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AREA OF RESEARCH

Polymeric drug delivery system using nucleation and crystallization inhibition, Solid state pharmaceuticals (cocrystal, amorphous solid dispersions, amorphous salt solid dispersions), Polymeric micellar drug delivery systems. Lipid based drug delivery systems

WORK EXPERIENCE

Assistant Professor (2009-2014): NIPER, SAS Nagar

Associate Professor (2014-2019): NIPER, SAS Nagar

Professor (2019-Till Date): NIPER, SAS Nagar

TOTAL PUBLICATIONS : 106

RECENT PUBLICATIONS : Since 2015

1. Roshan M. Borkar, Murali Mohan Bhandi, Ajay P. Dubey, Prajwal P. Nandekar, **Abhay T. Sangamwar**, Sanjay K. Baberjee, R. Srinivas. Plasma protein binding, pharmacokinetics, tissue distribution, and CYP450 biotransformation studies of fidarestat by ultra high performance liquid chromatography-high resolution mass spectrometry. **J Pharm Biomed Anal.** (2015) 102: 386-399
2. Patel SR, Gangwal R, **Sangamwar AT**, Jain R. Synthesis, biological evaluation and 3D QSAR study of 2, 4-disubstituted quinolines as anti-tuberculosis agents **Eur J Med Chem** (2015) 26(93):511-22
3. Amit Mahindra Rahul P. Gangwal Sunil Bansal, Nathan E. Goldfarb, Ben M. Dunn, **Abhay T. Sangamwar** and Rahul Jain. _Antiplasmodial activity of short peptide-based compounds **RSC Adv.**, (2015) 5:22674-22684
4. Prinesh N. Patel, Roshan M. Borkar, Pradipbhai D. Kalariya, Rahul P. Gangwal, **Abhay T. Sangamwar**, Gananadhamu Samanthula and Srinivas Ragampeta Characterization of degradation products of Ivabradine by LC-HR-MS/MS: a typical case of exhibition of different degradation behaviour in HCl and H₂SO₄ acid hydrolysis **J Mass Spectrom** (2015) 50(2):344–353
5. Gangwal RP, Damre MV, Das NR, Dhoke GV, Bhadauriya A, Varikoti RA, Sharma SS, **Sangamwar AT**. Structure based virtual screening to identify selective phosphodiesterase 4B inhibitors **J Mol Graph Model** (2015) 57:89-98
6. Sunil K Jena, Sarsija Suresh, **Abhay T Sangamwar**. Modulation of tamoxifen induced hepatotoxicity by tamoxifen-phospholipid complex. **J Pharm Pharmacol** (2015) 67(9):1198-206

7. Dara A, **Sangamwar AT**. Technology Whitespaces India Should Focus: A Comparative Anticancer Patent Rational Analysis of Indian and International Public Funded Universities. **Recent Pat Anticancer Drug Discov** (2015) 10(2):163-9
8. Satya Prakash Tripathi, Rameshwar Prajapati, Neha Verma, **Abhay T. Sangamwar**. Predicting substrate selectivity between UGT1A9 and UGT1A10 using molecular modelling and molecular dynamics approach. **Mole Simul** (2016) 42(4):270-288
9. Prakram Singh Chauhan, Satya Prakash Tripathi, **Abhay T Sangamwar**, Neena Puri, Prince Sharma, Naveen Gupta. Cloning, molecular modelling, and docking analysis of alkali-thermostable β -mannanase from *Bacillus nealsonii* PN-11. **Appl Microbiol Biotechnol** (2015) 99(21):8917-25
10. Neeraj K Patel, Khemraj Bairwa, Rahul Gangwal, Gaurv Jaiswal, Sanjay M Jachak, **Abhay T Sangamwar**, Kamlesh K Bhutani. 2'-hydroxy flavanone derivatives as inhibitors of pro-inflammatory mediators: Experimental and molecule docking studies. **Biorg and Med chem letters**. (2015) 25 (9):1952-1955
11. Dara Ajay, Rahul P Gangwal, **Abhay T Sangamwar**. IPAT: A freely accessible software tool for analysing multiple patent documents with inbuilt landscape visualizer. **Pharm. Pat. Anal.** (2015) 4(5):377-386
12. Chhuttan L. Meena, Shubdha Ingole, Satyendra Rajpoot, Avinash Thakur, Prajwal P. Nandekar, **Abhay T. Sangamwar**, Shyam S. Sharma, Rahul Jain. Discovery of a low affinity thyrotropin releasing hormone (TRH) like peptide that exhibits potent inhibition of scopolamine induced memory impairment in mice. **RSC Adv** (2015) 5:56872-56884
13. Chhuttan L Meena, Avinash Thakur, Prajwal P Nandekar, Shyam S Sharma, **Abhay T Sangamwar**, Rahul Jain. Synthesis and biology of ring-modified l-histidine containing thyrotropin releasing hormone (TRH) analogues. **Eur. J. Med. Chem.** (2016) 111:72-78
14. Inderjit S Yadav, Prajwal P Nandekar, Shambhavi Shrivastava, **Abhay Sangamwar**, Ashok Chaudhary, Subhash Mohan Agrawal. Ensemble docking and molecular dynamics identify knoevenagel curcumin derivatives with potent anti-EGFR activity. **Gene** (2014) 539:82-90
15. Geetika Aggarwal, Rameshwar Prajapati, Rajan K Tripathy, Priyanka Bajaj, A R Satvik Iyengar, **Abhay T Sangamwar**, Abhay H Pande. Toward understanding the catalytic mechanism of human paraoxonase 1: Site specific mutagenesis at position 192. **PLoS ONE** (2016) 11(2):e0147999
16. Kesharwani SS, Nandekar PP, Pragyan P, Rathod V, **Sangamwar AT**. Characterization of differences in substrate specificity among CYP1A1, CYP1A2 and CYP1B1: an integrated approach employing molecular docking and molecular dynamics simulations **J Mol Recognit** (2016) 29(8):370-390
17. Nandekar PP, Khomane K, Chaudhary V, Rathod VP, Borkar RM, Bhandi MM, Srinivas R, **Sangamwar AT**, Guchhait SK, Bansal AK. Identification of leads for antiproliferative activity on MDA-MB-435 human breast cancer cells through pharmacophore and CYP1A1 mediated metabolism. **Eur J Med Chem** (2016) 115: 82-93
18. Rathod V, Belekar V, Garg P, **Sangamwar AT**. Classification of human pregnane X receptor (hPXR) activators and non-activators by machine learning techniques: A multifaceted approach. **Comb Chem High Throughput Screen.** (2016) 19(4):307-318
19. Sunil K Jena and **Abhay T Sangamwar**. Polymeric micelles of amphiphilic graft copolymer of alpha tocopherol succinate-g-carboxymethyl chitosan for tamoxifen

delivery: Synthesis, characterization and in vivo pharmacokinetic study. **Carbohydr. Polym** (2016) 151:1162-74

20. Vishnu k sharma, Prajwal P Nandekar, **Abhay Sangamwar**, Horacio Perez –Sanchez, Subhash Mohan Agrawal. Structure guided design and binding analysis of EGFR inhibiting analogues of erlotinib and AEE788 using ensemble docking, molecular dynamics and MM-GBSA. **RSC Adv** (2016) **6**:65725-65735
21. Ankit Dhaundiyal, Sunil K Jena, Sanjaya K Samal Bhavin Sonwane, Mahesh Chand, **Abhay T sangamwar**. Alpha lipoic acid sterylamine conjugate based solid lipid nanoparticles for tamoxifen delivery: Formulation, optimization, in vivo pharmacokinetic and hepatotoxicity study **J Pharm Pharmacol** (2016) 68(12):1535-1550
22. Sunil K Jena, **Abhay T Sangamwar**. Polymeric micelles: a promising tool for tamoxifen delivery in cancer? **Therapeutic Delivery**. (2017) 8(3):109-111
23. Poonam Singh Thakur, Narinder Singh, **Abhay T Sangamwar**, Arvind K Bansal. Investigation of need of natural bioenhancer for a metabolism susceptible drug- raloxifene, in a designed self-emulsifying drug delivery system. **AAPS Pharm SciTech** (2017) Feb 21
24. Sawni G Khare, Sunil K Jena, **Abhay T Sangamwar**, Sadhika Khullar, Sanjay K Mandal. Multicomponent pharmaceutical adducts of α -eprosartan: Physicochemical properties and pharmacokinetics study. **Cryst. growth Des** (2017) 17(4):1589-1599
25. Sunil K Jena, Sanjay K Samal, Shamandeep Kaur, Mahesh Chand, **Abhay T Sangamwar**. Potential of amphiphilic graft copolymer α -tocopherol succinate-g-carboxymethyl chitosan in modulating the permeability and anticancer efficacy of tamoxifen. **Eur J Pharm sci** (2017) 101:149-159
26. Shamandeep Kaur, Sunil K Jena, Sanjay K Samal, **Abhay T Sangamwar**. Freeze dried solid dispersion of exemestane: A way to negate an aqueous solubility and oral bioavailability problems. **Eur J Pharm Sci** (2017) 107:54-61
27. Amarjit Jana, Jagannath Jana, Kartick Patra, Soma Mondal, Jyotsna Bhat, Arnab Sarkar, Pallabi Sengupta, Anindya Biswas, Meghomukta Mukherjee, Satya Prakash Tripathi, Rahul Gangwal, Joyita Hazra, **Abhay T. Sangamwar** Gopeswar Mukherjee, Shamee Bhattacharjee, Deba Prasad Mandal and Subhrangsu Chatterjee LINCRNA00273 promotes cancer metastasis and its G-Quadruplex promoter can serve as a novel target to inhibit cancer invasiveness **Oncotarget** (2017) 8:110234-110256
28. Metre S, Mukesh S, Samal SK, Chand M, **Sangamwar AT**. Enhanced Biopharmaceutical Performance of Rivaroxaban through Polymeric Amorphous Solid Dispersion. **Mol. Pharm.** (2018) 15(2):652-668
29. Thanki K, Prajapati R, **Sangamwar A T**, Jain S. Long chain fatty acid conjugation remarkably decreases the aggregation induced toxicity of Amphotericin B. **Int J Pharm** (2018) 544(1):1-13
30. Ikjot Sodhi, **Abhay T Sangamwar**. Microarray plate method for estimation of precipitation kinetics of celecoxib under biorelevant conditions and precipitate characterisation. **Mol. Pharm.** (2018) 15(6):2423-2436
31. Siddharth S Kesharwani, Shamandeep Kaur, Hemachand Tummala, **Abhay T Sangamwar**. Multifunctional approaches utilizing polymeric micelles to circumvent multidrug resistant tumors. **Colloids Surf. B** (2019) 173:581-590
32. Siddharth S Kesharwani, Shamandeep Kaur, Hemachand Tummala, **Abhay T Sangamwar**. Overcoming multiple drug resistance in cancer using polymeric micelles **Expert Opin Drug Deliv** (2018) 15(11):1127-1142

33. Prachi Joshi and **Abhay T Sangamwar**. Stabilizing supersaturated drug delivery system through mechanism of nucleation and crystal growth inhibition of drugs. **Ther. Deliv.** (2018) 9(12) 873-885
34. Shrishti S Tiwari, Balasaheb B Chavan, Bhoopendra S Kushwah, Naga Veera Yerra, Sumit Mukesh, **Abhay T Sangamwar**, Jagadeshwar Reddy Thaota, M V N Kumar Talluri. In vitro and in vivo investigation of metabolic fate of riociguat by HPLC-Q-TOF/MS/MS and in silico evaluation of the metabolites by ADMET predictorTM. **J. Pharm.. Biomed. Anal.** (2019) 164:326-336
35. Samarth S Thakore, Rahul P Gangwal, Ajit S Narang, **Abhay T Sangamwar**. Assessment of biopharmaceutical performance of supersaturating formulations of carbamazepine in rats using PBPK modelling. **AAPS PharmSciTech** (2019) 20(5):179
36. Ikjot Sodhi, Prabhakar Mallepogu, Vaibhav P Thorat, Mahesh C Kashyap, **Abhay T Sangamwar**. Insights on role of polymers in precipitation of celecoxib from supersaturated solutions as assessed by focused beam reflectance measurement (FBRM) **Eur J Pharm Sci** (2019) 137:104983
37. Navpreet Kaur, Poonam Singh Thakur, Ganesh Shete, Rahul Gangwal, **Abhay T. Sangamwar**, and Arvind Kumar Bansal. Understanding the oral absorption of Irbesartan using biorelevant dissolution testing and PBPK modelling. **AAPS PharmSciTech** (2020) 21:102
38. Santosh Sunnam, Ikjot Sodhi, Prachi Joshi, Sanjaya K Samal, **Abhay T Sangamwar**. Correlating precipitation inhibition efficacy of Eudragit EPO and polyvinyl pyrrolidone (PVP) K30 on supersaturated solution of atorvastatin calcium with Caco-2 permeability enhancement. **J Drug Del Sci Tech** (2020) 57:101692
39. Mandeep, Shamandeep Kaur, Sanjaya K Samal, Sabyasachi Roy, **Abhay T Sangamwar**. Successful oral delivery of fexofenadine hydrochloride by improving permeability via phospholipid complexation. **Eur J Pharm Sci** (2020) 149:105338
40. Rahul Kumar, Arvind Sirvi, Shamandeep Kaur, Sanjaya K Samal, Sabyasachi Roy, **Abhay T Sangamwar**. Polymeric micelles based on amphiphilic oleic acid modified carboxymethyl chitosan for oral drug delivery of BCS class IV compound: intestinal permeability and pharmacokinetic evaluation. **Eur J Pharm Sci** (2020) 153:105466
41. Shristy S. Tiwari, Sumit Mukesh, **Abhay T Sangamwar**, M V N Kumar Talluri. In vivo metabolic investigation of cetilistat in normal versus pseudo-germ-free rats using UPLC-QTOFMS/MS and in silico toxicological evaluation of its metabolites. **Biomed. Chromatogr** (2020) 34(8):e4860
42. Shristy S Tiwari, Vivek Dhiman, Sumit Mukesh, **Abhay T Sangamwar**, Ragampeta Srinivas, M V N Kumar Talluri. Identification and characterisation of novel metabolites of nintedanib by ultra-performance liquid chromatography/quadrupole time-of-flight tandem mass spectrometry with in silico toxicological assessment. **Rapid Commun. Mass Spectrom.** (2020) 34(22):e8915
43. Ridhima Singh, Vaibhav Thorat, Harpreet Kaur, Ikjot Sodhi, Sanjaya K Samal, Kailash C Jena, **Abhay T Sangamwar**. Elucidating the molecular mechanism of drug-polymer interplay in a polymeric supersaturated system of rifaximin. **Mol. Pharm.** (2021) 18(4):1604–1621
44. Ridhima Singh, Vikram Joshi, Nitin Mehetre, **Abhay T Sangamwar**. Insights into co-amorphous systems in therapeutic drug delivery. **Ther Deliv.** 2021 12(3):245-265

45. Sumit Mukesh, Prachi Joshi, Arvind Bansal, Mahesh Kashyap, Sanjay Mandal, Vasant Sathe, **Abhay T Sangamwar**. Amorphous salt solid dispersions of celecoxib: Enhanced biopharmaceutical performance and physical stability. **Mol. Pharm.** (2021) 18(6):2334-2348
46. Ravi Chakravarti, Shamandeep Kaur, Sanjaya K Samal, Mahesh C Kashyap, **Abhay T Sangamwar**. Combination of phospholipid complex and matrix dispersion techniques for improving oral bioavailability and hypolipidemic activity of simvastatin. **AAPS PharmSciTech.**(2021) 22(5):189
47. Samarth D Thakore, Arvind Sirvi, Vikram C Joshi, Sanjali S panigrahi, Arijita Manna, Ridhima Singh, **Abhay T Sangamwar**, Arvind K Bansal. Biorelevant dissolution testing and physiologically based absorption modeling to predict in vivo performance of supersaturating drug delivery systems. **Int. J Pharm.** (2021) 607:120958
48. Prachi Joshi, Prabhakar Mallepogu, Harpreet Kaur, Ridhima Singh, Ikjot Sodhi, Sanjaya K. Samal , Kailash C. Jena, **Abhay T Sangamwar** Explicating the molecular level drug-polymer interactions at the interface of supersaturated solution of the model drug: Albendazole **Eur. J Pharm. Sci.** (2021) 10 (107):106014
49. Prachi Joshi, **Abhay T Sangamwar**. Insights into the role of compendial/biorelevant media on the supersaturation behavior of drug combination (drug-drug interaction) and precipitation inhibition by polymers. **AAPS PharmSciTech** (2022) 23(8):300
50. Mahendra Chougule, Arvind Sirvi, Vanshul Saini, Mahesh Kashyap, **Abhay T Sangamwar**. Enhanced biopharmaceutical performance of brick dust molecule nilotinib via stabilised amorphous nanosuspension using facile acid-base approach **Drug Deliv Transl Res** (2023) 13(10):2503-2519
51. Smiritilekha Mondal, Arvind Sirvi, Karan Jadhav, **Abhay T Sangamwar**. Supersaturating lipid based solid dispersion of atazanavir provides enhanced solubilization and supersaturation in the digestive aqueous phase **Int. J Pharm.** (2023) 638:122919
52. Yashdeep Mukheja, Jaspreet Kaur, Khushboo Pathania, Sangeeta P Sah, Deepak B salunke, **Abhay T Sangamwar**, Sandip V Pawar. Recent advances in Pharmaceutical and biotechnological applications of lignin based materials **Int J Biol Macromol** (2023) 241:124601
53. Sumit Mukesh, Goutam Mukherjee, Ridhima Singh, Nathan Steenbuck, Carolina Demidova, Prachi Joshi, **Abhay T Sangamwar**, Rebecca C Wade. Comparative analysis of drug-salt-polymer interactions by experiment and molecular simulation improves biopharmaceutical performance. **Comm Chem** (2023) 6:201
54. Arvind Sirvi, Shubham Debaje, Kajal Guleria, **Abhay T Sangamwar**. Critical aspects involved in lipid dispersion and digestion: Emphasis on in vitro models and factors influencing lipolysis of oral lipid based formulations. **Adv Colloid Interface Sci** (2023) 321:103028
55. Karan Jadhav, Arvind Sirvi, Akash Janjal, Mahesh C Kashyap, **Abhay T Sangamwar**. Utilization of lipophilic salt and phospholipid complex in lipid based formulations to modulate drug loading and oral bioavailability of pazopanib. **AAPS PharmSciTech** (2024) 25(59)
56. Ajay Sanjay Lale, Arvind Sirvi, Shubha Debaje, Sadhana Patil, **Abhay T Sangamwar** Supersaturable diacyl phospholipid dispersion for improving oral bioavailability of brick dust molecule: A case study of aprepitant **Eur J Pharm Biopharm** (2024) 197:114241

57. Arvind Sirvi, Karan Jadhav, **Abhay T Sangamwar**. Enabling superior drug loading in lipid based formulations with lipophilic salts for a brick dust molecule: Exploration of lipophilic counterions and in vitro-in vivo evaluation **Int. J Pharm.** (2024) 6556, 124108.
58. Mehak Juneja, Krishna Mehtre, Vanshul Saini, Ridhima Singh, Prakash Amate, Mahesh Kashyap, Abhay T Sangamwar. Synergistic effect of polymers in stabilizing amorphous pretomanid through high drug loaded amorphous solid dispersion. *Drug Deliv. Transl. Res* (2024)

Book Chapters

1. Rahul P Gangwal A, Mangesh V Damre, Abhay T Sangamwar (2016). **Chemometrics Applications and Research**, In Andreaw G Mercader, Pablo R Duchowicz and P M Sivakumar (Eds)**Apple Academic Press**, NJ 08758. USA

INVITED TALKS

19 invited talks delivered in national and international conferences

CONFERENCES/SYMPOSIUM/WORKSHOPS

1. 5 International symposium on drug metabolism and pharmacokinetics was organised as a coordinator
2. 1 National symposium organised on experimental research and alternatives in collaboration with PGIMER, Chandigarh

AWARDS, HONORS & ACHIEVEMENTS

1. DAAD (German Academic Exchange Programme) fellowship for two times to visit and stay at German Universities
2. Fellow of Maharashtra Academy of Science (FMASc)

EXTRAMURAL PROJECTS

Sr No.	Grant Agency	Title of the project	Duration/Status	Amount (INR)
1	DST, New Delhi	Design and pharmaceutical profiling of anti-inflammatory leads: small molecule approaches	2010-2013/Completed	18,40,000/-
2	CSIR, New Delhi	Investigations of the solid state properties of pharmaceutical solids by	2011-2014/Completed	6,63,000/-

		in silico approaches		
3	DBT, New Delhi	Molecular dynamics studies of homology model of CYP1A1, structure based drug design and virtual screening of potential ligands that modulates the biological function of CYP1A1	2012--2015/Completed	38,04,000/-
4	DBT, New Delhi	Computational and in vitro screening of bioflavonoids for selective P-gp inhibition	2015/ 2018	31,83,200/-
5	BMBF-DBT science programme	Investigations of drug polymer interactions by coarse grained molecular dynamics simulations for stable drug formulations	2018/2021	1,00,35712/-

FOREIGN COLLABORATIONS

1. Prof Rebecca Wade, Heidelberg University, Germany

Investigation on drug-polymer interactions through coarse grained molecular dynamics simulations for stable drug formulations

This project covers the advanced drug formulations for spatiotemporal release of the drug. Drug-excipient interactions are explored using coarse-grained MD simulations. These interactions helped in screening the suitable excipients for stable drug formulations.

Outcome- 1 Indian patent

1 Research paper at Nature- Communications Chemistry

2. Prof. Jennifer Keiser, Swiss Tropical and Public Health Institute, CH-4123 Allschwil

Improvement in the oral bioavailability of albendazole-mebendazole combination through supersaturation

This project covers the albendazole-mebendazole combination drug formulations by selecting the excipients on the basis of precipitation inhibition at the intestinal pH. The pharmacodynamics study is completed at Swiss Tropical and Public Health Institute, Switzerland.

