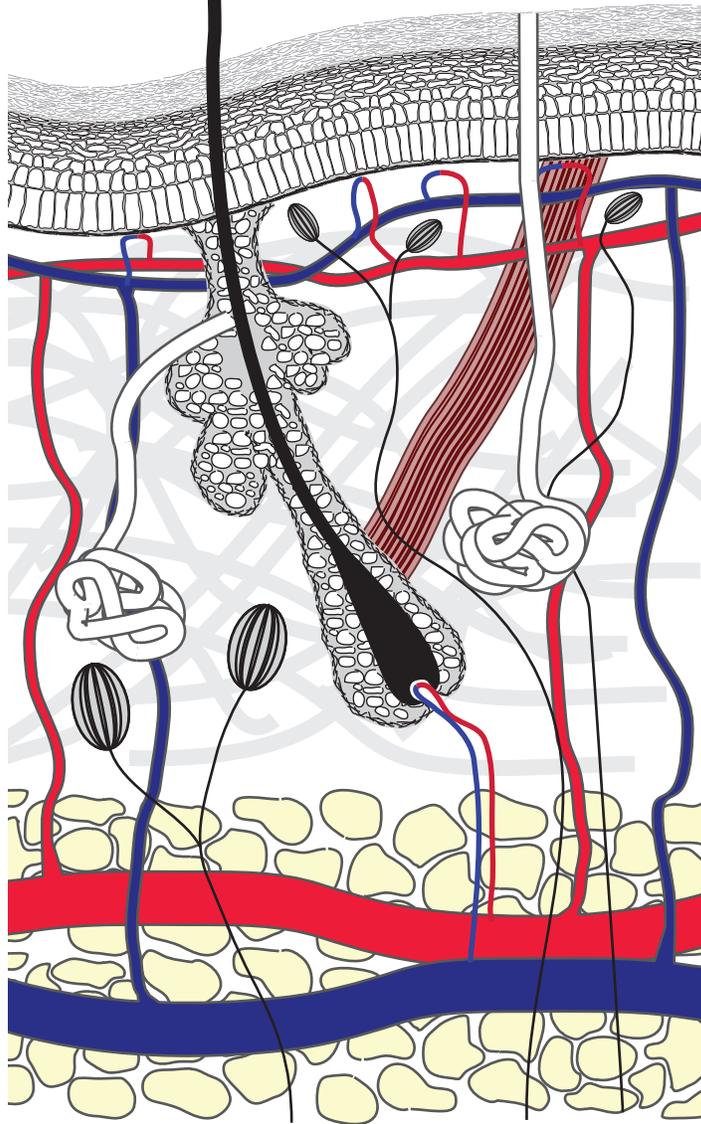


Foundational Handouts for Wound Healing “Essay”



By Noel Ways

Endospore Forming Anaerobic Bacteria

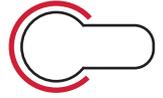
Growth Potential
(Generation Time = 30 min)
(24 hours)

0	1
0.5	2
1.0	4
1.5	8
2.0	16
2.5	32
3.0	64
3.5	128
4.0	256
4.5	512
5.0	1,024
5.5	2,048
6.0	4,096
6.5	8,192
7.0	16,384
7.5	32,768
8.0	65,536
8.5	131,072
9.0	262,144
9.5	524,288
10.0	1,048,576
10.5	2,097,152
11.0	4,194,304
11.5	8,388,608
12.0	16,777,216
12.5	33,554,432
13.0	67,108,864
13.5	134,217,728
14.0	268,435,456
14.5	536,870,912
15.0	1,073,741,824
15.5	2,147,483,648
16.0	4,294,967,296
16.5	8,589,934,592
17.0	17,179,869,184
17.5	34,359,738,368
18.0	68,719,476,736
18.5	137,438,953,472
19.0	274,877,906,944
19.5	549,755,813,888
20.0	1,099,511,627,776
20.5	2,199,023,255,552
21.0	4,398,046,511,104
21.5	8,796,093,022,208
22.0	17,592,186,044,416
22.5	35,184,372,088,832
23.0	70,368,744,177,664
23.5	140,737,488,355,328
24.0	281,474,976,710,656

Growth Potential Realized



Mature Bacterium



Favorable Environmental Conditions

"Step on Rusty Nail Scenario. Necrotic Wound"
Unfathomable numbers of airborne endospores



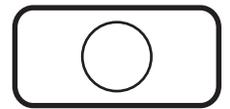
Release of Endospore



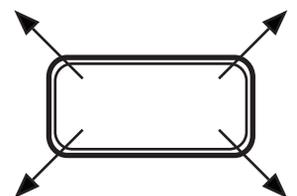
Disintegration of Cell Wall



Endospore Coat Formation and Stabilization of Cytoplasm



Water Loss



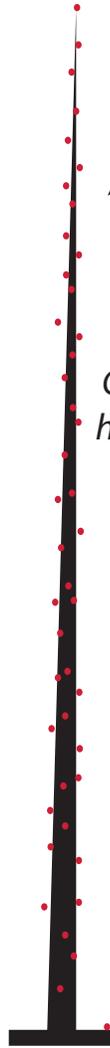
Environmental Stress



Neruo toxin Induced Paralysis

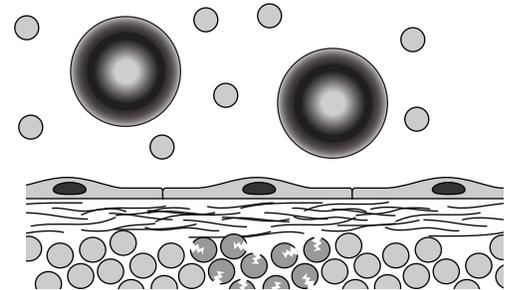
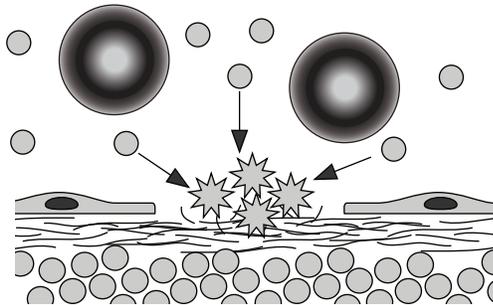
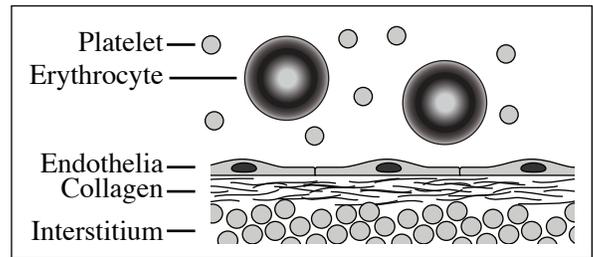


Endospores of *Clostridium tetani* have an affinity for iron oxide



Hemostasis

Platelet Plug - Exposed collagen due to endothelia damage allows for platelet adhesion, enlargement, and aggregation. Platelets soon release serotonin and clotting factors.



Platelet-released clotting factors initiate a complex cascade of reactions culminating in Factor X activation and the, therefore, the "common pathway".

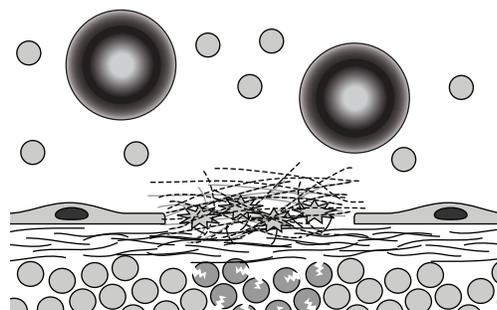
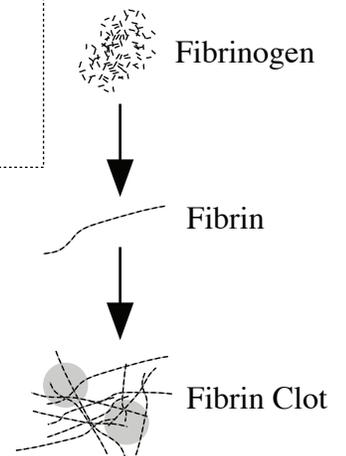
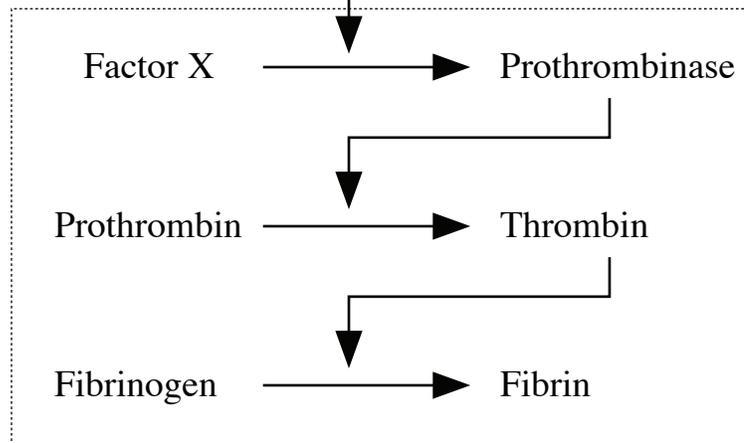
Intrinsic Pathway

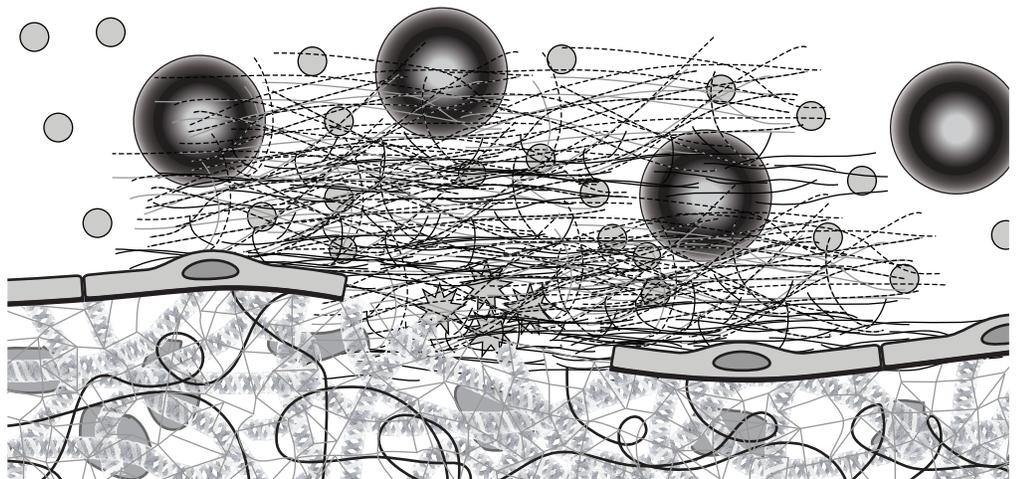
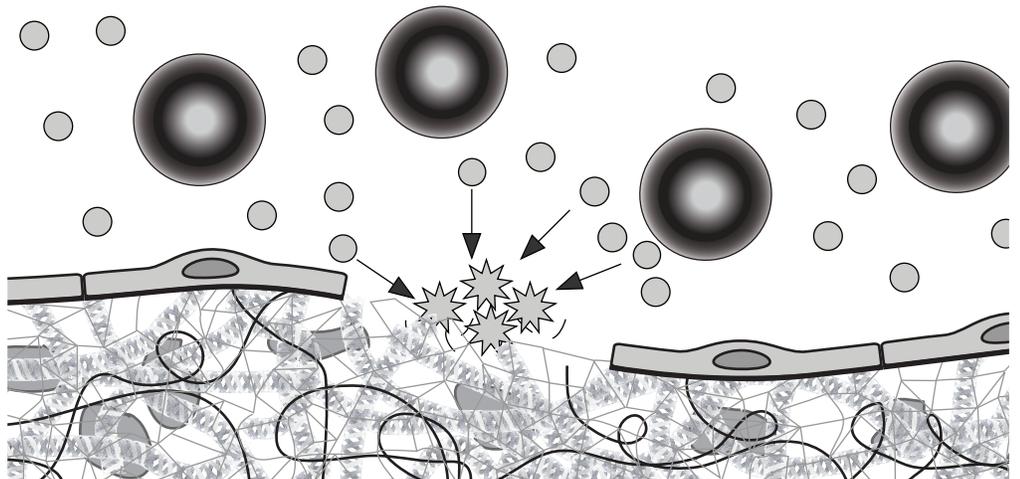
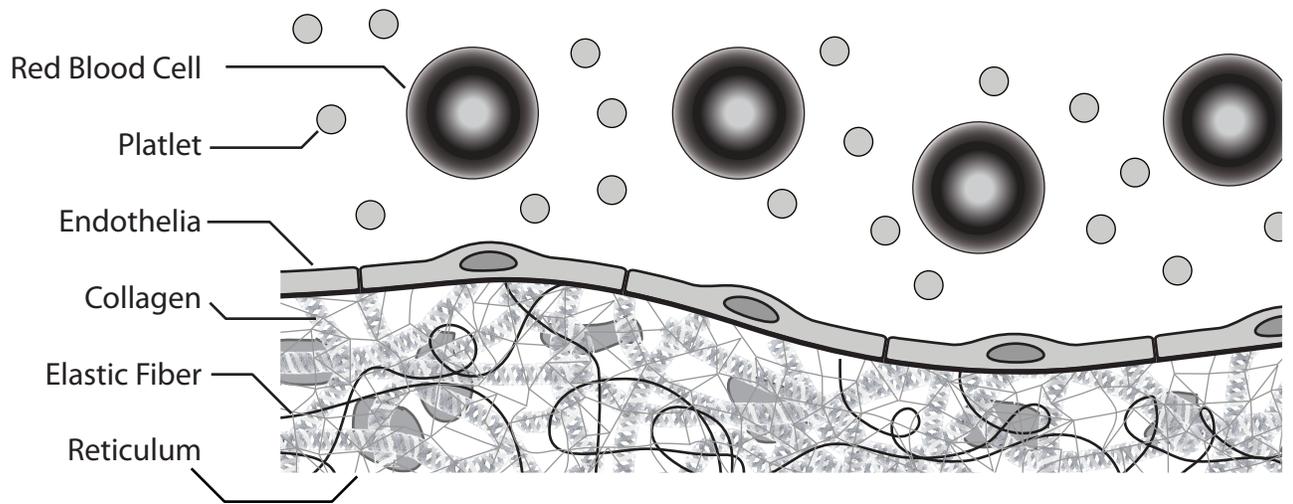
Synergist operation of both pathways results in both a quick and prolonged response that will efficiently stop blood flow in almost all cases.

Extrinsic Pathway

Damaged tissues release "tissue factor," which bypasses several reactions of the Intrinsic pathway prompting quick activation of the common pathway.

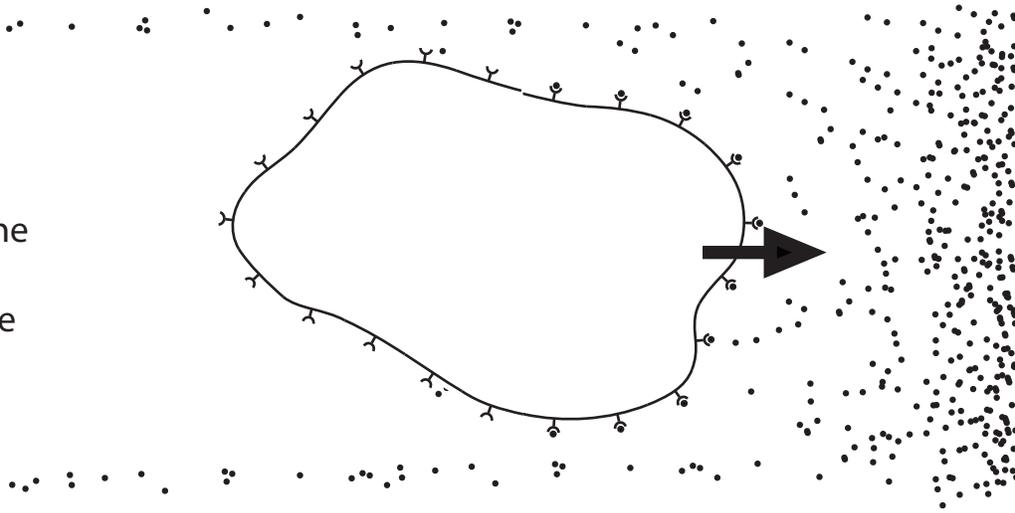
Common Pathway leads to polymerization of Fibrinogen into fibrin fibers. These fibrin fibers will be cross-linked to form a secure adhesive mesh that can effectively stop bleeding.



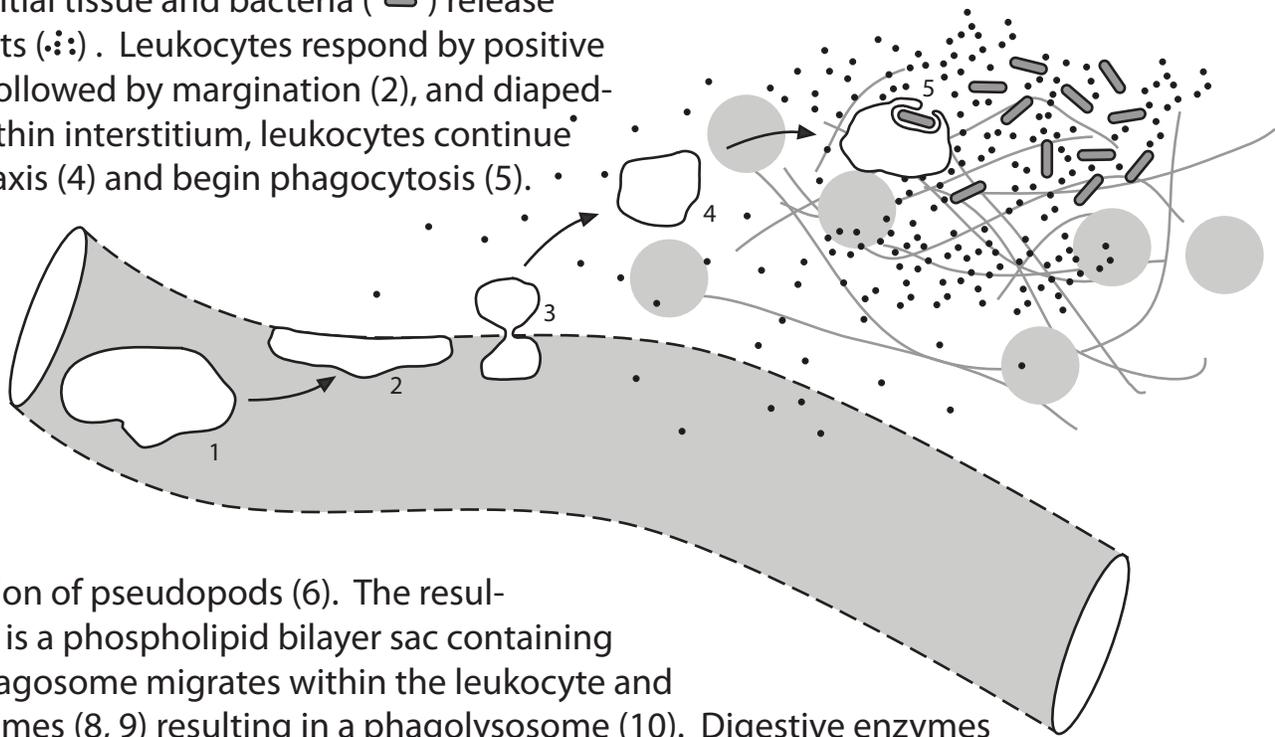


Leukocyte Activity

Leukocytes move by chemotaxis. Cell surface receptors (—Y—) may bind to a chemo-attractant (: :). When the complex forms (—Y—), the cell responds by moving. If the leukocyte moves towards the source of the chemoattractant, the term positive chemotaxis is used. Negative chemotaxis would be moving away from the chemical.



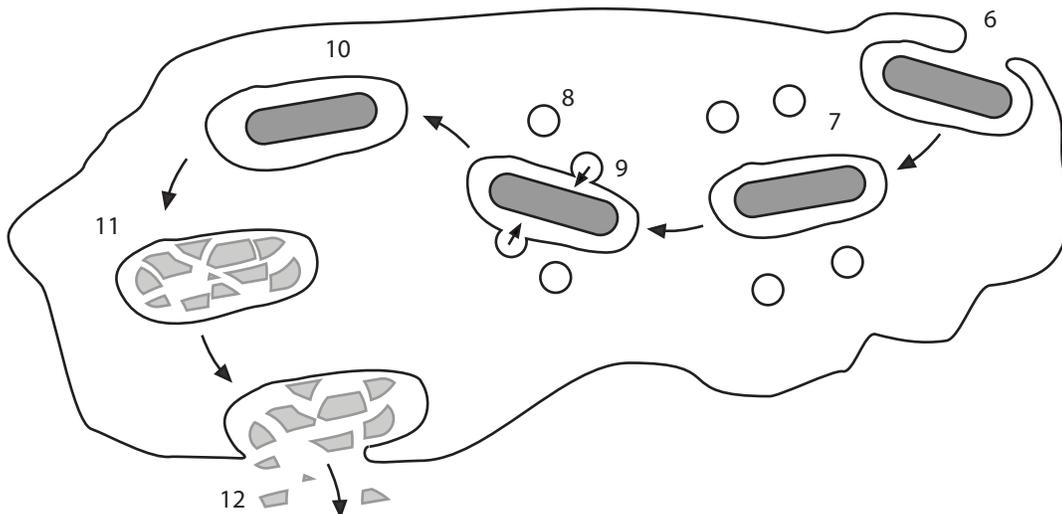
Damaged interstitial tissue and bacteria (—) release chemo-attractants (: :). Leukocytes respond by positive chemotaxis (1), followed by margination (2), and diapedesis (3). Once within interstitium, leukocytes continue positive chemotaxis (4) and begin phagocytosis (5).



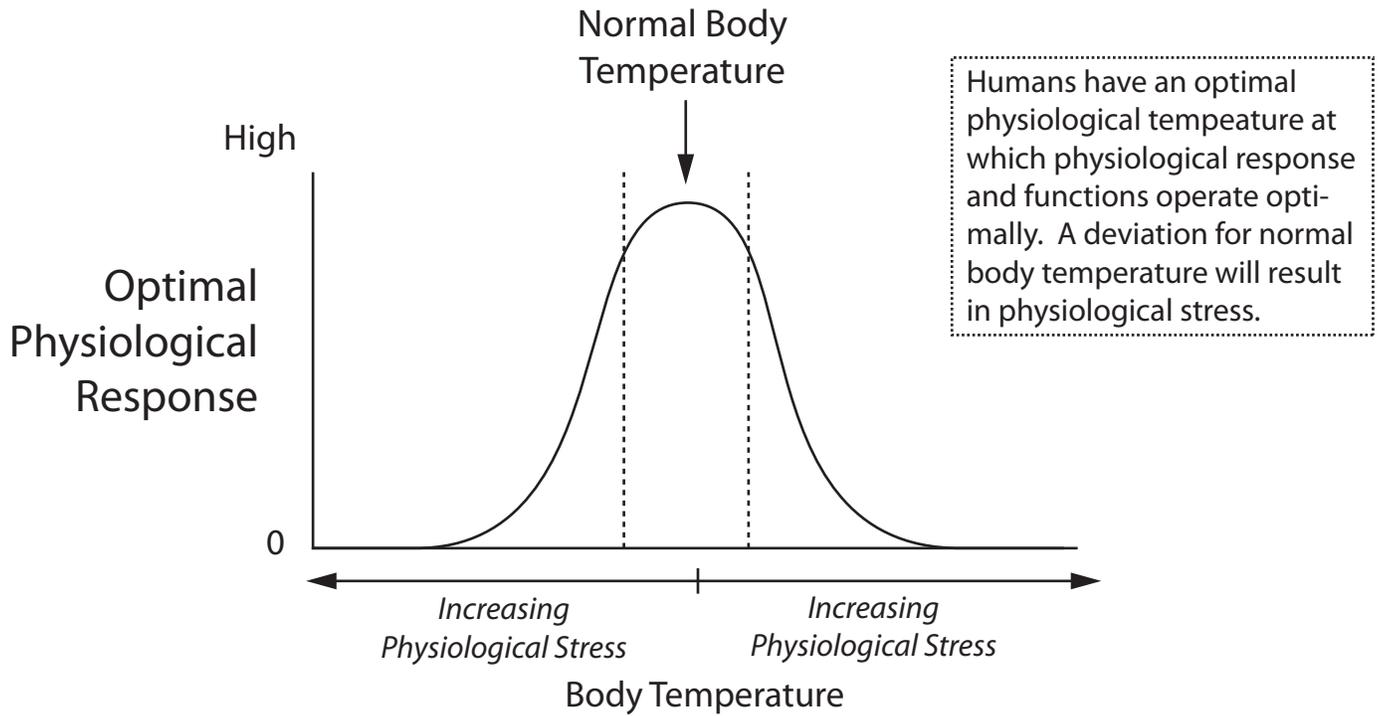
Phagocytosis

results in the fusion of pseudopods (6). The resultant phagosome is a phospholipid bilayer sac containing bacteria. The Phagosome migrates within the leukocyte and fuses with lysosomes (8, 9) resulting in a phagolysosome (10). Digestive enzymes

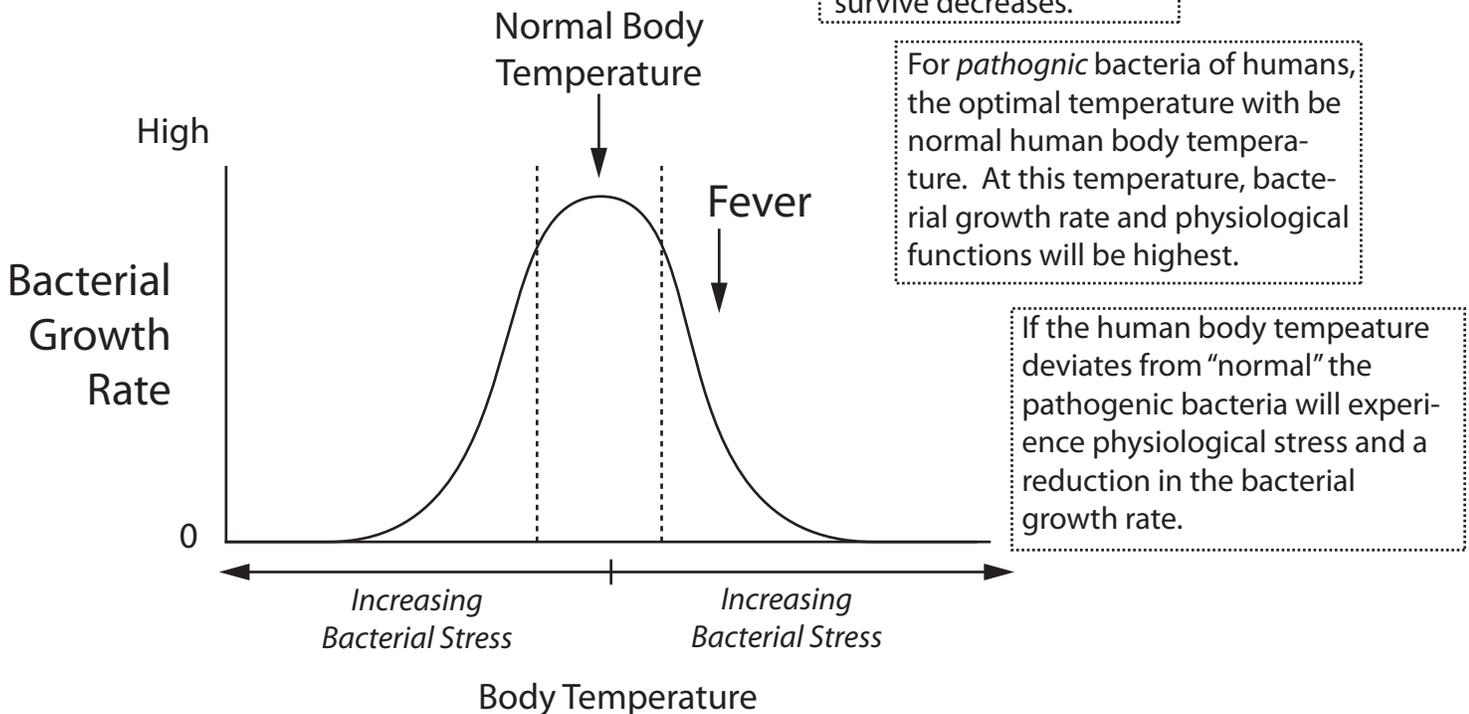
(such as lysozyme) digest bacteria (11), and this vesicle may now be considered a residual body. Elimination by exocytosis (12) of debris concludes the process.



Human Body Temperature and Optimal Physiological Function



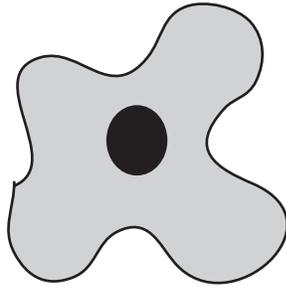
Effects of Temperature on the Physiological Function of Bacteria



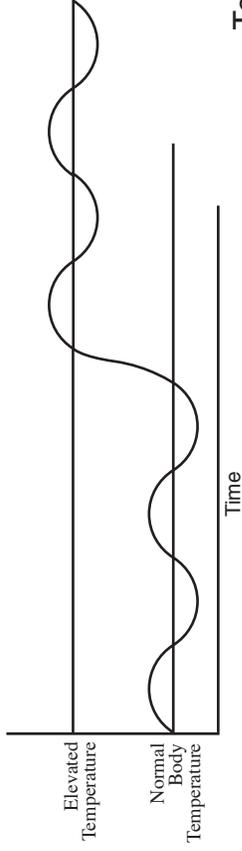
Interstitial Increase in Basal Metabolic Rate



Secretion of Pyrogen



Neutrophil

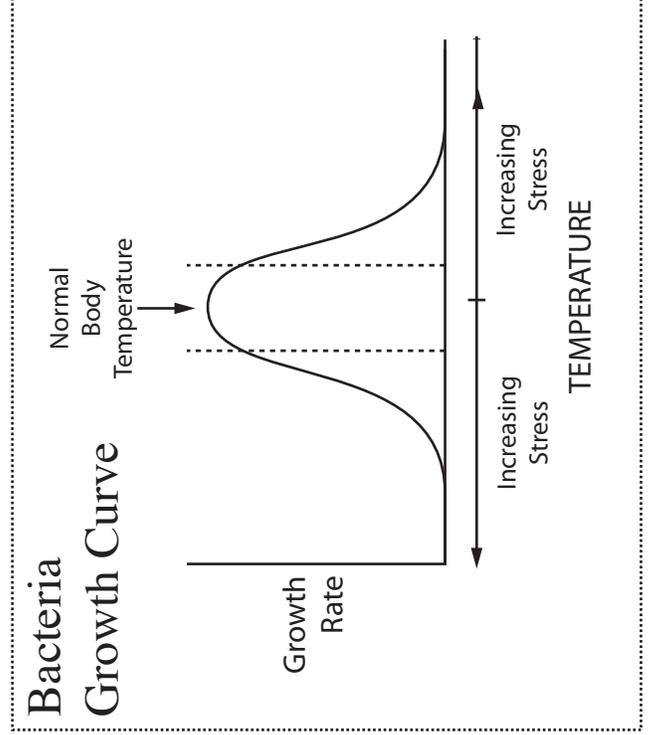
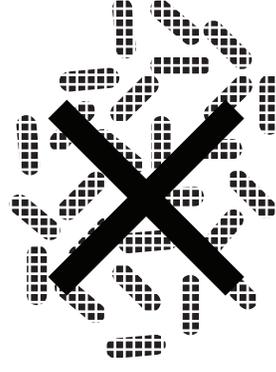


Elevated Temperature



Inhibits Pathogen Growth

Promotes Immune Responses



FEVER

