

LinkedIn : <https://www.linkedin.com/in/kimjihun>

## CURRENT POSITION

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**University of Pennsylvania**, Philadelphia, PA, USA

Postdoctoral Researcher, Department of Bioengineering <sup>(W & D)</sup>

February 2016 – present

- Postdoc training focusing on 3D genome structure analysis using cutting edge chromatin capture technologies (e.g. 5C) and its transcriptional effect on neurobiology.
- Key achievements:
  - Led a team to engineer 3D genome loops using blue light in LADL-transfected mouse ES cells.
  - Identified the transcriptional effect of the engineered 3D genome looping using single molecule RNA FISH through the collaboration with Raj lab (University of Pennsylvania).
  - Developed and implemented 5C-ID, with dramatically improved resolution and background, by combining 5C with double alternating 5C primer design and in situ technologies.
  - Succeeded in 5C from low-input using 5C-ID.

Advisor :

Jennifer E. Phillips-Cremins

## EDUCATION

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**University of Melbourne**, Melbourne, Australia

Doctor of Philosophy from Department of Paediatrics

May 2009 – March 2014

Thesis : Condensin: a dynamic organizer of vertebrate chromosome structure

Advisors :

Damien F. Hudson

Paul Kalitsis

K.H. Andy Choo

**University of Melbourne**, Melbourne, Australia

Bachelor of Science with Honours (Second Class Honour A)

March 2008 – December 2008

Department of Medicine (RMH/WH)

Thesis: Generation and analysis of axin-RFP stable cell lines

Advisors :

Anthony W. Burgess

Maree Faux

**University of Melbourne**, Melbourne, Australia

Bachelor of Biomedical Science (Second Class Honour A)

February 2005 – December 2007

Major in Pharmacology

## PROFESSIONAL RESEARCH EXPERIENCE

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**Jackson Laboratory for Genomic Medicine**, Farmington, CT, USA

Postdoctoral Associate, Lee lab <sup>(W & D)</sup>

May 2014 – January 2016

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<sup>W</sup> : wet lab experience

<sup>D</sup> : dry lab experience (NGS analysis)

- Postdoc training focusing on the effect of copy number variations on diseases using genome editing
- Key achievements:
  - Investigated the effect of copy number variations of super enhancers on various cancers, using TCGA data analysis and genome editing (CRISPR-Cas9) and lentiviral transduction
  - Implemented and trained CRISPR-Cas9 genome editing method to the lab
  - Supported developing the tool to model 3D genome structure using public HiC data

Advisor :

Charles Lee (Scientific Director)  
Chengsheng Zhang (Associate Director of Cytogenetics Laboratory)

**Seoul National University**, Seoul, South Korea

Visiting Scientist, Cancer Research Institute, College of Medicine <sup>(D)</sup>

April 2014

- Visiting scientist analyzing RNA-seq data during the transition between Ph.D. and postdoc.
- Key achievement :
  - Produced gene expression profiles that are regulated by condensin I and II in vertebrates

Advisor :

Charles Lee

**Wellcome Trust Centre for Cell Biology**, Edinburgh, UK

Visiting Scientist, Earnshaw lab <sup>(W)</sup>

June 2010 – November 2010

- Visiting scientist at Earnshaw lab for 6months as a part of my Ph.D.
- Key achievement :
  - Isolated DT40 cells at each cell cycle based on their physical properties using an elutriator.
  - Completed ChIP-seq protocol and conducted the first NGS for the lab
  - Isolated and purified large masses of condensin I and II for 3D protein structure analysis using 3D-MS, through the collaboration with Rappsilber lab (Wellcome Trust Centre for Cell Biology).

Advisor :

William C. Earnshaw

**Murdoch Children's Research Institute**, Melbourne, Australia

Ph.D. Researcher <sup>(W & D)</sup>

May 2009 – March 2014

- Conducted Ph.D. research projects, affiliated with Department of Paediatrics, University of Melbourne.
- Key achievements :
  - Created the first genome-wide map of condensin (a major structural protein in chromatin conformation) in vertebrates, suggesting the spatiotemporal model of chromosome formation.
  - First identified the function of condensin on gene expression regulation
  - Developed and implemented ChIP-seq method in the lab.
  - Self-learnt NGS data analysis
  - Supported PI preparing grant application (ARC in 2011 and NHMRC in 2012).

Advisors :

Damien F. Hudson  
Paul Kalitsis  
K.H. Andy Choo (Theme director)

**Ludwig Institute for Cancer Research**, Melbourne, Australia

Undergraduate Research Student <sup>(W)</sup>

March 2008 – December 2008

- Generated MDCK cell lines that stably express RFP-conjugated axin using tetOn/Off system, to understand its role in Wnt signaling in colorectal cancer.

Advisor :

Anthony W. Burgess (Institute Director)  
Maree Faux

## PUBLICATIONS

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1. **Ji Hun Kim**, Mayuri Rege, Jacqueline Valeri, Margaret C. Dunagin, Aryeh Metzger, Katelyn R. Titus, Thomas G. Gilgenast, Wanfeng Gong, Jonathan A. Beagan, Arjun Raj, Jennifer E. Phillips-Cremins, LADL: light-activated dynamic looping for endogenous gene expression control, **Nature Methods**, doi : 10.1038/s41592-019-0436-5, 2019
  - Highlighted in Linda Koch, Optoeigenetics for 3D genome engineering, **Nature Review Genetics**, doi: 10.1038/s41576-019-0154-y
  - Highlighted in Evan M. Lerner, Penn Engineers' 'LADL' Uses Light to Serve Up On-demand Genome Folding, **Penn Today**
  - Preprint at Bioarxiv : <https://www.biorxiv.org/content/10.1101/349340v1>
2. Paul Kalitsis, Tao Zhang, **Ji Hun Kim**, Christian F. Nielsen, Kathryn M. Marshall, Damien F. Hudson, Knocking in Multifunctional Gene Tags into SMC Complex Subunits Using Gene Editing. In: Badrinarayanan A. (eds) SMC Complexes. **Methods in Molecular Biology**, doi: 10.1007/978-1-4939-9520-2\_8, 2019
3. **Ji Hun Kim**, Katelyn R. Titus, Wanfeng Gong, Jonathan A. Beagan, Zhendong Cao, Jennifer E. Phillips-Cremins, 5C-ID: Increased resolution Chromosome-Conformation-Capture-Carbon-Copy with in situ 3C and double alternating primer design, **Methods**, 142, 39-46, doi: 10.1016/j.jymeth.2018.05.005, 2018
  - Preprint at Bioarxiv : <https://www.biorxiv.org/content/10.1101/244285v1>
4. Tao Zhang, James R Paulson, Muhammed Bakhrebah, **Ji Hun Kim**, Cameron Nowell, Paul Kalitsis, Damien F. Hudson, Condensin I and II behavior in interphase nuclei and cells undergoing premature chromosome condensation, **Chromosome Research**, 24, 243-269, doi:10.1007/s10577-016-9519-7, 2016
5. Helena Barysz, **Ji Hun Kim**, Zhuo Angel Chen, Damien F. Hudson, Juri Rappsilber, Dietlind L. Gerloff, William C. Earnshaw, 3D topology of a core SMC2/SMC4 sub-complex of chicken condensin I revealed by cross-linking and molecular modeling **Open Biology**. 5: 150005.doi: 10.1098/rsob.150005, 2015
6. **Ji Hun Kim**, Tao Zhang, Nicholas C. Wong, Nadia Davidson, Jovana Maksimovic, Alicia Oshlack, William C. Earnshaw, Paul Kalitsis, Damien F. Hudson. Condensin I associates with structural and gene regulatory regions in vertebrate chromosomes. **Nature Communications**, 4, 2537, doi:10.1038/ncomms3537, 2013
7. **Ji Hun Kim**, Paul Kalitsis, Mark D. Pertile, Dianna Maglian, Lee Wong, K.H. Andy Choo, Damien F. Hudson. Nucleic Acid: Hybridization. **Encyclopedia of Life Science**, Wiley, doi: 10.1002/9780470015902.a0003148.pub2, 2012
8. Lydia C. Green, Paul Kalitsis, Tsz M. Chang, Miri Cipetic, **Ji Hun Kim**, Owen Marshall, Lynne Turnbull, Cynthia B. Witchurch, Paola Vagnarelli, Kumiko Samejima, William C. Earnshaw, K.H. Andy Choo, Damien F. Hudson. Contrasting roles of condensin I and condensin II in mitotic chromosome formation. **Journal of Cell Science** 125, 1591-1604, doi:10.1242/jcs.097790, 2012
9. **Ji Hun Kim**, Tsz M. Chang, Alison N. Graham, K.H. Andy Choo, Paul Kalitsis, Damien F. Hudson. Streptavidin-Binding Peptide (SBP)-tagged SMC2 allows single-step affinity fluorescence, blotting or purification of the condensing complex. **BMC Biochemistry**, 15:50, doi:10.1186/1471-2091-11-50, 2010

## CONFERENCE PLATFORM PRESENTATIONS - TALK

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### *Postdoctoral*

1. **Ji Hun Kim**, EMBO Workshop on 3D genome folding, Kyllini, Greece, May 20-24, 2019

### *Doctoral*

2. **Ji Hun Kim**, 2nd UK-Korea Mitosis Meeting, Seoul, South Korea, February 24, 2014

## CONFERENCE PLATFORM PRESENTATIONS - POSTER

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1. Ji Hun Kim, Tao Zhang, Nicholas C. Wong, K.H. Andy Choo, William C. Earnshaw, Nadia Davidson, Jovana Maksimovic, Alicia Oshlack, Paul Kalitsis, Damien F. Hudson. Mitotic map of condensin I in vertebrate cells, American Society for Cell Biology annual meeting, San Francisco, CA, USA, December 15-19, 2012. (poster)
2. Ji Hun Kim, Tsz M. Chang, K.H. Andy Choo, Paul Kalitsis, Damien F. Hudson. Creating a Genome-Wide Map of Condensin in Vertebrate Cells. WEHI Next-Generation Sequencing Workshop, Melbourne, Australia, May 10, 2010 (poster)
3. Ji Hun Kim, Tsz M. Chang, K.H. Andy Choo, Paul Kalitsis, Damien F. Hudson. Creating a Genome-Wide Map of Condensin in Vertebrate Cells. Epigenetics 2009. Melbourne, Australia, December 1-4, 2009 (poster)

## SEMINAR TALKS

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### *Postdoctoral*

1. Ji Hun Kim, Asan Medical Center, Ulsan University, February 7, 2019
2. Ji Hun Kim, JAG meeting, Perelman School of Medicine, University of Pennsylvania, October 12, 2018

### *Doctoral*

3. Ji Hun Kim, Cancer Research Institute, Seoul National University, Seoul, South Korea, April 4, 2014
4. Ji Hun Kim, Yonsei University, Seoul, South Korea, Jan 14, 2014
5. Ji Hun Kim, Webinar series of Notable Korean Scientists, Biological Research Information Center, South Korea, November 29, 2013 ([http://www.ibric.org/seminar/seminar\\_detail.php?id=27](http://www.ibric.org/seminar/seminar_detail.php?id=27))
6. Ji Hun Kim, CENs seminar, Wellcome Trust Centre for Cell Biology, University of Edinburgh, Edinburgh, UK, Oct 22, 2013
7. Ji Hun Kim, Genetic Disorder seminar series, Murdoch Children's Research Institute, Melbourne, Australia, March 1, 2013
8. Ji Hun Kim, Brigham and Women's Hospital, Harvard Medical School, Cambridge, MA, USA, December 7, 2012
9. Ji Hun Kim, Molecular Medicine seminar series, Murdoch Children's Research Institute, Melbourne, Australia, October 9, 2012
10. Ji Hun Kim, Laboratory and Community Genetics seminar series, Murdoch Children's Research Institute, Melbourne, Australia, March 5, 2010
11. Ji Hun Kim, PSA symposium, Murdoch Children's Research Institute, Melbourne, Australia, December 11, 2009

## SUPERVISED/MENTORED

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1. Jacqueline Valeri, Undergraduate student, University of Pennsylvania, Philadelphia, PA, USA, July 2017 – July 2018
2. James H. Sun, Post-Baccalaureate student, University of Pennsylvania, Philadelphia, PA, USA, May 2016 – Nov 2016
3. Michael T. Duong, Undergraduate student, University of Pennsylvania, Philadelphia, PA, USA, February - April 2016.
4. Rachel Furhang, JAX summer student program, Jackson Laboratory for Genomic Medicine, Farmington, CT, USA, June-July 2015
5. Muhammed Bakhreba, M.S. & Ph.D. student, Murdoch Childrens Research Institute, The University of Melbourne, Melbourne, Australia, 2011-2013

## **AWARDS AND ACADEMIC HONORS**

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- Notable Korean Scientist, Biological Research Information Center, South Korea (2019)
- Notable Korean Scientist, Biological Research Information Center, South Korea (2013)
- Melbourne Abroad Travel Scholarship, University of Melbourne, Australia (2012)
- Murdoch Childrens Research Institute Conference Scholarship, Australia (2012)
- Overseas Research Experience Scholarship, University of Melbourne, Australia (2010)
- Global Mobility U21 Scholarship, University of Melbourne, Australia (2010)
- Scholarship, Wellcome Trust Centre for Cell Biology, UK (2010)
- Murdoch Childrens Research Institute Travel Scholarship, Australia (2010)
- Medallion from Postgraduate Student Association Symposium, University of Melbourne, Australia (2009)