Stanford

Pritam Kumar Panda

Postdoctoral Scholar, Anesthesiology, Perioperative and Pain Medicine

Curriculum Vitae available Online

Bio

BIO

Dr. Pritam Kumar Panda is an accomplished bioinformatician and researcher specializing in drug design, molecular modeling, and AI-driven protein design. Originally from India and currently based in San Francisco, California, he holds a Ph.D. in Physics, specializing in Atomic, Molecular, and Condensed Matter Physics from Uppsala University in Sweden, where his research bridged quantum and biological phenomena, particularly in bio-inspired materials modeling. With a strong academic background that includes a Master of Science from Utkal University and a Master of Technology from D Y Patil University in India, Dr. Panda has honed his expertise in computational methods for drug design.

Throughout his career, Dr. Panda has held impactful roles in bioinformatics at institutions such as the University Medical Center Freiburg in Breisgau, Germany (2017), Karolinska Institute, Sweden (2021), and the German Cancer Research Center (DKFZ), Heidelberg, Germany (2023). His work in these roles includes developing advanced NGS data analysis pipelines using R, Bash, and Python and integrating cloud computing (AWS) with Nextflow, Docker, Singularity, and Snakemake for workflow automation, markedly enhancing data processing efficiency. His expertise spans molecular modeling, drug design, biophysics, multiomics data management, and high-performance computing, with notable contributions to predictive models in clinical genomics and data visualization.

In addition to his institutional roles, Dr. Panda founded and led Nerdalytics (2021-2023), a bioinformatics consultancy serving the pharmaceutical industry. Under his leadership, the firm focused on delivering cutting-edge solutions in drug design and molecular modeling. One of his significant achievements during this time was securing a research grant from Colgate-Palmolive to develop a pipeline for combinatorial synergy-based drug design targeting photoaging and hyperpigmentation.

An advocate for education and knowledge sharing, Dr. Panda is a recognized Nextflow ambassador and a member of Sigma Xi. He actively contributes to the bioinformatics community through publications, mentoring, and creating instructional content on platforms like YouTube. His excellence in the field has been acknowledged through multiple awards and grants from institutions like the Karolinska Institute and Uppsala University. He has also been featured in The Global Indian series "Indians in Europe" for his contributions to science and technology.

Currently, Dr. Panda serves as a Postdoctoral Scholar in the Department of Anesthesiology, Perioperative, and Pain Medicine at Stanford University School of Medicine. His current research is centered on the development of novel, battlefield-ready anesthetics to reduce injury-associated trauma and improve combat casualty outcomes. His research combines AI-driven protein design with high-throughput virtual screening to accelerate drug discovery

and design safer anesthetic agents. His work also aims to unravel the poorly understood neural and molecular mechanisms of anesthesia, with the ultimate goal of creating drugs that are significantly safer than current options, enabling unmonitored use in battlefield conditions.

HONORS AND AWARDS

- Computer-Aided Drug Design (CADD) Research Grant, Colgate & Palmolive, New York, USA (2021)
- Uppsala University Innovation Grant, ABB Power Grids, Hitachi, Sweden (2022)
- IMM Strategic Interdisciplinary Collaboration Grant, Karolinska Institute (2022)

BOARDS, ADVISORY COMMITTEES, PROFESSIONAL ORGANIZATIONS

- Nextflow Ambassador, Seqera (2024 - present)
- SigmaXi Member, The Scientific Research Honor Society (2024 - present)

PROFESSIONAL EDUCATION

- Bachelor of Science, Utkal University, India , Bioinformatics (2012)
- Master of Science, Utkal University, India , Bioinformatics (2014)
- Master of Technology, D Y Patil University, India , Bioinformatics (2016)
- Doctor of Philosophy, Uppsala University, Sweden , Physics (Specialization in Atomic, Molecular and Condensed Matter Physics) (2023)

STANFORD ADVISORS

- Edward Bertaccini, Postdoctoral Faculty Sponsor

PATENTS

- Johan Frostegård MD, Shailesh Kumar Samal Ph.D., Pritam Kumar Panda Ph.D.. "Sweden Patent WO2023217787 (Patent Cooperation Treaty (PCT) COMPOSITION, METHODS AND USES FOR ANTI-VIRAL THERAPY", INFLAVONA AB, Nov 16, 2023

LINKS

- Google Scholar: https://scholar.google.com/citations?user=H2ggrzQAAAAJ&hl=en
- LinkedIn: https://www.linkedin.com/in/pritam-kumar-panda/
- GitHub: https://github.com/pritampanda15
- Portfolio: https://www.atomodyssey.com

Research & Scholarship

RESEARCH INTERESTS

- Brain and Learning Sciences
- Data Sciences
- Research Methods
- Technology and Education

CURRENT RESEARCH AND SCHOLARLY INTERESTS

Dr. Panda’s current research at Stanford University School of Medicine centers on the innovative design of anesthetics optimized for battlefield application. His work integrates advanced methodologies such as AI-driven protein design, molecular dynamics simulations, and computational drug design to identify and model potential anesthetic compounds with precision and efficacy.

Leveraging AI protein design, Dr. Panda uses deep learning algorithms to explore and predict structural variations in proteins that can enhance the effectiveness of anesthetic agents, focusing on stability and adaptability in extreme conditions. Molecular dynamics simulations play a crucial role in this process, allowing Dr. Panda to observe the interactions of candidate compounds at the atomic level and simulate their behavior under diverse physiological scenarios. This approach provides a predictive framework to refine anesthetic agents for resilience and quick action.

His research also incorporates Quantitative Structure-Activity Relationship (QSAR) modeling, which enables him to quantitatively link molecular properties to the compounds' pharmacodynamic and pharmacokinetic attributes. This comprehensive QSAR analysis aids in predicting the efficacy and safety of novel anesthetic agents, reducing the need for preliminary testing. By combining these computational techniques, Dr. Panda's work aims to accelerate the development of anesthetics that meet the unique demands of military and field medicine.

Publications

PUBLICATIONS

- **An ATM-AMPK-Wip1 feedback loop governing DNA-damage signaling and tumor stress responses.** *Cell death & disease*
  Gupta, S., Panda, P. K.
  2026

- **Clinical evolution, genetic landscape and trajectories of clonal hematopoiesis in SAMD9/SAMD9L syndromes.** *Nature medicine*
  Sahoo, S. S., Pastor, V. B., Goodings, C., Voss, R. K., Kozyra, E. J., Szvetnik, A., Noellke, P., Dworzak, M., Starý, J., Locatelli, F., Masetti, R., Schmugge, M., De Moerloose, et al
  2021; 27 (10): 1806-1817

- **Degradation of Alzheimer's Amyloid-β by a Catalytically Inactive Insulin-Degrading Enzyme.** *Journal of molecular biology*
  Sahoo, B. R., Panda, P. K., Liang, W., Tang, W. J., Ahuja, R., Ramamoorthy, A.
  2021; 433 (13): 166993

- **Structure-based drug designing and immunoinformatics approach for SARS-CoV-2.** *Science advances*
  Panda, P. K., Arul, M. N., Patel, P., Verma, S. K., Luo, W., Rubahn, H. G., Mishra, Y. K., Suar, M., Ahuja, R.
  2020; 6 (28): eabb8097

- **Investigation of the Factors That Dictate the Preferred Orientation of Lexitropsins in the Minor Groove of DNA.** *Journal of medicinal chemistry*
  Alniss, H. Y., Witzel, I. I., Semreen, M. H., Panda, P. K., Mishra, Y. K., Ahuja, R., Parkinson, J. A.
  2019; 62 (22): 10423-10440

- **Azacitidine is effective for targeting leukemia-initiating cells in juvenile myelomonocytic leukemia.** *Leukemia*
  Krombholz, C. F., Gallego-Villar, L., Sahoo, S. S., Panda, P. K., Wlodarski, M. W., Aumann, K., Hartmann, M., Lipka, D. B., Daskalakis, M., Plass, C., Niemeyer, C. M., Erlacher, M., Flotho, et al
  2019; 33 (7): 1805-1810

- **Monosomy 7 As the Initial Hit Followed By Sequential Acquisition of SETBP1 and ASXL1 Driver Mutations in Childhood Myelodysplastic Syndromes**
  Loyola, V., Panda, P., Sahoo, S., Szvetnik, E., Kozyra, E. J., Voss, R. K., Lebrecht, D., Wehrle, J., Erlacher, M., Stary, J., Flotho, C., Goehring, G., Schlegelberger, et al
  AMER SOC HEMATOLOGY.2018

- **SAMD9 and SAMD9L Germline Disorders in Patients Enrolled in Studies of the European Working Group of MDS in Childhood (EWOG-MDS): Prevalence, Outcome, Phenotype and Functional Characterisation**
  Sahoo, S., Loyola, V., Panda, P., Szvetnik, E., Kozyra, E. J., Voss, R. K., Lebrecht, D., Barzilai, S., Buchner, J., Catala, A., De Moerloose, B., Dworzak, M., Fabri, et al
  AMER SOC HEMATOLOGY.2018

- **A novel professional-use synergistic peel technology to reduce visible hyperpigmentation on face: Clinical evidence and mechanistic understanding by computational biology and optical biopsy.** *Experimental dermatology*
  Bhardwaj, V., Handler, M. Z., Mao, J., Azadegan, C., Panda, P. K., Breunig, H. G., Wenskus, I., Diaz, I., König, K.

2024; 33 (4): e15069

- **Network analysis of chromophore binding site in LOV domain.** *Computers in biology and medicine*
  Panda, R., Panda, P. K., Krishnamoorthy, J., Kar, R. K.
  2023; 161: 106996
- **Nanocarrier vaccine therapeutics for global infectious and chronic diseases** *MATERIALS TODAY*
  Simnani, F., Singh, D., Patel, P., Choudhury, A., Sinha, A., Nandi, A., Samal, S., Verma, S. K., Panda, P.
  2023; 66: 371-408
- **Putative targeting by BX795 causes decrease in protein kinase C protein levels and inhibition of HSV1 infection.** *Antiviral research*
  Suryawanshi, R. K., Patil, C. D., Wu, D., Panda, P. K., Singh, S. K., Volety, I., Ahuja, R., Mishra, Y. K., Shukla, D.
  2022; 208: 105454
- **Phage delivered CRISPR-Cas system to combat multidrug-resistant pathogens in gut microbiome.** *Biomedicine & pharmacotherapy = Biomedecine & pharmacotherapie*
  Nath, A., Bhattacharjee, R., Nandi, A., Sinha, A., Kar, S., Manoharan, N., Mitra, S., Mojumdar, A., Panda, P. K., Patro, S., Dutt, A., Ahuja, R., Verma, et al
  2022; 151: 113122
- **Antibodies Against Phosphorylcholine Among 60-Year-Olds: Clinical Role and Simulated Interactions.** *Frontiers in cardiovascular medicine*
  Samal, S. K., Panda, P. K., Vikström, M., Leander, K., de Faire, U., Ahuja, R., Frostegård, J.
  2022; 9: 809007
- **Nanocarrier cancer therapeutics with functional stimuli-responsive mechanisms.** *Journal of nanobiotechnology*
  Kaushik, N., Borkar, S. B., Nandanwar, S. K., Panda, P. K., Choi, E. H., Kaushik, N. K.
  2022; 20 (1): 152
- **Dynamical modeling of miR-34a, miR-449a, and miR-16 reveals numerous DDR signaling pathways regulating senescence, autophagy, and apoptosis in HeLa cells.** *Scientific reports*
  Gupta, S., Panda, P. K., Hashimoto, R. F., Samal, S. K., Mishra, S., Verma, S. K., Mishra, Y. K., Ahuja, R.
  2022; 12 (1): 4911
- **The Hha-TomB toxin-antitoxin module in Salmonella enterica serovar Typhimurium limits its intracellular survival profile and regulates host immune response.** *Cell biology and toxicology*
  Paul, P., Patel, P., Verma, S. K., Mishra, P., Sahu, B. R., Panda, P. K., Kushwaha, G. S., Senapati, S., Misra, N., Suar, M.
  2022; 38 (1): 111-127
- **Plasmodium falciparum HSP40 protein eCiJp traffics to the erythrocyte cytoskeleton and interacts with the human HSP70 chaperone HSPA1.** *FEBS letters*
  Sahu, W., Bai, T., Panda, P. K., Mazumder, A., Das, A., Ojha, D. K., Verma, S. K., Elangovan, S., Reddy, K. S.
  2022; 596 (1): 95-111
- **Molecular nanoinformatics approach assessing the biocompatibility of biogenic silver nanoparticles with channelized intrinsic steatosis and apoptosis** *GREEN CHEMISTRY*
  Panda, P., Kumari, P., Patel, P., Samal, S., Mishra, S., Tambuwala, M. M., Dutt, A., Hilscherova, K., Mishra, Y., Varma, R. S., Suar, M., Ahuja, R., Verma, et al
  2022; 24 (3): 1190-1210
- **Publisher Correction: Clinical evolution, genetic landscape and trajectories of clonal hematopoiesis in SAMD9/SAMD9L syndromes.** *Nature medicine*
  Sahoo, S. S., Pastor, V. B., Goodings, C., Voss, R. K., Kozyra, E. J., Szvetnik, A., Noellke, P., Dworzak, M., Starý, J., Locatelli, F., Masetti, R., Schmugge, M., De Moerloose, et al
  2021; 27 (12): 2248
- **Autoimmunity roots of the thrombotic events after COVID-19 vaccination.** *Autoimmunity reviews*
  Elrashdy, F., Tambuwala, M. M., Hassan, S. S., Adadi, P., Seyran, M., Abd El-Aziz, T. M., Rezaei, N., Lal, A., Aljabali, A. A., Kandimalla, R., Bazan, N. G., Azad, G. K., Sherchan, et al
  2021; 20 (11): 102941
- **Bio-acceptable 0D and 1D ZnO nanostructures for cancer diagnostics and treatment** *MATERIALS TODAY*

Ortiz-Casas, B., Galdamez-Martinez, A., Gutierrez-Flores, J., Baca Ibanez, A., Panda, P., Santana, G., Astudillo de la Vega, H., Suar, M., Gutierrez Rodelo, C., Kaushik, A., Mishra, Y., Dutt, A.
2021; 50: 533-569

- **The mechanism behind flaring/triggering of autoimmunity disorders associated with COVID-19.** *Autoimmunity reviews*
  Redwan, E. M., Alghamdi, M. F., El-Aziz, T. M., Adadi, P., Aljabali, A. A., Attrish, D., Azad, G. K., Baetas-da-Cruz, W., Barh, D., Bazan, N. G., Brufsky, A. M., Chauhan, G., Hassan, et al
  2021; 20 (10): 102909

- **Effects of Atorvastatin on T-Cell Activation and Apoptosis in Systemic Lupus Erythematosus and Novel Simulated Interactions With C-Reactive Protein and Interleukin 6.** *ACR open rheumatology*
  Sun, J., Kumar Panda, P., Kumar Samal, S., Ahuja, R., Ajeganova, S., Hafström, I., Liu, A., Frostegård, J.
  2021; 3 (9): 642-653

- **A unique view of SARS-CoV-2 through the lens of ORF8 protein.** *Computers in biology and medicine*
  Hassan, S. S., Aljabali, A. A., Panda, P. K., Ghosh, S., Attrish, D., Choudhury, P. P., Seyran, M., Pizzol, D., Adadi, P., Abd El-Aziz, T. M., Soares, A., Kandimalla, R., Lundstrom, et al
  2021; 133: 104380

- **Molecules versus Nanoparticles: Identifying a Reactive Molecular Intermediate in the Synthesis of Ternary Coinage Metal Chalcogenides** *INORGANIC CHEMISTRY*
  Gahlot, S., Jeanneau, E., Singh, D., Panda, P., Mishra, Y., Ahuja, R., Ledoux, G., Mishra, S.
  2020; 59 (11): 7727-7738

- **Green synthesized MgO nanoparticles infer biocompatibility by reducing in vivo molecular nanotoxicity in embryonic zebrafish through arginine interaction elicited apoptosis.** *The Science of the total environment*
  Verma, S. K., Nisha, K., Panda, P. K., Patel, P., Kumari, P., Mallick, M. A., Sarkar, B., Das, B.
  2020; 713: 136521

- **Landscape of ROD9 Island: Functional annotations and biological network of hypothetical proteins in Salmonella enterica.** *Computational biology and chemistry*
  Soni, N., Swain, S. K., Kant, R., Singh, A., Ravichandran, R., Verma, S. K., Panda, P. K., Suar, M.
  2019; 83: 107110

- **Molecular insight to influential role of Hha-TomB toxin-antitoxin system for antibacterial activity of biogenic silver nanoparticles.** *Artificial cells, nanomedicine, and biotechnology*
  Paul, P., Verma, S., Kumar Panda, P., Jaiswal, S., Sahu, B. R., Suar, M.
  2018; 46 (sup3): S572-S584

- **Structural discordance in HIV-1 Vpu from brain isolate alarms amyloid fibril forming behavior- a computational perspective.** *Journal of theoretical biology*
  Sneha, P., Panda, P. K., Gharemirshamlu, F. R., Bamdad, K., Balaji, S.
  2018; 451: 35-45

- **Molecular aspects of core-shell intrinsic defect induced enhanced antibacterial activity of ZnO nanocrystals.** *Nanomedicine (London, England)*
  Verma, S. K., Jha, E., Panda, P. K., Das, J. K., Thirumurugan, A., Suar, M., Parashar, S.
  2018; 13 (1): 43-68

- **Genetics of PCOS: A systematic bioinformatics approach to unveil the proteins responsible for PCOS.** *Genomics data*
  Panda, P. K., Rane, R., Ravichandran, R., Singh, S., Panchal, H.
  2016; 8: 52-60

- **Mutation-based structural modification and dynamics study of amyloid beta peptide (1-42): An in-silico-based analysis to cognize the mechanism of aggregation.** *Genomics data*
  Panda, P. K., Patil, A. S., Patel, P., Panchal, H.
  2016; 7: 189-94