No cross reactivity was observed with any of the malarial species tested. Babesia M1, Babesia duncanii and all bacterial isolates tested were negative by the BcMPCR. Intra-run, inter-run and day to day reproducibility of the assay was 100%.

Conclusion. The B. microti real time PCR assay developed by Northwell Health Laboratories is rapid, sensitive, specific and reproducible. With the sample to result turnaround time of 2.5 hours and hands on time on of only 5 minutes per sample, BcMPCR can be used as screening assay for B. microti in clinical laboratories.

Disclosures. All authors: no reported disclosures.

2088. A Novel Diagnostic Method for Malaria Using Loop Mediated Isothermal Amplification (LAMP) and MinION Nanopore Sequencer

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Background. Simply and accurately diagnostic tool for Malaria is required for clinical diagnosis and epidemiological survey. We have developed a novel diagnostic tool for Malaria using loop mediated isothermal amplification (LAMP) with MinION nanopore sequencer.

Methods. In this study, we have designed human Plasmodium parasites-specific LAMPPrimers targeting for the lesion of 18S rDNA gene, which were locating on the conserved sequences across all five Plasmodium species. Plasmodium falciparum, P. vivax, P. ovale (Po. wallikeri and Po. crutisi), P. knowlesi and P. malariae, containing each species-specific sequence within F1-B1 primer pairs. The sensitivities were evaluated using 10-4 dilutions of infected plasmodium harboring the sequences of 18S-rDNA. We also applied our protocol to human blood samples collected and stored with FTA elute cards derived from 30 Malaria patients, who are clinically diagnosed as Malaria in Indonesia. Its analytical sensitivities and specificities were also evaluated while comparing the results of previously described nested PCR methods. Finally, we performed amplicon sequencing of our LAMP methods using MinION nanopore sequencer to identify each Plasmodium species.

Results. Our LAMP method could amplify all targeting 18S-rDNA gene on conserved sequences across five Plasmodium species harboring the sequences of 18S-rDNA. We also applied our protocol to human blood samples collected and stored with FTA elute cards derived from 30 Malaria patients, who are clinically diagnosed as Malaria in Indonesia. Its analytical sensitivities and specificities were also evaluated while comparing the results of previously described nested PCR methods. Finally, we performed amplicon sequencing of our LAMP methods using MinION nanopore sequencer to identify each Plasmodium species.

Conclusion. Our innovative diagnostic technology with LAMP and MinION could become a powerful tool for identification of Plasmodium parasites even in resource-limited situation.

Disclosures. All authors: no reported disclosures.

2089. Accelerating Time to Pathogen-adapted Antibiotic Treatment through Culture-independent Antimicrobial Susceptibility Testing in Patients suffering from Sepsis

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Background. Accurate and fast pathogen identification and consecutive antimicrobial susceptibility testing (AST) is of vital importance for patient outcome in patients suffering from sepsis.

Methods. The Accelerate Phenom™ system is a new, fully automated, culture-independent diagnostic method for both pathogen identification (ID) and antimicrobial susceptibility testing (AST). We analyzed positive blood cultures from critically ill patients with new onset of sepsis according to the new sepsis guidelines, using both conventional standard methods (VITEK, MALDI-TOF) and Accelerate Phenom™ system. ID/AST results of the Accelerate Phenom™ system were not reported to treating physicians as part of our internal evaluation process.

Results. Accelerate Phenom™ system correctly detected 74 pathogens [Gram-negative (GN) (n = 27), Gram-positive (GP) (n = 47)] straight out of 84 positive blood culture bottles. Gram-negative (GN) pathogens were identified as E. coli (n = 15; concordance rate (CR) 100%), K. pneumonia MT (n = 7, 71.4%), S. marcescens (n = 3, 100%), E. cloacae (n = 2; 50%), P. mirabilis (n = 1; 100%) and P. aeruginosa (n = 1; 33%). Gram-positive pathogens were identified as CNS (n = 24; 82.6%), S. aureus (n = 15; 88.2%), E. faecium (n = 6; 100%) and E. faecalis (n = 2; 100%). The Accelerate Phenom™ system generated a GN-AST result in 74.9% (19 of 25) runs and a GP-AST result in 61.7% (29 of 47) samples when compared with routine AST. Growth control, analysis and mechanical failure led to reduced results in comparison to conventional ID/AST. Accelerate Phenom™ delivered correct MIC-results for most of the panel antibiotics [e.g., meropenem: 83.3%, gentamicin: 88.9%, ertapenem: 100%].

Conclusion. The use of the Accelerate Phenom™ system significantly improved time-to-ID/AST and would have led to a reduced time-to-treatment in patients suffering from sepsis if results would have been reported. The system currently lies in some weakness in the detection of polymicrobial and streptococcal infections but due to the short hands-on-time, culture-independence and fast generation of results, it represents a promising new diagnostic method for the consecutive antibiotic treatment of septic patients.

Disclosures. All authors: no reported disclosures.

2090. T-Cell Immunity Panel Measures CMV Specific CD4 and CD8 T-Cell Responses

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Background. Infection and disease from human cytomegalovirus (CMV) is a major complicating factor for both solid organ and hematopoietic stem cell transplant recipients. Antiviral therapy is often used to control CMV infections, but presents problems of toxicity, antiviral resistance and excessive costs. Currently, treating physicians are limited in the information and data available to assess a patient's ability to control a potential CMV infection post-transplant. Recent studies have shown that measuring a patient's CMV specific T cell mediated immunity may provide valuable information in informing management of CMV infection/disease in transplant patients and may aid in determining which patients need antiviral therapy.

Methods. For this purpose, a flow cytometry assay was developed to determine the percentages of CD4+ and CD8+ T cells that respond to stimulation with CMV antigens. The assay was performed concurrently on the instrument. Samples were incubated for up to 16 hours on MALDI-TOF MS. AST for ampicillin, cefazolin, ceftriaxone and ciprofloxacin was performed on 123 samples. No cross reactivity was observed with any of the malarial species tested.

Results. Our innovative diagnostic technology with LAMP and MinION could become a powerful tool for identification of Plasmodium parasites even in resource-limited situation.

Discussion. This assay evaluates a patient's pre-existing CMV specific T cell immunity and their global T cell function.

Disclosures. C.B. Lutgen: Vircar Flooens Clinical Diagnostics: Employee, Salary; L. Flebbe-Rehwaldt, Vircar Flooens Clinical Diagnostics: Employee, Salary; S. Kleboeker, Vircar Flooens Laboratories: Employee, Salary; S. Klemas, Vircar Flooens Clinical Diagnostics: Employee, Salary; J. Rodgers, Vircar Flooens Clinical Diagnostics: Employee, Salary; K. Steffens, Vircar Flooens Clinical Diagnostics: Employee, Salary; M. Altrich, Vircar Flooens Laboratories: Employee, Salary.

2091. Application of Laser Light Scattering Technology in Rapid Diagnosis of Urinary Tract Infections and Antimicrobial Susceptibility Testing in a Tertiary Children's Hospital

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Background. Timely and accurate microbiology testing is crucial in the diagnosis and management of urinary tract infections (UTIs). The ability to rapidly screen for potential UTIs can lead to early rule out and judicious use of antimicrobial therapy. This study examines the application of laser scattering for bacterial detection and antimicrobial susceptibility testing (AST) directly from urine.

Methods. Residual urine samples collected for routine culture were tested using the BacterioScan™ 216DS™ UTI System and 216R AST System. Continuous collection of overnight urine samples generated growth results with greater than 100 copies in 1 hour. The BacterioScan™ 216R AST System delivers correct MIC-results for most of the panel antibiotics such as e.g., meropenem: 83.3%, gentamicin: 88.9%, ertapenem: 100%.

Conclusion. The use of the Accelerate Phenom™ system significantly improved time-to-ID/AST and would have led to a reduced time-to-treatment in patients suffering from sepsis if results would have been reported. The system currently lies in some weakness in the detection of polymicrobial and streptococcal infections but due to the short hands-on-time, culture-independence and fast generation of results, it represents a promising new diagnostic method for the consecutive antibiotic treatment of septic patients.

Disclosures. All authors: no reported disclosures.