Pranav Joshi

Fort Worth, TX | 216-702-9499 | Pranav.mtn@gmail.com | LinkedIn | Publications

Education

Ph.D. in Applied Biomedical Engineering
Cleveland State University, Cleveland, OH — 2019
Specialization: Developmental Neurotoxicity, Organoid Culture, High-Throughput Screening

B.E. in Electronics Engineering (Biomedical Instrumentation)
Tribhuvan University, Kathmandu, Nepal — 2009

Professional Experience

Senior Scientist, Product Development Manager

Bioprinting Laboratories Inc. | Dallas, TX / Cleveland, OH | July 2020 - Current

- Directed commercialization of 36/144/384PillarPlate and PerfusionPlate for high-throughput 3D cell and organoid culture and launched 6 commercial organoid culture products (36/144/384PillarPlate, PerfusionPlate) for HTS applications
- Applied Lean Startup methodology to reduce R&D costs by 25% and increase throughput and reproducibility by 40%
- Designed 3D assay platforms for high-throughput evaluation of therapeutic drugs, environmental chemicals, and consumer product formulations using fluorescent & luminescent viability readouts.
- Created and validated ATP-based microbial viability assays for assessing antimicrobial compound efficacy and release kinetics.
- Led multi-phase development of a novel high-throughput antimicrobial preservative efficacy test (APET) benchmarked to USP <51>.
- Authored technical documentation, regulatory-aligned SOPs, and preclinical validation protocols for cross-functional teams.
- Led multiple NIH SBIR and industrially funded projects focused on organoid-based high-throughput drug screening and disease modeling platforms.
- Supervised 5 scientists and technicians, and collaborated with global biotech partners for the development and validation of pillar and perfusion plates for drug screening and disease modeling.
- Managed quality control and regulatory documentation aligned with ISO 13485, ISO 10993 and FDA 21 CFR 820.
- Published 6 peer-reviewed research articles and 3 book chapters articles.

Postdoctoral Scientist

Bioprinting Laboratories Inc. | Cleveland, OH | May 2019 – June 2020

- Developed co-culture models of neural stem cells and liver spheroids to assess metabolism-mediated neurotoxicity.
- Standardized assay-ready formats of brain organoids in 384PillarPlate for neurotoxicity screening.
- Led AET validation for fresh and aged detergent samples, achieving reproducible log-reduction values and demonstrating preservative stability over time.
- Mentored and supervised 3 PhD students, 4 undergrads in both research and maintaining safe lab practices.
- Published 1 peer-reviewed research article and 1 book chapter.

Research Associate (PhD Research)

Bioprinting Labs, Cleveland State University | Cleveland, OH | Jan 2014 – April 2019

- Conducted NIH R01-funded research on establishing high-throughput 3D-cultured neural stem cell model for the screening of developmental neurotoxicity.
- Engineered dual-reporter lentiviral biosensor assays and implemented high-content imaging SOPs.
- Managed RNA-seq-based ion channel and transporter profiling for pharmacological testing of neurotoxic drugs.
- Developed hydrogel-based 3D co-culture systems for metabolism-mediated neurotoxicity and drug interaction screening.
- Published 4 peer-reviewed research articles, 6 book chapters, and 2 review articles.

Entrepreneurial Scientific Lead

I-Corps @ Ohio MedTech Program | Columbus, OH | Apr 2017 – July 2017

- Conducted customer discovery interviews with >50 stakeholders to understand the need and market for 3D HTS products for drug screening and disease modeling.
- Delivered commercialization strategy and secured follow-on funding from TVSF Phase II.
- Implemented key business modeling concepts, including problem-solution fit, customer/market segments, value propositions, channels, and revenue streams.
- Assessed core assumptions by developing and testing hypotheses about each critical aspect of the total commercial opportunity

Medical Device Service Engineer

Arya Surgical Pvt. Ltd. | Kathmandu, Nepal | Aug 2010 – Dec 2012

- Installed, maintained, and trained hospital staff on diagnostic imaging and monitoring systems.
- Supported pre-sales technical demonstrations and post-sales service for critical care devices.

Teaching Experience

Co-Instructor

Course: Three-Dimensional (3D) Bioprinting and Pharmaceutical Assay Development

Department of Biomedical Engineering, University of North Texas | 2022 - 2025

- Created teaching materials on the topic of cell staining, image acquisition, image processing, and data analysis.
- Shared teaching responsibilities with the main instructor for 30 graduate students.
- Gave lab demonstration on cell staining, image acquisition, image processing, and data analysis.

Teaching Assistant

Department of Chemical and Biomedical Engineering, Cleveland State University | 2014 – 2015

- Assisted undergraduates in understanding the concepts of their respective courses by answering questions as well as proctoring exams and grading homework on a weekly basis
- TA courses: Pharmaceutical assay development, 3D Bioprinting, Matlab
- Graded weekly assignments, exams, and quizzes
- Provided students with one-on-one tutoring both in-class and out-of-class assistance

Grants & Funding

- **PI**, NIH SBIR Phase I (R43 ES035653): *Gene-Edited Liver Organoids for Predictive Hepatotoxicity*, 2023–2024

- **PI**, NIH SBIR Phase II (R44 TR003491): *Pillar and Perfusion Well Plate Platforms for Organoid Culture*, 2020–2023
- **PI**, Colgate-Palmolive: *Development of High-Throughput AET on 384PillarPlates*, 2019–2022
- **PI**, MBD Korea: *Dynamic Culture of Cancer Organoids for Anti-Cancer Drug Screening*, 2022–2023

Projects Overview

NIH-Funded Projects

Gene-Edited Liver Organoids for Predictive Hepatotoxicity

- *Funding Agency:* NIH/NIEHS (R43 ES035653), 2023–2024
- *Role:* Principal Investigator (PI)
- *Objective:* Develop genetically engineered liver organoids on the pillar/perfusion plate for metabolism-based hepatotoxicity testing.
- *Outcome:* Integration of gene-editing techniques with dynamic 3D culture systems; supports high-throughput DILI screening for safer therapeutics.

Pillar and Perfusion Well Plate Platforms for Organoid Culture

- *Funding Agency:* NIH/NCATS (R44 TR003491), 2020–2023
- *Role:* Principal Investigator (PI)
- *Objective:* Develop and validate 36/144/384PillarPlate formats and complementary perfusion plates for scalable, reproducible organoid generation.
- *Technologies Developed:* Microarray 3D bioprinting, cryopreservation, and assay-ready cerebral and hepatic organoids.
- *Publications:* Zolfaghar et al., ACS Biomater Sci Eng (2024); Acharya et al., Biofabrication (2024).
- *Impact:* Foundation for launching commercial plate formats; supports high-content imaging and automated screening.

Industry-Funded Contract Research Projects

Development of High-Throughput Antimicrobial Efficacy Testing on 384PillarPlate

- *Funding Organization:* Colgate-Palmolive, 2019–2022
- *Role:* Principal Investigator (PI)
- *Objective:* Create ATP-based on-chip AET on 384PillarPlate for rapid assessment of preservative efficacy in consumer products.
- *Technological Features:* Miniaturized agarose-based microbial encapsulation; luminescence-based readouts; benchmarking against traditional CFU methods.
- *Outcomes:* 98% sensitivity; 71% overall predictivity; validated across nine detergent formulations under fresh and aged conditions.

Dynamic Culture of Cancer Organoids for Predictive Screening of Anti-Cancer Drugs

- *Funding Organization:* MBD Korea, 2022–2023
- *Role:* Principal Investigator (PI)
- *Objective:* Optimize bioprinting protocols and perfusion culture of Hep3B liver tumor spheroids in the 144Pillar/PerfusionPlate system.
- *Publications:* Joshi et al., Biotechnol Bioeng (2025).
- *Impact:* Demonstrated enhanced drug diffusion and dynamic flow benefits; reduced IC_{50} of tamoxifen by >5-fold in dynamic vs static cultures.

FULL LIST OF PEER-REVIEWED PUBLICATIONS

- *A full bibliography can be found at NIH MyBibliography*

Certifications

- ICH Good Clinical Practice (GCP) Certification
- Good Design Practices for GMP Pharmaceutical Facilities
- Aha! Product Management Professional Certificate

Technical Skills

Organoid Engineering & 3D Cell Culture: Extensive experience with iPSC-derived organoids culture (liver, brain, intestine, tumor), co-cultures with immune cells (e.g., NK-92 + Hep3B), cryopreservation, bioprinting, and perfusion cultures.

Assay Development & Imaging: Skilled in high-content imaging, viability/cytotoxicity assays (e.g., CellTiter-Glo 3D), functional transporter/ion channel assays, luminescence-based antimicrobial testing, and quality control metrics (Z′, CV%).

Instrumentation & Prototyping: Proficient in automated liquid handling, microplate readers, bioreactors, and solid modeling of assay platforms (SolidWorks); familiar with FTIR, Raman, qPCR, ELISA.

Data Analysis & Bioinformatics: Experienced in statistical analysis software (GraphPad Prism, Minitab, R, Origin), RNA-seq data analysis, and image quantification workflows (ImageJ).

Digital & Workflow Tools: Power BI for reporting, Jira/Asana for project management, and strong command of Microsoft Office, Google Workspace, and Adobe tools.

Awards & Honors

- NIH SBIR Grant Awardee – $1M+ (2020–2024)
- Cellular & Molecular Medicine Fellowship – Cleveland Clinic (2017–2019)
- Graduate Leadership Award – Washkewicz College of Engineering (2018)
- Dissertation Research Award – Cleveland State University (2017)