Infectious Disease Overview

Discovery Themes at The Ohio State University
BOLD.
ENGAGED.
DISRUPTIVE.
CATALYZING.
INNOVATIVE.
PARTICIPATORY.
LIFE-CHANGING.
COLLABORATIVE.
SOLUTIONS-ORIENTED.
Introducing **Discovery Themes**

Our world faces grand and complex challenges. Solutions are hard to come by and require brilliant and bold thinking—collaborating across all disciplines as never before.

To find durable solutions to the most compelling issues, The Ohio State University has launched Discovery Themes, a significant investment in three thematic areas in which the university will make a global impact:

**Energy and Environment:** Ohio State faculty from virtually every specialization are working together and with experts beyond the university to lead the way in developing scientific and policy responses to the global need for energy and the associated effects on the environment.

**Food Production and Security:** Experts in food, agricultural and environmental sciences as well as business, health sciences, law and other areas are working to enhance the quality of food and animal feed and ensure an adequate, affordable and safe food supply for the global population.

**Health and Wellness:** Ohio State is the only university with seven health sciences colleges and an academic medical center. This concentration of health experts and their collaboration with colleagues throughout the university creates critical mass to address issues such as disease prevention and response, community health, and health systems.

As the nation’s most comprehensive university, Ohio State is able to develop solutions as global as the challenges they answer. The solutions have many dimensions—technology, logistics, ethics, policy and more. They require sophistication in focus and a collaborative approach to be effective—to produce translatable results while also building new knowledge and educating the problem-solvers of tomorrow.
Infectious diseases are a leading cause of mortality worldwide and a major threat to our food supply and natural resources—particularly with the emergence of new and invasive pathogens. Ohio State is prepared to make the prevention, detection and management of infectious diseases a priority as a part of its Discovery Themes initiative.

Through an unprecedented investment, the university seeks to hire numerous new key faculty—both up-and-coming and senior faculty at the tops of their fields—to work alongside Ohio State’s 180+ renowned infectious disease faculty and research teams. This new group of experts will represent 22 disciplines, spanning human, animal and plant health and organize their focus within five areas: antibiotic discovery and optimization; treatment and prevention of emerging viruses; immunity to pathogens and other microbial communities; pathogen emergence; and social networks and health policy.

Together, researchers will work to understand the interactions among hosts, pathogens and the environment that result in disease, including drivers of pathogen evolution and antimicrobial resistance, animal reservoirs, host range and immunity, as well as the impacts of infectious diseases on natural and agroecosystems and a sustainable food, fiber and biofuel supply.

Drawing on the successes of Ohio State’s existing Public Health Preparedness for Infectious Disease program (phpid.osu.edu) and support from other Ohio State groups, centers and industry partners, this project will continue to transform Ohio State into a world leader in infectious disease research, leading to new discoveries and real-world solutions that will improve the health of people and ecosystems across the globe.

**Emergence, Surveillance and Predictive Modeling**

- Emerging viruses
- Emerging viruses at the human-animal interface
- Molecular epidemiology – zoonoses
- Medical entomology
- Emerging infectious disease ecology, disease ecology
- Ecosystem health
- Predictive ecosystem modeling
- Evolutionary biology
- Virus discovery
- Biosensors
Infectious Disease Detection, Treatment and Prevention
 Emergence, Surveillance and Predictive Modeling

Emerging viruses
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Emerging infectious disease ecology, disease ecology
Ecosystem health
Predictive ecosystem modeling
Evolutionary biology
Virus discovery
Biosensors

Antibiotic pharmacology
Drug discovery – viruses, bacteria, protozoa
Drug resistance
Drug delivery systems
Vaccinology, animal models
Adaptive immunity: host genetics and microbiomes
Immunity to viruses
Immunity to fungi, intracellular bacteria and protozoa

Social networks
Health policy
Systems biology – therapeutic leads
Ohio State is a dynamic community of incredibly diverse people and resources. With the world-class Wexner Medical Center, 15 colleges and 210 academic centers and institutes, the university offers students, faculty, staff and communities a tremendous scope and depth of opportunity across various fields and professions.

Our university is the only one in the U.S. that convenes all seven health science colleges, as well as the College of Food, Agricultural, and Environmental Sciences, on one walkable, easily navigable campus. Experts in hundreds of disciplines exist in close proximity and embrace the type of transdisciplinary collaboration that is required for meaningful discovery.

Researchers in the infectious disease arena at Ohio State are members of numerous multi- and interdisciplinary Board of Trustees-approved centers, including the Center for Microbial Interface Biology (cmib.osu.edu), the Ohio Agricultural Research and Development Center (oardc.osu.edu), the Center for Retroviral Research (vet.osu.edu/retrovirus-research), the Center for Applied Plant Sciences (caps.osu.edu), and Nationwide Children’s Hospital Center for Microbial Pathogenesis (nationwidechildrens.org/microbial-pathogens).

Our faculty utilize state-of-the-art resources that maximize their ability to drive innovation, including:

- Campus Chemical Instrumentation Center
- Comprehensive Cancer Center Shared Resources
- Ohio Supercomputer Center
- Data Analytics Collaborative (also part of the Discovery Themes initiative)
- Select Agents BSL3 facilities
- Plant Microbe Genomics Facility
- Plant and Animal Agrosecurity Research Facility
- Drug Discovery Institute
- Technology Commercialization Office
- Industry Liaison Office
- And more...
Ohio State is creating the 21st-century university of the future through our Discovery Themes, as we seek solutions to our world’s most pressing challenges at one of the nation’s most comprehensive research universities.

In addition to their academic potential and demonstrated successes, the faculty who join our ranks through Discovery Themes will be notable for their commitment to inclusion; collaboration with other faculty, external partners and industry; and diversity. Along with our current faculty experts, they will discover and apply new knowledge to enhance the university’s teaching, research and outreach.

And as they pioneer new theories, applications and approaches that accelerate discovery, this larger critical mass of faculty will create the solutions-based university of the future, at Ohio State.

For more information about opportunities in Infectious Disease Detection, Treatment and Prevention, please visit go.osu.edu/DTInfectiousDiseases.

JOIN THE DISCOVERY THEMES CONVERSATION

DiscoveryThemes  @DiscoveryOSU  http://go.osu.edu/q7Z

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Learn more about how Ohio State is changing the world at discovery.osu.edu.