**SHILPA SANAPALA**

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**EDUCATION:**

**Certificate in Data Analytics, Anticipated Completion Dec 2025**

*Washington University in St. Louis, MO*

Project: Evolutionary Divergence of ACE2 Receptors in Bats and Other Mammals: Implications for Coronavirus Host Interactions

**Master of Science in Biotechnology**, May 2011

*The University of Texas at San Antonio, TX*

Thesis: Effector Mechanisms in Protective Immunity Against Francisella tularensis

**Bachelor of Technology in Biotechnology**, May 2007

*Jawaharlal Nehru Technological University, India*

**TECHNICAL SKILLS:**

* **Programming:** R (tidyverse, Biostrings, ggplot2), Python (basic)
* **Bioinformatics Tools:** MUSCLE, Jalview, Bioconductor
* **Data Analysis:** Excel, RStudio, statistical modeling, data visualization
* **Other Tools:** GitHub, Markdown, Microsoft Office

**PROFESSIONAL EXPERIENCE:**

**Staff Scientist in Medicine**, Nov 2022 – Present

*Washington University School of Medicine, St. Louis, MO*

• Conduct immunologic and virologic assays to assess the protective efficacy of mRNA LNP and ChAd-based vaccines against SARS-CoV-2.

• Use animal models to investigate vaccine-host interactions.

• Contribute to the development of vaccines and antiviral therapeutics for emerging viruses.

• Resolve lab equipment and test subject-related issues.

• Recommended technical and procedural enhancements for testing methods.

**Staff Scientist in Neurology**, Nov 2021 – Nov 2022 & June 2018 – Feb 20

*Washington University School of Medicine, St. Louis, MO*

• Performed pediatric low-grade glioma modeling using immunocompromised mouse models and induced pluripotent stem cell lines to study the temporal course of tumor formation upon injecting neonatal mice with NF1 mutation-carrying progenitor cells.

• Conducted patient-derived xenograft studies to model high-grade glioma using neural progenitor cells carrying NF1 mutations in conjunction with TP53 knockout mutations.

• Managed lab mouse colony, controlled substance inventory, mouse orders, genotyping, and IDT primer stocks.

• Recruited and trained federal work-study students and oriented new lab members with the onboarding process.

• Authored and reviewed Standard Operating Procedures and animal study protocols.

• Shipped Category B and GMO materials and coordinated internal and external mouse shipments.

• Facilitated and oversaw lab operations such as freezer defrosting, ordering CO2 tanks, and assigning tasks to lab members.

**Reviewer on Contract**, April 2020 – June 2021 *Cactus Communications, Mumbai, India*

• Proficient in working with manuscript publication and editorial guidelines, offering comprehensive assistance to researchers.

• Specialized expertise includes abstract writing, manuscript editing, submission, journal selection, and adeptly addressing journal reviewer feedback.

**Biological Scientist**, July 2015 – May 2018

*University of Florida, Gainesville, FL*

• Constructed and evaluated Salmonella and Yersinia-based recombinant attenuated bacterial vaccines.

• Assisted in maintaining equipment and inventory in BSL-3 suites.

• Mentored veterinary student interns on their summer projects.

• Oriented and trained new researchers for experiments in BSL-2 and BSL-3

• Managed hazardous chemical inventory and waste disposal.

• Authored and reviewed SOPs and animal study protocols.

**Associate Research Technologist**, Aug 2011 – July 2015

*Biodesign Institute, Arizona State University, Tempe, AZ*

• Constructed antigen-delivering Salmonella strains targeting pneumonic and bubonic plague, pneumococcal disease, and tuberculosis.

• Evaluated antigen synthesis, vaccine strain colonization, antibody & cell-mediated responses, and protection in murine animal models.

**Teaching Experience**

Adjunct Faculty: General Biology I for Majors, Auh 2012 – Dec 2012

*Mesa Community College, Mesa, AZ*

Teaching Assistant: Microbiology and Biosciences I, Aug 2008 – Dec 2010

*University of Texas at San Antonio, TX*

**PUBLICATIONS:**

Case, J. B., Sanapala, S., Dillen, C., Rhodes, V., Zmasek, C., Chicz, T. M., Switzer, C. E., Scheaffer, S. M., Georgiev, G., Jacob-Dolan, C., Hauser, B. M., Dos Anjos, D. C. C., Adams, L. J., Soudani, N., Liang, C. Y., Ying, B., McNamara, R. P., Scheuermann, R. H., Boon, A. C. M.,…Diamond, M. S. (2024). A trivalent mucosal vaccine encoding phylogenetically inferred ancestral RBD sequences confers pan-Sarbecovirus protection in mice. *Cell Host Microbe*, *32*(12), 2131–2147 e2138. https://doi.org/10.1016/j.chom.2024.10.016

Lee, J., Case, J. B., Park, Y. J., Ravichandran, R., Asarnow, D., Tortorici, M. A., Brown, J. T., Sanapala, S., Carter, L., Baker, D., Diamond, M. S., & Veesler, D. (2024). A pan-variant miniprotein inhibitor protects against SARS-CoV-2 variants. bioRxiv. https://doi.org/10.1101/2024.08.08.606885

Wamhoff, E. C., Ronsard, L., Feldman, J., Knappe, G. A., Hauser, B. M., Romanov, A., Case, J. B., Sanapala, S., Lam, E. C., Denis, K. J. S., Boucau, J., Barczak, A. K., Balazs, A. B., Diamond, M. S., Schmidt, A. G., Lingwood, D., & Bathe, M. (2024). Enhancing antibody responses by multivalent antigen display on thymus-independent DNA origami scaffolds. *Nat Commun*, *15*(1), 795. https://doi.org/10.1038/s41467-024-44869-0

Case, J. B., Scheaffer, S. M., Darling, T. L., Bricker, T. L., Adams, L. J., Harastani, H., Trende, R., Sanapala, S., Fremont, D. H., Boon, A. C. M., & Diamond, M. S. (2023). Characterization of the SARS-CoV-2 BA.5.5 and BQ.1.1 Omicron Variants in Mice and Hamsters. *bioRxiv*. https://doi.org/10.1101/2023.04.28.538747

Anastasaki, C., Chatterjee, J., Cobb, O., Sanapala, S., Scheaffer, S. M., De Andrade Costa, A., Wilson, A. F., Kernan, C. M., Zafar, A. H., Ge, X., Garbow, J. R., Rodriguez, F. J., & Gutmann, D. H. (2022). Human induced pluripotent stem cell engineering establishes a humanized mouse platform for pediatric low-grade glioma modeling. *Acta Neuropathol Commun*, *10*(1), 120. https://doi.org/10.1186/s40478-022-01428-2

De Andrade Costa, A., Chatterjee, J., Cobb, O., Sanapala, S., Scheaffer, S., Guo, X., Dahiya, S., & Gutmann, D. H. (2022). RNA sequence analysis reveals ITGAL/CD11A as a stromal regulator of murine low-grade glioma growth. *Neuro Oncol*, *24*(1), 14–26. https://doi.org/10.1093/neuonc/noab130

Chatterjee, J., Sanapala, S., Cobb, O., Bewley, A., Goldstein, A. K., Cordell, E., Ge, X., Garbow, J. R., Holtzman, M. J., & Gutmann, D. H. (2021). Asthma reduces glioma formation by T cell decorin-mediated inhibition of microglia. *Nat Commun*, *12*(1), 7122. https://doi.org/10.1038/s41467-021-27455-6

Guo, X., Pan, Y., Xiong, M., Sanapala, S., Anastasaki, C., Cobb, O., Dahiya, S., & Gutmann, D. H. (2020). Midkine activation of CD8(+) T cells establishes a neuron-immune-cancer axis responsible for low-grade glioma growth. *Nat Commun*, *11*(1), 2177. https://doi.org/10.1038/s41467-020-15770-3

Sanapala, S., Mosca, L., Wang, S., & Curtiss, R. (2018). Comparative evaluation of Salmonella Typhimurium vaccines derived from UK-1 and 14028S: Importance of inherent virulence. *PLoS One*, *13*(9), e0203526. https://doi.org/10.1371/journal.pone.0203526

Sanapala, S., Rahav, H., Patel, H., Sun, W., & Curtiss, R. (2016). Multiple antigens of Yersinia pestis delivered by live recombinant attenuated Salmonella vaccine strains elicit protective immunity against plague. *Vaccine*, *34*(21), 2410–2416. https://doi.org/10.1016/j.vaccine.2016.03.094

Sun, W., Sanapala, S., Rahav, H., & Curtiss, R., 3rd. (2015). Oral administration of a recombinant attenuated Yersinia pseudotuberculosis strain elicits protective immunity against plague. *Vaccine*, *33*(48), 6727–6735. https://doi.org/10.1016/j.vaccine.2015.10.074

Sun, W., Sanapala, S., Henderson, J. C., Sam, S., Olinzock, J., Trent, M. S., & Curtiss, R., 3rd. (2014). LcrV delivered via type III secretion system of live attenuated Yersinia pseudotuberculosis enhances immunogenicity against pneumonic plague. *Infect Immun*, *82*(10), 4390–4404. https://doi.org/10.1128/IAI.02173-14

Sun, W., Olinzock, J., Wang, S., Sanapala, S., & Curtiss, R., 3rd. (2014). Evaluation of YadC protein delivered by live attenuated Salmonella as a vaccine against plague. *Pathog Dis*, *70*(2), 119–131. https://doi.org/10.1111/2049-632X.12076

Sanapala, S., Yu, J. J., Murthy, A. K., Li, W., Guentzel, M. N., Chambers, J. P., Klose, K. E., & Arulanandam, B. P. (2012). Perforin- and granzyme-mediated cytotoxic effector functions are essential for protection against Francisella tularensis following vaccination by the defined F. tularensis subsp. novicida DeltafopC vaccine strain. *Infect Immun*, *80*(6), 2177–2185. https://doi.org/10.1128/IAI.00036-12

Thathiah, P., Sanapala, S., Rodriguez, A. R., Yu, J. J., Murthy, A. K., Guentzel, M. N., Forsthuber, T. G., Chambers, J. P., & Arulanandam, B. P. (2011). Non-FcepsilonR bearing mast cells secrete sufficient interleukin-4 to control Francisella tularensis replication within macrophages. *Cytokine*, *55*(2), 211–220. https://doi.org/10.1016/j.cyto.2011.04.009

**HONORS & AWARDS:**

Certificate in College Teaching, UTSA

Silver Medal for Academic Excellence, JNTU

Best student all-rounder, 2002 – 2003

**ACTIVITIES & MEMBERSHIPS:**

Science Fair Judge, Public School in FL & MO, 2016 – Present

Member, Environment Texas, 2008 – Present

Member, Association of Scientists of Indian Origin in America, 2009 – Present

Graduate Student Representative, Bioclub (UTSA), 2009 – 2010

Volunteer, National Social Service, India, 2004 – 2007