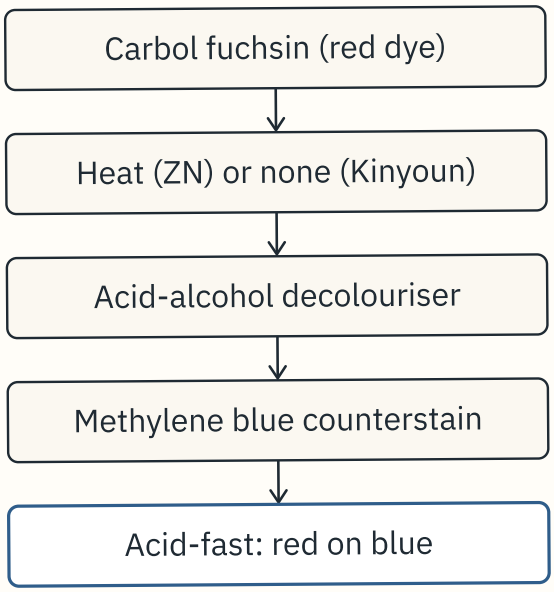
Acid-fast stain in one card

Mycolic acids: waxy wall, red on blue



Step by step

1. Carbol fuchsin (red)
2. Heat (ZN) or no heat (Kinyoun)
3. Acid-alcohol strips ordinary cells
4. Methylene blue counterstain

Layer	Made of	Drug that blocks it
Inner	Peptidoglycan	not covered here
Middle	Arabinogalactan	Ethambutol
Outer	Mycolic acids (wax)	Isoniazid (KatG-activated; blocks InhA)

Mycobacterial wall and drug targets

Rule of thumb

Wax holds the red: acid-fast = red on blue

Ordinary cell: red lost, ends blue

Same wax = barrier to many antibiotics

Exam traps

- Gram stain works poorly on mycobacteria; use the acid-fast stain.
- Nocardia is only weakly acid-fast: weaker acid to decolourise.
- A positive sputum smear is confirmed by culture.

Acid-fast stain and the mycobacterial cell wall

Video, written lesson, practice question and sources: medservatory.com/usmle-step-1/microbiology/acid-fast-stain-mycobacteria

For exam study only, not medical advice. Follow local guidelines and your lab's ranges.
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