TEACHER PROFILE

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8.	**QUALIFICATIONS**		

Qualifications	Name of the University	Subject	Month and year of passing	Percentage of Marks
PhD (Pursuing)	GITAM University Visakhapatnam	Drug Delivery	Joined in Jan 2020	---
MSc Organic Chemistry	Andhra University	Organic Chemistry	Apr 2008	73.2
BSC	Andhra University	MPC	Apr 2006	79.9
Intermediate	Intermediate Board of education	MPC	Apr 2003	94.3
SSC	School of Secondary Education , A.P.		Apr 2001	86.7

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S.No.	Course	University	Year
1	Orientation Course	Moulana Azad National Urdu University , Hyderabad	10.05.2012 to 06.06.2012
2	Refresher Course	Sri Venkateswara University , Tirupathi	04.08.2014 to 23.08.2014
3	NCC ANO PRCN Course	Kamptee , Nagpur	22.12.2014 to 21.03.2014
4	Search & Rescue Course	National Civil Defence College, Nagpur	09.02.2015 to 10.05.2015
3	Refresher Course	Andhra University, Visakhapatnam	18.09.2019 to 01.10.2019

12. **LMS Question bank generator for Chemistry on topic "Nuclear Magnetic Resonance spectroscopy"**

13. **Paper Publications :**

- Published a paper titled "Fabrication of Sodium alginate/Gum Ghatti IPN Microbeads Intercalated with Kaolin Nano Clay for Controlled release of Curcumin" in International journal of Applied Pharmaceuticals (a Scopus indexed journal) in Jan-2021.

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Original Article

FABRICATION OF SODIUM ALGINATE/GUM GHATTI IPN MICROBEADS INTERCALATED WITH KAOLIN NANO CLAY FOR CONTROLLED RELEASE OF CURCUMIN

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ABSTRACT

Objective: The objective of this study is to fabricate sodium alginate (SA)/gum ghatti (GG) microbeads intercalated with Kaolin (KA) nano clay for the sustained release of curcumin (CUR).

Methods: The microbeads were prepared by a simple ionotropic gelation technique. The developed beads were characterized by fourier transform infrared spectroscopy (FTIR), differential scanning calorimetry (DSC), thermogravimetric analysis (TGA), X-ray diffraction (X-RD), and scanning electron microscopy (SEM). Swelling studies and *in vitro* release studies were investigated under both pH 7.4 and pH 1.2 at 37 °C.

Results: The developed microbeads were characterized by FTIR, which confirms the interaction between CUR, polymeric matrix and KA. DSC and XRD analysis reveals that the CUR has molecularly dispersed in the polymer matrix. *In vitro* results illustrated that microbeads were influenced by the pH of test media, which might be suitable for intestinal drug delivery. The drug release mechanism was analyzed by fitting the release data into different kinetic equations and n values are obtained in the range of 0.609-0.640, suggesting that the developed microbeads showed the non-Fickian diffusion type drug release.

Conclusion: These results clearly illustrated that the developed KA intercalated polymeric microbeads are potential drug carriers for the controlled release of CUR.

Keywords: Gum Ghatti, Kaolin, Sodium alginate, Curcumin, Microbeads

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INTRODUCTION

In today's pharmaceutical formulations, polymers play a vital role in the progression of drug delivery technology by offering different types of pharmaceutical dosage formulations such as oral, parenteral, semisolid, controlled and sustained drug delivery systems because it can control the drug release and also it may increase the safety, efficacy, and bioavailability of the drugs with increased patient compliance [1-3]. Over the past few decades, polymeric interpenetrating polymer network (IPN) hydrogel microbeads have been broadly used as an intelligent biomaterial in many biomedical applications such as drug delivery and tissue engineering due to their excellent physical and chemical properties such as high water absorption tendency, high mechanical strength, capable of swelling under physiological conditions, providing a suitable environment for cell adhesion and new bone formation [4-6]. However, hydrogels have few disadvantages such as unconstrained release rate and uncontrolled swelling properties, leading to several side effects. To overcome these problems, certain substances have been introduced into the hydrogels such as clay minerals, surface coating with other polymers such as poly-L-Lysine [7], chitosan [8]. By introducing clay minerals such as Kaolin, montmorillonite into hydrogels, this controls the release rate of hydrogels, minimizing side effects and maintaining the drug concentration at effective levels in plasma over a period of time [9].

During the last few years, a wide range of clay minerals have been used in pharmaceutical and biomedical fields exclusively for controlled drug delivery systems because it can control the efficiency and consistency in dosage formulations and also improve the bioavailability of the drug molecules due to their larger specific surface area and considerable ion-exchange capacity which attributes to their ability to control the efficiency of bioactive molecules [10-12]. Kaolin is a hydrated two-dimensional (2D) aluminosilicate clay mineral which has been extensively used in biomedical related applications such as an activating agent for blood clotting [13], as an ingredient for operation hemostasis [14] and also used in drug delivery systems for prolonged-release, especially of basic drugs because it can act as an active excipient in pharmaceutical dosage forms to increase the efficiency and bioavailability of drug molecules [15]. In fact their medicinal utilities have been discovered by many traditional civilizations (Egyptians, Assyrians, Babylonians, Indians, Chinese), Greeks, Romans and medieval Arab Muslims till the recent times [16].

Curcumin is a yellow bioactive compound obtained from the yellow spice of *Curcuma longa*, possesses a wide variety of pharmacological properties such as antibacterial, antioxidant, anti-inflammatory, anti-malarial, antifungal antiviral and also enhances anti-tumor activity against different types of cancer cells, including colon, prostate and breast cancers [17-19]. Due to its poor solubility and rapid metabolism, its biomedical applications are limited which results in poor bioavailability [20]. To increase the bioavailability and encapsulation efficiency of CUR, KA clay mineral was used in the present study because KA intercalates with drug molecules by adsorption process, which inturn increases the encapsulation and bioavailability of CUR.

Gum Ghatti (GG) is an anionic polysaccharide obtained from the species *Anogeissus latifolia*, comprising ~~of~~ linked -D-galactopyranose major units and alternating 4-O-subsituted and 2-O-subsituted-d-mannopyranose units along with a single larabinofuranose unit as side chain [21, 22]. GG has widely used in food and pharmaceutical applications, due to its excellent emulsification property, many researchers have shown potential interest in the usage of GG in drug delivery applications as a controlling polymer [23]. Sodium alginate (SA) is a linear anionic polymer consisting of various amounts of ~~1~~→4 linked β -D-guluronic acid and α-L-mannuronic acid residues. SA has been commonly used in the food and biomedical applications due to its flexible characters such as biocompatible, biodegradable, inherent hydrophilicity and non-toxic in nature [24]. SA forms three dimensional hydrogel networks through the electrostatic attraction between carboxylic acid groups of guluronic acid residues and divalent ions (Ca^{2+}, Mg^{2+} and Ba^{2+}) and makes egg-box structure [25]. However, the SA