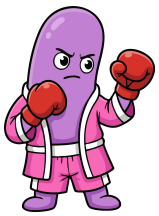
TOPIC: NORMAL MICROBIOTA OF THE UROGENITAL SYSTEM

- *Recall*: microbial antagonism — _____ microbiome will protect from pathogens.

- **Urinary system**: _____ microbiome; *Lactobacillus* & *Streptococcus* common.
  - More diverse in _____ & near end of _____.
  - Urine naturally antimicrobial, plus _____ action of urine, sphincters/valves, antimicrobial proteins.

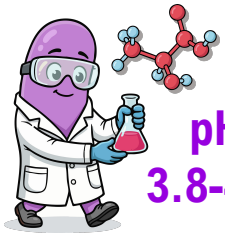
- **Reproductive system**: vaginal microbiome.

Microbial Antagonism



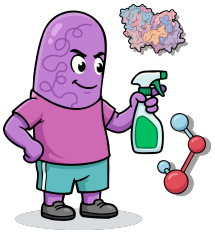
- _____ *Lactobacillus* species.
- *Candida* in ~10-25% of healthy vaginal microbiomes.

Acidic Environment



- *Lactobacillus* convert _____ to _____ acid.
- Maintains acidic pH.

Antimicrobial Chemicals



- *Lactobacillus* also produce:
  - Hydrogen _____.
  - Antimicrobial peptides.

EXAMPLE

Mark the following statements with a check mark (✓) if the statement correctly describes the normal function of lactobacillus in the urogenital system. Mark the statement with a cross (X) if the statement does not describe the normal function of lactobacillus in the urogenital system:

Lactobacilli produce lactic acid, which maintains the acidic pH of the vagina.	_____
Lactobacilli produce ammonia, which inhibits growth of pathogens that enter the vagina.	_____
Lactobacilli compete with potential pathogens for space & nutrients.	_____
Lactobacilli are regularly found in the microbiome of the urethra in healthy individuals.	_____
Lactobacilli produce hydrogen peroxide, which inhibits growth of other bacteria.	_____
Lactobacilli produce IgA antibodies which can bind to & inhibit bacteria/viruses.	_____

PRACTICE

Which bacterium is most directly responsible for the acidic environment of the vagina?

a) Streptococcus. b) Lactobacillus. c) Candida. d) Enterococcus.

PRACTICE

Why do you think it is generally recommended that urine samples be taken "mid-stream" and not by starting urination directly in a collection cup?

a) Collecting urine mid-stream will allow urine coming from the kidneys to be analyzed, rather than urine from the bladder.
b) The flushing action of urine will remove bacteria that may be in the end of the urethra, allowing the microbes in the bladder to be collected cleanly.
c) Urine collected mid-stream is expected to be sterile, so the presence of any bacteria will indicate a urinary tract infection.
d) The first amount of urine expelled during urination will have been in the urethra for several hours allowing a buildup of bacterial growth.

PRACTICE

True or False: if false, choose the answer that best corrects the statement.

Identification of *Candida* in the vagina is insufficient to diagnose a vaginal yeast infection.

a) True.
b) False – *Candida albicans* is the primary cause of yeast infections, so its presence always indicates an infection.
c) False – Presence of *Candida albicans* indicates bacterial vaginosis, not a yeast infection.
d) False – Presence of Lactobacillus indicates a vaginal yeast infection, not *Candida*.