Clinical Laboratory Testing for *Mycobacterium chimaera* (Updated 1/24/17)

On October 13, 2016 the CDC released a Health Alert Network (HAN00397) regarding the potential contamination of heater-cooler devices [Stöckert 3T heater-cooler, LivaNova PLC] used during cardiac surgery with *Mycobacterium chimaera*. Health departments are being asked to communicate with healthcare facilities that perform cardiac surgery using heater-cooler devices about the risk of *M. chimaera* infection associated with these devices and to be prepared to assist with further investigations.

Public Health Laboratories may have already received inquiries on the best approaches for testing for *M. chimaera*. From the laboratory perspective, identification of *M. chimaera* can be quite difficult. *M. chimaera* is part of the *Mycobacterium avium* complex (MAC) and is very similar to *M. intracellulare* with only a single nucleotide difference in 16s rDNA (base pair difference between *M. intracellulare* T450C and *M. chimaera*).1,2

Environmental, water and air sampling and monitoring is challenging due to issues with specimen collection and the possibility of false negatives. Laboratories should refer to information provided by the manufacturer of the heater-cooler units and FDA for appropriate monitoring.

**Methods to Identify *M. chimaera***

Commonly used identification methods for *Mycobacterium* such as HPLC, MALDI-TOF3 and Accuprobe4 are able to identify to the *M. avium* complex level or to the species level *M. avium* or *M. intracellulare* but they are unable to identify *M. chimaera*. Those commonly used method can be used to perform the initial identification but then suspect cases that are positive for the *M. avium* complex or *M. intracellulare* would need to be triaged to a sequencing based method, which is currently the only method that can discriminate between *M. chimaera* and *M. intracellulare*. Of note, there are several different sequencing methods published (see the references below) including 16s rDNA, *rpoB*, internal transcribed spacer (ITS) or whole genome sequencing (WGS) to distinguish between the two species.

**Resources for laboratories interested in performing their own sequencing:**


Hasan NA, et al. Complete Genome Sequence of Mycobacterium chimaera Strain AH16. 2016 (Genome Announcements; Accepted).

**Resources for laboratories interested in using a reference laboratory:**

If your laboratory is interested in using a reference laboratory we suggest you contact your local or state public health laboratory to assist you in identifying a laboratory that utilizes a methodology sufficient to identify *M. chimaera* specifically.

**FDA Resources**


**CDC Resources**

Perkins KM, et al. Notes from the Field: Mycobacterium chimaera Contamination of Heater-Cooler Devices Used in Cardiac Surgery — United States. 2016. MMWR 65(40):1117-8. Available at: https://www.cdc.gov/mmwr/volumes/65/wr/mm6540a6.htm?s_cid=mm6540a6_w


Contaminated Heater-Cooler Devices. Available at: https://www.cdc.gov/hai/outbreaks/heater-cooler.html
References


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