

Failure of *Mycobacterium avium* to Adhere to Interior Surfaces of Oscillating Positive Expiratory Pressure (OPEP) and Nebulizer Devices

Falkinham, J¹, Schloss, J², Suggett, J³, Coppolo, D²

¹ Department of Biological Sciences, Virginia Tech ² Monaghan Medical Corporation, New York, USA ³ Trudell Medical International, London, Canada

BACKGROUND

Risk of respiratory infection is a common concern for bronchiectasis patients often leading to caution involving use of medical devices for inhalation. *M. avium* is a major cause of lung infection in bronchiectasis patients and is common in household drinking water that could be used to rinse respiratory devices.

Accordingly, the object of this study was to measure the adherence of *M. avium* cells to the interior walls of two commonly used respiratory devices.

METHODS

One OPEP device (**Aerobika**^{*}, Monaghan Medical) and one nebulizer device (**AeroEclipse**^{*} **XL BAN**^{*} Nebulizer, Monaghan Medical) were evaluated.

Each device was disassembled and separately submerged in a one-liter high density suspension of *M. avium* for 24 hours and then air dried.

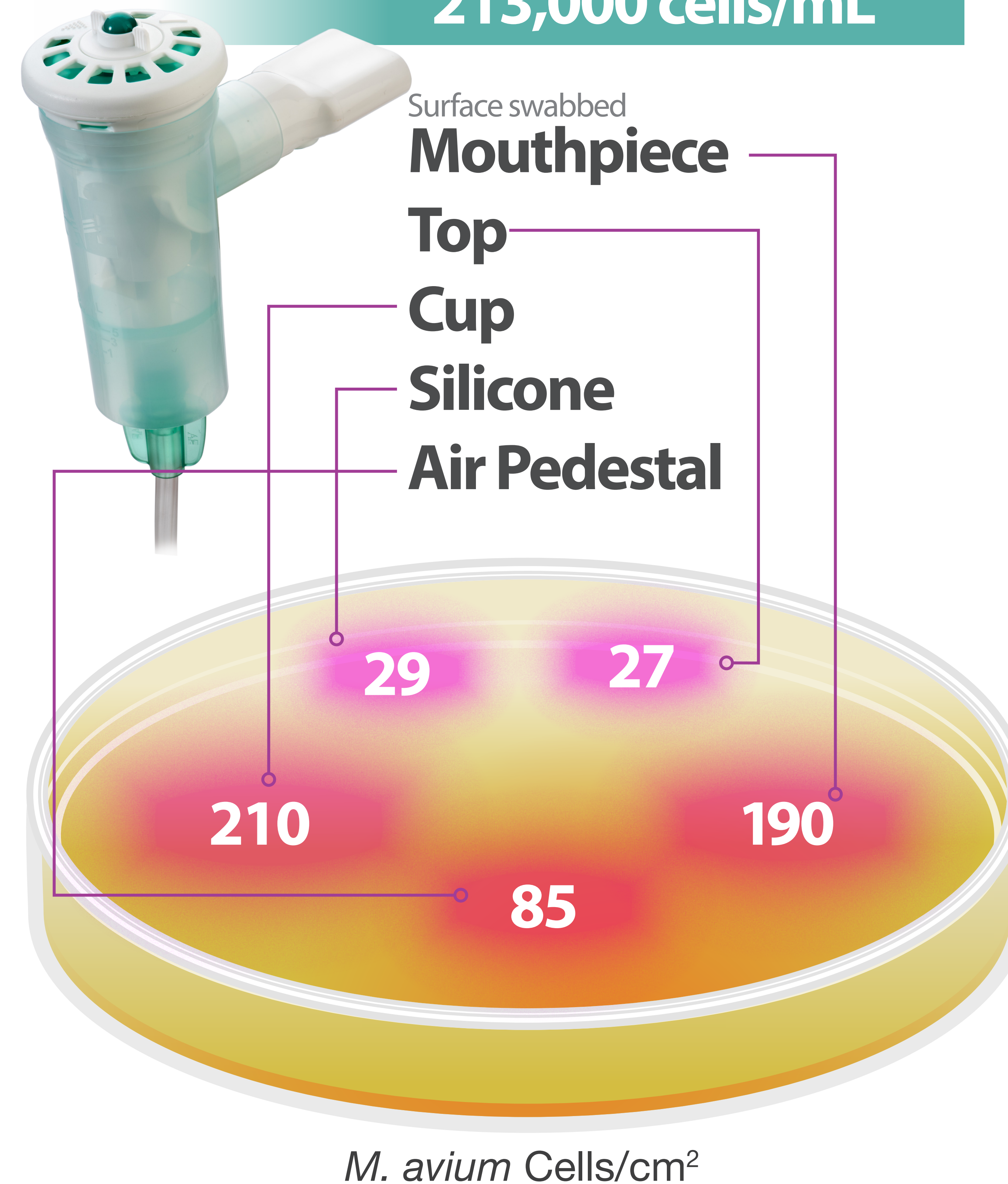
A 4-cm² area of each device part was swabbed. The swab was placed in 2 mL of sterile distilled water and vortexed to release and suspend *M. avium* cells.

Cells were counted as colony-forming units on Middlebrook 7H10 agar media after 10 days incubation at 37° C.

RESULTS

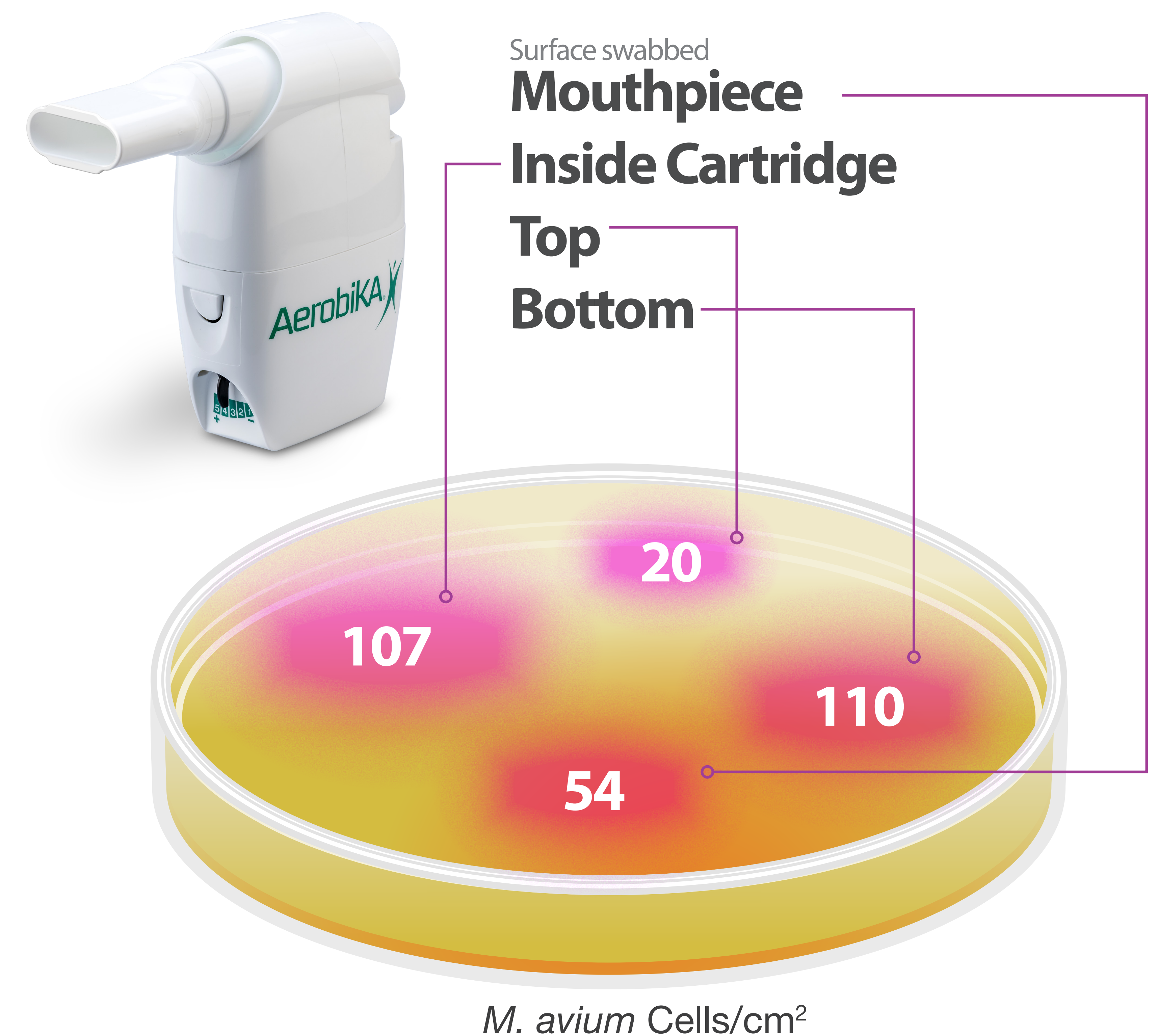
AeroEclipse^{*}

Submerged in *M. avium* Density
213,000 cells/mL



Aerobika^{*}

Submerged in *M. avium* Density
450,000 cells/mL



CONCLUSION

The test was designed to provide a worst-case scenario, with a very high-density suspension of *M. avium* cells and a long 24-hr period to allow for adherence.

Compared to copper, stainless steel, galvanized steel, and PVC surfaces (average > 2,000 cells/cm² in 24 hr.), the number of adherent *M. avium* cells on the surfaces of the **AeroEclipse**^{*} **XL BAN**^{*} Nebulizer and **Aerobika**^{*} OPEP device is minimal.

Thus, even under a worst-case scenario, the measurements indicate the materials comprising the **Aerobika^{*} OPEP and **AeroEclipse**^{*} **XL BAN**^{*} Nebulizer devices fail to collect adherent *M. avium* cells.**

This provides some assurance to patients that the risk of infection from such microorganisms will be low in the event that cleaning and disinfection is not performed robustly.