

A young man with dark skin and short black hair is smiling at the camera. He is wearing a light blue short-sleeved polo shirt and blue denim jeans. He is holding a light gray rectangular sign in front of his chest with both hands. The sign has the word "ACTINOMYCETES" written on it in a bold, purple, sans-serif font. The background is plain white.

ACTINOMYCETES

Clinically important Gram positive bacilli

- **Spore forming**

1. Bacillus
2. Clostridium

- **Non-spore forming**

1. Corynebacterium
2. Listeria
3. Lactobacillus

- **Bacilli with branching filaments**

1. Actinomyces
2. Nocardia



ACTINOMYCETES

Actinomycetes Ecology

- Predominantly soil bacteria
- Give soil the “earthy” smell

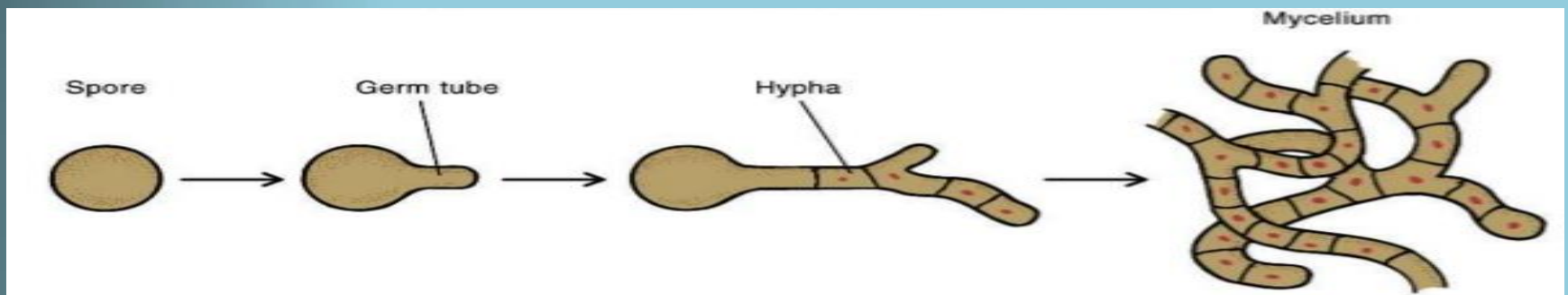
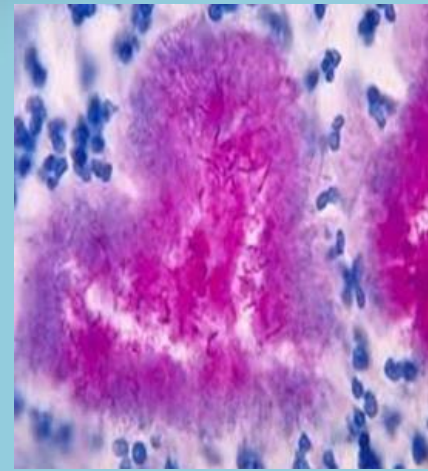
Human host:

- Commensals in the Mouth

ACTINOMYCETES

Actinomycetes morphology

- Gram-positive bacilli
- Have filamentous growth
- Facultative anaerobes



ACTINOMYCETES

- $\frac{3}{4}$ of human cases are caused by *Actinomyces israelii*
- Some are aerobic and others are anaerobic
- All are slow growing

Actinomyces israelii

Clinical significance:

- Actinomycosis
- Mycetoma
- Cervicofacial infection
- Thoracic actinomycosis
- Abdominal actinomycosis
- Pelvic actinomycosis



DIAGNOSIS

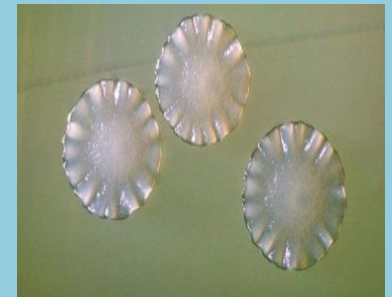
- **Specimens:**

- ✓ should be obtained directly from lesions by open biopsy, needle aspiration
- ✓ Sputum
 - Sulfur granules



- **Culture:**

- Anaerobic
- Growth is slow
- enriched media
- Metronidazole



ACTINOMYCETES

Treatment:

- Penicillin V

A man with dark, wavy hair and a bright smile is holding a gray rectangular sign in front of his chest. He is wearing a dark gray button-down shirt. The background is plain white.

Nocardia

Nocardia

- rod- shaped bacteria
- weakly acid- fast beaded branching filaments
- A total of 85 species
- Some species are responsible for nocardiosis

Nocardia

Ecology and Epidemiology

- Environmental saprophyte
- Tropical and subtropical regions

Nocardia

Risk Factors

- **Immunocompromised**
- Organ transplantation
- Steroid use
- Diabetes

Nocardia

Virulence Factors

- Inhibit Phagosome-lysosome fusion
- Survive in macrophages for days

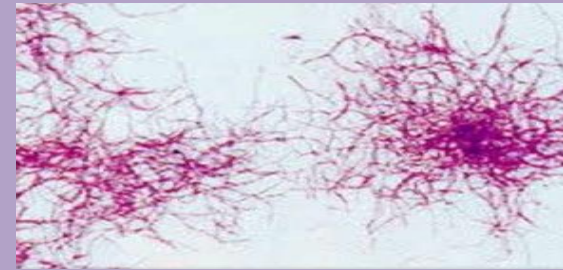
Nocardia

Clinical presentation

- **Invasive pulmonary infection**
- **Disseminated infection**
- **Brain abscess**
- Cellulitis
- Cutaneous nocardiosis
- Mycetoma
- *Madura foot*

DIAGNOSIS

- Sulfur granules
- Usually weak acid fast
- Culture (48 hrs – 4 wks)
- Strictly aerobic
- Culture at 37°C, **45°C**
- Sabouraud's dextrose agar with **antibiotic** or LJ medium, brain-heart infusion agar



Nocardia

Treatment

- Long-term antibiotic therapy (usually with sulfamethoxazole with trimethoprim)
- **Chronic suppressive therapy**