# 1st annual

CENTRAL VALLEY

# SYMPOSIUM

ON BASIC AND CLINICAL SCIENCES

*Hosted by*

## California Health Sciences University
## College of Pharmacy

120 North Clovis Avenue, Clovis, CA 93612

**Thursday, August 7, 2014**

**7:00 a.m. to 6:10 p.m.**

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# Welcome to the 1st annual

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**7:00 a.m. to 6:10 p.m.**

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**Registration is free and includes breakfast, lunch and refreshments.**

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**featuring:**
**3 Keynote Speakers | 4 Symposium Sessions**
**presented by 20 highly acclaimed health care professionals**

**learn about advances in:**
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**Licensed Pharmacists Can Earn up to Eight (8) Continuing Education Credit Hours***

Students will also present research topics during a poster session.
Abstracts and Speaker biographies can be viewed inside and at our website:
**www.centralvalleysymposium.org**

CHSU CALIFORNIA HEALTH SCIENCES UNIVERSITY

## CVSBCS Objectives

- ◊ Place the Valley in the forefront of health education and research
- ◊ Offer scholarly and professional development opportunities
- ◊ Promote interdisciplinary collaboration
- ◊ Share current advancements in basic and clinical sciences
- ◊ Provide health care professionals with networking opportunities
- ◊ Garner and facilitates student learning

## *Licensed Pharmacists Can Earn up to Eight (8) Continuing Education Credit Hours

California Health Sciences University is accredited by the California Accreditation for Pharmacy Education as a provider of California continuing pharmacy education. CAPE Provider #215, [1] contact hour (0.1CEU) for each (1) contact hour attended at no cost for pharmacists that attend. To receive credit, participants must attend the entire event and complete the activity evaluation. Statements of credit will be sent electronically within 4-6 weeks or given at the conclusion of the activity.  Grant D. Lackey, PharmD, CHSU CAPE CE Administrator.

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CHSU CALIFORNIA HEALTH SCIENCES UNIVERSITY

CENTRAL VALLEY
SYMPOSIUM
ON BASIC AND CLINICAL SCIENCES

# Program Schedule

| | |
|---|---|
| 7:00 a.m. – 8:00 a.m. | Registration – Lobby<br>Poster Mounting – Classroom 2<br>Breakfast – Classroom 2<br>Tour – Research Laboratory |
| **Morning Welcome** | **Classroom 1** |
| 7:00 a.m. – 8:00 a.m. | Inaugural Address – David Hawkins, PharmD, Dean of Pharmacy, California Health Sciences University<br><br>Chief Guest Address – Flo T. Dunn, President, California Health Sciences University<br><br>Special Invited Guest Address – Lynne Ashbeck, MA, MS, RD, Regional Vice President, Hospital Council of Northern and Central California; Mayor, City of Clovis |
| **Keynote Speaker I** | **Classroom 1** |
| 8:15 a.m. – 8:45 a.m. | Keynote Speaker I – Michael W. Peterson, MD, Valley Medical Foundation Professor of Medicine and Chief of Medicine, UCSF Fresno Medical Education Program, Vice Chair of Medicine, UCSF<br>*Topic: Outcomes and Lessons Learned from a Multidisciplinary Lung Nodule Program in an Endemic Area for Coccidioidomycosis* |
| **Session 1 – Advances in Pharmaceutical Sciences** | **Classroom 1** |
| 8:45 a.m. – 10:25 a.m. | Session 1 Chair: Dr. Chandra Kolli |
| 8:45 a.m. – 9:05 a.m. | Ahmmed Ally, MD, PhD, Professor of Pharmacology, CHSU College of Pharmacy<br>*Topic: Drug Delivery by Microdialysis* |
| 9:05 a.m. – 9:25 a.m. | Qiao-Hong Chen, PhD, Assistant Professor of Organic Chemistry, California State University, Fresno<br>*Topic: Anti-cancer Agents Inspired by Dietary Curcumin* |
| 9:25 a.m. – 9:45 a.m. | M. Delwar Hussain, MPharm, PhD, Professor of Pharmaceutics, CHSU College of Pharmacy<br>*Topic: Cancer Nanomedicine: Novel Nanoparticles for Advanced Cancer Therapy* |
| 9:45 a.m. – 10:05 a.m. | Santanu Maitra, PhD, Assistant Professor of Organic Chemistry, California State University, Fresno<br>*Topic: Organic Molecules in Coronary Artery & Alzheimer's Disease* |
| 10:05 a.m. – 10:25 a.m. | Chandra Kolli, PhD, Associate Professor of Pharmaceutics, CHSU College of Pharmacy<br>*Topic: Microneedle Mediated Transdermal Delivery of Drugs* |

# Program Schedule
(continued)

| Refreshment Break<br>10:25 a.m. – 10:35 a.m. | Classroom 2 |
|---|---|
| **Session 2 – Advances in Biomedical Sciences** | **Classroom 1** |
| 10:35 a.m. – 11:55 p.m. | Session 2 Chair: Dr. Kalyan Munshi |
| 10:35 a.m. – 10:55 a.m. | Cory L. Brooks, PhD, Assistant Professor of Biochemistry, California State University, Fresno<br>*Topic: Exploiting the Camel Immune System for the Prevention of Listeriosis* |
| 10:55 a.m. – 11:15 a.m. | John Martin, PhD, Professor of Pharmacology, CHSU College of Pharmacy<br>*Topic: Studies on the Posterior Hypothalamic Nucleus: Cardiovascular System Effects* |
| 11:15 a.m. – 11:35 a.m. | Sudhakar Yakkanti, MSc, MPhil, PhD, Associate Director, Center for Cancer and Metabolism, Cell Signaling Laboratory, Bioscience Division, Stanford Research Institute, International<br>*Topic: Regulation of Tumor Metastasis by Endogenous Metabolite* |
| 11:35 a.m. – 11:55 a.m. | Kalyan Munshi, MSc, PhD, Assistant Professor of Medicinal Chemistry, CHSU College of Pharmacy<br>*Topic: Polymeric Antiviral Drug Design: Novel Adamantanoids-based Polymeric Therapeutics* |
| **Lunch and Poster Session** | **Classroom 2** |
| 12:00 p.m. – 1:30 p.m. | Lunch and Poster Viewing |
| 12:45 p.m. – 1:15 p.m. | Poster presenters available for Q & A and judging |
| 1:15 p.m. – 1:25 p.m. | Poster awards presented |
| **Keynote Speaker II** | **Classroom 1** |
| 1:30 p.m. – 2:00 p.m. | Keynote Speaker II - Lakshmaiah Sreerama, PhD, Senior Fulbright Scholar, Professor, Department of Chemistry and Earth Sciences, Qatar University, Qatar and St. Cloud State University, St. Cloud, MN<br>*Topic: Ottelione A: A Natural Product with Potent Anticancer Activity, Mode of Action and Molecular Basis for Resistance* |

# Program Schedule
(continued)

| Keynote Speaker III | Classroom 1 |
|---|---|
| 2:00 p.m. – 2:30 p.m. | Keynote Speaker III – Lynne Ashbeck, MA, MS, RD, Regional Vice President, Hospital Council of Northern and Central California; Mayor, City of Clovis<br>*Topic: Population Health: The Only Thing Certain Is That It Will Take All of Us to Achieve!* |
| **Session 3 – Advances in Population Health** | **Classroom 1** |
| 2:30 p.m. – 4:10 p.m. | Session 3 Chair: Dr. Mohammad Rahman |
| 2:30 p.m. – 2:50 p.m. | Robert Clegg, PhD, MPH, MCHES, Associate Professor of Administrative Sciences, CHSU College of Pharmacy<br>*Topic: Does evidence-based practice influence patient safety? A retrospective analysis of SB 1301 in Central California* |
| 2:50 p.m. – 3:10 p.m. | Jaymin Kwon, PhD, REHS, Assistant Professor of Public Health, California State University, Fresno<br>*Topic: Comparison of Personal Exposure of Bicyclists to PM2.5, Black Carbon (BC), and Ultrafine Particles in Indoor and Outdoor Air in Fresno, California* |
| 3:10 p.m. – 3:30 p.m. | Jared Rutledge, PhD, Epidemiologist – Communicable Diseases, Department of Public Health, Fresno County, CA<br>*Topic: Advances in Public Health: Innovations in the local health jurisdiction* |
| 3:30 p.m. – 3:50 p.m. | Lauren Lessard, MPH, Research Fellow, Central Valley Health Policy Institute, University of California, Los Angeles<br>*Topic: Place and Health: Preventable Hospitalizations for Children in the San Joaquin Valley of California* |
| 3:50 p.m. – 4:10 p.m. | Mohammad Rahman, PhD, Associate Professor of Public Health, California State University, Fresno<br>*Topic: Can More Use of Supporting Primary Care Health Practitioners Increase Efficiency of Health Clinics? Evidence from California's San Joaquin Valley* |
| **Refreshment Break 4:10 p.m. – 4:20 p.m.** | **Classroom 2 (Poster Removal)** |

# Program Schedule
(continued)

| Session 4 – Advances in Primary Care | Classroom 1 |
|---|---|
| 4:20 p.m. – 6:00 p.m. | Chair: Dr. Jennifer Hudspeth |
| 4:20 p.m. – 4:40 p.m. | Tony Eid, PharmD, REHS, Assistant Professor of Clinical Sciences, CHSU College of Pharmacy<br>*Topic: Improving Pharmacotherapy in Patients with Hyperlipidemia Focus on Novel Agents* |
| 4:40 p.m. – 5:00 p.m. | Patty Havard, PharmD, Professor of Clinical Sciences, CHSU College of Pharmacy<br>*Topic: Interdisciplinary practice and research to improve quality of care and transform clinical translational research training in HIV and pregnancy* |
| 5:00 p.m. – 5:20 p.m. | Jennifer West, PharmD, FASCP, CGP, Assistant Professor of Clinical Sciences, CHSU College of Pharmacy<br>*Topic: What pushed pharmacists to get SB 493 approved in California?* |
| 5:20 p.m. – 5:40 p.m. | Michael Freudiger, PharmD, BCPS, CGP, Clinical Pharmacist, St. Agnes Medical Center<br>*Topic: A Review of Current Pharmacy Practice Models* |
| 5:40 p.m. – 6:00 p.m. | Jennifer Hudspeth, PharmD, CGP, Assistant Professor of Clinical Sciences, CHSU College of Pharmacy<br>*Topic: The future of pharmacists: What's on the horizon after SB 493?* |
| **Closing Remarks** | **Classroom 1** |
| 6:00 p.m. – 6:10 p.m. | M. Delwar Hussain, MPharm, PhD, Professor of Pharmaceutics, CHSU College of Pharmacy |

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## Inaugural Address

**David Hawkins, PharmD**

*Provost and Dean of Pharmacy,*
*California Health Sciences University*

Email: dhawkins@chsu.org

California Health Sciences University College of Pharmacy offers an innovative doctor of pharmacy curriculum and a broad-based research agenda in the pharmaceutical, biomedical, and clinical sciences. The curriculum is built on a team-based learning frame that is designed to engage students in active learning, critical thinking, and problem-solving. The research program focuses on developing and evaluating novel drug formulations, neuro and cardiovascular pharmacology, clinical translational experiments, health care outcomes, and clinical practice interventions. Our faculty are also setting up interprofessional educational activities with other health professional students in the area and collaborative research projects with faculty at Fresno State University.

## Chief Guest Address

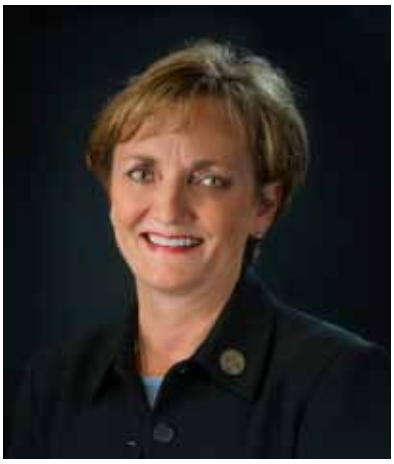
**Flo T. Dunn**

*President,*
*California Health Sciences University*

Email: fdunn@chsu.org

California Health Sciences University was founded to provide our future health care professionals with a unique opportunity — the opportunity to practice in the forefront of their fields and to make a significant impact in the state's fastest-growing region. The healthcare needs of Central California are great. Our hope is that our graduates will develop a deep-rooted connection to our community and learn to deliver evidence-based, compassionate care and enhance the quality of life for our incredibly diverse population.

## Special Invited Guest Address



**Lynne Ashbeck, MA, MS, RD**

*Regional Vice President,*
*Hospital Council of Northern and Central California*

Email: lashbeck@hospitalcouncil.net

The City of Clovis has many unique assets and distinctions that set us apart from other communities in the Valley but perhaps none so clear as our commitment to education. From our outstanding public school system to the launch of the California Health Sciences University College of Pharmacy, Clovis is committed to supporting the highest-quality education, innovation, and technology in the region. We are honored to be 'home' to the launch of this outstanding university and look forward to supporting your efforts in any way we can.

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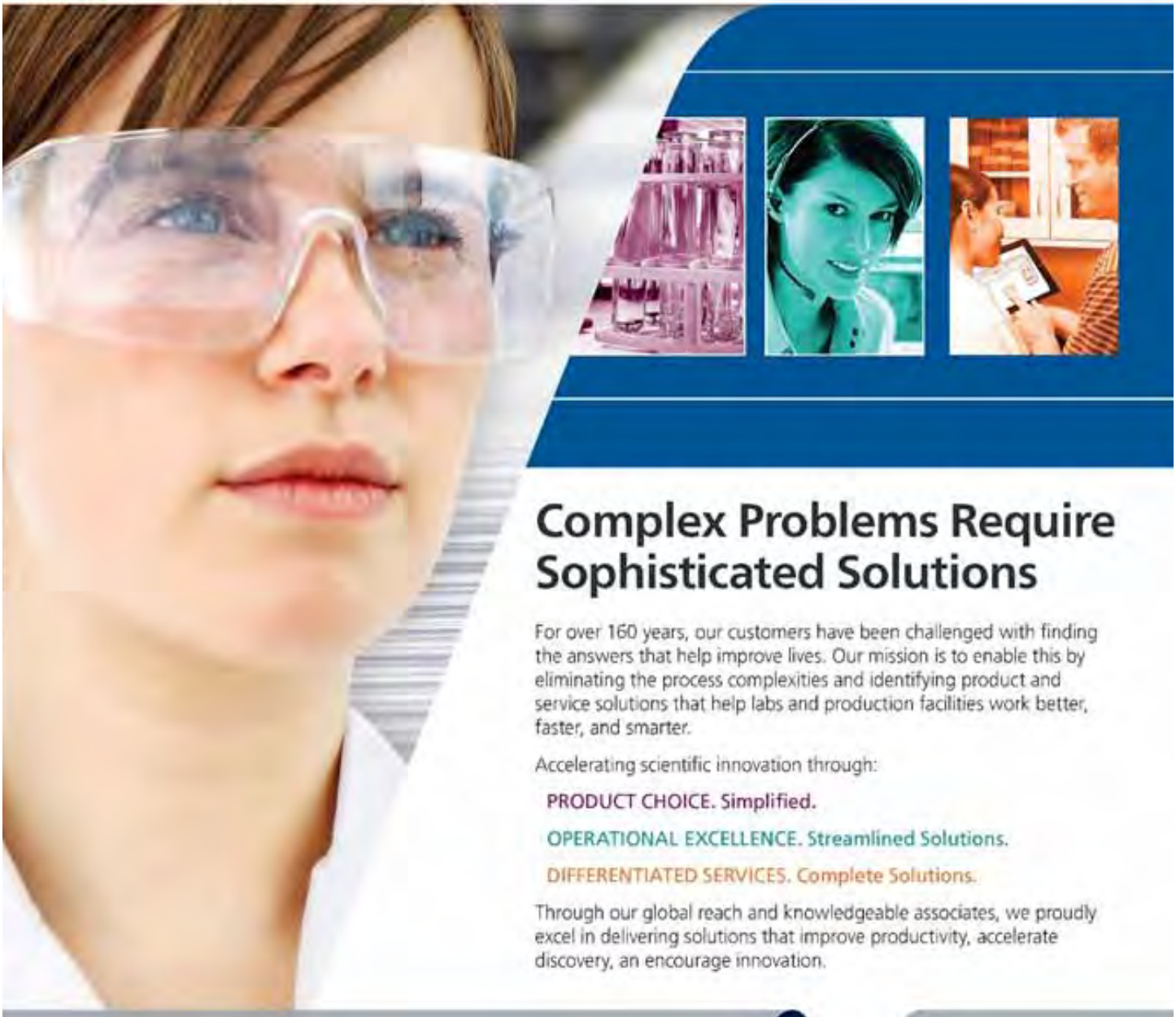

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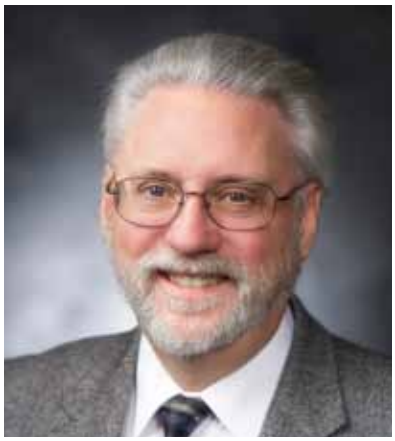
## Keynote Speaker I 8:15 a.m. – 8:45 .am.



**Michael W. Peterson, MD**

*Valley Medical Foundation Professor of Medicine and Chief of Medicine, University of California San Francisco Fresno Medical Education Program, Vice-Chair of Medicine, UCSF*

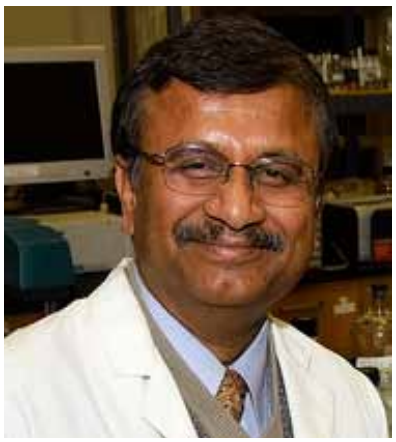
Email: mpeterson@fresno.ucsf.edu

**Title:** *Outcomes and Lessons Learned from a Multidisciplinary Lung Nodule Program in an Endemic Area for Coccidioidomycosis*

**Abstract:** Lung nodules are common findings on chest CT scans and will become more common if lung cancer screening with low dose CT scanning is adopted. Recognizing lung cancers at an early stage improves survival, and delays in referral and diagnosis result in increased mortality. Only a small fraction of lung nodules found on CT scanning are cancers, but distinguishing these malignant lesions from benign lesions is challenging for clinicians. This challenge is heightened in areas with endemic mycosis such as Coccidioidomycosis which can present in the lung as nodules that are indistinguishable from lung cancer. To help address this we established a Multidisciplinary Lung Nodule Clinic in 2009. We have seen more than 2000 patients over those five years. The clinic has reduced the time from abnormal CT scan to diagnosis from 87 days to seven days with a significant increase in early stage cancer diagnoses. In addition we have developed a database of patient information that has allowed us to measure the clinical performance of laboratory tests, pathology, radiological appearance and clinical risk factors in distinguishing Coccidioidomycosis nodules from early lung cancer. This patient population is now available for further testing of newer diagnostic modalities for both Coccidioidomycosis and lung cancer and in testing treatment paradigms for Coccidioidomycosis. In addition, by establishing a tissue bank for these patients, we will provide a resource for multiple investigators to rapidly test hypotheses for diagnosis and treatment of these two diseases.

**Biography:** Michael W. Peterson is the Valley Medical Foundation Professor of Medicine and Chief of Medicine, UCSF Fresno Medical Education Program and Vice-Chair of Medicine, UCSF. He currently practices as a pulmonologist and critical care specialist at CRMC in Fresno. He graduated from the University of Minnesota Medical School. He completed his residency and chief residency in Internal Medicine at the University of Wisconsin and his fellowship in pulmonary and critical care medicine at the University of Iowa before joining the faculty at the University of Iowa. In 2002 he moved to Fresno to assume his current role in the UCSF training program in Fresno.

## Keynote Speaker II 1:30 p.m. – 2:00 p.m.



**Lakshmaiah Sreerama, PhD**

*Professor, Dept of Chemistry and Earth Sciences, Qatar University, Qatar and St Cloud State University, St. Cloud, MN, USA*

Email: lsreerama@qu.edu.qa

**Title:** *Ottelione A: A Natural Product with Potent Anticancer Activity, Mode of Action and Molecular Basis for Resistance*

**Abstract:** Ottelione A, a natural product isolated from Ottelia alismoides, exhibits potent antitumor activity (LC50 values 25-60 nM) against a panel of breast tumor cell lines. Its antitumor activity is believed to be due to the inhibition of microtubule assembly during mitosis and thus commit cells to apoptosis. Our studies show that any structural modifications to Ottelione A will result in significant loss of antitumor activity against the panel of breast tumor cells tested. A human breast adenocarcinoma cell line (MCF 7/OttA) resistant to ottelione A, is also resistant to Ottelione A structural analogues as well as other microtubule assembly inhibitors/destabilizing agents. Molecular analysis of MCF-7/OttA cells suggests the resistance is due to multi-factorial changes in the resistant cells. Over-expression of ABCG2 (a member of multi-drug resistance family protein) and mislocalization of mitotic arrest deficiency proteins, e.g., MAD1 and MAD2, partly account for resistance to Ottelione A. Microarray analysis of parent (MCF-7/0) and Ottelione A resistant MCF-7/OttA cell lines performed using a human cancer and drug metabolism gene array shows significant differences in gene expression patterns.

**Biography:** Dr. Sreerama received his Ph.D. (Chemistry/Biochemistry) from Bangalore University, Bangalore, India and postdoctoral training at University of Minnesota. He has been a faculty member at University of Minnesota and St Cloud State University, MN USA. He also served as the toxicologist for the State of Minnesota. He is currently Professor of Biochemistry at Dept of Chemistry and Earth Sciences, College of Arts and Science, Qatar University and is on leave from Department of Chemistry, St Cloud State University, St. Cloud, MN 56301, USA.

## Keynote Speaker III 2:00 p.m. – 2:30 p.m.

**Lynne Ashbeck, MA, MS, RD**

*Regional Vice President, Hospital Council of Northern and Central California*

Email: lashbeck@hospitalcouncil.net

**Title:** *Population Health: The Only Thing Certain Is That It Will Take All of Us to Achieve!*

**Abstract:** According to a recent report from the American Hospital Association, "population health [is] a must-do strategy for hospitals and health systems to succeed in the evolving healthcare environment." Attention to population health is not a new emphasis for hospitals but, driven in large measure by the Affordable Care Act, it clearly represents a shift in the long-held business models of acute care hospitals that have been based on in-patient volume, patient encounters, and length-of-stay measures, as examples. Hospitals are engaged in many initiatives that support broader population health goals, including care transitions, readmissions, chronic care disease management clinics/services and quality and patient safety. Just how those initiatives develop and impact the health of our community is yet to be fully known but one thing is certain: it will take a partnership between hospitals, healthcare providers, universities and all engaged in our community healthcare system to affect real change. This session will explore population health, current initiatives, and new opportunities to collaborate, measure and impact the health of those we all serve and who call the Valley 'home.'

**Biography:** Lynne Ashbeck is the Regional Vice President for the Hospital Council of Northern and Central California, working with every hospital in the eight Central California/ Central Coast counties on projects driven by the shared interests of all hospitals, including community benefits, workforce, mental health, homeless health care, emergency medical services, care transitions, "safe prescribing" initiatives, and other local issues.

Lynne completed both her Bachelor's Degree and Master's Degree at Fresno State (1977) and is a Registered Dietitian. She completed a Master's degree in Conflict Resolution and Peacemaking from Fresno Pacific University in May 2012 and is a trained mediator.

She is currently the Mayor of the City of Clovis and has served on the Clovis City Council since 2001.

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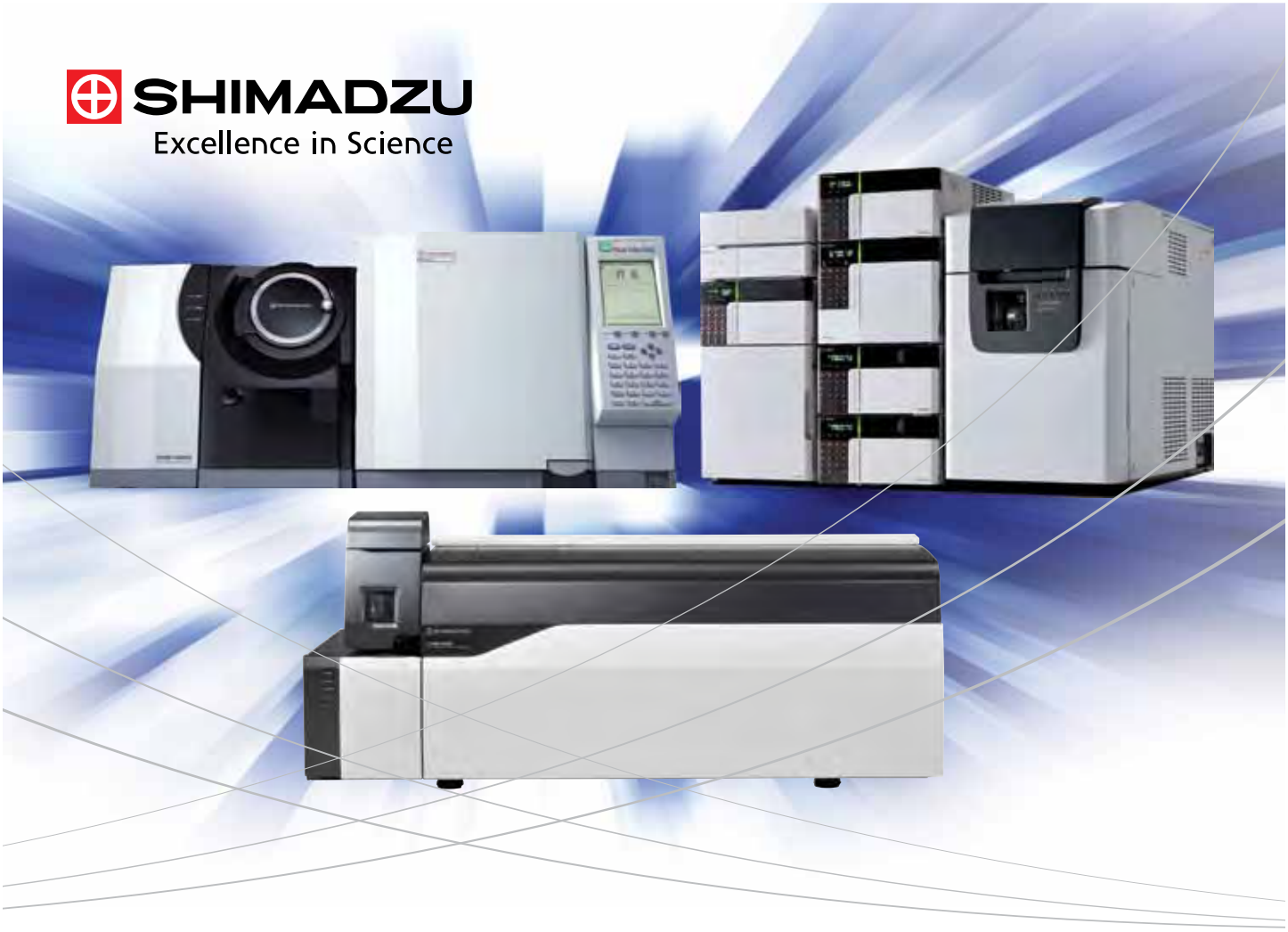

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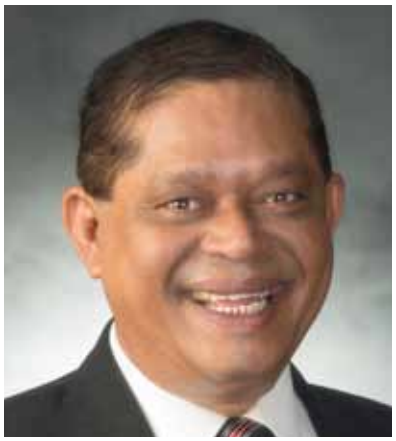
## Session 1 - Advances in Pharmaceutical Sciences



**Ahmmed Ally, MD, PhD**

*Professor of Pharmacology, CHSU College of Pharmacy*

Email: aally@chsu.org

**Title:** *Drug Delivery by Microdialysis*

**Biography:** Ahmmed Ally, Professor at California Health Sciences University received his M.D. degree and a Ph.D. from Chiba University School of Medicine, Japan in 1992. Dr. Ally contributes to Physiology and Immunology textbooks, has 70 publications, and over 100 presentations in national/international conferences. He received awards/grants from NIH and American Heart Association. He is in study section of American Heart Association and Alzheimer's Foundation, editorial board of Journal of Pharmacology and reviewer of numerous journals. Dr. Ally's research focuses on identifying molecular/neurochemical mechanisms within the brain that regulate cardiovascular system during static exercise and whether they are impaired following stroke.

# Session 1 - Advances in Pharmaceutical Sciences

**Qiao-Hong Chen, PhD**

*Assistant Professor of Organic Chemistry,*
*California State University, Fresno*

Email: qchen@csufresno.edu

**Title:** *Anti-Cancer Agents Inspired by Dietary Curcumin*

**Abstract:** Prostate cancer has the highest incidence and the second highest cancer mortality in American men. Approximately 30,000 men die each year of hormone-refractory prostate cancer, which becomes refractory by the inevitable progression of resistance to first-line treatment with docetaxel. Dietary curcumin has a high safety profile in humans and has been demonstrated to have anti-cancer potential in several culture cell systems and human xenograft mouse models, in particular against hormone-refractory prostate cancer. However, the clinical advancement of curcumin has been hindered by its low bioavailability due to poor water solubility and rapid in vivo metabolism.

Our curcumin project aims to engineer drug-like curcumin analogs with improved bioavailability and enhanced potency towards hormone refractory prostate cancer. Four scaffolds of heteroaromatic curcumin analogs (over sixty analogues in total) have been designed and synthesized. Their cytotoxicity against two hormone-independent prostate cancer cell lines, as well as three other aggressive cancer cell lines, was evaluated. More than 90% of these analogues are more cytotoxic than parental curcumin towards these aggressive human cancer cell lines in trypan blue dye exclusion assay. The design, syntheses, cytotoxic data, and structure-activity relationships will be presented.

**Biography:** Qiao-Hong Chen received her Ph.D. degree from Sichuan University, China. Appointed as a Lecturer in 2001, she was promoted to the position of Full Professor in 2003 at Sichuan University. She was a Postdoctoral Fellow for three years at the University of Alberta in Canada and a Senior Research Fellow for six years at Virginia Tech. She has been at Fresno State as an Assistant Professor of Chemistry since 2012 and is a recipient of 2013/2014 Provost's Award for Promising New Faculty. Her research interests focus on natural products-based anticancer agents. She has published over 100 peer-reviewed scientific publications.

# Session 1 - Advances in Pharmaceutical Sciences

**Muhammad Delwar Hussain, PhD**

*Professor of Pharmaceutics,*
*CHSU College of Pharmacy*

Email: dhussain@chsu.org

**Title:** *Cancer Nanomedicine: Novel Nanoparticles for Advanced Cancer Therapy*

**Abstract:** Nanotechnology is providing new tools in cancer therapy resulting in several products on the market. Advantages of Nanoparticles (NPs) for cancer therapy include improved solubility and stability, sustained release, increased accumulation in cancer cells, decreased side effects, combination therapy for synergistic effect or reversal of multi-drug resistance, and theranostic use. Our objective is to design nanoparticle system which can deliver anticancer drugs specifically to metastatic and resistant cancer cells in sufficient concentration and avoid side-effects. We have developed few NPs systems in our laboratory such as targeted polymeric NPs, efflux-pump inhibiting micelles and platelet-shaped zirconium phosphate (ZrP) NPs. The biodegradable polymeric targeted NPs were used to deliver 17-allylamino-17-demethoxy geldanamycin (17-AAG), an inhibitor of heat shock protein 90 (HSP90). The polymeric micelles were used for delivery of poorly water soluble anticancer natural products such as gambogic acid, curcumin and other agents. Release of these agents were sustained as a result of encapsulation into the NPs. The NPs had increased uptake and in vitro cytotoxicity in multidrug-resistant ovarian and other cancer cell lines. The drug loaded NPs have significantly enhanced tumor inhibition effect in animal model of multidrug resistant cancer over untreated control and drug treated groups. The ZrP NPs are capable of intercalating high load (35% w/w) of the model anti-cancer drug, doxorubicin (DOX) into their layered structures. DOX loaded ZrP NPs showed higher cellular uptake and increased cytotoxicity in sensitive and metastatic breast cancer cells. These multifunctional nanoparticle systems can be developed for nano drug delivery in advanced cancer therapy.

**Biography:** Muhammad Delwar Hussain is Professor of Pharmaceutics, California Health Sciences University. He received his Ph.D. from University of Alberta, Canada. Dr. Hussain's research focuses on drug delivery, nanomedicine, pharmacokinetics and cancer therapeutics. He has more than 100 publications, and several federal, foundation and industrial grants. His work in pharmaceutical industries led to marketed products such as Eligard® for prostate cancer. He is associate editor and editorial board member of several journals. He served United States Pharmacopeia (USP) as expert committee member. He is currently the Chair-elect of Pharmaceutics Section, American Association of Colleges of Pharmacy (AACP).

# Session 1 - Advances in Pharmaceutical Sciences

**Santanu Maitra, PhD**

*Associate Professor of Organic Chemistry,*
*California State University, Fresno*

Email: smaitra@csufresno.edu

**Title:** *Organic Molecules in Coronary Artery & Alzheimer's Disease*

**Abstract:** Small organic compounds constitute a majority of FDA approved drugs to combat a plethora of human illnesses. The highly creative, high-risk, and time-consuming drug development process involves a massive collaborative effort between various disciplines of science. This presentation will focus on two such journeys in two different therapeutic areas: coronary artery disease and Alzheimer's disease. The first part of the talk will be on coronary artery disease that can be caused by the build-up of mass in arteries rich in LDL. The phenomenon is called 'atherosclerosis' and leads to the constriction of the arteries. The research team at Dr. Reddy's Lab attempted to develop therapy by up-regulating HDL – the good cholesterol with small organic molecules. Several lead molecules were identified and the most promising compound received FDA approval for human clinical trials for further development. The second half of the presentation will focus on the current endeavor in developing small molecule drugs for Alzheimer's disease. A carrier protein, apolipoprotein E (apoE) has been implicated to be closely involved in the complex mechanism of Alzheimer's disease. Out of the three forms: apoE2, apoE3, and apoE4, apoE4 has been unanimously stamped as the 'bad protein' playing a major role in the onset of the disease. Research at Fresno State has identified two classes of small organic molecules that modulate the production of apoE in brain cells. Development of more efficacious molecules with 'drug-like' properties is underway. The research offers the promise to contribute to Alzheimer's therapy in the future.

**Biography:** Santanu Maitra obtained his Ph.D. degree in Synthetic Organic Chemistry from Prof. David Lightner's research laboratory in University of Nevada Reno. He pursued a postdoctoral stint in the area of Bioorganic Chemistry in the research laboratory of Prof. James Nowick at University of California Irvine. He spent the next 8+ years in pharmaceutical industry – first in Albany Molecular Research in Albany, NY followed by Dr. Reddy's Laboratories in Hyderabad, India. He joined the faculty in the Department of Chemistry at California State University Fresno in the Fall of 2008.

# Session 1 - Advances in Pharmaceutical Sciences

**Chandra Kolli, PhD**

*Associate Professor of Pharmaceutics,*
*CHSU College of Pharmacy*

Email: ckolli@chsu.org

**Title:** *Microneedle Mediated Transdermal Delivery of Drugs*

**Abstract:** Microneedles are tiny micron sized structures that disrupts the stratum corneum for enhancing skin permeation of drugs. The utility of microneedles (from Dermaroller™) in increasing in vitro skin permeation of drugs was investigated. Microneedles when used either alone or in combination with iontophoresis, enhanced the transdermal flux of drugs. Dermaroller™ created microchannels that were visualized using methylene blue staining and scanning electron microscopy. Localized disruption of the stratum corneum was confirmed by Transepidermal water loss measurements. In vitro skin permeation studies were performed using vertical static Franz diffusion cells. Iontophoretic protocols involved application of direct current at a density of 0.1-0.5 mA/cm2 using Ag as an anode and Ag/AgCl as a cathode. The effect of drug concentration, number of passes of microneedles (0, 5, 10 and 20) on both iontophoretic and passive delivery was investigated. The effect of lipophilicity of drug on the microneedle mediated transdermal iontophoretic delivery was also investigated. The DermarollerTM was found to successfully breach the skin barrier and a linear relationship (r2 = 0.99) was observed between the number of passes of the Dermaroller™ and the number of microchannels created. The transdermal flux increased following pretreatment with microneedle (used alone or in conjunction with iontophoresis). Depending on the physicochemical properties of the drug, there was a statistically significant increase in transdermal flux as compared to passive delivery.

**Biography:** Chandra Sekhar Kolli obtained his Bachelor's, Master's and PhD degree in Pharmacy from Kakatiya University (India) followed by a Post-Doctoral training from Mercer University (GA, USA). He is currently working as Associate Professor of Pharmaceutics at California Health Sciences University (CA, USA). His research interests include transdermal drug delivery using active enhancement strategies and transmucosal drug delivery. He authored and co-authored publications and presentations related to drug delivery. He is also serving as a sub-chair for scientific abstract screening committee in AAPS, Associate editor for two journals and reviewer for several peer reviewed scientific journals.

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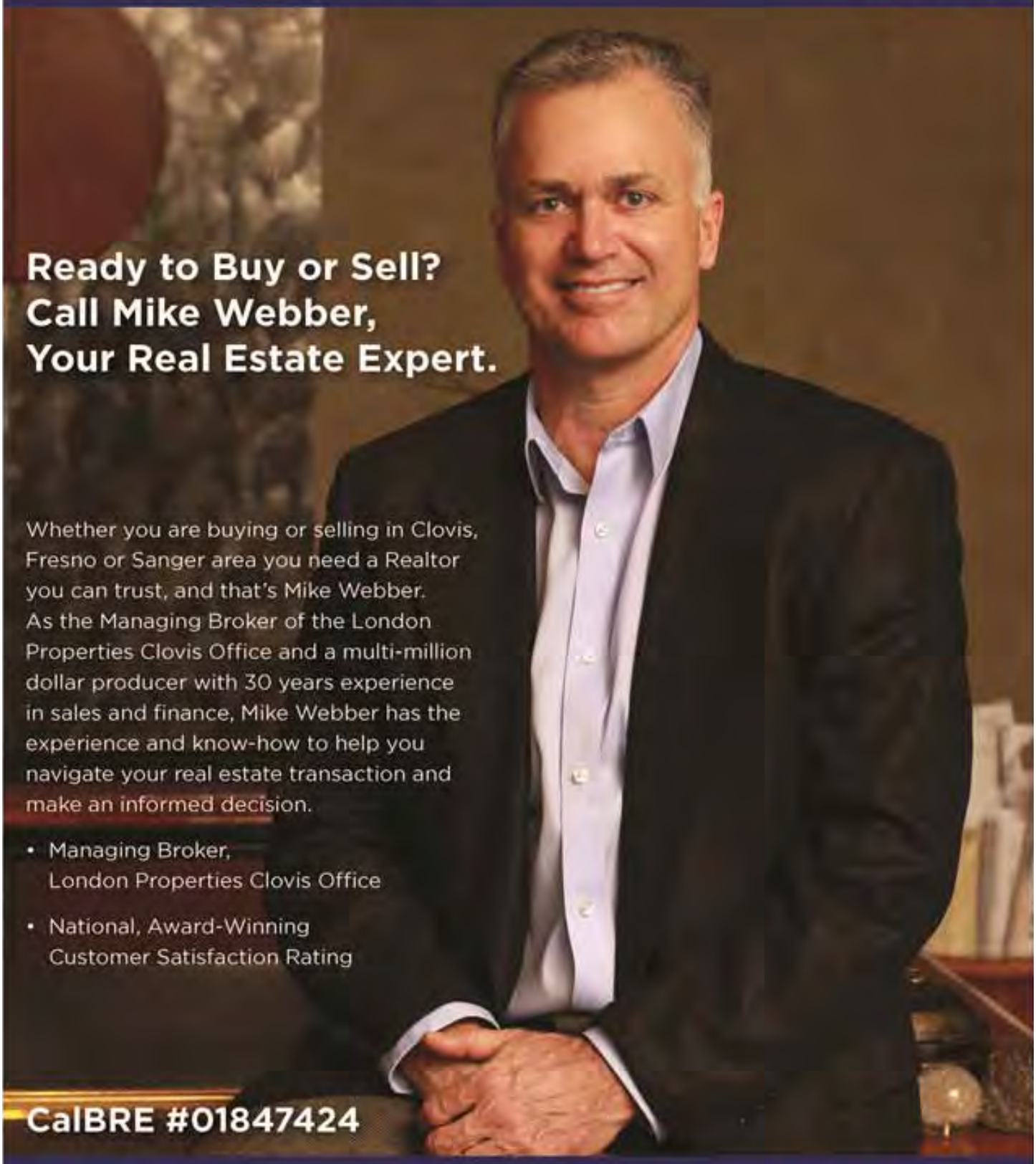

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## Session 2 - Advances in Biomedical Sciences

**Cory L. Brooks, PhD**

*Assistant Professor of Biochemistry,*
*California State University, Fresno*

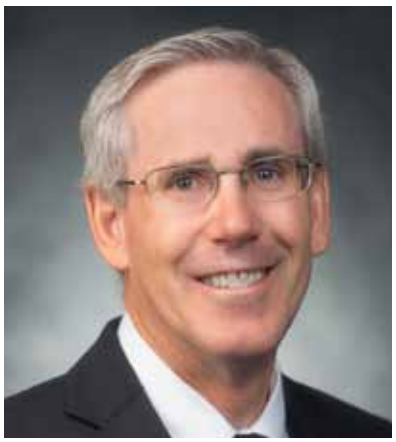
Email: cbrooks@csufresno.edu

**Title:** *Exploiting the Camel Immune System for the Prevention of Listeriosis*

**Abstract:** There exists a critical need for new strategies to combat the potentially fatal food borne disease Listeriosis. Tragically, the bacteria can cross the fetal-maternal barrier during pregnancy triggering miscarriages even in asymptomatic cases. Given the danger posed by Listeriosis during pregnancy, the development of a prophylactic that can prevent bacterial invasion would be welcome addition to prenatal care regimens. The causative agent of Listeriosis, Listeria monocytogenes mobilizes protein virulence factors called internalins to bind host cell receptors, activating receptor mediated endocytosis facilitating invasion of epithelial cells. This first phase in the infective process is essential for pathogenesis, and represents an attractive step for therapeutic intervention. To inhibit the interaction of Listeria Internalin B (InlB) with the host cell receptor c-met, we are exploiting the unique antibodies derived from the Camel immune system. Typical antibody binding sites are formed by pairing two protein chains (heavy and light chain), Camels have evolved to produce an antibody devoid of a light chain. The single domain antibodies (sdAb) produced by Camels have many beneficial properties including high stability, ease of recombinant production and can bind epitopes inaccessible to traditional antibodies. We have generated a panel of sdAb that bind Listeria Internalin B. Using X-ray crystallography we have mapped the nature of the molecular nature of this interaction and demonstrate that these sdAb can inhibit Listeria invasion in vitro. Our results highlight a novel approach for combating Listeriosis.

**Biography:** Cory L. Brooks is an Assistant Professor of Biochemistry, at California State University Fresno. He received his Ph.D. from the University of Victoria, Canada. And conducted his post-doctoral work at the University of Alberta, Canada. Dr. Brooks is interested in using X-ray crystallography and protein engineering to better understand how antibodies interact with their targets. Dr. Brooks' lab is exploring the ability of single domain antibodies (nanobodies) to neutralize the food pathogen Listeria, and engineering therapeutic antibodies to bind the cancer associated protein MUC1.

## Session 2 - Advances in Biomedical Sciences



**John R. Martin, PhD**

*Professor of Pharmacology,*
*CHSU College of Pharmacy*

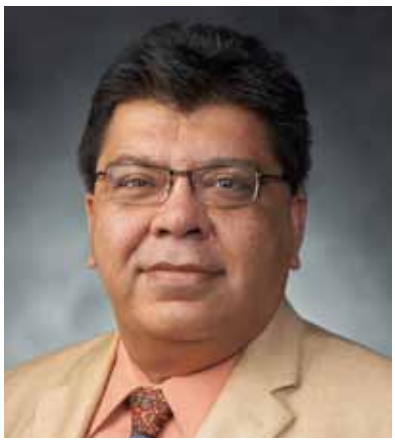
Email: jmartin@chsu.org

**Title:** *Studies on the Posterior Hypothalamic Nucleus: Cardiovascular System Effects*

**Abstract:** The posterior hypothalamic nucleus (PHN) of the rat is known to contain acetylcholine (ACh) in nerves that originate in the anterior hypothalamic/preoptic area (AH/PO) and cannabinoid subtype 1 receptors (CB1). Microinjection of carbachol (CCh), a cholinergic receptor agonist, into the rat PHN increases blood pressure (BP) accompanied by a biphasic change in heart rate (HR), which initially increases due to sympathoexcitation and then decreases due to increased vagal tone and circulating AVP. The increase in AVP occurs at the highest dose of CCh, which coincides with the ability of CCh in the PHN to increase baroreceptor reflex (BR) sensitivity. Blockade of systemic AVP V1-receptors returns BR sensitivity to normal. In addition, blockade of muscarinic receptors in the PHN decreases the rate of recovery of blood pressure towards normal after rapid blood loss (i.e. hemorrhage). These findings suggest that activation of cholinergic pathways in the PHN may occur during specific cardiovascular events. Stimulation of a serotonergic pathway from the AH/PO to the PHN by DOI evokes an increase in BP and HR while muscarinic receptor blockade in the PHN prevents these increases. Stimulation of the CB1 receptor in the PHN attenuates these changes. These changes are reversed by PHN presence of a CB1 antagonist and a non-specific CB agonist. Interestingly, a non-specific CB agonist, a CB2 antagonist, or the combination of the CB2 antagonist and the CB1 agonist revealed a biphasic DOI-evoked pressor response. These results suggest the possibility that release of ACh in the PHN may be modified by CB1 and additional CB receptor subtypes.

Biography: Dr. Martin is Professor and Associate Dean for Academic Affairs and Assessment at California Health Sciences University College of Pharmacy. He is interested in the regulation of the cardiovascular system by the posterior hypothalamic nucleus, the neurotransmitters of this region and the connections of this nucleus with other brain regions. Research has included determining the role and relationships between acetylcholine, neuropeptide Y, cannabinoids and serotonin in the hypothalamus. These studies increase our understanding of mechanisms of action of neurotransmitters and their involvement in regulating the cardiovascular system. He has been awarded AHA and NIH AREA grants to fund his research.

## Session 2 - Advances in Biomedical Sciences



**Rajat Sethi, PhD**

*Associate Professor of Pharmacology,*
*CHSU College of Pharmacy*

Email: rsethi@chsu.org

**Title:** *Caveolin Mediated P38mapk Associated Cell Signaling in Air Pollution Induced Cardiac Toxicity: What We Need To Know As Health Professionals*

**Abstract:** Out of 350,000 sudden cardiac deaths each year in the United States, 60,000 deaths have been linked to air pollution, suggesting a detrimental role of environmental pollutants in the development of cardiac toxicity. Although epidemiology studies have associated exposure to particulate matter (PM) with acute mortality and morbidity, only recently have they found associations between ozone (O3) and mortality. It has been challenging to disentangle the toxic effects of O3 from those of PM in these studies because the two pollutants are often closely correlated temporally and geographically. In studies using rats from a controlled O3 exposure environment we showed moderate and chronic cardiac dysfunction after 4 and 8 weeks of O3 inhalation respectively. In addition this stage dependent progressive decline in cardiac function subsequent to O3 exposure was associated with increasing levels of inflammatory mediators. These findings were cited in a recent USEPA sponsored study where exposure to O3 was shown to modulate the cardiovascular system by increasing the levels inflammatory mediators in human subjects. Interaction of the lipid raft proteins (caveolin) with inflammatory protein (p38MAPK) plays a significant role in regulating death and survival signaling in the cardiac muscle. In this regard the stage dependent alterations we observed in caveolin mediated p38MAPK induced cell signaling in O3 - exposed rats suggest more than one mechanistic pathways in the pathology of O3- mediated cardiac toxicity.

Biography: Rajat Sethi received his PhD from the Department of Medicine, University of Manitoba, Canada. He currently is the Chair of the Department of Pharmaceutical & Biomedical Sciences and Director of Research at the California Health Sciences University, Fresno, California. He is well published in the field of cardiac pathology/pharmacology/toxicology, holds 22 patents, authored/edited 9 books, and serves as the editorial board member for many journals. Dr. Sethi has received numerous grants. He has been invited to present at many national and international conferences and is the recipient of numerous awards and honors for his contribution to research, education, and service.

## Session 2 - Advances in Biomedical Sciences

**Sudhakar Yakkanti, MSc, MPhil & PhD**

*Associate Director: Center for Cancer & Metabolism, Cell Signaling Laboratory, Bioscience Division, SRI International, 333 Ravenswood Avenue, Menlo Park, California 94025-3493.*

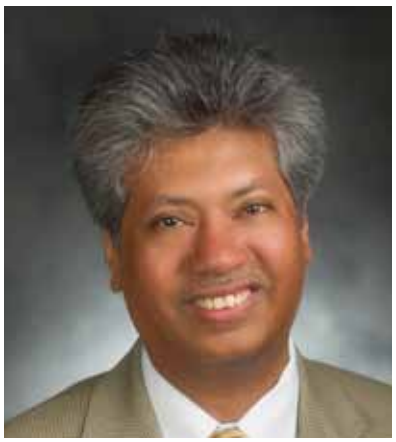
Email: Sudhakar.yakkanti@sri.com

**Title:** *Regulation of Tumor Metastasis by Endogenous Metabolite*

**Abstract:** Metastasis is frequently deadlier than the original tumor-ultimately, reducing the risk or occurrence of metastasis could effectively cure or at least manage human cancer. My laboratory has carried out research that could significantly contribute to the control of malignant progression, involving the use of endogenous metabolite that is released from the extracellular matrix, which is both an endogenous angiogenesis inhibitor and anti-metastatic molecule. The signaling mechanism(s) underlying the influence of this metabolite on regulation of tumor angiogenesis and tumor metastasis are not yet known. We identified that this metabolite binds to different cell surface integrins, inhibits different cellular signaling in a manner distinct from that of other extra cellular matrix derived metabolites studied to date. Treatment of endothelial cells with this metabolite specifically inhibiting elastin-mediated phosphorylation of FAK, Akt, mTOR and PI-3K signaling. In addition different *in-vitro* and *in-vivo* studies, we found that this metabolite possibly binding to Laminin D-III and D-IV domains and inhibits Laminin degradation by the matrix metalloprotease-14 (MMP-14), and thereby reduces the generation of different sized peptides that can bind to the EGF receptor and promote cancer metastasis, in addition to its integrin(s) mediated signaling. Our findings suggest that this metabolite interacting with different cell surface integrins and cross talking with other receptors or other extracellular matrix molecules and inhibiting tumor angiogenesis and tumor metastasis both *in-vitro* and *in-vivo.*

Biography: Sudhakar Yakkanti, Associate Director/Senior Scientist at Center for Cancer & Metabolism, Bioscience Division, SRI International, California. He did his postdoctoral training at Harvard Medical, Boston USA. He received Indian President's fellowships, YCS, Michael A. O'Connor Young Investigator Awards from FAMRI and Mayo Clinic. He has more than 40 publications including Science, JCI, Blood, PNAS etc. His research focuses on cell signaling and tumor metastasis, which is supported by federal and foundation grants. He was served as grant reviewer for DT study section. He is serving as an Editor-in-Chief and also honored as keynote speaker and session chair for many conferences.

## Session 2 - Advances in Biomedical Sciences



**Kalyan Munshi, PhD**

*Assistant Professor of Medicinal Chemistry,*
*CHSU College of Pharmacy*

Email: kmunshi@chsu.org

**Title:** *Polymeric Antiviral Drug Design: Novel Adamantanoids-based Polymeric Therapeutics*

**Abstract:** R&D in Pharmaceutical Chemistry revealed remarkable Biological Activity of Adamantanoids, and identified them as a new class of potential antiviral agents. For instance, Amantadine and Rimantadine are well known anti-influenza drugs. However, wide use of adamantanoid drugs in clinical practice is quite limited due to their high toxicity, immune-depressant nature and susceptibility for the quick growth of viral drug resistance. To overcome the said drawbacks, and to impart a broad spectrum of antiviral and immunological properties, we put forwarded a Novel Macromolecular Approach for Polymeric Antiviral Drug Design.

Based on desired macromolecular design, several polymeric drugs (PD) have been synthesized from bioactive maleic anhydride copolymers and adamantanoid fragments with specific spacer groups of different length and conformational mobility. By optimizing molecular weight and hydrophilic-lipophilic balance, several PD having low toxicity and high antiviral activity on different virus models have been obtained. The antiviral activity of the PD was studied in vitro against different Influenza strains & HIV-1 replication. The cytotoxicity level to MDCK cells was also determined. The newly designed Adamantanoid Anti-Influenza / Anti-HIV Preparations showed a bright perspective of Polymeric Drug Design. Obtained results revealed 1.2 orders less toxicity & high antiviral efficacy against both Influenza virus - A & B. Moreover, the synthesized PD exhibited ~100% inhibition against HIV-1 replication. The effects of the synthesized PD on ionic channels and ionic pumps of frog skin epithelial cells were investigated. In correlation with the bioelectric characteristics of epithelial cell membranes, the mechanism of polymeric drug action has been suggested.

**Biography:** Kalyan Munshi received his PhD in Chemistry from Russian Academy of Sciences, and MS in Chemical Engineering from Gubkin State University, Moscow. Prior to joining CHSU, he has been a faculty member at Texas A&M University, St Cloud State University, University of Minnesota, and Russian State University, Moscow. His research interests focused on a) Strategic Design & Syntheses of Antiviral/ Antibacterial Therapeutic Agents from Triterpenoid-based Natural Products; b) Polymeric Drug Design & Macromolecular Architecture for Novel Biomaterials c) Design & Creation of Bioactive Polymer Matrix incorporated Novel Drug Delivery System. He has numerous awards, patents, publications, and presentations in international conferences.

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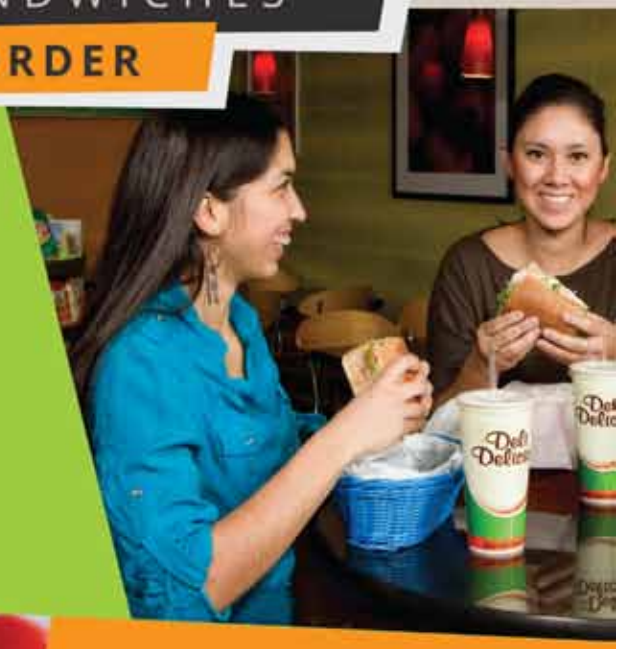

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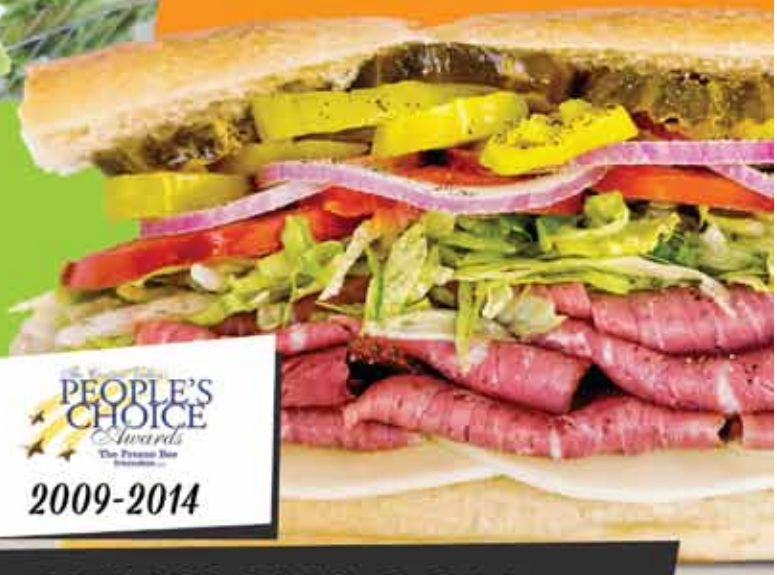

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# Session 3 - Advances in Population Health

**Robert Clegg, PhD, MPH, MCHES**

*Associate Professor of Administrative Sciences,*
*CHSU College of Pharmacy*

Email: kmunshi@chsu.org

**Title:** *Does evidence-based practice influence patient safety? A retrospective analysis of SB 1301 in Central California*

**Abstract:** Over the past two decades, the healthcare system in the United States has been unsettled by research highlighting a number of problems that hinder the delivery of quality medical care. While these findings have resulted in an increase in the medical malpractice litigation to crisis levels in many states, they have also spurred the development of the patient safety movement throughout the nation. With the passing of Senate Bill 1301 in California, acute care hospitals are mandated to report the occurrence of any adverse event to the California Department of Public Health (CDPH). According to SB 1301, any acute care hospital in California that is cited for violating the "Never Events," including surgery performed on the wrong patient/body part, objects left inside patients after surgery, and death/serious disability resulting from a medication error, can be monetarily penalized up to $50,000 per incident. While research has found no statistical significance between the number of visits, citations and monetary fines administered by the CDPH for SB 1301 reportable events among Central California acute care hospitals that possess evidence-based patient safety programs and those facilities that do not have such programs in place, the results concluded that by placing less consequence on individual blame that is punitive in nature and more focus on incorporating a "just culture" – one that highlights system failures as opposed to individual acts of negligence – emphasis can be placed on implementing proactive changes within the healthcare delivery system to minimize risk and improve the overall quality of patient care.

**Biography:** Robert Clegg is an Associate Professor of Administrative Sciences at California Health Sciences University in Clovis, CA. He received his PhD in Health Care Administration from Capella University in Minneapolis, MN, and a Master of Public Health from California State University, Fresno. Dr. Clegg is a Master Certified Health Education Specialist (MCHES) through the National Commission for Health Education Credentialing, Inc., and has served on the Board of Directors for a number of regional and statewide professional and philanthropic organizations, including the American Red Cross - Central Valley Chapter and California Association for Health, Physical Education, Recreation and Dance (CAHPERD).

# Session 3 - Advances in Population Health

**Jaymin Kwon, PhD, REHS**

*Assistant Professor of Public Health,*
*California State University, Fresno*

Email: jkwon@csufresno.edu

**Title:** *Comparison of Personal Exposure of Bicyclists to PM2.5, Black Carbon (BC), and Ultrafine Particles in Indoor and Outdoor Air in Fresno, California*

**Abstract:** Ambient air quality in Fresno California has been an important environmental issue impacting public health for decades. People who stay outside for recreational activity such as bicyclists are exposed to outdoor pollution. In March 2014, the personal exposures to multiple air pollutants in Fresno were measured while young male adult participants riding stationary bikes in indoor and outdoor locations. PM2.5, ultrafine particles, and black carbon concentrations were measured using the real-time monitors. Personal exposures were measured inside of the South Gym on campus of California State University Fresno and outside of the California State University Fresno Foundation near highway 168 for comparison.

PM2.5 concentrations were measured using Dust Trak DRX 8533 and 8534. Using CPC 3007, personal exposures to ultrafine particles were measured. MicroAeth AE51 collected the black carbon concentration. Temperature and humidity were recorded using sensors. The time-location data for each bicyclist was recorded hard copy. It is a within-group experimental design in which all subjects participate in the inside and outside stationary cycling. The heart rate, blood pressure, respiratory rate, pulmonary function testing via a spirometer were measured at baseline, during the test, post-test, and 4 hours after for each condition. Subjects cycled within an hour period under the same cycling protocol with cardiopulmonary and air pollution measurements throughout testing.

PM2.5 and ultrafine particle concentrations were significantly higher in outdoor air compared to levels measured in indoor air. Ultrafine particle concentrations were influenced immediately when wind was blown from smoke stack of the broiler restaurant nearby. The personal exposure to air pollution levels by location and time are being analyzed and will be compared.

**Biography:** Dr. Kwon is an assistant professor of Environmental Health of the Department of Public Health in California State University, Fresno. Dr. Kwon obtained his Ph.D. degree in Exposure Sciences from the joint program of Rutgers University and the University of Medicine & Dentistry of New Jersey - Robert Wood Johnson Medical School. He assessed the influence of proximity to the emission sources on the ambient air concentrations of gas and particle phase air pollutants around the studied homes. He has been doing research on the personal exposure to air pollutants using GIS mapping and proximity modeling, real-time sample collection and time location measurements in New Jersey, Houston Texas, and Los Angeles and Fresno California. He is a collaborating investigator of EPA/NIEHS UC Berkley/ Stanford Children's Center, Children's Health and Air Pollution Study in San Joaquin Valley (CHAPS-SJV). The study focuses on air pollution and birth outcome, children's asthma, diabetes and obesity.

# Session 3 - Advances in Population Health

**Jared Rutledge, PhD**

*Epidemiologist,*
*Fresno County Public Health Department, Fresno, Ca*

Email: jrutledge@co.fresno.ca.us

**Title:** *Advances in Public Health: Innovations in the local health jurisdiction*

**Abstract:** Historically, public health departments have collected a variety of data on communicable diseases, cancers, syndromic surveillance, tobacco use, and other population relevant information. The local health jurisdictions have not traditionally been able to use these data to guide interventions. Often this is due to the limitations of grant funding or a lack of trained staff able to conduct rigorous scientific investigations. Fresno County Department of Public Health (FCDPH) is now starting to partner with University California San Francisco (UCSF), California State University, Fresno (CSUF), and other regional health jurisdictions to produce research on the health of the residents in the Central Valley. Recently, FCDPH partnered with UCSF to evaluate the persistence of Kaposi's Sarcoma in Fresno County. Future collaborations will focus on Valley Fever projects with University of California Merced (UCM) and UCSF. The goal of these collaborations is to continue to show where the health disparities exist in Fresno County to guide the appropriate targeting regions within the Central Valley for the purpose of using data to drive the application of evidence based public health interventions. FCDPH is now using Geographic Information Systems along with predictive mathematical models to show the impact of these public health issues on the health care infrastructure of the Central Valley. FCDPH is using the data to assist with driving health policy in Fresno County. Fresno County regularly is one of the poorest health jurisdictions in the nation. It is through these new techniques that we will be able to more effectively use our resources.

**Biography:** Jared Rutledge is an epidemiologist for Fresno County Public Health Department. He has his PhD in Public Health with emphasis in Epidemiology. While Jared Rutledge was trained in multiple sub-disciplines in epidemiology he favors communicable diseases. His current research has focused on Hepatitis C in incarcerated populations and HIV/AIDS in Fresno County. Jared is currently engaging in population based research with Gilead Pharmaceuticals as well as various academic and private institutions Jared specializes in analysis of secondary data analysis and building of predictive epidemiological models.

## Session 3 - Advances in Population Health

**Lauren Lessard, MPH PhD Candidate**

*Fresno State University, Central Valley Health Policy Institute (Post-graduate Research Fellow) University of California, Los Angeles*

Email: llessard@csufresno.edu

**Title:** *Place and Health: Preventable Hospitalizations for Children in the San Joaquin Valley of California*

**Abstract:** Health inequalities are the most striking feature of population health in the Central Valley and are linked to social and environmental factors unique to the region. In this study, pediatric preventable disease hospitalization rates indicate the burden of disease on children, their families and the community that disproportionately affect the Central Valley.

Hospitalization rates for 8 Central Valley counties were obtained from the California Office of Statewide Health Planning and Development. Census Data provided zip-code level factors including racial composition, distance from hospital and poverty rates. The California Office of Environmental Health Hazard Assessment (OEHHA) pollution burden score was calculated using 11 indicators for pollution. OLS and negative binomial regression for preventable pediatric conditions were calculated and mapped to illustrate the variance in hospitalization rates by zip code across the Central Valley.

Zip codes with high concentrations of families in poverty are associated with a 57% increase in preventable disease hospitalizations for children 15 and under. As pollution burden increases by 10%, hospitalizations rates increase by 11% and 16% in age groups 0-5 and 5-14, respectively. The interaction between pollution and poverty is a significant predictor of preventable admissions in the 0-5 age group. Maps depict strong correlations between hospitalizations and high rates of poverty, racial diversity and pollution. Results are significant at p-value <= .05.

Understanding the geographic distribution of disease and impact of community level factors is essential to expanding access to preventive resources to improve the health of children in the Central Valley.

**Biography:** Lauren N. Lessard is a post-graduate research fellow with the Central Valley Health Policy Institute. Her research investigates health disparities within the Central Valley's underserved populations, particularly among women and children. Lauren is concurrently a PhD candidate in the Department of Community Health Sciences, Fielding School of Public Health at UCLA with an expected completion date of September 2014. Lauren received her MPH from UC Berkeley in Maternal and Child Health. Prior to completing her MPH, Lauren was a Peace Corps Volunteer in Suriname, South America and completed her BA in Political Science at the University of California, Santa Cruz.

## Session 3 - Advances in Population Health

**Mohammad A Rahman, PhD**

*Associate Professor of Public Health,*
*California State University, Fresno*

Email: mrahman@csufresno.edu

**Title:** *Can More Use of Supporting Primary Care Health Practitioners Increase Efficiency of Health Clinics? Evidence from California's San Joaquin Valley*

**Abstract:** This study examined 67 primary healthcare centers operating in the San Joaquin Valley, California and explored the factors that may have contributed to productive efficiency gains. The study used Data Envelopment Analysis (DEA) technique to measure efficiency of the clinics and then used Tobit regression analysis to understand the factors that affected efficiency. It was found that clinics that employed relatively more 'unlicensed' supporting practitioners compared to 'licensed' practitioners were more likely to be efficient. The results also showed that clinics that employed fewer physicians compared to all 'licensed' practitioners were likely to be more efficient. In addition, providing transportation services to patients also enhanced clinics' efficiency.

**Biography:** Mohammad Rahman, Ph.D. is an Associate Professor, at the Department of Public Health in California State University, Fresno where he teaches Public Health Administration, Human Resource Management in Health care and the Economics of Health care. His research interests are in the areas of efficiency analysis of healthcare organizations, telemedicine and e-health.

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## Session 4 - Advances in Primary Care

**Tony Joseph Eid, PharmD, REHS**

*Assistant Professor of Clinical Sciences,*
*CHSU College of Pharmacy*

Email: teid@chsu.org

**Title:** *Improving Pharmacotherapy In Patients With Hyperlipidemia Focus On Novel Agents*

**Abstract:** HMG-CoA reductase inhibitors (statins) are recommended as the first-line of drug therapy to meet low-density lipoprotein (LDL) cholesterol goals when lifestyle modifications are not effective and are therefore used ubiquitously in primary prevention of cardiovascular disease (CVD). Adherence to medications for the prevention of asymptomatic chronic diseases in real-world practice settings is known to be suboptimal.

Review of past trials demonstrated that musculoskeletal pain and cost account for the vast majority of statin discontinuance as demonstrated by both the PRIMO and USAGE trials respectively. Results of these trials demonstrated that 10-20 % of statin users discontinued therapy secondary to myalgia like symptoms while results from most other studies of statin adherence and persistence have suggested that up to 34% of statin users discontinued therapy due to financial issues were the primary determinants. Novel modalities offer a great advantage in achieving lipid goals while enhancing adherence. Such modalities include monoclonal antibody agents such as proprotein convertase subtilisn/kexin type 9 or PCSK9. These agents offer a greater reduction in LDL levels, results show up to 50% reduction. Novel modalities are an emerging modality in the area of hyperlipidemia and needed in patients who cannot tolerate statin therapy. A review of these novel lipid modalities will be discussed.

**Biography:** Tony Eid is Assistant Professor of Clinical Sciences at California Health Sciences University. He received his PharmD from Loma Linda University School of Pharmacy. Dr. Eid's research interest is on cardiovascular risk reduction. He has several publications, and received pharmaceutical grants on diabetes education. He is also a peer reviewer for American Journal of Health System Pharmacy.

# Session 4 - Advances in Primary Care

**Patty Havard, PharmD**

*Professor of Clinical Sciences,*
*CHSU College of Pharmacy*

Email: phavard@chsu.org

**Title:** *Interdisciplinary Practice And Research to Improve Quality of Care and Transform Clinical Translational Research Training in Hiv and Pregnancy*

**Abstract:** Approximately 71% of women with HIV/AIDS are between the reproductive age of 24 and 44 years. In the absence of antiretroviral therapy (ART), the risk of mother-to-child transmission (MTCT) of HIV-1 is approximately 25%. The risk of vertical transmission has decreased to <1% with HIV testing, counseling, tripartite use of ART, mode of delivery, and discouragement from breast feeding. An interdisciplinary HIV High Risk Pregnancy Clinic (HHRPC) was implemented at The Ohio State University in July 2001 in collaboration with the Departments of Infectious Diseases, Obstetrics & Gynecology, Pediatrics and Pharmacy. Outcomes database was established to improve quality-of-care for HIV-infected pregnant women and babies, and establish a research platform for postgraduate training in clinical translational research. Between July 2001 and June 2006, there was a total of 150 referrals to the HHRPC (25% Caucasian, 75% African American, 2.1% Hispanic). The use of antepartum ART evolved from dual nucleoside reverse transcriptase inhibitors (NRTIs) to protease-inhibitor (PI) plus dual NRTIs combination for viral suppression. Undetectable viral load (VL) at delivery was achieved in 102 of122 (84%) women. Maternal ART-related adverse events included nevirapine (NVP) associated hepatotoxicity (n=3) and elevated liver enzymes (n = 2). Premature delivery was reported in 26 of 123 (21.3%) live births, and all infants were HIV-negative. A total of five interdisciplinary clinical translational research studies are pending or have been published. A similar interdisciplinary model in primary care will be developed to promote quality-of-care to the residents of Central California and scholarship for faculty and collaborators.

**Biography:** Dr. Havard was Assistant/Associate Professor at Rutgers University (1988-2003), the Ohio State University (1994-2006), and University at Buffalo (2006 - 2014). She served as Interim Associate Dean of Academic Affairs at UB between 10/2010 and 3/2013. Her future scholarship interests include 1) clinical efficacy and safety of curcumin in the treatment of aromatase-inhibitors-induced arthralgia in women with breast cancer; and, 2) characterization of drug-herb interactions of curcumin and HIV-protease inhibitors in HIV-infected patients, and 3) interprofessional education and intercollaborative practices to improve access and quality of care to the underserved population and enhance scholarship for faculty and collaborators.

# Session 4 - Advances in Primary Care

**Jennifer West, PharmD, CGP**

*Assistant Professor of Clinical Sciences,*
*CHSU College of Pharmacy*

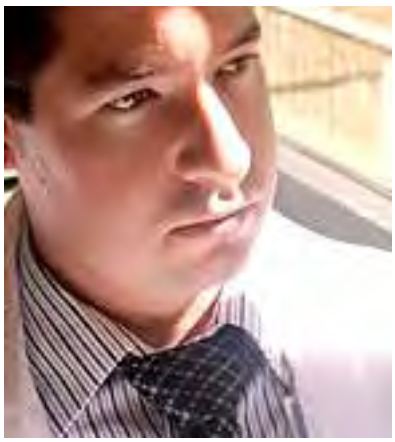
Email: jwest@chsu.org

**Title:** *What Pushed Pharmacists to Get Sb 493 Approved in California?*

**Abstract:** Pharmacists have a long history of being an integral part of the health care profession. From going beyond medication dispensing, to helping manage medication use alongside physicians under protocol, pharmacists have always offered other healthcare services from behind the counter. With Obamacare in place, there is more opportunity for the pharmacist to expand their roles in managing patient's medications. This session will provide background into other services a pharmacist currently can offer outside of dispensing, and how SB 493 expands the pharmacist's scope of practice.

**Biography:** Jennifer West, PharmD, FASCP, CGP, is an Assistant Professor of Clinical Sciences, at California Health Sciences University (CHSU). She graduated with a PharmD from the University of California, San Francisco, and completed a Geriatric Fellowship at UCSF and Mt. Zion Hospitals. Her previous work includes: skilled nursing facility pharmacy consulting, staff and manager of community pharmacies, formulary management for an insurance company, adjudicating California's Medi-Cal TARs, directing an inpatient psychiatric and respiratory hospital pharmacies. She is coordinating a Self-Care class at CHSU, serves as Curriculum Committee Chair and Admissions Committee member. Jennifer recently received a Certificate in Geriatric Pharmacy.

# Session 4 - Advances in Primary Care



**Michael Freudiger, PharmD, BCPS, CGP**

*Clinical Pharmacist,*
*Saint Agnes Medical Center*

Email: Michael.Freudiger@gmail.com

**Title:** *A Review of Current Pharmacy Practice Models*

**Abstract:** SB 493 is opening up discussion on new and alternatives ways of practicing pharmacy. For many years, integrated health systems such as the Department of Veterans Affairs and Kaiser Permanente have operated with alternative models which include pharmacists in direct patient care. These extremely successful programs fully utilize the extensive knowledge of pharmacists in clinical monitoring and medication management. Data from the Department of Veterans Affairs shows a significant cost savings when pharmacists are used for management of chronic diseases, such as diabetes, hypertension, dyslipidemia, and anticoagulation. Other pharmacist based clinics for management of HIV, HCV, heart failure, psychiatry, pain management, rheumatoid arthritis, ESA monitoring, etc. have been recently implemented. These types of successful programs need to be examined when discussions of SB 493 implementation occur.

**Biography:** Michael Freudiger is a clinical pharmacist and USP<797> compliance supervisor at Saint Agnes Medical Center in Fresno, CA. He received his PharmD at University of the Pacific and completed a PGY-1 Pharmacy Practice Residency at the Department of Veterans Affairs Healthcare System in Loma Linda, CA. Michael's interests include critical care, long term care, and oncology, and he has recently published a pharmacotherapy chapter in The Manual of Clinical Problems in Pulmonary Medicine 7th Edition. He is a Board Certified Pharmacotherapy Specialist (BCPS) and Certified Geriatric Pharmacist (CGP).

# Session 4 - Advances in Primary Care

**Jennifer Hudspeth, PharmD, CGP**

*Assistant Professor of Clinical Sciences,*
*CHSU College of Pharmacy*

Email: jhudspeth@chsu.org

**Title:** *The future of pharmacists: What's on the horizon after SB 493?*

**Abstract:** With SB 493 being signed into law, the California State Board of Pharmacy now has the task to decide how to implement the many changes this law provides. Currently, the State Board of Pharmacy is working in a joint effort with the California Medical Board to develop protocols for pharmacists to furnish hormonal contraceptives and nicotine replacement therapy. Of important consideration is how to implement the new Advanced Practice Pharmacist designation. The board is considering how other states have implemented similar programs and using this information to help develop a protocol for the State of California. SB 493 brings many new responsibilities to pharmacists. Of particular interest, this bill has named pharmacists 'providers' which may have a positive effect on pharmacy practice by improved payment for services. While full implementation will take time, the future of pharmacy is looking brighter for pharmacists.

**Biography:** Jennifer Hudspeth is an Assistant Professor of Clinical Sciences and Director of Introductory Pharmacy Practice Experiences at California Health Sciences University. She received her PharmD from Massachusetts College of Pharmacy and Health Sciences. Jennifer has previously worked as pharmacy manager for Walgreens, Renal Pharmacist and Clinical Coordinator at Sierra View District Hospital. Her interests focus on End-Stage Renal Disease including dialysis, independent pharmacy practice, drug development, medication therapy management and complementary and alternative medicine. Jennifer has also received certification in geriatric pharmacy.

## Poster 1

**Name:** Faith Olivares
**Advisor:** MaryAnn Huntsman, Pharm D, BCACP, CDE
**Affiliation:** Share Our Selves Community Health Center
**Email:** faithjoy.olivares@gmail.com

**Title:** *Incentivizing Self Monitoring Of Blood Glucose Adherence In A Community Health Center*

**Abstract:** We performed a randomized, controlled, behavioral study testing the effect of incentivizing self monitoring of blood glucose (SMBG) in the insulin-dependent diabetic population. There were 3 groups to the study: (1) control – standard care, (2) pain free incentive – pain free blood testing method and (3) financial incentive – gift card reward.

Although there was a decrease in adherence in the pain free incentive group compared to the control and financial incentive groups, the ANOVA test found no overall difference between the groups. The fisher exact test found there was no association between incentive groups and adherence groups (p=0.07). All study SMBG adherence outcomes were lower than the national SMBG adherence of 64%.

## Poster 2

**Name:** Ian Huh[1], Robert Gene[2], Jyothi Kumaran[2], C. Roger MacKenzie[2], and Cory L. Brooks[1]
**Advisor:** Dr. Cory L. Brooks
**Affiliation:** [1]Department of Chemistry, California State University, Fresno, Fresno, CA, 93740
[2]Institute for Biological Sciences, National Research Council of Canada, Ottawa, ON, Canada.
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**Title:** *Neutralization of Listeria Monocytogenes by Single Domain Antibodies*

**Abstract:** Listeriosis is a serious food-borne disease caused by the Gram-positive bacteria Listeria monocytogenes. The bacteria are of particular concern for pregnant women, as even in asymptomatic cases the bacteria can cross the placental barrier to cause abortion. Although the bacteria can be treated with antibiotics, inclusion of a prophylactic that can prevent Listeria colonization as a component of pre-natal care would greatly reduce the risk of Listeriosis. Bacterial invasion of epithelial cells is mediated by coupled-bindings of the virulence factors Internalin A (InlA) and Internalin B (InlB) to receptors on the target cell surface. InlA binds the E-Cadherin while InlB binds the hepatocyte growth factor receptor (c-Met) to trigger endocytosis of Listeria. Therefore, inhibition of internalin interactions with their cognate receptors may inhibit Listeria from invading a cell. Single domain antibodies (sdAb) are the smallest known antibody fragments that retain binding function. They are derived from the unique heavy chain antibodies found in camels, alpacas and llamas. Due to the convex architecture of sdAb binding sites, they can access epitopes unavailable to conventional antibodies, such as enzyme active sites and protein-protein interaction sites. Using gentamicin protection assays and flow cytometry we have demonstrated that InlB specific sdAb are capable of inhibiting Listeria invasion of HeLa cells in vitro. Furthermore, we have discerned the molecular mechanism behind the capability of the sdAb to inhibit Listeria colonization. We have obtained a high resolution X-ray crystal structure of InlB in complex with an sdAb. The structure revealed that the sdAb binds in a negatively charged cavity on the surface of InlB. Comparison of our structure with a structure of InlB in complex with c-Met revealed that the sdAb directly competes for the same binding site as the Listeria cell surface receptor, leading to the invasion inhibition. Our results demonstrate the potential of sdAb as a new class of therapeutics to protect women from Listeria during pregnancy.

## Poster 3

**Name:** Mohammadreza Movahedin
**Advisor:** Cory L. Brooks
**Affiliation:** Department of Chemistry, California State University Fresno, Fresno, CA, 93740
**Email:** mrezamov@mail.fresnostate.edu

**Title:** *Structural Basis for Antigen Recognition of a Tumor Specific Therapeutic Antibody*

**Abstract:** Monoclonal antibody (MAbs) mediated immunotherapy of tumors is revolutionizing cancer treatment. The specificity of MAbs enables specific targeting of tumor cells. A universal feature of cancer cells is aberrant protein glycosylation. Changes in the glycosylation pattern results in exposure of new and truly tumor specific epitopes that are attractive targets for therapeutic MAbs. MUC1 is a mucin family membrane glycoprotein found in epithelial cells. During neoplastic transformation a region of MUC1 exhibits truncated glycosylation, exposing a peptide sequence and truncated carbohydrate structures. The aberrantly glycosylated MUC1 is overexpressed in the majority of adenocarcinomas. MAb-AR20.5 is a therapeutic antibody currently undergoing clinical development for treatment pancreatic cancer. The antibody was generated by immunization with cancer derived MUC1. The antibody binds to a peptide epitope within MUC1, however the molecular details of this interaction and the role of antigen glycosylation are uncharacterized. To further our understanding of this antibody antigen interaction, we have purified and crystallized the Fab fragment of AR20.5 in complex with a MUC1 peptide. We have cultured the AR20.5 hybridoma in a large quantities. Using papain digestion and cation exchange chromatography we have purified Fab fragments from IgG, for binding and structural studies. We have grown crystals of AR20.5 Fab in complex with peptide that diffract to 2.2 Å. The Fab structures reveal the nature of the interaction. Ultimately by understanding epitope recognition and the effects of antigen glycosylation we seek to improve antibody affinity and specificity.

## Poster 4

**Name:** Nafisa Jaghuri
**Affiliation:** www.webmd.com
**Email:** njaghuri@gmail.com

**Title:** *Digital Mammograms: A Clearer Picture*

**Abstract:** Breast cancer is the second most common cancer in women in the U.S. It is second only to skin cancer. Fortunately, deaths caused by breast cancer have declined over the past 20 years. Many experts believe this is, in part, a result of improved screening and treatment techniques. Mammograms are the preferred diagnostic test to find breast cancer in its early stages. They do this by using X-rays to scan the breasts for cancer.

For many years, the only option was mammograms that record images of the breast on film. Now, digital mammograms are available. Digital mammograms store and analyze the information using a computer.
All mammograms work by sending X-rays through the breast tissue to obtain images. These pictures are then analyzed for abnormalities and assessed for changes from previous tests. Whether your doctor recommends a film or digital mammogram, the experience will be the same.

To get the best images possible in either a film or digital mammogram, the technologist needs to flatten and compress the breasts before taking images. Breasts will be flattened between two special plates before X-rays are used to take the image. For both types of mammograms, the entire test lasts about 20 minutes.

In a digital mammogram, X-rays are still used. But they are turned into electric signals that can then be stored in a computer. This is similar to the way digital cameras take and store pictures.

*http://www.webmd.com/breast-cancer/digital-mammograms-a-clearer-picture*

## Poster 5

**Name:** Tsigereda Mulugeta
**Affiliation:** California Health Science University, Clovis, CA
**Email:** Rosetaye@gmail.com

**Title:** *Symptoms of Breast Cancer and its Treatments*

**Abstract:** Breast cancer has different types of symptoms such as lumps or mass in the Breast tissue, swelling, skin change and nipple discharge other than Brest milk. Breast cancer is cancer that forms in cell of the Breast. Breast cancer is the common cancer that mostly happens to the women between the ages of 45 to 50. There are different types of Breast cancer which mainly occurs in two broad categories: Non-invasive and invasive. Invasive Breast cancer is the cancer that the cancerous cell breaks through normal tissue barriers and spread to other parts of the body through the bloodstream and lymph.

Non Invasive Breast Cancer is the cancerous cells remain in a particular location of the breast without spreading to surrounding tissue. Having the understanding of the types of breast cancer and their symptoms will help how to treat the cancerous cell as early as possible with advanced types of medical treatment. There are different types of advanced medical treatments such and the most common treatments are radiation, surgery and chemotherapy. Radiation therapy uses X-ray or radioactive substances to destroy the cancer cell; surgery is used to diagnose, stage and treat cancer and Chemotherapy is the use of anticancer drugs, which targeted to slow the fastest growth of the cancer cell throughout the body. Receiving all the necessary treatments following by early diagnose of breast cancer may save many of our mothers' life.

## Poster 6

**Name:** Samariah Bautch
**Advisor:** Cory L. Brooks
**Affiliation:** Department of Chemistry, California State University Fresno, Fresno, CA, USA, 93740
**Email:** bautchsm@mail.fresnostate.edu

**Title:** *Stability and Proteases Resistance of Camelidae Nanobodies for the Development of Oral Therapeutics*

**Abstract:** An illness affecting approximately 1600 people per year, the effects of Listeriosis can be devastating. According to the CDC, it results in 260 deaths annually in the United States. Due to its ability to cross the placental barrier, it is especially harmful when it infects pregnant women and their unborn child. This study aims to develop oral therapeutics that can target the disease. The immune systems of camels, alpacas and llamas produce a unique heavy chain only antibody. By cloning the variable region of these antibodies, the smallest known antigen-binding fragment, the nanobody, is produced. The unique binding sites of nanobodies have the ability to bind epitopes typically unavailable to traditional antibodies such as cavities on protein surfaces. In addition, they have unusually high affinity and stability. We have isolated five nanobodies that potentially inhibit Listeria colonization of cells, and present the potential for a new type of Listeria therapeutic. To develop effective pharmaceuticals that block Listeria infection, understanding the stability of the nanobodies in the conditions of the human body would be highly beneficial. To this end, we are examining the resistance of the nanobodies to the digestive proteases trypsin, chymotrypsin and pepsin using gel shift assays. We are also investigating the stability of the nanobodies using the ThermoFluor assay and differential scanning calorimetry. The results obtained from this study will guide future development of these nanobodies as oral therapeutics for treatment of Listeria.

## Poster 7

**Name:** Sami M.R Al-Jabban
**Advisor:** Qiao-Hong Chen, Ph.D.
**Affiliation:** California State University, Fresno
**Email:** soum000@mail.fresnostate.edu

**Title:** *Synthesis and Evaluation of Quercetin Derivatives as Anti-Prostate Cancer Agents*

**Abstract:** Prostate cancer is the most common diagnosed invasive cancer in American men and is the second leading cause of cancer-related deaths after lung. Although there are several therapies successful in treating early, localized stage prostate cancer, current treatment of advanced metastatic castration-resistant prostate cancer remains ineffective due to inevitable progression of resistance to first-line treatment with docetaxel. The natural product quercetin (3,3',4',5,7-pentahydroxyflavone), a flavonoid compound ubiquitous in plant food sources, possesses evidenced potential in treating advanced metastatic castration-resistant prostate cancer. However, its poor bioavailability and moderate potency hinder its advancement into clinical therapy. We aim to design and synthesize quercetin derivatives with improved potency and a better pharmacokinetic profile for the treatment of advanced metastatic prostate cancer. We started this project with creating a small library of alkylated derivatives of quercetin for in vitro evaluation of their cytotoxicity towards androgen-independent PC-3 and DU-145 prostate cancer cell lines. The biological data and chemical properties from literature on quercetin derivatives directed us to design trialkylated quercetins as our first batch of targets. These targets were semi-synthesized from commercially available quercetin via one step reaction. In this poster, we will present the design, synthesis, and cytotoxicity against PC-3 and DU-145 prostate cancer cells of the trialkylated quercetins.

## Poster 8

**Name:** Gordon Won
**Email:** gordonwon@yahoo.com

**Title:** *Effects of Smoking Cessation on COPD*

**Abstract:** Smoking is considered a major cause for chronic obstructive pulmonary diseases(COPD) such as bronchitis, emphysema, and pneumonia. Smoking is also a causal factor for asthma, a restrictive pulmonary disease, for acute and chronic stages of this disease. Asthma and COPD can be life-threatening. Pharmacists are using inhaled corticosteroid drugs to lessen damaging effects of asthma and COPD. Smoking cessation programs of asthma and COPD sufferers should be advised by their physicians and pharmacists.

## Poster 9

**Name:** William Whalen
**Affiliation:** California State University, Fresno
**Email:** williamwhalen@mail.fresnostate.edu

**Title:** *Novel Methods for 3D Spheroid Cultures Using MDA-MB-231 Breast Cancer Isogenic Variants*

**Abstract:** Traditional cell culture techniques grow cells in a 2D format on compatible surfaces, but cells do not grow like this in vivo. A fast emerging alternative is 3D cell culture, which encourages cells to work together while suspended in a matrix rather than relying on adhesion to a treated surface. Most studies utilize a commercially available, industry standard recombinant basement membrane substitute---Matrigel®; however, this is proprietary and expensive. For these studies, our goal was to refine an alternative to Matrigel® for use as a suspension media. Our efforts focused on economical Methocel (methylcellulose dissolved into basal growth media) in combination with rat-tail collagen (Type I). Methocel allowed the formation of spheroids among several cell lines including all three isogenic variants of a triple-negative metastatic breast cancer cell line, MDA-MB-231, notoriously difficult to get into spheroid culture.

While not required for all cell lines, the addition of collagen (Type I) greatly increased the efficacy of spheroid formation among all cell lines. Once harvested, spheroids were suspended within a Methocel-collagen gel. Cultures were treated with various drugs which included: bisphosphonates (Ibandronate and Zoledronic acid) and a second line chemotherapeutic drug (Docetaxol). The effectiveness of these drugs to inhibit metastasis of the MDA breast cancer variants through a surrogate extracellular matrix was determined by the degree, or lack there of, of invasion. Ultimately, this cost effective model system allows for an in vivo-like microenvironment in which to study tumor development and metastasis with the simplicity and replicability of in vitro methods.

## Poster 10

**Name:** Andrew J. Hoppenrath [1], Michael Phillips [1], Timothy J Maher [2], Ahmmed Ally [3]
**Advisor:** Cory L. Brooks
**Affiliation:** [1] South College School of Pharmacy, Knoxville, TN, USA; [2] Pharmaceutical Sciences, Massachusetts College of Pharmacy & Health Sciences University, Boston, MA, USA, [3] California Health Sciences University, Clovis, CA, USA
**Email:** aally@chsu.org

**Title:** *Inducible Nitric Oxide Synthase (iNOS) Blockade Within the Ventrolateral Medulla Differentially Modulates the Exercise Pressor Reflex in Stroke Rats*

**Abstract:** We have previously shown that blockade of neuronal nitric oxide synthase (nNOS) within the rostral (RVLM) and caudal ventrolateral medulla (CVLM) differentially modulates cardiovascular responses via changes in extracellular glutamate and GABA concentrations during static skeletal muscle contraction. Using left-sided stroked rats in this study, we determined if microdialyzing a specific iNOS antagonist into the left RVLM and/or the left CVLM would alter cardiovascular responses during static muscle contraction commonly known as the *Exercise Pressor Reflex*. Rats were stroked by employing a 90-minute left-sided middle cerebral artery occlusion (MCAO) followed by 24 hours of reperfusion. In protocol 1, microdialysis of a selective iNOS antagonist, aminoguanidine (AGN; 10 μM) for 120 minutes into the left RVLM significantly attenuated cardiovascular responses during a static muscle contraction compared to those induced in intact rats. In Protocol 2, application of AGN into the left CVLM significantly potentiated the cardiovascular responses during muscle contractions. Finally, in Protocol 3, administration of AGN simultaneously into both the left RVLM and left CVLM produced results similar to those observed with Protocol 1. These results demonstrate that blockade of iNOS within the two regions of the ventrolateral medulla differentially modulates cardiovascular responses during static exercise in stroked rats.

## Poster 11

**Name:** Ahmmed Ally [1] and Timothy J Maher [2]
**Affiliation:** [1] South College School of Pharmacy, Knoxville, TN, USA; [2] Pharmaceutical Sciences, Massachusetts College of Pharmacy & Health Sciences University, Boston, MA, USA.
**Email:** aally@chsu.org

**Title:** *Effects of Neuronal NOS Blockade Within the Ventrolateral Medulla on Cardiovascular Responses During Static Skeletal Muscle Contraction in Stroke Rats*

**Abstract:** We have previously shown that blockade of neuronal nitric oxide synthase (nNOS) within the rostral (RVLM) and caudal ventrolateral medulla (CVLM) differentially modulates cardiovascular responses via changes in glutamate and GABA concentrations during static skeletal muscle contraction (Brain Res. 977: 80-89, 2003). In this study, we determined if microdialyzing a specific nNOS antagonist into the left RVLM or the left CVLM and into both the left RVLM and CVLM would affect cardiovascular responses expression during the exercise pressor reflex in left-sided stroked rats. Rats were stroked by employing a 90 minute left-sided middle cerebral artery occlusion (MCAO) followed by 24 hours of reperfusion. In protocol 1, microdialysis of a selective nNOS antagonist, 1-(2-trifluoromethylphenyl)-imidazole (TFMP, 1.0 microM), for 120 min into the left RVLM significantly potentiated cardiovascular responses during a static muscle contraction compared to intact rats. In Protocol 2, application of TFMP into the left CVLM significantly attenuated cardiovascular responses during muscle contractions. Finally, administration of TFMP into both the left RVLM and left CVLM produced results similar to those observed with Protocol 1. These results demonstrate that blockade of nNOS within the ventrolateral medulla differentially modulates cardiovascular responses during static exercise in stroked rats.

## Poster 12

**Name:** Patty Fan-Havard, PharmD
**Affiliation:** The Ohio State University and California Health Sciences University
**Email:** phavard@chsu.org

**Title:** *Placental ß-Catenin Using Morphometric Analysis of Tissue Microarray Sections in Women with Gestational Diabetes, HIV and Normal Healthy Pregnancies*

**Abstract:** Gestational diabetes mellitus (GDM) is associated with a significant decrease in both placental *ß*-catenin and VE-cadherin expression and enhanced endothelial permeability. Protease inhibitors (PIs)-based antiretroviral therapy (ART) has been associated with insulin resistance. The purpose of the study is to examine the expression of placental *ß*-catenin in (1) HIV-positive; (2) GDM, and (3) healthy mothers using tissue microarray technology and morphometric analyses.

Placental tissues were obtained from pregnant women >18 years old with (1) HIV-infection, (2) GDM diagnosed during the present pregnancy, or (3) uncomplicated singleton pregnancies. Consecutive TMA sections were stained with an anti-*ß*-catenin antibody. Two methods were used to quantitate *ß*-catenin expression: 1) Manual visual inspection by a placental pathologist using a 3-point qualitative scale (0 = negative; 1 = weakly positive; and, 2 = strongly positive); and, 2) Positive Pixel Count Algorithm using morphometric parameters that included number of pixel counts (N) and intensity (I) for weak positive (wp), positive (p), and strong positive (sp). All measurements were corrected for area counted. One-way ANOVA analysis was used to compare the difference in *ß*-catenin expression between the three groups. Significance was set at $p<0.05$.

A decrease in the mean intensity visual score was observed for placental *ß*-catenin from GDM and HIV-positive women ($p>0.05$). In contrast, a significant decrease in the quantitation of *ß*-catenin was achieved using morphometric analysis ($p<0.001$).

Our data suggest a significant decrease in placental *ß*-catenin expression from HIV-infected women by morphometric analyses, unrelated to the mechanism of GDM.

## Poster 13

**Name:** Patty Fan-Havard, PharmD
**Affiliation:** The Ohio State University and California Health Sciences University
**Email:** phavard@chsu.org

**Title:** *Aperio Imagescope Algorithm Is A More Sensitive Tool In Detecting Differences In IHC Staining Intensity of the Placental Vasculature as Compared with Visual Scoring by a Clinical Pathologist*

**Abstract:** The gold standard for interpreting immunohistochemistry (IHC) stains relies on the subjective visual score made by an experienced pathologist. Computational analysis of IHC staining may offer greater sensitivity and reliability in detecting changes in protein expression. The aim of this study is to assess and compare these techniques in their ability to detect differences in protein expression of ß-catenin and VE-cadherin within the placental vasculature.

Tissue-micro-arrays were created from cores of placental samples from healthy mothers (control), gestational diabetic mothers (GDM), and mothers being treated for HIV (n=68) and IHC stained for ß-catenin or VE-cadherin. Fetal capillaries were selected and analyzed for protein staining by visual inspection and Aperio ImageScope Positive Pixel Count Algorithm, which respectively yielded a visual score and pixel count, based on the following scale: 1–negative; 2–weakly positive; 3–positive; and, 4–strongly positive.

Using ANOVA analysis, significant correlations were found between visual score and strong positive pixel count ($p<0.05$) as well as intensity ($p<0.05$) for ß-catenin and VE-cadherin. Computer-aided analysis was able to detect significant differences between ß-catenin expression of GDM ($p<0.05$) and ($p<0.05$) groups from control in contrast to visual scores.

Our preliminary data suggest that while visual scores and Aperio's analyses are correlative, the computer-aided quantitative method may be more sensitive in the detection of differences between exposure groups than visual examination by a clinical pathologist.

## Poster 14

**Name:** Mark Wienhold [1] and Kalyan Munshi [2]
**Advisor:** Kalyan Munshi, PhD.
**Affiliation:** [1] St Cloud State University, St. Cloud, MN, USA; [2] California Health Sciences University, Fresno, CA, USA
**Email:** kmunshi@chsu.org

**Title:** *A Novel One Pot Synthesis of a Potential Bioactive Molecule Betulone & its Analogs*

**Abstract:** Throughout the history of medical practices, numerous natural products and their extracts are widely used for curing/treating several human diseases. During the last two decades, research and development in triterpenoid-based natural products revealed remarkable biological activity of this particular class of plant metabolite. Recent studies on their biological and pharmaceutical properties identified them as a new class of non-toxic, antiviral and antibacterial agents with a novel mechanism of drug action. Ongoing pre-clinical and clinical tests of some novel triterpenoids e.g., Betulin, Betulinic Acid, Betulin 3-caffeate etc. have exhibited their strong anti-cancer and anti-HIV activity in vitro and in vivo. The prominent bioactivity of a naturally occurring, trace-abundant, triterpene molecule 'Betulone' has also indicated the bright perspective of its potential application in design and synthesis of triterpenoid-based antiviral chemotherapeutics, and created a solid platform for synthesizing Betulone and Betulone-based antiviral libraries. The ultimate goal of this research project is to develop a novel short pathway for the successful synthesis of Betulone and its derivatives. The logic of total synthesis vs. semi-synthesis with an emphasis on selective oxidation has been explained and evaluated. Application of modified Cannizzaro Reaction has been discussed in detail. The scale-up method developments and one-pot synthesis (simultaneous production) for another valuable antiviral drug precursor (Betulonic Acid) has also been described. Finally, the strategic design and designed synthesis for Betulone analogs as well as study on their SAR has concisely been outlined.

## Poster 15

**Name:** Chandra Kolli, PhD
**Affiliation:** California Health Sciences University, Fresno
**Email:** ckolli@chsu.org

**Title:** *Transdermal Delivery Using Solid Metalic Microneedles*

**Abstract:** OBJECTIVE: The feasibility of delivering nicardipine hydrochloride (NH) using solid metallic microneedles was investigated and skin irritation studies were performed. Permeation using microneedles was compared with passive delivery and with iontophoresis used in conjunction.

METHODS: Skin permeation studies were conducted using dermatomed human skin mounted over Franz diffusion cells. Donor solution was composed of 10 mg/ml of nicardipine hydrochloride in pH 4.0 citrate buffer containing 20 % ethanol and 125 mM NaCl. Skin was porated using microneedles varying lengths (1000, 500 and 200 µm). Anodal iontophoresis was employed using Ag/AgCl electrodes at a current of 0.5 mA/cm2. Laser Doppler (LDV) and Transepidermal water loss (TEWL) measurements were considered for monitoring irritation.

RESULTS: Passive flux of NH (1.30 µg/cm2/hr) was less compared to microneedles (6.43 µg/cm2/hr), iontophoresis (40.2µg/cm2/hr) or combined strategy (58.9µg/cm2/hr). Among the microneedles tested, 500 µm long needles were found to have better flux values compared to the rest. This combined strategy also reduced the lag time (30 min) when compared to iontophoresis (1 hr) or microneedles alone (6 hr) or passive (8 hr). Percentage change from base value for TEWL and LDV was monitored for assessment of skin irritation. There was an increase in LDV (93%) and TEWL (218%) values within 30 minutes following poration but the values returned to base value within 75 min.

CONCLUSION: Results show improved flux with microneedles used in conjunction with iontophoresis as compared to passive diffusion or by using microneedles or iontophoresis alone.

## Poster 16

**Name:** Mohamed Traore [1] and Kalyan Munshi [2]

**Affiliation:** : [1] University of Minnesota, Minneapolis, MN, USA; [2] California Health Sciences University, Fresno, CA, USA

**Email:** kmunshi@chsu.org

**Title:** *Strategic Design and Semi-synthesis of a New Class of Pharmaceutically Interesting Antiviral Drug Precursors from Triterpenoid-based Natural Products*

**Abstract:** One of the burning questions of 21st century seems to be the right choice for combating against the deadly threats of fatal viral replications of different etiology. Although modern research and developments in parallel and combinatorial synthesis for antiviral drug discovery contributed a lot in this direction and invented several antiviral drugs; however, their wide use in clinical practice is often quite limited due to the high toxicity and quick growth of viral drug resistance.

One of the effective and trust-worthy trends in contemporary antiviral drug discovery research is to develop a thorough pathway for the strategic design and designed synthesis of natural-products based biologically active molecules and their analogs. Modern research and biological studies in triterpenoid-based natural products have shown the fruitfulness of their clinical use as potential antiviral and antibacterial chemotherapeutics. Ongoing biological tests of some novel triterpenoids e.g., Betulin, Betulinic acid and Betulonic Acid already indicated the perspectives of these natural products as potential drug precursors and opened a new avenue for design and synthesis of a new class of highly efficacious anti-cancer and anti-HIV agents based on natural products. The main objective of this research project is to design a novel series of potential antiviral agents from Betulonic Aldehyde and Betulonic Acid and carrying out designed synthesis through several new key-intermediates. The second phase of the project will be followed by the characterization and study on structure-activity relationship, including the evaluation of their biological activity.

In our presentation semi-synthesis of Betulonic Aldehyde and Betulonic Acid has concisely been described. Strategic design and synthesis of a new class of pharmaceutically interesting drug precursors has thoroughly been discussed. The logic and feasibility of synthesizing a new generation of non-toxic, triterpenoid-based antiviral libraries has also been outlined.

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