

# Hoon Kim

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CONTACT INFORMATION	The Jackson Laboratory for Genomic Medicine 10 Discovery Drive Farmington, CT 06032	(860) 837-2474 Hoon.Kim@jax.org wisekh6@gmail.com
RESEARCH INTERESTS	Biomolecular Big Data Mining, Computational Biology, Bioinformatics, Genetics and Genomics, Tumor Resistance	
EDUCATION	<b>Columbia University</b> , New York, NY  Ph.D., Electrical Engineering, 2011 <ul style="list-style-type: none"><li>• Thesis Topic: <i>Selection of Disease-Associated Gene Sets</i></li><li>• Advisor: Dr. Dimitris Anastassiou</li></ul> <b>University of Michigan</b> , Ann Arbor, MI  M.Sc., Electrical Engineering-Systems, 2005 <b>Korea University</b> , Seoul, South Korea  B.E., Electrical Engineering, 2000  B.Sc., Genetic Engineering, 2000	
POSITIONS	<b>Senior Research Scientist</b> Genomic Medicine The Jackson Laboratory for Genomic Medicine, Farmington, CT	2017 - Present
	<b>Instructor</b> Department of Genomic Medicine MD Anderson Cancer Center, Houston, TX	2015 - 2016
	<b>Postdoc Fellow</b> Department of Bioinformatics and Computational Biology MD Anderson Cancer Center, Houston, TX Supervisors: Dr. Roel Verhaak	2011 - 2015
	<b>Research Assistant</b> Genomic Information Systems Laboratory Columbia University, New York, NY Supervisors: Dr. Dimitris Anastassiou	2006 - 2010
	<b>Research Intern</b> Biomedical Informatics Dept. Philips Research North America, NY	2009
	<b>Teaching Assistant</b> Signals and Systems (E3801) Columbia University, New York, NY	2005

## System Engineer

2000 - 2002

Universal Mobile Telecommunication Systems  
LG Electronics Inc., South Korea

### WORK-IN- PROGRESS

1. Hoon Kim, Nam Nguyen, Kristen Turner, Sihan Wu, Jihe Liu, Sandeep Namburi, Howard Chang, Paul Mischel, Vineet Bafna, Roel Verhaak. “The landscape and impact of extrachromosomal DNA amplification in cancer.” *Accepted for publication in Nature Genetics*, 2020, <https://www.biorxiv.org/content/10.1101/859306v1>
2. Yanfen Zhu<sup>1</sup>, Amit D. Gujar, [...], Hoon Kim, Ana DeCarvalho, Roel G.W. Verhaak, Chia-Lin Wei. “Extrachromosomal DNA Function as Mobile Enhancers and Global Transcriptional Amplifiers in Cancer” *Manuscript under review*, 2019
3. 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.” *Manuscript under review*, 2019

### PUBLISHED WORK

1. Samir Amin, [...], Hoon Kim, Roel G.W. Verhaak. “Comparative molecular life history of spontaneous canine and human glioma” *Cancer Cell*, 2020 Feb 10
2. Floris P. Barthel, Kevin C. Johnson, The Glioma Longitudinal Analysis Consortium (Kim H included). “Longitudinal Molecular Trajectories of Diffuse Glioma in Adults” *Nature*, 2019 Nov 20. doi:10.1038/s41586-019-1775-1  
(Role: Project coordination, Data preprocessing, Pipeline development)
3. Kristen M. Turner, Sihan Wu, [...], 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 20. doi:10.1038/s41586-019-1763-5
4. Ana deCarvalho, Hoon Kim (*co-first author*), Laila M. Poison, Mary Winn, Claudius Mueller, David Cherba, Julie Koeman, Sahil Seth, Alexei Protopopov, Michelle Felicella, Siyuan Zheng, Jianhua Zhang, Emanuel F. Petricoin, 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.
5. The Glioma Longitudinal Analysis Consortium (Kim H included). “Glioma Through the Looking GLASS: the Glioma Longitudinal Analysis consortium, molecular evolution of diffuse gliomas” *Neuro Oncology*, 2018 Jun 18
6. 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 1
7. Wang Q, Hu B, Hu X, Kim H, Nam DH, Verhaak RG. “Tumor evolution of glioma intrinsic gene expression subtype associates with immunological changes in the microenvironment.” *Cancer Cell*, 2017 Jul 10;32(1):42-56.
  8. Hu X, Martinez-Ledesma E, Zheng S, Kim H, 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 1
  9. Zheng S, Cherniack AD, Cancer Genome Atlas Research Network (Kim H included), Verhaak RG. “Comprehensive Pan-Genomic Characterization of Adrenocortical Carcinoma.” *Cancer Cell*, 2016 May 9;29(5):723-36.
  10. Cancer Genome Atlas Research Network (Kim H included). “Comprehensive, Integrative Genomic Analysis of Diffuse Lower Grade Gliomas.” *New England Journal of Medicine*, 2015 Jun 25;372(26):2481-98.
  11. Kim H, Verhaak RG. “Transcriptional mimicry by tumor-associated stroma.” *Nature Genetics*, 2015 Apr;47(4):307-9.
  12. Kim H, 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;25(3):316-27.
  13. Yoshihara K, Wang Q, Torres-Garcia W, Zheng S, Vegesna R, Kim H, Verhaak RG. “The landscape and therapeutic relevance of cancer-associated transcript fusions.” *Oncogene*, 2015 Sep 10;34(37):4845-54.
  14. Cancer Genome Atlas Research Network (Kim H included). “Multiplatform analysis of 12 cancer types reveals molecular classification within and across tissues of origin.” *Cell*, 2014 Aug 14;158(4):929-44.
  15. Martínez E, Yoshihara K, Kim H, 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 4.
  16. Zheng S, Kim H, Verhaak RG. “Silent mutations make some noise.” *Cell*, 2014 Mar 13;156(6):1129-31.
  17. Cancer Genome Atlas Research Network (Kim H included). “The Cancer Genome Atlas Pan-Cancer analysis project.” *Nature Genetics*, 2013 Oct;45(10):1113-20.
  18. Cancer Genome Atlas Research Network (Kim H included). “Comprehensive molecular characterization of clear cell renal cell carcinoma.” *Nature*, 2013 Jul 4;499(7456):43-9.

19. Yoshihara K, Shahmoradgoli M, Martínez E, Vegesna R, Kim H, Verhaak RG. “Inferring tumour purity and stromal and immune cell admixture from expression data.” *Nat Commun.*, 2013;4:2612.
20. Cheng WY, Kim H, 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* (<http://precedings.nature.com/documents/5924/version/1>)
21. Kim H, Watkinson J, Anastassiou D. “Biomarker discovery using statistically significant gene sets.” *J Comput Biol.*, 2011 Oct;18(10):1329-38.
22. Kim H, Watkinson J, Varadan V, Anastassiou D. “Multi-cancer computational analysis reveals invasion-associated variant of desmoplastic reaction involving INHBA, THBS2 and COL11A1.” *BMC Med Genomics*, 2010 Nov 3;3:51.[Highly accessed]

- AWARDS
- **Caroline Ross Endowed Fellowship Award** 2015  
The University of Texas MD Anderson Cancer Center
  - **Odyssey Fellowship Award** 2012-2014  
Theodore N. Law Endowment for Scientific Achievement  
The 1<sup>st</sup> recipient in the Bioinformatics/Computational Biology Dept.

- GRANT
- Under Review**
- **Title: Characterization of extrachromosomal DNAs in tumors through computational analysis of sequencing data**
  - Role: Principal investigator
  - Grant mechanism: NIH R21

- Funded**
- **Title: Modeling Tumor Evolution in Glioma**
  - Role: Co-Investigator
  - Grant mechanism: R21 NS114873-01
  - Funding Period: 9/30/2019 - 8/31/2021

- PATENT
- Published**
- Dimitris Anastassiou, John Watkinson, Hoon Kim. “Biomarkers based on a multi-cancer invasion-associated mechanism.”, *Publication number: WO2011130435 A1*
  - Hoon Kim, Roel Verhaak, Ana Decarvalho, Tom Mikkelsen. “A Method of Targeting Patient-Specific Oncogenes in Extrachromosomal DNA To Treat Glioblastoma.”, *Publication number: WO/2018/136837*

**Pending**

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

- INVITED TALKS
- “Extrachromosomal DNA elements are frequent in tumors and can contribute to tumor heterogeneity.” *Lecture*, 2019, Seoul National University, Korea
  - “Extrachromosomal DNA elements are frequent in tumors and can contribute to tumor heterogeneity.” *Lecture*, 2019, Ewha Womans University, Korea
  - “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.” *Symposium: computational approaches in cancer biology*, 2018, Rotterdam, Netherlands
  - “Extrachromosomal DNA elements drive disease evolution in glioblastoma.” *JAX Scientific Symposium*, 2017, Bar Harbor, ME
  - “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.” *2014 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

MEMBERSHIPS **Society for Neuro-Oncology** 2014 - Present  
<https://www.soc-neuro-onc.org>

**Glioma Longitudinal Analysis Consortium** 2015 - Present

- <http://glass-consortium.org/>
- Data Infrastructure and Processing Committee member
- **Role:** Project coordination, Data preprocessing, Pipeline development

PROFESSIONAL SERVICE **Ph.D. Dissertation Committee** 2015

- Emmanuel Martinez, Ph.D. Tecnologico de Monterrey, Mexico  
 Thesis Advisor: Dr. Victor M. Treviño Alvarado  
 Dissertation Title: “Identification of features related to cancer stages, survival, and subtypes from diverse genomics data”

**Graduate Mentor** 2018

- Anzhela Moskalik

Graduate student, University of Connecticut School of Medicine, Farmington, CT

- Olajide Abiola 2017  
Graduate student, University of Connecticut School of Medicine, Farmington, CT
- Emmanuel Martinez 2012  
Research Intern, MD Anderson Cancer Center, Houston, TX
- Seyed Saman Amini 2012 - 2013  
Research Intern, MD Anderson Cancer Center, Houston, TX

#### Peer Reviewer

- **publons:** <https://publons.com/researcher/1287836/hoon-kim/peer-review/>
- 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

#### REFERENCES

##### **Paul S. Mischel, M.D.**

Member and Head  
Laboratory of Molecular Pathology  
Ludwig Institute for Cancer Research  
Distinguished Professor  
University of California at San Diego

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##### **Dimitris Anastassiou, Ph.D.**

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##### **Roel Verhaak, Ph.D.**

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Genomic Medicine  
The Jackson Laboratory

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E-mail: Roel.Verhaak@jax.org

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