

BIOGRAPHICAL SKETCH

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NAME: CHATRAWEE DUANGJAN

eRA COMMONS USER NAME (credential, e.g., agency login): DUNGJIAN

POSITION TITLE: Assistant Professor, Director of the Appalachian Natural Products Program

EDUCATION/TRAINING

INSTITUTION AND LOCATION	DEGREE	Completion Date	FIELD OF STUDY
Department of Medical Technology, Faculty of Allied Health Sciences, Chulalongkorn University, Bangkok, Thailand	BS	2010-2014	Medical Technology (Second Class Honors)
Department of Medical Technology, Faculty of Allied Health Sciences, Chulalongkorn University, Bangkok, Thailand	PHD	2014-2019	Clinical Biochemistry and Molecular Medicine
The Leonard Davis School of Gerontology, University of Southern California, California, Los Angeles, USA	Postdoctoral Research Scholar	2020-2024	Aging and metabolic homeostasis

A. Personal Statement

The most important desire in human's life is live longer and healthier. As the time approached for me to set my personal and professional goals, I realized that my deepest desire was to contribute positively to mankind by enhancing health and longevity. This realization led me to pursue a career in biomedical sciences.

From a young age, I have been driven by a healthy curiosity and a desire to satisfy my intellectual curiosity. My passion for helping people and my aptitude for sciences naturally guided me towards this field. During my undergraduate studies in Medical Technology, I excelled academically, earning second-class honors. Holding a medical technologist license, I have had the opportunity to work part-time in a hospital. This experience has not only honed my medical skills but also fulfilled my childhood passion for helping people. My enthusiasm for experimentation was particularly evident during my senior research project, where I discovered my deep passion for scientific inquiry. Pursuing a doctoral degree in Clinical Biochemistry of Molecular Medicine is the next step in my journey. I am committed to advancing medical science and making a meaningful impact on human health.

As a doctoral student, my thesis focuses on neurosciences and aging. My area of research interest is related to investigate the molecular mechanisms underlying the potential effects of natural products in aging and neurodegenerative diseases. I favor interdisciplinary approaches to biological questions and have incorporated cell biological and biochemical approaches in my research. My research goals are to understand the molecular mechanism of aging as well as nutrigenetics for using diet as a means to circumvent genetic predisposition and prevent or reduce the severity of age-related disease.

As a post-doctoral research fellowship, I was supervised by Prof. Dr. Sean Curran in the Leonard Davis School of Gerontology, University of Southern California. In the Curran laboratory, I focus on the biology of aging and metabolic homeostasis. In my first year, I discovered the lifespan and healthspan properties of Oolonghomobisflavans (OFs) from oolong tea (*Camellia sinensis*) in *Caenorhabditis elegans*. In addition, I investigated the effects and underlying mechanisms of OFs in neuroprotective effects against amyloid beta/tau-induced proteotoxicity in *C. elegans*. By incorporating emerging technologies and collaborating with colleagues in the USC School of Pharmacy, I have extended my research from molecular biology to pharmacology, investigating the potential effects of OFs on tau fibrils aggregation by Cryo-Electron Microscopy. This work provides new evidence to support the health benefits of oolong tea and importantly identify OFs as potent bioactive molecules that promote healthy aging, suggesting new therapeutic strategies for neurodegenerative conditions.

To enhance my research capabilities, I am dedicated to continuous learning and development. Recently appointed to a tenure-track faculty position, I now serve as the Director of the Appalachian Natural Products Research Program (ANPRP) in the Department of Biomedical Sciences at the Joan C. Edwards School of Medicine, Marshall University. The ANPRP is committed to identifying bioactive molecules in Appalachian plants to improve therapeutic treatments and drug development for age-related diseases. I am confident that my enthusiasm for natural products research will significantly advance our understanding and improving human health in the future.

B. Positions, Scientific Appointments, and Honors

Positions/Education / Training

2010-2014	Medical Technology Student, Chulalongkorn University, Thailand Supervisor: Assist. Prof. Dr. Tewin Tencomnao Field of Study: Medical Technology Medical laboratory skills: -Venipuncture -Blood and plasma preparing -Blood cells analysis and identify by using a microscope -Body fluids chemical analysis -Stool and urine examination
2014-2020	Ph.D. Candidate, Chulalongkorn University, Thailand Supervisor: Assist. Prof. Dr. Tewin Tencomnao Field of Study: Clinical Biochemistry and Molecular Medicine

Thesis Title: Effects and mechanisms of *Anacardium occidentale* and *Glochidion zeylanicum* left extracts on neuroprotective, neuritogenesis, oxidative stress resistance and anti-aging properties.

Research skills: Molecular biology and neurosciences

- Cell culture and applications
- DNA and RNA extraction, conventional PCR and quantitative RT-PCR
- Protein extraction and western blot analysis
- Immunofluorescence staining
- Neurite outgrowth quantification

2015 Inter-university Exchange Program toward Medical and Dental Networking in Southeast Asia, Student exchanges at Tokyo Medical and Dental University, Tokyo, Japan
Supervisor: Professor Motoji Sawabe
Research skills: Immunohistochemistry

2017-2018 Short term research fellowship in Institute of Pharmacy and Molecular Biotechnology, Heidelberg University, Germany.
Supervisor: Professor Michael Wink
Research skills: Aging and anti-oxidant

- *C. elegans* culture and applications
- Plant extracts and metabolite

2020-2024 Postdoctoral Research Scholar, University of Southern California, USA
Supervisor: Sean Curran, PhD - Associate Dean of Research
Field of Study: Aging and metabolic homeostasis
Project Title: WDR23-dependent proteostasis mediates glucose and lipid handling
Research skills: Molecular biology of aging and metabolic diseases

- Cell culture and applications (Cell line and primary cells)
- *C. elegans* culture and applications
- Mouse tissues collection and behavior

2025-Present Assistant Professor, Director of the Appalachian Natural Products Program, Department of Biomedical Sciences, Joan C. Edwards School of Medicine, Marshall University

Professional Experience

2015-2019 Medical Technologist, Rajavithi Hospital, Bangkok, Thailand (part time)
Performing venipuncture for clinical laboratory test and finger blood drawing for blood sugar test as well as quality control for glucometer in the Department of Clinical Chemistry

Honors and Awards

2014-2020 Full scholarship by the 72nd Birthday Anniversary of His Majesty the King's University Fund for Doctoral Scholarship, Chulalongkorn University

2016-2020 Full scholarship by the 90th Anniversary Fund, Chulalongkorn University

2017-2018 Full scholarship by the Overseas Research Experience Scholarship for Graduate Students, Chulalongkorn University

2018 Full scholarship by the Overseas Academic Presentation Scholarship for Graduate Students, Chulalongkorn University

Location: The 30th International Symposium on the Chemistry of Natural Products and the 10th International Congress on Biodiversity (ISCNP30 & ICOB10)

2018 Best oral presenter award for INBIOSIS GRADUATED SYMPOSIUM 2018, University Kebangsaan Malaysia

2022 AFAR 2022 Glenn Foundation for Medical Research Postdoctoral Fellowship in Aging Research

2023, 2024 Postdoctoral Scholar Conference & Travel Support, University of Southern California

C. Contributions to Science

My area of research interest is related to investigate the principles underlying mechanisms of human homeostasis during aging and age-related degenerative diseases. I favor interdisciplinary approaches to biological questions and have incorporated cell biological and biochemical approaches in my research. Below is a discussion of my current research as well as future research interests.

Previous Research

As a Ph.D. student, I was supervised by Prof. Tewin Tencomnao in the Clinical Biochemistry and Molecular Medicine Program, the Department of Clinical Chemistry at Chulalongkorn University. In Dr. Tencomnao's lab, I focused on neurosciences by using cultured neuronal cell models. I investigated the effects and underlying mechanisms of plant extracts on neuroprotective effect and neuritogenesis properties. The results of this study established neuroregenerative and neuroprotective potential in vitro and concluded these plant extracts could be a potential therapeutic candidate for neurodegenerative diseases. During this time, I received a short-term research fellowship in the Institute of Pharmacy and Molecular Biotechnology, Heidelberg University, Germany, supervised by Prof. Michael Wink. In Dr. Wink's lab, I focused on antioxidant and anti-aging properties in *Caenorhabditis elegans* model. I investigated the effects and underlying mechanisms of the plant extracts on anti-oxidative stress and longevity using *C. elegans*. The results of this study established the antioxidant and anti-aging activity of the plant extracts in vivo and suggest its potential as a dietary supplement and alternative medicine to combat and alleviate oxidative stress and physiological attributes associated with aging.

Oxidative stress plays a major role in aging and neurodegenerative diseases. From my previous researches, I found the anti-oxidative stress properties of natural products connected with anti-aging and degenerative diseases via the insulin transduction and the SIRT1/Nrf2 signaling pathways. I conclude that the protective effects against oxidative stress could be the strategy to delay aging and age-related degenerative diseases.

Natural products from food supplements and medicinal plants with antioxidant properties could be promising candidates for fighting against various aging-related diseases. However, nutrient supplements could not be a root cause solutions. The molecular mechanisms in genetic and biochemical approaches are a principal step to understand the root cause of degenerative diseases. Thus, the knowledge of molecular mechanisms together with the efficiency of nutrient supplements can both protect and treatment age-related degenerative diseases.

1. **Duangjan C**, Rangsinth P, Gu X, Wink M and Tencomnao T: Lifespan extending and oxidative stress resistance properties of a leaf extracts from *Anacardium occidentale* L. in *Caenorhabditis elegans*", *Oxidative Medicine and Cellular Longevity*, 2019.

2. **Duangjan C**, Rangsinth P, Gu X, Zhang S, Wink M and Tencomnao T: "Glochidion zeylanicum leaf extracts exhibit lifespan extending and oxidative stress resistance properties in *Caenorhabditis elegans* via DAF-16/FoxO and SKN-1/Nrf-2 signaling pathways", *Phytomedicine*, 2019.

3. **Duangjan C**, Rangsinth P, Gu X, Zhang S, Wink M and Tencomnao T: "Vitis vinifera leaf extract protects against glutamate-induced oxidative toxicity in HT22 hippocampal neuronal cells and increases stress resistance properties in *Caenorhabditis elegans*", *Frontiers in Nutrition*, 2021.

4. **Duangjan C**, Rangsinth P, Gu X, Zhang S, Wink M and Tencomnao T: "Neuroprotective Effects of Glochidion zeylanicum Leaf Extract against H₂O₂/Glutamate-Induced Toxicity in Cultured Neuronal Cells and A β -Induced Toxicity in *Caenorhabditis elegans*", *Biology*, 2021.

As a post-doctoral research fellow, I was supervised by Prof. Sean P. Curran at the Leonard Davis School of Gerontology, University of Southern California. In Dr. Curran's lab, my research focuses on the biology of aging and metabolic homeostasis across species (worm, mouse, and cultured human cells). We are investigating the molecular, genetic, and environmental factors that impact multiple parameters of health such as resistance to environmental and dietary stress, mobility, metabolism, reproductive-fitness, and mitochondrial functions.

Promoting long life and healthy aging through genetic, dietary, and pharmacological interventions has been a constant topic of study since the discovery that it's possible not only to increase maximal lifespan, but also healthspan. Tea is one of the most important natural products rich in polyphenols, highlighting its potential benefits for influencing healthy aging. I have established a solid foundation of the health benefits of oolong tea and importantly highlight oolonghomobisflavans as potent bioactive molecules that promote healthy aging. Due to the knowledge gained in my oolong tea studies, I am additionally contributing to the Elsevier Book: Tea in Health and Disease Prevention, in a chapter outlining how oolonghomobisflavans in oolong can aid in preventing aging and promoting longer lifespan.

During the second year of my post-doctoral research, I received the Glenn Foundation for Medical Research Postdoctoral Fellowship in Aging Research from the American Federation for Aging Research. I dedicated all of my efforts to investigate a novel role of WDR23 in glucose and lipid metabolisms which I established WDR23 as a new marker of metabolic diseases.

1. **Duangjan C** and Curran SP, "Oolonghomobisflavans from *Camellia sinensis* increase *Caenorhabditis elegans* lifespan and healthspan", *GeroScience*, 2021.

2. **Duangjan C.**, Arpawong TA, Spatola BN, and Curran SP: "Hepatic WDR23 proteostasis mediates insulin clearance by regulating insulin-degrading enzyme", *GeroScience*, 2024.

3. **Duangjan C.** and Curran SP: "Oolonghomobisflavans in oolong tea and lifespan effects, *The Elsevier Book Tea in Health and Disease Prevention*", 2024.

4. **Duangjan C**, Chang X, Seidler PM and Curran SP, "Oolonghomobisflavans from *Camellia sinensis* disaggregate tau fibrils across Alzheimer's disease models", *Science Translational Medicine*, *Submitted*, 2025

Current and Future Research

My research goals are to advance my knowledge to identify and understand aging mechanisms at the whole organism level. I have a deep passion for biological aging, which requires a holistic approach to studying fundamental questions in biology. Specifically, my goal is to elucidate new molecular mechanisms of metabolic homeostasis and oxidative stress which play important roles in healthy brain aging and when disrupted lead to neurodegenerative diseases. I am also interested in novel therapeutic targets and potential interventions against human aging and age-related degenerative diseases.

I am dedicated to enhancing my research skills through ongoing projects at the ANPRP, which focus on uncovering the bioactive properties of natural products in age-related degenerative diseases.

I aspire to be a leader in natural product and pharmaceutical research, with long-term goals centered on becoming an expert scientist in biomedical sciences. As people strive for longevity and better health, I envision my research focusing on the molecular mechanisms of metabolic homeostasis, aging, and age-related degenerative diseases, affected by genetic and environmental factors such as oxidative stress using several models for study. I am confident that my dedication to investigating the molecular mechanisms of natural products will profoundly impact our understanding of therapeutic treatments and contribute to enhanced human health.

Complete List of Published Work in my Bibliography:

<https://www.ncbi.nlm.nih.gov/myncbi/chatrawee.duangjan.1/bibliography/public/>