



News



News

[News From the Field](#)

[For the News Media](#)

[Special Reports](#)

[Research Overviews](#)

[NSF-Wide Investments](#)

[Speeches & Lectures](#)

[NSF Current Newsletter](#)

[Multimedia Gallery](#)

[News Archive](#)

News by Research Area

[Arctic & Antarctic](#)

[Astronomy & Space](#)

[Biology](#)

[Chemistry & Materials](#)

[Computing](#)

[Earth & Environment](#)

[Education](#)

[Engineering](#)

[Mathematics](#)

[Nanoscience](#)

[People & Society](#)

[Physics](#)

Press Release 09-191

Ecology of Infectious Disease Grants Awarded by NSF, NIH

Researchers will study links among spread of infectious diseases, global warming and other environmental changes



Trapping and testing rodents is important to understanding transmission of leptospirosis.
[Credit and Larger Version](#)

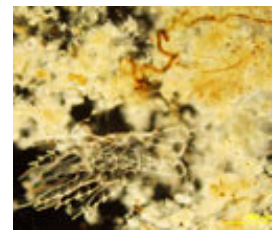
October 7, 2009

The spread of malaria to formerly disease-free regions like East Africa's highlands, H1N1, the "swine flu," and the specter of its appearance around the globe. Lyme disease in the eastern U.S. and its transmission in a global warming world.

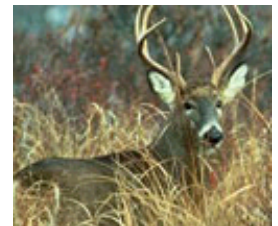
To better understand the ecological mechanisms that govern relationships between human-induced environmental changes and the emergence and transmission of infectious diseases, the National Science Foundation (NSF) and National Institutes of Health (NIH) have awarded 10 grants through the Ecology of Infectious Diseases (EID) program. It is the tenth year of funding in the joint NSF-NIH program.

Interdisciplinary projects funded through the EID program will study how large-scale environmental events--such as habitat destruction and global warming--alter the risks of viral, parasitic and bacterial diseases in humans and animals.

"Unprecedented rates of change in biodiversity have coincided with the emergence and re-emergence of numerous infectious diseases around the world," says Sam Scheiner, EID program director at NSF, which funds the program through its directorate for biological sciences and directorate for geosciences. "We have to get a handle on why--and how."



Harmless it's not: marine snow in estuaries and oceans often carries pathogens.
[Credit and Larger Version](#)



Chronic wasting disease (CWD) affects deer and elk and is related to mad cow disease.
[Credit and Larger Version](#)



Blacklegged ticks--key carriers of Lyme disease--are tiny menaces.
[Credit and Larger Version](#)



Michigan State researchers Sarah Hamer and Chris Neibuhr look for ticks on wild deer mice.
[Credit and Larger Version](#)

The benefits of EID research include: development of disease transmission theory; improved understanding of unintended health effects of development projects; increased capacity to forecast outbreaks; and insights into how infectious diseases emerge and re-emerge.

"The need is being driven by the increased pace of climate change coupled with society's greater global mobility," says Josh Rosenthal, program director at NIH's Fogarty International Center, which co-funded the research.

Human infection with *Leptospira*, for example, can occur after contact with infected animals or with a contaminated environment, says Claudia Munoz-Zanzi of the University of Minnesota, an EID grantee. It's usually associated with agricultural practices, contamination of household or recreational water, poor housing and waste disposal, or changes in the density or proximity of infected animals such as rodents, domestic animals and wildlife. Munoz-Zanzi will study the ecological and sociological elements that influence human infection in rural, peri-urban and urban communities in Latin America to identify intervention strategies for reducing the disease's impact on human health.

Fred Dobbs, Maille Lyons and colleagues at Old Dominion University and other institutions will look at "marine snow" (organic detritus in oceans and estuaries) to investigate its role in the persistence of aquatic pathogens, or disease-causing organisms. The concepts of island biogeography may apply to bacterial pathogens in aquatic environments, the scientists believe, especially to those disease-causing organisms that flow from point sources of pollution and are subsequently incorporated into aggregates of marine snow. These "microscopic islands" may carry pathogens as they're transported in currents. Among the team's goals is improving decisions made by water-quality managers about opening or closing beaches and shellfish beds.

Chronic wasting disease, or CWD, affects members of the deer family. CWD is similar to diseases like mad cow disease--or bovine spongiform encephalopathy--in cattle. It's caused by misfolded proteins that resist breakdown by enzymes within cells. These proteins cause fatal neurological damage. Understanding and managing CWD depends on developing predictive models that track how the disease spreads. Biologist Tom Hobbs of Colorado State University will model the impact of CWD on deer populations in an effort to better understand the dynamics of the disease's transmission. CWD is an important challenge for managing wildlife resources in Colorado, says Hobbs.

This year's awards will address:

- Ecological dynamics of bacterial pathogens: transmission of virulence factors (Jim Bever, Indiana University)
- Spatial modeling of onchocerciasis foci in Africa by remote sensing (Thomas Unnasch, University of South Florida)
- Linking host behavior to disease transmission in the ranavirus-salamander system (Jessie Brunner, SUNY College of Environmental Science and Forestry)
- Island biogeography and aquatic pathogens colonizing marine aggregates (Fred Dobbs, Old Dominion University)
- Bayesian hierarchical modeling of disease dynamics: a case example using chronic wasting disease (Tom Hobbs, Colorado State University)
- Transmission of infections by intermittently shed pathogens with environmental persistence (Renata Ivanek Miojevic, Texas Agricultural Experiment Station)
- Eco-epidemiology of leptospirosis in Latin America (Claudia Munoz-Zanzi, University of Minnesota)
- The role of environment and direct transmission in chronic wasting disease dynamics (Michael Samuel, University of Wisconsin-Madison)

- Quantifying the influence of environmental temperatures on transmission of vector-borne diseases (Matthew Thomas, Penn State University)
- Gradients in Lyme disease in the eastern U.S. (Jean Tsao, Michigan State University)

-NSF-

Media Contacts

Cheryl Dybas, NSF (703) 292-7734 cdybas@nsf.gov
Ann Puderbaugh, NIH (301) 402-8614 puderba@mail.nih.gov

Related Websites


NSF Ecology of Infectious Diseases Program:
http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5269
NIH Ecology of Infectious Diseases Initiative:
http://www.fic.nih.gov/programs/research_grants/ecology/
Ecology of Infectious Diseases: An NSF Special Report:
http://www.nsf.gov/news/special_reports/ecoinf/index.jsp

The National Science Foundation (NSF) is an independent federal agency that supports fundamental research and education across all fields of science and engineering. In fiscal year (FY) 2009, its budget is \$9.5 billion, which includes \$3.0 billion provided through the American Recovery and Reinvestment Act. NSF funds reach all 50 states through grants to over 1,900 universities and institutions. Each year, NSF receives about 44,400 competitive requests for funding, and makes over 11,500 new funding awards. NSF also awards over \$400 million in professional and service contracts yearly.

 [Get News Updates by Email](#)

Useful NSF Web Sites:

NSF Home Page: <http://www.nsf.gov>
NSF News: <http://www.nsf.gov/news/>
For the News Media: <http://www.nsf.gov/news/newsroom.jsp>
Science and Engineering Statistics:
<http://www.nsf.gov/statistics/>
Awards Searches: <http://www.nsf.gov/awardsearch/>

 [Print this page](#)

[↑ Top](#)

[Web Policies and Important Links](#) | [Privacy](#) | [FOIA](#) | [Help](#) | [Contact NSF](#) | [Contact Webmaster](#) | [SiteMap](#)



The National Science Foundation, 4201 Wilson Boulevard, Arlington, Virginia 22230, USA
Tel: (703) 292-5111, FIRS: (800) 877-8339 | TDD: (800) 281-8749

Last Updated:
October 7, 2009
[Text Only](#)

Last Updated: October 7, 2009