Hridaya Shrestha

Molecular and Cell Biologist (Cancer Researcher)

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Summary

Detail-oriented and passionate Cancer Researching professional with 10+ years of experience in molecular & cell biology, specializing in cancer cell signaling and genetic mouse models. Proven track record of publishing research papers and presenting at conferences. Proficient in various molecular biology techniques, such as DNA & RNA isolation, PCR, Western blot analysis, and immunoprecipitation. Skilled in bulk & single-cell RNA sequencing analysis and critical thinking to provide accurate findings. Highly motivated, proactive, and organized, with excellent communication skills and the ability to work effectively both independently and as part of a team.

Work Experience

Wayne State University
Michigan, US

Postdoctoral Research Associate
2018–2024

- Mentor: Prof. Kay-Uwe Wagner
- Conducted research on the role of JAK1 in pancreatic cancer initiation and progression as part of an NIH-funded project by applying molecular and cellular biology techniques related to DNA/RNA/protein analysis, using cell lines and genetically engineered mouse models, successfully completing the project and publishing one first-author research paper and one co-authored review paper.
- Identified critical roles of JAK/STAT signaling in postnatal pancreas development and pancreatitis by employing a genetically engineered mouse model to analyze the pancreas at various developmental stages, both prenatal and postnatal, with a first authored manuscript detailing these findings currently in preparation.
- Initiated and established the pancreatic explant culture in Wagner's lab, becoming the first to do so after training at Dr. Howard Crawford's lab at Henry Ford Health in Michigan, USA, and subsequently trained others in the procedure.
- Conducted drug assays for a JAK1 inhibitor using pancreatic cancer cell lines to study JAK/STAT signaling in cancer cell proliferation and in explant cultures to evaluate JAK1's role in acinar-to-ductal metaplasia. This research contributed to an NIH grant submission, with results currently pending.
- Performed bioinformatic analysis of bulk and single-cell RNA sequencing datasets for projects focused on pancreas and mammary gland development, leading to valuable insights into the role of JAK/STAT signaling in developmental processes.
- Collaborated and assisted in a project focused on the biological significance of growth-regulatory signaling networks and proto-oncogenes in normal mammary gland development and tumorigenesis, resulting in the publication of four co-authored research papers.
- Guided and trained interns and graduate students in conducting laboratory experiments using molecular biology, cell biology, immunological, and in-vivo animal techniques, fostering skill development and ensuring high-quality research outcomes.
- Reviewed over 30 articles on cancer biology, encompassing molecular mechanisms, treatment strategies, and emerging research trends, for prestigious scientific journals, thereby enhancing the quality and dissemination of cutting-edge research.

Chonnam National Univeristy
Gwangju, South Korea

Graduate Student
2012–2017

- Mentor: Prof. Kim Kwonseop
- Conducted extensive molecular biology experiments to investigate factors affecting adherens junction complexes and the function of δ-catenin in cancer, contributing to an enhanced understanding of cancer progression and resulting in three first-authored peer-reviewed publications, two co-authored papers, and multiple conference presentations, demonstrating effective communication and presentation skills.
- Collaborated with multidisciplinary teams on projects investigating the role of δ-catenin in Alzheimer's disease, enhancing understanding of its involvement and contributing valuable insights to interdisciplinary research efforts.
- Supported faculty in teaching undergraduate courses through conducting proctoring of exams, grading assessments, and supervising practical classes, facilitating effective course administration and enriching the educational experience for students.

Pinnacle Technical College Pvt. Ltd.
Lalitpur, Nepal

Lecturer
2008–2010

- Mentored and supervised Diploma in Pharmacy students by conducting theory classes and overseeing practical lessons in Pharmaceutical Chemistry and Pharmacology for 2nd and 3rd-year students, each class containing 35+ students, resulting in a 100% pass rate in board exams for each taught subject and significantly enhancing their understanding and practical skills.

Education

Chonnam National University
Gwangju, South Korea

PhD in Pharmacy (Molecular Pathology)
2014–2017

- Advisor: Prof. Kim Kwonseop
- GPA: 4.46/4.5
- Dissertation title: Investigation of the molecular mechanism of Hakai-mediated stabilization of δ-catenin

Chonnam National University
Gwangju, South Korea

Master of Pharmacy
2012–2014

- Advisor: Prof. Kim Kwonseop
- GPA: 4.29/4.5
- Thesis title: Hakai, an E3-ligase for E-cadherin, stabilizes δ-catenin and affects E-cadherin complex.

Pokhara University
Pokhara, Nepal

Bachelor of Sciences (Pharmaceutical Sciences)
2004–2008

- GPA: 3.59/4.00

Skills

- **Molecular Biology:** DNA and RNA isolation | PCR and RT-qPCR | Western blot analysis | Immuno-precipitation (IP)
- **Microbiology:** Biosafety Level 2 Pathogens | Bacterial Cultures | Transformations
- **In vivo Animal Techniques (mouse):** Animal husbandry | Tail tipping and ear tagging | Intravenous tail vein injection | Intraperitoneal injection | Subcutaneous injection | Oral gavage | Dissection (lymph nodes, spleen, thymus, pancrease, mammary glands, lungs, liver, prostate) | Pancreas and mammary gland digestion for flow cytometry | Orthotopic transplantation
- **Microscopy:** Brightfield microscopy | Immunohistochemistry | Immunofluorescence | Fluorescence microscopy
- **Tissue culture techniques:**Mammalian Cell Culture | Stable Cell Line Generation | Transfection and electroporation | Retro/Lenti-virus Production/Transduction | 3D Cell Culture | siRNA and shRNA Knockdown | CRISPR Knockdown | Cell Proliferation Assay | Cell Migration Assay | Cell Viability Assay | Tumorsphere Assay | Pancreas Explant Culture
- **Softwares and Data Analysis tools**
  - *Bioinformatics:* Bulk RNA-Seq Analysis | Single Cell RNA-Seq Analysis | ChIP-Seq Analysis
  - *Softwares:* FlowJo | ImageJ | GraphPad Prism | SnapGene | Endnote | Microsoft Office Suite | Adobe Illustrator and Photoshop

Publications

Published Journal Articles

For a complete list of publications, see *my Google Scholar profile*.

1. **Shrestha, H.**, Rädler, P. D., Dennaoui, R., Wicker, M. N., Rajbhandari, N., Sun, Y., Peck, A. R., Vistisen, K., Triplett, A. A., Beydoun, R., Sterneck, E., Saur, D., Rui, H., & Wagner, K. U. (2024). The Janus kinase 1 is critical for pancreatic cancer initiation and progression. *Cell reports, 43*(5), 114202.
2. Rädler, P. D., Vistisen, K., Triplett, A. A., Dennaoui, R., Li, Y., **Shrestha, H.**, Ferraiuolo, R. M., Thangasamy, A., Saur, D., & Wagner, K. U. (2021). Dual recombinase action in the normal and neoplastic mammary gland epithelium. *Scientific reports, 11*(1), 20775.
3. Dennaoui, R., **Shrestha, H.**, & Wagner, K. U. (2021). Models of pancreatic ductal adenocarcinoma. *Cancer metastasis reviews, 40*(3), 803–818.
4. Rädler, P. D., Wehde, B. L., Triplett, A. A., **Shrestha, H.**, Shepherd, J. H., Pfefferle, A. D., Rui, H., Cardiff, R. D., Perou, C. M., & Wagner, K. U. (2021). Highly metastatic claudin-low mammary cancers can originate from luminal epithelial cells. *Nature communications, 12*(1), 3742.
5. Wehde, B. L., Rädler, P. D., **Shrestha, H.**, Johnson, S. J., Triplett, A. A., & Wagner, K. U. (2018). Janus Kinase 1 Plays a Critical Role in Mammary Cancer Progression. *Cell reports, 25*(8), 2192–2207.e5.
6. Shrestha, N., **Shrestha, H.**, Ryu, T., Kim, H., Simkhada, S., Cho, Y. C., Park, S. Y., Cho, S., Lee, K. Y., Lee, J. H., & Kim, K. (2018). δ-Catenin Increases the Stability of EGFR by Decreasing c-Cbl Interaction and Enhances EGFR/Erk1/2 Signaling in Prostate Cancer. *Molecules and cells, 41*(4), 320–330.
7. **Shrestha, H.**, Yuan, T., He, Y., Moon, P. G., Shrestha, N., Ryu, T., Park, S. Y., Cho, Y. C., Lee, C. H., Baek, M. C., Cho, S., Simkhada, S., Kim, H., & Kim, K. (2016). Investigation of the molecular mechanism of δ-catenin ubiquitination: Implication of β-TrCP-1 as a potential E3 ligase. *Biochimica et biophysica acta, 1863*(9), 2311–2321.
8. **Shrestha, H.**, Ryu, T., Seo, Y. W., Park, S. Y., He, Y., Dai, W., Park, E., Simkhada, S., Kim, H., Lee, K., & Kim, K. (2017). Hakai, an E3-ligase for E-cadherin, stabilizes δ-catenin through Src kinase. *Cellular signalling, 31*, 135–145.

Submitted, Pending Submission, and In Revision Journal Articles:

1. **Shrestha, H.**, Vistisen, K., Rädler, P.D. and Wagner, K.U. The Janus kinase 1 is critical for the postnatal development of the pancreas. (pending submission).

Others

- **Trainings and Workshops:** 15-weeks of hands-on workshop on Data Management & Statistical Analysis in R, Wayne State University (2021)
- **Awards, Scholarships, and Fellowships:** WooJung Education and Culture Foundation Aid Fund (2015-2017) | Fostering Next Generation Researchers Program Scholarship (2013-2017) | Korean Government Academic Achievement Award (2013) | Korean Government Scholarship (2010-2014)
- **Volunteer Work:** Ad-hoc reviewer for the following journals: Scientific Reports, Cellular Signalling, Cancer Control, The International Journal of Biochemistry & Cell Biology, European Journal of Cell Biology, Cells, Cancers,International Journal of Molecular Sciences, Biomolecules, Medicina and Journal of Clinical Medicine (2020-present)
- **Professional Societies:** Associate Member of American Association for Cancer Research (AACR) (2017-present) | Regular Member of Korean Society of Molecular Cell Biology, South Korea (2021-present) |
- **Conferences and Presentations:**Participant at Cold Spring Harbor Laboratory's meeting on JAK-STAT Pathways in Health & Disease Meeting (2020) | Poster presentation at American Association for Cancer Research Annual Meeting (2017) | Poster presentation at International Conference of the Korea Society for Molecular and Cellular Biology (2013)
- **References:** References will be provided upon request.