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3.3.2 Number of books and chapters in edited volumes/books published and papers published in national/ international conference proceedings per teacher during last five years

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Sl. No.	Name of the teacher	Title of the book/chapters published	National / International	Calendar Year of publication	ISBN number of the proceeding	Name of the publisher
1	S. N. Nangare, P. O. Patil	Nanostructures used in cancer imaging	International	2023	978-0-323-95171-5	Elsevier
2	V. S. Bagul	A Practical Handbook of Pharmaceutical Microbiology	National	2023	978-93-5735-219-2	Pritam Publications, Jalgaon
3	L. R. Zawar	A Textbook of Dietary Supplements and Nutraceuticals	National	2023	978-81-7660-385-0	Everest Publication House, Pune
4	K. B. Patil	MCQS Book for Pharmacy	National	2023	978-93-91208-60-8	IP Innovative Publication Pvt. Ltd, New Delhi
5	S. N. Jain, N. R. Shirsath	Fungal-mediated Zinc Nanoparticles and their Applications	International	2023	978-1-032-35540-5	CRC Press, Taylor & Francis
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CHAPTER 7

Nanostructures used in cancer imaging

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7.1 Introduction

Unregulated growth of cells in any organ system, irrespective of the physical attributes of a human cellular environment, is considered cancer. Multifactorial etiology is associated with cancer like genetic exposure to tobacco, chemicals, infection, long exposure to radiation, inappropriate lifestyle, etc. Cancer is the most devastating disease, and very few patients in India can afford the treatment. Developing countries like India lack a regulated cancer care system. Worldwide 71% of deaths account for noncommunicable diseases, while India accounts for 63% of all deaths. In India, 9% of deaths are due to cancer. The systemic data collection approach has been followed and established population and hospital-based cancer registry since 1981. National Cancer Registry Programme (NCRP) was developed by the Indian Council of Medical Research (ICMR) under the National Centre for Disease Informatics and Research (NCDIR) [1].

7.1.1 Cancer statistics

The reports suggest that 13.9 lakh patients were diagnosed with cancer in 2020 and are expected to be increased by 15.7 lakh by 2025. India has heterogeneous cultures, and work and lifestyle factors are also differentiated among the population. In India, cancer of the mouth, stomach, lungs, and esophagus is the majorly diagnosed cancer in males. Cancer of the breast, cervix uteri is the leading cause of cancer in females. The rate of incidence of cancer was heterogeneous in India, with lacunas observed in treatment, infrastructure, human resources, diagnosis, clinical investigation, and improper consultation, high doses of anticancer drugs are possible reasons for increasing death rate [1,2].

The Tata Memorial Hospital registered a higher number of cases among all population based cancer registry (PBCR) (81,260), with the total number of cases registered by 2016 being 667,666. The Aizawl district reports the highest number (269.4) of cases in age-adjusted rates among males, while in females, Papum Pare district has reported about 219.8. In Arunachal Pradesh, Papum Pare district reports the highest number of cancer patients every one out of four people has been diagnosed with cancer. The rate of

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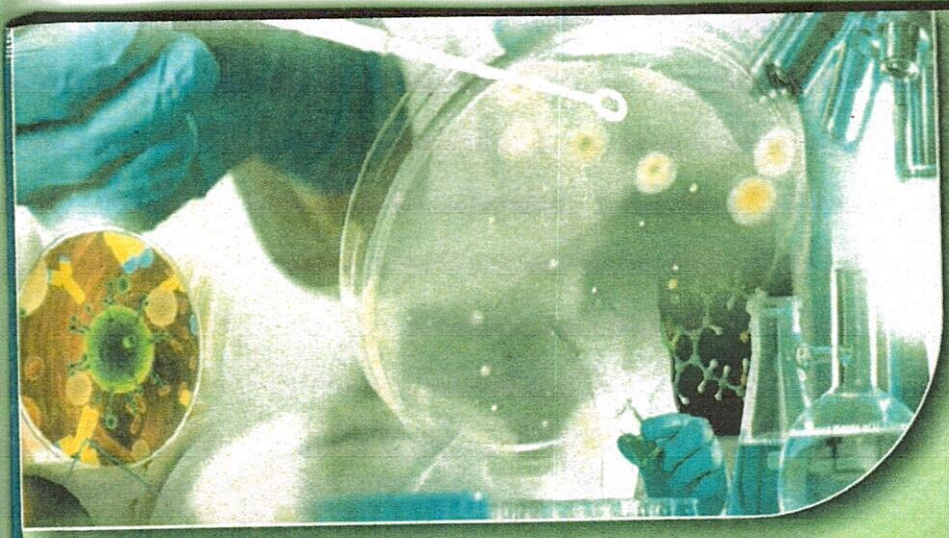

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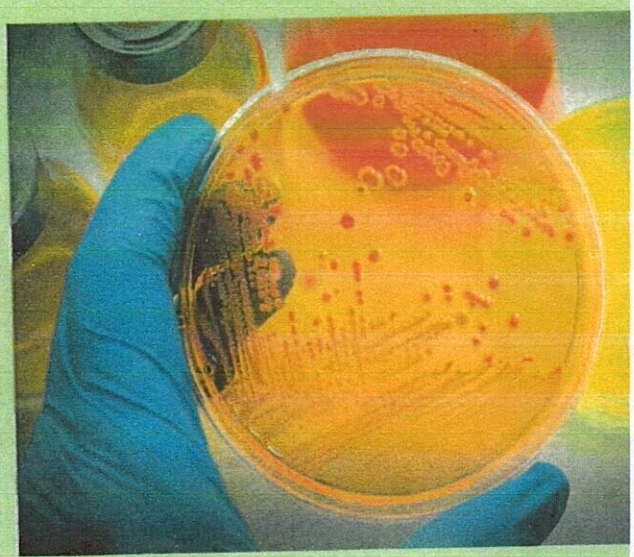

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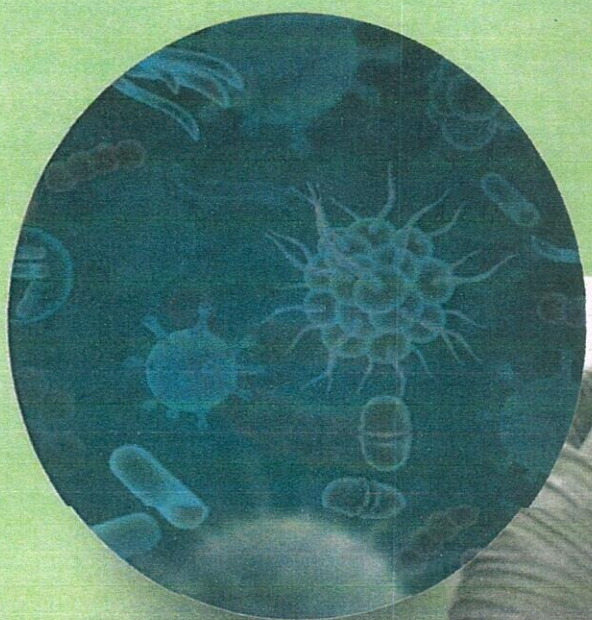

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Pharmaceutical Education, for pharmacists, however, does not intervene, even when they see and understand a drug therapy problem, its causes, and its solutions. I have long suspected that one underlying cause of such inaction is a lack of confidence as if pharmacists do not appreciate their knowledge and how much they can contribute to patient welfare. If this book helps pharmacists to focus, recognize and appreciate their pharmacy knowledge, it will be a useful addition to that enterprise.

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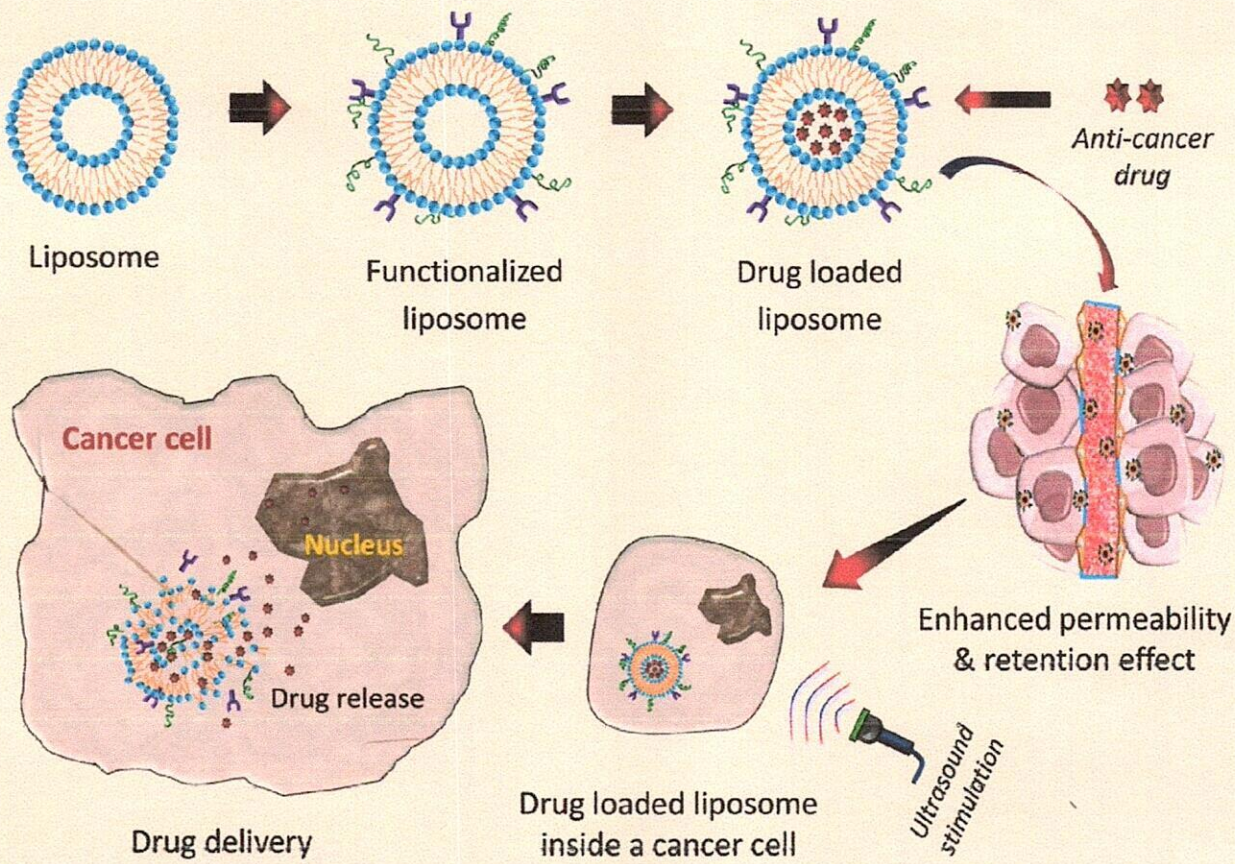

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Fungal-mediated Zinc Nanoparticles and their Applications

Chandrakant V. Pardeshi,[1,*] *Swapnil N. Jain*[2] and *Nitin R. Shirsath*[2]

Introduction

Nanotechnology has become one of the important areas in the field of modern material sciences. NPs are considered potential scientific tools which are widely used in various biotechnological and pharmacological industries. Nanoscience is the study of substances at the molecular and atomic levels. The basic component in the manufacture of nanostructures is the matter at the nanoscale of the order of 10^{-9} m = 1 nm, which is one-billionth of a meter. This technology is being employed in many areas and not limited to textile industries, agriculture, food processing, sophisticated diagnostic and medicinal techniques, and drug delivery, etc. (Boroumand Moghaddam et al. 2015, Pandurangan and Kim 2015). NPs are usually utilized for the exploration, synthesis, and characterization of materials in the range of 1–100 nm (Li et al. 2011).

NPs make a part of a large group of nanomaterials, with 'nano' indicating a tiny physical unit of dimension. Hence, NPs have properties that are quantitatively or qualitatively distinct from other physical forms of the same material (Saravanan et al. 2021). The large surface area to mass ratio, resulting in an increased ratio of surface to core atoms and an increased set of corner and edge atoms is sufficient to explain the size-related modifications in particle properties. This may not only result in greater reactivity but also enhanced related physical properties, allowing new applications to be developed (Medhi et al. 2020).

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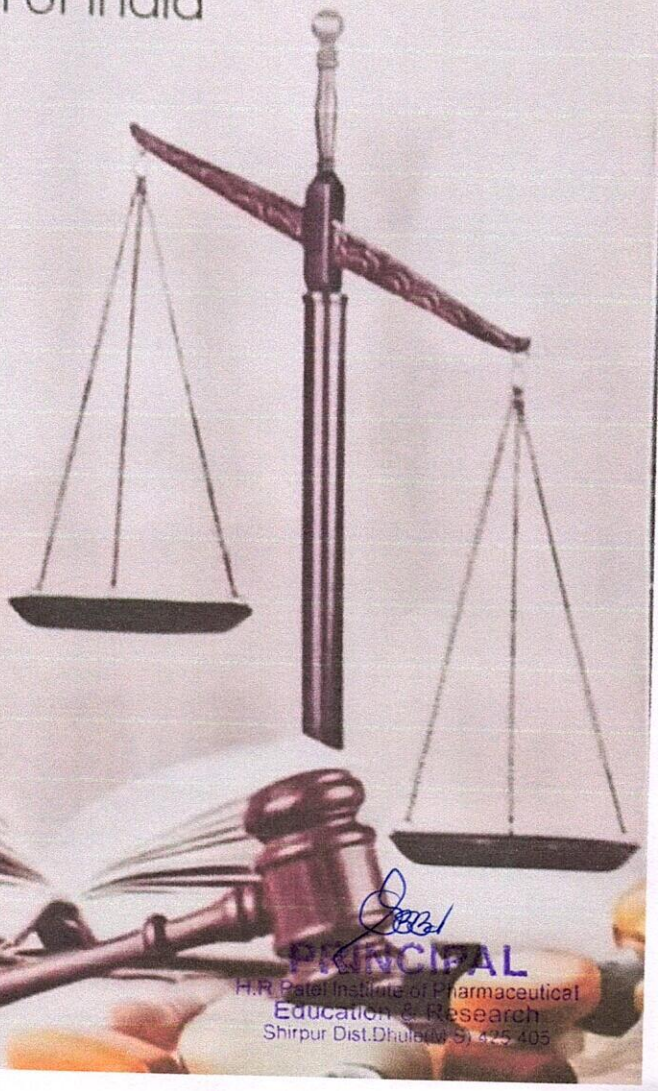

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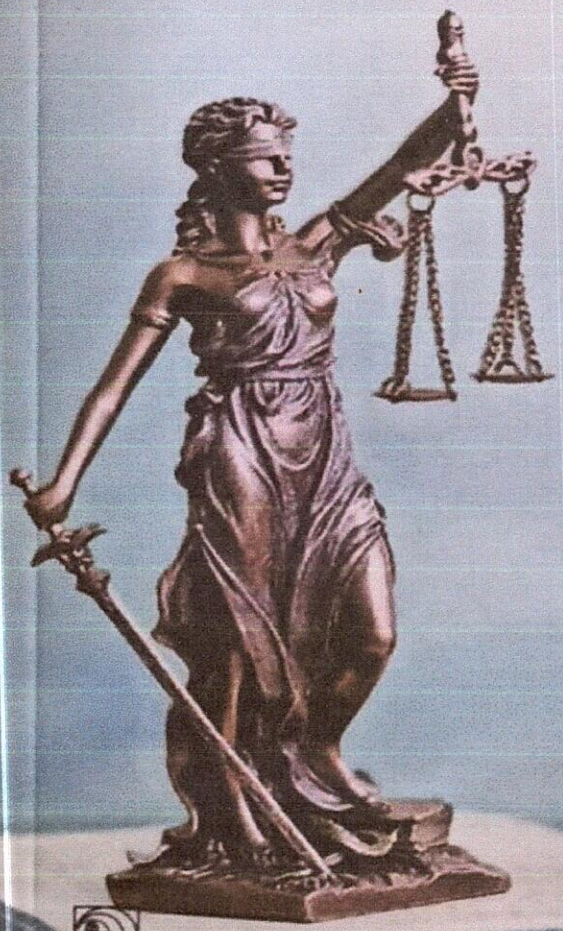

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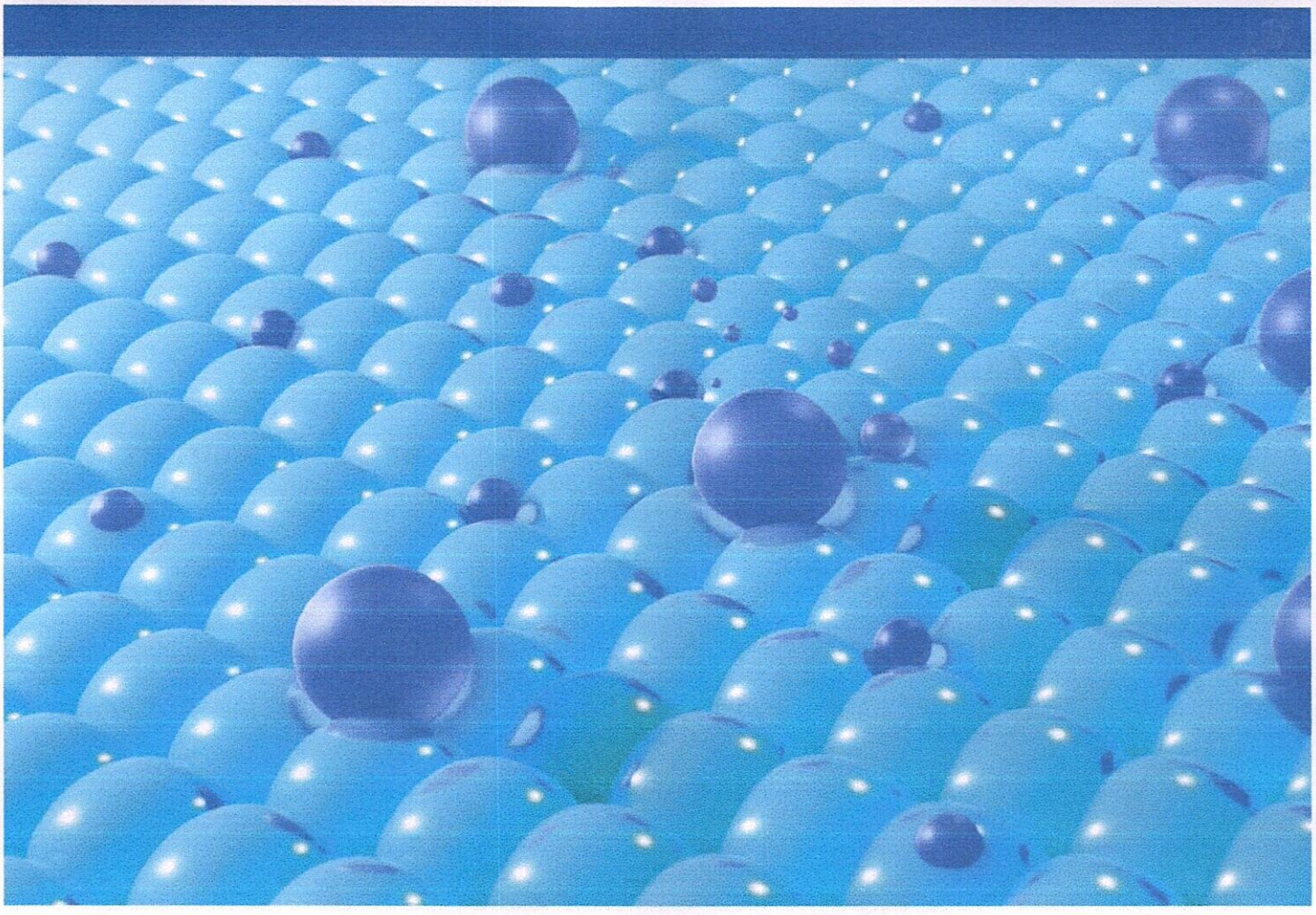

Topical and Transdermal Drug Delivery Systems

Applications and Future Prospects

Nayan A. Gujarathi | Juliana Palma Abriata
Raj Kumar Keservani | Anil K. Sharma
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CHAPTER 9

Skin Sensitivity and Irritation Testing for Transposing Transdermal Drug Delivery System

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ABSTRACT

Skin irritation and sensitivity evaluation is a major hurdle in current development, wherever newer formulations are come in market with differential composition and components. Each excipient or chemical must be tested for its irritant potential. Guidelines asserted by various regulating agencies, need to be considered before proceeding for test protocols. As per the current scenario adapted by regulatory authorities, the researcher selected an appropriate testing protocol like an in-vitro test methodology for determining irritant potential. Various underlying techniques are covered within this chapter to understand the methodologies used to test the irritant effect of chemicals. Researcher continuously working on simulating or

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Anindita Behera
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Polymeric nanoparticles for the treatment of solid tumors

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Passive and Active Targeting for Solid Tumors

Mahesh P. More, Prashant K. Deshmukh, Pravin O. Patil, Sopan N. Nangare, Rahul S. Tade, Ashwini G. Patil, Abhijeet Pandey, Srinivas Mutalik, Prashant B. Patil, Zamir G. Khan, and Vivek B. Borse

5.1 Introduction

Cancer is a disease condition where abnormally mutated cells are divided in an uncontrolled way which leads to complex malignancy, if untreated (Padhi et al. 2015). The associated complexities potentially affect every organ of human body. Cancer is the most devastating disease as more than seven million deaths are reported each year. The conventional chemotherapeutic approaches are unable to provide a sufficient recovery rate due to inherent drawbacks. In addition to chemotherapy, solid tumors are also being treated using surgery or laser therapy, or a combination thereof (Thakar et al. 2021).

Conventional approaches have their own limitations in terms of side effects, dosing level, dosing interval, patient safety, etc. There is a constant need to develop an economical approach for the delivery of the drugs to the targeted sites. The current developments in nanotechnology supports better preclinical or laboratory results but did not reach to the clinical or commercial level. The nanotechnology based

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Chapter 14
Polymer-Based Nanoplatforms for Targeting Breast Cancer

Rahul Shankar Tade, Pravin Onkar Patil, Sopan Namdev Nangare, Ashwini Ghanshyam Patil, Mahesh Prabhakar More, Prashant Krishnarao Deshmuk, Zamir Gaffar Khan, Abhieet Pandey, Sai Boddu, Dilip R. Patil, Srinivas Mutalik, Arun M. Patil, Sharad Wakode, and Sanjaykumar Baburao Bari

14.1 Introduction

Breast cancer remains the utmost feared disease among women with the highest mortality rate. It impacts about 2.1 million lives each year (DeSantis et al. 2019). Researchers speculate that soon breast cancer will be the major disease of concern in the health care system. Clinicians describe or classify by staging or grading systems. The systematic classification helps to find suitable or available treatment options along with the forecasting of treatment strategies (Harwansh and Deshmukh 2020; Tade and Patil 2020). The molecular as well as histological indications

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Chapter 16
Polymeric Nanoplatforms for the Targeted Treatment of Prostate Cancer

Sopan Namdev Nangare, Pravin Onakr Patil, Rahul Shankar Tade, Ashwini Ghanashyam Patil, Prashant Krishnarao Deshmukh, Abhijeet Pandey, Zamir Gaffar Khan, Srinivas Mutalik, Namdeo Ramhari Jadhav, Jayvadan Kantilal Patel, Mahesh Prabhakar More, and Sanjaykumar Baburao Bari

16.1 Introduction

Cancer is one of the world's principal public health problems (Fitzmaurice et al. 2015; Padhi and Behera 2020). It is the second-largest consequence of patient deaths and is accountable for seven million deaths annually (12.5% worldwide) (Orive et al. 2005; Siege et al. 2014). Followed by cardiovascular disease, cancer in the United States is the second most frequent cause of death with a total of 1,665,540 new cancer cases and 585,720 deaths in 2014 (Siege et al. 2014). More particularly, as per american cancer statistics evidence (2014), prostate cancer (233,000), female breast cancer (235,030), lungs/bronchus cancer (224,210), colon/rectum cancer (136,830) seems to be the most common forms of cancer (Salaam et al. 2018; Siege

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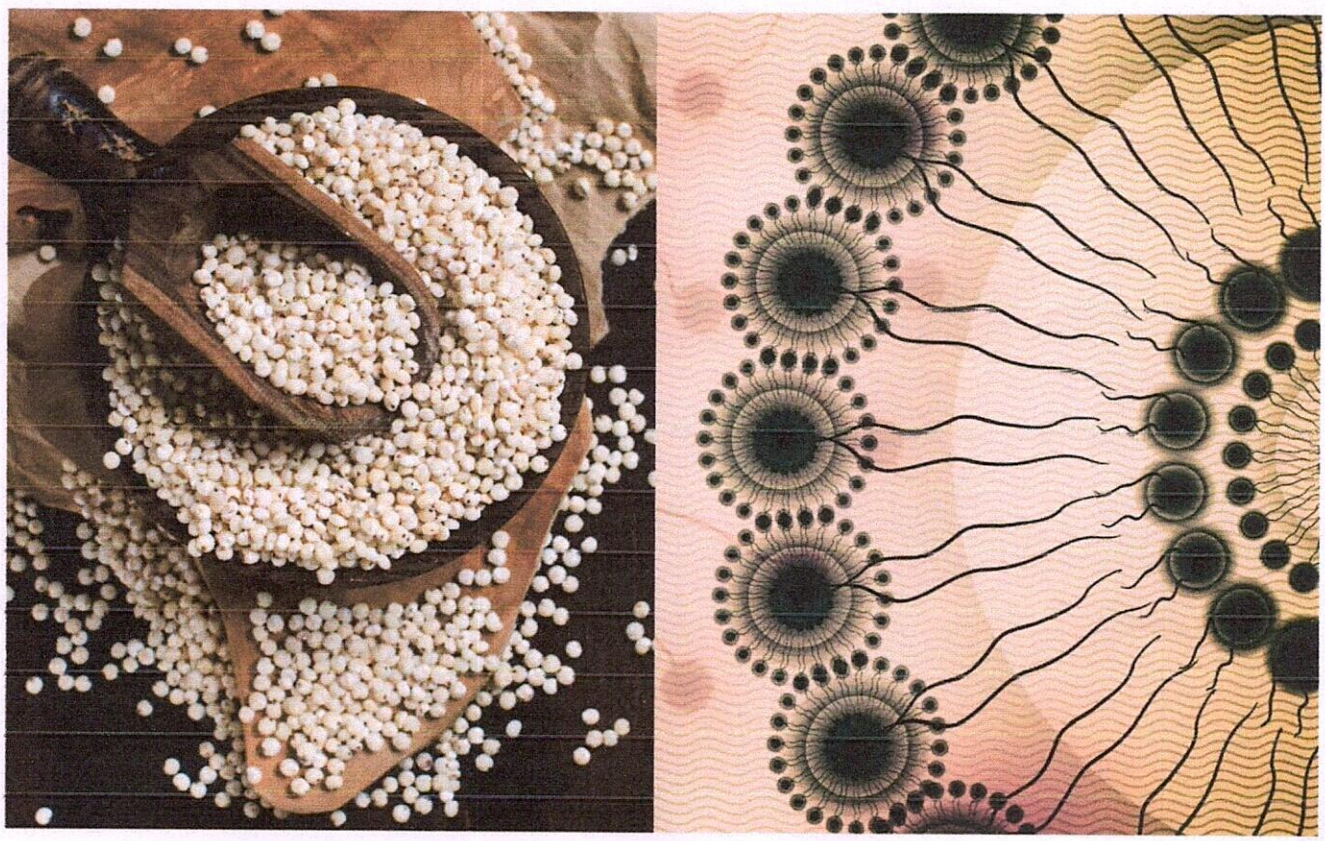

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CHAPTER 3

Solid Lipid Nanoparticles (SLNs): An Emerging Platform for Nutraceutical Delivery

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ABSTRACT

Current development in the science of nutraceuticals aims to improve the benefits of functional foods, including minerals, vitamins, and other dietary supplements (DS). Nano-nutraceuticals actively participate in the safe and effective delivery of dietary bioactive. Recent trends in the delivery of nutraceuticals, including medical nutrition, phytonutrients, and nutrition via solid lipid nanoparticles (SLNs), have emerged since the last few decades with the objective of controlled and targeted delivery. SLNs witnesses promising alternatives for various colloidal drug and nutraceuticals delivery systems viz., nanoemulsion, liposomes, and polymeric nanoparticles. The biodegradable and biocompatible nature of SLNs proves itself favorable among other polymeric nanoparticles. Furthermore, SLNs ensure better therapeutics by modifying nutrients release kinetics, bio-distribution, and greater uptake in tissues. Despite the potential ability of SLNs for nutrient delivery, their manufacturing still poses a challenge. USFDA (United States

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Chapter 4
Recent Updates on In Silico Screening of Natural Products as Potential Inhibitors of Enzymes of Biomedical and Pharmaceutical Importance

Mohini Patil, Samadhan Patil, Vijay L. Maheshwari, Laxmikant Zawar, and Ravindra H. Patil

Abstract Natural products from medicinal plants have been increasingly used in modern medicine due to their safety, efficacy, and lesser toxicity. World over, a large number of natural compounds are evaluated for the desired bioactivity. A wide range of phytoconstituents such as alkaloids, terpenoids, tannins, steroids, etc. have been recognized for their varying biological activities. However, obtaining the natural products with the desired bioactivity is a time-consuming and commercially difficult process. Molecular docking is used for screening known as well as novel drugs to identify novel compounds by predicting their binding mode and affinity. Moreover, in silico molecular docking can be performed to analyze their binding capabilities into the 3D structure of proteins. AutoDock and AutoDockTools are open-source techniques that have been extensively cited in the literature as essential tools in structure-based drug design. These methods are fast enough to permit the virtual screening of ligand libraries containing tens of thousands of compounds. This article highlights the recent developments in the virtual screening of enzyme inhibitors using various docking tools and their significant applications in designing potent inhibitors for the management of various metabolic and infectious diseases.

Keywords Natural products · Virtual screening · Molecular docking · In silico · AutoDock and AutoDockTools

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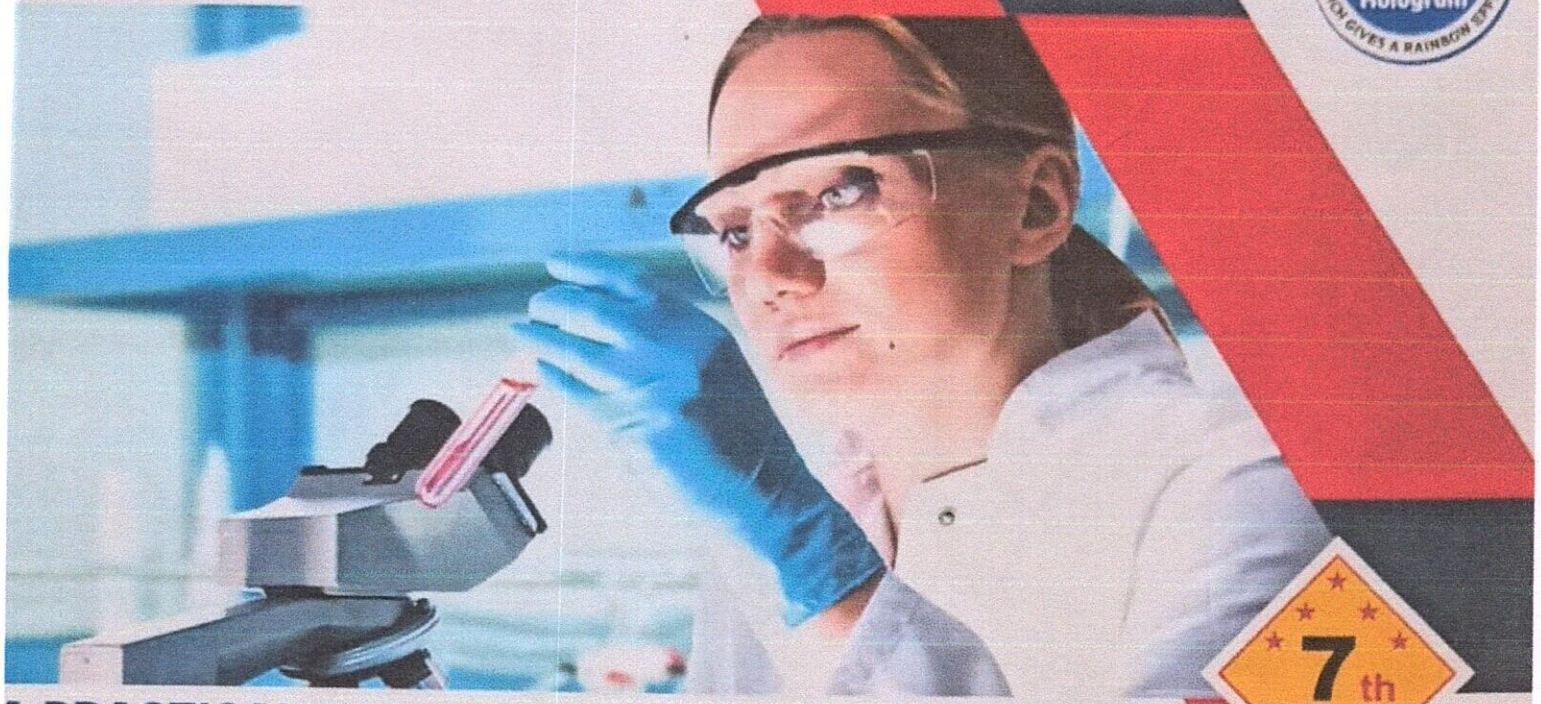

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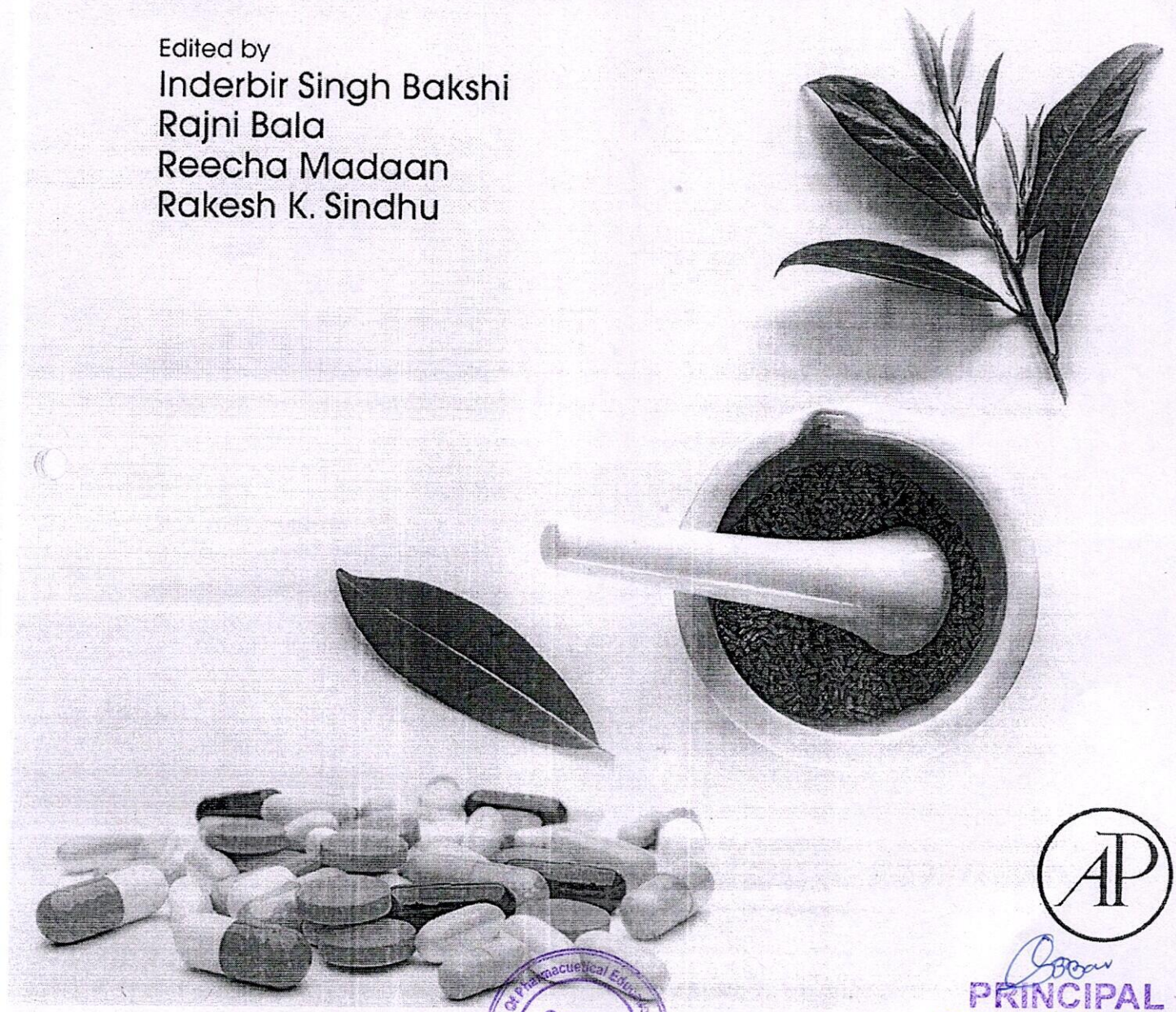

About the book

Description

Herbal Bioactive-Based Drug Delivery Systems: Challenges and Opportunities provides a wide-ranging, in-depth resource for herbal bioactives, including detailed discussion of standardization and regulations. The book first explores specific drug delivery systems such as gastrointestinal, ocular, pulmonary, transdermal, and vaginal and rectal. It then discusses novel applications for nano, cosmetics, nutraceuticals, wound healing and cancer treatment. Finally, there is a section focusing on standardization and regulation which includes an enhancement of properties. This book is an essential resource for pharmacologists, pharmaceutical scientists, material scientists, botanists, and all those interested in natural products and drug delivery systems developments.

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CHAPTER

14

Standardization of herbal bioactives

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14.1 Introduction

All over the world natural products from herbal origin and traditional systems of medication have been a trend for centuries. Indian system of medicine (Ayurveda, 3000 years old system) Babylon, Greek, and Roman systems furnish instructions for the preparation, formulation, and administration of the herbal medicines. According to one of the estimates, modern scientific investigation increases the awareness amongst world population for the use of natural products for primary healthcare needs (Farzaneh & Carvalho, 2015; Joana Gil-Chávez et al., 2013). Bioactive agents such as anthocyanins, flavonoids, alkaloids, phenolics, stilbenes, polysaccharides, essential oils, water-soluble vitamins and fats, have garnered attention as bioactive agents in management of various dangerous diseases (Ramawat, Dass, & Mathur, 2009). The toxic effects of synthetic drugs and their less availability for many chronic diseases has led to emergence of use of bioactive herbal constituents (Eisenberg et al., 1993; MacLennan, Wilson, & Taylor, 1996; Sawyer, Gannoni, Toogood, Antoniou, & Rice, 1994). Plant-based medicines have been used for general ailments for conditions such as hypersensitivity, carcinoma, hypertension, to dangerous diseases including cancers, diabetes, Alzheimer's diseases, and cardiovascular diseases (Andrae-Marobela, Ghislain, Okatch, & Majinda, 2013; Domian et al., 2009; Lacroix & Li-Chan, 2014; Liu et al., 2013; Shao & Xiao, 2013; Xiao, Muzashvili, & Georgiev, 2014; Zhu et al., 2020).

All over India around ~18,000 species of flowering plants are found of which 6000–7000 are estimated to have medicinal properties. Even to minimize the financial load on governments of developed country, the World Health Organization (WHO) encourages use of herbal medicine (Ravishankar & Shukla, 2008).

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Jayvadan K. Patel
Yashwant V. Pathak *Editors*

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Pharmacokinetics of Drug-in-Polymer Matrix-Based Nanoparticulate Drug Delivery System

9

Sopan Nangare, Prashant Patil, Ashwini Patil, Prashant Deshmukh, Trupti Powar, Jidnyasa Pantwalawalkar, Zamir Khan, Rahul Tade, Jayvadan K. Patel, and Pravin Patil

Contents

Abstract

The application of nanotechnology in drug delivery is gaining much attention from researchers due to their plethora of benefits especially in the improvement of pharmacokinetics as compared to conventionally available dosage forms. In this line, numerous advanced approaches have been adopted that demonstrated excellent applicability in the drug delivery systems. Despite this, they are lacking the foremost limitations related to absorption, distribution, metabolism, and excretion of the drug that affect the therapeutics of the active. Noteworthily, polymeric materials

Prashant Patil contributed equally with all other contributors.

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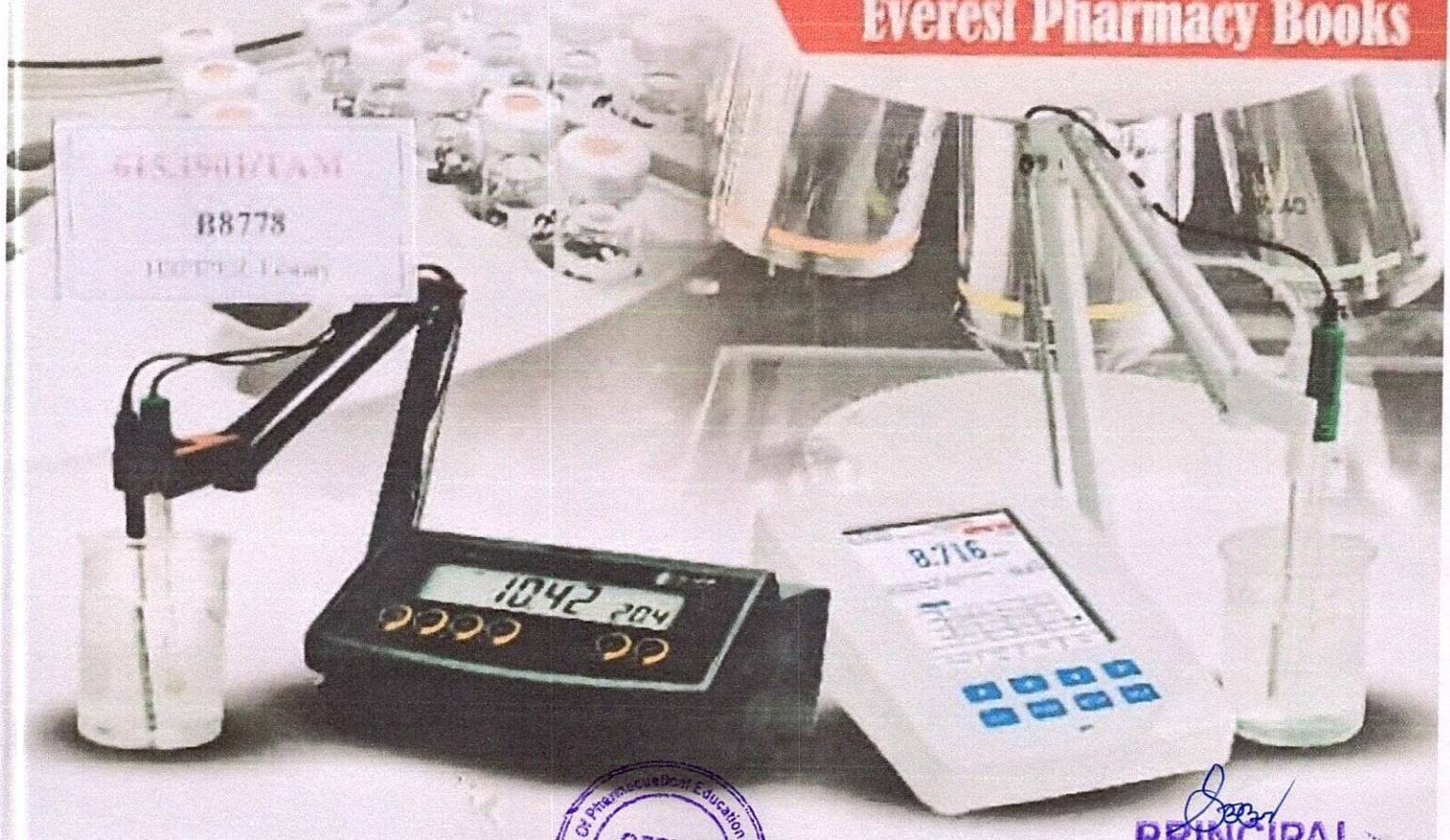

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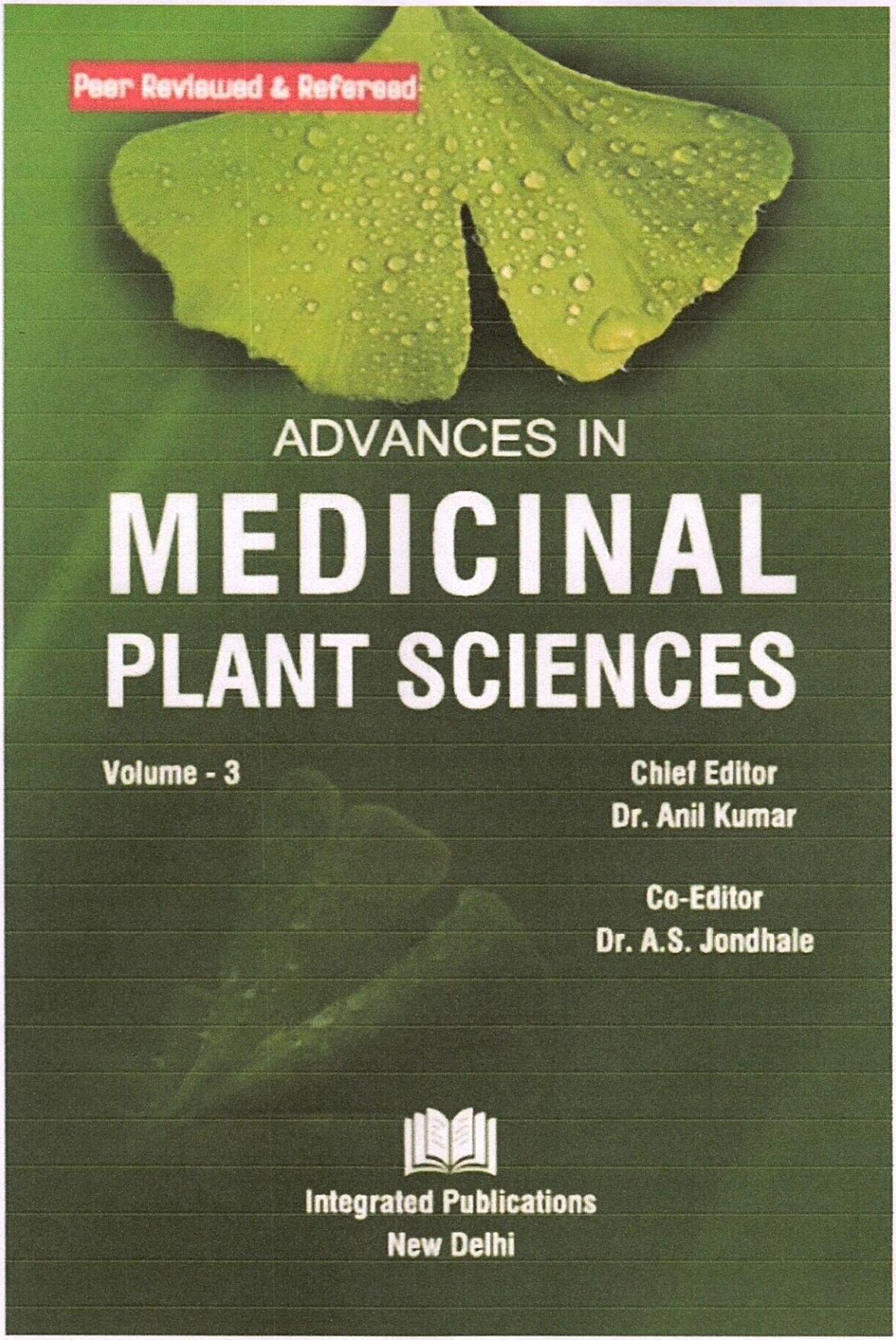

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Chapter - 7

A Review on Acacia Species of Medicinal Value

Swati P. Deshmukh

Abstract

Plants are used medicinally in different countries and are a source of many potent and powerful drugs. Various plants of Acacia species were claimed to possess traditional medicinal activities. Different parts of plant have different phytochemical constitution and different pharmacological action. Different species of Acacia have been reported, but only a few of these find medicinal importance out of which the prominent ones are Acacia nilotica, *Acacia polyacantha*, *Acacia leucocephala* and *Acacia farnesiana*. In light of this, the present review aims at exploring current scientific findings on the various plants of this specie. The present review mainly covers some of the important medicinal plants belonging to the *Acacia* spp. with special attention towards their various traditional uses, chemical constituents and medicinal properties.

Keyword: Acacia, scientific findings, traditional system of medicine

Introduction

The genus *Acacia* belongs to family Mimosaceae. *Acacia* Wild. is a very large genus containing trees, shrubs and climbers. It is indigenous to the Indian Sub-continent as also in Tropical Africa, Burma, Sri Lanka, Saudi, Arabia, Egypt and in West and East Sudan. In India, natural babul forests are generally found in Maharashtra, Gujarat, Andhra Pradesh, Rajasthan, Haryana and Karnataka. However, scattered trees in groups occur naturally and also widely planted in almost all states and Union territories except north-eastern states, Kashmir and Kerala [1]. It is estimated that there are roughly 1380 species of Acacia worldwide, about two-third of them native to Australia and rest of spread around tropical and subtropical regions of the world.

The Ayurveda system of medicine uses about 700 species, Unani 700, Siddha 600 and modern medicine around 30 species [2]. Plants are used medicinally in different countries and are a source of many potent and

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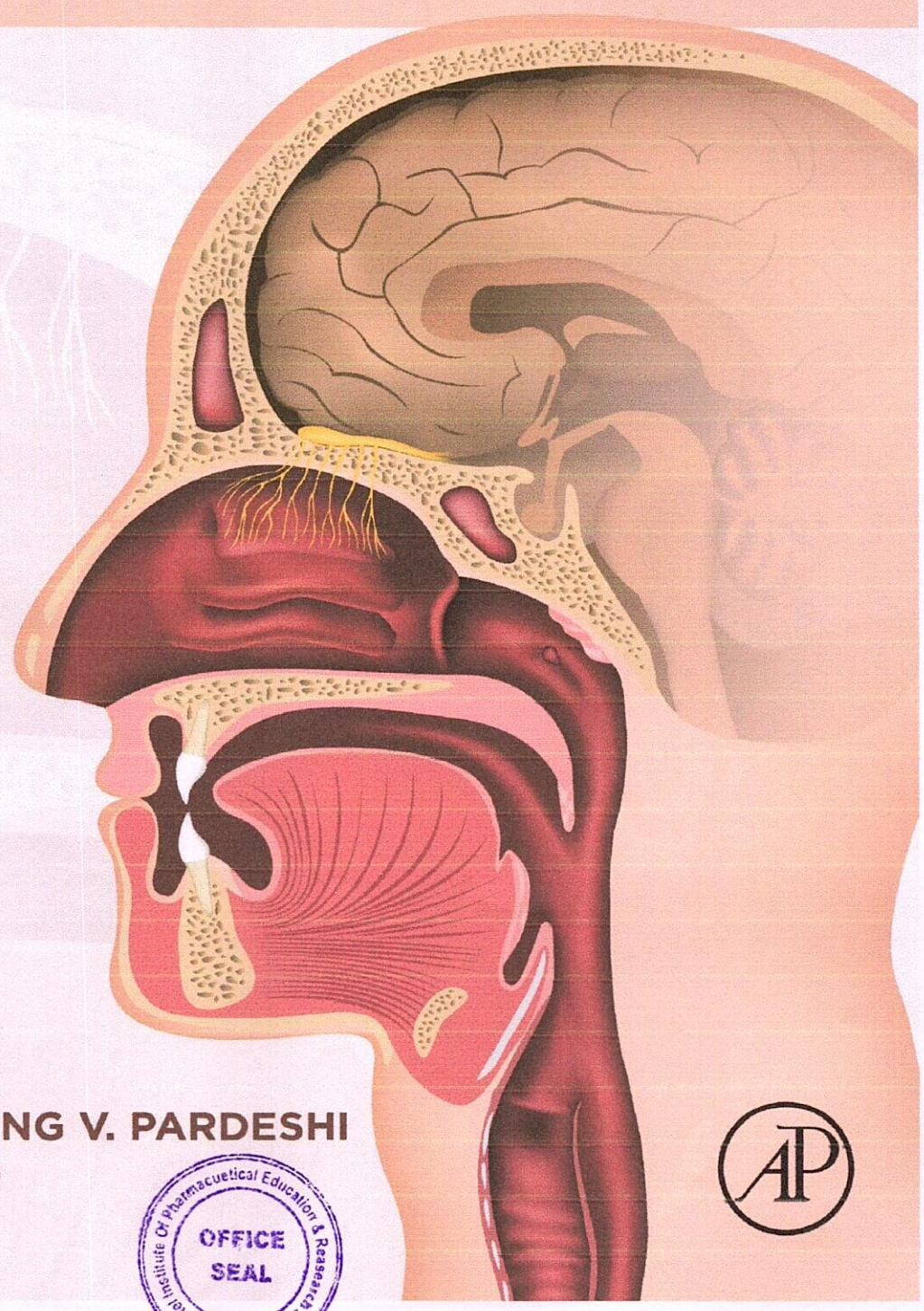

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Chapter 11

Vesicular carriers for direct nose-to-brain drug delivery

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Abbreviations

AD	Alzheimer's disease
AFM	atomic force microscopy
aMCI	amnestic mild cognitive impairment
BBB	blood-brain barrier
bFGF	basic fibroblast growth factor
CNS	central nervous system
CSF	cerebrospinal fluid
CTL	cytotoxic T lymphocytes
DCP	dicetyl phosphate
DLS	dynamic light scattering
DSPC	1,2-distearyl-sn-glycero-3-phosphocholine
FFF	field-flow fractionation
GI	gastrointestinal
HLB	hydrophilic-lipophilic balance
OL	odorranalectin
PC	phosphatidylcholine
SDS	sodium deoxycholate
TEM	transmission electron microscope
TP	tripalmitin
TS	tristearin
WHO	World Health Organization

11.1 Introduction

The nasal route of delivering the drug has significant historical background for achieving local effects. It was the time of early 1980s, which witnessed the emergence of nasal route as an important systemic delivery system and alternative to the conventional drug delivery routes available at that time. The oral route is one of the most promising and suited routes of administration for many drugs. But, there are some consequences like reduced bioavailability, first-pass effect, and gastric irritation, which forced the researchers to hunt for the alternative routes [1, 2].

The central nervous system (CNS) is one of the most complex systems of human body that assures the normal functioning of the human body such as of breathing, walking, talking, and thinking [3]. Nose-to-brain delivery route improves the specific targeting of drugs and dilutes the systemic side effects. The important feature of nose-to-brain delivery is that it bypasses the blood-brain barrier (BBB) and targets the drug to the brain via olfactory and trigeminal neural pathways [4, 5]. BBB is the dense network of blood vessels with tightly packed endothelial cells. BBB distinguishes the brain from circulatory system. It shields the brain from harmful substances viz. bacteria and toxins [6].

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Pharmacy Practice

Essentials of Hospital, Clinical and Community Pharmacy

Sanjaykumar B. Bari
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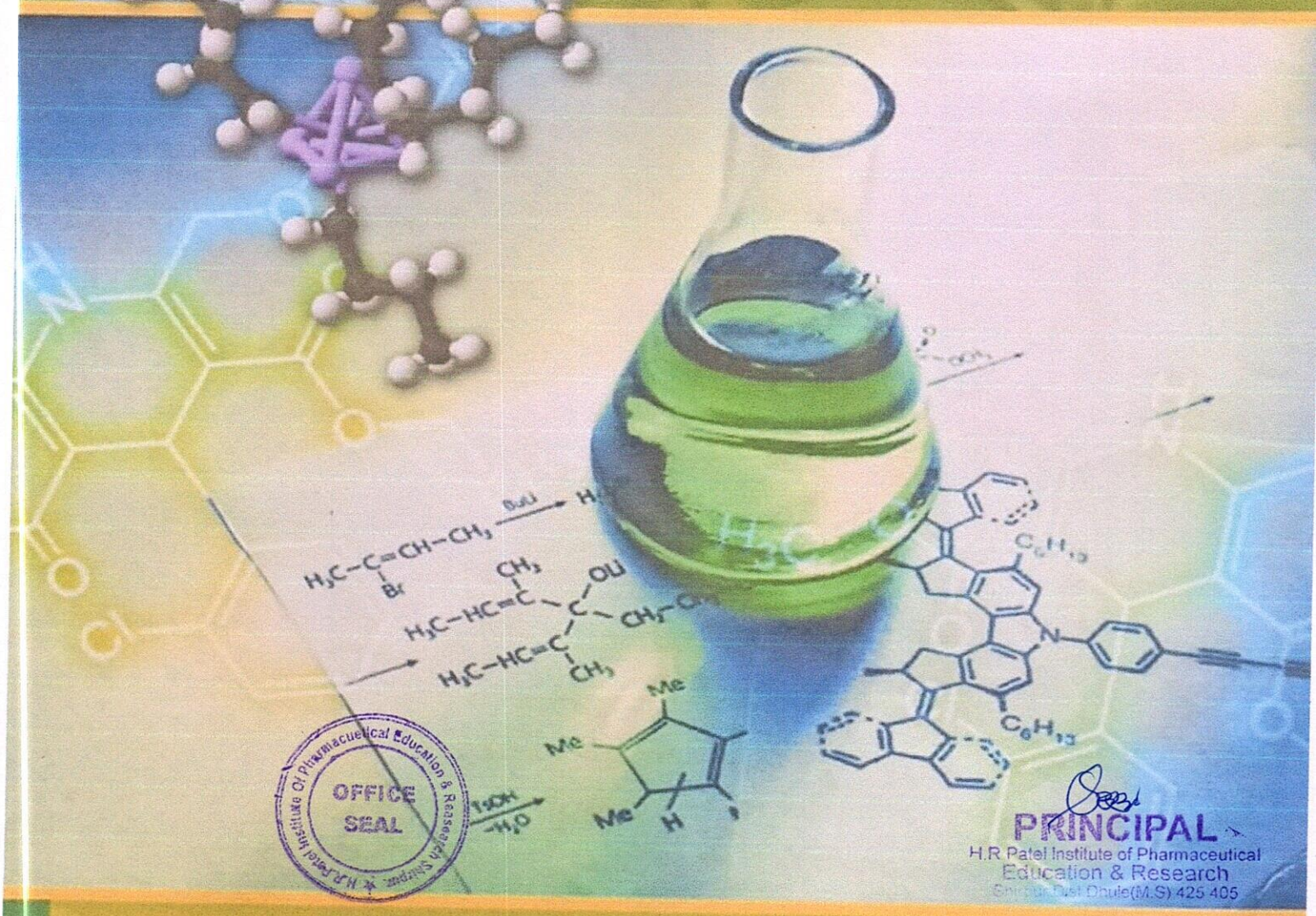

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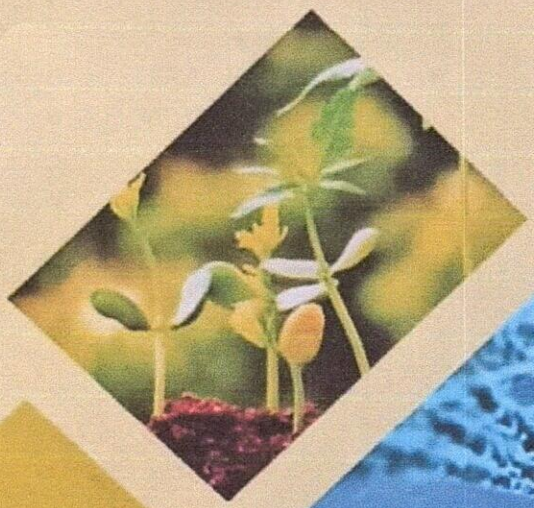

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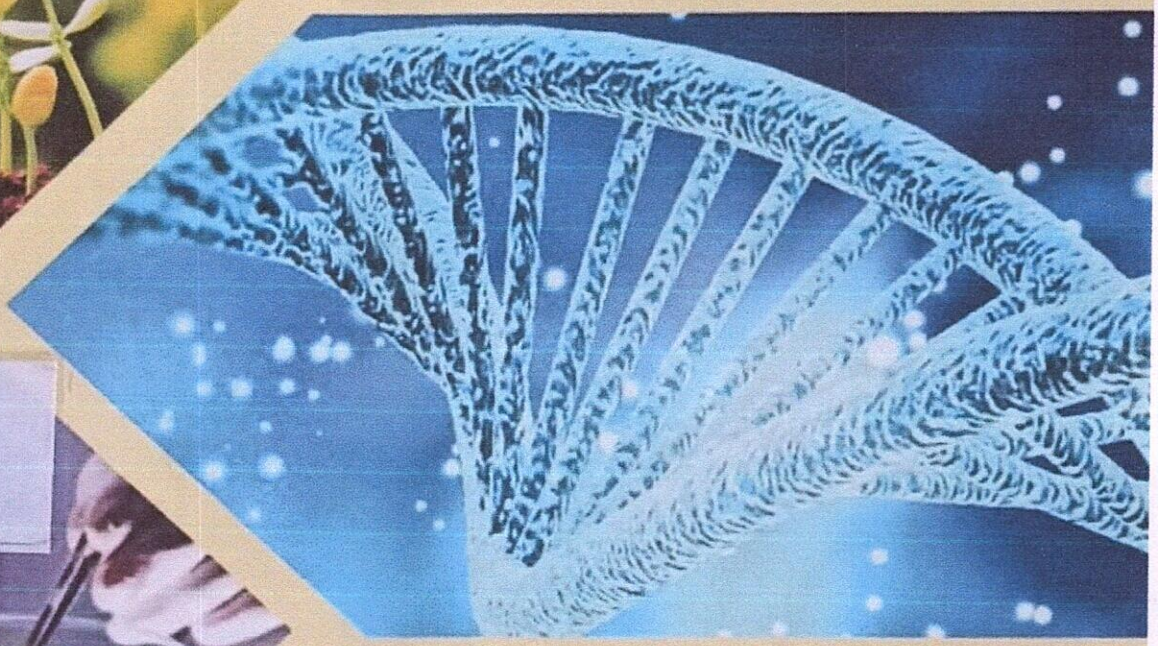

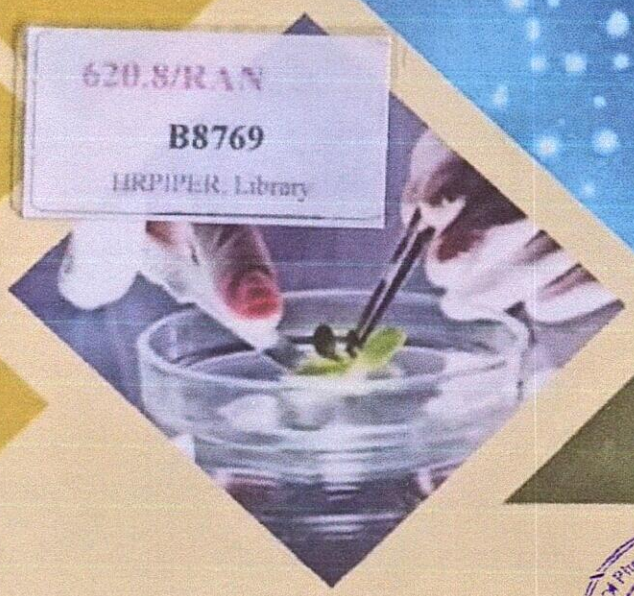

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CHAPTER 9

N-METHYL-D-ASPARTATE RECEPTOR ANTAGONISTS: EMERGING DRUGS TO TREAT NEURODEGENERATIVE DISEASES

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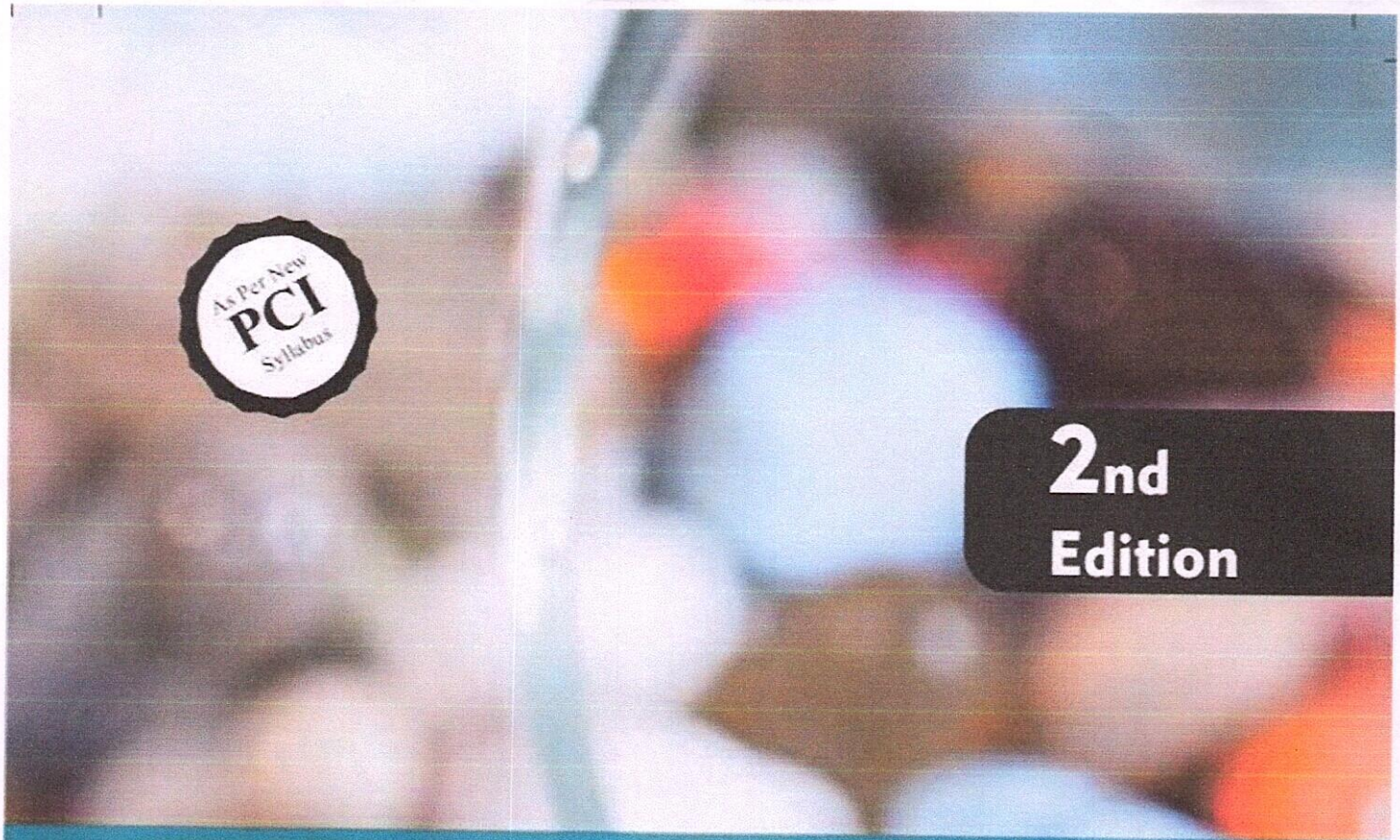
ABSTRACT

N-methyl-D-aspartate (NMDA) receptor is a subtype of ionotropic glutamate receptor. NMDA receptor plays a decisive role in significant high-level brain processes and has been involved in diverse neuropsychological conditions. NMDA receptor antagonists have exposed their clinical effectiveness in neurodegenerative diseases such as epilepsy, Alzheimer's disease, Parkinson's disease, pain, and depression. Depending on the clinical observations and insights into NMDA receptor pharmacology, novel modulatory approaches are beginning to emerge with potential therapeutic benefits. Hence, NMDA receptor is considered to be a prospective target for the treatment of neurodegenerative diseases. NMDA receptor has diverse sites where ligands can bind to provoke bioactivity in



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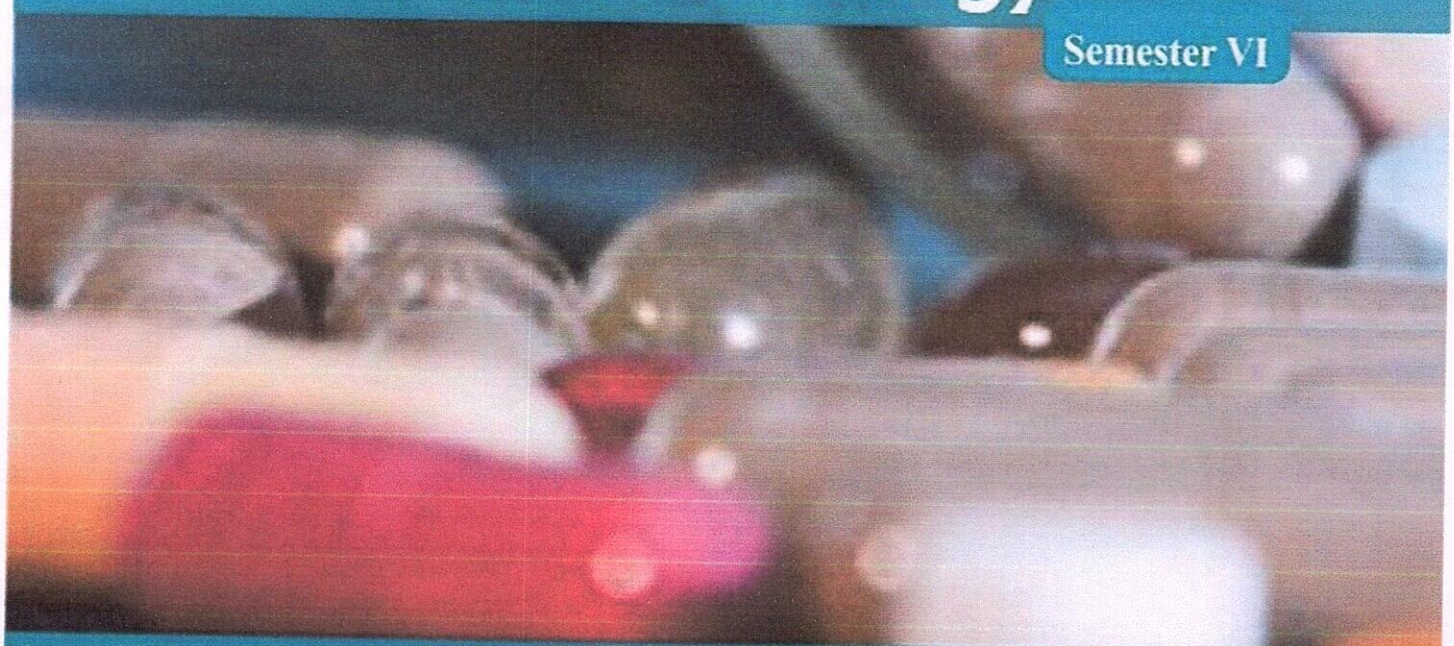

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About the Book

The book is intended for both undergraduate and postgraduate, with a view to encourage them to synthesize what they have learned in traditional courses on their way to making creative contributions in science. The authors claim that scientists already working in related fields will gain an appreciation for the vast sweep of microbial biotechnology, and that the book will be a useful source of information for the non-scientist. The book should indeed perform admirably in these roles, although its use to non-scientists is likely to be limited by the prerequisite specialist knowledge required for an understanding of the processes and approaches described. In the authors' preamble they say that they regard the book to be unique, because they make no artificial attempt to confine their discussion to a single scientific discipline.

The book examines the fundamental principles and facts that underline current practical applications of DNA, Fermentors and techniques of Biotechnology, detail study of genes and their analyses in bioinformatics describes these applications and examine future prospects for related technologies. As usual in books on biotechnology, judgments on appropriated categories of products for inclusion have been made. The reviewer considers the content to be appropriate but there are a few surprises.

Salient Features

- Text book of Pharmaceutical Biotechnology is a student friendly book which aims to simply understand the basic fundamentals of Pharmaceutical Biotechnology.
- Perfect merger of fundamentals of all the major areas of Pharmaceutical Biotechnology like Enzyme, Enzyme immobilization, Immunology, Antigen-Antibody Reaction, Monoclonal Antibodies, Recombinant DNA technology, Protoplast fusion, Gene therapy, Microbial Transformation, Industrial Biotechnology, Biomass and Bio-energy, Animal cell culture, Tissue culture, Healthcare Biotechnology, Biotechnology and Ethics.
- The new chapter describe the scientific discipline of mapping, sequencing and analyzing chromosomal genes by management and analysis of biological information of database in easiest manner for both undergraduate and postgraduate Pharmacy students.
- The text matter is simple, easy to read and remember.
- Additional tables, boxes and charts have been given to enhance the utility value of text.
- The outlines give practical based examples.

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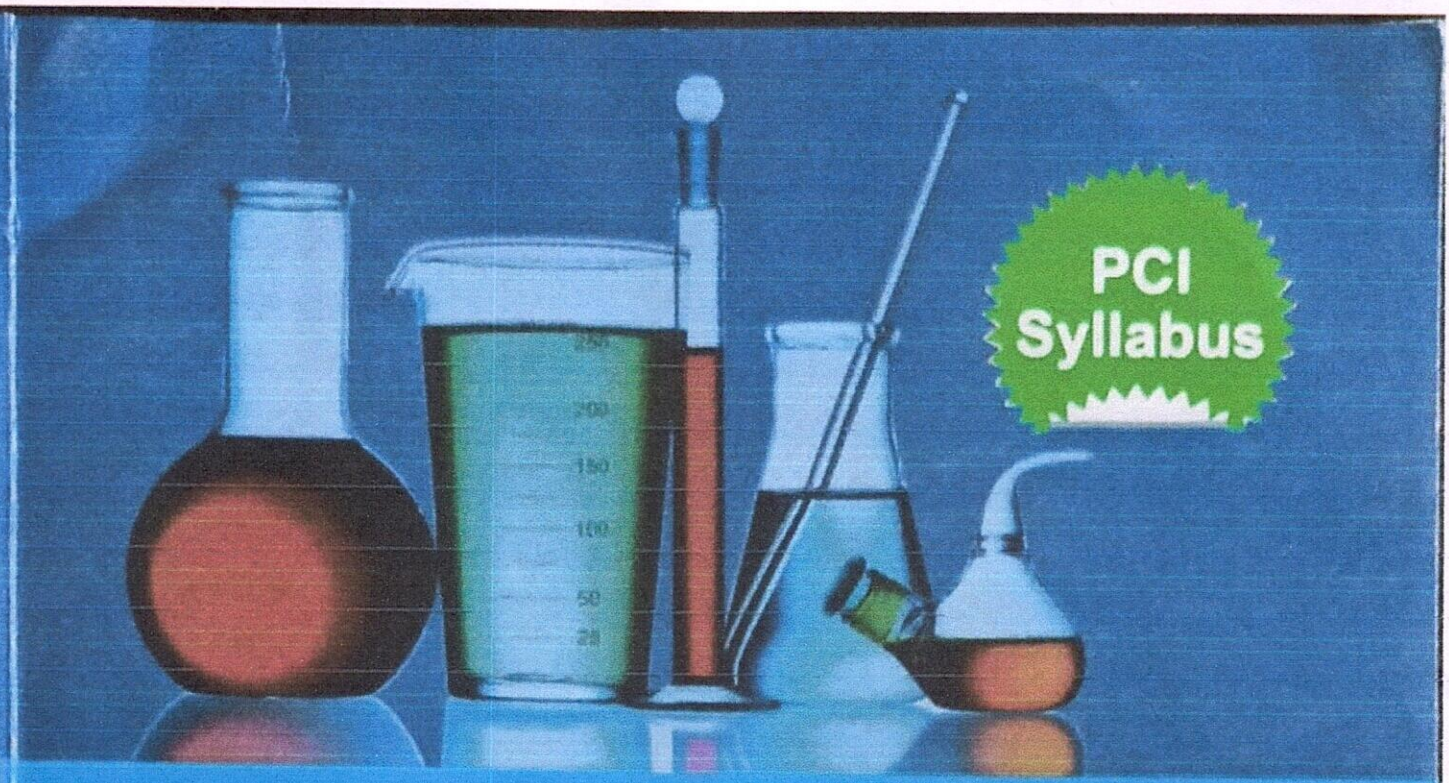

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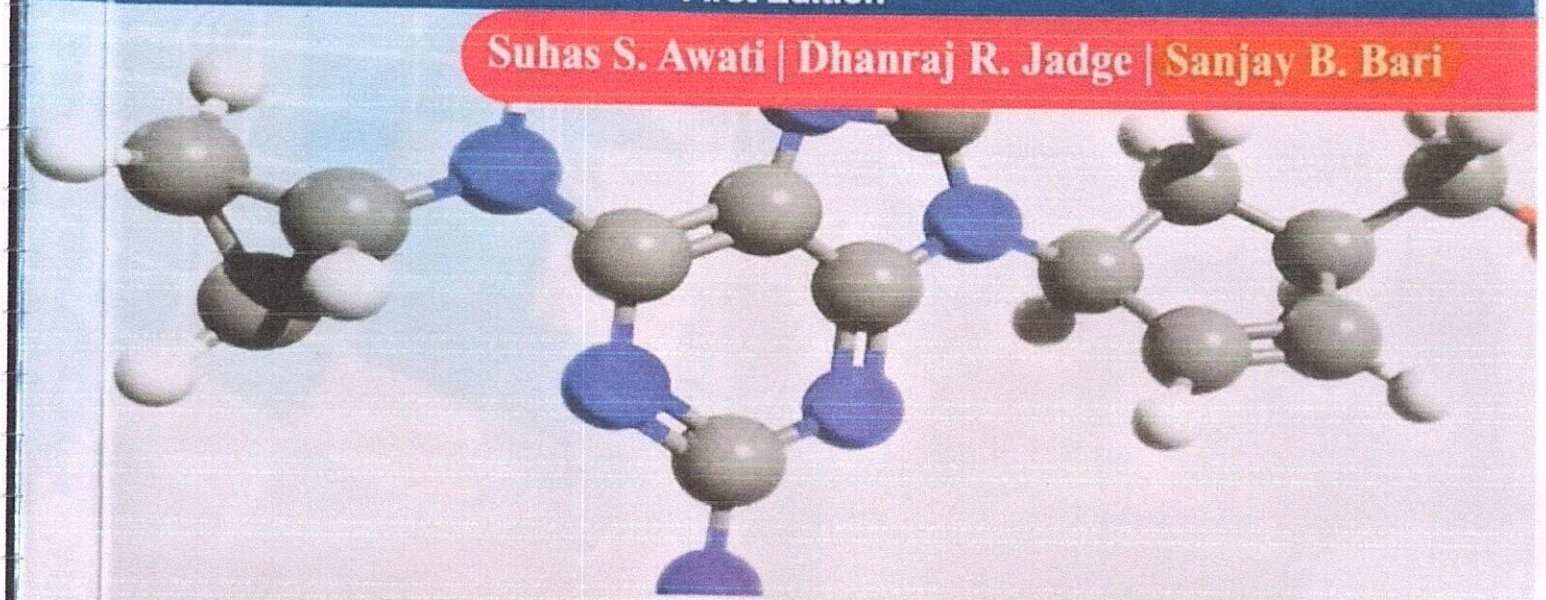

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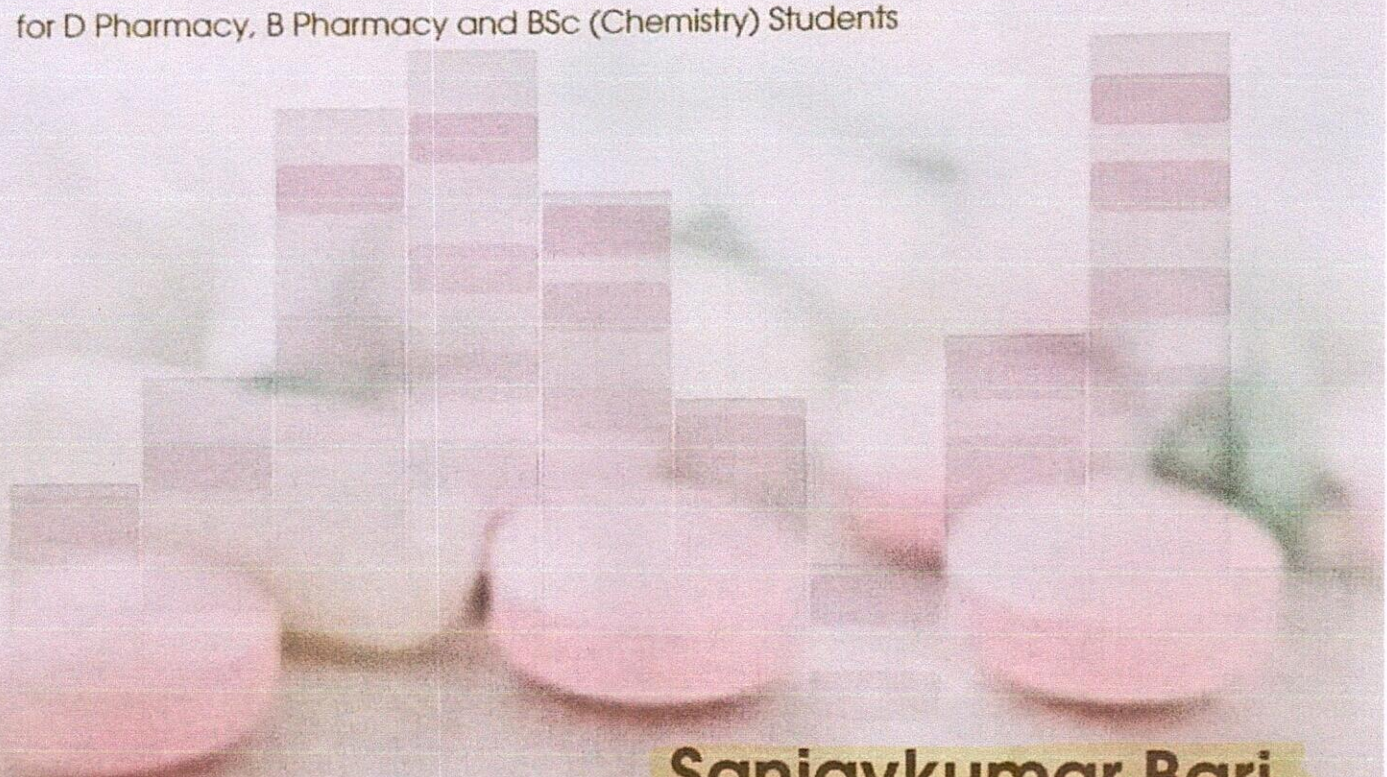

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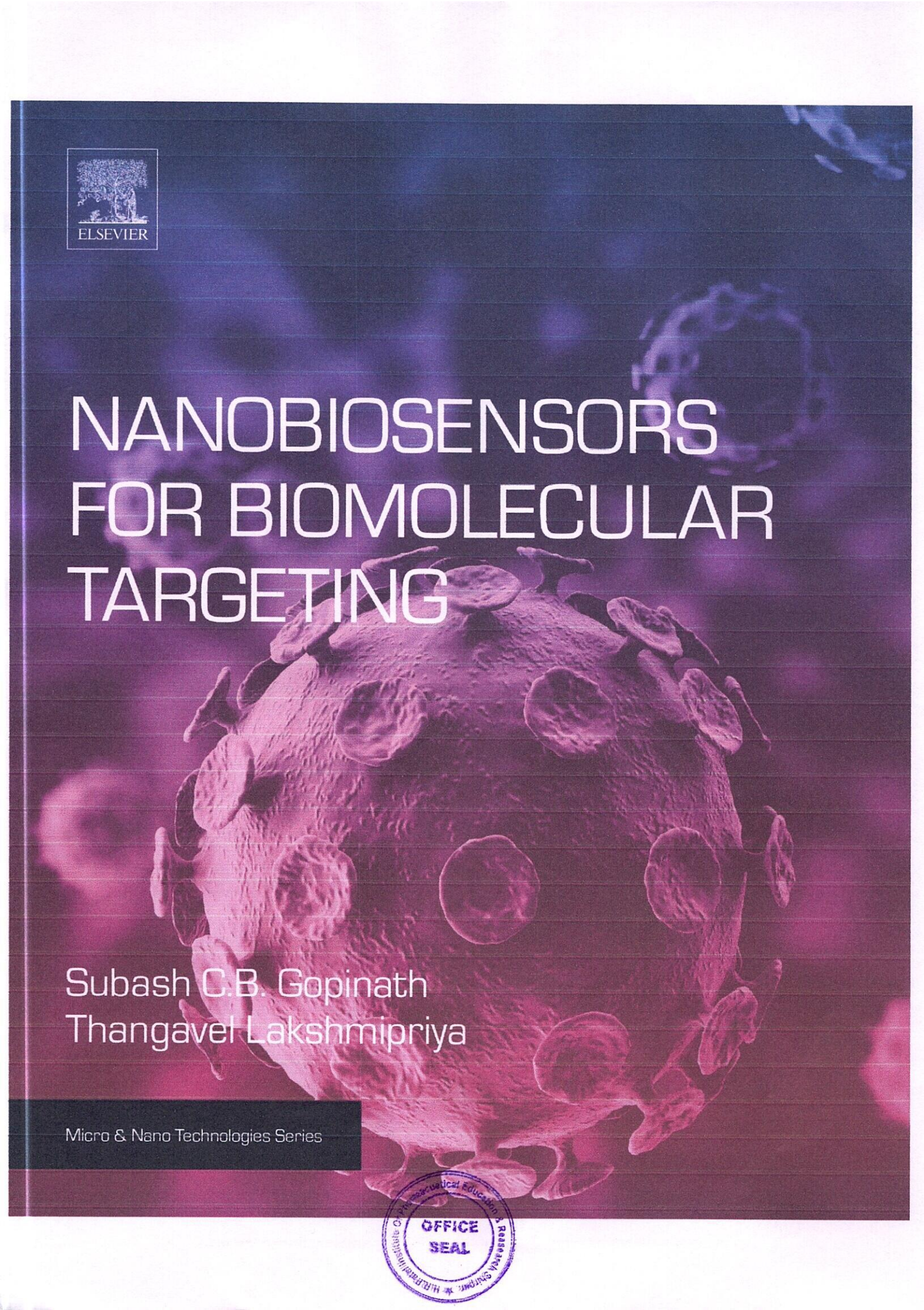
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7 Antibody-Mediated Diagnosis of Biomolecules

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7.1 Introduction

In the recent years of developmental research, significant improvement has been noticed in the performance of nanomaterial-based immunobiosensors. The classic immunoassay methods are improving day by day, as well as evolving into more robust, easy, and economical methods. In comparison with sensitivity and selectivity for the specific substrate, usability is of prime importance while designing biosensors. Until now, enzyme-based sensors have had the highest usability compared with other types of similar antibody-based sensors that are developed based on substrate specificity. Specifically, young researchers are focusing on the aspects based on substrates used for biosensing, which will be discussed in subsequent sections.

Development of immunosensors for detection of biomolecules in a rapid time frame with the highest sensitivity is a challenging task. The first biosensor was described in the literature in the early 1960s. In comparison with the upgraded development in enzyme-based biosensors, antibody-based sensors are still in nascent phases. In addition, they exhibit long response times, poor selectivity, and low sensitivity (Clark and Lyons, 1962). However, there has recently been an explosive advancement of research activities and biomolecular interaction studies (Nice and Catimel, 1999; Tess and Cox, 1999; Weetall, 1999).

The term "biosensor" is often used to cover sensor devices used in order to determine the concentration of substances and other parameters of biological interest, even where they do not utilize a biological system directly. Biosensors work by combining a biological sensing element with a detector system using a transducer (Malhotra et al., 2005). Leland Clark presented the glucose sensor in 1956, and provided the first description of a biosensor, the detection of which was based on an amperometric enzyme electrode that consisted of variation in the recorded electric impulse (Clark Jr, 1987, 1988). Biosensors are

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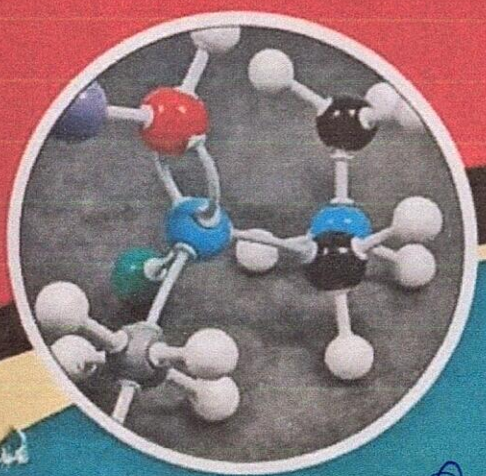

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