Nisha Chaudhary

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AI scientist with a PhD in Computational Biology and expertise in digital pathology, deep learning, and cancer diagnostics. Experienced in developing explainable models for whole-slide imaging and integrating imaging data for precision oncology.

Education

Jamia Millia Islamia *New Delhi, IN*
PhD Computational Biology *Feb. 2025*
Advisor: Dr. Tanveer Ahmad

Jamia Millia Islamia *New Delhi, IN*
M.Sc. Bioinformatics *2015 - 2017*

Maharshi Dayanand University *Haryana, IN*
B.Sc. (Hons) Zoology *2012 - 2015*

Research Experience

MicroCRISPR Pvt. Ltd *New Delhi, IN*
Research & Development, AI ML Unit *2024-2025*
• Manager

Jamia Millia Islamia *New Delhi, IN*
Advisor: Dr. Tanveer Ahmad *2018-2024*
• Ph.D. Scholar
  Artificial intelligence based oral cancer diagnosis and prognosis using digital pathology images

Jamia Hamdard *New Delhi, IN*
Advisor: Dr. Mymoona Akhtar *2017 (six months)*
• Studentship, DBT-funded Bioinformatics Centre (BIC)
  Pharmacophore mapping of newly patented antimalarial agents and virtual screening of database(s) opt in newer antimalarial agents

Jamia Millia Islamia *New Delhi, IN*
Advisor: Dr. Mohammad Husain *2016 (one month)*
• Summer intern, Centre for Innovation and Entrepreneurship
  In-silico Designing of Anticancer Drug for MMPs family

Publications

* first author

- **Chaudhary N*,** Muddemanavar P, Singh DK, Rai A, Mishra D, Sowmya SV, Augustine J, Chandra A, Chaurasia A, Ahmad T. Dual-stage AI system for *Pathologist-Free Tumor Detection and subtyping in Oral Squamous Cell Carcinoma*. medRxiv. 2025 Jun 5; 2025.06.05.25329090.

- **Chaudhary N***, Rai A, Rao AM, Faizan MI, Augustine J, Chaurasia A, Mishra D, Chandra A, Chauhan V, Ahmad T. *High-resolution AI image dataset for diagnosing oral submucous fibrosis and squamous cell carcinoma*. Scientific Data. 2024 Sep 27;11(1):1050.

- Ansari MS*, Chauhan V, Singh A, Akhtar A, **Chaudhary N**, Tyagi R, Divya, et al. *AI-Guided CAR Designs and AKT3 Degradation Synergize to Enhance Bispecific and Trispecific CAR-T Cell Persistence and Overcome Antigen Escape*. bioRxiv. 2025 Jun 12; 2025.06.12.658477.

- Sagar S*, Faizan MI, **Chaudhary N**, Singh V, Singh P, Gheware A, Sharma K, Azmi I, Singh VP, Kharya G, Mabalirajan U. *Obesity impairs cardiolipin-dependent mitophagy and therapeutic intercellular mitochondrial transfer ability of mesenchymal stem cells*. Cell Death & Disease. 2023 May 13;14(5):324.

- Faizan MI*, Chaudhuri R, Sagar S, Albogami S, **Chaudhary N**, Azmi I, Akhtar A, Ali SM, Kumar R, Iqbal J, Joshi MC. *NSP4 and ORF9B of SARS-CoV-2 induce pro-inflammatory mitochondrial DNA release in inner membrane-derived vesicles*. Cells. 2022 Sep 23;11(19):2969.

- Ahmad T*, Vullhorst D, Chaudhuri R, Guardia CM, **Chaudhary N**, Karavanova I, Bonifacino JS, Buonanno A. *Transcytosis and trans-synaptic retention by postsynaptic ErbB4 underlie axonal accumulation of NRG3. Journal of Cell Biology*. 2022 May 17;221(7):e202110167.

- Azmi I*, Faizan MI, Kumar R, Raj Yadav S, **Chaudhary N**, Kumar Singh D, Butola R, Ganotra A, Datt Joshi G, Deep Jhingan G, Iqbal J. *A saliva-based RNA extraction-free workflow integrated with Cas13a for SARS-CoV-2 detection. Frontiers in cellular and infection microbiology*. 2021 Mar 16;11:632646.

- Sagar S*, Kapoor H, **Chaudhary N**, Roy SS. *Cellular and mitochondrial calcium communication in obstructive lung disorders.* Mitochondrion. 2021 May 1;58:184-99.

Patents

- Ahmad T, **Chaudhary N**. An artificial intelligence-based system for prognosis and stage-specific diagnosis of oral cancer. ***Provisional Indian Patent 202211005720***. February 2022.
- **Chaudhary N**, Ahmad T, Chaurasia A, Rai A, Mishra D. System and method for genomic markers and digital pathology image-based prediction of oral malignant disorders. ***GOI Indian Patent No. 556810***. December 2024.

Selected presentations

- **Grade-level classification of oral squamous cell carcinoma (OSCC) from digital pathology using ensemble deep learning algorithms.** Oral presentation, 15th RECOMB satellite workshop in Computational Cancer Biology, Istanbul, Turkey (2023)
- **An artificial intelligence based oral cancer diagnosis system.** Poster presentation, The role of AI in transforming healthcare, Jointly organized by THSTI-Faridabad and Oxford University, UK (2022)
- **Histology image based diagnostic tool for Oral Submucous Fibrosis (OSMF).** Oral presentation, BIOPHYSIKA, Jamia Millia Islamia, New Delhi, India (2019)

Skills

Technical Skills

- **Deep Learning & AI**: Proficient in designing and implementing CNNs, RNNs, attention-based MIL models, and GANs for medical image analysis and classification tasks.
- **Frameworks & Libraries:** Extensive experience with PyTorch, TensorFlow, and Keras; skilled in building, training, and deploying scalable deep learning pipelines.
- **Image Processing:** Specialized in digital pathology image analysis — including preprocessing, patch extraction, augmentation, and feature extraction using tools like OpenSlide and OpenCV.
- **Programming**: Python (primary), R; experienced in shell scripting for workflow automation.

- **Spatial & Omics Tools:** Familiar with single-cell and spatial transcriptomics analysis using Scanpy, Squidpy, and AnnData.
- **Visualization & Analysis:** Proficient in pandas, NumPy, Matplotlib, Seaborn for statistical analysis and data visualization; experience with UMAP, t-SNE, ROC/PR plots.
- **Reproducibility & HPC:** Experience with high-performance computing environments; currently learning Snakemake for workflow management and reproducible ML pipelines.
- **Software & Platforms:** Fiji/ImageJ, QuPath, Visual Studio Code, Pathomation.

Research Skills
- **Experimental Design and Literature Review:** Skilled in hypothesis formulation, cohort design, and critical review of interdisciplinary literature in computational pathology and AI for biomedical imaging.
- **Data Collection and Management:** Experience in large-scale WSI curation, patch-level dataset creation, image annotation coordination, and metadata integration across multi-institutional cohorts
- **Publication, Presentation, and Grant Writing:** Proficient in preparing high-impact manuscripts, grant applications, and patent documentation; experienced in oral/poster presentations at international conferences.

Soft Skills
- **Critical Thinking:** Strong analytical approach to designing AI models and interpreting clinical imaging data; skilled in troubleshooting deep learning pipelines and optimizing for real-world variability.
- **Teamwork and Collaboration:** Collaboration: Experienced in working across interdisciplinary teams with pathologists, and computational scientists in both academic and multi-institutional research settings.
- **Leadership:** Successfully led data curation and model development phases in high-impact research projects; mentored junior researchers in code organization, debugging, and experiment planning.

References

1. **Dr. Tanveer Ahmad**
   Assistant Professor
   Multidisciplinary Centre for Advanced Research & Studies (MCARS),
   Jamia Millia Islamia, New Delhi, India.
   Email: tahmad7@jmi.ac.in
2. **Dr. Akhilanand Chaurasia**
   Associate Professor, Oral Medicine and Radiology,
   King George's Medical University (KGMU)
   Lucknow, India.
   Email: chaurasiaakhilanand49@gmail.com
3. **Dr. Anurag Agarwal**
   Dean, Biosciences and Health Research
   Trivedi School of Biosciences, Ashoka University
   Head, Koita Centre for Digital Health, India.
   Email: anurag.agrawal@ashoka.edu.in