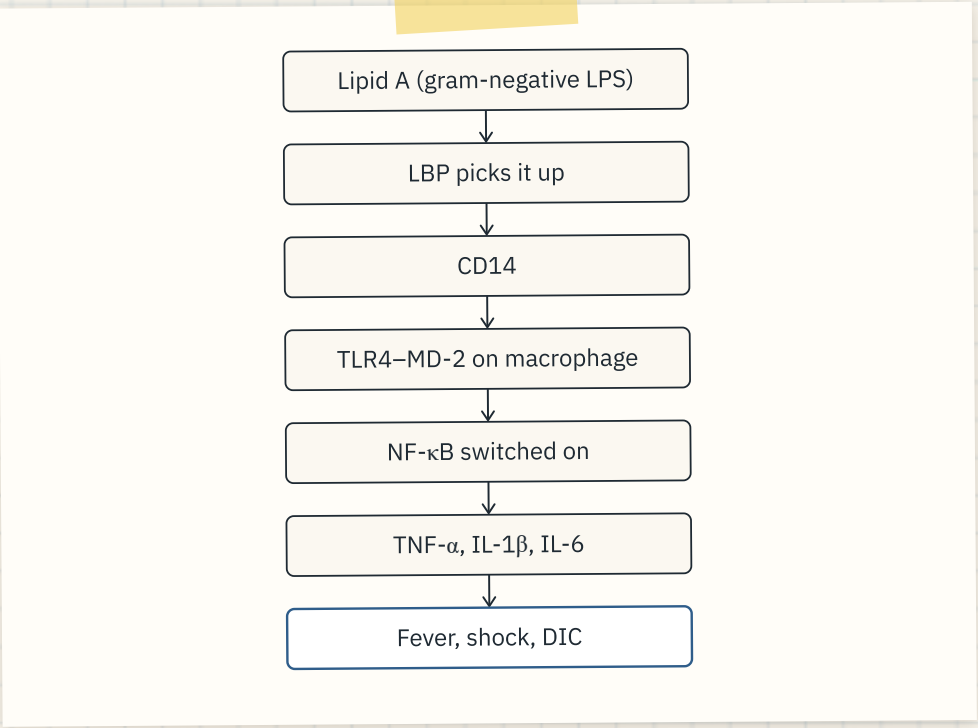
Endotoxin vs exotoxin

Source, chemistry, mechanism and effect



Step by step

1. LBP picks up the LPS
2. CD14 receives it
3. TLR4–MD-2 on macrophage
4. NF-κB, then TNF-α, IL-1β, IL-6
5. Fever, low BP, shock, DIC

	Endotoxin	Exotoxin
Source	Gram-negative outer membrane	Secreted, living bacteria
Chemistry	LPS; lipid A toxic	Protein
Heat	Stable	Mostly labile
Mechanism	TLR4–MD-2, NF-κB	Specific target, A-B
Effect	Fever, shock, DIC	Depends on target
Vaccine	No toxoid	Toxoid (formaldehyde)

Endotoxin vs exotoxin

Memory hook

Endotoxin = general alarm

Exotoxin = precise tool

Exam traps

- Lipid A is toxic; the O side chain is the antigen.
- Exotoxins come from gram-positive and gram-negative bacteria.
- Only the protein exotoxin becomes a toxoid.

Endotoxin vs exotoxin: lipid A, A-B toxins and toxoids

Video, written lesson, practice question and sources: medservatory.com/usmle-step-1/microbiology/endotoxin-vs-exotoxin

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