

# Heechul (Ryan) Chung

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## RESEARCH INTERESTS

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Single-cell genomics; Prostate Cancer; Translational Cancer genomics; Machine Learning for precision medicine

## PROFESSIONAL WORK & RESEARCH EXPERIENCE

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**Research Institute of the McGill University Health Centre** Aug 15, 2022 – Jan 14, 2023  
Research Associate (Research supervisor: [Jun Ding, Ph.D.](#)) Montreal, Quebec

- Participated in research about the role of cancer-associated fibroblasts in reduced lung metastasis of mammary tumor from EIF4E deficient mice samples and WT samples.

**Veraverse, Inc. (In collaboration with Milner Therapeutics Institute)** Sep 01, 2021 – May 31, 2022  
Computational biologist Seoul, Korea  
(Research supervisor: [Namshik Han, Ph.D.](#))

- Participated in research about Stem-like subtype of gastric cancer
- Investigated the characteristics of Stem-like gastric cancer derived metastasis

**Asan Center for Cancer Genome Discovery in Collaboration with Dana-Farber Cancer Institute** May 01, 2020 – Aug 15, 2021  
Seoul, Korea

Computational biologist/Research associate

(Research supervisor: [Chang Ohk Sung, M.D., Ph.D.](#))

- Participated in research about colon cancer organoids and primary tumors
- Investigated the genetic lineage between cancer-associated fibroblasts and normal tissue resident fibroblasts
- Investigated the putative biomarkers for HCC, predicted immunotherapy response in HCC patients by machine learning
- Participated in research to identify specific lung cancer organoids and corresponding primary tissues for developing new immunotherapy

## RESEARCH EXPERIENCES

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**Collins Lab, The University of British Columbia** May 2023 - Vancouver, BC  
Ph.D. student (Supervisor: [Colin Collins, Ph.D.](#))

- Ph.D. student working on translational cancer genomics with multi-omics prostate cancer data, especially focusing on the role of stromal cells and their associated genes, interactoms in the neuroendocrine transdifferentiation (NEtD).

**AndersenLab, Northwestern University** Sep 2018 - Sep 2019  
MS student (Supervisor: [Erik Andersen, Ph.D.](#)) Evanston, IL

- Investigated natural variation in mtDNA copy number of *C. elegans* wild isolates by both laboratory experiments and computational analyses

**Department of Computer and Information Technology, Purdue University** Summer 2017  
Internship (Advisor: [Erik Matson, Ph.D.](#)) West Lafayette, IN

- Selected as one of the 30 South Korea government sponsored students, participated in big-data research about two months

**Genomic Diversity Lab, Sogang University, Undergraduate Research Assistant** Sep 2017 - Aug 2018  
(Advisor: [Hyung-Doo Shin, DVM., Ph.D.](#)) Seoul, Korea

- Participated on researching on validation of Acute Myeloid Leukemia (AML) specific genetic variants
- Learned basic lab techniques and how to deal with basic equipment

## CORE COURSES

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**The University of British Columbia** May 2023 - Vancouver, BC

- Concepts in Oncology, Seminars in Oncology

**Northwestern University** Sep 2018 - Sep 2019  
Evanston, IL

- Computational biology- *Quantitative Biology, Quantitative Analysis of Biology*
- Genetics/Genomics- *Functional Genomics, Genetics & Epigenetics, Biomedical Genetics*
- Machine Learning/Statistics- *Statistics for Life Sciences*

**Sogang University** Feb 2012 – Aug 2018  
Seoul, Korea

- CS major- *Data Structures, Programming Languages, Computer Organization and Logic, Design and Analysis of Algorithms, Operating Systems, Introduction to Computer Network*
- Life Sciences major- *General Biology 1&2, Biochemistry 1&2, Molecular Biology, Molecular Cell Biology, Genetics, Cancer Biology, Applied Biotechnology Experiment*
- Math courses- *Calculus 1&2, Linear Algebra, Applied Mathematics 1&2*

## PUBLICATIONS

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- **Chung, H.C.**, Cho, E.J., Lee, H., Kim, W.-K., Oh, J.-H., Kim, S.-H., Lee, D. and Sung, C.O. (2021), Integrated single-cell RNA sequencing analyses suggest developmental paths of cancer-associated fibroblasts with gene expression dynamics. Clin. Transl.

Med., 11: e487. <https://doi.org/10.1002/ctm2.487> (2020 Citation Impact: **11.492**)

- Cho, E.J., Kim, M., Jo, D. *et al.* Immuno-genomic classification of colorectal cancer organoids reveals cancer cells with intrinsic immunogenic properties associated with patient survival. *J Exp Clin Cancer Res* 40, 230 (2021). <https://doi.org/10.1186/s13046-021-02034-1> (5 years Citation Impact: **11.161**)
- **Chung, H.C., Funda Sar., Lin, Y.Y. et al.** Longitudinal single-cell RNA sequencing of a neuroendocrine transdifferentiation model reveals transcriptional reprogramming in treatment-induced neuroendocrine prostate cancer. *Genome Biology* (2024) (Submitted)

## EDUCATION

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### **The University of British Columbia - Faculty of Medicine**

*Ph.D. in Interdisciplinary Oncology*

May 2023 -

*Vancouver, BC*

### **Northwestern University - Department of Molecular Biosciences**

*Master of Science in Quantitative and Systems biology*

Sep 2018 - Sep 2019

*Evanston, IL*

*Thesis project: Elucidating the molecular mechanism underlying natural variation in C. elegans mitochondrial DNA copy number*

### **Sogang University – School of Engineering & Natural Sciences**

*Bachelor of Science in computer science & Life science (Double Degree)*

Feb 2012 - Aug 2018

*Seoul, Korea*

### **Gyeonggi Academy of Foreign Languages**

*High school*

Feb 2008 - Feb 2011

*Uiwang-Si, Gyeonggi-Do*

## LEADERSHIP EXPERIENCE & EXTRA CURRICULAR ACTIVITIES

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### **Sogang Software Education Center – Undergraduate teaching assistant**

- An undergraduate teaching assistant for basic Python programming - Was essential to all freshmen

Sep 2016 - Aug 2017

*Seoul, Korea*

### **USFK, 2<sup>nd</sup> operations command – Interpreter/Squad Leader**

- Interpreter/Squad Leader at the 2<sup>nd</sup> operations command of ROK Army & 2502<sup>nd</sup> DLD of 8<sup>th</sup> army, USFK
- Provided simultaneous translations, led the squad of interpreters

Sep 2013 – Aug 2014

*Daegu, Korea*

## AWARDS & CERTIFICATIONS

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- Medal from Colonel Robert G. Mcneil of US army for my contribution as an interpreter/squad leader
- Certificate from Professor Erik T. Matson of Purdue University for my summer internship
- Nominated for the “Hanbitsa” (Korean academic distinction for outstanding scholars) in the Biological Research Information Center (BRIC)
- Faculty of Medicine Awards (Affiliated with the University of British Columbia)
- International Tuition Awards (Affiliated with the University of British Columbia)

## SKILLS

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**Programming languages:** R (Proficient), Bash (Proficient), Python (Competent)

**Machine learning frameworks:** TensorFlow, Pytorch

## REFEREES

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### **Dr. Colin Collins, Ph.D.**

Professor of Urologic Sciences, The University of British Columbia

Senior Research Scientist, Vancouver Prostate Centre

2660 Oak Street, Vancouver, BC V6H 3Z6 Canada

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### **Dr. Namshik Han, Ph.D.**

Associate Faculty of Applied Mathematics and Theoretical Physics, University of Cambridge

Head of Computational Research & AI, Milner Therapeutics Institute

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### **Dr. Chang Ohk Sung, M.D., Ph.D.**

Professor of Pathology, University of Ulsan College of Medicine

Director of Bioinformatics Core Laboratory, Asan Medical Center

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