IKJOT SINGH SOHAL, Ph.D.

Assistant Professor of Cancer Biology
Department of Biological Sciences
University of North Texas, Denton, TX 76201
Email: ikjot.sohal@unt.edu | Website: https://sohallab.com/ | Phone: (857) 400-6365

About Me – I have a broad and deep interest in intercellular crosstalk at tumor-host interfaces and its therapeutic targeting. My extensive training in research, mentoring, and teaching has taught me to conduct innovative research that values people's success and collaboration while being committed to providing the highest quality mentorship and education.

EDUCATION

2013 – 2018 **Ph.D. Biomedical Engineering & Biotechnology**
University of Massachusetts-Lowell

2008 – 2012 **B.Sc. Biotechnology (Honors)**
Punjab Agricultural University, India

RESEARCH BACKGROUND

2024 – 2025 **Research Associate**
2018 – 2024 **Postdoctoral Research Associate**
Purdue Institute for Cancer Research
Purdue University, West Lafayette, IN, USA
Mentor: Andrea L. Kasinski, Ph.D.
My research focused on understanding the biogenesis of extracellular vesicles and their role in immune suppression as well as developing targeted miRNA therapeutics in lung and prostate cancer. This work led to the development of a first-in-class fully chemically modified miR-34a that when delivered to the tumor using targeted approach led to sustained gene silencing and tumor regression. My ongoing work has detailed the tumor-intrinsic and tumor-extrinsic biology of a novel subpopulation of extracellular vesicles that potently suppresses T cells and contributes to immune-cold tumor microenvironment.

2016 – 2018 **Visiting Research Fellow**
Harvard T.H. Chan School of Public Health
Harvard University, Boston, MA, USA
Mentor: Philip Demokritou, Ph.D.
In this internationally collaborative effort, we demonstrated a novel application of nanocellulose as a food additive to reduce fat absorption and manage weight loss.

2013 – 2018 **Doctoral Research**
Department of Public Health
University of Massachusetts-Lowell, Lowell, MA, USA
Mentor: Dhimiter Bello, Sc.D., M.Sc.
I developed a physiologically relevant mucus-secreting co-culture model of gut epithelium. Owing to the model's increased sensitivity to exogenous exposures, I further demonstrated its superiority in studying toxicity of ingested nanomaterials.

GRANTS AWARDED

2025 – 2027 **National Cancer Institute** (About)
R03 grant
Role: Principal Investigator
$78.5K/year for 2 years (research)

2023 – 2024 **Indiana Clinical and Translational Sciences Institute** (About)
Postdoc Challenge Research Award
Role: Principal Investigator
$5,000 research funds

2021 – 2023 **Department of Defense Prostate Cancer Research Program** (About)
Early Investigator Research Award
Role: Principal Investigator
$230K/year for 2 years (research)

2019 – 2020 **Purdue University**
Shared Resource 2019-20 Cycle 1
Role: Principal Investigator
$2,500 research funds

2017 – 2018 **University of Massachusetts-Lowell**
Seed Grant
Role: Graduate Trainee
$10,000 research funds

AWARDS

2025 **Young Investigator Award** (American Association of Indian Scientists in Cancer Research)
2025 **Outstanding Service and Engagement Award** (Purdue Institute for Cancer Research)
2024 **Outstanding Postdoctoral Researcher Award** (Purdue Institute for Cancer Research)
2024 **Employee Recognition Award** (Department of Biological Sciences, Purdue University)
2023 **Purdue Postdoc Mentor Award** (The Graduate School at Purdue University)
2022 **Purdue Postdoc Travel Grant** (for attending AACR 2022)
2022 **Young Investigator Award** (7th Midwest Tumor Microenvironment Meeting)

MANUSCRIPTS IN PREPARATION

1. Sohal IS†, Shaw S, Santos AD, Elzey BD, Harper HA, Meeks LN, Hasan H, Soto-Vargas Z, Abdullah N, Sahoo SS, Kazemian M, Olson MR, Kasinski AL*. “Golgi-derived extracellular vesicles attenuate T cell function in immunologically cold tumors.” (2025)

PREPRINTS AND PEER-REVIEWED PUBLICATIONS

†First author, *Corresponding author

1. Sohal IS*, Pal AK, Lepine J, Liu P, Wisnewski AV, Redlich CA, Bello D*. "A cross-week analysis of urinary extracellular vesicles after respiratory tract exposure intervention identifies systemic signaling changes – a pilot study of isocyanate-exposed workers." ***bioRxiv*** (2025).

2. Iyer SG†, Sohal IS, and Kasinski AL*. "Redesigning miR-34a: structural and chemical advances in the therapeutic development of an miRNA anti-cancer agent." ***Biochemical Society Transactions*** (2025).

3. Abdelaal AM, Sohal IS*, Iyer SG, Sudarshan K, Orellana EA, Ozcan K, Santos AP, Low P, and Kasinski AL*. "Selective targeting of chemically modified miR-34a to prostate cancer using a small molecule ligand and an endosomal escape agent." ***Molecular Therapy – Nucleic Acids*** (2024).

4. Abdelaal A, Sohal IS*, Iyer S, Kasireddy S, Lanman N, Kothandaraman H, Low P, and Kasinski A*. "A first-in-class fully modified version of miR-34a with outstanding stability, activity, and anti-tumor efficacy." ***Oncogene*** (2023).
    - *The article has an Altmetric attention score of 344. The article was ranked #2 of 67 outputs of similar age from Oncogene and is in the **top 5%** of all research outputs ever tracked by Altmetric* (Link).
    - *Featured by Purdue University* (Link) *and 31 other news outlets globally* (Link).

5. Sohal IS, Kasinski, A*. "Emerging diversity in extracellular vesicles and their roles in cancer". ***Frontiers in Oncology*** (2023). (invited review)

6. Dar MS, Mensah IK, He M, McGovern S, Sohal IS, Whitlock HC, Bippus NE, Ceminsky M, Emerson ML, Tan HJ, Hall MC, Gowher H*. "Dnmt3bas coordinates transcriptional induction and alternative exon inclusion to promote catalytically active Dnmt3b expression." ***Cell Reports*** (2023)

7. Kaur J†, Sohal IS†, Singh H, Gupta NK, Sehrawat S, Puri S, Bello D*, Khatri M*. "Toxicity screening and ranking of diverse engineered nanomaterials using hierarchical testing approaches with an in vivo zebrafish model." ***Environmental Science: Nano*** (2022).

8. Hasan H†, Sohal IS†, Soto-Vargas Z†, Byappanahalli, AM, Humphrey SE, Kubo H, Kitdumrongthum S, Copeland S, Tian F, Chairoungdua A, Kasinski AL*. "Extracellular vesicles released by non-small cell lung cancer cells drive invasion and permeability in non-tumorigenic lung epithelial cells." ***Scientific Reports*** (2022).
    - *This article has been **accessed 5006 times**, **cited 12 times** and is in the **top 25%** of all research outputs ever tracked by Altmetric* (Link)
    - *This article was the 32nd most downloaded article published in Scientific Reports in the year 2022* (Link).

9. Pal AS†, Agredo A†, Lanman NA, Son J, Sohal IS, Bains M, Li C, Clingerman J, Gates K, Kasinski AL*. "*Loss of KMT5C Promotes EGFR Inhibitor Resistance in NSCLC via LINC01510-Mediated Upregulation of MET.*" ***Cancer Research*** (2022).
    - *The article has an Altmetric attention score of 87. Based on the article metrics, it is in the **98th percentile** and among **top 5%** of all research outputs ever tracked by Altmetric* (Link).

10. Sohal IS†, DeLoid GM†, O'Fallon KS, Gaines P, Demokritou P*, Bello D*. "Effects of ingested food-grade titanium dioxide, silicon dioxide, iron (III) oxide and zinc oxide nanoparticles on an in vitro model of intestinal epithelium: Comparison between monoculture vs. a mucus-secreting coculture model." ***NanoImpact*** (2020).

11. Sohal IS*, O'Fallon KS, Gaines P, Demokritou P, Bello D*. "Ingested engineered nanomaterials: state of science in nanotoxicity testing and future research needs." ***Particle and Fibre Toxicology*** (2018).
    - *The article has been **accessed 8408 times** and **cited 152 times**.*
12. Sohal IS*, Cho YK, O'Fallon KS, Gaines P, Demokritou P, Bello D*. "Dissolution Behavior and Biodurability of Ingested Engineered Nanomaterials in the Gastrointestinal Environment." ***ACS Nano*** (2018).
    - *In **May 2019**, the article was highlighted by ACS Nano (#1 journal in the field of nanoscience and nanotechnology) in a virtual collection of **most recent notable developments** in the field of Nanosafety research* (Link)
13. DeLoid GM†, Sohal IS, Lorente LR, Molina RM, Pyrgiotakis G, Stevanovic A, Zhang R, McClements DJ, Geitner NK, Bousfield DW, Ng KW, Loo SCJ, Bell DC, Brain J, Demokritou P*. "Reducing Intestinal Digestion and Absorption of Fat Using a Nature-Derived Biopolymer: Interference of Triglyceride Hydrolysis by Nanocellulose." ***ACS Nano*** (2018).
    - *The article has been **cited 148 times** and has an Altmetric attention score of 87. Based on the article metrics, it is in the **98th percentile** and **top 5%** of all research outputs ever tracked by Altmetric* (Link).
    - *Featured by **Harvard School of Public Health*** (Link) *and 9 other news outlets globally* (Link).
14. Lee S†, Sohal IS, Therrien MA, Pal AK, Bello D, Shea TB*. "Additive impairment of synaptic signaling in cultured cortical neurons by exogenously-applied oligomerized amyloid-β and airborne nanoparticles generated during photocopying." ***Journal of Alzheimer's Disease*** (2015).

PEER-REVIEWED BOOK CHAPTERS

1. Liu X, Zhang B, Sohal IS, Bello D, Chen H. "Is "nano safe to eat or not"? a review of the state-of-the art in soft engineered nanoparticle (sENP) formulation and delivery in foods." ***Advances in Food and Nutrition Research*** (2019).

INVITED TALKS, SEMINARS AND PANELS

2023	**Session Chair**, "Engineering the tumor microenvironment" 8th Midwest Tumor Microenvironment Meeting
2023	**Invited Talk**, "Novel Cell-to-Cell Crosstalk Biology in Lung Cancer and its Role in T-Cell Suppression" Purdue Biological Sciences Graduate Student Association Symposium
2023	**Invited Seminar**, "Unconventional extracellular vesicle biogenesis and its role in immune regulation in lung cancer" Purdue Cell and Molecular Biology Symposium
2020	**Invited Seminar**, "Unconventional exosome biogenesis pathways and its dysregulation in aggressive mesenchymal-like cancers" Purdue Cell and Molecular Biology Symposium

CONFERENCE AND RESEARCH PRESENTATIONS

1. Poster, "Golgi-derived extracellular vesicles lack conventional tetraspanins and mediate immune evasion in cancer." **American Association for Cancer Research (AACR) Annual Meeting** (April 2025)

2. Presentation, “The origin and regulation of immunosuppressive extracellular vesicles.” **Purdue Biological Sciences Department Retreat** (January 2024)
3. Poster, “Electron microscopy imaging using genetically-encoded APEX2 tag elucidates novel EV biogenesis in non-small cell lung cancer.” **American Association for Cancer Research (AACR) Annual Meeting** (April 2023)
4. Poster, “Extracellular vesicles released from Golgi mediate immunosuppression in lung cancer” **Purdue Cancer Research Day** (April 2023)
5. Poster, “The Golgi origin of extracellular vesicles and its role in cancer-T cell crosstalk in lung cancer” **8th Midwest Tumor Microenvironment Meeting** (May 2023)
6. Poster and Presentation, “Extracellular vesicles of highly metastatic lung cancer cells promote intravasation by disrupting epithelial barrier and inducing epithelial-to-mesenchymal plasticity in a 16-day mature bronchial epithelium.” **7th Annual Midwest Tumor Microenvironment meeting** (May 2022)
    - *Received **Young Investigator Award***
7. Poster, “Determining the intracellular fate of ligand-conjugated therapeutics using nanogold labeling.” **AACR Annual Meeting** (April 2022)
    - *Received **Purdue Postdoc Travel Grant***
8. Poster, “Determining the intracellular fate of ligand-conjugated therapeutics using nanogold labeling” **Purdue Cancer Research Day** (September 2021)
9. Virtual Presentation, “A comprehensive comparative analysis of extracellular vesicle release in non-small cell lung cancer and its potential to drive cancer hallmarks in non-cancerous lung epithelial cells.” **ISEV2021 Virtual Annual Meeting** (May 2021)
10. Virtual Poster, “Extracellular vesicles from highly metastatic lung cancer cells induce barrier impairment, permeability, and epithelial-to-mesenchymal plasticity in a 16-day mature bronchial epithelium.” **ISEV2020 Virtual Annual Meeting** (July 2020)
11. Presentation, “Unconventional exosome biogenesis pathway and its dysregulation in highly aggressive mesenchymal-like cancer cells.” **Purdue Biological Sciences Department Retreat** (November 2019)
12. Poster, “Lung cancer exosomes induce barrier impairment, permeability, and epithelial-to-mesenchymal transition in a 16-day mature bronchial epithelium.” **ISEV-MRS Joint Conference on Extracellular Vesicles in Cancer** (August 2019)
13. Presentation, “Investigation of toxicity of a panel of food-grade nanomaterials on an in vitro triculture model of the mucus-secreting intestinal epithelium.” **TechConnect World Innovation Conference** (May 2018)
14. Poster, “*Understanding behavior and dissolution kinetics of ingested ENMs in simulated digestive fluids*.” **TechConnect World Innovation Conference** (May 2018)
15. Poster, “Reassessing toxicity of engineered food-grade nanomaterials in C2BBe1 and oral keratinocytes.” **8th International Nanotoxicology Congress** (June 2016)
16. Presentation, “Revisiting the safety of food-grade nanomaterials: Towards more realistic and relevant studies.” **4th Sustainable Nanotechnology Organization Conference – Presentation** (November 2015)

TEACHING AND MENTORSHIP EXPERIENCE

2018 – 2025 **Research Mentor | Kasinski Lab**

Purdue Institute for Cancer Research

Purdue University, West Lafayette, IN, USA

Mentoring undergraduate and graduate students in extracellular vesicle biology and miRNA therapeutics research:

- Sydney N. Shaw graduated in 2024. Her research focus was understanding how cancer-derived EVs interact with and impair the function of immune T cells. She is a two-times recipient of Summer Research Awards from the Purdue Biology Department and the Purdue Institute for Cancer Research. She has joined Tempus, a healthcare company, and is eager to pursue graduate research in the future.
- Noor Abdullah, an undergraduate student, studied how cancer-derived extracellular vesicles affect non-tumorigenic epithelial cells. She identified her interest in Medicine and went on to join the residency program at IU School of Medicine with an academic honors scholarship.
- Mentored undergraduate and graduate students in designing hypothesis, bioinformatics analysis, animal work, feedback on research presentations, and scientific writing.

Name	*Role*	*Period*
Lauren Meeks	Ph.D. student	2024 – 2025
Sharjeel Anjum	Ph.D. student	2023 – 2025
Kenan Ozcan	Ph.D. student	2022 – 2025
Samira Piltan	Ph.D. student	2022 – 2025
Shreyas G. Iyer	Ph.D. student	2021 – 2025
Jihye (Julie) Son	Ph.D. student	2020 – 2025
Antionette P. Yasko	Rotation student	2023
Humna Hasan	Ph.D. student	2018 – 2024
Jasleen Kaur	Ph.D. student (India)	2021 – 2022
Zulaida Soto-Vargas	Ph.D. student	2018 – 2023
Alejandra M. Agredo	Ph.D. student	2018 – 2023
Ahmed M. Abdelaal	Ph.D. student	2018 – 2023
Manvir Bains	Undergraduate	2018 – 2020

- Arranged lab visits for high school students by directly working with Purdue Polytechnic High School teachers.
- Received Purdue Postdoc Mentor Award in 2023 in recognition of these contributions.

2022 – 2023 **Research Mentor | Lumiere Education**

A global mentorship program that allows high school students from anywhere in the world work one-on-one with a Ph.D. mentor in a 10-week long intensive program to learn about the cutting-edge research in their field of interest and produce an independent research paper:

- Taha Lakhani, a student at Eastside Secondary School, Belleville, Ontario, Canada, worked with me from December 2022 – March 2023. I developed a personalized research program that was based on Taha's interest in Immunotherapy. We met on a weekly basis to develop a strong understanding of

the lung immune system, mechanisms that allow lung cancers to evade immune response, and immunotherapy in lung cancer. Through his passion, and a little bit of my guidance, he wrote a detailed research paper titled “Introduction to Immunotherapy in Lung Cancer: A Review”, summarizing his understanding of the field.

- Besufekad Liyew, a student at Wheaton High School, Wheaton, Maryland, worked with me from March 2023 – June 2023. Through extensive discussions and meetings on a weekly basis, Besu developed a comprehensive understanding of miRNA biogenesis, their mechanism of action, and their utilization as cancer therapeutics. He demonstrated his understanding of these concepts in a research paper titled “The mechanics of miRNA therapeutics and their effectiveness in combatting cancer development”.

2014 – 2018 **Teaching Assistant | University of Massachusetts-Lowell**

Instructed graduate and undergraduate level courses and designed and graded exams:

- Toxicology and Health course (PUBH.5030), a graduate-level course offered every Fall semester (15 lectures per semester). It involved conducting detailed discussions regarding toxic exposures in personal and work environments, and cellular and molecular mechanisms of toxicity, preparing exams, and grading
- Life Science I (83.101) and Life Science II (83.102), undergraduate-level courses offered every other semester (45 lectures/labs per semester). It involved meeting with over 100 students on a weekly basis, conducting lectures, labs, assignments, and grading.

SERVICE

2025 – present **Associate Member, American Association for Cancer Research**

2020 – present **Member, International Society of Extracellular Vesicles**

2018 – present **Reviewer for peer-reviewed Journals**

Scientific Reports
Nanotoxicology
Particle and Fibre Toxicology
Environmental Science: Nano
NanoImpact
ACS Nano
Environmental Science & Technology
Cell Biology & Toxicology

2024 – 2025 **President | Society of Research Fellows | Purdue Institute for Cancer Research**

I am the founding president of the Society of Research Fellows at the Purdue Institute for Cancer Research (PICR-SRF). The mission of PICR-SRF is to foster a sense of community among graduate students and postdocs at the Purdue Institute for Cancer Research and provide opportunities for personal and professional development. To work towards this mission, our efforts are broadly divided into following categories:

- Social and fun events that bring together the PICR graduate students and postdocs and provides opportunities to interact directly with senior PICR leadership.
- Workshops that provide competitive technical skills in creating publication-quality graphics, bioinformatics, imaging analysis, etc.
- Career advancement opportunities, such as resume/CV editing, writing feedback, and mock interviews.
- Invited talks from academia and industry.

Check the PICR-SRF website to know more about the organization.

2018 – present **Invited Talks and Other Contributions**

2024 Invited Talk at Postdoc Power Session, "How to find and apply for early-career fellowships", The Office for Postdoctoral Scholars, Purdue University

2024 Invited Talk, "Gaining external funding as a postdoc", Purdue Institute for Cancer Research

2024 Lab tour for Zeta Tau Alpha Women's Night of Hope event
Provided lab tours to undergraduate students and cancer survivors

2023 Lab tour for high school students
Coordinated lab visit for Purdue Polytechnic High School students, showcasing environment and dynamics of a cancer research lab

2022 Invited to be part of a Mentoring Panel to "Address student and faculty's questions and concerns about selecting the right mentor, work environment, ideology differences, and addressing conflicts", Purdue Biological Sciences Department Retreat

2022 Invited Talk, "A postdoc's guide to gaining external funding" Purdue Biochemistry Graduate Student Association

2022 Invited to Lead a Roundtable Discussion on "Overcoming Writer's Block to Get Your Inspiration and Creative Thinking Flowing", Purdue Biological Sciences Department Retreat

2021 Invited Talk, "A postdoc's guide to gaining external funding as a non-immigrant in the US" Purdue Cancer Research Day

2018 – 2020 Postdoc coordinator, Life Science Postdoc Initiative, Purdue University
Involved in coordinating meetings related to grant writing, funding, mentoring and other aspects of scientific training for postdocs at Purdue University

PATENTS

2022 - present **Folate-fully-modified miR-34a as an anti-cancer agent.**
United States 63/454,177 Filed: 2022