Raunak Shrestha, PhD

Curriculum Vitae [Last Updated: November 1, 2023]

Helen Diller Family Comprehensive Cancer Center,
University of California, San Francisco,
1450 3rd St, San Francisco, CA 94158, USA

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Web: http://raunakms.github.io/
Publications: [Google Scholar]
ORCID: 0000-0002-1144-1413

Employment

2019 - Current Post-doctoral Research Fellow,
University of California, San Francisco (UCSF), San Francisco, CA, USA
Advisor: Dr. Felix Y. Feng

2020 - Current Research Scientist, Adjunct (Equivalent to Assistant Professor),
Nepal Applied Mathematics & Informatics Institute (NAAMII), Kathmandu, Nepal

2018 - 2019 Post-doctoral Research Fellow, **Vancouver Prostate Centre**,
University of British Columbia, Vancouver, BC, Canada
Advisor: Dr. Colin C. Collins

2009 - 2011 Research Associate, **Center for Molecular Dynamics Nepal**, Kathmandu, Nepal

Education

2012 - 2018 Doctor of Philosophy in Bioinformatics, **University of British Columbia**, Canada
Vancouver Prostate Centre, Vancouver, BC, Canada
under CIHR Bioinformatics Training Program
Advisors: Dr. Colin C. Collins and Dr. S. Cenk Sahinalp
Thesis Title: "*Computational Prioritization of Cancer Driver Genes for Precision Oncology*"

2011 - 2012 Master of Science in Bioinformatics, **Simon Fraser University**, Canada
under CIHR Bioinformatics Training Program
(Transferred to PhD program)

2005 - 2009 Bachelors of Technology (B.Tech.) in Biotechnology, **Kathmandu University**, Nepal

Grants and Awards/Honors

2022-2025	Prostate Cancer Foundation (PCF) Young Investigator Award	(USD 225,000)
2018	UBC Translational Cancer Genomics Travel Award	(CND 2,000)
2016-2018	Mitacs Accelerate PhD Fellowship	(CND 135,000)
2015-2016	Prostate Cancer Foundation - British Columbia (PCF-BC) Research Awards	(CND 25,000)
2014-2016	Faculty of Science Graduate Award, University of British Columbia	(CND 10,200)
2014	International Society for Computational Biology (ISCB) Travel Fellowship	(USD 500)
2011-2013	CIHR Bioinformatics Training Program for Health Research.	(CND 42,000)

Fellowship Awards for Trainees

2021-2022 NIHR Early Career Grant, The Royal Society of Tropical Medicine and Hygiene (RSTMH)
Mr. Parikshit Prasai (GBP 5,000)

Selected Publications

[1] **R. Shrestha**, M. L. Fernandez, A. Dawson, J. Hoenisch, S. Volik, Y.-Y. Lin, S. Anderson, H. Kim, A. Haegert, S. Colborne, N. Wong, B. McConeghy, R. H. Bell, S. Brahmbhatt, C.-H. Lee, G. E. DiMattia, S. Le Bihan, G. B. Morin, C. C. Collins, and M. S. Carey. *Multiomics Characterization of Low-grade Serous Ovarian Carcinoma Identifies Potential Biomarkers of MEK-inhibitor Sensitivity and Therapeutic Vulnerability.* **Cancer Research**, 2021. ISSN 0008-5472. doi: 10.1158/0008-5472.CAN-20-2222. URL https://pubmed.ncbi.nlm.nih.gov/

33441310

[2] **R. Shrestha**, N. Nabavi, S. Volik, S. Anderson, A. Haegert, B. McConeghy, F. Sar, S. Brahmbhatt, R. H. Bell, S. Le Bihan, Y. Wang, C. C. Collins, and A. Churg. *Well-Differentiated Papillary Mesothelioma of the Peritoneum is Genetically Distinct from Malignant Mesothelioma.* **Cancers**, 12(6), 06 2020. doi: 10.3390/cancers12061568. URL https://pubmed.ncbi.nlm.nih.gov/32545767

[3] **R. Shrestha**, N. Nabavi, Y.-Y. Lin, F. Mo, S. Anderson, S. Volik, H. H. Adomat, D. Lin, H. Xue, X. Dong, R. Shukin, R. H. Bell, B. McConeghy, A. Haegert, S. Brahmbhatt, E. Li, H. Z. Oo, A. Hurtado-Coll, L. Fazli, J. Zhou, Y. McConnell, A. McCart, A. Lowy, G. B. Morin, T. Chen, M. Daugaard, S. C. Sahinalp, F. Hach, S. Le Bihan, M. E. Gleave, Y. Wang, A. Churg, and C. C. Collins. *BAP1 Haploinsufficiency Predicts a Distinct Immunogenic Class of Malignant Peritoneal Mesothelioma.* **Genome Medicine**, 2019. doi: 10.1186/s13073-019-0620-3. URL https://pubmed.ncbi.nlm.nih.gov/30777124

[4] E. Hodzic, **R. Shrestha***, K. Zhu, K. Cheng, C. C. Collins, and S. C. Sahinalp. Combinatorial detection of conserved alteration patterns for identifying cancer subnetworks. **GigaScience**, 8(4), 04 2019. ISSN 2047-217X. doi: 10.1093/gigascience/giz024. URL https://pubmed.ncbi.nlm.nih.gov/30978274. *As joint first author

[5] **R. Shrestha**, E. Hodzic, T. Sauerwald, P. Dao, K. Wang, J. Yeung, S. Anderson, F. Vandin, G. Haffari, C. C. Collins, and S. C. Sahinalp. *HIT'nDRIVE: patient-specific multidriver gene prioritization for precision oncology.* **Genome Research**, 27(9):1573–1588, sep 2017. ISSN 1549-5469. doi: 10.1101/gr.221218.117. URL https://pubmed.ncbi.nlm.nih.gov/28768687

[6] **R. Shrestha**, E. Hodzic, J. Yeung, K. Wang, T. Sauerwald, P. Dao, S. Anderson, H. Beltran, M. A. Rubin, C. C. Collins, G. Haffari, and S. C. Sahinalp. *HIT'nDRIVE: Multi-driver Gene Prioritization Based on Hitting Time. Research in Computational Molecular Biology: 18th Annual International Conference,* **RECOMB 2014**, *Pittsburgh, PA, USA, April 2-5, 2014, Proceedings*, pages 293–306, 2014. doi: 10.1007/978-3-319-05269-4_23. URL http://dx.doi.org/10.1007/978-3-319-05269-4_23

Relevant Publications

[7] A. Lundberg, M. Zhang, R. Aggarwal, H. Li, L. Zhang, A. Foye, M. Sjostrom, J. Chou, K. Chang, T. Moreno-Rodriguez, **R. Shrestha**, A. Baskin, X. Zhu, A. Weinstein, N. Younger, J. Alumkal, T. Beer, K. Chi, C. Evans, M. Gleave, P. Lara, R. Reiter, M. Rettig, O. Witte, A. Wyatt, F. Feng, E. Small, and D. Quigley. *The genomic and epigenomic landscape of double-negative metastatic prostate cancer.* **Cancer Research**, 2023. ISSN 0008-5472. doi: 10.1158/0008-5472.CAN-23-0593. URL https://pubmed.ncbi.nlm.nih.gov/37289025

[8] M. Sjostrom, S. G. Zhao, S. Levy, M. Zhang, Y. Ning, **R. Shrestha**, A. Lundberg, C. Herberts, A. Foye, R. R. Aggarwal, J. T. Hua, H. Li, A. Bergamaschi, C. Maurice-Dror, A. Maheshwari, S. Chen, S. Ng, W. Ye, J. Petricca, M. Fraser, L. Chesner, M. Perry, T. Moreno-Rodriguez, W. S. Chen, J. J. Alumkal, J. Chou, T. M. Beer, M. Gleave, P. Lloyd, T. Phillips, E. McCarthy, M. C. Haffner, A. Zoubeidi, R. E. Reiter, M. B. Rettig, O. Witte, L. Fong, R. Bose, F. Huang, A. Bjartell, J. M. Lang, N. Mahajan, P. N. Lara, C. P. Evans, P. Tran, E. M. Posadas, C. He, X. Cui, J. Huang, W. Zwart, L. A. Gilbert, C. A. Maher, P. C. Boutros, K. N. Chi, A. Ashworth, E. J. Small, H. H. H, A. W. Wyatt, D. A. Quigley, and F. Y. Feng. *The 5-Hydroxymethylcytosine Landscape of Prostate Cancer.* **Cancer Research**, 2022. doi: 10.1158/0008-5472.CAN-22-1123. URL http://www.ncbi.nlm.nih.gov/pubmed/36251389

[9] R. Das, M. Sjostrom, **R. Shrestha**, C. Yogodzinski, E. A. Egusa, L. N. Chesner, W. S. Chen, J. Chou, D. K. Dang, J. T. Swinderman, A. Ge, J. T. Hua, S. Kabir, D. A. Quigley, E. J. Small, A. Ashworth, F. Y. Feng, and L. A. Gilbert. An integrated functional and clinical genomics approach reveals genes driving aggressive metastatic prostate cancer. **Nature Communications**, 12(1):4601, 2021. ISSN 2041-1723. doi: 10.1038/s41467-021-24919-7. URL https://pubmed.ncbi.nlm.nih.gov/34326322

[10] N. R. Rydzewski, E. Peterson, J. M. Lang, M. Yu, S. Laura Chang, M. Sjostrom, H. Bakhtiar, G. Song, K. T. Helzer, M. L. Bootsma, W. S. Chen, **R. Shrestha**, M. Zhang, D. A. Quigley, R. Aggarwal, E. J. Small, D. R. Wahl,

F. Y. Feng, and S. G. Zhao. Predicting cancer drug TARGETS - TreAtment Response Generalized Elastic-neT Signatures. **NPJ genomic medicine**, 6(1):76, sep 2021. ISSN 2056-7944. doi: 10.1038/s41525-021-00239-z. URL http://www.ncbi.nlm.nih.gov/pubmed/34548481

[11] E. Hodzic, **R. Shrestha**, S. Malikic, C. C. Collins, K. Litchfield, S. Turajlic, and C. Sahinalp. Identification of conserved evolutionary trajectories in tumors. **Bioinformatics**, 36(Supplement1):i427–i435, 07 2020. ISSN 1367-4803. doi: 10.1093/bioinformatics/btaa453. URL https://pubmed.ncbi.nlm.nih.gov/32657374. (*ISMB 2020*)

[12] ICGC/TCGA Pan-Cancer Analysis of Whole Genomes Consortium. Pan-cancer analysis of whole genomes. **Nature**, 578(7793):82–93, feb 2020b. ISSN 1476-4687. doi: 10.1038/s41586-020-1969-6. URL https://pubmed.ncbi.nlm.nih.gov/32025007

[13] ICGC/TCGA Pan-Cancer Analysis of Whole Genomes Consortium. Analyses of non-coding somatic drivers in 2,658 cancer whole genomes. **Nature**, 578:102–111, feb 2020a. doi: 10.1038/s41586-020-1965-x. URL https://pubmed.ncbi.nlm.nih.gov/32025015

[14] M. A. Reyna, D. Haan, M. Paczkowska, L. P. C. Verbeke, M. Vazquez, A. Kahraman, S. Pulido-Tamayo, J. Barenboim, L. Wadi, P. Dhingra, **R. Shrestha**, G. Getz, M. S. Lawrence, J. S. Pedersen, M. A. Rubin, D. A. Wheeler, S. Brunak, J. M. G. Izarzugaza, E. Khurana, K. Marchal, C. von Mering, S. C. Sahinalp, A. Valencia, PCAWG Drivers and Functional Interpretation Working Group, J. Reimand, J. M. Stuart, B. J. Raphael, and PCAWG Consortium. Pathway and network analysis of more than 2500 whole cancer genomes. **Nature communications**, 11(1):729, feb 2020. ISSN 2041-1723. doi: 10.1038/s41467-020-14367-0. URL https://pubmed.ncbi.nlm.nih.gov/32024854

[15] W. S. Chen, W. A. Haynes, R. Waitz, K. Kamath, A. Vega-Crespo, **R. Shrestha**, M. Zhang, A. Foye, I. B. Carretero, I. G. Perez, M. Zhang, S. G. Zhao, M. Sjöström, D. A. Quigley, J. Chou, T. M. Beer, M. Rettig, M. Gleave, C. P. Evans, P. Lara, K. N. Chi, R. E. Reiter, J. J. Alumkal, R. Aggarwal, E. J. Small, P. S. Daugherty, A. Ribas, D. Y. Oh, J. C. Shon, and F. Y. Feng. Autoantibody landscape in patients with advanced prostate cancer. **Clinical Cancer Research**, 2020. doi: 10.1158/1078-0432.CCR-20-1966. URL https://pubmed.ncbi.nlm.nih.gov/32967941

[16] N. M. D'Costa, D. Cina, **R. Shrestha**, R. H. Bell, Y.-y. Lin, H. Asghari, C. U. Monjaras-Avila, C. Kollmannsberger, F. Hach, C. I. Chavez-Munoz, and A. I. So. Identification of gene signature for treatment response to guide precision oncology in clear-cell renal cell carcinoma. **Scientific Reports**, 10(1):2026, feb 2020a. ISSN 2045-2322. doi: 10.1038/s41598-020-58804-y. URL https://pubmed.ncbi.nlm.nih.gov/32029828

[17] N. M. D'Costa, M. R. Lowerison, P. A. Raven, Z. Tan, M. E. Roberts, **R. Shrestha**, M. W. Urban, C. U. Monjaras-Avila, H. Z. Oo, A. Hurtado-Coll, C. Chavez-Munoz, and A. I. So. Y-box binding protein-1 is crucial in acquired drug resistance development in metastatic clear-cell renal cell carcinoma. **Journal of experimental & clinical cancer research: CR**, 39(1):33, feb 2020b. ISSN 1756-9966. doi: 10.1186/s13046-020-1527-y. URL https://pubmed.ncbi.nlm.nih.gov/32041631

[18] M. Yamada, J. Tang, J. Lugo-Martinez, E. Hodzic, **R. Shrestha**, H. Ouyang, P. Radivojac, C. Sahinalp, F. Menczer, Y. Chang, A. Saha, H. Mamitsuka, and D. Yin. *Ultra High-Dimensional Nonlinear Feature Selection for Big Biological Data*. **IEEE Transactions on Knowledge and Data Engineering**, 30(7):1352–1365, 2018. ISSN 1041-4347. doi: 10.1109/TKDE.2018.2789451. URL https://doi.org/10.1109/TKDE.2018.2789451

[19] E. E. Gill, L. S. Chan, G. L. Winsor, N. Dobson, R. Lo, S. J. Ho Sui, B. K. Dhillon, P. K. Taylor, **R. Shrestha**, C. Spencer, R. E. W. Hancock, P. J. Unrau, and F. S. L. Brinkman. *High-throughput detection of RNA processing in bacteria*. **BMC Genomics**, 19(1):223, 2018. ISSN 1471-2164. doi: 10.1186/s12864-018-4538-8. URL https://pubmed.ncbi.nlm.nih.gov/29587634

[20] I. S. U. Luk, **R. Shrestha**, H. Xue, Y. Wang, F. Zhang, D. Lin, A. Haegert, R. Wu, X. Dong, C. C. Collins, A. Zoubeidi, M. E. Gleave, P. W. Gout, and Y. Wang. *BIRC6 Targeting as Potential Therapy for Advanced, Enzalutamide-Resistant Prostate Cancer*. **Clinical Cancer Research**, 23(6):1542–1551, mar 2017. ISSN 1078-

0432. doi: 10.1158/1078-0432.CCR-16-0718. URL https://pubmed.ncbi.nlm.nih.gov/27663589

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[22] K. Wang, **R. Shrestha**, A. W. Wyatt, A. Reddy, J. Lehár, Y. Wang, A. Lapuk, and C. C. Collins. *A meta-analysis approach for characterizing pan-cancer mechanisms of drug sensitivity in cell lines.* **PloS One**, 9(7): e103050, 2014. ISSN 1932-6203. doi: 10.1371/journal.pone.0103050. URL https://pubmed.ncbi.nlm.nih.gov/25036042

[23] **R. Shrestha**, R. N. Joshi, K. Joshi, B. H. Poudel, and B. G. Shrestha. *Analysis of KatG Ser315Thr Mutation in Multidrug Resistant Mycobacterium tuberculosis and SLC11A1 Polymorphism in Multidrug Resistance Tuberculosis in Central Development Region of Nepal Using PCR-RFLP Technique: A Pilot Study.* **Nepal Journal of Biotechnology**, 1(1):14–21, 2011. URL https://www.nepjol.info/index.php/NJB/article/view/4169

[24] R. K. Shrestha, **R. Shrestha**, S. Shneiderman, and J. Baniya. *Beyond Reconstruction: What Leads to Satisfaction in Post-Disaster Recovery? (Journal of Happiness Studies)*, Mar 2023. ISSN 1573-7780. doi: 10.1007/s10902-023-00642-6. URL https://doi.org/10.1007/s10902-023-00642-6

Thesis

- **R. Shrestha**. *Computational Prioritization of Cancer Driver Genes for Precision Oncology*. PhD thesis, The University of British Columbia, 2018. URL https://open.library.ubc.ca/cIRcle/collections/24/items/1.0370936. Advisors: Dr. Colin C. Collins & Dr. S. Cenk Sahinalp

Presentations

Selected Oral Talks

- *Inactivation of BAP1 Predicts a Distinct Immunogenic Class of Malignant Peritoneal Mesothelioma.* **Terry Fox Seminar, Vancouver Prostate Centre**. September 28, 2018, Vancouver General Hospital, Vancouver, Canada.

- *BAP1 Loss Predicts Therapeutic Vulnerability in Malignant Peritoneal Mesothelioma.* **14th International Conference of the International Mesothelioma Interest Group (iMig2018)**. May 2-5, 2018, Ottawa, Canada

- *HIT'nDRIVE: Patient-Specific Multi-Driver Gene Prioritization for Precision Oncology.* **8th Annual Scientific Meeting, Terry Fox Research Institute**. November 4, 2017, Vancouver, Canada

- *Translating Big-Data to Precision Oncology.* **Terry Fox Seminar, Vancouver Prostate Centre**. February 17, 2017, Vancouver General Hospital, Vancouver, Canada.

- *HIT'nDRIVE: Patient-Specific Multi-Driver Gene Prioritization for Precision Oncology.* **Vancouver Bioinformatics User Group (VanBUG)**. November 3, 2016, Vancouver, Canada

- *HIT'nDRIVE: Patient-Specific Multi-Driver Gene Prioritization for Precision Oncology.* **10th Annual Lorne D. Sullivan Lectureship & Research Day**. June 21, 2016, Vancouver General Hospital, Vancouver, Canada.

- *HIT'nDRIVE: Patient-Specific Multi-Driver Gene Prioritization to Guide Precision Cancer Medicine.* **Workshop on Network Biology (Algorithmic Challenges in Genomics)**. April 11-15, 2016, Simons Institute for the Theory of Computing, University of California Berkeley, Berkeley, CA, USA.

https://simons.berkeley.edu/talks/raunak-shrestha-04-12-16

- *Computational Detection and Prioritization of Driver Alterations in Cancer*. **Terry Fox Seminar, Vancouver Prostate Centre**. November 3, 2014, Vancouver General Hospital, Vancouver, Canada.

- *HIT'nDRIVE: Multi-Driver Gene Prioritization based on Hitting Time*. **18th Annual International Conference on Research in Computational Molecular Biology (RECOMB)**. April 2-5, 2014, Pittsburgh, PA, USA.

Invited Talks

- *Computational Prioritization of Cancer Driver Genes for Precision Oncology*. **University of California San Francisco**. April 8, 2019, San Francisco, CA, USA.

- *Computational Prioritization of Cancer Driver Genes for Precision Oncology*. **National Cancer Institute**. December 10, 2018, Bethesda, MD, USA.

- *Computational Prioritization of Cancer Driver Genes for Precision Oncology*. **University of California San Diego**. November 13, 2018, San Diego, CA, USA.

- *Computational Prioritization of Cancer Driver Genes for Precision Oncology*. **University of California Santa Cruz**. November 9, 2018, Santa Cruz, CA, USA.

Research Interest

Bioinformatics	Cancer Genomics	Prostate Cancer	Sequencing
Immuno-Oncogenomics	Single-cell Genomics	Epigenomics	Precision Oncology
Network Medicine	Infectious Disease Genomics	Machine Learning	Data Science

Technical Skills

Programming Languages	R, perl, python, C, C++
Web Development	php, HTML/5, CSS, JavaScript, R-shiny
Databases & Query Languages	MySQL
Others	CPLEX, GitHub
Molecular Biology	Experienced in routine genomics & proteomics laboratory works

Software Packages & Data Analytics

- **HIT'nDRIVE** (https://github.com/sfu-compbio/hitndrive)
- **cd-CAP** (https://github.com/ehodzic/cd-CAP)
- **Group Segmentation and Diversity** *Nudging households towards clean cooking: the role of group segmentation based on diversity in fuel choice* (https://github.com/raunakms/diversity_cooking_fuel)
- **Happiness in Post-Disaster Reconstruction** *What Leads to Satisfaction in Post-Disaster Recovery?* (https://github.com/raunakms/happiness_reconstruction)

Trainees Mentored

2023	Sanyukta Chapagain	Research Intern, NAAMII, Nepal
2023	Peshal Regmi	Research Intern, NAAMII, Nepal
2023	Aayush Ojha	Research Intern, NAAMII, Nepal
2021 - 2022	Parikshit Prasai	Research Assistant, NAAMII, Nepal
2020	Aroj Hada	Research Intern, NAAMII, Nepal
2020	Rajesh Timilsina	Research Intern, NAAMII, Nepal

Academic Community Service

Journal Editorial Board

2014 -	Nepal Journal of Biotechnology (NJB)	Editor

Professional Organization

2013-2019	Vancouver Bioinformatics User Group (VanBUG)	Development Group
2009-2011	Biotechnology Society of Nepal (BSN)	Executive Board Member

Peer Reviews

(number of reviews parenthesized)

Grants: PCF Young Investigator Award (2); PCF Challenge Award (1)

Academic Papers: Nature (1); Science (3); Nature Communications (3); Bioinformatics (3); Bioinformatics Advances (1); Cancer Research (2); Genome Medicine (1); European Urology (1); BMC Genomics (1); BMC Bioinformatics (1); Cancers (1); Neoplasia (1); The American Journal of Human Genetics (AJHG) (1); Research in Computational Molecular Biology (RECOMB) (3); International Conference on Intelligent Systems for Molecular Biology (ISMB) (1); The Asia Pacific Bioinformatics Conference (APBC) (1); Workshop on Algorithms in Bioinformatics (WABI) (1); International Conference on Computational Advances in Bio and medical Sciences (ICCABS) (1); International Journal of Cancer (IJC) (1); Nepal Journal of Biotechnology (8)

References

References can be made available upon request

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http://raunakms.github.io/pdf/cv_shrestha_raunak.pdf