they adapt effectively to environmental stresses encountered within the host body. Upon recognition by host immune cells, C. glabrata is engulfed and exposed to a combination of stresses. In contrast to other pathogenic fungi, C. glabrata is highly resistant to stress allowing it to survive the host immune defenses. This suggests that resistance to both antifungal drugs and natural host-induced stressors are essential for the establishment and progression of infection. The molecular mechanisms underlying antifungal resistance and the response to individual stressors have been investigated in isolation, however, little is known about how C. glabrata adapts to combinatorial stresses. The mechanistic explanation of stress adaptation will yield new insights into Candida infection.

Using a newly discovered sexual cycle in C. glabrata, I have generated a series of related strains of the same fungal pathogen that have increased resistance to combinatorial and drug stresses. I will sequence their genomes to identify the critical genes involved in stress resistance and characterize the mechanisms of C. glabrata stress responses. My preliminary data demonstrate that the C. glabrata response to an combinatorial stress is similar to that observed upon phagocyte engulfment. At the level of gene expression, there is an up-regulation of genes encoding function related to stress adaptation and nutrient recycling overlap. Understanding this regulatory network and the role that selected components (different genes) play in stress resistance, is essential to the development of future drug regimens.

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Comparison of Candida colonization in intensive care unit patients with and without COVID-19: First prospective cohort study from Turkey

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Objectives: Candida species, as the main component of human microbiome, are the most common cause of fungal infections in intensive care units (ICU). ICU patients with COVID-19 are more prone to fungal infections, due to various causes like mechanical ventilation, use of steroids, and long-term hospitalization. There is yet no extended prospective study examining Candida colonization rates, epidemiology of species, and predisposing factors in this population. This is the first prospective cohort study examining the time-varying colonization features of Candida species in ICU patients with and without COVID-19.

Methods: This study was performed between March 2021-December 2021 in ICUs of Istanbul University, Istanbul Faculty of Medicine, Department of Anesthesiology and Reanimation. COVID-19 and non-COVID-19 ICU patients who were ≥ 18 years and expected to stay in the ICU for at least 7 days were included in the study.

Samples were taken at certain time intervals from different body parts of the patients (mouth, skin (axilla), rectal, and urine) (Table 1) and evaluated at Istanbul University, Istanbul Faculty of Medicine, Department of Medical Microbiology, Mycology Laboratory. All specimens were inoculated on CHROMagar Candida media (CHROMagar Candida, France) to detect mixed growth and CHROMagar Candida Plus media (CHROMagar Candida Plus, France) to avoid missing Candida aurea. Cultures were incubated at 35-37°C for 48 h and photometrically different colonies on primary media were subcultured on corn meal-mannitol-80 agar for determining their morphology. All strains were identified to the species level using MALDI-TOF MS (Version 4.1.10, Bruker Bremen, Germany), Faculty of Engineering, Genetics and Biosengineering Department. Patient groups were compared statistically in terms of isolated Candida species and distribution according to regions.

Results: The study consisted of 122 ICU patients including 62 COVID-19 (25 female, 37 male, mean age 63.29 years) and 60 non-COVID-19 (24 female, 36 male, mean age 63.5 years). A total of 1464 samples (764 COVID-19 and 700 non-COVID-19 patients) were taken (Table 1) and fungi grew in 540 (37.2%) samples. Mixed growth was observed in 108 cultures, was more frequently in COVID-19 patients (P < 0.5), and significantly higher in oral samples (P < 0.05).

Out of a total of 473 strains that were obtained from fungal cultures, C. albicans (42.2%) and C. glabrata (24.2%) were most frequently isolated. Candida aurea was not observed in this period (Table 2).

Patients with COVID-19 were found more frequently colonized in oral (P < 0.01), rectal (P < 0.05) regions and urine (P < 0.01) compared with non-COVID-19 patients. There was no growth in the axillary region in any of the patients.

Non-albicans Candida strains were found significantly more frequent in patients with COVID-19 in oral (P < 0.01) and rectal regions (P < 0.05). CONCLUSION: In this study, we found significantly higher oral, rectal, and urine Candida colonization rates in COVID-19 ICU patients compared with non-COVID-19 individuals. Increased oral Candida colonization can be the result of insufficient oral care application to these patients in the ICU due to infection control anxiety, and also mechanical ventilation. Because non-albicans Candida strains were found significantly more frequent in COVID-19 patients, non-albicans resistant isolates should be kept in mind before administering antifungals.

The high mixed growth rate detected in all individuals and especially in COVID-19 patients will affect the antifungal therapy and therefore the importance of using chromogenic media for routine evaluation.

P045
Contamination of wind instruments: A potential threat to musicians

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Research shows that wind instruments are often contaminated with various bacteria and mold, creating a potential threat to musicians. These microorganisms are partially transferred from the players to the instruments during playing. Since the moist and dark inner surface of the instruments create the perfect environment for the microorganisms, they can easily nestle and grow. Then, they are retransferred back to the players as they inhale during playing. Current literature reports many cases of Hypersensitivity Pneumonitis caused by contaminated instruments.

Objectives: The objective of the current research is to explore the amount and variety of microorganisms inside brasswooden instruments as well as testing antibacterial properties of different materials used in instrument production.

Method: In this three-part study, first of all, with a face-to-face survey, information such as instrument cleaning habits, cleaning products, and methods they use and etc. are collected from the subjects. Then, with samples taken from two-three different parts of the subjects’ instruments, the amount and types of microorganisms are detected. Lastly, three instruments made of three different materials (gold, silver, brass) are tested for differences in the growth rate of the pathogens, and their advantages/disadvantages for health purposes are evaluated.

Results: When obtained instagromic data are analyzed, it is found that the tested instruments were highly contaminated with various bacteria, many of which are opportunistic pathogens, and mold. Furthermore, the tests done on instruments made of different materials reveal that silver instruments have antibacterial characteristics. On the other hand, gold and brass instruments do not have antibacterial characteristics.

Conclusion: To conclude, the brass instruments harbor a vast amount of microorganisms and need to be regularly cleaned with an effective hygiene protocol by the players. Also, due to its antibacterial properties, the use of silver plating in brass instruments would be preferable for health purposes.
Table 2. Distribution of the fungi isolated from different samples / regions of COVID-19 (+) and COVID-19 (-) patients

| FUNGI           | ORAL (n) | RECTAL (n) | URINE (n) | TOTAL (n) |
|-----------------|----------|-----------|-----------|-----------|
| Candida albicans| 81       | 25        | 21        | 127       |
| Non-albicans Candida| 30       | 32        | 18        | 70        |
| Candida glabrata | 12       | 12        | 6         | 30        |
| Candida tropicalis| 12        | 14        | 7         | 33        |
| Candida krusei  | 12       | 14        | 7         | 33        |
| Candida planulis| 12       | 14        | 7         | 33        |
| Candida parapsilosis| 12        | 14        | 7         | 33        |
| C. glabrata & C. krusei| 24   | 28        | 14        | 66        |
| C. glabrata & C. tropicalis| 24   | 28        | 14        | 66        |
| C. glabrata & C. parapsilosis| 24   | 28        | 14        | 66        |
| C. tropicalis & C. parapsilosis| 24   | 28        | 14        | 66        |
| C. parapsilosis & C. krusei| 24   | 28        | 14        | 66        |
| C. glabrata & C. tropicalis & C. parapsilosis| 24   | 28        | 14        | 66        |
| C. glabrata & C. tropicalis & C. krusei & C. parapsilosis| 24   | 28        | 14        | 66        |
| C. tropicalis & C. parapsilosis & C. krusei & C. glabrata| 24   | 28        | 14        | 66        |
| C. glabrata & C. tropicalis & C. parapsilosis & C. krusei| 24   | 28        | 14        | 66        |
| C. parapsilosis & C. krusei & C. glabrata & C. tropicalis| 24   | 28        | 14        | 66        |
| C. tropicalis & C. parapsilosis & C. krusei & C. glabrata & C. tropicalis| 24   | 28        | 14        | 66        |
| C. parapsilosis & C. krusei & C. glabrata & C. tropicalis & C. parapsilosis| 24   | 28        | 14        | 66        |
| C. glabrata & C. tropicalis & C. parapsilosis & C. krusei & C. glabrata| 24   | 28        | 14        | 66        |
| C. parapsilosis & C. krusei & C. glabrata & C. tropicalis & C. parapsilosis & C. glabrata| 24   | 28        | 14        | 66        |
| C. tropicalis & C. parapsilosis & C. krusei & C. glabrata & C. tropicalis & C. parapsilosis| 24   | 28        | 14        | 66        |
| C. parapsilosis & C. krusei & C. glabrata & C. tropicalis & C. parapsilosis & C. glabrata & C. tropicalis| 24   | 28        | 14        | 66        |
| C. glabrata & C. tropicalis & C. parapsilosis & C. krusei & C. glabrata & C. tropicalis & C. parapsilosis| 24   | 28        | 14        | 66        |
| C. parapsilosis & C. krusei & C. glabrata & C. tropicalis & C. parapsilosis & C. glabrata & C. tropicalis & C. parapsilosis| 24   | 28        | 14        | 66        |
| C. glabrata & C. tropicalis & C. parapsilosis & C. krusei & C. glabrata & C. tropicalis & C. parapsilosis & C. krusei & C. glabrata| 24   | 28        | 14        | 66        |
| C. parapsilosis & C. krusei & C. glabrata & C. tropicalis & C. parapsilosis & C. glabrata & C. tropicalis & C. parapsilosis & C. glabrata| 24   | 28        | 14        | 66        |
| C. glabrata & C. tropicalis & C. parapsilosis & C. krusei & C. glabrata & C. tropicalis & C. parapsilosis & C. krusei & C. glabrata & C. tropicalis| 24   | 28        | 14        | 66        |

Results:

- Proportion of patients who developed fungal infection during treatment was significantly lower in group A—453 patients (84.85%) as compared with group B—273 patients (87.65%), respectively (P-value < .0001).
- Candida albicans was detected in 7 patients (18.82%) while non-albicans Candida was detected in 15 patients (68.18%).
- Candida parapsilosis, C. tropicalis, C. krusei, and C. glabrata were detected. A total of 3 infected patients (75%) in group A were resistant to Fluconazole but showed sensitivity to voriconazole, posaconazole, and caspofungin B. While in group B, 3/16 infected patients (6.47%) showed resistance to Fluconazole and these were sensitive to voriconazole, amphotericin B, posaconazole, and caspofungin B. Mean week of onset of fungal infection in group A was 5.5 weeks which was significantly higher as compared with group B of 4.48 weeks (P-value = .029).
- Proportion of patients who developed grade 3/4 mucositis was significantly lower in group A as compared with group B of 58.55% vs. 81.82%, respectively (P-value = .012). Median week of onset of grade 3/4 mucositis in group A was 5.5 weeks which was significantly higher as compared with group B of 4.5 weeks (P-value = .029).
- Proportion of patients with treatment completion was significantly higher in group A as compared with group B—84.85% vs. 60.60%, respectively (P-value = .027). Mean number of days needed for treatment completion in group B was 17.21 days which was significantly greater as compared with group A of 10.69 days (P-value = .033). Median treatment gap in group B was 10 days which was significantly higher as compared with group A of 4 days (P-value = .033).

See Figures below.

Conclusion: Tab Fluconazole 100 mg prophylaxis in head and neck cancer patients receiving chemo-radiation is:

1. An effective way to reduce fungal infections, ideal prophylaxis beginning at the fourth week.
2. An effective way to reduce the severity of radiation-induced oral mucositis—thereby translating into reduced morbidity, treatment interruptions, and overall treatment time, which have been shown to impact prognosis favorably.