

2nd FDLC/ATLAS Course in Clinical Fungi

Organized by FDLC (Fungal Diagnostic Laboratory Consortium), Foundation Atlas of Clinical Fungi, Radboud University Medical Center, Nijmegen, Netherlands, and Mayo Clinic, Rochester, Minnesota, USA

September 23 – 28, 2024, Mayo Clinic, Rochester, Minnesota, USA

Morning sessions: 8:30a-12:45p (except Monday and Tuesday morning starts at 8:00);
afternoon sessions: 1:45-5:15p. Lectures are maximally 45-60 min with 15 min break.

Course Directors:

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| Sean Zhang | Johns Hopkins Hospital/Johns Hopkins School of Medicine, USA |
| Sybren de Hoog | Center of Expertise in Mycology of RadboudUMC, Nijmegen, The Netherlands |
| Paschalis Vergidis | Mayo Clinic, USA |
| Nancy Wengenack | Mayo Clinic, USA |

Course Faculty:

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| Barbara Alexander | Duke University Medical Center |
| Esther Babady | Memorial Sloan Kettering Cancer Center |
| Avrom Caplan | New York University Grossman School of Medicine |
| Kimberly Hanson | ARUP |
| Shawn Lockhart | CDC Mycotic Diseases Branch |
| Hong Nguyen | University of Pittsburgh Medical Center |
| Andrew Norgan | Mayo Clinic |
| Gary Procop | American Board of Pathology |
| Elitza Theel | Mayo Clinic |
| Roxana G. Vitale | CONICET (Consejo Nacional de Investigaciones Científicas y Tecnológicas), Hospital JM Ramos Mejía, Buenos Aires, Argentina |
| Thomas Walsh | Center for Innovative Therapeutics and Diagnostics |
| Nathan Wiederhold | Fungus Testing Laboratory, University of Texas San Antonio |

Technical and Administrative Assistance:

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| Susan Reigel | Administrative Assistance, Mayo Clinic |
| Heather Schultz | Administrative Assistance, Mayo Clinic |
| Melissa Frechette | Teaching Assistance, Mayo Clinic |
| Amber Milone | Teaching Assistance, Mayo Clinic |
| Warda Memon | Teaching Assistance, Johns Hopkins Hospital |
| Rachel Green | Teaching Assistance, Johns Hopkins Hospital |
| Xin Zhou | Teaching Assistance, Center of Expertise in Mycology of RadboudUMC, Nijmegen, The Netherlands |

Venue:

Mayo Clinic, Rochester, Minnesota, U.S.A.

Costs and requirements:

The course fee for 6 full days course is US\$ 1,000, including breakfast, luncheons, coffee/tea with snacks/cookies during breaks, and a course reception/dinner on Tuesday evening. The course materials are based on the Atlas of Clinical Fungi (by Sybren de Hoog, Josep Guarro, ..., and Roxana Vitale, which can be purchased at <https://www.atlasclinicalfungi.org/> and includes an electronic searchable version). Please bring your laptop and a lab-coat.

Provisional program:

Monday (9/23): The fungal Kingdom; Introduction

7:15 am: Registration and Breakfast

Lectures: 8:00-9:35a and 9:45a-12:45p (4.5 hours)

- 8:00-8:05: Course Directors: Welcome & Introduction.
- 8:05-9:05: **Sybre de Hoog**: General taxonomy; life cycles; pleomorphism, nomenclature
- 9:05-9:35: **Sybre de Hoog**: Fungal diseases of animals & Zoonoses
- 9:35-10:30: **Thomas Walsh**: The host, who are at risk for fungal diseases?
- **10:30-10:45: Break**
- 10:45-11:45: **Sybre de Hoog**: Introduction to Atlas of Clinical Fungi; diagnostic keys
- 11:45-12:45: **Sybre de Hoog**: Taxonomy and solutions for nomenclatural stability.

Lunch: 12:45-1:30p

Lectures: 1:30-3:00p and 3:15-5:30p (3.5 hours)

- 1:30-2:00: **Nancy Wengenack**: Principles and procedures for detection and culture of fungi in clinical specimens
- 2:00-2:30: **Sybre de Hoog**: Introduction to microscopic methods.
- 2:30-3:00: **Sean Zhang**: Direct microscopic examination on clinical specimens
- **3:00-3:15: Break**
- 3:15-4:15: **Nathan Wiederhold**: Practice of antifungal testing, PK/PD of antifungals, antifungal Therapeutic Drug Monitoring
- 4:15-5:15: **Shawn Lockhart**: Antifungal drug acquired and intrinsic resistance.

Tuesday (9/24): Mucorales and Entomophthorales & Eurotiales

7:15 am Breakfast

Lectures: 8:00-10:00a and 10:15a-12:45p (4.5 hours)

- 8:00-9:00: **Sybre de Hoog**: Taxonomy of the Mucorales and Entomophthorales.
- 9:00-10:00: **Thomas Walsh**: Infections by Mucorales and Entomophthorales.
- **10:00-10:15: Break**
- 10:15-10:30: **Sybre de Hoog**: Short introduction to ascomycetes.
- 10:30-11:00: **Sybre de Hoog**: Conidiogenesis in asexual fungi: hyphomycetes and coelomycetes.
- 11:00-11:45: **Sybre de Hoog**: Taxonomy of Eurotiales: *Aspergillus*, *Paecilomyces*, *Talaromyces*.
- 11:45-12:45: **Barbara Alexander**: Aspergillosis.

Lunch: 12:45-1:45p

1:00-1:15 OPTIONAL Non-CME Product Theater: Pearl Diagnostics

1:25-1:40 OPTIONAL Non-CME Product Theater: T2 Biosystems

Practice: 1:45-3:30pm and 3:45-5:15pm (3.25 hours)

- 1:45-1:55: Introduction: common lab tools and techniques for fungal identification (Rachel Green, Warda Memon)

- 1:55-3:30: Microscopy mucormycetes (*Lichtheimia ramosa*, *Cunninghamella bertholletiae*, *Mucor circinelloides*, *Rhizopus arrhizus*, *Syncephalastrum racemosum*, *Rhizomucor pusillus*).
- **3:30-3:45: Break**
- 3:45-5:15: Microscopy of Eurotiales (*Aspergillus fumigatus*, *Aspergillus terreus*, *Aspergillus calidoustus*, *Paecilomyces variotii*, *Rasamsonia argillacea*, *Talaromyces [Penicillium] purpureogenus*).

7:00: Welcome Dinner – Nathan Landow Atrium

Enter through the east front door of the Gonda building across from the Kahler Grand

Wednesday (9/25): Onygenales

7:45 am Breakfast

Lectures: 8:30-9:45a and 10:00a-12:45p (4 hours)

- 8:30-9:00: **Sybre de Hoog**: Introduction to ecology of primary and opportunistic pathogens
- 9:00-9:45: **Xin Zhou**: Taxonomy and evolution of Arthrodermataceae (dermatophytes).
- **9:45-10:00: Break**
- 10:00-11:00: **Avrom Caplan**: Dermatophyte infections, a Dermatologist's Perspective
- 11:00-11:45: **Sybre de Hoog**: Ajellomycetaceae: agents of systemic mycoses.
- 11:45-12:45: **Paschalis Vergidis**: Coccidioidomycosis, Paracoccidioidomycosis, Blastomycosis, Histoplasmosis, Emergomycosis, Talaromycosis.

Lunch: 12:45-1:45p

1:00-1:15 OPTIONAL Non-CME Product Theater: Bruker

1:25-1:40 OPTIONAL Non-CME Product Theater: Melinta

Practice: 1:45-3:30pm and 3:45-5:15pm (3.25 hours)

- 1:45-3:30: Microscopy Dermatophytes (*Epidermophyton floccosum*, *Microsporum canis*, *Nannizzia gypsea [Microsporum gypserum]*, *Trichophyton interdigitale*, *Trichophyton rubrum*, *Trichophyton tonsurans*, *Trichophyton [Arthroderma] benhamiae*).
- **3:30-3:45: Break**
- 3:45-4:45: Microscopy review of endemic mycoses (*Histoplasma capsulatum*, *Coccidioides immitis/posadasii*, *Blastomyces dermatitidis*).
- 4:45-5:15: **Andrew Norgan**: Histopathology review of endemic mycoses (Histoplasmosis, Coccidioidomycosis, Blastomycosis, Paracoccidioidomycosis, Talaromycosis, Emergomycosis)

Thursday (9/26): Yeasts and Yeast-like fungi

7:45 am Breakfast

Lectures: 8:30-10:30a and 10:45a-12:45p (4 hours)

- 8:30-9:30: **Sybre de Hoog**: Overview of yeasts and yeast-like fungi.
- 9:30-10:30: **Hong Nguyen**: Candidiasis

- **10:30-10:45: Break**
- 10:45-11:45: **Kimberly Hanson**: Cryptococcosis
- 11:45-12:45: **Esther Babady**: Pneumocystis

Lunch: 12:45-1:45p

1:00-1:15 OPTIONAL Non-CME Product Theater: CHROMagar

1:25-1:40 OPTIONAL Non-CME Product Theater: SmartGene

Practice: 1:45-3:30pm and 3:45-5:15pm (3.25 hours)

- 1:45-2:45: Microscopy of ascomycetous yeasts (*Candida albicans*, *Candida glabrata* [*Nakaseomyces glabrata*], *Candida krusei* [*Pichia kudriavzevii*], *Candida tropicalis*, *Candida auris*, *Magnusiomyces capitatus* [*Saprochaete capitata*], *Geotrichum candidum*)
- 2:45-3:30: Microscopy of basidiomycetous yeasts (*Cryptococcus neoformans*, *Malassezia furfur*, *Trichosporon asahii*, *Rhodotorula mucilaginosa*).
- **3:30-3:45: Break**
- 3:45-4:30: **Elitza Theel**: Fungal antigen and antibody testing
- 4:30-5:15: **Sean Zhang**: Current diagnostic techniques – MALDI-TOF MS, molecular and sequencing identification

Friday (9/27): Black yeasts and other dematiaceous opportunists

7:45 am Breakfast

Lectures: 8:30-10:30a and 10:45a-12:45p (4 hours)

- 8:30-9:30: **Sybren de Hoog**: Taxonomy of black yeasts and relatives; diagnostic overview.
- 9:30-10:30: **Sybren de Hoog**: Clinical pictures of black yeasts and relatives.
- **10:30-10:45: Break**
- 10:45-11:30: **Roxana Vitale**: Chromoblastomycosis & Emerging and common mycoses in South America
- 11:30-12:15: **Sybren de Hoog**: Mycetoma, melanized opportunists in Pleosporales (dematiaceae, coelomycetes).
- 12:15-12:45: **Sybren de Hoog**: Microascales: *Scedosporium* and brain infection.

Lunch: 12:45-1:45p

1:00-1:15 OPTIONAL Non-CME Product Theater: DiaSorin

Practice: 1:45-3:30pm and 3:45-5:15pm (3.25 hours)

- 1:45-3:30: Microscopy of traumatic Chaetothyriales (*Exophiala dermatitidis*, *Cladophialophora emmonsii*, *Phialophora verrucosa*, *Rhinoctadiella similis*) and Microascales (*Lomentospora* [*Scedosporium*] *prolificans*, *Microascus paisii* [*Scopulariopsis brumptii*])
- **3:30-3:45: Break**
- 3:45-5:15: Microscopy of Pleosporales and other melanised fungi (*Alternaria alternata*, *Curvularia geniculata*, *Bipolaris spicifera*, *Phaeoacremonium parasiticum*, *Phoma herbarum*).

Saturday (9/28): Hyaline opportunists and conclusion

7:45 am Breakfast

Lectures: 8:30-10:30a and 10:45a-12:45p (4 hours)

- 8:30-9:00: **Sybre de Hoog**: Ophiostomatales: *Sporothrix* and sporotrichosis.
- 9:00-10:00: **Sybre de Hoog**: Hypocreales: *Fusarium* and relatives.
- **10:00-10:15: Break**
- 10:15-11:15: **Sybre de Hoog**: Basidiomycetous filamentous fungi.
- 11:15-12:15: **Gary Procop**: Fungal histopathology.
- 12:15-12:45: **Sybre de Hoog**: Overview of pathogenicity in the fungal kingdom

Lunch: 12:45-1:45p

Practice: 1:45-3:15p and 3:30-5:00 (3 hours)

- Microscopy of filamentous Basidiomycetes (*Schizophyllum commune*, *Phanerochaete chrysosporium* [*Sporotrichum pruinosum*]).
- Microscopy of Hypocreales (*Fusarium oxysporum*, *Sarocladium* [*Acremonium*] *kiliense*).
- Microscopy of Ophiostomatales (*Sporothrix schenckii*).
- **3:15-3:30: Break**
- 3:30-5:00: **Sean Zhang & Paschalis Vergidis**: Case studies

Certificates and Farewell 5:00-5:15pm