T2Biosystems®

SEPSIS, » HEMATOLOGY & ONCOLOGY

Enhance the standard of care for the detection of bloodstream infections in vulnerable patient populations

FOR HEMATOLOGY AND ONCOLOGY PATIENTS, SEPSIS POSES A SIGNIFICANT THREAT.

The prevalence of bloodstream infections (BSIs) for patients with cancer can range from 11% to 38%[1] and febrile neutropenia adds additional complexity for these patients by increasing the risk of BSIs. Bloodstream infections affect patient outcomes by delaying chemotherapy and lengthening hospital stays, which can lead to suboptimal treatment, a higher mortality (up to 55%), and increased healthcare costs.[1,2] Furthermore, infections with resistant bacteria (i.e. MRSA, ESBL-producing *Enterobacteriaceae*, CRE) are associated with a higher rate of intubation, sepsis and mortality.[3]

Excess antimicrobial use in the hematology and oncology patient population, combined with limited blood culture (BC) yield makes early pathogen identification challenging.[4,5,6] It's essential to rapidly identify organisms in the bloodstream to provide physicians with the information they need to target antimicrobial therapy sooner. Targeted therapy allows for enhanced antimicrobial stewardship and infection control practices and has the potential to improve patient outcomes.

CULTURE-INDEPENDENT DIAGNOSTICS *for sepsis*

IDENTIFY INFECTIONS FASTER

Rapidly and accurately detect ESKAPEc pathogens in hematological malignancy/hematopoietic stem cell transplant (HSCT) populations[7]

IMPACT THERAPY DECISIONS

Decrease unnecessary antibiotic use in HSCT populations & initiate targeted therapy faster[8]

TRUST IN CLINICAL RESULTS

In a cohort of critically ill patients with febrile neutropenia, the median time to detection of candidemia was significantly shorter in the T2Candida group compared to BC group (9 vs 41 hours, respectively)[9]

Hospital Use Cases

ANTI-FUNGAL THERAPY IN A FEBRILE PATIENT | UofL Hospital, Louisville, KY[10]

T2Candida aided in the confirmation of an actual bloodstream fungal infection, which helped to target the treatment for *Candida albicans/ Candida tropicalis*. Early species identification allowed justification for the port to be removed as the source of the infection.

An oncology patient was admitted presenting with persistent spiking fevers.

- Broad-spectrum treatment was administered
- Blood cultures were negative, despite the continual escalation of fever
- T2Candida was ordered and tested positive for *Candida albicans/ Candida tropicalis*
- The port was removed and patient was placed on targeted antifungals
- Patient fever was terminated, their condition improved and they were discharged

RAPID IDENTIFICATION OF *E. FAECIUM* INFECTION | Gemelli Hospital, Rome, Italy[11]

A T2Bacteria result improved the timely and accurate diagnosis of an *Enterococcus faecium* infection. Early species identification led to targeted treatment 24 hours sooner than traditional blood culture based species identification methods.

A patient presented with acute myeloid leukemia and was on the 15th day of severe neutropenia. Patient had a fever for one week, PCT 2.56 mg/ml and CRP >156 mg/L.

- T2Bacteria Panel was positive for *E. faecium* 4 hours after initial blood draw and tigecycline therapy was initiated
- MALDI-TOF detected *E. faecium* after 28 hours
- Blood culture antimicrobial susceptibility testing (AST) detected *E. faecium* (vancomycin-resistant VRE)

T2 BIOSYSTEMS SEPSIS PANELS

T2Bacteria® Panel	T2Resistance® Panel	T2Candida® Panel
• *Enterococcus faecium*	• *mecA/C*	• *Candida albicans*
• *Staphylococcus aureus*	• *vanA/B*	• *Candida tropicalis*
• *Klebsiella pneumoniae*	• KPC	• *Candida parapsilosis*
• *Acinetobacter baumannii*	• AmpC (CMY/DHA)	• *Candida krusei*
• *Pseudomonas aeruginosa*	• OXA-48 Group	• *Candida glabrata*
• *Escherichia coli*	• NDM/VIM/IMP	
	• CTX-M 14/15	

**See footnotes for panel clinical sensitivity, specificity and limit of detection (LoD)*
***T2Resistance has not yet been reviewed by FDA for clearance*

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*T2Bacteria – Sensitivity 90%,[12,13] Specificity 98%,[12,13] LoD 2-11 CFU/mL[13] | T2Resistance– >99% sensitivity[14], >99% specificity[14], LoD 3-11 CFU/mL[14] | T2Candida – Sensitivity 91%,[15,16] Specificity 99%,[15,16] LoD 1-3 CFU/mL[16]

1. Garcia- Vidal C, et al. PLoS ONE. 2017. 2. Van Beers EJ, et al. Hematology. 2016. 3. Vossen MG, et al. ESMO Open. 2018. 4. Cusini A, et al. Antimicrob Resist Infect Control. 2018. 5. La Martire G, et al. Eur J Clin Microbiol Infect Dis. 2018. 6. Piukovics K, et al. Eur J Microbiol Immunol (Bp). 2015. 7. Walsh T, et al. Poster presented at ECCMID 2019. 8. Horowitz, J. et al. Poster presented at Transplant and Cellular Therapies Meeting; February 21, 2020 9. Steuber TD, et al. Eur J Clin Microbiol Infect Dis. 2021. 10. Snyder J, World Microbe Forum: Industry & Science Symposium. 2021 11. DeAngelis, Presentation ECCMID 2019. 12. Nguyen, M. H., et al. Annals of Internal Medicine, 2019. 13. T2Bacteria Instructions for Use 14. T2Resistance Instructions for Use 15. Mylonakis, E., et al. Clinical Infectious Diseases, 2015. 16. T2Candida Instructions for Use