

# Hoon Kim

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## Education

### Columbia University

Ph.D., Electrical Engineering

- Thesis Topic: Selection of Disease-Associated Gene Sets

- Advisor: Dr. Dimitris Anastassiou

New York, NY

2011

### University of Michigan

M.Sc., Electrical Engineering

Ann Arbor, MI

2005

### Korea University

B.Sc., Life Science - Genetic Engineering

Seoul, South Korea

2000

## Positions

### Sungkyunkwan University

Associate Professor, School of Pharmacy

South Korea

2021 - Present

### Kumamoto University

Visiting Professor

Kumamoto, Japan

2024 - Present

### The Jackson Laboratory for Genomic Medicine

Affiliate Scientist

Farmington, CT

2021 - 2023

### The Jackson Laboratory for Genomic Medicine

Senior Research Scientist

Farmington, CT

2016 - 2021

### MD Anderson Cancer Center

Instructor, Department of Genomic Medicine

Houston, TX

2015 - 2016

### MD Anderson Cancer Center

Postdoc Fellow, Department of Bioinformatics and Computational Biology

Houston, TX

2011 - 2015

### Columbia University

Research Assistant, Genomic Information Systems Laboratory

New York, NY

2006 - 2010

### Philips Research North America

Research Intern, Biomedical Informatics Dept.

New York, NY

2009

### LG Electronics Inc.

System Engineer, Universal Mobile Telecommunication Systems

South Korea

2000-2002

## Publications

- “AmpliconSuite: an end-to-end workflow for analyzing focal amplifications in cancer genomes”, *bioRxiv*, In Review
- Eun Seop Seo<sup>\*</sup>, [...], Sepil An, [...], Hoon Kim<sup>#</sup>, [...], Ji-Yeon Kim<sup>#</sup>, “Spatial and genomic profiling of residual breast cancer after neoadjuvant chemotherapy unveil divergent fates for each breast cancer subtype”, *Cell Rep Med*, 2025 May
- Hoon Kim<sup>\*#</sup>, Soyeon Kim<sup>\*</sup>, [...], Eunhae Yeo, Sepil An, Junyong Ko, Yoonjoo Nam, Hwa Yeon Lee, Seunghyun Kang, Heesuk Chung, [...], Roel Verhaak<sup>#</sup>. “Mapping extrachromosomal DNA amplifications during cancer progression.”, *Nature Genetics*, 2024 Nov.
- Jens Luebeck, [...], Hoon Kim, [...], Vineet Bafna, Paul S. Mischel. “Extrachromosomal DNA in the cancerous transformation of Barrett’s oesophagus”, *Nature*, 2023 April

- Frederick S Varn, Kevin C Johnson, [...], Hoon Kim, [...], Roel GW Verhaak, The GLASS Consortium. “Glioma progression is shaped by genetic evolution and microenvironment interactions.”, *Cell*, 2022 Jun
- Yi E., Gujar A, Guthrie M, Hoon Kim, Johnson K, Amin S, Das S, Clow P, Cheng A, Verhaak RG. “Live-cell imaging shows uneven segregation of extrachromosomal DNA elements and transcriptionally active extrachromosomal DNA clusters in cancer.”, *Cancer Discovery*, 2021 Nov
- Johnson K\*, Anderson K, [...], Hoon Kim, Estecio MRH, Tang M, Navin N, Maurya R, Ngan CY, Verburg N, Witt Hamer PC, Bulsara K, Samuels ML, Das S, Robson P, Verhaak RG. “Single-cell multimodal glioma analyses reveal epigenetic regulators of cellular plasticity and environmental stress response”, *Nature Genetics*, 2021 Sep.
- Yanfen Zhu\*, Amit D. Gujar\*, Chee-Hong Wong\*, [...], Hoon Kim, [...], Roel G.W. Verhaak, Chia-Lin Wei. “Oncogenic Extrachromosomal DNA Functions as Mobile Enhancers to Globally Amplify Chromosomal Transcription.”, *Cancer Cell*, 2021 April
- Hoon Kim\*, Nam Nguyen\*, Kristen Turner, [...], Sihan Wu, Jihe Liu, Sandeep Namburi, Howard Chang, Paul Mischel, Vineet Bafna, Roel Verhaak. “Extrachromosomal DNA is associated with oncogene amplification and poor outcome across multiple cancers.”, *Nature Genetics*, 2020 Aug.
- Oldrini Barbara, Nuria Vaquero-Siguero, Quanhua Mu, [...], Hoon Kim, [...], Tao Jiang, Jiguang Wang and Massimo Squatrito. “MGMT genomic rearrangements contribute to chemotherapy resistance in gliomas.”, *Nature Communications*, 2020 Aug.
- Samir Amin, Kevin J Anderson, C Elizabeth Boudreau, Emmanuel Martinez-Ledesma, [...], Hoon Kim, [...], Roel G.W. Verhaak. “Comparative molecular life history of spontaneous canine and human glioma”, *Cancer Cell*, 2020 Feb.
- Floris P. Barthel, Kevin C. Johnson, The Glioma Longitudinal Analysis Consortium (Hoon Kim included). “Longitudinal Molecular Trajectories of Diffuse Glioma in Adults”, *Nature*, 2019 Nov.
- Sihan Wu, Kristen M. Turner, [...], Hoon Kim, Julie Law, Roel Verhaak, Frank Furnari, Howard Chang, Bing Ren, Vineet Bafna, Paul Mischel. “Circular extrachromosomal DNA promotes accessible chromatin and high oncogene expression.”, *Nature*, 2019 Nov.
- Ana deCarvalho\*, Hoon Kim\*, Laila M. Poison, [...], Lynda Chin, Tom Mikkelsen, Roel G.W. Verhaak. “Discordant inheritance of chromosomal and extrachromosomal DNA elements contributes to dynamic disease evolution in glioblastoma.”, *Nature Genetics*, 2018 Apr.
- The Glioma Longitudinal Analysis Consortium\* (Hoon Kim included). “Glioma Through the Looking GLASS: the Glioma Longitudinal Analysis consortium, molecular evolution of diffuse gliomas”, *Neuro Oncology*, 2018 Jun.
- Javier Figueroa, Lynette Phillips, Tal Shahar, Anwar Hossain, Joy Gumin, Hoon Kim, Andrew Bean, George Calin, Juan Fueyo, Edgar Walters, Raghu Kalluri, Roel Verhaak, Frederick Lang. “Exosomes from Glioma-Associated Mesenchymal Stem Cells Increase the Tumorigenicity of Glioma Stem-like Cells via Transfer of Specific microRNA.”, *Cancer Research*, 2017 Nov.
- Wang Q, Hu B, Hu X, Hoon Kim, Nam DH, Verhaak RG. “Tumor evolution of glioma intrinsic gene expression subtype associates with immunological changes in the microenvironment.”, *Cancer Cell*, 2017 Jul.
- Hu X, Martinez-Ledesma E, Zheng S, Hoon Kim, Barthel F, Jiang T, Hess KR, Verhaak RG. “Multigene signature for predicting prognosis of patients with 1p19q co-deletion diffuse glioma.”, *Neuro Oncology*, 2017 Jun.
- Zheng S, Cherniack AD, Cancer Genome Atlas Research Network (Hoon Kim included), Verhaak RG. “Comprehensive Pan-Genomic Characterization of Adrenocortical Carcinoma.”, *Cancer Cell*, 2016 May.
- Cancer Genome Atlas Research Network\* (Hoon Kim included). “Comprehensive, Integrative Genomic Analysis of Diffuse Lower Grade Gliomas.”, *New England Journal of Medicine*, 2015 Jun.
- Hoon Kim\*, Verhaak RG. “Transcriptional mimicry by tumor-associated stroma.”, *Nature Genetics*, 2015 Apr.
- Hoon Kim\*, Zheng S, Amini SS, Mikkelsen T, Meyerson M, Chin L, Barnholtz-Sloan JS, Verhaak RG. “Whole-genome and multisector exome sequencing of primary and post-treatment glioblastoma reveals patterns of tumor evolution.”, *Genome Research*, 2015 Mar.

- Yoshihara K, Wang Q, Torres-Garcia W, Zheng S, Vegesna R, Hoon Kim, Verhaak RG. “The landscape and therapeutic relevance of cancer-associated transcript fusions.”, *Oncogene*, 2015 Sep.
- Cancer Genome Atlas Research Network\* (Hoon Kim included). “Multiplatform analysis of 12 cancer types reveals molecular classification within and across tissues of origin.”, *Cell*, 2014 Aug.
- Martínez E, Yoshihara K, Hoon Kim, Mills GM, Treviño V, Verhaak RG. “Comparison of gene expression patterns across 12 tumor types identifies a cancer supercluster characterized by TP53 mutations and cell cycle defects.”, *Oncogene*, 2014 Aug.
- Zheng S, Hoon Kim, Verhaak RG. “Silent mutations make some noise.”, *Cell*, 2014 Mar.
- Cancer Genome Atlas Research Network\* (Hoon Kim included). “The Cancer Genome Atlas Pan-Cancer analysis project.”, *Nature Genetics*, 2013 Oct.
- Cancer Genome Atlas Research Network\* (Hoon Kim included). “Comprehensive molecular characterization of clear cell renal cell carcinoma.”, *Nature*, 2013 Jul.
- Yoshihara K, Shahmoradgoli M, Martínez E, Vegesna R, Hoon Kim, Verhaak RG. “Inferring tumour purity and stromal and immune cell admixture from expression data.”, *Nature Communications*, 2013.
- Cheng WY, Hoon Kim, Kandel J, Anastassiou D. “Cancer invasion associated gene expression signature is present in differentially expressed genes in the reprogramming of fibroblasts into stem cells.” 2011. Available from *Nature Precedings*
- Hoon Kim\*, Watkinson J, Anastassiou D. “Biomarker discovery using statistically significant gene sets.”, *Journal of Computational Biology*, 2011 Oct.
- Hoon Kim\*, Watkinson J, Varadan V, Anastassiou D. “Multi-cancer computational analysis reveals invasion-associated variant of desmoplastic reaction involving INHBA, THBS2 and COL11A1.”, *BMC Medical Genomics*, 2010 Nov., Cited by 141 according to google search

## Grant

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### FUNDED

- *Understanding the role of chromosomal instability in bladder cancer metastasis*
  - Role: Principal investigator
  - Grant mechanism: 2023 Mid-career Research by the Ministry of Science and ICT, Korea
  - Project Period: 3/2023 - 2/2028
- *Discovery of novel diagnostic and therapeutic technologies based on extrachromosomal DNA*
  - Role: Principal investigator
  - Grant mechanism: 2022 STEAM Pioneer by the Ministry of Science and ICT, Korea
  - Project Period: 8/2022 - 12/2026
- *Understanding the drug-resistant mechanisms driven by extrachromosomal DNA*
  - Role: Principal Investigator
  - Grant mechanism: Industrial Sector, Korea
  - Funding Period: 7/2022 - 6/2025
- *Epigenome Dynamics Control*
  - Role: Collaborator
  - Grant mechanism: MRC, Korea
  - Project Period: 3/2021 - 12/2025
- *Regulating Glioblastoma aggressiveness*
  - Role: Collaborator
  - Grant mechanism: 2024 Research-Oriented Hospital, Korea
  - Project Period: 8/2024 - 12/2025
- *International Consortium for Development of Innovative anti-Cancer Drugs*

- Role: Collaborator
- Grant mechanism: 2024 Boston-Korea, Korea
- Project Period: 10/2024 - 2/2028

## Awards

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### Interdisciplinary Research Award

2024

The Ministry of Science and ICT, Korea

### Caroline Ross Endowed Fellowship Award

2015

MD Anderson Cancer Center

### Odyssey Fellowship Award

2012-2014

Theodore N. Law Endowment for Scientific Achievement, MD Anderson Cancer Center

The 1<sup>st</sup> recipient in the Bioinformatics/Computational Biology Dept.

## Patent

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### PUBLISHED

- Ji-Yeon Kim, Hoon Kim, "Method for predicting prognosis of breast cancer patients", 2025
- Se Young Chun, Hoigi Seo, Hyewon Bae, Dongun Kang, Hyun Jeong Sun, Hoon Kim, "Device and method for extracting high-dimensional gene features based on data dimension reduction", 2025
- Dimitris Anastassiou, John Watkinson, Hoon Kim, "Biomarkers based on a multi-cancer invasion-associated mechanism", WO2011130435 A1, 2011
- Hoon Kim, Roel Verhaak, Ana Decarvalho, Tom Mikkelsen, "A Method of Targeting Patient-Specific Onco-genes in Extrachromosomal DNA To Treat Glioblastoma", WO/2018/136837, 2018

### PENDING

- Amit Gujar, Jihe Liu, Hoon Kim, Roel Verhaak, "Extrachromosomal DNA Enrichment and Characterization in Cancer Cells"

## Invited oral presentations

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- "Discovering clinically relevant therapeutic targets – Extrachromosomal DNAs- through omics analysis", [AOS 2025] 5th International Congress of Asian Oncology Society, July 3, 2025, COEX, Seoul, Korea
- "Longitudinal characterization of extrachromosomal dna amplifications in adult glioma cohort", 24th International Conference on Brain Tumor Research and Therapy, June 23, 2025, Hokkaido, Japan
- "Extrachromosomal DNA amplification in glioblastoma.", 2024 KSNO Translational Research Symposium, Feb. 16, 2024, Korea
- "Intratumoral heterogeneity of extrachromosomal DNA amplifications in cancer", 2022 The 43rd Frontier Scientists Workshop (KAST), Nov 28-29, 2022, University of California San Diego, CA
- "Extrachromosomal DNA in Cancer", 2022 BK21 Symposium Korea University, August 24, 2022, Korea
- "Extrachromosomal DNA in Cancer", 2022 SNU CRI Symposium, June 24, 2022, Korea
- "Extrachromosomal DNA in Multiple Cancers", AOS 2022 - Asian Oncology Society, June 17, 2022, Korea
- "The role of extrachromosomal DNA in cancer", 2022 Yonsei Team Science Award Symposium: launching multi-omics precision medicine, June 10, 2022, Korea
- "A journey to understand intratumor heterogeneity and tumor evolution", 17<sup>th</sup> UOS Life Science Symposium: Recent Advances in Genomics, Univ of Seoul, Jan. 28, 2022
- "The role of extrachromosomal DNA in Cancer", 2021 Fall Life Sciences Seminar, POSTECH, Dec. 17, 2021
- "Extrachromosomal DNA in Cancer", Annual Conference of Korean Society for Bioinformatics, Oct. 2021, Korea
- "Extrachromosomal DNA in Cancer", Korea SuperComputing Conference, KISTI, Oct. 2021, Korea
- "A journey to understand intratumor heterogeneity", International Conference of the Genetics Society Korea, Oct. 2021, Korea
- "Extrachromosomal DNA in Cancer", KOGO Annual Conference, September 2021, Korea
- "Extrachromosomal DNA in Cancer", Seminar, Seoul National University Cancer Research Institute, September 7 2021, Korea
- "Extrachromosomal DNA in Cancer", KRIBB, August 2021, Korea

- “Extrachromosomal DNA in Cancer”, Korean Basic Medical Scientists, June 2021, Korea
- “A journey to understand intratumor heterogeneity”, Sorak Conference, June 2021, Korea
- “Extrachromosomal DNA in Cancer”, KCA Annual Meeting, June 2021, Korea
- “Extrachromosomal DNA in Cancer”, Korean Society for Biochemistry and Molecular Biology, May KSBMB, 2021, Korea
- “Extrachromosomal DNA in Cancer”, Digital Therapeutics, May 2021 KAIST, Korea
- “Studies on extrachromosomal DNA alterations using cloud computing over multiple tumor types.” Oct. 2020, NIH, USA [Online responding to Covid 19]
- “Extrachromosomal DNA elements are frequent in tumors and can contribute to tumor heterogeneity.” *Lecture*, 2019, Samsung Medical Center, Korea
- “Extrachromosomal DNA elements are frequent in tumors and can contribute to tumor heterogeneity.” *Lecture*, 2019, KAIST, Korea
- “Extrachromosomal DNA elements are frequent in tumors and can contribute to tumor heterogeneity.” *Lecture*, 2019, Seoul National University, Korea
- “Molecular evolution of diffuse gliomas and the Glioma Longitudinal Analysis (GLASS) consortium (on behalf of GLASS)” *The Society for Neuro-oncology*, 2018, New Orleans, LA
- “Extrachromosomal DNA elements are frequent in tumors and can contribute to tumor heterogeneity.” *Symposium: computational approaches in cancer biology*, 2018, Rotterdam, Netherlands
- “Extrachromosomal DNA elements drive disease evolution in glioblastoma.” *Scientific Symposium*, 2017, Bar Harbor, ME
- “Non-Mendelian inheritance of extrachromosomal DNA elements can drive disease evolution in glioblastoma” *The Society for Neuro-oncology*, 2016, Scottsdale, AZ
- “Whole-genome and Multisector Exome Sequencing of Primary and Post-treatment Glioblastoma Reveal Patterns of Tumor Evolution.” *Training in Brain Tumor Research*, 2015, Houston, TX
- “Alteration of the p53 pathway is associated with subclonal tumor progression in glioblastoma.” *The Society for Neuro-oncology*, 2014, Miami, FL
- “Alteration of the p53 pathway is associated with subclonal tumor progression in glioblastoma.” *AACR Annual Meeting Minisymposium session*, 2014, San Diego, CA
- “The Intratumoral Heterogeneity of Glioblastoma Suggests a Pivotal Role for Clonal Evolution.” *Advances in Genome Biology and Technology*, 2014, Marco Island, FL

## Professional Service

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### ADVISING AND MENTORSHIP

- Soyeon Kim – Master’s Thesis, Sungkyunkwan University, 2024
  - Project: “Mapping extrachromosomal DNA amplifications during cancer progression.”
  - Current: Ph.D. Program, Wellcome Sanger Institute, University of Cambridge

### PEER REVIEWER

- **ORCID:** <https://orcid.org/0000-0003-4244-6126/>
- Nature Genetics, PLOS Genetics, Neuro-Oncology, Molecular Carcinogenesis, BMC Medical Genomics, Oncotarget, Cold Spring Harbor Molecular Case Studies, Cancer Biology and Medicine, Critical Reviews in Clinical Laboratory Sciences, Theoretical Biology and Medical Modelling

### GLIOMA LONGITUDINAL ANALYSIS CONSORTIUM ([HTTPS://WWW.GLASS-CONSORTIUM.ORG](https://www.glass-consortium.org))

- Data Analysis Committee Member, 2014 ~ Present