648. Balexavir Resistance: qPCR Detection of Antiviral Resistance Markers in Influenza A Virus

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Background. Influenza (flu) infections affect a large subset of the population every year and have significant impacts on the health of patients, especially those with weak or compromised immune systems such as the elderly, children, cancer patients, and transplant recipients. Balexavir marboxil was approved in October 2018 as a novel antiviral thera-
petic for treating flu. During clinical trials, mutations were identified at the 128 codon of the polymerase acidic (PA) protein that greatly increased the resistance of a flu strain to this novel drug. In this study, a qPCR was developed and validated to identify these resistance mutations, allowing for guided therapeutic decisions based on the resistance profile of the strain.

Methods. Flu A sequences (6,175) of the PA gene from the NCBI Influenza Virus Database collected over the last 5 years were compiled and aligned. Primers and probes were designed to target the 128 codon of the PA gene, and specific probes for each codon yielding a resistant amino acid mutation (Δ2T, -M, and -F) were designed. Locked nucleic acid (LNA) bases were used to increase the specificity of the probes. A combination of clinical flu specimens, laboratory strains, and synthetic constructs of each potential resistance mutation were used to validate the precision, sensitivity, and accuracy of the assay in nasopharyngeal swabs.

Results. Cycle threshold (Ct) values for each detector were determined to have a standard deviation of less than 3 for inter-assay and less than 2 for intra-assay replicates. Sensitivity was determined to be 800 copies/mL in nasopharyn-
gal swabs. Accuracy was found to be 92.3%. A single laboratory strain from the H1N1 2009 wild-type strain that was re-activated with both wild-type and resistant probes, but no circulating clinical H1N1 samples tested showed this response.

Conclusion. The precision, sensitivity, and accuracy of a qPCR for resistance mutations to balexavir marboxil support this assay’s utility as an aid in the treatment of flu in at-risk patient groups. This assay allows for rapid detection (<24 hours) of resistance markers to aid clinicians in improving flu case outcomes.

Disclosures. All authors: No reported disclosures.

649. Prospective Validation of an 11-mRNA Host Immune Signature as a Novel Blood Test for Acute Septic Arthritis

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Background. Septic arthritis is an orthopedic emergency requiring immediate sur-
geon intervention. Joint aspirations detect inflammatory cells within hours but often cannot distinguish between infections (e.g., bacterial) or other causes (e.g., gout). Cultures take days, so decisions about surgery are made with incomplete data. Aspirations carry risk and require technical skill and advanced imaging, novel diagnostics are thus needed. An 11-mRNA host immune blood signature has been validated to distinguish between infec-
tions and noninfectious sepsis. Part of the 29-mRNA HostRx Septis test that can also distinguish between bacterial and viral infections and predicts severity (cur-
tently under development as a rapid point-of-care test). We studied whether the 11-mRNA host immune blood signature has been validated to distinguish between infec-
tion and noninfection.

Methods. A combination of clinical flu specimens, laboratory strains, and synthetic constructs of each codon yielding a resistant amino acid mutation (I38T, -M, and -F) were designed. Locked nucleic acid (LNA) bases were used to increase the specificity of the probes. Each potential resistance mutation were used to validate the precision, sensitivity, and accuracy of the assay in nasopharyngeal swabs.

Results. Cycle threshold (Ct) values for each detector were determined to have a standard deviation of less than 3 for inter-assay and less than 2 for intra-assay replicates. Sensitivity was determined to be 800 copies/mL in nasopharyn-
gal swabs. Accuracy was found to be 92.3%. A single laboratory strain from the H1N1 2009 wild-type strain that was re-activated with both wild-type and resistant probes, but no circulating clinical H1N1 samples tested showed this response.

Conclusion. The precision, sensitivity, and accuracy of a qPCR for resistance mutations to balexavir marboxil support this assay’s utility as an aid in the treatment of flu in at-risk patient groups. This assay allows for rapid detection (<24 hours) of resistance markers to aid clinicians in improving flu case outcomes.

Disclosures. All authors: No reported disclosures.

650. Relationship of a Multiplex Molecular Pneumonia Panel (PP) Results with Hospital Outcomes and Clinical Variables

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Background. The Pneumonia Panel (PP) (BioFire Diagnostics, Salt Lake City, UT) detects 15 potentially pathogenic bacteria semiquantitatively (copy #/mL), 8 viruses and 7 resistance genes from the lower respiratory tract in ~1 hour in the labora-
tory. Since identification and susceptibility take 2 days, this rapid test time is very attractive; however, the clinical significance of the PP copy #/mL as well as a predict-
able group of PP positive but culture negative patients is unknown. We retrospectively studied the relationship of 270 PP results to culture results, clinical data and outcomes.

Methods. Bronchoalveolar lavage fluid (N = 197) and endotracheal aspirates (N = 73) submitted to the UF Health Shands Hospital microbiology laboratory from June-September 2018 were frozen at 70°C, until tested on the PP. Patient data were extracted from the inpatient electronic medical record (Epic).

Results. Of 270 patients tested, 111(27.1%) were PP bacteria negative/cul-
ture no growth or normal flora (Group 1), 59(20.1%) were PP positive/culture negative, and 99 (36.2%) were PP positive/culture positive (Group 3). We also compared the basin-
cular pathogen culture-positive/PP-positive group vs. not positive groups. ICU admission markers to aid clinicians in improving flu case outcomes.

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651. Multi-Center Evaluation of the BioFire FilmArray Blood Culture Identification 2 Panel for the Detection of Microorganisms and Resistance Markers in Positive Blood Cultures

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Background. The BioFire FilmArray Blood Culture Identification 2 (BCID2) Panel is a diagnostic test that provides results for 26 bacterial, 7 fungal pathogens and 10 antimicrobial resistance (AMR) genes from positive blood culture (BAC) specimens in about an hour. The BCID2 Panel builds upon the existing BCID Panel with several addi-
tional assays that include Candida auris and an expanded AMR gene menu that provides methicillin-resistant Staphylococcus aureus (MRSA) results plus detection for mcr-
-1, carbapenem resistance, and ESBL. Here, we summarize studies conducted to establish clinical performance using an Investigational Use Only version of the BCID2 Panel.

Methods. Three studies were performed. The first involves prospective collection and testing of an expected ~1,000 residual PICs at 7 US and 2 EU sites, which began in