Evaluation of the APAS Independence with Thermo Fisher Brilliance MRSA Analysis Module at NHS William Harvey Hospital

B. Sloan [1], **M. Dawson** [1] **and R. Arkley** [1]
[1]William Harvey Hospital, Kent, United Kingdom

NHS
East Kent
Hospitals University
NHS Foundation Trust

INTRODUCTION

Screening of MRSA samples in routine microbiology is an important service to assist with infection control surveillance. The low prevalence of colonisation (<2% in the UK) means that significant time is spent by skilled staff to examine and report negative plates. As workload pressures on laboratories increase, there is an increase in demand to investigate technologies to assist with routine plate reading.

PURPOSE

This investigation was performed to evaluate the use of an automated plate interpretation workflow using the APAS Independence compared to traditional microbiology technician plate reading within a busy NHS clinical microbiology laboratory setting. The APAS Independence utilises advanced artificial intelligence and machine learning in the examination of culture plates through image capture via the automated on-board imaging suite.

METHODOLOGY

Routine surveillance specimens (1319) received into the laboratory were cultured onto Thermo Fisher Brilliance MRSA II Agar and incubated for 18-24 hours/37°C, in accordance with manufacturer's recommendations. Samples were subsequently processed through the APAS Independence with MRSA Analysis Module and compared with the microbiologist plate-in-hand result, using the same plate.

RESULTS

The isolation rate of MRSA for this study was 0.83% (11 true positives).

Measurement	Performance
PPA	100%
NPA	97.9%
NPV	99.9%

The APAS Independence did not report any false negatives and performed with a Positive Percent Agreement (PPA) of 100% and Negative Percent Agreement of 97.9%. The Negative Predictive Value (NPV) was 99.9%. Some false positive screening results occurred with APAS Independence due to the presence of charcoal particulates, detection of blue colonies that did not confirm as MRSA, and significant gouges in agar.
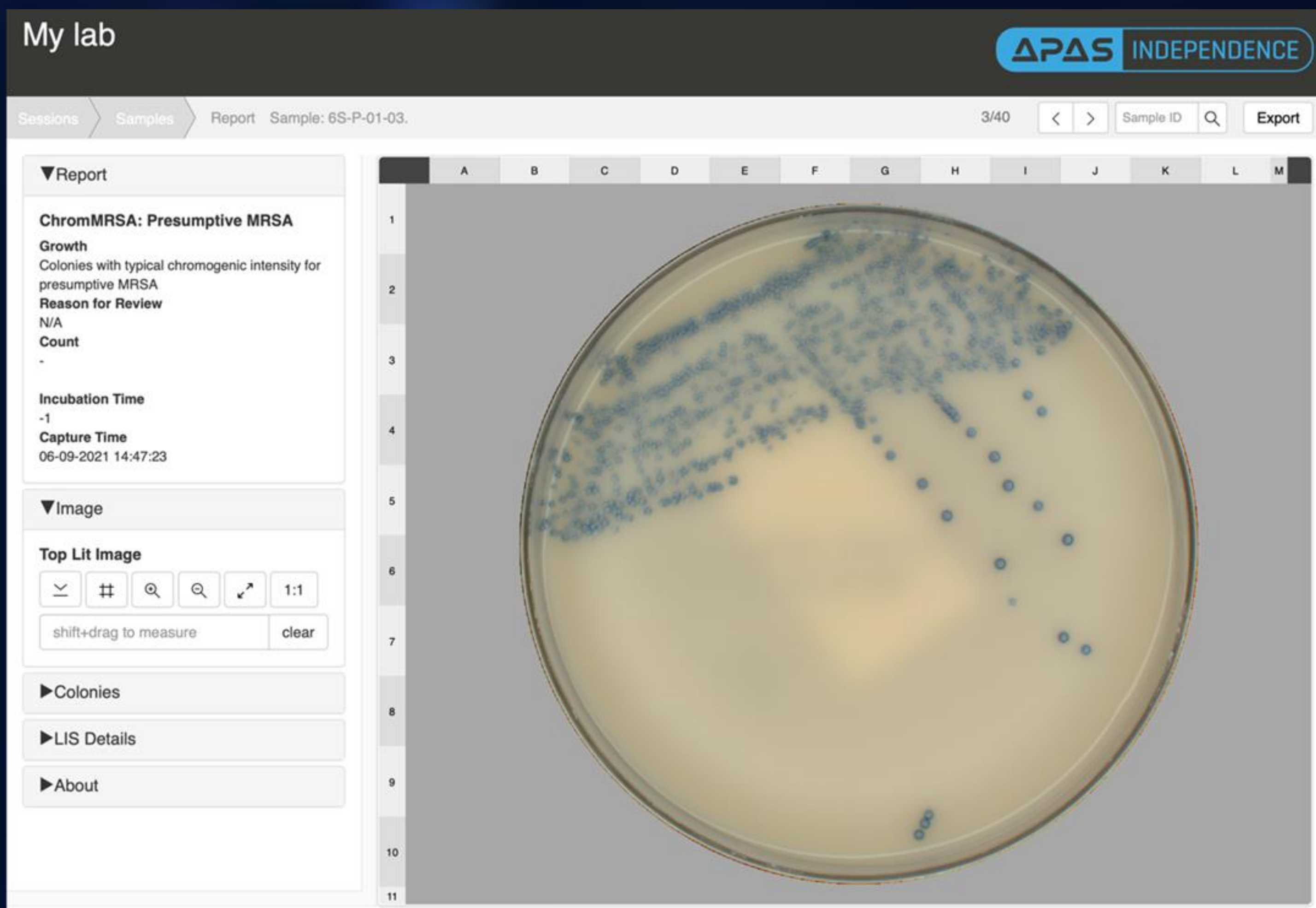

Figure 1: APAS web report displaying the image and growth interpretation. A number of image tools are available for manipulation
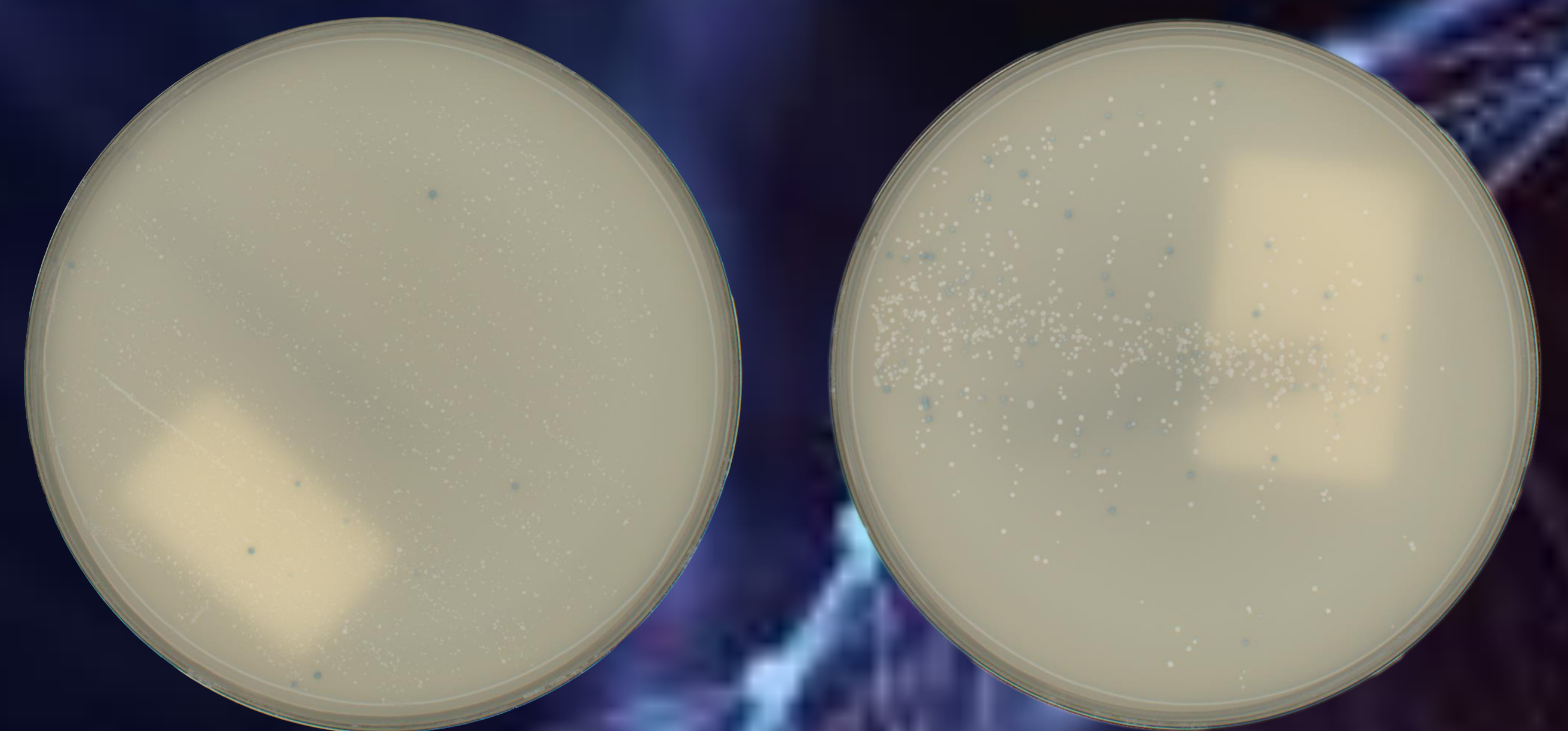

Figure 2: Examples of positive MRSA plates detected by the APAS Independence

CONCLUSION

- ✓ Reliable use of the APAS Independence over traditional workflow for reading MRSA infection control samples was demonstrated.

- ✓ No MRSA positive cultures were missed in the entirety of the investigation.

- ✓ A few false positives were detected (27), however these were reviewed after being sent to the positive output stack of the APAS Independence.

- ✓ No false negatives were detected, highlighting the strong reliability of the system to remove negative culture results entirely from the workflow.

- ✓ Users can save >90% of reading time in automating the process with the APAS Independence.

ACKNOWLEDGEMENT

CONTACT INFORMATION

benjamin.sloan@nhs.net