PILOT AWARDS PROGRAM

2023 Annual Summary Report

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ICTS Evaluation Unit

UCI Institute for Clinical & Translational Science

NIH National Center for Advancing Translational Sciences

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This report summarizes the components of the UCI ICTS Pilot Awards Program by highlighting its accomplishments and overall impact.

UC Irvine ICTS

The UC Irvine Institute for Clinical and Translational Science (ICTS) is a member of a consortium of over 60 Clinical and Translational Science Awards (CTSAs) housed at academic medical centers throughout the United States. The consortium is funded by the National Institute for Advancing Translational Sciences within the National Institutes of Health., with the mandate to "develop innovative solutions that will improve the efficiency, quality and impact of the process for turning observations in the laboratory, clinic and community into interventions that improve the health of individuals and the public" (https://ncats.nih.gov/ctsa).

The UCI Pilot Program

Guided by the Leadership of the ICTS, the Pilot Awards Program supports local cutting-edge research in the early phases with the goal of nurturing these projects as they plan for larger, externally funded studies.

ICTS pilot grants are designed specifically to support exceptionally innovative and/or unconventional research projects that have the potential to create or overturn fundamental paradigms.

The ICTS Pilot Awards Program seeks to support studies that will advance the goals of the CTSA Awards Program:

- Train and cultivate the translational science workforce.
- Engage patients and communities in every phase of the translational process.
- Promote the integration of diverse and under-resourced populations in translational research across the human lifespan.
- Innovate processes to increase the quality and efficiency of translational research.
- Advance the use of cutting-edge informatics.

Pilot Awards Program

Summary of Awards

The ICTS releases a call for proposals once each year, with proposals due in the fall. Each proposal is reviewed by at least 3 experienced and expert investigators, one of whom is external to UCI and one of whom is from the non-academic community.

A unique feature of our review process is our participation in the CTSA External Reviewers Exchange Consortium (CEREC), which affords us access to reviewers at 8 partner CTSAs so that we can recruit the best experts and also avoid conflict of interest in the review process. Our CEREC partners include University of Washington; Ohio State University; Medical College of Wisconsin; University of Alabama at Birmingham; University of Arkansas Medical Sciences; Harvard Catalyst; University of Southern California; and Virginia Commonwealth University

Each year the UCI ICTS supports up to 8 awardees with approximately $25,000 in direct funds. The goal of the program is to promote collaborations among faculty members on relatively short-term projects, "high- risk/high-yield" pilot research investigations, and research which may lead to further discoveries and/or large- scale extramural funding.

Research Acceleration and Facilitation Team (RAFT)

Our support of the research process does not end when we transfer the funds. Throughout the one-year period of active funding, our RAFT team reaches out proactively to our awardees to ensure that we assist them with overcoming the many small hurdles that can delay research: regulatory processes (for example, the Institutional Review Board and the Institutional Animal Care and Use Committee); difficulties with obtaining chemical assays or biological materials; and challenges with recruiting study participants in human studies.

Program Inputs (2010-2023)

89
Principal Investigators

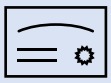
44
UCI Departments

$2,637,227
Invested

Program Outputs (2010-2023)

99
Projects

385
Publications



519
Extramural Grants

$192,901,597
in Extramural Funds

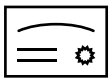
$35,206,554
in Extramural Funds Directly Related to the Pilot Award

Return on Investment (ROI) for Pilot Awards (2011-2023)

Total ROI = 74.12

Related ROI = 13.45

For every dollar invested, there have been approximately $13.45 returned in total extramural grant funding for projects directly related to the Pilot funding.



46% of Pilot Studies Yielded at Least One Subsequent related *Grant*

62% of Pilot Studies Yielded at Least One Subsequent related *Publication*

Details regarding the computations that informed these metrics can be found on page 13.

Assessing Translational Science Benefits

In August 2023, 29 investigators who received ICTS pilot funding within the four years spanning July 2019 to July 2023 reported on the impacts of their projects using the Translational Science Benefits Model (TSBM)[1]. The surveys gathered self-reported information about the clinical, community, economic, and policy-related impacts (benefits) of the research.

Out of the 29 projects, 21 (72%) reported translational science benefits that either were expected to or had resulted from their research. Independent verification of self-reports confirmed that 6 of the projects (21%) had already demonstrated translational science benefits. These project outcomes are presented in Figure 2 below.

Figure 2. Translational Science Benefits of ICTS-funded Pilot Projects[2]

Clinical & Medical Benefits

Dr. Morey's 2020 project yielded an investigative procedure for determining how neighborhood factors are associated with rates of asthma for Asian-American and Pacific Islander populations.

Dr. Acharya's 2020 pilot project identified a drug that can be repurposed to reduce cancer-related cognitive impairment.

Dr. Epstein's 2021 project developed software technology designed for prescribers of antidepressants to track side effects and to help patients safely and gradually taper off of medication.

Community & Public Health Benefits

Dr. Lee's 2021 pilot project trained pre-diabetes patients to use flash glucose monitoring to engage in healthier lifestyles designed to slow down or stop the progression to diabetes.

Economic Benefits

Dr. Haun's 2019 project resulted in co-founding a company to commercialize microfluidic technology to process adipose tissue at the point-of-care and rapidly deploy stem-cell therapeutics that promote wound healing.

Policy & Legislative Benefits

Dr. Yeung's 2021 project led to the investigator participating in the national committee on perioperative use of cannabis and cannabinoids, which is drafting national guidelines.

[1] Institute of Clinical & Translational Sciences at Washington University in St. Louis. Translational Science Benefits Model (TSBM) website. https://translationalsciencebenefits.wustl.edu. Published February 1, 2019. Accessed Sept 21, 2022.
[2] Format for this figure and the project highlights adapted from the Implementation Research Institute Impact Highlights 2021 on the TSBM website. https://cpb-us-w2.wpmucdn.com/sites.wustl.edu/dist/4/1094/files/2022/03/IRI-Impact-Highlights-2021-1.pdf. Accessed Sept 21, 2022

Pilot Awardees (2010-2023)

2010

Leslie Lock, Beckman Laser Institute: Normalizing the Mutation that Causes FSH Muscular Dystrophy in FSH Induced Pluripotent Stem Cells.

Albert Cerussi, Department of Dermatology: Development of Metabolic Imaging Probes Embedded into Standard Minimally Invasive Clinical Instruments for Improving Critical Care Patient Outcomes.

Anand Ganesan, Department of Neurology: RhoJ- a Novel Regulator of Melanoma Invasion and Chemoresistance.

Edwin Monuki, Department of Pathology: Accelerating the Translation of a Laboratory Finding into Clinical Applications Using Choroid Plexus Epithelial Cells (CPECs).

David Nolan, Division of Gastroenterology: To Determine Whether Oral Betaine At 4 Grams/Day, 8G/D Or 12G/D Improves Homeostasis Model Assessment of Insulin Resistance (Homa-ir) In Patients with Impaired Fasting Glucose.

Annabel Wang, Department of Neurology: Predictors of Phenotype in Patients with Spinal Muscular Atrophy and Calf Hypertrophy.

Xiaolin Zi, Department of Urology: Inhibition of Pro-invasive Effects Of Anti-vegf Therapy by Secreted Wnt Antagonists.

2011

Elliot Botvinick, Beckman Laser Institute: Bloodless Laparoscopic Cutting Tool.

Elizabeth Chao, Department of Pediatrics: Early Detection of Prostate Cancer by Profiling Nucleosome Phase Profiling in Peripheral Samples.

Gregory Evans, Department of Plastic Surgery: Reprogramming of Adipose Derived Stem Cells (Adscs) To Ips and Further Differentiation to Neuronal Cells for the Treatment of Peripheral Neuropathy.

Lisa Flanagan, Department of Neurology: Developing a Novel Cell Sorting Technology to Purify Cells For Transplantation.

Arash Kheradvar, Department of Biomedical Engineering: Development of A Novel Self-expandable Bioprosthetic Heart Valve for Percutaneous Delivery And Implantation.

Dara Sorkin, Department of Medicine & Health Policy Institute: Unidas Por La Vida: United for Life.

2012

David Fruman, Department of Molecular Biology & Biochemistry: mTOR Kinase Inhibitors: Cancer Therapeutics Repurposed for Treatment Of Autoimmune Disease.

Kim Green, Department of Neurobiology & Behavior: Treating Traumatic Brain Injuries Via a Novel Method of Brain Microglia Elimination.

Jung-ah Lee, Nursing Science: A Technology Driven Safety Intervention For Older Adults New To Anticoagulation Therapy.

Hannah Park, Department of Epidemiology & Biostatistics: Quantitative Analysis Of Potential Plasma Methylation Markers For Breast Cancer.

Leslie Thompson, Department of Psychiatry & Human Behavior: Zfn-mediated Knockdown Of Mutant Htt In Patient- Derived Ips Cells.

Michael Zaragoza, Department of Pediatrics: Mitochondrial And Nuclear Dna "Double Mutations" In The Progression Of Cardiomyopathy To End-stage Heart Failure.

2013

Hak Lee, Department of Urology: Quantitative Assessment of the Effects of Hydrogen Sulfide (H_2S) in Renal Ischemic and Reperfusion Injury for Partial Nephrectomy in a Porcine Model Using Spatial Frequency Domain Imaging (SFDI).

Roxanne Silver, Department of Psychology & Social Behavior: A Gene-Environment Study of Coping Among an Indonesian Sample Exposed to Repeated Natural Disasters.

Kyoko Yokomori, Department of Biological Chemistry: Development of a Novel ChIP-Based Diagnostic Assay for FSHD.

Ellis Levin, Department of Endocrinology: Reversing Tamoxifen Resistance in Breast Cancer Hiroshi Yoshioka: Study of Knee Cartilage Degeneration by Novel Orientation/Thickness Dependent T_2 and T_{1rho} Mapping Approach.

Hiroshi Yoshioka, Department of Radiological Sciences: Study of Knee Cartilage Degeneration by Novel Orientation/Thickness Dependent T_2 and T_{1rho} Mapping Approach.

Bogi Anderson, Department of Endocrinology: Cell Type-Specific Analysis of Epigenetic Marks in Human Tissues.

2014

John Billimek, Health Policy Institute: The Empathy Toolkit: A prototype Software Application to Help Low-Income Diabetes Patients Overcome Barriers to Medication Adherence.

Hye-Won Shin, Department of Pediatrics: A Novel Noninvasive Approach for Inhaled Corticosteroids Compliance: Quantification of Aerosol Hydrofluoroalkane Elimination Kinetics in the Exhaled Breadth of Asthmatics.

Bernard Choi, Beckman Laser Institute: Objective Measure of Anastomotic Blood Flow After Gastrointestinal Surgery Using Laser Speckle Imaging.

Alan Widgerow, Aesthetic & Plastic Surgery Institute: Signaling Profile of Thermal Trauma (SPoTT) - Exudate (fluid) Analysis in Acute Burn Patients - a Diagnostic Test and Device with Therapeutic Potential.

Xiaolin Zi, Department of Urology: A Novel Mechanism of Targeting LEF1 for Treatment of Castration-Resistant Prostate Cancer.

Arash Kheradvar, Department of Biomedical Engineering: Development of a Bio-Inspired Transcatheter Mitral Valve for Transapical Implantation.

Wendy Liu, Department of Biomedical Engineering: Immunomodulatory Materials for Bioabsorbable stents.

2015

Aileen Anderson, Department of Physical Medicine & Rehabilitation: Inhibition of Neutrophil Infiltration to Improve Donor Human Neural Stem Cell-Driven Motor and Sensory Function After Spinal Cord Injury.

Daniela Bota, Department of Neurology: An Old Drug with a New Potential Use: n-acetylcysteine Preclinical Testing as a Treatment for Chemotherapy-Related Cognitive Impairment.

Lisa Flanagan, Department of Neurology: Stem Cell Scaffolds to Treat Brain Trauma.

David Fruman, Department of Molecular Biology & Biochemistry: Efficacy and Selectivity of a Novel Drug Combination in Aggressive Lymphoma.

Harrison Lin, Department of Otolaryngology: Chronic Implantation of the Auditory Nerve: a Successor to the Cochlear Implant.

Hartmut Luecke, Department of Molecular Biology & Biochemsitry: Understanding How Lead Compounds Reactivate p53 Cancer Mutant Function Using Novel Biochemical and Biophysical Techniques.

Wayne Poon, Institute for Memory Impairments & Neurological Disorders (MIND): Genetics of Sporadic AD: The Identification of Endophenotypes as Potential Diagnostic Biomarkers.

Jing Yang, Department of Ophthalmology: Evaluation of Retinal Progenitor Cells (RPCs) as Therapeutic Candidate for Retinopathy of Prematurity (ROP).

2016

Munjal Acharya Department of Radiation Oncology: Adenosine Kinase Inhibition Therapy for Radiation-Induced Cognitive Dysfunction.

G.P. Li, Department of Engineering: Determining Optimal Pain Medication for Postoperative Outpatient Surgical Pain Using an Innovative Oral Patient Controlled Analgesia Device Melanie Cocco: Blocking nogo to Promote Neuronal Regeneration.

Susan Huang*, Division of Infectious Diseases: Improving C Difficile Infection CDI Diagnosis, Reporting, and Treatment: a UC Team Science Approach.

Bert Semler, Department of Microbiology & Molecular Genetics: Discovery of Inhibitors of a Novel Host Activity Required for Human Rhinovirus Replication.

Leslie Thompson, Department of Psychiatry & Human Behavior: Fenofibrate as a Treatment for Huntington's Disease Lorraine Evangelista: Informatics: Transitional Care Using Supportive Techniques for Advanced Heart Failure (TRUST).

2017

Kelly Biegler, Department of Medicine: Mi Vida, Mi Salud: A Mobile Health Intervention for the Development of Personal Rules Promoting Weight Loss, Symptom Management, and Reduction in Proinflammatory Biomarkers in Latina Breast Cancer Survivors.

Daniela Bota, Department of Neurology: Preclinical Development of Coumarinic Compounds as a Novel, Mitochondrial-Targeted Therapy for Glioblastoma.

Aimee Edinger, Department of Developmental & Cell Biology: Evaluation of sphingolipid-inspired small molecules as calorie restriction mimetics.

Robert Spitale*, Department of Pharmaceutical Sciences: Constructing the In-Brain Transcriptional Landscape of Transplanted Stem Cells During Rescue of Cognitive Impairment Due to Radiotherapy Damage.

Angela Fleischman, Department of Hematology & Oncology: SMAC Mimetics as a Therapeutic Approach in Myeloproliferative Neoplasm.

Felicia Lane, Department of Urogynecology: Determination of LOXL1 and Fibulin 5 Levels in the Vaginal Secretions of Women With and Without Pelvic Organ Prolapse.

Jeremiah Tao, Department of Ophthalmology: A Digital Prosthetic Eye with Functional Eye Mimicry

Armando Villalta, Department of Physiology & Biophysics: Regulatory T-cell Responses in Muscle Degenerative Disorders.

Mark Warschauer, School of Education: Telepresence Robots for Virtual Academic Inclusion and Improved Well-Being, Health, and Social Outcomes for Homebound Pediatric Patients.

Jean Gehricke*, Department of Pediatrics: The Efficacy of a Brief Career Development Program for Young Adults with Autism.

2018

Chris Hughes, Department of Molecular Biology & Biochemistry: Validation of a Microfluidic Device to Study Patient-Derived Colon Cancer Cells and Determine Clinical Predictive Value.

Hamid Moradi, Department of Nephrology: Safety and Efficacy of 2-arachidonoyl-sn-glycerol in Treatment of End Stage Renal Disease (ESRD)-related Cachexia.

Kate Kuhlman, Department of Psychology & Social Behavior: Neuroendocrine and Inflammatory Mechanisms of Cognitive and Affective Processes in Adolescents Exposed to Childhood Adversity.

Michelle Khine, Department of Biomedical Engineering: Conformal Wearable Electronics to Monitor Congestive Heart Failure.

Wendy Liu, Department of Biomedical Engineering: Immunomodulatory Biomaterials for Skin Regeneration Yama Akbari: A Novel, Prognostic EEG Signal During Cardiac Arrest with Therapeutic Potential.

William Karnes, Department of Gastroenterology: Robust Real-Time Polyp Detection and Classification During Colonoscopy Using Deep Learning.

2019

Ariel Neikrug, Department of Psychiatry & Human Behavior: Interacting Mechanisms of Sleep and Fitness: Implications for Health in the Growing Child.

Autumn Ivy, Department of Pediatrics: Early-life Exercise May Rescue Cognitive Impairments After Chronic Early-life Stress: Epigenetic Mechanisms in Preclinical Models.

Dongbao Chen, Department of Obstetrics & Gynecology: Molecular Signatures of Serum Endothelial Exosomes in Pregnant Women with Placenta Accrete.

Hamid Djalilian*, Department of Otolaryngology: Randomized Clinical Trial of Migraine Medications in Treatment of Tinnitus.

Ichiro Yuki, Department of Neurosurgery: New Generation Liquid Embolic Material for the Use of Endovascular Treatment: An Organic Polymer Composite Activated by the Ca2+ in the Blood.

Jered Haun, Department of Biomedical Engineering: Microfluidic Device Platform for Processing Human Fat for Autologous Therapies.

Michael Hoyt, Department of Population Health & Disease Prevention: A Biobehavioral Intervention for Young Men with Testicular Cancer.

Shahrdad Lotfipour, Department of Emergency Medicine: Molecular Neurobiology of Nicotine Use.

Shahrdad Lotfipour*, Department of Emergency Medicine: Gut-Brain Axis Interactions in Opioid Use.

Terrye Peterson*, Department of Obstetrics & Gynecology: Comparison Study of Hypoglycemia in Pregnancy Among Women with No Complications and Women with Diabetes.

2020

Brittany Morey, Department of Public Health: Neighborhood Risk and Resilience for Asian American, Native Hawaiian, and Pacific Islander Respiratory Health Disparities.

Edward Kuan, Department of Otolaryngology: Electrochemical Point-of-Care Cerebrospinal Fluid Detection.

Lee Bardwell, Department of Developmental & Cell Biology: Novel Inhibitors of Phosphoinositide 3-kinase (PI3K) that Target Scaffold Protein-Mediated Interactions.

Maya Hatch, Department of Physical Medicine & Rehab: A Novel Balance Assessment Outcome for Individuals with Spinal Cord Injury.

Munjal Acharya, Department of Radiation Oncology: Targeting Complement Signaling in Glioblastoma.

Natasha Mesinkovska, Department of Molecular Biology & Biochemistry: Collective Mechanism of Hair Regrowth During Alopecia Areata Resolution.

Olga Razorenova, Department of Molecular Biology & Biochemistry: Dissecting the Mechanism of Mitochondrial Fatty Acid Oxidation Dysregulation in Breast Cancer.

Virginia Kimonis, Department of Pediatrics: Modulation of Heat Shock Proteins B8 by Colchicine: Example for Neurodegenerative Diseases Therapy.

2021

Alexander Brandt, Department of Neurology: Quantitative MRI of Myelin Integrity in a Mouse Model of Toxic Demyelination.

Alexandre Chan, Department of Clinical Pharmacy Practice: Augmentation of BDNF Levels to Prevent Cancer-Related Cognitive Impairment (ABC Study).

Brent Yeung, Department of Anesthesiology: Cannabis Use's Effect on the Endocannabinoid System and Anesthetic Management in Patients Undergoing Traumatic Orthopedic Surgery.

Daniel Epstein, Department of Informatics: A feasibility Study of An Innovative Informatics Application that Facilitates Tapering of Psychiatric Medications through Patient-Reported Outcomes and Shared Decision-Making.

Jaime Landman, Department of Urology: Aptamer-based urinary biosensor for bladder cancer detection and surveillance.

Joyce Lee, Department of Clinical Pharmacy Practice: Evaluating the Receptiveness to Wear a Flash Glucose Monitoring System in People with Prediabetes: A Feasibility and Acceptability Study.

Peter Kaiser, Department of Biological Chemistry: Structure Function Analyses of P53 Cancer Mutants with Corrector Drug Leads.

Ruiming Zhao, Department of Physiology & Biophysics: A Trial of Suppression of SARS-CoV-2-associated Acute Respiratory Distress Syndrome (ARDS) with the hHv1 Blocker C6.

2022

Elizabeth Thomas, Department of Epidemiology & Biostatistics: Salivary Cytokines as Indicators of Early Cognitive Decline.

Hamid Djalilian, Department of Otolaryngology: A Novel Therapeutic Strategy of Mitochondrial Transplantation into Inner Ear for the Treatment of Hearing Loss.

Helen Ma, Department of Hematology & Oncology: Outcomes from the National Database of Lymphoid Malignancies in US Veterans Using Data from the Veterans Health Administration.

Maheswari Senthil, Department of Surgery: Plasma Levels of Exosomal PD-L1 and Gene Expression as Predictors of Response to Immune Checkpoint Inhibitors in Gastrointestinal Cancers.

Michael Hicks, Department of Physiology & Biophysics: A Combined Cell and Gene Therapy for Retrograde Delivery of Neurotrophic Payloads for Neuromuscular Disease.

Shahrdad Lotfipour, Department of Emergency Medicine: Post-Translational Mechanisms of a 3' UTR Alpha6 Nicotinic Receptor Polymorphism in Adolescent Substance Use.

Wenqi Wang, Department of Developmental & Cell Biology: Developing a Small Peptide Modulator of the Hippo-YAP Pathway for Cancer Treatment.

2023

Andrej Luptak, Department of Pharmaceutical Sciences: Investigating the Role of CPEB3 Ribozyme in Glioblastoma.

Bryce Mander, Department of Psychiatry & Human Behavior: Assessment of Relationships Among Sleep Quality, Memory, and Salivary Alzheimer's Disease, Glial Activation, and Neurodegeneration Biomarkers.

Dorota Skowronska-Krawczyk, Department of Physiology & Biophysics: RGC Protection in Glaucoma.

Farouk Nouizi, Department of Radiological Sciences: Physiological Monitoring of Transarterial Embolization Outcomes using a dedicated CT-guided Optical Imaging System.

Lisa Wagar, Department of Physiology & Biophysics: Tracking Immune Responses to Live-Attenuated Influenza Vaccine in Human Tonsils.

Oliver Eng, Department of Surgery: Metabolic Phenotype and Development of Novel Therapeutics for Peritoneal Metastases.

Oswald Steward*, Department of Anatomy & Neurobiology: Quantitative Assessment of Arm Movement Function for Nerve Repair Surgery Prognosis.

Ralph Clayman, Department of Urology: Intraoperative Ureteral Dilation Using Electromotive Drug Administration (EMDA).

Yama Akbari, Department of Anatomy & Neurobiology: Brain-Heart Connections During Cardiac Arrest for Early Stage Prognosis and Treatments to Improve Outcome.

*These awardees received institutional funds, rather than NCATS funds.

Notes on Data Presented in this Report

The data and metrics displayed on page 4 were calculated in a variety of ways, further detailed below, using internal ICTS Evaluation databases and resources.

Note that **ROI** and **Common Metrics** refer to the impact of awards conferred in **2011-2022**. This includes extramural funding received and publications produced through December 2023.

Program Outputs:

- The number of publications was calculated by tracking all publications per each Pilot awardee following their Pilot award. This number includes the total publications associated with each Pilot awardee's original Pilot project.
- The number of extramural grants and total funding amount was tracked through the UC Irvine Data Warehouse. The data showcase the total number and cost of extramural NIH grant funds received by each awardee, including those related to their original Pilot project.

Return on Investment (ROI):

((Total Funds Returned – Total Funds Invested)/(Total Funds Invested)) * 100

- Total ROI refers to funds returned by the PI in general following their initial Pilot award.
- Related ROI refers to funds returned by the PI that are directly related to the initial research funding topic and are not counted toward the ROI if the funds result from another topic of research led by the PI.

Common Metrics Initiative:

The percentages for Pilot Awardees with (1) at least one subsequent grant and (2) at least one subsequent publication were calculated using the guidelines of the Common Metrics Initiative established by the National Center for Advancing Translational Science (NCATS). No longer mandated by NCATS, we continue to track these metrics for comparison over time.

Percent of Pilot studies with at least one subsequent grant:

- (Total projects with *at least* 1 related grant through 2023 (39) / Total Pilot Projects between 2011-2022 (84)) * 100 = 46%

Percent of Pilot studies with at least one subsequent publication:

- (Total projects with *at least* 1 related publication through 2023 (52) / Total Pilot Projects between 2011-2022 (84)) * 100 = 62%

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