Table 1. Patient demographics and co-morbidities.

| Variable                        | Total (N=108) |
|---------------------------------|---------------|
| Average Age (years)             | 58.6          |
| Male – No. (%)                  | 64 (59.2)     |
| Race/Ethnicity – No. (%)        |               |
| White                           | 62 (57.4)     |
| Black                           | 44 (40.7)     |
| Asian                           | 2 (1.8)       |
| Immunosuppression – No. (%)     |               |
| Solid malignancy                | 17 (15.7)     |
| Hematologic malignancy          | 6 (5.6)       |
| SOT                             | 11 (10.2)     |
| HSCT                            | 3 (2.8)       |
| Other                           | 17 (15.7)     |
| Diabetes – No. (%)              | 34 (31.5)     |
| Cardiovascular disease – No. (%)| 19 (17.6)     |
| Chronic lung disease – No. (%)  | 21 (19.4)     |
| CKD – No. (%)                   | 19 (17.6)     |
| ESRD – No. (%)                  | 8 (7.4)       |
| Cirrhosis – No. (%)             | 13 (12.0)     |
| IVDU – No. (%)                  | 3 (2.8)       |
| Mechanical ventilation – No. (%)| 19 (17.6)     |
| Trauma at time of admission – No. (%) | 10 (9.3) |
| Burn at time of admission – No. (%) | 1 (0.9) |
| Pitt Bacteremia Score (Mean)    | 2.5           |

Table 2. Gram-negative bacteria frequency.

| Gram-negative Bacteria         | Total (%) |
|--------------------------------|-----------|
| *Escherichia coli*             | 30 (27.8) |
| *Klebsiella pneumoniae*        | 24 (22.2) |
| *Pseudomonas aeruginosa*       | 11 (10.2) |
| *Polymicrobial*                | 11 (10.2) |
| Enterobacter species           | 9 (8.3)   |
| Other                          | 7 (6.5)   |
| Not detected                   | 6 (5.5)   |
| *Klebsiella oxytoca*           | 4 (3.7)   |
| *Serratia marcescens*          | 3 (2.8)   |
| *Acinetobacter baumannii*      | 3 (2.8)   |

Conclusion. The BCID-GN panel enabled earlier time to optimal treatment of highly resistant bacteria as well as multiple opportunities for narrowing gram negative spectrum and a higher degree of certainty in cessation of broad-spectrum antibiotics.

Methods. 107 lung transplant recipients (79% with cystic fibrosis) were enrolled at Duke University Medical Center over a 2-year period ~ 59% with acute respiratory symptoms, the remainder as healthy controls. Whole blood was collected by PAXGene for RNA sequencing. Prior to undergoing biomarker analysis, each case was adjudicated to the appropriate clinical phenotype: bacterial infection, viral infection, allograft rejection, and healthy. Logistic regression models were applied to gene expression data to identify classifiers capable of identifying each etiology.

Results. In lung transplant recipients, 117 genes were upregulated at least 2-fold in the presence of viral infection compared to healthy transplant controls. These genes clustered into expected antiviral pathways, including type I interferon signaling, interferon gamma mediated signaling, and defense response to virus, although the magnitude of gene expression was significantly less than that seen in non-transplant cohorts.

Conclusion. Even in the presence of systemic immunosuppression and regardless of presence/absence of cystic fibrosis, core canonical components of the host response to infection and rejection are seen. Gene expression signatures based on these conserved components offer the potential for diagnostic capability in the setting of nonspecific respiratory illness in these vulnerable hosts.

Disclosures. Julie M. Steinbrink, MD, CareDx (Research Grant or Support) Alice Gray, MD, CareDx (Advisor or Review Panel member, Research Grant or Support, Speaker’s Bureau) Polarean (Advisor or Review Panel member)

1024. Using DOOR-MAT to Theoretically Compare Three Rapid Diagnostic Tests for Gram-Negative Bloodstream Infections in Immunocompromised Patients

Background. Molecular rapid diagnostic tests (RDTs) for bloodstream infections (BSI) utilize a variety of technologies and differ substantially in organisms and resistance mechanisms detected. RDT platforms decrease time to optimal antibiotics; however, data on RDTs in special populations, such as immunocompromised are extremely limited. This study aimed to compare theoretical changes in antibiotics based on differences in panel identification of organisms and resistance targets among three commercially available RDT panels.

Methods. Retrospective cohort of immunocompromised patients treated for gram-negative BSI at University of Maryland Medical Center from January 2018 to September 2020. Immunocompromised was defined as active hematologic or solid tumor malignancy at time of BSI diagnosis, history of hematopoietic stem cell transplantation (HSCT) or solid organ transplantation (SOT), or absolute neutrophil count (ANC) < 1000 cells/mm³ at any time 30 days prior to BSI diagnosis. Verigene BC-GN was performed as standard of care. GenMark ePlex BCID and BioFire FilmArray BCID 2 results were assigned based on respective identifiable organism panels.

An infectious diseases clinician blinded to final antimicrobial susceptibility testing (AST) results used RDT results to assign antibiotic treatments for each platform. Decisions were referenced against a priori DOOR-MAT matrices. A partial credit scoring system (0 to 100) was applied to each decision based on final AST results. The mean and standard deviation (SD) were compared across panels using One-Way Repeated Measures ANOVA with modified Bonferroni for multiple comparisons.

Results. A total of 146 patients met inclusion. Baseline characteristics are summarized in Table 1. The mean (SD) DOOR-MAT scores for the three RDT panels were: 86.1 (24.4) Verigene BC-GN vs. 88.5 (22.2) GenMark BCID vs. 87.2 (24.4) BioFire BCID 2. There was no statistically significant difference between the panels for DOOR-MAT score (P=0.6).

Table 1. Baseline Patient Characteristics and Organism Identification

| Variable                        | Total (N=108) |
|---------------------------------|---------------|
| Age; mean, years                | 57 (15)       |
| Male; n (%)                     | 92 (63)       |
| Level of care; n (%)            | 87 (59.6)     |
| MAC; n (%)                      | 59 (36.7)     |
| ICU; n (%)                      | 20 (13.7)     |
| Type of immunosuppression; n (%)|               |
| Hematologic malignancy only     | 45 (30.8)     |
| SOT only                        | 45 (30.8)     |
| Any history of HSCT             | 44 (30.1)     |
| Hematologic malignancy and history of HSCT | 43 (29.5) |
| Solid tumor malignancy only     | 12 (8.2)      |
| Solid tumor malignancy and history of HSCT | 1 (0.7)   |
| Most common organisms isolated; n (%)|         |
| *Escherichia coli*              | 48 (32.9)     |
| *Pseudomonas aeruginosa*        | 34 (23.3)     |
| *Klebsiella pneumoniae*         | 32 (21.3)     |
1025. Prediction of Intravenous Immunoglobulin Resistance and Coronary Artery Dilatation in Kawasaki Disease: a Multicenter Study from Oman

Fatma Al Mwati, resident; Zaid Alhini, MD FAAP, FFPPDS; Safiya AlAbrawi, senior consultant pediatric rheumatologist; Amshlan AL maram, MD; Reem Abdwani, Rheumatology associated professor; Khalfan Al Senidi, pediatric cardiology senior consultant.

Oman, Sultan Qaboos University, Muscat, Masqat, Oman; SQU, Muscat, Masqat, Oman; MOH, Masqat, Masqat, Oman; SQU, Masqat, Masqat, Oman; SQUH, Mascat, Masqat, Oman

Session: P-58: New Approaches to Diagnostics

**Background.** Prediction of intravenous immunoglobulin (IVIG) resistance and coronary artery dilatation continues to be a challenge in the management of Kawasaki disease. Significant differences exist among different populations.

**Methods.** Children < 13 years of age who presented to the two main tertiary care hospitals in Oman (Royal Hospital and Sultan Qaboos University Hospital) between 2008 and 2019 with a diagnosis of Kawasaki disease were included. Diagnosis was confirmed and clinical, laboratory and echocardiography data was systematically collected and checked for accuracy. The primary outcome was the presence of IVIG resistance or coronary artery dilatation at the 6-week follow-up. Bivariate analysis was used to identify significant predictors of the primary outcome, followed by multivariable logistic regression to determine independent predictors. The Muscat Index of Kawasaki disease Severity (MIKS) score was created based on the results.

**Results.** 156 children with Kawasaki disease were included. Median age was 2.1 years (IQR 0.9-3.8), and 64% were males. All patients received IVIG, 26 (17%) received steroids, and one received infliximab. Coronary dilatation was identified in 41 (26%) patients on initial echocardiogram, and 26 (18%) at the 6-week follow-up visit. Variables significantly associated with the primary outcome were age ≤15 months (P=0.031), hemoglobin (P=0.009), WBC count (P=0.002), absolute neutrophil count (P=0.006), and CRP ≥150 mg/L (P=0.015). These variables in addition male gender (P=0.058), ALT >80 IU/L (P=0.10) and serum sodium (P=0.10), were entered into multivariable logistic regression. A predictive model based on CRP ≥150 mg/L (LR=2.2, P=0.049), male gender (LR=2.1, P=0.095) and WBC (LR=1.1, P=0.017) resulted, and it was used as basis for the MIKS score (Table 1). The MIKS score performed favorably to the Kobayashi score in its sensitivity to predict the primary outcome and its separate components (Table 2). Combining the MIKS score with other high-risk criteria had a sensitivity of 95% in predicting the primary outcome and a specificity of 56%.

**Conclusion.** Open-ended, plasma-based mcfDNA NGS provides a rapid, non-invasive test to diagnose diverse clinical manifestations of zoonotic infections such as Q fever and Brucellosis against competing broad differential diagnoses. Furthermore, these cases highlight the potential of the KT to diagnose infections caused by fastidious/unculturable pathogens with cystic clinical presentations.

**Methods.** Nicholas R. Degner, MD, MPH, MS, Karius Inc. (Employee), Sharita Omar, RN, Ricardo Castillo-Galvan, MD MPH, Karius Inc. (Employee); Jose Alexander, MD, D(ABMM), FCCM, CIC, SM, MB(ASCP), BCMAS, Karius Inc. (Employee) Aparna Arun, MD, Karius (Employee); Ann Macintyre, DO, Karius, Inc. (Employee); Bradley Perkins, MD, Karius, Inc. (Employee) Asim A. Ahmed, MD, Karius, Inc. (Employee) Matthew Smollin, PharmD, Karius, Inc. (Employee)

**Session:** P-58: New Approaches to Diagnostics

**Background.** The ePlex BCID Gram-Positive (GP) panel utilizes electroswetting technology to detect the most common causes of GP bacteremia (20 targets) and 4 antimicrobial resistance (AMR) genes in positive blood culture (BC) bottles. Rapid detection (100% male gender (LR=2.1, P=0.095) and WBC (LR=1.1, P=0.017) resulted, and it was used as basis for the MIKS score (Table 1). The MIKS score performed favorably to the Kobayashi score in its sensitivity to predict the primary outcome and its separate components (Table 2). Combining the MIKS score with other high-risk criteria had a sensitivity of 95% in predicting the primary outcome and a specificity of 56%.

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