

Curriculum Vitae

Rahul Jain, Ph. D.

Professor

Department of Medicinal Chemistry

In-charge, Central Instrumentation Laboratory (CIL)

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Education

1984 – 1989

Central Drug Research Institute/University of Lucknow, *Lucknow*

Doctor of Philosophy (Ph.D.)

Subject: Organic/Medicinal Chemistry

1982 – 1984

University of Lucknow, *Lucknow*

Master of Science (M.Sc.)

Subject: Organic Chemistry

1980 – 1982

University of Lucknow, *Lucknow*

Bachelor of Science (B.Sc.)

Subjects: Physics, Chemistry, and Mathematics

Professional Experience

June 2016 – present

National Institute of Pharmaceutical Education and Research, *S. A. S. Nagar, Punjab 160 062, India*

◆ Associate Dean (Academics)

2011 – present

Central Instrumentation Laboratory (CIL), National Institute of Pharmaceutical Education and Research, *S. A. S. Nagar, Punjab 160 062, India*

◆ In-charge

2007 – present

Laboratory of Biomolecular Chemistry, Department of Medicinal Chemistry, National Institute of Pharmaceutical Education and Research, *S. A. S. Nagar, Punjab 160 062, India*

◆ Professor

2002 – 2007

Laboratory of Biomolecular Chemistry, Department of Medicinal Chemistry, National Institute of Pharmaceutical Education and Research, *S. A. S. Nagar, Punjab 160 062, India*

◆ Associate Professor

1997 – 2002

Laboratory of Biomolecular Chemistry, Department of Medicinal Chemistry, National Institute of Pharmaceutical Education and Research, *S. A. S. Nagar, Punjab 160 062, India*

◆ Assistant Professor

1996 – 1997

Peptide Research Laboratories, Department of Medicine, Tulane University Medical Center, *New Orleans, LA 70112, USA*

◆ Assistant Professor

1990 – 1996

Laboratory of Bioorganic Chemistry, NIDDK, National Institutes of Health, *Bethesda, MD 20892, USA*

◆ Fogarty International Visiting Fellow

1989 – 1990

Department of Molecular Genetics, University of Texas, Southwestern Medical School, *Dallas, TX 75235, USA*

◆ Robert A. Welch Post-doctoral Research Fellow

1984 – 1989

Division of Medicinal Chemistry, Central Drug Research Institute, *Lucknow, 226 001, India*

◆ Research Fellow

Summary of Expertise

Areas of interest: Medicinal chemistry, Peptide synthesis

- Synthesis and mechanistic studies of ultra short neuropeptides, antimicrobial peptides, and antiplasmodial peptides.
- C-H and C-N functionalization of natural and unnatural amino acids.
- Backbone modification of peptides by C-H and C-N functionalization.
- Sustainable peptide synthesis methodologies.
- Synthesis and mechanistic studies of unnatural amino acids.
- Synthesis of new structural classes of antiplasmodial and anti-tuberculosis agents.
- Over 25 years of experience in medicinal chemistry/basic drug research and teaching.
- Supervised and trained more than 90 masters and doctoral students in medicinal chemistry/drug research.
- Solution phase synthesis of peptides under microwave irradiation.
- Manual and fully automated conventional solid phase peptide synthesis.
- Fully automated solid phase peptide synthesis under microwave irradiation.
- Consultancy on projects related to peptides and their synthesis.
- Consultancy on projects related to medicinal chemistry.

Publications

- [1] Sharma, K. K.; Mandloi, M.; Jain, R. Regioselective access to 1,2-diaryl histidines via copper-catalyzed N-(1)-arylation of 2-aryl histidines. *Eur. J. Org. Chem.* **2017**, DOI: 10.1002/ejoc.201601566.
- [2] Bansal, S.; Maurya, I. K.; Shenmar, K.; Yadav, N.; Thota, C. K.; Kumar, V.; Tikoo, K.; Chauhan, V. S.; Jain, R. A β ₁₋₄₂ C-terminus fragment derived peptides prevents the self-assembly of parent peptide. *RSC Adv.* **2017**, 7, DOI: 10.1039/C6RA26295C.
- [3] Sharma, K. K.; Mandloi, M.; Rai, N.; Jain, R. Copper-catalyzed N-(hetero)arylation of amino acids in water. *RSC Adv.* **2016**, 6, 96762-96767.
- [4] Mittal, S.; Maurya, I. K.; Kaur, S.; Swami, A.; Jain, R.; Wangoo, N.; Sharma, R. K. Insights into mechanistic and synergistic aspects of novel synthetic short cationic antibacterial peptides. *ChemistrySelect* **2016**, 1, 5510-5516.
- [5] Rajput, S. K.; Sharma, A. K.; Meena, C. L.; Pant, A. B.; Jain, R. Sharma, S. S. Effect of L-pGlu-(1-benzyl)-L-His-L-Pro-NH₂ against in-vitro and in-vivo models of cerebral ischemia and associated neurological disorders. *Biomed. Pharmacother.* **2016**, 84, 1256-1265.
- [6] Sharma, K. K.; Mandloi, M.; Jain, R. Regioselective copper-catalyzed N(1)-(hetero)arylation of protected histidine. *Org. Biomol. Chem.* **2016**, 14, 8937-8941.
- [7] Bansal, S.; Maurya, I. K.; Yadav, N.; Thota, C. K.; Kumar, V.; Tikoo, K.; Chauhan, V. S.; Jain, R. C-Terminal fragment, A β ₃₂₋₃₇ analogues protect against A β aggregation-induced toxicity. *ACS Chem. Neurosci.* **2016**, 7, 615-623.
- [8] Mittal, S.; Kaur, S.; Swami, A.; Maurya, I. K.; Jain, R.; Wangoo, N.; Sharma, R. K. Alkylated histidine based short cationic antifungal peptides: synthesis, biological evaluation and mechanistic investigations. *RSC Adv.* **2016**, 6, 41951-41961.
- [9] Meena, C. L.; Thakur, A.; Nandekar, P. P.; Sharma, S. S.; Sangamwar, A. T.; Jain, R. Synthesis and biology of ring-modified L-histidine containing thyrotropin-releasing hormone (TRH) analogues. *Eur. J. Med. Chem.* **2016**, 111, 72-83.
- [10] Kaur, S.; Bhararia, A.; Sharma, K. K.; Mittal, S.; Jain, R.; Wangoo, N.; Sharma, R. K. Thyrotropin-releasing hormone loaded and chitosan engineered polymeric nanoparticles: towards effective delivery of neuropeptides. *J. Nanosci. Nanotechnol.* **2016**, 16, 5324-5332.
- [11] Sharma, K. K.; Patel, D. I.; Jain, R. Metal-free synthesis of N-fused heterocyclic iodides via C-H functionalization mediated by *tert*-butylhydroperoxide. *Chem. Commun.* **2015**, 51, 15129-15132.
- [12] Meena, C. L.; Thakur, A.; Nandekar, P.; Sangamwar, A. T.; Sharma, S. S.; Jain, R. Synthesis of CNS active TRH-like peptides: Biological evaluation and effect on cognitive impairment induced by cerebral ischemia. *Bioorg. Med. Chem.* **2015**, 23, 5641-5653.
- [13] Meena, C. L.; Shubdha, I.; Rajpoot, S.; Thankur, A.; Nandekar, P. P.; Sangamwar, A. T.; Sharma, S. S.; Jain, R. 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.

- [14] Sharma, K. K.; Sharma, S.; Kudwal, A.; Jain, R. Room temperature N-arylation of amino acids and peptides using copper(I) and β -diketone. *Org. Biomol. Chem.* **2015**, *13*, 4637-4641.
- [15] Mahindra, A.; Gangwal, R.; Bansal, S.; Goldfrab, N. E.; Dunn, B. M.; Sangamwar, A. T.; Jain, R. Antiplasmodial activity of short peptide-based compounds. *RSC Adv.* **2015**, *5*, 22674-22684.
- [16] Patel, S.; Gangwal, R.; Sangamwar, A. T.; Jain, R. Synthesis, biological evaluation and 3D QSAR study of 2,4-disubstituted quinolines as anti-tuberculosis agents. *Eur. J. Med. Chem.* **2015**, *93*, 511-522.
- [17] Mahindra, A.; Bagra, N.; Wangoo, N.; Khan, S. I.; Jacob, M. R.; Jain, R. Discovery of short peptides exhibiting high potency against *Cryptococcus neoformans*. *ACS Med. Chem. Lett.* **2014**, *5*, 315-320.
- [18] Mahindra, A.; Sharma, K. K.; Rathore, D.; Khan, S. I.; Jacob, M. R.; Jain, R. Synthesis and antimicrobial activities of His(2-aryl)-Arg and Trp-His(2-aryl) classes of dipeptidomimetics. *Med. Chem. Commun.* **2014**, *5*, 671-676.
- [19] Mahindra, R.; Jain, R. Regiocontrolled palladium-catalyzed and copper-mediated C-H bond functionalization of protected L-histidine. *Org. Biomol. Chem.* **2014**, *12*, 3792-3796.
- [20] Mahindra, A.; Bagra, N.; Wangoo, N.; Jain, R.; Khan, S. I.; Jacob, M. R.; Jain, R. Synthetically modified L-histidine-rich peptidomimetics exhibit potent activity against *Cryptococcus neoformans*. *Bioorg. Med. Chem. Lett.* **2014**, *24*, 3150-3154.
- [21] Patel, S. R.; Gangwal, R.; Sangamwar, A. T.; Jain, R. Synthesis, biological evaluation and 3D-QSAR study of hydrazide, semicarbazide and thiosemicarbazide derivatives of 4-(adamantan-1-yl)quinoline as anti-tuberculosis agents. *Eur. J. Med. Chem.* **2014**, *85*, 255-267.
- [22] Bagul, P.; Khomane, K. S.; Kesharwani, S. S.; Pragyan, P.; Nandekar, P. P.; Meena, C. L.; Bansal, A. K.; Jain, R. Tikoo, K. B.; Sangamwar, A. T. Intestinal transport of TRH analogues through PepT1: The role of *in silico* and *in vitro* modeling. *J. Mol. Recognit.* **2014**, *27*, 609-617.
- [23] Mahindra, A.; Patel, N.; Bagra, N.; Jain, R. Solvent-free peptide synthesis assisted by microwave irradiation: environmentally benign synthesis of bioactive peptides. *RSC Adv.* **2014**, *4*, 3065-3069.
- [24] Mahindra, A.; Bagra, N.; Jain, R. Palladium-catalyzed regiospecific C-5 arylation of protected L-histidine: Microwave-assisted C-H activation adjacent to donor arm. *J. Org. Chem.* **2013**, *78*, 10954-10959.
- [25] Mahindra, A.; Nooney, K.; Uraon, S.; Sharma, K. K.; Jain, R. Microwave-assisted solution phase peptide synthesis in neat water. *RSC Adv.* **2013**, *3*, 16810-16816.

- [26] Verma, R.; Tripathy, R. K.; Paul, M. K.; Nayyar, A.; Jain, R.; Mukhopadhyay, A. Bacterial DNA Gyrase is not the target of quinolone-based anti-tuberculosis compounds. *Int. Res. J. Pharm.* **2013**, *4*, 284-291.
- [27] Kumar, L.; Meena, C. L.; Pawar, Y. B.; Wahlang, B.; Tikoo, K. B.; Jain, R.; Bansal, A. K. Effect of counterions on physicochemical properties of prazosin salts. *AAPS PharmSciTech* **2013**, *14*, 141-150.
- [28] Mahindra, A.; Sharma, K. K.; Jain, R. Rapid microwave-assisted solution-phase peptide synthesis. *Tetrahedron Lett.* **2012**, *53*, 6931-6935.
- [29] Mahindra, A.; Jain, R. Regiospecific direct C-H arylation at the 2-position of L-histidine using arylboronic acids. *Synlett* **2012**, *23*, 1759-1764.
- [30] Kaur, K.; Jain, M.; Khan, S. I.; Jacob, M. R.; Tekwani, B. L.; Singh, S.; Singh, P. P.; Jain, R. Amino acid, dipeptide and pseudodipeptide conjugates of ring-substituted 8-aminoquinolines: Synthesis and evaluation of anti-infective, β -hematin inhibition and cytotoxic activities. *Eur. J. Med. Chem.* **2012**, *52*, 230-241.
- [31] Khomane, K. S.; Nandekar, P. P.; Wahlang, B.; Shaikh, N.; Pawar, Y. B.; Meena, C. L.; Sangamwar, A. T.; Jain, R.; Tikoo, K. Bansal, A. Molecular mechanistic insights into the PepT1-mediated intestinal transport of a novel antiepileptic, NP-647. *Mol. Pharmaceutics* **2012**, *9*, 2458-2468.
- [32] Dubey, R. K.; Kumar, N.; Jain, R. Facile syntheses of histamine and imidazole-4-propionic acid-derived room-temperature ionic liquids. *Synth. Commun.* **2012**, *42*, 2207-2216.
- [33] Kumar, N.; Jain, R. Convenient syntheses of bulky group containing imidazolium ionic liquids. *J. Heterocyclic Chem.* **2012**, *49*, 370-374.
- [34] Khomane, K. S.; Meena, C. L.; Jain, R.; Bansal, A. K. Novel thyrotropin-releasing hormone analogs: A patent review. *Expert Opin. Ther. Patents* **2011**, *21*, 1673-1691.
- [35] Sah, N.; Rajput, S. K.; Singh, J. N.; Meena, C. L.; Jain, R.; Sikdar, S. K.; Sharma, S. S. L-pGlu-(2-propyl)-L-His-L-ProNH₂ attenuates 4-aminopyridine-induced epileptiform activity and sodium current: A possible action of new TRH analog for its anticonvulsant potential. *Neuroscience* **2011**, *199*, 74-85.
- [36] Kaur, K.; Jain, M.; Khan, S. I.; Jacob, M. R.; Tekwani, B. L.; Singh, S.; Singh, P. P.; Jain, R. Extended side chain analogues of 8-aminoquinolines: Synthesis and evaluation of antiprotozoal, antimicrobial, β -hematin inhibition, and cytotoxic activities. *Med. Chem. Commun.* **2011**, *2*, 300-307.
- [37] Rajput, S. K.; Siddiqui, M. A.; Kumar, V.; Meena, C. L.; Pant, A. B.; Jain, R.; Sharma, S. S. Protective effects of L-pGlu-(2-propyl)-L-His-L-ProNH₂, a newer thyrotropin-releasing hormone analog in in vitro and in vivo models of cerebral ischemia. *Peptides* **2011**, *32*, 1225-1231.
- [38] Monga, V.; Meena, C. L.; Rajput, S.; Pawar, C.; Sharma, S. S.; Lu, X.; Gershengorn, M. C.; Jain, R. Synthesis, receptor binding and CNS pharmacological studies of new thyrotropin-releasing hormone (TRH) analogues. *ChemMedChem* **2011**, *6*, 531-543.

- [39] Kailas, K.; Kumar, L.; Meena, C. L.; Jain, R.; Bansal, A. K. NP-647, a novel TRH analogue: Investigating physicochemical parameters critical for its oral and parenteral delivery. *Int. J. Pharm.* **2011**, *406*, 21-30.
- [40] Kaur, K.; Jain, M.; Khan, S. I.; Jacobs, M. R.; Tekwani, B. L.; Singh, S.; Singh, P. P.; Jain, R. Synthesis, antiprotozoal, antimicrobial, β -hematin inhibition, cytotoxicity and methemoglobin (MetHb) formation activities of bis(8-aminoquinolines). *Bioorg. Med. Chem.* **2011**, *19*, 197-210.
- [41] Garg, A.; Prasad, B.; Takwani, H.; Jain, M.; Jain, R.; Singh, S. Evidence of the formation of direct covalent adducts of primaquine, 2-*tert*-butylprimaquine (NP-96) and monohydroxy metabolite of NP-96 with glutathione and *N*-acetylcysteine. *J. Chromatogr. B*, **2011**, *879*, 1-7.
- [42] Jain, R.; Gupta, M.; Kanani, V. Peptides as therapeutics for microbial infections. *Chron. Pharmabiz* **2010**, 38-39.
- [43] Jain, R.; Kapoor, C. Peptides as therapeutics for Alzheimer's diseases. *Chron. Pharmabiz* **2010**, 40-41.
- [44] Pahwa, S.; Kaur, S.; Jain, R.; Roy, N. Structure based design of novel inhibitors for histidinol dehydrogenase from *Geotrichum candidum*. *Bioorg. Med. Chem. Lett.* **2010**, *20*, 3972-3976.
- [45] Thuy, N. N. T.; Tien, H. N.; Jain, R.; Kamei, K. 2-*tert*-Butylprimaquine exhibit potent blood schizontocidal activity via inhibition of heme crystallization. *Malarial J.* **2010**, *9* (Suppl 2), P69.
- [46] Rajput, S. K.; Singh, J. N.; Meena, C. L.; Jain, R.; Pant, A.; Sharma, S. S. L-pGlu-(1-benzyl)-L-His-L-ProNH₂: A newer thyrotropin-releasing hormone analog with anticonvulsive and neuroprotective properties. **2010**, *FASEB J.* 762.9.
- [47] Kaur, K.; Jain, M.; Reddy, R. P.; Jain, R. Quinolines and structurally related heterocycles as antimalarials. *Eur. J. Med. Chem.* **2010**, *45*, 3245-3264.
- [48] Sonje, V. M.; Kumar, L.; Puri, V.; Meena, C. L.; Jain, R.; Bansal, A. K.; Brittain, H. G. Atorvastatin calcium. In *Profiles of Drug Substances, Excipients, and Related Methodology*, Harry G. Brittain, Eds., Burlington: Academic Press, **2010**, Vol. 35, pp. 1-70.
- [49] Sharma, R. K.; Sundriyal, S.; Wangoo, N.; Tegge, W.; Jain, R. New antimicrobial hexapeptides: Synthesis, antimicrobial activities, cytotoxicity and mechanistic studies. *ChemMedChem* **2010**, *5*, 86-95.
- [50] Mayatra, S. J.; Prasad, B.; Jain, M.; Singh, S.; Jain, R. Development and validation of a sensitive and selective UHPLC-MS/MS method for quantitation of an investigational anti-malarial compound, 2-*tert*-butylprimaquine (NP-96) in rat plasma, and its application in a preclinical pharmacokinetic study. *J. Pharm. Biomed. Anal.* **2010**, *52*, 410-415.
- [51] Sharma, S. S.; Rajput, S. K.; Ingole, S.; Jain, R.; Kaur, N.; Monga, V.; Meena, C. L. CNS safety pharmacology of a newer TRH analog - pGlu-His(1-benzyl)-ProNH₂. *J. Pharmacol. Toxicol. Methods* **2010**, *62*, e21-e22.

- [52] Sharma, R. K.; Reddy, R. P.; Tegge, W.; Jain, R. Discovery of Trp-His and His-Arg analogues as new structural classes of short antimicrobial peptides. *J. Med. Chem.* **2009**, *52*, 7421-7431.
- [53] Rajput, S. K.; Singh, J. N.; Ingole, S.; Jain, G.; Kaur, N.; Monga, V.; Meena, C. L.; Jain, R.; Sharma, S. S. Neuropharmacological profile of L-pGlu-(1-Benzyl)-L-His-L-ProNH₂, a newer thyrotropin-releasing hormone analog: Effects on seizure models, sodium current, cerebral blood flow and behavioral parameters. *Epilepsy Res.* **2009**, *87*, 223-233.
- [54] Kaur, K.; Jain, M.; Kaur, N.; Jain, R. Antimalarials from nature. *Bioorg. Med. Chem.* **2009**, *17*, 3229-3256.
- [55] Rajput, S. K.; Kirshnamoorthy, S.; Pawar, C.; Kaur, N.; Monga, V.; Meena, C. L.; Jain, R.; Sharma, S. S. Antiepileptic potential and behavioral profile of L-pGlu-(2-propyl)-L-His-L-ProNH₂, a newer thyrotropin-releasing hormone (TRH) analog. *Epilepsy Behav.* **2009**, *14*, 48-53.
- [56] Nayyar, A.; Patel, S. R.; Shaikh, M.; Coutinho, E.; Jain, R. Synthesis, anti-tuberculosis activity and 3D-QSAR study of amino acid conjugates of 4-(adamantan-1-yl) group containing quinolines. *Eur. J. Med. Chem.* **2009**, *44*, 2017-2029.
- [57] Nayyar, A.; Patel, S. R.; Jain, R. Recent advances in new structural classes of anti-tuberculosis agents. In *Frontiers in Medicinal Chemistry*, Allen B. Reitz, Atta-ur-Rahman, M. I. Choudhary, Eds.; The Netherlands, Bentham Science Publisher, **2009**, Vol. 4, pp. 506-540.
- [58] Kumar, L.; Alam, M. D.; Meena, C. L.; Jain, R.; Bansal, A. K. Fexofenadine hydrochloride. In *Profiles of Drug Substances, Excipients, and Related Methodology*, Harry G. Brittain, Eds., Burlington: Academic Press, **2009**, Vol. 34, pp. 153-192.
- [59] Monga, V.; Meena, C. L.; Kaur, N.; Jain, R. Chemistry and biology of thyrotropin-releasing hormone (TRH) and its analogs. *Curr. Med. Chem.* **2008**, *15*, 2718-2733.
- [60] Monga, V.; Meena, C. L.; Kaur, N.; Kumar, S.; Pawar, C.; Sharma, S. S.; Jain, R. Facile Synthesis of *N*- α -Boc-1,2-dialkyl-L-histidines: Utility in the synthesis of thyrotropin-releasing hormone (TRH) analogs and evaluation of the CNS activity. *J. Heterocyclic Chem.* **2008**, *45*, 1603-1608.
- [61] Pahwa, S.; Chavan, A. G.; Jain, R. Roy, N. Target specific anti-fungal discovery by targeting *Geotrichum candidum* histidinol dehydrogenase: a hybrid approach. *Chem. Biol. Drug Des.* **2008**, *72*, 229-234.
- [62] Kadam, R. U.; Chavan, A. G.; Monga, V.; Kaur, N.; Jain, R.; Roy, N. Selectivity based QSAR approach for screening and evaluation of TRH analogs for TRH-R1 and TRH-R2 receptor subtypes. *J. Mol. Graph. Model.* **2008**, *27*, 309-320.
- [63] Sundriyal, S.; Sharma, R. K.; Jain, R.; Bhartam, P. V. Minimum requirement of hydrophobic and hydrophilic features in cationic peptide antibiotics (CPAs): Pharmacophore generation and its validation on cationic steroid antibiotics (CSAs). *J. Mol. Model.* **2008**, *14*, 265-278.

- [64] Nayyar, A.; Jain, R. Synthesis and anti-tuberculosis activities of 2,4-disubstituted quinolines. *Indian J. Chem.* **2008**, *47B*, 117-128.
- [65] Nayak, S. K.; Monga, V.; Kaur, N.; Jain, R. Facile regiospecific syntheses of *N*- α ,*N*-1(τ)-dialkyl-L-histidines. *J. Heterocyclic Chem.* **2007**, *44*, 1265-1270.
- [66] Huy, N. T.; Mizunuma, K.; Kaur, K.; Nhien, N. T. T.; Jain, M.; Uyen, D. H.; Harada, S.; Jain, R.; Kamei, K. 2-*tert*-Butyl-8-quinolinamines exhibits potent blood-schizontocidal antimalarial activity via inhibition of the heme crystallization. *Antimicrob. Agents Chemother.* **2007**, *51*, 2842-2847.
- [67] Sharma, R. K.; Jain, R. Unprecedented 1,1'-carbonyldiimidazole mediated amidation of unprotected α -amino acids in water. *Synlett* **2007**, 603-606.
- [68] Vangapandu, S.; Jain, M.; Kaur, K.; Patil, P.; Patel, S. R.; Jain, R. Recent advances in antimalarial drug development. *Med. Res. Rev.* **2007**, *27*, 65-107.
- [69] Kaur, K.; Patel, S. R.; Patil, P.; Jain, M.; Khan, S. I.; Jacobs, M. R.; Ganesan, S. Tekwani. B. L.; Jain, R. Synthesis, antimalarial, antileishmanial, antimicrobial, cytotoxicity and methemoglobin (MetHb) formation activities of new 8-quinolinamines. *Bioorg. Med. Chem.* **2007**, *15*, 916-931.
- [70] Nayyar, A.; Monga, V.; Malde, A. Coutinho, E. Jain, R. Synthesis, Anti-tuberculosis activity and 3D-QSAR study of 4-(adamantan-1-yl)-2-substituted quinolines. *Bioorg. Med. Chem.* **2007**, *15*, 627-641.
- [71] Kaur, N.; Monga, V.; Lu, X.; Gershengorn, M. C.; Jain, R. Modifications of the pyroglutamic acid and histidine residues in thyrotropin-releasing hormone (TRH) yield analogs with selectivity for TRH receptor type 2 over type 1. *Bioorg. Med. Chem.* **2007**, *15*, 433-443.
- [72] Kumar, R.; Ramachandran, U.; Raichur, S.; Chakrabarti, R.; Jain, R. Synthesis and evaluation of *N*-acetyl-L-tyrosine based compounds as PPAR α selective activators. *Eur. J. Med. Chem.* **2007**, *42*, 503-510.
- [73] Monga, V.; Jain, R. New facile route to *N*- α -Boc-1,2-disubstituted-L-histidines and their utility in the synthesis of thyrotropin-releasing hormone (TRH) analogs. *Med. Chem. Res.* **2007**, *15*, 316-317.
- [74] Nayyar, A.; Malde, A. Coutinho, E.; Jain, R. Synthesis, anti-tuberculosis activity and 3D-QSAR study of ring-substituted-2/4-quinolinecarbaldehyde derivatives. *Bioorg. Med. Chem.* **2006**, *14*, 7302-7310.
- [75] Kaur, N.; Monga, V.; Josan, J. S.; Lu, X.; Gershengorn, M. C.; Jain, R. Synthesis, receptor binding and activation studies of N(1)-alkyl-L-histidine containing thyrotropin-releasing hormone (TRH) analogues. *Bioorg. Med. Chem.* **2006**, *14*, 5981-5988.
- [76] Engel, S.; Neumann, S.; Kaur, N.; Monga, V.; Jain, R.; Northup, J.; Gershengorn, M. C. Low affinity analogs of thyrotropin-releasing hormone are super-agonists. *J. Biol. Chem.* **2006**, *281*, 13103-13109.
- [77] Sundriyal, S.; Sharma, R. K.; Jain, R. Current advances in antifungal targets and drug development. *Curr. Med. Chem.* **2006**, *13*, 1321-1335.
- [78] Chawrai, S.; Jain, R. Herbal plant *Momordica charantia* and its implications in diabetes mellitus. A book chapter in *Recent Prog. Med. Plants - Search for*

Natural Drugs, Ed. Govil, J. N., Singh, V. K., Arunachalam, C. Stadium Press, LLC, Houston, TX, **2006**, *13*, 351-373.

- [79] Jachak, S. M.; Jain, R. Current status of target-based antimycobacterial natural products. *Anti-infect. Agents Med. Chem.* **2006**, *5*, 123-133.
- [80] Nayyar, A.; Malde, A.; Jain, R.; Coutinho, E. 3D-QSAR Study of ring-substituted quinoline class of anti-tuberculosis agents. *Bioorg. Med. Chem.* **2006**, *14*, 847-856.
- [81] Kaur, N.; Lu, X.; Gershengorn, M. C.; Jain, R. Thyrotropin-releasing hormone (TRH) analogues that exhibit selectivity to TRH receptor subtype 2. *J. Med. Chem.* **2005**, *48*, 6162-6165.
- [82] Vats, R. K.; Ramachandran, U.; Jain, R. New trends in harnessing diabetes. *Chron. Pharmabiz* **2005**, 163-164.
- [83] Nayyar, A.; Jain, R. Recent advances in new structural classes of anti-tuberculosis agents. *Curr. Med. Chem.* **2005**, *12*, 1873-1886.
- [84] Jain, M.; Khan, S. I.; Tekwani, B. L.; Jacob, M. R.; Singh, S.; Singh, P. P.; Jain, R. Synthesis, antimalarial, antileishmanial and antimicrobial activities of some 8-quinolinamine analogues. *Bioorg. Med. Chem.* **2005**, *13*, 4458-4466.
- [85] Jain, R.; Chawrai, S. Advancements in the anti-diabetes chemotherapeutics based on amino acids, peptides, and peptidomimetics. *Mini Rev. Med. Chem.* **2005**, *5*, 469-477.
- [86] Monga, V.; Nayyar, A.; Vaitilingam, B.; Palde, P. B.; Jhamb, S. S.; Kaur, S.; Singh, P. P.; Jain, R. Ring-substituted quinolines. Part 2. Synthesis and antimycobacterial activities of ring-substituted quinolinecarbohydrazide and ring-substituted quinolinecarboxamide analogues. *Bioorg. Med. Chem.* **2004**, *12*, 6465-6472.
- [87] Sundriyal, S.; Jain, R. A survey of new antifungal targets and investigational agents. *Curr. Res. Inform. Pharm. Sci.* **2004**, *5* (4), 10-15.
- [88] Kaur, N.; Monga, V.; Jain, R. Facile one-step synthesis of *N*- α -Boc-1-alkyl-L-histidines. *Tetrahedron Lett.* **2004**, *45*, 6883-6885.
- [89] Gupta, P.; Hameed, S.; Jain, R. Ring-substituted imidazoles as a new class of anti-tuberculosis agents. *Eur. J. Med. Chem.* **2004**, *39*, 805-814.
- [90] Vaitilingam, B.; Nayyar, A.; Palde, P. B.; Monga, V.; Jain, R.; Kaur, S.; Singh, P. P. Synthesis and antimycobacterial activities of ring-substituted quinolinecarboxylic acid/ester analogues. Part 1. *Bioorg. Med. Chem.* **2004**, *12*, 4179-4188.
- [91] Vangapandu, S.; Jain, M.; Jain, R.; Kaur, S.; Singh, P. P. Ring-substituted quinolines as potential anti-tuberculosis agents. *Bioorg. Med. Chem.* **2004**, *12*, 2501-2508.
- [92] Jain, R.; Chawrai, S. Advancements in the peptides based anti-diabetes agents. *Curr. Res. Inform. Pharm. Sci.* **2004**, *5*, 9-13.
- [93] Jain, M.; Vangapandu, S.; Sachdeva, S.; Jain, R. Synthesis and blood-schizontocidal antimalarial activities of 2-substituted/2,5-disubstituted-8-

- quinolinamines and some of their amino acid conjugates. *Bioorg. Med. Chem.* **2004**, *12*, 1003-1010.
- [94] Jain, M.; Vangapandu, S.; Sachdeva, S.; Singh, S.; Singh, P. P.; Gena, G. B.; Tikoo, K.; Ramarao, P.; Kaul, C. L.; Jain, R. Discovery of a bulky *tert*-butyl group containing primaquine analogue that exhibits potent blood-schizontocidal antimalarial activities and complete elimination of methemoglobin toxicity. *J. Med. Chem.* **2004**, *47*, 285-287.
- [95] Vangapandu, S.; Sachdeva, S.; Jain, M.; Singh, S.; Singh, P. P.; Kaul, C. L.; Jain, R. 8-Quinolinamines conjugated with amino acids are exhibiting potent blood-schizontocidal antimalarial activities. *Bioorg. Med. Chem.* **2004**, *12*, 239-247.
- [96] Vangapandu, S.; Sachdeva, S.; Jain, M.; Singh, S.; Singh, P. P.; Kaul, C. L.; Jain, R. 8-Quinolinamines and their pro prodrug conjugates as potent blood-schizontocidal antimalarial agents. *Bioorg. Med. Chem.* **2003**, *11*, 4557-4568.
- [97] Chandana, P.; Nayyar, A.; Jain, R. Trityl-directed regiospecific synthesis of 2,3-disubstituted bioimidazoles. *Synth. Commun.* **2003**, *33*, 2925-2933.
- [98] Jain, R.; Balasubramanian V.; Nayyar, A.; Palde, P. B. Substituted 4-methylquinolines as a new class of anti-tuberculosis agents. *Bioorg. Med. Chem. Lett.* **2003**, *13*, 1051-1054.
- [99] Jain, R. Recent advancements in antimalarial drug development. *Curr. Res. Inform. Pharm. Sci.* **2002**, *3*, 2-8.
- [100] Jain, R.; Suryanarayana V.; Jain, M.; Kaur, N.; Singh, S.; Singh, P. P. Antimalarial activities of ring-substituted bioimidazoles. *Bioorg. Med. Chem. Lett.* **2002**, *12*, 1701-1704.
- [101] Jain, R.; Singh, J.; Perlman, J. H.; Gershengorn, M. C. Synthesis and biology of new thyrotropin-releasing hormone (TRH) analogues. *Bioorg. Med. Chem.* **2002**, *10*, 189-194.
- [102] Naraynan, S.; Suryanarayana V.; Jain, R. Regiospecific synthesis of 2,3-disubstituted-L-histidines and histamines. *Bioorg. Med. Chem. Lett.* **2001**, *11*, 1133-1136.
- [103] Jain, R. Convenient *N*-protection of L-pyroglutamic acid esters. *Org. Prep. Proc. Intl.* **2001**, *33*, 406-409.
- [104] Jain, R. Combinatorial Chemistry. *Curr. Res. Inform. Pharm. Sci.* **2000**, *1*, 8.
- [105] Jain, R.; Hocart, S. J.; Murphy, W. A.; Taylor, J. E.; Coy, D. H. Highly potent cyclic disulfide antagonists of somatostatin. *J. Med. Chem.* **1999**, *42*, 1863-1871.
- [106] Jain, R.; Coy, D. H.; Murphy, W. A.; Rossowski, W. J.; Hocart, S. J.; Fuselier, J.; Taylor, J. E. Somatostatin receptor antagonist based on a mixed neuromedin B antagonist/somatostatin agonist. In *Peptides: Frontiers of Peptide Science, Proceedings of the 15th American Peptide Symposium*; Tam, J.P.; Kaumaya, P.T.P., Eds.; Kluwer: Dordrecht, The Netherlands, **1999**; pp 526-529.
- [107] Jain, R.; Hocart, S. J.; Murphy, W. A.; Taylor, J. E.; Morgan, B.; Coy, D. H. Potent antagonists of somatostatin: Synthesis and biology. *J. Med. Chem.* **1998**, *41*, 1146-1154.

- [108] Jain, R., Avramovitch, B.; Cohen, L. A. Synthesis of ring-halogenated histidines and histamines. *Tetrahedron* **1998**, *54*, 3235-3242.
- [109] Perlman, J. H.; Colson, A. O.; Jain, R.; Czyzewski, B.; Cohen, L. A.; Osman, R.; Gershengorn, M. C. Role of the extracellular loops of the thyrotropin-releasing hormone receptor: Evidence for an initial interaction with thyrotropin-releasing hormone. *Biochemistry* **1997**, *36*, 15670-15676.
- [110] Jain, R.; Cohen, L. A.; King, M. M. Synthesis of novel ring-substituted histidines and histamines. *Tetrahedron* **1997**, *53*, 4539-4548.
- [111] Jain, R.; El-Kadi, N.; King, M. M.; Cohen, L. A. Regiospecific alkylation of histidines and histamines at C-2. *Tetrahedron* **1997**, *53*, 2365-2370.
- [112] Jain, R.; Cohen, L. A. Regiospecific alkylation of histidines and histamines at N-1(τ). *Tetrahedron* **1996**, *52*, 5363-5370.
- [113] Jain, R.; Siddiqi, S. M.; Ji, Xiao-duo; Melman, N.; Olah, M. E.; Evans, P.; Glashofer, M.; Padgett, W.; Cohen, L. A.; Daly, J. W.; Stiles, G.; Jacobson, K. A. A survey of non-xanthine derivatives as adenosine receptor ligands. *Nucleosides Nucleotides* **1996**, *15*, 693-718.
- [114] Jain, R.; El-Kadi, N.; King, M. M.; Cohen, L. A. Synthesis of 2-substituted histidines and histamines. *Peptides 1996, The Royal Society of Chemistry Perkin Division and The European Peptide Society, 24th Symposium of the European Peptide Society*, Edinburgh, Scotland, **1996**, Sept. 8-13 No. 96, page 309-310.
- [115] Jain, S.; Jain, R.; Singh, J.; Anand, N. Lactam acetals Part XXIV: Reaction with activated haloalkyl compounds with and without zinc. *Tetrahedron Lett.* **1994**, *35*, 2951-2954.
- [116] Jain, R.; Jain, S.; Singh, J.; Anand, N. A convenient synthesis of 4 β -(2-heterocycloalkyl)quinoline-4-ethanols as potential antimalarial agents. *Indian J. Chem.* **1994**, *33B*, 747-751.
- [117] Jain, R.; Jain, S.; Gupta, R. C.; Anand, N.; Dutta, G. P.; Puri, S. K. Synthesis of amino acid derivatives of 8-[4-amino-1-methylbutylamino]-6-methoxy-4-substituted/4,5-disubstituted quinolines as potential tissue-schizontocidal antimalarial agents. *Indian J. Chem.* **1994**, *33B*, 251-254.
- [118] Jain, R.; Jain, S.; Singh, J.; Anand, N. Lactam acetals Part XXIII: Synthesis of lactam spirocyclic acetals and their use in ω -hydroxyalkylation reactions. *J. Ind. Inst. Sci.* **1994**, *74*, 117-133.
- [119] Jain, R.; Gupta, R. C.; Anand, N. Putative metabolites of 8-aminoquinoline antimalarials: Synthesis and tissue schizontocidal activity of 8-substituted-amino-5,6-dihydroxy/5-hydroxy-6-methoxy-4-methylquinolines and 6-alkoxy-5,8-quinolinequinones. *Indian J. Chem.* **1994**, *33B*, 792-794.
- [120] Jain, R.; Jain, S.; Singh, J.; Anand, N. A new approach to the preparation of monoacyldiols and arylmercaptoalkanols from diols *via* lactam acetals. *Chem. Ind.* **1990**, *18*, 576.
- [121] Jain, R.; Jain, S.; Singh, J.; Anand, N. A new synthesis of di-(1-methylazacycloalkano)[2,3-b:2',3'-d]pyridines through annulation on lactam acetals. *Tetrahedron Lett.* **1990**, *31*, 131-134.

Patents

- [1] Vig, A.; Jain, R. Alternative route for the synthesis of pethidine. **2008**, *WTO Indian Patent Application No.* 1910/DEL/2008, filed July 12, 2008.
- [2] Jain, R.; Sharma, R. K. A process for the synthesis of α -amino acid amides using unprotected α -amino acids under ambient reaction conditions and water as solvent. **2008**, *WTO Indian Patent Application No.* 338/DEL/2008, filed February 07, 2008.
- [3] Roy, N.; Pahwa, S.; Jain, R.; Monga, V.; Sharma, R. K.; Kadam, R. U.; Chavan, A. Novel method screening method for antifungal compounds targeted against fungal histidinol dehydrogenase. **2007**, *WTO Indian Patent Application No.* 1117/DEL/2007.
- [4] Roy, N.; Pahwa, S.; Jain, R.; Monga, V.; Sharma, R. K.; Rohilla, R. K. Ring-modified imidazoles as novel antifungal compounds targeted against fungal histidinol dehydrogenase. **2007**, *WTO Indian Patent Application No.* 1116/DEL/2007.
- [5] Bansal, A. K.; Jain, R.; Kumar, L.; Amin, A. Novel acid addition salts of enalapril. **2007**, *WTO Indian Patent Application No.* 1064/DEL/2007.
- [6] Jain, R.; Monga, V.; Kaur, N. A process for the synthesis of CNS active thyrotropin-releasing hormone analogs. **2006**, *WTO Indian Patent Application No.* 2066/DEL/2006.
- [7] Jain, R.; Monga, V.; Kaur, N.; Sharma, S. S.; Kumar, S.; Roy, N.; Majumdar, J.; Agarwal, S.; Pawar, C.; Kadam, R. U.; Chavan, A. CNS effective thyrotropin-releasing hormone analogs. **2006**, *WTO Indian Patent Application No.* 2065/DEL/2006.
- [8] Jain, R.; Ahsan, W. 4-Substituted-2,8-bis(trifluoromethyl)quinolines as new structural class of anti-tuberculosis agents. **2006**, *WTO Indian Patent Application No.* 1232/DEL/2006.
- [9] Jain, R.; Ahsan, W. A process for the synthesis of 4-substituted-2,8-bis(trifluoromethyl)quinolines effective as anti-tuberculosis agents. **2006**, *WTO Indian Patent Application No.* 1233/DEL/2006.
- [10] Jain, R.; Nayyar, A. A process for the synthesis of 4-(1-adamantyl)-2-substitutedquinolines effective for the treatment of tuberculosis, *Indian Patent No.* 268314, 20th April, **2006**, (appl. no. 1024/DEL/2006), 51pp.
- [11] Jain, R.; Nayyar, A. 4-(1-Adamantyl)-2-substitutedquinolines as new structural class of anti-tuberculosis agents. Filed **2006**, Indian Pat. Appl. (2007), 51pp., CODEN: INXXBQ IN 2006DE01025 A 20071102. Application: IN 2006-DE102520060420. Priority: AN 2007:1264595.
- [12] Jain, R.; Sharma, R. K.; Sundriyal, S. Novel linear antimicrobial peptides (AMPs) effective against fungal and bacterial infections. Filed **2006**, Indian Pat. Appl. (2008), 18pp., CODEN: INXXBQ IN 2006DE01011 A 20080118. Application: IN2006-DE101120060418. Priority: AN 2008:100081.
- [13] Jain, R.; Sharma, R. K.; Sundriyal, S. A process for the development of novel linear antimicrobial peptides (AMPs). Filed **2006**, Indian Pat. Appl. (2007),

28pp., CODEN: INXXBQ IN 2006DE01010 A 20071026. Application: IN2006-DE101020060418. Priority: AN 2007:1249362

- [14] Jain, R.; Jain, M.; Singh, P. P.; Singh, S.; Sachdeva, S.; Misra, V.; Ramarao, P.; Kaul, C. L.; Tikoo, K. Ring-substituted 8-aminoquinoline analogs as antimalarial agents and process for their preparation. *European Patent No.* EP1606263, WO 2004085402, dated 21/12/2005, *Appl. No.* PCT/IB03/06362, filed 15/12/2003, 62 pp.
- [15] Jain, R.; Jain, M.; Singh, P. P.; Singh, S.; Sachdeva, S.; Misra, V.; Ramarao, P.; Kaul, C. L.; Tikoo, K. Ring-substituted 8-aminoquinoline analogs as antimalarial agents and process for their preparation. *US Patent No.* 6,979,740, Dec 27, **2005**, 18 pp.
- [16] Jain, R.; Jain, M.; Singh, P. P.; Singh, S.; Sachdeva, S.; Misra, V.; Ramarao, P.; Kaul, C. L.; Tikoo, K. Ring-substituted 8-aminoquinoline analogs as antimalarial agents and process for their preparation. *Australian Patent No.* AU2003292489A1, dated 18/10/2004, *Appl. No.* AU2003-292489, dated 22/12/2003.
- [17] Jain, R.; Jain, M.; Singh, P. P.; Singh, S.; Sachdeva, S.; Misra, V.; Ramarao, P.; Kaul, C. L.; Tikoo, K. Ring-substituted 8-aminoquinoline analogs as antimalarial agents and process for their preparation. *Brazilian Patent No.* BR2003018214A, dated 21/3/2006, *Appl. No.* BR0318214-2, dated 22/12/2003.
- [18] Jain, R.; Jain, M.; Singh, P. P.; Singh, S.; Sachdeva, S.; Misra, V.; Ramarao, P.; Kaul, C. L.; Tikoo, K. Ring-substituted 8-aminoquinoline analogs as antimalarial agents and process for their preparation. *Japanese Patent No.* 4727233/JP dated 22/04/2011; *Appl. No.* JP2006521284T, dated 21/9/2006, JP2004-569883, dated 22/12/2003.
- [19] Jain, R.; Jain, M.; Singh, P. P.; Singh, S.; Sachdeva, S.; Misra, V.; Ramarao, P.; Kaul, C. L.; Tikoo, K. Ring-substituted 8-aminoquinoline analogs as antimalarial agents and process for their preparation. *South African Patent No.* 2005/07787/ZA, dated 30/09/2009.
- [20] Jain, R.; Jain, M.; Singh, P. P.; Singh, S.; Sachdeva, S.; Misra, V.; RamaRao, P.; Kaul, C. L. Ring-substituted 8-aminoquinoline analogues as antimalarial agents. **2003**, *Indian Patent No.* IN2003DE00459, dated 9/3/2007, *Appl. No.* 459/DEL/2003, dated 27/3/2003.
- [21] Jain, R.; Jain, M.; Singh, P. P.; Singh, S.; Sachdeva, S.; Misra, V.; RamaRao, P.; Kaul, C. L. A process for preparation of ring-substituted 8-aminoquinoline analogues as antimalarial agents. **2003**, *Indian Patent No.* IN 234308, dated 19/6/2009, *Appl. No.* IN2003DE00473, dated 27/3/2003.
- [22] Jain, R.; Balasubramanian V.; Nayyar, A.; Palde, P. B.; Jain, M.; Sachdeva, S.; Kaur, S.; Misra, V.; Singh, P. P.; Kaul, C. L. Ring-substituted quinolines as anti-tuberculosis agents. *Indian Pat. Appl.* **2005**, CODEN: INXXBQ IN 2002DE00628 A 20050311 AN 2007:299982.
- [23] Jain, R.; Suryanarayana V.; Singh, P. P.; Kinshikar, A. G.; Singh, S.; Jain, M.; Sachdeva, S.; Misra, V.; Ramarao, P.; Kaul, C. L. Quinoline analogues with broad-spectrum of antimalarial activities (Novel 4-ethyl-5-alkoxyprimaquine compounds). **2011**, Patent no. IN 248025 dated 9/6/2011, *Appl. No.* IN2002DE01112 A2005031.

- [24] Jain, R.; Gupta, R. C.; Anand, N.; Puri, S .K.; Dutta, G. P. A process for the synthesis of 6-methoxy-8-(*N*-substituted-1-methyl-4-aminobutyl)aminoquinolines. **1995**, Patent no. IN 175156, *Appl. No.* IN1988DE00982 19881115.

Presentations/Invited Lectures

- [1] Jain, R. Invited lecture at the Advanced analytical techniques: Basic principles and application for quality assessment of drugs and pharmaceuticals for export, entitled: Mass spectroscopy- an introduction. *An intensive course sponsored by Ministry of External Affairs (ITEC-SCAAP)*, 14-23rd September **2016**, NIPER, SAS Nagar, India.
- [2] Jain, R. Synthetic histidines and their applications in the discovery of bioactive peptides. Invited lecture at the “National Colloquium on Organic and Bioorganic Chemistry: Recent Trends” organized by Srinivasa Ramanujan Institute for Basic Sciences (SRIBS)- A Capacity Building Initiative of KSCSTE, 29-31st July **2016**, Kottiyam, India.
- [3] Mittal, S.; Wangoo, N.; Jain, R.; Sharma, R. K. Synthesis, biological evaluation and mechanistic action of novel tripeptides as potential antifungal agents. *5th India Peptide Symposium*, 24-25th September **2015**, JNCASR, Bengaluru, India.
- [4] Kaur, S.; Wangoo, N.; Jain, R.; Sharma, R. K. Novel chitosan engineered thyropropin-releasing hormone encapsulated polymeric nanoformulation: towards effective delivery of neuropeptides. *5th India Peptide Symposium*, 24-25th September **2015**, JNCASR, Bengaluru, India.
- [5] Jain, R. Invited lecture at the *National Symposium on Interfacing Chemical Biology and Drug Design*, entitled: Synthetic histidines: Application in the synthesis of bioactive peptides, Amity University, Lucknow, Feb. 24-25, **2015**.
- [6] Bansal, S.; Jain, R. Oral presentation at the *International Symposium on Recent Advances in Medicinal Chemistry (ISRAM)* entitled: Abrogation of amyloid-induced toxicity by short β -sheet breaker peptides, 8-10th September **2014**, NIPER, SAS Nagar, No. RSP-3.
- [7] Shenmar, K. Jain, R. Synthesis and antimicrobial activities of hexapeptides containing unnatural amino acids, *International Symposium on Recent Advances in Medicinal Chemistry (ISRAM)*, 8-10th September **2014**, NIPER, SAS Nagar, No. P57.
- [8] Bagra, N.; Jain, R. Direct CH arylation of L-histidine for modified peptidomimetics, *International Symposium on Recent Advances in Medicinal Chemistry (ISRAM)*, 8-10th September **2014**, NIPER, SAS Nagar, No. P11.
- [9] Bansal, S.; Jain, R. Beta sheet breaker peptides synthesized by the modification of a fragment of A β attenuates the toxicity of parent peptide in PC-12 cells, *International Symposium on Recent Advances in Medicinal Chemistry (ISRAM)*, 8-10th September **2014**, NIPER, SAS Nagar, No. P50.
- [10] Jain, M.; Jain, R. Design and synthesis of 8-quinolinamines as antimalarial agents. *Challenges in Bioorganic and Organic Medicinal Chemistry, 15th Tetrahedron Symposium*, 24-27th June **2014**, London, United Kingdom, Reference No. 2.27.
- [11] Mahindra, A.; Jain, R. Oral presentation at the *97th Canadian Chemistry Conference and Exhibition*, entitled: Discovery and identification of ultra-short

peptide Sequence exhibiting high potency against *Cryptococcus neoformans*. June 1-5th **2014**, Vancouver, British Columbia, Canada.

- [12] Jain, R. Invited lecture at the Satellite Symposium, *Indian Peptide Society*, entitled: Synthetic histidines: Applications in the discovery of bioactive peptides. 21st February **2014**, IMTECH, Chandigarh.
- [13] Bagra, N.; Mahindra, A.; Jain, R. Synthesis of C-2 and C-5 L-histidine libraries for antimicrobial peptidomimetics. *16th Chemical Research Society of India (CRSI) National Symposium in Chemistry*. IIT, Bombay, 6-9th February **2014**, P-433.
- [14] Bansal, S.; Jain, R. Tetrapeptide analogues of C-terminal fragment of A β ₁₋₄₂ as potential anti-Alzheimer's disease agents. *MEDCHEM 2013, On the Advances in Anticancer Drug Discovery and Development*, 25-26th October **2013**, IIT, Madras, P-13.
- [15] Jain, R. Invited lecture at the three week advanced analytical techniques: Basic principles and application for quality assessment of drugs and pharmaceuticals for export entitled: Mass spectroscopy- an introduction. *An intensive course sponsored by Ministry of External Affairs (ITEC-SCAAP)*, 11-22nd November **2013**, NIPER, SAS Nagar, India.
- [16] Jain, R. Invited lecture at the "Recent Trends in Bioorganic Chemistry" organized by Srinivasa Ramanujan Institute for Basic Sciences (SRIBS)- A Capacity Building Initiative of KSCSTE (Title: Advances in the Synthesis of peptides), 24-26th October **2013**, Calicut University, Calicut, India.
- [17] Jain, R. Invited lecture at the three week advanced analytical techniques: Basic principles and application for quality assessment of drugs and pharmaceuticals for export entitled: Mass spectroscopy- an introduction. *An intensive course sponsored by Ministry of External Affairs (ITEC-SCAAP)*, 8-19th October **2012**, NIPER, SAS Nagar, India.
- [18] Jain, R. 8-Aminoquinolines as antimalarials. Invited lecture at the Malaria Conference (*Antimalarials: Current Approaches and Future Directions*), 16th November **2011**, Central Drug Research Institute, Lucknow, India.
- [19] Jain, R. Short antimicrobial peptides. Invited lecture at the Medicinal Chemistry Conference (*MedChem 2011*), 28-29th October **2011**, Indian Institute of Technology Madras, Chennai, India, IL-12.
- [20] Kanani, V.; Gupta, M.; Meena, C. L.; Jain, R. Synthesis of His-His class of dipeptides as potential antimicrobial agents. *3rd India Peptide Symposium*, 24-25th February **2011**, Yashada, Pune, India, P-53.
- [21] Gupta, M.; Kanani, V.; Meena, C. L.; Jain, R. Synthesis of His-Arg-His class of tripeptides as short antimicrobial peptides. *3rd India Peptide Symposium*, 24-25th February **2011**, Yashada, Pune, India, P-41.
- [22] Meena, C. L.; Thakur, A.; Nandekar, P.; Sharma, S. S.; Sangambar, A.; Jain, R. Design, synthesis and biological activities of CNS active novel Thyrotropin-releasing hormone (TRH) analogues. *3rd India Peptide Symposium*, 24-25th February **2011**, Yashada, Pune, India, P-34.

- [23] Kapoor, C.; Jain, R. Synthesis of peptide inhibitors of amyloidosis as therapeutics for Alzheimer's disease. *3rd India Peptide Symposium*, 24-25th February **2011**, Yashada, Pune, India, P-32.
- [24] Vashisht, V.; Jain, R. Synthesis of potential peptide inhibitors of Urotensin-II. *3rd India Peptide Symposium*, 24-25th February **2011**, Yashada, Pune, India, P-30.
- [25] Shalu, J.; Prasad, B.; Wagh, S. J.; Puma Chandra Rao, K. N.; Arora, K.; Soni, R.; Jain, R.; Singh, S. Cytochrome P450 inhibition studies on primaquine and 2-tert-butylprimaquine (NP-96). *3rd International Symposium on Drug Metabolism and Pharmacokinetics (DMPK): Application towards Drug Discovery and Development*, 11-13th February **2011**, NIPER, SAS Nagar, India, P-14.
- [26] Khomane, K.; Wahlang, B.; Pawar, Y.; Jain, R.; Bansal, A. K. Intestinal transport mechanism of a novel Thyrotropin-releasing hormone analogue: NP-647. *3rd International Symposium on Drug Metabolism and Pharmacokinetics (DMPK): Application towards Drug Discovery and Development*, 11-13th February **2011**, NIPER, SAS Nagar, India, P-16.
- [27] Jain, R. Mass spectroscopy: An introduction. Invited lecture at the three weeks intensive educational training program on regulatory and analytical aspects for drug regulatory/industry representatives and labs from Nigeria. *Intensive course sponsored by Ministry of External Affairs (ITEC-SCAAP)*, 7-25th March **2011**, NIPER, SAS Nagar, India.
- [28] Prasad, B.; Garg, A.; Takwani, H.; Singh, S.; Jain, R. Identification of in vitro metabolites of novel anti-tubercular quinolines in human and rat liver microsomes using advanced LC-MS approaches. *FIP PSWC/AAPS Annual Meeting & Exposition*, 14-18th November **2010**, New Orleans, USA, Abstract No. W4301.
- [29] Jain, R. Mass spectroscopy: An introduction. Invited lecture at the Advanced Analytical Techniques: Basic Principles and Application for Quality Assessment of Drugs and Pharmaceuticals for export. *Intensive course sponsored by Ministry of External Affairs (ITEC-SCAAP)*, 25th October **2010**, NIPER, SAS Nagar, India.
- [30] Prasad, B.; Amit Garg, A.; Singh, S.; Jain, R. Evidences of covalent adduct formation of quinoline compounds and their phase I metabolites with glutathione and N-acetyl cysteine, *Drug Metabolism Reviews*, August **2010**, Vol. 42, No. S1, Pages 1-323, Abstract No P-306.
- [31] Prasad, B.; Garg, A.; Singh, S.; Jain, R. Evidences of covalent adduct formation of quinoline compounds and their phase I metabolites with glutathione and N-acetyl cysteine. *9th International ISSX Meeting*, September 4-8th **2010**, Istanbul, Turkey, P-306.
- [32] Sharma, R. K.; Reddy, R. P.; Tegge, W.; Jain, R. Discovery of Trp-His and His-Arg analogues as new structural classes of short antimicrobial peptides. *3rd EuCheMS Chemistry Congress: Chemistry – The Creative Force*, August 29th to September 2nd **2010**, Nüremburg, Germany.
- [33] Patel, S.; Jain, R. Synthesis and anti-tuberculosis activity of novel quinoline-2-carbohydrazide derivatives. *International Symposium on Advancing the*

Chemical Sciences (ISACS): Challenges in Organic Chemistry and Chemical Biology (ISACSI), 6-9th July **2010**, San Francisco, USA, C-5.

- [34] Meena, C. L.; Ingole, S.; Sharma, S. S.; Jain, R. Synthesis of new thyrotropin-releasing hormone (TRH) analogues. *Gordon Research Conference on Peptides, Chemistry and Biology*, 28th February to 5th March **2010**, Four Points Sheraton/Holiday Inn Express, Ventura, CA, USA, P-63.
- [35] Garg, A.; Prasad, B.; Jain, R.; Singh, S. Identification of reactive metabolites of primaquine and its structural congener NP-96 in human and rat liver microsomes supplemented with GSH and NAC. *2nd International DMPK Symposium*, 27-28th February **2010**, NIPER, SAS Nagar, India, PP-2.
- [36] Takwani, H. S.; Prasad, B.; Meena, C. L.; Jain, R.; Singh, S. Metabolic fate of Thyrotropin-releasing hormone (TRH) and its newer analogues in rat plasma. *2nd International DMPK Symposium*, 27-28th February **2010**, NIPER, SAS Nagar, India, PP-13.
- [37] Khomane, K.; Ramachandran, S.; Jain, R.; Bansal, A. K. Development of “consensus models” for prediction of physicochemical properties of novel Thyrotropin-releasing hormone analogues. *2nd International DMPK Symposium*, 27-28th February **2010**, NIPER, SAS Nagar, India, PP-17.
- [38] Rajput, S. K.; Singh, J. N.; Kumar, V.; Meena, C. L.; Pant, A.; Jain, R.; Sharma, S. S. Modulation of voltage-gated Na⁺ channels and glutamate excitotoxicity by L-pGlu-(2-propyl)-L-His-L-ProNH₂: A potential anti-epileptic TRH analog. *Epilepsy: Recent Advances in Drug Discovery and Treatment*, 13th February **2010**, New Delhi, India.
- [39] Meena, C. L.; Ingole, S.; Sharma, S. S.; Jain, R. Synthesis of new thyrotropin-releasing hormone (TRH) analogues. *Invited lecture at the Recent Trends in Peptide Science (Organized by the Indian Peptide Society)*, 8th January **2010**, Bose Institute, Kolkata, India.
- [40] Meena, C. L.; Ingole, S.; Sharma, S. S.; Jain, R. Synthesis of new thyrotropin-releasing hormone (TRH) analogues. *Recent Trends in Peptide Science (Organized by the Indian Peptide Society)*, 8th January **2010**, Bose Institute, Kolkata, India, P-7.
- [41] Jain, R. Mass spectroscopy: An introduction. Invited lecture at the Advanced Analytical Techniques: Basic Principles and Application for Quality Assessment of Drugs and Pharmaceuticals for export. *Intensive course sponsored by Ministry of external affairs*, October **2009**, NIPER, SAS Nagar, India.
- [42] Mayatra, S. J.; Sharma, D.; Prasad, B.; Jain, R.; Singh, S. Evaluation of plasma protein binding, metabolism and pharmacokinetic of an investigational anti-malarial drug, 2-*tert*-butylprimaquine (NP-96). *20th International Symposium on Pharmaceutical and Biomedical Analysis*, 1-4th March **2009**, Agra, India.
- [43] Sharma, D.; Prasad, B.; Jain, R.; Singh, S. LC-MS/TOF investigation of *in vitro* and *in vivo* metabolism of a new anti-malarial drug, 2-*tert*-butylprimaquine. *DMPK Symposium*, 13-14th February **2009**, NIPER, SAS Nagar, India, P-29.

- [44] Mayatra, S. J.; Prasad, B.; Jain, R.; Singh, S. Determination of 2-*tert*-butylprimaquine (NP-96) in rat plasma using validated bioanalytical method. *DMPK Symposium*, 13-14th February **2009**, NIPER, SAS Nagar, India, P-21.
- [45] Mayatra, S. J.; Sharma, D.; Prasad, B.; Jain, R.; Singh, S. Development and application of a high throughput HPLC method for determination of plasma protein binding of NP-96. *60th Indian Pharmaceutical Congress*, December **2008**, New Delhi, BP-12.
- [46] Jain, R. Mass spectroscopy: An introduction. Invited lecture at the Advanced Analytical Techniques: Basic Principles and Application for Quality Assessment of Drugs and Pharmaceuticals for export. *Intensive course sponsored by Ministry of external affairs*, 13-25th October **2008**, NIPER, SAS Nagar, India.
- [47] Jain, R. Receptor subtype selective thyrotropin-releasing hormone (TRH) analogs. Invited lecture at the 3rd *CRSI Mid-Year Symposium*, 25-26th July **2008**, NIPER, SAS Nagar, India, IL-5.
- [48] Kaur, K.; Jain, R. Side chain modified 8-aminoquinolines as potential antiprotozoal and antimicrobial agents. *9th Tetrahedron Symposium: Challenges in Organic and Bioorganic Chemistry*, 22-25th July **2008**, Berkley, CA, USA, P2.49.
- [49] Sharma, R. K.; Sundriyal, S.; Bhartam, P. V.; Tegge, W.; Jain, R. Design, synthesis and biological activities of dipeptidic compounds exhibiting antimicrobial activities. *International Conference on the Interface of Chemistry-Biology in Biomedical Research*, 22-24th February **2008**, BITS Pilani, India, PP-211.
- [50] Kaur, K.; Jain, R. 8-Aminoquinolines as potential broad-spectrum antimalarial agents. *International Conference on the Interface of Chemistry-Biology in Biomedical Research*, 22-24th February **2008**, BITS Pilani, India, PP-93.
- [51] Kaur, K.; Jain, R. Side chain modified 8-aminoquinolines as potential antimalarial agents. *10th CRSI National Symposium in Chemistry*, 1-3rd February **2008**, IISc Bangalore, India, P-104.
- [52] Rajput, S. K.; Monga, V.; Kaur, N.; Jain, R.; Sharma, S. S. Protective effect of NP-647 (L-pGlu-(2-propyl)-L-His-L-ProNH₂), a novel TRH analog in seizure models. *40th Annual Conference of Indian Pharmacological Society*, 1-3rd November **2007**, NIPER, SAS Nagar, Punjab, India.
- [53] Sharma, R. K.; Sundriyal, S.; Reddy, R. P.; Bhartam, P. V.; Jain, R. Design and synthesis of dipeptides exhibiting antimicrobial activities. *20th American Peptide Society Symposium*, 26-30th June **2007**, Montreal, Quebec, Canada, PS1-80.
- [54] Monga, V.; Kaur, N.; Kumar, S.; Sharma, S. S.; Jain, R. Synthesis and biological activity of thyrotropin-releasing hormone (TRH) analogues. *20th American Peptide Society Symposium*, 26-30th June **2007**, Montreal, Quebec, Canada, PS1-77.
- [55] Chavan, A. G.; Pahwa, S.; Sharma, R. K.; Monga, V.; Jain, R.; Roy, N. Inhibitor-based validation of a homology model for *GcHDDH*: A novel antifungal target. *Workshop on Pharmacoinformatics: Tools for Drug Target*

Identification, 14-16th March **2007**, National Institute of Pharmaceutical Education and Research, SAS Nagar, Punjab, P-2.

- [56] Pahwa, S.; Chavan, A. G.; Sharma, R. K.; Monga, V.; Jain, R.; Roy, N. Histidinol dehydrogenase of *Geotrichum candidum* as target for rational drug design. *Workshop on Pharmacoinformatics: Tools for Drug Target Identification*, 14-16th March **2007**, National Institute of Pharmaceutical Education and Research, SAS Nagar, Punjab, P-11.
- [57] Sharma, R. K.; Jain, R. 1,1-Carbonyldiimidazole mediated amidation of unprotected α -amino acids in water. *Invited lecture at the 1st Indian Peptide Symposium*, 22-23rd February **2007**, Agriculture University Campus, Hyderabad, OP-32.
- [58] Monga, V.; Kumar, S.; Sharma, S. S.; Jain, R. Synthesis and biology of new thyrotropin-releasing hormone (TRH) analogues. *Invited lecture at the 1st Indian Peptide Symposium*, 22-23rd February **2007**, Agriculture University Campus, Hyderabad, OP-36.
- [59] Joshi, A.; Jain, R. Synthesis of TRH analogues containing 1,2-dialkyl-L-histidine and (1S)-3-thioxocyclopentane-1-carboxylic acid residues. *1st Indian Peptide Symposium*, 22-23rd February **2007**, Agriculture University Campus, Hyderabad, P-42.
- [60] Gupta, V. K.; Jain, R. A new facile and convenient method for the synthesis of dialkylated histamines. *1st Indian Peptide Symposium*, 22-23rd February **2007**, Agriculture University Campus, Hyderabad, P-46.
- [61] Kaur, K.; Jain, R. Synthesis of dipeptides conjugates of ring-substituted 8-quinolinamines as potent broad-spectrum antimalarial agents. *1st Indian Peptide Symposium*, 22-23rd February **2007**, Agriculture University Campus, Hyderabad, P-48.
- [62] Maneesh; Jain, R. Synthesis of TRH analogues containing 1-alkyl-L-histidine and (1S)-3-thioxocyclopentane-1-carboxylic acid residues. *1st Indian Peptide Symposium*, 22-23rd February **2007**, Agriculture University Campus, Hyderabad, P-49.
- [63] Monga, V.; Jain, R. New facile route to *N*- α -Boc-1,2-disubstituted-L-histidines and their utility in the synthesis of thyrotropin-releasing hormone (TRH) analogs. *CTDDR- 2007 Current Trends in Drug Development & Research-2007, 3rd International symposium*, 17-21st February **2007**, CDRI, Lucknow, P-116.
- [64] Pahwa, S.; Chavan, S.; Sharma, R. K.; Monga, V.; Jain, R.; Roy, N. Cloning and characterization of *Geotrichum candidum* histidinol dehydrogenase as target for rational drug design. *Proceedings of the International Conference on the Biology of Yeast and Filamentous Fungi*, 15-16th February **2007**, NCL, Pune, India.
- [65] Rajput, S. K.; Monga, V.; Kaur, N.; Jain, R.; Sharma, S. S. Effect of novel thyrotropin-releasing hormone analogues on central nervous system. *39th Annual Conference of Indian Pharmacological Society*, 21-23rd December **2006**, Jaipur, India.

- [66] Jain, R. Mass spectroscopy: An introduction. Development, scale up and production of biopharmaceuticals. Invited lecture at the *Intensive course sponsored by Ministry of external affairs*, 9-26 October **2006**, NIPER, SAS Nagar, Punjab.
- [67] Majmudar, J.; Jain, R. Design and synthesis of C-2-alkyl-D-histidine containing thyrotropin-releasing hormone (TRH) analogs. *Challenges in Drug Discovery Research: Networking Opportunities between Academia and Industry*, 7-8th April **2006**, BITS Pillani, P-DS608.
- [68] Agarwal, S.; Jain, R. Design and synthesis of N-1-alkyl-D-histidine containing thyrotropin-releasing hormone (TRH) analogs. *Challenges in Drug Discovery Research: Networking Opportunities between Academia and Industry*, 7-8th April **2006**, BITS Pillani, P-DS619.
- [69] Meena, C. L.; Jain, R. Facile synthesis of *N*- α -Boc protected 1-alkyl-5-halogenated and 1-alkyl-2,5-dihalogenated-L-histidines. *National Symposium on New Challenges in Chemistry*, 20-21st March **2006**, GNDU, Amritsar, PP 8.
- [70] Vikram Deep; Kumar, S.; Sharma, S. S.; Jain, R. Synthesis and biological activity of novel dialkyl-substituted histidine containing thyrotropin-releasing hormone (TRH) analogues. *National Symposium on New Challenges in Chemistry*, 20-21st March **2006**, GNDU, Amritsar, PP 9.
- [71] Ali, I.; Ramachandran, U.; Jain, R. Naphthoquinone derivatives as biologically active agents. *National Symposium on New Challenges in Chemistry*, 20-21st March **2006**, GNDU, Amritsar, PP 48.
- [72] Hasan, W.; Ramachandran, U.; Jain, R. Synthesis and biological evaluation of new ring-substituted quinoline analogues as anti-tuberculosis agents. *IUPAC IInd International Symposium on Green/Sustainable Chemistry*, 10-13th January **2006**, New Delhi, P-5.
- [73] Patel, S.; Patil, P.; Jain, M; Jain, R. Design and synthesis of amino acid conjugates of *N*⁸-(4-amino-1-methylbutyl)-2-*tert*-butyl-6-methoxy-8-quinolinamine as potential antimalarial agents. *IUPAC IInd International Symposium on Green/Sustainable Chemistry*, 10-13th January **2006**, New Delhi, P-99.
- [74] Patil, P.; Patel, S.; Jain, M; Jain, R. Design and synthesis of amino acid conjugates of *N*⁸-(4-amino-1-methylbutyl)-4-ethyl-6-methoxy-5-pentoxy-8-quinolinamine as antimalarial agents. *IUPAC IInd International Symposium on Green/Sustainable Chemistry*, 10-13th January **2006**, New Delhi, P-111.
- [75] Vats, R. K.; Ramachandarn, U.; Jain, R. Heteroaryl compounds as PPAR- γ parital agonists. *Joint Conference by ACS-CSIR on Building Bridges, Forging Bonds for 21st Century Organic Chemistry and Chemical Biology*, 7-9th January **2006**, NCL, Pune, P-068.
- [76] Kumar, R.; Sundriyal, S.; Jain, R. Design, synthesis and antimicrobial activities of hexapeptides. *International Symposium on Organic Chemistry – Today and Tomorrow*, 4-7th January **2006**, IISC, Bangalore, P-7.
- [77] Vangapandu, S.; Jain, R. New blood schizontocidal 8-aminoquinoline antimalarials. Invited lecture at the *54th Annual Meeting of the American Association of Tropical Medicine and Hygiene (ASTMH), Symposium on 8-*

Aminoquinolines: Present Past and Future, 10-15th December **2005**, Washington DC, USA, OP-4.

- [78] Malde, A.; Nayyar, A.; Jain, R.; Coutinho, E. 3D-QSAR study of ring-substituted quinoline class of anti-tuberculosis agents. *National Symposium on Molecular Mechanism of Diseases and Drug Action (MMDDA 2005)*, 16-18th November **2005**, Saha Institute of Nuclear Physics, Kolkata, West Bengal, P-57.
- [79] Jain, R. Mass spectroscopy: An introduction. Development, scale up and production of biopharmaceuticals. Invited lecture at the *Intensive course sponsored by Ministry of external affairs*, 5-23 September **2005**, NIPER, SAS Nagar, Punjab.
- [80] Singh, S.; Vangapandu, S.; Jain, M.; Jain, R.; Singh, P. P. Tissue-schizontocidal activity of a new potent blood-schizontocide compound NP-96 in *P. yoelii nigeriensis*-infected mice. *7th International Symposium on Vector and Vector Borne Diseases*, 18-20 February **2005**, Patalia, Punjab, P-12.
- [81] Singh, S.; Vangapandu, S.; Jain, M.; Jain, R.; Singh, P. P. Causal prophylactic activity of a new potential antimalarial compound NP-96 using *P. yoelii nigeriensis* mice model. *7th International Symposium on Vector and Vector Borne Diseases*, 18-20 February **2005**, Patalia, Punjab, P-13.
- [82] Kaur, N.; Jain, R. Synthesis and receptor binding studies of novel 2-alkyl-substituted-imidazole containing thyrotropin releasing hormone (TRH) analogues. *International Conference on Chemistry Biology Interface: Synergistic New Frontiers*, 26-31 November **2004**, New Delhi, P23-39.
- [83] Nayyar, A.; Jain, R. Synthesis of novel 2-(N'-substitutedhydrazino)quinoline-4-carboxylic acid amide derivatives as potential anti-tuberculosis agents. *International Conference on Chemistry Biology Interface: Synergistic New Frontiers*, 26-31 November **2004**, New Delhi, P24-3.
- [84] Monga, V.; Jain, R. Facile synthesis of N- α -Boc-1,2-disubstituted-L-histidines. *International Conference on Chemistry Biology Interface: Synergistic New Frontiers*, 26-31 November **2004**, New Delhi, P24-54.
- [85] Chawrai, S.; Barari, R.; Bhutani, K. K.; Jain, R. Synthesis of novel heptapeptides as potential antidiabetic agents. *International Conference on Chemistry Biology Interface: Synergistic New Frontiers*, 26-31 November **2004**, New Delhi, P22-67.
- [86] Sundriyal, S.; Jain, R. Synthesis of novel hexapeptides as potential antifungal agents. *International Conference on Chemistry Biology Interface: Synergistic New Frontiers*, 26-31 November **2004**, New Delhi, P23-72.
- [87] Jhamb, S. S.; Nayyar, A.; Jain, R. Singh, P. P. In vitro anti-tuberculosis activity of ring-substituted quinolines. Association of Microbiologists of India, 45th Annual Conference, Microtech-2K4, 23-25 November **2004**, Karnal, MPM-18.
- [88] Nayyar, A.; Monga, V.; Jain, R. Design and synthesis novel 2,4-disubstituted-quinolines as potent anti-tuberculosis agents. *IUPAC International Conference on Biodiversity and Natural Products: Chemistry and Medical Applications*, 26-31st January **2004**, New Delhi, P 238.

- [89] Kaur, N.; Singh, J.; Jain, R. Synthesis and receptor binding studies of N^{ϵ} -substituted-imidazole containing thyrotropin releasing hormone (TRH) analogues. *IUPAC International Conference on Biodiversity and Natural Products: Chemistry and Medical Applications*, 26-31st January **2004**, New Delhi, P 149.
- [90] Monga, V.; Kaur, N.; Jain, R. First synthesis of N^{α} -methyl- N^{ϵ} -substituted-L-histidines. *IUPAC International Conference on Biodiversity and Natural Products: Chemistry and Medical Applications*, 26-31st January **2004**, New Delhi, P 87.
- [91] Suryanarayana V.; Naraynan, S.; Jain, R. Regiospecific synthesis of 2,3-dialkyl-L-histidines and histamines. *International Symposium on Current Trends in Drug Discovery Research*, Central Drug Research Institute, Lucknow, 11-15th February **2001**, India, P 91.
- [92] Jain, R.; Cohen, L. A. Regiospecific alkylation of histidine and histamine at N-1 (τ) and antimalarial activities of the analogues. *Division of Medicinal Chemistry, 210th National Meeting of American Chemical Society*, Chicago, 20-24 August **1995**, USA, P 217.
- [93] Jain, R.; Cohen, L. A. Radical C-cycloalkylation of histidine, histamine and other azaheteroaromatic systems as a route to potential medicinal agents. *Division of Medicinal Chemistry, 210th National Meeting of American Chemical Society*, Chicago, 20-24 August **1995**, USA, P 226.
- [94] Jain, R.; Avramovitch, B.; Cohen, L. A. Synthesis and biological activities of ring-halogenated histidines and histamines. *Division of Medicinal Chemistry, 208th National Meeting of American Chemical Society*, Washington DC, 21-26 August **1994**, USA, P 23.

MS Dissertation Supervised/Under-supervision

- [1] Copper-catalyzed N-alkynylation of L-histidine. [Deepika Kundal] [Due in June 2017] [MS-Pharm].
- [2] C-Terminus fragment A β ₃₉₋₄₂ derived peptides as potential Anti-Alzheimer's disease agents [Akshay Kapadia] [Due in June 2017] [MS-Pharm].
- [3] Synthesis of tertapeptides as potential Anti-Alzheimer's disease agents [Aesan P. Patel] [Due in June 2017] [MS-Pharm].
- [4] Synthesis of ring-substituted quinolines as potential anti-tuberculosis agents [Khushwantdeep Kaur] [Due in June 2017] [MS-Pharm].
- [5] Synthesis of arylated quinolines as potential anti-tuberculosis agents [Chintan V. Rana] [Due in June 2017] [MS-Pharm].
- [6] Directing group guided C-5 alkynylation of L-histidine. [Jyoti Tomar] [Due in June 2017] [MS-Pharm].
- [7] Synthesis of ring-alkylated quinolines as potential anti-tuberculosis agents [Vijay Kumar] [Due in June 2017] [MS-Pharm].
- [8] Synthesis of 4-(1-adamantyl)-2-substituted quinolines as potential anti-tuberculosis agents. [Ripul] [June 2016] [MS-Pharm].
- [9] Synthesis of 2-substituted-4-arylquinolines as potential anti-tuberculosis agents. [Mrunali R. Patil] [June 2016] [MS-Pharm].

- [10] *N*-Arylation of amino acids using bidentate ligands. [Meenakshi Mandloi] [June 2016] [MS-Pharm].
- [11] Direct C-2 alkynylation of histidine. [Neeraj Verma] [June 2016] [MS-Pharm]
- [12] Synthesis of short peptides as potential antimicrobial agents. [Neha Rai] [June 2016] [MS-Pharm].
- [13] Amidation of α -amino acids under microwave irradiation. [Pooja Kumari] [June 2016] [MS-Pharm].
- [14] Synthesis of R-His-(Ar)-Arg-NH-Bzl class of tripeptidomimetics as potential antimicrobials [Anurag Kudwal] [June 2015] [MS-Pharm].
- [15] Synthesis of His(2-alkyl)-Trp-Arg class of antimicrobial lipo-tripeptidomimetics [Azaz Ali] [June 2015] [MS-Pharm].
- [16] Synthesis of His(2-aryl)-Trp-Arg class of peptidomimetics as potential antimicrobials [Ravikant Ravi] [June 2015] [MS-Pharm].
- [17] Synthesis of triazole substituted L-histidine derivatives [Geeta Chawan] [June 2015] [MS-Pharm].
- [18] Synthesis of quinazoline ring containing antimalarials [M. Vasu] [June 2015] [MS-Pharm].
- [19] Synthesis of *N*-arylated peptides [Swagat Hasmukhbhai Sharma] [June 2014] [MS-Pharm].
- [20] Synthesis of thyrotropin-releasing hormone (TRH) analogues containing modified residues [S. Venkataramesh] [June 2014] [MS-Pharm].
- [21] Synthesis of side-chain modified 8-aminoquinolines [Preeti Pal] [June 2014] [MS-Pharm].
- [22] Synthesis of *N*-alkylated peptides [Dhananjaybhai Ishwarbhai Patel] [June 2014] [MS-Pharm].
- [23] Synthesis of modified proline residue containing thyrotropin-releasing hormone (TRH) analogues [Pratima Rajpoot] [June 2014] [MS-Pharm].
- [24] Synthesis of thyrotropin-releasing hormone (TRH) analogues containing N-1 benzylated histidine residue [Kishorbhai Labubhai Gohil] [June 2014] [MS-Pharm].
- [25] Synthesis of 4-arylquinoline-2-carboxamide/carbothioamides as potential anti-tuberculosis against (Borra Laxmi Narsaiah) [June 2014] [MS-Pharm].
- [26] Synthesis of 5-aryl-L-histidines (Nitin Bagra) [June 2013] [MS-Pharm].
- [27] Peptide bond formation in water assisted by microwave-irradiation (Karthik Nooney) [June 2013] [MS-Pharm].
- [28] Microwave-assisted peptide bond formation under neat conditions (Neha Patel) [June 2013] [MS-Pharm].
- [29] Synthesis of iodinated histidine residue containing TRH analogues (Jitendra Patidar) [June 2013] [MS-Pharm].
- [30] Synthesis of arylated quinolines as anti-tuberculosis agents (Ram Brajesh Prajapati) [June 2013] [MS-Pharm].

- [31] Minisci reaction under microwave irradiation (Abhishek J. Maddela) [June 2013] [MS-Pharm].
- [32] Solution phase peptide synthesis under microwave irradiation (Shrikant Uraon) [June 2013] [MS-Pharm].
- [33] Synthesis of His(2-aryl)-Trp-His(2-aryl) class of tripeptides as potential antimicrobial agents. (Krishna K. Sharma) [June 2012] [MS-Pharm].
- [34] Synthesis of Arg-His(2-alkyl)-Arg class of tripeptides as potential antimicrobial agents. (Sunkavalli S. L. Suchitra) [June 2012] [MS-Pharm].
- [35] Synthesis of arylquinolines as potential anti-tuberculosis agents. (Umamaheshwara Rao K.) [June 2012] [MS-Pharm].
- [36] Synthesis of His(2-aryl)-His(2-aryl) class of dipeptides as potential antimicrobial agents. (Ramu Eppa) [June 2012] [MS-Pharm].
- [37] Synthesis of aryl-8-aminoquinolines as potential antimalarial agents. (B. Suresh) [June 2012] [MS-Pharm].
- [38] Synthesis of His(2-aryl)-Arg class of dipeptides as potential antimicrobial agents. (Dinesh Kumar R.) [June 2012] [MS-Pharm].
- [39] Synthesis of peptide inhibitors of β -amyloid peptide as potential therapeutics for Alzheimer's disease. (Cheshta Kapoor) [June 2011] [MS-Pharm].
- [40] Synthesis of potential peptide inhibitors of Urotensin-II. (Vidhi Vashisht) [June 2011] [MS-Pharm].
- [41] Synthesis of His-His class of dipeptides as potential antimicrobial agents. (Vijay Kanani) [June 2011] [MS-Pharm].
- [42] Synthesis of His-Arg-His class of tripeptides as potential antimicrobial agents. (Mohit Gupta) [June 2011] [MS-Pharm].
- [43] Synthesis of bisquinolines as potential anti-tuberculosis agents (Maddi Soumya) [June 2010] [MS-Pharm].
- [44] Synthesis of 5-quinolinamines as potential antimalarial agents (Pankaj Kumar) [June 2010] [MS-Pharm].
- [45] Synthesis of bis(8-quinolinamines) as potential antimalarials (Smita Jain) [June 2010] [MS-Pharm].
- [46] Synthesis of putative metabolites of 2-*tert*-butylprimaquine (Hiren Khimani) [June 2010] [MS-Pharm].
- [47] Synthesis of 5,8-quinolinamines as potential antimalarials (Muhammed Shukkoor K.) [June 2010] [MS-Pharm].
- [48] Synthesis of hybrid antimalarial agents (Atin Goel) [June 2009] [MS-Pharm].
- [49] Synthesis of hybrid anti-tuberculosis agents (Yogeshwar B. Bandal) [June 2009] [MS-Pharm].
- [50] Synthesis of imidazole based ionic liquids (Ravikant Dubey) [June 2009] [M. Tech. Pharm].
- [51] Synthesis of 4-aminoquinoline and 8-aminoquinoline adducts as potential antimalarial agents (Tarandeep Kaur) [June 2008] [MS-Pharm].

- [52] Synthesis of quinoxalines as potential anti-tuberculosis agents (Narender Malothu) [June 2008] [MS-Pharm].
- [53] Synthesis of ring-substituted imidazoles as potential histidinol dehydrogenase inhibitors (Burhanuddin Hussain) [June 2008] [MS-Pharm].
- [54] Synthesis of pseudodipeptides as potential antimicrobial agents (Samreen Shaikh) [June 2008] [MS-Pharm].
- [55] Synthesis of bulky groups containing ionic liquids (Neeraj Kumar) [June 2008] [M. Tech. Pharm].
- [56] Synthesis of TRH analogues containing (1*S*)-3-thioxocyclopentane-1-carboxylic acid and 1,2-dialkyl-L-histidine residues (Anand A. Joshi) [June 2007] [MS-Pharm].
- [57] Synthesis of TRH analogues containing 1-alkyl-L-histidine and (1*S*)-3-thioxocyclopentane-1-carboxylic acid residues (Maneesh) [June 2007] [MS-Pharm].
- [58] Synthesis of disubstituted histamines (Vinod K. Gupta) [June 2007] [MS-Pharm].
- [59] Synthesis of ω -heterocyclic containing α -amino acids (Arun Sharma) [June 2007] [M. Tech. Pharm].
- [60] Synthesis of 1-alkyl-D-histidine containing thyrotropin-releasing hormone (TRH) analogues (Sanchita Agarwal) [June 2006] [MS-Pharm].
- [61] Synthesis of 2-alkyl-D-histidine containing thyrotropin-releasing hormone (TRH) analogues (Jaimeen Majumdar) [June 2006] [MS-Pharm].
- [62] Synthesis of 1-alkyl-5-halogenated and 1-alkyl-2,5-dihalogenated-L-histidines (Chuttan Lal Meena) [Due in June 2006] [MS-Pharm].
- [63] Quinoline analogues as anti-tuberculosis agents (Waquar Ahsan) [June 2006] [M. Tech. Pharm].
- [64] Naphthoquinones as biologically active agents (Israr Ali) [June 2006] [M. Tech. Pharm].
- [65] Design and synthesis of amino acid conjugates of *N*⁸-(4-Amino-1-methylbutyl)-4-ethyl-6-methoxy-5-pentoxo-8-quinolinamine as potential antimalarial agents (Premanand Patil) [June 2005] [MS-Pharm].
- [66] Synthesis of N(1)-N^o-disubstituted-L-histidines (Surendra K. Nayak) [June 2005] [MS-Pharm].
- [67] Design and synthesis of amino acid conjugates of *N*⁸-(4-amino-1-methylbutyl)-2-*tert*-butyl-6-methoxy-8-quinolinamine as potential antimalarial agents (Sanjay R. Patel) [June 2005] [MS-Pharm].
- [68] Design and solid phase synthesis of antifungal hexapeptides (Sandeep Sundriyal) [Dec. 2003] [MS-Pharm].
- [69] Design and Synthesis of anti-diabetic heptapeptides (Suresh Charwai) [Dec. 2003] [MS-Pharm].
- [70] Design and synthesis of pyridyl-4-acetic acid derivatives as potential anti-tuberculosis agents (Sarika Ramnani) [Dec. 2003] [MS-Pharm].

- [71] Synthesis of heptapeptides as antidiabetic agents (Rahul Birari) [Dec. 2003] [MS-Pharm].
- [72] Synthesis of ring-substituted imidazole-4-carboxylic acids as anti-tuberculosis agents (Preeti Gupta) [Dec. 2002] [MS-Pharm].
- [73] Synthesis of 4-adamantyl-quinoline-2-carboxylic acid derivatives as anti-tuberculosis agents (Vikram Deep) [Dec. 2002] [MS-Pharm].
- [74] Regiospecific synthesis of 2,3-disubstituted L-histidines and histamines (Pooja Chandana) [Dec. 2001] [MS-Pharm].
- [75] Synthesis of substituted-imidazole containing thyrotropin-releasing hormone analogues (Jatinder Singh) [Dec. 2001] [MS-Pharm].
- [76] Bioimidazoles: Synthesis of 2,3-disubstituted L-histidines and histamines (Sanju Narayanan) [Dec. 2000] [MS-Pharm].
- [77] Anti-tuberculosis agents: Synthesis of substituted quinoline-3- and 4-carboxylic acids (Amit R. Nayyar) [Dec. 2000] [MS-Pharm].
- [78] Anti-tuberculosis agents: Synthesis of substituted quinoline-4-acetic acids derivatives (Prakash B. Palde) [Dec. 2000] [MS-Pharm].
- [79] Anti-tuberculosis agents: Synthesis of substituted quinolines (Balasubramanian V.) [Dec. 1999] [MS-Pharm].
- [80] Anti-tuberculosis agents: Synthesis of ring-substituted imidazoles (Shahul Hameed P.) [Dec. 1999] [MS-Pharm].

Summer Internship Dissertation Supervised

- [1] Studies on the halogenation reactions of (+)-(7*S*)-5,6,7,8-tetrahydro-7-(methoxythiocarbonyl)-5-oxoimidazo-[1,5-*c*]pyrimidines. (Hari P. Sharma) [June 2000] [MS].
- [2] Synthesis of dialkoxynitrobenzenes as precursors for the synthesis of potential antimalarial agents. (Nidhi Bansal) [July 2000] [M. Sc.].
- [3] Studies on the halogenation reactions of (+)-(7*S*)-5,6,7,8-tetrahydro-7-(methoxycarbonyl)-5-oxoimidazo-[1,5-*c*]pyrimidines. (Praveen Gupta) [June 2000] [MS].

Ph. D. Dissertation Supervised/Under-supervision

- [1] Design and synthesis of potential broad-spectrum antimalarial agents. (Suryanarayana, V.) [Nov. 2001].
- [2] Design and synthesis of thyrotropin-releasing hormone (TRH) analogues (Navneet Kaur) [Jan. 2005].
- [3] Design and synthesis of ring-substituted quinolines as potential anti-tuberculosis agents. (Amit Nayyar) [Jan. 2006].
- [4] Design and synthesis of novel insulin sensitizers as antidiabetic agents. (Rakesh Kumar) [Aug. 2006].
- [5] Design and synthesis of thyrotropin-releasing hormone (TRH) analogues containing modified histidine and pyroglutamic acid residues. (Vikramdeep Monga) [Nov. 2007].

- [6] Design, synthesis and biological evaluation of antimicrobial peptides. (Rohit K. Sharma) [Feb. 2009].
- [7] Design and synthesis of 8-quinolinamines as potential antiprotozoal and antimicrobial agents. (Kirandeep Kaur) [Oct. 2009].
- [8] Design, synthesis, molecular docking and 3D-QSAR studies of quinoline derivatives as potential anti-tuberculosis agents. (Sanjay R. Patel) [Dec. 2011].
- [9] Synthesis and biological evaluation of new thyrotropin-releasing hormone (TRH) analogues. (Chhuttan L. Meena) [Nov. 2012].
- [10] Design and synthesis of antimicrobial and antiplasmodial peptides (Amit Mahindra) [Aug. 2013].
- [11] Design and synthesis of β -sheet breaker peptides as potential anti-Alzheimer's disease agents (Sunil Bansal) [July 2015].
- [12] Design, synthesis and mechanistic studies of potential antimicrobial peptides (Kitika Shenmar) [July 2016].
- [13] Synthesis of functionalized *N*-heterocycles: Utility in the synthesis of bioactive molecules (Krishna K. Sharma) [on-going].
- [14] Design and synthesis of short peptidomimetics derived from functionalized histidine and phenylalanine (Nitin Bagra) [on-going].
- [15] Transition metals-catalyzed functionalization of amino acids and peptides (Komal Sharma) [on-going].
- [16] Design and synthesis of functionalized amino acids containing short antimicrobial peptides (Shams Aagaaz) [on-going].
- [17] Investigations into nanoparticle mediated targeting of bacteria using cell-penetrating peptides (Munish Kumar, Department of Organic Chemistry, Panjab University) [on-going] – External Supervisor.

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Personal Information

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