behaviour of hydrogel. DPPH Assay confirmed the role of 2-amino guanidine in nullifying the side effect of GS and inhibition percentage of DDLHG is found to be 85.0 %. Antimicrobial studies revealed the increased efficiency of the drug combination in killing bacteria.

Keywords: Gentamicin; Combination therapy; Synergism; Polymer drug conjugate; Multi drug resistance; Gelatin methacrylate.

1. Introduction

Hydrogels are hydrophilic three dimensional macromolecular network, which imbibes large amount of water without dissolving due to chemical, physical or both types of crosslinking [1-3]. Considering their characteristic property of swelling in water, hydrophilicity, biocompatibility, biodegradability, in toxicity etc and their ability to respond to the external stimuli like pH, temperature, light, magnetic and electric field, certain chemicals and enzymes, they are usually named as “smart”, “intelligent”, “stimuli

Download English Version:

<https://daneshyari.com/en/article/8327901>

Download Persian Version:

<https://daneshyari.com/article/8327901>

[Daneshyari.com](https://daneshyari.com)