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.

THE ART + SCIENCE OF HUMAN WELLBEING

Health Research and Scholarship Across USC Dornsife

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**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.

**Relationships Matter**  
Social connection is a public health priority and a 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.

**Mental Health**

**Freeze Frame: Snapshots of Biological Molecules**  
Using two of the world’s most advanced cryo-electron microscopes, housed on the UPC campus, 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 learn the secrets of new therapies.

**Advanced Medical Technology**

**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 health challenges. By creating virtual, dynamic models of structures such as a Pancreatic Beta Cell that regulates blood sugar, our team 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.

**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.

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

**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.

**Unraveling the Building Blocks of Life**

**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 techniques 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.

**Magnifying Discovery**

For example, Cornelius Gati and his collaborators recently determined the atomic-level structure of a key 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.

**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) takes the nation’s temperature on current issues and attitudes that affect our choices.

**Preventing and Treating the Spread of Cancer**

At the USC Michelson Convergent Science Institute in Cancer, world-renowned researchers leverage big data and novel, noninvasive 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.

**Targeting Single Cancer Cells**  
USC Dornsife researchers in the Single Molecule Biophysics Group use tiny nanoprobes with big health implications for personalized medicine. The new technology enables gold particles to bind cells, which can simplify the researchers’ ability to detect overexpressed or mutated proteins — indicators that cells could be cancerous. Their work may lead to noninvasive detection and treatments of cancer at the level of a single cell.

**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 $2 billion in unnecessary health expenditures. Oliva’s research — much of which focuses on the developing world — also provides insight on the connection between rising temperatures and infant mortality, and the inequitable distribution of environmental damages affecting the health of underserved populations.

**Flexible Fabrication**

**Using Tech to Motivate Healthy Choices**  
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.