

Biology 675


MICROBES & DISEASE

- Infection
- Pathogen
- Virulence

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"Humboldt has observed that...the smallest marshes are the most dangerous ...the greatest risk is run by sleeping on shore ..."

—Darwin, 1845




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Germ Theory of Disease

- 1545: Girolamo Fracastoro
- 1835: Agostino Bassi
- 1840: Gustav Henle
- 1857: Louis Pasteur
- 1864: Joseph Lister
- 1866: Anton De Bary
- 1876: Robert Koch

Koch's Postulates

1. Observe **microbe** in sick organism, and not in healthy one.
2. Culture **microbe** from sick organism.
3. Inoculate **microbe** into a healthy organism & cause symptoms.
4. Reisolate the **microbe** from the lab organism.




Gastric (peptic) & duodenal ulcers are caused by:

- A. Diet.
- B. Excess acid production.
- C. Stress.
- D. A bacterial infection.
- E. A, B, and C above.

Gastric (peptic) & duodenal ulcers are caused by:

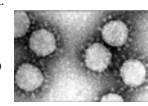
- A. Diet.
- B. Excess acid production.
- C. Stress.
- D. A bacterial infection.
- E. A, B, and C above.



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Which one of the following is **not** required to prove that a Coronavirus causes SARS?

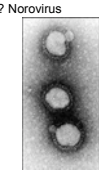
- A. Isolate the virus from ill host.
- B. Inoculate susceptible host and cause symptoms.
- C. Show the disease is transmitted from one host to another.
- D. Isolate the virus from inoculated host.
- E. None of the above.



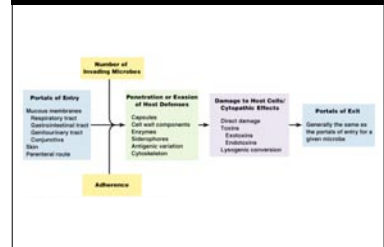
Case Definition

- Vomiting, diarrhea, fever (>38°C), chills.
- Nasal discharge, obstruction of nasal breathing, swelling of the sinus membranes, sneezing, sore throat, cough, and headache. Fever is usually slight.
- Fever, headache, tiredness, dry cough, sore throat, body aches.

? Common cold
? Influenza
? Norovirus



Pathogenicity



ID₅₀

Number of bacteria	Number of dead mice	% dead mice
10		
100		
1000		

What's the ID₅₀?

Bacillus anthracis ID₅₀


	# endospores
• Cutaneous	50
• Pulmonary	20,000
• Intestinal	1,000,000

ID₅₀

	# cells
• Legionella	1
• Salmonella	10,000
• Shigella	200
• Treponema	50

CDC'S Prevention Strategy


Are infectious diseases a thing of the past?



CDC'S Prevention Strategy

Where do new diseases come from?

- Re-emergence
- Natural disasters
- New agents



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How can we prevent infectious diseases?

