

## Publications \_ Dr. Neeraj Kumar

### Invited Talks

1. **"Polymersome: New nano-micro carrier for drugs"** International conference on Drug Discovery and Nanotechnology (YMDDNT2008), January 27-28, 2008 Nanded, Maharashtra.
2. **"Biodegradable injectable in-situ depot forming drug delivery systems"** Conference on "Contemporary issues in drug development and future challenges" 5-7 October 2007, Seth G S Medical College and KEM Hospital, Parel, Mumbai
3. **"Biomimetic Polymeric Scaffold for Tissue Engineering"**, DBT workshop on "Biomaterials for Medical Devices and Drug Delivery" IIT-Delhi, 17<sup>th</sup> February 2007.
4. **"Biomaterials in Tissue Engineering"**, Dhirubhai Ambani Life Science Centre, Navi Mumbai, India. (Host: Professor Arnab Kapat), 3<sup>rd</sup> January 2007.
5. **"Injectable Temperature Responsive Biodegradable PLGA-PEG-PLGA Triblock Copolymers: Synthesis, Characterization and Effect of Copolymer Composition on Release of Methotrexate"** International Conference on Design of Biomaterials (BIND-06) and XVII Annual Meeting of SBAOI, 8-11 December, 2006, IIT-Kanpur, India.
6. **Intensive workshop on "Modern Analytical Techniques in Quality Control of Drugs and Pharmaceuticals"** Sep.'1-19, 2003, NIPER, (Title of presentation: Particle Size Analysis: A Pharmaceutical Approach)
7. **National Seminar on "Polymers and Applications"** February 05-07, 2004 NITTTR, Chandigarh, India. (Title of Presentation: Polymer coated medical devices for the prevention of restenosis)

### Patents

Injectable depot forming drug delivery system, **Neeraj Kumar** and Jay Prakash Jain, Filed on 19<sup>th</sup> March 2007, File ref. no. at attorney office, IPO 5680/MT/NK; Application No. **589/DEL/2007**.

Design of glucose sensitive in situ gelling system based on chitosan for pulsatile delivery of insulin, M.N.V. Ravikumar, Nandini Kashyap, Vishwanand Bhoomi, Vivekanand Bhardwaj, P. Ramarao, **Neeraj Kumar**, Filed on 3<sup>rd</sup> January 2006, File ref. no. at attorney office IPO 3155.VS/RK

### Editorial Activities

Co-editor, Special Issue: Abraham J. Domb, Jorge Hellar and **Neeraj Kumar**, "Polyanhydrides and polyorthoesters" Advanced Drug Delivery Reviews, Volume 54(7) (2002) 887-1051.

### List of Publications

#### 2008

1. J.P. Jain, Sweta Modi, and **Neeraj Kumar**, "Hydroxy fatty acid based polyanhydride as drug delivery system: Synthesis, characterization, *in vitro* degradation, drug release and biocompatibility" J. Biomed. Mater. Res. (In press).
2. J.P. Jain, M. Sokolsky, **Neeraj Kumar**, and A.J. Domb, "Fatty acid based biodegradable polymers", Polymer Reviews (In Press).
3. Rajesh Rathore, Jay Prakash Jain, Amit Srivastava, S. M. Jachak and **Neeraj Kumar**, "Simultaneous determination of hydrazinocurcumin and phenol red in samples from rat intestinal permeability studies: HPLC method development and validation" Journal of Pharmaceutical and biomedical analysis, (In Press)
4. R. Okner, M. Oron, N. Tal, A. Nyska, **Neeraj Kumar**, D. Mandler, A.J. Domb, "Electrocoating of stainless steel coronary stents for extended release of paclitaxel" *J. Biomed. Mater. Res. Part-A* (In press).

#### 2007

5. Anupma Mittal, Deepak Chitkara, and **Neeraj Kumar**, "HPLC method for the determination of carboplatin and paclitaxel with cremophor EL in an amphiphilic polymer matrix" *Journal of Chromatography B* 855(2) (2007) 211-219
6. Esther Eljarrat-Binstock, Alfonso Bentolila, **Neeraj Kumar**, Hannah Harel, and Abraham J. Domb, "Preparation, characterization and sterilization of hydrogel sponges for iontophoretic drugdeliveryuse", *Polymers for Advanced Technologies* 18 (2007)1-12.

7. Kalpna, Shalini Verma, S. Jonnalagadda and **Neeraj Kumar**, "Fast Degradable Poly (L-lactide-co-ε-caprolactone) Microsphere for Tissue Engineering: Synthesis, Characterization and Degradation Behavior" *Journal of polymer science Part A: Polymer Chemistry* 45(13) (2007) 2755-2764.
8. Wahid Khan, Mamta Kapoor and **Neeraj Kumar**, "Protein Attached Active Polypyrrole Coating for Improved Biocompatibility of Metallic Surfaces" *Acta Biomaterialia* 3(4) (2007) 541-549.
9. Kalpna, Shalini Verma, K. Tikoo, and **Neeraj Kumar**, "Surface Modified Poly(L-lactide-co-ε-caprolactone) Microspheres as Scaffold for Tissue Engineering" *J. Biomed. Mater. Res. Part-A* 82(3) (2007) 747-756.
10. Anupama Mittal, Deepak Chitkara, Rajendra Pawar, Ben Corn, **Neeraj Kumar** and Avi Domb, "**Polymeric carriers for regional drug therapy**" in **Smart Polymers: Production, study and application in biotechnology and biomedicine**, 2007.

## 2006

11. Wahid Khan, Tesfa Marew and **Neeraj Kumar**, "Immobilization of drugs and biomolecules on in situ copolymerized active ester polypyrrole coating for biomedical applications" *Biomedical Materials* 1 (2006) 235-241.
12. Shimon Ben-Shabat, **Neeraj Kumar** and Abraham J. Domb, "PEG-PLA Block Copolymer as Potential Drug Carrier: Preparation and Characterization" *Macromolecular Biosciences*, 6 (12) (2006) 1019-1025.
13. Deepak Chitkara, Ariella Shikanov, **Neeraj Kumar** and A. J. Domb, "Biodegradable Injectable *In Situ* Depot Forming Drug Delivery Systems" *Macromolecular Biosciences*, 6 (12) (2006) 977-990. **(Featured Article in the journal)**
14. Michal Y. Krasko, **Neeraj Kumar** and Abraham J. Domb, "Protein and peptide release from in situ gelling polymer" *Biomacromolecules* 7(8) (2006) 2461-2463.
15. Sweta Modi, Jay Prakash Jain, A. Domb, **Neeraj Kumar**, Copolymers of pharmaceutical grade lactic acid and sebacic acid: Drug release behavior and biocompatibility, *Eur. J. Pharm. Biopharm.* 64 (2006) 277-286.
16. Sweta Modi, Jay Prakash Jain, A. Domb, **Neeraj Kumar**, Exploiting EPR for tumor targeting in polymer drug conjugate delivery, *Current Pharmaceutical Design*, 12 (36)(2006) 4785-4796.

## 2005

17. S. Modi, J.P. Jain, and **Neeraj Kumar**, Synthesis, characterization and degradation of poly(ester-anhydride) for particulate delivery, *Israel J. Chem.*, 45(2005) 401-409. (I.P. 1.984)
18. A. Shikanov, Neeraj Kumar, A. J. Domb, Biodegradable polymers: An update, *Israel J. Chem.*, 45(2005) 393-399. (I.P. 1.984)
19. J.P. Jain, S. Modi, A. J. Domb and **Neeraj Kumar**, The role of polyanhydrides as localized drug carrier, *J. Controlled Release* 103 (2005) 541-563. (I.P. 2.63)
20. Neeraj Kumar, A. Bentolila and A.J. Domb, Structure and Biological Activity of Heparinoid, *Mini Rev Med Chem.* 5 (5) (2005) 441-447
21. J.P. Jain, V. Wanknis, S. Modi, M.N.V. Ravikumar and **Neeraj Kumar**, Trapping EPR for polymer drug conjugate delivery, *Drug Del. Tech.* 5(3) (2005) 65-69.
22. N. Kashyap, **Neeraj Kumar** and M. N. V. Ravi Kumar, Hydrogels for pharmaceutical and biomedical applications, *Crit. Rev. Ther. Drug Carr. Syst.*, 22(2) (2005)107-150.
23. V. Bhardwaj, S. Hariharan, I. Bala, A. Lamprecht, **Neeraj Kumar**, R. Panchagnula, M. N. V. Ravi Kumar, Pharmaceutical aspects of nanoparticulate oral delivery, *J. Biomed. Nanotech.* 1(3) (2005) 235-258.

## 2004

24. N. Kashyap, **Neeraj Kumar** and M.N.V. Ravi Kumar, Hydrogel for biomedical applications, *Drug Del. Tech.* 4(7) (2004) 32-39.

## 2003

25. Osnat Shaaya, Tzviel Sheskin, Amir Magora, Aliza Raziell, **Neeraj Kumar**, Abraham J. Domb, "Anhydride Prodrugs for Non-Steroidal Anti-Inflammatory Drugs" *Pharmaceutical Research*, 20(2) (2003) 205-211.
26. **Neeraj Kumar**, Zhong Zhao, A.J. Domb, "Polyanhydrides" in *Encyclopedia of Polymer Science and Technology*, J.I. Kroschwitz (Ed.) 3rd Edition, Vol. 7, pp 368-393, Wiley-Interscience NewYork (Published on web).
27. **Neeraj Kumar**, A.J. Domb, "Biodegradable polymers" in *Encyclopedia of Polymer Science and Technology*, J.I. Kroschwitz (Ed.) 3rd Edition, Vol. 5, pp 263-285, Wiley-Interscience NewYork (Published on web).

28. **Neeraj Kumar**, Mahesh Chaubal, A.J. Domb, M.N.V. Ravikumar, "Controlled drug release technology" in Encyclopedia of Polymer Science and Technology, J.I. Kroschwitz (Ed.) 3rd Edition, Wiley-Interscience NewYork (Published on web).

## 2002

29. **Neeraj Kumar**, Tony Azzam, Abraham J. Domb, "Molecular mass distribution of polycations by high-performance size-exclusion chromatography, *Polymers for Advanced Technologies*, **13(10-12)** (2002) 1071-1077
30. Michal Y. Krasko, **Neeraj Kumar**, Abraham J. Domb, "Fatty acid terminated polyanhydrides - A new approach, *Polymers for Advanced Technologies*, **13(10-12)** (2002) 960-968.
31. **Neeraj Kumar**, R. Langer, A.J. Domb, "Polyanhydrides: An Overview" *Adv. Drug Del. Reviews* 54(7) (2002) 889-910
32. **Neeraj Kumar**, Mahesh Krishnan, Tony Azzam, Amir Magora, M.N.V. Ravikumar, Douglas R. Flanagan, and A.J. Domb, "Analysis of Fatty Acid Anhydrides and Polyanhydrides", *Analytica Chimica Acta* 465 (1-2) (2002) 257-272
33. M. N. V. Ravi Kumar, **Neeraj Kumar**, Meenakshi Arora and Abraham J. Domb, "A Review of Polymeric controlled drug release formulations, *Adv. Polym. Sci.*, 160 (2002) 45-117.
34. **Neeraj Kumar**, M.N.V. Ravikumar, Raia Slivniak, Michal Y. Krasko, A.J. Domb, "Biodegradation of Polyanhydrides" in *Biopolymers: Other Biopolymers and Biodegradation of Synthetic Polymers*, A. Steinbuchel and S. Matsumura (Eds.), Vol. 9, Wiley-VCH Germany, 2002, pp. 423-456.
35. **Neeraj Kumar**, Ann-Christine Albertsson, Ulrica Edlund, Doron Teomim, A. Rasiel and Abraham J. Domb, "Polyanhydrides" in *Biopolymers: Polyesters III - Applications and Commercial Products*, A. Steinbuchel and Y. Doi (Eds.), Vol. 4, Wiley-VCH Germany, 2002, pp. 203-234.

## 2001

36. **Neeraj Kumar**, M.N.V. Ravi Kumar and Abraham J. Domb, "Biodegradable block copolymers", *Adv. Drug Del. Reviews*, 53-1 (2001) 23-44.
37. M. N. V. Ravi Kumar and **Neeraj Kumar**, "Polymeric controlled drug release formulations: Perspective issues and opportunities", *Drug Dev. Ind. Pharm.*, **27** (2001) 1-30
38. R.N. Goyal, **Neeraj Kumar**, "Oxidation chemistry and biochemistry of 5-hydroxyindole, *Oxidation Communications*, **24(4)** (2001) 563-575.
39. Abraham J. Domb, **Neeraj Kumar**, Tzviel Sheskin, Alfonso Bentolila, Joram Slajer, and Doron Teomim, "Biodegradable Polymers as Drug Carrier Systems", in: *Polymeric Biomaterials*, S. Dumitriu (Ed.), Marcel Dekker, 2001, pp. 91-122.

## Pre-2001

40. Tanveer Alam, Hina Tarannum, **Neeraj Kumar**, Kamaluddin, "Interaction of 2-Amino-, 3-Amino-, and 4-Aminopyridines with Chromium and Manganese Ferrocyanides", *J. Colloid Interface Sci.*, **224(1)** (2000) 133-139
41. R.N. Goyal, **Neeraj Kumar**, Bhanu P. Srivastava, "Oxidation chemistry of 4-hydroxy and 5-hydroxyindoles in micellar medium, *Indian J. Chem., Sect. B: Organic Chemistry including Medicinal Chemistry*, **40** (9)(2001)806-812
42. R. N. Goyal, P. P. Thankachan, **Neeraj Kumar**, Aditi Sangal, "Effect of methyl groups on the oxidation of xanthine and correlation of oxidation potentials with frontier molecular orbital energies", *Indian J. Chem., Sect. A: Inorg., Bio-inorg., Phys., Theor. Anal. Chem.*, 39A(9)(2000) 953-963
43. R.N. Goyal, **Neeraj Kumar**, "Electrooxidation of 4-hydroxyindole and effects of its oxidation product on blood parameters of albino mice", *Bioorg. Chem.*, 27(1999) 239-252
44. R.N. Goyal, **Neeraj Kumar**, "Cyclic voltammetry and chronoamperometry of 1-methylxanthine: Evidence for an unstable para-quinonoid diimine intermediate", *Aust. J. Chem.*, 52 (1999) 43-50
45. R.N. Goyal, **Neeraj Kumar**, Naveen K. Singhal, "Oxidation chemistry and biochemistry of indole and effect of its oxidation product in albino mice", *Bioelectrochem. Bioenerg.*, 45 (1998) 47-53
46. R.N. Goyal, Madhu Shri Verma, **Neeraj Kumar**, "Electrochemical and peroxidase-catalysed oxidation of 1-methyl uric acid", *Bioelectrochem. Bioenerg.*, 43 (1997) 205-213
47. R.N. Goyal, **Neeraj Kumar**, "Electrochemical Reduction of 2-(2-Thiazolylazo)- p-cresol at a Pyrolytic Graphite Electrode", *Croatica chemica Acta*, 70(4) (1997) 925-939

**Abstracts and proceedings**

1. Kalpna, Shalini Verma, K. Tikoo, and **Neeraj Kumar**, "Surface Modified Poly(L-lactide-co- $\epsilon$ -caprolactone) Microspheres as Scaffold for Tissue Engineering" Indo-Australian conference BITE&RM January 10-12, 2007, Sree Chitra Tirunal Institute for Medical Sciences & Technology, Thiruvananthapuram, India.
2. Wahid Khan, Tesfa Marew, and **Neeraj Kumar**, "Immobilization of drugs and biomolecules on in situ copolymerized active ester polypyrrole coating for biomedical applications" International Conference on Design of Biomaterials (BIND-06) and XVII Annual Meeting of SBAOI, 8-11 December, 2006, IIT-Kanpur, India.
3. Deepak Chitkara, Anupma Mittal, and **Neeraj Kumar**, "Injectable Temperature Responsive Biodegradable PLGA-PEG-PLGA Triblock Copolymers: Synthesis, Characterization and Effect of Copolymer Composition on Release of Methotrexate" International Conference on Design of Biomaterials (BIND-06) and XVII Annual Meeting of SBAOI, 8-11 December, 2006, IIT-Kanpur, India.
4. Kalpna Garkhal, Shalini Verma, and **Neeraj Kumar**, "Fast degradable poly (l-lactide-co-"epsilon"-caprolactone) microspheres for tissue engineering: Synthesis, characterization and degradation behavior" International Conference on Design of Biomaterials (BIND-06) and XVII Annual Meeting of SBAOI, 8-11 December, 2006, IIT-Kanpur, India.
5. Neha Shoree and **Neeraj Kumar**, "Poly (ester-anhydride) microspheres as localized carriers for methotrexate" International Conference on Design of Biomaterials (BIND-06) and XVII Annual Meeting of SBAOI, 8-11 December, 2006, IIT-Kanpur, India.
6. Shalini Verma and **Neeraj Kumar**, "Surface Modified Polymeric Microspheres: Moldable Scaffold for Tissue Engineering" International Conference on Design of Biomaterials (BIND-06) and XVII Annual Meeting of SBAOI, 8-11 December, 2006, IIT-Kanpur, India.
7. Wahid Khan, Mamta Kapoor, and **Neeraj Kumar**, " Synthesis of N-substituted polypyrrole coating for covalent attachment of protein and amino group containing drugs to improve biocompatibility and for localized drug delivery from implantable medical devices" Biomaterials, XVI conference of SBAOI on "Tissue Engineering and Medical Diagnostics" 24-26 February, 2006, IIT-Delhi, India.
8. Shalini Verma, Kalpna, R. S. Bhatnagar, P. Ramarao, and **Neeraj Kumar**, "P-15 modified PLGA microspheres for tissue engineering", Biomaterials, XVI conference of SBAOI on "Tissue Engineering and Medical Diagnostics" 24-26 February, 2006, IIT-Delhi, India.
9. Kalpna, Shalini Verma and **Neeraj Kumar**, Surface modified poly(L-lactide-co-e-Caprolactone) microspheres for tissue engineering, 2<sup>nd</sup> International symposium on "Drug Discovery and Process Research" 10-12 February, 2006, Belgaum, India.
10. Mamta Kapoor, **Neeraj Kumar**, " Synthesis and characterization of 3-substituted pyrrole as electrocoating material for metallic devices", IXX National symposium & Professor Ram Chand Paul second symposium on "Recent Trends in Chemistry" December 22-23, 2005, Punjab University, Chandigarh, India.
11. Jay P. Jain, Sweta Modi and **Neeraj Kumar**, "Injectable oligomeric ricinoleic acid based polyanhydrides as localized drug carriers for anticancer drugs", Proceedings of 32th Controlled Release Society Annual Meeting, June 18-22, 2005, Miami Beach, Florida U.S.A.
12. Jay P. Jain, Sweta Modi and **Neeraj Kumar**, "Biodegradable oligomeric fatty acid based polyanhydrides as drug carrier for anticancer agents", National conference on "Recent trends in polymer science and technology" 6-7 May, 2005, Patiala, India
13. S. Modi, J.P. Jain and **Neeraj Kumar**, " Synthesis and characterization of poly(ester-anhydride) as drug carriers for anticancer agents", Proceedings of 32th Controlled Release Society Annual Meeting, June 18-22, 2005, Miami Beach, Florida U.S.A.
14. Jay P. Jain, Sweta Modi and **Neeraj Kumar**, Oligomeric ricinoleic acid based injectable polymer: synthesis, characterization and in-vitro drug release, National seminar on 'Recent Developments in Biomedical Polymers and their Applications' 13-14 May, 2005, Bangalore, India.
15. S. Modi, J.P. Jain and **Neeraj Kumar**, "Synthesis and characterization of PLA-PSA as biodegradable polymer", National conference on "Recent trends in polymer science and technology" 6-7 May, 2005, Patiala, India.
16. Vrushali Wanknis, **Neeraj Kumar**, T N Guru Row, Deepak, P V Bharatam, C.L. Kaul, Ramesh Panchagnula, "Single crystal studies of mefenamic acid as a tool to understand polymorphism", [PPXRD-3 -](#)

[Pharmaceutical Powder X-ray Diffraction Symposium](#) 23-25 Feb 2004, Hilton Head Island, South Carolina, USA.

17. **Neeraj Kumar**, Zhaoyang Ye, Laura Thoma, Duane D. Miller, Ram I. Mahato, "Design of PEI-Based Lipopolymeric Carrier for Gene Delivery", Proceedings of 30th Controlled Release Society Annual Meeting, July 19-23, 2003, Glasgow, Scotland.
18. Zhaoyang Ye, **Neeraj Kumar**, Ajit S. Narang, Laura Thoma, Duane D. Miller, Ram I. Mahato, "Hydrophobization of Cationic Polymers for Enhanced Gene Delivery", Proceedings of 6th American Society of Gene Therapy Annual Meeting, June 4-8, 2003, Washington, DC, USA.
19. **Neeraj Kumar**, Tony Azzam, Abraham J. Domb, "Molecular mass distribution of polycations by high-performance size-exclusion chromatography", Proceedings of 6<sup>th</sup> International symposium on Polymers for Advanced Technologies (PAT-2001), September 2-6, 2001, Eilat, Israel.
20. Michal Y. Krasko, **Neeraj Kumar**, Abraham J. Domb, "Fatty acid terminated polyanhydrides – A new approach", Proceedings of 6<sup>th</sup> International symposium on Polymers for Advanced Technologies (PAT-2001), September 2-6, 2001, Eilat, Israel.