Oral Presentations

S1.1d Risk factors associated with oropharyngeal candidiasis in COVID-19 patients: a case-control study
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S1.1 Controversies in the clinical management of atopic dermatitis in critically ill patients, September 21, 2022, 11:00 AM - 12:10 PM

Objectives: To compare the spread and the most common dermatitic disorders caused by the skin: as an underestimated case of Malassezia bloodstream infections (BCIs) in immunocompromised patients and neutrons, associated with COVID-19 disease, promoting pancreatic oncogenesis, and exacerbating acute illnesses. Malassezia furfur in the number one Malassezia BCI case and is also implicated in many skin disorders. With these new discoveries of Malassezia’s impact on human health, the need for a better understanding of its evolution and pathobiology also became more pressing. Hybridization has been suggested as a biological mechanism of adaptation to new hosts and as the main cause of increased pathogenicity. More examples of new hybrid forms of pathogens exist, such as Candida albicans, C. tropicalis, C. parapsilosis, and many examples in the Cryptococcus gattii/Cryptococcus neoformans species complex. Thus, the multiple hybridization events of the Malassezia furfur species complex will be discussed. Two distinct hybridization events are described, and a common pathway of hybridization was observed. The hybridization event leads to increased virulence and antibiotic resistance, and the species was found to be more pathogenic. The hybridization event was found to be a complex, multi-omics approach, which allows for a better understanding of its evolution and pathobiology.

Conclusions: The hybridization event is a complex, multi-omics approach, which allows for a better understanding of its evolution and pathobiology.

S1.2c Diagnosis of fungal infections in animals: Combining the old and the new to maximize results
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S1.2 Emerging and Expanding Fungal Mycoses, September 21, 2022, 11:00 AM - 12:30 PM

There is a broad spectrum of fungal infections involving companion, veterinary, and wild animals. Some fungi are devastating veterinary pathogens. Others, such as the dematiaceous fungi Malassezia dermatitica and Sporothrix schenckii, are primary pathogens with a more defined geographical distribution. Dermatophytes cause severe diseases limited to the skin. However, they are rare cases in which they are rarely found. Moreover, some dermatophytes are transmitted from animals to humans. Therefore, in these infections, veterinarians represent a public health problem.

In recent years, opportunistic fungal infections (e.g., Aspergillus, Candida, Cryptococcus) in human medicine have increased. The most important is the rise of people with immunosuppression of various origins (AIDS, chemotherapy, immunosuppressive therapies in organ transplantation). The need for therapeutic strategies for these patients is increasing. The spectrum of fungi causing infections is expanding, which constitutes an identification challenge for even the most experienced mycologists. There are many more fungi than currently recognized in the fungal kingdom, and some fungi can be difficult to identify. The identification of these fungi can be challenging, especially in animals. The most common methods for the detection of fungal elements in tissues are PCR-based techniques, histological techniques, and fungal identification (e.g., matrix-assisted laser desorption/ionization-time-of-flight mass spectrometry). Newer methods are available in traditional methods (microscopic examination of samples, with or without culture). The identification of fungi in tissues can be challenging, but the results are necessary for the proper treatment of these infections.

Conclusions: The identification of fungi in tissues can be challenging, but the results are necessary for the proper treatment of these infections.

S1.3 Diversity and hybridization in Malassezia furfur
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S1.3.1 Malassezia genomics, genomics, and biology, September 21, 2022, 11:00 AM - 12:30 PM

The Malassezia furfur yeast Malassezia is the most abundant fungal genus on healthy human skin but may also cause various skin disorders such as seborrhoeic dermatitis, dandruff, and pityriaform verrucosis. In recent years, Malassezia has increasingly been associated with health and disease beyond the skin: as an underestimated case of Malassezia bloodstream infections (BCIs) in immunocompromised patients and neutrons, associated with COVID-19 disease, promoting pancreatic oncogenesis, and exacerbating acute illnesses. Malassezia furfur in the number one Malassezia BCI case and is also implicated in many skin disorders. With these new discoveries of Malassezia’s impact on human health, the need for a better understanding of its evolution and pathobiology also became more pressing. Hybridization has been suggested as a biological mechanism of adaptation to new hosts and as the main cause of increased pathogenicity. More examples of new hybrid forms of pathogens exist, such as Candida albicans, C. tropicalis, C. parapsilosis, and many examples in the Cryptococcus gattii/Cryptococcus neoformans species complex. Thus, the multiple hybridization events of the Malassezia furfur species complex will be discussed. Two distinct hybridization events are described, and a common pathway of hybridization was observed. The hybridization event leads to increased virulence and antibiotic resistance, and the species was found to be more pathogenic. The hybridization event was found to be a complex, multi-omics approach, which allows for a better understanding of its evolution and pathobiology.

Conclusions: The hybridization event is a complex, multi-omics approach, which allows for a better understanding of its evolution and pathobiology.

S1.3.2 The human pathobiont Malassezia furfur secreted protein MISAP1 regulates cell dispensal and exacerbates sepsis
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5.1 Malassezia: genomics, genomics, and biology, September 21, 2022, 11:00 AM - 12:30 PM

Objectives: Malassezia is an important member of the skin microbiome. Malassezia species possess a repertoire of secretory hydrolases involved in protein and lipid metabolism which alter the external cutaneous environment. The exact role of most Malassezia secreted enzymes, including those in interaction with the epithelial surface, is not well characterized.

Methods and Results: In this study, we compared the expression level of secreted proteases, lipases, phospholipases, and sphingomyelinases of M. globosa in healthy subjects and seborrhoeic dermatitis or atopic dermatitis patients. We observed upregulated gene expression of the previously characterized secretory atypar (MSP 1) and phospholipase in both the keratinized and non-keratinized skin compared to basal expression. To explore the functional role of MSP1 in skin disease, we generated a knockout mutant of the homologous promoter MSP1 in the genetically tractable M. furfur. We observed the loss of MISAP1 resulted in dramatic changes in the cell adhesion and dispersion in both culture and a human 3D reconstructed epithelial model. In a murine model of Malassezia colonization, we further demonstrated MISAP1 contributes to inflammation as observed by reduced edema and myeloid population formation with the knockout mutant versus wildtype. Conclusion: Together, we show that this dominant secretary M. aparrea promoter has an important role in enabling a planktonic cellular state that can potentially aid in colonization and additionally as a virulence factor in barrier-compromised

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S1.4d Cryptococcus qPCR assay: the future for routine mycological labs and clinical trials dealing with cryptococcosis

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S1.4 Fungal infections in Asia, bringing it out of the dark, September 22, 2021, 11:00 AM - 12:30 PM

Background: Routine laboratory testing for cryptococcal meningitis currently consists of Cryptococcus antigen (Ag) testing in blood and cerebrospinal fluid (CSF), CSF India and CSF fungal culture. Quantitative cryptococcal culture (QCC) is laborious intensive, and not feasible in most settings.

Objective: We have evaluated quantitative (qPCR) and reverse transcriptase (RT-qPCR) assay to quantify cryptococcal load in CSF, plasma, and blood. We also investigated the dynamics of fungal DNA and RNA detection during antifungal treatment.

Methods: We developed a qPCR assay that can differentiate serotypes A, D, and B/C of Cryptococcus neoformans and C. gattii based on the amplification of a unique nuclear locus questions presenting 1-POJ and a multiplex 28S RNA genes and evaluated the assays on 205 patient samples from the AMFAM trial in Benin and Malawi (2018-2021). CSF, plasma, and whole blood samples were stored at -80°C and were used for analysis.

Results: A total of 205/209 stored patient samples (85 from Benin, 124 from Malawi), were used. For QPCR, the qPCR results were ND (n=138, 67%) were sera A, B/C with the QPCR assay, and QCC showed a good correlation with qPCR quantification with QPCR slopes 0.789, R2 = 0.73) and with 28S RNA qPCR (Slopes: 0.772, R2 = 0.772) assays. The fungal load in A90 was significantly higher in patients who died at week 2 (n=2) and at week 15 (n=3) compared with patients who survived beyond the week 10 period. An initial fall in fungal load in both treatment regimens (P<0.05). Detection of Cryptococcus DNA (28S RNA qPCR) in plasma or whole blood within the first 24 h of treatment was significantly correlated with early survival and a fall to zero level (P<0.05). QPCR RT-qPCR assays showed that the presence of DNA was due to viable fungal cells as the quantitation of QPCR whole nuclear DNA was significantly higher (X2=5) than that of DNA.

Conclusion: Quantification of C. neoformans and C. gattii load in CSF and plasma at ND is useful in identifying patients at risk of death and may be a promising tool for monitoring treatment response in the future.

S1.5 Epidemiology of mycotic keratitis in developing countries

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S1.5 Mycotic keratitis, September 21, 2021, 11:00 AM - 12:10 PM

Mycotic keratitis (corneal infection due to a fungal etiology) is a well-recognized ophthalmological emergency warranting rapid initiation of specific antifungal therapy. However, the magnitude of the problem of mycotic keratitis in the community, especially in the Indian subcontinent and the developing world, is, however, less apparent. A national annual incidence estimate of 1051, 787 cases (23.600.000 population) globally has recently been reported, with the highest rates being in Asia (330,900.000 pop., an absolute number of 539 897) and Africa (130,150.000, 77 196), if all culture-negative cases are assumed to be fungal, especially when the incidence of mycotic keratitis is known to be high, then the annual incidence would be about 1480 956 cases. A fungal etiology has been found to account for a very high proportion (45%) of microbial keratitis cases in developing countries (especially tropical regions).

Correlation between the incidence of fungal keratitis and the rate of corneal scar formation: A meta-analysis including an array of studies which compared the incidence of fungal keratitis nearly equal to about the latter. Interestingly, the proportion of microbial keratitis patients with a positive fungal etiology shows a significant negative correlation with the gross domestic product per capita. Although it is clear that the most common fungal organisms involved in corneal abscesses, marked regional variations in fungal etiology also exist and have been noted. It is important to realize that usually the cultural patterns of specific fungal pathogens can vary, depending on the population, as well as the serotype and sensitivity of the organisms. For example, some countries, such as India, may have a very high proportion of fungal keratitis cases due to the presence of Ophiothrix sp. or Histoplasma capsulatum var. farcimineus. The actual number of cases is influenced by the location of the clinical practice, the corneal surgery, and other risk factors. However, an estimate is that 10%-11% of patients with fungal keratitis, the affected eye needs to be removed, representing an irreversible annual number of 84 315 137 cases. It is recognized that many people suffering from mycotic keratitis in rural distant communities may present late and are thus likely to have a higher rate of visual impairment. Although the actual number of cases is difficult to determine, the incidence of fungal keratitis has been found to be much higher in the blind and visually impaired compared to the general population. The fact that a fungal etiology of mycotic keratitis, mainly late due to the disease and during therapy, and reduced quality of life due to permanent disability (corneal scarring) in the Indian subcontinent and developing countries require further study.