Immune, Infectious, and Dermal Disease Prevention Program

What are our priorities?

The National Institute for Occupational Safety and Health (NIOSH) Immune, Infectious, and Dermal Disease Prevention Program works with partners in industry, labor, trade associations, professional organizations, and academia. The program focuses on these areas:

- Reducing immune abnormalities (including immune aspects of asthma) associated with workplace exposures.
- Reducing work-place skin disorders and exposures that result in disease.
- Identifying and reducing exposure and transmission of infectious diseases in the workplace.

What do we do?

- Conduct research to better understand the impact and basic mechanisms of work-place exposures on the immune system, including exposures to chemical, biological, or infectious agents.
- Improve surveillance and statistical modeling for hazard identification, exposure assessment, and risk characterization of chemicals absorbed through the skin that lead to immune or systemic toxicity (e.g., damage to internal organs).
- Identify and increase awareness of work-place immune and dermal health hazards through collaborations with NIOSH sector programs, contributions to field investigations and dissemination of research findings.
- Conduct investigations and provide evidence-based guidance on prevention measures for employers and workers to reduce transmission of infectious disease in the workplace.
- Publish Skin Notation (SK) Profiles, hazard warnings used worldwide, to alert workers and employers to the health risks of skin exposures to workplace chemicals.

What have we accomplished?

- Updated a fact sheet on protecting workers from histoplasmosis, an infection caused by the *Histoplasma* fungus, which is often present in agricultural and construction environments.
- Published research on the systemic toxicity induced by dermal exposure to perfluoroalkyl substances (PFAS).
- Published research on the reduction of exposure to simulated respiratory aerosols using ventilation, physical distancing, and universal masking, which demonstrated that a layered mitigation approach composed of engineering and administrative controls remains important in reducing transmission in indoor spaces.
- Published research about the association of the abundant indoor yeast species *Vishniacozyma victoriae* in the homes of asthmatic and non-asthmatic children.

What's next?

- Investigate the effects of dermal exposure to PFAS on the immune system using animal models.
- Conduct research on how exposure to disinfectants used during the COVID-19 pandemic affect the immune system.
- Investigate and publish research on how air purifiers can mitigate the spread of COVD-19 aerosols.
- Assist with planned updates to national guidelines for isolation precautions and prevention of infectious disease transmission in healthcare settings.
- Conduct studies to study the signs of disease involved in the immune response to the fungi *Stachybotrys chartarum* and *Aspergillus versicolor* exposure.

Centers for Disease Control and Prevention
National Institute for Occupational Safety and Health

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At-A-Glance

The Immune, Infectious, and Dermal Disease Prevention Program primarily focuses on hazard identification to prevent and minimize the effects of work-related dermal, infectious and immune diseases. This snapshot shows recent accomplishments and upcoming projects and activities.

Systemic toxicity induced by topical application of heptafluorobutyric acid (PFBA) in a murine model

Photo: Port of Seattle Fire Department

PFAS is often a component of Aqueous Film Forming Foam (AFFF), a class B firefighting foam used for suppression of liquid fuel fires.

Publication Spotlight: Histoplasmosis Fact Sheet

To learn more, visit
www.cdc.gov/niosh/programs/idid
September 2022

The National Institute for Occupational Safety and Health (NIOSH)

CDC Centers for Disease Control and Prevention

Promoting productive workplaces through safety and health research NIOSH

Immune, Infectious and Dermal Disease Prevention Program

Updated April 4, 2022

The Immune, Infectious, and Dermal Disease Prevention Program works with outside partners in industry, labor, trade associations, professional organizations, and academia to reduce the incidence of immune, infectious, and dermal diseases associated with workplace exposures.

Featured Items

New Resources: Understand and Prevent Work-related Histoplasmosis

NIOSH recently released new resources for employers and workers with information needed to understand and prevent work-related histoplasmosis in the United States. The new webpage and fact sheets can help readers understand what histoplasmosis is, to recognize activities that might expose them to *Histoplasma*, and to protect themselves from exposure. Visit the NIOSH Histoplasmosis webpage to learn more.

- Histoplasmosis is an infection caused by a fungus called *Histoplasma*. The fungus lives in the environment, particularly in soil that contains large amounts of bird or bat droppings.
- In areas where *Histoplasma* is common, people who work in construction, demolition, and extraction occupations and in agriculture and forestry industries may be at higher risk for histoplasmosis.

Description

Occupational immune, infectious, and dermal diseases are some of the most common illnesses that affect workers in the United States. Immune dysfunction includes inflammation, allergy, suppression, or autoimmune responses following exposure in the work environment. Infectious agents are organisms that are capable of producing infection or infectious disease. They include bacteria, fungi, viruses, and parasites. Dermal diseases are caused by chemicals that enter the body through the skin and injure individual organs or groups of organs.

The Immune, Infectious, and Dermal Disease Prevention (IID) Program conducts research to better understand the impact of occupational exposures to chemical, biological, or infectious agents. New occupational hazards continue to emerge and require characterization to better understand the nature and magnitude of their effects on the body.

Therefore it is critical that we understand the biological mechanisms that cause or worsen immune, infectious and dermal diseases. Specific understanding of mechanisms allows occupational safety and health professionals to develop appropriate intervention and prevention strategies.

Research Priorities

The IID Program has selected research priorities on the basis of burden, need, and impact and collaborated with other NIOSH research programs to write research goals included in the NIOSH Strategic Plan for FYs 2019-2024. The priority areas of IID research include:

- Among agriculture workers, reduce skin exposure to pesticides and as well as infectious disease spread between humans and animals
- Reduce infectious disease transmission and chemical exposures that contribute to immune diseases among healthcare and social assistance workers
- Reduce exposures that contribute to immune diseases among manufacturing workers
- Prevent hazardous dermal exposures among oil and gas extraction workers
- Reduce infectious disease transmission and dermal exposure to illicit drugs among public safety workers
- Reduce exposures that contribute to immune diseases among services workers

Accomplishments

The IID Program Performance One-Pager (PPOP) offers a snapshot of IID's priorities, strategies used to make progress towards priorities, recent accomplishments, and upcoming work.

To learn more

Resources and Topic Pages

Learn more about immune, infectious, and dermal diseases using the links below.

Occupational immune diseases are some of the most common illnesses that affect workers in the United States. Among the most common is work-related asthma. Over 300 known or suspected substances in the workplace can cause or worsen asthma. Indoor environmental quality impacts occupational immune diseases, as does the presence second hand tobacco smoke in the workplace. Nail technicians and dry cleaning workers in particular are exposed to chemical agents that can cause allergic disease.

Occupational infectious diseases can occur from other humans, animals, or the environment and can occur in various occupations and industries. Examples include COVID-19, avian and seasonal influenza, bloodborne infectious disease (HIV, Hepatitis B and C) and mosquito-borne diseases. Healthcare workers, laboratory workers, and animal workers are at high risk of contact with infectious agents.

Dermal, or skin, diseases can take different forms, such as a rash caused by skin irritation or allergies (contact dermatitis), skin cancers, and skin infections. Learn more about skin exposures and effects.

NORA Council

The IID Program helps lead the NORA Immune, Infectious and Dermal Disease Prevention Council, which brings together individuals and organizations to share information, form partnerships, and promote adoption and dissemination of solutions that work. The council seeks to facilitate the most important research, understand the most effective intervention strategies, and learn how to implement those strategies to achieve sustained improvements in workplace practice. The final version of the research agenda for the IID Council can be found here.

Contact

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Page last reviewed: April 4, 2022, 10:30 AM