KGI KECK GRADUATE INSTITUTE

15th Annual Keck Graduate Institute Research Symposium

FRIDAY, JANUARY 10, 2020
SMITH CAMPUS CENTER - EDMUNDS BALLROOM
POMONA COLLEGE, CLAREMONT, CA

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- Western University of Health Sciences
- City of Hope
- Marshall B. Ketchum University
- University of California, Berkeley
- University of California, Los Angeles
- St. Joseph Health
- University of California, Irvine

Agenda

Time	Topic Title/Presenter
7:30 a.m. – 8:15 a.m.	**Registration and check-in**
7:45 a.m. – 8:15 a.m.	**Continental breakfast**
8:15 a.m. – 8:20 a.m.	**Opening remarks** Srikanth Kolluru, Symposium Chair; Associate Dean of Assessment and Faculty Development, Professor, and PhD Program Director, KGI
8:20 a.m. – 8:25 a.m.	**Welcome** Sheldon Schuster, President and Professor, KGI
8:25 a.m. – 8:30 a.m.	**KGI research** Larry Grill, Dean of Research, KGI
Session 1 (8:30 a.m. – 10:10 a.m.)	**Chair: Abrar Al Maghribi**, PhD Student, KGI
8:30 a.m.– 9:30 a.m.	**Keynote speaker Helge Zieler, PhD,** Founder and President, Primordial Genetics *Function Generator: improvement of microbes and enzymes with combinatorial gene fusion libraries*
9:30 a.m. – 9:50 a.m.	**Carl Decker,** PhD Candidate, KGI *Doxorubicin-Induced Mitochondrial Remodeling and Metabolic Programming*
9:50 a.m. – 10:10 a.m.	**Vishwanath Venketaraman, PhD**, Professor, College of Osteopathic Medicine of the Pacific, Western University of Health Sciences *Host-directed therapies for tuberculosis*
10:10 a.m. – 10:30 a.m.	**Break**
Session 2 (10:30 a.m. - 11:50 a.m.)	**Chair: Jonalyn Herce,** PhD student, KGI
10:30 a.m. – 10:50 a.m.	**Rakesh Tiwari, PhD,** Assistant Professor of Biopharmaceutical and Biomedical Sciences, Chapman University School of Pharmacy *Development of Amphipathic Cyclic Peptides as Antimicrobial Agents against Resistant Pathogenic Bacteria*
10:50 a.m. – 11:10 a.m.	**Derick Han, PhD**, Associate Professor of Biopharmaceutical Sciences, KGI School of Pharmacy and Health Sciences *Mitochondria: the good, the bad, and the intriguing*
11:10 a.m. – 11:30 a.m.	**Nixon Mwebi, PhD**, Professor, Chemistry; Department Chair of Chemistry, University of La Verne *Effect of Adding milk on antioxidant potential of Tea*
11:30 a.m. – 11:50 a.m.	**Animesh Ray, PhD**, Professor, KGI Henry E. Riggs School of Applied Life Sciences *Exosome-mediated MIR211 modulates tumor microenvironment via the DUSP6-ERK5 axis and contributes to BRAFV600E inhibitor resistance in melanoma*
Session 2 Parallel Session (10:30 a.m. – 11:15 a.m.) Hart Room, Second Floor Room 201	**Chair: Kerry Anne Rambaran, PharmD, BCPS**, Assistant Professor of Clinical Sciences, KGI

Agenda

Time	Topic Title/Presenter
10:30 a.m. – 11:15 a.m.	**Steve Casper, PhD**, Dean of the Henry E. Riggs School of Applied Life Sciences; Henry E. Riggs Professor of Management, KGI **George Bradford**, Director of Instructional Design and Development, KGI *Teaching Critical Thinking Across Disciplines and Learning Modalities*
11:50 a.m. – 12:15 p.m.	**Symposium group picture** (outside in the courtyard near the fountain)
12:15 p.m. – 2:40 p.m.	**Lunch, poster session, vendor fair, and raffle drawing** **Poster Session Chairs:** Payam Amiri, PhD student, and Carl Decker, PhD Student, KGI **Poster Categories:** • Basic Sciences/Mechanisms of Disease: Posters 1–14 • Biomanufacturing: Posters 16-18 • Drug Discovery and Development: Posters 19–30 • Healthcare: Posters 31–48 • Medical Devices and Diagnostics: Posters 49–53 • Scholarship of Teaching and Learning: Posters 54–55
12:45 p.m. – 1:30 p.m.	Even poster number presenters are required to stay at their posters
1:30 p.m. – 2:25 p.m.	Odd poster number presenters are required to stay at their posters
2:25 p.m. – 2:40 p.m.	**Sponsorship recognition and raffle drawing**
Session 3 (2:40 p.m. – 4:20 p.m.)	**Chair**: **Joshua Yang**, PhD student, KGI
2:40 p.m. – 3:00 p.m.	**James Sterling, PhD**, Professor, KGI *Electrophoresis and Ion-pairing in Cell Biology*
3:00 p.m. – 3:20 p.m.	**Payam Amiri**, PhD Candidate, KGI *The Development of a Microfluidic Organ-on-a-Chip to Explore the Effects of Young and Old*
3:20 p.m. – 3:40 p.m.	**Angelika Niemz, PhD**, Arnold and Mabel Beckman Professor, KGI *Point of care infectious disease diagnosis through an integrated and automated nucleic acid testing device*
3:40 p.m. – 4:00 p.m.	**Saurav Datta, PhD**, Assistant Professor, Amgen Bioprocessing Center, KGI *Functionalized Polymeric Membranes for Bioseparation and Biocatalysis*
4:00 p.m. – 4:20 p.m.	**Larry Grill, PhD,** Dean of Research and Research Professor, KGI *Enabling a Rapid Response to Control Diseases*

Time	Topic Title/Presenter
Session 3 Parallel Roundtable Discussions/Podium Session #2 (3:00 p.m. – 4:00 p.m.; Hart Room, Second Floor Room 201)	**Chair: Nathan Vega**, PharmD student, KGI
3:00 p.m. – 3:30 p.m.	**Armen Simonian, PharmD**, Assistant Dean and Chair of Clinical and Administrative Sciences, Associate Professor, KGI School of Pharmacy and Health Sciences *Shark Tank meets Hackathon App Competition: A Pharmacy Informatics Active Learning Exercise*
3:30 p.m. – 4:00 p.m.	**Roundtable Session** Facilitator: Daniel Kudo, PharmD, Adjunct Associate Professor, KGI School of Pharmacy and Health Sciences Co-Authors: Tania Stewart, PharmD, FCSHP; Gregory Reardon, PhD, RPh, MS *"A Paucity of Data": Case Studies of Clinical Issues Where Existing Data is Sparse or Non-Existent*
4:20 p.m. – 5:40 p.m.	**Evening Reception** Live music by Dan Kudo, Alex Zambon, and Armen Simonian, faculty from the KGI School of Pharmacy and Health Sciences **Poster and podium contest winner announcements, and raffle drawing**
5:15 p.m. – 5:30 p.m.	**Poster and podium contest winner announcements and raffle drawing**
5:30 p.m. – 5:40 p.m.	**Closing Remarks** **Srikanth Kolluru**, Associate Dean of Assessment and Faculty Development, Professor, and PhD Program Director, KGI

Poster Presentation Listing

*Indicates the Presenting Author

Poster Category: Basic Sciences/Mechanisms of Disease

1. Mechanisms of Brain Endothelial Erythrophagocytosis: Insights into the Pathogenesis of Cerebral Microbleeds

Jiahong Sun*, Prema Vyas, Samar Mann, Sriyansh Yarlagadda, Mark J. Fisher, Rachita K. Sumbria

Keck Graduate Institute

2. Exploring age-related immune cell changes in normal breast tissue

Arrianna Zirbes*, J. Lopez, S. Shalabi, R.W. Sayaman, M.R. Stampfer, T. Chavez, C. Thai, A. Sanchez, J. Calero, B. Jeang, S.J. Priceman, M.A. LaBarge

City of Hope

3. Origin and Distribution of Recurrent CHEK2 and PALB2 Germline Variants Among non-BRCA1/2 Breast Cancer Susceptibility Genes in the Americas

Gubidxa Gutierrez Seymour*, Jeffrey Weitzel

Keck Graduate Institute

4. Microfluidics PaperChromatography (MFPC)

Vendanshi Bhojak*, Wilson Lee, Young Ba

Cal State LA

5. Pharmacokinetics and Safety Profile of a High-Affinity Transferrin Receptor Antibody in Mice

Demi Castellanos*, Jiahong Sun, Joshua Yang

Keck Graduate Institute

6. The Mechanism of Calreticulin Mutant Activation of the Jak-Stat Pathway

Prathyusha Dasari*, Ariel Tang, Jacob Gomez, Eyouab Tadesse, Jamie Liu, Craig W Adams

Keck Graduate Institute

7. Doxorubicin (DxR) Induced Mitochondrial Remodeling and its Effects on Jurkat Cells

Kristelle Gatchalian*, Carl Decker

Keck Graduate Institute

8. Identification of a Receptor for Vegetative Insecticidal Protein in Drosophila melanogaster

Summer O'Brien*, Mikhail Martchenko, Karen Paco, Larry Grill

Keck Graduate Institute

9. The Role of the Retromer in Autophagy and in the Pathogenesis of Parkinson's Disease

Rasha Jaber*, Katerina Venderova, Radek Linhart

Keck Graduate Institute

10. Utilizing EMP2 to identify breast cancer patients at risk for metastasis and relapse

Ryan Elshimali*, Madhuri Wadehra, Lynn Gordon

Keck Graduate Institute; UCLA

11. Quantification of mannitol by using an HPLC- ELSD method

Helen Truong*, Rajesh Vadlapatla, Zhijun Wang, Jay Panchal

Marshall B. Ketchum University

12. Identification of the Glucocorticoid Receptor in Drosophila melanogaster

Gloria Bartolo*, Mikhail Martchenko

Keck Graduate Institute

13. Genes involved in adaptive resistance to Erlotinib

Utkarsha Paithane*, Michael De La Cruz, Animesh Ray

Keck Graduate Institute

14. Huntington's Disease Observed Using A Progressive Disease Model in Drosophila Melanogaster

Joseph Nguyen*, Alyssa Selve*, Radek Linhart, Rasha Jaber, Phuong-Lan Nguyen

Keck Graduate Institute

Poster Category: Biomanufacturing

16. Raman Spectroscopy as a PAT tool for monitoring and controlling perfusion cell culture

Christine Urrea*, Hu Zhang

Keck Graduate Institute

17. Investigation of Chromatographic Resin Shape for Gene Therapy Vector Purification Using CFD

Kevin Vehar*, Cameron Bardliving, Hu Zhang

Keck Graduate Institute

18. Determination and Approach to the Cross-Therapeutic Potential of Mesenchymal Stem Cells and Various Naturally-Occurring Plant Molecules

Brian Hogan*, Hu Zhang

Keck Graduate Institute

Poster Category: Drug Discovery and Development

19. The Plasma Pharmacokinetic Profile of a High Affinity Transferrin Receptor Antibody-Erythropoietin Fusion Protein Following Intraperitoneal and Subcutaneous Routes of Administration

Joshua Yang*, Jiahong Sun, and Rachita Sumbria

Keck Graduate Institute

20. NSC-Mediated Delivery of Thymidine Kinase 1 (TK 1) Attenuated Chimeric Oncolytic Orthopoxvirus (CF33) for Targeting TK1 Overexpressing Tumors

Mohamed Hammad*, Connor Burke, Rachael Mooney, Zheng Liu, Yate-Ching Yuan, Thanh Dellinger, Nanhai G. Chen, Jianming Lu, Yuman Fong, Karen S. Aboody

City of Hope

Poster Presentation Listing

21. The Next Generation of Treatments for Rare Neuromuscular Disorders – New Therapies and Pipeline Drugs

Veronica Sanchez*, Ali Hasan, Kacey Egusa, Christine Cadiz

Keck Graduate Institute; City of Hope

22. Cyclodextrin Complexes to Improve Bioavailability of an Anti-rheumatic Remedy Celastrol

Madison Seifer*, Srikanth Kolluru

University of California, Berkley; Keck Graduate Institute

23. Docking of Benznidazole on Various Cyclodextrins

Nathan Vega*, Srikanth Kolluru

Keck Graduate Institute

24. Synthesis of Metabolites and Analogs of Emerging Synthetic Opioids

Emmanuel Freeman*, John Krstenansky

Keck Graduate Institute

25. Compound 21: Novel treatment for Melanoma Brain Metastasis

Eemon Tizpa*, Hannah J. Young, Kimberley-Jane C. Bonjoc, Ammar A. Chaudhry

Keck Graduate Institute

26. Anticancer Activities of Natural Foods

Amir Shirazi*, Kevan Parang

Marshall B. Ketchum University

27. Gadolinium-peptide Complex as Drug Delivery Systems

Amir Shirazi*, Shang Eun Park, Ryley Hall, Sandeep Lohan, Khalid Zoghebi, Shirin Rad, Luiza Baloyan, Dindayal Mandal, Keykavous Parang, Rakesh Tiwari

Marshall B. Ketchum University

28. Tumor targeted delivery of siRNA using fatty acyl conjugates of cell penetrating peptides

Muhammad Imran Sajid*, Nagla Salem El-Sayed Ibrahim, Hamidreza Montazeri Aliabadi, Rakesh K. Tiwari

Chapman University

29. Homochiral L-Cyclic Peptides for Enhanced siRNA Delivery

Amir Shirazi*, Dindyal Mandal, Rakesh Tiwari, Keykavous Parang

Marshall B. Ketchum University

30. Alzheimer's Disease Active Immunotherapy Using the Tobacco Mosaic Virus (TMV) by Targeting a Structural Domain of Pathalogical TAU

Karen Yrene Paco Mendivil*, Larry Grill

Keck Graduate Institute

Poster Category: Healthcare

31. Surgical Site Infection Prevention

Alison Chen*

Keck Graduate Institute

32. A Retrospective Analysis of the Efficacy of Clinical Cardiac Rehabilitation for Patients with Concurrent Coronary Artery Disease (CAD) and Atrial Fibrillation (AF) at Kaiser Permanente - Riverside

Savannah Creel*

Keck Graduate Institute

33. HAPI Days: A Pressure Injury Reduction Initiative

Adnan Attla-Saied*, Elizabeth Winokur, Darcie Peterson

Keck Graduate Institute

34. Pay for Performance Pilot Project

Justin Bolig*

Keck Graduate Institute

35. Prevention of Catheter-Associated Urinary Tract Infection in an Acute Care Hospital

Alhasan Ali Alani*, Tina Retrosi, Virginia Scanlan

Keck Graduate Institute

36. Reducing Door-To-Needle Times for Acute Ischemic Stroke Patients

Soz Mirza*, Michelle Jocson

Keck Graduate Institute

37. Comorbid Type 2 Diabetes and Cardiovascular Disease-Related Mortality in the United States, 2008-2017

Calvin Bron Susbilla*, Noel Barragan, Tony Kuo

Keck Graduate Institute

38. Chronic Kidney Disease related deaths and associated comorbidities in the United States, 2013-2017

Lovleen Kaur Dhaliwal*, Noel Barragan, Tony Kuo, Anastasia Levitin

Keck Graduate Institute

39. Nanofiber-based Scaffold for MSC Culture

Hu Zhang*, Karisa Caso, Sandy Lin, David Ju, Andrew Burns

Keck Graduate Institute

40. Pharmacists' Touch Improves Diabetes Outcomes

Jeany K Jun*, Danielle Tessier*, Dacloc Brandon Nguyen*, Chien Originales*, Mai-Han Dinh

Keck Graduate Institute

41. Improving Patient Satisfaction at Mission Hospital in Mission Viejo

Erick Yeh*, Kopitzee Parra-Thorton

Keck Graduate Institute

Poster Presentation Listing

42. Implementation of Post-Discharge Follow-Up Phone Call Interventions on Heart Failure Patients to Prevent Hospital Readmissions

Eva Wong*, Anh-Thu Ha, Aileen Ingles, Dana N. Rutledge, Patricia Nguyen, Sy Amirpoor

Marshall B. Ketchum University

43. Cardiac Rehabilitation (CR) Retrospective Study: Comparing Efficacy and Outcomes of Home Based CR vs. Clinic Based CR

Ayymen Amaar*, Pennie Coleman, Maria Diestra

Keck Graduate Institute

44. Assessing discrepancies that contribute to an increase in health-systems readmission rates and the impact of continuum of care on post-discharge patients

Stephanie Truc Nguyen*, Ramisha Ali, Jonathan Echeverri, Andrew Shahbazian, Mitchell Timbol, Stephanie Kourtakis, Ethan Hyunh, Victor Law

Keck Graduate Institute

45. The Pharmacist's Role in ending the opioid crisis

Sangwon Park*, Marian Pascual, Sampaguita Salabao, Veronica Sanchez

Keck Graduate Institute

46. Improving patient Perioperative Care and promoting home discharge at POD1 through the implementation and execution of Enhanced Recovery After Surgery (ERAS) methods in Total Joint Replacement (TJR) surgeries at Emanate Health

Candy Carillo*, Sajid Sindha

Keck Graduate Institute

47. Statin Therapy in the Elderly: The Risk Benefit Controversy

Carolyn Saba*, Cassie Lee, Rachel Kim, Utsav Shah

Keck Graduate Institute

48. Distinctive Cellular Response to Aluminum-Based Adjuvants

Krisha Hidalgo*, Issac Nies, Arezoo Campbell, Stephen Bondy

Western University of Health Sciences; UC Irvine School of Medicine

Poster Category: Medical Devices and Diagnostics

49. Point-of-Care Pathogen Identification of Urinary Tract Infections Using Diauxic-like Batch Multiplexing

Steven Lee*, Travis Schlappi, Tochukwu Dubem Anyaduba

Keck Graduate Institute

50. Primer-payload Systems for Multiplex Isothermal Nucleic-acid Amplification

Tochukwu Dubem Anyaduba*, Travis Schlappi

Keck Graduate Institute

51. Understanding the Role of Old and Young Blood - Derived Exosomes in Aging

Jonalyn Herce*, Kiana Aran

Keck Graduate Institute

52. Point of Care Infectious Disease Diagnosis via Isothermal Nucleic Acid Amplification Integrated into a Sample to Answer Device

Abrar Al Maghribi*, Abrar AL-Adhmi, Angela Sun, Hsiang-Wei Lu, Katlin Wilson, Adison Drewery, Rama Sakamuri, Angelika Niemz, Hua Wei Chen, Tania Maldonado, Gabriel Defang, Shuenn-Jue Wu

Keck Graduate Institute

53. Infectious Disease Diagnosis via Nucleic Acid Testing: Process Development and Device Integration

Abrar Al-Adhmi*, Abrar Al Maghribi, Angela Sun, Hsiang-Wei Lu, Katlin Wilson, Elizabeth Celaya, Adison Drewery, Rama Sakamuri, Angelika Niemz, Hua Wei Chen, Tania Maldonado, Gabriel Defang, Shuenn-Jue Wu

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Poster Category: Scholarship of Teaching and Learning

54. A Sustainable Mentoring Program for Students

Daniel Kudo*, Neiloo Jafari, Gregory Reardon

Keck Graduate Institute

55. Assessing students' experience and perception about podium presentations at the Inaugural AAAS Pacific Division-AACP Students' Symposium: a descriptive study

Eva Wong*, Jozef Stec, Charitha Madiraju, Ronny Priefer

Marshall B. Ketchum University

Keynote Speaker

Helge Zieler, PhD

Founder and President, Primoridal Genetics Team

Helge Zieler founded Primordial Genetics in 2011 with the goal of building the premier company for genetic improvement of microbes. He is a biotechnology professional and entrepreneur with 14 years of industry experience in technology development, R&D project leadership, and IP development/management in early-stage biotechnology companies. He has a passion for early-stage genetic technologies, and has helped launch the operations of multiple biotech startups including Akkadix, Chromatin, Synthetic Genomics, Agradis, Primordial Genetics, and Industry3200.

Zieler's background combines strong technical skills in molecular biology, genomics, plant and algal biotechnology, and synthetic biology with entrepreneurism and R&D project leadership. He did his doctorate work in yeast molecular genetics in Nobel laureate Paul Berg's laboratory at Stanford University's famed Biochemistry department and received his PhD in 1994.

Following an interest in malaria research, he then did his postdoctoral work in the Laboratory of Parasitic Diseases at the National Institutes of Health. Starting in 2000, Zieler worked on a variety of projects in crop plant biotechnology and genomics. He led a group at Chromatin, Inc. that successfully developed artificial chromosomes as gene delivery vehicles in multiple crop species. As Senior Director for Plant Genomics at Synthetic Genomics Inc, he spearheaded efforts to sequence the oil palm and jatropha genomes and set up a molecular breeding project for castor improvement, while also participating in metagenomic studies of microbial populations in subsurface hydrocarbons.

Podium Presentation Abstracts

Session 1 (8:30 a.m. – 10:10 a.m.)

8:30 a.m. – 9:30 a.m. - Keynote Speaker

Function Generator: improvement of microbes and enzymes with combinatorial gene fusion libraries

Helge Zieler, PhD, Founder and President, Primordial Genetics

Primordial Genetics Inc. has developed Function Generator™, a novel combinatorial gain-of-function genetic technology designed to enhance productivities of microbes used for the production of proteins (therapeutic proteins, industrial enzymes) and chemicals/fuels/pharmaceuticals. Function Generator™ is capable of dramatic improvement of productivities, tolerances, and growth characteristics in production organisms to achieve economic and sustainable biological production systems.

9:30 a.m. – 9:50 a.m.

Doxorubicin-Induced Mitochondrial Remodeling and Metabolic Programming

Carl Decker, PhD Candidate, Keck Graduate Institute

Doxorubicin was administered to a Jurkat cell culture in concentrations of 1.0ÂµM, 1.25ÂµM, 1.50ÂµM for an treatment interval of 24 hours. Western blot analysis revealed a considerable increase in all electron transport chain (ETC) complexes in DxR treated cells compared to control, with ATP Synthase (Complex V) demonstrating a significant 10-fold increase in expression. The GTPase proteins responsible for the fusion of the outer mitochondrial membrane, Mfn-1,2, were found to have reduced abundance, while DRP-1, responsible for mitochondrial fission, was shown to be increased. Data collected through the use of a Clark-type oxygen electrode suggested that DxR treated cells respire at an increased rate relative to control (an approximately 3x increase), while comparable respiratory control ratios for DxR treated and control cells (2.9 and 2.94, respectively) appear to indicate tight mitochondrial coupling. RT-PCR showed a significant decrease in DRP-1 expression from control to 1.0 ÂµM of DxR and a significant increase in Mfn-2 and OPA-1 expression from control to 1.0 ÂµM Â Taken together, our data indicate that mitochondrial oxidative phosphorylation, normally de-emphasized in cancer cell physiology, is employed at greatly increased rates under DxR treatment.

9:50 a.m. – 10:10 a.m.

Host-directed therapies for tuberculosis

Vishwanath Venketaraman, PhD, Professor, College of Osteopathic Medicine of the Pacific, Western University of Health Sciences

Background and objectives: Mycobacterium tuberculosis (M. tb), the etiological agent that is responsible for causing tuberculosis (TB), continues to affect millions of people worldwide. Glutathione (GSH), a biological antioxidant has been shown to have direct antimycobacterial effects. GSH enhancement also improved the ability of natural killer cells and T cells to control M. tb infection inside macrophages. Furthermore, HIV positive subjects and individuals with type 2 diabetes (T2DM) have been shown to have compromised levels of GSH due to diminished levels of enzymes involved in the synthesis of GSH. Further studies demonstrated that supplementation of HIV-positive subjects with liposomal GSH for three months restored the levels of GSH, induced cytokine and redox balance, and improved intracellular control of M. tb infection. We recently tested if N-acetyl cysteine (NAC, the precursor molecule for the synthesis of GSH) when supplemented in combination with suboptimal levels of standalone first-line antibiotics would be sufficient to completely clear M. tb infection within in vitro derived granulomas from healthy subjects and individuals with type 2 diabetes (T2DM). Results: Our results revealed that by virtue of immune modulation, the addition of NAC to subprime levels of isoniazid (INH) and rifampicin (RIF) was indeed capable of inducing complete clearance of M. tb among healthy individuals. Furthermore, in healthy individuals, NAC promotes the formation more solid and stable granulomas, as well as increased acidification of M. tb inhabited phagosomes. Addition of NAC also resulted in a significant reduction of M. tb burden in diabetic individuals. Conclusion: NAC can be advantageous as a prophylactic adjunct to first-line antibiotics, bolstering cytokine modulation, as well as the reduction and clearance of M. tb infection. Therefore, we believe that enhancing GSH by means of NAC supplementation in the antibiotic treatment of TB would not only reduce the toxicity of anti-TB medications through GSHâ€™s redox potentiality, but permit lessening the required antibiotic dosages to confer mycobacterial clearance, which could promote enhanced treatment compliance and circumvent the emergence of drug resistant strains of M. tb.

Session 2 (10:30 a.m. – 11:50 a.m.)

10:30 a.m. – 10:50 a.m.

Development of Amphipathic Cyclic Peptides as Antimicrobial Agents against Resistant Pathogenic Bacteria

Rakesh Tiwari, PhD, Assistant Professor of Biopharmaceutical and Biomedical Sciences, Chapman University School of Pharmacy

The increasing number of multi-drug resistant pathogens created a global issue of antimicrobial resistant due to overuse of antibiotics. As a result, the discovery of newer classes of drugs is vital to alleviate infectious diseases caused by resistant microbial strains. Antibacterial peptides are an emerging class of antibacterial agents against multidrug-resistant pathogenic bacteria. Previously, cyclic peptide [R4W4] containing positively-charged arginine (R) and hydrophobic tryptophan (W) residues had antibacterial activity with a minimum inhibitory concentration (MIC) value of 4 Âµg/mL against methicillin-resistant Staphylococcus aureus (MRSA) and 42 Âµg/mL against Pseudomonas aeruginosa (PSA). We selected cyclic peptide [R4W4] as a lead compound for the development of effective broad-spectrum antimicrobial agents. Structure activity-relationships (SAR) were performed to optimize the antibacterial activity of the cyclic peptide by modification in the amino acid residues, increasing the number of residues, conjugation with classical antibiotics (levofloxacin), and with fatty acylation. All the peptides were synthesized using Fmoc-based solid-phase chemistry, characterized by Matrix-Assisted Laser Desorption/Ionization Time-of-Flight mass spectroscopy (MALDI-TOF), and purified with high-performance liquid chromatography (HPLC). The antimicrobial activities were evaluated using microbroth assay to determine MICs of synthesized compounds against MRSA, Klebsiella pneumoniae carbapenemase producing strains (KPC), Pseudomonas aeruginosa (PSA), and Escherichia coli using meropenem and vancomycin as positive controls. The stability and cytotoxicity of synthesized peptides were evaluated against human serum, human red blood cells, and normal human embryonic kidney cells (HEK-293). This presentation will provide overview of optimized antimicrobial peptides, which could be used as potent antimicrobial agents against resistant pathogens.

10:50 a.m. – 11:10 a.m.

Mitochondria: the good, the bad, and the intriguing

Derick Han, PhD, Associate Professor of Biopharmaceutical Sciences, KGI School of Pharmacy and Health Sciences

Mitochondria play a central role in life but also have also been implicated in aging and many diseases. Recent work down in my lab suggest that mitochondria are very dynamic in the liver and alter in response to metabolic changes. These mitochondrial alterations triggered by metabolic changes may play an important role in adaptation but may also mediate liver disease.

11:10 a.m. – 11:30 a.m.

Effect of Adding milk on antioxidant potential of Tea

Nixon Mwebi, PhD, Professor, Chemistry; Department Chair of Chemistry, University of La Verne

Tea is the second most consumed beverage across world, water being the first water. Tea is usually made from the leaf and bud of the plant camellia sinessis and the way the leaf is processed determines the resulting product, which may be black tea (fermented), oolong tea (semi-fermented) or green tea (non-fermented). Research has

Podium Presentation Abstracts

always linked tea consumption with increased health benefits mainly attributed to the antioxidant potential of the various compounds such as polyphenols in the tea. In most instances, tea is consumed with milk; the milk is added after brewing. In this case, whole milk, reduced percent milk, skimmed milk or powdered non-dairy milk is used. Several studies have addressed the effect of adding milk on the antioxidant potential of tea. However, these studies have been inconclusive and differed widely; with some studies indicating that addition of milk has minimal or no effect on the antioxidant potential of tea; other studies indicate that milk addition enhances the antioxidant potential of tea, yet others argue that the milk addition inhibits the antioxidant potential of tea. Furthermore, the addition of sugar or sweetener, which is a common practice globally, compounds this even further. This debate forms the basis of this study, which systematically addresses the effect of adding milk on black and green tea under the optimized conditions used in other studies. This study employs the FRAP technique which involves the reducing of the ferric complex to the ferrous complex by the reductant (antioxidant in the teas) as well as the DPPH method that quantify the ability of the antioxidant in the teas to reduce the free radical moiety. Our results indicate that milk and sugar addition has an effect on the antioxidant potential of teas and the effect depends on several factors including the fat content of the milk added and the type of sugar added.

11:30 a.m. – 11:50 a.m.

Exosome-mediated MIR211 modulates tumor microenvironment via the DUSP6-ERK5 axis and contributes to BRAFV600E inhibitor resistance in melanoma

Animesh Ray, PhD, Professor, Keck Graduate Institute, Henry E. Riggs School of Applied Life Sciences

The microRNA MIR211 is an important regulator of melanoma tumor cell behavior. Previous studies suggested that in certain tumors, MIR211 acted as a tumor suppressor while in others it behaved as an oncogenic regulator. When MIR211 is expressed in BRAFV600E-mutant A375 melanoma cells in mouse xenografts, it promotes aggressive tumor growth accompanied by increased cellular proliferation and angiogenesis. We demonstrate that MIR211 is transferred to adjacent cells in the tumor micro-environment via exosomes. Cross-species genome-wide transcriptomic analysis showed that human tumor-derived MIR211 interacts with the mouse transcriptome in the tumor microenvironment, and activates ERK5 signaling in human tumor cells via the modulation of a feedback loop. Human miR211 directly inhibits human DUSP6 protein phosphatase at the post-transcriptional level. We provide support for the hypothesis that DUSP6 inhibition conferred resistance of the human tumor cells to the BRAF inhibitor vemurafenib and to the MEK inhibitor cobimetinib, with associated increases in ERK5 phosphorylation. These findings are consistent with a model in which MIR211 regulates melanoma tumor proliferation and BRAF inhibitor resistance by inducing ERK5 signaling within the complex tumor microenvironment.

Session 2 Parallel Session Roundtable Discussion - Podium Session (10:30 a.m. – 11:15 a.m.)

10:30 a.m. – 11:15 a.m.

Teaching Critical Thinking Across Disciplines and Learning Modalities

Steve Casper, PhD, Dean of the Henry E. Riggs School of Applied Life Sciences;
Henry E. Riggs Professor of Management, Keck Graduate Institute;

George Bradford, Director of Instructional Design and Development, Keck Graduate Institute

Critical thinking is one of the most important learning outcomes in higher education. It is treated as a core institutional learning outcome in many universities, and commonly assumed to be a major goal of a higher education. Concepts associated with critical thinking, such as analysis and evaluation, form the core of most typologies of higher level learning (Anderson and Krathwohl 2001). While there is vigorous discussion in the higher education literature on the general importance of critical thinking and debate over definitions, there is much less research on how to systematically teach it, particularly within disciplinary specific content oriented courses. The goal of this presentation is to provide tools that can help instructors systematically teach critical thinking as part of content oriented courses across a variety of disciplines. The presentation will explain what critical thinking is, provide strategies to integrate learning outcomes linked to critical thinking within content oriented courses, and explain how to implement instructional activities that can effectively teach critical thinking across a variety of learning modalities. What is critical thinking? While high level definitions vary, there is broad agreement in the literature that critical thinking teaching involves foundational concepts and habits of mind in three broad areas: creating logically consistent arguments, using appropriate evidence to evaluate claims, and making use of decision analysis tools, in particular surrounding cognitive bias. A major problem in critical thinking is that these are complex topics, each of which should be broken down into numerous potential concepts and related skills that should be explicitly taught and assessed to learners. Drawing on strategies being implemented at the Minerva Schools at KGI (Kosslyn and Nelson 2017), a list of key foundational concepts and habits of mind linked to each area of critical thinking will be presented. A problem with teaching critical thinking is the lack of specificity by which it is taught, particularly within content oriented courses. In many disciplines, and particularly STEM fields, faculty find themselves arguing that critical thinking will be learned as part of the process of completing challenging sequences of courses, but without it being explicitly assessed (see Paul, Elder, and Bartell, 1997). The idea here is that particular courses, such as organic chemistry, are extremely challenging to most learners, leading to a claim that by successfully completing such courses a learner will become strong in critical thinking. While this argument may well be true, absent the identification of instructional activities within such classes that are linked to particular facets of critical thinking, and then assessed, it is impossible to know. When critical thinking is assessed, it is commonly as part of writing assignments. Assessing critical thinking through writing makes sense, as virtually all essay assignments include one or more of the key elements of critical thinking that can be assessed, such as logically consistent arguments, or the appropriate use of evidence when evaluating claims. Over two dozen rubrics used to assess critical thinking were reviewed as part of the research linked to this presentation. A common issue with these rubrics is that they are overly general. While they almost always include a standard linked to the logical consistency of arguments, for example, they rarely break down this facet of critical thinking into more specific concepts or skills, such avoiding false dichotomies, beginning the question, or making false cause (post hoc) arguments. Similarly, rubrics commonly have standards linked to the appropriate use of evidence, but again at a very general level. Common issues linked to the use of evidence, such as making hasty generalizations or appeals to authority, are rarely included in rubrics.To teach critical thinking effectively, instructional activities must be designed to emphasize subject matter that is linked to the assessment of specific critical thinking facets. A major goal of this presentation will be to provide examples showing how instructors can embed and assess critical thinking teaching within content oriented courses. Drawing on examples graduate social science oriented courses taught at the Keck Graduate Institute, the presentation will demonstrate strategies that can effectively build and assess critical thinking skills in learners, while also teaching disciplinary content.

Session 3 (2:40 p.m. – 4:20 p.m.)

2:40 p.m. - 3:00 p.m.

Electrophoresis and Ion-pairing in Cell Biology

James Sterling, PhD, Professor, Keck Graduate Institute

Large negatively-charged polysaccharides in animals serve as seas of carboxylates and sulfates at cell surfaces and in the mucosal glycocalyx where net electroneutrality is attained through diffusion, electrophoresis and ion-pairing processes. In this talk, we will describe a continuum mathematical model of mucosal surface biophysics that utilizes a form of the Poisson-Boltzmann equation with ion-charged group dissociation constants to marry microscale continuum-electrostatics with ion-specific effects in glycan-rich environments. The model has been used to fit experimental work on the electrokinetics of soft-diffuse layers of in-vitro biohydrogels on a surface. Furthermore, the transient response of glycan-rich domains to ion-exchange processes are modeled using so-called Poisson-Nernst-Planck equations. Finally, some results of all-atom molecular dynamics simulations of heparan sulfate tethered to a surface to form a model glycocalyx will also be presented.

Podium Presentation Abstracts

3:00 p.m. – 3:20 p.m.

The Development of a Microfluidic Organ-on-a-Chip to Explore the effects of Young and Old

Payam Amiri, PhD Candidate, Keck Graduate Institute

Advancements in modern medicine have greatly extended human life expectancy. However, with the onset of age-associated conditions such as Alzheimer's disease, autoimmune disorders, and certain cancers, healthy aging is becoming an increasingly pressing issue. New and innovative solutions are needed to improve the quality of life as our population ages. A single heterochronic blood exchange has shown to have rejuvenative effects on old mice and inhibitory effects on young mice. However, it remains unclear whether the effects of the blood exchange observed in the old animal are due to the rejuvenating factors of young blood, a dilution of inhibitory factors of old blood, or a combination of the two. Recent findings in our lab suggest the pivotal role that cellular blood components, specifically erythrocytes may have on the decline neurogenesis observed in the young animal following blood exchange. This works aims to present a microfluidic approach to assess the effects of erythrocytes on resistance of the blood-brain barrier to the passage of sub-cellular factors in a physiologically similar organ-on-a-chip.

3:20 p.m. – 3:40 p.m.

Point of care infectious disease diagnosis through an integrated and automated nucleic acid testing device

Angelika Niemz, PhD, Arnold and Mabel Beckman Professor, Keck Graduate Institute

We are developing a rapid, affordable, and easy to use minimally instrumented nucleic acid testing system for point of care infectious disease diagnosis. This platform technology is designed to detect viruses or bacteria from blood, urine, or swab samples through integrated sample preparation, isothermal nucleic acid amplification, and lateral flow detection.

3:40 p.m. – 4:00 p.m.

Functionalized Polymeric Membranes for Bioseparation and Biocatalysis

Saurav Datta, PhD, Assistant Professor, Amgen Bioprocessing Center, Keck Graduate Institute

Conventional membranes separate molecules based on size. With the advent of novel polymers and activation chemistries, a new group of membranes are developed, known as functionalized membranes. In these membranes, active groups/moieties are incorporated within the porous matrix that enables the membranes to function not only for separation, but also for enzyme immobilization, drug delivery, biosensor, chromatography, etc. Our research group is involved in development and applications of functionalized membranes for bioseparation and biocatalysis. We leverage scientific principles and engineering practices from Chemical Engineering, Chemistry and Biotechnology to achieve our targets. In bioseparation, formation of an avidin-functionalized membrane for affinity-based separation of a biotin-tagged protein will be discussed. This will be followed by an example of virus filtration with functionalized membrane. Functionalized membrane led to higher productivity and superior quality of product compare to the conventional separation techniques. In biocatalysis, development of phospholipid bilayer functionalized membranes for immobilized enzymatic catalysis with improved stability, activity and reusability will be discussed.

4:00 p.m. – 4:20 p.m.

Enabling a Rapid Response to Control Diseases

Larry Grill, PhD, Dean of Research and Researech Professor, KGI

The world response to disease outbreaks is perilously slow and we lack the capability to contain the next pandemic. Our research is directed at making low cost, rapid response vaccines. By fusing immunologically active peptide sequences from pathogens to the surface proteins of non-infectious plant virus particles, we have developed a rapid response platform for a low-cost vaccine.

Session 3 Parallel Roundtable Discussion - Podium Session (3:00 p.m. – 4:00 p.m.)

3:00 p.m. – 3:30 p.m.

Shark Tank meets Hackathon App Competition: A Pharmacy Informatics Active Learning Exercise

Armen Simonian, PharmD, Assistant Dean and Chair of Clinical and Administrative Sciences, Associate Professor, KGI School of Pharmacy and Health Sciences

Technology applied to health care is changing rapidly. Within pharmacy informatics syllabi, instructors can introduce current, commercially available applications, but by the time students graduate and start practicing, the future state of medication use technology might be quite different. A “Shark Tank meets Hackathon app competition” active learning exercise was created to challenge P2 pharmacy students to recognize and address the issues facing pharmacy practice and to develop informatics solutions to help address the identified issues. The exercise provides an opportunity for students to employ recently learned management and informatics concepts and develop realistic business plans for developing and marketing their new applications.

3:30 p.m. – 4:00 p.m.

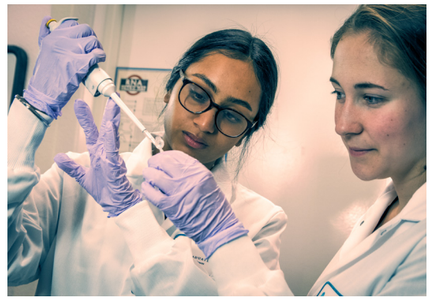
Roundtable Session: “A Paucity of Data”: Case Studies of Clinical Issues Where Existing Data is Sparse or Non-Existent

Daniel Kudo, PharmD, Adjunct Associate Professor, KGI School of Pharmacy and Health Sciences

There are several therapeutic areas where there is little or no evidence to guide the clinician in the selection of drugs or where existing guidelines do not encompass a given therapeutic category. Utilization of observational data as well as expert opinion can provide the clinician with information that can help create a more informed decision. In addition, the systematic review of large databases can provide a better understanding of the magnitude of this issue. The discussion at this roundtable will begin with a case study related to the paucity of data for statins in the elderly, and a similar discussion in oncology. In addition, there will be a review of the opportunities for using large databases to assess the magnitude of these issues in specific populations.

Poster Presentations Abstracts

Basic Sciences/Mechanisms of Disease



1. Mechanisms of Brain Endothelial Erythrophagocytosis: Insights into the Pathogenesis of Cerebral Microbleeds

Jiahong Sun*, Prema Vyas, Samar Mann, Sriyansh Yarlagadda, Mark J. Fisher, Rachita K. Sumbria, Keck Graduate Institute

Background: Cerebral microbleeds are thought to arise from brain microvessel disruption. Our prior work suggests brain endothelial erythrophagocytosis (BEE) producing microhemorrhage-like lesions by oxidatively-stressed red blood cells (RBC) in absence of vascular disruption. Herein we investigated a) role of oxidative stress and RBC phosphatidylserine (PS) exposure in BEE and b) intracellular endosomal trafficking of RBC within brain endothelial cells. Methods: Murine brain endothelial cells (bEnd.3 cells) were incubated with 2x106 mouse RBC treated with 3mM tert-butylhydroperoxide (t-BHP, an oxidative stressor) or sterile PBS for 48h, in the presence of annexin V to cloak PS, or vitamin C to reduce reactive oxygen species (ROS). BEE was evaluated by hematoxylin & eosin stain and diaminofluorene assay for hemoglobin. RBC ROS levels, PS exposure, and cell viability were measured. bEnd.3 cells were immunostained to visualize RBC in early and late endosomes. Results: tBHP induced both ROS production and PS exposure in RBC. There was a 9-fold increase ($p<0.001$) in BEE of t-BHP-RBC compared with control. Vitamin C reduced RBC ROS levels (70%, $p<0.001$) and PS exposure (27%, $p<0.001$), while annexin V blocked RBC PS exposure (65%, $p<0.001$). BEE was significantly attenuated by annexin V (63%, $p<0.001$) and vitamin C (39%, $p<0.001$). No change in bEnd.3 viability was observed and t-BHP-RBC localized to both early and late endosomes. These data demonstrate the importance of RBC PS exposure in BEE, and describe the intracellular trafficking of RBC in brain endothelial cells, which provide insights into the development of cerebral microbleeds.

2. Exploring age-related immune cell changes in normal breast tissue

Arrianna Zirbes*, J. Lopez, S. Shalabi, R.W. Sayaman, M.R. Stampfer, T. Chavez, C. Thai, A. Sanchez, J. Calero, B. Jeang, S.J. Priceman, M.A. LaBarge, City of Hope

A number of changes occur in the human mammary gland (MG) with age; the MG microenvironment likely plays a role in these changes, but the underlying mechanisms are not well understood. Breast cancer (BC) incidence increases with age, and because BC cells-of-origin reside in the luminal epithelial (LEP) neighborhood of the MG we want to understand why these cells change with age. Immune-epithelial cell interactions are important during MG development and the immune system plays an important role in BC progression. The composition of human immune cell populations are known to change in peripheral blood with age and in breast tissue during BC progression; however it is unknown whether breast tissue-resident immune populations and their interactions with mammary epithelia change with age. We evaluated immune subsets via flow cytometry in normal (non-cancerous) breast tissue from 116 women ages 31-74 and in peripheral blood from 20 of these women to characterize age-related changes and determine whether subsets changed in parallel or were tissue-dependent. Immune cell proportions were validated and their locations relative to epithelial cells were determined via immunohistochemistry (IHC) of formalin-fixed, paraffin-embedded breast tissue sections matched from donors. Proportions of B and T lymphocytes decreased and macrophages increased in aged breast tissue. T cells and macrophages tended to localize with epithelial cells, suggesting they play an important role in epithelial cell communication, and thus may impose age-dependent LEP changes that coincide with BC progression. Immune-epithelial cell interactions inferred in IHC data will be investigated further using in vitro co-cultures.

3. Origin and Distribution of Recurrent CHEK2 and PALB2 Germline Variants Among non-BRCA1/2 Breast Cancer Susceptibility Genes in the Americas

Gubidxa Gutierrez Seymour*, Jeffrey Weitzel, Keck Graduate Institute

Hereditary breast cancer (BC) accounts for ~5-10% of all breast cancers. BRCA1/2 pathogenic variants account for ~80% of variants observed in hereditary BC, whereas other high, moderate, and low penetrance variants likely account for the remainder. Among these, we suspect that several recurrent pathogenic and likely pathogenic variants in the BC susceptibility genes, Checkpoint Kinase 2 (CHEK2) and Partner and Localizer of BRCA2 (PALB2), are founder variants originating in Mexico. This study aims to interrogate these variants' ancestral origin and determine their distribution among non-BRCA1/2 BC susceptibility genes to better understand their relative contribution to hereditary BC in the Latina population. The long-term goal of this study is to enable informed genetic cancer risk assessment for Latinas.

4. Microfluidics PaperChromatography (MFPC)

Vendanshi Bhojak*, Wilson Lee, Young Ba, Cal State LA

Paper chromatography is a basic technique to examine the separation and polarity of chemicals. Thin Layer Chromatography (TLC) is the ideally used technique to identify the separation of food dyes. However, this method has poor resolution due to horizontal diffusion, higher chances of color mixing with each other and limited number of dye spots to test. This research demonstrates the advantage of developing MicroFluidics device for Paper Chromatography (MFPC). Goal of this research is to develop convenient MFPC device, that is made with hydrophobic wax channels, to test the separation and polarity of more than 3 (up to 8) food dyes.

5. Pharmacokinetics and Safety Profile of a High-Affinity Transferrin Receptor Antibody in Mice

Demi Castellanos*, Jiahong Sun, Joshua Yang, Keck Graduate Institute

Finding non-invasive routes of administration to deliver neurotherapeutics to the brain for neurological diseases has been a challenge due to the blood-brain barrier (BBB). One approach to deliver therapies into the brain non-invasively via the transvascular route is to use monoclonal antibodies that target receptors known to undergo receptor-mediated transcytosis (RMT). Transferrin receptor (TfR) is one such RMT system widely expressed at the BBB, and antibodies targeting the TfR (TfRMAbs) act as vectors to deliver drugs into the brain. Work over the last decade has provided some evidence regarding the impact of TfRMAb affinity on brain uptake, transferrin receptor expression and FC-effector function side effects in animal models. However, these studies used TfRMAbs with a human fragment crystallizable (Fc)-region, and the effect of a high-affinity TfRMAb with a murine Fc-region is not well characterized. The aim of the current study was therefore to characterize the plasma pharmacokinetics and safety profile of a high-affinity TfRMAb with a murine Fc-region following acute and chronic dosing in mice.

6. The Mechanism of Calreticulin Mutant Activation of the Jak-Stat Pathway

Prathyusha Dasari*, Ariel Tang, Jacob Gomez, Eyouab Tadesse, Jamie Liu, Craig W Adams, Keck Graduate Institute

Myeloproliferative neoplasms (MPNs) are cancers of myeloid cells that result in the proliferation of red blood cells, white blood cells, or platelets. Essential thrombocythemia (ET) is an MPN that can result from mutations in Jak kinase 2 (Jak2), calreticulin (Calr), thrombopoietin receptor (TpoR), or unknown mutations (triple-negative/TN). The Jak-Stat pathway is the primary signal transduction pathway for thrombocyte and platelet proliferation. Mutations in Jak2, Calr, or TpoR activate this pathway, leading to constitutive signaling and the clinical disease ET. While Jak2 and TpoR play obvious roles in the pathway, Calr does not. Nonetheless, Calr mutations activate the pathway and result in disease. Our experimental strategy hopes to answer two questions: (1) Does CalrMut activate TpoR by rotational change? (2) Does CalrMut activate TpoR intracellularly at the endoplasmic reticulum (ER)? To address the first question, alanine insertions (1A-4A) were made (between R522 and R523) to assess if altered rotational alignment will alter the activation (each insertion leads to ~120Â° rotational change). If so, this implies that the mechanism is related to rotational change. To address the second question, KDEL was inserted at the carboxyl-end of TPOR, which retains TpoR in the ER. If so, this implies that activation occurs at the ER. A total of 12 vectors with TpoR variants and Calr variants have been constructed. These bicistronic vectors will be transfected into Hap1 (TpoR-/Calr-) cells using the Sleeping Beauty transposase. Immunoblot analysis will be used to quantify the impact of these mutations on Jak-Stat activation.

7. Doxorubicin (DxR) Induced Mitochondrial Remodeling and its Effects on Jurkat Cells

Kristelle Gatchalian*, Carl Decker , Keck Graduate Institute

Non-Hodgkin's Lymphoma (NHL) continues to be one of the most common forms of cancer with about 500,000 new cases and claiming a little less than 300,000 lives in 2018 alone. First-line treatment, which includes Doxorubicin (DxR) typically results in immunosuppression and adverse complications.

Poster Presentations Abstracts

Long term use could also result in cells becoming chemo resistant. Mitochondrial dynamics have been well studied in many disease states but its role in cancer cell survival and during chemotherapy is still unclear. Studying drug-induced mitochondrial dynamics and how it may affect the survival of cancerous cells could help elucidate new approaches for treating cancer and improving drug sensitivity.

8. Identification of a Receptor for Vegetative Insecticidal Protein in Drosophila melanogaster

Summer O'Brien*, Mikhail Martchenko, Karen Paco, Larry Grill, Keck Graduate Institute

Entomopathogenic Bacillus thuringiensis is a Gram-positive spore forming bacterium that has been used for more than 60 years as a bio-insecticide in agriculture, transgenic crops, and forestry. Vegetative insecticidal proteins (Vips) are secreted by many Bacillus thuringiensis strains during their vegetative growth stage and are unique from known insecticidal crystal proteins. Vip is a binary toxin that consists of a receptor-binding component (Vip1) and a cytotoxic ADP-rybosyltransferase component (Vip2). Therefore, Vip1 and Vip2 represent second-generation insecticidal toxins for insect orders Lepidoptera, Diptera, and Coleoptera that could combat insect resistance and reduce ecological off-target effects. Although these toxins were discovered nearly 10 years ago, the cellular mechanism of Vip1 and Vip2 is unclear and there are no known insect receptors. This research aims to identify Vip1 receptors in Drosophila melanogaster and provide an insight into the mode of action of Vip complex that will significantly facilitate the study of its insecticidal mechanism and application.

9. The Role of the Retromer in Autophagy and in the Pathogenesis of Parkinson's Disease

Rasha Jaber*, Katerina Venderova, Radek Linhart, Keck Graduate Institute

The Retromer is a pentamer complex (consisting of Vps35, Vps29, Vps26 and sorting nexins) that is essential for protein sorting and trafficking. The Venderova lab has previously demonstrated that the retromer is involved in the pathogenesis of Parkinson's Disease. Also, the lab proved that the mechanism by which mutant vps35 causes neuronal death is dysregulation of autophagy. To delineate how vps35 regulates autophagy and the effect of the pathogenic mutant vps35, a series of experiments in Drosophila Melanogaster are being done primarily using the Atg1 eye phenotype and survival assays.

10. Utilizing EMP2 to identify breast cancer patients at risk for metastasis and relapse

Ryan Elshimali*, Madhuri Wadehra, Lynn Gordon, Keck Graduate Institute; UCLA

Over the last few years, the use of circulating tumor cells (CTCs) as "liquid biopsies" of solid tumors has gained momentum. However, current methodologies to recover CTCs from women with breast cancer (BC) poorly discriminate between early-stage patients amenable to surgical therapy and advanced-stage patients receiving chemotherapy. Moreover, there are no assays currently approved which can predict patient response. As breast cancer is the second most common cause of cancer deaths in women, exploring novel prognostic and diagnostic markers in BC CTCs is of great significance. To this end, we have recently identified a diagnostic marker, epithelial membrane protein-2 (EMP2). EMP2 is highly expressed in all subtypes of BC, with over 90% of TNBC patients showing expression of the protein. New data suggests that EMP2 increases the tumorigenic potential and resistance of cancer cells, suggesting it may be a marker to track cells commonly referred to as "cancer stem cells". We seek to show antibodies that recognize EMP2 can capture CTCs to diagnose and stage disease. We further propose to characterize EMP2 + CTCs as a means for improved personalized medicine.

11. Quantification of mannitol by using an HPLC- ELSD method

Helen Truong*, Rajesh Vadlapatla, Zhijun Wang, Jay Panchal, Marshall B. Ketchum University

Mannitol is an osmotic agent used in emergency settings to decrease intracranial pressure after head trauma. When stored at room temperature mannitol crystallizes, but at higher temperatures (above ~36 Â°C) it dissolves and remains in solution form. Therefore, storage of mannitol solution at a higher temperature can prevent its crystallization. However, the stability of mannitol at higher temperatures is unknown. The objective of this project is to determine the stability of mannitol solutions when storing at 37Â°C. Mannitol formulation (25% mannitol injection, USP, Hospira, Inc, Lake Forest, IL) was stored at 37Â°C in an incubator and periodically tested in terms of physical appearance and concentration. At time intervals of 1, 2, and 4 weeks, the concentrations of mannitol were determined using a high-performance liquid chromatography (HPLC, Prominence LC-2030C, Shimadzu, Carlsbad, CA) coupled with an evaporative light scattering detection (ELSD) which was operated at 60Â°C, 50 psi nitrogen with a gain setting of 1 throughout the experiments. The separation of mannitol was carried out using a LunaÂ® Omega 3 Âµm Sugar LC column (250 x 4.6 mm, Phenomenex, Torrance, CA) by isocratic elution with acetonitrile:H2O (80:20, v/v). There was no significant change in the physical appearance by visual check. The average deviation for the amount of mannitol of each time point was less than 2.26% for a 1-month period. The results indicated that mannitol was stable at 37Â°C for at least 1 month. A long term stability test over 6 months will be further conducted. This study suggests evidence that mannitol solution can be stored at 37Â°C rather than room temperature to effectively avoid crystallization.

12. Identification of the Glucocorticoid Receptor in Drosophila melanogaster

Gloria Bartolo*, Mikhail Martchenko, Keck Graduate Institute

Glucocorticoids are a common anti-inflammatory regimen prescribed to cancer patients and organ transplant recipients to suppress the immune system. While the mechanisms of glucocorticoids and their nuclear glucocorticoid receptor (GR) are well-known in humans, the GR homolog in Drosophila melanogaster, which has previously been shown to be immunosuppressed by steroids, has not been explicitly identified. This study aims to identify a gene encoding for a functional GR in steroid-immunosuppressed flies during microbial infections.

13. Genes involved in adaptive resistance to Erlotinib

Utkarsha Paithane*, Michael De La Cruz, Animesh Ray, Keck Graduate Institute

Lung cancer is one of the most common cancers in the world, with 80% of them being non-small cell lung cancer (NSCLC). The current treatment for metastatic lung cancer is anti-cancer chemotherapy targeted against the specific molecular form of the cancer determined through molecular typing of the cancer tissues; however, patients often relapse due to drug resistance. Multiple drug interventions can help to reduce the rate of resistance. By using two drugs simultaneously would reduce the chances of the cell to adapt to the drugs. A drawback of this approach to treatment is that it is rarely feasible because simultaneous use of multiple anti-cancer chemotherapeutic agents can be toxic. Therefore, clinicians alternate between two drugs. Consequently, over time the cells become resistant to both the drugs Identification of the genes that contribute to chemotherapy resistance will help in understanding the mechanisms by which the cells adapt themselves to drugs. This can then be applied to drug development so that drugs can be made while keeping in mind the genes and how they contribute to cells become resilient against the drug.

14. Huntington's Disease Observed Using a Progressive Disease Model in Drosophila Melanogaster

Joseph Nguyen*, Alyssa Selve*, Radek Linhart, Rasha Jaber, Phuong-Lan Nguyen, Keck Graduate Institute

Huntington 's Disease (HD) is an autosomal dominant neurodegenerative disorder commonly characterized by the progressive decline in movement and cognitive ability. HD is known to be caused by a polyglutamine (polyQ) mutation in the huntingtin (Htt) protein which impedes in its function. The exact pathogenesis of HD, the physiological function of Htt, or how exactly mutant Htt causes the neuronal death is not well understood. Due to the large gap in knowledge of the molecular and genetic pathway(s) involved in HD, there are currently inadequate treatments available for the disease. To address this, we have developed an HD model in Drosophila melanogaster that successfully mimics the progressive neurodegeneration typical for HD in patients. Furthermore and unlike the previous models, our model allows genetic analyses in a more advanced age which again is more relevant to the disease in humans. We are using this model to map new genetic pathways that can serve as potential novel pharmacological targets for a disease modifying treatment of HD.

Poster Presentations Abstracts

Biomanufacturing

16. Raman Spectroscopy as a PAT tool for monitoring and controlling perfusion cell culture

Christine Urrea*, Hu Zhang, Keck Graduate Institute

Raman spectroscopy has been used as a non-destructive and non-invasive analytical method capable of giving information of chemicals based on their interaction with monochromatic light. In recent years it has shown great potential as a process analytical technology (PAT) tool for real time monitoring of biopharmaceutical manufacturing which has the potential to eliminate the manual operation involved in monitoring and feeding bioreactors. The aim of this work is to develop calibration models to be used to monitor cell culture metabolites and control key cell culture components such as glucose and glutamine in a perfusion bioreactor.

17. Investigation of Chromatographic Resin Shape for Gene Therapy Vector Purification Using CFD

Kevin Vehar*, Cameron Bardliving, Hu Zhang, Keck Graduate Institute

Demand to improve the biomanufacturing process of gene therapy products has grown with the recent approval of several gene therapy based therapeutics. While the number of clinical trials investigating the therapeutic use of viral vectors continues to grow, the absence of an ideal scalable process limits both clinical advancement for many investigational products, as well as, successful commercialization of approved products. A major focus in the development of gene therapy products is the improvement of purification strategies for viral vectors. Currently, most viral vector downstream processes are based on methods developed for recombinant protein purification. While these methods are attractive for their scalability and routine usage in industry, challenges arise when applying these methods to much larger molecules, such as DNA and viruses. Column chromatography using spherical porous particle-based media is one such protein purification technique, whose yield is low when adapted to gene therapy vector purification due to the heavy reliance on diffusive mass transport. This diffusive limitation, coupled with the fact that viral diffusion can be orders of magnitudes slower than proteins, prompts the need to investigate how porous particle morphology can be modified for improved viral absorption. Experimental studies from literature using microfluidic packed beds, various resins, and viral particles will be used to validate the computational fluid dynamic models of packed beds with complex particle shapes.

18. Determination and Approach to the Cross-Therapeutic Potential of Mesenchymal Stem Cells and Various Naturally-Occurring Plant Molecules

Brian Hogan*, Hu Zhang, Keck Graduate Institute

With advances made in the landscapes of mesenchymal stem cells and plant molecules in reducing inflammation and modulating endogenous immune responses, it is important to find areas of overlap. My research aims to confirm or refute the notion that CBD-derived molecules and mesenchymal stem cells when co-cultured have the capacity for greater therapeutic potential.

Drug Discovery and Development

19. The Plasma Pharmacokinetic Profile of a High Affinity Transferrin Receptor Antibody-Erythropoietin Fusion Protein Following Intraperitoneal and Subcutaneous Routes of Administration

Joshua Yang*, Jiahong Sun, Rachita Sumbria, Keck Graduate Institute

Background: Erythropoietin (EPO), a neurotrophin, is a potential therapeutic for Alzheimer's disease, but has limited blood-brain barrier (BBB) permeability. The transferrin receptor monoclonal antibody fused to EPO (TfRMAb-EPO), is a chimeric monoclonal antibody that ferries EPO into the brain via the transvascular route. However, TfRMAbs have Fc-effector function adverse effects including reticulocyte suppression. To overcome this, we recently developed an effectorless TfRMAb-EPO fusion protein (TfRMAb-N292G-EPO) by eliminating the Fc N-linked glycosylation site at position 292. The mutant fusion protein displays accelerated plasma clearance and dramatically reduced plasma concentrations compared with the wild-type (WT) fusion protein necessitating the use of higher doses. The aim of the current study was to characterize the pharmacokinetic (PK) profile of this effectorless TfRMAb-N292G-EPO at different doses following different routes of administration in mice, for future therapeutic studies. Methods: Adult C57BL/6J male mice were injected with a single dose (3, 6, 9, or 20 mg/kg) of TfRMAb-N292G-EPO through either the subcutaneous (SQ) or intraperitoneal (IP) route. TfRMAb-N292G-EPO plasma concentrations were determined at 3-, 6-, and 24-hours post-injection using ELISA. Mice were sacrificed 24 hours after injection, and terminal blood was used for a complete blood count. Results: We observed stark differences in the plasma PK of TfRMAb-N292G-EPO between the IP and SQ routes of administration. Though the plasma Cmax increased with dose, plasma Cmax following the SQ route was 19- to 459-fold lower compared with the IP route. Dose escalation from 3-20 mg/kg increased the plasma Cmax only 3.5-fold for the SQ route, compared with an 84-fold increase for the IP route. This finding is consistent with a 29-fold higher apparent clearance following the SQ route compared with the IP route at the highest dose administered. No reticulocyte suppression was observed at the 3mg/kg SQ dose of TfRMAb-N292G-EPO. However, reticulocyte suppression increased with an increase in dose and plasma AUC for both the IP and SQ routes. Conclusions: Overall, elimination of the Fc N-linked glycosylation site of TfRMAb-N292G-EPO, to mitigate TfRMAb effector function side effects, has a profound effect on the plasma exposure of the fusion protein following the SQ route of administration. The beneficial rescue of reticulocyte suppression by the N292G mutation is a function of plasma AUC and is negated at high doses of the N292G mutant that are required to achieve plasma concentrations comparable to that of the WT fusion protein.

20. NSC-Mediated Delivery of Thymidine Kinase 1 (TK 1) Attenuated Chimeric Oncolytic Orthopoxvirus (CF33) for Targeting TK1 Overexpressing Tumors

Mohamed Hammad*, Connor Burke, Rachael Mooney, Zheng Liu, Yate-Ching Yuan, Thanh Dellinger, Nanhai G. Chen, Jianming Lu, Yuman Fong, Karen S. Aboody, City of Hope

Background: Lung, breast, colorectal and ovarian malignancies are the leading cause of cancer-related deaths in the world. TK1 gene expression correlated with patients' survival outcome as a potential biomarker. We previously developed theTK1 attenuated CF33 that displays a selective tumor cell killing. However, in vivo systemic delivery of oncolytic viruses is hampered by rapid inactivation by the host immune system. To overcome this hurdle, we loaded CF33 into HB1.F3.CD21 neural stem cells (NSCs) that are tumor tropic and have demonstrated safety in several clinical trials. NSCs can shield the virus from the immune system en route to targeting metastatic tumor sites. Methods: In this study, NSCs were modified to deliver CF33, providing selectivity of viral replication only within tumor cells that are TK1 positive. CF33-expressing NSCs (CF33-NSCs) were cocultured with murine (ID8) and human (OVCAR8) ovarian cancer cell lines at a ratio of 1:1000. A C57BLK/6 ID8 syngeneic mouse model was treated for 3 weekly intraperitoneal injections of PBS, free CF33, or CF33-NSCs starting 1 week post-tumor implantation. Results: CF33-NSCs lysed ovarian cancer cells in 3 days in vitro and enabled the highest distribution of CF33 in vivo. Conclusion: CF33-NSCs is a promising candidate for human cancer treatment.

21. The Next Generation of Treatments for Rare Neuromuscular Disorders – New Therapies and Pipeline Drugs

Veronica Sanchez*, Ali Hasan, Kacey Egusa, Christine Cadiz, Keck Graduate Institute; City of Hope

The National Institute of Health estimates that 25 to 30 million Americans live with a rare disease.1 As awareness and advocacy have taken a significant leap over the past several decades, so too have the available treatments. This has meant potentially mitigating outcomes that are extremely debilitating or even fatal for people suffering from a rare disease. A particular research focus area has been the investigation of treatments for neuromuscular diseases. There has been an uptick of novel treatments approved by the FDA in recent years, with numerous other biopharmaceuticals currently in development. For clinicians in the neuromuscular space, pinpointing a rare disease and understanding potential therapeutic options may make an extraordinary difference in a patient's life. To that end, this article reviews drugs, biologics, gene therapies, and new or expanded indications recently approved by the FDA, as well as the pipeline of agents currently in the late-phases of investigation.

22. Cyclodextrin Complexes to Improve Bioavailability of an Anti-rheumatic Remedy Celastrol

Madison Seifer*, Srikanth Kolluru, University of California Berkley; Keck Graduate Institute

In the realm of drug repurposing and development, work focusing on improving the efficacy of promising compounds is an efficient way to shorten the development process. Currently researched as a potential anti-obesity remedy, celastrol is a compound derived from the Thunder God Vine with relatively low

Poster Presentations Abstracts

bioavailability of 17.06% when unformulated. To find solutions for its lower bioavailability, it is necessary to research and determine what types of supplemental structures are most efficient, including the use of widely researched and commonly used cyclodextrins (CD). In this experiment, we utilized differently substituted beta-CDs to improve the expected solubility of celastrol and predict the most optimal substituents for the CD structure in its binding to celastrol. The sulfobutyl ether 7 (SBE7) CD class was seen to have the highest overall predicted binding affinity to the target celastrol, with the positioning of longer substituents around celastrol aiding in the favorability of the binding. Thus, this class of CDs is expected to have the largest positive effect on the solubility of celastrol in the human body out of the substituted CD's tested.

23. Docking of Benznidazole on Various Cyclodextrins

Nathan Vega*, Srikanth Kolluru, Keck Graduate Institute

Drug development can be both costly and time consuming, in silico modeling can potentially lower this burden through computer based modeling. Drug docking studies are one example of an in silico method used for the characterization of ligand-receptor interactions. The present study aims to characterize the interactions of benznidazole (BNZ) and various cyclodextrin (CD) ethers to screen for their ability to bind BNZ and to increase BNZ apparent aqueous solubility. Clinically, BNZ is the only FDA approved treatment for Chagas Disease and is given in two divided oral doses for a 60 day period. Common adverse reactions include abdominal pain (25%), weight decrease (13%), and nausea/vomiting (5%). For drug delivery, CD's funnel like structure has the ability to encapsulate BNZ within the apolar CD cavity, providing increased apparent solubility and lowered potential to cause gastrointestinal adverse reactions. In the present study, BNZ was docked onto each CD ether through the Genetic Optimization of Ligand Design (GOLD) docking suite program to evaluate binding interactions and binding pose. Docking results showed no difference between varying substitutions on Î²-CD, while the smaller Î±-CD showed higher binding affinity to BNZ. Our results indicate that BNZ has stronger binding affinity to Î±-CD and ether substitutions on CD have minimal effects on BNZ binding affinity.

24. Synthesis of Metabolites and Analogs of Emerging Synthetic Opioids

Emmanuel Freeman*, John Krstenansky, Keck Graduate Institute

The opioid crisis is a growing epidemic, that's resulting in the deaths of many people. With the availability of prescription and illicit opioids, their abuse continues to grow. For example, heroin is an incredibly addictive drug due to its ability to numb pain and produce profound euphoria. This research aims to synthesize metabolites and analogues of one such abused compound, AH-7921. We wish to better understand the pharmacology of this series of Î¼-opioids and potentially discover antagonist or partial agonists that might be useful in the treatment of opioid use disorder. AH-7921 acts on the Î¼-opioid receptor located in the brainstem and medial thalamus to exert its analgesic effects. Using established methods, we have synthesized a series of analogs that will later be tested for their pharmacological activity. The compounds were characterized by NMR, IR, and Raman spectroscopy to establish their identity and purity.

25. Compound 21: Novel treatment for Melanoma Brain Metastasis

Eemon Tizpa*, Hannah J. Young, Kimberley-Jane C. Bonjoc, Ammar A. Chaudhry, Keck Graduate Institute

Melanoma brain metastases (MBM) are common with a median overall survival of 4-5 months. Although immunotherapy has improved clinical outcomes and have doubled overall survival, there is a high incidence rate of relapse from drug resistance in these cases. AXL, a receptor tyrosine kinase (RTK), drives the mesenchymal phenotype of cancer cells and its expression is associated with drug resistance and metastasis in many cancers, including acute myeloid leukemia (AML), breast cancer, lung cancer, melanoma, and many more. In MBM, AXL is upregulated and associated with disease progression, promoting cell migration and invasion. Compound 21, an investigational small molecule inhibitor of AXL, has shown efficacy in reversing the mesenchymal phenotype and re-sensitizing resistant cancer cells to targeted therapies in cancer models. In this study, we assess Compound 21's efficacy in reducing tumor resistance as a mono-therapy for MBM.

26. Anticancer Activities of Natural Foods

Amir Shirazi*, Kevan Parang, Marshall
B. Ketchum University.

Natural Foods have been introduced as one of the most reliable resources with reasonable therapeutic properties. People take various types of Natural Products as their dietary supplements on daily basis that makes this market interesting to researchers. Natural Products offer therapeutic benefit as traditional medicines for treating diseases. In addition, researchers in drug discovery always try to find lead compounds using Natural Product extracts. Here, we investigated the potency of various natural products such as Ashwagandha, Turmeric, Pomella, Seasamin, and Cinnamon for their antiproliferative activity in cancer cells. Among all the Natural Foods, Ashwagandha was discovered to be the most potent in inhibiting the proliferation of colon and breast cancer cells. These data suggested that the Natural Foods can be potentially used for the treatment of cancer in in-vitro assays. However, further investigations are required to optimize the dose, formulation, and pharmacokinetic and pharmacodynamic profile of them before tested in human subjects.

27. Gadolinium-peptide Complex as Drug Delivery Systems

Amir Shirazi*, Shang Eun Park, Ryley Hall, Sandeep Lohan, Khalid Zoghebi, Shirin Rad, Luiza Baloyan, Dindayal Mandal, Keykavous Parang, Rakesh Tiwari, Marshall B. Ketchum University

A cyclic peptide containing one cysteine, five tryptophan, and five arginine amino acids was assembled via F-moc solid-phase method. The ability of the peptide to cap gadolinium particles through in-situ method to form Gd-[W5R5C] particles was evaluated. The particles were obtained through one-pot synthesis method using aqueous solution of GdCl3 and [W5R5C] peptide. Direct physical mixing of the cyclic peptide with an aqueous solution of GdCl3 led to the formation of [W5R4C]-GdPs through the combination of reducing and capping activity of amino acids in the peptide structure. Flow cytometry studies showed that the cellular uptake of a fluorescence-labeled phosphopeptide (F'-GpYEEI, where F' = fluorescein)) was approximately three-times higher in the presence of [W5R4C]-GdPs than those of F'-GpYEEI alone in human leukemia adenocarcinoma (CCRF-CEM) cells after 2 h incubation, respectively. Confocal microscopy also exhibited higher cellular delivery of F'-GpYEEI in the presence of [W5R4C]-GdPs compared to their parent drug alone in human breast adenocarcinoma (MCF-7) cells after 2 h incubation at 37 ºC. The antiproliferative activities of several anticancer drugs such as epirubicin, cisplatin, gemcitabine, etoposide, carboplatin, and camptothecin was enhanced in the presence of the carrier. These data suggest that these complexes have the potential to be employed as non-covalent drug delivery of negatively charged biomolecules and anticancer drugs.

28. Tumor targeted delivery of siRNA using fatty acyl conjugates of cell penetrating peptides

Muhammad Imran Sajid*, Nagla Salem El-Sayed Ibrahim, Hamidreza
Montazeri Aliabadi, Rakesh K. Tiwari, Chapman University

Tumor-targeted carriers provide efficient delivery of chemotherapeutic agents to tumor. siRNA offers innovative therapeutics for cancer treatment but pose severe limitation such as stability and delivery in the cells. CGKRK is one of the well-known peptides which targets heparin sulfate receptor in the tumor cells. The linear and cyclic peptide containing alternate histidine and arginine amino acids (HR) are reported as efficient molecular transporters inside the cell. The purpose is to investigate the binding and delivery of siRNA to tumor cells using Fatty acyl-CGKRK-(HR) n peptide conjugates. We hypothesized that conjugation of fatty acylated CGKRK peptide with cell-penetrating peptide will provide efficient delivery and targeting of siRNA in the tumor cells. Several peptides with sequences (HR)4, [HR]4,(HR)5, [HR]5 CGKRKK(HR)4, C18-CGKRKK(HR)4, C18-CGKRKK(C18)-(HR)4 and CGKRKK(C18)-(HR)4 were synthesized using Fmoc/tBu solid-phase peptide synthesis (SPPS). All peptides were purified by preparative RP-HPLC and analyzed by MALDI-TOF mass spectrometry and then tested for siRNA binding affinity using a standard SYBR Green II dye exclusion assay. Zeta potential, size particles, cytotoxicity, serum stability and gene silencing ability of siRNA-conjugate complex will be investigated in future. All the peptides were synthesized with >95 % purity as confirmed using analytical HPLC. Different concentrations of peptides were investigated for their

Poster Presentations Abstracts

binding affinity to siRNA, which were incubated with these peptides for 30 min at room temperature at different N/P ratios. The binding affinity, termed BC50, with all the peptides studied were highly significant with the maximum binding observed with cyclic [HR]4 peptides. The HR peptide showed a highly significant binding and it can be inferred from the results that that all modified peptides would completely bind the siRNA at N/P ratio of 1. As, the modified peptides being investigated have shown to be effective molecular transporters, they can efficiently deliver siRNA in the tumor cells.

29. Homochiral L-Cyclic Peptides for Enhanced siRNA Delivery

Amir Shirazi*, Dindyal Mandal, Rakesh Tiwari, Keykavous Parang, Marshall B. Ketchum University

Previously, we have reported the synthesis of a homochiral L-cyclic peptide containing arginine and tryptophan amino acids based gold nanoparticles for the delivery of small interfering RNA molecule (siRNA) in human cervix adenocarcinoma (HeLa) cells. Here, a cyclic peptide containing one cysteine, five tryptophan, and five arginine amino acids was synthesized. The potency of the peptide to deliver a class of siRNA was evaluated in T lymphoblastoid leukemia cells. Flow cytometry investigation revealed that the intracellular uptake of a fluorescence-labeled non-targeting siRNA (200 nM) was enhanced in the presence of [W5R5C] by 3-fold when compared with that of siRNA alone after 2 h of incubation. Further investigations are undergoing to compare the peptide toxicity and delivery potency with currently available carriers such as Lipofectamine.

30. Alzheimer's Disease Active Immunotherapy Using the Tobacco Mosaic Virus (TMV) by Targeting a Structural Domain of Pathalogical TAU

Karen Yrene Paco Mendivil*, Larry Grill, Keck Graduate Institute

Alzheimer's disease (AD) affects approximately 50 million people worldwide. As a result of recent failed clinical trials targeting amyloid-beta protein, the scientific community has directed more attention to the tau protein aggregates present in the brain of Alzheimer's patients. One therapeutic approach is using antibodies to target tau by promoting tau clearance and inhibiting tau seeding and it's spreading through neurons. The active immunotherapy approach engages the patient's own immune system to offer long-lasting effects; contrarily passive immunotherapy requires purified mAbs with repeated administrations, making affordability one of the major concerns. Despite the advantages of active immunotherapy, one of the main challenges is the selection of an effective epitope, without considering the complexity of the structure of tau, which involves many modifications such as phosphorylation, truncation, oligomerization, etc. Recently, it was reported that the presence of a pathological domain of tau (p-tau) is involved in aggregation and neurofibrillary tangle formation. As a result, targeting p-tau by using active immunotherapy may be a promising alternative for AD and other tauopathies involving tau aggregation. Epitope display on the surface of virus-like particles (VLP) is a strategy to enhance antigen immunogenicity. In this project, we propose displaying p-tau epitopes on the surface of the Tobacco Mosaic Virus (TMV) using leaves of Nicotiana benthamiana plants as an expression system. This platform will be capable of producing safe, effective and low-cost alternatives for AD and other tauopathies.

Healthcare

31. Surgical Site Infection Prevention

Alison Chen*, Keck Graduate Institute

32. A Retrospective Analysis of the Efficacy of Clinical Cardiac Rehabilitation for Patients with Concurrent Coronary Artery Disease (CAD) and Atrial Fibrillation (AF) at Kaiser Permanente - Riverside

Savannah Creel*, Keck Graduate Institute

Cardiovascular disease (CVD) remains the number one leading cause of death in the United States and around the world. Since its inception in the late 1960's, Cardiac rehabilitation globally has decreased CVD mortality by 26% over three years and repeat hospitalizations by 31% in the year after an acute coronary event. Studies show that this intervention is important for the full recovery of cardiovascular patients, reducing all-cause readmission rates and mortality. This study will evaluate any benefit conferred to patients who underwent CR for a diagnosis of CAD with concurrent AF at Kaiser Permanente's Riverside's Clinical Cardiac Rehabilitation Center.

33. HAPI Days: A Pressure Injury Reduction Initiative

Adnan Attla-Saied*, Elizabeth Winokur, Darcie Peterson, Keck Graduate Institute

Hospital Acquired Pressure Injuries (HAPI's) are a "never-event" with significant economic and reputational costs for hospitals, as well as serious consequences for patient outcomes. Excessive linen and diaper use contribute to the formation of HAPI's through localized increases in temperature and pressure that result in skin breakdown. Through proper patient turning procedures, best practices in linen and diaper use, appropriate skin set ordering, and consistent documentation, HAPI's have been reduced to an incidence of 0% in the definitive step-down unit. As this project is expanded to other units in St. Joseph Hospital, resistance to change will be a primary issue. As such, a microteaching approach based on adult learning theory will be implemented to bring best practices re-education to the point of clinical practice.

34. Pay for Performance Pilot Project

Justin Bolig*, Keck Graduate Institute

Traditional Fee-for-Service (FFS) healthcare delivery has demonstrably proven to be ineffective and inefficient. Transitioning into a Pay-for-Performance (PFP) is conceptually promising, but has many logistical hurdles in a complex healthcare system. The Bundled Payment For Care Improvement-Advanced (PBCI-A) is a volunteer pilot program by Medicare and presents an opportunity for hospitals to become fiscally responsible for care delivery and patient outcomes. Initial data for patient health outcomes and financial benefit are promising, yet many challenges exist in attempting to align payer and provider incentives.

35. Prevention of Catheter-Associated Urinary Tract Infection in an Acute Care Hospital

Alhasan Ali Alani*, Tina Retrosi, Virginia Scanlan, Keck Graduate Institute

Urinary tract infections are one of the most common types of nosocomial infection, with the vast majority attributable to an indwelling urinary catheter. Catheter-associated urinary tract infections (CAUTIs) could lead to serious complications, discomfort to the patient, and increased hospital stay, resulting in around 9000 deaths and costing the healthcare system $500 million annually. This study will assess the incidence of CAUTI in an acute care hospital and compare current protocols to nationally recommended guidelines. Although there has been a significant reduction in CAUTI incidence, the overall goal of this study is to completely prevent CAUTIs using a combination of methods including daily review of catheter necessity, RN-driven timely catheter removal, aseptic management, educational programs, and through the use of alternative options such as super-absorbent pads.

36. Reducing Door-To-Needle Times for Acute Ischemic Stroke Patients

Soz Mirza*, Michelle Jocson, Keck Graduate Institute

Stroke is the leading cause of disability, and the third leading cause of death in the United States. The severity of stroke-related disability and death can be reduced if appropriate and timely patient care is given. According to the Get with the Guidelines protocol, intravenous injection of tissue plasminogen activator (tPA) should be given within an hour of patient arrival, and 4.5 hours after the onset of symptoms. Evidence shows that the earlier patients are treated after symptom onset, the more favorable their outcomes will be. This project, at Adeventist Health Glendale Hospital, aims to analyze the delays in tPA delivery, and to implement interventions to reduce door to needle times, and thus improve patient outcomes.

Poster Presentations Abstracts

37. Comorbid Type 2 Diabetes and Cardiovascular Disease-Related Mortality in the United States, 2008-2017

Calvin Bron Susbilla*, Noel Barragan, Tony Kuo, Keck Graduate Institute

The Centers for Disease Control and Prevention are able to gauge the health of the United States population by regularly collecting and analyzing health-related data to uncover important trends, such as disease mortality. Type 2 diabetes (T2D) and cardiovascular disease (CVD) are leading causes of death in the United States and often present as comorbid chronic conditions in afflicted individuals. As such mortality trends of these diseases are tracked as millions are affected by T2D and/or CVD. There is little work examining trends in these diseases as comorbid conditions and previous work has been based on single underlying cause of death data. This project addresses these gaps by basing mortality trends on multiple causes of death data in those comorbid with T2D and CVD. As multiple causes of data includes associated causes of death, a more in depth analysis can be obtained. In addition, this project provides an update to the literature as death data for 2017 has been recently added.

38. Chronic Kidney Disease related deaths and associated comorbidities in the United States, 2013-2017

Lovleen Kaur Dhaliwal*, Noel Barragan, Tony Kuo, Anastasia Levitin, Keck Graduate Institute

Chronic Kidney Disease (CKD) is a gradual loss of kidney function caused by numerous risk factors including diabetes and hypertension. There is a total of five stages of CKD which have their own symptoms and treatments. Chronic kidney disease is an under-recognized public health crisis that affects an estimated 37 million people in the United States. The purpose of this study is to recognize multiple causes of death, and comorbidities, associated with chronic kidney disease reported in death certificates nationwide.

39. Nanofiber-based Scaffold for MSC Culture

Hu Zhang*, Karisa Caso, Sandy Lin, David Ju, Andrew Burns, Keck Graduate Institute

We used a biodegradable gelatin nanofiber to culture adipose-derived mesenchymal stem cells. The harvested cell/gelatin nanofiber can be delivered to the defects for tissue regeneration.

40. Pharmacists' Touch Improves Diabetes Outcomes

Jeany K Jun*, Danielle Tessier*, Dacloc Brandon Nguyen*, Chien Originales*, Mai-Han Dinh, Keck Graduate Institute

Objective: The purpose of this study was to evaluate the impact of ambulatory care pharmacists' interventions on A1C changes in uncontrolled type 2 diabetes mellitus (T2DM) patients during a 3- to 6-month period. Methods: A retrospective chart review evaluated A1C changes from baseline to 3- to 6-months in T2DM patients referred to a pharmacist-managed diabetes clinic. Non-pregnant adults above 18 years with an A1C≥9%, and seen between January 1, 2017 and December 31, 2018 were included in the analysis. This study was IRB approved. Results: A total of 631 referrals were received for pharmacist management of uncontrolled T2DM patients during 2017-2018. Of those, 228 were excluded, 280 patients were closed out due to the unsuccessful attempts to reach patients (277) or patients expired (3). Out of 123 active patients, 86 had a baseline and 3- or 6-month A1Cs to be evaluated. The mean age was 50.6 years with 57% being female and 72.1% being Hispanic. A mean A1C reduction of 4.0% was achieved at 3-months from a baseline of 12.0% (range 9.0 – 17.7%) to 8.0% (range 5.1 to 13.8%) and a reduction of 4.7% was achieved at 6-months with a mean A1C of 7.4% (range 5.1 to 13.4%). No severe hypoglycemia episodes were documented. There were no significant changes in blood pressure but there was a mean increase in weight of 4.0 kg at 3 months and 5.9 kg at 6 months. Conclusion: Intensive diabetes management by ambulatory care pharmacists was associated with improved A1C outcomes.

41. Improving Patient Satisfaction at Mission Hospital in Mission Viejo

Erick Yeh*, Kopitzee Parra-Thorton, Keck Graduate Institute

Overall patient experience in Southern California hospitals has been on a steady decline. Since the last 5 years, Mission Hospital of Mission Viejo has dropped in rank from the top 75th percentile to the 50th percentile for overall patient satisfaction among all California medical facilities. In an attempt to mitigate this decline, Administrators have implemented several measures to improve patient care and service in Mission Hospital's healthcare departments. This project investigates the efficacy of these statutes for improving patient experience.

42. Implementation of Post-Discharge Follow-Up Phone Call Interventions on Heart Failure Patients to Prevent Hospital Readmissions

Eva Wong*, Anh-Thu Ha, Aileen Ingles, Dana N. Rutledge, Patricia Nguyen, Sy Amirpoor, Marshall B. Ketchum University

Rationale for Study: In the United States, 25% (1 in 4) of patients with heart failure (HF) were readmitted to the hospital within 30 days. Additionally, HF is one of the six core conditions/procedures with excess hospital readmissions that may lead to payment reduction as part of the Hospital Readmissions Reduction Program beginning in 2012. It has been demonstrated that post-discharge follow-up phone calls to HF patients have a positive clinical impact on the HF hospital readmission rate. Currently, all HF patients with LACE index for readmission score > 11 receive either a manual or automated Cipher post-discharge follow-up call. HF patients with LACE > 11 with certain insurances (e.g., Medicare, One Care Connect, Cigna, HMO, CAPSR, SJoHMG, SJoHAP), these patients will receive a manual call from a Cipher nurse agent to review the patient's specific hospital discharge instructions (Group 1). In patients with LACE > 11, those with all other insurances (e.g., Cal Optima, Medicaid/Medi-cal, VA, Workman's Comp, all PPOs except for Cigna) receive an automated Cipher call and are provided with pre-selected numerical options to 'alert' a manual Cipher SJO call if they have questions (Group 2a: responded to call; Group 2b: did not respond to call). Additionally, HF patients with LACE of 10 have been re-admitted within 30 days at our SJO institution but currently receive no follow up post-discharge call (Group 3). Objective: To evaluate the impact of post-discharge follow-up phone calls provided by clinical pharmacists and Doctorate of Pharmacy (PharmD) students on 30-day hospital readmissions for heart failure patients. Methods: Under the supervision of a clinical pharmacist, PharmD students on their advanced pharmacy practice experience (APPE) rotations will review the daily discharge LACE readmission index report (length of stay in hospital [L]; acuity of admission [A]; comorbidity [C]; and emergency department utilization in the 6 months before admission [E]) and HF patient's electronic medical record (EMR) profile. The significance of this study is to evaluate the impact of post-discharge follow-up call on two subsets of HF patients using an adopted version of the AHA's validated HF post-discharge telephone follow-up form [6]. The two subsets would be those patients with LACE scores >11 who did not opt to receive the automated call (Group 2b) and HF patients with LACE scores of 10 (Group 3). The 30-day readmission rate of this subset of HF patients that receive the pharmacy post-discharge phone call intervention within 72 hours will be compared against two controls group of patients: 1) patients who received the manual call (Group 1); and 2) patients who received the alternate automated call (Group 2a). Data will be collected from telephone patient care interactions and will be analyzed using descriptive statistics; the associations between each clinical characteristics and care strategies will be determined using Phi and Chi-squared analysis, and association between the intervention and the control groups will be determined using the ANOVA analysis. Results/Conclusion: This research is in progress. Preliminary results will be presented.

43. Cardiac Rehabilitation (CR) Retrospective Study: Comparing Efficacy and Outcomes of Home Based CR vs. Clinic Based CR

Ayymen Amaar*, Pennie Coleman, Maria Diestra, Keck Graduate Institute

The American Heart Association (AHA) reports that cardiovascular disease (CVD) is one of the leading causes of death in the United States, and approximately 30% of patients who have a first CVD event are likely to experience another potentially fatal CVD. To mitigate the negative impact caused by CVD's, cardiac rehabilitation, a multidisciplinary and evidence-based program, which consists of a home-based and clinic-based option, has emerged as a critical tool to reduce mortality and hospitalizations after an adverse cardiac event. Despite the clear benefits of CR, patient referrals, and utilization of CR is low. This study seeks to compare the efficacy and outcomes of clinic-based and home-based CR, which will give more insight into increasing patient participation for CR and expanding home-based CR.

Poster Presentations Abstracts

44. Assessing discrepancies that contribute to an increase in health-systems readmission rates and the impact of continuum of care on post-discharge patients

Stephanie Truc Nguyen*, Ramisha Ali, Jonathan Echeverri, Andrew Shahbazian, Mitchell Timbol, Stephanie Kourtakis, Ethan Hyunh, Victor Law, Keck Graduate Institute

PURPOSE: Transitions between inpatient and community settings are prone to medication errors related to lack of communication between healthcare providers, inadequate patient education, incomplete medication reconciliation, and the absence of patient involvement in medication management. This project was designed to identify discrepancies that contribute to an increase in readmission rates within the San Gabriel Valley. The continuum of care was analyzed for the need for improvements in post-discharge care and medication management, while reducing penalties and costs. METHOD: A continuum of care service evaluated a total of 472 high risk patients with disease states including diabetes, heart failure, and COPD. These services included medication reconciliation performed by licensed pharmacists within a designated timeline to better assess the patient's post-discharge transition. During the home visit, the assessment was developed to determine contributing factors in patient comprehension of medication and disease state. These factors include discrepancies in: patient education, patient assessment, consultation, OTC product recommendation, discontinued medications, storage, expired medications, dosing, missing medications, drug-drug interactions/adverse drug reactions, therapeutic duplication, and treatment duration. RESULTS: Of the 472 patients, at least one discrepancy per patient was identified upon medication reconciliation post-discharge. Upon discharge, more than 50% of patients were misinformed in regards to their treatment and/or disease state. Discrepancies not commonly seen in practice, including cultural norms, were also discovered as an area for improvement and inclusion for patient assessments. CONCLUSION: Continuum of care services were helpful in identifying 12 critical discrepancies and correcting a gap in patient comprehension. Transitional care allow for the discovery and assessment of various discrepancies which may potentially cause readmissions. Identifying these issues can reduce patient costs, avoid readmission penalties, and optimize patient care.

45. The Pharmacist's Role in ending the opioid crisis

Sangwon Park*, Marian Pascual, Sampaguita Salabao, Veronica Sanchez, Keck Graduate Institute

In combating the rising opioid epidemic, healthcare professionals are trained to interact with the patient population in education, drug consultation, and being a source of accessible resource for information. However, there is a lack of information regarding inter-professional conduct with individuals undergoing narcotic treatment protocols (NTP) within the healthcare setting. Pharmacists, being the forefront of helping to combat the opioid epidemic, attitudes and focus within the profession must also reflect a willingness to de-stigmatize people going through NTP. In this study, we survey pharmacists in different professional healthcare settings to determine the willingness within the healthcare system to work alongside individuals undergoing NTP.

46. Improving patient Perioperative Care and promoting home discharge at POD1 through the implementation and execution of Enhanced Recovery After Surgery (ERAS) methods in Total Joint Replacement (TJR) surgeries at Emanate Health.

Candy Carillo*, Sajid Sindha, Keck Graduate Institute

Orthopedic surgery, particularly Total Joint Replacement, remains one the most common ambulatory and surgical procedures in the nation, due to the rapid rise in the aging population. The high demand for such surgical procedures can place patient outcome at risk and as well cause a monetary burden to the healthcare system. The Enhanced Recovery After Surgery (ERAS) is a multidisciplinary approach designed to target the factors that delay postoperative recovery, shortening hospital stays, accelerate patient recovery rates, and improving patient satisfaction. This project aims to analyze and evaluate the current ERAS methods implemented for orthopedic surgery at Emanate Health. The study will focus on the various perioperative steps and discuss what should be focused on and improved.

47. Statin Therapy in the Elderly: The Risk Benefit Controversy

Carolyn Saba*, Cassie Lee, Rachel Kim, Utsav Shah, Keck Graduate Institute

Data from meta-analyses of statin use among Spanish elderly between 2006 to 2015 has been shown to support statins use for the primary prevention of CVD in those aged 65 years or more. Most of this evidence does not, however, include people older than 74 years, and especially those older than 84 years - an age group that is underrepresented in clinical trials and observational studies. The study (is this the Spanish study?) assesses whether statin use is associated with a reduction in atherosclerotic cardiovascular disease and mortality among 65 and older adults with and without diabetes. A literature review of current evidence was performed where information was identified using three eligible types of study designs: prospective cohort, RCTs and clinical trials. Interventions from selected articles included statins efficacy, safety, tolerability within the population to reduce the risk of CVD. The results stated that in participants older than 74 years without type 2 diabetes, statin treatment was not associated with a reduction in atherosclerotic CVD or in all cause mortality, even when the incidence of atherosclerotic CVD was statistically significantly higher than the risk thresholds proposed for statin use.

48. Distinctive Cellular Response to Aluminum-Based Adjuvants

Krisha Hidalgo*, Issac Nies, Arezoo Campbell, Stephen Bondy, Western University of Health Sciences; UC Irvine School of Medicine

Aluminum-based adjuvants (ABAs) are used in human vaccines to enhance protective immunity. Stress signals released by aluminum-exposed necrotic cells play a role in modulating an inflammatory response that contributes to the adjuvant's effectiveness. We conjectured that U.S. approved formulations of ABAs will cause cell necrosis and consequent secretion of pro-inflammatory cytokines. Cell viability, reactive oxygen species formation, and production of cytokines were quantified. Three commercially available formulations of ABAs were examined. We have previously reported that low concentrations of aluminum in the drinking water induces an inflammatory response in the brain. To determine if tissue origin underlies cellular response to ABAs, macrophages or astrocytes were evaluated. Cells were exposed to different concentrations of the adjuvants for 24h or 72h. Both Alhydrogel and Adju-Phos caused decreased cell viability. At the 72h time point, the decrease in viability was associated with increased ROS formation. Neither Imject Alum nor alum caused any detectable changes. Astrocytes and macrophages presented a distinct profile of cytokine secretion. This may relate to the function and unique characteristics of each cell type. The extent to which these variations may be related to the efficacy and/or potential harmfulness of ABAs in vaccines should be evaluated in further detail.

Devices and Diagnostics

49. Point-of-Care Pathogen Identification of Urinary Tract Infections Using Diauxic-like Batch Multiplexing

Steven Lee*, Travis Schlappi, Tochukwu Dubem Anyaduba, Keck Graduate Institute

Urinary tract infections (UTIs) are one of the most common infections that affect people globally. Those experiencing UTIs are often under severe discomfort and if left untreated, can experience life-threatening complications such as sepsis. With the rise of multidrug resistant pathogens, it is crucial to develop new diagnostic tools to help reduce the chance of patients developing antibiotic resistant bacteria. Current diagnostic measures for UTIs either take too long, or are unable to identify the pathogen that is infecting the patient. We propose to identify pathogens associated with UTIs by multiplexing using a diauxic-like batch method. This can lay the groundworks for developing a point-of-care medical device, which can be used for rapid pathogen identification in clinics and resource limited settings.

50. Primer-payload Systems for Multiplex Isothermal Nucleic-acid Amplification

Tochukwu Dubem Anyaduba*, Travis Schlappi, Keck Graduate Institute

Loop-mediated isothermal amplification has been widely published as a choice for the advancement of nucleic acid-based diagnostics at point of care and limited-resource settings. This is owed to the advantages which it presents above polymerase chain reaction, PCR. A major limitation to the LAMP protocol, however, is the concern

Poster Presentations Abstracts

for non-specific amplification or primer dimerization in the diagnosis of multi-pathogen diseases such as urinary and respiratory tract infections. This challenge, however, can be averted if there was a way to control the delivery of primer sets into the amplification. We are currently developing a platform capable of achieving this aim; digital bead-based primer delivery. In this method, microbeads characterized by their size and the fluorescent intensity ratio of dyes infused in them are functionalized using streptavidin and biotinylated primer capture oligonucleotide probes, (COP). The COP hybridize to complementary sequences attached to the primers. Each bead class delivers a set of target-specific primers. Upon mixing with samples, these primers (especially, FIP) hybridize to specific targets leading to the formation of bead-probes-primers-target complexes. Downstream, these complexes are enclosed in picolitre-scale water-in-oil droplets containing LAMP reagents and are used in amplification.

51. Understanding the Role of Old and Young Blood - Derived Exosomes in Aging

Jonalyn Herce*, Kiana Aran, Keck Graduate Institute

Through heterochronic blood exchange in a murine model, a decline in hippocampal performance was observed in a young mouse who received old blood. To understand what blood factors are associated with this decline, penetration across the blood-brain barrier (BBB) will be explored. Additionally, the observed decline was seen after a single blood exchange. Red blood cells (RBC) may play a large role in this rapid decline given that they are the most abundant cells in blood. Moreover, exosomes participate in intercellular communication and appear to be rich within RBCs. RBC secreted exosomes or soluble exosomes in blood will be examined for their capability of passage through the BBB.

52. Point of Care Infectious Disease Diagnosis via Isothermal Nucleic Acid Amplification Integrated into a Sample to Answer Device

Abrar Al Maghribi*, Abrar AL-Adhmi, Angela Sun, Hsiang-Wei Lu, Katlin Wilson, Adison Drewery, Rama Sakamuri, Angelika Niemz, Hua Wei Chen, Tania Maldonado, Gabriel Defang, Shuenn-Jue Wu, Keck Graduate Institute

Sexually transmitted infections caused by Chlamydia trachomatous (CT) and Neisseria gonorrhea (NG) are often under-diagnosed, miss-diagnosed, and not properly treated, leading long term complications such as ectopic pregnancy and infertility, and to emergence of drug resistance. Dengue virus (DENV) infections can cause dengue fever (DF), which if not properly managed can lead to Dengue hemorrhagic fever (DHF) and dengue shock syndrome (DSS), causing significant morbidity and mortality. In both cases, early and accurate detection at the point of care is critical to facilitate proper patient care and disease management. However, current diagnostic methods based on culture, or detection of antigens or host antibodies either are complex with long turn-around times, or lack sensitivity and specificity. Nucleic acid amplification tests (NAATs) provide suitable sensitivity and specificity, but are often complex, expensive, and difficult to implement at the point of care. We are developing loop mediated isothermal nucleic acid amplification (LAMP) assays coupled with upstream sample preparation and downstream lateral flow detection integrated into a compact sample to answer device to facilitate point of care diagnosis of CT, NG, and DENV. Our goals include implementing these assays in thermostable dry reagent format, establishing multiplex detection of CT and NG, as well as detection of all DENV serotypes.

53. Infectious Disease Diagnosis via Nucleic Acid Testing: Process Development and Device Integration

Abrar Al-Adhmi*, Abrar Al Maghribi, Angela Sun, Hsiang-Wei Lu, Katlin Wilson, Elizabeth Celaya, Adison Drewery, Rama Sakamuri, Angelika Niemz, Hua Wei Chen, Tania Maldonado, Gabriel Defang, Shuenn-Jue Wu, Keck Graduate Institute

Early diagnosis of infectious diseases is essential to improving patient outcomes and preventing disease transmission within the global population. Chlamydia trachomatis (CT) and Neisseria gonorrhoeae (NG) are the top two most common (STDs) in the United States and holds a high prevalence world-wide. Many infected patients are asymptomatic, which can result in disease progression and further transmission of these STDs within a population. Rapid and accurate diagnosis of CT/NG can promptly detect the diseases and curb transmission. In addition, Dengue virus (DENV) infection has also become a global problem and, like CT and NG, often goes undiagnosed. This puts patients at higher risk for severe complications such as dengue fever (DF), dengue hemorrhagic fever (DHF), and dengue shock syndrome (DSS). Early detection is critical in improving these DENV infected patient's outcomes.

This project is working on the development of a point-of-care (POC) in vitro diagnostic device to detect CT/NG and DENV infections via nucleic acid amplification testing (NAAT). Specifically, this study's primary focus is to develop and optimize a benchtop process for sample preparation, inhibitor removal, amplification and lateral flow detection. All of these processes will then be integrated into a fully automated system comprised of an instrument and a disposable cartridge. Additionally, this study will test the analytical and clinical performance of the overall system after device integration, through evaluating the limit of detection (LOD), sensitivity, and specificity of the device.

Scholarship of Teaching and Learning

54. A Sustainable Mentoring Program for Students

Daniel Kudo*, Neiloo Jafari, Gregory Reardon, Keck Graduate Institute

Formalized pharmacy didactic and practical courses develop fundamental skills needed to function in a clinical environment and to pass the national licensure examination. Intern pharmacists are taught important skills associated with the practice of pharmacy by their preceptor. However, feedback from senior-level pharmacy students and alumni suggests that such traditional coursework and "on the job" training is not optimal for helping them to identify and select a career path consistent with their interest. Mentoring programs often lack uniformity, are typically of a limited duration, may not be focused on career path development, and traditional 1:1 mentoring programs are limited in scalability. If given the opportunity, a surprisingly large number of students may have an interest in career mentoring. A group mentoring program at Keck Graduate Institute (KGI) School of Pharmacy has been developed to help pharmacy students identify and develop areas of interest and to find career paths that most closely match them. The group mentoring process focuses on identifying areas of significant interest through independent research and reporting of finding to the group, which in-turn benefits from this research. In this way, career path research can be significantly enhanced through group interactions. This scalable group mentoring program design can be used by a variety of preceptors including hospital, retail, managed care, or pharmacy faculty settings.

55. Assessing students' experience and perception about podium presentations at the Inaugural AAAS Pacific Division-AACP Students' Symposium: a descriptive study

Eva Wong*, Jozef Stec, Charitha Madiraju, Ronny Priefer, Marshall B. Ketchum University

Objectives: To assess pharmacy students' experience and perception on podium presentations at the Inaugural AAAS Pacific Division-AACP Students' Symposium. Methods: Pre- and post-symposium surveys were distributed to the student presenters prior to and after the symposium, respectively. The respondents were asked to anonymously answer the survey consisting of 15 questions regarding their experience and perception on scholarly podium presentations. The results of the surveys were subsequently analyzed for cumulative student responses. Results: At the 99th Annual Meeting of the American Association for the Advancement of Science Pacific Division (AAAS PD), thirteen (13) student presenters delivered their podium presentations at the symposium entitled "Pharmaceutical Research and Development: From Bench to Patient-Centered Care" held on June 13th 2018 in Pomona, CA. All presenting students completed the pre- and post-symposium questionnaires, which were subsequently analyzed and the obtained responses demonstrated that the intended goals of the symposium were achieved. The participating students had the opportunity to: prepare and independently deliver a podium presentation on pharmacy-related research topic at a regional meeting; network, learn from each other, and from health professionals present in the audience about diverse aspects pertinent to clinical pharmacy research; and mastered soft skills. Conclusion: A 100% participation of pre- and post-symposium surveys by the student presenters revealed an overall positive perception on scholarly podium presentations and experienced scientific benefits, networking opportunities, and mastering soft skills.

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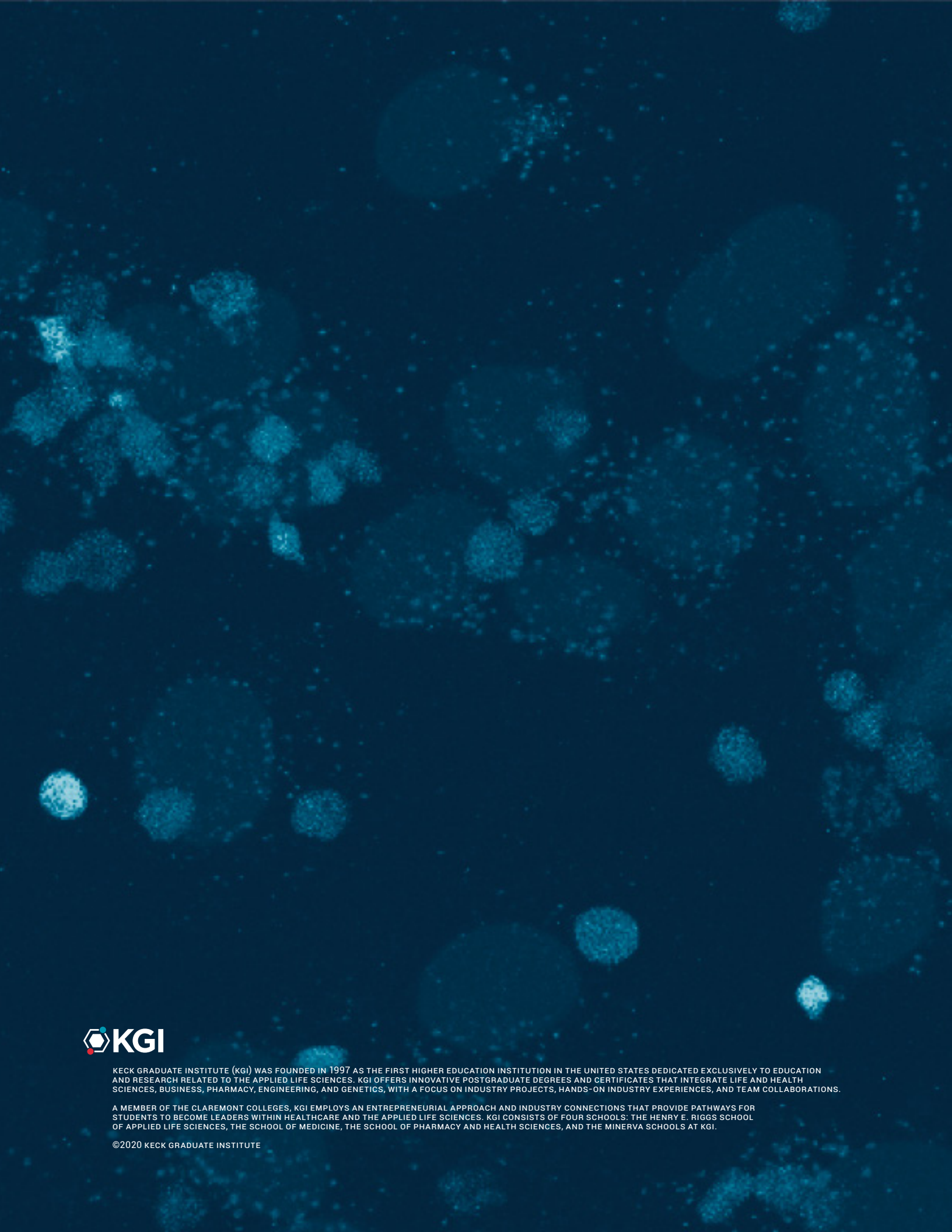

KGI

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