Hajin Kim

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Current Position
Associate professor
Department of Biomedical Engineering, UNIST

Education

Seoul National University, Seoul, Korea
Ph.D. Physics (Young Kuk group) Feb 2006
"One-Dimensional Heterogeneous Electronic Structure of Carbon Nanotubes: Bandgap Modulation, Defect States, and Luttinger Liquid Behavior"
M.S. Physics (Young Kuk group) Feb 2001
"A Study of Bromobenzene Molecules Adsorbed on the Cu(111) Surface with a Low Temperature Scanning Tunneling Microscope"
B.S. Physics Feb 1999
Seoul Science High School, Seoul, Korea 1992 – 1995

Professional Experience

Associate Professor at **UNIST** Sep 2019 –
Assistant Professor at **UNIST** Jan 2014 – Aug 2019
Research Associate at **Howard Hughes Medical Institute** (**Taekjip Ha** group) Nov 2009 – Dec 2013
Postdoctoral Research Associate at the **University of Illinois, Urbana-Champaign** (**Taekjip Ha** group) May 2009 – Nov 2009
Postdoctoral Scholar at **University of California, Berkeley** and **Stanford University** (**Steven Chu** group) Dec 2006 – May 2009

Current Research Topics

Super-resolved chromosome structure and dynamics
Single molecule epigenomics (Aksimentiev group, UIUC)
Transcription/replication dynamics (Patel group, Rutgers University; Myung group, IBS)
Imaging-based bacterial identification

†: equally contributing authors; *: corresponding authors

Selected Publications

Narendra Chaudhary, Si-Hyeong Nho, Hayoon Cho, Narangerel Gantumur, Jae Sun Ra, Kyungjae Myung, and **Hajin Kim***
"Background-Suppressed Live Visualization of Genomic Loci with an Improved CRISPR System Based on a Split Fluorophore"
Genome Research (2020)

Byeong-Kwon Sohn†, Urmimala Basu†, Seung-Won Lee, Hayoon Cho, Jiayu Shen, Aishwarya Deshpande, Laura C. Johnson, Kalyan Das, Smita S. Patel*, and **Hajin Kim***
"The Dynamic Landscape of Transcription Initiation in Yeast Mitochondria"
Nature Communications (2020)

Urmimala Basu†, Seung-Won Lee†, Aishwarya Deshpande†, Jiayu Shen, Byeong-Kwon Sohn, Hayoon Cho, **Hajin Kim***, and Smita S. Patel*
"The C-terminal tail of the yeast mitochondrial transcription factor Mtf1 coordinates template strand alignment, DNA scrunching, and timely transition into elongation"
Nucleic Acids Research (2020)

Mi-Sun Kang†, Eunjin Ryu†, Seung-Won Lee†, Jieun Park, Na Young Ha, Jae Sun Ra, Yeong Jae Kim, Jinwoo Kim, Mohamed Abdel-Rahman, Su Hyung Park, Kyoo-young Lee, **Hajin Kim***, Sukhyun Kang*, and Kyungjae Myung*
"Regulation of PCNA cycling on replicating DNA by RFC and RFC-like complexes"
Nature Communications (2019)

Hyunju Kang†, Jejoong Yoo†, Byeong-Kwon Sohn, Seung-Won Lee, Hong Soo Lee, Wenjie Ma, Jung-Min Kee, Aleksei Aksimentiev*, and **Hajin Kim***
"Sequence-dependent DNA condensation as a driving force of DNA phase separation"
Nucleic Acids Research (2018)

Jejoong Yoo†, **Hajin Kim†**, Aleksei Aksimentiev, and Taekjip Ha*
"Direct evidence for sequence-dependent attraction between double-stranded DNA controlled by methylation"
Nature Communications (2016)

Hajin Kim†, Sanjaya Abeysirigunawardena†, Kaushik Ragunathan, Megan Mayerle, Ke Chen, Zaida Luthey-Schulten, Taekjip Ha*, and Sarah Woodson*
"Protein-Guided RNA Dynamics during Early Ribosome Assembly"
Nature (2014)

Total citation: 1,588 h-index: 15 (as of 2020)

Publications

Narendra Chaudhary, Si-Hyeong Nho, Hayoon Cho, Narangerel Gantumur, Jae Sun Ra, Kyungjae Myung, and **Hajin Kim***
"Background-Suppressed Live Visualization of Genomic Loci with an Improved CRISPR System Based on a Split Fluorophore"
Genome Research (2020)

Byeong-Kwon Sohn†, Urmimala Basu†, Seung-Won Lee, Hayoon Cho, Jiayu Shen, Aishwarya Deshpande, Laura C. Johnson, Kalyan Das, Smita S. Patel*, and **Hajin Kim***
"The Dynamic Landscape of Transcription Initiation in Yeast Mitochondria"
Nature Communications (2020)

Jun Ho Lee, Jae Hee Suh, Hyun Je Kang, Soo Youn Choi, Seok Won Jung, Whaseon Lee-Kwon, Soo-Ah Park, **Hajin Kim**, Byeong Jin Ye, Eun Jin Yoo, Gyu Won Jeong, Neung Hwa Park, and Hyug Moo Kwon*
"Tonicity-Responsive Enhancer-Binding Protein Promotes Stemness of Liver Cancer and Cisplatin Resistance"
EBioMedicine (2020)

Urmimala Basu†, Seung-Won Lee†, Aishwarya Deshpande†, Jiayu Shen, Byeong-Kwon Sohn, Hayoon Cho, **Hajin Kim***, and Smita S. Patel*
"The C-terminal tail of the yeast mitochondrial transcription factor Mtf1 coordinates template strand alignment, DNA scrunching, and timely transition into elongation"
Nucleic Acids Research (2020)

Xianan Qin, Lei Liu, Sang Kwon Lee, Adolfo Alsina, Teng Liu, Chao Wu, Hojeong Park, Chenglong Yu, **Hajin Kim**, Jun Chu, Antoine Triller, Ben Zhong Tang, Changbong Hyeon*, Chan Young Park*, and Hyokeun Park*
"Increased Confinement and Polydispersity of STIM1 and Orai1 after Ca2+ Store Depletion"
Biophysical Journal (2020)

Seoyun Choi, Seung-Won Lee, **Hajin Kim***, Byungchan Ahn*
"Molecular characteristics of reiterative DNA unwinding by the Caenorhabditis elegans RecQ helicase"
Nucleic Acids Research (2019)

Mi-Sun Kang†, Eunjin Ryu†, Seung-Won Lee†, Jieun Park, Na Young Ha, Jae Sun Ra, Yeong Jae Kim, Jinwoo Kim, Mohamed Abdel-Rahman, Su Hyung Park, Kyoo-young Lee, **Hajin Kim***, Sukhyun Kang*, and Kyungjae Myung*
"Regulation of PCNA cycling on replicating DNA by RFC and RFC-like complexes"
Nature Communications (2019)

Jyoti Bhardwaj, Narendra Chaudhary, **Hajin Kim**, and Jaesung Jang*
"Subtyping of influenza A H1N1 virus using a label-free electrochemical biosensor based on the DNA aptamer targeting the stem region of HA protein"
Analytica Chimica Acta (2019)

Hyunju Kang†, Jejoong Yoo†, Byeong-Kwon Sohn, Seung-Won Lee, Hong Soo Lee, Wenjie Ma, Jung-Min Kee, Aleksei Aksimentiev*, and **Hajin Kim***
"Sequence-dependent DNA condensation as a driving force of DNA phase separation"
Nucleic Acids Research (2018)

Sanjaya C. Abeysirigunawardena†, **Hajin Kim†**, Jonathan Lai, Kaushik Ragunathan, Mollie C. Rappé, Zaida Luthey-Schulten, Taekjip Ha*, and Sarah A. Woodson*
"Evolution of protein-coupled RNA dynamics during hierarchical assembly of ribosomal complexes"
Nature Communications (2017)

Yuri Choi, Byungkyun Kang, Jooyong Lee, Sunghu Kim, Gyeong Tae Kim, Hyunju Kang, Bo Ram Lee, **Hajin Kim**, Sang-Hee Shim, Geunsik Lee, Oh-Hoon Kwon, and Byeong-Su Kim*
"Integrative Approach toward Uncovering the Origin of Photoluminescence in Dual Heteroatom-Doped Carbon Nanodots"
Chemistry of Materials (2016)

Jejoong Yoo†, **Hajin Kim†**, Aleksei Aksimentiev, and Taekjip Ha*
"Direct evidence for sequence-dependent attraction between double-stranded DNA controlled by methylation"
Nature Communications (2016)

Daniel Sewell, **Hajin Kim**, Taekjip Ha, and Ping Ma*
"A parameter estimation method for fluorescence lifetime data"
BMC Research Notes (2015)

Boyang Hua, Kyu Young Han, Ruobo Zhou, **Hajin Kim**, Xinghua Shi, Sanjaya C Abeysirigunawardena, Ankur Jain, Digvijay Singh, Vasudha Aggarwal, Sarah Woodson, and Taekjip Ha*
"An improved surface passivation method for single-molecule studies"
Nature Methods (2014)

Hajin Kim†, Sanjaya Abeysirigunawardena†, Kaushik Ragunathan, Megan Mayerle, Ke Chen, Zaida Luthey-Schulten, Taekjip Ha*, and Sarah Woodson*
"Protein-Guided RNA Dynamics during Early Ribosome Assembly"
Nature (2014)

Jorge A. Lamboy†, **Hajin Kim**†, Holly Dembinski, Taekjip Ha*, and Elizabeth Komives*
"Single molecule FRET reveals the energy landscape of the native state dynamics of the IκBα ankyrin repeat domain"
J. Mol. Biol. (2013)

Hajin Kim and Taekjip Ha*
"Single Molecule Nanometry for Biological Physics"
Reports on Progress in Physics (2013)

Ibrahim Cisse, **Hajin Kim**, and Taekjip Ha*
"A Rule of Seven in Watson-Crick Base Pairing of Mismatched Sequences"
Nature Struct. Mol. Biol. (2012)

Ke Chen, John Eargle, Jonathan Lai, **Hajin Kim**, Taekjip Ha, Megan Mayerle, Sarah Woodson, and Zaida Luthey-Schulten*
"Assembly of the Five-way Junction in the Ribosomal Small Subunit Using Hybrid MD-Go Simulations"
Journal of Physical Chemistry B (2012)

Hajin Kim, Guo-Qing Tang, Smita S. Patel*, and Taekjip Ha*
"Opening-Closing Dynamics of the Mitochondrial Transcription Pre-initiation Complex"
Nucleic Acids Research (2011) (*featured article*)

Jorge A. Lamboy†, **Hajin Kim**†, Kyung Suk Lee, Taekjip Ha*, and Elizabeth A. Komives*
"Visualization of the Nanospring Dynamics of the IκBα Ankyrin Repeat Domain in Real Time"
Proc. Natl. Acad. Sci. 108 (2011) (equal contribution)

Helen Hwang, **Hajin Kim**, and Sua Myong,
"Protein Induced Fluorescence Enhancement as a Single Molecule Assay with Short Distance Sensitivity"
Proc. Natl. Acad. Sci. 108, 7414-7418 (2011)

Byoung-Young Choi, S.-J. Kahng, S. Kim, **H. Kim**, H. W. Kim, Y. J. Song, J. Ihm, and Y. Kuk,
"Conformational Molecular Switch of the Azobenzene Molecule: A Scanning Tunneling Microscopy Study"
Phys. Rev. Lett. 96, 156106 (2006)

Sungjun Lee, G. Kim, **H. Kim**, B.-Y. Choi, J. Lee, B. W. Jeong, J. Ihm, Y. Kuk, and S.-J. Kahng,
"Paired Gap States in a Semiconducting Carbon Nanotube: Deep and Shallow Levels"
Phys. Rev. Lett. 95, 166402 (2005)

Hajin Kim, J. Lee, S. J. Lee, J.-Y. Park, S.-J. Kahng, and Y. Kuk*,
"Local Electronic Density of States of a Semiconducting Carbon Nanotube Interface"
Phys. Rev. B 71, 235402 (2005)

Hajin Kim, J, Lee, S. Lee, Y. J. Song, B.-Y. Choi, Y. Kuk, and S.-J. Kahng*,
"Scanning Tunneling Spectroscopy of a Semiconducting Heterojunction Nanotube on the Au(111) Surface"
Surf. Sci. 581, 241 (2005)

Jhinhwan Lee, S. Eggert, **H. Kim**, S.-J. Kahng, H. Shinohara, and Y. Kuk*,
"Real Space Imaging of One-Dimensional Standing Waves: Direct Evidence for a Luttinger Liquid"
Phys. Rev. Lett. 93, 166403 (2004)

Hajin Kim, J. Lee, Y. J. Song, B. Y. Choi, S.-J. Kahng, and Y. Kuk*,

"Nano-Scale Structures of a One-Dimensional Junction"
Thin Solid Films 464, 335 (2004)

Hajin Kim, H. J. Chung, J. Lee, S. J. Lee, B.-Y. Choi, Y. J. Song, and Y. Kuk*,
"Functionalized One-Dimensional Wires and Their Interconnections"
Jpn. J. Appl. Phys. 42, 4780 (2003)

Hajin Kim, J. Lee, S.-J. Kahng, Y.-W. Son, S. B. Lee, C.-K. Lee, J. Ihm, and Y. Kuk*,
"Direct Observation of Localized Defect States in Semiconductor Nanotube Junctions"
Phys. Rev. Lett. 90, 216107 (2003)

Hajin Kim, H. J. Chung, J. Lee, and Y. Kuk*,
"Functionalized One-Dimensional Devices and Their Interconnections"
J. of Kor. Phys. Soc., 42, S134 (2003)

Jhinhwan Lee, **H. Kim**, S.-J. Kahng, G. Kim, Y.-W. Son, J. Ihm, H. Kato, Z. W. Wang, T. Okazaki, H. Shinohara, and Y. Kuk*,
"Bandgap Modulation of Carbon Nanotubes by Encapsulated Metallofullerenes"
Nature 415, 1005 (2002)

Patents

Method for improving efficiency of detecting microorganisms by FISH, 10-2070914 (2020, South Korea)
Method for detecting microorganisms using multiple probe hybridization, 10-2084688 (2020, South Korea)