California Initiative to Advance
Precision Medicine

2024
ANNUAL
REPORT

ANXIETY INTERVENTION
TOOLKIT

Relaxing Walk

Deep Breathing

California Initiative to Advance Precision Medicine 2024 Annual Report to the California Legislature

Report prepared by the California Health and Human Services Agency (CalHHS)

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In Memoriam: CIAPM honors the life and legacy of Dr. Atul Butte, who served as the founding Principal Investigator for the entire CIAPM program when launched and administered through UCSF from 2015-2018. A fierce advocate and entrepreneur in the biomedical data science space, his work provided a pivotal framework for funded researchers to blend health data, state-of-the-art data analysis, and artificial intelligence to further precision medicine and equitable outcomes.
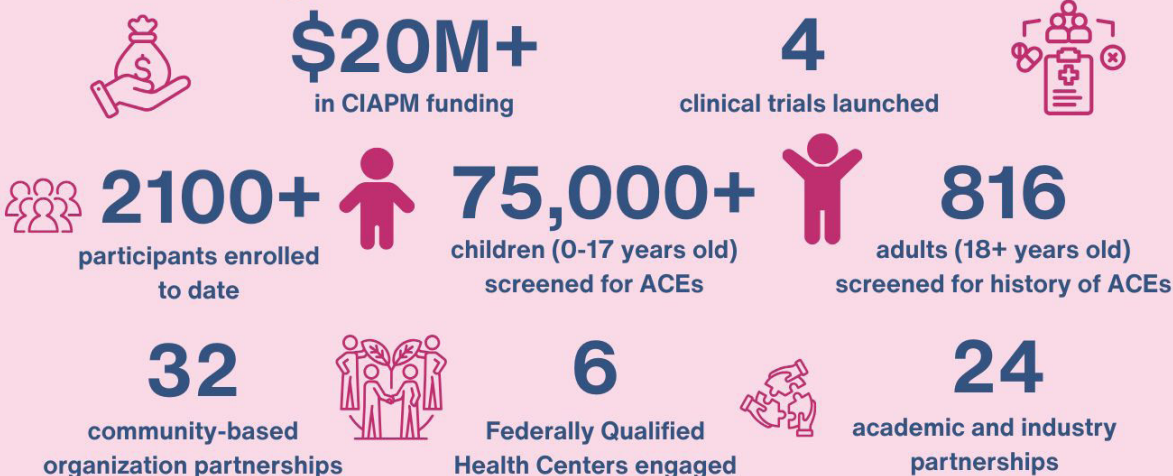
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CA Initiative to Advance Precision Medicine

2024 Highlights

Adverse Childhood Experiences (ACEs) Research Program

Since starting in 2021:

$20M+
in CIAPM funding

4
clinical trials launched

2100+
participants enrolled to date

75,000+
children (0-17 years old) screened for ACEs

816
adults (18+ years old) screened for history of ACEs

32
community-based organization partnerships

6
Federally Qualified Health Centers engaged

24
academic and industry partnerships

In 2024:

Additional Funding Awarded

5
additional awards

$2M+
in post-funding

Research Output

63
publications

103
presentations

14
outreach and digital assets

Collaborators and Trainees

6
networks and collaborations

36
research trainees

166
community health workers and clinical trainees

Depression Research Program

CIAPM's 3 funded depression projects will begin enrolling participants in 2025, including LGBTQ+ and publicly-funded youth, and patients served at a Federally-Qualified Health Center in CA.

$9M
in CIAPM funding

8
research trainees

5
community-based organizations

13
networks and collaborations

https://ciapm.chhs.ca.gov/

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California Health & Human Services Agency

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Executive Summary

The California Initiative to Advance Precision Medicine (CIAPM), which was established in 2015 within the Governor's Office of Planning & Research (now Governor's Office of Land Use and Climate Innovation), transitioned to the California Health and Human Services Agency (CalHHS) in July 2024 as part of the AB/SB 164 budget package.

Precision medicine, also called *precision health, personalized medicine,* or *individualized medicine*, aims to account for all aspects of one's biology, behavior, lifestyle, and environment to provide personalized and optimized health interventions. CIAPM supports cutting-edge biomedical and health research that harnesses data to generate new insights, prioritizes whole-person care, and advances community-driven solutions to reduce health inequities. CIAPM's mission is to drive the development of innovative technologies and personalized strategies and to coordinate cross-sector partnerships for prevention, diagnosis, and treatment to improve the health and well-being of all Californians. Primarily through research grantmaking, CIAPM pushes the field of precision medicine to consider the whole person, including social determinants of health, for individualized prevention, diagnostic, and treatment strategies. CIAPM seeks to facilitate and support innovative research studies, interventions, and collaborations that engage participants and community-based organizations (CBOs) as co-leaders in striving for whole-person health research and care to improve health for all Californians.

Since 2015, CIAPM has funded demonstration research projects in patient- and community-engaged precision medicine research and supported cross-sector partnerships throughout California to achieve more equitable health outcomes. As CIAPM enters its tenth year, we have launched our fourth research program (focused on depression) and are evaluating the results of concluded projects (focused on cancer disparities). CIAPM's portfolio in 2024 also includes community-centered, biomedical research on adverse childhood experiences (ACEs) and the development of an approach to increase research representation in California. By considering the whole person, CIAPM-funded research projects aim to develop and implement innovative data-driven approaches that ultimately allow patients to receive the right health strategies at the right time.

Significant milestones of the CIAPM program in 2024 include:

- CIAPM transitioned from the Governor's Office of Land Use and Climate Innovation (formerly Governor's Office of Planning and Research) to the California Health and Human Services Agency (CalHHS) in July 2024. The move to CalHHS highlights the integration of advancing precision medicine and public health through research and innovation.
- CIAPM concluded its Depression Research Request for Proposals and selections process, which began in 2023, culminating in awards to three outstanding three-year projects. These projects, listed below, leverage academic-community partnerships and private sector collaborations to identify new approaches for the prevention, diagnosis, and treatment of depression that center the whole person. The projects are:
  - Making the Unseen Seen Trial of Depression (MUST-D): Scrutinizing social determinants of depression to advance precision and equitable care, Suzi Hong, PhD, University of California, San Diego.
  - Personalized and scalable interventions for reducing depression among adolescents: Combining novel digital therapeutics and peer counseling, Greg Hajcak, PhD, Santa Clara University.

- o Precision Mental Health to Predict Risk, Prevent, and Treat Depression in Publicly Funded Youth, Tony Yang, MD, PhD, University of California, San Francisco.
- CIAPM entered into a Memorandum of Understanding with the National Institutes of Health's (NIH) *All of Us* Research Program, to encourage participation in biomedical research from groups in California whose health outcomes have been understudied in biomedical research as part of CIAPM's Representative Research Collaborative.
- CIAPM launched the evaluations process for the Cancer Disparities Research Program, which includes independent reviews by out-of-state subject matter experts and will culminate in an Evaluation Report for the Legislature in late 2025.
- CIAPM-funded researchers, past and present, contributed 63 peer-reviewed, in press, or pre-print publications to the field of precision medicine, 103 presentations at domestic and international conferences, and 6 press stories in 2024.
- Staff hosted an annual ACEs Research Program Symposium, showcasing project results and facilitating discussions among researchers, community partners, Depression Research Program leads, and others.
- Five annual site visits were conducted of project teams around the state from the Adverse Childhood Experiences (ACEs) Research Program.
- CIAPM leadership mentored three California-based graduate student interns and fellows, who furthered programmatic efforts and trained in research administration, science policy, and public policy procedures.

2025 Priorities

- For the Cancer Disparities Research Program, CIAPM will complete and publish a comprehensive Evaluation Report for the Legislature.

- As ACEs projects conclude in 2025 and 2026, CIAPM will recruit and facilitate an out-of-state Expert Evaluation Committee to assess projects' progress and impact, culminating in a comprehensive Evaluation Report for the Legislature.

- The team will continue sharing the CIAPM model and expanding its precision medicine network through attendance at the Precision Medicine World Conference. Additionally, staff and lead ACEs researchers will showcase the ACEs Research Program at the Pediatric Academic Societies meeting, including sharing preliminary data at the intersection of ACEs, toxic stress, biomarkers, implementation science, and policy implications.

- CIAPM will convene the current research teams of the ACEs and Depression Research programs for a Current Grantees Meeting to share lessons learned, best practices, and key takeaways from research projects.

- CIAPM will oversee and manage the launch of the Depression Research Program and facilitate collaborations.

- CIAPM will continue to develop the Representative Research Collaborative, which aims to engage underrepresented communities in research, including through the development of a Request for Applications for 'Representative Precision Medicine Research.'

- CIAPM will explore potential integrations within CalHHS to advance precision medicine and public health through research and innovation.

Recognizing the public and the Legislature's continued interest in the strides CIAPM has made, the California Health and Human Services Agency respectfully submits this report. [Health and Safety Code, Division 110. § 130302, subd. (4) (A)]

Message from the Secretary

Dear Honorable Members of the State Legislature,

On behalf of the California Health and Human Services Agency (CalHHS), we proudly present to you the 2024 Annual Report for the California Initiative to Advance Precision Medicine (CIAPM).

CIAPM transitioned to CalHHS from the Governor's Office of Land Use and Climate Innovation (formerly Governor's Office of Planning and Research) in July 2024. We welcomed CIAPM into the Agency team, transitioned its staff, and continue to provide resources to sustain its success. CIAPM's mission to harness data to support new insights, prioritize whole-person care, and advance community-driven solutions to reduce health inequities is deeply aligned with the CalHHS guiding principles, and we are deeply grateful for their expertise and vision.

Highlights of CIAPM in 2024 include awarding three innovative three-year precision medicine research projects focused on addressing depression in underserved populations after a rigorous and evidence-based selections process, in which CIAPM received a record number of applications (60, from 25 California institutions). CIAPM also continues to advance research on the health impacts of adverse childhood experiences (ACEs) through seven research projects to enable earlier detection and tailored interventions that improve the health of children, youth, and their families.

Additionally, CIAPM has announced two Requests for Applications (RFAs) for innovative research proposals in 'representative research.' This initiative is an effort to encourage participation in biomedical research from underserved and under-researched communities so that research benefits all Californians and reduces health disparities. The first RFA seeks to award approximately $2.3 million to support around 15 doctoral students conducting representative precision medicine research projects in California over a 2.5-year project term. The second RFA will award up to $6 million to support approximately 3-5 project teams conducting representative precision medicine research projects in California over a 2.5-year project term.

By continuing to lead ten active precision medicine research project teams across the state, developing strategies to promote representative research, and showcasing their innovative research grantmaking model through conference participation and symposia, CIAPM is advancing the role of California as the global leader in innovation.

I invite you to learn more about California's precision medicine research in this report and thank you for your continued support of CIAPM's important work.

Sincerely,

Kim Johnson

Secretary

California Health and Human Services Agency

Background and History

What is Precision Medicine?

Standard medical research and care has been historically rooted in developing prevention, diagnostics, and treatment strategies focused on the commonalities of a disease or disorder across patients, and less so on how the disease or disorder manifests in an individual patient. However, because each patient's environmental and social conditions as well as their biology and genetics are different, the same disease or disorder can manifest itself differently from patient to patient. These determinants of one's health outcomes can include access to housing and utilities, environmental exposures, access to care, education, and nutrition, or discrimination based on gender, ethnicity, or orientation. These factors can render a "one-size-fits-all" intervention ineffective or even harmful to a patient.

Precision medicine, sometimes known as *precision health* or *personalized medicine*, attempts to merge all aspects and influences of a person's health to create tailored health care interventions for a patient based on their diverse genetics and individual health and life circumstances (see image below).
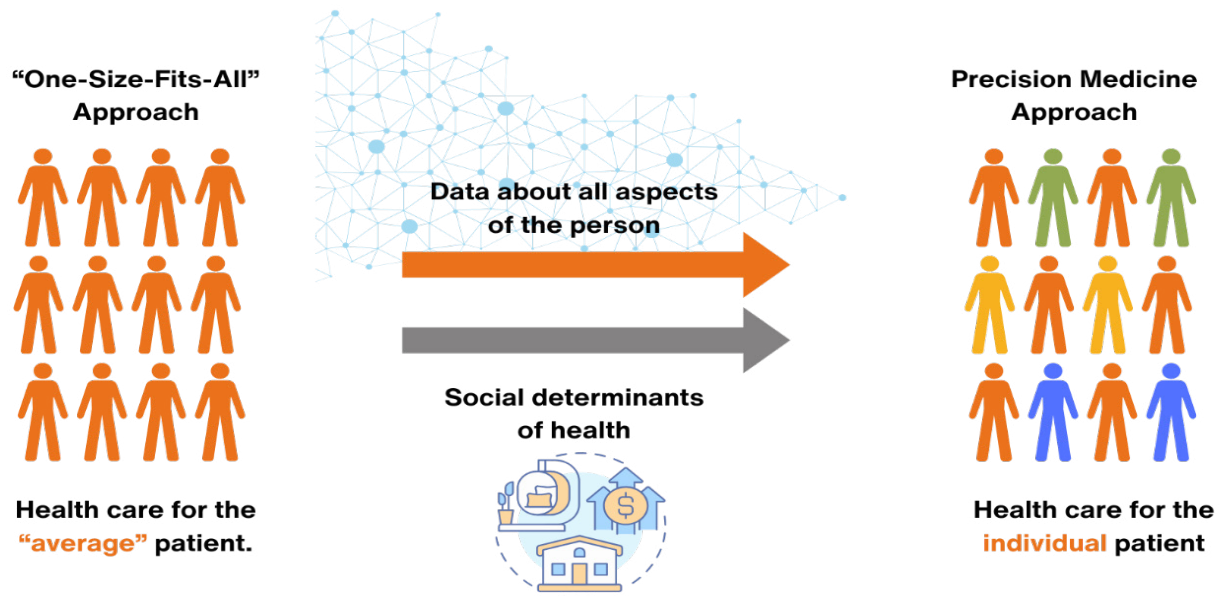
Caption: Precision medicine breaks the mold of a standard biomedical approach by integrating data about the 'whole-person' for an individualized health care experience.

As examples, precision medicine advances have allowed researchers and health care providers to:

- Provide digital genetic counseling to guide patients through appropriate pathways of care
- Test for cancer via non-invasive liquid biopsies for byproducts from a tumor in circulating body fluids
- Use rapid molecular profiling tools in critical care settings for timely treatment decisions
- Conduct genetic testing for pharmaceutical responses to mental health treatments
- Perform population-based genetic screens to determine if enough people in a region

suffer from a condition and warrant additional and specific health services.[1]

These technologies can provide more targeted and fewer unnecessary treatments, lowered medical costs, increased efficiencies and development in the healthcare workforce, increased patient understanding of the causes of disease and their own health predispositions, and increased awareness of how to seek care.

Prior to the completion of the Human Genome Project and the computational power of the new millennium, the research and treatment pipeline tended away from a whole person approach, given how much data and how complicated it was to integrate these health factors and discover personalized treatments. Further, some populations are rarely engaged and often overlooked in long-term biomedical observations. Certain diseases may be too rare for tangible commercial returns on investment, resulting in less industry-wide research efforts.

However, the age of big data brings forth an opportunity to find new insights that researchers alone cannot discern and brings us a step closer to providing equitable health outcomes for each individual patient. Additionally, the precision medicine age has refocused industry-wide efforts to more equitably recruit and represent patients from all walks of life in research to fine-tune biomedical and health care interventions. California has recognized these possibilities and is leading a consolidated approach to break the typical research-to-care cycle and provide the right treatments to the right patients.

About CIAPM

CIAPM was first established in 2015 within the Governor's Office of Planning and Research (now the Governor's Office of Land Use and Climate Innovation) as a first-of-its-kind state initiative to harness the biomedical prowess and expertise across multiple sectors in the State of California, including academia, industry, healthcare, nonprofits, and community-based organizations. As a demonstration of the role that state government can play in engaging these various interests, Governor Jerry Brown and the California State Legislature launched the program to drive biomedical research that addresses health equity gaps and accelerates novel prevention strategies, diagnostics, and treatments in line with a patient's diverse health and life circumstances.

CIAPM supports cutting-edge biomedical and health research that harnesses data to generate new insights, prioritizes whole-person care, and advances community-driven solutions to reduce health inequities. CIAPM's mission is to drive the development of innovative technologies and personalized strategies and to coordinate cross-sector partnerships for prevention, diagnosis, and treatment to improve the health and well-being of all Californians.

The Initiative is tasked with developing funding opportunities for demonstration projects that, through research, can provide tangible benefits to California patients and reduce health disparities. To date, CIAPM has funded 21 projects on topics across the biomedical research spectrum (see table below), selected by experts in the field of precision medicine. CIAPM is also required to provide annual updates, evaluations on the demonstration projects after completion, and host the California Precision Medicine Asset Inventory to inform on strategic areas for future research development.

Transition to the California Health and Human Services Agency (CalHHS)

In 2024, as part of the enacted 2024-2025 Budget Act (AB/SB 164), CIAPM transitioned to the California Health and Human Services (see Appendix D for the Governor's Office press release). By harnessing the initiative's existing capability to foster public-private partnerships,

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1   Basharat S, Smith A, Darvesh N, et al.; Authors. 2023 Watch List: Top 10 Precision Medicine Technologies and Issues: CADTH Horizon Scan [Internet]. Ottawa (ON): Canadian Agency for Drugs and Technologies in Health; 2023 Mar.

the Initiative expanded in scope to include preparation and prevention against infectious diseases and pandemics, with the goal of developing targeted and effective precision medicine measures.

The Press Release can also be found in full at the Governor's Office Newsroom.[2]

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2 Governor's Office Press Release.

CIAPM Allocation of Funds

Budget Year	Budget Appropriation for Precision Medicine (in millions)	Number of Demonstration Projects Funded	Demonstration Project Topics
2014/2015	$3.0	2	• Pediatric cancer • Genetics of infectious diseases
2016/2017	$10.0	6	• Traumatic brain injury • Remote heart monitoring • Genomic sequencing • Mobile mental health • Multiple sclerosis • Prostate cancer
2017/2018	$10.0	3	• Cancer health disparities
2018/2019	$30.0*	4	• Adverse Childhood Experiences (ACEs)
2020	$-18.2**		
2021/2022	$12.415*	3	• ACEs
2022/2023	$19.25*	3-7	• Depression • Representative Research Collaborative

*Currently funded projects

**In 2020, $18.2 Million from CIAPM's 2018/2019 appropriation were diverted to the General Fund to support critical services due to the COVID-19 pandemic.

Demonstration Project Portfolio

Demonstration research projects are the throughline of CIAPM, supporting precision medicine research in California that considers the whole person, centers community, and seeks to address health disparities.

In 2024, CIAPM led two ongoing demonstration precision medicine research programs, one focused on addressing the health impacts of adverse childhood experiences (ACEs) and the other focused on precision medicine approaches for the prevention, diagnosis, and treatment of depression. Projects in both research programs are co-led by an academic research institution and a community-based organization.

For the ACEs Research Program, CIAPM funded seven projects in 2021 or 2022, which conclude in 2025 or 2026. All projects received a one-year no cost extension due to technical and administrative challenges experienced at the start of their project related to the COVID-19 pandemic. These projects seek to advance innovative research that addresses the health impacts of ACEs through a collaborative precision medicine and community-centered approach.

For the Depression Research Program, CIAPM continued the 2023 Request for Proposals (RFP) for research projects, received submissions, and completed the competitive selections processes. The selections process culminated in awards to three outstanding three-year research projects focused on precision medicine approaches to address health disparities in depression. In addition to the academic-community partnership, these projects also required a private sector collaborator to add a capability, scalability, or sustainability to the project.

ACEs Research Program

Caption: Schematic showing the ten types of ACEs, in three categories: abuse, neglect, and household challenges.

ACEs refer to ten types of adversity that people can experience during their first 17 years of life. These challenges fall into three domains: abuse, neglect, and household challenges. ACEs can trigger excessive or prolonged activation of the body's stress response systems, termed the 'toxic stress response.' The toxic stress response can lead to enduring changes that increase the risk for people who experience ACEs to develop physical conditions and mental disorders. People from low socioeconomic and minoritized communities have a greater risk of exposure to ACEs and worse health outcomes. According to data from the ACEs Aware Progress Report, 72% of adults in California have experienced at least one ACE and 20% have experienced at least 4 ACEs. 34% of youth (ages 0-17) have experienced at least one ACE and 4% have experienced 4 or more ACEs.[3]

Championed by the State's current and former Surgeons General, Dr. Diana Ramos and Dr.

3   ACEs Aware Progress Report: 2019-2023. California Department of Health Care Services.

Nadine Burke Harris, ACEs have been a priority of state government throughout the Newsom Administration, including through the ACEs Aware program,[4] in partnership with the Department of Health Care Services and the University of California. CIAPM's support of ACEs research aims to complement this work by identifying biological and behavioral markers of the health impacts of ACEs to enable earlier detection and tailored interventions that improve the health of children, youth, and their families.

ACEs Research Symposium

On December 6, 2024, CIAPM hosted its third ACEs Research Symposium, held virtually. CIAPM's Chief Science Officer, Dr. David Reiner, overviewed the research portfolio and CIAPM Advisory Council Chair, Dr. Clara Lajonchere, provided opening remarks. California Surgeon General and CIAPM Advisory Council member, Dr. Diana Ramos, also participated in the symposium and discussion.

ACEs research teams from Children's Hospital Los Angeles, Stanford University, Loma Linda University, UC Irvine, UC Los Angeles, UC San Francisco, and UC San Diego briefly presented summaries of their projects and engaged in rich discussions of preliminary data, lessons learned, policy implications and collaborative approaches for follow-on funding.

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4   ACEs Aware Program.
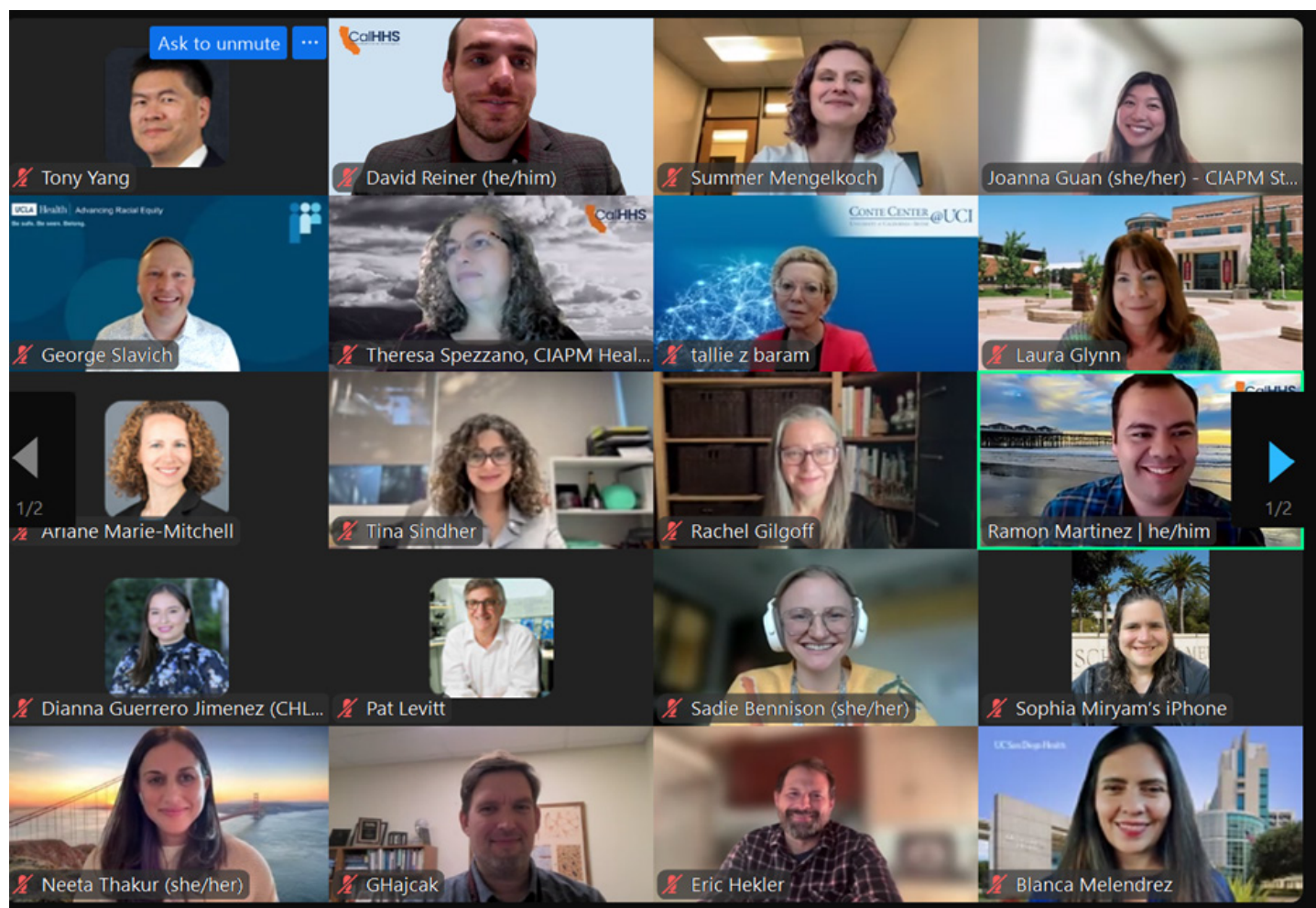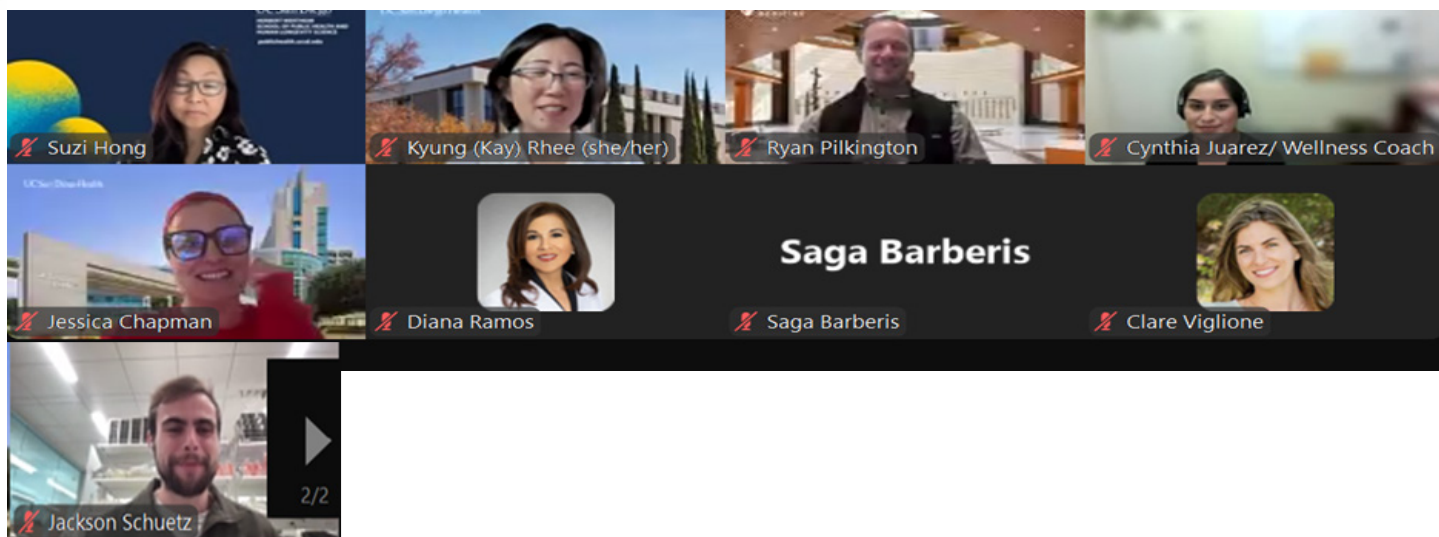
Caption: Zoom gallery screenshots during the 2024 ACEs Symposium.

Site visits

CIAPM staff attended virtual site visits for ACEs projects at Children's Hospital Los Angeles, UC Irvine, UC Los Angeles, UC San Francisco, and Stanford University. Project teams presented research and community updates, described their progress towards achieving project milestones, and engaged with CIAPM staff about research directions and impacts.

Summaries of ACEs Projects

Scalable Measurement and Clinical Deployment of Mitochondrial Biomarkers of Toxic Stress (2021-2025)

Lead Principal Investigator: Dr. Pat Levitt, Children's Hospital Los Angeles (CHLA)

Partners (listed alphabetically): Early Childhood Mental Health Program @ CHLA, Fiesta Educativa, Inc., Help Me Grow Los Angeles, Kaiser Permanente of Southern California, Karsh Family Social Service Center, Ventura County Medical Center

Early identification of ACEs and toxic stress during infancy and toddlerhood have great promise for early interventions that reduce ACEs-related health conditions. In California, a large portion (40%) of children are not screened with any developmental tool. Screening can help identify children who may be most at-risk for poorer health outcomes and referred to resources and services. Even amongst those who are screened, there are racial/ethnic disparities to screening, and routine developmental screeners often overlook ACEs-related health conditions.

Currently, ACEs are identified through questionnaires, but there are no agreed upon measures of toxic stress, which is the child's physiological response that causes *allostatic load* (disruptions to normal brain and body functioning over the lifespan). To understand the intersection of ACEs, toxic stress and child developmental outcomes, the team partnered with Kaiser Permanente of Southern California and Ventura County Medical Center to recruit over 300 mother-infant pairs seen at six, twelve, and twenty-four months after birth. In this *Family First Study*, the team is measuring maternal health and well-being and infant development with existing evaluation tools. Mother-infant dyads attend laboratory sessions, during which the team monitors mother-infant play interactions to identify social engagement and attachment behaviors, attention to objects and faces, and measures of brain-body connections during these laboratory-based tasks. The team also employs easy-to-collect cheek swabs to measure mitochondrial allostatic load (MAL), a proposed biomarker of toxic stress in infants

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and mothers. To address the goal of leveraging MAL as a biomarker of toxic stress, the team developed and validated biomeasures of MAL.

Through 2024, the team enrolled 311 mothers and their infants and completed 237 12-month and 71 24-month appointments. The team assayed biological samples and is analyzing data on associations among ACEs, MAL, and brain-body connections in infants' responses to tasks. In 2024, 260 samples from mothers and infants from all ages were processed with a custom protocol developed at CHLA to assess MAL. The team will continue follow up with the mother-infant dyads in 2025 for their 12- and 24-month (supported by CIAPM), and 36-month appointments.

In 2024, the team continued to engage with their Community Advisory Committee (CAC) to provide input on design and future implementation of a program incorporating MAL bio-markers and ACEs measures for a highly diverse and socially vulnerable Southern California community. The CAC concluded that major limitations to implementing a MAL biomarker and ACEs program in this community include maintaining community with organizations, maintaining community investment, transitions to in-person meetings, and language barri-ers for non-English speaking participants. Additionally, the team has supported the training of one early-career faculty, one post-doctoral researcher, five research assistants and one graduate student researcher.

In 2025, the team will continue enrolling participants and anticipate complete enrollment of 340 mother-infant dyads by the end of the year. Additionally, the team will continue data analyses and disseminate findings via publications and presentations. The team has also sub-mitted grants to the National Institutes of Health and Treehouse Family Foundation to extend on this CIAPM-funded work.
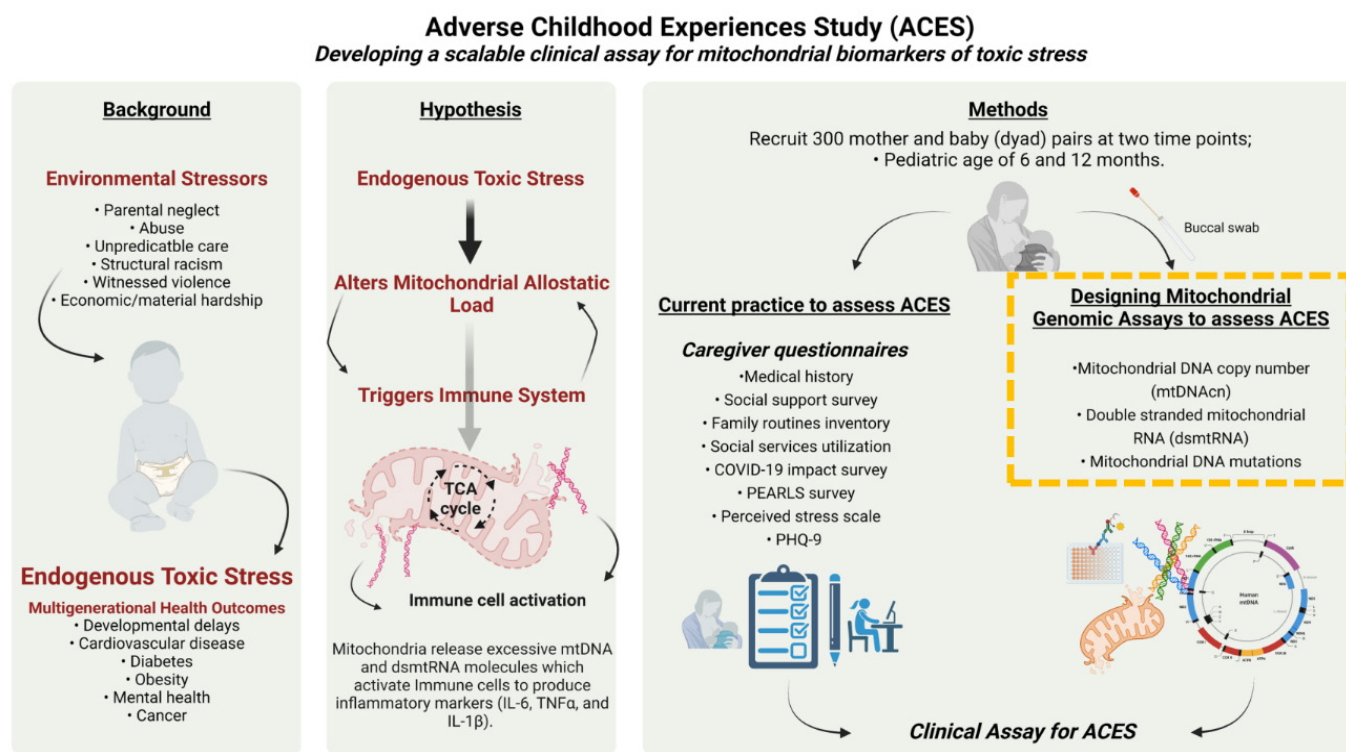
Caption: Figure depicting the background, hypothesis, and present study methods for exam-ining environmental stressors' influence on endogenous toxic stress, with downstream effects on mitochondrial allostatic load that trigger the immune system.

A Multi-Component Intervention to Strengthen Families and Build Youth Resilience (2021-2025)

Lead Principal Investigator: Dr. Ariane Marie-Mitchell, Loma Linda University

Partners (listed alphabetically): FIRST 5 San Bernardino; Help Me Grow Inland Empire; Inland Empire Health Plan; Loma Linda University Faculty Medical Group; Loma Linda University Institute for Community Partnerships; San Bernardino City Unified School District; Social Action Community Health in San Bernardino; University of California, Los Angeles; Walden Family Services

To address fragmented health and education systems that do not accommodate families based upon different levels of need, the Loma Linda team leverages Health, Education, And Learning (HEAL) partnerships among pediatricians, community health workers (CHWs), and parenting educators.

These partnerships are a scalable approach for pediatric preventive care that could decrease toxic stress, reduce disparities, and increase positive health and psychosocial outcomes over the lifespan. Additionally, this project provides a model to successfully connect families to ACEs-related resources.

The Loma Linda team trains HEAL partners in an evidence-informed FIRST (Families Implementing Resilient Systems Together) curriculum to optimize the delivery of vital information and resources to a diverse population of families with ACEs. The training focuses on understanding trauma and promoting resilience, supporting stress management and executive function, and creating safe, stable, nurturing relationships to encourage social-emotional development. To evaluate the efficacy of the HEAL FIRST intervention, the team is comparing data on Child ACEs, toxic stress biomarkers, child health and psychosocial problems, and potential mediators and moderators in pediatric patients in the FIRST intervention, the usual well-child care control group, and the no ACEs comparison group at 2 weeks, 3 months, 6 months, and 12 months after the intervention.

Through 2024, the Loma Linda team has trained a total of 117 pediatric residents, 31 pediatric faculty, 15 CHWs, and 10 parenting educators in the FIRST curriculum. Trained pediatricians are more likely than untrained providers to document counseling about ACEs and lifestyle, as well as to include educational handouts about ACEs and resilience. Approximately 10% of Medi-Cal families attending well-child care visits agreed to a referral for additional family support, and approximately 35% of these referrals resulted in engagement with a CHW. Referral success is comparable across Child-ACE scores and race/ethnic groups, slightly higher for males and adolescents, and slightly lower for families who report significant financial difficulties. CHWs coach families on a range of topics including caregiver self-care, nurturing relationships, and promoting resilience. CHWs also share resources with families such as distribution of goods and connection to behavioral health services. Preliminary clinical data suggests that CHW support helps address basic needs and reduce caregiver stress.

Through 2024, the team has recruited a total of 205 participants. Preliminary research data show that there is a strong correlation between child behavioral symptoms and Child-ACEs reported at both the clinic and research visits. The association between Child-ACEs and child behavioral symptoms is increased when ACEs are experienced prior to age 5 and reduced when caregivers engage in healthy lifestyles. In addition, higher Child-ACE scores are associated with higher HbA1c levels and higher cortisol:cortisone ratios, biomarkers of poor physical health.

To carry out the study, the Loma Linda team coordinates with a number of community-based organizations including Social Action Community (SAC) Health System, Inland Empire Health Plan, Help Me Grow Inland Empire, Walden Family Services, San Bernardino City Unified School District, and Loma Linda faculty clinics and Institute for Community Partnerships. In addition to training through the FIRST curriculum, the team has trained seven
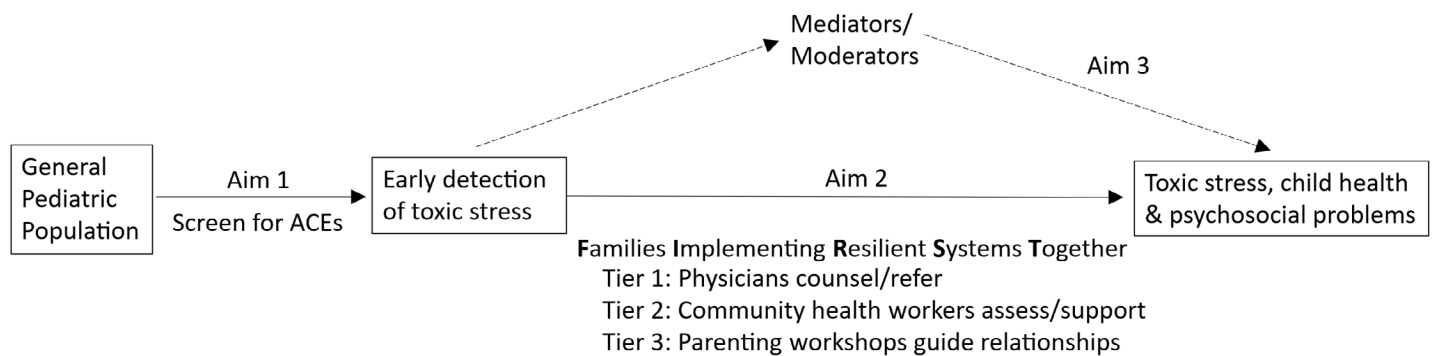
research assistants.

In 2025, the team will complete study recruitment, begin analyzing the laboratory data on potential measures of toxic stress, and evaluate the impact of the HEAL FIRST intervention.

Analytic Framework for Reducing Health Impacts of ACEs

Aim 1. To test the association between Child ACE scores and toxic stress at baseline in children age 3-11 years old
Aim 2. To test whether the intervention reduces toxic stress and child health & psychosocial problems at follow-up for children age 3-11 years old with ACEs compared to usual well-child care
Aim 3. To evaluate the impact of mediating and moderating variables on intervention efficacy

Caption: Illustration of the research analytic framework for the HEAL FIRST study.

Systems-based, Multidisciplinary Assessment of Adversity and Toxic Stress for Individualized Care (The SYSTEMAATIC Project) (2022-2026)

Lead Principal Investigator: Dr. Sayantani Sindher

Partners (listed alphabetically): Center for Youth Wellness/Safe and Sound; Central Valley Community Foundation; Federally Qualified Health Center (FQHC) clinics of San Mateo Medical Center; Kaiser Permanente Northern California; Sean N. Parker Center for Allergy & Asthma

To address the critical clinical need for a multidisciplinary approach to identify and quantify the toxic stress response, the Stanford team is developing a toxic stress assessment profile. Through a precision medicine approach, the team aims to identify disruptions in the neurological, endocrine, and immune pathways under stress. They also are piloting the feasibility, adaptability, and validity of this assessment profile and effectiveness of available resources within partner clinics and organizations to mitigate the impacts of the toxic stress response. This toxic stress assessment profile could help providers more easily identify patients affected by toxic stress and recommend personalized intervention and treatment strategies.

To aid in the development of the toxic stress assessment profile, the team aims to compare assessments of adults that did not report having any ACEs with assessments of adults that had exposure to four or more ACEs. The team will assess participants response to an acute stress at baseline and at twelve months, measuring toxic stress through a blood panel, stress-related biomarkers, a protective biomarker, neurological activity, and questionnaires on mental, physical, and relational health completed throughout the twelve months. The study design (see figure below) breaks down the toxic stress assessment profile at the com-

munity level through community voice, focus groups, and trainings and at the individual level from biomarkers, toxic stress assessment, and interventions.

The study then aims to assess changes in the Toxic Stress Assessment Panel in response to an acute stressor after one year, comparing values relative to baseline among individuals who have shown improvement in their mental and physical health scores or not. Additionally, the study will evaluate changes in key biomarkers, including cortisol, oxytocin, and an immune panel to understand the physiological and immune system responses to stress in relation to health outcomes.

In addition to the toxic stress assessment profile, the team is partnering with the Center for Youth Wellness/Safe and Sound to lead focus groups on barriers and facilitators to accessing behavioral intervention for ACEs, ACEs preparedness, interventions to increase knowledge of areas of wellness, and strategies to increase participation of diverse populations in ACEs/toxic stress research.
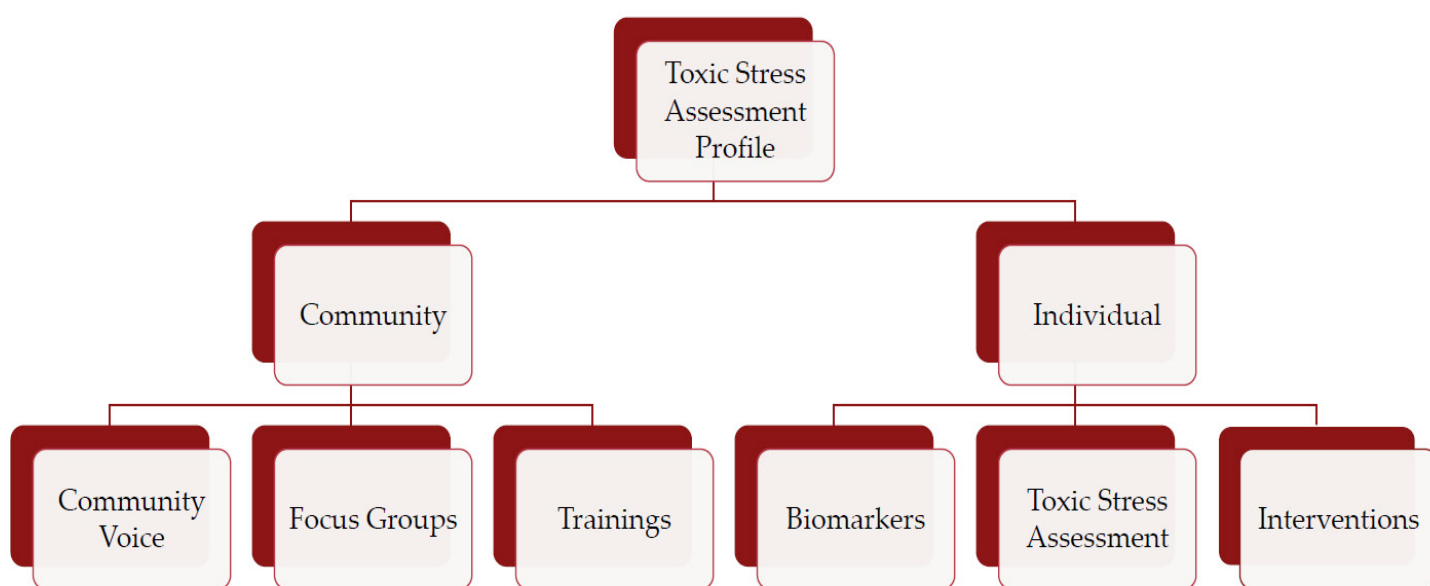
Caption: Study design of Stanford ACEs project.

Through 2024, the team recruited 27 participants, is continuing recruitment efforts to complete the patient cohort, and is collecting and analyzing preliminary biological data from the toxic stress assessment profile at baseline. The team is also establishing a biobank of collected samples, laying the foundation for future investigations, and enabling comprehensive analyses beyond the scope of the current study. In 2024, this project team mentored three students, facilitating the successful completion of their degrees and supporting advancement of their overall career goals.

In 2025, the team will incorporate additional strategies to accelerate recruitment, through a research participant engagement program and a newly established partnership with Kaiser Permanente Northern California. Additionally, the team will engage participants at the twelve-month visit, continue collecting and analyzing data from the toxic stress assessment profile, and mentor two additional students.

Using Precision Medicine to Tackle the Impact of ACEs (including a Novel Actionable ACE) on Children Neurodevelopment (2021-2025)

Lead Principal Investigator: Dr. Tallie Z Baram, UC Irvine

Partners (listed alphabetically): Allevato Pediatrics, CHOC Primary Care Clinic, CHOC Health Center, Clinica CHOC Para Niños, Los Alamitos Pediatrics, Orange Doctors of Kids and Teens, Pediatric and Adult Medicine Tustin, Premier Pediatrics, Sea View Pediatrics, Southern Orange County Pediatric Associates

Exposure to adverse childhood experiences (ACEs) is associated with poorer physical and mental health. However, while at the population level, ACEs are associated with adverse outcomes, current methods cannot predict for an individual child whether they will be impacted and identify children who can most benefit from scarce resources. One potential reason for this inability to predict who will be affected by ACEs is because important early-life adversity (ELA) is not included in typical ACEs screens. Based on their work in preclinical models, the team has identified a previously unrecognized ACE: unpredictable signals from caretakers and the environment. Unpredictability can manifest as inconsistent care, lack of family routines, and frequent changes in the person, timing, or location of interactions with care takers. In study cohorts, unpredictability was a significant contributor to poorer mental health and cognitive outcomes. However, if this is true in 'real world' contexts in California was unknown. This is important, because unpredictability is a novel type of adversity that, when identified, is most amenable to intervention.

To advance identification of this new type of ACE and compare its importance to established ACEs, the team partnered with clinics serving families from a broad range of socio-economic and ethnic backgrounds in Orange County (OC) to implement screening for unpredictability in childhood, in addition to existing ACEs screening. In 2024, the team collaborated with over 19 primary pediatric clinics to administer the Questionnaire of Unpredictability (QUIC5) and PEARLS ACEs screens (in English or Spanish), receiving 75,000+ screens. Analyzing surveys from 29,305 children and families for associations among ACEs, childhood unpredictability, and child mental and physical health, the team discovered that unpredictability is as good as typical ACEs for identifying children at risk for depression, obesity and other problems. In addition, screening for unpredictability added value to ACEs screens because it identified children at high risk for depression and obesity that would otherwise be missed. These results are now under peer review at a professional journal.

Additionally, the team aims to find biological markers that predict, in young children, whether or not they are impacted by ACEs, comparing DNA from saliva samples at approximately ~one month and ~one year of age and the changes between these samples. These changes may signify resilience or vulnerability to ACEs. In a representative sample of 120 infants, the team has now shown proof-of-concept supporting for this biomarker approach, and in 2024, after completing 24-month neurodevelopmental assessments, published the first paper on this predictive marker.

During 2024, the team supported three undergraduate students, three post-baccalaureate trainees (two of whom are beginning doctoral programs in the Fall), one doctoral candidate, and one post-doctoral researcher. The team also meets quarterly with their Community Advisory Board (CAB) to discuss recruitment efforts, study measures, research questions and analysis of results. The team wrote up a paper on the contributions of the CAB, which is currently under revision.

In 2025, the team will complete the 24-month infant neurodevelopmental assessments, conduct data analysis, continue CAB meetings, and share findings via publications and presentations.

Implementation of QUIC-5 Screening
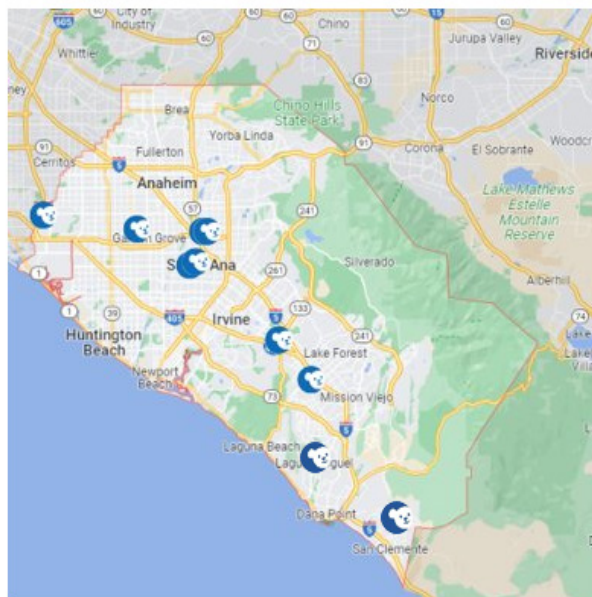
1. Allevato Pediatrics, Orange
2. Orange Doctors of Kids and Teens, Orange
3. CHOC Primary Care Clinic, Orange
4. CHOC Health Center, Orange
5. Los Alamitos Pediatrics, Los Alamitos
6. CHOC Health Center, Garden Grove
7. Clinica CHOC Para Niños, Santa Ana
8. Santa Ana Boys and Girls Club, Santa Ana
9. Premier Pediatrics, Irvine
10. Sea View Pediatrics, Irvine
11. Sea View Pediatrics, Laguna Hills
12. Sea View Pediatrics, Aliso Viejo
13. Sea View Pediatrics, San Clemente
14. Southern Orange County Pediatrics, RSM
15. Southern Orange County Pediatrics, Ladera Ranch
16. Southern Orange County Pediatrics, Lake Forest
17. Southern Orange County Pediatrics, San Clemente
18. Total Pediatrics, Costa Mesa
19. Pediatric & Adult Medicine, Tustin

QUIC-5 screens completed to date: 75,000+

Caption: Map of Orange County, showing the 19 clinics that screened for unpredictability, totalling over 75,000 unpredictability screeners from children.

Identifying Social, Molecular, & Immunological Processes for Mitigating Toxic Stress & Enhancing Personalized Resilience (2021-2025)

Lead Principal Investigator: Dr. George Slavich, UC Los Angeles

Partners (listed alphabetically): All Children Thrive, Am I Hungry, Los Angeles County Department of Health Services, Million Maker, Nutritious Movement, UCLA's Center for Accessible Education, UCLA Online Teaching & Learning Team, UCLA STAND Program, UCLA-UCSF ACEs Aware Family Resilience Network (UCAAN)

Adversity during childhood, if not supported by nurturing relationships and environments, can lead to a so-called "toxic stress response". These responses involve a heightened activation of biological systems that can increase a person's risk for physical and mental health conditions across the lifespan. The team aims to address the effects of toxic stress and promote personalized resilience to toxic stress through two overarching goals: 1) developing and disseminating tools to study stress and precision medicine and 2) developing a stress and resilience study that aims to examine whether certain intervention programs can reduce stress levels and promote biopsychosocial resilience.

The team established the California Stress, Trauma, & Resilience (CAL STAR) Network, which engages in scientific, educational, training, and community engagement activities related to stress and resilience, and associated biomarkers. In 2024, the team built an entirely new, freely available Massive Open Online Course (MOOC), which featured 25 world-renowned speakers working in the stress, health, and resilience space. The team also developed a free Research Training Program that trained 124 students across the world in a series of 12 webinars focused on conducting research on stress, health, and resilience.

In terms of research, the team developed a stress and resilience study that involved a cross-sectional analysis that aims to leverage real-time biological and behavioral data. The

team recruited 344 participants for this 3-week cross sectional study, in which participants provide survey assessments, biological samples, and smartwatch data. The cross-sectional study provides individualized results and feedback on personal health and informs a longitudinal study, which tests the effectiveness of personalized online biopsychosocial resiliency training programs. The longitudinal study is a 27-week remote precision stress intervention clinical trial, that includes a 12-week participant period for five intervention conditions (targeting cognitive responses, social relationships, sleep, diet, and physical activity) and two control conditions.

Participants' data on their biological, social, and psychological processes helped identify their most dysregulated biobehavioral process. Based on this information, participants were assigned to online, coach-assisted, personalized interventions that targeted patients' most dysregulated domain. In 2024, the team enrolled 425 participants who have been randomized to one of the seven arms and 366 of those participants completed the entire study. The team published and presented a study protocol paper, and preliminary data show that the precision intervention decreased perceived stress compared to control conditions. The intervention also reduced symptoms of anxiety and depression, although to a lesser extent.

Additionally, the UCLA team engaged community partners in their communication and dissemination efforts with a newsletter and established a Social Justice, Equity, and Inclusion working group to serve as consultants for stress researchers studying diverse identities. They also partnered with the UCLA's Center for Accessible Education to develop a survey to assess students' stressors and inform on resource allocation. The team actively engages mentors and trainees, four post-baccalaureate research coordinators, four post-doctoral scholars, and two doctoral candidates. The UCLA team's CAL STAR Network has 188 members on their discussion forum and 678 subscribed to their listserv.

In 2025, the team will launch the MOOC, recruit a second cohort of their research training program, and continue to analyze data from the stress and resilience study and submit manuscripts for publication. Additionally, the team has been beta-testing an ecological stress tracker and in 2025, will be preparing final versions of the weekly diary dataset for analyses.
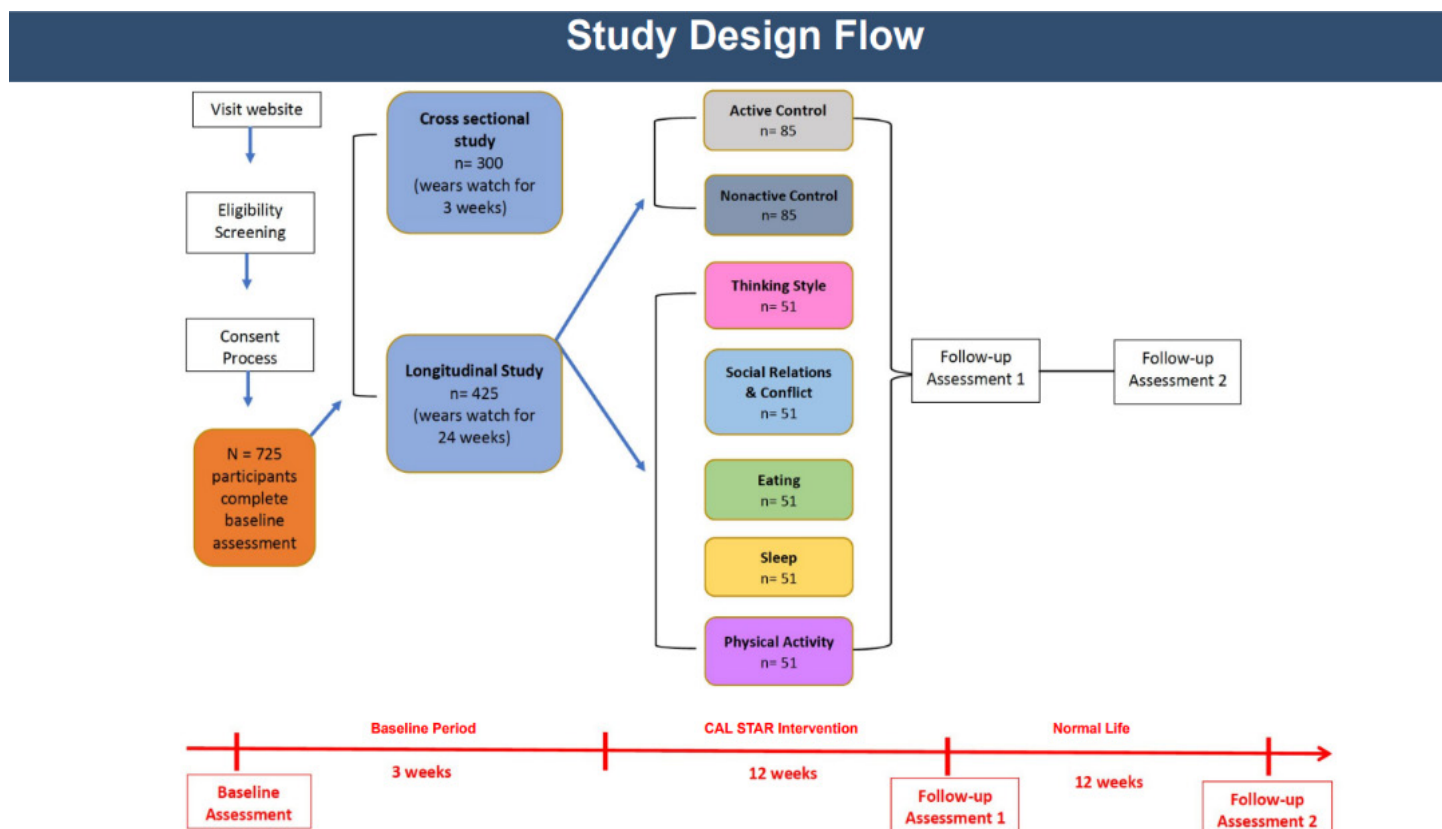
Study Design Flow

Caption: Study design flow of the cross-sectional and longitudinal studies. The longitudinal study has seven study conditions and two follow-up assessments.

Advancing a Precision Population Health Approach to ACEs to Reduce Health Disparities (HEALthy4You) (2021-2025)

Lead Principal Investigator: Dr. Gary S. Firestein, UC San Diego

Partners (listed alphabetically): American Academy of Pediatrics, California Chapter 3; Chicano Federation; Comité Organizador Latino de City Heights; Family Health Centers of San Diego; Olivewood Gardens and Learning Center, Kitchenistas; San Diego County Childhood Obesity Initiative; San Diego County Promotores Coalition; San Diego State University School of Public Health; South Bay Community Services; StreetWyze; Vista Community Clinic/Poder Popular; YMCA Partners in Prevention

ACEs exposure doubles the risk of obesity in Latino communities, and one out of three children in San Diego are obese, many with ACEs. Additionally, ACEs are highly stigmatizing, particularly among historically underserved communities. To address the need for ACEs interventions that aim to improve a key health outcome (obesity), that are culturally appropriate, and that communities will perceive as acceptable and feasible, the UCSD team collaborated with community to design and implement an ACEs intervention that personalizes treatment for obesity. This approach could serve as an effective, sustainable, and scalable model to address ACEs and childhood obesity, compared to the current standard of care.

The team developed the intervention with: (1) community input, (2) worked with community-based organizations to collect community-generated data through Streetwyze, a web-based mapping program for sharing community-centered stories and information about resources and needs, and (3) enrolled participants in a study to determine if the precision, community-based approach to ACEs and childhood obesity improves health outcomes.

The intervention, called *Healthy Together*, involves: (1) a wellness coach who provides a monthly navigation session with family, referrals for weight management, referrals for social drivers of health (e.g., food, housing, poverty); (2) health education & physical therapy, including bi-weekly diet education and assessments, bi-weekly exercise sessions and assessment; and (3) a mental health assessment, as clinically indicated. The team completed enrollment in 2024, with a total of 227 participants into one the following treatment arms: usual care, the Healthy Together intervention with either a CHW/promotora or mental health family support, or the Healthy Together intervention with both a CHW/promotora and mental health family support.

The team has conducted 22 exit interviews to collect feedback from parents of participants about their experience with the study, including feedback on program components, structure, and process improvement. Additionally, the team conducted focus groups with the clinical teams, including mental health providers, medical assistants, referring physicians, health educators, CHW/promotoras, and clinical directors. To aid in centering community in their work, the team created guidelines and a toolkit for community-based organizations to outline best practices for community groups and researchers and to collaborate in the manuscript writing process.

Nearly 1,500 San Diegans shared approximately 8,000 stories from across San Diego County regarding several components of Social Determinants of Health and how it has impacted their ability to access resources, using Streetwyze. The Community Council identified priority areas that need to be addressed, including food, health, and neighborhood justice, and will be working with local authorities and CBOs to develop specific actions to address the concerns of the community. In addition, the team had an active teaching program that trained three undergraduate students, three master's degree students, and two doctoral degree students. Other trainees that were engaged by the program included promotoras and men-

tal health providers.

In 2025, the team will conduct data analysis, share findings via publications and presentations, and continue to collaborate with community partners around data sharing, sustainability, and scalability. The team will also disseminate findings from the exit interviews and focus groups.

Healthy Together Plus Program

CBO & SD Childhood Obesity Initiative Community Organizing and Advocacy
-Families trained in Streetwyze to report on SDOH & quality of safety net services
- CBOs organize and translate insights into feedback and advocacy options in SDCOI
-Advocacy in SDCOI to influence safety net & SDOH
- Reports shared with Navigator

Healthy Together
- **Wellness Coach:**
  - One time family decision support
  - Monthly navigation session with family
    - Referrals for weight management
    - Referrals for social drivers of health (e.g. food, housing, poverty)
- **Health Education & Physical Therapy:**
  - Bi-weekly diet education and assessment
  - Bi-weekly exercise sessions and assessment
- **Mental Health Assessment**
  - As clinically indicated

Parenting training:
Parenting training: 8-10 sessions delivered by mental health

Promotoras:
- Weekly sessions with families to support skills adoption; provide social & practical support; reinforces behaviors, problem solves issues, assists with community connections
- Weekly supervision
- Weekly coordination with navigator/wellness coach

UC San Diego Health

Caption: Schematic of UCSD study design, involving *Healthy Together* program, promotoras, and parenting training, in addition to activities for community input on resources and social determinants of health through Streetwyze.

The Collaborative Approach to Examining Adversity and Building Resilience (CARE) Program (2021-2025)

Lead Principal Investigator: Dr. Neeta Thakur, UC San Francisco

Partners (listed alphabetically): Benioff Children's Hospital Oakland, Futures Without Violence, LifeLong Medical Care, Santa Barbara Neighborhood Clinic, UC Santa Barbara, UC Berkeley

ACEs exposure has been linked to various negative health outcomes across the lifespan. However, health for some children may be more negatively impacted by ACEs exposure than others. Identifying who may be at heightened risk for the downstream health impacts of ACEs and developing effective interventions are critical priorities. The UCSF team collaborated with community-based organizations on discovery, intervention, and implementation research that aims to address these gaps in ACEs research.

To advance the evidence base for longitudinal health outcomes associated with ACEs, the
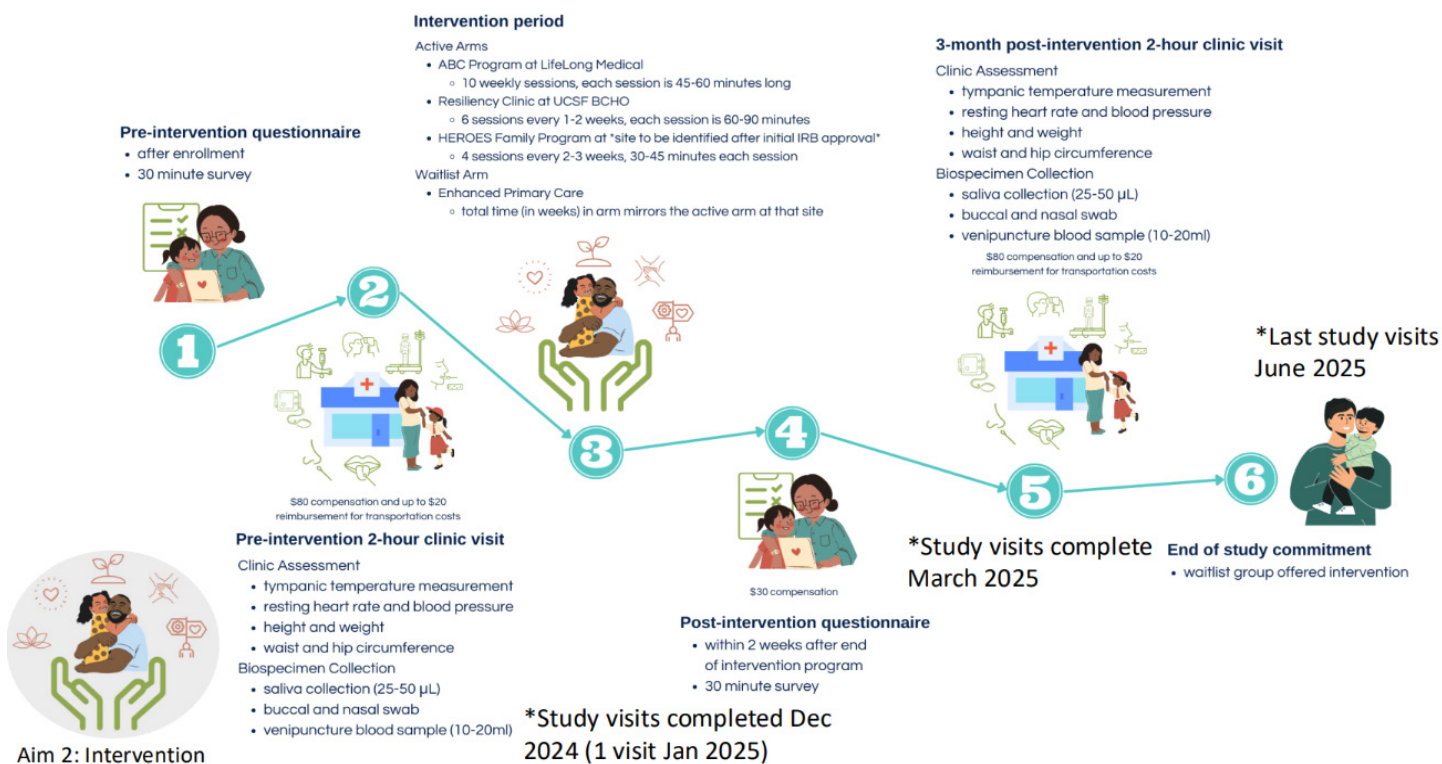
team added a 3-year follow-up study to an existing cohort of children already screened for ACEs. This longitudinal discovery goal will identify early effects of ACEs exposure, including risk and protective factors, and better connect those effects with health outcomes as the children grow. This database will include psychological, behavioral, and social measures, as well as stress-sensitive biomarkers, which together can inform on intervention targets. In 2024, the team closed enrollment for the longitudinal study, completing five-year follow-up visits for 243 participants, which is 44% of the originally screened cohort. The team is currently completing analyses for the association between ACEs and biomarkers of chronic disease risk for an initial manuscript from this large dataset.

In addition to their longitudinal study, through a collaboration with three California-based low-income serving clinics, the team is also testing an intervention study, with three previously piloted, resilience-promoting, caregiver-child interventions compared to usual care. At the Benioff Children's Hospital, caregivers are recruited for the *Resilience Clinic*, which is a primary-care based group intervention for parents and caregivers. At Lifelong Medical, caregivers are recruited for the *Attachment and Biobehavioral Catch-up* intervention, which is a home-based, caregiver-child dyadic intervention that is conducted in the home. In collaboration with the Santa Barbara Neighborhood Clinics (SBNC), the team recruited caregivers to join the *HEROES Family Program*, a primary care-based, caregiver-child dyadic program. All three of these caregiver-child interventions aim to promote positive parenting/caregiving skills and stress coping strategies. In 2024, the team completed recruitment of 183 participants across the three clinic sites and assigned them into either usual care or a caregiver intervention. One hundred and seventy-six participants attended their final in-person assessments.

The team conducted 13 semi-structured interviews with parent caregivers at Lifelong Medical and SBNC to refine the Pediatric ACEs and Related Life Events Screener (PEARLS) tool wording and screening workflows for low-resource clinical settings. With this information, the team assembled the initial components for a resilience toolkit. With the stakeholder board of families, the team finalized patient-facing materials, provider scripts, and patient/family resources. Additionally, the team has also provided training opportunities for three graduate-level students and two early-career faculty.

In 2025, the team will complete follow-up assessments for the interventions and conduct data analysis, share findings via publications and presentations. Study staff continue to actively engage participants to maximize retention in the study. During this year, the team will also present provider-facing and health system-facing materials to LifeLong Medical leadership to finalize the resilience toolkit, containing both types of materials. The team will also finalize and disseminate the resilience toolkit to the community in collaboration with community-based organizations.

Intervention period

Active Arms
- ABC Program at LifeLong Medical
  - 10 weekly sessions, each session is 45-60 minutes long
- Resiliency Clinic at UCSF BCHO
  - 6 sessions every 1-2 weeks, each session is 60-90 minutes
- HEROES Family Program at *site to be identified after initial IRB approval*
  - 4 sessions every 2-3 weeks, 30-45 minutes each session

Waitlist Arm
- Enhanced Primary Care
  - total time (in weeks) in arm mirrors the active arm at that site

3-month post-intervention 2-hour clinic visit

Clinic Assessment
- tympanic temperature measurement
- resting heart rate and blood pressure
- height and weight
- waist and hip circumference

Biospecimen Collection
- saliva collection (25-50 μL)
- buccal and nasal swab
- venipuncture blood sample (10-20ml)

$80 compensation and up to $20 reimbursement for transportation costs

Pre-intervention questionnaire
- after enrollment
- 30 minute survey

*Last study visits June 2025

$80 compensation and up to $20 reimbursement for transportation costs

Pre-intervention 2-hour clinic visit

Clinic Assessment
- tympanic temperature measurement
- resting heart rate and blood pressure
- height and weight
- waist and hip circumference

Biospecimen Collection
- saliva collection (25-50 μL)
- buccal and nasal swab
- venipuncture blood sample (10-20ml)

$30 compensation

Post-intervention questionnaire
- within 2 weeks after end of intervention program
- 30 minute survey

*Study visits complete March 2025

End of study commitment
- waitlist group offered intervention

*Study visits completed Dec 2024 (1 visit Jan 2025)

Aim 2: Intervention

Caption: Study flow for the intervention study which includes pre-intervention surveys and assessments, intervention period, post-intervention questionnaires, and 3-month follow-up clinic visit.

Depression Research Program

Depression is a complex disorder, characterized by symptoms including, but not limited to, a sad or "empty" mood, diminished interest in activities, fatigue and loss of energy, changes in sleep and/or appetite, aches or pains, difficulty concentrating, feelings of worthlessness and guilt, and thoughts of death and suicide.[5] In California in 2023, roughly 1-in-3 adults reported symptoms of a depressive or anxiety disorder, and nearly 1-in-3 of those with symptoms had an unmet need for mental health counseling or therapy.[6] Further, among adolescents, nearly 1-in-3 reported feelings of sadness or hopelessness, with percentages worsening as students age into young adulthood. Vulnerable groups of adults include people of color and females, in adolescents LGBTQ+ youth are especially vulnerable to depression, and white males of all ages are especially at risk for suicide.[7]

In 2024, California voters passed Proposition 1, the Behavioral Health Services Act, which approved funding to build more community behavioral health treatment sites and supportive housing and a comprehensive reform initiative of existing state mental health programs by Governor Newsom known as *Mental Health for All*.[8] CIAPM's support of precision research in depression complements this work by identifying sub-population factors that contribute to a risk for depression, use data processing to predict depressive symptoms, and use digital applications to provide personal mental health support for populations at risk.

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5   National Institute of Mental Health: Depression (2024).

6   Kaiser Family Foundation: Mental Health in California (2023).

7   Let's Get Healthy California: Reducing Adult Depression (2018).

8   California Governor's Office: *California moves faster to transform mental health system for all, with urgent focus on most seriously ill & homeless* (2024).

Continuation of Request for Proposals from 2024

CIAPM continued its Request for Proposals (RFP) for precision medicine depression research, which began in 2023. The RFP aimed to drive innovation by funding three to five independent research teams ($1.8 to $3 million per team) that apply a precision medicine approach to improve outcomes for patients with or at risk for depression, particularly as a path to reduce health disparities. The 2023 Annual Report describes the development of the RFP, designed to be responsive to community needs and informed by interviews with subject matter experts.

The RFP is available on the CIAPM Website.[9]

The proposal submission process was divided into three stages:

Stage 1: Letters of Intent (LOI), due October 30, 2023 (required, but non-binding and not scored)

Stage 2: Concept Proposals, due December 1, 2023 (required and scored)

Stage 3: Full Proposals (by invitation) due February 15, 2024 (only a subset advanced to this stage)

California-based research teams were to be co-led by at least one non-profit academic research institution and at least one non-profit community-based organization, patient advocacy group, community clinic, or public or tribal entity that provides support to people with, or at risk for, depression. Candidates were provided a two-page list of resources curated by CIAPM staff guiding the development and fostering of effective academic-community partnerships. By the full proposal stage, projects were to include at least one collaborator from the private sector who contributes in-kind, financial, or other resources to the project.

	Total Number	Number of Institutions
Letters of Intent	60	25
Concept Proposals	41	22
Full Proposals	16	8
Awardees	3	3

Expert Selection Committee Proceedings

In 2023, CIAPM recruited an out-of-state expert selection committee (full biographies in Appendix F) to review Concept and Full Proposals, based on their expertise across the spectrum of depression research and precision medicine. Through May 2024, they recommended which proposals advanced to the Finalist stage and were invited to submit Full Proposals, and recommended awardees from the Finalist pool and who were finally awarded. The review and selections followed CIAPM policies and procedures, adapted from NIH study sections. Proposals were reviewed and scored within the following categories: 1) significance, 2) innovation or potential for public benefit, 3) approach, 4) project team, 5) community partnership, and 6) overall impact. Additional selection criteria included that at least one awardee must be a public institution located in Northern California and one public institution in Southern California, per CIAPM's statute. Additionally, lead institutions were to only receive one award, as required in the RFP.

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9   CIAPM Depression RFP.

Chair

Olusola Ajilore, MD, PhD

Professor

University of Illinois at Chicago

Bruno Anthony, PhD

Professor

University of Colorado

Justin Baker, MD, PhD

Associate Professor

Harvard University

Crystal Barksdale, PhD, MPH

Program Director

National Institute on Minority Health and Health Disparities

Joyonna Gamble-George, MHA, PhD

Associate Research Scientist

Yale University

Annie Fox, PhD

Associate Professor

Massachusetts General Hospital Institute of Health Professions

Yolangel Hernandez Suarez, MD, MBA

Associate Professor

Florida International University

Darrell Hudson, PhD, MPH

Associate Professor

Washington University in St. Louis

Patricia Kerig, PhD

Professor

University of Utah

Sahnah Lim, PhD, MPH, MIA

Assistant Professor

New York University

Ziad Nahas, MD, MSCR

Professor

University of Minnesota

Katherine Sanchez, PhD, LCSW

Associate Investigator

Baylor Scott & White Research Institute

Anne Saw, PhD

Associate Professor

DePaul University

Arash Shaban-Nejad, PhD, MPH, MSc

Associate Professor

University of Tennessee Health Science Center

Susan Shortreed, PhD

Senior Biostatistics Investigator

Kaiser Permanente Washington Health Research Institute

Madhukar Trivedi, MD

Professor

University of Texas Southwestern

Jürgen Unützer, MD, MPH, MA

Professor

University of Washington

In February 2024, the selection committee selected 16 finalists out of a total of 41 projects from the concept proposal stage to design full proposal projects, demonstrating novel and equitable precision medicine approaches for diagnostic, preventative, or treatment strategies against depression.

In May 2024, the selection committee re-convened to select the top three fundable projects

in the finalist pool that demonstrated unique and boundary-spanning approaches to precision depression care.

A listing of all applicants, including non-selected finalists, is provided on the CIAPM Depression Research Program page.[10]

Launch of the Research Program

Following CIAPM's move to CalHHS, the three finalists in the Depression Program selection process were announced in October 2024 (CalHHS Press Release listed in Appendix D). They included:

1) Making the Unseen Seen Trial of Depression (MUST-D): Scrutinizing social determinants of depression to advance precision and equitable care (Lead Principal Investigator: Suzi Hong, PhD). University of California, San Diego

2) Personalized and scalable interventions for reducing depression among adolescents: Combining novel digital therapeutics and peer counseling (Lead Principal Investigator: Greg Hajcak, PhD). Santa Clara University

3) Precision Mental Health to Predict Risk, Prevent, and Treat Depression in Publicly Funded Youth (Lead Principal Investigator: Tony Yang, MD, PhD). University of California, San Francisco

Full descriptions of the projects and their proposed goals are listed below.

Depression Research Projects

Making the Unseen Seen Trial of Depression (MUST-D): Scrutinizing social determinants of depression to advance precision and equitable care

Lead Principal Investigator: Suzi Hong, PhD, University of California San Diego

Partners (listed alphabetically): Family Health Centers of San Diego, NeuroUX

Social determinants of health (SDoH) are a collection of social conditions that shape individuals' daily lives such as education, housing, income, and environment and are a primary source of health disparities. Currently, due to many obstacles, mental health care does not consider SDoH in a consistent and impactful manner to improve depression outcomes. These include a lack of evidence-based guidance, low workforce capacity to collect such information, and limited resources to incorporate them in clinical practice and patient care.

The UCSD 'MUST-D team' aims to determine SDoH that are closely related to, and predictors of, depression outcomes over 12 months by following 800 people to characterize time-dependent trajectories and relationships of depression-related SDoH with depression outcomes. To achieve this, the community clinic partner, Family Health Centers of San Diego (FHCSD), will support recruitment and clinical infrastructure. FHCSD is the largest federally qualified health center (FQHC) in the region and serves communities that are marginalized and underserved. The private sector collaborator NeuroUX will refine and maximize the utility of a smartphone-based, health-related data collection platform and develop and provide patient reports in a culturally sensitive, easy-to-understand manner.

The team aims to uncover what, when, how much, and how SDoH influence depression in marginalized populations. The findings from this study will be impactful in improving equity in depression care and outcomes for the marginalized individuals in California, while advancing individualized precision care for depression. The project began in October 2024, and in 2025, the team will co-design many aspects of the SDoH and depression data collection system with a community advisory board and begin patient participant recruitment.

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10   CIAPM Depression Research Program Page.

Personalized and scalable interventions for reducing depression among adolescents: Combining novel digital therapeutics and peer counseling

Lead Principal Investigator: Greg Hajcak, PhD, Santa Clara University

Partners (listed alphabetically)**:** Alum Rock Counseling Center, Flourish Labs, Muse, Colibri Digital Marketing, Rosalind Franklin University of Medicine and Science, Stanford University, University of California Los Angeles, Yale University

In 2021, the U.S. Surgeon General declared a youth mental health crisis, and post-COVID estimates suggest that one in five adolescents have experienced depression in the past year. To address this urgent public health issue, the Santa Clara 'BALANCE Study' team aims to examine whether two online interventions (a novel digital application and telehealth-based peer counseling) can be personalized for youth to reduce depression. The intervention focuses on: (1) increasing resiliency to stress (e.g., help youth to externalize and reduce internalized forms of stress), (2) decreasing negative emotions, and (3) increasing positive emotions.

The team aims to recruit 800 youth for the intervention, with approximately half representing LGBTQ+ identities, given these youth are twice as likely to experience depression due to social stigma, rejection, and victimization related to their marginalized sexual identities. The team will work closely with community partners and a Youth Advisory Board for all aspects of their study. The community partner Alum Rock Counseling Center will support the team in development of a digital application, peer counseling materials, and recruitment. The private sector collaborators Flourish Labs will provide peer counseling and MUSE will create the digital application.

The team will create a website for resources, including training and intervention materials, at no cost, thereby improving outcomes for youth with, or at risk for, depression and reducing health disparities. The project began in October 2024, and in 2025, the team will obtain approval from their institutional review board to carry out the study, facilitate meetings with the Youth Advisory Board, build the novel digital application, ensure the necessary infrastructure for the peer counseling, and begin participant recruitment.

Precision Mental Health to Predict Risk, Prevent, and Treat Depression in Publicly Funded Youth

Lead Principal Investigator: Tony Yang, MD, PhD, University of California San Francisco

Partners (listed alphabetically)**:** Edgewood Center for Children and Families, NeuMarker, Teens4Teens

Publicly funded youth, which include justice-involved individuals, foster care youth, and youth from low-income families who are Black, Native American, and of color, are at disproportionately higher risk for developing clinical depression.

The UCSF team will accomplish the following five Aims: (1) identify youth who are at highest risk for developing clinical depression through analysis of the publicly available data of 10,000+ youth from the NIH Adolescent Brain and Cognitive Development study, the largest long-term study of brain development and pediatric health in the nation; (2) test intervention efficacy of an innovative neuroscience-based mindfulness intervention in 100 publicly funded youth, developed by the team to treat and prevent depression; (3) identify the best clinical treatment option for 1000 youth diagnosed with depression who received care at UCSF clinics or UCSF Benioff Children's Hospitals; (4) build a precision medicine platform to help clinicians identify and choose the best prevention and treatment combinations for specific patients, ultimately leading to personalized patient care; and (5) UCSF and the community partner Edgewood Center will help create a new community advisory board (CAB) and focus groups to build strong, trusting community relationships and obtain community

feedback. In addition, the other community partner, Teen4Teens, will help with recruitment of current and/or former publicly funded youth, as well as share and promote the current CIAPM project to public stakeholders in the State of California. The private sector collaborator NeuMarker will provide cutting-edge analytical precision medicine software tools that can match a person with depression with optimal treatment.

The team will obtain approval from their institutional review board to carry out the study, determine strategies to identify the study cohort and variables for the data already generated, and begin participant recruitment. The project began in December 2024, and the UCSF IRB application was submitted by December 20, 2024. In 2025, they received UCSF IRB approval to carry out the study.

Former Research Programs

CIAPM's first eight demonstration projects concluded in December 2018, and the Cancer Disparities Research Program concluded in December 2023. CIAPM continues to collect and report on the ongoing impact of the work from the Cancer Disparities Research Program cohort, while the inaugural first eight CIAPM projects are past their five-year post-award reporting period. The eleven former projects, as well as publications and presentations in 2024 from the Cancer Research Program cohort are listed in Appendix B. Detailed reports about the first eleven projects can be found in the 2019 Evaluation Report to the California Legislature [11] and the upcoming 2025 Cancer Research Program Evaluation Report to the California Legislature.

Representative Research Collaborative

CIAPM continued developing the Representative Research Collaborative, a program dedicated to increasing engagement in biomedical research for all Californians. Representation of all communities in biomedical research is necessary for research outcomes that improve the understanding of disease prevention, diagnosis, and treatment to benefit all Californians. In 2025, CIAPM will continue to develop the Representative Research Collaborative and support the engagement of Californians within biomedical research, including the development of two Requests for Applications (RFAs) for innovative research proposals in 'representative precision medicine research.'

NIH *All of Us* Research Program

As part of its Representative Research Collaborative work, CIAPM partnered with the National Institutes of Health's (NIH) *All of Us* Research Program, which aims to build a national infrastructure for biomedical research by delivering one of the largest and richest biomedical data sets while protecting participant privacy. Through signing a Memorandum of Understanding, California became the first state partner of *All of Us*. CIAPM worked to support *All of Us'* engagement efforts, with a focus on promoting voluntary participation and bringing additional researchers to the *All of Us* dataset to advance scientific discovery. With these approaches, CIAPM aims to promote representative research, accelerating the benefits of research to all California communities.

In July 2024, NIH onboarded CIAPM staff to align on messaging and resources. CIAPM staff attended visits of the *All of Us* Journey, a mobile unit for enrollment, in San Jose and the Central Valley. CIAPM also attended the launch of the Southern California Consortium, a partnership between NIH, UC Irvine, Loma Linda University Health, and MemorialCare (see below).

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11   2019 CIAPM Evaluation Report to the California Legislature

CIAPM Staff Attend the Launch of the *All of Us* Southern CA Consortium

To demonstrate support from the State of California for research participation of local institutions in the *All of Us* Research Program, CIAPM Staff Drs. David Reiner, Theresa Spezzano, and Ramon Martinez attended the launch of the Southern California Consortium of the *All of Us* Research Program on August 6th, 2024.

This consortium, funded by the National Institutes of Health, is headed by Dr. Hoda Anton-Culver of the University of California, Irvine, with investigation and enrollment sites at MemorialCare of Orange County and Loma Linda University.

Notable presentations about this critical partnership with these California institutions were given by *All of Us*'s CEO, Dr. Josh Denny, and CA Surgeon General Dr. Diana Ramos.

The press release about the Southern California Consortium is available at the UC Irvine News page.[12]

Caption: CIAPM Staff Drs. David Reiner, Theresa Spezzano, and Ramon Martinez briefed the crowd and stood by CA Surgeon General Dr. Diana Ramos, *All of Us* CEO Dr. Josh Denny, and Dr. Dmitry Abramov of Loma Linda University Health and Dr. Fady Youssef of MemorialCare of Orange County.

Request for Applications (RFA) for 'Representative Precision Medicine Research'

Into the start of 2025, CIAPM began development of an RFA for 'Representative Precision Medicine Research.' At the time of publication, two RFAs have been launched; the first seeks to award approximately $2.3 million to support around 15 doctoral students conducting representative precision medicine research projects in California over a 2.5-year project term. The second RFA will award up to $6 million to support approximately 3-5 project teams conducting representative precision medicine research projects in California over a 2.5-year project term.

Impact Assessment
The research teams funded by CIAPM made significant contributions to science, communi-

12   UC Irvine News page announcement about the Southern California Consortium of the *All of Us* Research Program.

ty –building, and training over the year. In 2024, 63 publications and 103 presentations were disseminated by currently and previously funded CIAPM research groups.

The ACEs research program continued to establish strong community and academic partnerships through the inclusion of 56 community-based or partner academic organizations. Additionally, over 2100 participants have been enrolled through 2024, allowing researchers to work towards or complete their targeted research numbers and establish full-scale analyses of their datasets. Not only has this research program successfully integrated themselves in such a way that allows for extensive recruitment, but they have also served as a valuable educational resource, training and collaborating with over 400 clinicians, researchers, and community health workers across the state of California.

The initiation of the depression research program has integrated an additional 13 partnerships into the community and across universities. Research groups within the CIAPM network continue to develop ground-breaking scientific contributions in conjunction with large-scale training and community partnerships that will extend into the coming years and beyond.

Highlight of the Recently Concluded Cancer Disparities Research Program

The three CIAPM-funded cancer projects began in 2019 and concluded in 2023. The teams made significant strides in using 'big data' to personalize cancer care, empowering communities through education, and strengthening cancer care delivery in the community. The UCSD team developed the Celsus computational model, a tool with the potential to identify effective therapeutic combinations for triple-negative breast cancer patients, offering a more personalized and efficient approach. The UCSF team focused on Latina breast cancer patients, analyzing over 1,600 tumor samples to refine genetic testing approaches for cancers in underrepresented populations and improve precision medicine interventions. UCSF also highlighted how understanding family history and undergoing genetic testing can uncover individual cancer risks, though challenges remain in the care continuum, such as high costs and other barriers to testing and retention.

Community health workers (CHWs), or promotoras, have played a crucial role in building trust and connecting people to care, and Stanford's ALCANCE project demonstrated that CHW-led education and intervention models improved cancer care navigation and outcomes in Latinx communities in Monterey County. UCSF also utilized CHWs to educate Latinas about hereditary breast cancer risk. Altogether, the Cancer Disparities Research Program demonstrated the importance of including patients from diverse communities, providing information in culturally relevant languages and accessible formats, and centering care around the needs of communities.

Evaluation of the Cancer Disparities Research Program

In 2024, CIAPM convened a panel of out-of-state experts supporting the evaluation of CIAPM-funded Cancer Disparities research projects and aided CIAPM in preparation of an evaluation report to the Legislature, as required through CIAPM's enabling statute.

Several served in the initial expert selection committee for the Cancer Disparities projects, and altogether bring expertise across biomedical and precision medicine sectors. Full biographies are in Appendix F.

Gloria Coronado, PhD

Professor

University of Arizona

Martha "Meg" Gaines, JD, LLM

Distinguished Clinical Professor Emerita

University of Wisconsin

Elizabeth Gross Cohn, RN, PhD, FAAN

Vice President for Health Equity Research

Northwell Health

Jennifer Mack, MD, MPH

Associate Professor

Harvard University

Elaine Mardis, PhD

Professor

Ohio State University

Rulla Tamimi, SciD, MS

Professor

Cornell University

Program Highlights

Communications

As part of the new Communications portfolio, CIAPM spent much of 2024 expanding its footprint in the social media and web-based media ecosystem, launching new website pages and announcing programmatic accomplishments both at their previous home and using new social media tools at CalHHS. This year, six bi-monthly newsletters were released, along with posts highlighting our Depression Research Program, the *All of Us* partnership, and our intern search.

Newsletters

CIAPM continued to release regular newsletters, providing a network of over 1,300 recipients with updates and opportunities to be involved with the program.

The newsletters shared key CIAPM announcements, provided meeting updates and summaries, introduced new staff, interns, and council members, and highlighted important gatherings for the Depression Research Program, among providing other information. The series of Researcher Spotlights continued through 2024, largely highlighting CIAPM-funded community researchers, detailing how their involvement is critical to the goals of the ACEs research program. The newsletters also served as an important bridge for program announcements as we transitioned from the Governor's Office of Planning and Research to CalHHS.

Current and archived newsletters are available on the CIAPM website. Interested stakeholders can also sign up for the distribution list on the website.[13]

Depression Research Program Launch

The selection of the awardees for the Depression Research Program was widely distributed to our newsletter recipient list and featured on the CalHHS webpage.

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13   CIAPM News Page.

California Awards Innovative Proposals for Precision Medical Research on Depression

Blog, Featured /
October 25, 2024

Caption: Blog post of announcement of Depression Research Program awardees on CalHHS webpage.

The full press release of the selected awardees is available in Appendix D.

Intern Search

CIAPM looked to social media to disseminate a call for interns for the program to a wider audience.

As part of the posting amplification, CIAPM received over 100 applications for the two open roles, demonstrating the broad and state-wide interest in our program for California students seeking training in biomedical policy and grant administration.

Caption: LinkedIn post amplifying an open call for interns for the CIAPM program.[14]

NIH All of Us Partnership Launch

The partnership launched with the NIH *All of Us* Research Program, as part of the Memorandum of Understanding, was highlighted across multiple professional social media platforms and CIAPM's newsletter recipient list, as well as featured on the CalHHS webpage. The NIH also posted on social media and published a formal press release on their website of our 'first-of-its-kind' state government partnership with the program.

Caption: X post announcing the novel partnership between the National Institutes of Health

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14   CalHHS LinkedIn Post of Intern Search.

and the California Health and Human Services Agency.[15]

The full press release of the partnership launch is available on Appendix D.

Network Engagement and Outreach

Special Recognitions

In February 2024, CIAPM-supported UCSD Principal Investigator Blanca Meléndrez, Executive Director of the UCSD Center for Community Health, and her colleague, Amina Sheik Mohamed, Director of the Center, received the 2024 James Irvine Foundation Leadership Award [16] for advancing health equity through collaborative, community-led initiatives through their work researching Adverse Childhood Experiences (ACEs). CIAPM staff attended Blanca and Amina's recognition of the award on the Senate floor on February 12, 2024.

15   CalHHS X post about *All of Us* Partnership.
CalHHS LinkedIn Post about *All of Us* Partnership.
NIH X Post about *All of Us* Partnership.
NIH *All of Us* Partnership Press Release.
16   Press Release for the UCSD investigators receiving the James Irvine Foundation Award
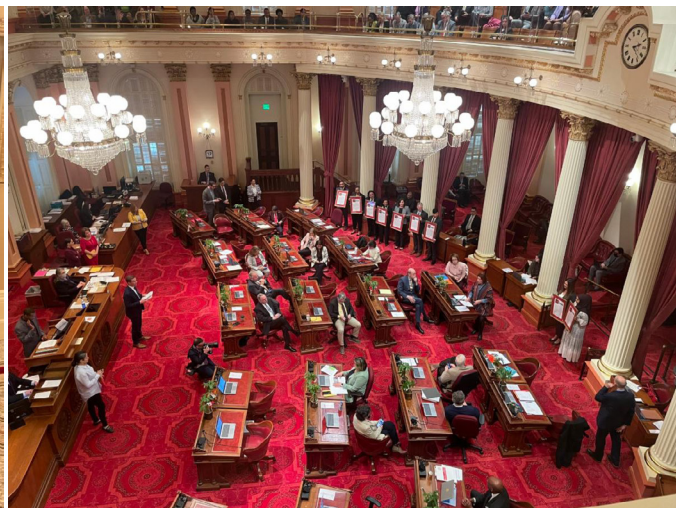
Captions: *Photo 1:* Blanca Meléndrez, Don Howard, CEO of Irvine Foundation, and Amina Sheik Mohamed, holding James Irvine Foundation Leadership Awards.

*Photo 2***:** Blanca Meléndrez and Amina Sheik Mohamed with CIAPM Staff Dr. Julianne Mc-Call, Dr. David Reiner, and Saga Barberis

*Photo 3***:** Blanca Meléndrez and Amina Sheik Mohamed receiving award recognition on the Senate floor by Senator Toni G. Atkins.

Credits: Chase Daley, Blanca Meléndrez, and Julianne McCall.

Community Events

Science Officer, Dr. David Reiner, attended the UCSF ACE's inaugural Community Science Day on August 3, 2024, in which the team shared research updates with community members and participants, attendees engaged in family-friendly activities about ACEs and toxic stress, and community members and participants had opportunities to ask questions about the research study.

Caption: UCSF ACEs Lead Principal Investigator Dr. Neeta Thakur provides an introduction to the community about their project's research, as well as the whole research team.

Contributions to Scientific and Policy Discussions

In April 2024, former CIAPM Director Dr. Julianne McCall led a panel for *Innovation Strategies for Healthcare* at the National Science Policy Symposium, hosted at UC Riverside April 12-14, 2024. This panel covered the effects from local to international level policies on healthcare innovations and services.

Caption: Banner of symposium panel session with Dr. McCall, Dr. Stephen Cutie (California Life Sciences) and Michael Chen (World Telehealth Initiative).

A full listing of CIAPM external engagements is listed in Appendix C.

Mental Health Commission Site Visit in Berkeley

On June 12, CIAPM Staff were honored to be invited by the Mental Health Services and Oversight Accountability Commission to join a site visit at UC Berkeley to explore areas for innovation and investment to meet Californians' behavioral health needs.

The gathering brought together leaders from the Innovation Genomics Institute, the Garwood Center for Corporate Innovation, the California Institute for Quantitative Biosciences, the Sutardja Institute for Entrepreneurship, and other venture capital experts and researchers.

Caption: CIAPM Science Officer Dr. David Reiner, Science Communications Officer Dr. Ramon Martinez, and Former Director Dr. Julianne McCall at the Innovative Genomics Institute.

California Precision Medicine Advisory Council

The California Precision Medicine Advisory Council was launched in 2020 to advise on current and future programs of the Initiative. The 11-member Council is comprised of precision medicine experts from a broad range of backgrounds and sectors, including academia, government, industry, finance, patient advocacy, and clinical care. The Council meets quarterly for discussions and updates on CIAPM's portfolio of programs and projects.

Some of the topics covered during this year's advisory council meetings included the Request for Proposals and launch of the Depression Research Program, federal engagements, the new Communications portfolio, the Representative Research Collaborative, Advisory Council member additions and onboarding, bylaws changes, and the transition to CalHHS.

The council also said goodbye to longtime advisors Dr. Yvette "Bonnie" Maldonado, Dr. Oliver Keown, and Ysabel Duron after their term on the council was reached. Three new advisors were recruited to the Council, Dr. Hala Madanat, Dr. Elize Bradley, and Gay Grossman (biographies of the new and continuing council members are provided in Appendix G).

During the July 2024 Council meeting, advisors renewed their terms for leadership roles of Chair Dr. Clara Lajonchere and Vice Chair Dr. Keith Yamamoto by unanimous votes. In October 2024, the Council also met in person for the first time at the CalHHS headquarters in Sacramento.

In 2024, CIAPM also launched a webpage on Equitable Consent Frameworks and Guidance for Community Members and Researchers [17] as a deliverable and goal of the Equitable Consent working group of the Advisory Council, which completed their quarterly meetings in 2023. More about this webpage and Equitable Consent resources are noted in the section below, entitled Equitable Consent Frameworks Web Resource.

Caption: Members of the California Precision Medicine Advisory Council joined CIAPM staff in Sacramento for their first in-person meeting of 2024.

Meeting agendas and summaries can be found in Appendix H and on the CIAPM Meetings Page.[18]

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17   CIAPM Equitable Consent Frameworks Webpage.

18   CIAPM Meetings Webpage.

Equitable Consent Frameworks Web Resource

CIAPM launched the Equitable Consent Frameworks website in 2024,[17] following input from the CIAPM Advisory Council's Equitable Consent Working Group. This framework is a resource for Californians on clinical research and clinical trials to understand the significance of clinical trial participation. Clinical trial participation can lead to advancements of diagnostic, treatment, and prevention strategies that help providers, scientists, and researchers discover and learn effective ways to treat chronic diseases.

In order to learn what treatments work best for all people, clinical research and clinical trials that are representative of wider demographics and patient populations are critical. Diversity within a clinical trial is essential as people's bodies can respond to treatments differently despite having the same disease diagnosis. All races and ethnicities are encouraged to participate in clinical trials especially those who are from racially and ethnically diverse communities, over the age of 55, pregnant and lactating, gender and sexually diverse, and/or have disabilities. Overall, individuals who identify within any of the categories above are less likely to participate in clinical trials. As a result, medical treatments, tests, and devices may not be equally effective and safe for all patients.

The Equitable Consent Framework website has several distinct sections: (1) Get Involved in Clinical Trials, (2) Important Information to Know, (3) Know Your Rights, and (4) Addressing Underrepresentation in Clinical Trials. Each section includes important information, statistics, and resources for both researchers and potential clinical trial participants.

In the "Get Involved in Clinical Trials" and "Addressing Underrepresentation in Clinical Trials" sections, statistics and information on disparities in clinical trial representation are provided as well as resources to overcome these barriers. For example, 51% of cancer patients are female, but only 41% of patients from cancer clinical trials are female. To ensure individuals face less barriers, researchers can provide travel accommodations, language support, ensure cultural sensitivity, and offer paid opportunities when possible.

In the "Important Information to Know" and "Know Your Rights" sections, information on rights and responsibilities for a clinical trial participant are provided. For example, participants are entitled to be fully informed about a study including the purpose, the use of data, reimbursement opportunities, and any possible side effects.

For more resources and information on ongoing clinical trials, please visit these websites:

https://clinicaltrials.gov/

https://www.cc.nih.gov/recruit

https://clinicaltrials.ucbraid.org/

Research and Policy Training

In 2024, three graduate student fellows were part of CIAPM, and an additional two interns were recruited at the end of the calendar year, with start dates in 2025.

Trainees were tasked with administrative duties for the California Precision Medicine Advisory Council, helped co-author an evaluation report for the cancer research portfolio, co-author annual reports, build out the Asset Inventory, support the continued development of the Representative Research Collaborative, and support the administration and launch of the Depression Research Program.

A Look Ahead

After a year of change for the program, having moved to CalHHS in 2024, CIAPM in 2025 is

managing and overseeing the Depression and ACEs Research Programs, preparing a comprehensive evaluation report for the Legislature, developing approaches to encourage representative research, sharing the CIAPM model broadly amongst the precision medicine community, and expanding the precision medicine network through conferences and convenings.

Depression and ACEs Research Programs

Following a successful Request for Proposals and selections process, CIAPM will oversee three outstanding three-year research projects that aim to use a precision approach to prevent, diagnose, and treat depression. CIAPM will also continue to oversee and advance the ACEs Research Program, which concludes in 2025 and 2026.

Evaluating CIAPM Research Programs

CIAPM will complete and publish a comprehensive Evaluation Report on the Cancer Disparities Research Program for the Legislature. CIAPM will also initiate the evaluations process for the ACEs Research Program, which will involve recruiting an Expert Evaluation Committee to assess projects' progress and impact.

Reducing Health Disparities Through Representative Research

CIAPM staff will continue to develop the Representative Research Collaborative, including through the development of a Request for Applications for 'Representative Precision Medicine Research,' to promote representation in biomedical research, so new treatments, diagnostics, and prevention strategies arising from research serve *all* Californians.

CIAPM Networking and Convening

Staff will continue sharing the CIAPM model and expanding our precision medicine network through attendance at the Precision Medicine World Conference and the Pediatric Academic Societies Meeting. Additionally, CIAPM will convene the current research teams of the ACEs and Depression Research Programs for a Current Grantees Meeting to share lessons learned, best practices, and key takeaways from research projects.

Appendices

Appendix A. New Publications, Presentations, and Press Coverage of Currently Funded Projects

Adverse Childhood Experiences (ACEs) Research Projects

Scalable Measurement and Clinical Deployment of Mitochondrial Biomarkers of Toxic Stress

Lead Principal investigator: Dr. Pat Levitt

Host Institution: Children's Hospital Los Angeles (CHLA)

Publications

1. Maggo S, North LY, Ozuna A, Ostrow D, Grajeda YR, Hakimjavadi H, Cotter JA, Judkins AR, Levitt P, Gai X. (2024). A method for measuring mitochondrial DNA copy number in pediatric populations. *Front Pediatr*. 12:1401737.

Presentations

1. A'di Dust, Pat Levitt, Maja J. Matarić. Behind the Smile: Mental Health Implications of Mother-Infant Interactions Revealed Through Smile Analysis. In Proceedings of the 12th International Conference on Affective Computing and Intelligent Interaction (ACII). September 15-18, 2024, Glasgow, Scotland.

A Multi-Component Intervention to Strengthen Families and Build Youth Resilience

Lead Principal Investigator: Dr. Ariane Marie-Mitchell

Host Institution: Loma Linda University (LLU)

Publications

1. Marie-Mitchell, A., Delgado, C., Gilgoff, R. (2024) "Parenting Education to Improve Relational Health through Pediatric Primary Care: A Scoping Review." *Journal of Primary Care & Community Health*, 15: 1-19.

Presentations

1. Mangunsung J., Marie-Mitchell, A. "Parent Perspectives on Pediatric Interventions to Address Adverse Childhood Experiences." Oral Presentation, Western Medical Research Conference, January 2024.

2. Krance, L., Fong, M., Marie-Mitchell, A. "Potential Disparities in Reporting and Referring for Adverse Childhood Experiences." Poster presentation, Loma Linda's Diversity and Equity Annual Meeting, February 2024.

Digital Assets

Websites

1. Information related to the Whole Child Assessment, . This website was updated in May 2024 with version 3 of the Whole Child Assessment.

Databases

1. Clinical database with data collected at medical visits and through community partnerships.

2. Research database with data collected at the research visits.

Algorithms

1. Whole Family Care algorithm to determine level of support based upon family risk factors

Educational Aids and Curricula

1. FIRST introductory 4-hour curriculum for pediatric providers

2. FIRST introductory 3-hour curriculum for community health workers (mentors)

3. FIRST content integrated into seven lessons of the Nurturing Families curriculum

4. Educational handouts for families available to print or include in medical record, English & Spanish

   a. Understanding ACEs & Resilience

   b. Stress Management

   c. Healthy Relationships

Collaborations

1. National Academy of Science, Engineering, & Medicine Forum for Children's Well-Being Healthy Parenting Collaborative, 1/2022-current

2. Epic Equitable Care Brain Trust, 4/2022- current

3. ACEs Aware Evaluation and Evidence Advisory Roundtable for UCLA-UCSF ACEs Aware Family Resilience Network (UCAAN), 2/2023-current

The SYSTEMAATIC Project: Systems-based, Multidisciplinary Assessment of Adversity and Toxic Stress for Individualized Care

Lead Principal Investigator: Dr. Sayantani (Tina) Sindher

Host Institution: Stanford University

Publications

1. Abdulahad L, Forkey H, Gilgoff R, Keeshin B, Reid K, Rodriquez D. (2024) Practical Strategies for Implementing Trauma-Informed Care [online course]. PediaLink. American Academy of Pediatrics. https://bit.ly/3YIp03L. Published 8/12/2024. Accessed 9/25/24. I co-authored "Module #4: Implementing Trauma-Informed Care with Infants and Young Children."

2. Marie-Mitchell, A., Delgado, C., Gilgoff, R. (2024) Parenting Education to Improve Relational Health Through Pediatric Primary Care: A Scoping Review. *J Prim Care Commu-*

nity Health. Jan-Dec;15.

3. Gilgoff, R., Mengelkoch, S,, Elbers, J., Kotz, K., Radin, A., Pasumarthi, I., Murthy, R., Sindher, S., Burke Harris, N., Slavich, G.E. (2024) The Stress Phenotyping Framework: A Multidisciplinary Biobehavioral Approach for Assessing and Therapeutically Targeting Maladaptive Stress Physiology. *Stress.* 27 (1).

4. Martinez, A., Ye, M., Hessler, D., de la Rosa, R., Benson, M., Gilgoff, R., Koita, K., Bucci, M., Harris, N.B., Long, D., Thakur, N. (2024) Adverse Childhood Experiences and Related Events are Associated with Asthma Symptoms in Children. *Acad Pediatr.*

Presentations

1. Safe Spaces: Foundations of Trauma-Informed Training and Practice for Educational and Care Settings. California Department of Public Health, November 2024.

2. Safe Spaces: Foundations of Trauma-Informed Training and Practice for Educational and Care Settings. Strong Start Coalition, November 2024

3. Stress, Nutrition, and Physical Activity: Science, Symptoms, and Healing. University of California Agriculture and Natural Resources (UCANR) , October 2024

4. Using Stress Biology to Inform Our Clinical Approach. Children Youth and Family Network, The Social Changery, September 2024.

5. Stress Busters: Evidence-Based Strategies for Mitigating the Toxic Stress Response. UCSF Pediatric Grand Rounds, September 2024.

6. Stress Busters: Integrative, Evidence-Based Strategies for Mitigating the Toxic Stress Response in Standard Clinical Practice. Integrative Medicine for Us (IM4US) Conference, August 2024.

7. Safe Spaces: Foundations of Trauma-Informed Training and Practice for Educational and Care Settings. Northern ACEs Champion Convening, Population Health Innovation Lab, July 2024.

8. Stress and Health: Science, Symptoms, and Healing Strategies. National Alliance on Mental Illness, NAMICon 2024, June 2024.

9. Helping All of Us Cope, Heal, and Thrive in Stressful Times. Developmental Disability and Neurodiversity Conference, Special Care Services, April 2024.

Digital Assets

1. Abdulahad L, Forkey H, Gilgoff R, Keeshin B, Reid K, Rodriquez D. (2024) Practical Strategies for Implementing Trauma-Informed Care [online course]. PediaLink. American Academy of Pediatrics. https://bit.ly/3YIp03L. R. Gilgoff co-authored "Module #4: Implementing Trauma-Informed Care with Infants and Young Children."

Trainees

- One clinical research trainee
- One medical student

Using Precision Medicine to Tackle Impacts of Adverse and Unpredictable Experiences on Children's Neurodevelopment: The SoCal Kids Study

Lead Principal Investigator: Dr. Tallie Z. Baram

Host Institution: UC Irvine

Publications

1. Short, A.K., Weber, R., Kamei, N., Wilcox Thai, C., Arora, H., Mortazavi, A., Stern, H.S., Glynn, L., Baram, T.Z. (2024) Individual longitudinal changes in DNA-methylome identify signatures of early-life adversity and correlate with later outcome. *Neurobiology of Stress*

2. Irwin, J.L., Davis, E.P., Sandman, C.A., Baram, T.Z., Stern, H.S., Glynn, L.M. (2024) Infant hedonic/anhedonic processing index (HAPI-Infant): Assessing infant anhedonia and its prospective association with adolescent depressive symptoms. *Journal of Affective Disorders.*

3. Aran, Ö., Swales, D.A., Bailey, N.A., Korja, R., Holmberg, E., Eskola, E., Nolvi, S., Perasto, L., Nordenswan, E., Karlsson, H., Karlsson, L., Sandman, C.A., Stern, H.S., Baram, T.Z., Glynn, L.M., Davis, E.P. (2024). Across ages and places: Unpredictability of maternal sensory signals and child internalizing behaviors. *Journal of Affective Disorders.*

4. Glynn, L.M., Liu, S.R., Lucas, C.T. & Davis, E.P (2024). Leveraging the science of early life predictability to inform policies promoting child health. *Developmental Cognitive Neuroscience.*

5. Glynn, L.M. (2024). Predictability can reduce the burden of adverse childhood experiences: policies to promote it. *Policy Insights from the Behavioral and Brain Sciences.*

6. Hardy, M., Chen, Y., Baram, T.Z., Justice, N.J. (2025). Targeting corticotropin-releasing hormone receptor type 1 (Crhr1) neurons: validating the specificity of a novel transgenic Crhr1-FlpO mouse. *Brain Structure and Function.*

7. Levis, S.C., Birnie, M.T., Xie, Y., Kamei, N., Kulkarni, P.V., Montesinos, J.S., Perrone, C.R., Cahill, C.M., Baram, T.Z., Mahler, S.V. (2024). Opioid drug seeking after early-life adversity: a role for delta opioid receptors. *Addiction Neuroscience.*

8. Kangas, B.D., Ang, Y., Short, A.K., Baram, T.Z., Pizzagalli, D.A. (2024). Computational Modeling Differentiates Learning Rate From Reward Sensitivity Deficits Produced by Early-Life Adversity in a Rodent Touchscreen Probabilistic Reward Task. *Biological Psychiatry Global Open Science.*

9. Baram, T.Z., Birnie, M.T. (2024). Enduring memory consequences of early-life stress / adversity: Structural, synaptic, molecular and epigenetic mechanisms. *Neurobiology of Stress.*

10. Hunt, C., Vinograd, M., Glynn, L.M., Davis, E.P., Baram, T.Z., Stern, H., Nievergelt, C., Cuccurazzu, B., Napan, C., Delmar, D., Baker, D.G., Risborough, V.B. (2024). Childhood unpredictability is associated with increased risk for long- and short-term depression and anhedonia symptoms following combat deployment. *Journal of Mood & Anxiety Disorders.*

11. Jirsaraie, R.J., Palma, A.M., Small, S.L., Sandman, C.A., Davis, E.P., Baram, T.Z., Stern, H., Glynn, L.M., Yassa, M.A. (2024) Prenatal Exposure to Maternal Mood Entropy Is Associated With a Weakened and Inflexible Salience Network in Adolescence. *Biological Psychiatry: Cognitive Neuroscience and Neuroimaging.*

Presentations

1. Baram, T.Z. The Thalamic Paraventricular Nucleus Encodes Early-Life Adversity, Contributing to Consequent Disruption of Adult Reward Behaviors, Gordon Research Conference, February 2024.

2. Baram, T.Z. NIH NIMH intramural program conference. The PVT - an encoder of salient early-life experiences, mediates their consequences on adult behavior, September 2024.

3. Baram, T.Z. Flux Congress, Symposia, How Unpredictable and Stressful Environments Impact Brain Development, Presenter, September 2024.

4. Baram, T.Z. International Society for Developmental Psychobiology (ISDP) Annual Meeting, How early-life adversity influences adult behavior, October 2024.

5. Campi, E., Davis, E.P., Sandman, C.A., & Glynn, L.M. Sensory reactivity affects response to early life unpredictability: A proof-of-concept study. Poster presentation at University of California, Irvine Annual Conte Center Symposium, Irvine, California. March 2024.

6. Cohen, S., Campi, E., Glynn, L.M. DHEA is sensitive to prenatal maternal psychological distress. Poster presentation at Western Psychological Association Convention, San Fransisco, California. April 2024.

7. Glynn, L.M. The role of early life unpredictability in reward processing: a cross-species study. Paper presentation at the annual meeting of the American Psychosomatic Society. March 2024.

8. Glynn, L.M. Novel perspectives on the role of maternal perinatal mental health in child psychopathology: examination of positive affect and mood variability. In Novel Predictors of Maternal and Child Mental Health and Well-Being. Symposium at the annual meeting of the Society for Behavioral Medicine. March 2024.

9. Abdusalem, S., Akande, O., Chandekar, A., Nwoke, M., Makar, C., Balogun, T., Taylor Lucas, C., Saadat, S., Chakravarthy, B. Exploring the intersection between primary care provider trust, primary care provider visit frequency and emergency department visits in a level 1 trauma center in southern California. Platform presentation at UCI Susan & Henry Samueli College of Health Sciences Scholars Day, Irvine, California. May 2024.

10. Balogun, O., Shin, J., Tetteh, E., Rhoads-Baeza, E., Leung, A., Taylor Lucas, C., Parker, N., Noori, E., Llauro, N., Pham, C., Huyng, A., Lopez, M. Your CARE2 matters: Multi-pronged approaches to improving perinatal outcomes. Abstract and platform presentation at UCI Health and Beyond, University of California Community Health Conference, Irvine, California. April 2024.

11. Lindert, N.G., Davis, E.P., Sandman, C.A., & Glynn, L.M. Maternal positive affect uniquely predicts infant anhedonia. Poster presentation at Western Psychological Association Convention, San Francisco, California. April 2024.

12. Lindert, N.G., Vargas, V.M., Cohen, S., Liu, S.R., Stern, H.S., Baram, T.B., Golden, C.V., Weiss, M.A., Ehwerhemuepha, L., & Glynn L.M. Progress in screening for unpredictability in childhood in CHOC primary care clinics. Data Blitz and poster presentation at University of California, Irvine Annual Conte Center Symposium, Irvine, California. March 2024.

13. Liu, S.R., Taylor Lucas, C., Maxwell, M., Lindert, V., Vargas, V., & Glynn, L.M. Community engaged team science to enhance research on early life adversity. Paper presented

at Society for Prevention Research Annual Meeting, Washington, District of Columbia. May 2024.

14. Messele, F., Meller, L., Makar, C., Arham, A., Gebreyes, M., Okeke, C., Taylor Lucas, C., Sadaat, S. Education Level and Healthcare Experiences among Black Patients in the Emergency department: A cross-sectional study. Platform presentation at Western Medical Research Conference, Carmel, California. January 2024.

15. Payne, C., Zieve, H., Taylor Lucas, C., Shekarabi, N., Vasa, M., Reddy, V, Bauer, K., Afghani, B. Pediatric educational discussion scenarios: Empowering residents to cope with difficult patient encounters and adverse medical events. Poster presentation at Western Medical Research Conference, Carmel, California. January 2024.

16. Peterson, D., Roux, J., McCallum, E., Stokes, L., Louis, C., Billimek, J., Zieve, H., Taylor Lucas, C. Who to ask? A cross-sectional study assessing agreement in child and caregiver reported health behaviors. Poster presentation at Pediatric Academic Societies Meeting, Toronto, Canada. May 2024

17. Taylor Lucas., C. Your CARE matters: A multi-pronged approach to improving perinatal outcomes at UCI Health. Poster presentation at UCI Health Innovation Gallery Walk, Irvine, California. March 2024.

18. Vargas, V.M., Campi, E., Sandman, C., Davis, E.P., Glynn, L.M. The association between ADHD and unpredictability is sex dependent. Poster presentation at University of California, Irvine Conte Annual Center Symposium, Irvine, California. March 2024.

19. Zandueta-Duarte, A., Campi, E., & Glynn, L.M. Probing associations between negative life events and approach-avoidance in adolescence. University of California, Irvine - Annual Conte Center Symposium, Irvine, California. March 2024.

20. Campi, E., Berardi, V., Davis, E.P., Sandman, C.A., & Glynn, L.M. (2024, November). *Mom's developing too: The reciprocal effects of infant sensory reactivity and maternal sensitivity.* Children's Hospital Orange County Annual Research Day, Orange, CA.

21. Glynn L.M. (2024, November). The translational potential of early life unpredictability to enhance child mental health. In *Bench to Bedside: Implementation of Experimental and Cross-Species Research to Benefit Maternal and Child Health*. Symposium at the annual meeting for the International Society for Developmental Psychobiology, Chicago, Illinois.

22. Taylor Lucas, C. (2024, October). Moderator at Birthing Joy Symposium. University of California, Irvine School of Medicine, Irvine, California.

23. Vargas, V.M., Liu, S.R., Taylor Lucas, C., Maxwell, M., Lindert, N.G., Cooper, D.M., Golden, C.V., Weiss, M., Glynn, L.M. (2024, November) Who, why, and how to screen: Community perspectives on early life adversity screening and research in primary care settings [Poster Presentation]. Children's Hospital of Orange County's Research Day, Orange, California.

Digital Assets

1. REDCap – software application to build and manage online clinical research databases and surveys (includes demographic characteristics, survey data, EHR data, and lab results)

<u>Education and Outreach</u>

1. Glynn, L.M. New directions in understanding prenatal origins of health: psychobiological risk and resilience. Grand rounds presentation for the UCI Department of Obstetrics and Gynecology. February 2024.

2. Liu, S.R. Implications of early life adversity for pediatric health & health equity. Invited talk at Leadership Education to Advance Diversity- African, Black, and Caribbean (LEAD-ABC), University of California, Irvine School of Medicine, Irvine, California. February 2024.

3. Baram, T.Z. "Early-life Adversities Shape Adult Behaviors: From the Clinic to the Lab- and Back", Medical College of Wisconsin. February 2024.

4. Baram, T.Z. How Early-Life Experiences Sculpt Brain Circuit Maturation; Implications for Mental Health and Disease Coldspring Harbor Laboratory. April 2024.

5. Baram, T.Z. How Early-life Adversities Shape Adult Behaviors: From the clinic to the lab - and back, University of Minnesota Neuroscience. May 2024.

6. Taylor Lucas, C. & Liu, S.R. SoCal Kids Study Community Engagement Studios Update. University of California, Irvine, Institute for Clinical and Translational Science Steering Committee Meeting. July 2024.

<u>Trainees</u>

- Three undergraduate students
- Three post-baccalaureate trainees
- One doctoral candidate
- One post-doctoral researcher

Identifying Social, Molecular, & Immunological Processes for Mitigating Toxic Stress & Enhancing Personalized Resilience

Lead Investigator: Dr. George Slavich

Host Institution: UC Los Angeles

<u>Publications</u>

1. Mengelkoch, S., & Slavich, G. M. (2024). Sex differences in stress susceptibility as a key mechanism underlying depression risk. *Current Psychiatry Reports*, 26, 157-165. doi: 10.1007/s11920-024-01490-8

2. Moriarity, D. P., & Slavich, G. M. (2024). Toward a dynamic immunopsychiatry. *Brain, Behavior, and Immunity*, 118, 50-51. doi: 10.1016/j.bbi.2024.02.011.

3. Tsomokos, D. I., & Slavich, G. M. (2024). Bullying fosters interpersonal distrust and degrades adolescent mental health as predicted by Social Safety Theory. *Nature Mental Health*, 2, 328-336. doi: 10.1038/s44220-024-00203-7

4. Kim, L. Y., Schüssler-Fiorenza Rose, S. M., Mengelkoch, S., Moriarity, D. P., Gassen, J., Alley, J. C., Roos, L. G., Jiang, T., Alavi, A., Thota, D. D., Zhang, X., Perelman, D., Kodish, T., Krupnick, J. L., May, M., Bowman, K., Hua, J., Liao, Y. J., Lieberman, A. F., Butte, A. J., Lester, P., Thyne, S. M., Hilton, J. F., Snyder, M. P., & Slavich, G. M. (2024). California Stress, Trauma, and Resilience Study (CalSTARS) protocol: A multiomics-based cross-sectional investigation and randomized controlled trial to elucidate the biology of ACEs and test a precision intervention for reducing stress and enhancing resilience.

Stress, 27(1):2401788. doi: 10.1080/10253890.2024.2401788

5. Kelly, C., Trumpff, C., Acosta, C., Assuras, S., Baker, J., Basarrate, S., Behnke, A., Bo, K., Bobba-Alves, N., Champagne, F. A., Conklin, Q., Cross, M., De Jager, P., Engelstad, K., Epel, E., Franklin, S. G., Hirano, M., Huang, Q., Junker, A., Juster, R. P., Kapri, D., Kirschbaum, C., Kurade, M., Lauriola, V., Li, S., Liu, C. C., Liu, G., McEwen, B., McGill, M. A., McIntyre, K., Monzel, A. S., Michelson, J., Prather, A. A., Puterman, E., Rosales, X. Q., Shapiro, P. A., Shire, D., Slavich, G. M., Sloan, R. P., Smith, J. L. M., Spann, M., Spicer, J., Sturm, G., Tepler, S., de Schotten, M. T., Wager, T. D., Picard, M., & MiSBIE Study Group. (2024). A platform to map the mind-mitochondria connection and the hallmarks of psychobiology: The MiSBIE study. *Trends in Endocrinology and Metabolism*, 35, 884-901. doi: 10.1016/j.tem.2024.08.006

6. Kim, S., Brennan, P. A., Slavich, G. M., Hertzberg, V., Kelly, U., & Dunlop, A. L. (2024). Black-white differences in chronic stress exposures to predict preterm birth: Interpretable, race/ethnicity-specific machine learning model. *BMC Pregnancy Childbirth*, 24, 438. doi: 10.1186/s12884-024-06613-w

7. Miller, A. B., Jenness, J. L., Elton, A. L., Pelletier-Baldelli, A., Patel, K., Bonar, A., Martin, S., Dichter, G., Giletta, M., Slavich, G. M., Rudolph, K. D., Hastings, P., Nock, M., Prinstein, M. J., & Sheridan, M. A. (2024). Neural markers of emotion reactivity and regulation before and after a targeted social rejection: Differences among girls with and without suicidal ideation and behavior histories. *Biological Psychiatry*, 95, 1100-1109. doi: 10.1016/j.biopsych.2023.10.015

8. Gruhn, M. A., Siciliano, R. E., Anderson, A. S., Vreeland, A., Henry, L. M., Watson, K. H., Slavich, G. M., Ebert, J., Kuhn, T., & Compas, B. E. (2024). Dimensions of childhood adversity differentially affect autonomic nervous system coordination in response to stress. *Stress*, 27, 2419668. doi: 10.1080/10253890.2024.2419668

9. Nail-Beatty, O., Ibanez, A., Ayadi, R., Swieboda, P., Njamnshi, A. K., Occhipinti, J-A ., Hynes, W., Ikiz, B., Castro-Aldrete., L., O'Brien, K., Platt, M. L., Adalat, S., Malin Abdullah, J., Dhamija, R. K., Merali, Z., Mostert, C., Beck, D., Saxena, S., Salama, M., Abdelraheem, O. M., Destrebecq, F., Slavich, G. M., Shehu, B., Fieggen, G., Ghogomu, P. M., Bassetti, C. L., & Eyre, H. A. (2024). Brain health is essential for smooth economic transitions: Toward socio-economic sustainability, productivity, and wellbeing. *Brain Communications*, 6, fcae360. doi: 10.1093/braincomms/fcae360

10. Pelletier-Baldelli, A., Sheridan, M. A., Rudolph, M. D., Eisenlohr-Moul, T., Martin, S., Srabani, E. M., Giletta, M., Hastings, P. D., Nock, M. K., Slavich, G. M., Rudolph, K. D., Prinstein, M. J., & Miller, A. B. (2024). Brain network connectivity during peer evaluation in adolescent females: Associations with age, pubertal hormones, timing, and status. *Developmental Cognitive Neuroscience*, 66, 101357. doi: 10.1016/j.dcn.2024.101357

11. Telles, R., Zimmerman, M. B., Thaker, P. H., Slavich, G. M., Ramirez, E. S., Zia, S., Goodheart, M. J., Cole, S. W., Sood, A. K., & Lutgendorf, S. K. (2024). Rural-urban disparities in psychosocial functioning in epithelial ovarian cancer patients. *Gynecologic Oncology*, 184, 139-145. doi: 10.1016/j.ygyno.2024.01.024

12. Gruhn, M., Miller, A. B., Eisenlohr-Moul, T. A., Martin, S., Clayton, M. G., Giletta, M., Hastings, P. D., Nock, M. K., Rudolph, K. D., Slavich, G. M., Prinstein, M. J., & Sheridan, M. A. (2024). Threat exposure moderates associations between neural and physiological indices of emotion reactivity in adolescent females. *Psychoneuroendocrinology*, 159,

106405. doi: 10.1016/j.psyneuen.2023.106405

13. Lutgendorf, S. K., Telles, R. M., Whitney, B., Thaker, P. H., Slavich, G. M., Goodheart, M. J., Penedo, F. J., Noble, A. E., Cole, S. W., Sood, A. K., & Corn, B. W. (2024). The biology of hope: Inflammatory and neuroendocrine profiles in ovarian cancer patients. *Brain, Behavior, and Immunity*, 116, 362-369. doi: 10.1016/j.bbi.2023.12.014

14. Rodriguez-Thompson, A. M., Miller, A. B., Wade, M., Meyer, K. N., Machlin, L., Bonar, A., Patel, K. P., Giletta, M., Hastings, P. D., Nock, M. K., Rudolph, K., Slavich, G. M., Prinstein, M. J., & Sheridan, M. A. (2024). Neural correlates of p-factor in adolescence: Cognitive control with and without enhanced affective demands. *Biological Psychiatry: Cognitive Neuroscience and Neuroimaging*, 9, 30-40. doi: 10.1016/j.bpsc.2023.03.012

15. Chiappelli, J., Savransky, A., Ma, Y., Gao, S., Kvarta, M. D., Kochunov, P., Slavich, G. M., & Hong, L. E. (2024). Impact of lifetime stressor exposure on neuroenergetics in schizophrenia spectrum disorders. *Schizophrenia Research*, 269, 58-63. doi: 10.1016/j.schres.2024.04.027

16. Ganz, A. B., Rolnik, B., Chakraborty, M., Wilson, J., Tau, C., Sharp, M., Reber, D., Slavich, G. M., & Snyder, M. P. (2024). Corrigendum to "Effects of an immersive psychosocial training program on depression and well-being: A randomized clinical trial" [*J. Psychiatr. Res*. 150 (2022) 292-299]. *Journal of Psychiatric Research*, 179, 163-166. doi: 10.1016/j.jpsychires.2024.09.015

17. Hemond, C. C., Deshpande, M., Berrios-Morales, I., Zheng, S., Meyer, J. S., Slavich, G. M., & Cole, S. W. (2024). A single-arm, open-label pilot study of neuroimaging, behavioral, and peripheral inflammatory correlates of mindfulness-based stress reduction in multiple sclerosis. *Scientific Reports*, 14, 14044. doi: 10.1038/s41598-024-62960-w

18. McGuire, A., Jackson, Y., Grasso, D. J., Slavich, G. M., & Kingston, N. (2024). Caregiver report of children's exposure to adverse life events: Concordance between questionnaire and interview approaches. *Journal of Interpersonal Violence*, 39, 3712-3737. doi: 10.1177/08862605241233271

19. McLoughlin, E., Arnold, R., Moore, L. J., Slavich, G. M., & Fletcher, D. (2024). A qualitative exploration of how lifetime stressor exposure influences sport performers' health, well-being, and performance. *Anxiety, Stress, & Coping*, 37, 233- 250. doi: 10.1080/10615806.2023.2246023

20. McLoughlin, E., Fletcher, D., Graham, H. L., Arnold, R., Madigan, D. J., Slavich, G. M., & Moore, L. J. (2024). Cumulative lifetime stressor exposure and health in elite athletes: The moderating role of perfectionism. *International Journal of Sport and Exercise Psychology*, 22, 553-571. doi: 10.1080/1612197x.2022.2153203

21. Mengelkoch, S., Gassen, J., Slavich, G. M., & Hill, S. E. (2024). Hormonal contraceptive use is associated with differences in women's inflammatory and psychological reactivity to an acute social stressor. *Brain, Behavior, and Immunity*, 115, 747-757. doi: 10.1016/j.bbi.2023.10.033

22. Ahn, S., Kim, S., Zhang, H., Dobalian, A., & Slavich, G. M. (2024). Lifetime adversity predicts depression, anxiety, and cognitive impairment in a nationally representative sample of older adults in the United States. *Journal of Clinical Psychology*, 80, 1031-1049. doi: 10.1002/jclp.23642

23. Alley, J. C., Moriarity, D. P., Figueroa, M. B., & Slavich, G. M. (2024). Characterizing the

hierarchical depression phenotype in sexually diverse individuals. *Journal of Psychiatric Research*, 173, 157-162. doi: 10.1016/j.jpsychires.2024.03.005

24. Gassen, J., Mengelkoch, S., & Slavich, G. M. (2024). Human immune and metabolic biomarker levels, and stress-biomarker associations, differ by season: Implications for biomedical health research. *Brain, Behavior, and Immunity – Health*, 38, 100793. doi: 10.1016/j.bbih.2024.100793

25. Gilgoff, R., Mengelkoch, S., Elbers, J., Kotz, K., Radin, A., Pasumarthi, I., Murthy, R., Sindher, S., Burke Harris, N., & Slavich, G. M. (2024). The Stress Phenotyping Framework: A multidisciplinary biobehavioral approach for assessing and therapeutically targeting maladaptive stress physiology. *Stress*, 27, 2327333. doi: 10.1080/10253890.2024.2327333

26. Klatzkin, R. R., Nadel, T., Lallo, B., Mosby, E., Perkins, D., Qureshi, H., McKay, N. J., & Slavich, G. M. (2024). Lifetime stressor exposure is associated with greater rewarding effects of stress-related eating. *Physiology & Behavior*, 284, 114610. doi: 10.1016/j.physbeh.2024.114610

27. Mohan, L., Roos, L. G., Bui, T. Q., Sichko, S., & Slavich, G. M. (2024). Social support and cognitive reappraisal in adolescent females: The moderating role of lifetime stressor exposure. *International Journal of Clinical and Health Psychology*, 24, 100525. doi: 10.1016/j.ijchp.2024.100525

28. Mengelkoch, S., Gassen, J., Lev-Ari, S., Alley, J. C., Schüssler-Fiorenza Rose, S. M., Snyder, M. P., & Slavich, G. M. (2024). Multi-omics in stress and health research: Study designs that will drive the field forward. *Stress*, 27, 2321610. doi: 10.1080/10253890.2024.2321610

29. Rosero-Pahi, M., Andoh, J., Shields, G. S., Acosta-Ortiz, A., Serrano-Gomez, S., & Slavich, G. M. (2024). Cumulative lifetime stressor exposure impairs stimulusresponse but not contextual learning. *Scientific Reports*, 14, 13080. doi: 10.1038/s41598-024-62595-x

30. Seiler, A., Milliken, A., Leiter, R. E., Blum, D., & Slavich, G. M. (2024). The Psychoneuroimmunological Model of Moral Distress and Health in healthcare workers: Toward individual and system-level solutions. *Comprehensive Psychoneuroendocrinology*, 17, 100226. doi: 10.1016/j.cpnec.2024.100226

31. Shields, G. S., Vinograd, M., Bui, T., Sichko, S., Irwin, M. R., & Slavich, G. M. (2024). Heightened neural activity and functional connectivity responses to social rejection in female adolescents at risk for depression: Testing the Social Signal Transduction Theory of Depression. *Journal of Affective Disorders*, 345, 467-476. doi: 10.1016/j.jad.2023.10.113

32. Zhang, X., Merrin, G. J., & Slavich, G. M. (2024). Adverse childhood experiences (ACEs) and emotion dysregulation phenotypes: An intersectional analysis of race/ethnicity and gender in a nationally representative U.S. sample. *Child Abuse & Neglect*, 158, 107129. doi: 10.1016/j.chiabu.2024.107129

33. Gassen, J., Mengelkoch, S., Shanmugam, D., & Hill, S. E. (2024). Longitudinal Changes in Desire and Attraction Among Women Who Have Discontinued Hormonal Contraceptives: A Preregistered Study of 1,596 Natural Cycles® Users. *Hormones and Behavior*, 162, 105546. https://doi.org/10.1016/j.yhbeh.2024.105546

34. Mengelkoch, S., Cunningham, K., Gassen, J., Targonskaya, A., Zhaunova, L., Salimgaraev, R., & Hill, S. E. (2024). Longitudinal associations between women's cycle characteristics and sexual motivation using Flo cycle tracking data. *Scientific Reports*, 14(1),

10513. https://doi.org/10.1038/s41598-024-60599-1

35. Espinosa, M., Butler, S. A., Mengelkoch, S., Prieto, L. J., Russell, E., Ramshaw, C., Naha-vandi, S . & Hill, S. E. (2024). The Impact of a Digital Contraceptive Decision Aid on User Outcomes: Results of an Experimental, Clinical Trial. *Annals of Behavioral Medicine*, kaae024. https://doi.org/10.1093/abm/kaae024

36. Signa, K., & Mengelkoch, S. (2024). Does Domestic Violence Decrease as Women Age? Understanding the Patterns of Domestic Violence in India. *The Journal of the Evolutionary Studies Consortium*, 14(1), 42-74. https://doi.org/10.59077/GBPT5213

37. Roos, L. G., Sagui-Henson, S. J., Castro Sweet, C., Smith, Brooke, J., & Chamberlain, C. E. (2024). Improvement and maintenance of clinical outcomes in a digital men-tal health platform: Findings from a longitudinal observational real-world study. *JMIR mHealth uHealth*,12(e48298). https://doi.org/10.2196/48298

38. Danielson, C. K., Hahn, A. M., Bountress, K. E., Gilmore, A. K., Roos, L. G., Adams, Z. W., Kirby, C. M., & Amstadter, A B. (2024). Depressive symptoms, avoidant coping, and al-cohol use: differences based on gender and posttraumatic stress disorder in emerging adults. *Current Psychology*. https://doi.org/10.1007/s12144-024-06150-x

39. Alley, J. C., McDonnell, A.S. & Diamond, L.M. (2024) Early adversity and sexual diversity: The importance of self-reported and neurobiological sexual reward sensitivity. *Sci Rep* 14, 8717.

Presentations

1. Precision medicine approaches to reducing stress and promoting healthy aging. The Role of the Behavioral and Social Sciences in Geroscience Workshop, Division of Be-havioral and Social Research, National Institute on Aging, Bethesda, MD. February 2024.

2. Reimagining cancer research to address cancer disparities. National Cancer Institute, Bethesda, MD. February 2024.

3. Leveraging stress biology and precision medicine to reduce depression risk in women. Workshop on Essential Health Care Services Related to Anxiety and Mood Disorders in Women, The National Academies of Sciences, Engineering, and Medicine, Washing-ton, D.C. April 2024.

4. Why conduct research in stress and resilience? Research Training Program in Stress, Health, & Resilience, University of California, Los Angeles. October 2023.

5. Stress processes: How stress shapes our health – Terminology: Getting to know the con-structs. Research Training Program in Stress, Health, & Resilience, University of California, Los Angeles. October 2023.

6. Physiological stress theories: How does stress get "under the skin"? Research Training Program in Stress, Health, & Resilience, University of California, Los Angeles. November 2023.

7. Psychological stress theories: How does our brain and body decide what's worthy of a stress response and what isn't? Research Training Program in Stress, Health, & Resil-ience, University of California, Los Angeles. November 2023.

8. Measuring stressor exposure retrospectively (e.g., using questionnaires). Research Train-

ing Program in Stress, Health, & Resilience, University of California, Los Angeles. January 2024.

9. Measuring stressor exposure in real time (e.g., using ecological momentary assessment and daily diaries to collect data on exposures in naturalistic settings). Research Training Program in Stress, Health, & Resilience, University of California, Los Angeles. January 2024.

10. Eliciting stress responses experimentally: A review of common stress induction methods. Research Training Program in Stress, Health, & Resilience, University of California, Los Angeles. February 2024.

11. Measuring stress responses: Psychological and behavioral stress responses. Research Training Program in Stress, Health, & Resilience, University of California, Los Angeles. February 2024.

12. Measuring stress responses: Physiological stress reactivity. Research Training Program in Stress, Health, & Resilience, University of California, Los Angeles. February 2024.

13. Measuring stress responses: Chronic stress responses. Research Training Program in Stress, Health, & Resilience, University of California, Los Angeles. March 2024.

14. Measuring stress responses in youth/children. Research Training Program in Stress, Health, & Resilience, University of California, Los Angeles. March 2024

15. Interacting with and debriefing participants in stress research. Research Training Program in Stress, Health, & Resilience, University of California, Los Angeles. April 2024.

16. Precision stress management. Paper presented at the 2024 annual meeting of the Society for Research in Psychopathology, Montreal, Canada. October 2024.

17. Precision approaches to diagnosis and treatment. 21st annual meeting of Society in Science, Zurich, Switzerland. November 2024.

18. Changing social dynamics and their health implications in India: A narrative review. Poster presented at the annual meeting of the Society for Personality and Social Psychology, San Diego, CA. February 2024.

19. Associations between adverse childhood experiences, COVID, and Long COVID: A population-based study. Poster presented at the 2024 annual meeting of the Association of Academic Physiatrists, Orlando, FL. February 2024.

20. Wearable technologies for empowering next-generation health research: Opportunities, limitations, and practical and conceptual considerations. Paper presented at the 2024 annual meeting of the American Psychosomatic Society, Brighton, UK. March 2024.

21. Sex differences in interpersonal life stressor contributions to autistic suicidality. Paper presented at the 2024 annual meeting of the American Psychosomatic Society, Brighton, UK. March 2024.

22. Rural-urban disparities in psychosocial functioning in epithelial ovarian cancer patients. Paper presented at the 45th annual meeting of the Society of Behavioral Medicine, Philadelphia, PA. March 2024.

23. The role of systemic inflammation in the within-person associations between peer victimization and depressive symptoms during adolescence. Paper presented at the 81st

annual meeting of the American Psychosomatic Society, Brighton, UK. March 2024.

24. Associations between early life adversity and mitochondrial bioenergetics in distinct immune cell subtypes. Paper presented at the 81st annual meeting of the American Psychosomatic Society, Brighton, UK. March 2024.

25. Early life adversity is related to different ex vivo inflammatory responses in older men and women. Paper presented at the 2023 annual meeting of the Human Biology Association, Los Angeles, CA. March 2024.

26. Hierarchical inflammatory phenotypes of depression featuring multiple inflammatory proteins. Paper presented at the 2024 Hierarchical Taxonomy of Psychopathology (HiTOP) Annual Conference, San Diego, CA. March 2024.

27. Selective effects of stressor-type on decisions involving uncertainty. Paper presented at the 2024 annual meeting of the Society for Affective Science. March 2024.

28. Gender differences in the association between recent parent stressor exposure and adolescent cardiovascular risk. Poster presented at the 94th annual convention of the Rocky Mountain Psychological Association, Denver, CO. April 2024.

29. Sex differences in interpersonal life stressor contributions to autistic suicidality. Paper presented at the 2024 annual meeting of the International Society for Autism Research, Melbourne, Australia. May 2024.

30. Level 1 and Level 2 screening protocol for detecting suicidal thoughts and behavior in autistic adults. Paper presented at the 2024 annual meeting of the International Society for Autism Research, Melbourne, Australia. May 2024.

31. This too shall pass: Autistic adults lived experiences of chronic suicidal ideation. Paper presented at the 2024 annual meeting of the International Society for Autism Research, Melbourne, Australia. May 2024.

32. Lessons from lived experience: A new framework to promote effective access and use of supports for autistic adults. Paper presented at the 2024 annual meeting of the International Society for Autism Research, Melbourne, Australia. May 2024.

33. The impact of adverse childhood experiences on internalizing symptoms during the transition to college: A multiverse analysis of different ACE quantifications. Poster presented at the 2024 annual meeting of the Association for Psychological Science, San Francisco, CA. May 2024.

34. Dynamic, bidirectional, within-person effects between social experiences and suicidality during the transition to college. In S. Asadi (Chair), Dynamic Socioemotional Risk Factors for Self-Injurious Thoughts and Behaviors. Paper presented at the 2024 annual meeting of the Association for Psychological Science, San Francisco, CA. May 2024.

35. Rethinking catastrophes: A brief mindset intervention reduces depressive symptoms and biomarkers of chronic inflammation in the aftermath of the COVID-19 pandemic. Poster presented at the 2024 annual meeting of the Association for Psychological Science, San Francisco, CA. May 2024.

36. Stress and Resilience Study Protocol: A multiomics-based randomized controlled trial to elucidate the biology of ACEs and test a scalable precision stress management intervention for normalizing biopsychosocial functioning and enhancing resilience. Poster presented at the 2024 annual meeting of the Association for Psychological Science,

San Francisco, CA. May 2024.

37. Determining the association of cognitive emotion regulation practices on perceived stress levels in college students. Poster presented at the 2024 UCLA Undergraduate Research Symposium, Los Angeles, CA. May 2024.

38. Associations between multifaceted emotion regulation traits and internalizing symptoms during the transition to college for first-year students. Poster presented at the 2024 annual meeting of the Association For Psychological Science, San Francisco, CA. May 2024.

39. Characterizing suicidal behavior in autism across the lifespan using the Columbia-Suicide Severity Rating Scale (C-SSRS): A multinational study. Poster presentation at the 2024 annual meeting of the International Society for Autism Research (INSAR), Melbourne, Australia. May 2024.

40. Associations between multifaceted emotion regulation traits and internalizing symptoms during the transition to college for first year students. Poster presented at the 2024 annual meeting of the Association for Psychological Science, San Francisco, CA. May 2024

41. DAGnabbit: Incorporation of Directed Acyclic Graphs in Stress Research. Paper presented at the 2024 annual meeting of the Association for Psychological Science, San Francisco, CA. May 2024.

42. Bidirectional, within-person effects between social characteristics and suicidality during the transition to college. Paper presented at the 2024 annual meeting of the Association for Psychological Science, San Francisco, CA. May 2024.

43. Body awareness moderates the efficacy of a precision stress management intervention for reducing stress. Poster presented at the 2024 annual meeting of the Association for Psychological Science, San Francisco, CA. May 2024.

44. Menstrual cycle phase moderates the trajectory of internalizing symptoms across the transition to first-year college life in residence. Poster presented at the 2024 annual meeting of the Association for Psychological Science, San Francisco, CA. May 2024.

45. Interaction between cognitive reappraisal and expressive suppression predicts daily levels of anxiety during the transition to college. Paper presented at the 2024 annual meeting of the Association for Psychological Science, San Francisco, CA. May 2024.

46. Associations between specific types of adverse and positive childhood experiences and arrest and conviction by early adulthood. Paper presented at the 2024 Annual Meeting of the Pediatric Academic Societies, Washington, DC. May 2024.

47. Maternal childhood trauma and its association with offspring neonatal white matter development. Paper presented at the 2024 annual meeting of the Society of Biological Psychiatry, Austin, TX. May 2024.

48. Racial differences in associations between adversity and inflammation: Findings from the Einstein Aging Study. Paper presented at the 2024 annual meeting of the Psychoneuroimmunology Research Society, Halifax, Nova Scotia, Canada. June 2024.

49. Association among cognitive stress appraisal, chronic stress, and cognition in cognitively normal older adults: Preliminary findings. Poster presented at the 2024 Alzheimer's Association International Conference, Philadelphia, PA. July 2024.

50. Lifetime stressor exposure and cognition in community-dwelling older Latino adults from the Boston Latino Aging Study. Poster presented at the 2024 Alzheimer's Association International Conference, Philadelphia, PA. July 2024.

51. Stress mindset and the relationship between lifetime stress exposure and performance outcomes in college baseball players. Paper presented at the annual meeting of the Sabermetrics, Scouting, and Science of Baseball Annual Meeting, Chicago, IL. August 2024.

52. Acute and chronic childhood stressors and resting-state functional connectivity in young adults. Paper presented at the 2024 annual meeting of the Flux Society, Baltimore, MD. September 2024.

53. Daily interpersonal life stress experiences as proximal risk factors for increases in suicide ideation. Paper presented at the 2024 annual meeting of the Society for Research in Psychopathology, Montréal, Canada. October 2024.

54. Psychobiological adjustment to bereavement among cancer caregivers. Paper presented at the McGill International Palliative Care Congress, Montréal, Canada. October 2024.

55. Lifetime stressor exposure and positive childhood experience are associated with health behaviors among adolescents. Paper presented at the 57th Annual Meeting of the International Society for Developmental Psychobiology, Chicago, IL. October 2024.

56. Neural, endocrine and immune interactions during grief and bereavement: A systematic review. Paper presented at the 2024 annual European Grief Conference, Ireland. November 2024

57. Understanding unsafe sex: The roles of risk and benefit perception in the context of early adversity. Paper presented at the 2024 meeting of the Society for the Scientific Study of Sexuality, San Diego, California. November 2024.

58. Stressor exposure, subjective cognitive decline, and cognition in preclinical autosomal dominant Alzheimer's disease from the Colombia-Boston Biomarker Study. Poster presented at the 2024 annual meeting of the Neurobiology of Stress Workshop, Boston, MA. November 2024.

Press

1. Childhood trauma linked to major biological and health risks: UCLA researchers say risk for numerous health problems, disease biomarkers differ based on sex and type of childhood adversity experienced, University of California, Los Angeles. September 16, 2024.
2. Searching for stress-busting strategies? UCLA psychologists share their favorites, UCLA Health. January 23, 2024.
3. Being bullied in childhood more than triples risk of mental health struggles later, HealthDay News, Report. February 13, 2024.
4. Study finds childhood bullying linked to distrust and mental health problems in adolescence, UCLA Health. February 13, 2024.
5. How does grief affect your body? UCLA Health.

Digital Assets

1. Massive Open Online Course platform, public virtual dashboard of stress burden track-

ing, survey data, ambulatory assessments, and lab results

<u>Trainees</u>

- Four high school students
- Four post-baccalaureate research project coordinators
- Twenty-two undergraduate scholars
- Two doctoral candidates
- Five post-doctoral scholars

Advancing a Precision Population Health Approach to ACEs to Reduce Health Disparities (HEALthy4You)

Lead Investigator: Dr. Gary S. Firestein

Host Institution: UC San Diego

<u>Publications</u>

1. Terrana, A., Viglione, C., Rhee, K., Rabin, B., Godino, J., Aarons, G. A., Chapman, J., Melendrez, B., Holguin, M., Osorio, L., Gidwani, P., Juarez Nunez, C., Firestein, G., & Hekler, E. (2024). The core functions and forms paradigm throughout EPIS: designing and implementing an evidence-based practice with function fidelity. *Frontiers in Health Services*, 3. https://doi.org/10.3389/frhs.2023.1281690

<u>Digital Assets</u>

1. REDCap – software application to build and manage online clinical research databases and surveys (includes demographic characteristics, survey data, EHR data, and lab results)

The Collaborative Approach to Examining Adversity and Building Resilience (CARE) Program

Lead Principal Investigator: Dr. Neeta Thakur

Host Institution: UC San Francisco

<u>Publications</u>

1. de la Rosa, R., Le, A., Holm, S., Ye, M., Bush, N. R., Hessler, D., Koita, K., Bucci, M., Long, D., & Thakur, N. (2024). Associations Between Early-Life Adversity, Ambient Air Pollution, and Telomere Length in Children. Psychosomatic medicine, 86(5), 422–430. https://doi.org/10.1097/PSY.0000000000001276

<u>Digital Assets</u>

1. REDCap – software application to build and manage online clinical research databases and surveys (includes demographic characteristics, survey data, EHR data, and lab results)

Depression Research Projects

*Projects were in the initiation stages at the end of 2024, some achievements and project deliverables may evolve as projects continue.

Making the Unseen Seen Trial of Depression (MUST-D): Scrutinizing social determinants of depression to advance precision and equitable care

Lead Principal Investigator: Suzi Hong, PhD

Host Institution: University of California San Diego

Trainees

1. UCSD HW School of Public Health PhD student, Health Services research, mental health focus.

Collaborations

1. Active collaborative efforts and data alignment with the other CIAPM depression projects, UC San Francisco (PI: T. Yang) and Santa Clara University (PI: G. Hajcak)

2. Collaborative effort with a previous CIAPM ACE project team, UC Los Angeles (PI: G. Slavich)

3. Developing a collaboration and engagement with a CIAPM Advisory Council member, Gay Grossman, to advance patient advocacy initiatives in mental health care

Follow-on funding

1. Seed Grant from UCSD Health Sciences Academy - *Leveraging UCSD EPIC data for assessment and treatment of SDoH in patients with psychiatric emergencies* (July 2024 – June 2025)

Personalized and scalable interventions for reducing depression among adolescents: Combining novel digital therapeutics and peer counseling

Lead Principal Investigator: Greg Hajcak, PhD

Host Institution: Santa Clara University

Trainees

1. One undergraduate student, Santa Clara University
2. One postbaccalaureate scholar, Chapman University
3. Three master's students, Santa Clara University
4. One postdoctoral fellow, University of California, Los Angeles.

Collaborations

1. Alum Rock Counseling Center
2. Flourish Labs
3. Muse
4. Colibri Digital Marketing

Press

1. Counseling Psychology Professor Receives $3M Grant to Address Youth Mental Health Crisis. Santa Clara University. October 28, 2024.

Digital Assets

1. YouTube Educational Video for Training Peer Supporters.

Precision Mental Health to Predict Risk, Prevent, and Treat Depression in Publicly Funded Youth

Lead Principal Investigator: Tony Yang, MD, PhD

Host Institution: University of California San Francisco

Trainees

1. UCSF first-year medical student; literature review for predictors of risk for developing depression using the NIH ABCD dataset and provide critique of the BRIDGE dashboard.

2. UCSF child and adolescent psychiatry fellows will assist with participant recruitment.

3. Psychiatry, psychology, and Family Therapy (MFT) Trainees at Edgewood Center will further identify youth participants and themselves provide critique of the BRIDGE platform.

Collaborations

1. Teens4TeensHelp.org in Southern California to promote and share the current CIAPM project to stakeholders in the California public.

2. Edgewood Center for Children and Families to 1) create brand new community advisory board (CAB) and focus groups to give community feedback to help Edgewood improve their care and outreach to the San Francisco Bay Area community, 2) collect patient and clinician feedback on the BRIDGE precision medicine dashboard, and to 3) recruit publicly funded depressed youth including those from underrepresented minority populations into the randomized controlled trial and feedback for the clinical BRIDGE dashboard.

3. NeuMarker Inc. to help with the development of a machine learning approach and AI algorithms on neuroimaging (i.e., EEG, MRI) and mental health measures (i.e., clinical depression rating scales).

4. Shared behavioral measures and assessments are further being used by CIAPM Depression projects at SCU and UCSD, and in a collaboration with Dr. George Slavich at UCLA for immunological biomarker assessment.

Digital Assets

1. Tentative release of pseudo-code, non-proprietary parts of the programming code and the trained model in a public repository, such as github.com, towards the project's end.

Appendix B. Summaries of Previously Funded Projects; New Publications, Presentations, Press, and Patents from Past CIAPM Projects

Cancer Disparities Research Program

Reducing Cancer Disparities Through Innovative Community-Academic Partnerships

Lead Principal Investigator: Dr. Manali Patel

Host Institution: Stanford University

Partners: Cancer Patients Alliance, Latino Cancer Institute, Pacific Cancer Care, Clinica de Salud del Valle de Salinas

Project Period: 2019-2023

The Addressing Latinx Cancer Care Equity (ALCANCE) project developed and tested a Community Health Worker (CHW)-based model to increase access to high-quality and equitable care for low-income and Latino communities in Monterey and Salinas Valley. This study focused on two outcomes: (1) to improve primary care screening and prevention at Clinica de Salud del Valle de Salinas (CSVS) and (2) execute a randomized clinical trial for cancer-diagnosed patients treated at Pacific Cancer Care (PCC). Additional community partners included the Latino Cancer Institute, and the Cancer Patients Alliance.

In the screening and prevention study branch, CHWs assisted 153 of the 158 consenting women in completing medical and family history screening to determine their need for genetic testing. Of these 153, seven also underwent a pre-genetic test counseling from their clinician and subsequently received such genetic testing for cancer risk. In the randomized clinical trial study branch, 110 cancer patients received either usual cancer care or care <u>with</u> 12 months of education and encouragement from a CHW to discuss and consider precision medicine tools with their clinician. After follow-up, the research team discovered an increase in precision medicine knowledge, more patient satisfaction, and a desire to seek out precision medicine materials after they received the CHW education. Cancer patients were three times as likely to receive recommended tumor testing and there were reduced patient times from diagnosis to treatment by nearly half, county-wide.

<u>Trainees</u>

The ALCANCE project supported 11 trainees across the career span from undergraduate trainees through to career researcher. Several trainees in 2024 achieved significant milestones in their careers, including a Stanford University Internal Medicine Residency, an Assistant Professorship in Hematology and Oncology at Northwestern University, and a Chief Residency in Pediatrics at Boston Medical Center.

<u>Follow-on Funding</u>

- The ALCANCE project received several rewards for follow-on funding in 2024, including a $300,000 grant from the American Cancer Society – Navigation and Capacity Building Program,
- $100,000 funding from the LUNGevity Foundation, and
- Support from the California Breast Cancer Research Program.

Notable Accomplishments in 2024

<u>Publications:</u>

1. Hanna, M., Wood, E. H., Noyola Perez, A., Villicana, G., Guzman, L. L., Reynaga, J., ... & Patel, M. I. (Jan 2025). Food for Cancer Health Equity: A Qualitative Study Among People With Cancer Who Are Low-Income, Latino or Hispanic, Immigrant, and Individuals With Multiple Minoritized Races and Ethnicities. *JCO Oncology Prac-*

tice, OP-2

Conference Presentations and Invited Talks:

1. Emily Hayes Wood et al. A community health worker–led intervention to improve patient knowledge and receipt of precision medicine: Updated ALCANCE randomized clinical trial findings. *JCO Oncol Pract 20*, 181-181(2024). DOI:10.1200/OP.2024.20.10_suppl.181

2. Wood, E. H., Kamran, R., Lopez Guzman, L., Reynaga, J., Villicana, G., Valdez-Garcia, J., ... & Patel, M. I. (2024). Addressing Latinx cancer care equity program for long-term united skills building (ALCANCE-PLUS): Updated results from an ongoing implementation.

3. Hanna, M. T., Wood, E. H., Villicana, G., Lopez Guzman, L., Escobar, K., Reynaga, J., ... & Patel, M. I. (2024). Food for cancer health equity: The impact of a culturally tailored food voucher intervention on food insecurity among Latinx patients with cancer.

4. Patel, M.I., October 4th, 2024 – One Step Forward, Two Steps Back – Advances and Barriers in Latina Breast Cancer. The Latino Cancer Institute 2024, Friday Forum Series. [Latino Cancer Institute Link](#)

Integrated Machine-Learning Platform to Inform Precision Therapy in Triple-Negative Breast Cancer Patients

Lead Principal Investigators: Dr. Pablo Tamayo & Dr. William Kim

Host Institution: UC San Diego

Partners: El Centro Medical Center, Moores Cancer Center, Cancer Resource Center of the Desert, Tri-City Medical Center, SDSU Institute for Public Health (IPH).

Project Period: 2019-2023

The UCSD Cancer Demonstration Project (Project CELSUS) analyzed the genetic profiles of Triple Negative Breast Cancer (TNBC) tumors using a machine-learning computational model.

The project aimed to (1) launch a nationwide dataset of breast and all-cancer genomes to develop and test a computer model that characterized genome and tumor states, (2) use and verify a computer program to propose a series of evidence-based drug combinations to treat TNBC tumors, (3) test the accuracy of such drug combinations on TNBC tumor samples from living and deceased Latina patients, and (4) evaluate the overall efficacy of this computer program and evaluate how to implement this model, interpret its utility, and disseminate this information, while determining the barriers to implementing a precision medicine approach to breast cancer. Community partners included the El Centro Medical Center, the Moores Cancer Center, the Cancer Resource Center of the Desert, and the Tri-City Medical Center.

Project CELSUS tested 47 existing drug combinations against cancer cells to find validity of the computer model identifying useful novel drugs or drugs already used in other types of cancer outside of TNBC. Their model also displayed a predictive capability in determining drug function and downstream resistance against these therapies and would be more

effective in predicting therapeutic combinations as more patients input data.

The team also obtained information from 48 patients and community stakeholders and determined low-English literacy, health literacy, misunderstandings of treatments and the healthcare system, geographic distance, fears of immigration status, and feeling dismissal of their symptoms, all as barriers to care. The economic impact of their pipeline was also measured and found disease progression, desired quality of life, drug tolerability, and survival as factors affecting the broad applicability of this model.

Trainees

The Celsus project supported eleven trainees across the career spectrum, including undergraduate, Master's, doctoral students, and postdoctoral fellows in the fields of cancer, computational, and experimental biology, genomics, precision oncology, and pharmacology. Additionally, the team is developing a new course, entitled "Analytical Approaches to Precision Medicine in Cancer: Data, Models and Paradigms," for a new Masters in Precision Medicine program.

Follow-on Funding

- Funding for methodology that led to the development of the Celsus model from the NIH, prior to and during the project period (2017-2023, $5,014,003).
- Additionally, the UCSD team is collaborating with SDSU to study the role of 'obesogens,' chemicals that disrupt biological processes and contribute to negative health outcomes, in aggressive TNBC in Hispanic women.

Improving Precision Medicine for Breast Cancer in Latinas: A Multi-Tiered Approach

Lead Principal Investigator: Dr. Elad Ziv

Host Institution: UC San Francisco

Partners: Zuckerberg San Francisco General Hospital, Latina Breast Cancer Agency, Latino Cancer Institute, Promoters for Better Health, Vision y Compromiso, City of Hope, UC Davis, Stanford University.

Project Period: 2019-2023

The UCSF Cancer Demonstration Project aimed to characterize a set of genetic variations indicating higher risk of cancer, particularly in Latina patients, and encourage genetic testing to determine cancer risk. This project aimed to 1) using 3,500 Latina breast cancer genomes, identify genetic markers leading to higher cancer risk in Latinas, 2) implement an education program with Latinas about the importance of breast cancer care and genetic testing using 'Promotoras' as community educators, 3) analyze almost 500 tumor samples to determine novel genetic-mutation signatures unique to Latinas of various racial-backgrounds, while determining treatment outcomes for Latinas with cancers, and 4) determine expense barriers to genetic testing through patient and professional interviews.

The project team found several genes with a high association to estrogen-receptor positive and negative tumors, depending on racial-background. Additionally, the team recruited 1500 Latina patients (supplemented with 1000 samples from a Peruvian database) and found certain genetic markers associated with cancer risk in racially indigenous Latinas. The team used a bilingual training program in San Francisco, Sacramento, and Los

Angeles to educate over 1300 Latinas on hereditary breast cancer risk and directed over 100 to genetic testing. Finally, the team tested over 800 tumors from UCSF Zuckerberg General Hospital and City of Hope patients and found biomarkers common to Mexican and Indigenous American patients. The UCSF team also identified 45 women with genetic variants of concern and informed their providers. Additional community partnerships in this project included the Latina Breast Cancer Agency, the Latino Cancer Institute, Promoters for Better Health, and Vision and Compromiso.

Trainees

The UCSF team trained two postdocs and supported their attendance at multiple national and international conferences. Additionally, the team trained 24 bilingual, bicultural promotoras to educate Latina women in their community about hereditary breast cancer risk.

Follow-on Funding

- A grant from NCI for $2 million to study genetic susceptibility of breast cancer in Latinas
- A grant from NCI for $2.5 million to build an international consortium to study breast cancer risk in U.S. Hispanic/Latina women and in Latin American women
- A grant from Gilead for $750,000 for community education in collaboration with Vision y Compromiso.
- The team developed a new study of 1659 Latina women with breast cancer from California (UCSF, Zuckerberg San Francisco General Hospital and City of Hope), called the California Breast Cancer in Latinas Study (CBLS).

Notable Accomplishments in 2024

Publications

1. Nierenberg, J. L., Adamson, A. W., Hu, D., Huntsman, S., Patrick, C., Li, M., ... & Neuhausen, S. L. (2023). Whole exome sequencing and replication for breast cancer among Hispanic/Latino women identifies FANCM as a susceptibility gene for estrogen-receptor-negative breast cancer. *medRxiv*.

2. Huang, X., Lott, P. C., Hu, D., Zavala, V. A., Jamal, Z. N., Vidaurre, T., ... & Fejerman, L. (2025). Evaluation of multiple breast cancer polygenic risk score panels in women of Latin American Heritage. *Cancer Epidemiology, Biomarkers & Prevention*, *34*(2), 234-245.

3. Ding, Y. C., Song, H., Adamson, A. W., Schmolze, D., Hu, D., Huntsman, S., ... & Ziv, E. (2023). Profiling the somatic mutational landscape of breast tumors from Hispanic/Latina women reveals conserved and unique characteristics. *Cancer research*, *83*(15), 2600-2613.

4. Perez, F., Hernandez, M., Martinez, A., Castaneda, P., Ponce, R., Gonzalez, M., ... & Fejerman, L. (2023). Promotores' perspectives on the virtual adaptation of a hereditary breast cancer education program. *Journal of genetic counseling*, *32*(6), 1226-1231.

Inaugural Precision Medicine Projects

The first eight projects of CIAPM ended their reporting period in 2023. Below are the titles for the first eight projects, as well as links to the CIAPM webpage summarizing the work of those demonstration projects.

Precision Diagnosis of Acute Infectious Diseases

Lead Principal Investigator: Dr. Charles Chiu

Host Institution: UC San Francisco

Project Period: September 1, 2015 – December 31, 2018

Partners: Abbott Laboratories, Inc.; American Tissue Culture Collection; California Department of Public Health; Children's Hospital Colorado / University of Colorado; Children's Hospital Los Angeles; Children's National Medical Center at Washington D.C.; DNAnexus, Inc.; Google, Inc.; Illumina, Inc.; Oxford Nanopore Technologies, Inc.; Quest Diagnostics, Inc.; St. Jude Children's Research Hospital; Synapse, Inc.; U.S. Food and Drug Administration; UC Berkeley; UC Davis; UCLA; UC San Diego; University of Maryland; Zuckerberg San Francisco General Hospital and Trauma Center

[CIAPM Webpage Link](#)

California Kids Cancer Comparison

Lead Principal Investigator: Dr. David Haussler

Host Institution: UC Santa Cruz

Project Period: September 1, 2015 – December 31, 2018

Partners: Alex's Lemonade Stand Foundation; Amazon Services, Inc.; Microsoft Azure, Inc.; Children's Hospital Orange County; Children's Mercy Hospital in Kansas City; DNAnexus, Inc.; Jacob's Heart; Key for a Cure; Kids v Cancer; Live for Others Foundation; NuMedii, Inc.; Pacific Pediatric Neuro-Oncology Consortium; Philanthropist George Kraw; Sanford University of South Dakota Medical Center; Seven Bridges Genomics, Inc.; Stanford University Hospital; St. Baldrick's Foundation; Team Finn; Team G Foundation; UC San Francisco; University of British Columbia Cancer Agency; University of Michigan; University of Pittsburg; Unravel Pediatric Cancer

[CIAPM Webpage Link](#)

Personal Mobile and Contextual Precision Health

Lead Principal Investigator: Dr. Nicholas Anderson

Host Institution: UC Davis

Project Period: January 1, 2017 – December 31, 2018

Partners: Overlap Health, Inc.; UC Berkeley; UC San Francisco

[CIAPM Webpage Link](#)

Early Prostate Cancer: Predicting Treatment Response

Lead Principal Investigator: Dr. Sheldon Greenfield

Host Institution: UC Irvine

Project Period: January 1, 2017 – December 31, 2018

Partners: Ambry Genetics Corporation; Cedars-Sinai Medical Center; GenomeDx Biosciences, Inc.; Vanderbilt University; Veterans Affairs Los Angeles; UCLA Medical Center

CIAPM Webpage Link

__In Memoriam__: In 2025, Dr. Sheldon Greenfield passed away from a battle with cancer. CIAPM mourns his loss, and remembered his life in an obituary in May 2025.[19]

Precision Medicine for Multiple Sclerosis: Making It Work

Lead Principal Investigator: Dr. JB Jones

Host Institution: Sutter Health

Project Period: March 1, 2017 – December 31, 2018

Partners: National Multiple Sclerosis Society; Palo Alto Medical Foundation; Plan Language Health, Inc.; Roche/Genentech, Inc.; Sutter's Jordan Research and Education Institute; Sutter Philanthropy; UC San Francisco

CIAPM Webpage Link

Full Genome Analysis to Guide Precision Medicine

Lead Principal Investigator: Dr. David Martin

Host Institution: Children's Hospital Oakland Research Institute

Project Period: March 1, 2017 – December 31, 2018

Partners: GenomeOne, Inc.; Human Longevity, Inc.; Illumina, Inc.; UC Berkeley; UC San Francisco; UCSF Benioff Children's Hospital Oakland

CIAPM Webpage Link

Artificial Intelligence for Imaging of Brain Emergencies

Lead Principal Investigator: Dr. Pratik Mukherjee

Host Institution: UC San Francisco

Project Period: February 1, 2017 – December 31, 2018

Partners: Brain Trauma Foundation; Community Regional Medical Center in Fresno; Stanford University; TBI Endpoints Development Project; Transforming Research and Clinical Knowledge in Traumatic Brain Injury Consortium; UC Berkeley; Zuckerberg San Francisco General Hospital and Trauma Center

CIAPM Webpage Link

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19   May 2025 CIAPM Newsletter.

Early Prediction of Major Adverse Cardiovascular Event Surrogates

Lead Principal Investigator: Dr. Brennan Spiegel

Host Institution: Cedars-Sinai Medical Center

Project Period: January 1, 2017 – December 31, 2018

Partners: Agilent, Inc.; AliveCor, Inc.; Beckman Coulter, Inc.; DocuSign, Inc.; Fitabase, Inc.; Fitbit, Inc.; HealthLoop, Inc.; Neoteryx, Inc.; SCIEX, Inc.; Tasso, Inc.; Thermo Fisher Scientific, Inc.; UCLA

CIAPM Webpage Link

For additional information about the projects, please read the 2023 CIAPM Annual Report and the 2019 CIAPM Evaluation Report.[20, 21]

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20   2023 CIAPM Annual Report.
21   2019 CIAPM Evaluation Report.

Appendix C. Selected Invited Talks and CIAPM Representation at 2024 External Events

February 12 – Senate Recognition Ceremony for UCSD ACEs Research Team, recipients of James Irvine Foundation Leadership Award, Drs. McCall, Reiner, Ms. Barberis.

April 5 – Biocom California San Diego Fireside Chat at Board of Governors Meeting, Dr. Mc-Call.

April 12– Minority-Serving Institutes Summit on Health Care Equity and Access, San Diego State University, Dr. McCall

April 14 – National Science Policy Symposium (NSPN), UC Riverside, Chair for *Innovation Strategies for Healthcare* panel, Dr. McCall

April 23 – Virtual Fireside chat with NSPN Executive Director Tepring Piquado, Dr. McCall

May 1 – 2024 White House Summit on STEMM Equity and Excellence: Propelling Progress and Prosperity by 2050 in Washington D.C., Dr. McCall

June 12 – UC Berkeley Site visit with the Mental Health Services Oversight and Accountability Commission, Drs. McCall, Reiner, and Martinez.

August 3 – UC San Francisco Inaugural Community Science Day with UCSF ACEs Research Team, Dr. Reiner

August 6 – Launch of the Southern California Consortium of the *All of Us* Research Program, Drs. Reiner, Martinez, Spezzano.

Appendix D. Press Releases for the CIAPM Program

Press Release from the Governor's Office Announcing the CIAPM Transition to CalHHS

California to focus on pandemic preparedness and prevention through precision medicine research

What you need to know: California is set to leverage the lessons learned from the COVID-19 pandemic to further design and harness new technologies and tools to prepare for and prevent future pandemics.

Sacramento, California – Today, California Governor Gavin Newsom announced an agreement to enhance the state's ability to prepare for, and potentially prevent, the next pandemic by integrating the California Initiative to Advance Precision Medicine into the California Health and Human Services Agency (CalHHS) and broadening its scope to include technologies relevant to pandemic prevention. Precision medicine, particularly when used with advanced diagnostic tools for infectious diseases, has the potential to alleviate the burdens of future pandemics by enabling early detection, faster response, and more effective countermeasures.

"The COVID-19 pandemic highlighted the necessity for robust public-private partnerships to respond rapidly to emerging public health threats. By harnessing the power of precision medicine, California is moving to the forefront of pandemic preparedness and prevention."

Governor Gavin Newsom

Why this matters

Pandemic preparedness and prevention are critical to safeguarding public health and ensuring societal and economic resilience against infectious disease outbreaks. This involves a multi-faceted approach that includes early detection through advanced diagnostics, rapid response mechanisms, and the integration of data and technology to monitor and predict disease trends. Strengthening healthcare infrastructure, enhancing the public health workforce, and fostering community engagement are also essential components. By strategically investing in precision medicine research to develop next-generation tools and approaches, the state can achieve a more targeted and effective response to infectious diseases.

Key context

The California Initiative to Advance Precision Medicine was launched in 2015 to support collaborative research and foster partnerships between the state, researchers, patients, communities, and industry to further the aims of this approach to health and medicine. Precision medicine aims to use advanced computing tools to aggregate, integrate, and analyze vast amounts of data from research, clinical, environmental, and population health settings, to better understand health and disease, and to develop and deliver more targeted diagnostics, therapeutics, and prevention measures.

Experts weigh in

Max Henderson, Co-Founder, CEO, and Chief Data Scientist at CovidActNow, a US-based non-profit formed in April 2020 to provide modeling and infrastructure to track the spread of the pandemic: "The time to prepare is now. California already has many promising technologies to mitigate future pandemics, but we need consistent focus to drive down costs and deploy them in the field. This new focus on pandemic prevention will help California lead the way in preventing the loss of life, economic devastation, and large-scale shutdowns from future outbreaks. I commend the Newsom administration for pledging to carry on with this important work."

Dr. Mark Ghaly, CalHHS Secretary: "California aims to set a new standard for pandemic preparedness and prevention, ensuring a safer and healthier future for all residents," "This move underscores California's commitment to advancing public health through innovation."

Dr. Steve Luby, Director of Research at the Stanford Center for Innovation in Global Health and globally renowned expert in pandemic prevention: "There are very few actions we can take in this world that could result in alleviating more suffering and saving more lives than preventing another global pandemic – I am glad to see Governor Newsom and the State of California pick up that torch to help Californians and all of humanity."

Bigger picture

This reorganization and expansion is reflected in AB/SB 164. Once this legislation is passed by the Legislature, Californians Against Pandemics, proponents of a ballot initiative eligible for the November 2024 ballot that would create the California Institute for Pandemic Prevention, have agreed to withdraw their measure.

Published: June 25, 2024

Link to Original Press Release

Press Release for the Depression Research Program Awardees

California Awards Innovative Proposals for Precision Medical Research on Depression

"1 in 7 adults in California has experienced a mental illness"

Sacramento, CA – California is announcing awards for innovative research on the prevention, diagnosis, and treatment of depression through the California Initiative to Advance Precision Medicine (CIAPM). Precision medicine is an innovative approach to disease pre-

vention and treatment that tailors individual treatment to specific patients. "The newly established research projects that address depression demonstrate the Newsom administration's continued commitment to transforming and improving [Mental Health for All](#) Californians," said **California Health and Human Services (CalHHS), Secretary Kim Johnson**. "This critical investment marks an expanded California Initiative to Advance Precision Medicine-supported research portfolio in mental and behavioral health, including seven research projects on Adverse Childhood Experiences (ACEs) funded in 2021/2022."

RESEARCH AWARD RECIPIENTS: After a competitive selection process, three research teams have been awarded up to $3 million each for a 3-year project term:

1) Making the Unseen Seen Trial of Depression (MUST-D): Scrutinizing social determinants of depression to advance precision and equitable care – Lead Principal Investigator: Suzi Hong, PhD, University of California San Diego (UCSD); Family Health Centers of San Diego; NeuroUX

- The UCSD team will aim to discover the social and environmental factors leading to depression risk or resilience in communities that experience those factors associated with greater incidence of depression. These studies will help identify the needs, priorities, and barriers, to prevent depression and determine mental health outcomes through assessments using a mobile mental health platform.

2) Personalized and scalable interventions for reducing depression among adolescents: Combining novel digital therapeutics and peer counseling – Lead Principal Investigator: Greg Hajcak, PhD, Santa Clara University (SCU); Alum Rock Counseling Center; Rosalind Franklin University of Medicine and Science; Stanford University; Yale University; UCLA; Muse; Flourish Labs

- The SCU team will focus on reducing depression among LGTBQ+ youth by building and disseminating accessible and innovative digital therapeutic tools for emotional regulation and increasing positive emotions to bolster stress resilience. In addition, they will aim to train and develop educational materials for peer counselors working with LGBTQ+ youth.

3) Precision Mental Health to Predict Risk, Prevent, and Treat Depression in Publicly Funded Youth – Lead Principal Investigator: Tony Yang, MD, PhD, University of California San Francisco (UCSF); Edgewood Center for Children and Families; NeuMarker; Teens4Teens

- The UCSF team aims to improve the mental health outcomes of publicly supported, at-risk youth by identifying those most likely to develop depression based on clinical data, test the efficacy of neuroscience-based interventions to prevent depression, and build an online dashboard to help clinicians identify and choose the best prevention and treatment combinations for specific patients.

Research teams are co-led by academic research institutions and one or more community-based organizations or community clinics that support people with, or at risk for, depression and includes a private sector collaborator that contributes in-kind, financial, or other resources.

WHY THIS IS IMPORTANT: According to the [California Healthcare Foundation](#), roughly 1 in 7 adults in California has experienced a mental illness, and nearly two-thirds of California youth with major depression do not receive treatment for their condition. Further, Black, Native American, and LGBTQ+ youth have been underrepresented in biomedical research according to the [National Institutes of Health](#).

"We are grateful for the recognition of important research needs that address depression prevention, diagnosis, and treatment by the California Legislature," said **CIAPM Science Officer Dr. David Reiner**. "Post-COVID, many states including [California](#), saw rises in depressive symptoms. Youth [report](#) barriers related to access, stigma, transportation and privacy when attempting to address their mental health. These research projects will provide innovative

ways to identify and provide care to these vulnerable populations."

ABOUT THE CALIFORNIA INITIATIVE TO ADVANCE PRECISION MEDICINE

CIAPM, which moved from the Governor's Office of Planning and Research to the California Health and Human Services Agency (CalHHS) in July 2024, will administer the research grant funds. The funding will support precision medicine research studies in California to improve outcomes for people with, or at risk, for depression, particularly as a pathway to reduce health inequities.

Published: October 25, 2024

Contact: Ramon Martinez, Science Communications Officer

California Health and Human Services Agency (CalHHS)

1215 O Street, Sacramento, CA 95814; (916) 279-6332

Email – ramon.martinez@chhs.ca.gov

Link to Original Press Release

Press Release for the CalHHS Partnership with the All of Us Research Program

California Announces First-of-its-Kind Partnership with the National Institutes of Health's *All of Us* Research Program to Engage Underrepresented Communities in Research

SACRAMENTO, CA – The California Initiative to Advance Precision Medicine (CIAPM) has entered into a Memorandum of Understanding with the National Institutes of Health's *All of Us* Research Program to support the program's engagement and enrollment efforts, with a focus on promoting voluntary participation from underrepresented groups in biomedical research, accelerating the benefits of research to all communities.

"This project encapsulates the California Initiative to Advance Precision Medicine's mission to invest in transformational work which delivers the benefits of biomedical research and next-generation health solutions to all communities," said **Kim Johnson, California Health and Human Services (CalHHS) Secretary**. "For nine years, the initiative has nimbly demonstrated the power of centering communities in world-class precision medicine research, and we see this partnership with the *All of Us* Research Program as another step to further serve Californians over the long-term."

ABOUT THE NATIONAL INSTITUTES OF HEALTH'S *ALL OF US* RESEARCH PROGRAM

All of Us incorporates data from participant surveys, electronic health records, and DNA sequencing to drive forward research that could improve health and the early detection, treatment, and prevention of disease. The program follows strict security protocols and processes to keep data safe. Identifying information is removed and data are then made available to registered researchers through a secure cloud-based 'Researcher Workbench.[22]' All research projects and individual participant data remain on this platform and are prohibited from downloading. "Partnerships are paramount to the success of the *All of Us* Research Program," said **Josh Denny, M.D., M.S., chief executive officer of the *All of Us* Research Program**. "Our goal of building one of the most diverse health research databases in history can only come to fruition when we are able to successfully reach communities that have historically been overlooked by medical research. CIAPM will help the program reach more people living in California so they can participate in this important work, and bring additional researchers to this resource to advance scientific discovery and health equity for all."

WHY THIS IS IMPORTANT: Nationwide, researchers have already identified more than 275 million previously unreported genetic variants through the *All of Us* effort, in part due to en-

22   *All of Us* Researcher Workbench.

gaging voluntary participants from communities who have been left out of research in the past. Californians who choose to participate in the program can learn information about the health and research studies that use *All of Us* data. *All of Us* aims to enroll 1 million or more participants nationwide reflective of the US population, building one of the largest health databases of its kind, with diversity in race, ethnicity, age group, geography, gender identity, sexual orientation, socioeconomic status, education, disability, and health status.

ABOUT THE CALIFORNIA INITIATIVE TO ADVANCE PRECISION MEDICINE

CIAPM, formerly housed within the Governor's Office of Planning and Research and now residing within the [California Health and Human Services Agency (CalHHS)](#), is committing $9.25 million over four years, to further the scope of *All of Us* in California by reaching out to and learning from participants and researchers through the Representative Research Collaborative, a new and actively growing network of state and local agencies, universities, community-based organizations, clinics, philanthropists, and researchers.

Broader and diverse representation in biomedical research is deeply needed and will benefit all Californians. As one of the most diverse states in the nation, California has great potential to further this goal.

To learn more about the *All of Us* Research Program, please visit the [National Institutes of Health's *All of Us* webpage](#) to join.[23]

Please also visit the [California Initiative to Advance Precision Medicine webpage](#) to learn more about state-level research and engagement efforts.

Published: November 14, 2024

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[Link to Original Press Release](#)

[Link to NIH Press Release](#)

Appendix E. Catalog of CIAPM Newsletters in 2024

CIAPM publishes a free bi-monthly newsletter highlighting program updates, researchers, and advancements in science and precision medicine across California. In 2024, CIAPM published six newsletters sent through our mailing list and those are also archived on our website.

[CIAPM February 2024 Newsletter Link](#)

[CIAPM May 2024 Newsletter Link](#)

[CIAPM June 2024 Newsletter Link](#)

[CIAPM September 2024 Newsletter Link](#)

[CIAPM November 2024 Newsletter Link](#)

[CIAPM December 2024 Newsletter Link](#)

To sign up for our newsletter, please visit the [CIAPM webpage](#). [24]

23   [National Institutes of Health's *All of Us* webpage](#).
24   [CIAPM Newsletter Signup](#).

Appendix F. Biographies for the Selection and Evaluation Committees for CIAPM Research Programs

Biographies for the Depression Research Program Selection Committee

Olusola Ajilore, MD, PhD

Professor, Selection Committee Chair

University of Illinois at Chicago

Dr. Ajilore is the Director of the Mood and Anxiety Disorders Program, Director of the Clinical Research Core in the Center for Clinical and Translational Science, Center for Depression and Resilience Professor of Psychiatry, Co-director of the Medical Scientist Training Program, and Associate Head for Faculty Development at the University of Illinois at Chicago. Dr. Ajilore uses a variety of technologies to study structural and functional brain connectivity in major depressive disorder, viewing the brain as a network. He graduated magna cum laude from Harvard University with a bachelor's degree in biology and completed his MD/PhD degrees at Stanford University. Prior to joining UIC, Dr. Ajilore was an Assistant Professor in the Department of Psychiatry at UCLA. Currently, as Director of the Connected Technologies (CoNeCT) Lab, he has numerous NIH funded grants focused on evaluating and treating depression in adults and geriatric patients using neuroimaging and computational science techniques to develop technology-based treatments. Dr. Ajilore also is a member of the National Advisory Mental Health Council for the National Institute of Mental Health.

Bruno Anthony, PhD

Professor

University of Colorado

Dr. Anthony is a Professor, Vice Chair for Psychology and Director of the Office of Psychological Science and Practice, Department of Psychiatry, University of Colorado School of Medicine and Chief of Psychology for the Pediatric Mental Health institute, Colorado Children's Hospital. His research focuses on how mental health disparities affect vulnerable populations and ways to improve the systems and practices to ultimately improve health outcomes. He received his bachelor's degree in biology from University of Pennsylvania and a PhD in psychology from Columbia University. His work also focuses on ways to empower youth and families in decision-making, including programs to help providers and families build effective partnerships to enhance outcomes. More recently, his work focuses on best practices to support primary care practices, schools and parents in enhancing children's mental health. Dr. Anthony has served as a member of NIH and PCORI study sections and serves as an ad hoc grant reviewer for the National Science Foundation, Veterans Administration, and the Administration for Children, Youth and Families.

Justin Baker, MD, PhD

Associate Professor

Harvard University

Dr. Baker is an Associate Professor of Psychiatry at Harvard Medical School. He is also Director of the Laboratory for Functional Neuroimaging and Bioinformatics and the Scientific Director of the McLean Institute for Technology in Psychiatry (ITP). Dr. Baker co-founded the ITP, a first-of-its-kind research and development center to foster tool development and novel applications of consumer technology in psychiatric research and care delivery. He received his undergraduate degree in neuroscience at Brown University and his MD/PhD from the Washington University in St. Louis in neurobiology. Dr. Baker uses bioinformatical approaches and functional imaging to understand what causes the behavioral differences in the brains of

people with lifelong psychiatric conditions like schizophrenia. He and his lab use techniques such as latent construct modeling, machine learning, and dynamical systems analysis to develop translational approaches to help individuals.

Crystal Barksdale, PhD, MPH

Program Director

National Institute on Minority Health and Health Disparities (NIMHD)

Dr. Barksdale a licensed clinical psychologist and is a Program Director in the Division of Community Health and Population Science at the National Institute of Minority Health and Health and Disparities. She earned her bachelor's degree in psychology at the University of North Carolina at Chapel Hill and her master's degree in public health from Johns Hopkins Bloomberg School of Public Health. She received her doctorate in clinical psychology from George Washington University. She has used her expertise to evaluate and consult on children's mental health projects focused on depression and suicide, disparities in child-serving systems, and culturally and linguistically appropriate interventions for at-risk youth and their families. Dr. Barksdale's current work and research interests are focused on identifying, disseminating, and supporting community-based and community-engaged, multilevel interventions to eliminate health disparities, with a particular focus on the role of structural and social determinants of health.

Annie Fox, PhD

Associate Professor

Massachusetts General Hospital Institute of Health Professions

Dr. Fox is an Associate Professor of Healthcare Data Analytics in the School of Healthcare Leadership at the MGH Institute of Health Professionals. As a social psychologist, Dr. Fox is interested in the conceptualization, measurement, and consequences of mental illness stigma. She obtained a bachelor's in psychology from College of the Holy Cross, and her Masters and PhD in social psychology from the University of Connecticut. Her current research uses advanced statistical models to examine the longitudinal relationships between stigma and mental health in young adults in order to determine the optimal timing for stigma interventions and increase rates of treatment seeking. She also serves as a statistician in the Women's Health Sciences Division of the National Center for PTSD, where her research focuses on PTSD, trauma, and women's health.

Joyonna Gamble-George, MHA, PhD

Associate Research Scientist

Yale University

Dr. Gamble-George is an Associate Research Scientist in Public Health at the Yale University School of Public Health. With over a decade of experience discovering cures for the most common health diseases and disorders and across clinical, administrative, and research sectors of the healthcare field, Dr. Gamble-George is an internationally acclaimed scientist. She has traveled the globe sharing her research approaches to medicine with diverse audiences, including Nobel Prize Winners. She holds a Bachelor of Science in Biochemistry and Biology with Honors in Mathematics from Xavier University of Louisiana and a Master of Health Administration from the University of South Florida College of Public Health. During her doctoral studies at Vanderbilt University, she co-founded SciX, LLC, a biotech company searching for methods to combat brain disorders and other health issues.

Yolangel Hernandez Suarez, MD, MBA

Associate Professor

Florida International University

Dr. Hernandez Suarez is an Associate Professor in Obstetrics and Gynecology and the Executive Associate Dean for Students at FIU Herbert Wertheim College of Medicine. She is also a board-certified obstetrician and gynecologist. She earned her bachelor's degree at Swarthmore College and completed her MD at the Johns Hopkins University School of Medicine. She trained in Obstetrics and Gynecology at the University of Iowa Hospital and Clinics. She holds a Master of Business Administration with specialization in Health Administration and Policy from the University of Miami. With skills in both hospital administration and academic research, her primary goal is to build bridges among hospitals, academia and the community to create value for systems, patients and learners. Dr. Hernandez Suarez is the Founding Chair of the Miami-Dade Health Action Network, a 2008 National Public Hospital Fellow "Future Leader of Public Hospitals" and a board member of the National Hispanic Medical Association.

Darrell Hudson, PhD, MPH

Associate Professor

Washington University in St. Louis

Dr. Hudson holds a joint appointment with the Washington University Department of Psychiatry and is a Faculty Scholar with the Institute for Public Health. He was recently appointed named the Director of Center for the Study of Race, Ethnicity & Equity at Washington University. Dr. Hudson's career is dedicated to the elimination of racial/ethnic inequities in health. His research agenda centers on how social determinants of health, particularly racism, affect multiple health outcomes. He earned his bachelor's in psychology from Morehouse College. He completed his Master of Public Health in Health Behavior and Health Education and PhD in Health Behavior and Health Education from the University of Michigan School of Public Health. By studying the social epidemiology of depression among African Americans, his research has sought to determine how stress is socially patterned, and the coping strategies and resources that individuals develop and can access to cope with stress.

Patricia Kerig, PhD

Professor

University of Utah

Dr. Kerig is a Professor of Clinical Psychology at the University of Utah, where she directs the Risk to Resilience Laboratory. She earned her B.A. in Psychology from UC Irvine and Ph.D. in Clinical Psychology from UC Berkeley. Dr. Kerig is a developmental psychopathologist who studies the developmental processes that contribute to risk or resilience across the lifespan, particularly among youth exposed to trauma. Dr. Kerig also has an abiding interest in resilience and how it can be promoted through intervention. Her current research is focused on investigating the mechanisms accounting for the link between trauma and youth involvement in the justice system. Dr. Kerig also served on the Adverse Childhood Experiences Selection Committee for CIAPM.

Sahnah Lim, PhD, MPH, MIA

Assistant Professor

New York University

Dr. Lim is an Assistant Professor at the NYU Grossman School of Medicine. She is currently leading the Gender Equity scientific track and Mental Health scientific track at the Department of Population Health's Section for Health Equity and is a steering committee member of the Asian American Native Hawaiian Pacific Islander 'OHANA Center of Excellence on mental health and substance use. Her research focus research understands how multiple marginalization impacts mental and sexual health outcomes, drawing from intersectionality and syndemics frameworks to address gender-related health issues among hard-to-reach populations. Dr. Lim's research interests also include reproductive and sexual health, mental health, and substance use. Her work uses mixed methods and community-engaged research approaches to advance health equity of individuals from mixed-marginalized populations. Dr. Lim obtained her PhD from Johns Hopkins University and an MPH from Columbia University.

Ziad Nahas, MD, MSCR

Professor

University of Minnesota

Dr. Nahas is a Neuromodulation Researcher, Professor & Executive Vice Chair for Clinical Affairs at the Department of Psychiatry & Behavioral Sciences. He received his Medical Degree from Saint Joseph University in Lebanon and then completed an internship in Psychiatry at L'Institut Paul Silvadon, a Lacanian day hospital, and Hopital Charles Foix, both in Paris, France before moving to Houston, Texas as a resident in Psychiatry at Baylor College of Medicine. Before the University of Minnesota, he was previously at the Medical University of South Carolina and American University of Beirut Medical Center, where he helped develop the department's clinical, educational, and research portfolio. Dr. Nahas' scientific interests lie in translational research of mood dysregulation and depressive disorders with unique expertise is in functional neuroimaging and brain stimulation across various modalities.

Katherine Sanchez, PhD, LCSW

Associate Investigator

Baylor Scott & White Research Institution

Dr. Sanchez is an Associate Investigator and Director of Diversity and Inclusiveness in Research for Baylor Scott & White Health's Research Institute (BSWRI) in Dallas, Texas. She is a clinician-researcher, with over 15 years of experience as a bilingual clinical social worker. Her research interests are in integrated health care, investigating effective interventions aimed at reducing disparities and improving uptake in evidence-based mental health treatments in primary care through socio-culturally, linguistically adapted models for the treatment of co-morbid mental and physical illness. Dr. Sanchez's research agenda has segued from a focus on small scale interventions in primary care to advance the science around reducing mental health disparities through efforts at the health delivery system level She also represents BSWRI on the governing board of the Health Care Systems Research Network, a network of 20 non-profit healthcare delivery systems.

Anne Saw, PhD

Associate Professor

DePaul University

Dr. Saw is an Associate Professor of Clinical-Community Psychology at DePaul University. Her lab aims to promote health equity through conducting community-engaged research and studying structural and sociocultural influences on coping and health behaviors and

contribute to the development, evaluation, implementation, and dissemination of culturally responsive behavioral health interventions. Her research program is focused on reducing health and mental health disparities, particularly for Asian American immigrant and refugee communities. Dr. Saw completed her PhD in Clinical/Community Psychology at the University of Illinois at Urbana-Champaign. She completed a predoctoral internship at McLean Hospital/Harvard Medical School and postdoctoral fellowship at UC Davis Dr. Saw also served as a panelist at the Inaugural Asian American, Native Hawaiian, and Pacific Islander Mental Health Summit hosted by the Biden-Harris Administration in July 2023.

Arash Shaban-Nejad, PhD, MPH, MSc

Associate Professor

University of Tennessee Health Science Center

Dr. Shaban-Nejad is an Associate Professor and Director of Population and Precision Health at the UTHSC-OAK-Ridge National Lab Center for Biomedical Informatics, and the Department of Pediatrics at the University of Tennessee Health Science Center. Dr. Shaban-Nejad received his MSc and Ph.D. in Computer Science from Concordia University and Master of Public Health from UC Berkeley and completed a postdoctoral fellowship at McGill University. Currently, his primary research interest spans population health intelligence, epidemiologic surveillance and big-data semantic analytics using tools and techniques from artificial intelligence, knowledge representation, and the semantic web. Dr. Shaban-Nejad is an associate editor of BMC Medical Informatics and Decision Making and a guest editor of Nature - Digital Medicine, Artificial Intelligence in Medicine, and IEEE Journal of Biomedical and Health Informatics journals. Dr. Shaban-Nejad previously served on the Adverse Childhood Experiences Selection Committee for CIAPM.

Susan Shortreed, PhD

Senior Biostatistics Investigator

Kaiser Permanente Washington Health Research Institute

Dr. Shortreed is a Biostatistics Investigator at Kaiser Permanente Washington Health Research Institute and Affiliate Professor in the Department of Biostatistics at the University of Washington. She uses statistics and machine learning methods to address health science problems, with a special emphasis on analyzing complex longitudinal data, such as electronic health records. She is leading a project to develop statistical methods for constructing personalized treatment strategies using data captured from electronic health records. She obtained her PhD in statistics from the University of Washington. Prior to her current role, she spent two years in the Department of Epidemiology and Preventive Medicine at Monash University in Melbourne, Australia, and another two years in the School of Computer Science at McGill University in Montreal, Canada. Dr. Shortreed collaborates scientists in a broad range of areas including alcohol use, cancer screening, and medication safety, and now works alongside researchers in mental and behavioral health.

Madhukar Trivedi, MD

Professor

University of Texas Southwestern

Dr. Trivedi is a Professor of Psychiatry, Chief of the Division of Mood Disorders, and the founding Director of the Center for Depression Research and Clinical Care at UT Southwestern Medical Center, where he holds the Betty Jo Hay Distinguished Chair in Mental Health and the Julie K. Herse Chair for Depression Research and Clinical Care. He earned his MS and

MBBS (MD equivalent) in Baroda, India, completing his residencies in Psychiatry at University General Hospital, Baroda, India and Henry Ford Hospital. Certified by the American Board of Psychiatry and Neurology, Dr. Trivedi focuses on developing and validating biosignatures of depression as well as the pharmacological, psychosocial, and nonpharmacological treatments for depression. He has been a principal investigator on numerous translational projects and clinical trials and has one of the longest running longitudinal research studies on depression.

Jürgen Unützer, MD, MPH, MA

Professor

University of Washington

Dr. Unützer is a board-certified psychiatrist and a Professor of Psychiatry and Behavioral Sciences. He completed his medical degree at the Vanderbilt University School of Medicine and his residency at the UCLA. His work focuses on innovative models of care that integrate mental health and general medical services and on translating research on evidence-based mental health care into effective clinical and public health practice. He has more than 300 scholarly publications and is the recipient of numerous federal and foundation grants and awards for his research to improve the health and mental health of populations through patient-centered integrated mental health services. Dr. Unützer works with various national and international organizations to improve behavioral health care for diverse populations, most notably having served as Senior Scientific Advisor to the World Health Organization and as an advisor to the President's New Freedom Commission on Mental Health.

Biographies for the Cancer Disparities Research Program Evaluation Committee

Gloria Coronado, PhD

Dr. Gloria Coronado is the Associate Director of Population Science at the University of Arizona Cancer Center and the Maynard Chair in Prevention Research. Dr. Coronado is an epidemiologist who champions affordable, long-term solutions to health disparity issues. She leads a well-funded research portfolio that inspires health system leaders to make sensible, evidence-informed choices to engage hard-to-reach populations in life-saving preventive behaviors. Dr. Coronado's research uses existing health system data and population segmentation approaches to proactively deliver outreach to patients who need it the most. Her research strives to promote health care efficiency while advancing equity. Dr. Coronado's team specializes in applying patient-engagement strategies to develop culturally relevant health education materials. Content developed by her team (both English- and Spanish-language patient-facing materials) have been disseminated to hundreds of health systems and community organizations across the United States. Dr. Coronado has developed several innovative, cost-effective interventions to improve the rates of participation in cancer screening for patients served by community health centers. Her work has led to successful partnerships with large health plans, state institutions, and community clinics. Dr. Coronado received her PhD in epidemiology from the University of Washington and was a Research Associate Professor in the university's Department of Epidemiology. She also received training at Stanford University.

Meg Gaines, JD, LLM

Meg Gaines founded the interdisciplinary Center for Patient Partnerships at the University of Wisconsin, serving as Director for 20 years, and is currently the Director Emerita. The Center's mission is to disrupt dysfunctional health care by restoring people to the core of care. Professor Gaines' work focuses on consumer engagement and empowerment in health care reform, health professionals' education, and access to high quality, effective health care. She has collaborated with the Robert Wood Johnson Foundation (RWJF), the Kaiser Family Foun-

dation (KFF), the American Board of Internal Medicine Foundation (ABIMF), the Josiah Macy Jr Foundation, and the National Cancer Institute (NCI) among others. She currently serves on the Board of the Academy of American Medical Colleges (AAMC) and previously on the Boards of the National Quality Forum (NQF), the Academy on Communication in Healthcare (ACH), and the National Cancer Research Advocates of the NCI (NCRA). She co-chaired the Josiah Macy Jr Foundation annual conference *"Partnering with Patients, Families, and Communities to Link Interprofessional Practice and Education."* Recent publications include the National Academies of Sciences, Engineering, and Medicine's Committee report on the *Vital Directions for Health and Healthcare* and *Making Medicines Affordable: A National Imperative*, the Association of American Medical Colleges paper on the *Charter on Organizational Professionalism for Healthcare Organizations* as a companion to the *Charter on Medical Professionalism* of the Choosing Wisely Campaign, and the American Medical Association publications on *How HIPAA Harms Care, and How to Stop It* and *Changing the Game of Prior Authorization: The Patient Perspective* with Dr. Don Berwick, MD. She is a graduate of Vassar College (A.B.) and the University of Wisconsin Law School (JD, LLM) and a "durable survivor" of metastatic ovarian cancer. She previously served on CIAPM's Cancer Disparities Selection Committee.

Elizabeth Gross Cohn, RN, PhD, FAAN

Dr. Elizabeth Gross Cohn is the Vice President for Health Equity Research at Northwell Health and Professor at the Institute for Health System Science at the Feinstein Institute for Medical Research in the Zucker School of Medicine at Hofstra University. Her research focuses on the ethical and social issues at the intersection of precision medicine and health disparities through the engagement of underrepresented communities, community-engaged research, and the ethical, legal, social, and scientific issues of emerging technologies and public health. Her model for translating the lab to the living room promotes interactions between scientists and the communities they serve. Through this work, she has developed an interactive graphic novel, a community education program on precision medicine, and a decision tool for community faith-leaders who are advising congregants on research participation. She is part of the leadership of the Communities of Harlem Health Revival, a member of the New York State Health Equity Council, a Fellow in the New York Academy of Medicine, and she mentors investigators in community-based and community-engaged research. Dr. Gross Cohn was named a 2016 White House Champion of Change in Precision Medicine for her work at the intersection of precision medicine, public health, and health equity. Dr. Cohn received her associate degree from Nassau Community College, her bachelor's Degree from the State University of New York at Purchase, her master's degree and Nurse Practitioner training from the State University of New York at Stony Brook, and her Doctorate from Columbia University. Dr. Cohn previously served on CIAPM's Cancer Disparities Selection Committee.

Jennifer Mack, MD, MPH

Dr. Jennifer Mack is a Senior Physician, the Associate Chief of the Division of Population Sciences, and an Associate Professor in Pediatrics at Harvard Medical School. As a pediatric oncologist, she has a particular interest in cancer-related communications as a model for all difficult medical conversations. Her work focuses on communication about cancer diagnoses, cancer treatment decision-making, and the transition to palliative care, where communication can have a major impact on the way care unfolds at the end of life. The overarching objective of her work is to build patient-clinician relationships and improve patient outcomes through effective communication. She has developed clinical expertise in communication through dedicated inpatient and outpatient care of childhood cancer patients, created a body of research that defines specific attributes and outcomes of high-quality communication, and trained pediatric hematology/oncology fellows and other physicians to communicate effectively with patients and families. Ultimately, Dr. Mack hopes that this

work will enable valid assessment of care quality, and rigorous evaluation of interventions that improve the delivery of adolescent and young adult end-of-life care. Dr. Mack received her MD from Harvard Medical School, completed a residency in Pediatrics, and a fellowship in Pediatric Hematology Oncology and Pediatric Palliative Care between Children's Hospital Boston and Dana-Farber Cancer Institute. Dr. Mack also received a Master's in Public Health from the Harvard School of Public Health.

Elaine Mardis, PhD

Dr. Elaine Mardis is Co-Executive Director of the Steve and Cindy Rasmussen Institute for Genomic Medicine at Nationwide Children's Hospital and holds the Rasmussen Nationwide Foundation Endowed Chair in Genomic Medicine. She is also a Professor of Pediatrics at The Ohio State University College of Medicine. Dr. Mardis is an internationally recognized expert in cancer genomics, with ongoing interests in the 1) integrated characterization of cancer genomes, 2) defining DNA-based somatic and germline interactions and RNA-based pathways, and 3) immune microenvironments that lead to cancer onset and progression, specifically involving pediatric cancers. Most recently, her research has been oriented toward translational aspects of cancer genomics, such as 1) identifying how the cancer genome changes with treatment, including acquired resistance, 2) the use of genomics in understanding immune therapy response, and 3) the clinical benefit of cancer molecular profiling in the pediatric setting. Dr. Mardis served as president of the American Association for Cancer Research (AACR) from 2019-2020. In 2019, she was elected a fellow of the AACR Academy and a member in the prestigious National Academy of Medicine. Educated at the University of Oklahoma with a B.S. in Zoology and a PhD in Chemistry and Biochemistry, Dr. Mardis conducted postgraduate work in industry at BioRad Laboratories. She was on the faculty of Washington University School of Medicine from 1993-2016, where she served as co-director of the McDonnell Genome Institute at Washington University. Dr. Mardis previously served on CIAPM's Cancer Disparities Selection Committee, and the 2018 CIAPM Evaluation Committee.

Rulla Tamimi, SciD, MS

Dr. Rulla Tamimi is a Professor of Population Health Sciences, Division Chief of Epidemiology, and Professor of Epidemiology in Pathology and Laboratory Medicine at Cornell University. As the Associate Director for Population Science at the Sandra and Edward Meyer Cancer Center, she works closely with an interdisciplinary group of investigators to study cancer risk and survival, with the goal of reducing morbidity and mortality in the New York City area. Her research goal is to better understand breast cancer risk and prognosis by designing epidemiological studies that integrate biomarkers, imaging, and lifestyle factors. Specifically, her research has focused on intermediate markers of breast cancer risk including mammographic density and benign breast diseases. As a principal investigator on numerous NIH-funded grants and author of over 200 peer-reviewed publications, she has identified a number of genetic, molecular and lifestyle predictors of breast cancer risk. Her foundational work includes studies on early life and environmental exposures' linked to breast disease, molecular characterization of breast tumors, and mammographic density as a predictor of breast cancer. Dr. Tamimi received her bachelor's degree from Tufts University and her master's degree and doctorate in epidemiology from the Harvard T. H. Chan School of Public Health. Previously, she was an associate professor in epidemiology at the Harvard T.H. Chan School of Public Health, associate professor of medicine at Harvard Medical School, and the co-lead of the Breast Cancer Program at the Dana Farber/Harvard Cancer Center.

Appendix G. Biographies for the CIAPM Advisory Council

Clara Lajonchere, PhD

Chair

Professor & Director for Precision Health

UCLA

Keith Yamamoto, PhD

Vice Chair

Emeritus Professor & Vice Chancellor of Science Policy and Strategy, UCSF

Elize Bradley, DrPH, JD

Senior Health Equity Fellow

Central Valley Community Foundation

Debra Cooper, PhD

Assistant Secretary, Program and Fiscal Affairs

CalHHS

E. Gay Grossman

Patient Advocacy and Engagement Lead

GeneDX

K. Jones, PhD

Assistant Secretary, Program and Fiscal Affairs

CalHHS

Kenneth Kim, MD

Executive Chairman

Ark Clinical Research

Hala Madanat, PhD

Vice President for Research and Innovation

San Diego State University

Fatima Muñoz, MD

Director of Research and Health Promotion

San Ysidro Health

Diana Ramos, MD, MBA

CA Surgeon General

CalHHS

Hakan Sakul, PhD

President

Precision Dx Strategies

Emerita Advisors

Ysabel Duron

Founder & CEO

Latino Cancer Institute

Oliver Keown, MD

Founder & CEO

Oath Surgical

Yvonne Maldonado, MD

Professor & Chief of Infectious Diseases

Stanford University

Clara Lajonchere, PhD

Chair

Dr. Clara Lajonchere is the Deputy Director for the UCLA Institute for Precision Health, Co-Director of the Clinical Neurogenomics Research Center and Adjunct Professor of Neurology in the David Geffen School of Medicine at UCLA. Dr. Lajonchere's background reflects a wide range of professional, clinical, and research activities across central nervous system disorders. She has spent her career on cross-cutting issues in psychiatric genetics and translational medicine. Through the UCLA Institute for Precision Health, Dr. Lajonchere is working collaboratively with thought leaders across the State of California to advance precision medicine and improve outcomes for patients. She currently serves as chair of the California Precision Medicine Advisory Council for the California Health and Human Services Agency. Prior to UCLA, Dr. Lajonchere held faculty appointments at the USC Keck School of Medicine where she served as Principal Investigator and Director of the NIH Center for Genomic and Phenomic Studies in Autism and conducted research on models for inclusion of underserved populations in biomedical research. She also served as Vice President of Clinical Programs for *Autism Speaks* for over a decade where she oversaw a diverse portfolio of basic science and clinical programs. She currently consults for several tech start-ups in the autism space focused on Artificial Intelligence, robotics, and targeted therapeutics.

Keith Yamamoto, PhD

Vice Chair

Dr. Keith R. Yamamoto is Vice Chancellor for Science Policy and Strategy, and Director of Precision Medicine at UCSF. A UCSF researcher since 1973, he is a leader in the determination of gene regulatory mechanisms. He has led or served on national committees focused on public and scientific policy, public understanding of science, science education, open science, and peer review. He chairs the Coalition for the Life Sciences and sits on the National Research Council Governing Board Executive Committee, the Board of Directors of Research!America, the Board of Directors of the Public Library of Science, the Governing Board of the California Institute for Regenerative Medicine, and the Advisory Board for Lawrence Berkeley National Laboratory. As Chair of the National Academy of Sciences Board on Life Sciences, Dr. Yamamoto created the study committee that produced Toward Precision Medicine, which enunciated the precision medicine concept, and he helped lead efforts in the White House, Congress, Sacramento, and UCSF to implement it. He was elected to the National Academy of Sciences, the National Academy of Medicine, the American Acade-

my of Arts and Sciences, and is a fellow of the American Association for the Advancement of Science (AAAS). In 2023, he served as President of AAAS.

Elize Bradley, DrPH, JD

Dr. Elize M. Bradley is the Senior Health Equity Fellow with the Central Valley Community Foundation. She is a seasoned public health and health care executive with a successful 20+ year career in health policy, and research recruitment, planning, and administration. Her broad areas of expertise include community engagement, health promotion and prevention, and equity, diversity, inclusion, and belonging within the healthcare, academic, philanthropic, and community-based sectors. She is also currently the Hewlett Packard Senior Health Equity Fellow for the Central Valley Community Foundation.

She previously served as the Regional Managing Director and HIPAA Privacy Officer for Kaiser Permanente's (KP) Division of Research, where she had primary responsibility for all research operations for Northern California. While at KP, she created and managed the Community Advisory Panel, as well as the Ethics Advisory Panel, for the Kaiser Permanente Research Biobank. With more than 400,000 participants, KP's Biobank is one of the largest biobanks in the United States, and was designed to advance precision medicine, medical research, and translational research. Prior to her 15 years with Kaiser Permanente, Dr. Bradley served as Senior Program Officer for The Robert Wood Johnson Foundation (RWJF).

Dr. Bradley holds a DrPH in Health Policy and Management from the University of California, Berkeley, a J.D. from the University of California, Los Angeles, and a B.A. in Sociology (High Honors) from Williams College.

Debra Cooper, PhD

Dr. Debra Cooper received her undergraduate degree in psychology from Duke University and her PhD in Neuroscience from Emory University. Her graduate research focused on studying treatments for drug addiction. After receiving her doctorate, she continued doing research in drug addiction as a postdoctoral fellow at the University of Texas Medical Branch at Galveston.

In 2014, Dr. Cooper was selected to serve as a Policy Fellow for the California Council on Science and Technology (CCST), where she was placed in the California State Senate Office of Research. She continued working in the State Legislature for 8 years, with roles such as Principal Consultant for the Senate Appropriations Committee and as the Chief Consultant for the State Assembly's Human Services Committee.

She is currently an Assistant Secretary at the California Health & Human Services Agency in the Office of Fiscal and Program Affairs. Additionally, Dr. Cooper serves on the Executive Board of the California Black Health Network.

E. Gay Grossman

Gay Grossman is the Patient Advocacy and Engagement Lead at GeneDx, and is the Co-Founder of ADCY5.org.

Ms. Grossman has been an advocate in the rare disease community for over twenty-five years, advocating for use and access to genetic testing, shared data, and for patients to learn how to use their data. She co-founded ADCY5.org on behalf of her daughter and all those with the rare ADCY5-Movement Disorder Syndrome, to engage directly with researchers and clinicians for novel treatments.

Ms. Grossman previously served as the Director of Patient Advocacy and Engagement at Neurogene, where she helped the organization establish durable and trusting relationships with patients, families, and advocacy groups.

Ms. Grossman has leveraged her personal and professional experience with the pharmaceutical industry to help teach and explain about the burden of disease and educate patients in the fields of genetic testing, biospecimen collection, and rare conditions. This has garnered invitation to speak at numerous university and non-profit venues and recognition from industry leaders such as Biocom California and Illumina.

K. Jones, PhD

Dr. K. Jones (they/them) is the Assistant Secretary of Programs and Fiscal Affairs at the California Health & Human Services Agency.

They received their PhD in Interdisciplinary Neuroscience from the University of Missouri and a BS in Psychology from The Ohio State University.

As a postdoctoral research fellow at UC Davis, they were a leader in the field of autism research, specializing in identifying genetic and environmental risk factors of autism spectrum disorder to move closer to a precision medicine approach. They have additional expertise in psychology, neuroimmunology, nutrition, and epidemiology. Dr. Jones has participated in consortiums that resolve science, clinical practice, and policy issues related to autism. They have contributed high-profile scientific manuscripts to the American Association for the Advancement of Science.

After their postdoctoral work, Dr. Jones was selected to be a Society for Neuroscience Policy Ambassador and advocated for voters' rights and social justice issues as the inaugural Trudy Schafer Advocacy Fellow at the League of Women Voters of California. Prior to joining CalHHS, they served as Legislative Director to Assemblymember Dr. Joaquin Arambula.

Kenneth Kim, MD

Dr. Kenneth Kim received his MD from Harvard Medical School, completed a fellowship at the MIT Sloan School of Management, and received internal medicine and allergy/immunology training at UCLA. He has served on the clinical faculty both at UCLA and UC Irvine for over 15 years. He has been a medical monitor, consultant, and investigator on over 600 clinical trials, having published over 30 research articles and 50 abstracts in peer-reviewed journals. He is a nationally recognized expert in the areas of early-stage clinical research, ethno-bridging of drug development strategy, influenza challenge, mold allergy, and latex allergy.

He has founded numerous health care service businesses, including a 200+ employee clinical research organization which he transitioned to private equity. He is currently the medical director of Ark Clinical Research and a strategic investor in a variety of startups, while also maintaining a private allergy and asthma practice in Southern California.

Hala Madanat, PhD

Dr. Hala Madanat is the Vice President for Research and Innovation at San Diego State University and the Albert W. Johnson Distinguished Professor of Public Health. Dr. Madanat stewards the university's expansive research enterprise, leads the development of SDSU's Mission Valley Innovation District, and oversees SDSU's research advancement, support services and technology transfer efforts, the SDSU Research Foundation, as well as the university's start-up incubator, the Zahn Innovation Platform Launchpad.

Under Dr. Madanat's leadership, SDSU's research has grown fiscally, launching accelerator Techstars San Diego Powered by SDSU, developed the Academic Health and Human Services Department, a collaboration between SDSU and the County of San Diego Health and Human Services to establish the Live Well Center for Innovation and Leadership, and launched the Center for Equitable and Diverse Research, a recruitment center for underrepresented minorities into clinical trials.

From 2016 to 2020, Dr. Madanat served as the Director of SDSU's School of Public Health. As professor of health promotion and behavioral sciences, her research addresses health disparities through community-engaged research. During the COVID-19 pandemic, Dr. Madanat co-led a contact tracing program aimed at enhancing support in underserved communities and curbing the spread of the novel coronavirus.

Dr. Madanat has a B.S. in Biological Sciences from the University of Jordan, a M.S. in Community Health Sciences, and a Ph.D. in Sociology with a minor in Public Health, both from Brigham Young University. Dr. Madanat is also a graduate of the San Diego Chamber of Commerce LEAD Advance program.

Fatima Muñoz, MD

Dr. Fatima Muñoz is the Director of the Department of Research and Health Promotion at San Ysidro Health (SYHealth), a high performing Federally Qualified Health Center (FQHC) providing care to over 105,000 patients throughout San Diego County. Fatima completed her medical training in Mexico and earned a Master's in Public Health from Universidad Autónoma de Baja California.

She possesses over 15 years of clinical research experience working in health promotion programs and epidemiological research studies, specifically among underserved populations. Fatima's expertise in public health issues spans both sides of the U.S.-Mexico border with emphasis in the elimination of health disparities. Her award-winning research portfolio includes chronic disease, HIV prevention and treatment, cervical and breast cancer, and the impact of bi-national access to care on health policy.

Most recently, under her leadership, SYHealth was awarded a grant from the *All of Us* Research Program from the National Institute of Health. It is only one of six FQHCs west of the Mississippi that is part of this Program and Fatima is the Principal Investigator for SYHealth. In this capacity, she and her team have been contributing in the development and implementation of the program Spanish-speaking participants.

Diana Ramos, MD, MBA

California Surgeon General Dr. Diana E. Ramos is dedicated to improving health care quality and equity. She recently served as the Assistant Deputy Director of Chronic Disease Prevention for the California Department of Public Health. Past roles include being the Director for Reproductive Health in the Los Angeles County Department of Public Health and adjunct Associate Professor at the Keck University of Southern California School of Medicine.

Her areas of expertise include health disparities, social determinants of health, preconception/interconception health, preterm birth, contraception and quality improvement in health. Dr. Ramos has written and contributed numerous articles for the obstetrics and gynecology and public health literature and has lectured in Spanish and English, locally, nationally and internationally.

Dr. Ramos received her medical degree from the University of Southern California with honors and completed her residency training in obstetrics and gynecology at Los Angeles County-University of Southern California Medical Center. She received her MBA from the UCI Paul Merage School of business with an emphasis in entrepreneurship and innovation and her master's in public health from the University of California, Los Angeles. Dr. Ramos completed her undergraduate degree, a BA in Communications, Arts & Science from the University of Southern California.

Hakan Sakul, PhD

As former VP and Head of Diagnostics, Dr. Hakan Sakul founded and led Pfizer's Diagnostics

group, with dozens of drug/diagnostics combination approvals in global markets under his leadership. During his 24-year tenure at Pfizer, Hakan also held leadership positions in Clinical Pharmacogenomics, Molecular Profiling, and Translational Oncology. One of his most significant professional accomplishments was to lead Pfizer's flagship CDx program for Xalkori®, resulting in simultaneous FDA approvals of the drug/diagnostic combination in 2011.

Prior to Pfizer, Hakan worked in the biotech industry in human genetics and statistical genetics. Hakan's contributions to precision medicine and diagnostics have been widely recognized through both internal and external awards and frequent speaking engagements. He is a former member of the Board of The Personalized Medicine Coalition, served as a Scientific Advisor to Luminex Corp, and currently is a Board member of Progentec Diagnostics, as well as BASH Biotech.

He received his BS and MSc degrees from Ankara University in Turkey, PhD in Quantitative Genetics from the University of Minnesota as a Rotary Foundation Scholar and conducted postdoctoral studies at the University of California-Davis. He has authored over 30 refereed scientific articles as well as many other publications. Hakan is keenly interested in molecular diagnostics, liquid biopsy and related medical technologies to advance Precision Medicine for the improvement of individualized healthcare.

Transitioned to Emerita Advisors in 2024

Ysabel Duron

Ysabel Duron is the Founder/CEO of the California based Latino Cancer Institute working to eliminate the Latino cancer burden nationwide by driving equitable access, research and policy.

Duron was an award-winning TV journalist for 43 years in the San Francisco Bay Area and elsewhere, but stepped away in 2013 to continue her role as a patient advocate and voice for the Latino community.

A cancer survivor, she serves both on the Institutional Review Board of the NIH All of Us Research Program, and most recently joined the Board of California Institute for Regenerative Medicine, a state taxpayer funded initiative to support stem cell research.

She was inducted into the National Association of Hispanic Journalists Hall of Fame in 2009, named one of the 25 most outstanding Hispanics in the Bay Area in 2005 and honored with the W.E.B. DuBois from the SJ Chapter of the NAACP in 2011, amongst other honors that reflect her community engagement.

Oliver Keown, MD

Dr. Oliver Keown is a UK-trained physician, scientist and former policy advisor turned healthcare and medical technologies venture capitalist (VC) and founder of Cleo Surgical. Prior to Cleo, he was a VC investor and founder with Intuitive Ventures and GE Ventures, driving startup deal-flow in the Bay Area and beyond across HealthTech, life science and MedTech domains.

In past roles Oliver has advised and supported a range of US and international healthcare innovation projects across technology, policy, commercial, and academic fields. Early in his career he worked as a junior doctor in the UK National Healthcare Service across a variety of medical and surgical disciplines. He holds an MD and a Bachelor's degree in Pharmacology from the University of Edinburgh, Scotland.

Yvette "Bonnie" Maldonado, MD

Dr. Yvonne (Bonnie) A. Maldonado is Professor in the Departments of Pediatrics and Epidemi-

ology and Population Health, Chief of the Division of Infectious Diseases, and Senior Associate Dean for Faculty Development and Diversity at Stanford University School of Medicine.

Her research activities have included the epidemiology and prevention of viral infections such as rotavirus, measles, mumps, rubella, polio and pediatric HIV infection. Her research is conducted internationally in Zimbabwe and Mexico, as well as in the United States. She has written over 200 articles in peer-reviewed journals, and 50 book chapters on these topics. In 1989, Dr. Maldonado received the Epidemic Intelligence Service Alumni Award from the Centers for Disease Control and Prevention, and she was inducted into the Multicultural Alumni Hall of Fame at Stanford University in 2001 and the Stanford Medical Alumni RISE (Reach, Inspire, Serve and Engage) award in 2018.

She is a Fellow of the American Academy of Pediatrics, a member of the Society for Pediatric Research, the Pediatric Infectious Disease Society and the American Public Health Association. Dr. Maldonado has devoted substantial effort to teaching and training activities at Stanford University as well as in the national and international setting. Throughout her career, she has invested heavily in her commitment to improving cultural and gender diversity at all levels.

Appendix H. Advisory Council Agendas and Meeting Minutes

The California Precision Medicine Advisory Council (CPMAC) held four meetings in 2024 in March, July, October, and December. Below are the pre-meeting materials that were provided on our website (Agenda) and the meeting summaries approved by the council after convening (Summary).

25 March 2024 CPMAC Meeting

25 March 2024 CPMAC Agenda Link

25 March 2024 CPMAC Summary Link

9 July 2024 CPMAC Meeting

9 July 2024 CPMAC Agenda Link

9 July 2024 CPMAC Summary Link

30 October 2024 CPMAC Meeting

30 October 2024 CPMAC Agenda Link

30 October CPMAC Summary Link

16 December 2024 CPMAC Meeting

16 December 2024 CPMAC Agenda Link

16 December 2024 CPMAC Summary Link

Appendix I. Key Personnel in 2024

Sam Assefa, MCP, OPR/LCI Director (September 2021 - Present)

Mark Ghaly, MD, CalHHS Secretary (March 2019 – September 2024)

Kim Johnson, CalHHS Secretary (October 2024 – Present)

K. Jones, PhD, Assistant Secretary for Programs & Fiscal Affairs (July 2023 – Present)

David Reiner, PhD, Chief Science Officer (April 2023 – Present)

Julianne McCall, PhD, Director of CIAPM (February 2019 – April 2023)

Saga Barberis, JD, Program Officer (January 2023 – Present)

Ramon Martinez III, PhD (January 2024 – Present)

Theresa Spezzano, PhD (January 2024 – January 2025)

Joanna Guan, MA, Policy Fellow (November 2023 – Present)

Hanna Butler-Struben, PhD, Policy Fellow (November 2023 – November 2024)

Yuki Hebner, PhD, Policy Fellow (October 2022 – August 2024)