

USC Dornsife Health Education

PHD SPECIALIZATIONS

Chemical Biology
(Chemistry)

Computational Biology and Bioinformatics
(Quantitative and Computational Biology)

Molecular Biology
(Biological Sciences)

Neurobiology
(Biological Sciences)

Physical Biology
(Physics)

Population, Health, and Place
(Spatial Sciences Institute)

Social Medicine (Anthropology)

UNDERGRADUATE DEGREE PROGRAMS

Health and Human Sciences B.A.

Human Biology B.A. and B.S.

International Health, Development, and Social Justice (Minor)

CO-CURRICULAR PROGRAMS

Joint Educational Project
(Health-related mini teams; Medical STEM Program)

Physical Education and Mind Body Health

Pre-Health Advising and Student Shadowing Program

Trojan Health Volunteers



The SoCal Treatment

Located in the heart of Los Angeles — where the urban society of tomorrow emerges in the present — USC Dornsife grapples with pressing human health challenges while getting ahead of complex issues on the global horizon.

Here, research moving from bench to bedside is informed by the city's unmatched cultural and socioeconomic diversity, ensuring that everyone stands to benefit from our discoveries. Robust collaboration between institution and industry accelerates the development of novel therapeutics. And innovation, infused with SoCal's entrepreneurial spirit, is guided by a long tradition of integrating cutting-edge technology with the arts and humanities.

At USC Dornsife, we harness urban complexity and diverse populations to spark new ways of thinking about the future of human wellbeing.



THE ART + SCIENCE OF HUMAN WELLBEING

Health Research and Scholarship Across USC Dornsife

Imagine a future where physical, mental, and social wellbeing are virtually guaranteed.

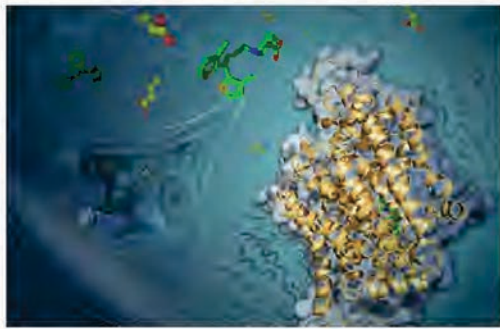
This future requires more than the next big leap in biomedicine and medical technology. We must also gain a more complete understanding of the environmental and socioeconomic factors that contribute significantly to human health.

At USC Dornsife, we don't make hard distinctions between art and science. We explore the entire range of complexities that affect human health. Together with collaborators across the university, our experts explore everything from the fundamental molecular mechanisms underpinning biology to the ways that culture and traditions influence therapeutics.

Here, researchers aim to stop the progression of debilitating conditions, send them into remission, and prevent them from happening to begin with. We do this not just to create a world free of disease and infirmity but to unlock the entirety of human potential.

We invite you to join us in realizing this vision.

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Magnifying Discovery

The incredible imaging capability made possible through a partnership with biotech giant Amgen that brought two cutting-edge cryo-electron microscopes to USC is already yielding significant discoveries. For example, **Cornelius Gati** and collaborators recently determined the atomic-level structure of a protein that influences neurons in the brain, which could inform new therapies for debilitating neurological disorders. And a research team led by **Vsevolod Katritch** uncovered a chemical link that could block harmful side effects of fentanyl and still reduce pain.



The Alarming Cost of Pollution

Using data from urban Chinese populations, environmental economist **Paulina Oliva** found that spikes in air pollution correspond to higher rates of mental illness. Adding to the problem, it's costing China more than \$23 billion in unnecessary health expenditures. Oliva's research — much of which focuses on the developing world — also provides insights on the connection between rising temperatures and infant mortality, and the inequitable distribution of environmental damages affecting the health of underserved populations.



Understanding Health in America

From surprising predictors of “long COVID” to the ways that sleep trends shed light on social inequities, the **Center for Economic and Social Research (CESR)** is helping us understand how geographic location, minority status, gender, age, disability, and other demographic measures contribute to an individual's health. Using a unique methodology that leverages data from a panel of approximately 9,500 American households, CESR takes the nation's temperature on current issues and attitudes that affect our choices.

Preventing Alzheimer's Disease and Cognitive Disorders

USC researchers take the approach that aging may be inevitable, but disease is not. They investigate the underlying factors that contribute to neurological conditions such as Alzheimer's, while exploring new ways to prevent these conditions before they take hold.

Giving Heart and Soul to A.I.

A long-term project at the **Brain and Creativity Institute** integrates new knowledge about the biological origin of consciousness with the design of A.I. — a combination that may lead to new ways of thinking about self-preservation and healthy companionship.

Incentivizing Healthy Environments

Environmental problems have a major impact on human health. And underserved populations bear the brunt of these effects — from increased exposure to toxic waste to higher infant mortality rates. By modeling economic incentives that promote more sustainable ways of living, USC Dornsife environmental economists aim to level the playing field for marginalized populations around the world.

Public Exchange™: USC Urban Trees Initiative

Working with the City of Los Angeles, **Public Exchange** provides data-driven recommendations to support the city's goal of adding 90,000 new trees to L.A.'s urban forest that will mitigate the effects of heat and air pollution on vulnerable populations.

Targeting Single Cancer Cells

USC Dornsife researchers in the Single Molecule Biophotonics Group use tiny nanoprobe with big health implications for personalized medicine. The new technology binds gold particles to living cells, which can amplify the ability to detect overexpressed or mutated proteins — indicators that cells could be cancerous. Their work may lead to noninvasive detection and treatment of cancer at the level of a single cell.

Predicting and Treating the Spread of Cancer

At the **USC Michelson Convergent Science Institute in Cancer** researchers leverage big data and novel detection methods like liquid biopsy to increase the probability of successful treatment in an individual, while expanding our fundamental understanding of cancer dynamics across populations.

Mental Health

Relationships Matter

Social connection is a public health priority and a recognized buffer against stress and disease. Scholars and clinicians at the **Center for the Changing Family** offer fresh insights on topics like health across the lifespan, family systems, the foster care system, and the psychological effects of intergenerational trauma.

Healthcare Access and Equity

Accelerating Data-Driven Policy and Advocacy

The Equity Research Institute uses community-centered data — often focused on vulnerable populations across Southern California — to shape new narratives for health equity, health policy priorities, and environmental justice.

Cancer

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Advanced Imaging and Medical Technology

Freeze Frame: Snapshots of Biological Molecules

Leveraging two of the world's most advanced **cryo-electron microscopes**, USC researchers and industry partners study biological components in unprecedented levels of detail. By visualizing in three dimensions how molecules change when other molecules — such as new drugs — are present, USC can lead the search for novel therapies.

Designing Virtual Models to Fast-Track Therapies

Housed in the USC Michelson Center for Convergent Bioscience, **The Bridge Institute** brings together natural scientists, engineers, and visual artists to address complex health challenges. By creating virtual, dynamic models of structures such as a pancreatic beta cell that regulates blood sugar, our teams will enable researchers to quickly test new generations of therapies and identify biomarkers of disease.

Expressions and Experiences of Human Health

Defining the Future of Social Medicine

USC Dornsife researchers working in the emerging field of social medicine study how health and illness are experienced in the context of cultural, historical, and political forces. A subfield of anthropology, these experts connect the dots that illuminate how issues like poverty, war, food systems, and cultural norms affect illness and disease. With a broader perspective, we may develop more equitable and empathetic approaches to healthcare.

Tell Me Where It Hurts

Patients bring more than a list of symptoms into the doctor's office; they also bring personal experiences, emotions, and relationships with disease. At USC, experts across areas including English, Classics, and Clinical Medicine are shaping the burgeoning field of Narrative Medicine to better understand how our stories affect diagnoses and medical interventions.

Exploring the History of Health and Disease

USC historians and anthropologists grapple with topics including medical ethics, the history of psychiatry and PTSD, bacteriology, and addiction in early America. Through this research, they expand our contemporary understanding of disease, as well as issues like bioethics and reproductive rights.

Unraveling the Building Blocks of Life

Applying Algorithms to Biological Data

With a tradition of academic leadership that dates back to the first efforts to map the human genome, USC faculty in the **Department of Quantitative and Computational Biology** use advanced computational and statistical techniques to derive meaning from large sets of biological data.

Microbes and the Human Organism

Tiny microbes have an oversized influence on your immune system, mental health, and even your behaviors. USC Dornsife scientists are uncovering new ways to combat pathogenic microbes and harnessing those that have potential health benefits.

Manipulating Biological Structures for New Abilities

USC Dornsife experts in the emerging field of synthetic biology leverage the power of nature to create new tissues, drugs, and products. Using sophisticated techniques to engineer proteins and reprogram cells, researchers expand our understanding of foundational biology principles, while opening new pathways in regenerative medicine.

Using Tech to Motivate Healthy Choices

Experts at the **Center for Economic and Social Research** apply behavioral science to technology to better understand how patients make health decisions. Their work includes the use of wearable technology to measure psychological and environmental factors affecting choices that contribute to problems like obesity and diabetes.