Dr. Sushant Singh

Contact Information

Tel- +91-930-481-2820 (India)
Office- Amity Institute of Biotechnology (AIB)
Amity University Raipur, Chhattisgarh
Manth (Kharora) State Highway 9, Raipur Baloda Bazar Road
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Google Scholar- https://scholar.google.com/citations?hl=en&user=2Cf-mpgAAAAJ
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Research Interest

Redox Modulating Biomaterials for Antioxidative Therapeutics and Diseased States using Biochemistry and Nanotechnology Based Approaches. Biomaterials for Application as Synthetic Nanozymes, in Drug Deliveries aspect to Mammalian Cellular System and Future Biomedical Based Applications towards Understanding Nano-Bio Interfaces. Exploring the Green route of Biomaterials for Antioxidative Therapeutics and Biomedical Application.

Academic Responsibilities

Member – Institute Innovation Council (IIC), AUC
Coordinator – Internalization - AIB, AUC
Coordinator – Research & Development - AIB, AUC

Teaching & Lab Interests

BTS2503- Nanobiotechnology (NBT)
MSB4304- Recombinant Biotechnology (RDT)
MTB4304 - Nano-BioTechnology (NBT)
MSB4324 - RDT Laboratory
MTB4323 - NBT Laboratory
PHD104-Research and Publication Ethics

Academic Appointments

Associate Professor ***March 2021-Present***
Amity Institute of Biotechnology (AIB)
Amity University Raipur, Chhattisgarh-493225

Research Associate ***Nov 2016-Sept 2019***
Advanced Materials Processing and Analysis Center (AMPAC)
Nanoscience Technology Center (NSTC)
University of Central Florida, Orlando
Florida-32816, USA

Education

Postdoctoral Research Associate — ***Oct 2014-Nov 2016***
College of Medicine
Ohio State University, Columbus, Ohio
SBP Medical Discovery Institute, Orlando, Florida-32817, USA

Indian Institute of Technology (IIT) Guwahati, India — ***2009 - 2014***
PhD, Center for Environment
Advisor - Prof. Vikash Kumar Dubey
Dept. of Biosciences and Bioengineering, IIT Guwahati
Research Area - Biochemistry / Nanotechnology / Environment

Master of Science (M.Sc.) Biotechnology — ***2007-2009***
Meerut Institute of Engineering and Technology (MIET)
Affiliated - CCS University, Meerut, UP, India

P.G Diploma in Bioinformatics — ***2007-2008***
Distance Education Section, Jamia Hamdard
Hamdard University, New Delhi, India

Bachelor of Science (B.Sc.) (Hons.) Biotechnology — ***2004-2007***
Institute of Applied Medicine and Research (IAMR),
Ghaziabad, Affiliated - CCS University, Meerut, UP, India

Honors and Awards

Exceptional Student Mentor-ASPIRE Award. Lake Highland Preparatory School. Orlando, Florida, USA — ***2018-2019***

Selected among **50 International Researcher** and received Travel Grant for Research Opportunity Week Programme 17th-21st March 2014, Technical University of Munich, Germany — ***2014***

Govt. of India - Ministry of Human Resource Development (MHRD) Fellowship to carry out Doctoral Research in IIT Guwahati, India — ***2009-2014***

Qualified **Graduate Aptitude Test in Engineering (GATE - 2009)** in Life Sciences, conducted by IIT Roorkee, India — ***2009***

Post Graduate Diploma in Bioinformatics (PGDBI) Distance Education Section, Jamia Hamdard, Hamdard University, New Delhi — ***2008***

Intellectual Property Rights (IPR)-Certificate General Course (Online) World Intellectual Property Organization (W.I.P.O), Geneva, Switzerland — ***2008***

Professional Affiliations

1. Life Member-(LM 1579)- **Biotech Research Society, India-(BRSI),** 2014 onwards
2. Life Member-(LM 3120)- **Society of Biological Chemist, India-(SBC),** 2014 onwards

Invited Talks

1. Sushant Singh. "**Recent Advances in Application of Cerium Oxide Nanomaterials in Diagnostic, Therapeutics and Biomedical Arena**." 5 Days Faculty Development Programme on "Emerging Technologies in Industry 4.0" organized by Amity School of Engineering and Technology (ASET) from 14th - 18th June, 2021 at Amity University Chhattisgarh Campus
2. **Sushant Singh,** TS Sakthivel, C Zgheib, KW Liechty, S Seal. **Cerium Oxide Materials in Biomedical Applications.** National Conference on Innovations and Technologies for Ceramics (InTeC-2019). CSIR-NIIST, Thiruvananthapuram Kerala, India, 11th-12th December 2019. (***Special lecture)***
3. **Sushant Singh,** TS Sakthivel, CJ Neal, N Saraf, G Sener, SA Hilton, KW Liechty, MD Krebs, S Seal. **Cerium oxide materials in Diagnostic and Therapeutics.** 3rd International Conference in Advance Functional Materials, CSIR-NIIST, Thiruvananthapuram Kerala, India, 9th-10th December 2019. (***Young Investigator Forum)***

Technical Workshop

1. **Science Leadership Workshop,** Organized by Central University of Punjab, Bhatinda, Punjab, India, June 22nd-28th 2020.
2. **Materials in Medicine** conducted by Industry Institute Partnership Cell (IIPC) Sree Chitra Tirunal Institute for Medical Sciences & Technology (SCTIMST), Thiruvananthapuram, Kerala, India, February 6th-7th 2020.
3. **Research Opportunity Week Programme**, at Technical University of Munich (TUM University), Munich, Germany, 17th-21st March, 2014

Conference/Webinar Organized

1. *Webinar on **"Recent Trends and Techniques in Cancer Therapy".** Amity Institute of Biotechnology, Amity University Chhattisgarh, Raipur-493225, 18th August, 2021*
2. *Webinar on **"Role of Transdisiplinary Approaches in Cancer Diagnosis".** Amity Institute of Biotechnology, Amity University Chhattisgarh, Raipur-493225, 11th August, 2021*
3. ***International Webinar on Animal Diversity: Local to Global"**. Organized by Department of Zoology, Govt. N.P.G College of Science from 14th-16th June 2021 in Raipur, Chhattisgarh – 492010*

Webinars Participated

1. National Level Webinar on **"Personality Development."** Organized by SKPFG College, Mysuru, Karnataka, India, October 10th, 2020.
2. **Celebrating 18 Years of BT Cotton in India: Scientists & Farmers Meet**, Organized by Biotecnika Info Labs Pvt Ltd, India, September 12th 2020
3. National Level webinar on **"Spiritual Health: Need Of The Hour",** Organized by SKPFG College, Mysuru, Karnataka, India, September 8th 2020.
4. National Level webinar on **"Conducting Research Through Open Source Software",** Organized by SKPFG College, Mysuru, Karnataka, India, August 27th 2020.
5. National Level webinar on **"2020 : The Age of Realization – Will lessons be Learnt",** Organized by SKPFG College, Mysuru, Karnataka, India, August 18th 2020.
6. 5 Day Multidisciplinary International Faculty Development Programme on **"Perspective of Human Health and Environment"** Organized by the Science forum-Scientia, SJR College Bangalore, India. August 3rd- August 7th, 2020
7. National Level webinar on **"Integrating Employability Skills Among Students at Higher Level",** Organized by SKPFG College, Mysuru, Karnataka, India, August 7th 2020.
8. **Battle Against Novel Coronavirus.** Organized by Promega India Pvt. Limited and Biotecnika Info Labs Pvt Ltd, India, August 5th 2020.
9. National Level webinar on **"PSYCHOLOGICAL SUPPORT FOR STUDENTS DURING COVID-19", Organized by** SKPFG College, Mysuru, Karnataka, India, August 5th 2020.
10. International Webinar Series on **"Recent advances in Biomaterials & Biosciences (RABB-2020)"**. Organized by Department of Analytical Chemistry, University of Madras, Society for Biomaterials and Artificial Organs-Chennai Chapter, India and Abinnovus Consulting Pvt. Ltd-India. July 27th - 31st, 2020.
11. **"Genome Scale Screening of Protein Stabilizers for Oncogenes or Tumor Suppressors using CRISPR/cas 9 system."** Dept. of Biotechnology, SJR College Bangalore, India. July 29th, 2020.
12. **Biotech Crops and Indian Agriculture**: Can India Solve its Farmers Plight and Become Food Bowl of the World, Organized by Biotecnika Info Labs Pvt Ltd, India, 22nd July 2020.

Patent

1. Patent PUB No- US 2021/0187128A1, PUB Date. 24th June 2021
   A COLOR CHANGING SILK PATCH FOR VISIBLE ROS DETECTION. Submitted through University of Central Florida, Orlando, USA

Scientific Publication

Journals Research / Book Chapters / Conference Proceeding Papers / Abstracts / Oral Presentations / Poster Presentations

Journal Manuscript / Book Chapters (Upcoming)

1. SM Niemiec, SA Hilton, A Wallbank, AE Louiselle, H Elajaili,J Hu,Sushant Singh,S Seal,E Nozik, B Smith,C Zgheib,KW Liechty. Lung Function Improves After Delayed Treatment with CNP-miR146a Following Acute Lung Injury (Submitted)

Journal Research Papers (Published)

2. LC Dewberry, SM Niemiec, SA Hilton, AE Louiselle, **Sushant Singh**, TS Sakthivel, J Hu, SSeal, KW Liechty, CZgheib. Cerium oxide nanoparticle conjugation to microRNA-146a mechanism of correction for impaired diabetic wound healing **Nanomedicine: Nanotechnology, Biology and Medicine (IF 6.45)**. Accepted for Publication
3. KE Peloi, BA Ratti, CV Nakamura, CJ Neal, TS Sakthivel, **Sushant Singh**, SSeal, SOS Lautenschlager. Engineered nanoceria modulate neutrophil oxidative response to low doses of UV-B radiation through the inhibition of reactive oxygen species production. **Journal of Biomedical Materials Research: Part A. (IF 3.5)** https://doi.org/10.1002/jbm.a.37251
4. Baltej Dhillon*, **Sushant Singh***, Jason Keifer, Udit Kumar, Saad Shaikh, Son Ho, Sudipta Seal. Ameliorating Hydroxychloroquine Induced Retinal Toxicity through Cerium Oxide Nanoparticle Treatments. **Journals of Biomaterials Applications. (IF 2.7). (Accepted) (*Equal Contribution), *(Corresponding Author)*** https://doi.org/10.1177/08853282211030150
5. **Sushant Singh***, U Kumar, D Gittess, T Sakthivel, B Babu, S Seal. Cerium Oxide Nanomaterial With Dual Antioxidative Scavenging Potential: Synthesis and Characterization. **Journals of Biomaterials Applications. (IF-2.7).** https://journals.sagepub.com/doi/abs/10.1177/08853282211013451 ***(*Corresponding Author)***
6. SM. Niemiec, SA. Hilton, A Walbank, M Bannerman,AE. Louiselle, H Elajaili, A Allawzi, J Xu, C Mattson, LC. Dewberry, J Hu, **Sushant Singh**, TS Sakthivel, E Grayck, B Smith, S Seal, C Zgheib, KW. Liechty. Cerium oxide nanoparticles conjugated to anti-inflammatory microRNA-146a prevent bleomycin-induced acute lung injury. **Nanomedicine: Nanotechnology, Biology and Medicine (IF 6.45)** https://www.sciencedirect.com/science/article/pii/S1549963421000319
7. **Sushant Singh**, NC Bal, M Periasamy. Strain specific differences in muscle Ca^{2+} transport and mitochondrial electron transport proteins between FVB/N and

C57BL/6J mice. **Journal of Experimental Biology. 2020. (IF-3.01)** https://jeb.biologists.org/content/early/2020/12/01/jeb.238634

8. **Sushant Singh**, G Cortes, U Kumar, T Sakthivel, S Niemiec, A Louiselle, M Bannerman, C Zgheib, KW Liechty, S Seal. Silk Fibroin Nanofibrous Mats for Visible Sensing of Oxidative Stress in Cutaneous Wounds. ***Biomaterials Science (Royal Society of Chemistry),)***. ***2020*** **(IF-6.8)** https://doi.org/10.1039/D0BM01325K
9. LM Estes*, P Singha*, **Sushant Singh***, TS Sakthivel, E Brisbois, S Seal, H Handa. Characterization of a Nitric Oxide (NO) Donor Molecule and Cerium Oxide Nanoparticle (CNP) Interactions and Their Synergistic Antimicrobial Potential for Biomedical Applications. **Journal of Colloid and Interface Science. (2020)**

   (*Equal Contribution) **(IF-8.12)** https://doi.org/10.1016/j.jcis.2020.10.081
10. J Keifer*, **Sushant Singh***, B Dhillon, U Kumar, S Shaikh, S Ho, S Seal. Ceria Nanoparticles Mitigate Iron Oxidative Toxicity of Human Retinal Pigment Epithelium. **Cureus 12(8): e9675.** DoI:10.7759/cureus.9675 ***(*Equal Contribution)*** https://pubmed.ncbi.nlm.nih.gov/32923270/
11. SM. Niemiec, AE Louiselle, SA Hilton, LC Dewberry, L Zhang, MAzeltine, J Xu, **Sushant Singh**, TS Sakthivel, SSeal, KW Liechty, C Zgheib. Nanosilk Increases the Strength of Diabetic Skin and Delivers CNP-miR146a to Improve Wound Healing. **Frontiers in Immunology-Inflammation, 11, 590285 (2020) (IF-6.4)** https://doi.org/10.3389/fimmu.2020.590285
12. FM Ribeiro, M Maciel de Oliveira, **Sushant Singh**, T Sakthivel, C Neal, S Seal, T Nakamura, S Lautenschlager, C Nakamura. CNP decrease UVA-induced fibroblast death through cell redox regulation leading to cell survival, migration and proliferation. **Frontiers in Bioengineering and Biotechnology,** ***8 (577557), 2020)***. **(IF-4.2)** https://www.frontiersin.org/articles/10.3389/fbioe.2020.577557/full
13. M Doshi, A Bosak, C Neal, N Isis, U Kumar, A Jeyaranjan, T Sakthivel, **Sushant Singh**, A Willenberg, R Hines, S Seal, B Willenberg. Exposure to nanoceria impacts larval survival, life history traits and fecundity of Aedes aegypti. **PLOS Neglected Tropical Diseases**.14(9):e0008654***(2020)***.**(IF-4.4)** https://journals.plos.org/plosntds/article?id=10.1371/journal.pntd.0008654
14. KE Peloi, CA Contreras, CV Nakamura, **Sushant Singh**, T Sakthivel, S Seal, S Lautenschlage. Antioxidant Photochemoprotector Effects of Cerium Oxide Nanoparticles on UV irradiated Fibroblast cells. **Colloids and Surfaces B: Biointerfaces.**111013,2020.**(IF-3.9).** https://www.sciencedirect.com/science/article/abs/pii/S0927776520302435
15. G Sener, SA Hilton, MJ Osmond, C Zgheib, JP Newsom, L Dewberry, **Sushant Singh**, TS Sakthival, S Seal, KW Liechty, MD Krebs. Injectable, Self-Healable Zwitterionic Cryogels with Sustained MicroRNA-Cerium Oxide Nanoparticle Release Promote Accelerated Wound Healing. **Acta Biomaterialia.** 101, 262-272, 2020. **(IF - 6.3).** https://www.sciencedirect.com/science/article/pii/S1742706119307548

16. A Gupta, TS Sakthival, CJ Neal, S Koul, **Sushant Singh**, A Kushima, S Seal. Antioxidant Properties of Nanoceria Films with Tunable Valency. **Biomaterials Science.** 7, 3051-3061,2019**(IF-5.8).** https://pubs.rsc.org/en/content/articlelanding/2019/bm/c9bm00397e!divAbstract

17. N Saraf, S Barkam, M Peppler, A Metke, AV Guardado, **Sushant Singh**, C Emile, A Bico, C Rodas, SSeal. Microsensor for limonin detection: an indicator of citrus greening disease. **Sensors and Actuators B: Chemical**. 283,724-730. 2019. **(IF - 6.3).** https://www.sciencedirect.com/science/article/abs/pii/S0925400518321865

18. **Sushant Singh**, A Ly, S Das, T. S. Sakthivel, S Barkam, S Seal. Cerium Oxide Nanoparticle at the Nano-Bio Interface - Size Dependent Cellular Uptake. **Artificial Cells, Nanomedicine and Biotechnology**. 2018; 46; 956-963. **(IF - 4.46)** https://www.tandfonline.com/doi/full/10.1080/21691401.2018.1521818

19. S. Seal, **Sushant Singh**, K. Crawford, E. J. Brisbois, M. Coathup. Novel Polymers for Use in Total Joint Arthroplasty. Advance Materials & Processes. 2018; October, 30-33. **(IF 0.2)** https://static.asminternational.org/amp/201807/30/

20. C Zgheib, SA Hilton, LC Dewberry, MM Hodges, S Ghatak, J Xu, **Sushant Singh**, S Roy, CK Sen, S Seal, KW Liechty. Use of Cerium Oxide Nanoparticles Conjugated with MicroRNA-146a to Correct the Diabetic Wound Healing Impairment. Journal of the American College of Surgeons. 2018; October- 22. **(IF - 4.45).** https://www.journalacs.org/article/S1072-7515(18)32072-6/fulltext

21. NC Bal, **Sushant Singh**, FG Dos Reis, SK Maurya, S Pani, LA Rowland, M Periasamy. Both brown adipose tissue and skeletal muscle thermogenesis processes are activated during mild to severe cold adaptation in mice. Journal of Biological Chemistry. 2017. 292(40); 16616-16625. [Publisher: American Society for Biochemistry and Molecular Biology] **(IF - 4.1).** https://www.jbc.org/content/292/40/16616.full

22. M Periasamy, SK Maurya, SK Sahoo, **Sushant Singh**, FG Dos Reis, NC Bal. The role of SERCA pump in muscle thermogenesis and metabolism. Comprehensive Physiology. 2017.7(3);879-890.[Publisher:Wiley]**(IF-6.24).** https://pubmed.ncbi.nlm.nih.gov/28640447/

23. NC Bal, SK Maurya, **Sushant Singh**, XHT Wehrens and M Periasamy. Increased reliance on muscle based thermogenesis upon acute minimization of brown adipose tissue function. Journal of Biological Chemistry. 2016. 291(33): 17247-57. [Publisher: American Society for Biochemistry and Molecular Biology] **(IF - 4.1).** https://www.jbc.org/content/291/33/17247.full

24. **Sushant Singh** and VK Dubey. Multiwalled Carbon Nanotubes-Superoxide Dismutase biocatalytic conjugate towards alleviating induced oxidative stress in human skin cell line. International Journal of Peptide Research and Therapeutics.

22;2;171-177,2015.[Publisher:Springer]**(IF-1.219).** https://link.springer.com/article/10.1007/s10989-015-9495-3

25. Vidhyadhar N, **Sushant Singh**, AN. Singh, VK Dubey. Procerain B, a cysteine protease from Calotropis Procera, requires N-terminus pro-region for activity: cDNA cloning and expression with pro-sequence. Protein Expression and Purification. 103; 16-22, 2014.[Publisher:Elsevier]**(IF-1.29).** https://www.sciencedirect.com/science/article/pii/S1046592814001703?via%3Dihub

26. **Sushant Singh**, AN Singh, A Verma and VK Dubey. Biodegradable polycaprolactone (PCL) nanosphere encapsulating superoxide dismutase and catalase enzymes. Applied Biochemistry and Biotechnology. 171(7): 1545-1558, 2013. [Publisher: Springer] **(IF - 1.42).** https://link.springer.com/article/10.1007/s12010-013-0427-4

27. **Sushant Singh**, AN Singh, A Verma and VK Dubey. A novel superoxide dismutase from *Cicer arietinum* L. seedlings: purification and characterization. Protein and Peptide Letters. 20(7): 741-748, 2013. [Publisher: Bentham Science] **(IF-1.16).** http://www.eurekaselect.com/110841/article

28. AN Singh, **Sushant Singh** and VK Dubey. Immobilization of Procerain B, a Cystein Endopeptidase, on Amberlite MB-150 Beads. PLOS ONE, 2012, 8(6): e66000] **(IF - 2.77).** https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0066000

29. **Sushant Singh**, A Verma and VK Dubey. Effectivity of antioxidative enzymatic system on diminishing the oxidative stress induced by aluminium in chickpea (*Cicer arietinum* L.) seedlings. Braz. J. Plant Physiol., 24(1): 47-54, 2012. **(IF - 1.5).** https://www.scielo.br/scielo.php?pid=S167704202012000100007&script=sci_abstract

30. AN Singh, **Sushant Singh**, N Suthar and VK Dubey. Glutaraldehyde activated chitosan matrix for immobilization of a novel cysteine protease, procerain B. Journal of Agricultural and Food Chemistry. 59; 6256-62, 2011, [Publisher: American Chemical Society] **(IF - 3.15).** https://pubs.acs.org/doi/abs/10.1021/jf200472x

31. BP Kumar, **Sushant Singh** and VK Dubey. Effect of Arsenic stress on *Vigna radiate*: A Biochemical study. International Journal of Environmental Science and Engineering Research. 1; 1-4, 2010. **(IF - 0.0).** http://journal-ijeser.com/searchyears-volumeID-1.html

Book Chapters

32. **Sushant Singh**. Nanotechnology in Cancer Therapeutics: Cerium Oxide Nanomaterials as Cancer Therapeutic Agents. Protocol Handbook for Cancer Biology. Elsevier. https://www.elsevier.com/books/protocol-handbook-for-cancer-biology/misra/978-0-323-90006-5

33. **Sushant Singh**, NC Bal. Membrane Biophysics. Introduction to Bimolecular structure and Biophysics. 1st Edition, Springer, 2017, Pg. 183-204. https://link.springer.com/chapter/10.1007/978-981-10-4968-2_7

34. **Sushant Singh**, SK Sahoo, M Periasamy. Sarcolipin. Encyclopedia of Signaling Molecules, 2nd Edition.2019, Springer. https://link.springer.com/referenceworkentry/10.1007%2F978-1-4614-6438-9_101787-1

Conference Proceeding Papers

35. G Sener, J Newsom, SA Hilton, C Zgheib, **Sushant Singh**, S Seal, KW Liechty, MD Krebs. Self-healable and sustained release zwitterionic cryogels for wound healing. Transactions of the Annual Meeting of the Society for Biomaterials and the Annual International Biomaterials Symposium, 2019. https://2019.biomaterials.org/sites/default/files/abstracts/372.pdf

36. S Ho, J Kieffer, B Dhillon, **Sushant Singh**. Cerium Oxide Nanoparticles Mitigate Hydroxychloroquine Induced Toxicity in Human Retinal Pigment Epithelium Investigative Ophthalmology & Visual Science. 2019, 60,(9), 1955. https://iovs.arvojournals.org/article.aspx?articleid=2745734

Conference Abstract & Presentation

37. **Sushant Singh**. **Advances in Biomedical Applications: A Cerium Oxide Nanomaterial Perspective.** Virtual National Conference of Recent Advances in Biological Research (RABR 2020). Organized by Heredity LifeSciences India, August 8th-10th 2020**.** ***(Oral presentation)***

38. TS Sakthivel, CJ Neal, A Jeyaranjan, U Kumar, **Sushant Singh**, S Seal. Sustainable development of Nano-Micromaterials: Reduce, Recycle, Reuse (R3CYCLE). Nano-Micromaterials for Circular economy and Sustainability in the East Asia Pacific. National University of Singapore, Singapore, Aug 29th-Sep 1st, 2019. ***(Oral presentation)***

39. M Doshi, C Neal, A Bosak, N Isis, A Willenberg, A Jayaranjan, U Kumar, **Sushant Singh**, S Seal, B J. Willenberg. New Nanoceria-Based Pesticide for Mosquitoes. 11th Annual Graduate Research Colloquium. August 20th 2019, College of Medicine, UCF, Orlando, Florida, USA. ***(Poster presentation)***

40. B Babu, TS Sakthivel, **Sushant Singh**, U Kumar, CJ Neal, A Jeyaranjan, S Seal. Controlling size of hollow nanoceria and its biomedical applications. 11th Annual Graduate Research Colloquium. August 20th 2019, College of Medicine, UCF, Orlando, Florida, USA. ***(Poster presentation)***

41. G Sener, J Newsom, SA Hilton, C Zgheib, **Sushant Singh**, S Seal, KW Liechty, MD Krebs. Self-healable and sustained release zwitterionic cryogels for wound healing. Transactions of the Annual Meeting of the Society for Biomaterials and the Annual International Biomaterials Symposium, 2019. ***(Poster Presentation)***

42. G Cortes, **Sushant Singh**, U Kumar, T Sakthivel, C Zgheib, KW Liechty, S Seal. A Color Changing Silk Patch for Visible ROS Detection: Research in Progress. Research Experiences for Undergraduates (REU) Presentation- July 27th, 2019, UCF, Orlando, Florida, USA. ***(Poster presentation).***

43. M Livingstone, M Johnstone, W Self, **Sushant Singh**, U Kumar, TS Sakthivel, S Seal. Examining the Effects of Cerium Nanoparticles on a Silk Patch**.** Research Experiences for Undergraduates (REU) Presentation- July 27th, 2019, UCF, Orlando, Florida, USA. ***(Poster presentation).***

44. **Sushant Singh**, TS Sakthivel, S Busatto, JEV Wolfram, S Seal. Silk/CNP/EVs- An Electrospun Biocompatible Patch for Wound Recovery. Student Research Week Presentation, April 1st-5th, 2019, UCF, Orlando, Florida, USA. ***(Poster presentation).***

45. S Ho, B Dhillon, J Keifer, **Sushant Singh**. Cerium Oxide Nanoparticles Mitigate Hydroxychloroquine Induced Toxicity in Human Retinal Pigment Epithelium. ARVO Annual Meeting, 28th April-02 May 2019, Vancouver, Canada. ***(Poster presentation)***

46. SA Hilton, LC Dewberry, C Zgheib, MM Hodges, EJ Burtch, J Jacot, P Rozance, A Metke, **Sushant Singh**, S Seal, KW Liechty. Isolation of Amniotic Fluid Mesenchymal Stem Cells and Incorporation into Nanofiber Silk Patch. 14th Annual Academic Surgical Congress. Houston, Texas, USA

47. V Porter, **Sushant Singh**, P CheSutton, S Busatto, JEV. Wolfram, E Brisbois, and S Seal. Nanoceria-Integrated Biopatch to Accelerate Wound Healing. Research Experiences for Undergraduates (REU) Presentation- July 27th, 2018, UCF, Orlando, Florida, USA. ***(Poster presentation).***

48. P CheSutton, **Sushant Singh**, S Seal. Antioxidative CNPs-Silk Patch for Wound Recovery. National Science Foundation Research Experiences for Teachers (RET) Presentation- July 27th, 2018, UCF, Orlando, Florida, USA. ***(Poster presentation).***

49. SA Hilton, C. Zgheib, L.C. Dewberry, M.M. Hodges, **Sushant Singh**, S. Seal, G. Sener, M. Krebs, K.W. Liechty. Cerium Oxide Nanoparticle with MircoRNA 146a Delivered via Zwitterionic Gel Improves Skin Strength. 14th Annual Academic Surgical Congress. Houston, Texas, USA

50. S Sims, **Sushant Singh**, S Seal. Antioxidative Cerium oxide nanoparticle Silk Patch for Expedited Wound Recovery (ACOSPER). 15th Showcase of Undergraduate Research Excellence (SURE) Presentation. April 5, 2018 UCF, Orlando, Florida, USA. ***(Poster presentation).***

51. A Bico, **Sushant Singh**, A Metke, J Wolfram, Patel, S Seal. A Biocompatible Silk Patch for Wound Healing. Research Experiences for Undergraduates (REU) Presentation- July 29th, 2017, UCF, Orlando, Florida, USA. ***(Poster presentation).***

52. N Saraf, S Das, AR Brown, A Bosak, **Sushant Singh**, BJ Willenberg, S Seal. Role of Gold Nanoparticle Size and Shape on the Sensitivity of Aptasensor Development. 14th Graduate Research Forum Presentation, April 4th, 2017, UCF, Orlando, Florida,

USA. ***(Poster presentation).***

53. **Sushant Singh,** NC. Bal, SK Maurya, LA Rowland and M Periasamy. Skeletal Muscle Compensates for Loss of Brown Adipose Tissue During Cold-Induced Thermogenesis. Advances in Skeletal Muscle Biology in Health and Disease Conference, University of Florida, Gainesville, FL USA. JANUARY 20-23, 2016. ***(Oral and Poster Presentation).***

54. **Sushant Singh**, A Verma and Vikash Kumar Dubey. Superoxide Dismutase; A novel antioxidative protein alleviating the Oxidative stress environment. National Conference on Sustainable Development of Environmental Systems (NCODOES-2014), IIT Guwahati, Guwahati, Assam. June 20 -21, 2014**. *(Oral presentation).***

55. **Sushant Singh**, Anil Verma and Vikash Kumar Dubey. Polycaprolactone (PCL) nanoencapsulation of Superoxide Dismutase/ Catalase towards elevating antioxidative defense against generated oxidative stress. International conference on Advance Nanomaterials and Nanotechnology (ICANN-2013). IIT Guwahati, Guwahati, Assam. Dec 1 -3, 2013. ***(Poster presentation).***

56. **Sushant Singh**, Anil Verma and Vikash Kumar Dubey. Environmental stress induced Superoxide Dismutase: A Novel Antioxidative protein against Oxidative Stress conditions. TechEvince 1.0, The Annual Research Exhibition. IIT Guwahati, Guwahati. November 9-10, 2013**. *(Poster presentation).***

57. **Sushant Singh** and Vikash Kumar Dubey. Biomarkers: Effect of pollutants on biological systems. Quality improvement programme (QIP) on "Green Chemistry and Clean Technology". Organized by Centre for Environment, IIT Guwahati. November 26-28, 2012.

58. **Sushant Singh**, Abhay Narayan Singh, Anil Verma and Vikash Kumar Dubey. Nanoencapsulating superoxide dismutase/catalase towards enhancing antioxidative defense against generated oxidative stress. 81 Annual Meeting of the Society of Biological Chemists (India) & Symposium on Chemistry and Biology: Two Weapons against Diseases. Science city, Kolkata (W.B). November 8- 11, 2012. ***(Poster presentation)***

59. International Symposium on "BIOENGINEERING 2012" (ISBE 2012), Indian Institute of Technology Guwahati, Assam. India, 10 December 2012. ***(Participation)***

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Cicer arietinum L. seedlings. 80 Annual Meeting of the Society of Biological Chemists (SBC). Central Institute of Medicinal and Aromatic Plants (CIMAP). Lucknow (U.P). November 12-15, 2011. ***(Poster presentation)***

63. **Sushant Singh**, Anil Verma and Vikash Kumar Dubey. Effects of increasing Aluminium metal stress in germinating chickpea (*Cicer arietinum*) seeds. International Conference on 'Climate Change and Water: Assessing vulnerability, impact, and adaptation in the Eastern Himalayas''. IIT Guwahati, Guwahati, Assam. January 3-5, 2011. ***(Poster presentation).***
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Journal Reviewer

Radiation Research
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Journal of Nanoparticle Research
Nanotechnology
Biotechnology Industry Research Assistance Council (BIRAC) Research Proposals

Journal Cover Image Published

Showcasing research from Professor Sudipta Seal's laboratory, Department of Materials Science and Engineering, University of Central Florida, Orlando, Florida, USA.

Silk fibroin nanofibrous mats for visible sensing of oxidative stress in cutaneous wounds

Sensing the level of oxidative stress in cutaneous wounds would be highly beneficial towards enhancing wound healing therapy. The cover image shows the applicability of amplex red infused silk matte in detecting the real-time scenario of oxidative stress in a cutaneous wound over time. Artwork by Ryan Dickerson (Medical Illustrator, Educational technology, University of Central Florida).

As featured in:

See Sudipta Seal *et al.*, *Biomater. Sci.*, 2020, **8**, 5900.

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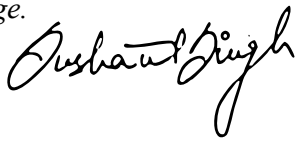
Current Research Summary 2016 onwards	I joined Prof. Seal lab in November 2016 for my next Postdoctoral Research Training at the Nanoscience Technology Center, University of Central Florida (UCF) in Orlando, Florida. The research majorly focused on the antioxidative and regenerative potential of cerium oxide nanoparticle (CNPs). Ceria Nanoparticles (CNPs) have emerged out as a fascinating and lucrative material in biomedical science. These CNPs have unique ability to switch oxidation states between +3 and +4 based on surrounding environment. The ability of these CNPs to switch between oxidation states is comparable to that of biological antioxidant molecules. This CNPs are being explored in various aspects including accelerated wound healing and as antioxidative material in biodegradable nanocomposite for tissue engineering and drug delivery application.
Past Research Summary 2014–2016	I worked in Prof. Periasamy lab from October 2014- November 2016, for my initial Postdoctoral Research Training. His research has major interest in the area of proteins of muscle biology and its functional role in the overall body metabolism and metabolic stresses. The research was highly focused on the role of a novel protein "Sarcolipin" in sarcoendoplasmic reticulum Ca ATPase (SERCA) regulation and muscle metabolism overall.
PhD Research Summary 2009–2014	My PhD research at IIT Guwahati (July2009- May2014) was focused on novel antioxidative superoxide dismutase (SOD) enzyme and its therapeutic potentials on ameliorating reactive oxygen species. A novel SOD enzyme purified from *Cicer arietinum* seedlings with high molecular weight, broad pH, temperature optima and high substrate specificity was studied in detail. Unique characteristics motivated us to explore its therapeutic potentials for ROS scavenging. In one study, highly aqueous dispersible oxidized MWCNTs and in another study a biodegradable polycaprolactone (PCL) nanospheres encapsulating antioxidative SOD and catalase (CAT) enzyme together were synthesized. These nano-bioconjugates were highly efficient in reducing oxidative stress condition in human skin HaCat cells.

The above furnished information is true to the best of my knowledge.



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