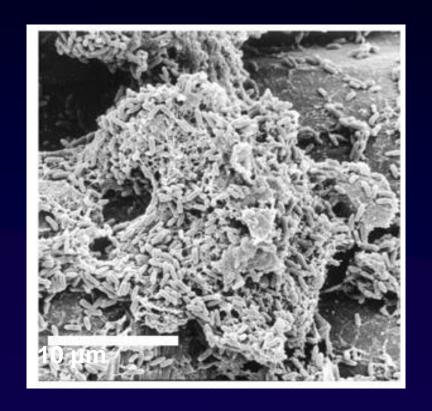
#### Microbe Mission 2018

Texas State Science Olympiad Coaches Clinic November 18, 2017



Gregory Palmer, Ph.D.

State and National Event Supervisor

## **Proud Science Olympiad Alum!**



- Competed in Science Olympiad from 8<sup>th</sup>-12<sup>th</sup> grade
- Serve on National Science Olympiad Rules Committee for Life Sciences
- State and National Microbe Mission Event Supervisor
- Re-started the UT-Austin Regional tournament

# UT-Austin Regional Tournament

• February 24, 2018



- All 28 B and C events
  - Teams pick their 5 drop events

2017 Nationals participants grant regionals extra State Tournament bids

#### Cellular biology life sciences events cycle

2017-18: Microbe Mission B/C

 2019-20: Designer Genes C and Heredity B

 2021-22: Cell Biology C and Bio Process Lab B

2023-24: Microbe Mission B/C

#### Rules details

Must bring goggles (eye protection C)

 Single page of notes not in sheet protector with no annotations affixed

2 non-programmable, non-graphing calculators

#### **Event structure**

Often students take an exam

Exam should contain lab activities

Event may be run as stations

## Stations philosophy

Why have stations?

 How can we keep stations fair/consistent for all teams?

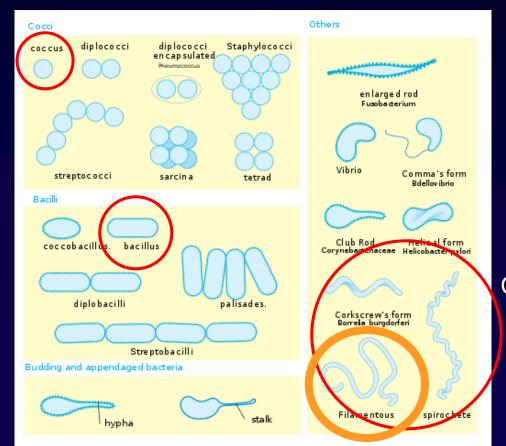
 How do you prepare your students for stations?

## New topics

 Names for and recognition of bacterial shapes is now a B/C topic

Cocci

Bacilli (rods)



Corkscrew/Spirochetes

## New topics

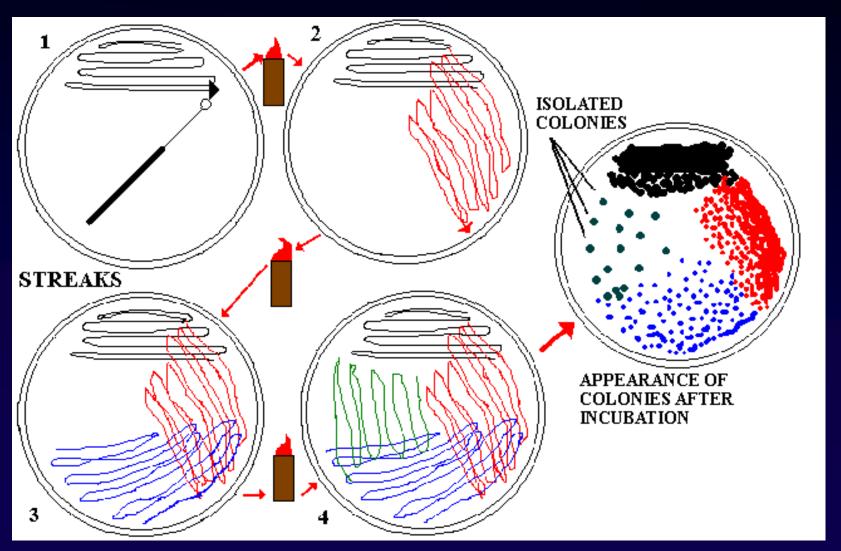
- Measuring bacterial growth for B and C
  - Direct counting
    - Counting chamber
    - Plate counts
  - Indirect counts
    - Turbidity (Optical Density)
    - Dry weight
    - Total DNA or Protein
  - Total cells vs. viable cells
  - Consider advantages and disadvantages of each method

## New topics

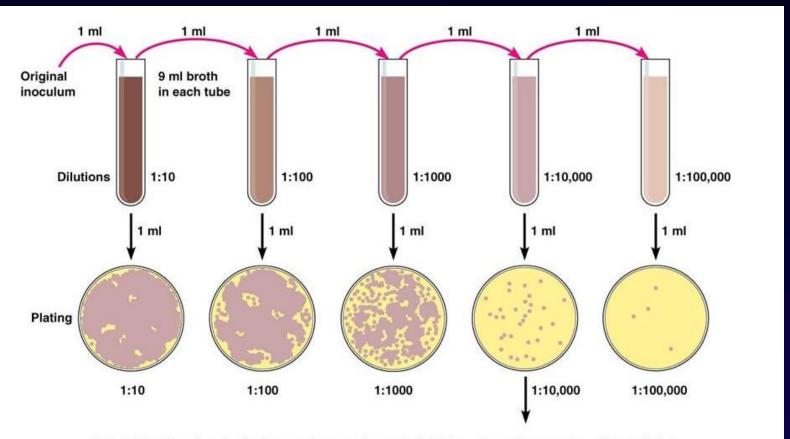
Isolating bacteria by streaking and serial dilution (Div C only)

- Goal is to get isolated colonies
  - One bacterium (in theory) forms one colony

# Streaking for isolation



## Serial dilution and plating



Calculation: Number of colonies on plate  $\times$  reciprocal of dilution of sample = number of bacteria/ml (For example, if 32 colonies are on a plate of  $^{1}/_{10,000}$  dilution, then the count is  $32 \times 10,000 = 320,000$  bacteria/ml in sample.)

Copyright @ 2007 Pearson Education, Inc., publishing as Benjamin Cummings.

#### New items on disease list

Viruses: norovirus and zika virus

Protozoans: Naegleria

- Bacteria: no changes state and regionals
  - Pseudomonas aeruginosa for nationals

Prions: chronic wasting disease

Fungi: White nose syndrome

#### Resources

- National website has great resources
- Student wiki is okay on most topics
  - Test exchange!
- Our website (www.atxscioly.com) for UT-Austin exams!

- Textbooks: Campbell (Pearson), Microbe (ASM), Microbiology: an Introduction (Pearson)
- Austin Community College course notes: http://www.austincc.edu/rohde/noteref.htm

### Questions?

