David R Boulware
Medicine (Infectious Diseases & International Medicine)
Medical School

Advancing therapeutics for COVID-19 and for HIV-related meningitis through clinical trials to impact global guidelines.

David Boulware is an infectious disease physician-scientist who has built a clinical research team focused on improving the diagnosis, treatment, and prevention of HIV- related meningitis in low and middle income countries. Early in the COVID-19 pandemic, Boulware stepped forward to create and lead a series of innovative remote, internet-based nationwide randomized clinical trials testing outpatient COVID-19 therapeutics. These trials informed international treatment guidelines for a number of medications, most notably hydroxychloroquine and ivermectin.

Peter Bruggeman
Mechanical Engineering
College of Science and Engineering

Plasma Science and Engineering for Advancing Human Health and Sustainability

Peter Bruggeman's research is focused on plasma science and engineering, the investigation of ionized gases, and plasma-based technologies that enable advances in health care and sustainability. His research group is particularly known for state-of-the-art diagnostic approaches and collaborative multidisciplinary studies that uncovered the mechanisms of the interactions of plasmas with solids, liquids and living matter. His research has enabled fundamental and technological advances in four areas: decontamination, water treatment, green chemical conversion, and manufacturing.

Paul Dauenhauer
Chemical Engineering & Materials Science
College of Science and Engineering

Catalysis for Sustainable Energy and Materials

Producing energy with limited impact on the environment is a leading challenge for engineers in the 21st century. Paul Dauenhauer's research uses catalysts to control and optimize reactions to convert water, nitrogen, and carbon dioxide to manufacture carbon-neutral fuels, materials including biodegradable plastics, carbon-sequestering solids, and liquid hydrogen carriers such as ammonia. Transformational reactions and catalytic materials are designed using mechanistic insight, fundamental chemical kinetics, and quantitative mathematical modeling of catalytic systems.

Joshua M. Feinberg
Earth and Environmental Sciences
College of Science and Engineering

Understanding the Earth and its environments through the magnetism of natural materials

Joshua Feinberg is a geophysicist who studies the magnetic properties of natural materials to advance understanding of the behavior of the Earth's magnetic field, track environmental change through time, and characterize novel magnetic materials. He combines magnetic methods with field geology and electron microscopy to explore processes that operate on global, tectonic, outcrop, and nanometer scales. Feinberg is also passionate about improving the effectiveness and inclusivity of undergraduate education.

Jasmine Foo
Mathematics
College of Science and Engineering

Mathematical modeling for precision oncology

Jasmine Foo's research focuses on developing mathematical theories that describe the complex processes driving cancer evolution, using probability theory, differential equations and statistics. Her research leverages these results to gain insights into cancer progression, optimal therapy regimens, and personalized treatments. Foo collaborates closely with experimental biologists and clinicians to integrate these mathematical models with clinical and experimental data, with the ultimate goal of improving our understanding of cancer and how to treat it.

Jason D. Hill
Bioproducts and Biosystems Engineering
College of Food, Agricultural and Natural Resource Sciences

Sustainability of food and energy systems

Jason Hill seeks to understand the environmental impacts of our food and energy systems, and to find ways of making them more sustainable. He takes a life cycle perspective in exploring effects on climate change and air quality in the United States and globally. His work on these topics—and on biofuels, greenhouse gas accounting, and environmental justice—have been used to inform consumers and policymakers on how to move toward a more sustainable future.

R. Stephanie Huang
Experimental and Clinical Pharmacology
College of Pharmacy

Finding better ways to treat cancer while reducing toxicity through computational drug repurposing

Ineffectiveness and/or severe toxicity are commonly associated with cancer therapy. Stephanie Huang is an international leader in the field of pharmacogenomics of anticancer therapy. She develops novel models to translate complex cancer molecular profiles to therapeutic decisions. Her work enables the identification and repurposing of efficacious drugs to treat cancers and tailor therapy to the right patients. The net result is faster, less costly development of more effective, less toxic anticancer medications.

Ronald R. Krebs
Political Science
College of Liberal Arts

Rhetoric, narrative, and the politics of national security

Rhetorical battles over national security are not a sideshow diverting attention from the "real" drivers of policy. Ron Krebs' award-winning research has uncovered how language in its various forms, from rhetorical tropes to dominant narratives, shapes the politics of national security. His research into the origins of national security policy, grand strategy, the effects of war on democracy, and militarism—among many other substantive questions—has shown that language is power politics.

Nathan Kuncel
Psychology
College of Liberal Arts

What leads to success in school, work, and life and how do we measure it accurately?

Nathan Kuncel has substantially widened and deepened our understanding of how personal characteristics affect success in school, work, and life in general. At the same time, he has demonstrated that many common practices in admissions and hiring are both ineffective and biased, which has led to identifying better practices in these two critical domains.

Chad L. Myers
Computer Science and Engineering

College of Science and Engineering

Computing on genetic networks to chart the rules of life

Chad Myers's research focuses on developing data mining and machine learning methods for analyzing large-scale genomic data to understand how genes function, and more broadly, how biological systems are organized. His lab has developed approaches for mapping, analyzing and integrating biological networks to answer questions in a variety of systems from yeast to humans. Myers's work has advanced our understanding of how genome variation affects traits.

Eric W. Seabloom
Ecology, Evolution and Behavior
College of Biological Sciences

Securing the University of Minnesota as an international center of excellence in ecology

Eric Seabloom is an internationally recognized plant ecologist who has helped to establish how anthropogenic increases in nutrient availability affect biological invasions, ecosystem productivity, and other ecological processes. His leadership of local field stations and international networks of field sites has helped to secure the University of Minnesota in the top three universities internationally in the field of ecology.

Changquan Calvin Sun
Pharmaceutics
College of Pharmacy

Materials science and engineering for improved pharmaceuticals

Changquan Calvin Sun advances the science and technology required to develop and manufacture high quality tablet products to promote the health and well-being of society. By introducing new characterization tools and applying integrated crystal and particle engineering techniques, he has solved several long-standing problems in tablet manufacturing. Sun is known for his transformative and systematic work leading to the efficient design of high quality and low cost medicines.