

**SONIA ARORA, MS, Ph.D.**

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**SUMMARY**

Scientist with research experience in the fields of molecular pharmacology, oncology, structural bioinformatics, natural products and human diseases.

- Productive researcher with strong publication record
- Excellent communication & scientific writing skills, worked on manuscripts, grant proposals, slide decks & posters
- Effective liaison between chemists, modelers and biologists
- Extensive teaching and curriculum/ program development experience in all subjects of life sciences
- Experience in managing research groups and multiple research projects
- Technical expertise in both *in vitro* assays and *in silico* (computational) methods

**EDUCATION**

Post Doctoral Fellowship: Bioinformatics and Computational Biology

Robert Wood Johnson Medical School

Rutgers University, New Jersey

2004-2006

Doctor of Philosophy: Molecular Biosciences

Rutgers The State University of New Jersey

*Thesis Title: Identification and characterization of a novel inhibitor of elongation factor 2 kinase against cancer cells*

1999-2004

Masters of Science: Biochemistry

All India Institute of Medical Science, New Delhi, India

*Thesis Title: Study of p53-MDM2 pathway in esophageal squamous cell carcinoma*

1996-1998

Bachelor of Science (Honors): Biochemistry

University of Delhi, India

1993-1996

**PROFESSIONAL APPOINTMENTS**

2014- Present: Teaching Instructor, Rutgers University, New Brunswick, NJ.

2010- 2013: Assistant Professor, Kean University, Union, NJ.

2004- 2009: Postdoctoral Fellow & Research Teaching Specialist, Rutgers University, Piscataway, NJ

2008- 2009: Visiting Assistant Professor (Part-time), Richard Stockton College of New Jersey, Pomona, NJ.

1999- 2004: Doctoral Research Fellow, Cancer Institute of New Jersey, Rutgers University, New Brunswick, NJ

2000-2004: Group Leader and Tutor, ODASIS Program, Div. of Life Sciences, Rutgers University, Piscataway, NJ

1996-1999: Junior Research Fellow, All India Institute of Medical Sciences, New Delhi, India

## AWARDS AND HONORS

- Key Note Speaker, 58th Annual Meeting of the New Jersey Academy of Science, 2013
- Invited Reviewer, RSC Advances, Medicinal Chemistry Communication, Royal Society of Chemistry, 2012, 2013
- Faculty Mentor, Ronald E. McNair Summer Institute, 2011, 2012
- Invited Reviewer, Bioinformatics & Biology Insights, Cancer Informatics, Libertas Academia Press, 2010, 2011
- Faculty Mentor, Merck-AAAS Undergraduate Science Research Program, 2010
- NCI Cancer Pharmacology Training Fellowship Grant, 2008-2009
- Invited Grant Reviewer: CDMRP Programs, United States Army, 2007, 2008.
- Young Investigator Award, Department of Pharmacology, UMDNJ, 2001, 2002.
- Research Fellowship, Molecular Biosciences Program, Rutgers University, 1999-2000.
- W.H.O. Scientific Resource Person for Cancer Workshop at All India Institute of Medical Sciences, 1999.
- Prestigious Junior Research Fellowship, Council of Scientific and Industrial Research, Govt. India, 1998.
- National Eligibility Award for Lecturership in Life Sciences, University Grant Commission, Govt. India, 1997.
- Prestigious Scholarship, Department of Biotechnology, Govt. of India, 1996.
- **Gold Medal**, B.S. (Honors) Biochemistry, University of Delhi, 1993-1996.

## DRUG DISCOVERY PATENTS

- Anti-Mitotic Anti-Proliferative Compounds (US Patent # 20090317440, Granted October 2013)
- Opioid Receptor Subtype Selective Agents (US Patent # US 20090181998, Granted May 2012)
- Peripheral opioid receptor active compounds (International Patent: WO 2008/064318)
- Lipophilic opioid receptor active compounds. (International Patent: WO 2008/064317)
- Mixed opioid receptor active compounds. (International Patent: WO 2008/064310)

## PRESS RELEASES

- Seeking HIV treatment clues in the Neem tree. Science Daily, April 22nd 2012.
- Seeking HIV treatment clues in the Neem tree. Science News Online, April 23rd 2012.
- Neem may thwart HIV. The Hindu, April 24th 2012.
- Neem leaves can fight HIV virus. Times of India, April 27th 2012.
- Can Neem extracts fight HIV? Sonia Arora investigates. India Abroad May 18, 2012.

## PUBLICATIONS

1. Tobak A, **Arora S**, Welsh WJ. Structural model of the mammalian target of rapamycin (mTOR) kinase domain. Online Journal of Bioinformatics, 11 (1): 128-144, 2010.
2. Hartman I, Gillies AR, **Arora S**, Andaya C, Royapet N, Welsh WJ, Wood DW, Zauhar RJ. Application of screening methods, shape signatures and engineered biosensors in early drug discovery process. Pharm Res. 10: 2247- 2258, 2009.
3. **Arora S**, Wang XI, Keenan SM, Andaya, C, Zhang Q, Peng Y, Welsh WJ. Novel microtubule polymerization inhibitor with potent antiproliferative and antitumor activity. Cancer Res., 69: 1910:1915, 2009.
4. Peng Y, Zhang Q, **Arora S**, Keenan SM, Kortagere S, Wannemacher KM, Howells RD, Welsh WJ Novel delta opioid receptor agonists exhibit differential stimulation of signaling pathways Bioorg. Med. Chem. 17: 6442-50, 2009.
5. Zhang Q, Peng Y, Wang XI, Keenan SM, **Arora S**, Welsh WJ. Highly potent triazole-based tubulin polymerization inhibitors. J. Med. Chem. 50, 749-754, 2007.
6. Wang CY, Ai N, **Arora S**, Erenrich E, Nagarajan K, Zauhar R, Young D, Welsh WJ. Identification of previously unrecognized antiestrogenic chemicals using a novel virtual screening approach. Chem Res Toxicol. 19(12):1595-601, 2006.

7. **Arora S**, Yang JM, and Hait WN. Mechanism of degradation of Eukaryotic Elongation Factor 2 Kinase in human cancer cells. *Cancer Res.*, 65: 3806-3810, 2005.
8. **Arora S**, Yang JM., Ryutaro Utsumi R, Okamoto T, Kitayama T, and Hait WN. P-glycoprotein mediate resistance to histidine kinase inhibitors. *Mol. Pharm.*, 66: 460-467, 2004.
9. **Arora S**, Yang JM, Kinzy TG, Ryutaro Utsumi R, Okamoto T, Kitayama T, Ortiz PA and Hait WN Identification and Characterization of an Inhibitor of Eukaryotic Elongation Factor 2 Kinase against Human Cancer Cell Lines. *Cancer Res.*, 63: 6894-6899, 2003.
10. **Arora, S**, Yang JM, Craft J and Hait WN. Detection of anti-elongation factor 2 kinase (calmodulin-dependent protein kinase III) antibodies in patients with systemic lupus erythematosus. *Biochem Biophys Res Commun*, 293: 1073-1076, 2002.
11. Mathew R, **Arora S**, Khanna R, Mathur M, Shukla, NK and Ralhan R. Alterations in p53 and pRb pathways and their prognostic significance in oesophageal cancer. *Eur J Cancer*, 38: 832-841, 2002.
12. **Arora S**, Mathew R, Mathur M, Chattopadhyay TK and Ralhan R. Alterations in MDM2 expression in esophageal squamous cell carcinoma: relationship with p53 status. *Pathol Oncol Res*, 7: 203-208, 2001.
13. Mathew R, **Arora S**, Mathur M, Chattopadhyay TK and Ralhan R. Esophageal squamous cell carcinomas with DNA replication errors (RER+) are associated with p16/pRb loss and wild-type p53. *J Cancer Res Clin Oncol*, 127: 603-612, 2001.
14. Mathew R, **Arora S**, Khanna R, Shukla NK, Mathur M and Ralhan R. Alterations in cyclin D1 expression in esophageal squamous cell carcinoma in the Indian population. *J Cancer Res Clin Oncol*, 127: 251-257, 2001.
15. Ralhan R, Mathew R, **Arora S**, Bahl R, Shukla NK and Mathur M. Frequent alterations in the expression of tumor suppressor genes p16INK4A and pRb in esophageal squamous cell carcinoma in the Indian population. *J Cancer Res Clin Oncol*, 126: 655-660, 2000.
16. Ralhan R, **Arora S**, Chattopadhyay TK, Shukla NK and Mathur M. Circulating p53 antibodies, p53 gene mutational profile and product accumulation in esophageal squamous-cell carcinoma in India. *Int J Cancer*, 85: 791-795, 2000.
17. Bahl R, **Arora S**, Nath N, Mathur M, Shukla NK and Ralhan R. Novel polymorphism in p21 (waf1/cip1) cyclin dependent kinase inhibitor gene: association with human esophageal cancer. *Oncogene*, 19: 323-328, 2000.
18. Gaur D, **Arora S**, Mathur M, Nath N, Chattopadhaya TK. and Ralhan R. High prevalence of p53 gene alterations and protein overexpression in human esophageal cancer: correlation with dietary risk factors in India. *Clin Cancer Res*, 3: 2129-2136, 1997.

## CHAPTERS IN BOOKS

- **Arora, S.**, Mathur, M., Chattopadhaya T.K., and Ralhan, R. Esophageal cancer: Correlation of molecular alterations with dietary factors. In: *Oral Oncology*, Volume VI, A. K. Verma Eds., p11-14, 1999.
- Khanna, R., **Arora, S.**, Mathew, R., Mathur, M., Chattopadhaya T.K., Shukla, N.K. and Ralhan, R. Bidi Smoking Associated Esophageal cancer in The Indian Subpopulation. In: *Tobacco Counters Health*, A.K. Verma Eds., p94-98, 2000.

## INVITED TALKS AND CONFERENCE PRESENTATIONS

- Arora S. "Biomedicine, Chemistry and Informatics at the Crossroads of Drug Discovery." Keynote Speech: 58th Annual Meeting of the New Jersey Academy of Science. April 27, 2013.
- Arora S. "Repurposing Old Drugs for New Uses: Targeting Multidrug Resistance in Cancer". Faculty Presentation: Kean University Research Day, April 23, 2013.
- Kaur R. and Arora S. "Efficacy Profile of T115 Combinations in Treatment of Breast Cancer". AAAS Annual Meeting, Boston, February 16, 2013.
- Finding New Uses for Old Drugs Using Structural Bioinformatics Approaches. New Jersey Annual Cancer Retreat, New Jersey, May 24, 2012.
- Repurposing old drugs for new uses: targeting multidrug resistance in cancer. Poster on Hill Conference, Council of Undergraduate Research, Washington DC, April 24, 2012

- Identification of mechanism of action of anti-HIV properties of compounds present in Neem (*Azadirachta indica*) extracts. Experimental Biology 2012- Annual Conference of FASEB (Federation of American Societies of Experimental Biology), San Diego, April 22, 2012
- New uses for old drugs: discovery of multidrug resistance modulator for cancer cells. 57th Annual New Jersey Academy of Science Meeting, New Jersey, April 21, 2012.
- In silico and in vitro studies of CDK-2 and its potential inhibitors. 57th Annual New Jersey Academy of Science Meeting, New Jersey, April 21, 2012.
- Repurposing Old Drugs to Identify Inhibitors/ Modulators of P-glycoprotein. Annual McNair Conference, Delaware, October 14, 2011
- Repurposing Old Drugs to Discover Novel Multidrug Resistance (MDR) Modulators for Anti-Cancer Therapy. Experimental Biology 2011- Annual Conference of FASEB, Washington D.C., April 10, 2011 (*Winner of Travel Grant award*)
- Discovery of Novel Tubulin Polymerization Inhibitor using Computer Aided Drug Design Strategies. Biophilia Seminar Series, Department of Biology, Kean University, March 10, 2011
- Discovery for Novel Cyclin Dependent Kinase Inhibitors Using Computational Biology Tools for Treatment of Cancer. 55th Annual New Jersey Academy of Science Meeting, April 24, 2010.
- Identification of a novel Inhibitor of Eukaryotic Elongation Factor 2 Kinase (Calmodulin dependent kinase III) as a potential anti-cancer drug. Annual Meeting of American Association of Cancer Research, 2003.
- Role of Ubiquitin-Proteasome Pathway in the degradation of Elongation Factor 2 Kinase. Annual Meeting of American Association of Cancer Research, 2004.
- The signal transduction inhibitors, 2-methyl imidazolium iodides, are substrates for P-glycoprotein. Annual Meeting of American Association of Cancer Research, 2004.
- Detection of Anti-Elongation Factor 2 Kinase Antibodies in Cancer and Lupus Patients. Annual Meeting of American Association of Cancer Research, 2001.
- Putative molecular markers for esophageal squamous cell carcinoma. International Symposium on Predictive and Preventive Oncology, Switzerland, 2000 (*Winner of Travel Grant award*)
- Microsatellite alterations at 3p, 2p and 15q loci in esophageal squamous cell carcinoma: Association with cell cycle regulatory proteins. International Symposium on Predictive and Preventive Oncology, Switzerland, 2000 (*Winner of Travel Grant award*)
- Esophageal cancer: Correlation of molecular alterations with dietary factors. 6th International congress on oral cancer (New Delhi, India), 1999
- Microsatellite alterations in esophageal carcinoma. XV Asia Pacific Cancer Conference, Chennai, Madras, India, 1999