Curriculum Vitae

June 2020

Cho-Yi Chen (陳卓逸), PhD

Assistant Professor
Institute of Biomedical Informatics
National Yang-Ming University

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RESEARCH INTERESTS

1. Bioinformatics & Computational Biology
2. Genomics & Systems Biology
3. Circadian Medicine & Network Medicine
4. Data Mining & Machine Learning

TRAINING & EDUCATION

2015-2017	**Postdoctoral Research Fellow** Department of Biostatistics and Computational Biology Dana-Farber Cancer Institute & Harvard University
2010-2015	**Ph.D.** Joint Program in Genome and Systems Biology National Taiwan University & Academia Sinica
2014	**Predoctoral Visiting Scholar** Department of Biostatistics, Graduate School of Public Health University of Pittsburgh
2007-2009	**M.S.** Graduate Institute of Biomedical Electronics and Bioinformatics National Taiwan University *(GPA: 4.0/4.0; Rank: 1th/26)*
2003-2007	**B.S.** Department of Computer Science and Information Engineering National Taiwan University *(GPA: 3.94/4.0; Rank: 7th/108)*

EXPERIENCE

Work

2017-present	Assistant Professor Institute of Biomedical Informatics, National Yang-Ming University, Taipei, Taiwan

Research

2015-2017 Functional Genomics of COPD: Systems Biology, Bioinformatics, and Biostatistics

Development a network approach to integrate multiple data types and construct gene regulatory networks in lung diseases.

Advisors: Prof. John Quackenbush, Prof. Kimberly Glass & Prof. Dawn DeMeo

2014 Meta-Analysis of Gene Network/Circadian Gene Expression

1. *Detection of differentially coexpressed network via meta-analysis.*
2. *Detection of circadian gene expression patterns in human brains.*

Advisors: Prof. George Tseng, Prof. Etienne Sibille & Prof. Colleen McClung

2012-2013 Evolution and Complexity of Regulatory 3'UTRome

Dynamics of regulatory 3'UTRome organization and network architecture in animal evolution, development, and tumorigenesis.

Advisors: Prof. Hsueh-Fen Juan & Prof. Hsuan-Cheng Huang

2011 Quality Control for Next-Generation Sequencing (NGS) Data

Model-based quality assessment and control of Illumina second-generation sequencing data.

Advisors: Prof. Wen-Hsiung Li & Dr. Arthur Chun-Chieh Shih

2010–2011 Competitive Swimming (Part of *Alternative Civil Service*)

1. *Year-round training at the National Sports Training Center.*
2. *Participating in the 16th Asian Games, the 10th World Swimming Championships, and Swimming World Cup Series 2011.*

2007–2009 MicroRNA (miRNA) Gene Regulatory Networks

3. *Characterization of miRNA-regulated protein-protein interaction network.*
4. *Coregulation of miRNAs and transcription factors in gene regulatory networks. (Master Thesis)*

Advisors: Prof. Hsueh-Fen Juan & Prof. Hsuan-Cheng Huang

2006–2007 Embedded System & System-on-a-Chip (SoC)

Intercommunication protocol and model design for embedded systems, demonstrated on field-programmable gate array (FPGA). (Undergraduate Senior Project)

Advisor: Prof. Mong-Kai Ku

Teaching

2018-presnet *Assistant Professor* National Yang-Ming University
Fundamental Programming for Data Science (62166)
An advanced Python programming course designated for graduate students

2018-presnet *Assistant Professor* National Yang-Ming University
Computational and Data Science Laboratory (62201)
An advanced level course designated for undergraduates & graduate students

2018-present *Assistant Professor* National Yang-Ming University
Computer Programming (62277)
An introductory level course designated for undergraduates

2017-present *Assistant Professor* National Yang-Ming University
Principles of Bioinformatics (62112)
An advanced level course designated for graduate students

2017-presnet *Assistant Professor* National Yang-Ming University
Introduction to Computer Science (62104)
An introductory level course designated for undergraduates

2011-2013 *Teaching Assistant* National Yang-Ming University
Bioinformatics Programming (62137)
An advanced graduate level course designated for graduate students

2012-2013 *Teaching Assistant* National Taiwan University
Bioinformatics Laboratory (LS 3006)
An introductory level course designated for undergraduates

Conference/Workshop (selected)

2020 **The 27th Symposium on Recent Advances in Cellular and Molecular Biology**, Kenting, Taiwan
Invited Speaker

2019 **Bioinformatics & Data Science Workshop**, NCU, Taoyuan, Taiwan
Invited Speaker

2018 **ISEGB**, 2018 International Symposium on Evolutionary Genomics and Bioinformatics, Taipei, Taiwan
Invited Speaker

2017 **GEW,** 2017 Genomic Epidemiology Workshop, Taipei, Taiwan
Invited Speaker

2015 **EITA-YIC**, the 4th EITA Young Investigator Conference, Cambridge, MA, USA
Invited Speaker

2014 **ICSB**, the 15th International Conference on Systems Biology, Melbourne, Australia
Poster Presentation, ***Student Travel Fellowship***

2014 **EITA**, the 2014 EITA Conference on New Media and Biomedical Research, Cambridge, MA, USA
Invited Speaker

2013 **AYRCOB**, the 7th Asian Young Researchers Conference on Computational and Omics Biology, Tokyo, Japan
Oral Presentation, ***Travel Fellowship*** *(6 winners)*

2011 **APBC**, the 9th Asia Pacific Bioinformatics Conference, Incheon, Korea
Oral Presentation (33% accepted), ***NSC Fellowship***

2009/2011 **JACBS**, the 24th/26th Joint Annual Conference of Biomedical Science, Taipei, Taiwan
Oral/Poster Presentation

Academic Society

2012-present Founding member, Taiwan Society of Evolution and Computational Biology

Reviewer/Referee

Conference APBC 2020, the 17th Asia Pacific Bioinformatics Conference
APBC 2019, the 17th Asia Pacific Bioinformatics Conference
IEEE BIBE 2018, the 18th IEEE International Conference on Bioinformatics and Bioengineering
APBC 2018, the 16th Asia Pacific Bioinformatics Conference
GIW/BIOINFO 2017, the 28th International Conference on Genome Informatics
APBC 2017, the 15th Asia Pacific Bioinformatics Conference
GIW 2013, the 24th International Conference on Genome Informatics

Journal *Bioinformatics*, Oxford Journals
Nucleic Acids Research, Oxford Journals
PLoS ONE, the Public Library of Science
Scientific Reports, Nature Publishing Group

Book *R Bioinformatics Cookbook, 1st editions*, Packt Publishing Ltd.
Bioinformatics with Python Cookbook, 1st & 2nd editions, Packt Publishing Ltd.

Invited Lecture/Talk (selected)

2019	Invited talk, Department of Bioinformatics and Medical Engineering, Asia University, Taichung, Taiwan
2019	Invited talk, Institute of Molecular Biology, Computational Biology and Bioinformatics Seminar Series, Academia Sinica, Taipei, Taiwan
2019	Invited talk, Graduate Institute of Biomedical Informatics, Taipei Medical University, Taipei, Taiwan
2018	Invited talk, Molecular Medicine Retreat, Taiwan International Graduate Program (TIGP), Fullon, New Taipei City, Taiwan
2018	Invited talk, Ph.D. Progam in Toxicology, Kaohsiung Medical University, Kaohsiung, Taiwan
2017	Invited talks, Institute of Biomedical Informatics, National Yang-Ming University, Taipei, Taiwan
2016	Invited talks, CDNM Statistical Genetics and Network Science Seminar, Harvard Medical School, Boston, USA
2014	Invited lecture, Ph.D. Program for Cancer Biology and Drug Discovery, Taipei Medical University, Taiwan.
2014	Invited talk, ELBE Program, Max Planck Institute for the Physics of Complex Systems (MPI-PKS), Dresden, Germany
2013	Invited lecture, Department of Life Science, NTU, Taiwan
2012	Invited talk, Physical Education Office, NTU, Taiwan
2012	Invited lecture, Department of Life Science, NTU, Taiwan
2011	Invited lecture, Department of Life Science, NTU, Taiwan

Sports Competition (selected)

2011	The FINA Swimming World Cup Series 2011, World Tour
2010	The 12th World Swimming Championships, Dubai, UAE
2004	The 28th Olympic Games, Athens, Greece

Team & Club (selected)

2010-2012	Athlete Endorser, Speedo® Taiwan
2007-2008	Captain, NTU Men's Swimming
2005-2006	Sponsored Athlete, Mizuno Swim® Taiwan
2001-2004	Sponsored Athlete, Arena® Taiwan

Record (selected)

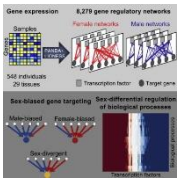
2010-2014	National Record, *4x100m Medley Relay*
2001-2013	High School Record, *200m Breaststroke*
2001-2005	National Record, *200m Breaststroke*
2002-2009	Asian Age Group Records (U18), *50, 100 & 200m Breaststroke*

HONORS AND AWARDS (SELECTED)

2020	**NYMU Excellence in Teaching Award** *3 awardees per year (top 5% in the School of Life Science)*
2018	**MOST Young Scholar Fellowship** *37 awardees nationwide*
2014	**Student Travel Fellowship**, the 15th ICSB
2014	**NSC Study Abroad Grant** *Full sponsorship*
2013	**Student Travel Fellowship**, the 7th AYRCOB *6 winners per year*
2011	**Sportsmanship Award**, Taiwan University Sports Federation *3 winners among 9,200 athletes from 164 colleges in Taiwan*
2011	**NSC Sponsorship** for Attending International Conference *Full sponsorship*
2007	**NTU Outstanding College Youth** *15 winners per year from 32,791 NTU students*
2007	**NTU Presidential Awards** *(2003, 2004, 2007)* *Top 5% students in each department*
2006	**NTU Scholarship for Outstanding Performance** *15 winners per year from 32,233 NTU students*
2005	**Chinese Chia-Hsin Sports Scholarship** 10-15 winners per year from all college athletes in Taiwan
2003	**Guo-Guang Sports Medal, Republic of China (Taiwan)** *Athletes' most prestigious honor in Taiwan*

PUBLICATIONS

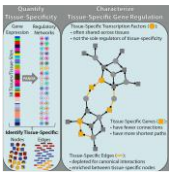
Journal Papers



Sex Differences in Gene Expression and Regulatory Networks across 29 Human Tissues

Lopes-Ramos CM, Chen CY, Kuijjer ML, Paulson JN, Sonawane AR, Fagny M, Platig J, Glass K, Quackenbush J, DeMeo DL

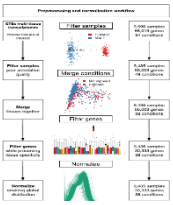
Cell Reports 2020, **31**(12): 107795. (PMID: 32579922)



Understanding Tissue-Specific Gene Regulation

Sonawane AR, Platig J, Fagny M, Chen CY, Paulson JN, Lopes-Ramos CM, DeMeo DL, Quackenbush J, Glass K, Kuijjer ML

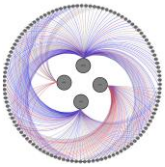
Cell Reports 2017, **21**(4): 1077–1088. (PMID: 29069589)



Tissue-aware RNA-Seq Processing and Normalization for Heterogeneous and Sparse Data

Paulson JN, Chen CY, Lopes-Ramos CM, Kuijjer ML, Platig J, Sonawane AR, Fagny M, Glass K, Quackenbush J

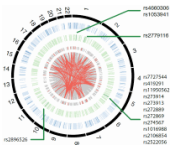
BMC Bioinformatics 2017, **18**(1): 437. (PMID: 28974199)



Regulatory Network Changes Between Cell Lines and Their Tissues of Origin

Lopes-Ramos CM*, Paulson JN*, Chen CY, Kuijjer ML, Fagny M, Platig J, Sonawane AR, DeMeo DL, Quackenbush J, Glass K

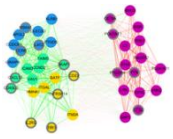
BMC Genomics 2017, **18**: 723. (PMID: 28899340)



Exploring Regulation in Tissues with eQTL Networks

Fagny M, Paulson JN, Kuijjer ML, Sonawane AR, Chen CY, Lopes-Ramos CM, Glass K, Quackenbush J, Platig J

Proc Natl Acad Sci U S A 2017, **114**(37): E7841-E7850. (PMID: 28851834)

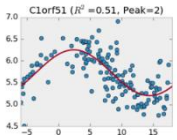


MetaDCN: Meta-Analysis Framework for Differential Coexpression Network Detection with an Application in Breast Cancer

Zhu L*, Ding Y*, Chen CY*, Wang L, Huo Z, Kim S, Sotiriou C, Oesterreich S, Tseng GC

Bioinformatics 2017, **33**(8): 1121-1129. (PMID: 28031185)

*Joint first authors.

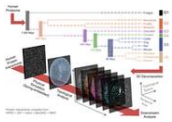


Effects of Ageing on Circadian Patterns of Gene Expression in the Human Prefrontal Cortex

Chen CY, Logan RW, Ma T, Tseng GC, Sibille E, McClung CA

Proc Natl Acad Sci U S A 2016, **113**(1): 206-211. (PMID: 26699485)

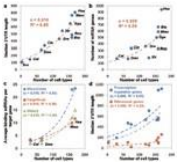
High Attention Paper 



Dissecting the Human Protein-Protein Interaction Network via Phylogenetic Decomposition

Chen CY, Ho A, Huang HY, Juan HF, Huang HC

Scientific Reports 2014, **4**: 7153. (PMID: 25412639)

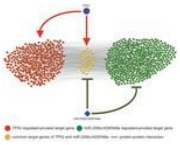


Lengthening of 3'UTR Increases Morphological Complexity in Animal Evolution

Chen CY, Chen ST, Juan HF, Huang HC

Bioinformatics 2012, **28**(24): 3178-3181. (PMID: 23080117)

ESI Highly Cited Paper

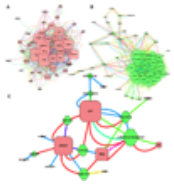


Crosstalk Between Transcription Factors and MicroRNAs in Human Protein Interaction Network

Lin CC*, Chen YJ*, Chen CY, Oyang YJ, Juan HF, Huang HC

BMC Systems Biology 2012, **6**:18. (PMID: 22413876)

Highly Accessed



Coregulation of Transcription Factors and MicroRNAs in Human Transcriptional Regulatory Network

Chen CY, Chen ST, Fuh CS, Juan HF, Huang HC

BMC Bioinformatics 2011, **12**(Suppl 1):S41. (PMID: 21342573)

ESI Highly Cited Paper

Conference Papers

Ensemble Learning Model Identifies Pan-cancer Hallmark Genes in TNFA Signaling Pathway

Su YY, Chen CY, Lin CC

ISMB/ECCB 2019, Basel, Switzerland

Analysis of Brain Transcriptomes Reveals Candidate Genes and Pathways Influenced by Cerebrovascular Diseases

Chen CY

ICSB 2018, Lyon, France

The effects of aging and psychiatric disease on circadian patterns of gene expression in the human prefrontal cortex

Chen CY, Logan RW, Ma T, Tseng GC, Sibille E, McClung CA

Neuropsychopharmacology 2015, 40: S199–S200.

SOFTWARE

YARN

A Bioconductor package for robust multi-condition RNA-Seq preprocessing and normalization

http://bioconductor.org/packages/yarn

omics

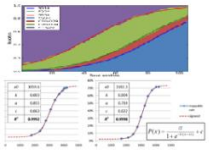
A Python package for omics data analysis, with main focus on integrative genomics

http://pypi.python.org/pypi/omics

tablet

A tool for operations on tiny spreadsheet data structure developed in Python

http://pypi.python.org/pypi/tablet



IlluminaQA

Model-Based Quality Assessment of Illumina Short Read Sequencing Data

http://sbl.csie.org/IlluminaQA

LECTURES

Bioinformatics Programming using Python *(62137, NYMU)*

Summer 2011 | Summer 2012 | Summer 2013

Bioinformatics Laboratory *(LS 3006, NTU)*

Using DNA Microarrays to Assay Gene Expression

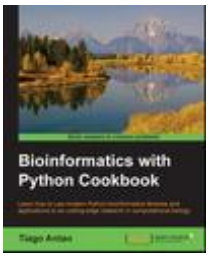
Spring 2012 | Spring 2013

Cancer Systems Biology *(MCB 5032, NTU)*

MicroRNA Research in Cancer Biology: Databases and Tools

Spring 2013

BOOKS

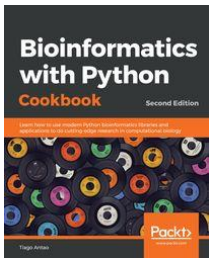


Bioinformatics with Python Cookbook

Learn how to use modern Python bioinformatics libraries and applications to do cutting-edge research in computational biology

ISBN: 1397817821751l7

Role: Technical Reviewer



Bioinformatics with Python Cookbook, Second Edition

Discover modern, next-generation sequencing libraries from Python ecosystem to analyze large amounts of biological data

ISBN: 9781789344691

Role: Technical Reviewer

BIOGRAPHY

Cho-Yi Chen was born in Taipei, Taiwan. He received his BS degree in Computer Science at National Taiwan University (NTU) in 2007. During his college years, he developed great interests in bioinformatics and computational biology, which leads him into his career as a biomedical data scientist. He received his MS degree in Bioinformatics and later his PhD degree in Genome and Systems Biology at NTU and Academia Sinica (joint degree) in 2015.

Cho-Yi was one of the founding members for Taiwan's Society of Evolution and Computational Biology. During his graduate years, he developed a functional network model to infer potential microRNA regulation and its cooperativity with transcription factors. This work was selected as an oral presentation in APBC 2011 and later published in *BMC Bioinformatics*, in which this paper ranked top 2% highly cited article according to the 2011 *Essential Science Index (ESI)*. In another study published in *Bioinformatics*, Cho-Yi found a striking exponential expansion of posttranscriptional regulatory circuits in parallel with the increase of morphological complexity during animal evolution. This study was also rated as Highly Cited Paper in the 2012 *ESI*.

In 2014, Cho-Yi won a study abroad grant from the Ministry of Science and Technology (MOST) of Taiwan. He visited George C. Tseng's group in the University of Pittsburgh, where he helped develop a meta-analysis framework to detect differential coexpression gene modules in diseases. He also collaborated with the researchers at the University of Pittsburgh Medical Center to study the aging effect on circadian gene expression patterns in the human brain. This study was published in *PNAS* in 2016 and was reported by National Public Radio and *The New York Times*.

In 2015-2017, Cho-Yi worked as a postdoctoral research fellow under the mentorship of Prof. John Quackenbush at the Dana-Farber Cancer Institute (DFCI) and Harvard School of Public Health (HSPH), where he developed a network approach to study gene function and sexual dimorphism in lung diseases.

In August 2017, Cho-Yi joined the faculty of the Institute of Biomedical Informatics as an Assistant Professor at the National Yang-Ming University (NYMU) in Taiwan. He won a young investigator grant from the MOST (the Einstein Program) in 2018.

Last but not least, Cho-Yi is also an enthusiastic swimmer. He was an Olympic swimmer and holder of several male swimming records in Taiwan. During his professional career, he has competed in several international sports events, including World Championships, Asian Games, and Olympic Games. He has won several prestigious awards, including College Sportsmanship Award, the Outstanding College Youth, and Guo-Guang Sports Medal (國光獎章) of Taiwan.