



# Nano Drug Delivery Strategies for the Treatment of Cancers

Edited by  
Awesh K. Yadav, Umesh Gupta, Rajeev Sharma



# NANO DRUG DELIVERY STRATEGIES FOR THE TREATMENT OF CANCERS

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ACADEMIC PRESS

An imprint of Elsevier

Academic Press is an imprint of Elsevier  
125 London Wall, London EC2Y 5AS, United Kingdom  
525 B Street, Suite 1650, San Diego, CA 92101, United States  
50 Hampshire Street, 5th Floor, Cambridge, MA 02139, United States  
The Boulevard, Langford Lane, Kidlington, Oxford OX5 1GB, United Kingdom

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#### **British Library Cataloguing-in-Publication Data**

A catalogue record for this book is available from the British Library

#### **Library of Congress Cataloging-in-Publication Data**

A catalog record for this book is available from the Library of Congress

ISBN: 978-0-12-819793-6

For Information on all Academic Press publications  
visit our website at <https://www.elsevier.com/books-and-journals>

*Publisher:* Stacy Masucci  
*Senior Acquisitions Editor:* Rafael E. Teixeira  
*Senior Editorial Project Manager:* Pat Gonzalez  
*Production Project Manager:* Niranjan Bhaskaran  
*Cover Designer:* Mark Rogers

Typeset by MPS Limited, Chennai, India



# Contents

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**List of contributors** xiii

**Preface** xv

## 1. Emergence of novel targeting systems and conventional therapies for effective cancer treatment 1

Laxmikant Gautam, Anamika Jain, Priya Shrivastava,  
Sonal Vyas and Suresh P. Vyas

- 1.1 Introduction 1
- 1.2 Conventional therapies for the treatment of cancer 2
  - 1.2.1 Role of surgery for cancer treatment 2
  - 1.2.2 Role of radiotherapy for cancer treatment 5
  - 1.2.3 Role of chemotherapy in cancer treatment 6
- 1.3 Novel approaches for the treatment of cancer 8
  - 1.3.1 Lipid-based nanomedicines 8
  - 1.3.2 Polymer-based nanomedicines 20
  - 1.3.3 Miscellaneous nanocarriers 25
- 1.4 Conclusion 27
- Acknowledgment 27
- References 27

## 2. Nanomedicine: future therapy for brain cancers 37

Shaguftha Haque, Caroline Celine Norbert and Chitta Ranjan Patra

- 2.1 Introduction 37
- 2.2 Global statistics of brain cancers 38
- 2.3 Major drawbacks and circumstances in brain tumors 39
- 2.4 General strategy of nanoparticles for the treatment of brain cancers 40
  - 2.4.1 Physical properties 40

- 2.4.2 Passive targeting 40
- 2.4.3 Active targeting 41
- 2.5 Mechanistic pathways employed by nanoparticles to cross the blood–brain barrier 41
  - 2.5.1 Carrier-mediated transport 41
  - 2.5.2 Receptor-mediated transport 42
  - 2.5.3 Adsorptive-mediated transport 43
- 2.6 Nanomedicine for the treatment and diagnosis of gliomas 43
- 2.7 Nanomedicine for the diagnosis of brain cancers 43
  - 2.7.1 Magnetic resonance imaging 44
  - 2.7.2 Raman scattering and computed tomography imaging 45
  - 2.7.3 Nanoparticles as carriers of fluorescent dyes for imaging tumors 45
  - 2.7.4 Nanoparticles as fluorescent agents for tumor imaging 48
- 2.8 Nanomedicine for the treatment of brain cancer 51
  - 2.8.1 Metal nanoparticles 51
  - 2.8.2 Liposomes 56
  - 2.8.3 Polymeric nanoparticles 58
  - 2.8.4 Dendrimers 60
- 2.9 Nanomedicines for brain cancer using a combinatorial approach 60
  - 2.9.1 Combination of magnetic resonance imaging and therapy 61
  - 2.9.2 Combination of optical imaging and therapy 63
  - 2.9.3 Combination of multimodal imaging and therapy 63
- 2.10 Future perspectives and challenges 64
- 2.11 Conclusion 65
- Acknowledgment 66
- Abbreviations 66
- References 67

3. Nano drug delivery strategies for the treatment and diagnosis of oral and throat cancers 75  
Sandra J. Perdomo, Angela Fonseca-Benítez, Andrés Cardona-Mendoza, Consuelo Romero-Sánchez and Jenny Párraga
- 3.1 Oral and throat cancers 75  
3.1.1 Conventional therapies for the management of oral cancers 75  
3.1.2 Cisplatin 76  
3.1.3 5-Fluorouracil 76  
3.1.4 Paclitaxel/docetaxel 76
- 3.2 Transport barriers to drug delivery in head and neck tumors 77
- 3.3 Nanotechnology in head and neck cancer detection and diagnosis 78  
3.3.1 Nano-based molecular imaging 79  
3.3.2 Nanotechnology-based drug delivery systems for the treatment of head and neck cancer 88
- 3.4 Conclusion 97  
References 97
4. Nanoparticles and lung cancer 107  
Sudha Vengurlekar and Subhash Chandra Chaturvedi
- 4.1 Introduction 107  
4.1.1 Cause, molecular target 108  
4.1.2 Traditional therapies for treatment 108  
4.1.3 Shortcomings with existing treatments 109
- 4.2 Nanotechnology and lung cancer 110  
4.2.1 Organic nanoparticles for lung cancer 111  
4.2.2 Inorganic nanoparticles for lung cancer 112  
4.2.3 Natural or biomaterials as nanoparticles 113  
4.2.4 Other novel nanoparticles systems for lung cancer 114
- 4.3 Conclusion 115  
References 116
5. Nanoparticles and liver cancer 119  
Mohammad Bayat and Davood Ghaidari
- 5.1 Introduction 119
- 5.2 Drug delivery to the liver with nanoparticles 120
- 5.3 Cellular uptake in vitro 124
- 5.4 Antitumor efficacy in vivo 126
- 5.5 Doxorubicin and lovastatin co-delivery liposomes 128  
5.5.1 Anticancer activity 129  
5.5.2 Histological analysis 130
- 5.6 Gold nanoparticles 130  
5.6.1 Gold nanoparticle thermal therapy 132  
5.6.2 Mechanism 134  
5.6.3 Antitumor effect in vivo 138
- 5.7 Toxicity 139
- 5.8 Conclusion 140  
References 140
6. Nanoparticles and pancreas cancer 145  
Akanksha Malaiya, Dolly Jain and Awesh K. Yadav
- 6.1 Introduction 145
- 6.2 Physiology of pancreatic cancer 145
- 6.3 Current scenario and epidemiology of pancreatic cancer 146
- 6.4 Treatment of pancreatic cancer 147
- 6.5 Mechanism of nanoparticle uptake in pancreatic cancer 148
- 6.6 Receptor for targeting pancreatic cancer 149  
6.6.1 Epidermal growth factor receptor 149  
6.6.2 CD44 receptor 149  
6.6.3 Folate receptor 150  
6.6.4 Transferrin receptor 150  
6.6.5 Vascular endothelial growth factor 150
- 6.7 Characterization techniques 151
- 6.8 Nanocarrier systems in the treatment of pancreatic cancer 151  
6.8.1 Nanoparticles 151  
6.8.2 Liposomes 155  
6.8.3 Carbon nanotubes 157  
6.8.4 Dendrimer 157  
6.8.5 Micelles 158  
6.8.6 Nanogel 158  
6.8.7 Quantum dots 159
- 6.9 Conclusion 159  
References 160

- 7. The role of nanoparticles in the treatment of gastric cancer 165**  
Kuldeep Rajpoot and Sunil K. Jain
- 7.1 Introduction 165
- 7.2 Nanoparticles in the imaging of gastric cancer 166
- 7.2.1 Nanoparticles in systemic imaging 167
- 7.2.2 Other ways of imaging 170
- 7.3 Nanoparticles in the detection of tumors 172
- 7.3.1 Nanoparticles in the early detection of gastric cancer via endoscopy 172
- 7.3.2 Nanoparticles in the detection of gastric cancer using biomarkers 173
- 7.3.3 Nanoparticles in the detection of circulating tumor cells in gastric cancer 173
- 7.4 Nanoparticle-based therapy of gastric cancer 174
- 7.4.1 Chitosan nanoparticles 174
- 7.4.2 Polymeric nanoparticles 175
- 7.4.3 Silver nanoparticles 177
- 7.4.4 Gold nanoparticles 178
- 7.4.5 Magnetic nanoparticles 178
- 7.4.6 Carbon nanotubes 178
- 7.4.7 Photodynamic therapy 179
- 7.4.8 Miscellaneous 179
- 7.5 Conclusion 179
- Disclosure statement 180
- Abbreviations 180
- References 181
- 8. Nanoparticles and colon cancer 191**  
Priya Shrivastava, Rajeev Sharma, Laxmikant Gautam, Sonal Vyas and Suresh P. Vyas
- 8.1 Introduction 191
- 8.2 Molecular biology of colon cancer 193
- 8.2.1 Adenoma–carcinoma sequence 193
- 8.2.2 Genetic mutations 194
- 8.2.3 Biomarkers 194
- 8.3 Conventional treatment options for colon cancer and their limitations 203
- 8.3.1 Surgical resection 203
- 8.3.2 Radiation therapy 204
- 8.3.3 Chemotherapy 204
- 8.3.4 Targeted therapy 204
- 8.3.5 Immunotherapy 206
- 8.4 Nanoparticles: the modern trends in the treatment of colon cancer 206
- 8.4.1 pH-responsive nanoparticles 207
- 8.4.2 Liposomes 208
- 8.4.3 Polymeric nanoparticles 209
- 8.4.4 Solid lipid nanoparticles 213
- 8.4.5 Metallic nanoparticles 213
- 8.4.6 Magnetic nanoparticles 214
- 8.4.7 Viral nanoparticles 215
- 8.4.8 Polymeric micelles 216
- 8.4.9 Hydrogel 216
- 8.4.10 Polymerosomes 217
- 8.4.11 Carbon nanotubes 217
- 8.5 Conclusion 218
- Acknowledgment 218
- Conflict of interest 219
- References 219
- 9. Treating blood cancer with nanotechnology: A paradigm shift 225**  
Chinmay Thakur, Pallavi Nayak, Vijay Mishra, Mayank Sharma and Gaurav K. Saraogi
- 9.1 Introduction 225
- 9.2 Cancer statistics 226
- 9.3 Blood cancer 226
- 9.4 Types of blood cancer 228
- 9.5 Pathophysiology of blood cancer 228
- 9.6 Therapies for blood cancer 229
- 9.6.1 Gene therapy 229
- 9.6.2 Chemotherapy 229
- 9.6.3 Immunotherapy 230
- 9.6.4 Radiation therapy 230
- 9.6.5 Advancements in blood cancer treatment 231
- 9.7 Nanotechnology in treatment of cancer 231
- 9.7.1 Nanoparticles 233
- 9.7.2 Drug–protein conjugation 234
- 9.7.3 Liposomes 234
- 9.7.4 Polymeric nanoparticles 234
- 9.7.5 Dendrimeric nanoparticles 235
- 9.7.6 Quantum dots 235
- 9.7.7 Carbon nanotubes 235
- 9.7.8 Metal nanoparticles 235
- 9.7.9 Silver nanoparticles 236
- 9.7.10 Gold nanoparticles 236
- 9.7.11 Mesoporous silica nanoparticles 236
- 9.7.12 Properties of nanocarriers 236

- 9.8 Challenges and remedies in the treatment of leukemia 237
- 9.8.1 Challenges 237
  - 9.8.2 Biological barriers 237
  - 9.8.3 Reticuloendothelial system 237
  - 9.8.4 Renal system 238
  - 9.8.5 Remedies 238
- 9.9 Diagnosis of blood cancer 239
- 9.9.1 Current theranostic approach 239
  - 9.9.2 Recent and ongoing clinical trials 240
- 9.10 Regulation aspects of nanotechnology-based tools 241
- References 241
- 10. Nanoparticles and skin cancer 245**
- Vishal Gour, Poornima Agrawal, Vikas Pandey, Indu Lata Kanwar, Tanweer Haider, Rahul Tiwari and Vandana Soni
- 10.1 Introduction 245
  - 10.2 Classification of skin cancer 247
    - 10.2.1 Nonmelanoma skin cancer 248
    - 10.2.2 Malignant melanoma 248
  - 10.3 Pathogenesis of skin cancer 248
    - 10.3.1 Ultraviolet radiation 248
    - 10.3.2 Immunosuppression and organ transplant recipients 249
    - 10.3.3 Human papillomavirus 250
  - 10.4 Detection of skin cancer 250
  - 10.5 Skin cancer treatment modalities 251
    - 10.5.1 Curettage and electrodesiccation 251
    - 10.5.2 Cryotherapy 251
    - 10.5.3 Photodynamic therapy (PDT) 253
    - 10.5.4 Radiation therapy 253
    - 10.5.5 Hedgehog pathway inhibitors 253
    - 10.5.6 Nonbiologics 254
    - 10.5.7 Synthetic chemotherapeutic agents 254
    - 10.5.8 Natural-origin bioactives 256
    - 10.5.9 Photosensitizers 258
    - 10.5.10 Miscellaneous products 259
    - 10.5.11 Biologics 259
  - 10.6 Nanocarriers as a potential tool for effective treatment of skin cancer 259
    - 10.6.1 Nanoparticles 259
  - 10.7 Conclusion 264
- References 264
- 11. Nanoparticles and prostate cancer 275**
- Ashish Garg, Sweta Garg and Nitin Kumar Swarnakar
- 11.1 Introduction 275
    - 11.1.1 Cancer 275
    - 11.1.2 Prostate gland and prostate cancer 275
  - 11.2 Nanotechnology 278
  - 11.3 Drug delivery 279
    - 11.3.1 Drug targeting toward tumor cells 280
    - 11.3.2 Active and passive targeting 280
  - 11.4 Routes of drug delivery to the prostate 281
    - 11.4.1 Systemic route 281
    - 11.4.2 Locoregional route 283
  - 11.5 Classification of nanoparticle systems for prostate targeting 285
    - 11.5.1 Liposomal nanoparticles in prostate cancer 285
    - 11.5.2 Albumin-bound system 286
    - 11.5.3 Polymeric nanoparticle systems for cancer treatment 287
    - 11.5.4 Carbon-based system 289
    - 11.5.5 Dendrimeric platform 289
    - 11.5.6 Quantum dot device 290
    - 11.5.7 Gold nanoparticulate system 290
    - 11.5.8 Metallic nanoparticle platform 292
    - 11.5.9 Nanocolloidal 295
  - 11.6 Treatment for prostate cancer: nanotechnology and prostate cancer 295
    - 11.6.1 Nanochemoprevention of prostate cancer 297
    - 11.6.2 Treatment of prostate cancer via gene delivery with nanomaterials 298
    - 11.6.3 Treatment of prostate cancer via cancer immunotherapy with nanomaterials 300
  - 11.7 Nanotechnology approach and prostate cancer diagnosis 301
    - 11.7.1 Nanotechnologies for fluorescence diagnosis of prostate cancer 302
    - 11.7.2 Targeted prostate-specific antigen nanoprobe for imaging prostate cancer 303
    - 11.7.3 Targeted prostate-specific membrane antigen nanoprobe for imaging prostate cancer 303

11.8 Conclusion	303
References	304
<b>12. Nanomedicine-based multidrug resistance reversal strategies in cancer therapy</b>	<b>319</b>
Rishi Paliwal, Shivani Rai Paliwal and Rameshroo Kenwat	
12.1 Introduction	319
12.2 Multidrug resistance in cancer therapy: a brief account	320
12.3 Mechanisms of multidrug resistance in cancer cells	320
12.3.1 Overexpression of P-glycoprotein efflux proteins	320
12.3.2 Xenobiotics	321
12.3.3 Tumor suppressor genes	321
12.3.4 Hypoxia	322
12.3.5 Autophagy	322
12.4 Novel strategies to combat multidrug resistance in cancer therapy	322
12.5 Nanomedicine-based multidrug resistance reversal strategies	322
12.6 Multidrug resistance in cancer therapy: the case of doxorubicin	323
12.7 Multidrug resistance reversal of doxorubicin-loaded nanomedicines	325
12.7.1 Nanomedicine coloaded with small interfering RNA and doxorubicin	325
12.7.2 Nanomedicine coloaded with P-gp efflux inhibitors and doxorubicin	329
12.7.3 Nanomedicine coloaded with D- $\alpha$ -tocopherol polyethylene glycol 1000 succinate and doxorubicin	331
12.7.4 Miscellaneous approaches	333
12.8 Conclusion	335
12.8.1 Grant support	335
Abbreviations	336
References	336
<b>Index</b>	<b>341</b>



# The role of nanoparticles in the treatment of gastric cancer

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## 7.1 Introduction

Cancer was first exposed in 1500 BCE. Since then, various approaches have been introduced and utilized to fight it, but still, no significant success has been attained (Sudhakar, 2009). In context of gastric cancer (GC), it is ranked as the fourth most frequently occurring type of cancer, and also proves to be a leading cause of mortality, predominantly in East Asia (Leake et al., 2012). Numerous factors (Fig. 7.1) that are linked are responsible for this deadly cancer. Moreover, GC may be host linked, environment related, or from bacterial sources. A few ethnic groups might be highly prone to it compared to other groups (Piazuelo & Correa, 2013). Further, GC is a kind of localized-tumor with locoregional metastasis, which is a most important negative prognostic factor (Imano et al., 2012). It is difficult to cure GC as most patients are only diagnosed at advanced stages. In clinical practice, apart from early diagnosis, it is also important to diagnose a cancer at diverse stages and to ensure proper planning of surgical resection. However, techniques for diagnosis as well as available approaches for the treatment of GC are inadequate. Nevertheless, surgery has been regarded as one of the most recognized methods to treat GC to date. In this context, further innovative approaches are required to deal with GC (Orditura et al., 2014). The diagnosis of GC includes (1) tumors imaging (i.e., regular systemic as well as locoregional imaging) in GC, (2) the detection of tumors in the primary stage using the endoscopy method or GC associated biomarkers, and (3) the detection of circulating tumor cells (CTCs) of GC.

The exceptional physicochemical aspects of nanomedicine have made it a vital candidate in theranostics applications. The incorporation of nanotechnology in medical applications is termed as nanomedicine. Moreover, illnesses in the stomach have been treated via many novel drug carrier systems such as microspheres (Jain, Patel, Rajpoot, & Jain, 2019; Patrey, Rajpoot, Jain, & Jain, 2016), microbeads (Jain, Kumar, Kumar, Pandey, & Rajpoot, 2016; Jain, Prajapati,