Runa Sur, Ph. D.

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Personal Details :

Date of birth: 01/01/1972
Nationality: Indian
Marital Status: Married

Academic Qualifications:

School/College & Board/University	Examinations Passed	Year of Passing	Class or Divn.	Percent of marks	Subjects studied
Sri Sathya Sai Senior Secondary School	All India Secondary School Examination	1987	First	75.6 %	English, Science, Sanskrit, Social Science, Maths, Physical Health Education
Sri Sathya Sai Senior Secondary School	All India Senior School Certificate Examination	1989	First	80%	English, Chemistry, Physics, Biology, Sanskrit
Bethune College, Calcutta University	B. Sc	1992	First	64.25% (6^{th} Rank in University)	Zoology Honours, Botany Pass, Chemistry Pass
Dept of Biophysics, Molecular Biology & Genetics, Calcutta University	M. Sc	1994	First	69.5% (4^{th} Rank)	Biophysics, Molecular Biology, Cell Biology, Microbiology and Genetics
Bose Institute, Jadavpur University	Ph D	2000	-	-	Gene Regulation in E. coli, Microbiology

Work Experience:

2013 -Present **Assistant Professor,** Department of Biophysics, Molecular Biology and Bioinformatics, University of Calcutta, 92 APC Road, Kolkata 700 009

Research Areas: **a)** Inflammatory Cell Signaling. Identification of natural compounds that exhibit efficacious anti-inflammatory and anti-oxidative effects on skin inflammatory responses and hepatocyte oxidative stress and determining their mechanism of action.

b) Understanding allergic inflammation mediated by mast cells (key effector cells in allergic diseases such as allergic rhinitis and asthma) via activation of their high affinity IgE-Fc epsilon Receptor I. Identifying novel pathogenic signaling pathways in mast cells and understanding their role in allergic diseases.

c) Screening and development of novel anti-cancer drugs and identifying their molecular targets.
d) Nanoencapsulation of drugs for efficient drug delivery to enhance their anti-inflammatory efficacy in models of inflammation.
e) Studying Manganese toxicity in *Escherichia coli* and understanding the role of different homeostasis proteins to evade Manganese stress.

2012 **Guest Lecturer,** Department of Botany, Scottish Church College, Kolkata

2011-2012 **Guest Lecturer,** Department of Microbiology, Rastraguru Surendranath College, Barrackpore, Kolkata

April2006-2009 **Skin Care Postdoctoral Fellow,** Department of Preclinical Pharmacology, Johnson & Johnson Consumer and Personal Products Worldwide, Skillman, NJ-08558, USA.
Research Area and Accomplishments: • Understanding the role of the anti-fungal agent Sertaconazole nitrate on human keratinocytes. Sertaconazole nitrate was found to exhibit anti-inflammatory activity both in vitro and in vivo. In the effort to elucidate the exact mechanism by which sertaconazole exerts its anti-inflammatory effects, we have found that sertaconazole activates the p38 MAP kinase and via induction of cycloxygenase-2 (COX-2), results in the potentiation of the lipid mediator PGE_2 production. PGE_2 has been implicated in resolving inflammation in many inflammatory models. This work will help us better understand novel pathways for anti-inflammatory activity and help develop screens for active naturals that act via these pathways to provide benefits to the skin.

• Supported the launch of Aveeno Eczema care product by investigating the mechanism of action of Avenanthramides, polyphenols found in oats. Avenanthramides were found to exert anti-inflammatory activity in the skin by inhibiting nuclear factor kappa B-α activity in keratinocytes. Topical application of 1-3 ppm avenanthramides mitigated inflammation in murine models of contact hypersensitivity and neurogenic inflammation and reduced pruritogen-induced scratching in a murine itch model. Taken together these results demonstrate that avenanthramides are potent anti-inflammatory agents that appear to mediate the anti-irritant effects of oats.

2004-2006 **COSAT Postdoctoral Fellow,** Inflammation Research Team, Department of Drug Discovery, Johnson & Johnson Pharmaceutical Research and Development L.L.C., Raritan, NJ-08869, USA.
Research Area and Accomplishments: Studied the role of JAK-STAT signaling pathway in IgE-Fc epsilon Receptor I mediated mast cell responses. From inhibitor and RNA interference studies found that Jak-2 kinase plays a role in regulating leukotriene C_4 synthesis from mast cells. This work may help us better understand a novel pathogenic pathway of allergic diseases.

2002-2004 **Research Associate**, Department of Cell Biology and Neuroscience, Rutgers University, Piscataway, NJ-08854, USA.
Research Area and Accomplishments: Cloned and characterized a novel DED-containing protein, Vanishin, which is regulated by ubiquitinylation. Vanishin is a homologue of PEA-15, a DED-containing phosphoprotein that regulates ERK MAP kinase signaling. Found that Vanishin is a nuclear pro-apoptotic protein. It interacts with the MAP kinases ERK and inhibits ERK activation and ERK dependent transcription. Due to its pro-apoptotic and anti-proliferative properties Vanishin has the potential of emerging as a cancer biomarker.

2000-2002 **Postdoctoral Fellow**, Department of Pharmacology and Toxicology, Environmental and Occupational Health Sciences Institute, Rutgers University, Piscataway, NJ-08854, USA.
Research Area and Accomplishments: Studied the effect of UVB radiation on the induction and transcriptional regulation of the γ-IFN inducible nitric oxide synthase gene (NOS2) that is upregulated during inflammation in murine keratinocytes and macrophages. Demonstrated that in these cell types UVB suppressed NOS2 expression by inhibiting two key transcription factors, NF-κB and STAT-1. Also established that UVB radiation downregulates cycloxygenase gene (COX-2) expression by altering the mRNA half-life. This work has direct therapeutic relevance in controlling the expression of two key proteins involved in inflammatory dermatosis.

1995-2000 **Graduate student**, Department of Biochemistry, Bose Institute, Calcutta, India.
Research Area and Accomplishments: Performed studies on the galactose operon of *E.coli*. Characterized a novel RNA Polymerase binding site (promoter P3) upstream of the galactose promoter in *E. coli*. Determined that promoter P3 aids galactose metabolism under conditions of stress.

1994 **Masters Research**, Electron microscopy division, National Institute of Cholera and Enteric diseases, Calcutta, India.
Research Area and Accomplishments: Gathered expertise on a variety of preparatory techniques for electron microscopy and studied different biological specimens including bacteria, viruses and DNA under the transmission electron microscope.

1993 **Masters Research**, Centre for Biotechnology, Jawaharlal Nehru University, India.
Research Area and Accomplishments: Analyzed the mechanism of DNA bending during *nif*LA gene trancription in *Klebsiella pneumoniae*.

Teaching Interests:

My educational and research background gives me good experience in teaching the following courses:

a) Biological macromolecules
b) Cell biology and cell signaling
c) Genetics
d) General and microbial metabolism
e) Cancer biology and molecular biology

Technical Skills:

***In vitro* and *in vivo* skills**

- **Mammalian cell culture techniques including cell transfection and establishing stable cell lines**
- **Harvesting bone marrow cells from femur of mice and culturing mast cells**
- **Experience using in vivo techniques in mice including intraperitoneal injections, oral gavage, collection of broncho-alveolar lavage fluid from asthmatic and non-asthmatic mice**
- **Experience working on mouse models of allergic asthma**
- **Experience working on *in vitro* models of allergic inflammation**
- **Experience working on *in vitro* models of skin (keratinocyte) inflammation**
- **Molecular biology techniques including DNA and RNA isolation, protein purification, fusion protein expression, mutational analysis of proteins, PCR, western and northern blotting, cloning of genes**
- **Immunoprecipitation**

- **ELISA**
- **Multi-cytokine assays using Luminex L100**
- **Electrophoretic Mobility Shift Assay (EMSA)**
- **DNase I Footprinting**
- **Assay development expertise in siRNA mediated gene knockdown in mammalian cells (RNAi)**
- ***In vitro* transcription and translation assays**
- **Luciferase and β- galactosidase reporter gene assays**
- **Spectroscopic Methods**
- **Flow Cytometry (FACS)**
- **Fluorescence microscopy for studying protein localization**
- **Real Time PCR analysis**

Clinical skills

- Experience in running proof of principle (POP) studies on human subjects. Performed tape stripping of skin from different body sections and analyzed skin cells for reactive oxygen species production in response to UV irradiation and standardized methods to measure cytokine levels from tape stripped skin cells.

Publications:

2020 **Malla** A., Gupta S. **and Sur, R.** Sulfonamides: A Valuable Weapon against Cancer with Sulfamethoxazole as a Potential Repurposed Lead Molecule, in "An Introduction to Cancer Therapy", *Nova Science Publishers*, Hauppauge, NY, USA.

2019 Basu C, A Chatterjee, S Bhattacharya, Dutta N and **Sur R.** S-Allyl Cysteine Inhibits TNF-α Induced Inflammation in HaCaT Keratinocytes by Inhibition of NF-κB-Dependent Gene Expression via Sustained ERK Activation. Experimental Dermatology 28 (11), 1328-1335. **Impact Factor: 4.43**

2019 Basu A., Kundu S., Basu C., Ghosh SK., **Sur R** and A Mukherjee. Biopolymer nanoparticle surface chemistry dictates the nature and extent of protein hard corona. Journal of Molecular Liquids. 2019 15 May; 282: 169-176**.** ISSN: 0167-7322**. Impact Factor: 4.51**

2018 Basu C and **Sur R.** S-allyl cysteine alleviates hydrogen peroxide induced oxidative injury and apoptosis through upregulation of Akt/Nrf2/HO-1 signaling pathway in HepG2 cells. *Biomed Res Int.* 2018 Nov 1; 3169431. doi: 10.1155/2018/3169431. *ISSN*: 2314-6133. **Impact Factor: 2.58**

2017 Kaur, G., Kumar, V., Arora, A., Tomar, A., Ashish, **Sur, R**. and Dutta, D. Affected energy metabolism under manganese stress governs cellular toxicity. *Scientific Reports* 7: 11645. ISSN: 2045-2322. **Impact Factor: 4.85**

2017 Bhattacherjee, D., Basu, C., Bhardwaj,Q., Mal, S., Sahu, S., **Sur, R.** and Bhabak, K.P. Design, Synthesis and Anti-Cancer Activities of Benzyl Analogues of Garlic-Derived Diallyl Disulfide (DADS) and the Corresponding Diselenides. Chemistry Select 2: 7399–7406. ISSN: 2365-6549. **Impact Factor: 1.5**

2016 Prajapati RK, **Sur R**, Mukhopadhyay J. A Novel Function of δ Factor from Bacillus subtilis as a Transcriptional Repressor. *J Biol Chem.*291(46):24029-24035. ISSN: 0021-9258. **Impact Factor: 4.12**

2013 **Sur, R.** and Mukhopadhyay, J. Mechanism of Transcription in Prokaryotes, in "Recent Trends in Gene Expression", Subhrangsu S. Mandal (Ed.), *Nova Science Publishers*, Hauppauge, NY, USA.

2010 Kaur, S., **Sur, R.,** Liebel, F., and Southall, M. Induction of Prostaglandin D (2) through the p38 MAPK pathway is responsible for the antipruritic activity of sertaconazole nitrate. *J Invest Dermatol.* 130: 2448-56. ISSN: 0022-202X**. Impact Factor: 6.45**

2009 **Sur, R.[*],** Lyte, P. **[*],** Nigam A, and Southall, M. Heat-Killed P. Acnes Is Capable Of Inducing Inflammatory Responses In Skin. *Exp Dermatol.* 18: 1070-72. * Co-first authors. ISSN: 1600-0625. **Impact Factor: 2.6**

2009 **Sur, R.,** Hall, J., Cavender, D. and Malaviya, R. Role of Jak-2 in IgE receptor -mediated leukotriene C4 production by mast cells. *Biochem Biophys Res Commun.* 390 (3):786-90. ISSN: 0006-291X. **Impact Factor: 2.5**

2009 **Sur, R.,** Martin, K., Liebel, F., Lyte, P., Shapiro, S. and Southall, M. Anti-Inflammatory Activity of Parthenolide-Depleted Feverfew (Tanacetum parthenium). *Inflammopharmacology* 17 (1): 42-49. ISSN: 0925-4692. **Impact Factor: 2.109**

2008 **Sur, R.,** Nigam, A., Grote, D., Liebel, F. and Southall M. Avenanthramides, polyphenols from oats, exhibit anti-inflammatory and anti-itch activity. *Arch Dermatol Res* 300(10):569-74. ISSN: 0340-3696. **Impact Factor: 2.24**

2008 Martin, K., **Sur, R.,** Liebel, F., Tierney, N., Lyte, P., Garay, M., Oddos, T., Anthonavage, M., Shapiro, S. and Southall, M. Parthenolide-depleted Feverfew (Tanacetum parthenium) protects skin from UV irradiation and external aggression. *Arch Dermatol Res* 300(2):69-80. ISSN: 0340-3696. **Impact Factor: 2.24**

2008 **Sur, R.,** Lyte, P. and Southall, M. Hsp27 regulates pro-inflammatory mediator release in keratinocytes by modulating NF-kB signaling. *J Invest Dermatol.* 128(5):1116-22. ISSN: 0022-202X**. Impact Factor: 6.45**

2008 **Sur, R.**, Babad, J. and Southall, M. Anti-Inflammatory Activity of Sertaconazole Nitrate is Mediated via Activation of a p38/COX-2/PGE_2 Pathway. *J Invest Dermatol.* 128(2):336-44. ISSN: 0022-202X. **Impact Factor: 6.45**

2007 **Sur, R.**, Cavender, D. and Malaviya, R. Different Approaches to Study Mast Cell Functions. *International Immunopharmacology* 7: 555-67. ISSN: 1567-5769. **Impact Factor: 2.38**

2006 **Malaviya, R., Ansell, J., Hall, L-R., Fahmy, M., Argentieri, R.L., Olini, G.C.Jr., Pereira, D.W., Sur, R. and Cavender, D.** Targeting cytosolic phospholipase A_2 by arachidonyl trifluoromethyl ketone prevents chronic inflammation in mice. *European Journal of Pharmacology* 539: 195-204. ISSN: 0014-2999. **Impact Factor: 3.04**

2005 **Sur, R.** and Ramos, J.W. Vanishin is a novel ubiquitinylated death effector domain protein that blocks ERK activation. *Biochemical Journal* 387: 315-24. ISSN: 0264-6021. **Impact Factor: 4.654**

2002 **Sur, R.**, Heck, D.E., Mariano, T. M., Jin, Y., Murphy W. J. and Laskin J. D. UVB light suppresses nitric oxide production by murine keratinocytes and macrophages. *Biochemical Pharmacology* 64: 1469-1481. ISSN: 0006-2952. **Impact Factor: 4.2**

2002 Billack B., Heck D.E., Mariano T.M., Gardner C.R., **Sur R.**, Laskin D.L. and Laskin J.D. Induction of Cox-2 by Heat Shock Protein 60 in macrophages and Endothelial Cells. *Am J Physiol Cell Physiol.* 283:C1267-77. ISSN: 0363-6143. **Impact Factor: 3.4**

2001 **Sur R.**, Debnath D., Mukhopadhyay J. and Parrack P. A novel RNA Polymerase binding site upstream of the galactose operon of *E. coli* exhibits promoter-like activity. *European Journal of Biochemistry* 268: 2344-2350. ISSN: 0014-2956. **Impact Factor: 2.7**

1999 Mukhopadhyay J., **Sur R.** and Parrack P. Functional roles of the two cyclic AMP-dependent forms of cyclic AMP receptor protein from *Escherichia coli*. *FEBS Letters* 453: 215-218. ISSN: 0014-5793**. Impact Factor: 3.0**

Presentations and talks:

Rohora talk

2018 Anti-mitotic activities and molecular target identification of Sulfonamide group of drugs. International Symposium on Frontiers in Development and Molecular medicine: Models to Insights. FDMM 2019

2018 Anti-mitotic activities of Sulfonamide group of drugs: Molecular target identification. SINP International Cancer Meeting. 2018

2018 Nanoencapsulation of DADS for enhanced anti-inflammatory efficacy in skin keratinocyte cells. Chatterjee A. and **Sur R.** SINP International Cancer Meeting. 2018

2017 Basu C. and **Sur R**. S-allyl cysteine protects against H2O2 induced hepatocyte injury via modulation of the Nrf2/HO-1 signaling pathway. **Poster Presentation** at National Symposium on Oxidative Stress Symposium 2017.

2016 Basu C. and **Sur R**. Protective effects of S-allyl cysteine against hydrogen peroxide induced cytotoxicity and oxidative injury in HepG2 cells. **Poster Presentation** at International Symposium on Chemical Biology and Drug Discovery ISCBDD-2016.

2016 Basu C. and **Sur R**. (**2016**) Protective effects of S-allyl cysteine against hydrogen peroxide induced cytotoxicity and oxidative injury in HepG2 cells. **Poster Presentation** at a National Symposium Exploring Biological Systems: Cell to Organism EBS-2016.

2016 Chatterjee A and **Sur R**. (**2016**) Differential effects of different doses of UV radiation on apoptosis in skin keratinocytes. A Review. **Poster Presentation** at a National Symposium Exploring Biological Systems: Cell to Organism EBS-2016.

2016 **Sur R.** Mast cells and Allergy: Identification of JAK-2 as a novel drug target. **Invited Lecture** at Acharya Prafulla Chandra College, New Barrackpore, Kolkata.

2010 Fantasia J., **Sur R.**, Kaur S., Vorobyeva-Schiano A., Chen T. and Southall, MD. Histological differences in skin architecture and matrix protein expression in photo-protected and photo-exposed skin of Caucasians, East Asians and African Americans. **Conference Proceedings**, Journal of investigative dermatology, 130, S72.

2010 Kaur S., Liebel F., Southall MD. and **Sur R.** Sertaconazole nitrate mediates its antiitch activity by inducing Pdg2 via the p38 Mapk pathway. **Conference Proceedings**, Journal of investigative dermatology, 62, AB24.

2008 **Sur R.,** Garay M., Liebel F. and Southall M. Novel anti-inflammatory activity of sertaconazole nitrate is mediated via activation of a p38/COX-2/PGE2 pathway. **Conference Proceedings**, Journal of The American Academy Of Dermatology, 58, AB11.

2008 Liebel F., **Sur R.,** Garay M. and Lyte P. Non-steroidal phytochemicals for the modulation of the T-cell response in atopic dermatitis**.** Journal of The American Academy Of Dermatology, 58, AB50.

2007 **Sur R.**, Babad J., Liebel F. and Southall M. Sertaconazole nitrate exerts its anti-inflammatory effects through PGE_2 production. Poster presentation at Johnson & Johnson Skin care Symposium.

2006 **Sur R.**, Babad J and Southall M. Sertaconazole nitrate exerts its anti-inflammatory effects through PGE_2 production. Poster presentation at 14^{th} International IRA conference.

2006 **Sur R.** and Southall M. Anti-inflammatory role of Sertaconazole nitrate. Presented as a talk at Johnson & Johnson science symposium.

2005 **Sur R.**, Cavender D. and Malaviya R. Role of Jak-2 on FcεRI mediated mast cell responses. Poster presentation at Johnson & Johnson science symposium.

2003 Laskin JD., **Sur R.,** Mariano TM., Debra LL. and Heck DE. Role of p38 map kinase in regulating the inhibitory effects of UVB light on cyclooxygenase-2 expression in mouse macrophages. **Conference Proceedings**, Toxicological Sciences, 72, 378.

2002 **Sur R.** and Ramos J.W. Microarray Analysis of PEA-15 regulation of transcription and identification and characterization of PEA-15 family members. Poster Presentaion at the ASCB meeting. Published in Supplement to *Molecular Biology of the Cell*, 13.

2002 **Sur R.**, Heck D. E., Mariano T. M., Jin Y., Murphy W. J. and Laskin J. D. UVB light suppresses nitric oxide production by murine keratinocytes and macrophages. Poster presentaion at the Society of Toxicology meeting. **Abstract # 814**.

2002 John V.X., **Sur R.**, Mariano T., Heck D.E. and Laskin J.D. UVB light induces degradation of Cox-2 mRNA in macrophages. Poster presentaion at the Society of Toxicology meeting. **Abstract # LB84**.

2002 **Sur R.**, Heck D. E., Mariano T. M., Jin, Y., Murphy, W. J. and Laskin, J. D. Mechanisms of UVB light induced suppression of nitric oxide production in murine keratinocytes. Poster presentaion at the 2002 Annual Retreat on Cancer Research in New Jersey. **Abstract # 16**.

2001 **Sur R.**, Heck D.E., Mariano T., Billac, B. and Laskin J.D. UVB light- induced suppression of nitric oxide production by murine keratinocytes. Presented as a talk at The 2001 Annual Retreat on Cancer Research in New Jersey. **Abstract pp.24**.

Awards and accomplishments:

2007 Best Scientific Poster Award at the Johnson & Johnson Skin Care Symposium.

2001 Gallo Award for outstanding contribution to Cancer research awarded at the New Jersey Cancer Retreat.

1994 University Grants Commission (Govt. of India) fellowship.

1994 Graduate Aptitude Test Examination with 98.04 percentile.

1992 National Scholarship based on outstanding proficiency in B.S. qualifiers.