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Fungi the Cause of Many Outbreaks of Disease but Mostly Ignored
Report Calls for New Resources for Studying Fungi That Impact Human Health and
Agriculture

Washington, DC – June 24, 2008 – Fungi can cause a number of life-threatening diseases but they also are becoming increasingly useful to science and manufacturing every year. However, many people, scientists among them, are largely unaware of the roles fungi play in the world around us. Research on fungi and fungal diseases are seriously neglected as a result – a situation with grave negative repercussions for human health, agriculture, and the environment-- according to *The Fungal Kingdom: Diverse and Essential Roles in Earth's Ecosystem*, a new report from the American Academy of Microbiology.

The report is the product of a colloquium convened by the Academy in November, 2007, where experts in mycology, medicine, plant pathogens, and ecology discussed the current state of research in mycology and compiled a list of specific recommendations for future work.

“The average person is at risk for several fungal diseases, from toenail infections to athlete’s foot to life threatening systemic infections,” says Arturo Casadevall of the Albert Einstein College of Medicine and one of the co-chairs of the colloquium. “Fungi may also predispose people to asthma and allergic diseases,” says Casadevall. Despite the frequency of fungal infections, according to the report they are relatively understudied, making fungal infections difficult to diagnose and treat. When faced with an undiagnosed fungal infection, doctors are forced to treat their patient without a firm grasp of which drugs will work and which drugs will only cost the patient valuable time.

But fungi are more than just a medical problem: as the cause of more than half of all plant diseases, fungi are also an expensive drain on agriculture. The economic repercussions of managing fungal pathogens on crops – the money and effort spent, the numerous pesticide applications, the consequences of these applications for surface water and soil quality, and the impacts on crop yields – are extraordinary.



In the environment, fungi are not seen as a liability but as an integral part of their ecosystems. They break down dead plants and animals (organic matter) into the building blocks plants need for growth and they engage in beneficial symbiotic relationships with plants, all functions necessary for maintaining healthy ecosystems. When an ecosystem is disturbed, fungi can behave in unexpected and often destructive ways, as in the case of the black mold that is overrunning the areas surrounding the Chernobyl nuclear power plant in Ukraine and outbreaks of coral bleaching that are destroying coral reefs. Scientists still do not understand fungi well enough to predict how these organisms will behave when their environment is disturbed.

Industry and food manufacturing benefit in many ways from the work fungi do. “Fungi are workhorses for research and biotechnology,” according to Joseph Heitman of the Duke University Medical Center, the other co-chair of the colloquium. “Both the hepatitis B vaccine and Gardasil (the vaccine for papilloma virus) are produced in yeast,” he notes.

The importance of fungi to human health, agriculture, the environment, and industry demands that we gain a better understanding of these organisms. Some of the report’s key recommendations include:

- Evaluate the Impacts of Mold in Homes and Businesses

There is a serious lack of scientific data to support any stance with respect to indoor mold toxicity or remediation. More effort should be devoted to testing and long-term monitoring of mold contamination and human health in New Orleans and other areas flooded by Hurricane Katrina. Natural disasters like Hurricane Katrina provide natural laboratories for understanding how fungi respond to disturbance and the subsequent impacts they have on human health.

- Create a Fungal Genomes Database

Researchers involved with fungi must focus efforts on developing a comprehensive fungal genomics database in order to make the vast quantities of sequence data more available and to enable the field to fully capitalize on the promise of genomics.

- Report and Track Fungal Infections

Public health agencies should implement formal programs to report cases, track disease progress, and design interventions in outbreaks of fungal disease. The lack of reporting and tracking systems has made it difficult to control the spread of fungal pathogens, because good epidemiological data on the scope of infection is usually not available.

A full copy of the report and further recommendations can be found on the Academy website at www.asm.org/colloquia/ext.

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The American Academy of Microbiology is the honorific leadership group of the American Society of Microbiology. The mission of the Academy is to recognize scientific excellence, as well as foster knowledge and understanding in the microbiological sciences. For more information about the American Society for Microbiology, contact Barbara Hyde at 202-942-9206 or visit www.asm.org.