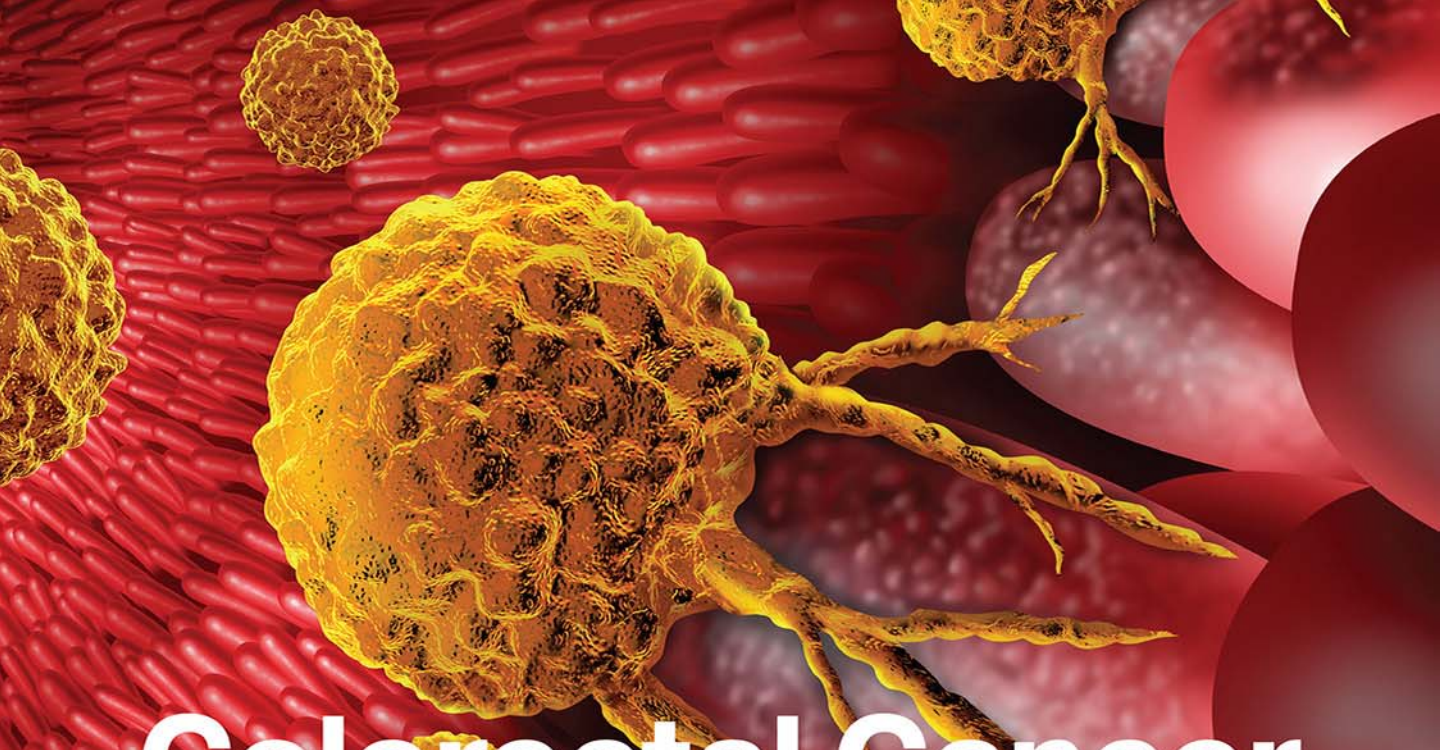
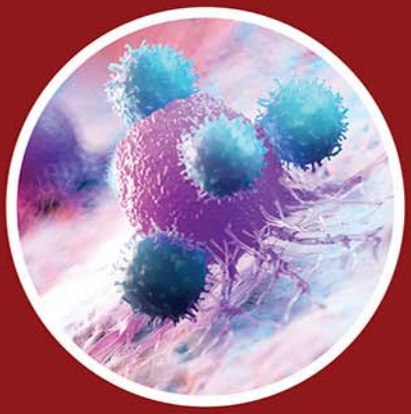


Colorectal Cancer

Disease and Advanced Drug Delivery Strategies



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Preface

Colorectal cancer is a life-threatening disease that impacts millions of individuals worldwide. It is the third most common cancer diagnosed in both men and women. It commonly begins as a small growth (polyp), which can become cancerous over time. Colorectal cancer can cause symptoms such as changes in bowel habits, bleeding, abdominal pain, weakness, and weight loss. If detected early, colorectal cancer can be treated with surgery, chemotherapy, radiation therapy, or other methods. However, many people are not screened for colorectal cancer or cannot access quality care. This book aims to educate and empower readers on colorectal cancer. Our book inspires hope and resilience in those affected by colorectal cancer, directly or indirectly. Our book aims to become an essential resource for healthcare professionals interested in colorectal cancer screening and treatment by sharing accurate and reliable information.

While the diagnosis of colon cancer can be overwhelming and frightening, it is important to know that many advances in research and treatment are helping improve patient outcomes. This book provides a comprehensive guide to the latest advances in the diagnosis, treatment, and research of colorectal cancer. The book is edited by Dr. Bhupendra G. Prajapati, Dr. Anil K. Philip, and Dr. Sankha Bhattacharya (Alka A., Alkeshkumar Patel, Archita Patel, Biswajit Basu, Ashwini Kishorchandra Bawankule, Lokesh Kumar Bhatt, Sankha Bhattacharya, Bhargav Chandegra, Vijay Chidrawar, Rupesh V. Chikhale, Mehul Chorawala, Paul David, Anindita De, Aarohi Despande, Kamal Dua, Shraddha Dubey, Ayon Dutta, Kevinkumar Garala, Aarohi Gherkar, Mangesh Godbole, Vora Hemangini, Ashwini Ingole, Bhuwan Joshi, Rachana Joshi, Mayur Kale, Dipanjan Karati, Shreyash Kolhe, Nirjari Kothari, Krishnakumar Kunnambath, Gowthamarajan Kuppusamy, Rahul Maurya, Deepak Mishra, Arun Mittal, Lucy Mohapatra, Shama N.A. Mujawar, Swarupananda Mukherjee, Satheeshkumar Nanjappan, Swati Pal, Rohini Palekar, Himanshu Paliwal, Aanshi Pandya. Sambit Kumar Parida, Akshay Parihar, Samir Gunvantbhai Patel, Maneesha Pathak, Prashant Pingale, Humzah Postwala, Lata Potey, Prajesh N. Prajapati, Vipul D. Prajapati, Khedekar Pramod, Nilesh Ramesh Rarokar, Swapnil Raut, Pooja Rawal, Salona D. Roy, Prafulla Madhukarrao Sabale, Vidya Sabale, Archana Negi Sah, Sauraj Sauraj, Aayushi Shah, Yesha Shah, Shraddha Shinde, Ruchi Shivhare, Princy Shrivastav, Samson Simon, Sachin Kumar Singh, Sudarshan Singh, Brijesh Taksande, Alok Shiomurti Tripathi, Milind Umekar, Aman B. Upaganlawar, Sable Vidya, Suchita Gulabrao

CHAPTER 10

Micro and nanoemulsions in colorectal cancer

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10.1 Introduction

Emulsions are heterogeneous systems in which a droplet of an immiscible liquid is spread throughout a liquid of another type. A further component or combination of emulsifying capabilities is added to this thermodynamically unstable solution to stabilize it kinetically [1]. Pharmaceutical research is constantly developing new drug delivery systems (DDS) and formulating them to improve the efficacy of existing medications due to the wide variety of drug delivery technologies.

10.2 Microemulsion

Hoar and Schulman proposed the idea of microemulsion (ME) in the 1940s after triturating a cloudy emulsion with hexanol to produce a transparent single-phase solution [2]. An immiscible liquid is dispersed in nanometric-sized droplets within another liquid to form an ME. MEs are created by simply combining the different parts (Fig. 10.1). ME [o/w or w/o] as a drug carrier system has drawn a lot of attention in recent years due to its improved drug solubilization, long shelf life, ease of preparation, modified drug release characteristic, enhanced bioavailability, etc. [3–5].

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