

October, 2020

## CURRICULUM VITAE

**Ke Hu**

### DEGREES

- 1993-1997 B.S. in Biology, Tsinghua University, Beijing, P.R. China  
1997-2002 Ph.D. in Biology, University of Pennsylvania, Philadelphia, PA,

### APPOINTMENTS

- 2002-2003 Postdoctoral Fellow, Department of Cell and Developmental Biology, University of Pennsylvania  
2003-2006 Postdoctoral Fellow, Department of Cell Biology, Scripps Research Institute  
2007-2014 Assistant Professor, Department of Biology, Indiana University, Bloomington  
2015 Feb-Jun Visiting Scholar, School of Botany/Queens College, University of Melbourne  
2015 Sept-Oct Visiting Scientist, Evolutionary Cell Biology Program, Kavli Institute of Theoretical Physics, the University of California, Santa Barbara  
2014 - 2020 Associate Professor, Department of Biology, Indiana University, Bloomington  
2020 Professor, Department of Biology, Indiana University, Bloomington  
2021 - Professor, Biodesign Center for Mechanisms of Evolution/School of Life Sciences, Arizona State University, Tempe.

### HONORS AND AWARDS

- 2002 Nachmias/Thimann Research Prize for Outstanding Research in Cell and Developmental Biology by Graduate Students and Postdoctoral Fellows (University of Pennsylvania)  
2005-2008 Leukemia and Lymphoma Society, Special Fellow Award  
2005 The Susan G. Komen Breast Cancer Foundation, Postdoctoral Fellowship Research Award (*Declined*)  
2005 American Heart Association, Postdoctoral Fellowship Research Award (*Declined*)  
2008-2011 Beckman Foundation, Young Investigator Award  
2008 Honorable Mentions, BioScapes International Imaging competition  
2010-2012 The March of Dimes, Basil O'Connor Award  
2016 Whitman Center Fellowship, Marine Biological Laboratory, Woods Hole, MA  
2017 Whitman Center Fellowship, Marine Biological Laboratory, Woods Hole, MA

### PUBLICATIONS

(\*equal contribution)

- 2002 **K. Hu**, T. Mann, B. Striepen, C. J. M. Beckers, D. S. Roos and J. M. Murray. "Daughter cell assembly in the protozoan parasite *Toxoplasma gondii*". *Molecular Biology of the Cell* 13: 593-606.  
2002 **K. Hu**, D. S. Roos and J. M. Murray. "A novel polymer of tubulin forms the conoid in *Toxoplasma gondii*". *Journal of Cell Biology* 156:1039-1050. **(Featured on cover of journal)**

- 2002 J. R. Swedlow, **K. Hu**, P. D. Andrews, D. S. Roos, and J. M. Murray. “Measuring tubulin content in *Toxoplasma gondii*: a comparison of laser-scanning confocal and wide-field fluorescence microscopy”. Proc. Nat'l Acad. Sci. 99: 2014-2019.
- 2002 L. Pelletier, A. Stern, M. Pypaert, D. Sheff, H. Ngo, N. Roper, C. He, **K. Hu**, D. Toomre, I. Coppens, D. S. Roos, K. Joiner, and G. Warren. “Golgi biogenesis in *Toxoplasma gondii*”. Nature 418: 548-552.
- 2003 D. M. Wetzel, S. Hakansson, **K. Hu**, D. Roos, and L. D. Sibley. “Actin filament polymerization regulates gliding motility by apicomplexan Parasites”. Molecular Biology of the Cell 14: 396-406
- 2004 **K. Hu**, D. S. Roos, S. O. Angel, and J. M. Murray. “Variability and heritability of cell division pathways in *T. gondii*”. Journal of Cell Science 117: 5697-5705
- 2006 **K. Hu**, J. Johnson, L. Florens, M. Fraunholz, S. Suravajjala, C. DiLullo, J. Yates, D. S. Roos, and J. M. Murray. “Cytoskeletal components of an invasion machine – the apical complex of *Toxoplasma gondii*”. PLoS Pathogens 2(2): 0121-0138 (**Featured on cover of journal; Faculty of 1000 Selection**)
- 2006 S. D. Gilk, Y. Raviv, **K. Hu**, J. Murray, C. J. M. Beckers, and G. E. Ward. “Identification of PhIL1, a novel cytoskeletal protein of the *Toxoplasma gondii* pellicle, through photosensitized labeling with 5-[<sup>125</sup>I]Iodonaphthalene-1-Azide”. Eukaryotic Cell 5: 1611-1621
- 2006 J. Hartmann, **K. Hu**, C. He, L. Pelletier, D. S. Roos, and G. Warren. “Golgi and centrosome cycles in *Toxoplasma gondii*”. Molecular and Biochemical Parasitology 145(1):125-7
- 2007 **K. Hu\***, L. Ji\*, K. Applegate, G. Danuser, and C. Waterman-Storer. “Differential transmission of actin motion within focal adhesions”. Science 315: 111-115  
**(This paper was featured in “Editor’s Choice” in Science; Faculty of 1000 Selection)**
- 2008 M. Nishi, **K. Hu**, J. M. Murray, and D. S. Roos. “Organellar dynamics during the cell cycle of *Toxoplasma gondii*”. Journal of Cell Science 121:1559-1568
- 2008 N. Miguel, M. Lebrun, A. T. Heaslip, **K. Hu**, C. J. Beckers, M. Matrajt, J. F. Dubremetz, and S. O. Angel. “*Toxoplasma gondii* Hsp20 is a stripe-arranged chaperone localized in the outer leaflet of the inner membrane complex”. Biology of the Cell 100(8): 479-89
- 2008 **K. Hu**. “Organizational changes of the daughter basal complex during the parasite replication of *Toxoplasma gondii*”. PLoS Pathogens 4(1): e10
- 2009 A. T. Heaslip, S. C. Ems-McClung, **K. Hu**. “TgICMAP1 is a novel microtubule binding protein in *Toxoplasma gondii*”. PLoS One 4(10): e7406.
- 2010 A. T. Heaslip, F. Dzierszynski, B. Stein, **K. Hu**. “TgMORN1 is a key organizer of the basal complex in *Toxoplasma gondii*”. PLoS Pathogens 6(2): e1000754
- 2011 A. T. Heaslip, M. Nishi, B. Stein, **K. Hu**. “The motility of a human protozoan parasite, *Toxoplasma gondii*, is regulated by a novel lysine methyltransferase”. PLoS Pathogens 7(9): e1002201. (**Faculty of 1000 Selection**)
- 2013 S. Sivagurunathan, A. T. Heaslip, J. Liu, **K. Hu**. “Identification of functional modules in AKMT, a novel lysine methyltransferase that regulates *Toxoplasma gondii* motility”. Molecular and Biochemical Parasitology 189: 43–53

- 2013 J. Liu, L. Wetzel, Y. Zhang, E. Nagayasu, S. C. Ems-McClung, L. Florens, **K. Hu**. “Novel thioredoxin-like proteins are components of a protein complex coating the cortical microtubules of *Toxoplasma gondii*”. *Eukaryotic Cell*, 12(12):1588-99 (**Featured on Cover of Journal**)
- 2015 J. Liu<sup>\*</sup>, Y. He<sup>\*</sup>, I. Benmerzouga, W. J. Sullivan Jr., N. S. Morrissette, J. M. Murray, **K. Hu**. “An ensemble of specifically targeted proteins stabilizes cortical microtubules in the human parasite *Toxoplasma gondii*”. *Molecular Biology of the Cell*, E15-11-0754 (**Featured on Cover of Journal**).
- 2016 E. Nagayasu, Y.-c. Hwang, J. Liu, J. Murray, and **K. Hu**. “Loss of a doublecortin (DCX) domain containing protein causes structural defects in a tubulin-based organelle of *Toxoplasma gondii* and impairs host cell invasion”. *Molecular Biology of the Cell*, E16-08-0587
- 2017 R. V. Stadler, L. A. White, **K. Hu**, B. P. Helmke, W. H. Guilford. “Direct measurement of cortical force generation and polarization in a living parasite”. *Molecular Biology of the Cell*, E16-07-0518 (**Selected for the special issue “Forces On and Within Cells”**)
- 2017 J. M. Leung, Y.-d. He, F.-l. Zhang, Y.-c. Hwang, E. Nagayasu, J. Liu, J. M. Murray, **K. Hu**. “Stability and function of a putative microtubule organizing center in the human parasite *Toxoplasma gondii*”. *Molecular Biology of the Cell*, E17-01-0045 (**Featured on Cover of Journal**)
- 2018 Y. Pivovarova, J. Liu, J. Lesigang, O. Koldyka, R. Rauschmeier, **K. Hu**<sup>\*</sup> and G. Dong<sup>\*</sup>. “Structure of a novel dimeric set domain methyltransferase that regulates cell motility” *Journal of Molecular Biology*, S0022-2836(18)30422-4.
- 2019 J. M. Leung<sup>\*</sup>, J. Liu<sup>\*</sup>, L. Wetzel, J. M. Murray, **K. Hu**. “Centrin2 from the human parasite *Toxoplasma gondii* is required for its invasion and intracellular replication” *Journal of Cell Science* 132: jcs228791 (**Featured as a Research Highlight**)
- 2020 J. M. Leung<sup>\*</sup>, E. Nagayasu<sup>\*</sup>, Y.-c. Hwang, P. Pierce, I. Phan, R. Stacy, J. M. Murray, **K. Hu**. “A doublecortin-domain protein of *Toxoplasma* and its orthologues bind to and modify the structure and organization of tubulin polymers” *BMC Molecular and Cell Biology*. 21(1):8. doi: 10.1186/s12860-020-0249-5

<sup>#</sup>Publication by Hu Lab members supported by the lab funding

- 2017 J. M. Murray<sup>#</sup>. “An icosahedral virus as a fluorescent calibration standard: a method for counting protein molecules in cells by fluorescence microscopy”. *Journal of Microscopy*, 267(2):193–213

## GRANTS

### CURRENT:

- 01/01/2018 - 12/31/2022 R01 National Institute of Allergy & Infectious Disease (PI: Hu)  
Understanding the Function of Cytoskeletal Machinery Driving Invasion by the Human Parasite, *Toxoplasma gondii*
- 07/01/2017 - 12/31/2020 (NCE) Indiana Clinical and Translational Sciences Institute (CTSI)- Core  
Pilot Funding Program (PI: Hu)  
Elucidating the Function of an Invasion Machine in a Human Parasite, *Toxoplasma gondii*

### COMPLETED:

- 01/01/2019 - 12/31/2019                      The March of Dime Foundation (PI: Hu)  
Understanding the Function of Cytoskeletal Assemblies in the Proliferation and Teratogenicity of *Toxoplasma gondii*
- 12/01/2012 - 11/30/2017 (NCE to 11/30/2019)    R01 NIAID (PI: Hu)  
The Role of Lysine Methylation in Regulating the Motility of *Toxoplasma gondii*
- 06/01/2015 - 5/31/2018                      The March of Dime Foundation (PI: Hu)  
Understanding the Function of the Cortical Microtubules in the Proliferation of *Toxoplasma gondii*
- 07/15/2017 - 9/17/2017                      Whitman Center Fellowship, Marine Biological Laboratory,  
From Free Living to Parasitism: Understanding the Evolutionary Path of The Apicomplexan Parasites Using Their Marine Relatives
- 06/29/2016 - 9/06/2016                      Whitman Center Fellowship, Marine Biological Laboratory,  
Woods Hole, MA (PI: Hu)  
Explore the Evolution of Parasitism Using Marine Protozoa Related to the Apicomplexan Parasites
- 03/01/2014 - 2/28/2016                      CTSI Core Pilot Funding Program (PI: Hu)  
Dissecting the Function of Novel Microtubule Associated Proteins in the Lytic Cycle of a Human Parasite, *Toxoplasma gondii*
- 06/01/2012 - 5/31/2015                      The March of Dime Foundation (PI: Hu)  
How *Toxoplasma gondii* Leaves its Host: Turning on Motility to Egress
- 02/01/2010 - 01/31/2012                      The March of Dimes, Basil O'Connor Award (PI: Hu)  
Understanding the Cytoskeletal Biogenesis of *Toxoplasma gondii*
- 09/15/2008 - 09/14/2011                      Beckman Foundation, Young Investigator Award (PI: Hu)  
How to Conceive a Parasite - the Role of Centrosome in the Cytoskeletal Biogenesis of *Toxoplasma gondii*
- 07/01/2005 - 06/30/2008                      Leukemia and Lymphoma Society, Special Fellow Award (PI: Hu)  
Dynamics and Proteomics Analysis of the Molecular Interactions within Focal Adhesion/Actin Cytoskeleton Assemblies

#### POSTDOCTORAL FELLOWSHIPS AWARDED TO LAB MEMBERS

- 07/01/2018 - 06/12/2019                      American Heart Association Postdoctoral Fellowship (PI: Leung)
- 07/01/2016 - 06/30/2018                      American Heart Association Postdoctoral Fellowship (PI: Leung)
- 03/01/2014 - 2/28/2015                      CTSI Postdoctoral Fellowship (PI: Liu)

#### **CLASSROOM TEACHING**

- 2008-2020                      Cell Biology, L586 (Graduate)
- 2009-2020                      Cell Biology, L312 (Undergraduate)
- 2018-2019                      Cell Biology Journal Club, Z620 (Graduate)

#### **UNIVERSITY AND DEPARTMENTAL SERVICE**

2008	Molecular Biology & Genetics Graduate Admissions Committee
2009 - 2012	The Committee on Curriculum and Courses
2009	The Search Committee for Microbiology Instructor
2012	Graduate Student Recruitment Weekend Steering committee (Chair)
2013	Graduate Student Recruitment Weekend Steering committee
2014	Graduate Student Recruitment Weekend Steering committee (Chair)
2013 - 2018	Flow Cytometry Advisory Committee
2016 - 2019	Departmental Planning Committee
2017	GCDB Graduate Admissions Committee
2018 - 2019	Joan Wood Lecture Series Committee
2019	GCDB Graduate Admissions Committee
2019	James P. Holland Lecture Series Committee

### INVITED SYMPOSIA AND CONFERENCE TALKS

2004	<i>Molecular microscopy in living cells</i> minisymposium, ASCB Meeting
2005	<i>At the Limits: Optical Methods for Single Molecules, Cells, Whole Genomes, &amp; Live Animals</i> subgroup, ASCB
2006	Gordon Research Conference - Biology of Host-Parasite Interactions
2008	Indiana Microscopy Meeting
2009	The 16th Midwest Microbial Pathogenesis Conference
2010	<i>Building the Cell</i> subgroup, ASCB
2011	Beckman Young Investigator symposium, Irvine, CA
2011	11th International Congress on Toxoplasmosis, Ottawa, Canada
2011	<i>Post-translational modification</i> subgroup, ASCB
2012	Gordon Research Conference- The Plant and Microbial cytoskeleton
2012	the Pediatric Academic Societies Annual Meeting
2012	Midwest Neglected Infectious Diseases meeting, Notre Dame, IN
2013	Midwest Protozoology Society Meeting (Keynote)
2013	March of Dimes Indiana Chapter, State Board meeting
2013	The 12 <sup>th</sup> international congress on Toxoplasmosis, Oxford, the United Kingdom
2014	Advanced Imaging Methods Workshop at University of California, Berkeley
2014	The British Parasitology Society Spring Meeting, Cambridge, United Kingdom
2015	VII European Congress of Protistology (joint meeting with the International Society of Protistologists)
2016	<i>Emerging model systems</i> subgroup, ASCB, San Francisco, CA
2017	Indiana Biology of Intracellular Pathogens Retreat, Indianapolis, IN
2017	Midwest Neglected Infectious Diseases Meeting, Notre Dame, IN
2017	March of Dimes, March for Babies, Bloomington, IN
2017	Development, Regeneration, and Stem Cell Biology mini-symposium, University of Chicago, IL
2019	<i>Mechanics of Large Cellular Machines</i> subgroup ASCB, Washington, D.C.

### INVITED SEMINARS

2008	Department of Medical Parasitology, New York University School of Medicine
2010	Marine Biological Laboratory, Woods Hole, MA; the Biology of Parasitism Course
2010	College of Life Sciences, Beijing Normal University, Beijing, China
2010	Department of Molecular Cell & Developmental Biology, University of California, Santa Cruz
2011	National University of Singapore, Singapore

2011 Marine Biological Laboratory, Woods Hole, MA; the Biology of Parasitism Course  
 2011 Institute of Biophysics, Chinese Academy of Sciences, Chinese Academy of Sciences, Beijing, China  
 2011 Molecular Genetics and Cell Biology Department, University of Chicago  
 2011 Department of Biological Sciences, Purdue University  
 2011 Department of microbiology, immunology and molecular genetics, University of California, Los Angeles  
 2012 Department of Pharmacology, Indiana University, School of Medicine  
 2012 Universidade Federal do Rio de Janeiro, Rio, Brazil  
 2012 Department of Molecular & Cellular Pharmacology, University of Miami, Miami, Florida  
 2012 Department of Biomedical Engineering, University of Virginia, Charlottesville, VA.  
 2015 School of Botany, University of Melbourne, Melbourne, Australia  
 2015 Bio21 Institute, University of Melbourne, Melbourne, Australia  
 2015 Max F. Perutz Institute, Vienna, Austria  
 2015 Evolutionary Cell Biology Program, Kavli Institute of Theoretical Physics, the University of California, Santa Barbara  
 2016 Marine Biological Laboratory, Woods Hole, MA  
 2016 Department of Biophysics, University of Vermont, Burlington, VT  
 2017 Marine Biological Laboratory, Woods Hole, MA  
 2017 Whitehead Institute-MIT, Boston, MA  
 2018 The Biology of Parasitism Course; Marine Biological Laboratory, Woods Hole, MA  
 2018 Tsinghua University, Beijing, China  
 2018 Beijing Normal University, Beijing, China  
 2018 China Agricultural University, Beijing, China  
 2019 University of Chicago, Chicago, IL  
 2020 Arizona State University, AZ  
 2020 University of Georgia, GA

## PROFESSIONAL SERVICE

### Grant Review and Other Related Activities

2016 Ad hoc, NIH, Infectious Diseases and Microbiology IRG/ “Eukaryotic Parasites and Vectors” study section  
 2016 - 2018 The Arnold and Mabel Beckman Foundation, Young Investigator Award Program  
 2018 Ad hoc, NIH, Infectious Diseases and Microbiology IRG/ “Pathogenic Eukaryotes Study Section” study section  
 2019 - present Executive Committee for the Beckman Young Investigator program, The Arnold and Mabel Beckman Foundation  
 2020 Ad hoc, NIH, Infectious Diseases and Microbiology IRG/ “Eukaryotic Parasites and Vectors” study section

### Teaching at the Cold Spring Harbor Laboratory

2007 - 2010 Faculty, *Immunocytochemistry, In Situ Hybridization, Super-resolution and Live Cell Imaging* course  
Manuscript Reviews  
 2010 Molecular & Biochemical Parasitology, PLoS Pathogens, Cytoskeleton, Journal of Cell Biology

2011 PLoS One, Molecular Biology of the Cell, PLoS Pathogens  
2012 Molecular & Biochemical Parasitology, Cellular Microbiology, Current Biology, PLoS Pathogens  
2013 Parasitology, Molecular Microbiology, Cellular Microbiology, PLoS One, PLoS Pathogens  
2014 PLoS One, Cellular Microbiology, PLoS Pathogens, eLife,  
2015 Molecular Microbiology, Cilia  
2016 Scientific Reports, Nature Microbiology  
2017 PLoS Pathogens, PLoS Genetics, mSphere, Nature communication  
2018 PLoS Pathogens  
2019 PLoS Pathogens, Parasites & Vectors, Cellular Microbiology, eLife, Molecular Biology of the Cell  
2020 PLoS Pathogens, Reviewer Commons, PLoS One