Clinical Laboratory Testing for *Mycobacterium chimaera*

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*, T450 and *M. chimaera*, C450).

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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 methods can be used to perform the initial identification, but then suspect cases associated with cardiac surgery and use of the heater-cooler device 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:

Both laboratories listed below are performing testing for M. chimaera associated with this HAN. If your laboratory is interested in using their services we suggest you contact them directly regarding your needs and their testing procedures.

National Jewish Health Mycobacteriology Laboratory:
Contact: 303-398-1339 or SalfingerM@njhealth.org (Max Salfinger, MD); 303-270-2753 RodgerR@njhealth.org (Rachael Rodger, MPH)

University of Texas Health Northeast Mycobacteria/Nocardia Laboratory:
Contact: 903.877.7685 or barbara.elliott@uthct.edu

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


Acknowledgements

This document was prepared by the APHL Tuberculosis Subcommittee. This project was 100% funded with federal funds from a federal program. This update was supported by Cooperative Agreement # U60OE000103 funded by the Centers for Disease Control and Prevention. Its contents are solely the responsibility of the authors and do not necessarily represent the official views of CDC or the Department of Health and Human Services. Office of Surveillance, Epidemiology and Laboratory Services (OSELS) National Center for HIV, Viral Hepatitis, STDs and TB Prevention (PS) National Center for Zoonotic, Vector-borne, and Enteric Diseases (CK) National Center for Immunization and Respiratory Diseases (IP) National Center for Environmental Health (NCEH) National Center for Birth Defects and Developmental Disabilities (NCBDD)