



Aerobiology Instruction and Research

Introductory Fungal Spore Identification

Including Information on Bioaerosol Samplers

A 4-Day Workshop

Amherst, Massachusetts
11 – 14 March 2019

Faculty:

Michael L. Muilenberg, M.S. (director)
Christine A. Rogers, Ph.D., CIH.



Organized by A.I.R., LLC



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Introduction

The ability to visually identify airborne fungal spores is a highly specialized skill. It takes commitment and time in order to develop the competence to accurately identify the wide variety of airborne spore types and differentiate them from other biological and non-biological particles. Our experience in managing pollen and spore certification programs has shown us that individuals gain greater competence in a shorter amount of time if they are given intensive instruction in both the biological aspects and hands on technical skills required for identification. We therefore offer this workshop which will be conducted over 4 days to allow ample time to describe and demonstrate a variety of spore types, as well as allow registrants to scan and identify these particles from air sample slides and tape samples. There will be ample time to address any questions about spore identification as well as sampling instruments.

A microscope will be provided to each participant for their use during the identification workshop. Participants are also encouraged to bring their own sample “unknowns” (air samples or bulk samples) for assistance with identification.

Workshop Description – Introductory Fungal Spore Identification (4 days)

This course is designed to help the “novice” fungal spore analyst learn necessary aeromycological fundamentals, including: microscopy, fungal reproduction, spore morphology, and learn to identify common spore types. The workshop is geared toward beginners but will also allow those who have identified spores for longer periods to expand their knowledge and improve their skills. Registrants will learn to identify characteristics of a number of ascospores, basidiospores, and mitospores (asexually formed spores). In addition to identification, aerobiological aspects will also be discussed (concentrations, seasonality, etc.). The bioaerosol sampler portion of the workshop will concentrate on Hirst-type Sampler (Burkard spore traps), Air-O-Cells and other impaction-type spore traps. Topics covered will include: set up of the samplers, application of adhesives to impaction surfaces (Burkard slides, or drums), mounting the recoveries for microscopic analysis, counting particles and reporting data,

as well as maintenance of the equipment. Instruction will be in the form of lecture, demonstration, and individual study of reference material and actual air-sample slides. This intensive four-day workshop has been expanded from its original 2.5 day format to allow additional time for reinforcement of recognition skills, review, and more one-on-one instruction.

Upon completion of the introductory workshop, participants will have the necessary skills to set up and operate different types of bioaerosol sampling equipment and be familiar with the advantages and disadvantages of each, prepare samples for analysis, accurately count and identify a variety of spore types, and calculate airborne concentrations. These skills will be useful for those intending to analyze, monitor, or study indoor or outdoor airborne spore concentrations.

Faculty: Dr. Rogers and Mr. Muilenberg are partners of Aerobiology Instruction and Research, LLC, (A.I.R.).

Michael L. Muilenberg, M.S. (director). Mr. Muilenberg is a former Research Assoc. and Instructor at Harvard T.H. Chan School of Public Health, and a former Senior Research Fellow at UMass School of Public Health. He has extensive experience in the set-up, operation, evaluation, and theory of aerobiological sampling equipment. He is a partner in A.I.R. and has broad knowledge of both pollen and fungal spore identification and has taught pollen and fungal spore identification workshops for 35 years, including for the Am. Academy of Allergy Asthma and Immunology (AAAAI), the American College of Asthma Allergy and Immunology (ACAAI), the University of Michigan Medical School, the Pan-American Aerobiology Association, McCrone Research Institute, Louisiana State University Health Science Center, and with other organizations. He was in charge of the quality control portion of the AAAAI Network for over 10 years, is currently Sec/Treas (and former Pres.) of the Pan-American Aerobiology Assoc., and is on the Board of Directors of the PanAmerican Aerobiology Certification Board, a program to certify spore analysts.

Christine A. Rogers, Ph.D., CIH, (faculty). UMass Asst. Dir. Academic Safety and Environmental Health. Dr. Rogers studied temporal and spatial aspects of airborne pollen and pollen forecasting for her doctorate at the University of Toronto and has been counting and identifying airborne particles since 1985. She is a partner in A.I.R. and has taught pollen identification at the AAAAI and ACAAI Aeroallergen Identification Workshops for several years. She joined the group at Harvard School of Public Health in 1998 and took a leading role in the Aeroallergen Network quality control program. She is currently Associate Director, Academic Safety and Environmental Health at University of Massachusetts and is a Certified Industrial Hygienist (CIH). She is a past President of the International Association for Aerobiology, current the President of the Pan-American Aerobiology Association, and on the Board of Directors of the Pan-American Aerobiology Certification Board.

When

The Workshop will be held Monday, 11 March 2019, beginning at 9:00 a.m., through 3:00 p.m. on 14 March 2019 (Thurs). See the complete schedule below.

Where

The Workshop will be held on the University of Massachusetts campus in the Lincoln Campus Center, 8th Floor (Room 805). For information about the UMass Campus, visit the university website at www.umass.edu. Click on “Visit Campus”, then scroll down to “Detailed Campus Map” to locate the Lincoln Campus Center in the center of the campus.

Registration

The registration fee is \$975 for the Introductory Fungal Spore Identification. In addition to four days of instruction, registrants will receive a syllabus, an informative aeromycology/ID book (*Mycology of the Air*), and a box of reference slides of known fungal spore types. Pre-registration is required and the deadline for registration is 11 February, 2019. Note that we have kept the registration fee the same for the past 6 years; and it is much less than other organizations charge. In addition, and our workshop evaluations are consistently extremely positive.

Accommodations

Please make your own arrangements for accommodations. Unfortunately, no rooms are available on the UMass campus at this time. Hotels are available in Amherst and Hadley within a few miles of the campus; contact the organizers if you would like help in selecting a hotel or bed & breakfast. We might suggest Courtyard Marriott, Howard Johnson, or Holiday Inn Express; all in Hadley, Mass., and a short drive from the UMass campus.

Note that UMass has a smoke-free policy; all public areas and individual work areas are designated non-smoking.

For more information contact Mr. Muilenberg at 617 504-7215 or by email (aerobiology@yahoo.com).

We look forward to hearing from you!

Workshop Schedule

subject to change

Monday, 11 Mar 2019

9:00-9:15	Introductions, Overview
9:15-10:30	.Intro. to fungal taxonomy/morphology
10:30-10:45	Break
10:45-12:00	Differentiating type (including phyla) of fungal spores
12:00-1:15	Lunch
1:15-1:45	Microscope use
1:45-2:30	Reference slides; Identification of common types; Microscopy
2:30-3:30	Mitospores: types of spore formation, morphology
4:00-5:00	Microscopy: mitospore morphology

Tuesday, 12 Mar 2019

9:00-10:30	Microscopy; identifying mitospores on air sample slides
10:30-10:45	Break
10:45-12:00	Principles of airborne particle collection, sampler types. Demos
12:00-1:15	Lunch
1:15- 2:00	Hands-on Experience (prep. of rods, slides, drums, sample processing, etc.)
2:00-2:45	Ascomycetes; morphology, ecology, aerobiology
2:45-3:00	Break
3:00-4:15	Microscopy: ascospore morphology
4:14-5:00	Ascospores on air sample slides; Microscopy
6:30-????	“Banquet”

Wednesday, 13 Mar 2019

9:00-10:00	Basidiomycetes: spore formation, ecology, morphology
10:00-10:15	Break
10:15-11:30	Microscopy: basidiospore morphology
11:30-12:00	Basidiospores on air sample slides; Microscopy
12:00-1:15	Lunch
1:00-2:00	Air sample collection; Air-O-Cell, Allergenco-D, Burkards, etc.
2:00-2:30	Counting methods, calculations from raw counts to particle concentration
2:30-2:45	Break
2:45-4:30	Microscopy – analysis of air sample slides
4:30-5:00	Identification of non-fungal particles

Thursday, 14 Mar 2014

9:00-9:30	Lecture/Microscopy: Basidiomycetes: rusts, smuts
9:30-10:15	Microscopy: identification of spore “unknowns”, air sample slides
10:15-10:30	Break
10:30-11:00	Lecture/Microscopy: Zygomycetes/Oomycetes
11:00-12:00	Microscopy: identification of spore “unknowns”, air sample slides
12:00-1:15	Lunch (on your own)
1:15-1:45	Outdoor fungal concentrations, temporal and spatial variability
1:45-2:45	Quiz (Microscopy)
2:45-3:00	Questions/Discussion; Adjourn



**Introductory Fungal Spore ID/Bioaerosol Sampler Workshop
(11 – 14 March 2019)**

Registration Form (registration deadline, 11 Feb 2019)

Name: _____ Telephone: _____

Affiliation: _____ FAX: _____

Address: _____ email: _____

City: _____

State/Province: _____

Country: _____ Postal Code: _____

Number of months experience counting: fungal spores? _____,

Where will you be staying during the Workshop?: _____

Intro Fungal Spore Identification Bioaerosol Sampler – 4 days (\$975): _\$ _____

Total Enclosed: _____ \$ _____

Make check or money order payable to **Aerobiology Instruction & Research, LLC**.

Send this form, along with a check, to: Aerobiology Instruction and Research, LLC
P.O. Box 45
Amherst, MA 01004 USA

If you need additional information, telephone Michael Muilenberg at 617 504-7215 (cell)
email: aerobiology@yahoo.com