

## BIOGRAPHICAL

### **Dr. Girish S Kesturu**

**Home Address:** # 3294, 21/A Cross  
Vijayanagara 2<sup>nd</sup> Stage,  
Mysore-570 017, Karnataka, India.

**Birth Place:** Kesturu, Karnataka, India

**Citizenship:** India  
**Postal Address:** Dr. Girish K.S  
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## EDUCATION & TRAINING

<b>Years attended</b>	<b>Name &amp; Location of the Institution</b>	<b>Degree (year received)</b>	<b>Major Subject/s</b>
<b>Under Graduation</b>			
1993-1996	Yuvaraja's College, University of Mysore, Mysore	B.Sc (1996)	Botany, Biochemistry & Microbiology
<b>Post-Graduation</b>			
1996-1998	DOS in Biochemistry University of Mysore, Mysore	M.Sc (1998)	Biochemistry
1999-2004	DOS in Biochemistry University of Mysore, Mysore	Ph.D (2004)	Biochemistry
2004-2005	Thomas E. Starzl Transplantation Institute, Department of Surgery, School of Medicine University of Pittsburgh, USA	Post-doctoral fellow	Virology
2005- 2007	Department of Orthopaedic Surgery, Orthopaedic Research Laboratories, University of Virginia Health System, USA	Research Associate	ECM biology

## **APPOINTMENTS & POSITIONS**

<b>Year</b>	<b>Name &amp; Location of the Institute</b>	<b>Position</b>
1999-2004	DOS in Biochemistry University of Mysore, Mysore, India	Post Graduate Teaching Assistant
2004-2005	Thomas E. Starzl Transplantation Institute, Department of Surgery, School of Medicine University of Pittsburgh, USA	Post-Doctoral Fellow
2005-2007	Department of Orthopaedic Surgery, Orthopaedic Research Laboratories University of Virginia Health System, USA	Research Associate
2007- 2012	DOS in Biochemistry University of Mysore, Mysore India	Assistant Professor
19 <sup>th</sup> Oct 2012- 18 <sup>th</sup> Oct 2015	Department of Studies & Research in Biochemistry Tumkur University, Tumkur, India	Associate Professor
19 <sup>th</sup> Oct 2015- to date	Department of Studies & Research in Biochemistry Tumkur University, Tumkur, India	Professor

## **AWARDS & RECOGNITIONS**

1. Contribution to research in the field of arthritis is recognized and reported by the TELEGRAPH daily national newspaper published in Kolkata.
2. Contribution to research in the field of Platelet apoptosis is recognized and reported by the TELEGRAPH daily national newspaper published in Kolkata.
3. Young Scientist Award-DST-2015.

## **LIST OF CURRENT RESEARCH INTERESTS**

1. Platelet Biology
2. Venom Pharmacology
3. Chemical Biology

Number of students awarded Ph.D. degree: **6 (University of Mysore)**

## **Research articles/reviews Published in:**

Journal of Pineal Research (IF-15.3)  
Trends in Biotechnology (IF-13.8)  
Nature Communications (IF-11.9)  
PNAS (IF-9.8)  
Haematologica (IF-7.6)  
Glia (IF-6.2)  
Free Radical Biology and Medicine (IF-6.14)  
Archives of Toxicology (IF-5.74)  
Critical Reviews in Oncology/hematology (IF-5.1)  
International Journal of Biological Macromolecules (IF-5.16)  
ACS Chemical Biology (IF-4.4)  
BBA Molecular Basis of Disease (4.4)  
BBA general subjects (IF-3.7)  
Nature Scientific Reports (IF-4.2)  
Journal of Biological Chemistry (IF-4.2)  
PLOS One (IF- 3.4)  
Biochemical Biophysical Research Communications (IF-2.9)

## **Research papers cited in the journals:**

Chemical Reviews,	Nature Reviews Drug Discovery,	Cancer Cell,
Pharmacological Reviews	Nature Reviews Immunology,	Physiological Reviews,
Nature Chemical Biology,	Cell Chemical Biology,	Natural Product Reports,
Biomaterials,	Journal of Controlled Release,	Redox Biology,
Journal of Pineal Research,	Medicinal Research Reviews,	Advanced Materials,
Autophagy,	ACS Chemical Biology,	Haematologica,
Biochimica et Biophysica Acta,	Annual Review of Entomology,	Cell Reports,
Annual Review of Phytopathology,	Free Radical Biology and Medicine,	

## Citation Index (As on May 2021)

Citation indices	All	Since 2016
Citations	5632	3410
h-index	39	31
i10-index	90	81

<https://scholar.google.co.in/citations?user=qrvfFJ4AAAAJ&hl=en>

**Research Gate Score: 40.52**

[https://www.researchgate.net/profile/Kesthuru\\_Girish](https://www.researchgate.net/profile/Kesthuru_Girish)

## Total Publications

Articles	National	International	Total
Research Articles	02	93	95
Review Articles	00	19	19
Grand Total			114

## Selected Research Publications (Top 15)

1. NaveenKumar SK, Hemshekhar M, Jagadish S, Manikanta K, Vishalakshi GJ, Kemparaju K, **Girish KS\***. Melatonin restores neutrophil functions and prevents apoptosis amid dysfunctional glutathione redox system. **Journal of Pineal Research**. 2020; 69(3): e12676.
2. Manikanta K, NaveenKumar SK, Hemshekhar M, Kemparaju K, **Girish KS\***. ASK1 inhibition triggers platelet apoptosis via p38-MAPK-mediated mitochondrial dysfunction. **Haematologica**. 2020; 105(8): e419-e423.
3. NaveenKumar SK, Hemshekhar M, Kemparaju K, **Girish KS\***. Hemin-induced platelet activation and ferroptosis is mediated through ROS-driven proteasomal activity and inflammasome activation: Protection by Melatonin. **Biochimica Biophysica Acta- Molecular Basis of Disease**. 2019; 1865(9): 2303-2316.
4. Paul M, Hemshekhar M, Kemparaju K, **Girish KS\***. Berberine mitigates high glucose-potentiated platelet aggregation and apoptosis by modulating aldose reductase and NADPH oxidase activity. **Free Radical Biology and Medicine**. 2019; 130: 196-205.
5. Kemparaju K, **Girish KS\***, Katkar GD. Reply to 'Evidence that neutrophils do not promote *Echis carinatus* venom-induced tissue destruction'. **Nature Communications**. 2018; 9(1): 2303.

6. NaveenKumar SK, SharathBabu BN, Hemshekhar M, Kemparaju K, **Girish KS\***, Muges G. The Role of Reactive Oxygen Species and Ferroptosis in Heme-Mediated Activation of Human Platelets. **ACS Chemical Biology**. 2018; 13(8): 1996-2002.
7. Katkar GD, Sundaram MS, NaveenKumar SK, Swethakumar B, Sharma RD, Paul M, Vishalakshi GJ, Devaraja S, **Girish KS\***, Kemparaju K. NETosis and lack of DNase activity are key factors in *Echis carinatus* venom-induced tissue destruction. **Nature Communications** 2016; 7: 11361
8. Hemshekhar M, Kemparaju K, **Girish KS\***. Nanoparticles for Modulating mTOR Signalling in Platelets. **Trends in Biotechnology** 2016. 34(11): 850-852.
9. Sharma RD, Katkar GD, Sundaram MS, Paul M, NaveenKumar SK, Swethakumar B, Hemshekhar M, **Girish KS\***, Kemparaju K. Oxidative Stress Induced Methemoglobinemia is the Silent Killer during Snakebite: A Novel and Strategic Neutralization by Melatonin. **Journal of Pineal Research** 2015; 59(2): 240-254.
10. Katkar GD, Sundaram MS, Hemshekhar M, Sharma RD, Santhosh MS, Sunitha K, Rangappa KS, **Girish KS\***, Kemparaju K\*. Melatonin Alleviates *Echis carinatus* Venom-induced Toxicities by Modulating Inflammatory Mediators and Oxidative Stress. **Journal of Pineal Research** 2014; 56: 295-312.
11. NaveenKumar SK, Hemshekhar M, Sundaram MS, Kemparaju K, **Girish KS\***. Cell-free methemoglobin drives platelets to apoptosis via mitochondrial ROS-mediated activation of JNK and p38 MAP kinase. **Biochemical and Biophysical Research Communications**. 2017; 491(1): 183-191.
12. Paul M, Hemshekhar M, Thushara RM, Sundaram MS, NaveenKumar SK, Naveen S, Devaraja S, Somyajit K, West R, Basappa, Nayaka SC, Zakai UI, Nagaraju G, Rangappa KS, Kemparaju K\*, **Girish KS\***. Methotrexate Promotes Platelet Apoptosis via JNK-mediated Mitochondrial Damage: Alleviation by N-acetylcysteine and N-acetylcysteine amide. **PLoS One** 2015; e0127558.
13. Swethakumar B, NaveenKumar SK, **Girish KS\***, Kemparaju K\*. The action of *Echis carinatus* and *Naja naja* venoms on human neutrophils; an emphasis on NETosis. *Biochim Biophys Acta Gen Subj*. 2020; 1864(6): 129561.
14. Vishalakshi GJ, Hemshekhar M, Sandesha VD, Prashanth KS, Jagadish S, Paul M, Kemparaju K, **Girish KS\***. Bisphenol AF elevates procoagulant platelets by inducing necroptosis via RIPK1-inflammasome axis. **Toxicology**. 2021; 454: 152742.
15. Vishalakshi GJ, Hemshekhar M, Kemparaju K, **Girish KS\***. Para-tertiary butyl catechol induces eryptosis in vitro via oxidative stress and hemoglobin leakage in human erythrocytes. **Toxicol In Vitro**. 2018; 52: 286-296.

## Selected Publications (With collaboration) (Top 5)

1. Pandey V, Wang B, Mohan CD, Raquib AR, Rangappa S, Srinivasa V, Fuchs JE, **Girish KS**, Zhu T, Bender A, Ma L, Yin Z, Basappa, Rangappa KS, Lobie PE. Discovery of a small-molecule inhibitor of specific serine residue BAD phosphorylation. **Proceedings of National Academy of Sciences (U S A)**. 2018; 115(44): E10505-E10514.
2. Su W, Matsumoto S, Banine F, Srivastava T, Dean J, Foster S, Pham P, Hammond B, Peters A, **Girish KS**, Rangappa KS, Basappa, Jose J, Hennebold JD, Murphy MJ, Bennett-Toomey J, Back SA, Sherman LS. A modified flavonoid accelerates oligodendrocyte maturation and functional remyelination. **Glia**. 2020; 68(2): 263-279.
3. Keerthy HK, Mohan CD, Siveen KS, Fuchs FE, Rangappa S, Sundaram MS, Li F, **Girish KS**, Sethi G, Basappa B, Bender A, Rangappa KS. Novel Synthetic Biscoumarins Target Tumor Necrosis Factor- $\alpha$  in Hepatocellular Carcinoma *In Vitro* and *In Vivo*. **The Journal of Biological Chemistry** 2014; 289(46):31879-90.
4. Deepthi BV, Somashekaraiah R, Poornachandra Rao K, Deepa N, Dharanisha NK, **Girish KS**, Sreenivasa MY. *Lactobacillus plantarum* MYS6 Ameliorates Fumonisin B1-Induced Hepatorenal Damage in Broilers. **Frontiers in Microbiology**. 2017; 8: 2317.
5. Arumugam S, Girish Subbiah K, Kemparaju K, Thirunavukkarasu C. Neutrophil extracellular traps in acrolein promoted hepatic ischemia reperfusion injury: Therapeutic potential of NOX2 and p38MAPK inhibitors. **Journal of Cellular Physiology**. 2018; 233(4): 3244-3261.

## List of Review Articles Published

1. **Girish KS**, Katkar GD, Harrison RA, Kemparaju K. Research into the Causes of Venom-Induced Mortality and Morbidity Identifies New Therapeutic Opportunities. **Am J Trop Med Hyg**. 2019; 100(5): 1043-1048.
2. Hemshekhar M, Thushara RM, Kumar SKN, Paul M, Sundaram MS, Kemparaju K, **Girish KS\***. Bone degeneration, Inflammation and Secondary complications of Arthritis: Potential Targets and their Natural Inhibitors. **Mini-Reviews in Medicinal Chemistry**. 2018; 18(3): 244-275.
3. Hemshekhar M, Thushara RM, Chandranayaka S, Sherman LS, Kemparaju K, **Girish KS\***. Emerging roles of hyaluronic acid bioscaffolds in tissue engineering and regenerative medicine. **International Journal of Biological Macromolecules** 2016; 86: 917-928.

4. Sunitha K, Hemshekhar M, Thushara RM, Santhosh MS, Sundaram MS, Kemparaju K, **Girish KS\***. Inflammation and oxidative stress in viper bite: An insight within and beyond. **Toxicon** 2015; 98: 89-97.
5. Thushara RM, Hemshekhar M, Basappa, Kemparaju K, Rangappa KS, **Girish KS\***. Biologicals, platelet apoptosis and human diseases: An outlook. **Critical reviews in Oncology/Hematology** 2015; 93(3): 149-158.
6. Hemshekhar M, Thushara RM, NaveenKumar SK, Basappa B, Kemparaju K, **Girish KS\***. Role of Cartilage Degrading Enzymes and their End products in the Pathogenesis of Inflammatory Arthritis. **Inflammation and Cell signaling** 2014; 1(5): e341.
7. Devaraja S, **Girish KS**, Kemparaju K, Pharmacology of spider venom toxins. **Toxin Reviews** 2014; 33(4): 206-220. Doi:10.3109/15569543.2014.954134.
8. Thushara RM, Hemshekhar M, Kemparaju K, Rangappa KS, Devaraja S, **Girish KS\***. Therapeutic Drug Induced Platelet Apoptosis: An Overlooked Issue in Pharmacotoxicology. **Archives of Toxicology** 2014; 88(2):185-198.
9. Sunitha K, Hemshekhar M, Thushara RM, Santhosh MS, Yariswamy M, Kemparaju K. **Girish KS\***. N-Acetylcysteine amide: A derivative to fulfill the promises of N-Acetylcysteine. **Free Radical Research** 2013; 47(5):357-367.
10. Thushara RM, Hemshekhar M, Santhosh MS, Devaraja S, Kemparaju K, **Girish KS\***. Differential action of phytochemicals on platelet apoptosis: A biological overview. **Current Medicinal Chemistry** 2013; 20(8)1018-1027.
11. Samy RP, Gopalakrishnakone P, Stiles BG, **Girish KS**, Swamy SN, Hemshekhar M, Tan KS, Rowan EG, Sethi G, Chow VT. Snake venom phospholipases A2: A novel tool against bacterial diseases. **Current Medicinal Chemistry** 2012; 19(36):6150-62.
12. Santhosh MS, Hemshekhar M, Sunitha K, Thushara RM, Jnaneshwari S, Kemparaju K, **Girish KS\***. Snake venom induced local toxicities: Plant secondary metabolites as an auxiliary therapy. **Mini-Reviews in Medicinal Chemistry** 2013; 13, 106-123.
13. Hemshekhar M, Sebastin Santhosh M, Kemparaju K, **Girish KS\***. Emerging Roles of Anacardic Acid and Its Derivatives: A Pharmacological Overview. **Basic & Clinical Pharmacology & Toxicology** 2012; 110,122–132.
14. Hemshekhar M, Sunitha K, Sebastin Santhosh M, Devaraja S, Kemparaju K, Vishwanath BS, Niranjana SR and **Girish KS\***. An overview on genus Garcinia: Phytochemical and therapeutical aspects. **Phytochemistry Reviews** 2011; 10: 325-351.

15. **Girish KS** and Kemparaju K. Overlooked issues of snakebite management: Time for strategic approach. **Current Topics in Medicinal Chemistry 2011**; 11:2494-2508.
16. **Girish KS\***, Kemparaju K, Nagaraju S, Vishwanath BS. Hyaluronidase inhibitors: A biological and therapeutic perspective. **Current Medicinal Chemistry 2009**; 16, 2261-2288.
17. James R, **Kesturu GS**, Balian G, Chhabra AB. Tendon: Biology, biomechanics, repair, growth factors, and evolving treatment options. **American Journal of Hand Surgery 2008**; 33, 102-112.
18. **Girish KS\***, Kemparaju K. The magic glue hyaluronan and its eraser hyaluronidase: a biological overview. **Life Sciences 2007**; 80:1921-1943.
19. Kemparaju K, **Girish KS**. Snake venom hyaluronidase: a therapeutic target. **Cell Biochemistry and Function 2006**; 24(1)7-12.

## **List of Book Chapters Published**

1. Hyaluronidases, a neglected class of glycosydases from snake venom: beyond a spreading factor in a book “**Hand Book of Venoms and Toxins of Reptiles**” Kemparaju K\*, **Girish KS\*** and Nagaraju S., CRC Press LLC, 2009 (ISBN #: **9780849391651**) p **237-258**.
2. An overview on remedial qualities of Tamarindus indica seeds. Book Chapter in “Nuts and Seeds in Health and Disease”. Hemshekhar M, Kemparaju K, and **Girish KS\***. Edited by Victor R Preedy, Academic Press-Elsevier. 2011, (ISBN # **9780123756886**) p **109-121**.
3. Animal Models Used in Studying Inflammatory Bowel Diseases. Book chapter in “Adversity or Disorders of Gastrointestinal System and Clinical Manifestations”. Swethakumar B, Paul M, **Girish KS\***, Kemparaju K\*. Edited by Senthilkumar, Saravanan, SengottuVelan. Nova Science Publishers, Inc. **2016**. (ISBN #: **978-1-63485-377-4**) p **67-88**
4. Human microbiota for human health. Book chapter in “The Handbook of Microbial Bioresources.” Raghavendra, MP, Mudili Venkataramana, Basappa, **Girish KS**, Siddaiah Chandranayaka. Edited by VK Gupta, GD Sharma, MG Tuohy, R Gaur and RML Avadh. **CABI**, USA 2016. (ISBN#: **9781780645216**) p **270-281**

**Note:** \* Corresponding Author(s)



## Invited Talks

1. Served as a resource person for the NSS camps organized by the NSS units of Tumkur University and delivered many scientific /awareness talks on Snakebite management, Nutrition and health, malnutrition, and recent advances in Science and Technology (2014-till date).
2. Served as a resource person in the Village education programs in villages adopted by Tumkur University and delivered many awareness talks on Snakebite management, Nutrition and health, and malnutrition (2014-till date).
3. Invited talk on “Bioactive Molecules and Human Health” at 7 Days workshop on Molecular Biology" organized by USIC, Karnataka University, Dharwad, Karnataka on 3<sup>rd</sup> March 2020.
4. Invited talk on “Role of Iron in Platelet functions” at Siddhartha First Grade College, Tumkur on 27<sup>th</sup> Feb 2020.
5. Invited talk in the plenary session of 107<sup>th</sup> Indian Science Congress held on Jan 3<sup>rd</sup> - 7<sup>th</sup> 2020 and delivered a talk on “Hemin-Induced Ferroptosis Mediates Platelet Activation and Formation of Neutrophil Extracellular Traps” at GKVK campus, Bangalore
6. Invited as Resource person to talk on “Role of Iron in platelet activation and Neutrophil Extracellular Trap formation” on December 8<sup>th</sup> -9<sup>th</sup> 2019. National Conference on Snakebite Management organized by DOS in Biochemistry, University of Mysore, Mysore.
7. Invited as Resource Person to talk on “Bioactive Molecules and Health” in the 7-day National workshop on "**Scientific Equipment: Application and Data Analysis in Advanced Research**" organized by Institution of Excellence, Vijnana Bhavan, University of Mysore on 17<sup>th</sup> to 23<sup>rd</sup> September 2019.
8. Invited as Resource Person to talk on “Research Methodology with reference to Biomaterials and Blood Cells” on 13<sup>th</sup> March 2019 in the 10<sup>th</sup> Refresher Course in Material Science (March 1<sup>st</sup> to March 23<sup>rd</sup> 2019) Organized by UGC- Human Resource Development Centre, University of Mysore, Mysore, India.
9. Invited talk on “Role of Cell Free Heme in Platelet Activation and Death” in National Conference on Frontier Areas in Chemical Biology-2019 on 21-22<sup>nd</sup> Feb 2019. Organized by Department of Chemistry and Biological Sciences, Dayananda Sagar University, Bangalore, India.
10. Keynote address on the “Role of Iron in Platelet Activation and Death” in the National Symposium on “Current Trends in Pharmaceutical Biotechnology” on 8<sup>th</sup> February, 2019, organized by Department of Biotechnology, Sahyadri Science College, Kuvempu University, Shimoga, Karnataka, India.

11. Invited talk on “High Glucose Induced Platelet Apoptosis and Aggregation: Mitigation by Berbarine, A hypoglycemic agent” in the 39<sup>th</sup> IABMS conference organized by DOS in Biochemistry, Mangalore University on 15<sup>th</sup> -17<sup>th</sup> November 2018 at Chikkaaluvara Kodagu, India.
12. Invited Talk on “Effect of Unconjugated Bilirubin on Platelets Development of Thrombocytopenia during Hyperbilirubinemia”. One-day National Seminar on Chemistry and chemical Biology on the occasion of Prof. K.S. Rangappa’s 60<sup>th</sup> Birthday Celebration, University of Mysore, Manasagangothri, Mysore. May 26<sup>th</sup> 2015.
13. Invited Talk on “Pro-Apoptotic Effect of Unconjugated Bilirubin on Platelets: Role in the Development of Thrombocytopenia during Hyperbilirubinemia”. UGC sponsored National Seminar on “Frontiers Innovations in Biochemistry and its Interdisciplinary relevance” Organized by Department of Studies in Biotechnology, Microbiology and Biochemistry, Pooja Bhagavat memorial Mahajana Education Centre, Post graduate wing of SBRR Mahajana First Grade college, Mysore. Mar 31<sup>st</sup> 2015.
14. Invited talk on “Pro-Apoptotic Effect of Unconjugated Bilirubin on Platelets: Role in the Development of Thrombocytopenia during Hyperbilirubinemia”. National Conference on Phytochemicals and Functional Foods: Current Situation and Future Prospects (PFFCSFP-2015). Organized by UGC and JSS College, Mysore. Feb 21<sup>st</sup> 2015.
15. Invited talk on “Methotrexate Induced Platelet Apoptosis. SBC sponsored Seminar on “Horizons of Biochemistry and Avenues for Biochemists”. Organized by Department of Studies and Research in Biochemistry, Shivagangothri, Davangere University. May 14<sup>th</sup> 2014.
16. Invited talk on “Arthritis and its Secondary Complications: Phytotherapeutic Approach”. Organized by Association of Microbiologists of India, Mysore Chapter. March 2013.
17. Invited talk on “Bioactive Peptide from Buffalo Colostrum  $\beta$ -Lactoglobulin Isolation and Characterization”. National conference on Recent Discoveries in Protein Science. Organized by Karnataka state higher education council and Centers for Bioscience and Innovation, Bioinformation. Tumkur University. Jan 2013
18. Invited talk on “Crocin: A dietary colorant as an anti-arthritic agent”. National Conference on Food Processing and Technology for Health Progression-NCFPTH-2013. Organized by Department of Food Science and Nutrition, Periyar University, Salem. Jan 9<sup>th</sup> and 10<sup>th</sup> 2013
19. Invited talk on “*Vipera russelli* venom induced oxidative damage on blood components: Amelioration by Crocin, a dietary colorant”. National conference on Snakebite management, 2<sup>nd</sup>

- Annual conference of Toxinological society of India. Organized by University of Mysore, Karnataka State Open University and Toxinological Society of India. Dec 2012.
20. Invited talk on “Crocic: A common dietary colorant as an anti-arthritis agent” in the National conference on perspectives on health benefits of therapeutic molecules. Organized by Karnataka State Higher Education Council and Centers for Bioscience and Innovation, Bioinformatics. Tumkur University. Jan 2012.
  21. Invited talk on “Microparticles: Number and Size Does Matter’ Organized by Indian council of Medical Research and Centers for Bioscience and Innovation, Bioinformatics. Tumkur University. Jul 2012.

### **National/International Symposia-Paper Presentation**

1. NaveenKumar SK, Sharath Babu, Bhowmick D, Kemparaju K, **Girish KS**, Mugesh G. Protective efficacy of Glutathione peroxidase (GPx) and peroxiredoxin (Prx) mimetics in oxidative stress induced apoptosis of nucleate cells. 6<sup>th</sup> International Conference on Metals in Genetics, Chemical Biology and Therapeutics. Organized by Indian Institute of Science, Bengaluru. Feb 17<sup>th</sup>-20<sup>th</sup> 2016.
2. Katkar GD, **Girish KS\***, Kemparaju K\*. Lupeol derivative mitigates *Echis carinatus* venom-induced tissue destruction by neutralizing venom toxins and protecting collagen and angiogenic receptors on inflammatory cells. 5<sup>th</sup> Annual Conference of Toxinological Society of India, Organized by Little Flower Hospital, Angamaly and Sree Narayana Institute of Medical Sciences, Chalakka, Kochin. Nov 21<sup>st</sup> - 22<sup>nd</sup> 2015.
3. Shanmuga Sundaram M, NaveenKumar SK, Rangappa KS, Kemparaju K, **Girish KS\***. Tamarind Seed (*Tamarindus indica*) Extract Ameliorates Adjuvant-Induced Arthritis *via* Regulating the Mediators of Cartilage/Bone Degeneration, Inflammation and Oxidative Stress. National Conference on Phytochemicals and Functional Foods: Current Situation and Future Prospects (PFFCSFP-2015). Feb 20<sup>th</sup> - 21<sup>st</sup> 2015. (**Best oral presentation award, First place**).
4. Shanmuga Sundaram M, Srinivasa V, NaveenKumar SK, Basappa, Kemparaju K, **Girish KS\***, Rangappa KS\*. Novel Apigenin Based Small Molecule that Targets Snake Venom Metalloproteases. International Symposium on “Chemical Biology Approach to Metabiomics, Chemical Genomics and Epigenomics and Second Annual Meeting of Chemical Biology Society, India”. Feb 18<sup>th</sup> - 19<sup>th</sup> 2015.
5. Paul M, Nagaraju G, Rangappa KS, Kemparaju K\*, **Girish KS\***. Methotrexate Promotes Platelet Apoptosis *via* JNK-mediated Mitochondrial Damage: Alleviation by N-acetylcysteine and N-acetylcysteine amide. International Symposium on “Chemical Biology Approach to Metabiomics,

- Chemical Genomics and Epigenomics and Second Annual Meeting of Chemical Biology Society, India". Feb 18<sup>th</sup> - 19<sup>th</sup> 2015.
6. Hemshekhar M, Shanmuga Sundaram M, Sunitha K, Sebastin Santhosh M, Kemparaju K, **Girish KS\***. 4-methylesculetin, a coumarin derivative attenuates arthritis by regulating cartilage degradation, inflammation and oxidative stress. International Symposium on "Chemical Biology-Drug Discovery Programme". Jan 9<sup>th</sup> -10<sup>th</sup> 2014.
  7. Paul M, Thushara RM, Naveen Kumar SK, Rangappa KS, Kemparaju K, **Girish KS\***. Melatonin stimulates apoptosis in human platelets *via* ROS mediated mitochondrial damage. International Symposium on "Chemical Biology-Drug Discovery Programme". Jan 9<sup>th</sup> – 10<sup>th</sup> 2014.
  8. Bharathkumar H, Anusha Sebastian, Shanmuga Sundaram M, Jagadeesh S, Shardul Paricharak, Kemparaju K, **Girish KS**, Rangappa KS, Andreas Bender, Basappa K. Novel benzoxanine-based aglycones block glucose uptake in-vivo by inhibiting glycosidases. International Symposium on "Chemical Biology-Drug Discovery Programme". Jan 9<sup>th</sup> – 10<sup>th</sup> 2014. (**Best poster presentation award, First place**).
  9. Rohit AC, Sebastin Santhosh M, **Girish KS**, Aparna HS. Anti-ophidian property of bioactive peptide from buffalo (*Bubalus bubalis*) colostrum  $\beta$ -lactoglobulin. International Symposium on "Chemical Biology-Drug Discovery Programme". Jan 9<sup>th</sup> – 10<sup>th</sup> 2014.
  10. Shanmuga Sundaram M, Hemshekhar M, Sebastin Santhosh M, NaveenKumar SK, Manoj Paul, Kemparaju K, **Girish KS\***. Procyanidin-rich tamarind seed fraction mitigates liver mitochondrial dysfunction in arthritic rats. National Conference on "Recent Trends in Chemical Biology: An Overview". Oct 25<sup>th</sup> – 26<sup>th</sup> 2013. (**Best oral presentation award, Second place**).
  11. Sebastin santhosh M, Shanmuga Sundaram M, Sunitha K, Hemshekhar M, Kemparaju K, **Girish KS\***. Propensity of crocin, an antioxidant carotenoid to offset Vipera russelli venom induced inflammation and apoptosis in blood components by inhibiting oxidative stress. "National conference on Snakebite management". Dec 10<sup>th</sup>- 12<sup>th</sup> 2012. (**Best poster presentation award, Third place**).
  12. Thushara RM, Hemshekhar M, Jnaneshwari S, Kemparaju K, **Girish KS\***. Sesamol, a component of sesame seed oil, induces apoptosis in human platelets. National Conference on "Emerging Trends in Ayurveda and Herbal drug Technology". Nov 22<sup>nd</sup> – 23<sup>rd</sup> 2012. (**Best oral presentation award, Second place**).
  13. Hemshekhar M, Thushara R Mohan, Sebastin santhosh M, Shanmuga Sundaram M, Kemparaju K, **Girish KS\***. Crocin, a dietary colorant alleviates arthritis and associated secondary complications.

- National Conference on “Emerging Trends in Ayurveda and Herbal drug Technology”. Nov 22<sup>nd</sup> – 23<sup>rd</sup> 2012. (**Best poster presentation award, Second place**).
14. Sebastin santhosh M, Shanmuga Sundaram M, Sunitha K, Kemparaju K, **Girish KS\***. *Vipera russelli* venom induced oxidative stress, inflammation and apoptosis in blood components: Amelioration by crocin a dietary colorant. National Conference on “Emerging Trends in Ayurveda and Herbal drug Technology”. Nov 22<sup>nd</sup> – 23<sup>rd</sup> 2012.
  15. Hemshekhar M, Shanmuga Sundaram M, **Girish KS\***. A dietary colorant crocin mitigates arthritis and its associated secondary complications like oxidative stress and platelet apoptosis. An International Symposium on “Recent Trends and Advances in Biomedical Research- An Integrated Approach”. Nov 2<sup>nd</sup> -3<sup>rd</sup> 2012. 33<sup>rd</sup> Annual Conference of Indian Association of Biomedical Scientists (IABMS). (**Best poster presentation award, First place**).
  16. Participated in 33<sup>rd</sup> Annual Conference of Indian Association of Biomedical Scientists and International Symposium on Recent Trends and Advances in Biomedical Research-An Integrated Approach” November 1-3, 2012 at Nitte University, Mangalore, Karnataka.
  17. Participated in the Workshop organized by International Society on Thrombosis and Haemostasis on “Thrombosis and Haemostasis: Discovery and Development of Tools and Therapeutics, December 8-9, **2012** at University of Mysore, Mysore.
  18. Participated in the International Conference on Recent Advances in Materials Science (RAMS-2012) organized by Karnataka State Higher Education Council in association with Mangalore University, Gulberga University, Kuvempu University and Tumkur University. 6-8 November 2012.
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22. Mahadeswraswamy YH, **Girish KS** and Kemparaju K. Local toxicity of Indian *Daboia/Vipera russellii* venom and its purified hemorrhagic complex: Contribution for the better management. **National conference on Medical Biotechnology and Clinical research**. October **2009**. Department of Biotechnology, Sri. M. Visvesvaraya Institute of Technology and Sri Krishnadevaraya Education Trust, JN Tata Auditorium, Indian Institute of Science campus, Bangalore, India. (**Best poster presentation award, Second place**).
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24. **Girish KS**, James R, Balian G and Chhabra A. GDF-5 modulates the synthesis and expression of extracellular matrix and cell adhesion related molecules of rat Achilles tendon fibroblasts. 54th Orthopedic Research Society meeting, San Francisco, CA, USA. Feb **2008**
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27. Hogan MV, Starnes T, **Kesturu Girish**, James R, Huang D, Balian G, Chhabra A. GDF-5 Induced Tendon Repair and Regeneration. **2007** National Medical Association Annual Convention and Scientific Assembly, Honolulu, HI (Podium)
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34. **Girish KS** and Kemparaju K. The hyaluronidase enzyme a prime target in management of snakebite. 3<sup>rd</sup> National symposium on venoms and toxins. University of Mysore, Mysore, India, Jan 23<sup>th</sup> to Jan 26<sup>th</sup> **2004**
35. Nagaraju S, **Girish KS** and Kemparaju K. Comparative characterization of three Indian funnel-web spider venoms. 3<sup>rd</sup> National symposium on venoms and toxins. University of Mysore, Mysore, Mysore, India, Jan 23<sup>th</sup> to Jan 26<sup>th</sup> **2004**
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37. Vedavathi M, **Girish KS** and Karunakumar M. Comparative characterization of low and high molecular weight isoforms of alanine aminotransferases from starved rat liver. 3<sup>rd</sup> National symposium on venoms and toxins. University of Mysore, Mysore, Mysore, India, Jan 23<sup>th</sup> to Jan 26<sup>th</sup> **2004**
38. Kemparaju K and **Girish KS**. A pharmacological examination of the Indian saw scaled viper venom. National Symposium on Proteins (Structure and Function). Mysore, India, **1999**

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#### **List of Patents:**

**Indian Complete Patent Application No. 4345/CHE/2015**

Filed on: August 19, 2015

Title: Compounds as modulators of tumor necrosis factor, methods and applications thereof K&S Ref.: IP29104/ATH/js

**External Reviewer:** External reviewer for Nature Disease Primers, Physiological Reviews, Hematologica, Cell Death and Disease, PLoS One, PLoS Neglected Tropical Disease, Scientific Reports, Journal of Ethnopharmacology, Toxicology, Biochimie, Connective Tissue Research, Journal of Medicinal Chemistry, Biomaterials, Toxicon, Tumor Biology, and Pesticide Biochemistry and Physiology.

## Significant contributions

We have made significant contributions in the clinically important but highly neglected area of snake-venom pharmacology and platelet biology. The main focus of our lab is to understand snakebite complications; understanding the Oxidative stress/hemolysis-mediated platelet apoptosis/Ferroptosis/dysfunction with a long-time goal of developing effective molecules to target the pathology.

Snakebites are one of the highly neglected issues in tropical countries including India as it mostly affects rural and farming populations. Bitten-site tissue necrosis is a serious complication in viper bites and unfortunately amputation is the only available solution as of now to overcome the progressing tissue necrosis. Although classic antivenoms are successful in reducing the mortality, they fail to prevent bitten-site tissue necrosis associated with viper bites. We have been exploring snake-venom complications and effective treatment for the last 15 years. Recently, our group for the first time dissected the molecular mechanism for sustained tissue necrosis at the bitten site. The research team has identified that the *Echis carinatus* (EC; Saw-scaled viper) venom induces formation of stable neutrophil traps (NETs), which block the blood vessels and entrap the venom toxins at the injection site, promoting tissue destruction (Katkar et al. 2016). The stability of NETs is due to absence of NETs-degrading DNase activity in venom. In a mouse tail model, mice co-injected with venom and DNase 1, and neutropenic mice injected with the venom, do not develop NETs, venom accumulation and tissue destruction at the injected site. This study promotes the use of DNase 1, which cleaves neutrophil extracellular traps preventing the tissue destruction as potential therapy for viper bites. This novel and outstanding contribution was published in highly reputed journal *Nature Communications* (Katkar et al. 2016). His group was appreciated worldwide by scientists and Snake-venom research enthusiasts. The significance of this study was featured in highly reputed scientific magazines including National Geographic, Asian Scientists, Discover magazine and India today science and technology columns with huge appreciations. This study has been considered and highlighted as one of the breakthrough discoveries in the



management of viper bites. Lately, his group further demonstrated naked DNA as a promising therapeutic molecule for snakebite management (Swethakumar et al. 2018).

In addition, we are working to understand the platelet functions during oxidative stress or hemolytic conditions, a key clinical condition. Recently our group for the first time demonstrated that hemolysis-associated elevated hemoglobin-derivative Hemin induces Ferroptosis, a non-classical form of cell death in platelets. Previously, he has shown that increased plasma bilirubin during Jaundice causes thrombocytopenia (low platelet count). Besides, we also discovered drugs/phytochemicals that can cause thrombocytopenia by instigating platelet apoptosis and its prevention. Lately, we demonstrated that Berberine can mitigate high glucose-potentiated platelet aggregation and apoptosis by modulating aldose reductase and NADPH oxidase activity. Our research contributions are highly significant and relevant in understanding cases of thrombocytopenia in hemolytic disorders and are published in highly reputed journals like *Free Radical Biology and Medicine* (Paul et al. 2018), *ACS Chemical Biology* (NaveenKumar et al. 2018), *Nature Scientific Reports* (NaveenKumar et al. 2016), *Biochimica et Biophysica Acta- Molecular Basis of Disease* (NaveenKumar et al. 2019) and *Haematologica* (Manikanta et al., 2019).

### **Additional information of relevance:**

Our proposal to use DNase 1 and DNase inhibitors as a potential anti-venom therapy for snake-bite was considered as top priority article by *Nature Communications* and it was press released globally by giving the title “Immunology: New possible treatment for saw-scaled viper venom”. In addition, the discovery was recognized and reported by several international magazines and scientific blogs including NATIONAL GEOGRAPHIC EDITORIAL BOARD, NATURE ASIA, NATURE INDIA, SCIENCE SUSHI, ASIAN SCIENTIST, and BUSINESS STANDARD.

#### **National Geographic Channel Editorial board**

<https://www.nationalgeographic.com/science/phenomena/2016/04/19/why-some-snakebites-are-so-destructive/>

#### **Nature Asia**

<https://www.natureasia.com/en/research/highlight/10640>

#### **Nature India**

<https://www.natureasia.com/en/nindia/article/10.1038/nindia.2016.50>

#### **Science sushi**

[http://blogs.discovermagazine.com/science-sushi/2016/04/19/new\\_tool\\_fight\\_snakebite\\_necrosis/#.XIcuZC0ZO3U](http://blogs.discovermagazine.com/science-sushi/2016/04/19/new_tool_fight_snakebite_necrosis/#.XIcuZC0ZO3U)

### **Asian Scientist**

<https://www.asianscientist.com/2016/04/in-the-lab/snakebite-neutrophil-dnase-scaled-viper/>

### **India Today**

<https://www.indiatoday.in/india/story/mysore-university-scientists-solve-riddle-of-flesh-destroying-viper-venom-12378-2016-06-04>

### **Business Standard**

[https://www.business-standard.com/article/current-affairs/mysore-university-scientists-crack-riddle-of-flesh-destroying-viper-venom-116060301320\\_1.html](https://www.business-standard.com/article/current-affairs/mysore-university-scientists-crack-riddle-of-flesh-destroying-viper-venom-116060301320_1.html)

4. Nominee's contribution to research in the field of arthritis was recognized and reported by the TELEGRAPH daily national newspaper published in Kolkata  
(<https://www.telegraphindia.com/india/hope-of-arthritis-remedy-in-saffron-pigment-promising-but-expensive/cid/390054>).
5. Contribution to research in the field of Platelet apoptosis was recognized and reported by the TELEGRAPH daily national newspaper published in Kolkata  
(<https://www.telegraphindia.com/science/carbon-footprint/cid/273998>).