

## Dr. PRABHAKAR SINGH D.Phil. (Biochemistry)

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### Academia

Degree	Subject	Year	Division	University/ Institute
B.Sc.	<b>Biochemistry, Chemistry &amp; Zoology</b>	2003-2006	First (66.20%)	University of Allahabad
M.Sc.	<b>Biochemistry</b>	2006-2008	First (64.10%)	University of Allahabad
D.Phil.	<b>Biochemistry</b>	<b>Award Date: 24<sup>st</sup> Aug 2015</b>		University of Allahabad

### Research Experience

<b>D.Phil.</b> (2009-2014)	<b>Studies on Antioxidants and membrane modulating effects of curcumin on cellular system.</b> <b>Supervisor:</b> Dr. Syed Ibrahim Rizvi, Professor and Head, Department of Biochemistry, University of Allahabad, Allahabad. U.P.
<b>M.Sc. Summer Training</b> (1 <sup>st</sup> June 2006- 31 <sup>st</sup> July 2006)	<b>Various techniques and protocol for isolation of human genomic DNA &amp; other molecular techniques.</b> <b>Supervisor:</b> Dr. Saeed Ahmad [Director] IQRA Biotech Services, Human DNA Bank, Biotech Park, Lucknow, U.P.
<b>Research Interest</b>	Biochemistry of Aging (Human and Animal), Natural Products, Oxidative Stress Biology

### Honours & Awards

<b>SRF –CSIR (Extended)</b>	Council of scientific and Industrial Research (CSIR), New Delhi.	2014-2015
<b>SRF-CSIR</b>	Council of scientific and Industrial Research (CSIR), New Delhi	2012-2014
<b>UGC-Fellow</b>	University Grants Commission (UGC), New Delhi.	2009-2012
<b>National Eligibility Test for Life Science</b>	Council of scientific and Industrial Research (CSIR), New Delhi.	June 2011
<b>Graduate Aptitude Test for Engineering (Life Sciences)</b>	Indian Institute of Technology Roorkee, Roorkee	2009
<b>CRET: Biochemistry Certificate in Computer Application (CCA) Award</b>	Department of Biochemistry, University of Allahabad, U.P. University of Allahabad, U.P.	July 2008 2005 (First)
	Presentation (01) + Poster (02)	

## Technical Expertise

- **Software Skill:** Prism 5.01 for statistical analysis, Chem-Draw, Photo-Shop, Coral, Reference Software- EndNote, **Writing Skills:** Research paper, Project, Presentation and Report Writing
- **Protocol Design:** *In-Vitro*, *In-Vivo* and *In-Silico* protocol design and analysis

## Publications

1. **Singh P**, Kesharwani RK, Misra K, Rizvi SI. Modulation of Erythrocyte Plasma Membrane Redox System Activity by Curcumin. *Biochemistry Research International*, **Volume 2016 (2016)**, **Article ID: 6025245, 1-8 (PubMed, Scopus, SCI)**
2. **Singh P**, Pandey KB, Rizvi SI. Curcumin: the yellow molecule in making life green. *Letters in Drug Design & Discovery*, **2015**, 13(2) 170-177. **IF: 1.17.**
3. **Singh P**, Rizvi SI. Modulation effects of curcumin on erythrocyte ion-transporter activity. *International Journal of Cell Biology*, **2015**, **Volume 2015**, **Article ID: 630246, 1-8. (PubMed, Scopus)**
4. Kesharwani RK, Srivastava V, **Singh P**, Rizvi SI, Adeppa K, Misra K. A novel approach for overcoming drug resistance in breast cancer chemotherapy by targeting new synthetic curcumin analogues against aldehyde dehydrogenase 1 (ALDH1A1) and glycogen synthase kinase-3  $\beta$  (GSK-3 $\beta$ ). *Applied Biochemistry and Biotechnology*, **2015**, 176 (7), 1996-2017. **Springer. IF: 1.75.**
5. **Singh P**, Kesharwani RK, Misra K, Rizvi SI. The modulation effects of curcumin on erythrocyte Na<sup>+</sup>/K<sup>+</sup>-ATPase activity. *Journal of Advanced Research*. **2015**, 6, 1023-1030, **Elsevier. SNIP-0.991, SJR: 0.291.**
6. **Singh P**, Rizvi SI. Role of curcumin in modulating plasma PON1 arylesterase activity and susceptibility to LDL oxidation in oxidatively challenged wistar rats. *Letters in Drug Design & Discovery*. **2015**, 12 (4), 319-323. **IF: 1.17.**
7. **Singh P**, Kesharwani RK, Misra K, Rizvi SI. *In silico* validation for the modulatory effect of tea catechins on erythrocyte Na<sup>+</sup>/K<sup>+</sup>-ATPase. *The Natural Products Journal*. **2014**, 4 (3) 173-182. **SCI, Scopus**
8. **Singh P**, Rizvi SI. Curcumin activates erythrocytes membrane acetylcholinesterase. *Letters in Drug Design & Discovery*. **2013**, 10 (6), 550-556. **IF: 1.17.**
9. Mehdi MM, **Singh P**, Rizvi SI. Erythrocyte sialic acid content during aging in humans: Correlation with markers of oxidative stress. *Disease Markers*, **2012**, 32(3): 179-186. **IF: 2.34.**
10. **Singh P**, Rizvi SI. Anti-oxidative effect of curcumin against *tert*-butyl hydroperoxide induced oxidative stress in the human erythrocytes. *The Natural Products Journal*. **2012**, 2, 69-73. **SCI, Scopus**
11. Rizvi SI, Kumar D, Chakravarti S, **Singh P**. Erythrocyte plasma membrane redox system may determine maximum life span. *Medical Hypotheses*, **2011**, 76: 547-549. **Elsevier. IF: 1.15.**

## Book Chapters

1. Kesharwani RK, **Singh P**, Kesharwani RK. "Green coffee bean extract and chlorogenic acids: Chemistry and novel antioxidant benefits", In, Bagchi D, Moriyama H, Swaroop A. "*Health benefits of green coffee bean in human*", CRC Press, **Taylor and Francis, 2016**, *ISBN 9781498716376*- CAT#K25397. **Chapter- 01**
2. **Singh P**, Singh S, Kesharwani RK. "Resealed erythrocytes as drug carriers and its application in therapy", In "*Recent Advances in Drug Delivery Technology*" Kesharwani RK, Sharma AK, Kesharwani RK. IGI Global. **2016**, pp. 341- 367. **Chapter – 12**. ISBN13: 9781522507512, ISBN10: 1522507515, EISBN13: 9781522507529; DOI: 10.4018/978-1-5225-0751-2.
3. **Singh P**, Kesharwani RK, Keservani RK. **Antioxidants and Vitamins: Roles in Cellular Function and Metabolism**. In, Bagchi D. Edition 1<sup>st</sup> "Sustained Energy for Enhanced Human Functions and Activity", Section- 4: Antioxidant and B-Vitamins. **Chapter- 24, pp- 385-407**. Academic Press, **Elsevier, 2017**, *ISBN: 9780128054130*.
4. **Singh P**, Kesharwani RK, Keservani RK. **Protein, Carbohydrates, and Fats: Energy Metabolism**. In, Bagchi D. Edition 1<sup>st</sup> "Sustained Energy for Enhanced Human Functions and Activity", Section- 1: Introduction. **Chapter- 06, pp- 103-115**. Academic Press, **Elsevier, 2017**, *ISBN: 9780128054130*.
5. Yadav D, Tripathi YB, **Singh P**, Kesharwani RK, Keservani RK. **Roles of AMP, ADP, ATP, and AMPK in Healthy Energy Boosting and Prolonged Life Span**. In, Bagchi D. Edition 1<sup>st</sup> "Sustained Energy for Enhanced Human Functions and Activity", Section- 1: Introduction. **Chapter- 02, pp- 31-51**. Academic Press, **Elsevier, 2017**, *ISBN: 9780128054130*.

## Article and Abstract presented and published in National/International Conferences

- 1- **Oral Presentation** "Role of curcumin in regulation of Plasma Membrane Redox System (PMRS) activity of erythrocytes and antioxidant potential of plasma" **1st International Conference on Novel Frontiers in Pharmaceutical & Health Sciences (INNOPHARM 1)**, Oct. 10-11, **2015**.
- 2- **Oral Presentation** "Role of curcumin in regulation of ion transporters and integrity of erythrocytes membrane" National Seminar on Science and Technology for Human Development organized by the Allahabad **Chapter of The Indian Science Congress Association**, Department of Chemistry, University of Allahabad, India, March 14-15, **2015**.
- 3- **Poster Presentation** "The modulating effects of curcumin on erythrocyte membrane acetylcholinesterase activity" **3<sup>rd</sup> Annual Meeting of the Indian Academy of Biomedical Sciences & Symposium on Modern Trends in Human Diseases**, organized by Department of Biochemistry, Faculty of Medicine, JNMC, AMU, Aligarh, Uttar Pradesh, India. December 14 & 15, **2013**.
- 4- **Poster Presentation** "Curcumin mitigates oxidative stress induced impairment in Paraoxonase 1 arylesterase activity, antioxidant potential of plasma and susceptibility of LDL to oxidation in albino rats" **International Conference on Health, Environment and Industrial Biotechnology, BioSangam-2013**, organized by Department of Biotechnology, MNNIT, Allahabad, Uttar Pradesh, India. November 21-23, **2013**.
- 5- **Poster Presentation** "The modulation of erythrocyte Na<sup>+</sup>/K<sup>+</sup>-ATPase activity by curcumin" **83<sup>rd</sup> Annual Session and Symposium on "SPACE FOR HUMAN WELFARE"** organized by Goa University, Goa, India, Section of Physical Science, December 05-07, **2013**. (*Abstract Accepted: Not Participated*)
- 6- **Poster Presentation** "Effects of curcumin on various oxidative stress markers in human erythrocytes" **International Symposium on Chemistry and Chemical Biology of Natural Products (CCBNP-2012)**. Indian Institute of Chemical Technology, Hyderabad, Andhra Pradesh, India. August 2-4, **2012**.
- 7- **Poster Presentation** "Anti-oxidative effect of curcumin on erythrocyte membrane" **National Conference on "Emerging Trends in Biochemistry and Satellite Symposium of the Academy of Environmental Biology"** Department of Biochemistry, University of Allahabad, Uttar Pradesh, India. January 23 & 24, **2010**.

## Symposium and Workshops Attended

- 1- One day author's workshop on "**Writing research paper**" supported by **SAGE publication** India Pvt. Ltd. New Delhi on **30<sup>th</sup> November 2015**.
- 2- Springer sponsored - Author workshop in V.B.S. Purvanchal University on 31<sup>st</sup> October **2015**.
- 3- Self-finance short term course on "**Hands on training on molecular techniques in biotechnology**", organized by Department of Biotechnology, MNNIT, Allahabad, Uttar Pradesh, India. January 16-22, **2015**.
- 4- One week Participation in the "**4<sup>th</sup> Inspired Program/Science Conclave: A Congregation of Nobel Laureate and Eminent Scientist**", an MHRD-DST initiative at IIIT-Allahabad during November 26- December 02, **2011**.
- 5- Workshop on "**Scientific paper writing**" organized by The National Academy of Science, India (NASI), October 22-24, **2011** at Allahabad.
- 6- Training program in "**Molecular biology application in herbal drug design and diagnostics**" Department of Biochemistry, University of Allahabad. March 31, 2011- April 2, **2011**.
- 7- "**Summer workshop on assessment of antioxidant activity of foods**", Jointly Organized by Department of Biochemistry and Department of Home Science, University of Allahabad, July 13, **2010** at Allahabad.
- 8- Three day workshop on "**Jetropa curcuus: Bio-diesel value chain in Uttar Pradesh**" At Bio-Energy Mission Cell, Uttar Pradesh, Lucknow, India. January 28-30, **2008**.

## Membership Of Scientific Societies

1. Life Member: Indian Science Congress Association (**L27194**), India
2. Annual Member Indian Academy of Biomedical Sciences (2014-2015), India.

## Member of Editorial Board

- International Journal of Life-Sciences Scientific Research.

**Reviewer:** National Academy Science Letters (Springer): 2 times

## Teaching Experience

**Guest lecturer: Date of Joining:** 07<sup>th</sup> September, 2015

## M.Sc. Biochemistry (Faculty of Science, VBSPU, Jaunpur)

<b>Paper I</b>	Biomolecules and Bioenergetics
<b>Paper V</b>	Instrumentation and Analytical Techniques
<b>Paper XI</b>	Intermediary Metabolism
<b>Paper XIII</b>	Clinical and diagnostic Biochemistry

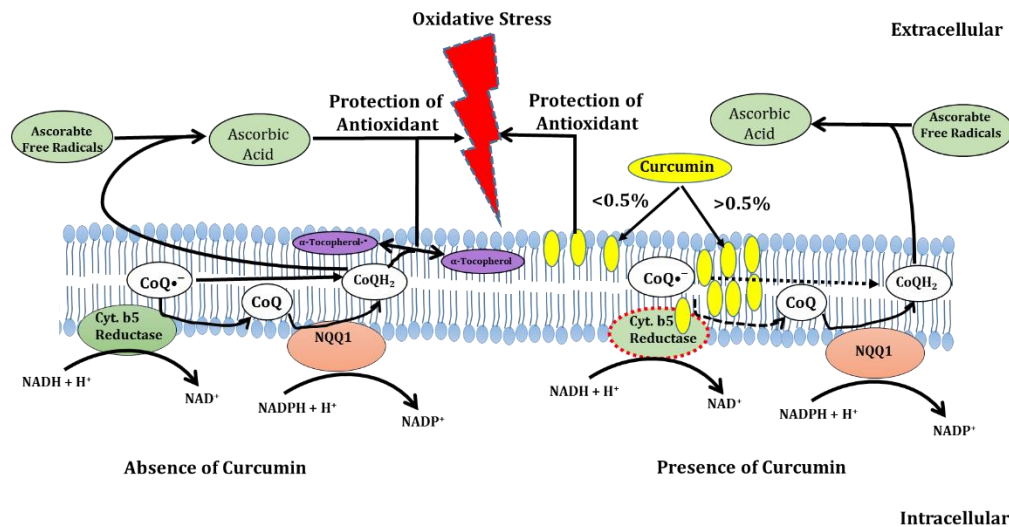
## RESEARCH EXPOSURE

- **Kinetic Analysis of Free Enzyme and Membrane associated Enzymes activity (published Paper 04)**

Na<sup>+</sup>/K<sup>+</sup> ATPase activity and Acetyl cholinesterase activity: Here we published that curcumin reduced the Km value of both enzyme to modulate the enzymes activity.

PON1 enzyme present on hydrophilic cavity of HDL is associated with LDL oxidation and we discovered that curcumin presence protects the LDL oxidation by reduced Km of PON1.

- **Proposed Pathways (Published): Plasma Membrane Redox System Activity (PMRS) and Modulation effects of lipophilic molecule curcumin (Communicated)**



- **In Silico Docking analysis (In collaboration): AutoDock 3, Cluster Analysis (Published Paper: 03)**

Docking simulation study revealed that curcumin actively interacts at the active cavity of Na<sup>+</sup>/K<sup>+</sup> ATPase activity. However, the competitive binding then natural ligands (ATP) is lower, hence required a higher concentration of curcumin to inhibit the Na<sup>+</sup>/K<sup>+</sup> ATPase activity.

## UNDERGOING RESEARCH: Extension work of my thesis

**"Biochemical and molecular profiling of protective role of curcumin against progressive cellular aging"**

**Biochemical Studies :** Plasma membrane redox system (PMRS), Ascorbate Free Radical (AFR) reductase, RBCs Sodium/Hydrogen Exchanger, Acetylcholine esterase, Na<sup>+</sup>-K<sup>+</sup> ATPase activity, Ca<sup>++</sup> ATPase activity, PON1 activity, LDL oxidation.

**Molecular Studies:** Apoptosis, Cell viability, genotoxicity, cytotoxicity, micronuclei assay, selected gene and protein expression through Real Time PCR, Western Blot analysis.

## PERSONAL DOSSIER

**Date of Birth** : 8<sup>th</sup> August 1985, **Marital status** : Married, **Nationality** : Indian

## REFERENCES

**1- Prof. Syed Ibrahim Rizvi**

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**2- Prof. Bechan Sharma**

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**Date:** March 29, 2018

**Place:** Jaunpur



**Prabhakar Singh**