

Introduction to Professors

Update: 2017/06/05

臺北醫學大學
TAIPEI MEDICAL UNIVERSITY

Affiliation list

Abbreviation	Full name
SBE	<u>School of Biomedical Engineering</u>
GIBMTE	<u>Graduate Institute of Biomedical Materials and Tissue Engineering</u>
GINME	<u>Graduate Institute of Nanomedicine and Medical Engineering</u>
GIBO	<u>Graduate Institute of Biomedical Optomechatronics</u>

Contact information

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Haw-Ming Huang		hhm@tmu.edu.tw
Tzu-Sen Yang		tsyang@tmu.edu.tw



Chih-Hwa Chen, MD

- Biomaterials in Orthopedics
- Tissue engineering
- Sports medicine
- Bone / Joint research
- Biomedical device

- 3-D cell sheets for tendon-to-bone healing of ACL reconstruction
- Thermosensitive hydrogel for tendon-to-bone healing of ACL reconstruction
- ACL graft fixation device
- TGF- β 1 to modify collagen I scaffolds and synovial fluid stem cells for cartilage regeneration
- PRP and alginate encapsulated synovial fluid stem cells for ACL partial tear
- Novel bone substitute



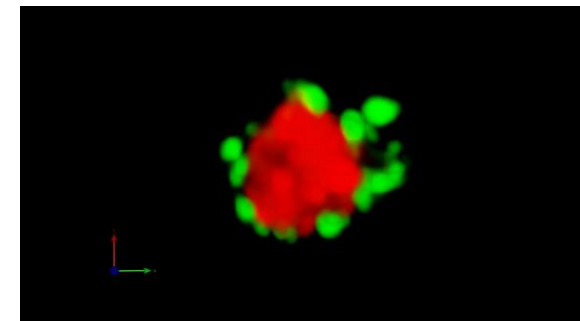
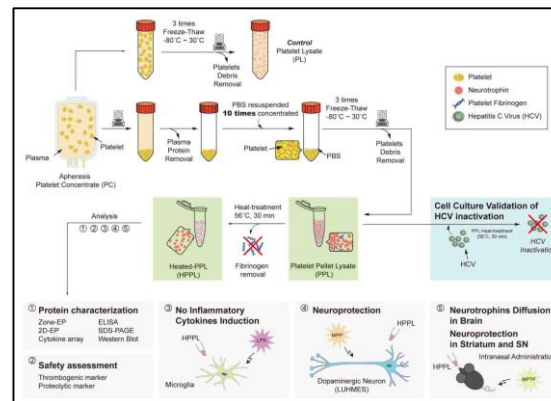
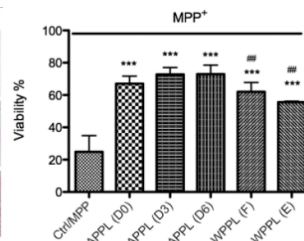
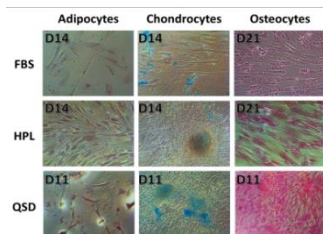


Research Focus

Thierry Burnouf, PhD

- Blood biomaterials
- Platelets nanoparticles
- platelet growth factors in regenerative medicine & *ex vivo* cell expansion

- Customized virally-inactivated, platelet growth factors preparations for regenerative medicine (neurodegeneration; wound healing) and cell therapy (*ex vivo* cell expansion for transplant).
- Blood cells and blood cell-derived microvesicles drug-delivery systems
- Bioprocessing for purification/virus inactivation of protein therapeutics and protein supplements used in cell therapy procedures.



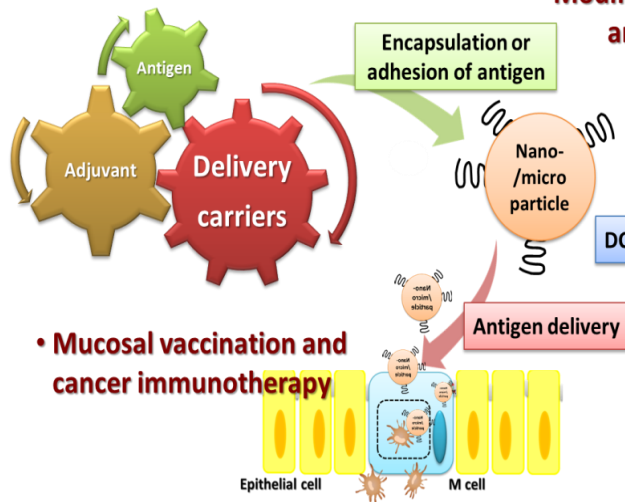
Research Focus

Der-Zen Liu, PhD, Professor

- Nano- and microparticle design and synthesis
- Drug and antigen delivery system
- Cancer vaccine

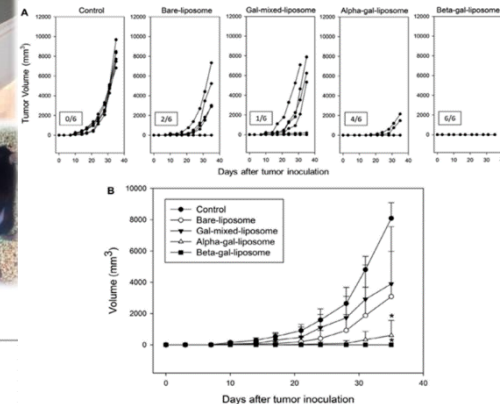
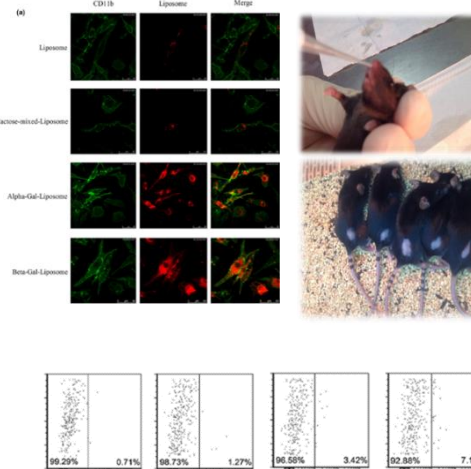
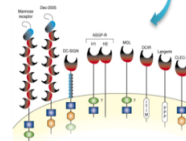
- Surface-modification of liposomes for antigen delivery
- Mucosal delivery routes for optimal immunization (e.g. oral, nasal, or ocular)
- Targeted-liposome platform for cancer vaccine applications

• Major components of vaccines



• Modification of nano- and microparticle

- Cationic molecule
- Immune stimulator
- DC targeting ligand





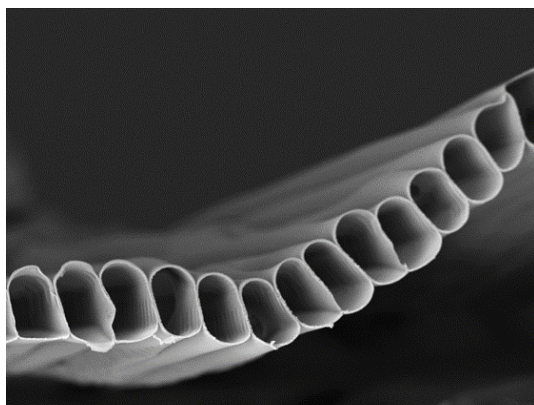
Research Focus

Chien-Chung Chen, PhD

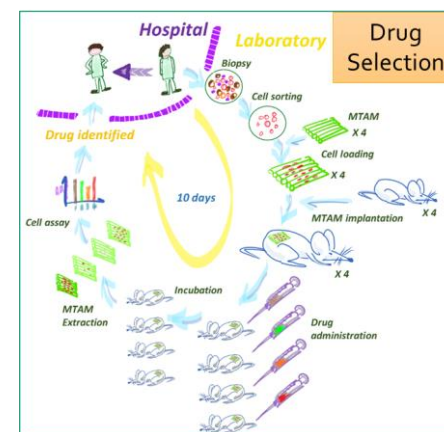
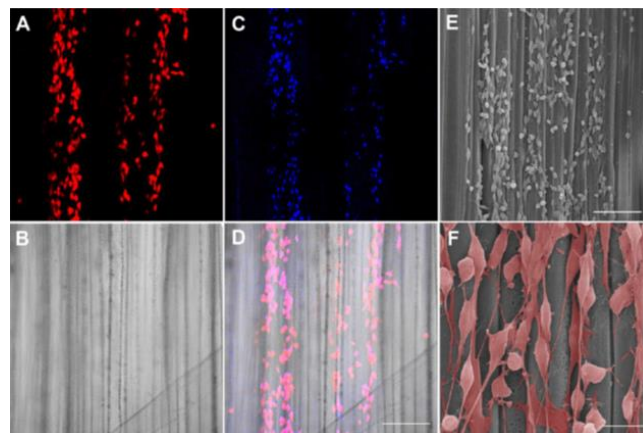
- Tissue engineering
- Polymeric medical device design and fabrication
- Electrospinning

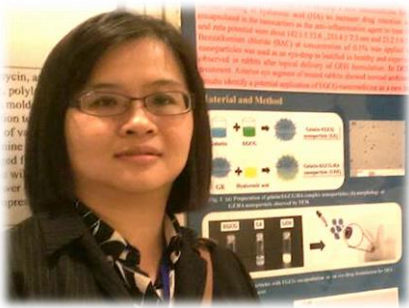
Spin-Out
Company

- Electrospinning of novel microtube array membranes (MTAMs)
- Drug screening platform and can achieve fast translation for R&D of anti-cancer drugs
- MTAM platform for encapsulated cell technology
- Microtube application in regenerative medicine and biological separation



TM3030_0058 2014/02/19 N x300 300 μm



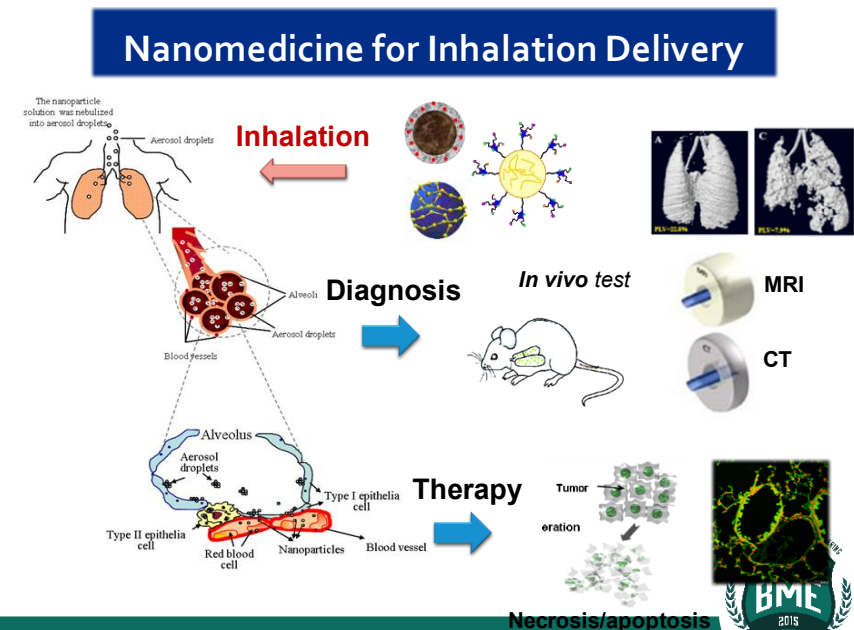
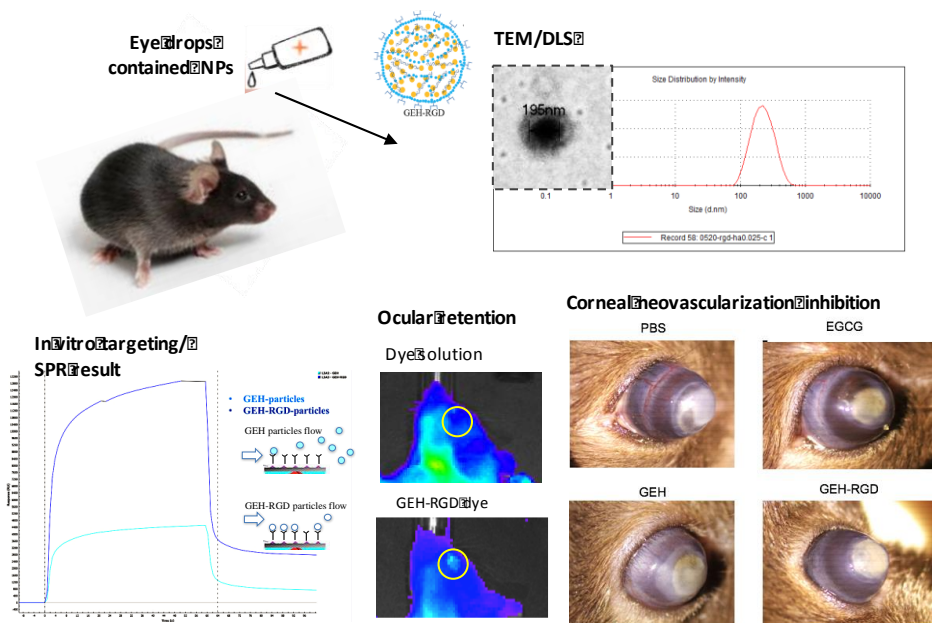


Research Focus

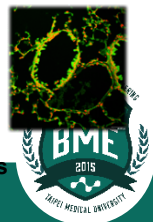
Ching-Li Tseng, PhD

- Biomaterials
- Nanomedicine
- Nanoparticle
- Targeted therapy

- Development of nanomaterials for medical applications.
- Innovative and multifunctional nanocomposites for efficient drug or gene delivery system
- Nanocarriers to treat ocular diseases
- Nanoparticles delivery to target tissue and organ (lung-inhalation)



Necrosis/apoptosis





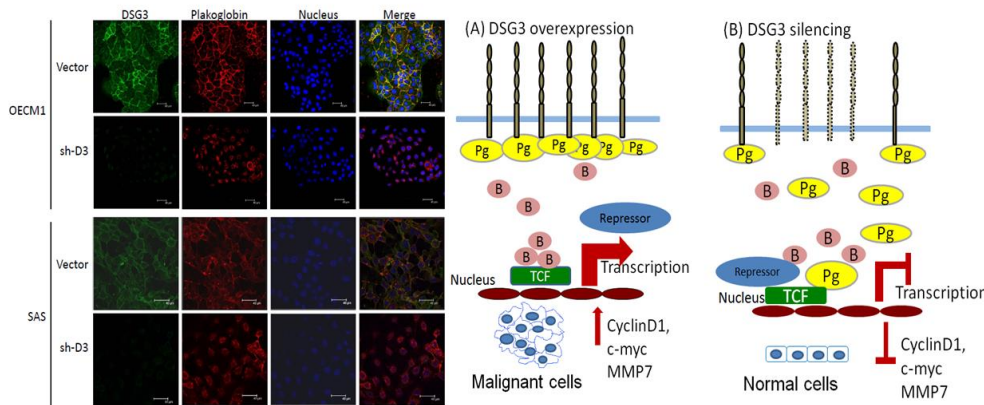
Research Focus

Yin-Ju Chen, PhD

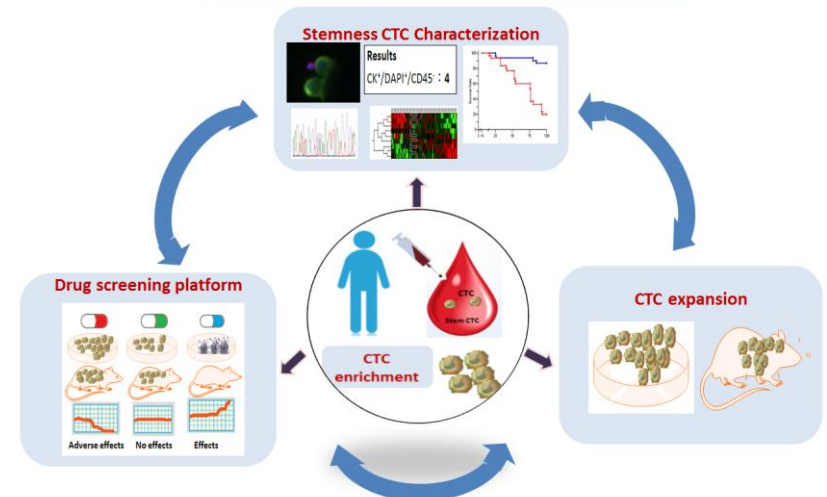
- Tumor biology
- Therapeutic drugs and biomarkers
- Personalized medicine

- Systemic approach to identify cancer associated genes.
- Expansion and characterization of circulating tumor cells (CTCs) for personalized cancer drug screening platform
- Integrated cancer gene signature and drug database to find potential drugs to improve therapeutic efficacy.

Identification of target genes



Personalized drug screening platform



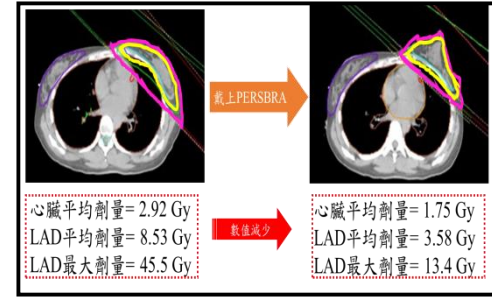
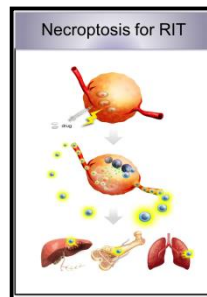
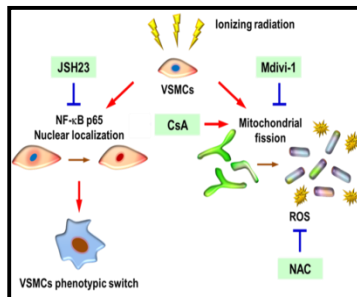
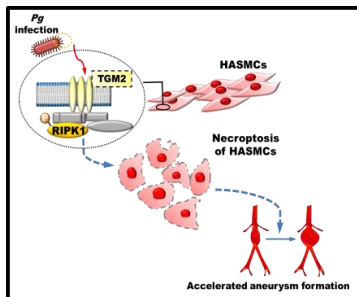


Research Focus

Long-Sheng Lu, MD, PhD

- Radiation oncology
- Tumor microenvironment
- Mitochondrial biology

- Ionization radiation alters tumor-host interaction via non-autonomous mechanisms
- Use of cell microscopy, image cytometry, molecular biology, explant culture, and murine models to explore the non-canonical effects of ionizing radiation
- Strategies for normal organ protection and anticancer immunity in the settings of metastatic breast and colorectal cancers.
- Non-destructive functional assays with circulating tumor cells for cancer theranostics
- Novel applications of 3D printing in clinical radiation oncology



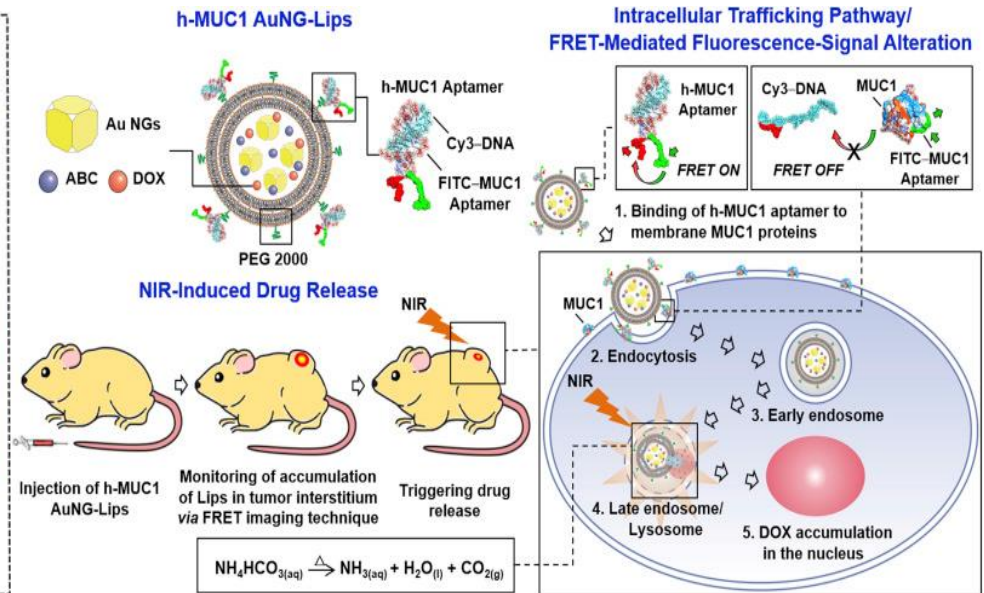
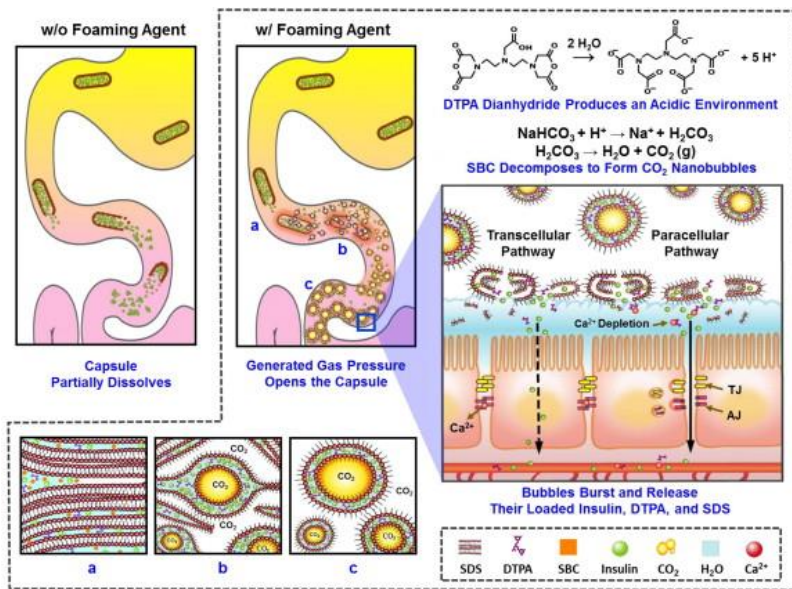


Research Focus

Er-Yuan Chuang, PhD

- Nano-Biomaterials
- Oral route drug delivery
- Cancer drug delivery

- Functional carrier systems for drug delivery in cancer and diseases, and for non-invasive photothermal anticancer therapy
- Nano-biomaterial for tissue engineering



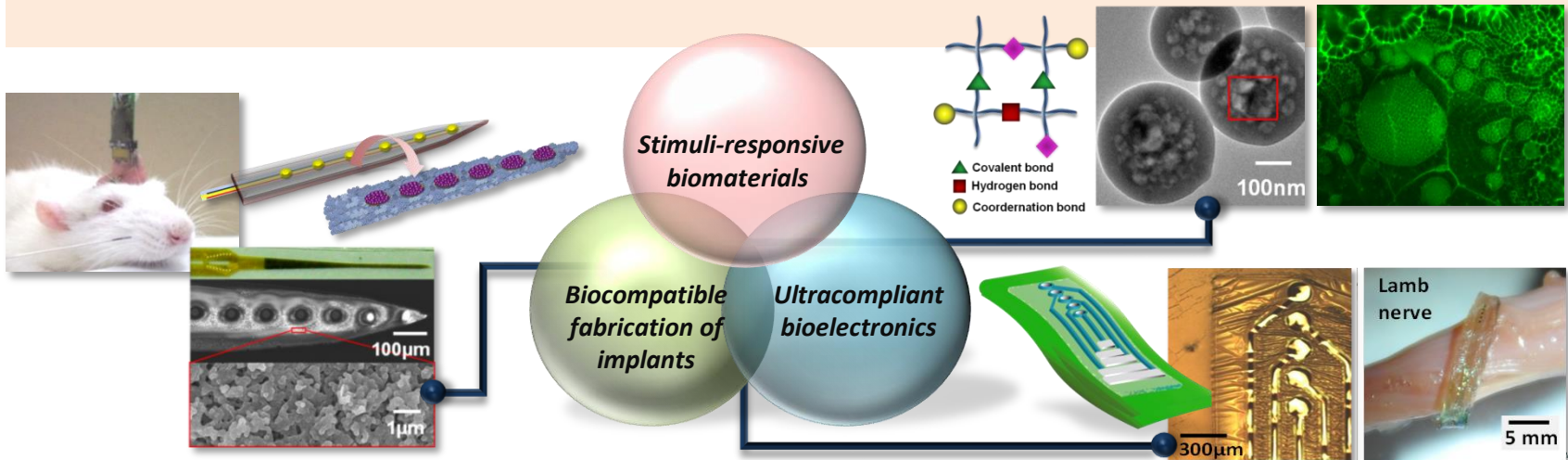


Research Focus

Wei-Chen Huang, PhD

- Biomedical materials
- Human-machine interface
- Implant/bioelectronics

- Fusion of human-machine interface
- Developing smart ultra-compliant biomedical implants
- Materials synthesis for functionalizing brain-machine interfaces
- Synthesize stimuli-responsive polymer-based materials applied for ultra-compliant implants/bioelectronics
- Fabrication process design specific for developing devices composed of hydrated materials and electronic microstructures





Research Focus

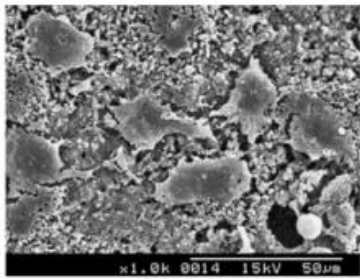
Jen-Chang Yang, PhD

- Polymer engineering
- Electrospinning
- Biomimetic materials

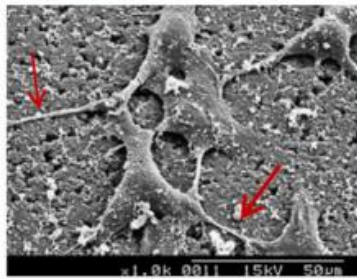
- Accelerate endodontic treatment and develop amorphous metal salts for facilitating the handling property of Portland cements and dental applications
- Novel Root Canal Filling Materials

Spin-Off
Company

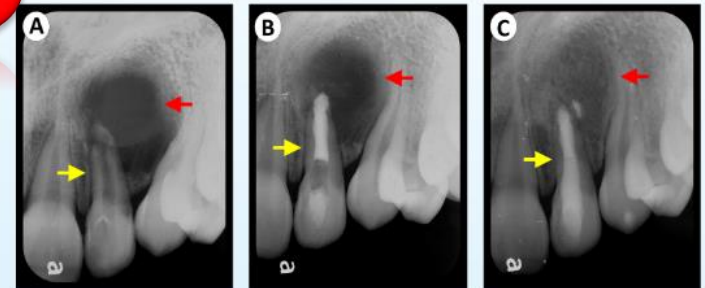
ProRoot® MTA



SavDen® MTA

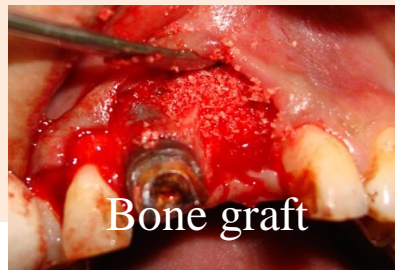


CLINICAL SUCCESS



Perfect healing of root-end and bone in 9 months by SavDen® MTA

Calcium Phosphate
Bioceramics



Bone graft



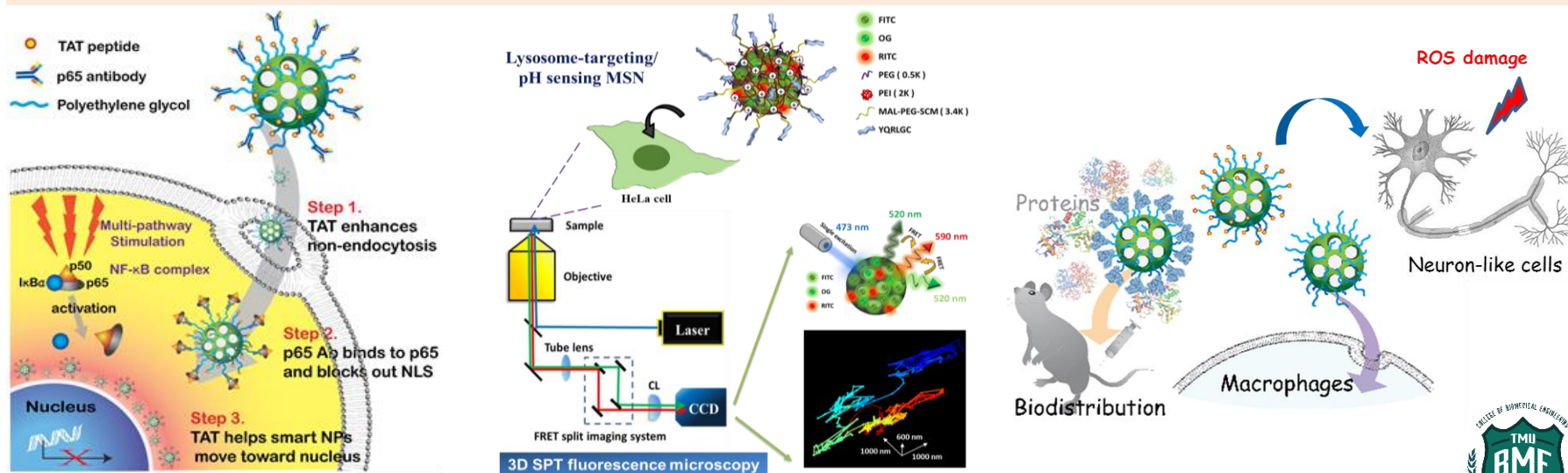


Research Focus

Yi-Ping Chen, PhD

- Nanoscale therapeutics and diagnostics
- Nanotoxicity

- Developed biocompatible and therapeutic MSM applied in medicine
- Investigated enzyme replacement therapy (ERT) using MSN-based protein delivery strategies
- Designed MSN as a smart antibody-targeting nanoparticle to block nuclear translocation of the activated NF- κ B p65 for cancer therapy
- Conjugated biological peptides onto MSN, which enhanced tumor targeting, intracellular uptake, and lysosomal targeting



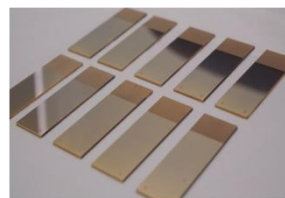


Research Focus

Tsung-Rong Kuo, PhD

- Disease biomarker detection
- Imaging contrast agent
- Hydrogen evolution reaction
- Nanomaterials syntheses

- Development of rapid, reliable and sensitive platform to detect disease biomarkers based on surface-enhanced Raman spectroscopy.
- Biocompatible nanomaterials for molecular imaging contrast agents
- Earth-abundant materials for hydrogen evolution reaction



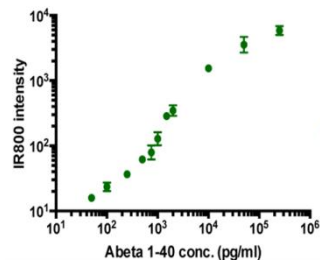
1. Ready-to-Go Chip



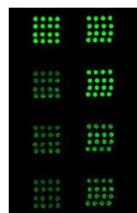
2. Injecting Samples



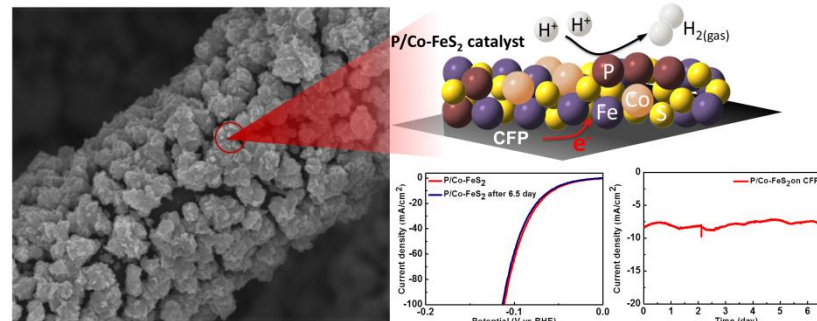
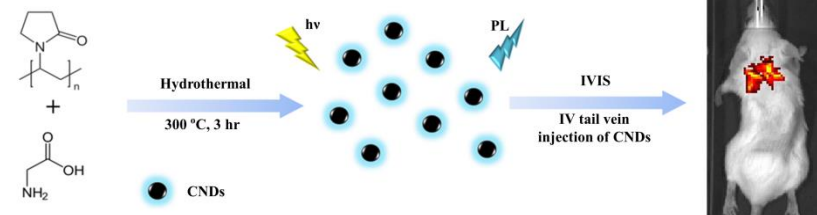
3. Scanning (Fluorescence)



5. Biomarker Concentrations



4. Collecting Data



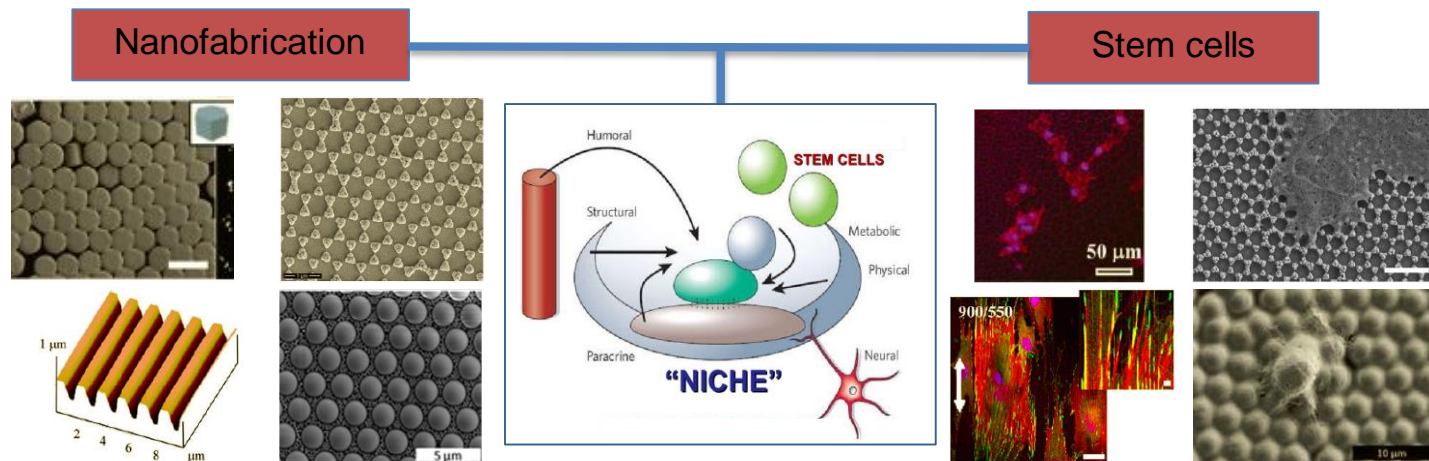


Research Focus

Peng-Yuan Wang, PhD

- Nanofabrication
- Colloidal lithography
- Biointerfaces
- Stem cells
- iPSCs

- Modulate stem cell behaviour using surface nanotopography and chemistry
- Fabricate new surface nanopatterns using nanofabrication technologies
- Mimic stem cell niche to study complex stem cell microenvironment
- Develop new cell culture tools and scaffolds for regenerative medicine
- Explore cell signalling using molecular biology approaches



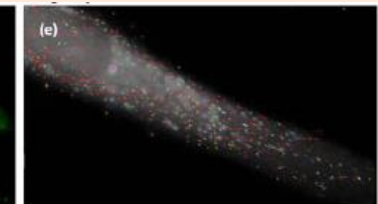
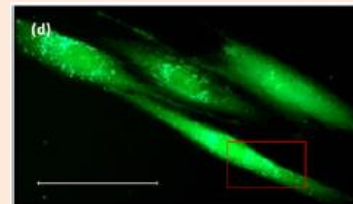
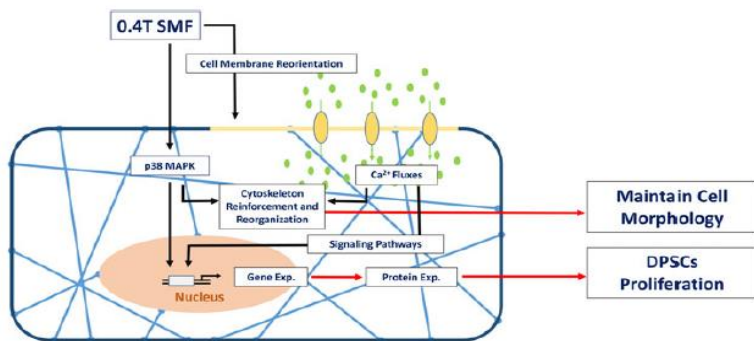
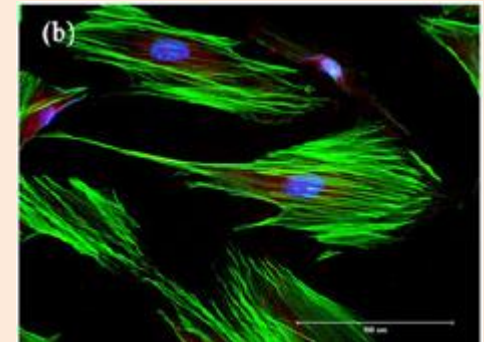
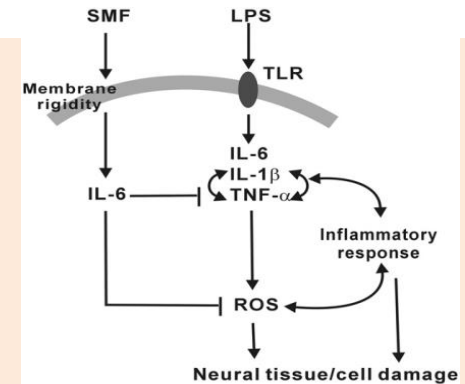


Research Focus

Haw-Ming Huang, PhD

- Biomechanics
- Biophysics
- Medical electronics

1. A novel radiopaque, biodegradable, and 3D printable bone screw was fabricated for the first time.
2. SMF pretreatment before LPS challenge improved body temperature controlled capability and reduced tissue damage.
3. SMF coupled with a DMSO-free freezing medium increased the survival rates of frozen-thawed dental pulp stem cells.
4. SMF coupled with the slow cooling procedure increased survival rates of frozen-thawed erythrocytes without any negative effects
5. The proliferation of DPSCs enhanced by the SMF is considered as a model of the p38 MAPK signalling pathway and intracellular calcium ion activation.
6. The molecular mechanisms occurring after the implantation of human dentin powder is related to the IL1RN-CCL2 mediated signaling pathway.
7. Damping factor analysis can be used as a supplementary tool to evaluate the healing process of osseointegration.



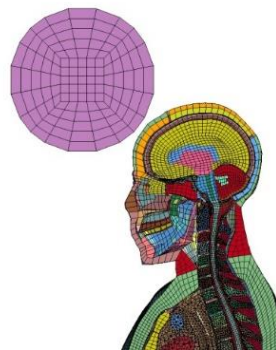
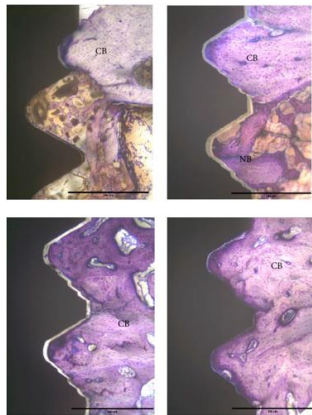


Research Focus

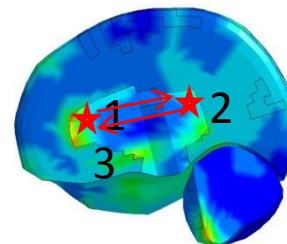
- Biomechanics
- Ergonomics
- Biomimetic design

Hsiang-Ho Chen, PhD

- Finite element to investigate brain responses to soccer-heading impacts
- Biomechanical comparison of axial load between cannulated locking screws and noncannulated cortical locking screws
- Bone remodeling characteristics of a short-stemmed total hip replacement
- Ultrastructure of anterior cruciate ligament graft by atomic force microscopy
- monitor the changes of viscoelastic properties at bone-implant interface via resonance frequency analysis

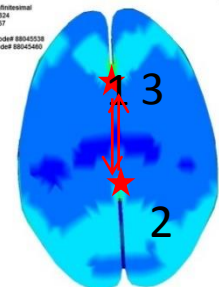


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Contours of 1st Principal Strain-Infinite
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max=0.0293225, at elem# 88020057
max displacement factor=0
section min = 0.00101465, near node# 88045371
section max = 0.0248898, near node# 88045448



Fringe Levels
2.932e-02
2.832e-02
2.639e-02
2.346e-02
2.053e-02
1.759e-02
1.466e-02
1.173e-02
8.797e-03
5.864e-03
2.932e-03
0.000e+00

THUMS AMS0 Pedestrian Model Academic Version 4 20111003
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Fringe Levels
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Research Focus

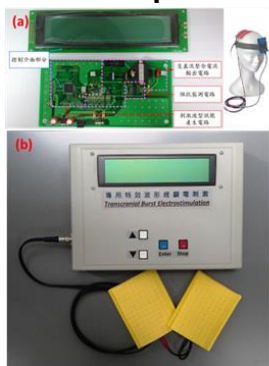
Chih-Wei Peng, PhD

- Assistive technology
- Rehabilitation engineering
- Neural engineering

My research employs engineering approaches to understand and develop neuromodulation approaches to restore function to neurological patients.

Current projects include:

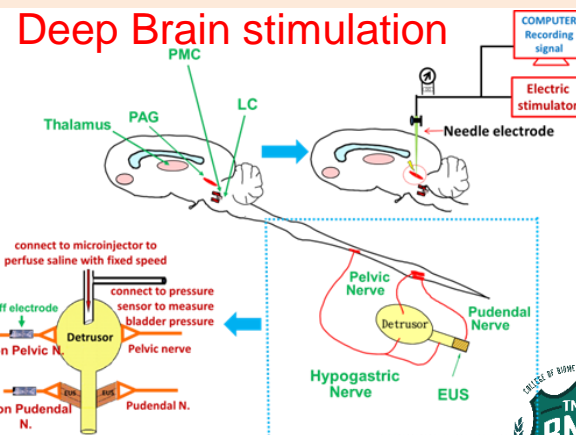
- Novel transcranial direct current stimulator (t-DCS) system for neural rehabilitation.
- Advanced neuromodulation approaches to treat bladder functions
- Intelligent drop foot stimulator with real-time adaptive feedback control to enhance the walking ability in stroke.
- Understanding the mechanisms of and developing advanced approaches of deep brain stimulation to treat bladder disorders.



t-DCS system



Drop foot stimulator system



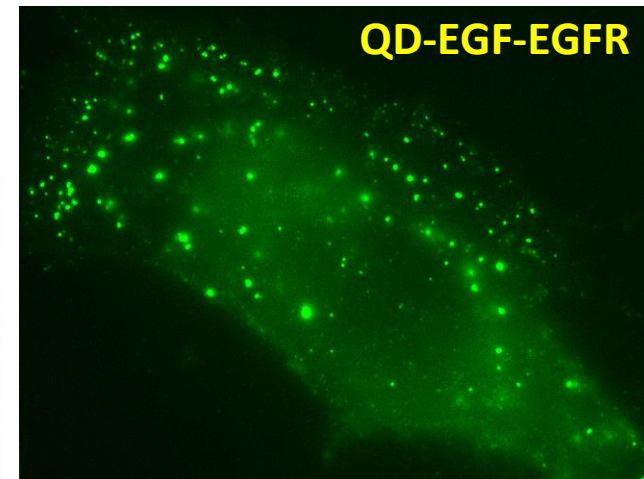
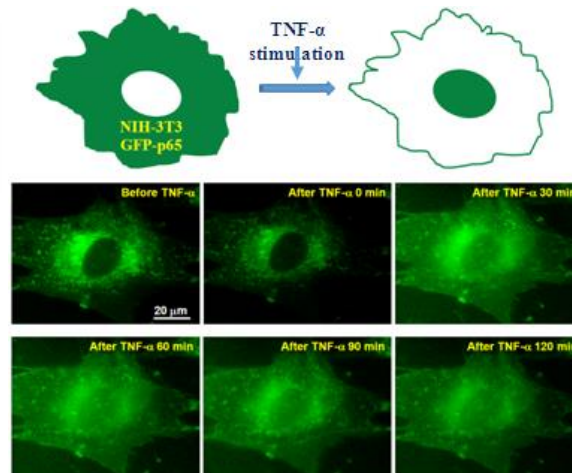
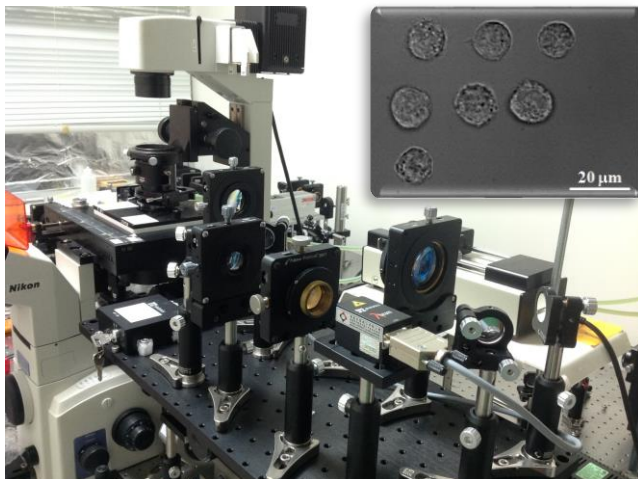


Research Focus

Tzu-Sen Yang, PhD

- Biophotonics
- Single-cell biomechanics
- Bionanotechnology

- Single-cell NF- κ B dynamics for modeling TNF- α signaling circuits
- High spatial-resolution single cell array and 3D cell bioprinting
- Mechanical properties and biocompatibility of Ti-6Al-4V produced by selective laser melting
- Action mechanism of nanoparticle-mediated photothermal therapy on intracellular killing of *Staphylococcus aureus*



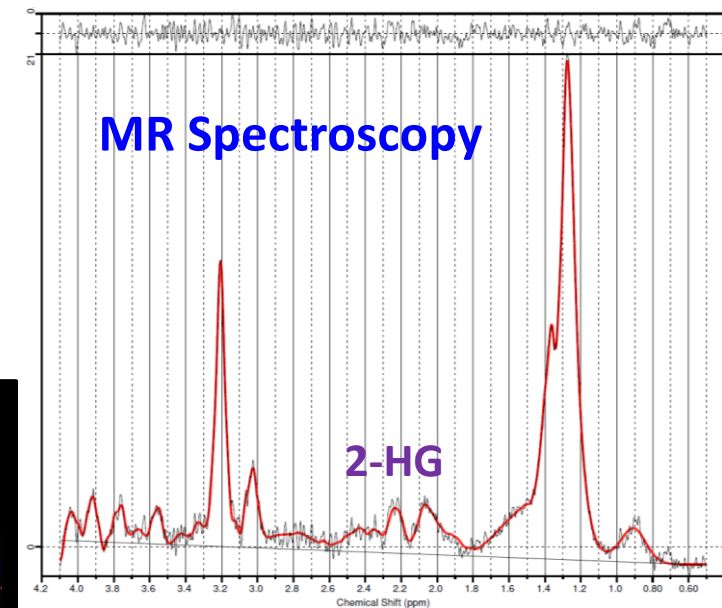
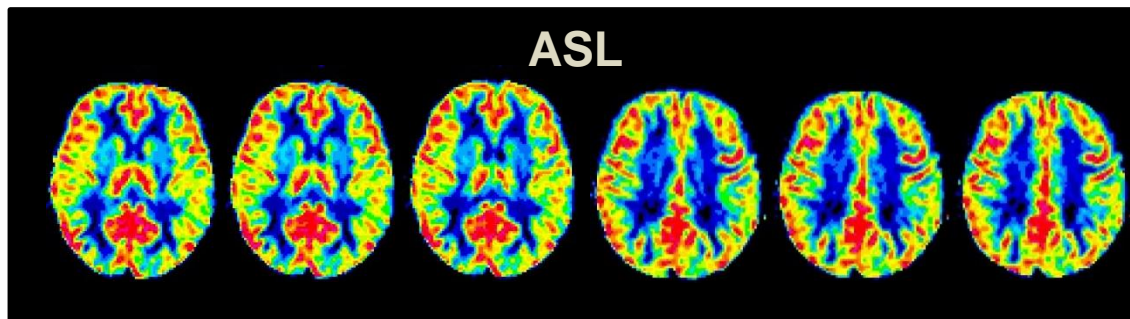
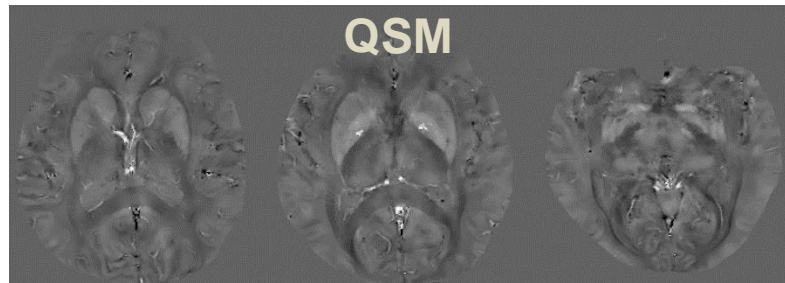


Research Focus

- Medical Imaging
- Advanced MR imaging and spectroscopic techniques

Hua-Shan Liu, PhD

- MR perfusion-weighted imaging using arterial spin labeled (ASL) MRI
- MR quantitative-susceptibility mapping (QSM) technique
- MR spectroscopic technique in detection of 2-hydroxyglutarate (2-HG) in brain tumors
- MR functional and structural connectivity data analyses





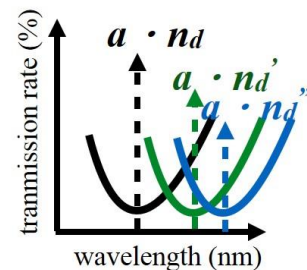
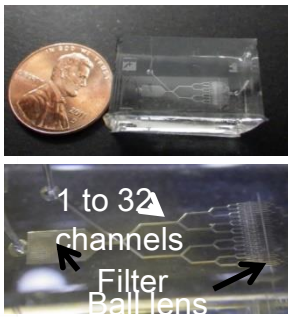
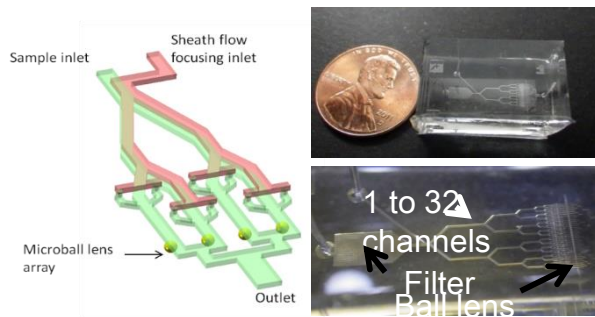
Research Focus

Yu-Jui Fan, PhD

- MEMS
- Optofluidics
- Biosensors
- Cell mechanics

Developing microfluidic devices using unique physics, microenvironment control, and the potential for automation associated with miniaturized system for applications in basic biology, medical diagnostics, and cell/tissue engineering.

- High throughput, parallel, and multi-color microflow cytometer.
- Concentrator integrated slit-based Surface Plasmon Resonance sensor
- Vessel mimicking microfluidic system



Resonance wavelength : $\lambda \sim a \cdot n$

