CURRICULUM VITAE

Abhishek Kumar Singh
PhD
Assistant Professor (Ad-hoc)
Department of Biotechnology
Guru Ghasidas Vishwavidyalaya (A Central University)
Koni, Bilaspur (C.G.)- 495009- India
Voice: +91-07752-260405 (Work)
+91-7587705205 (Personal)
E-mail: aks84m@yahoo.co.in , aks84m@gmail.com
URL: http://www.researcherid.com/rid/G-4032-2011
http://scholar.google.co.in/citations?user=107cCLUAAAAJ&hl=en&oi=ao

Academics:

High School, 1999: Allahabad Board. First (74.5%)

Intermediate, 2001: Allahabad Board. First (77.4%)

Graduation (Biology), 2004: University of Allahabad. First (66.3%)

Post Graduation (Biotechnology), 2007: Guru Nanak Dev University, Amritsar-India. First (77.6%; Gold Medalist)

***PhD (Biotechnology)**: Jamia Hamdard, Hamdard University, New Delhi.

Joining date: July 30, 2008; **Submitted:** September 18, 2012; **Defense date:** March 19, 2013**.**

*Work place for PhD research work: CSIR-Indian Institute of Toxicology Research (National Laboratory of Council of Scientific & Industrial Research, Government of India, New Delhi)

Position held:

July 2013- Till date: Assistant Professor (Ad-hoc) at Department of Biotechnology, Guru Ghasidas Vishwavidyalaya (A Central University), Bilaspur, Chhattisgarh.

July 2010- July 2013: Senior Research Fellow (CSIR-NET-SRF) at In Vitro Toxicology Laboratory, CSIR-Indian Institute of Toxicology Research (CSIR-IITR), Lucknow, Uttar Pradesh.

July 2008- July 2010: Junior Research Fellow (CSIR-NET-JRF) at In Vitro Toxicology Laboratory, CSIR-Indian Institute of Toxicology Research (CSIR-IITR), Lucknow, Uttar Pradesh.

October 2007- July 2008: Project Assistant at Cell Biology Laboratory, CSIR-Indian Institute of Integrative Medicine, Jammu.

Summary of PhD work:

Title: Study of Cytochrome P450s in Differentiating Neuronal Cells Derived from Human Stem Cells.

Supervisor: Dr. AB Pant (Senior Scientist- IITR, Lucknow, India)

Co-supervisor: Dr. SK Jain (Professor- Jamia Hamdard, Hamdard University, New Delhi)

Research Area:

Cellular and molecular understanding of pesticide induced developmental neurotoxicity.

Core Research Activity:

My major research focus was to understand developmental stage specific xenobiotic metabolizing capability of neuronal cells derived from human umbilical cord blood hematopoietic stem cells. I have developed and validated the new and more sensitive human stem cell based in vitro models to understand the molecular and cellular mechanisms involved in the environmental chemicals/ drugs induced human developmental neurotoxicity. Following the isolation and characterization, human umbilical cord blood hematopoietic stem cells were allowed to differentiate into neuronal cells. At various time points of maturity, expression and activity of markers involved in neuronal development, injury and repair were studied. Further, the developmental stage specific expression, inducibility and catalytic activity of various brain specific cytochrome P450s (CYP1A1, 1A2, 2B6, 2E1, 3A4, AHR, CAR and PXR) were carried out following the experimental exposure of environmental chemicals/ drugs. The vulnerability of cells towards toxicants (e.g. monocrotophos, an organophosphate pesticide, 3-methylcholanthrene, rifampin and cimetidine) were identified by studying the alterations in expression profiling of marker genes/ proteins involved in neurogenesis and xenobiotic metabolism. Perhaps for the first time, I have reported the expression profile and activity of P450s in primary cultures of developing human neuronal cells derived from stem cells. In addition, I have reported the developmental neurotoxicity potential of 3-methylcholanthrene.

Allied research activities:

Besides the core research activity, I have also been involved in various ongoing research projects in the laboratory as a team member. Few of the major research activities, where I am involved are:

(i) Developmental neurotoxicity of monocrotophos in rat PC-12 cells as in vitro model.

(ii) Development of in vitro models of cerebral stroke to evaluate neuroprotective effects of herbal drugs.

(iii) Development and validation of in vitro models for cytotoxicity, neurotoxicity and metabolism assessment.

(iv) Evaluation of the mechanism based cytotoxic potential of Nanomaterials such as MWCNTs and TiO_2.

Book Chapter:

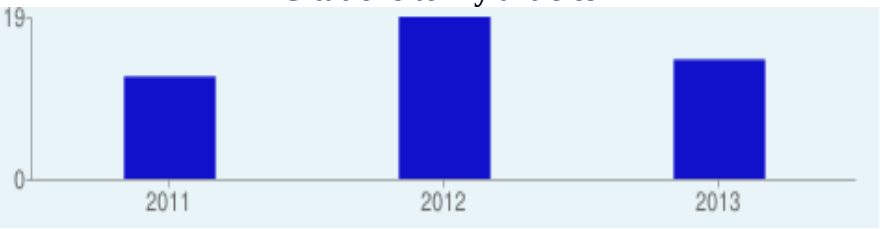
MP Kashyap, RK Srivastava, **AK Singh**, VK Khanna and AB Pant (2011). In vitro approaches for biosafety of nanoparticles: strategies and points to ponder. Chapter in book entitled “Biosafety of Nanoparticles and Nanomaterials”. (In Press; Springer Press)

Research Publications:

Citation indices

	All	Since 2008
Citations	49	49
h-index	3	3
i10 index	2	2

Citations to my articles



[**Pubmed Link:** http://www.ncbi.nlm.nih.gov/pubmed?term=singh%20ak%20pant%20ab]

1. **AK Singh,** MP Kashyap, V Kumar, VK Tripathi, DK Yadav, F Khan, S Jahan, VK Khanna, S Yadav, AB Pant (2013). 3-methylcholanthrene Induces Neurotoxicity in Developing Neurons Derived from Human $CD34^{+}Thy1^{+}$ Stem Cells by Activation of Aryl Hydrocarbon Receptor. *NeuroMolecular Medicine*. 15: 570-592. **[IF= 4.5]**
2. VK Tripathi, V Kumar, **AK Singh**, MP Kashyap, S Jahan, D Kumar, M Lohani (2013). Differences in the Expression and Sensitivity of Cultured Rat Brain Neuronal and Glial Cells Toward the Monocrotophos. *Toxicology International*. 20(2): 177-185.
3. V Kumar, VK Tripathi, **AK Singh**, M Lohani, M Kuddus (2013). Trans-resveratrol restores the damages induced by organophosphate pesticide-monocrotophos in neuronal cells. *Toxicology International*. 20(1): 48-55.
4. **AK Singh,** MP Kashyap, AB Pant (2013). Human cord blood stem cells derived neuronal cells: in vitro tool to assess chemical induced developmental neurotoxicity. *Journal of Neurochemistry*. 125 (S1): 173. **[IF= 4.06]**
5. VK Tripathi, V Kumar, **AK Singh,** S Jahan, S Yadav, M Lohani, AB Pant (2013). Xenobiotic metabolizing capabilities of cultured brain neuronal and glial cells; linearity analysis between rat and human. *Journal of Neurochemistry*. 125 (S1), 147. **[IF= 4.06]**
6. M Agrawal, V Kumar, **AK Singh**, MP Kashyap, VK Khanna, AB Pant (2013) Trans resveratrol protects ischemic PC12 cells by inhibiting the hypoxia associated transcription factors and increasing the levels of antioxidant defense enzymes. *ACS Chemical Neuroscience,* 4(2): 285-294. **[IF= 3.8]**
7. Srivastava RK, Rahman Q, Kashyap MP, **Singh AK**, Jain G, Jahan S, Lohani M, Lantow M, Pant AB (2013) Nano-titanium dioxide induces genotoxicity and apoptosis in human lung cancer cells-A549. *Human and Experimental Toxicology*, 32(2): 153-166. **[IF= 1.77]**
8. MP Kashyap, **AK Singh**, V Kumar, DK Yadav, F Khan, Jahan S, VK Khanna, S Yadav, AB Pant (2013) Pkb/Akt1 mediates Wnt/GSK3β/β-catenin signaling induced apoptosis in human cord blood stem cells exposed to organophosphate pesticide- monocrotophos. *Stem Cells and Development*, 22(2): 224-238. **[IF= 4.7]**
9. **Singh AK,** Kashyap MP, Jahan S, Kumar V, Tripathi VK, Siddiqui MA, Yadav S, Khanna VK, Jain SK, Das V, Pant AB (2012) Expression and inducibility of cytochrome P450s (CYP1A1,

2B6, 2E1, 3A4) in human cord blood CD34+ stem cell derived differentiating neuronal cells. *Toxicological Sciences*, 129(2): 392-410. **[IF= 4.65]**

10. Siddiqui MA, Kumar V, Kashyap MP, Agarwal M, **Singh AK**, Khanna VK, Al-Khedhairy AA, Musarrat J, Jahan S, Pant AB (2012) Short-term exposure of 4-hydroxynonenal induces mitochondria-mediated apoptosis in PC12 cells. *Human & Experimental Toxicology,* 31(4); 336-345. **[IF= 1.77]**
11. **AK Singh,** VK Tripathi, S Jahan, V Khanna, S Yadav, AB Pant (2012) Expression and inducibility of xenobiotic metabolizing cytochrome P450s in developing neurons derived from human cord blood stem cells. *Journal of Neurochemistry*, 123 (S1), 111-112. **[IF= 4.06]**
12. **AK Singh,** MP Kashyap, S Jahan, S Yadav, VK Khanna and AB Pant (2011). Human stem cells derived differentiating neurons have xenobiotic metabolizing capabilities. *Journal of Neurochemistry*. 118 (S1), 119. **[IF= 4.06]**
13. Kashyap MP, **Singh AK**, Kumar V, Tripathi VK, Srivastava RK, Agarwal M, Khanna VK, Yadav S, Jain SK and Pant AB (2011) Monocrotophos Induced Apoptosis in PC12 Cells: Role of Xenobiotic Metabolizing Cytochrome P450s. *PLoS ONE* 6(3): e17757. doi:10.1371/journal.pone.0017757. **[IF= 4.4]**
14. MP Kashyap, **AK Singh**, MA Siddiqui, V Kumar, VK Tripathi, VK Khanna, S Yadav, SK Jain and AB Pant (2010). Caspase cascade regulated mitochondria mediated apoptosis in monocrotophos exposed PC12 cells. *Chemical Research in Toxicology*, 23 (11). 1663-1672. **[IF= 4.1]**

Workshop and Refresher Course:

1. Attended the SNCI preconference workshop on "Techniques in Neurochemistry and Molecular Neurobiology" organized by All India Institute of Medical Sciences (AIIMS), New Delhi during February 14-20, 2013.
2. Attended 9th Technology Led Entrepreneurship Programme from March 14-30, 2012 at CSIR-Indian Institute of Chemical Technology, Hyderabad organized by Human Resource and Development Group (HRDG), Council of Scientific and Industrial Research (CSIR), New Delhi
3. Attended 12th ISN Advanced School organized by International Society for Neurochemistry (ISN) at Chichen Itza, Mexico during April 16-20, 2013.

Paper Presented in Overseas Conferences:

1. **AK Singh**, MP Kashyap, AB Pant. Human Cord Blood Stem Cells Derived Neuronal Cells: In Vitro Tool To Assess Chemical Induced Developmental Neurotoxicity. 24th Biennial Meeting of International Society for Neurochemistry (ISN) jointly with American Society for Neurochemistry (ASN) during April 20-24, 2013 at Cancun, Mexico.
2. **AK Singh,** VK Tripathi, S Jahan, VK Khanna, S Yadav and AB Pant. Expression and inducibility of xenobiotic metabolizing cytochrome P450s in developing neurons derived from human cord blood stem cells. 11th Biennial Meeting of Asia Pacific Society for Neurochemistry (APSN) jointly with 55th Annual Meeting of Japan Society for Neurochemistry (JSN) during September 29 to October 2, 2012 at Kobe, Japan.

3. **AK Singh**, MP Kashyap, S Jahan, VK Khanna, S Yadav and AB Pant. 3-methylcholanthrene induces the expression of cytochrome P450s and apoptosis differentiating neuronal cells derived from cord blood $CD34^+$ stem cells. 35th Annual Meeting of the Japan Neuroscience Society (JNS) during September 18 to 21, 2012 at Nagoya, Japan.
4. **AK Singh**, MP Kashyap, S Jahan, S Yadav, VK Khanna and AB Pant. Human stem cells derived differentiating neurons have xenobiotic metabolizing capabilities. 23rd Biennial Meeting of International Society for Neurochemistry (ISN) jointly with European Society for Neurochemistry (ESN) during August 28 to September 1, 2011 at Athens, Greece.

Paper Presented in National/ International Conferences/ Symposium in India:

1. **Singh AK**, Tripathi VK, Jahan S, Yadav S, Khanna VK, Pant AB. 3-methylcholanthere induced aryl hydrocarbon receptor affect human stem cell derived neuronal development. 27th Annual Meeting of Society for Neurochemistry, India (SNCI-2013) during February 20-23, 2013 at All India Institute of Medical Sciences (AIIMS), New Delhi.
2. **AK Singh,** V Kumar, VK Tripathi, S Jahan, S Yadav, VK Khanna, AB Pant. Involvement of mitochondrial caspases in monocrotophos induced ROS production and subsequent apoptotic events in PC12 cells in International conference on "Advances in Free Radicals, Redox Signaling and Translational Antioxidant Research & XII Annual Meeting of the Society for Free Radical Research- India" (SFRR STAR-2013) organized by CSIR-Indian Institute of Toxicology Research, Lucknow, India during, Jan 30th - Feb 1st, 2013.
3. **AK Singh,** S Jahan, VK Tripathi, V Kumar, S Yadav, VK Khanna, AB Pant. Human stem cell derived developing neuronal cells show metabolic activation against rifampin. Oral presentation delivered at 32nd Annual Conference of Society of Toxicology (STOX), India and International Symposium on New Paradigms in Toxicology (NPT-2012) organized at CSIR-Indian Institute of Toxicology Research (IITR), Lucknow, India during December 05-07, 2012.
4. Attended one day Workshop on "Good Laboratory Practices" held at Indian Institute of Toxicology, Lucknow (UP) on December 4, 2012.
5. **AK Singh**, MP Kashyap, S Jahan, VK Khanna, S Yadav and AB Pant. Human hematopoietic stem cells derived neuronal cells: triggering of apoptosis and metabolism. Oral presentation delivered at XXXI Annual Conference of Society of Toxicology (STOX), India and Symposium on Current Trends in Environmental Toxicology at The IIS University, Jaipur during December 22-24, 2011**.**
6. **AK Singh**, MP Kashyap, S Jahan, VK Khanna, S Yadav and AB Pant. Brain Cytochrome P450s in differentiating neuronal cells derived from human umbilical cord blood stem cells in 30th Annual Conference of Society of Toxicology, India during December 9-11. 2010 at Jamia Hamdard, Hamdard University, New Delhi, India.
7. Attended Symposium on Blood Component Therapy on May 1st, 2010 at Department of Pathology, Era's Lucknow Medical College & Hospital, Lucknow, India.

8. Attended International Symposium on Prognostic and Predictive Factors in Cancer Management during December 15-16, 2008 at Deportment of Radiotherapy, Chhatrapati Shahuji Maharaj Medical University, Lucknow, India.

Academic Awards, Honors and Distinction:

- First rank holder of college in 10^{th} and 12^{th} class.
- Availed National Scholarship by Govt. of India from 1999 to 2004.
- Qualified All India Combined Entrance Test for admission in M.Sc. in Biotechnology conducted by Jawaharlal Nehru University, New Delhi in 2005.
- Availed Scholarship sponsored by Department of Biotechnology (DBT), Govt. of India, from 2005 to 2007.
- Graduate Aptitude Test for Engineering (GATE) Qualified (Rank 494), Percentile-96, Year-2007 conducted by IIT Kanpur.
- Qualified National Examination for Junior Research Fellowship **(Two times)** conducted by Council of Scientific & Industrial Research, Govt. of India in December 2007.
- Qualified National Examination for Junior Research Fellowship conducted by Department of Biotechnology (DBT), Govt. of India in June 2008.
- Gold Medalist in M.Sc. (Biotechnology) by Guru Nanak Dev University, Amritsar, India.
- Awarded International Fellowship by ICMR, DST and DBT in 2011 to attend conferences abroad.
- Awarded International Travel Fellowship from International Society for Neurochemistry in 2011 to attend joint meeting of ISN-ESN at Athens Greece.
- Awarded International Travel Fellowship by Department of Science and Technology (DST), Govt. of India in 2012 to attend 35^{th} Annual Meeting of Japan Neuroscience Society (JNS) at Nagoya, Japan.
- Awarded best presentation award by 35^{th} Annual Meeting of Japan Neuroscience Society (JNS) in 2012 at Nagoya, Japan.
- Awarded International Travel fellowship by Asia Pacific Society for Neurochemistry (APSN) to attend 11^{th} Annual Meeting of APSN at Kobe Japan.
- Received best poster presentation award in Society for Neurochemistry, India (SNCI-2013) conference held at AIIMS, New Delhi during February 20-23, 2013.
- Awarded International Travel Fellowship from International Society for Neurochemistry jointly with American Society for Neurochemistry (ISN-ASN) in 2013 to attend joint meeting of ISN-ASN at Cancun, Mexico.
- Awarded International Travel Fellowship by Council of Scientific & Industrial Research (CSIR), Govt. of India in February, 2013 to attend 12^{th} ISN Advanced School of Neurochemistry, scheduled on 20-24 April, 2013 in Itza, Chichen, Mexico.

Membership of Scientific Societies

- Life Member of Indian Academy of Neuroscience (IAN), India
- Life Member of Society of Toxicology (STOX), India
- Life Member of European Society of Toxicology In Vitro (ESTIV)
- Member of International Society for Neurochemistry (ISN)
- Member of Japan Neuroscience Society (JNS)
- Member of Asia Pacific Society for Neurochemistry (APSN)
- Member of International Brain Research Organization (IBRO)
- Student member of Society for Free Radical Research (SFRR), India

Paper Reviewed

PLoS ONE
Toxicology International

Techniques Skills/ Expertise:

- Isolation of specific cells by robotic automated cell separator i.e. RoboSep^{TM}
- Isolation, characterization and maintenance of **Umbilical Cord Blood Hematopoietic and Mesenchymal Stem Cells**
- **Isolation and culturing of primary neuronal and glial cells**
- Maintenance of PC12, SHSY-5Y, A549, IMR32, HepG2, C6, U373 and many more cell lines
- Agarose and Polyacrylamide gel electrophoresis (PAGE),and **Tricine-PAGE**
- **FACS** (Immunophenotyping of cell surface markers and intracellular protein marker analysis).
- Inverted and Upright **Fluorescent** Microscopy
- Dual Immunocytochemistry/ Immunohistochemistry
- Gene expression analysis based on semi quantitative Reverse Transcriptase PCR & **Quantitative Real time PCR** (SYBR Green & TaqMan assays) and customization of TLDA plate
- Purification and characterization of Proteins, **Western Blotting**, ELISA
- **Transfection studies** (Lipofectamine LTX and by Amaxa Nucleofector™ Technology)
- Cytotoxicity assay (Trypan Blue, MTT, NRU, LDH), oxidative stress assays and various enzymatic assay like catalytic activity of cytochrome P450s, glutathione-S-transferases
- Reference Software- **EndNote**
- FACS Diva Version 6.0.0.software for FACS data analysis, Primer Express 3.0 for real time primer and probe designing, DNA Star, BLAST, Imaging analysis software- Leica Q win, Olympus master-2, and IM50
- Quantification of up or down regulation of nucleic acid and protein through Gel Documentation system using AlphaEase FC software and LICOR (Odyssy) software
- Well versed with computer application including MS office, various statistical softwares, internet surfing, and many more applications

Area of Interest:

- Stem Cell Biology
- Animal Tissue Culture
- Molecular Neuroscience
- Toxicology

Personal:

Father	:	Vijaya Kumar Singh
Mother	:	Urmila Singh
Date of Birth	:	August 11, 1984
Nationality	:	Indian (From birth)
Marital status	:	Married Male
Passport No	:	J6922378
Health	:	Excellent
Address (Work)	:	Department of Biotechnology, Guru Ghasidas Vishwavidyalaya Koni, Bilaspur Chhattisgarh, India- 495009