Weird Science
“It’s an outbreak...or not”

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St. Louis, MO
Description

• Hospital: 234 acute care facility
  – Regional referral center specializing in heart and vascular, orthopedic, maternity, cancer, digestive disorders and general surgery
  – 250 physicians representing all major medical specialties and most subspecialties
The event

- Between March 2018 and January 2019
- Nine patients have this organism isolated from their bronchwash specimen
- The organism is first isolated on fungal media (mycosel agar)
- Growth appears in 3-5 days
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<th>Hospital</th>
<th>Source</th>
<th>Age</th>
<th>Gender</th>
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Epi Curve

Series1
Growth on Mycosel Agar
Smear of the organism
What do you think the organism might be?

• This is a relatively rapid growing organism that is increasingly recognized to cause serious infections both pulmonary and extra-pulmonary
• It occurs most frequently in patients with cystic fibrosis and other lung diseases
• It is often intrinsically resistant to many antibiotics
With this information...
Identification

• SHL identified the organism using sequencing of ribosomal RNA, identification through MicrobeNet (CDC)
  – Mycobacterium bolletii 99.78%
  – Mycobacterium massiliense 99.78%
  – Mycobacterium chelonae 99.78%
  – Mycobacterium abscessus 99.78%

• Conclusion: *Mycobacterium chelonae/Mycobacterium abscessus* Group
Mycobacterium chelonae/Mycobacterium abscessus Group

- Rapidly growing acid-fast bacillus
- Seen as a respiratory pathogen in Cystic Fibrosis (CF) patients
  - None of these patients were diagnosed with CF
- Seen in soft tissue infections
- Also found as a contaminant
- *Mycobacterium chelonae/Mycobacterium abscessus* Group is a significant cause non-tuberculosis Mycobacteria pulmonary disease in some parts of the world
- Associated with poor prognosis for the patient because of macrolide resistance (erm gene)
Mycobacterium chelonae/Mycobacterium abscessus

1952: *M. abscessus* first isolated from knee abscess

1972: Designated subspecies; *M. chelonae* subsp. *abscessus*

1992: *M. abscessus* elevated to species status distinct from *M. chelonae*

2004: *M. massiliense* discovered in patient with Hemoptic pneumonia

2006: *M. boletti* discovered using *rpoB* analysis

2011: *M. boletti* and *M. massiliense* merged to form single subspecies of *M. abscessus*

2013: WGS confirms MABS complex consists of *M. abscessus* subsp. *abscessus*, *M. abscessus* subsp. *massiliense*, and *M. abscessus* subsp. *bolletii*
What are the possible sources?

• Dust – reports of *M. abscessus* associated with dust
• Biofilm in lungs - Mycobacterial biofilms have recently been identified in histological samples from lung cavitary disease
• Biofilms can form in the environment. Mycobacteria have been reported in many environmental studies, especially in water systems.
Polling Question 1:

• Is this a pathogen or colonization?
  1. Pathogen
  2. Colonization
ORIGINAL ARTICLE

Pseudo-outbreak of *Mycobacterium abscessus* Infection Caused by Laboratory Contamination

D. B. Blossom, MD, MS; K. A. Alelis, MPH; D. C. Chang, MD; A. H. Flores, BA; J. Gill, PhD, MPH; D. Beall, PhD; A. M. Peterson, MPH; B. Jensen, MMSc; J. Noble-Wang, PhD; M. Williams, PhD; M. A. Yakrus, MS, MPH; M. J. Arduino, DrPH; A. Srinivasan, MD

**Objective.** To investigate the cause(s) of an increased incidence of clinical cultures growing *Mycobacterium abscessus* at a hospital in Florida.

**Design.** Outbreak investigation.
What can the colony morphology tell us?

- In cystic fibrosis patients either the smooth or rough morphotypes are observed
- The rough morphology is associated with an increase in pathogenicity
Automated scope washers can become heavily contaminated with mycobacteria

- Found in rinse water from the bronchoscope disinfecting machine
- No control measure worked
  - Sterile water rinse
  - Increasing 2% alkaline glutaraldehyde exposure time
  - Frequent replace of glutaraldehyde
  - Disinfection of the machine
- Finally, rinsed scopes with 70% alcohol
Facility switched to a single use bronchoscope

- From February to April there were no additional cases
- When they switched back to the bronchoscope washer, the cases started again
Polling Question 2:

• If this is a new subspecies of *Mycobacterium chelonae/Mycobacterium abscessus* Group discovered do you want to name it?
  – Mycobacterium iowae
  – Mycobacterium bronchoscopica
  – Mycobacterium pentellae