Faculties in MBLS Program Accepting International Exchange Students in 2024

Supervisor	Position	Areas of Study	Accepted Number of Students	Web Links
Chia-Rui Shen	Chair/Professor	Immunology, Biotechnology, Clinical Chemistry and Serology.	2	https://mip.cgu.edu.tw/p/412-1078-9224.php?Lang=en
Shin-Ru Shih	Distinguished Professor/Director of Research Center for Emerging Viral Infections	Clinical Virology, Biotechnology, Molecular Biology, Biochemistry	2	https://rcevi.cgu.edu.tw/p/406-1030-12430,r1545.php?Lang=en https://mip.cgu.edu.tw/p/405-1078-36457,c920.php?Lang=zh-tw
Ann-Joy Cheng	Professor	Tumor Biology, Molecular Cellular Pathology, Non-coding RNA in Cancer	2	https://sites.google.com/view/annjoycheng1/ann-joy-cheng https://mip.cgu.edu.tw/p/405-1078-86860,c920.php?Lang=zh-tw
Ching-Ping Tseng	Professor	Cancer Biology, Platelet Biology, Molecular Diagnostics, Molecular and Cellular Biology	2	https://mip.cgu.edu.tw/p/412-1078-2873.php?Lang=en https://sites.google.com/site/ctsenglab/
Hsiu-Chuan Yen	Professor	Free Radical Biology and Medicine, Mitochondrial Biology and Medicine, Clinical Toxicology	0	https://mip.cgu.edu.tw/p/404-1078-10577-1.php?Lang=zh-tw
Hung-Yao Ho	Professor	Tissue Engineering, Stem Cell Research, Gerontological Research, Redox Biology	2	https://mip.cgu.edu.tw/p/412-1078-2877.php?Lang=en
Kowit-Yu Chong	Professor	Stem Cell, Regenerative Medicine, multidrug-resistant cancer cells	2	https://mip.cgu.edu.tw/p/412-1078-2936.php?Lang=en https://sites.google.com/site/kychong20155/
Chih-Ching Wu	Professor	Proteomics, Cancer Biology, Analytical Chemistry, Systems Biology	1	https://mip.cgu.edu.tw/p/405-1078-86909,c920.php?Lang=zh-tw

Supervisor	Position	Areas of Study	Accepted Number of Students	Web Links
Rei-Lin Kuo	Professor	Molecular virology; Virus and host Interactions	1	https://mip.cgu.edu.tw/p/412-1078-6597.php?Lang=en https://rcevi.cgu.edu.tw/p/406-1030-5759,r1545.php?Lang=en
Hsing-I Huang	Professor	Tumor Immunology, Cell Biology, Tissue-specific Stem cells, Stem Cell Differentiation	1	https://rcevi.cgu.edu.tw/p/406-1030-4047,r1545.php?Lang=zh-tw https://hihlab3721.wixsite.com/website/hsing-i-huang
Jwu-Ching Shu	Associate Professor	Clinical Microbiology, Biochemistry, Molecular Biology	0	https://mip.cgu.edu.tw/p/412-1078-2937.php?Lang=en
Mei-Hui Lin	Associate Professor	Clinical Microbiology, Bacteriology	0	https://mip.cgu.edu.tw/p/412-1078-2938.php?Lang=en
Chia-Chen Chang	Associate Professor	Biosensing Technology, Bioanalytical Chemistry	1	https://mip.cgu.edu.tw/p/412-1078-12940.php?Lang=en https://sites.google.com/gap.cgu.edu.tw/nbalab
Ching-Chi Chiu	Assistant Professor	Neuroscience, Pathogenesis of Alzheimer's disease and Parkinson's Disease, Induced pluripotent stem cell, Development of neuroprotective molecules using PD and AD knockin mice	1	https://ccchei178.wixsite.com/my-site-1

Chia-Rui Shen, Ph.D.
Professor

Highest degree:
Ph. D. in Immunology
University of Bristol, UK.

Areas of specialty:
Immuno-Regulation, Cell and Gene Therapy,
Clinical Laboratory Science.

Website:
https://mip.cgu.edu.tw/p/412-1078-9224.php?Lang=en

E-mail:
crshen@mail.cgu.edu.tw

Brief description of research interest:

Immuno-regulation in health and diseases

Immuno-regulation is the process of maintaining a balance between activation and suppression of effector cells to achieve an efficient immune response without damaging the host. It plays a crucial role in maintaining homeostasis and preventing autoimmune diseases. We intend to identify and rescue the dysregulation of the immune system leading to autoimmune diseases, allergies, and chronic inflammation (including cancers) utilizing the cell and gene therapies.

IVDs development

In vitro diagnostic products (IVDs) are tests that are performed on samples such as blood or tissue that have been taken from the human body. These tests can detect diseases or other conditions and can be used to monitor a person's overall health to help cure, treat, or prevent diseases

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Key learning points:
Expect to acquire knowledge and experimental skills in cell culture, Immunoassays, molecular and cell biology.

Shin-Ru Shih , Ph.D.
Professor

Highest degree:
Ph.D. in Molecular Biology and Biochemistry
Rutgers University, New Jersey, U.S.A.

Areas of specialty:
Clinical Virology, Biotechnology, Molecular Biology, Biochemistry

Website:
https://rcevi.cgu.edu.tw/p/406-1030-12430,r1545.php?Lang=zh-tw

E-mail:
srshih@mail.cgu.edu.tw

Brief description of research interest:
Shin-Ru Shih got her bachelors degree in Medical Biotechnology and masters degree in Biochemistry from National Taiwan University, and her Ph.D. in Biochemistry and Molecular Biology from Rutgers University, USA. Since 1996, she established a molecular virology laboratory in Chang Gung University and the Research Center for Emerging Viral Infections in 2008. Her team has been studying many aspects of emerging RNA viruses, including identification of unknown viruses using novel biotechnologies, mechanisms of pathogenesis and development of antiviral compounds. Their study of EV71 began in 1998, when a large EV71 outbreak occurred in Taiwan. Their participation contributed significantly to the laboratory diagnosis of EV71. They subsequently focused on viral-host interactions, in which molecular targets for drug discovery were identified, and series of compounds were developed that inhibit EV71 replication. Dr. Shih was awarded the National Medal for Outstanding Youth in 2004 for contributing to EV71 research in Taiwan.
Influenza virus is another focus of her team. This research includes molecular surveillance of Taiwanese strains, mechanistic study of host-restriction of influenza virus infection, pathogenesis study and development of anti-flu agents.

Key learning points:
The students are expected to know the knowledge concerning about Molecular Biology and Biochemistry, as well as RNA Virus.

Ann-Joy Cheng, Ph.D.

Professor

Highest degree:
Ph.D. in Tumor Biology
University of Texas, M.D. Anderson Cancer Center,
Houston, TX, USA

Areas of specialty:
Tumor biology, Translational cancer biology
Molecular cellular pathology, Biotechnology

Websites
https://sites.google.com/view/annjoycheng1/ann-joy-cheng
https://mip.cgu.edu.tw/p/405-1078-86860,c920.php?Lang=zh-tw

E-mail:
annjoycheng@gap.cgu.edu.tw

Brief description of research interest:
Head and neck cancer (HNC) is a prevalent neoplastic disorder, especially prominent in Southeast Asian populations. Our research laboratory is engaged in systematically elucidating the molecular mechanisms underpinning the carcinogenesis of HNC. We prioritize investigations into the carcinogenic implications of areca nut consumption, the characterization of tumor-associated markers, detailed molecular pathophysiology, intricate network analyses, and prognostic determinants. Employing advanced methodologies, including microarray technology and bioinformatic tools, we undertake an exhaustive analysis of genomic aberrations, transcriptomic profiles, and proteomic signatures specific to oncogenic phenotypes. These include cellular proliferation, metastatic potential, chemoradioresistance, and the reactions to areca nut exposure. Ultimately, our work seeks to deepen the understanding of cancer and foster advancements in precision medicine to enhance cancer treatment.

Key learning points:
Expect to acquire knowledge and experimental skills in molecular cellular oncology.

Ching-Ping Tseng, Ph.D.
Professor

Highest degree:
Ph. D. in Human Cancer Biology
University of Wisconsin-Madison

Areas of specialty:
Cancer biology, platelet biology, molecular diagnostics, molecular and cellular biology

Website:
https://mip.cgu.edu.tw/p/412-1078-2873.php?Lang=en
https://sites.google.com/site/ctsenglab/

E-mail:
ctseng@mail.cgu.edu.tw

Brief description of research interest:

Molecular analysis of the interplay between tumor microenvironment and cancer progression

Cancer is one of the major causes of death worldwide and has a significant impact on national health. We aim to identify novel regulators that are crucial for cancer cell-platelet interactions using various molecular and cellular approaches. Several regulators that mediate cancer cell-platelet interactions are candidates for translating to clinical application and are under investigation.

Molecular analysis of platelet function

Platelet is important in various physiological and pathological conditions, including hemostasis, thrombosis, and cancer. The functional role of the adaptor protein Disabled-2 in platelet function under pathological condition is investigated.

Key learning points:
Expect to acquire knowledge and experimental skills in platelet analysis, cancer biology, and molecular and cellular biology.

Hung-Yao HO, Ph.D.
Professor

Highest degree:
Ph. D.
National Defense Medical Centre, Taiwan
Institute of Life Sciences (a joint program with Academia Sinica, Taipei)

Areas of specialty:
Redox biology, molecular biology and diagnostics, biochemistry, metabolomics, virology

Website:
https://mip.cgu.edu.tw/p/412-1078-2877.php?Lang=en

E-mail:
hoh01@mail.cgu.edu.tw

Brief description of research interest:

The roles of redox homeostasis and metabolic reprogramming in viral infection

Viral infectious is a disease affected by host redox microenvironment. We have been studying the relationship between host redox homeostasis and viral pathogenesis, and the role of mitochondria in viral infection. Our effort leads to formulation of the concept that a vicious cycle exists between enteroviral infection and host oxidative stress. Currently, we are studying the mechanistic aspects of such relationship. Moreover, we have applied metabolomics and proteomics research technologies to elucidate the effect of viral infection on host metabolic reprogramming and vice versa. Furthermore, we explore the potential of using natural antioxidants or herbal compounds as antiviral therapeutics.

The roles of redox homeostasis in pathogenesis of diabetes

Diabetes is an important global health issue. It is always associated with hyperglycemia and hyperlipidemia, which are conducive to oxidative stress. We have been studying how oxidative stress and redox metabolism affect the physiology and metabolic signaling of pancreatic β-cells, as well as the pathogenesis of type II diabetes.

Key learning points:
Expect to acquire knowledge and experimental skills in virology, metabolomics, and molecular and biochemical techniques.

Kowit-Yu Chong, Ph.D.
Professor

Highest degree:
Ph. D. in Pharmacology
Southern Illinois University, IL, USA

Areas of specialty:
Stem cell therapy, Regenerative medicine, multidrug-resistant cancer

Website:
https://mip.cgu.edu.tw/p/412-1078-2936.php?Lang=en
https://sites.google.com/site/kychong20155/

E-mail:
kchong@mail.cgu.edu.tw

Brief description of research interest:

1. **Investigation of the protective effects of preconditioned mesenchymal stem cells against Chronic Obstructive Pulmonary Disease (COPD) in mouse model.**

Chronic Obstructive Pulmonary Disease (COPD) is an irreversible and progressive airway obstruction disease, often caused by long-term tobacco smoking, air pollution and other risk factors, which triggers an abnormal chronic inflammatory response in the lung. Recently, our publications demonstrated promising therapeutic effects of hypoxia-preconditioned mouse MSCs on bleomycin-induced pulmonary fibrosis mouse model, transplantation of genetically modified stem cells (MSC) or MSC-predifferentiated lung epithelial progenitor-like cells showed significantly improved elastase-induced mouse emphysema model.

2. **Investigation of the Relationship between Drug Resistance and Wnt pathway in Multiple Drug Resistant Cancer Cell line**

Multiple drug resistance (MDR) is a major obstacle to attenuating the effectiveness of chemotherapy to many human malignancies. Our laboratory study demonstrated that the Wnt ligand, Wnt5A modulates ABCB1-mediated MDR through activation of Wnt signaling in uterus sarcoma MDR cells. Wnt5A hypomethylated intron region was detected and abnormal upregulation of Wnt5A signaling pathway was shown to contribute to regulating the drug-resistance in the MDR cells and shown that high correlation between Wnt5A, ABCB1, and VEGF in the clinical chemoresistant breast cancer samples.

Key learning points:
Expect to acquire knowledge and experimental skills in stem cell therapy, multidrug-resistant cancer, and regenerative medicine.

Chih-Ching Wu, Ph.D.

Professor

Highest degree:
Ph. D. in Biochemistry
Chang Gung University, Taiwan

Areas of specialty:
Proteomics, cancer biology, analytical chemistry, systems biology

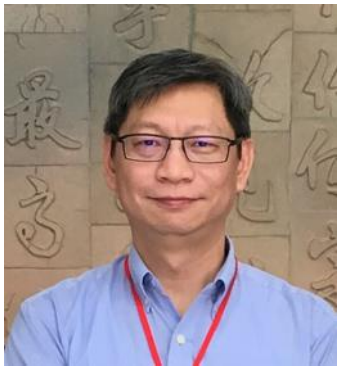
Website:
https://mip.cgu.edu.tw/p/405-1078-86909,c920.php?Lang=zh-tw

E-mail:
luckywu@mail.cgu.edu.tw

Brief description of research interest:
Chih-Ching Wu obtained his bachelor's degree in medical technology, master's degree in microbiology & immunology, and Ph.D. in biochemistry from Chang Gung University, Taiwan. He continued his post-doctoral training in proteomics from 2005 to 2008 and acted as Research Assistant Professor at Molecular Medicine Research Center, Chang Gung University from 2008 to 2010. Dr. Wu has joined Department of Medical Biotechnology and Laboratory Science, Chang Gung University since 2010. In the past decade, his team established multiple assay platforms to systematically identify biomarkers from diseased tissues or body fluids (e.g., sera, saliva, and pleural effusion) that are useful for detection, monitoring, or prognosis of diseases including various types of cancer, schizophrenia, and microbial infections. His research topics also include studies on an interplay between viral infection and host response. His team has been involved in identifying novel host factors that interact with proteins encoded by emerging viruses (e.g., influenza virus and enterovirus A71) and exploring functional roles of these host factors in viral replication.

Key learning points:
Expect to acquire knowledge and experimental skills in proteomics analysis, cancer biology, and analytical chemistry.

Rei-Lin Kuo, Ph.D.
Professor



Highest degree:
Ph. D. in Institute of Microbiology and Immunology, National Yang-Ming University, Taiwan

Areas of specialty:
Molecular virology: Enteroviruses and Influenza viruses

Website:
https://mip.cgu.edu.tw/p/412-1078-6597.php?Lang=en

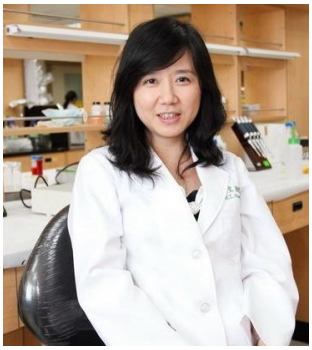
E-mail:
rlkuo@mail.cgu.edu.tw

Brief description of research interest:

1. Induction of the IFN expression is a critical event for innate immunity to disrupt viral replication in virus-infected cells. It has been demonstrated that viruses can evade host innate immunity by targeting the pathway for type I IFN activation. The regulation of the type I IFN production has been considered an important factor for virus pathogenicity. Since enteroviruses are important human pathogens that periodically causes several outbreaks with severe neurological complications in recent years, our lab is endeavoring to elucidate the mechanism for the regulation of signaling pathway for type I IFN production in enterovirus-infected cells. The understanding of the regulation of IFN production may provide the information for enterovirus pathogenicity and the basis for the development of new antiviral drugs.
2. Viral RNA synthesis is directly involved in the virus replication during influenza A virus infection. Based on pathogenicity studies, the viral polymerase has been considered as one of the contributors for the virulence of influenza viruses. Our lab is interested in verifying the polymerase activities of highly pathogenic influenza virus strains by several systems. In addition, influenza viral proteins interact with many host proteins. We are also investigating the impacts of the interactions in pathogenicity during influenza virus infection.

Key learning points:
The students are expected to learn the knowledge in molecular virology and experimental skills in identifying host factors that regulate viral infection.

Hsing-I Huang, Ph.D.
Professor



Highest degree:
Ph. D., Microbiology and Molecular Genetics, Rutgers University, USA

Areas of specialty:
Tumor Immunology, Cell Biology, Tissue-specific Stem cells, Stem Cell Differentiation

Website:
https://rcevi.cgu.edu.tw/p/406-1030-4047,r1545.php?Lang=zh-tw
https://hihlab3721.wixsite.com/website/hsing-i-huang

E-mail:
hihuang@mail.cgu.edu.tw

Brief description of research interest:

Impacts of Viral Infection on Neural Lineage Cells

We are interested on the impacts of neurotropic viral infections on neural lineage cells. Our results showed that enteroviruses have able to infect neural stem cells and induce apoptosis. This phenomenon has also been observed in mouse brains, suggesting potential route of neurological sequelae in infection. Additionally, enterovirus infection trigger human-derived neural stem cell-differentiated neurons autophagy process, which promotes enterovirus growth in neuronal cells. Our goal is to identify the factors that involved with the viral pathogenesis and to develop strategies against virus diseases.

Virus Infection of Intestinal Epithelial Cells

The intestinal epithelium is the first line of defense in the gastrointestinal tract to prevent pathogens from causing diseases. Little is now understood about how enteroviruses replicate in gastrointestinal epithelial cells or how they could infect other tissues or organs. To explore whether viruses employ different mechanisms to exit host cells in different host cells, we utilized human pluripotent stem cells to differentiate into intestinal epithelial organoids and conducted in vitro infection experiments. Exploring the mechanisms underlying the virus replication and spreading will broad our understanding about pathogenesis of enteric viruses.

Key learning points:
Expect to acquire knowledge and experimental skills in cell culture, cell differentiation, virus amplification, and virus detection.

Jwu-Ching Shu, Ph.D.
Associate Professor

Highest degree:
D. Phil. in Biochemistry
University of Oxford, U.K.

Areas of specialty:
Clinical Microbiology, Biochemistry, Molecular Biology

Website:
https://mip.cgu.edu.tw/p/412-1078-2937.php?Lang=en

E-mail:
shujc@mail.cgu.edu.tw

Brief description of research interest:

1. To investigate mechanisms of antibiotics resistance and pathogenesis in *Staphylococcus aureus*. *Staphylococcus aureus* which has long been recognized as a major cause of nosocomial infections can result in sepsis and septic shock associated with vascular damage and multiple organ failure. The spread of multidrug-resistant *Staphylococcus aureus* has raised a serious problem in the limitation of treatment options in the clinical environment. We are interested to study the impact of environmental stress on the expression of different virulence factors in *S. aureus*. In addition, regulatory mechanisms for antibiotic resistance and biofilm development will also be studied.
2. To study the bacteria (*S. aureus*)-host interaction. Bacterial infections are the result of complex interactions between invading bacteria and host defense mechanisms. One of the aims in this laboratory will be focused on evaluating the *S. aureus* pathogenicity in murine models upon environmental stress.
3. Molecular Epidemiology survey. In cooperation with colleagues in Chang Gung Memorial Hospital, molecular epidemiology survey for multidrug resistant pathogenic bacteria will be carried out.

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Key learning points:
The students are expected to know the knowledge concerning about Molecular Biology and Clinical Microbiology.

Chia-Chen Chang, Ph.D.
Associate Professor

Highest degree:
Ph. D. in Biomedical Engineering
National Taiwan University

Areas of specialty:
Optical biosensor, Bio-nano interface, Biomedical engineering

Website:
https://sites.google.com/gap.cgu.edu.tw/nbalab

E-mail:
chang@mail.cgu.edu.tw

Brief description of research interest:

Functional nucleic acids

Compared with antibody-based immunoassays, functional nucleic acid platforms are alternative designs for molecular analysis. Thus, we are interested in the exploration of these nucleic acid molecules as novel analytical tools for chemical sensing, biomolecular detection, and nanotechnology.

Nanosensing

Gold nanoparticls (AuNPs) are attractive because they provide unique size and distance-dependent SPR properties. The aggregation of AuNPs leads to a huge absorption band shift and color change from red to blue because of interparticle plasmon coupling. This color change allows AuNPs to be used for biosensing and biomedical applications. Therefore, our research focuses on the application of AuNPs as smart molecular probe for diagnostics and biosensing.

Key learning points:
Expect to gain knowledge and skills in the field of biosensors and bioelectronics.

Ching-Chi Chiu, Ph.D.
Assistant Professor

Highest degree:
Ph. D. in Biochemistry
Chang Gung University, Taiwan

Areas of specialty:
Pathogenesis of Alzheimer's disease and Parkinson's disease,
induced pluripotent stem cells of neurodegenerative disease, AD and PD knockin mice.

Website:
https://ccchei178.wixsite.com/my-site-1

E-mail:
ccchei@mail.cgu.edu.tw

Brief description of research interest:
1.Pathogenic mechanisms of Alzheimer's disease (AD) and Parkinson's disease (PD).
AD and PD are progressive neurodegenerative diseases. Genetic factors increase the risk of developing AD and PD. However, the etiology of PD and AD remains unclear. Our research focuses on the pathogenesis of PD- and AD-related mutant genes. Upon identification of novel candidate genes from AD and PD patients, we generated primary cultured neurons, patient-derived induced pluripotent stem cells and CRISPR/Cas knockin mice and further study signaling pathways of these genes involved in neurodegeneration.
2.Development of molecular biomarkers and therapeutic compounds for AD and PD.
There are only 6 FDA-approved drugs used for treating AD. Identification of therapeutic strategy for AD urgently needed. Mutant PLA2G6 and APP knockin mice may serve as a useful model for AD and research, identifying therapeutic compounds and biomarkers. Dysregulated levels of long-non coding RNA, microRNA and proteins in plasma samples from AD and PD patients can be used as biomarkers of AD and PD and could participate in the etiology of PD.

Key learning points:
Expect to gain knowledge and skills in the field of neurodegenerative disease, PD and AD knockin mice, and neuroprotective compounds.