



# CHIPS

CENTER FOR HETEROGENEOUS INTEGRATION  
AND PERFORMANCE SCALING

## *Trans-Disciplinary Hybrid Electronics in the UCLA CHIPS Ecosystem*

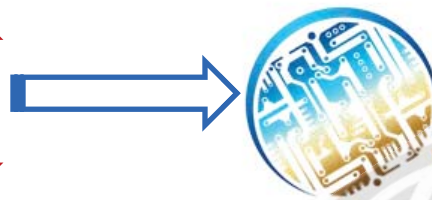
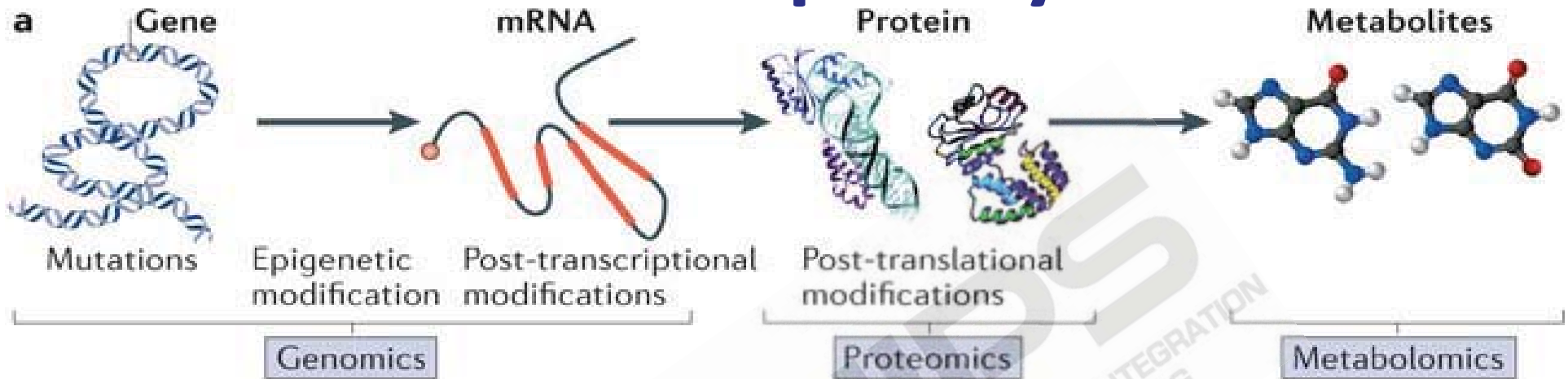
*Tzung Hsiai*  
*Medicine and Engineering, UCLA*

**UCLA** ENGINEERING  
Henry Samueli School of  
Engineering and Applied Science  
*Birthplace of the Internet*



**CHIPS**  
CENTER FOR HETEROGENEOUS INTEGRATION  
AND PERFORMANCE SCALING

# UCLA Trans-Disciplinary Research

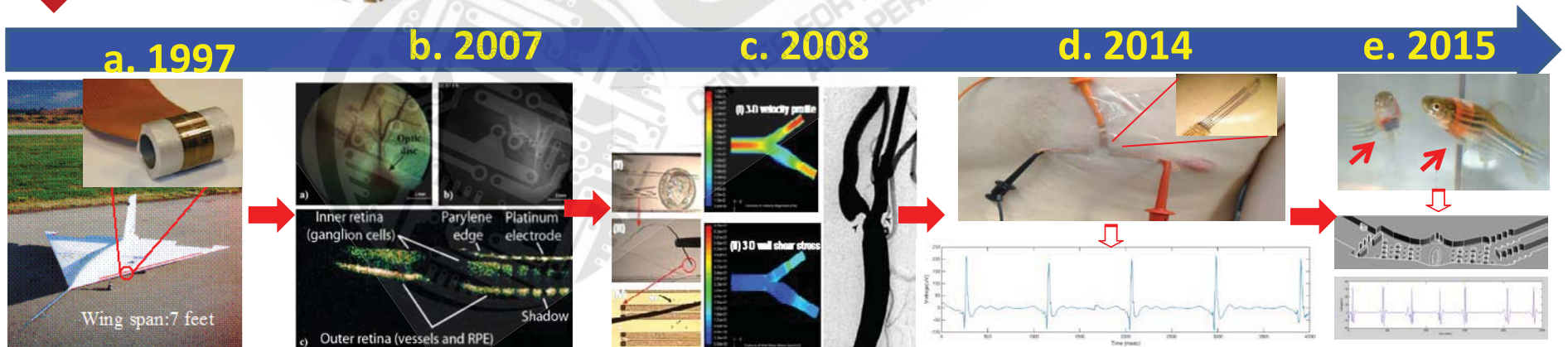


**CHIPS**  
CENTER FOR HETEROGENEOUS INTEGRATION  
AND PERFORMANCE SCALING

UCLA Health



David Geffen  
School of Medicine



**UCLA ENGINEERING**  
Henry Samueli School of  
Engineering and Applied Science  
*Birthplace of the Internet*



**CHIPS**  
CENTER FOR HETEROGENEOUS INTEGRATION  
AND PERFORMANCE SCALING



# Transformation of Patient-Centered Care



Inconspicuous, invisible...  
Compassionate,  
predictive,  
preventive...

Cardiac index...  
Wage pressure...  
 $V_E/VCO_2$ ...  
QTc intervals...  
SVT vs. VT...  
Metabolic states....  
Sympathetic vs.  
parasympathetic  
tone...  
Body weight...

Our Vision



L/min  
mmHg  
 $V_E$  rates/L/min  
sec/cycle  
beats/min  
 $ROS/O_2^-$   
Beats/min  
 $^{\circ}C$   
 $\Omega$   
 $Kg/m^2$

**UCLA** ENGINEERING  
Henry Samueli School of  
Engineering and Applied Science  
*Birthplace of the Internet*



**CHIPS**  
CENTER FOR HETEROGENEOUS INTEGRATION  
AND PERFORMANCE SCALING



David Geffen  
School of Medicine

<http://people.healthsciences.ucla.edu/institution/groups-new>

# Integration with UCLA Health and School of Medicine



## School of Medicine

## Clinical Departments

- Basic Science

- Biological Chemistry
- Biomathematics
- Human Genetics
- Microbiology, immunology & Molecular Genetics
- Molecular & Medical Pharmacology
- Neurobiology
- Physiology

- Labs, Institutes and Centers

- Atherosclerosis Research Units
- Cardiovascular Research Lab
- Clinical Trials
- Emergency Medicine
- Human Gene Therapy Center
- Immunity, Inflammation, Infection, & Transplant (I3T) Research Initiative
- Integrated Substance Abuse Programs
- Ronald S. Hirschberg Translational Pancreatic Cancer Research Laboratory
- UCLA Donated Body Program

- Anesthesiology

- Department of Medicine

- Cardiology, Clinical Nutrition, Dermatology, Digestive Diseases, Endocrinology, General Internal Medicine and Health Sciences Research, Geriatrics, Hematology-Oncology, Nephrology, Pulmonary, Critical Care, Rheumatology, VA Greater LA, VA Sepulveda
- Centers-CARE (AIDS) Center, Center for East-West Medicine, Clinical Immunology and Allergy, Clinical Epidemiology and Preventive Medicine

- Head and Neck Surgery

- Neurology

- Obstetrics and Gynecology

- Pathology and Laboratory Medicine

- Pediatrics

- Psychiatry and Biobehavioral Sciences

- Radiation Oncology

- Surgery

- Urology

**UCLA** ENGINEERING  
Henry Samueli School of  
Engineering and Applied Science  
*Birthplace of the Internet*



**CHIPS**  
CENTER FOR HETEROGENEOUS INTEGRATION  
AND PERFORMANCE SCALING



# UCLA Health and School of Medicine

**UCLA** Health



## UCLA Affiliated Teaching Hospitals

- Ronald Reagan Medical Center
- Greater Los Angeles VA Healthcare System
- Olive View Medical Center
- Harbor-UCLA Medical Center
- Santa Monica-UCLA Medical Center



**UCLA** ENGINEERING  
Henry Samueli School of  
Engineering and Applied Science  
*Birthplace of the Internet*



**CHIPS**  
CENTER FOR HETEROGENEOUS INTEGRATION  
AND PERFORMANCE SCALING



## Clinical and Translational Science Institute

[http://people.ctsi.ucla.edu/institution/personnel?personnel\\_id=8744](http://people.ctsi.ucla.edu/institution/personnel?personnel_id=8744)

- **Supports Training in Multidisciplinary Research and Integrates Community Priorities**
  - New investigator program
  - Junior faculty program
  - Pre-doctoral program
  - High school & Undergrad programs
- **Training and Resources for Career Development to Conduct Innovative and Translational Research**
  - Training program in translational science
  - Educational videos, tools & workshops
  - Course catalog
  - Commercialization & entrepreneurship



# UCLA



- **Heart Transplant Program**

- Since 1984, 2,000 patients have undergone this life-saving procedure at UCLA. The scientific advances and clinical trials that have come from UCLA have advanced knowledge in the field and improved the clinical results for all patients.

- **Cardiac Arrhythmia Center**

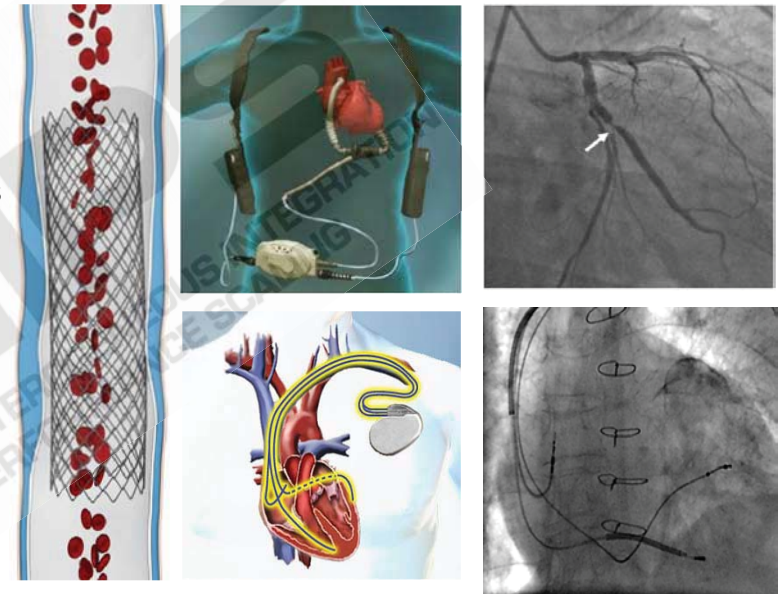
- The Center is dedicated to utilizing state-of-the-art medical technologies with compassionate care to address the needs of arrhythmia patients.

- **Adult Congenital Heart Disease Program**

- The Center is a national and international tertiary care resource that provides services to the growing number of patients with congenital heart disease who reach adulthood.

- **Ahmanson UCLA Cardiomyopathy Center  
(Congestive Heart Failure Program)**

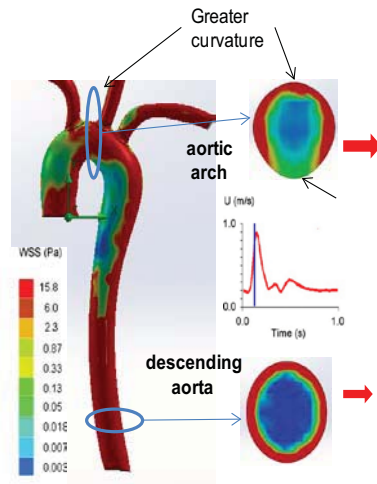
- **Interventional and Structural Heart Disease**
- **Cardiac Surgery**



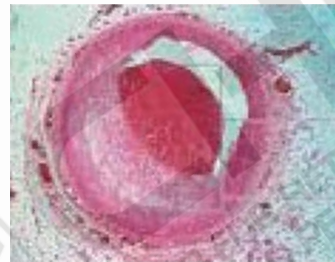
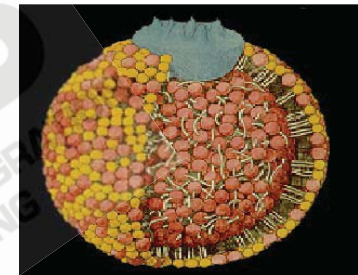
**UCLA** ENGINEERING  
Henry Samueli School of  
Engineering and Applied Science  
*Birthplace of the Internet*



# A Trans-Disciplinary Approach to Assess Unstable Plaque



**CHIPS**  
CENTER FOR HETEROGENEOUS INTEGRATION  
AND PERFORMANCE SCALING



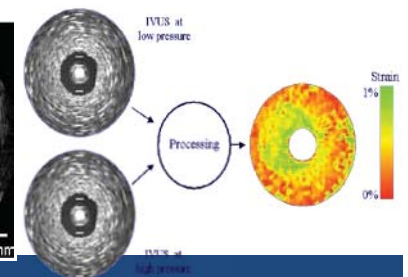
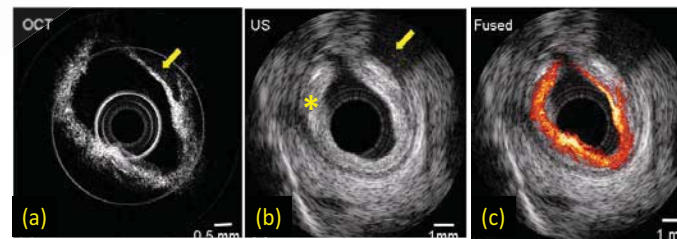
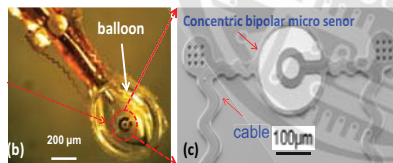
**UCLA** ENGINEERING



**UCLA** Health



David Geffen  
School of Medicine



**UCLA** ENGINEERING  
Henry Samueli School of  
Engineering and Applied Science  
*Birthplace of the Internet*



**CHIPS**  
CENTER FOR HETEROGENEOUS INTEGRATION  
AND PERFORMANCE SCALING