Chapter 6

References

References

1. Bray F, Ferlay J, Soerjomataram I, Siegel RL, Torre LA, Jemal A. Global cancer statistics 2018: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. *CA Cancer J Clin*, 68(6), 394-424 (2018).

2. Sung H, Ferlay J, Siegel RL *et al.* Global cancer statistics 2020: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. *CA: Cancer J. Clin.*, 71(3), 209-249 (2021).

3. Abbott J, Beattie K, Montague D. The role of UK oncogene-focussed patient groups in supporting and educating patients with oncogene-driven NSCLC: results from a patient-devised survey. *Oncol Ther*, 9(1), 187-193 (2021).

4. Amarasinghe H, Ranaweera S, Ranasinghe T *et al.* Economic cost of tobacco-related cancers in Sri Lanka. *Tobacco control*, 27(5), 542-546 (2018).

5. Noronha V, Pinninti R, Patil VM, Joshi A, Prabhash K. Lung cancer in the Indian subcontinent. *South Asian J. Cancer*, 5(3), 95 (2016).

6. Walser T, Cui X, Yanagawa J *et al.* Smoking and lung cancer: the role of inflammation. *Proc. Am. Thorac. Soc.*, 5(8), 811-815 (2008).

7. Furrukh M. Tobacco smoking and lung cancer: perception-changing facts. *Sultan Qaboos Univ. Med. J.*, 13(3), 345 (2013).

8. Besaratinia A, Pfeifer GP. Second-hand smoke and human lung cancer. *The lancet oncology*, 9(7), 657-666 (2008).

9. Smith C, Perfetti T, Garg R, Hansch C. IARC carcinogens reported in cigarette mainstream smoke and their calculated log P values. *Food Chem. Toxicol* 41(6), 807-817 (2003).

10. Larsen JE, Minna JD. Molecular biology of lung cancer: clinical implications. *Clin. Chest Med*, 32(4), 703-740 (2011).

11. Wistuba II, Gazdar AF. Lung cancer preneoplasia. *Annu. Rev. Pathol. Mech. Dis.*, 1, 331-348 (2006).

12. Gardiner N, Jogai S, Wallis A. The revised lung adenocarcinoma classification—an imaging guide. *J. Thorac. Dis.*, 6(Suppl 5), S537 (2014).

13. Parikh P, Ranade A, Govind B *et al.* Lung cancer in India: Current status and promising strategies. *South Asian J. Cancer*, 5(3), 93 (2016).

14. Barta JA, Powell CA, Wisnivesky JP. Global epidemiology of lung cancer. *Ann. Glob. Health*, 85(1) (2019).

15. Brambilla E, Gazdar A. Pathogenesis of lung cancer signalling pathways: roadmap for therapies. *Eur Respirat J*, 33(6), 1485-1497 (2009).

16. Inamura K. Lung Cancer: Understanding Its Molecular Pathology and the 2015 WHO Classification. *Front Oncol*, 7, 193 (2017).

17. Dela Cruz CS, Tanoue LT, Matthay RA. Lung cancer: epidemiology, etiology, and prevention. *Clin Chest Med*, 32(4), 605-644 (2011).

18. Chen Z, Fillmore CM, Hammerman PS, Kim CF, Wong KK. Non-small-cell lung cancers: a heterogeneous set of diseases. *Nat Rev Cancer*, 14(8), 535-546 (2014).

19. Šileikienė V, Gurskytė V, Zeleckienė I, Bernotienė E, Čibiras S. Pulmonary artery coil embolisation prevented tumour progression in a patient with advanced squamous cell lung carcinoma. *Ups J Med Sci*, 125(3), 257-261 (2020).

20. Ng TG, Um HB, Forsberg M, Trivedi U, George J. Pulmonary large cell neuroendocrine carcinoma: a rare type of non-small cell lung cancer. *Cureus*, 13(4), e14734 (2021).

21. Riaz SP, Lüchtenborg M, Coupland VH, Spicer J, Peake MD, Møller H. Trends in incidence of small cell lung cancer and all lung cancer. *Lung Cancer*, 75(3), 280-284 (2012).

22. Zappa C, Mousa SA. Non-small cell lung cancer: current treatment and future advances. *Transl Lung Cancer Res*, 5(3), 288-300 (2016).

23. Gandini S, Botteri E, Iodice S *et al.* Tobacco smoking and cancer: a meta-analysis. *Int J Cancer*, 122(1), 155-164 (2008).

24. Fleiss JL, Gross AJ. Meta-analysis in epidemiology, with special reference to studies of the association between exposure to environmental tobacco smoke and lung cancer: a critique. *J Clin Epidemiol*, 44(2), 127-139 (1991).

25. Peto R, Darby S, Deo H, Silcocks P, Whitley E, Doll R. Smoking, smoking cessation, and lung cancer in the UK since 1950: combination of national statistics with two case-control studies. *BMJ*, 321(7257), 323-329 (2000).

26. Parsons A, Daley A, Begh R, Aveyard P. Influence of smoking cessation after diagnosis of early stage lung cancer on prognosis: systematic review of observational studies with meta-analysis. *BMJ*, 340, b5569 (2010).

27. Gu JD, Hua F, Mei CR, Zheng DJ, Wang GF, Zhou QH. HapMap-based study on the association between MPO and GSTP1 gene polymorphisms and lung cancer susceptibility in Chinese Han population. *Acta Pharmacol Sin*, 35(5), 636-644 (2014).

28. Marshall AL, Christiani DC. Genetic susceptibility to lung cancer light at the end of the tunnel? *Carcinogenesis*, 34(3), 487-502 (2013).

29. Toumazis I, Bastani M, Han SS, Plevritis SK. Risk-based lung cancer screening: A systematic review. *Lung Cancer*, 147, 154-186 (2020).

30. Brenner DR, Boffetta P, Duell EJ *et al.* Previous lung diseases and lung cancer risk: a pooled analysis from the international lung cancer consortium. *Am J Epidemiol*, 176(7), 573-585 (2012).

31. Wang H, Yang L, Zou L *et al.* Association between chronic obstructive pulmonary disease and lung cancer: a case-control study in Southern Chinese and a meta-analysis. *PLoS One*, 7(9), e46144 (2012).

32. Young RP, Hopkins RJ, Christmas T, Black PN, Metcalf P, Gamble GD. COPD prevalence is increased in lung cancer, independent of age, sex and smoking history. *Eur Respir J*, 34(2), 380-386 (2009).

33. Liang HY, Li XL, Yu XS *et al.* Facts and fiction of the relationship between preexisting tuberculosis and lung cancer risk: a systematic review. *Int J Cancer*, 125(12), 2936-2944 (2009).

34. Robinson LA, Jaing CJ, Pierce Campbell C *et al.* Molecular evidence of viral DNA in non-small cell lung cancer and non-neoplastic lung. *Br J Cancer*, 115(4), 497-504 (2016).

35. Ragin C, Obikoya-Malomo M, Kim S *et al.* HPV-associated lung cancers: an international pooled analysis. *Carcinogenesis*, 35(6), 1267-1275 (2014).

36. Yu Y, Yang A, Hu S, Yan H. Correlation of HPV-16/18 infection of human papillomavirus with lung squamous cell carcinomas in Western China. *Oncol Rep*, 21(6), 1627-1632 (2009).

37. Muñoz JP, González C, Parra B *et al.* Functional interaction between human papillomavirus type 16 E6 and E7 oncoproteins and cigarette smoke components in lung epithelial cells. *PLoS One*, 7(5), e38178 (2012).

38. Zhai K, Ding J, Shi HZ. HPV and lung cancer risk: a meta-analysis. *J Clin Virol*, 63, 84-90 (2015).

39. Jones RN, Hughes JM, Weill H. Asbestos exposure, asbestosis, and asbestos-attributable lung cancer. *Thorax*, 51 Suppl 2(Suppl 2), S9-15 (1996).

40. Hessel PA, Gamble JF, McDonald JC. Asbestos, asbestosis, and lung cancer: a critical assessment of the epidemiological evidence. *Thorax*, 60(5), 433-436 (2005).

41. Straif K, Benbrahim-Tallaa L, Baan R *et al.* A review of human carcinogens--Part C: metals, arsenic, dusts, and fibres. *Lancet Oncol*, 10(5), 453-454 (2009).

42. Gulumian M. An update on the detoxification processes for silica particles and asbestos fibers: successess and limitations. *J Toxicol Environ Health B Crit Rev*, 8(6), 453-483 (2005).

43. Samet JM. Residential radon and lung cancer: end of the story? *J Toxicol Environ Health A*, 69(7), 527-531 (2006).

44. Grosche B, Kreuzer M, Kreisheimer M, Schnelzer M, Tschense A. Lung cancer risk among German male uranium miners: a cohort study, 1946-1998. *Br J Cancer*, 95(9), 1280-1287 (2006).

45. Omenn GS, Goodman GE, Thornquist MD *et al.* Effects of a combination of beta carotene and vitamin A on lung cancer and cardiovascular disease. *N Engl J Med*, 334(18), 1150-1155 (1996).

46. Woodson K, Tangrea JA, Barrett MJ, Virtamo J, Taylor PR, Albanes D. Serum alpha-tocopherol and subsequent risk of lung cancer among male smokers. *J Natl Cancer Inst*, 91(20), 1738-1743 (1999).

47. Hosseini M, Naghan PA, Jafari AM *et al.* Nutrition and lung cancer: a case control study in Iran. *BMC Cancer*, 14, 860 (2014).

48. Pan SY, Johnson KC, Ugnat AM, Wen SW, Mao Y. Association of obesity and cancer risk in Canada. *Am J Epidemiol*, 159(3), 259-268 (2004).

49. Deneo-Pellegrini H, De Stefani E, Ronco A, Mendilaharsu M, Carzoglio JC. Meat consumption and risk of lung cancer; a case-control study from Uruguay. *Lung Cancer*, 14(2-3), 195-205 (1996).

50. Bandera EV, Freudenheim JL, Vena JE. Alcohol consumption and lung cancer: a review of the epidemiologic evidence. *Cancer Epidemiol Biomarkers Prev*, 10(8), 813-821 (2001).

51. Luo RX, Wu B, Yi YN, Huang ZW, Lin RT. Indoor burning coal air pollution and lung cancer--a case-control study in Fuzhou, China. *Lung Cancer*, 14 Suppl 1, S113-119 (1996).

52. Pope CA, 3rd, Burnett RT, Thun MJ *et al.* Lung cancer, cardiopulmonary mortality, and long-term exposure to fine particulate air pollution. *Jama*, 287(9), 1132-1141 (2002).

53. Loomis D, Grosse Y, Lauby-Secretan B *et al.* The carcinogenicity of outdoor air pollution. *Lancet Oncol*, 14(13), 1262-1263 (2013).

54. Matakidou A, Eisen T, Houlston RS. Systematic review of the relationship between family history and lung cancer risk. *Br J Cancer*, 93(7), 825-833 (2005).

55. Gu J, Hua F, Zhong D, Chen J, Liu H, Zhou Q. Systematic review of the relationship between family history of lung cancer and lung cancer risk. *Zhongguo Fei Ai Za Zhi*, 13(3), 224-229 (2010).

56. Coté ML, Liu M, Bonassi S *et al.* Increased risk of lung cancer in individuals with a family history of the disease: a pooled analysis from the International Lung Cancer Consortium. *Eur J Cancer*, 48(13), 1957-1968 (2012).

57. Krech RL, Davis J, Walsh D, Curtis EB. Symptoms of lung cancer. *J. Palliat. Med,* 6(4), 309-315 (1992).

58. Henschke CI, Yankelevitz DF, Libby DM, Pasmantier MW, Smith JP, Miettinen OS. Survival of patients with stage I lung cancer detected on CT screening. *N Engl J Med*, 355(17), 1763-1771 (2006).

59. Aokage K, Yoshida J, Hishida T *et al.* Limited resection for early-stage non-small cell lung cancer as function-preserving radical surgery: a review. *Jpn J Clin Oncol*, 47(1), 7-11 (2017).

60. Akhurst T. Staging of non-small-cell lung cancer. *PET Clin*, 13(1), 1-10 (2018).

61. Nooreldeen R, Bach H. Current and future development in lung cancer diagnosis. *Int J Mol Sci*, 22(16) (2021).

62. Collins LG, Haines C, Perkel R, Enck RE. Lung cancer: diagnosis and management. *Am Fam Physician*, 75(1), 56-63 (2007).

63. Petty TL, Tockman MS, Palcic B. Diagnosis of roentgenographically occult lung cancer by sputum cytology. *Clin Chest Med*, 23(1), 59-64 (2002).

64. Jin Y, Chen Z, Chen Q, Sha L, Shen C. Role and significance of bioactive substances in sputum in the diagnosis of lung cancer. *Zhongguo Fei Ai Za Zhi*, 24(12), 867-873 (2021).

65. Dasgupta A, Jain P, Minai OA *et al.* Utility of transbronchial needle aspiration in the diagnosis of endobronchial lesions. *Chest*, 115(5), 1237-1241 (1999).

66. Mineshita M, Morikawa K, Furuya N *et al.* Flexible bronchoscopy for lung cancer diagnosis in patients aged ≥85 years. *Geriatr Gerontol Int*, 22(1), 32-35 (2022).

67. Rivera MP, Detterbeck F, Mehta. Diagnosis of lung cancer: the guidelines. *Chest,* 123(1), 129S-136S (2003).

68. Shure D, Fedullo PF. Transbronchial needle aspiration in the diagnosis of submucosal and peribronchial bronchogenic carcinoma. *Chest*, 88(1), 49-51 (1985).

69. Chakraborty S, Rahman T. The difficulties in cancer treatment. *Ecancermedicalscience*, 6, ed16 (2012).

70. Riehemann K, Schneider SW, Luger TA, Godin B, Ferrari M, Fuchs H. Nanomedicine--challenge and perspectives. *Angew Chem Int Ed Engl*, 48(5), 872-897 (2009).

71. Din FU, Aman W, Ullah I *et al.* Effective use of nanocarriers as drug delivery systems for the treatment of selected tumors. *Int J Nanomedicine*, 12, 7291-7309 (2017).

72. Patra JK, Das G, Fraceto LF *et al.* Nano based drug delivery systems: recent developments and future prospects. *J Nanobiotech*, 16(1), 71-71 (2018).

73. Bölükbas DA, Meiners S. Lung cancer nanomedicine: potentials and pitfalls. *Nanomedicine (Lond)*, 10(21), 3203-3212 (2015).

74. Chandolu V, Dass CR. Treatment of lung cancer using nanoparticle drug delivery systems. *Curr Drug Discov Technol*, 10(2), 170-176 (2013).

75. Tran S, DeGiovanni PJ, Piel B, Rai P. Cancer nanomedicine: a review of recent success in drug delivery. *Clin Transl Med*, 6(1), 44 (2017).

76. Patra JK, Das G, Fraceto LF *et al.* Nano based drug delivery systems: recent developments and future prospects. *J Nanobiotechnology*, 16(1), 71 (2018).

77. Mehata AK, Dehari D, Gupta A, Rabin DC, Miya A. Multifunctional liquid crystal nanoparticles for cancer therapy. *Current Nanomater*, 6(1), 4-16 (2021).

78. Bazak R, Houri M, Achy SE, Hussein W, Refaat T. Passive targeting of nanoparticles to cancer: A comprehensive review of the literature. *Mol Clin Oncol*, 2(6), 904-908 (2014).

79. Attia MF, Anton N, Wallyn J, Omran Z, Vandamme TF. An overview of active and passive targeting strategies to improve the nanocarriers efficiency to tumour sites. *J Pharm Pharmacol*, 71(8), 1185-1198 (2019).

80. Jahan ST, Sadat SMA, Walliser M, Haddadi A. Targeted therapeutic nanoparticles: an immense promise to fight against cancer. *J Drug Deliv*, 2017, 9090325 (2017).

81. Yu HP, Aljuffali IA, Fang JY. Injectable drug-loaded nanocarriers for lung cancer treatments. *Curr Pharm Des*, 23(3), 481-494 (2017).

82. Yu B, Tai HC, Xue W, Lee LJ, Lee RJ. Receptor-targeted nanocarriers for therapeutic delivery to cancer. *Mol Membr Biol*, 27(7), 286-298 (2010).

83. Lemjabbar-Alaoui H, Hassan OU, Yang YW, Buchanan P. Lung cancer: Biology and treatment options. *Biochim Biophys Acta*, 1856(2), 189-210 (2015).

84. Lang-Lazdunski L. Surgery for nonsmall cell lung cancer. *Eur Respir Rev*, 22(129), 382-404 (2013).

85. Lackey A, Donington JS. Surgical management of lung cancer. *Semin Intervent Radiol*, 30(2), 133-140 (2013).

86. Baskar R, Lee KA, Yeo R, Yeoh KW. Cancer and radiation therapy: current advances and future directions. *Int J Med Sci*, 9(3), 193-199 (2012).

87. Jeremic B, Casas F, Wang L, Perin B. Radiation therapy for early stage (I/II) non-small cell lung cancer. *Front Radiat Ther Oncol*, 42, 87-93 (2010).

88. Dolmans DE, Fukumura D, Jain RK. Photodynamic therapy for cancer. *Nat Rev Cancer*, 3(5), 380-387 (2003).

89. Simone CB, 2nd, Friedberg JS, Glatstein E *et al.* Photodynamic therapy for the treatment of non-small cell lung cancer. *J Thorac Dis*, 4(1), 63-75 (2012).

90. Nagasaka M, Gadgeel SM. Role of chemotherapy and targeted therapy in early-stage non-small cell lung cancer. *Expert Rev Anticancer Ther*, 18(1), 63-70 (2018).

91. Chan BA, Coward JI. Chemotherapy advances in small-cell lung cancer. *J Thorac Dis*, (Suppl 5), S565-578 (2013).

92. Viswanadh MK, Priya V, Mehata AK, Muthu MS. What are the unexplored facts about nanomicelles formed from docetaxel clinical injection? *Ther Deliv*, 11(1), 801-803 (2020).

93. Saloustros E, Georgoulias V. Docetaxel in the treatment of advanced non-small-cell lung cancer. *Expert Rev Anticancer Ther* 8(8), 1207-1222 (2008).

94. Herbst RS, Khuri FR. Mode of action of docetaxel - a basis for combination with novel anticancer agents. *Cancer Treat Rev*, 29(5), 407-415 (2003).

95. Pienta KJ. Preclinical mechanisms of action of docetaxel and docetaxel combinations in prostate cancer. *Semin Oncol*, 28(4 Suppl 15), 3-7 (2001).

96. Pobel C, Auclin E, Procureur A *et al.* Cabazitaxel schedules in metastatic castration-resistant prostate cancer: a review. *Future Oncol*, 17(1), 91-102 (2021).

97. Paller CJ, Antonarakis ES. Cabazitaxel: a novel second-line treatment for metastatic castration-resistant prostate cancer. *Drug Des Devel Ther*, 5, 117-124 (2011).

98. Azarenko O, Smiyun G, Mah J, Wilson L, Jordan MA. Antiproliferative mechanism of action of the novel taxane cabazitaxel as compared with the parent compound docetaxel in MCF7 breast cancer cells. *Mol Cancer Ther*, 13(8), 2092-2103 (2014).

99. Vrignaud P, Semiond D, Benning V, Beys E, Bouchard H, Gupta S. Preclinical profile of cabazitaxel. *Drug Des Devel Ther*, 8, 1851-1867 (2014).

100. Cagle PT, Chirieac LR. Advances in treatment of lung cancer with targeted therapy. *Arch Pathol Lab Med*, 136(5), 504-509 (2012).

101. Chan BA, Hughes BG. Targeted therapy for non-small cell lung cancer: current standards and the promise of the future. *Transl Lung Cancer Res*, 4(1), 36-54 (2015).

102. Minguet J, Smith KH, Bramlage P. Targeted therapies for treatment of non-small cell lung cancer-Recent advances and future perspectives. *Int J Cancer*, 138(11), 2549-2561 (2016).

103. Le T, Gerber DE. Newer-generation EGFR inhibitors in lung cancer: how are they best used? , 11(3), 366 (2019).

104. Mazzarella L, Guida A, Curigliano G. Cetuximab for treating non-small cell lung cancer. *Expert Opin Biol Ther*, 18(4), 483-493 (2018).

105. Fornaguera C, García-Celma MJ. Personalized nanomedicine: a revolution at the nanoscale. *J Pers Med*, 7(4) (2017).

106. Mehrotra N, Kharbanda S, Singh H. Peptide-based combination nanoformulations for cancer therapy. *Nanomedicine (Lond)*, 15(22), 2201-2217 (2020).

107. Stefanick JF, Omstead DT, Ashley JD *et al.* Optimizing design parameters of a peptide targeted liposomal nanoparticle in an *in-vivo* multiple myeloma disease model after initial evaluation *in-vitro*. *J Control Release*, 311-312, 190-200 (2019).

108. Hussain S. Nanomedicine for treatment of lung cancer. *Adv Exp Med Biol*, 890, 137-147 (2016).

109. Zito Marino F, Bianco R, Accardo M *et al.* Molecular heterogeneity in lung cancer: from mechanisms of origin to clinical implications. *Int J Med Sci*, 16(7), 981-989 (2019).

110. Welch DR. Biologic considerations for drug targeting in cancer patients. *Cancer Treat Rev*, 14(3-4), 351-358 (1987).

111. Jurczyk M, Jelonek K, Musiał-Kulik M, Beberok A, Wrześniok D, Kasperczyk J. Single- versus dual-targeted nanoparticles with folic acid and biotin for anticancer drug delivery. *Pharmaceutics*, 13(3) (2021).

112. Bae YH, Park K. Targeted drug delivery to tumors: myths, reality and possibility. *J Control Release*, 153(3), 198-205 (2011).

113. Xia W, Low PS. Folate-targeted therapies for cancer. *J Med Chem*, 53(19), 6811-6824 (2010).

114. Nunez MI, Behrens C, Woods DM *et al.* High expression of folate receptor alpha in lung cancer correlates with adenocarcinoma histology and EGFR [corrected] mutation. *J Thorac Oncol*, 7(5), 833-840 (2012).

115. Whitney JF, Clark JM, Griffin TW, Gautam S, Leslie KO. Transferrin receptor expression in nonsmall cell lung cancer. Histopathologic and clinical correlates. *Cancer*, 76(1), 20-25 (1995).

116. Dingemans AM, van den Boogaart V, Vosse BA, van Suylen RJ, Griffioen AW, Thijssen VL. Integrin expression profiling identifies integrin alpha5 and beta1 as prognostic factors in early stage non-small cell lung cancer. *Mol Cancer*, 9, 152 (2010).

117. Master AM, Sen Gupta A. EGF receptor-targeted nanocarriers for enhanced cancer treatment. *Nanomedicine (Lond)*, 7(12), 1895-1906 (2012).

118. Han H, Silverman JF, Santucci TS *et al.* Vascular endothelial growth factor expression in stage I non-small cell lung cancer correlates with neoangiogenesis and a poor prognosis. *Ann Surg Oncol*, 8(1), 72-79 (2001).

119. Humar M, Kern I, Vlacic G, Hadzic V, Cufer T. Insulin-like growth factor 1 receptor expression in advanced non-small-cell lung cancer and its impact on overall survival. *Radiol Oncol*, 51(2), 195-202 (2017).

120. Hu B, Ma Y, Yang Y, Zhang L, Han H, Chen J. CD44 promotes cell proliferation in non-small cell lung cancer. *Oncol Lett*, 15(4), 5627-5633 (2018).

121. Liang J-X, Gao W, Liang Y, Zhou X-M. Chemokine receptor CXCR4 expression and lung cancer prognosis: a meta-analysis. *Int. J. Clin. Exp. Med.*, 8(4), 5163-5174 (2015).

122. Zhao X, Liu X, Guo W, Li X. Expression of carbonic anhydrase IX in NSCLC and its relationship with VEGF and Ki67 expression. *Zhongguo Fei Ai Za Zhi*, 13(9), 861-866 (2010).

123. Tan S, Wang G. Lung cancer targeted therapy: Folate and transferrin dual targeted, glutathione responsive nanocarriers for the delivery of cisplatin. *Biomed Pharmacother*, 102, 55-63 (2018).

124. Lin C, Zhang X, Chen H *et al.* Dual-ligand modified liposomes provide effective local targeted delivery of lung-cancer drug by antibody and tumor lineage-homing cell-penetrating peptide. *Drug Deliv*, 25(1), 256-266 (2018).

125. Pooja D, Srinivasa Reddy T, Kulhari H et al. N-acetyl-d-glucosamine-conjugated PAMAM dendrimers as dual receptor-targeting nanocarriers for anticancer drug delivery. *Eur J Pharm Biopharm.,* 154, 377-386 (2020).

126. Shahid Ul, Butola BS. Recent advances in chitosan polysaccharide and its derivatives in antimicrobial modification of textile materials. *Int J Biol Macromol*, 121, 905-912 (2019).

127. Saravanakumar K, Sathiyaseelan A, Mariadoss AVA *et al.* Dual stimuli-responsive release of aptamer AS1411 decorated erlotinib loaded chitosan nanoparticles for non-small-cell lung carcinoma therapy. *Carbohydr Polym*, 245, 116407 (2020).

128. Maya S, Sarmento B, Lakshmanan VK, Menon D, Seabra V, Jayakumar R. Chitosan cross-linked docetaxel loaded EGF receptor targeted nanoparticles for lung cancer cells. *Int J Biol Macromol*, 69, 532-541 (2014).

129. Sahin A, Yoyen-Ermis D, Caban-Toktas S *et al.* Evaluation of brain-targeted chitosan nanoparticles through blood-brain barrier cerebral microvessel endothelial cells. *J Microencapsul*, 34(7), 659-666 (2017).

130. Nagpal K, Singh SK, Mishra DN. Chitosan nanoparticles: a promising system in novel drug delivery. *Chem Pharm Bull (Tokyo)*, 58(11), 1423-1430 (2010).

131. Martău GA, Mihai M, Vodnar DC. The use of chitosan, alginate, and pectin in the biomedical and food sector-biocompatibility, bioadhesiveness, and biodegradability. *Polymers (Basel)*, 11(11) (2019).

132. Gong CP, Luo Y, Pan YY. Novel synthesized zinc oxide nanoparticles loaded alginate-chitosan biofilm to enhanced wound site activity and anti-septic abilities for the management of complicated abdominal wound dehiscence. *J Photochem Photobiol B*, 192, 124-130 (2019).

133. Lee KY, Mooney DJ. Alginate: properties and biomedical applications. *Prog Polym Sci*, 37(1), 106-126 (2012).

134. Cheung RC, Ng TB, Wong JH, Chan WY. Chitosan: an update on potential biomedical and pharmaceutical applications. *Mar Drugs*, 13(8), 5156-5186 (2015).

135. Szymańska E, Winnicka K. Stability of chitosan-a challenge for pharmaceutical and biomedical applications. *Mar Drugs*, 13(4), 1819-1846 (2015).

136. Jhaveri J, Raichura Z, Khan T, Momin M, Omri A. Chitosan nanoparticles-insight into properties, functionalization and applications in drug delivery and theranostics. *Molecules*, 26(2) (2021).

137. Thai H, Thuy Nguyen C, Thi Thach L *et al.* Characterization of chitosan/alginate/lovastatin nanoparticles and investigation of their toxic effects *in-vitro* and *in-vivo*. *Sci Rep*, 10(1), 909 (2020).

138. Ishihara M, Kishimoto S, Nakamura S, Sato Y, Hattori H. Polyelectrolyte complexes of natural polymers and their biomedical applications. *Polymers (Basel)*, 11(4) (2019).

139. Alnaief M, Obaidat RM, Alsmadi MM. Preparation of hybrid alginate-chitosan aerogel as potential carriers for pulmonary drug delivery. *Polymers (Basel)*, 12(10) (2020).

140. Potaś J, Szymańska E, Winnicka K. Challenges in developing of chitosan – Based polyelectrolyte complexes as a platform for mucosal and skin drug delivery. *Eur Poly J*, 140, 110020 (2020).

141. Hamman JH. Chitosan based polyelectrolyte complexes as potential carrier materials in drug delivery systems. *Mar Drugs*, 8(4), 1305-1322 (2010).

142. Yoncheva K, Merino M, Shenol A *et al.* Optimization and *in-vitro*/*in-vivo* evaluation of doxorubicin-loaded chitosan-alginate nanoparticles using a melanoma mouse model. *Int J Pharm*, 556, 1-8 (2019).

143. Vasiliu S, Racovita S, Popa M, Ochiuz L, Peptu CA. Chitosan-based polyelectrolyte complex hydrogels for biomedical applications. In: *Cellulose-Based Superabsorbent Hydrogels.* Mondal, MIH (Ed. (Springer International Publishing, Cham, 2019) 1695-1725.

144. Sun X, Liu C, Omer AM, Yang LY, Ouyang XK. Dual-layered pH-sensitive alginate/chitosan/kappa-carrageenan microbeads for colon-targeted release of 5-fluorouracil. *Int J Biol Macromol*, 132, 487-494 (2019).

145. Vauthier C, Bouchemal K. Methods for the preparation and manufacture of polymeric nanoparticles. *Pharm Res*, 26(5), 1025-1058 (2009).

146. Crucho CIC, Barros MT. Polymeric nanoparticles: A study on the preparation variables and characterization methods. *Mater Sci Eng C Mater Biol Appl*, 80, 771-784 (2017).

147. Parhi R, Suresh P. Preparation and characterization of solid lipid nanoparticles-a review. *Curr Drug Discov Technol*, 9(1), 2-16 (2012).

148. Nava-Arzaluz MG, Piñón-Segundo E, Ganem-Rondero A, Lechuga-Ballesteros D. Single emulsion-solvent evaporation technique and modifications for the preparation of pharmaceutical polymeric nanoparticles. *Recent Pat Drug Deliv Formul*, 6(3), 209-223 (2012).

149. Krishnamoorthy K, Mahalingam M. Selection of a suitable method for the preparation of polymeric nanoparticles: multi-criteria decision making approach. *Adv Pharm Bull*, 5(1), 57-67 (2015).

150. Wang Y, Li P, Truong-Dinh Tran T, Zhang J, Kong L. Manufacturing techniques and surface engineering of polymer based nanoparticles for targeted drug delivery to cancer. *Nanomaterials (Basel)*, 6(2) (2016).

151. Tokumitsu H, Ichikawa H, Fukumori Y. Chitosan-gadopentetic acid complex nanoparticles for gadolinium neutron-capture therapy of cancer: preparation by novel emulsion-droplet coalescence technique and characterization. *Pharm Res*, 16(12), 1830-1835 (1999).

152. Mikušová V, Mikuš P. Advances in chitosan-based nanoparticles for drug delivery. *Int J Mol Sci.* 22(17), 9652 (2021).

153. Munshi N, De TK, Maitra A. Size Modulation of Polymeric Nanoparticles under Controlled Dynamics of Microemulsion Droplets. *J Colloid Interface Sci*, 190(2), 387-391 (1997).

154. Chaurasiya RS, Hebbar HU. Reverse micelles for nanoparticle synthesis and biomolecule separation. In: *Nanosci Food Agri.* (Springer, 2017) 181-211.

155. Sacco P, Pedroso-Santana S, Kumar Y, Joly N, Martin P, Bocchetta P. Ionotropic gelation of chitosan flat structures and potential applications. *Molecules*, 26(3) (2021).

156. Auriemma G, Russo P, Del Gaudio P, García-González CA, Landín M, Aquino RP. Technologies and formulation design of polysaccharide-based hydrogels for drug delivery. *Molecules*, 25(14) (2020).

157. Desai KG. Chitosan Nanoparticles Prepared by Ionotropic Gelation: An Overview of Recent Advances. *Crit Rev Ther Drug Carrier Syst*, 33(2), 107-158 (2016).

158. Yang C, Wu T, Qi Y, Zhang Z. Recent advances in the application of vitamin E TPGS for drug delivery. *Theranostics*, 8(2), 464-485 (2018).

159. Zhang Z, Tan S, Feng SS. Vitamin E TPGS as a molecular biomaterial for drug delivery. *Biomaterials*, 33(19), 4889-4906 (2012).

160. Vikas, Viswanadh MK, Priya V, Mehata AK, Muthu MS. What are the unexplored facts about nanomicelles formed from docetaxel clinical injection? *Ther Deliv*, 11(1), 801-803 (2020).

161. Tan S, Zou C, Zhang W, Yin M, Gao X, Tang Q. Recent developments in d-α-tocopheryl polyethylene glycol-succinate-based nanomedicine for cancer therapy. *Drug Deliv*, 24(1), 1831-1842 (2017).

162. Sonali, Agrawal P, Singh RP *et al.* Transferrin receptor-targeted vitamin E TPGS micelles for brain cancer therapy: preparation, characterization and brain distribution in rats. *Drug Deliv*, 23(5), 1788-1798 (2016).

163. Li D, Liu S, Zhu J, Shen L, Zhang QY, Zhu H. Folic acid modified TPGS as a novel nano-micelle for delivery of nitidine chloride to improve apoptosis

induction in Huh7 human hepatocellular carcinoma. *BMC Pharmacol Toxicol*, 22(1), (2021).

164. Viswanadh MK, Agrawal N, Azad S *et al.* Novel redox-sensitive thiolated TPGS based nanoparticles for EGFR targeted lung cancer therapy. *Int J Pharm*, 602, 120652 (2021).

165. Magesh V, Bhavani DK, Senthilnathan P, Rajendran P, Sakthisekaran D. *In-vivo* protective effect of crocetin on benzo(a)pyrene-induced lung cancer in Swiss albino mice. *Phytother Res*, 23(4), 533-539 (2009).

166. Kasala ER, Bodduluru LN, Barua CC, Sriram CS, Gogoi R. Benzo(a)pyrene induced lung cancer: Role of dietary phytochemicals in chemoprevention. *Pharmacol Rep*, 67(5), 996-1009 (2015).

167. Malyla V, Paudel KR, Shukla SD *et al.* Recent advances in experimental animal models of lung cancer. *Future Med. Chem,* 12(7), 567-570 (2020).

168. Singh RP, Sharma G, Sonali *et al.* Chitosan-folate decorated carbon nanotubes for site specific lung cancer delivery. *Mater Sci Eng C Mater Biol Appl*, 77, 446-458 (2017).

169. Cheng L, Ma H, Shao M *et al.* Synthesis of folate-chitosan nanoparticles loaded with ligustrazine to target folate receptor positive cancer cells. *Mol Med Rep*, 16(2), 1101-1108 (2017).

170. Stella B, Arpicco S, Peracchia MT *et al.* Design of folic acid-conjugated nanoparticles for drug targeting. *J Pharm Sci*, 89(11), 1452-1464 (2000).

171. Esfandiarpour-Boroujeni S, Bagheri-Khoulenjani S, Mirzadeh H, Amanpour S. Fabrication and study of curcumin loaded nanoparticles based on folate-chitosan for breast cancer therapy application. *Carbohydr Polym*, 168, 14-21 (2017).

172. Agrawal P, Singh RP, Sonali *et al.* TPGS-chitosan cross-linked targeted nanoparticles for effective brain cancer therapy. *Mater Sci Eng C Mater Biol Appl*, 74, 167-176 (2017).

173. Pan J, Feng S.S. Targeted delivery of paclitaxel using folate-decorated poly(lactide)–vitamin E TPGS nanoparticles. *Biomaterials*, 29(17), 2663-2672 (2008).

174. Mehata AK, Bharti S, Singh P *et al.* Trastuzumab decorated TPGS-g-chitosan nanoparticles for targeted breast cancer therapy. *Colloids Surf B Biointerfaces*, 173, 366-377 (2019).

175. Pooja D, Babu Bikkina DJ, Kulhari H *et al.* Fabrication, characterization and bioevaluation of silibinin loaded chitosan nanoparticles. *Int J Biol Macromol*, 69, 267-273 (2014).

176. Antoniou J, Liu F, Majeed H, Qi J, Yokoyama W, Zhong F. Physicochemical and morphological properties of size-controlled chitosan–tripolyphosphate nanoparticles. *Colloids Surf. A Physicochem. Eng. Asp.*, 465, 137-146 (2015).

177. Agarwal M, Agarwal MK, Shrivastav N, Pandey S, Das R, Gaur P. Preparation of chitosan nanoparticles and their *in-vitro* characterization. *Int. J. Life Sci. Res*, 4(2), 1713-1720 (2018).

178. Baghdan E, Pinnapireddy SR, Strehlow B, Engelhardt KH, Schäfer J, Bakowsky U. Lipid coated chitosan-DNA nanoparticles for enhanced gene delivery. *Int. J. Pharm.* 535(1), 473-479 (2018).

179. Muthu MS, Kutty RV, Luo Z, Xie J, Feng S.S. Theranostic vitamin E TPGS micelles of transferrin conjugation for targeted co-delivery of docetaxel and ultra bright gold nanoclusters. *Biomaterials*, 39, 234-248 (2015).

180. Bwatanglang IB, Mohammad F, Yusof NA *et al.* Folic acid targeted Mn:ZnS quantum dots for theranostic applications of cancer cell imaging and therapy. *Int J Nanomedicine*, 11, 413-428 (2016).

181. Viswanadh MK, Vikas, Jha A *et al.* Formulation and *in-vivo* efficacy study of cetuximab decorated targeted bioadhesive nanomedicine for non-small-cell lung cancer therapy. *Nanomedicine*, 15(24), 2345-2367 (2020).

182. Rennukka M, Sipaut CS, Amirul AA. Synthesis of poly(3-hydroxybutyrate-co-4-hydroxybutyrate)/chitosan/silver nanocomposite material with enhanced antimicrobial activity. *Biotechnol Prog*, 30(6), 1469-1479 (2014).

183. Saremi S, Atyabi F, Akhlaghi SP, Ostad SN, Dinarvand R. Thiolated chitosan nanoparticles for enhancing oral absorption of docetaxel: preparation, *in-vitro* and ex vivo evaluation. *Int J Nanomedicine*, 6, 119-128 (2011).

184. Soe ZC, Poudel BK, Nguyen HT *et al.* Folate-targeted nanostructured chitosan/chondroitin sulfate complex carriers for enhanced delivery of bortezomib to colorectal cancer cells. *Asian J Pharm Sci*, 14(1), 40-51 (2019).

185. Gurunathan S, Han JW, Eppakayala V, Jeyaraj M, Kim JH. Cytotoxicity of biologically synthesized silver nanoparticles in MDA-MB-231 human breast cancer cells. *Biomed Res Int*, 2013, 535796 (2013).

186. Mao W, Wu F, Lee RJ, Lu W, Wang J. Development of a stable single-vial liposomal formulation for vincristine. *Int J Nanomedicine*, 14, 4461-4474 (2019).

187. Lari AS, Zahedi P, Ghourchian H, Khatibi A. Microfluidic-based synthesized carboxymethyl chitosan nanoparticles containing metformin for diabetes therapy: *In-vitro* and *in-vivo* assessments. *Carbohydr Polym*, 261, 117889 (2021).

188. Viswanadh MK, Vikas, Jha A *et al.* Formulation and *in-vivo* efficacy study of cetuximab decorated targeted bioadhesive nanomedicine for non-small-cell lung cancer therapy. *Nanomedicine (Lond)*, 15(24), 2345-2367 (2020).

189. Bareford LM, Swaan PW. Endocytic mechanisms for targeted drug delivery. *Adv. Drug Deliv.* Rev., 59(8), 748-758 (2007).

190. Maya S, Kumar LG, Sarmento B *et al.* Cetuximab conjugated O-carboxymethyl chitosan nanoparticles for targeting EGFR overexpressing cancer cells. *Carbohydr Polym*, 93(2), 661-669 (2013).

191. Patiño-Ruiz D, Marrugo L, Reyes N, Acevedo-Morantes M, Herrera A. Ionotropic gelation synthesis of chitosan-alginate nanodisks for delivery system and *in-vitro* assessment of prostate cancer cytotoxicity. *Int. J. Polym. Sci.*, 2020, 5329747 (2020).

192. El-Feky GS, El-Banna ST, El-Bahy GS, Abdelrazek EM, Kamal M. Alginate coated chitosan nanogel for the controlled topical delivery of Silver sulfadiazine. *Carbohydr Polym*, 177, 194-202 (2017).

193. Jain A, Thakur K, Sharma G, Kush P, Jain UK. Fabrication, characterization and cytotoxicity studies of ionically cross-linked docetaxel loaded chitosan nanoparticles. *Carbohydr Polym*, 137, 65-74 (2016).

194. Sathiyabama M, Parthasarathy R. Biological preparation of chitosan nanoparticles and its *in-vitro* antifungal efficacy against some phytopathogenic fungi. *Carbohydr Polym*, 151, 321-325 (2016).

195. Yen HJ, Young YA, Tsai TN *et al.* Positively charged gold nanoparticles capped with folate quaternary chitosan: Synthesis, cytotoxicity, and uptake by cancer cells. *Carbohydr Polym*, 183, 140-150 (2018).

196. Mukhopadhyay P, Maity S, Mandal S, Chakraborti AS, Prajapati AK, Kundu PP. Preparation, characterization and *in-vivo* evaluation of pH sensitive, safe quercetin-succinylated chitosan-alginate core-shell-corona nanoparticle for diabetes treatment. *Carbohydr Polym*, 182, 42-51 (2018).

197. Niaz T, Shabbir S, Manzoor S *et al.* Antihypertensive nano-ceuticales based on chitosan biopolymer: Physico-chemical evaluation and release kinetics. *Carbohydr Polym*, 142, 268-274 (2016).

198. Lawrie G, Keen I, Drew B *et al.* Interactions between alginate and chitosan biopolymers characterized using FTIR and XPS. *Biomacromolecules*, 8(8), 2533-2541 (2007).

199. Bhattacharya D, Das M, Mishra D *et al.* Folate receptor targeted, carboxymethyl chitosan functionalized iron oxide nanoparticles: a novel ultradispersed nanoconjugates for bimodal imaging. *Nanoscale*, 3(4), 1653-1662 (2011).

200. Burande AS, Viswanadh MK, Jha A *et al.* EGFR targeted paclitaxel and piperine co-loaded liposomes for the treatment of triple negative breast cancer. *AAPS PharmSciTech*, 21(5), 151 (2020).

201. Barve A, Jain A, Liu H, Zhao Z, Cheng K. Enzyme-responsive polymeric micelles of cabazitaxel for prostate cancer targeted therapy. *Acta Biomater*, 113, 501-511 (2020).

202. Kommineni N, Mahira S, Domb AJ, Khan W. Cabazitaxel-loaded nanocarriers for cancer therapy with reduced side effects. *Pharmaceutics*, 11(3) (2019).

203. Leng ZH, Zhuang QF, Li YC *et al.* Polyamidoamine dendrimer conjugated chitosan nanoparticles for the delivery of methotrexate. *Carbohydr Polym*, 98(1), 1173-1178 (2013).

204. Ghasemi M, Turnbull T, Sebastian S, Kempson I. The MTT assay: utility, limitations, pitfalls, and interpretation in bulk and single-cell analysis. *Int J Mol Sci*, 22(23) (2021).

205. Ruman U, Buskaran K, Pastorin G, Masarudin MJ, Fakurazi S, Hussein MZ. Synthesis and characterization of chitosan-based nanodelivery systems to enhance the anticancer effect of sorafenib drug in hepatocellular carcinoma and colorectal adenocarcinoma cells. *Nanomaterials (Basel)*, 11(2) (2021).

206. Pan C, Qian J, Fan J *et al.* Preparation nanoparticle by ionic cross-linked emulsified chitosan and its antibacterial activity. *Colloids Surf. A Physicochem. Eng. Asp.* 568, 362-370 (2019).

207. Sorasitthiyanukarn FN, Muangnoi C, Rojsitthisak P, Rojsitthisak P. Chitosan-alginate nanoparticles as effective oral carriers to improve the stability, bioavailability, and cytotoxicity of curcumin diethyl disuccinate. *Carbohydr Polym*, 256, 117426 (2021).

208. Kato T, Jin CS, Ujiie H *et al.* Nanoparticle targeted folate receptor 1-enhanced photodynamic therapy for lung cancer. *Lung Cancer*, 113, 59-68 (2017).

209. Langston Suen WL, Chau Y. Size-dependent internalisation of folate-decorated nanoparticles via the pathways of clathrin and caveolae-mediated endocytosis in ARPE-19 cells. *J Pharm Pharmacol*, 66(4), 564-573 (2014).

210. Xiao Z, Zhang W, Yang Y, Xu L, Fang X. Single-molecule diffusion study of activated EGFR implicates its endocytic pathway. *Biochem Biophys Res Commun*, 369(2), 730-734 (2008).

Chapter 7

List of Publications

7.1. Publications from the research work

1. **Vikas**, M.K. Viswanadh, A.K. Mehata, V. Sharma, V. Priya, N. Varshney, S.K. Mahto, M.S. Muthu, Bioadhesive chitosan nanoparticles: Dual targeting and pharmacokinetic aspects for advanced lung cancer treatment, *Carbohydr Polym.* 274 (2021) 118617. **(Impact Factor: 10.72)**

2. **Vikas**, A.K. Mehata, M.N.L. Suseela, C. Behera, P. Kumari, S.K. Mahto, M.S. Muthu, Chitosan-alginate nanoparticles of cabazitaxel: Design, dual-receptor targeting and efficacy in lung cancer model, *Int. J. Biol. Macromol.* 221 (2022) 874-890. **(Impact Factor: 8.025)**

7.2. Other Publications

1. **Vikas**, Sahu, H. K., Mehata, A. K., Viswanadh, M. K., Priya, V., & Muthu, M. S. Dual-receptor-targeted nanomedicines: emerging trends and advances in lung cancer therapeutics. *Nanomedicine (Lond.)* 17,19 (2022): 1375-1395 **(Impact Factor: 6.096)**

2. S.K. Rout, V. Priya, **Vikas** A.K. Mehata, M.S.J.J.o.D.D.S. Muthu, Abciximab coated albumin nanoparticles of rutin for improved and targeted antithrombotic effect, *J Drug Deliv Sci Technol.* 76 (2022) 103785. **(Impact Factor: 5.06)**

3. V. Priya, **Vikas**, A.K. Mehata, D. Jain, S.K. Singh, M.S. Muthu, Efficient delivery of abciximab using mesoporous silica nanoparticles: *In-vitro* assessment for targeted and improved antithrombotic activity, *Colloids Surf. B: Biointerfaces* 218 (2022) 112697. **(Impact Factor: 5.9)**

4. A.K. Mehata, M.K. Viswanadh, V. Priya, **Vikas**, M.S. Muthu, Harnessing immunological targets for COVID-19 immunotherapy, *Future Virol.* 794 (2021) 0048. **(Impact Factor: 3.015)**

5. **Vikas**, M.K. Viswanadh, V. Priya, A.K. Mehata, M.S. Muthu, What are the unexplored facts about nanomicelles formed from docetaxel clinical injection?, *Therapeutic delivery* 11(1) (2020) 801-803. **(Cite score: 5.4)**

6. M.K. Viswanadh, **Vikas**, A. Jha, S.K. Reddy Adena, A.K. Mehata, V. Priya, K. Neogi, S. Poddar, S.K. Mahto, M.S. Muthu, Formulation and *in-vivo* efficacy study of cetuximab decorated targeted bioadhesive nanomedicine for non-small-cell lung cancer therapy, *Nanomedicine (Lond.)* 15(24) (2020) 2345-2367. **(Impact Factor: 6.096)**

7. A.K. Mehata, M.K. Viswanadh, V. Priya, **Vikas**, M.S. Muthu, Dendritic cell-targeted theranostic nanomedicine: advanced cancer nanotechnology for diagnosis and therapy, *Nanomedicine (Lond.)* 15(10) (2020) 947-949. **(Impact Factor: 6.096)**

8. Singh, C.; Mehata, A. K.; Priya, V.; Malik, A. K.; Setia, A.; Suseela, M. N. L.; **Vikas**; Gokul, P.; Samridhi; Singh, S. K.; Muthu, M. S., Bimetallic Au–Ag Nanoparticles: Advanced Nanotechnology for Tackling Antimicrobial Resistance. Molecules 2022, 27 (20), 7059. (Impact Factor: 4.927)

7.3 BOOK CHAPTERS

1. **Vikas**; Mehata, A. K.; Singh, C.; Malik, A. K.; Setia, A.; Muthu, M. S., (2022) "Alginate in cancer therapy", J. Sougata. "Alginate Biomaterial: Drug Delivery strategies and biomedical engineering", Springer Nature Singapore Pte Ltd., In Press.

2. Mehata, A. K.; Dehari D.; **Vikas**; Priya, V.; Muthu, M. S. (2022) "Drug-releasing textile materials: current developments and future", S. Navneet, B. Bhupendra. "Fiber and Textile Engineering in Drug Delivery Systems", Elsevier. In Press.

3. Setia, A., Mehata, A. K.; **Vikas**; Malik, A. K.; Muthu, M. S. (2022) "Synthesis and Processing Methods of Magnetic Nanosystems for Diagnostic Tools and Devices: Design Strategies and Physicochemical Aspects", Deshmukh. "Functionalized Magnetic Nanosystems for Diagnostic Tools and Devices", Elsevier. Accepted for publication.

Chapter 8

Curriculum Vitae

VIKAS

Research Scholar, Department of Pharmaceutical Engineering & technology,
Indian Institute of Technology (BHU), Varanasi, India,
Mobile : +91 9017198800, 9981976104
Email: vikas.rs.phe18@itbhu.ac.in

I have ten papers to my name and four of them as the first author (two research article, one review and one editorial). 4 more articles are in pipeline as co-author. I have six years of research experience in the area of drug delivery systems, particularly development of targeted nanomedicines for the treatment of cancer. The title of my doctoral research work is **Formulation and Evaluation of Dual-Receptor Targeted Nanomedicine for Lung Cancer Therapy**. Since, EGF and folate receptors are substantially expressed in the lung cancer, they can be used to design the dual-receptor targeted nanomedicine. The USFDA has approved clinical applications of folic acid and cetuximab, which can be employed as targeting ligands for folate and EGF receptors. The dual-receptor targeted chitosan nanoparticles and chitosan-alginate nanoparticles of docetaxel and cabazitaxel were developed by utilizing the pre-conjugation technique for folic acid conjugation followed by the post-conjugation of cetuximab by using carbodiimide cross-linkers. All the chitosan and chitosan-alginate based nanoparticle formulations were analyzed through physicochemical parameters such as particle size, surface charge, SEM, TEM and AFM. Moreover, the *in-vitro* drug release, XRD analysis and surface chemistry of chitosan nanoparticles were examined. The cytotoxicity, cellular uptake and the morphology assay was performed on A-549 cells. The *in-vivo* pharmacokinetic evaluation was studied on Wistar rats. The anticancer efficacy of the drug loaded formulation was determined on the B(a)P induced lung cancer mice model, by analyzing the total number of nuclei of the HE-stained microscopic slides of each treatment group. Both works are published in peer reviewed journals such as **Carbohydrate polymers (Elsevier, 10.72 impact factor)** and **International Journal of Biological Macromolecules (Elsevier, 8.025 impact factor)**.

EDUCATION

S. No.	Description	Board/University	Year	Percentage/Grade
1	B. Pharm.	PD. B.D. Sharma University, Rohtak	2016	71%
2	M. Pharm.	DOPS, Dr. H.S.G., Sagar	2017	A^+
3	Ph.D. **(Full time)**	Indian Institute of Technology (BHU)	24 July 2018- 09 September 2022 (Date of Pre-submission seminar delivered)	**Formulation and Evaluation of Dual-Receptor Targeted Nanomedicine for Lung Cancer Therapy**

PUBLICATIONS

1. **Vikas**, Sahu, H. K., Mehata, A. K., Viswanadh, M. K., Priya, V., & Muthu, M. S. Dual-receptor targeted nanomedicines for lung cancer: therapeutics and theranostic delivery. *Nanomedicine (Lond.)* Accepted for publication **(Impact Factor: 6.096)**

2. **Vikas**, A.K. Mehata, M.N.L. Suseela, C. Behera, P. Kumari, S.K. Mahto, M.S. Muthu, Chitosan-alginate nanoparticles of cabazitaxel: Design, dual-receptor targeting and efficacy in lung cancer model, *Int. J. Biol. Macromol.* 221 (2022) 874-890. **(Impact Factor: 8.025)**

3. S.K. Rout, V. Priya, **Vikas** A.K. Mehata, M.S.J.J.o.D.D.S. Muthu, Abciximab coated albumin nanoparticles of rutin for improved and targeted antithrombotic effect, *J Drug Deliv Sci Technol.* 76 (2022) 103785. **(Impact Factor: 5.06)**

4. **Vikas**, M.K. Viswanadh, A.K. Mehata, V. Sharma, V. Priya, N. Varshney, S.K. Mahto, M.S. Muthu, Bioadhesive chitosan nanoparticles: Dual targeting and pharmacokinetic aspects for advanced lung cancer treatment, *Carbohydr Polym*. 274 (2021) 118617. **(Impact Factor: 10.72)**

5. V. Priya, **Vikas**, A.K. Mehata, D. Jain, S.K. Singh, M.S. Muthu, Efficient delivery of abciximab using mesoporous silica nanoparticles: *In-vitro* assessment for targeted and improved antithrombotic activity, *Colloids Surf. B: Biointerfaces* 218 (2022) 112697. **(Impact Factor: 5.9)**

6. A.K. Mehata, M.K. Viswanadh, V. Priya, **Vikas**, M.S. Muthu, Harnessing immunological targets for COVID-19 immunotherapy, *Future Virol.* 794 (2021) 0048. **(Impact Factor: 3.015)**

7. **Vikas**, M.K. Viswanadh, V. Priya, A.K. Mehata, M.S. Muthu, What are the unexplored facts about nanomicelles formed from docetaxel clinical injection?, *Therapeutic delivery* 11(1) (2020) 801-803. **(Cite score: 5.4)**
8. M.K. Viswanadh, **Vikas**, A. Jha, S.K. Reddy Adena, A.K. Mehata, V. Priya, K. Neogi, S. Poddar, S.K. Mahto, M.S. Muthu, Formulation and *in-vivo* efficacy study of cetuximab decorated targeted bioadhesive nanomedicine for non-small-cell lung cancer therapy, *Nanomedicine (Lond.)* 15(24) (2020) 2345-2367. **(Impact Factor: 6.096)**
9. A.K. Mehata, M.K. Viswanadh, V. Priya, **Vikas**, M.S. Muthu, Dendritic cell-targeted theranostic nanomedicine: advanced cancer nanotechnology for diagnosis and therapy, *Nanomedicine (Lond.)* 15(10) (2020) 947-949. (Impact Factor: 6.096)
10. Singh, C.; Mehata, A. K.; Priya, V.; Malik, A. K.; Setia, A.; Suseela, M. N. L.; **Vikas**; Gokul, P.; Samridhi; Singh, S. K.; Muthu, M. S., Bimetallic Au–Ag Nanoparticles: Advanced Nanotechnology for Tackling Antimicrobial Resistance. Molecules 2022, 27 (20), 7059. (Impact Factor: 4.927)

ACHIEVEMENTS

- Obtained Second Position in **Quiz competition** in **53rd National Pharmacy Week**, 2014 held at college of pharmacy PT.B.D. Sharma University, Rohtak.
- Qualified in **NIPER- JEE 2016** with **452**th rank
- Qualified in **GPAT 2016** with **354**th rank

CONFERENCES and SEMINARS

- Poster presentation at 2nd Annual conference of APTI conducted on 24th December 2015 at Maharshi Dayanand University, Rohtak.
- Attended national seminar on "Trends and Techniques in Pharmaceutical Education and Research" conducted on 24th November 2017 at SVN Institute of Pharmaceutical Sciences, Sagar, M.P.
- Attended National seminar on "Progression in Pharmaceutical Chemistry" organized by Department of Pharmaceutical Sciences, conducted on 08th December 2017 at Dr. Harisingh Gour Vishwavidyalaya, Sagar, M.P. 470003.
- Poster presentation at 70th Indian Pharmaceutical Congress from 21st to 23rd December 2018 held at Amity University, Noida
- Attended 69th Indian Pharmaceutical Congress from 22nd to 24th December 2017 held at Chitkara University, Punjab.
- Attended AICTE Training and Learning (ATAL) Academy Online Elementary FDP on "Nano Furtherance of Pharmaceutical Engineering: An Industrial Perceive" from 21st to 25th June 2021 at Nirmala College of Pharmacy.

- Attended AICTE Training and Learning (ATAL) Academy Online Elementary FDP on "Drug Engineering" from 28th June to 2nd July 2021 at Delhi Institute of Pharmaceutical Sciences and Research.
- Attended Faculty Development Program on "Repurposing of Drugs "conducted on 15th to 17th July 2021by School of Pharmacy, Sathyabama Institute of Science & Technology, Chennai – 600119.

INSTRUMENTS HANDLED

- Particle size analyzer DLS (Malvern Nano S90)
- Freeze Dryer (Labocon)
- Cell Culture Facility (Biosafety cabinet, CO2 Incubator, Digital Inverted Microscope)
- High-speed Homogenizer (IKA)
- UV Visible Spectrophotometer (Agilent).
- HPLC (LC-20AR, with PDA detector, Shimadzu, Japan)
- 6 Jar Dissolution Apparatus (ELECTROLABS)
- Tablet Punching Machine (Single and Rotary, Karnavati)
- 5 Plate Multi mode Plate Reader (Spincotech Pvt. Ltd.)
- Colorimeter (SYSTRONICS),
- Ultra-centrifuge 18k (REMI)
- Rotary evaporator (IKA)

PROJECT INFORMATION

- **Ph.D. Research work: "**Formulation and Evaluation of Dual-Receptor Targeted Nanomedicine for Lung Cancer Therapy**"**
  Supervisor: Dr. M. S. Muthu
  Associate Professor
  Dept. Pharm. Engineering & Tech,
  Indian Institute of Technology (BHU), Varanasi - 22100
- **M Pharm Research work:** "Development and characterization of targeted chemotherapy to lungs"
  Supervisor: Professor S. P. Vyas
  Department of Pharmaceutical Sciences
  Dr. H.S. Gour University
  Sagar, M.P. India

PERSONAL INFORMATION

- **Name** : Vikas
- **Father Name** : Radha Charan Sharma
- **Gender** : Male
- **Marital status** : Unmarried
- **Languages Known** : English, Hindi and Sanskrit
- **Present address** : Department of Pharmaceutical Engineering & Technology, IIT (BHU)
- **Permanant address :**Village: Fathupur, Distt. Kurukshetra, Haryana, 136038

Hobbies and interests: Swimming, Singing and Playing guitar

REFERENCES:

1) **Dr. M.S. Muthu**
   Associate Professor,
   Department of Pharmaceutical Engineering & Technology,
   Indian Institute of Technology (BHU), Varanasi, UP, India.
   Mail: msmuthu.phe@iitbhu.ac.in Phone: +91 9235195928
2) **Dr. Shreyans K Jain**
   Assistant Professor,
   Department of Pharmaceutical Engineering & Technology,
   Indian Institute of Technology (BHU), Varanasi, UP, India.
   Mail: sjain.phe@iitbhu.ac.in Phone: +91-5427165763
3) **Dr. Dinesh Kumar**
   Assistant Professor
   Department of Pharmaceutical Engineering & Technology,
   Indian Institute of Technology (BHU), Varanasi, UP, India.
   Mail: dinesh.phe@itbhu.ac.in
   Phone: +918816089092

DECLARATION

I hereby declare that the above mentioned data are true, complete and correct to the best of my knowledge and belief.

Date: 30-09-2022

Place: Varanasi

Vikas Sharma

VIKAS