

REFERENCES

1. Illum L., Jorgensen H., Bissgard H, Krogsgaard O., Rossing N. 1987 Bioadhesive microspheres as a potential Nasal drug delivery System. *Int J. Pharm* 39:189-199.
2. Chien Y.W. *Novel Drug Delivery Systems*, 2nd Edn, 1992, Marcel Dekker, Inc. New York, 50:229-266.
3. Wise D.L., *Handbook of Pharmaceutical Controlled release Technology*, Vol-29, 2000, Marcel Dekker, Inc. New York, page no. 255, 329-338.
4. Patil SB, Mahajan HS, 2004, Nasal mucoadhesive drug delivery systems: An Overview *The Pharma Review*, 133-139.
5. Vasir J.K. 2003. Bioadhesive microsphere as a controlled drug delivery system. *Int J Pharm*. 255:13-32
6. Ryden Lena, Edmen Peter. 1992 Effect of polymer and microspheres on the nasal absorption of insulin in rats. *Int. J. Pharm*. 83:1-10
7. Fisher AN, Brown K, Davis S S, Parr GD, 1987, The effect of molecular size on the nasal absorption of water soluble compounds in the albino rats. *J Pharm Pharmacol*, 39:357-362.
8. Patil SB, Murthy RS., 2006, Preparation and in vitro evaluation of mucoadhesive chitosan microspheres of amlodipine besylate for nasal administration. *Indian J Pharm*, 68(1):64-67
9. Gavini E, Rassa G, Sanna V., Cossu M., 2004, Mucoadhesive microspheres for nasal administration of antiemetic drug, Metoclopramide: in vivo-ex vivo studies. *J P P* 57:287-294.

10. Chowdary K PR, Rao NK, Malathi K 2004, Ethyl cellulose microspheres of glipizide : characterization, in vitro and in vivo evaluation Indian J Pharm ,66(4):412-416.
11. Patel J.K., Bodar M.S., Amin A.F., Patel N.M. 2004 Formulation and optimization of mucoadhesive microspheres of metaclopramide. J Pharm Sci 66(3):300-305
12. Ryden Lena, Edmen Peter. 1992, Effect of polymer and microspheres on the nasal absorption of insulin in rats. Int J Pharm. 86:1-10.
13. Zhou HY, Guang Chen X, Liu CS, Meng XH, 2005, Chitosan/cellulose acetate microspheres. Preparation and Ranitidine release In Vitro. Pharmaceutical Development and Technology. 10(2)219-225.
14. Martinac A, Filipovic-Greic J., Voinovich D., Perisutti B., Francaschinis E. 2005, Development and evaluation of bioadhesive properties of chitosan ethyl cellulose microsphere for nasal delivery. Int J Pharm 291:69-77
15. Govender S, Pilay V, Chetty DD, Essack SY, Danger CM , 2005, Optimisation and characterization of bioadhesive controlled release tetracycline microspheres. Int J Pharm 306:24-40.
16. Illum L, Mathiowitz E, 1999, Bioadhesive formulation for nasal peptide delivery. Marcel Dekker. pp507-539
17. Jain NK, 2001, Advances in controlled & Novel Drug Delivery, CBS Publishers & Distributors 1:14,
18. Khar RK, Vyas SP, 2002, Targeted and Controlled drug delivery, CBS Publishers and Distributors 417-455.

19. Illum L, Jorensen H, Bisgaard H, Rossing N., 1987, Bioadhesive microsphere as a potential nasal delivery system. *Int J Pharm.* 39:189-199

20. Vyas S.P., Bhatnagar S., Gogoi P.J., Jain N.K. 1991, Preparation and characterization of HAS-propranolol microspheres for nasal administration. *Int J Pharm* 69:5-12

21. Rathbone MJ, Hadgraft J, Roberts MS, Modified release Drug Delivery Technology. Vol-126, Marcel Dekker Inc New York, 727-740.

22. Edman P., Bjork E., Ryden L. 1992, Microspheres as a nasal delivery system for peptide drugs. *J Controlled Release* 21:165-172.

23. United State Pharmacopoeia, 24th Edn, The United States Pharmacopoeial Convention, Inc., Rockville, MD, 2004, 805

24. Sweetman S.C., Matindale The complete drug reference, 33rd Edn, Pharmaceutical press London, 2002, page no. 1070.

25. Hardman J.B., Limbird L.E., Gilman A.G., Goodman and Gilman's The Pharmacological basis of therapeutics, 10th Edn McGraw-Hill Companies, Inc New York, 1996, 749

26. Illum L., Farrj N., Critchley H., Davis S.S. 1988, Nasal delivery of gentamycin using a novel microsphere delivery system. *Int J Pham* 46:261-265

27. Hersey SJ, Jackson RT, 1987, Effect of bile salts on the nasal permeability in vitro. *J Pharm Sci.*, 76:876-879.

28. Bjork E, Edman P, 1988, Degradable starch microspheres as a nasal delivery system for insulin. *Int J Pharm.* 47:233-238.

29. Farraj N.F., Johansen B.R., Davis S.S., Illum L. 1990, Nasal administration of insulin using bioadhesive microspheres as delivery system. *J. Controlled Release* 13:253-261

30. Farraj NF, Johansen BR, Davis SS, Illum L., 1990, Nasal administration of insulin using bioadhesive microspheres and lyophosphatidylcholine as a delivery system. *J Controlled Release*. 13:253-261.
31. Lewis HJ, Kellaway IW, 1990, In vitro investigation of the potential of mucoadhesive microspheres for the controlled nasal delivery of oxytocin. *J Pharm Pharmacol.*, 42:142
32. Bjork E., Edman P., 1990. Characterisation of degradable starch microspheres as a nasal delivery system for drugs. *Int J Pharm*. 62:187-192.
33. Thanoo BC, Sunny MC, Jayakrishnan A., 1992, Cross linked chitosan microspheres: Preparation and evaluation as a matrix for the controlled release of pharmaceuticals. *J Pharm Pharmacol.*, 44:238-286.
34. Almedia AJ, Alpar HO, Brown MR, 1993, Immune response to nasal delivery of antigenetically intact tetanus toxoid associated with poly(L-lactic acid) microspheres in rats, rabbits and guinea pig. *J Pharm Pharmacol.* 45:198-302.
35. Lin SY, Yu DMS, Amidon GL, 1993, Intranasal gelling delivery system: a viscoelasticity analysis of nasal residence time. *Pharm. Res.* 10:S195.
36. Abaua J., Durmaz G. 1994, Preparation and evaluation of cross linked chitosan microspheres containing furosemide. 111:217-222
37. Chiao CS, Price JC, 1994, Formulation, preparation and dissolution characteristics of propranolol hydrochloride microspheres. *J Microencapsul* 11(2):153-159

38. Viven N, Buri P, Balant L, Iacox S, 1994, Nasal absorption of metoclopramide administered to man. *Eur. J Pharm and Bio-Pharm.*40(4)228-231.
39. Chickering III D.E., Jacob J.S., Mathiowitz E. 1995, Bioadhesive microspheres II Characterization and evaluation of bioadhesion involving hard bioerodible polymers and soft tissue. *Reactive* 25:189-206
40. Kriwet B, Kissel T, 1995, Interaction between bioadhesive poly(acrylic acid) and calcium ions. *Int J Pharm*,127:135-145.
41. Pritchard K, Alison B, Gary PM, Mack H, Christopher M, 1996, Evaluation of bioadhesive properties of hyaluronan derivatives: detachment weight and mucociliary transport rate studies. *Int J Pharm*,129:137-145.
42. Pereswetoff-Morath L, Edman P, 1995, Dextran microspheres as a potential nasal drug delivery for insulin –in vitro and in vivo properties. *Int J Pharm*.124:37-44.
43. Chickering DE, Jacob JS, Desai, Harrison M, Haris WP, Morrel CN, 1997, Bioadhesive microspheres: An in vivo transit and bioavailability study of drug loaded alginate and poly(Fumaric-co-sebacic anhydride) microspheres. *J of Controlled Release* 35:46
44. Ramesh DV, Tabata Y, Ikada Y, 1998, Poly (DL lactic acid) microspheres for controlled drug delivery systems. *Indian J Pharm* 60 (4):232-234
45. Lin LY, Wan LS Effect of magnesium stearate on chitosan microspheres prepared by emulsification –coacervation technique. *J. Microencapsul* 15(2):319-333
46. Gohel MC. 1999, Studies in the preparation of diclofenac sodium microspheres by emulsion solvent evaporation technique using response surface analysis. *Indian J Pharm* 1999,61(1)48-53

- 47..Manmohan S,Maylene B,Dere KT,2000,A Novel bioadhesive intranasal delivery system for inactivated influenza vaccines. *J Controlled Release*.70:267-276.
- 48.ILLUM I.,Fisher A.N.,Jabbal-Gill I.,Davis S.S.,2001, Bioadhesive starch microspheres and absorption enhancing agents act synergistically to enhance the nasal absorption of polypeptides.*Int J Pharm* 222:109-119.
49. Soane RJ,Hinchdiffe M,Davis SS,2001 Clearance characteristics of chitosan based formulations in the sheep nasal cavity.*Int J Pharm* 217:183-191.
50. Varshosaz J,Keihanfar M,2001, Development and evaluation of sustained-release propranolol wax microspheres. *J Microencapsul.* 18(3):277-284.
- 51.Shabaraya AR, Narayanacharyulu R,2003, Design and evaluation of chitosan microspheres of metoprolol tartrate for sustained release. *Indian J Pharm*,65:250-262.
52. Arul B, Kothai R, Sangameswaran B, Jayakar B, 2000, Formulation and evaluation of chitosan microspheres containing isoniazid .*Indian J Pharm* ,65(6):640-642
53. Aulton ME, 2002, *Pharmaceutics, The Science O Dosage form Design, II Edn*, Churchill Livingstone.
54. Jain NK, 2001, *Advances in controlled & Novel Drug Delivery*, CBS Publishers & Distributors 1:14,
55. Khar RK, Vyas SP, 2002, *Targeted and Controlled drug delivery*, CBS Publishers and Distributors 417-455.
56. Lachman L, Lieberman HA, Kanig JL, *The Theory and practice Of Industrial pharmacy*, III Edn, Varghese Publishing House 52,181,182,412.

57. Rowe RC, Sheskey PJ , Owen SC, The Handbook of pharmaceutical Excipients, V Edn, Pharm Press, The American pharmacists Association.
58. Sethi PD, 2001, Thin Layer Chromatography, Quantitative Analysis of Pharmaceutical formulations, I Edn, CBS Publishers and Distributors.
59. Jain SK, Chourasia MK, 2004, Development and characterization of mucoadhesive microspheres bearing Salbutamol for nasal delivery, Drug Delivery 11:113-122
60. Mishra B, Rajinikanth PS, 2003, Sodium Alginate Microspheres of Metoprolol Tartarate for intranasal systemic delivery: Development and Evaluation, Drug Delivery 10:21-28.
61. Harikarnpakdee S, Lipipun V, 2006, Spray-dried Mucoadhesive Microspheres: Preparation and transport through nasal cell monolayer, Pharma Science Technology 1-19.
62. Illum L, 2003, Nasal drug delivery –possibilities, problems and solutions, Journal of Controlled Release 87:187-198.
63. Hussain AA, 1998, Intranasal drug delivery, Advanced Drug Delivery Reviews 29:39-49.
64. Kedzierewicz F, Darmz X, Etienne A, Lemut J, Hoffman M, Maincent P. 1998, Preparation of silicon microspheres by emulsion polymerization : application to the encapsulation of hydrophilic drug. J. Microencapsulation 15(2):227-236
65. Muthushamy k, Shibi KP., Rav T.K., Preparation and evaluation of chitosan albumin microspheres containing theophylline . J Pharm Sci 2:245-248.

66. Carbo D.C., Liu J.C., Chien Y.W., Characterisation of the barrier properties of mucosal membrane. *J Pharm Sci* 79:202-206
67. Harris H.A., Nilson I.M., Wagner Z.G., Alkner U. 1986 International administration of peptides: nasal deposition, biological response absorption of desmopressin. *J. Pharm Sci* 75:1085-1088
68. Harris A.S., Ohlin M., Sevansson S., Lethgon S., Nilson I.M. 1988a, Effects of concentration and volume on nasal bioavailability and biological response to desmopressin. *J Pharm Sci* 74:1298-1301
69. Huang C.H., Kimura R., Nassar R.B., Hussain A. 1985b, Mechanism of nasal absorption of drugs II: absorption of L-TYROSINE and the effect of structural modification on its absorption. *J Pharm Sci* 74:1298-1301
70. Ugwoke M.I., Sam E., Van Den Mooter G., Verbeke N. 1999, Nasal mucoadhesive drug delivery systems of the antiparkinsonian drug apomorphine. *Int J Pharm* 181:125-138
71. Helms R.A., Quan DJ., Herfinal E.T., Gourley D.R., *Textbook of Therapeutics Drug and Disease Management*, 8th Edn, Lippincott William & Wilkins, 1988
72. Robinson J.R., Lee V. H.L., *Controlled Drug Delivery-Fundamentals and application*, II edition, vol 29, Marcel Dekker, INC. New York.
73. Pujos EM, Flament WO, Paise MF, 2005, Comparison of the analysis of corticosteroids using different techniques. *Anal Bioanal Chem*. 381:244-254.
74. Riedley D, Perkins AC, Washington N, Wilson CG, 1995, Effects of posture on nasal clearance of bioadhesive starch microspheres. *S.T.P. Pharma Sci*. 5:442-446
- .

75. Moren F.C.H., Berthold A., 1998, Influence of chitosan microspheres on the transport of prednisolone sodium phosphate across HT-29 cell monolayers, *Pharm Res.* 15:58-65
76. Morath LP, 1998, Microspheres as nasal drug delivery systems, *Advanced Drug Delivery Review* 29:185-194.
77. Lim ST, Martin GP, 2000, Preparation and evaluation of the in vitro drug release properties and mucoadhesion of novel microspheres of hyaluronic acid and chitosan, *Journal of Controlled Release* 66:281-292.
78. Grcic JF, Lacan MB, 1996, Chitosan microspheres of nifedipine and nifedipine-cyclodextrin inclusion complexes, *Int J Pharm* 135:183-190.
79. Davis SS, Illum L, 1999, Sustained release chitosan microspheres prepared by novel spray drying methods, *J Microencapsulation* 16:343-355.
80. Ermis D, Yuksel A, 1999, Preparation of spray-dried microspheres of indomethacin and examination of the effects of coating on dissolution rates, *J Microencapsulation* 16:315-324.
81. Sahin S, Selek H, 2003, Formulation and in vitro/in vivo evaluation of terbutaline sulphate incorporated in PLGA(25/75) and L-PLA microspheres, *J Microencapsulation* 20:261-271.
82. Hwang SJ, Lee DW, 2003, preparation and release characteristics of polymer-coated and blended alginate microspheres, *J Microencapsulation* 20:179-192.
83. Khopade AJ, Mahadik KR, 1996, Enhanced Brain Uptake of Rifampicin from W/O/W Multiple Emulsions via nasal route, *Indian Journal of Pharmaceutical Sciences* 83-85

84. Miyazaki Y, Ogihara K, 2003, In vitro and in vivo evaluation of mucoadhesive microspheres consisting of dextran derivatives and cellulose acetate butyrate, *Int J Pharm* 258:21-29.
85. Behl CR, Pimplaskar HK, 1998, Optimization of systematic nasal drug delivery with Pharmaceutical excipients, *Advanced Drug Delivery Reviews* 29:117-133.
86. Berkland C, Kipper MJ, 2004, Microsphere size, precipitation kinetics and drug distribution control drug release from biodegradable polyanhydride microspheres, *Journal of Controlled release* 94:129-141.
87. Lim ST, Martin GP, 2000, Preparation and evaluation of the in vitro drug release properties and mucoadhesion of novel microspheres of hyaluronic acid and chitosan, *Journal of Controlled Release* 66:281-292.
88. El-Hameed MDA, Kellaway IW, 1997, Preparation and in vitro characterization of mucoadhesive polymeric microspheres as intra-nasal delivery systems, *European Journal of Pharmaceutics and Biopharmaceutics* 44:53-60.
89. Berthold A, Cremer K, 1996, Preparation and characterization of chitosan microspheres as drug carrier for prednisolone sodium phosphate as model for anti-inflammatory drugs, *Journal of Controlled Release* 39:17-25.
90. Iwata M, Nakamura Y, 1999, Particle size and loading efficiency of poly(D,L-lactic-co-glycolic acid) multiphase microspheres containing water soluble substances prepared by the hydrous and anhydrous solvent evaporation methods, *J Microencapsulation* 16:49-58.
91. Leucuta SE, Preda M, 2003, Oxprenolol-loaded bioadhesive microspheres: preparation and in vitro/in vivo characterization, *J Microencapsulation* 20:777-789.

92. Lucinda-silva RM, Evangelista RC, 2003, Microspheres of alginate-chitosan containing isoniazid, *J Microencapsulation* 20:145-152.
93. Sahin S, Selek H, 2002, Preparation, characterization and in vivo distribution of terbutaline sulfate loaded albumin microspheres, *Journal of Controlled Release* 82:345-358.
94. Morath LP, Edman P, 1995, Dextran microspheres as a potential nasal drug delivery system for insulin-in vitro and in vivo properties, *Int J Pharm* 124:37-44.
95. Chowdary KPR, Narayana TV, 2005, Preparation and evaluation of mucoadhesive microspheres of piroxicam for enhanced bioavailability, *Int J Pharma Excip* 49-52.
96. Dandagi PM, Mastiholimath VS, 2007, Mucoadhesive microspheres of propranolol hydrochloride for nasal delivery, *Indian Journal of Pharmaceutical Sciences* 402-407.
97. Krishnaiah YSR, Rama Prasad YV, 1996, Intranasal Drug delivery Systems :An overview 1-6.
98. Ugwoke MI, Verbeke N, 1997, Microencapsulation of apomorphine HCl with gelatin, *Int J Pharm* 148:23-32.
99. Sinha VR, Trehan A, 2003, Biodegradable microspheres for protein delivery, *Journal of controlled Release* 90:261-280.
100. Mahadik KR, Paradkar AR, 2003, Stability- indicating HPTLC determination of Tizanidine hydrochloride in bulk drug and pharmaceutical formulations, *Journal of Pharmaceutical and Biomedical Analysis* 33:545-552.

101. Katsumata H, Morimoto K, 2001, Evaluation of gelatin microspheres for nasal and intramuscular administrations of salmon calcitonin, *European Journal Of Pharmaceutical Sciences* 13:179-185.
102. Tabata Y, Wang J, 2006, Aminated gelatin microspheres as a nasal drug delivery system for peptide drugs: Evaluation of in vitro release and in vivo insulin absorption in rats, *Journal of controlled Release* 113:31-37.
103. Chickering III DE, Jacob JS, 1995, Bioadhesive Microspheres, characterization and evaluation of bioadhesion involving hard, bioerodible polymers and soft tissue, *Reactive polymers* 25:1899-206.
104. Artusi M, Sacchetti C, 2002, Caffeine microparticles for nasal administration obtained by spray drying, *Int J Pharm* 242:335-339.
105. Huang YC, Yeh MK, 2002, Formulation factors in preparing BTM-chitosan microspheres by spray drying method, *Int J Pharm* 242:239-242.
106. Bruschi ML, Cardoso MLC, 2003, Gelatin microparticles containing propolis obtained by spray-drying technique: preparation and characterization, *Int J Pharm* 264:45-55.
107. Jones N, 2001, The nose and paranasal sinuses physiology and anatomy, *Adv Drug Delivery* 51:5-19.
108. Vidgren P, Vidgren M, 1992, In vitro evaluation of spray-dried mucoadhesive microspheres for nasal administration, *Drug Dev Ind Pharm* 18:581-597.