

Atypical Mycobacteria

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✳ Atypical Mycobacteria (MOTTs / NTM)

✳ Definition

- Atypical mycobacteria = Mycobacteria other than tuberculosis (MOTTs) / Nontuberculous mycobacteria (NTM).
- Differ from *M. tuberculosis*:
 - 🌐 Widespread in environment (soil, water, animals).
 - ✗ Not pathogenic for guinea pigs.
 - *M. tuberculosis* → only humans + highly pathogenic for guinea pigs.

📖 Classification - Runyon's Groups

Group	Growth Rate	Pigment Formation	Typical Species	Clinical Note
I - Photochromogens	Slow	Pigment in light only	<i>M. kansasii</i> , <i>M. marinum</i>	TB-like lung disease, swimming pool granuloma
II - Scotochromogens	Slow	Pigment in dark	<i>M. scrofulaceum</i>	Scrofula (cervical lymphadenitis)

& light

III - Non chromogens	Slow	Little/no pigment	<i>M. avium-I ntracellulare</i> complex	Opportunistic infections in AIDS
IV - Rapid Growers	Rapid (<7 days)	None	<i>M. fortuitum, M. chelonae, M. abscessus</i>	Skin/soft tissue infections, prosthetic device infections

◆ Group I - Photochromogens

1. *Mycobacterium kansasii*

- 🧑 Causes lung disease similar to TB.
- Antigenically similar → Tuberculin skin test often positive.
- Geographical: Midwest USA, Texas.
- ✅ Susceptible to standard anti-TB drugs.

2. *Mycobacterium marinum*

- 🐟 Causes "Swimming pool granuloma" / "Fish tank granuloma".
- Clinical: Granulomatous, ulcerating skin lesions at

trauma sites in pools/aquariums.

- Habitat: Fresh & salt water.
-  Tx: Tetracyclines (e.g., minocycline).

◆ Group II – Scotochromogens

Mycobacterium scrofulaceum

-  Causes Scrofula = granulomatous cervical adenitis (children).
- Entry: Oropharynx → draining lymph nodes.
- Habitat: Environmental water + occasionally human respiratory tract.
-  Tx: Surgical excision of lymph nodes often curative.

◆ Group III – Nonchromogens

Mycobacterium avium-intracellulare (MAI / MAC)

- Includes *M. avium* + *M. intracellulare*.

- Clinical:
 - Pulmonary disease like TB.
 - Most common bacterial infection in AIDS (CD4 <200/ μ L).
- Habitat: Widespread (water, soil, esp. Southeast USA).
- ☹ Highly resistant to anti-TB drugs → need ≥ 6 drugs.
- 🕒 Current therapy:
 - Azithromycin OR Clarithromycin
 - Ethambutol / Rifabutin / Ciprofloxacin.
- 💡 Azithromycin prophylaxis for AIDS patients with CD4 <50.

◆ Group IV – Rapidly Growing Mycobacteria

1. *M. fortuitum-chelonae* complex

- Saprophytes in soil & water.

- Clinical:
 - Opportunistic infections → Immunocompromised, prosthetic joints, catheters.
 - Skin/soft tissue infections at trauma/tattoo sites.
- ⊗ Often resistant to anti-TB therapy.
- ⦿ Tx: Amikacin + Doxycycline ± surgical excision.

2. *M. abscessus*

- Habitat: Environmental.
- Clinical:
 - Chronic lung disease (esp. in Cystic Fibrosis).
 - Skin, bone, joint infections.
- ⊗ Highly antibiotic-resistant.
- ⦿ Tx: Amikacin + Imipenem OR Cefoxitin + Clarithromycin.

3. *M. smegmatis*

- Part of normal flora of smegma (under foreskin).
- ✗ Not pathogenic for humans.

Flowchart - Overview of Atypical Mycobacteria

Atypical Mycobacteria (NTM / MOTTs)

Group I - Photochromogens

- *M. kansasii* → TB-like lung disease
- *M. marinum* → Swimming pool granuloma

Group II - Scotochromogens

- *M. scrofulaceum* → Scrofula (cervical adenitis)

Group III - Nonchromogens

- *M. avium-intracellulare* → Pulmonary disease, AIDS opportunistic infection

Group IV - Rapid Growers

- *M. fortuitum*, *M. chelonae* → Prosthetic device &

soft tissue infections

- *M. abscessus* → CF lung infections, resistant
- *M. smegmatis* → Non-pathogenic

Exam Tips

- MCQ: Swimming pool granuloma → *M. marinum* 
- Viva: Scrofula → *M. scrofulaceum* (children)
- Short note: NTM in AIDS → *M. avium-intracellulare*
- High-yield: Runyon's classification (Group + pigment + examples).