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POSITIONS AND EMPLOYMENT

- *Assistant Professor of Practice* May 2023 – Present
Texas Tech University, Texas, USA
- *Research Assistant Professor* Oct. 2015 – May 2023
Texas Tech University, Texas, USA
- *Post-Doctoral Research Associate (Advisor: Dr. HS Gill)* July 2013-Sep. 2015
Texas Tech University, Texas, USA
- *Post-Doctoral Research Associate (Advisor: Dr. KS Nandakumar)* June 2012-June 2013
Karolinska Institute, Sweden

ACADEMIC TRAINING

Institution	Degree	Year	Field of study
CSJM University Kanpur, India	B.Sc.	2002	Chemistry, Botany
University of Lucknow, India	M.Sc.	2006	Biotechnology
Indian Institute of Technology Kanpur, India	Ph.D	2012	Biological Sciences and Bioengineering

Ph.D. (2006-2012): Biological Sciences and Bioengineering, Indian Institute of Technology Kanpur, India

Thesis title: Thermo-responsive polymer protein bioconjugates: Biomedical and biotechnological applications

FELLOWSHIPS AND AWARDS

- 2012 Swiss Government Excellence Post-Doctoral fellowship (not availed)
- 2011 Best poster presentation award in 4th Indo-Australian Conference on “Biomaterials, tissue engineering, and drug delivery systems” held in India February 10-12, 2011.
- 2011 International travel award from the Department of Science and Technology (DST), India
- 2011 Appreciation award for publications at the Indian Institute of Technology Kanpur, India
- 2008 Council of Science & Industrial Research (CSIR NET) Senior Research Fellowship, India
- 2006 Council of Science & Industrial Research (CSIR NET) Junior Research Fellowship, India

TEACHING

- Teaching assistant: IIT Kanpur, undergraduate class, Course- Biochemical Engineering (2009-2010).
- Guest teaching lecturers: IIT Jodhpur, undergraduate class, Course- Principles of downstream processing (2010)
- Undergraduate teaching at Karolinska Institute, Sweden (2012 fall), Course- General chemistry
- Laboratory teaching: Texas Tech University, Basic laboratory techniques to the undergraduate and graduate students (2013-2023).

RESEARCH PUBLICATIONS (Complete list of publications >[Google Scholar](#))

1. [AK Shakya](#), B Mallick, KS Nandakumar. A Perspective on Oral Immunotherapeutic Tools and Strategies for Autoimmune Disorders. *Vaccines*, 2023;11(6):1031.
2. [AK Shakya](#). Functionalized cryogel monoliths for fast and selective separation of nucleic acids directly from the crude lysate. *Biomedical Chromatography*, 2022;36:e5333.
3. LD Nesovic, [AK Shakya*](#), HS Gill. Treating allergies via skin-recent advances in cutaneous allergen immunotherapy. *Advanced Drug Delivery Reviews*, 2022, 114458. (*Sharing first authorship).
4. JJ Landers, KW Janczak, [AK Shakya](#), V Zarnitsyn, SR Patel, JRB Jr, HS Gill, JJ O'Konek. Targeted allergen-specific immunotherapy within the skin improves allergen delivery to induce desensitization to peanuts. *Immunotherapy*, 2022, 10.2217/imt02021-0226.
5. [AK Shakya](#), CH Lee, HS Gill. Microneedles mediated allergen-specific immunotherapy for the treatment of airway allergy in mice. *Molecular Pharmaceutics*, 2020;17:3033-3042.
6. [AK Shakya](#), RS Ingrole, G Joshi, MdJ Uddin, S Anvari, CM Davis, HS Gill. Microneedles coated with peanut allergen enable desensitization of peanut-sensitized mice. *Journal of Controlled Release*, 2019;314:38-47.
7. [AK Shakya](#), CH Lee, MdJ Uddin, HS Gill. Assessment of Th1/Th2 bias of STING agonists coated on microneedles for possible use in skin allergen immunotherapy. *Molecular Pharmaceutics*, 2018;15:5437-5443.
8. [AK Shakya](#), CH Lee, HS Gill. Coated microneedle-based cutaneous immunotherapy prevents Der p1-induced airway allergy in mice. *Journal of Allergy and Clinical Immunology*, 2018;142:207-2011.e3.
9. [AK Shakya](#), KS Nandakumar. An update on smart biocatalysts for industrial and biomedical applications. *Journal of the Royal Society Interface* 2018;15:20180062.
10. [AK Shakya](#), KS Nandakumar. Antigen-specific tolerization and targeted delivery as therapeutic strategies for autoimmune diseases. *Trends in Biotechnology, Cell Press* 2018;36:7:686-699.
11. [AK Shakya](#), CH Lee, HS Gill. Coated microneedles for cutaneous preventive immunotherapy against airway allergies. *Journal of Controlled Release*, 2017;265:75-82.
12. [AK Shakya](#), U Kandalam. Three-dimensional macroporous Materials for Craniofacial Bone Tissue Engineering. *British Journal of Oral & Maxillofacial Surgery*, 2017;55:875-91.
13. W Tao, B Hurst, [AK Shakya](#), MdJ Uddin, RS Ingrole, M Hernandez-Sanabria, R Arya, L Bimler, S Paust, EB Tarbet, HS Gill. Consensus M2e peptide conjugated to gold nanoparticles confers protection against H1N1, H3N2, and H5N1 influenza A viruses. *Antiviral Research*, 2017;141:62-72.
14. [AK Shakya](#), W Tao, MYE Chowdhury, HS Gill. Mucosal vaccine delivery: Current state and a pediatric perspective. *Journal of Controlled Release*, 2016;240:394-413.
15. [AK Shakya](#), A Kumar, R Holmdahl, KS Nandakumar. Macrophage-derived reactive oxygen species protect against autoimmune priming with a defined polymeric adjuvant. *Immunology*, 2016;147:125-32.
16. [AK Shakya*](#), A Srivastava, A Kumar. Polymeric cryogel-based boronate affinity chromatography for separation of Ribose Nucleic Acid. *Wiley Current Protocols in Nucleic acid chemistry*, 2015;63;10:1-10.
17. [AK Shakya](#), HS Gill. A comparative study of microneedle-based cutaneous immunization with other conventional routes to assess the feasibility of microneedles for allergy immunotherapy. *Vaccine*, 2015;33:4060-4.
18. E Jain, A Damania, [AK Shakya](#), A Kumar, SK Sarin, A Kumar. Fabrication of macroporous cryogels as potential hepatocyte carriers for bioartificial liver support. *Colloids Surf B Biointerfaces*, 2015;136:761-71.
19. [AK Shakya](#), KS Nandakumar, A Kumar. Chemical cross-linking abrogates the adjuvant potential of natural polymers. *Royal Society of Chemistry Advances*, 2014;4:13817-21.
20. [AK Shakya](#), R Holmdahl, KS Nandakumar, A Kumar. Polymeric cryogels are biocompatible and their biodegradation is independent of oxidative radicals. *Journal of Biomedical Materials Research Part A*, 2014;102:3409-18.

21. AK Shakya, KS Nandakumar. A synthetic polymer as an adjuvant in collagen-induced arthritis. *Wiley Current protocols Mouse biology*, 2014;4:1-12.
22. AK Shakya, R Holmdahl, KS Nandakumar, A Kumar. Characterization of chemically defined poly-N-isopropyl acrylamide-based copolymeric adjuvants. *Vaccine*, 2013;31:3519-27.
23. AK Shakya, A Kumar. Recent developments in atom transfer radical polymerization initiators for the development of polymer-protein bioconjugates. *Journal of Bioscience and Biotechnology*, 2013;2:1-11. (Invited article)
24. AK Shakya, KS Nandakumar. Polymeric adjuvants in studying autoimmune responses and vaccination against infectious diseases. *Journal of the Royal Society Interface*, 2013; 10:20120536.
25. AK Shakya, KS Nandakumar. Polymers as immunological adjuvants: An update on recent developments. *Journal of Bioscience and Biotechnology*, 2012;1:199-210. (Invited article)
26. A Srivastava, AK Shakya*, A Kumar. Boronate affinity chromatography of cells and biomacromolecules using cryogels. *Enzyme and Microbial Technology*, 2012;51:373-81 (*Sharing first authorship).
27. AK Shakya, A Kumar, D Klaczkowska, M Hultqvist, K Hagenow, R Holmdahl, KS Nandakumar. Collagen Type II and a Thermo-Responsive Polymer of N-Isopropylacrylamide Induce Arthritis Independent of Toll-Like Receptors: A Strong Influence by Major Histocompatibility Complex Class II and Ncf1 Genes. *American Journal of Pathology*, 2011;5:2490-2500.
28. AK Shakya, A Kumar, and KS Nandakumar. A thermo-responsive polymeric [poly(N-isopropyl acrylamide)] adjuvant with collagen-induced autoimmunity and arthritis in mice. *Journal of the Royal Society Interface* 2011; 8:1748-59.
29. AK Shakya, P Sharma, A Kumar. Synthesis and characterization of thermo-responsive poly(N-isopropyl acrylamide)-bovine liver catalase bioconjugate. *Enzyme and Microbial Technology*, 2010;47:277-82.
30. AK Shakya, H Sami, A Srivastava, A Kumar. Stability of responsive polymer–protein bioconjugates. *Progress in Polymer Science*, 2010;35:459-86.

PATENTS

1. Patent (**USA patent No. US20200138941A1**): *Methods and Devices for the Treatment of Food Allergies*, HS Gill, AK Shakya (Texas Tech University). Status: GRANTED.
<https://patents.google.com/patent/US20200138941A1/en>
2. Patent (**USA patent No. WO2019070631A1**): *Pollen grains for treatment of airway and other allergies*, HS Gill, AK Shakya (Texas Tech University). Status: published.
<https://patents.google.com/patent/WO2019070631A1/en>
3. Patent (**TTU Serial No. 43438611**): *Targeting Junctional Epithelium in the Gingival Crevice for Immune Modulation*, HS Gill, Rohan SJ Ingrole, AK Shakya (Texas Tech University). Status: filed.

RESEARCH GRANTS

Awarded

1. R01AI135197. *Microneedles for treatment of peanut allergies*. Sponsoring agency-National Institutes of Health (NIH), role-co-PI.
2. PA-18-575. *STTR Microneedle-based targeted allergen-specific immunotherapy for the treatment of peanut allergies*. Sponsoring agency-National Institutes of Health (NIH), role-co-PI.

BOOK CHAPTERS

1. AK Shakya, KS Nandakumar. Nano-size-based drug delivery systems for autoimmune diseases. In: Autoimmune disorders: Risk factors, pathogenesis, and treatments. Edited by KS Nandakumar. Nova Science publisher 2019 (ISBN:9781536160468).
2. AK Shakya, KS Nandakumar. Nanobiocatalysts for industrial applications. In: *Characterization and biology of nanomaterials for drug delivery*. Edited by S Mohapatra, S Ranjan, N Dasgupta, R Mishra, and S Thomas. Elsevier 2018. (ISBN:9780128140314)
3. AK Shakya, KS Nandakumar. Biomaterials for induction and treatment of autoimmunity. In: *Advances in biomaterials for biomedical applications*. Edited by A Tripathi, and JS Melo. Springer Singapore 2017. (ISBN:9789811033278)
4. AK Shakya, A Kumar. Biocompatibility of macroporous cryogel materials, In *Supermacroporous cryogels: Biomedical and biotechnological applications*. Edited by A Kumar, CRC Press 2015. (ISBN:9781482228816).
5. AK Shakya, H Madhyastha. Polymeric nanoparticles for vaccine delivery, In *Integrating biologically-inspired nanotechnology into medical practice*. Edited by A Nanda, and MA Bhat, IGI Global 2015. (ISBN13:9781522506102)
6. AK Shakya, KS Nandakumar. Stimuli-responsive polymers as adjuvants and carriers for antigen delivery. In: *Responsive materials and methods*. Edited by A Tiwari, and H Kobayashi. Scrivener Publishing Wiley 2013. (ISBN:9781118686225)
7. AK Shakya, KS Nandakumar. Nanomaterials applications in activation and suppression of immune response. In: *Handbook of research diverse application of nanotechnology in biomedicine, chemistry, and engineering*. Edited by S Soni, and A Salhotra. IGI Global 2014. (ISBN13:9781466663633)
8. A Srivastava, AK Shakya, A Kumar. Particulate/cell separations using macroporous monolithic matrices. In: *Advanced separations by specialized sorbents*. Edited by ES Dragan, CRC Press 2014. (ISBN:9781482220551).
9. AK Shakya, KS Nandakumar. New generation vaccines: the need for safe and improved adjuvant. In: *Vaccines and vaccine technology*. Edited by JR Vasconcelos OMICS Group eBooks 2013, Foster City, USA. (ISBN:9781632780423)

PROFESSIONAL SERVICES

2018	Expert reviewer for "Med Train Marie Sklodowska-Curie Fellowship 2018
2018-20	Examiner for "Undergraduate and graduate research conferences" at Texas Tech University
2019-present	An active member of the Institutional animal care and use committee (IACUC), Texas Tech University
2014-present	Active reviewer for the journals- Polymer (Elsevier), Biomaterials Sciences (Royal Society of Chemistry), Biomaterials, Journal of Controlled Release)

CONFERENCE PROCEEDINGS

1. CH Lee, AK Shakya, HS Gill. Elastin like polypeptides enhances mouse stem cells differentiation into cardiomyocyte-like cells, Annual meeting ISSCR 2019, CA, USA.

2. HS Gill, AK Shakya, CH Lee. *Microneedles for cutaneous peanut allergen immunotherapy*. American Institute of Chemical Engineers (AIChE) 2019, Orlando, USA.
3. AK Shakya, CH Lee and HS Gill, "Coated microneedles mediated allergen-specific immunotherapy for the treatment of airway allergy in mice", Barrier function of mammalian skin, Gordon Research Seminar (GRS) 2019, Waterville Valley, NH, USA.
4. AK Shakya, CH Lee, HS Gill. *Microneedles for Allergen Immunotherapy: In Vivo Efficacy in Mouse Models of Airway Allergy*. American Institute of Chemical Engineers (AIChE) 2018, Pittsburgh, USA.
5. AK Shakya, CH Lee, HS Gill. *Microneedles-based cutaneous immunotherapy for allergy treatment*. International Society of Vaccines 2016, Boston, USA.
6. AK Shakya, CH Lee, HS Gill. *Allergen-coated microneedles as a novel approach for preventive allergy immunotherapy*. Biomedical Engineering Society Annual meeting 2016, Minneapolis, USA.
7. AK Shakya, HS Gill. *Allergen-coated microneedles as a novel way for asthma preventive immunotherapy*. Annual meeting of Controlled Release Society 2015, Edinburg, Scotland.
8. AK Shakya, HS Gill. *Cutaneous allergen-specific immunotherapy using coated microneedles*. Skin Vaccination Summit 2015, Switzerland.
9. M Gatica, HS Gill, AK Shakya. *Delivery of Ovalbumin through microneedles to prevent Ova allergy in mice*. SACNAS National conference 2014, Los Angeles, USA.
10. AK Shakya, A Kumar, KS Nandakumar. *Poly-N-isopropylacrylamide as an adjuvant in collagen induced arthritis*. 4th Indo-Australian conference "Biomaterials, tissue engineering and drug delivery systems" 2011, Gujarat, India.
11. A Srivastava, AK Shakya, A Kumar. *Boronate affinity chromatography of cells and biomacromolecules using cryogels*. 4th Indo-Australian conference "Biomaterials, tissue engineering and drug delivery systems" 2011, Gujarat, India.
12. AK Shakya, A Kumar, KS Nandakumar. *Thermo-responsive poly-N-isopropylacrylamide as an adjuvant in experimental rheumatoid arthritis*. Annual Meeting & Exposition Society for Biomaterials 2011, Orlando Florida, USA.
13. A Srivastava, AK Shakya, A Kumar. *Poly(N-vinylcaprolactam) based cryogel scaffold for tissue engineering applications: Synthesis & biophysical characterization*. Annual meeting & Exposition, Society for Biomaterials 2010, Seattle Washington, USA.