



UFPR/Curitiba- INTERNATIONAL COURSE OF MEDICAL MYCOLOGY 2023

Morning sessions: 8.30-12.00; afternoon sessions: 13.30-18.00.

Lectures (Auditorium Mauricio Bissoli); Practices (laboratories); Campus Jardim Botânico/UFPR).

COURSE DIRECTORS, ORGANIZING COMMITTEE AND INSTRUCTIONS:

- Prof. Dr. Sybren de Hoog - Center of Expertise in Mycology of Radboudumc / CWZ, Nijmegen, The Netherlands.
- Dr. Roxana Vitale - Ramos Mejia Hospital, Mycology Branch, Buenos Aires, Argentina.
- Prof. Dr. Paul Verweij - Center of Expertise in Mycology of Radboudumc / CWZ, Nijmegen, The Netherlands.
- Prof. Dr. Jacques Meis - Excellence Center for Medical Mycology (ECMM), University Hospital Cologne, Germany.
- Dr. Flávio Queiroz-Telles - Department of Public Health, UFPR and INFOCUS LATAM
- Dr. Vania A. Vicente - CMRP/Taxonline, UFPR, Curitiba, Brazil.

Support material: Electronic version of the Atlas of Clinical Fungi (G.S. de Hoog et al., Edition 4);

Contact Address: Campus Jardim Botânico/UFPR - Av. Prefeito Lothário Meissner, 632, Curitiba - PR, CEP: 80210-170. Phone: (41) 3360-5000 – E mail: colecaocmrp@gmail.com;

Registrations: via *online* link: shorturl.at/bejM5;

Vacancies and Fees: (1) Theoretical Remote Module (Online) Fees: \$70 dollars – for No ISHAM members \$15 dollars - ISHAM member. (2) Theoretical face-to-face module (vacancies- 140*) Fees: US\$100 dollars - for no ISHAM members; US\$ 40 dollars – ISHAM members; US\$10 dollars - Younger ISHAM members. (3) Theoretical + Practical module (vacancies 60**) Fees: US\$ 140 dollars - for No ISHAM members, US\$ 60 dollars - ISHAM member, US\$30 dollars - Younger ISHAM member.*Theoretical face-to-face module vacancies 20 undergraduate students; 60 graduate students and 60 technicians and 60 professors from the associated institutions. **With a selection based on academic output.

Duration: 60 hours/number of credits: 4 considering Theoretical and Practical modules.

INVITED SPEAKERS

- **HC/UFPR**- Sergio Monteiro de Almeida - CV: <http://lattes.cnpq.br/7654951924169912>
- **UNESP/Botucatu** - Eduardo Bagagli - CV: <http://lattes.cnpq.br/3320327570429539>
- **UnB** - Anamélia Bocca - CV: <http://lattes.cnpq.br/7426592963217111>
- **HC/UFPR**-Flávio Queiroz-Telles - CV: <http://lattes.cnpq.br/0111936868262951>
- **Instituto Adolfo Lutz & UFMS** - Marcia S. C. Melhem - CV: <http://lattes.cnpq.br/2132609720093419>
- **UFPR/Biochemistry Dept.** - Emanuel M. Souza – CV: <http://lattes.cnpq.br/7436135069574190>
- **UNIFESP** - Arnaldo L. Colombo - CV: <http://lattes.cnpq.br/4512261018429681>
- **HC/UFPR** - Marisol D. Muro - CV: <http://lattes.cnpq.br/9690678154653832>
- **HC/UFPR** - Sonia Raboni - CV: <http://lattes.cnpq.br/1117884700210763>
- **UFPR/Basic Pathology Dept.** - Renata R. Gomes - CV: <http://lattes.cnpq.br/4672669767697565>
- **Hospital Universitário Osvaldo Cruz/HUOC** - Filipe Prohaska Batista, - CV: <http://lattes.cnpq.br/6474513941865537>
- **Instituto D'Or de Pesquisa e Ensino/IDOR** - Daniel W. C. L. Santos - CV: <http://lattes.cnpq.br/9535568373737991>
- **Center of Experimental and Molecular Medicine/AMC** - Leandro F. Moreno - CV: <http://lattes.cnpq.br/3120240292844089>
- **UFPR/Biochemistry and Molecular Biology Dept.** – Edileusa C. M. Gerhardt - CV: <http://lattes.cnpq.br/7775892771605715>
- **Medical Mycology Lab./UEM;** Dr. Terezinha I. E. Svidzinski –CV <http://lattes.cnpq.br/9325751411452030>
- **HC/UFPR** - Francilise Bridi Cavassin – CV: <http://lattes.cnpq.br/8238999725547723>
- **HC/UFPR** - Regielly C. R. Cogniali – CV: <http://lattes.cnpq.br/3504797067064893>
- **CMRP/Taxonline/UFPR** – Maria E. Grisolia – CV: <http://lattes.cnpq.br/5857201821285682>
- **UFPR/PPGMPP** – Gabriela X. Schneider – CV: <http://lattes.cnpq.br/1911503557488733>
- **CMRP/Taxonline** – Emanuel L Razzolini – CV: <http://lattes.cnpq.br/2133664065574688>
- **UFPR/PPGMPP** – Bruna Jacomel F S Lima – CV: <http://lattes.cnpq.br/1882480602815005>
- **National Institute of Allergy and Infectious Diseases, Bethesda/USA** - Amir S. Seyedmousavi:
ORCID: <https://orcid.org/0000-0002-6194-7447>
- **Biochemistry, Molecular Biology and Biophysics Dept., University of Minnesota/USA** - Cláudia Schmidt-Dannert -ORCID: <https://orcid.org/0000-0002-0559-3656>
- **Ramos Mejia Hospital, Mycology Branch, Buenos Aires, Argentina** – Roxana G. Vitale - ORCID-
<https://orcid.org/0000-0001-8425-0856>

TECHNICAL AND ADMINISTRATIVE ASSISTANCE:

- Prof. Dra. Izabella C. R. dos S. Weiss, UFPR, Curitiba, Brazil;
- Prof. Dr. Wesley M. de Souza UFPR, Curitiba, Brazil;
- Prof. Dra. Marisol D. Muro and Regielly C. R. Cogniali (HC/UFPR);
- Prof. Dra. Renata R. Gomes; Bruno P. R. Lustosa; Juliana Thaler; Bruna Jacomel F S Lima (CMRP/Taxonline – UFPR);
- Dra. Lorena C. Peña; Dr. Dr. Ricardo B.-Lopes; Adriana de F. Gabriel (CMRP/Taxonline – UFPR);
- Dr. Emanuel L. Razzolini; Dra. Maria E. Grisolia (CMRP/Taxonline – UFPR);
- Dr. Sionei R. Bonatto, Brazilian Society of Zoology, Curitiba, Brazil;
- Dr. Cristiano Marcondes Pereira (NAPI Taxonline – UFPR).



COURSE PROGRAM – from Thursday March 1st /2023 to Saturday 10th /2023

Wednesday – March 1st, 2023

Lectures: Auditorium Mauricio Bissoli/ Campus Botânico

14.00-14.10: Vania Aparecida Vicente - opening ceremony **INTERNATIONAL COURSE OF MEDICAL MYCOLOGY 2023**

14.10-14.40: Sybren de Hoog - **Overview of the course.**

14.40-15.10: Sybren de Hoog - General taxonomy; sexual life cycles.

15.10-16.00: Flávio Queiroz-Telles - Neglected endemic mycoses in the clinical practice.

16.00-17.00: Jacques F. Meis - World Emergence of mycoses casual agents

17.00-18.30: Happy hour

Thursday - March 2nd, 2023

Lectures: Auditorium Mauricio Bissoli/ Campus Botânico

8.30-10.00: Sybren de Hoog - Pleomorphism and nomenclature; introduction to microscopical methods; Introduction to the electronic Atlas of Clinical Fungi. The ultimate bench tool diagnostics 4th edition
<https://webshop.atlasclinicalfungi.org/>

10.00-10.15: Break

10.15-12.00: Sybren de Hoog - Taxonomy of the zygomycetes and infections by zygomycetes.

12.00-13.30: Lunch

13.30-14.30: Practice Part I:- Theoretical Auditorium Mauricio Bissoli/ Campus Botânico. Emanuel Razzolini, Renata Gomes and Vania Vicente - Identification based on DNA: DNA extraction, PCR and Sequencing.

14.30-14.45 Break

Practice Part II: Lab. Pharmacy Dept.

14:45-16:00 Practice: Group 2 -Identification of Zygomycetes down to genus level; Microscopy Zygomycetes (*Lichtheimia corymbifera*, *Basidiobolus ranarum*, *Cunninghamella bertholletiae*, *Mucor hiemalis*, *Rhizopus oryzae*)
Group 1-DNA extraction and PCR

16:00-18:15 Group 1 -Identification of Zygomycetes down to genus level; Microscopy Zygomycetes (*Lichtheimia corymbifera*, *Basidiobolus ranarum*, *Cunninghamella bertholletiae*, *Mucor hiemalis*, *Rhizopus oryzae*) **Group 2** - DNA extraction and PCR

20:00: Dinner

Friday - March 3rd, 2023

Lectures: Auditorium Mauricio Bissoli/ Campus Botânico

8.30-9.15: Sybren de Hoog - Introduction to Ascomycota; Conidiogenesis in Hyphomycetes and Coelomycetes.

9.15-10.30: Sybren de Hoog - Eurotiales: Taxonomy of *Aspergillus*, *Penicillium*, *Talaromyces*, and relatives.

10.00-10.15: Break

10.15-11.00: Flávio Queiroz-Telles & Regielly Cogniali - Aspergillosis: Mold Infections in immunocompromised patients: Focus in Aspergillosis, Fusariosis and Mucormycosis

11:00-11.45: Sonia Raboni - SARSCoV-2; Influenza and human respiratory infections associated to fungal opportunistic infection: a new Challenge. Department of Public Health and Hospital de Clínicas, UFPR

12.00-13.30: Lunch

Practice: Lab. Pharmacy Dept.

13.30-16.00: Group 1.Microscopy of Eurotiales (*Aspergillus flavus*, *Aspergillus fumigatus*, *Aspergillus niger*, *Aspergillus terreus*, *Aspergillus nidulans* (*Emericella nidulans*, *Paecilomyces variotii*, *Talaromyces marneffe*, *Aspergillus lentulus*). **Group 2.** Electrophoresis and PCR and purification.

16.00-16.15: Break

16.15-18.45: Group 2. Microscopy of Eurotiales (*Aspergillus flavus*, *Aspergillus fumigatus*, *Aspergillus niger*, *Aspergillus terreus*, *Aspergillus nidulans* (*Emericella nidulans*, *Paecilomyces variotii*, *Talaromyces marneffe*, *Aspergillus lentulus*). **Group 1.** Electrophoresis and PCR and purification.

20:00: Happy hour - Bar do alemão.

Saturday – March 4th, 2023

Molecular clinical mycology: Fungal Genomic analysis - Sybren de Hoog, Vania Vicente and Emanuel

Lectures: Auditorium Mauricio Bissoli/ Campus Botânico

08.30- 9.15: Sybren de Hoog - Molecular clinical mycology and Genomic sequencing of filamentous and yeast-like fungi.

9.15-10.00 Leandro F Moreno - Comparative genomic analysis and Mitochondrial genomes; Genome expansions and contractions based on functional domains and Gene prediction and annotation.

10.00-10.15: Break

10.15-11.00: Leandro F Moreno- Transcriptome as a tool in fungal study.

11.00-11.45: Edileusa C. M. Gerhardt - New methods of diagnosis in fungi: diagnosis MALDI-TOF.

11.45-12.30: Maria Eduarda Grisolia – Metagenomic on Clinical Mycosis

12.30-13.30: Lunch



13.30 – 18.00: Practice - Analyzes exercises via web

- Genomic DNA extraction, sequencing and assembly
- Comparative genomic analysis
- Mitochondrial genomes
- Orthologous gene comparison
- Genome expansions and contractions based on functional domains
- Prediction of genes related to pathogenicity

Monday- March 6th, 2023

Lectures: Auditorium Mauricio Bissoli/Campus Botânico

8.30-9.00: Roxana Vitale - Biosafety Classifications

9.00-9.45: Sybren de Hoog – Taxonomy and evolution

9.45-10.25: Roxana Vitale - Clinical aspects of dermatophytes.

10.25-10.30: Break

Practice Lab. Pharmacy Dept.

10.30-11.30: Group 1. Microscopy of dermatophytes (*Epidermophyton floccosum*, *Microsporum canis*, *Trichophyton rubrum*, *Trichophyton schoenleinii*, *Trichophyton tonsurans*, *Trichophyton verrucosum*, *Trichophyton erinacei*). Microscopy non-dermatophytic skin infections. **Group 2.** Omics analysis

11.30-12.30: Group 2. Microscopy of dermatophytes (*Epidermophyton floccosum*, *Microsporum canis*, *Trichophyton rubrum*, *Trichophyton schoenleinii*, *Trichophyton tonsurans*, *Trichophyton verrucosum*, *Trichophyton erinacei*). Microscopy non-dermatophytic skin infections. **Group 1.** Omics analysis.

12.30- 13.45: Lunch

Lectures: Auditorium Mauricio Bissoli/Campus Botânico

13.45-14.30: Franceline Bridi Cavasin - Systemic Antifungals drugs in the clinical practice

14.30-15.15: Jacques F. Meis: Genetic and Phenotypic Characterization of in-Host Developed Azole-Resistant *Aspergillus* Isolates

15.15-16.00: Sybren de Hoog - Taxonomy of yeast fungi.

16.00-16.45: Arnaldo L. Colombo - *Candida* genus: candidiasis and Invasive candidiasis: Epidemiology, diagnosis and clinical manifestations and therapeutic approach.

16:45-16.50: Break

Practice Lab. Pharmacy Dept.

16.50-17.35: Practice: Group 1. Roxana Vitale: Antifungal susceptibility testing: summary of laboratory procedures; **Group 2** sequencing reaction;

17.50-18.35 Practice: Group 2. Roxana Vitale: Antifungal susceptibility testing: summary of laboratory procedures; **Group 1** sequencing reaction;

20.00: Dinner

Tuesday - March 7th, 2023

Lectures: Auditorium Mauricio Bissoli/ Campus Botânico

8.30-9.00: Sybren de Hoog - Practical demonstration of identification keys.

9.00-10.00: Eduardo Bagagli - Introduction to Onygenales- Systemic infections: Histoplasmosis, Coccidioidomycosis, Paracoccidioidomycoses, Blastomycosis and Epidemiology of the endemic systemic mycoses in Latin America

10.00-10.15: Break

10.15-11.00: Sergio Monteiro de Almeida - Fungal infections of the Central Nervous System: Focus on Diagnosis

11.00-11.45: Flávio Queiroz-Telles – Paracoccidioidomycosis yesterday and today

12.00-13:30: Lunch

13.30-14.30: Gabriela X Schneider & Bruna J. F. de S. Lima - Molecular tools in the diagnosis of mycoses: Specific primers; RCA, LAMP.

Practice: Lab. Pharmacy Dept.

Part I - Demonstrative class 14.30-15.30: Renata Gomes and Vania Vicente - Clinical cases: sequences analysis, identification of species and phylogenetic analysis.

Part II – Practice: Lab. Pharmacy Dept.

15.30-17.00: Group 1. Histopathology and microscopy systemic infections (*Blastomyces dermatitidis*, *Histoplasma capsulatum*, *Emergomyces pasteurianus*, *Coccidioides immitis*, *C. posadasii*, *Paracoccidioides brasiliensis*)/. **Group 2.** Sequencing analyses of the result of the molecular practical classes.

17.00-18.30: Group 2. Histopathology and microscopy systemic infections (*Blastomyces dermatitidis*, *Histoplasma capsulatum*, *Emergomyces pasteurianus*, *Coccidioides immitis*, *C. posadasii*, *Paracoccidioides brasiliensis*)/ **Group 1.** Sequencing analyses of the result of the molecular practical classes.

Wednesday - March 8th, 2023

Lectures: Auditorium Mauricio Bissoli/ Campus Botânico

8.30-9.15: Marcia S. C. Melhem - Cryptococcosis: *Cryptococcus neoformans* and *C. gattii*

9.15-10.00: Anamélia Bocca - The intracellular life of *Cryptococcus neoformans*

10.00-10.45: Daniel W. C. L. Santos - Invasive fungal infections in transplant and HIV patients



10.45-11.00: Break

11.00-11.45: Amir S. Seyedmousavi - Neglected fungal zoonoses: hidden threats to man and animals

11.45-12.30: Sybren de Hoog - Ophiostomatales: *Sporothrix* species: Phylogeny Species delimitation, new markers and molecular epidemiology.

12.30- 13.30: Lunch

13.30-14.15: Sybren de Hoog - Microascales: *Scedosporium* and *Scopulariopsis*.

14.15-15.00: Daniel W. C. L. Santos - Hypocreales: *Fusarium*, *Acremonium* and relatives.

15.00-15.45: Sybren de Hoog - Practical demonstration of identification keys.

15.45-16.00: Break

Practice Lab. Pharmacy Dept.

16.00-17.15 **Group 1.** Microscopy of yeasts (*Candida albicans*, *C. dubliniensis*, *C. glabrata*, *C. parapsilosis*, *C. krusei*, *Clavispora lusitanae*, *Cryptococcus neoformans*, *Geotrichum capitatum*, *Malassezia furfur*, *Pichia anomala*, *Saccharomyces cerevisiae*, *Sporobolomyces roseus*, *Trichosporon inkin*, *Yarrowia lipolytica*); Identification with chromogenic agars; physiology with API, gel electrophoresis, genotyping.; **Group 2.** omics analyses

17.15-18.30 **Group 2.** Microscopy of yeasts (*Candida albicans*, *C. dubliniensis*, *C. glabrata*, *C. parapsilosis*, *C. krusei*, *Clavispora lusitanae*, *Cryptococcus neoformans*, *Geotrichum capitatum*, *Malassezia furfur*, *Pichia anomala*, *Saccharomyces cerevisiae*, *Sporobolomyces roseus*, *Trichosporon inkin*, *Yarrowia lipolytica*); Identification with chromogenic agars; physiology with API, gel electrophoresis, genotyping.; **Group 1.** omics analyses

20.00: Dinner

Thursday - March 9th, 2023

Lectures: Auditorium Mauricio Bissoli/ Campus Botânico

8.30-9.15: Filipe Prohaska Batista - Immunology of fungal infections.

9.15-10.00: Anamélia Bocca - chronic infection development associated with innate recognition characteristics.

10.00-10.15: Break

10.15-11.00: Flávio Queiroz-Telles & Regielly Cognialli – Sporotrichosis: One Health Approach

11.00-11.45: Sybren de Hoog - Black yeast and related opportunists, taxonomy and clinical aspects.

11.45-12.30: Anamélia Bocca: Pathogenicity and Growth Conditions Modulate *Fonsecaea* Extracellular Vesicles' Ability to Interact with Macrophages

12.30- 13.30: Lunch

Lectures: Auditorium Mauricio Bissoli/ Campus Botânico

13.30-14.15: Cláudia Schmidt-Dannert - Structural and functional comparative genomics analysis in the evaluation of biosynthetic genes of fungal species with antagonistic and pharmaceutical potential.

14.15-15.00 Amir S. Seyedmousavi: Cold-adapted Yeasts: Biodiversity and Adaptation Strategies

15.00-15.10: Break

Practice Lab. Pharmacy Dept.

15.10 -16.50: **Group 1.** Microscopy of Ophiostomatales (*Sporothrix schenckii*, *S. brasiliensis*, *S. globosa*), Microascales (*Scedosporium*), Hypocreales (*Fusarium oxysporum*, *Acremonium kiliense*, *Trichoderma harzianum*); **Group 2.** phylogenetic analyses.

16.50 -18.30: **Group 2.** Microscopy of Ophiostomatales (*Sporothrix schenckii*, *S. brasiliensis*, *S. globosa*), Microascales (*Scedosporium*), Hypocreales (*Fusarium oxysporum*, *Acremonium kiliense*, *Trichoderma harzianum*); **Group 1.** phylogenetic analyses.

Friday - March 10th, 2023

Lectures: Auditorium Mauricio Bissoli/ Campus Botânico

8.30-9.15: Sybren de Hoog - Opportunistic filamentous fungi (Pleosporales: *Alternaria*, Dothideales: *Phoma*, Calosphaerales: *Phaeoacremonium*; Basidiomycetes: *Coprinus*, *Schizophyllum*, *Tritirachium*).

9.15-10.00: Flávio Queiroz-Telles - Clinical aspects of mycetoma and mycetoma agents.

10.00-10.15: Break

Practice Lab. Pharmacy Dept.

10.15-11.15: **Group 1.** Microscopy of black yeasts and related fungi (*Cladophialophora carrionii*, *Cladosporium cladosporioides*, *Exophiala dermatitidis*, *Exophiala jeanselmei*, *Fonsecaea monophora*, *Fonsecaea pedrosoi*, *Hortaea werneckii*, *Verruconis gallopavum*, *Phialophora (Cyphellophora) europaea*, *Phialophora verrucosa*). **Group 2.** Microscopy of Pleosporales and Coelomycetes (*Alternaria alternata*, *Curvularia geniculata*, *Bipolaris spicifera*)

11.15-12.15: **Group 2.** Microscopy of black yeasts and related fungi (*Cladophialophora carrionii*, *Cladosporium cladosporioides*, *Exophiala dermatitidis*, *Exophiala jeanselmei*, *Fonsecaea monophora*, *Fonsecaea pedrosoi*, *Hortaea werneckii*, *Verruconis gallopavum*, *Phialophora (Cyphellophora) europaea*, *Phialophora verrucosa*). **Group 1.** Microscopy of Pleosporales and Coelomycetes (*Alternaria alternata*, *Curvularia geniculata*, *Bipolaris spicifera*)

12.15-13.30: Lunch

Practice Lab. Pharmacy Dept.

13.30-14.30: Mycetoma demonstration (*Neotestudina rosatii*, *Madurella mycetomatis*);

14.30-15.30: Microscopy of filamentous basidiomycetes: *Schizophyllum commune*

15.30-16.45: Break

17:00 - Final examination and closure of activities

18:00 – Close Section and Happy Hour