

## *Curriculum Vita*

### **Cheng-Fu Kao, Ph.D.**

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#### **PERSONAL INFORMATION**

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Name:	Cheng-Fu Kao
Date & Place of Birth:	June 20, 1967, Yun-Lin, Taiwan
Marital Status:	Married

#### **EDUCATION**

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April 2002 – November, 2006	<b>Postdoctoral training</b> with Mary Ann Osley at University of New Mexico
October 1997 – May 2002	<b>Ph. D.</b> Department of Biochemistry University of Edinburgh
September 1991- July 1993	<b>M. A.</b> , Depart of Nutrition, Fu-Jen Catholic University, Taiwan
September 1987- July 1991	<b>B.S.</b> , Depart of Nutrition, Fu-Jen Catholic University, Taiwan

#### **APPOINTMENTS**

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9/01, 2022- present	<b>Deputy Director</b> , Institute of Cellular and Organismic Biology, Academia Sinica
6/01, 2020- present	<b>Research Fellow</b> , Institute of Cellular and Organismic Biology, Academia Sinica
3/10, 2015- 5/31, 2020	<b>Associate Research Fellow</b> , Institute of Cellular and Organismic Biology, Academia Sinica
11/08, 2006-2015 3/09	<b>Assistant Research Fellow</b> , Institute of Cellular and Organismic Biology, Academia Sinica
3/01, 2005-10/31, 2006	<b>Research assistant professor</b> , University of New Mexico Health Sciences Center
4/22, 2002-2/28, 2005	<b>Postdoctoral Fellow</b> , University of New Mexico Health Sciences Center.

8/1, 1996- 7/31, 1997      **Teaching Assistant**, in Biochemistry, Fu-Jen Catholic University, Taiwan.

## **PROFESSIONAL EXPERIENCES**

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- 9/1, 2017 – 8/31, 2018      **Visiting scientist** in Dr. Sue Biggins's laboratory in the Fred Hutchinson Cancer Research Center, Seattle, USA
- 3/1, 2012 – 3/31, 2012      **Visiting scientist** in Dr. Marco Foiani's laboratory, IFOM - Fondazione Istituto FIRC di Oncologia Molecolare, Milan, Italy
- 1/1, 2016 – 3/31, 2016      **Visiting scientist** in Dr. Helle Ulrich's laboratory in the Institute of Molecular Biology, in Mainz, Germany

## **HONORS AND AWARDS**

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- 5/1 2022      **Outstanding Research Award**, Ministry of Science and technology, Taiwan
- 1/1, 2016 – 3/31, 2016      **EMBO short-term fellowship** to visit the Institute of Molecular Biology, in Mainz, Germany
- 1/1, 2009 – 12/31, 2011      **Career Development Grant**, National Health Research Institutes, Taiwan
- 7/1, 2005 – 6/30, 2008      **Special Fellow**, Career Development Program, The Leukemia & Lymphoma Society, USA

## **BIBLIOGRAPHY**

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2. Swygert SG, Lin D, Portillo-Ledesma S, Lin PY, Hunt DR, Kao CF, Schlick T, Noble WS, Tsukiyama T. Local chromatin fiber folding represses transcription and loop extrusion in quiescent cells. *Elife*. 2021 Nov 4;10:e72062. doi: 10.7554/eLife.72062.
3. Huang JH, Liao YR, Lin TC, Tsai CH, Lai WY, Chou YK, Leu JY, Tsai HK\*,

- Kao CF\***. iTARGEX analysis of yeast deletome reveals novel regulators of transcriptional buffering in S phase and protein turnover. *Nucleic Acids Res.* 2021 Jul 21;49(13):7318-7329. doi: 10.1093/nar/gkab555.
4. Hsu CL, Chong SY, Lin CY, **Kao CF\***. Histone dynamics during DNA replication stress. *J Biomed Sci.* 2021 Jun 19;28(1):48. doi: 10.1186/s12929-021-00743-5.
  5. Hsu CL, Lo YC, **Kao CF\***. H3K4 Methylation in Aging and Metabolism. *Epigenomes.* 2021 Jun 18;5(2):14. doi: 10.3390/epigenomes5020014.
  6. Chang CY, Hung JH, Huang LW, Li J, Fung KS, **Kao CF**, Chen L. Epigenetic Regulation of WNT3A Enhancer during Regeneration of Injured Cortical Neurons. *Int J Mol Sci.* 2020 Mar 10;21(5). pii: E1891. doi: 10.3390/ijms21051891.
  7. Chang CY, Liang MZ, Wu CC, Huang PY, Chen HI, Yet SF, Tsai JW, **Kao CF\***, Chen L\*. WNT3A Promotes Neuronal Regeneration upon Traumatic Brain Injury. *Int J Mol Sci.* 2020 Feb 21;21(4). pii: E1463. doi: 10.3390/ijms21041463.
  8. Chong SY, Cutler S, Lin JJ, Tsai CH, Tsai HK, Biggins S, Tsukiyama T, Lo YC and **Kao CF\***. H3K4 methylation at active genes mitigates transcription-replication conflicts during replication stress. *Nat Commun.* 2020 Feb 10;11(1):809. doi: 10.1038/s41467-020-14595-4.
  9. You ST, Zhou YT, **Kao CF**, Leu JY. Experimental evolution reveals a general role for the methyltransferase Hmt1 in noise buffering. *PLoS Biol.* 2019 Oct 15;17(10):e3000433.
  10. Wu MY, Lin CY, Tseng HY, Hsu FM, Chen PY and **Kao CF\***. H2B ubiquitylation and the Asf1 histone chaperone mediate the formation and maintenance of heterochromatin architecture. *Nucleic Acids Res.* 2017 May 17. doi: 10.1093/nar/gkx422. (\*correspondent author)
  11. Hung SH, Wong RP, Ulrich HD\* and **Kao CF\***. Bre1-mediated mono-ubiquitylation of H2B contributes to the bypass of DNA damage during and after DNA replication *Proc Natl Acad Sci U S A.* 2017 Mar 14;114(11):E2205-E2214. (\*correspondent authors)
  12. Chen KW, Chang YJ, Yeh CM, Lian YL, Chan MW, **Kao CF\*** and Chen L. SH2B1 modulates chromatin state and MyoD occupancy to enhance expressions of myogenic genes. *Biochim Biophys Acta.* 2017 Feb;1860(2):270-281.
  13. McDonald MJ, Yu YH, Guo JF, Chong SY, **Kao CF** and Leu JY. Mutation at a distance caused by homopolymeric guanine repeats in *Saccharomyces cerevisiae*. *Sci Adv.* 2016 May; 2(5): e1501033.

14. Hsu HE, Liu TN, Yeh CS, Chang TH, Lo YC\*, **Kao CF\***. Feedback Control of Snf1 Protein and Its Phosphorylation Is Necessary for Adaptation to Environmental Stress. *J Biol Chem*. 2015 Jul 3;290(27):16786-96. doi: 10.1074/jbc.M115.639443.
15. Wright DE and **Kao CF\***. (Ubi)quitin' the h2bit: recent insights into the roles of H2B ubiquitylation in DNA replication and transcription. *Epigenetics*. 2015 Feb;10(2):122-6. doi:10.1080/15592294.2014.1003750.
16. Lin CY, Wu MY, Gay S, Marjavaara L, Lai MS, Hsiao WC, Hung SH, Tseng HY, Wright DE, Wang CY, Hsu GSW, Devys D, Chabes A and **Kao CF\***. (2014) H2B mono-ubiquitylation facilitates fork stalling and recovery during replication stress by coordinating Rad53 activation and chromatin assembly. *PLoS Genet* 10: e1004667. (\*Correspondent author)
17. Bonnet J\*, Wang CY\*, Baptista T, Vincent SD, Hsiao WC, Stierle M, **Kao CF**, Tora L<sup>&</sup> and Devys D<sup>&</sup> (2014) The SAGA coactivator complex acts on the whole transcribed genome and is required for RNA polymerase II transcription. *Genes Dev*. 2014 Sep 15;28(18):1999-2012. doi: 10.1101/gad.250225.114. (\*First authors; <sup>&</sup>Correspondent authors)
18. Tang CH, Lai YR, Chen YC, Li CH, Lu YF, Chen HY, Lien HW, Yang CH, Huang CJ, Wang CY, **Kao CF**, Hwang SP. Expression of zebrafish anterior gradient 2 in the semicircular canals and supporting cells of otic vesicle sensory patches is regulated by Sox10. *Biochim Biophys Acta*. 2014 Jun;1839(6):425-37. doi: 10.1016/j.bbagr.2014.04.017.
19. Wu CS, Yu CY, Chuang CY, Hsiao M, **Kao CF**, Kuo HC, Chuang TJ (2013) Integrative transcriptome sequencing identifies trans-splicing events with important roles in human embryonic stem cell pluripotency. *Genome Res*. 2014 Jan;24(1):25-36. doi: 10.1101/gr.159483.113.
20. Lin CY, Hsiao WC, Huang CJ, **Kao CF\*** and Hsu GS W\* (2013) Heme oxygenase-1 induction by the ROS-JNK pathway plays a role in aluminum-induced anemia. *J Inorg Biochem*. 2013 Nov;128:221-8
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22. Lin CY, Hsiao WC, Wright DE, Hsu CL, Lo YC, Wang-Hsu GS and **Kao CF\*** (2013) Resveratrol activates the histone H2B ubiquitin ligase, RNF20, in MDA-MB-231 breast cancer cells. *J Funct Foods* 2013 5 (2): 790-800.
23. Lee CL, Hsiao WC, Wright DE, Chong SY, Leow SK, Ho CT, **Kao CF** and Lo YC (2013) Induction of GADD45a expression contributes to the

- anti-proliferative effects of polymethoxyflavones on colorectal cancer cells. *J Funct Foods* 2013 5 (2): 616-624.
24. Wright D.E, Wang CY, **Kao CF\*** (2012). Histone ubiquitylation and chromatin dynamics. *Front Biosci.* 2012 Jan 1;17:1051-78.
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  27. Wang CY, Hua CY, Hsu HE, Hsu CL, Tseng HY, Wright DE, Hsu PH, Jen CH, Lin CY, Wu MY, Tsai MD and **Kao CF\*** (2011). The C-terminus of histone H2B is involved in chromatin compaction specifically at telomeres, independently of its monoubiquitylation at lysine 123. *PLoS ONE* 6(7): e22209. doi:10.1371 /journal.pone.0022209.
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  31. Hwang YC, Lu TY, Huang DY, Kuo YS, **Kao CF**, Yeh NH, Wu HC\*, and Lin CT (2009). NOLC1, an enhancer for NPC progression, is essential for TP53 to regulate MDM2 expression. *Am J Pathol Jul; 175(1): 342-354.*
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  33. **Kao CF**, Chuang CY, Chen CH and Kuo HC. (2008): Human Pluripotent Stem Cells: Current Status and Future Perspectives. *Chin J Physiol* 51(4): 214-225.
  34. Osley, MA, Fleming, AB, and **Kao, CF** (2006): Histone ubiquitylation and the regulation of transcription, "Chromatin Dynamics in Cellular Function", *Results Probl Cell Differ.* 2006;41:47-75. ed. B. Laurent, Springer-Verlag

- (Heidelberg).
35. Xiao T\*, **Kao CF\***, Sun Z-W, Osley MA, and. Strahl BD. (2005). Histone H2B ubiquitylation is associated with elongating RNA polymerase II. *Mol Cell Biol.* 2005 Jan;25(2):637-51.
  36. **Kao CF**, Hillyer C, Tsukuda T, Henry K, Berger S, Osley MA. (2004). Rad6 plays a role in transcriptional activation through ubiquitylation of histone H2B. *Genes Dev.* 18(2):184-95.
  37. Henry, K., Wyce, A., Lo, W.-S., Duggan, L., Emre, T., **Kao, CF**, Pillus, L., Shilatifard, A., Osley, M.A., and Berger, S.L. (2003). Transcriptional activation via sequential histone H2B ubiquitylation and deubiquitylation, mediated by SAGA-associated Ubp8. *Genes Dev.* 17(21):2648-63
  38. Meehan, R., **Kao, CF.**, and Pennings, S. (2003). HP1 binding to native chromatin in vitro is determined by the hinge region and not the chromodomain. *EMBO J.* 22: 3164-3174.
  39. **Kao, CF** and Osley, M.A. (2003). In vivo assays to study histone ubiquitylation. *Methods* 31: 59-66.

## GRANTS

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### On-going support

**MOST 111-2320-B-001 -029 -MY3** 8/1/2022-7/31/2025  
Epigenetic mechanism in the maintenance of the maturation state of cardiomyocyte  
Role: PI

**MOST 109-2320-B-001 -017 -MY3** 8/1/2020-7/31/2023  
Investigating the Role of H3K4 Methylation in Suppressing Endogenous DNA  
Damage and Promoting genome stability  
Role: PI

**AS-GCS-110-01** 1/1/2021-12/31/2022  
Co-evolution of extrachromosomal circular DNA and transcriptional condensates  
Role: Program director

### Completed support

**AS-108-TP-L07** 1/1/2019-12/31/2021  
Homology directed repair and recombination: mechanisms, regulation and evolution  
Subproject 2: The role of chromatin structure in DNA damage repair during cell cycle  
and in response to replication fork stalling  
Role: PI

**MOST 108-2320-B-001-019** 8/1/2019-7/31/2020

Deciphering the functional links between histone H3K4 methylation and cellular metabolism in chromatin dynamics

Role: PI

**AS-107-TP-A06** 1/1/2018-12/31/2020

Evolution and the Mechanism of Gene Dosage Buffering in Eukaryote

Subproject 2: The Mechanism of Gene Dosage Buffering during S Phase and in aneuploidy

Role: Program director

**MOST 105-2320-B-001 -023 -MY3** 8/1/2016-7/31/2019

The function of histone H2B ubiquitylation in modulating DNA damage tolerance

Role: PI

**AS-103-TP-B02 (Thematic research program)** 1/1/2014-12/31/2016

Spatial-Temporal Chromatin organization during DNA Replication Checkpoint Activation

Role: PI

**MOST 104-2320-B-001-024 –(Project Plan)** 8/01/2015-7/31/2016

Investigate the role of Rnf20 E3 ubiquitin ligase in embryogenesis and tumorigenesis in a loss-of-function mouse model

Role: PI

**MOST 103-2320-B-001 -015 –(Project Plan)** 8/01/2014-7/31/2015

Functional Roles of Dynamic H2B Monoubiquitylation in Mammals

Role: PI

**NSC 102-2320-B-001-020-** 8/01/2013-7/31/2014

Role of Chromatin structure in genome stability during chronological aging

Role: PI

**NSC 100-2911-I-001-510** 11/01/2011-10/31/2012

**New Partnership Program for the Connection to the Top Labs in the World**

The mechanism of histone variant H2A.Z modulating DNA demethylation during cell differentiation

Role: PI

Postdoctoral research fellow: Dr. Chen-Yi Wang

Collaborator: Dr. Didier Devys, Institut de Génétique et de Biologie Moléculaire et Cellulaire (IGMBC)

NSC 100-2923-B-001-001-MY3

01/01/2011-12/31/2013

**An international cooperation grant between NSC, Taiwan and ANR, France**  
Dynamic Roles of H2B Monoubiquitylation in Eukaryotic Cells

Role: Co-PI

Collaborator: Dr. Didier Devys, Institut de Génétique et de Biologie Moléculaire et Cellulaire (IGMBC)

NSC 98-2320-B-001-015-MY3

8/01/2009-7/31/2012

Constructing cellular and physiological functions of histone H2B ubiquitylation

Role: PI

AS-99-TP-B20

1/1/2010-12/31/2012

Molecular mechanism of H2B ubiquitylation and ribosome synthesis

Role: PI

NHRI EX98-9817NC

1/01/2009 – 12/31-2011

Roles of Histone H2B modifications in DNA repair and cell cycle checkpoint control

Role: PI

NSC 98-3111-B-001-007

12/01/2008-9/30/2011

Epigenetic profiling and correlation of targeted genes with DNA methylation in stem cells

Role: Co-PI

NSC 96-2321-B-001-028-MY2

10/01/2007-7/31/2009

Molecular analysis of yeast ortholog of the human MLL leukemia oncogenes  
MLL

Role: PI

## **INVITED TALKS**

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### **2021**

7/27 National Institute of Cancer Research, NHRI, Taiwan

2/24-25 15th ASIAN EPIGENOMICS MEETING 2021



**2019**

- 10/16-18 Abcam Epigenetics Meeting, Academia Sinica  
9/5-6 18th Cross-Strait Symposium on Biomedical Research &  
16th Symposium of the Frontiers of Biomedical Sciences  
11/15-17 The Taiwan Society for Biochemistry and Molecular Biology Autumn  
Camp

**2018**

- 12/9-11 Mini-symposium for chromosome Biology, Academia Sinica  
7/11 Hosted by Dr. Sue Biggins, Director of Basic Sciences Division, Fred  
Hutchinson Cancer Research Center

**2016**

- 6/27 UMMS-Academia Sinica-NHRI joint Symposium 2016

**2015**

- 9/15-17 International RecA and Chromosome Biology conference

**2014**

- 3/12 Institute of Biotechnology National Cheng Kung University

**2013**

- 3/20 Keystone Symposia: Epigenetic Marks and Cancer Drugs, Santa Fe,  
New Mexico, USA  
9/2 Message from Yeast to Epigenetics ~ Yeast clarifies the frontiers of  
life science, Fukui, Japan

**2011**

- 5/19 Medical School, National Taiwan University  
6/6 Institute of Genetics and Molecular and Cellular Biology  
Strasbourg, France  
9/29-30 The 9th Symposium of Bioinformatics and Systems Biology in Taiwan  
10/28 Institute of Bioinformatics & Signal Transduction,  
National Cheng-Kung University  
11/28-29 Taiwan-UK Collaborative Forum: Systems Biology Symposium,  
National Taiwan University

**2010**

- 4/ 8-9 Academia Sinica - Kumamoto University Joint Conference on Organogenesis
- 7/ 21-23 Biological Summer Camp
- 9/ 6 National Institute of Cancer Research, NHRI

## **2009**

- 4/28 Department of Entomology, National Taiwan University
- 6/26 The 18<sup>th</sup> South Taiwan Statistics Conference, Kaoshiuang, Taiwan
- 8/19-21 Biology Summer Camp, Sitou, Taiwan
- 10/26 1st Taipei Epigenetics and Chromatin Meeting
- 11/7 Biotechnology Taiwan 2009

## **2008**

- 7/5 National Health Research Institute, Taiwan
- 10/15 Institute of Plant and Microbiology, Academia Sinica
- 11/26-29 International Symposia on Nuclear Architecture and Chromatin Dynamics, Hyderabad, India

## **2007**

- 8/1 Yeast Biology Annual Meeting, Taipei
- 12/3 Toxicology Group Meeting, Academia Sinica

## **SERVICES**

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### ● **Grant and manuscript review**

- |      |                                  |                                 |
|------|----------------------------------|---------------------------------|
| 2013 | National Taiwan University Award | Reviewer for Career Development |
| 2014 | National Science Council         | Reviewer for Project Plan       |
| 2015 | MOST                             | Reviewer for Project Plan       |
| 2016 | MOST                             | Reviewer for Project Plan       |
| 2017 | MOST                             | Reviewer for Project Plan       |
| 2019 | EMBO J                           | Reviewer for manuscript         |
| 2021 | Sci Adv.                         | Reviewer for manuscript         |

### ● **Lectures**

1. 2021-present Core approaches for current molecular biology research for TIGP-MBAS, TIGP-MCB and TIGP-MM, Academia Sinica
2. 2010-present Genomics and Systems Biology in Degree program of Genomics and Systems Biology, National Taiwan University and Academia Sinica
3. 2009-present Advanced Animal Biology in The Taiwan International Graduate

Program (TIGP) in Molecular and Biological Agricultural Sciences (MBAS),  
Academia Sinica

4. 2012-present Special Topics in Cellular and Organismic Biology in Graduate School, Department of Life Science, National Taiwan University

- **Committee members**

- **External committee**

1. 2018- present Member for the committee of Life Science library
2. 2009-2011 Advanced Bioinformatics Core Facility of National Research Program for Genomic Medicine
3. 2014-2016 Flow cytometry User Committee of Academia Sinica

- **Internal committee of ICOB, Academia Sinica**

1. 2021 Chair of Information Technology Management Committee, ICOB
2. 2020 Chair of recruitment committee for the manager of ICOB Bioinformatic Core
3. 2018-2019 Host of Seminar series for Genomic Research (4 speakers)
4. 2014-2017 Chair for Committee of Instrument management
5. 2008-present Committee of Instrument management
6. 2012-2016 Seminar Committee of ICOB
7. 2011-2013 Organizer for Poster competition