

Deepali L. Kundnani

I work at the intersection of **biology**, **statistics**, and **computation** with **Dr. Francesca Storici** as a Bioinformatics Ph.D. Graduate Research Assistant in the Storici Lab at Georgia Institute of Technology. My research has a strong application focus on the field of genomics and epigenomics with the goal to delineate presence of ribonucleotides(constructs of RNA) in human genomic DNA in both cancer and non-cancer cell types.

Through my work in The Storici Lab, I have recently developed an R **package** and **received US National Science Foundation Conference Award** for a **poster presentation** in RNA Society 2021

Before coming to Georgia Tech, I have been fortunate to work with amazing doctors and scientists at Hanash Lab in **MD Anderson Cancer Center** and have been a part of incredible effort in diagnostics of **Lung Cancer Risk Assessment Biomarkers**.



Education

Ph.D.	Bioinformatics – GPA 4.00/4.00 Georgia Institute of Technology Atlanta, GA – USA	Aug 2019 – Present
M.S.	Molecular Biotechnology – GPA 3.88/4.00 University of Houston – Clear Lake Houston, TX – USA	Aug 2013 – May 2015
B.E.	Biotechnology University of Mumbai Mumbai, India	Aug 2008 – May 2012

Honors and Awards

- US National Science Foundation Conference Award** 2021
Awarded for Poster presented on “The Expression Correlation and Copy Number Alteration(CNA) Prevalence of Human RNASEH2A in cancer supports a role for RNASEH2A in cancer proliferation.”
The 26th Annual Meeting of the RNA Society - RNA 2021.
- Jones NAS Biological Sciences Scholarship** 2014-2015
Merit based scholarship for students in Biological Sciences department
University of Houston, Clear-Lake, TX, USA
- Third Prize in National level Technical Paper Presentation** 2012
Prize awarded for presentation on “Genetic Algorithms” by Institute of Electrical and Electronics Engineers (IEEE) committee
University of Mumbai, India

Research Projects

- Studying ribonucleotide incorporation in *S. cerevisiae* containing Aicardi-Goutières syndrome (AGS) causing mutants in RNASEH2A/C orthologous gene** 2022-present
Graduate Research Assistant, Storici Lab, Georgia Institute of Technology, USA
 - Finding the effect of different AGS mutants on rNMP incorporation rates in nuclear and mitochondrial genome
 - Statistical testing to find differentially incorporated regions in the WT vs mutant cell lines
 - Finding differences in genomic content preference upstream and downstream of ribonucleotide incorporation.
- Studying ribonucleotide incorporation in human non- cancer and cancer cell type** 2021-present
Graduate Research Assistant, Storici Lab, Georgia Institute of Technology, USA
 - Mapping ribonucleotides on the human genome in various annotated regions of the human genome to study functional role/association of ribonucleotide incorporation.
 - Using probability distribution models to filter highly incorporated locations (hotspots) in the human cell lines/types.
 - Finding DNA sequence motifs or patterns of near the site of ribonucleotide incorporation.
- Understanding association of RNASEH2A gene in cancer** 2020-2021
Graduate Research Assistant, Storici Lab, Georgia Institute of Technology, USA
 - Expression correlation of RNASEH2A with cancer proliferation and cell cycle markers in large cancer cell lines and tissue datasets.
 - Copy number alteration prevalence of RNASEH2A gene in different cancers from The Cancer Genome Atlas (TCGA)-Pan Cancer Dataset.

- Discovery and validation of protein biomarkers (Diagnostic/Therapeutic) in cancer** 2015-2019
Research Assistant, Hanash Lab, M.D. Anderson Cancer Research Center, USA
- Utilizing Genomic and expression data to validate proteomic findings in various cancers cell lines.
 - Investigating splice variants to find novel antigens in cancer.
 - Validation of Protein Biomarker Panel for Early Detection of Lung and Pancreatic Cancer.
 - Development of auto-antibody test for Lung and Breast Cancer detection.
- 2015
- Development of Enzyme linked Immuno Assay kits for proteins used in diagnosis of various diseases.**
 Lab Technician, Ansh Labs, USA
- Antibody production for novel diagnostic ELISA kits.
 - Production of highly sensitive antigens in mammalian cell lines.
- Screening human lung cDNA library from Asthma patients for protein interaction with inducible Nitrous Oxide Synthase** 2014
 Independent student, Bazlur Lab, University of Houston – Clear Lake, USA
- Employed a yeast two-hybrid system to detect protein interaction between iNOS (Inducible Nitrous Oxide Synthetase) and human lung cDNA libraries from Asthma patients, followed by sequencing and identification of genes
- Creating and testing vectors for high and efficient production of monoclonal Antibodies in the mammalian cells lines** 2012-2013
 Research Assistant, Usha Biotech, India
- Testing of a various proprietary vector (including patented CELL EXPRESS - 100™ system) using eGFP reporter gene on CHO-K1 cell line.
- Assessment of Stem Cell Therapy and Analogous Wound Care Techniques for diabetic foot complications in reference to the standard therapy** 2011-2012
 Trainee, S.L.Raheja Hospital, Mumbai, India (B.E. Thesis)
- Track clinical trial from patient inclusion, consent to final day follow up of treatments.
 - Built statistical analysis to evaluate therapy/drug effectivity.

Publications

Journal Publications

Kundnani, D., & Storici, F. (2021). **FeatureCorr: An R package to study feature correlations aided with data transformation for sequencing and microarray data.** *Software Impacts*, 10, 100144. [🔗](#)

 PDF  REVIEW  CODE

Marsili, S., Tichon, A., Kundnani, D., & Storici, F. (2021). **Gene co-expression analysis of human *rnaseh2a* reveals functional networks associated with dna replication, dna damage response, and cell cycle regulation.** *Biology*, 10(3), 221. [🔗](#)

 PDF  REVIEW

Ostrin, E. J., Bantis, L. E., Wilson, D. O., Patel, N., Wang, R., Kundnani, D., Adams-Haduch, J., Dennison, J. B., Fahrmann, J. F., Chiu, H. T., Gazdar, A., Feng, Z., Yuan, J. M., & Hanash, S. M. (2021). **Contribution of a Blood-Based Protein Biomarker Panel to the Classification of Indeterminate Pulmonary Nodules.** *Journal of Thoracic Oncology*, 16(2), 228–236. [🔗](#)

 IMPACT

Kobayashi, M., Katayama, H., Irajizad, E., Vykoukal, J. V., Fahrmann, J. F., Kundnani, D. L., Yu, C.-Y., Cai, Y., Hsiao, F. C., Yang, W.-L., Lu, Z., Celestino, J., Long, J. P., Do, K.-A., Lu, K. H., Ladd, J. J., Urban, N., Bast Jr., R. C., & Hanash, S. M. (2020). **Proteome Profiling Uncovers an Autoimmune Response Signature That Reflects Ovarian Cancer Pathogenesis.** *Cancers*, 12(2), 485. [🔗](#)

 PDF

Subbalakshmi, A. R., Kundnani, D., Biswas, K., Ghosh, A., Hanash, S. M., Tripathi, S. C., & Jolly, M. K. (2020). **NFATc Acts as a Non-Canonical Phenotypic Stability Factor for a Hybrid Epithelial/Mesenchymal Phenotype.** *Frontiers in Oncology*, 10, 1794. [🔗](#)

 PDF  IMPACT

Capello, M., Fahrmann, J. F., Rios Perez, M. V., Vykoukal, J. V., Irajizad, E., Tripathi, S. C., Roife, D., Bantis, L. E., Kang, Y., Kundnani, D. L., Xu, H., Prakash, L. R., Long, J. P., Katayama, H., Fleury, A., Ferri-Borgogno, S., Baluya, D. L., Dennison, J. B., Aguilar-Bonavides, C., ... Hanash, S. M. (2020). **CES2 Expression in Pancreatic Adenocarcinoma Is Predictive of Response to Irinotecan and Is Associated With Type 2 Diabetes.** *JCO Precision Oncology*, 4, 426–436. [🔗](#)

 PDF

Jia, D., George, J. T., Tripathi, S. C., Kundnani, D. L., Lu, M., Hanash, S. M., Onuchic, J. N., Jolly, M. K., & Levine, H. (2019). **Testing the gene expression classification of the EMT spectrum.** *Physical Biology*, 16(2), 025002. [🔗](#)

 PDF  IMPACT

Capello, M., Vykoukal, J. V., Katayama, H., Bantis, L. E., Wang, H., Kundnani, D. L., Aguilar-Bonavides, C., Aguilar, M., Tripathi, S. C., Dhillon, D. S., Momin, A. A., Peters, H., Katz, M. H., Alvarez, H., Bernard, V., Ferri-Borgogno, S., Brand, R., Adler, D. G., Firpo, M. A., ... Hanash, S. M. (2019). **Exosomes harbor B cell targets in pancreatic adenocarcinoma and exert decoy function against complement-mediated cytotoxicity.** *Nature Communications*, 10(1), 1–13. [🔗](#)

 PDF  REVIEW

Fahrman, J. F., Bantis, L. E., Capello, M., Scelo, G., Dennison, J. B., Patel, N., Murage, E., Vykoukal, J., Kundnani, D. L., Foretova, L., Fabianova, E., Holcatova, I., Janout, V., Feng, Z., Yip-Schneider, M., Zhang, J., Brand, R., Taguchi, A., Maitra, A., ... Hanash, S. (2019). **A Plasma-Derived Protein-Metabolite Multiplexed Panel for Early-Stage Pancreatic Cancer.** *JNCI: Journal of the National Cancer Institute*, 111(4), 372–379. [🔗](#)

 PDF  NEWS

Guida, F., Sun, N., Bantis, L. E., Muller, D. C., Li, P., Taguchi, A., Dhillon, D., Kundnani, D. L., Patel, N. J., Yan, Q., Byrnes, G., Moons, K. G. M., Tjønneland, A., Panico, S., Agnoli, C., Vineis, P., Palli, D., Bueno-De-Mesquita, B., Peeters, P. H., ... Hanash, S. M. (2018). **Assessment of Lung Cancer Risk on the Basis of a Biomarker Panel of Circulating Proteins.** *JAMA Oncology*, 4(10), 182078. [🔗](#)

 NEWS

Capello, M., Bantis, L. E., Scelo, G., Zhao, Y., Li, P., Dhillon, D. S., Patel, N. J., Kundnani, D. L., Wang, H., Abbruzzese, J. L., Maitra, A., Tempero, M. A., Brand, R., Brennan, L., Feng, E., Taguchi, I., Janout, V., Firpo, M. A., Mulvihill, S. J., ... Hanash, S. M. (2017). **Sequential Validation of Blood-Based Protein Biomarker Candidates for Early-Stage Pancreatic Cancer.** *Journal of the National Cancer Institute*, 109(4), djw266. [🔗](#)

 PDF  NEWS

Conference Papers

Makoto Kobayashi, Katayama, H., Xu, H., Vykoukal, J. V, Fahrman, J. F., Kundnani, D. L., Wang, H., Celestino, J., Liu, J., Lu, K. H., & Hanash, S. M. (2019). **In-depth proteomics profiling of ovarian cancer ascites-derived tumor cells for therapeutic target discovery.** , JPrOS JES 2019.


 PDF

Web Posts

Kundnani, D., Thomas, S., Ulukaya, G. B., Kesar, D., Feldman, J., & Duan, J. (Nicole). (2019). **Differential gene expression in lung cancer cell lines between wildtype and mutant/variant p53.** *Biology Computes / Genomics and Bioinformatics at Georgia Tech.* [🌐](#)


Kesar, D., Kundnani, D., Feldman, J., Thomas, S. T., Ulukaya, G. B., & Duan, J. (Nicole). (2019). **Exome Analysis of Utah Resident with Northern and Western European Ancestry.** *Biology Computes / Genomics and Bioinformatics at Georgia Tech.* [🌐](#)

Presentations and Lectures

Oral Presentations

Deepali L. Kundnani, Tae Yang, Alli Gombolay, Havva Keskin, and Francesca Storici, **Effect of AGS-orthologous mutations on ribonucleotide incorporation rates and patterns in *Saccharomyces cerevisiae***, RNase H 2022 conference, Chesapeake Bay, Maryland-USA

Kundnani, D. L., Marsili, S., Tichon, A., & Storici, F. (2022) **Expression correlation of RNASEH2A in cancer datasets confirms its association with cancer proliferation and specific cell cycle markers**, Global Virtual Congress on Cancer research & Drug Development - Cancer Research 2022

Kundnani D. L., Railkar S., **Genetic Algorithms**, National Technical Paper Presentation, Institute of Electrical and Electronics Engineers - Engineering in Medicine & Biology Society (IEEE-EMBS), Mumbai - India, 2011  **Won Third Prize**

Poster Presentation

Kundnani, D. L., Marsili, S., Tichon, A., & Storici, F. (2021). Expression Correlation and Copy Number Alteration (CNA) Prevalence of Human RNASEH2A in cancer supports a role for RNASEH2A in cancer proliferation. The 26th Annual Meeting of the RNA Society - RNA 2021.

  **PDF**  **Received NSF Conference AWARD**

Lectures / Workshops

Data Preprocessing and Dimensionality reduction in Biomedical and Clinical settings, Biostatistics, Georgia Institute of Technology, 2020

DNA sequencing and Phylogenetic Analysis, Genetics Lab, Georgia Institute of Technology, 2019

Time Management, Thadomal Shahani Engineering College, Mumbai - India, 2010

Water Purification Systems, BIOZEAL, Mumbai - India, 2009.

Teaching Experience

Course	Position/Title	Institute	Semester
Biostatistics (APPH-6225)	Teaching Assistant	Georgia Institute of Technology, USA	Summer 2020
Scientific Foundations of Health (APPH 1040)	Teaching Assistant	Georgia Institute of Technology, USA	Spring 2020
Genetics Lab (BIOL-2345)	Teaching Assistant	Georgia Institute of Technology, USA	Fall 2019
Applied Biotechnology (BIOT 5031)	Teaching Assistant	University of Houston – Clear Lake, USA	Fall 2014
Mammalian Cell Culture Techniques	Teaching Assistant	Usha Biotech, India	Spring 2013

Mentoring Experience

Research mentor for 2 B.S. Biology students – Georgia Tech 2022-present
(Perna Kokil and Yashas Appaji)
Both mentees were trained in running Bioinformatics tools on Linux servers and code for customized scripts in R and python

Research mentor for 2 M.S. Bioinformatics Students – Georgia Tech 2021-present
(Ashlesha Gogate & Kirti Chhatlani)
Both mentees were trained on use of linux servers, use of bioinformatics tools and coding custom scripts. Both accomplished finding new results in undiscovered research areas and are currently aiding in publication support.



Both mentees have been awarded Graduate Research assistantship for their work.

Professional Training

ISO 9001:2008 Rules and Regulations, Ansh Labs, USA	2015
Mammalian Cell Culture and Molecular Cloning Techniques, Usha Biotech, India	2012
Applications of Immunology in Health and Medicine, Haffkine Institute, India	2011
Workings of Clinical Research, Institute of Clinical Research, India	2010

Professional Affiliations

Institute of Electrical and Electronics Engineers – Engineering in Medicine & Biology Society(IEEE-EMBS), member	2021-Present
RNA Society, member	2021-Present
American Association for the Advancement of Science (AAAS), member	2020-Present
International Society for Computational Biology (ISMB) , member	2019-Present
Association for Women in Science, Gulf Coast Houston (AWIS-GCH), member	2014-2019
Institute of Electrical and Electronics Engineers – Engineering in Medicine & Biology Society(IEEE-EMBS), member	2009-2010

Professional Service

Founding Student Member of GeorgiaTech' s Appleton's Molecular BioMedical (MBM) Talk Series	2022-Present
Member of Georgia Tech Bioinformatics T-shirt committee	2021
Assisted in Storici Lab's W. M. Keck Foundation Grant Writing 🔗	2021
Assisted with Article Review	2019 - Present
➤ Reijns MAM, Parry DA, Williams TC, et al. Signatures of TOP1 transcription-associated mutagenesis in cancer and germline [published correction appears in Nature. 2022 May;605(7910):E7]. <i>Nature</i> . 2022; 602(7898):623-631. 🔗	
➤ Penghao Xu, Francesca Storici, Frequency and patterns of ribonucleotide incorporation around autonomously replicating sequences in yeast reveal the division of labor of replicative DNA polymerases, <i>Nucleic Acids Research</i> , Volume 49, Issue 18, 11 October 2021, Pages 10542–10557, 🔗	
➤ Gombolay, A.L., Storici, F. Mapping ribonucleotides embedded in genomic DNA to single-nucleotide resolution using Ribose-Map. <i>Nat Protoc</i> (2021). 🔗	
➤ El-Sayed, W. M. M., Gombolay, A. L., Xu, P., Yang, T., et al. Disproportionate presence of adenosine in mitochondrial and chloroplast DNA of <i>Chlamydomonas reinhardtii</i> . <i>IScience</i> , 24(1), 102005 (2021). 🔗	

Community Service

SKY at Georgia Tech, President Making comprehensive well-being and resilience programs available to university students	2022-Present
ASHA for Education(Atlanta), Secretary Raising funds for education of disadvantaged children	2020-2022
National Service Scheme(India) - Blood Donation Camps, Volunteer Helping run Blood donation Camps	2009-2011

Skills

Programming: R, Bioconductor, Python, Bash, MATLAB, MySQL, C++,HTML, Markdown

Applications: SPSS, GraphPad prism, Excel, Tableau, Mendeley, AutoCAD, Adobe Illustrator

Platforms and Environments: Linux, Windows OS, Visual Studio Code, Sublime, Jupyter and Google Colab

Spoken Languages: English, Hindi, Sanskrit

Other

Citizenship: Indian