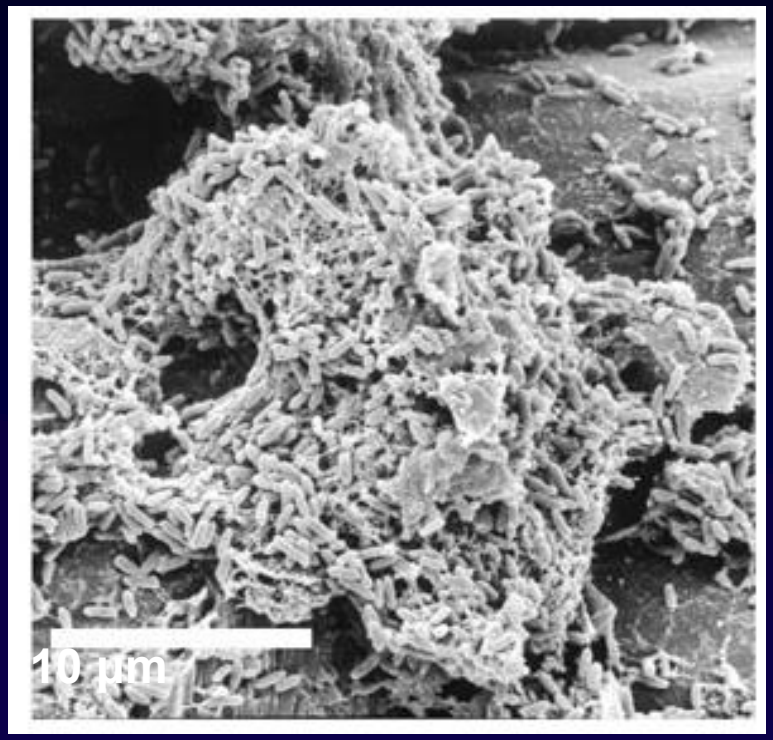
# Microbe Mission 2018

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 8th-12th 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
- 20**19-20:** 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

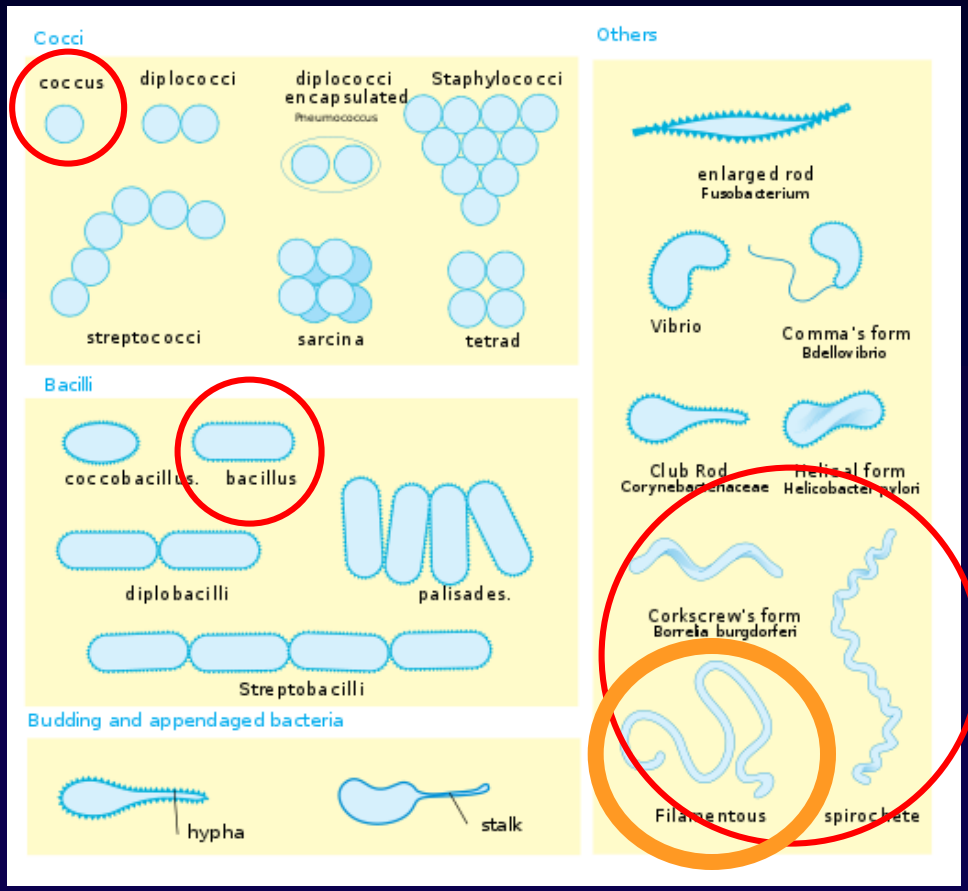
- Why have stations?
- How can we keep stations fair/consistent for all teams?
- How do you prepare your students for stations?

# New topics

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

Cocci

Bacilli (rods)




Corkscrew/Spirochetes

wikipedia

# New topics

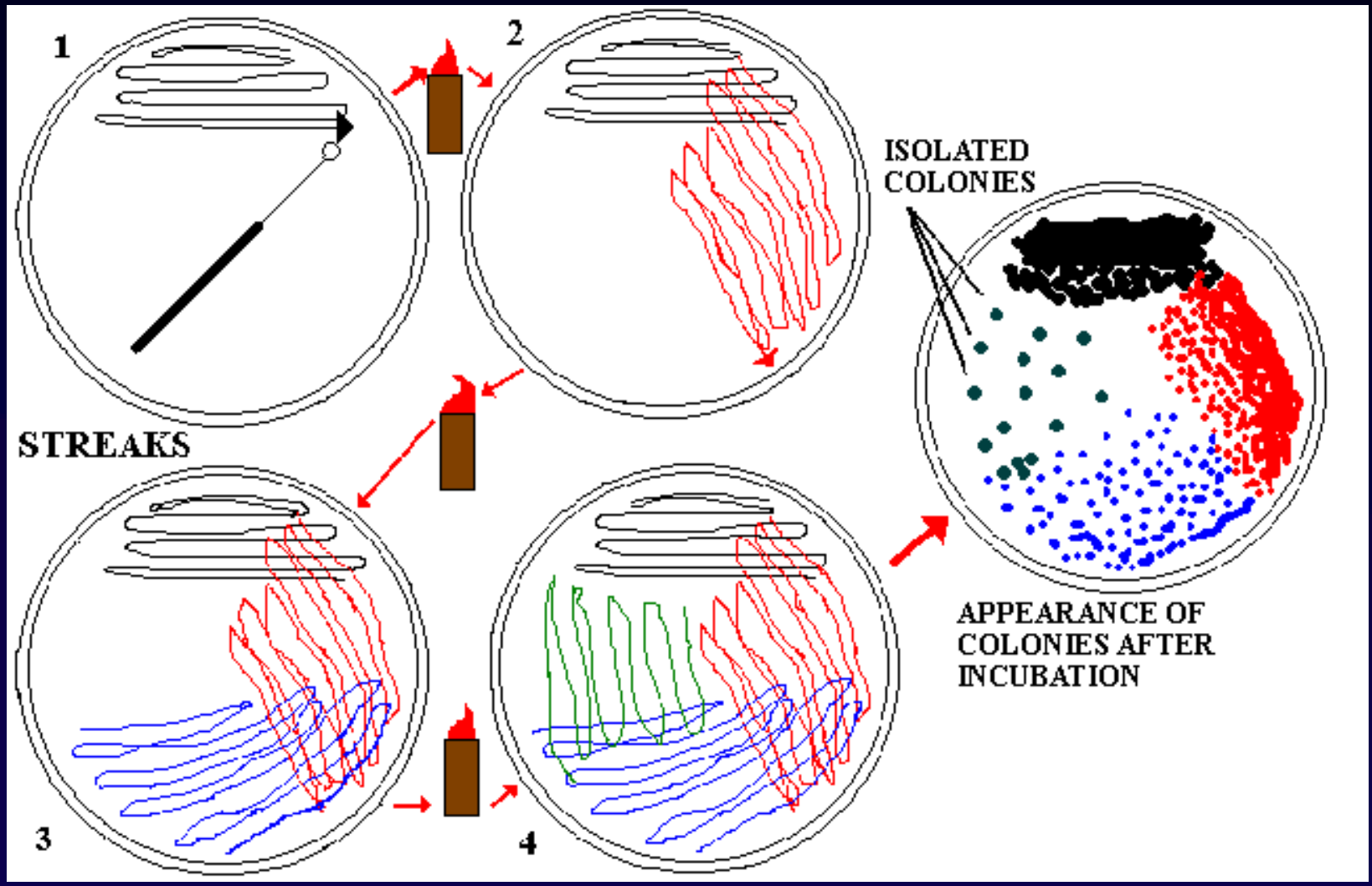
- Measuring bacterial growth for B and C
  - Direct counting
    - Counting chamber
    - Plate counts
  - Indirect counts
    - Turbidity (Optical Density)
    - Dry weight
    - Total DNA or Protein
  - Total cells vs. viable cells
  - Consider advantages and disadvantages of each method

# New topics

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

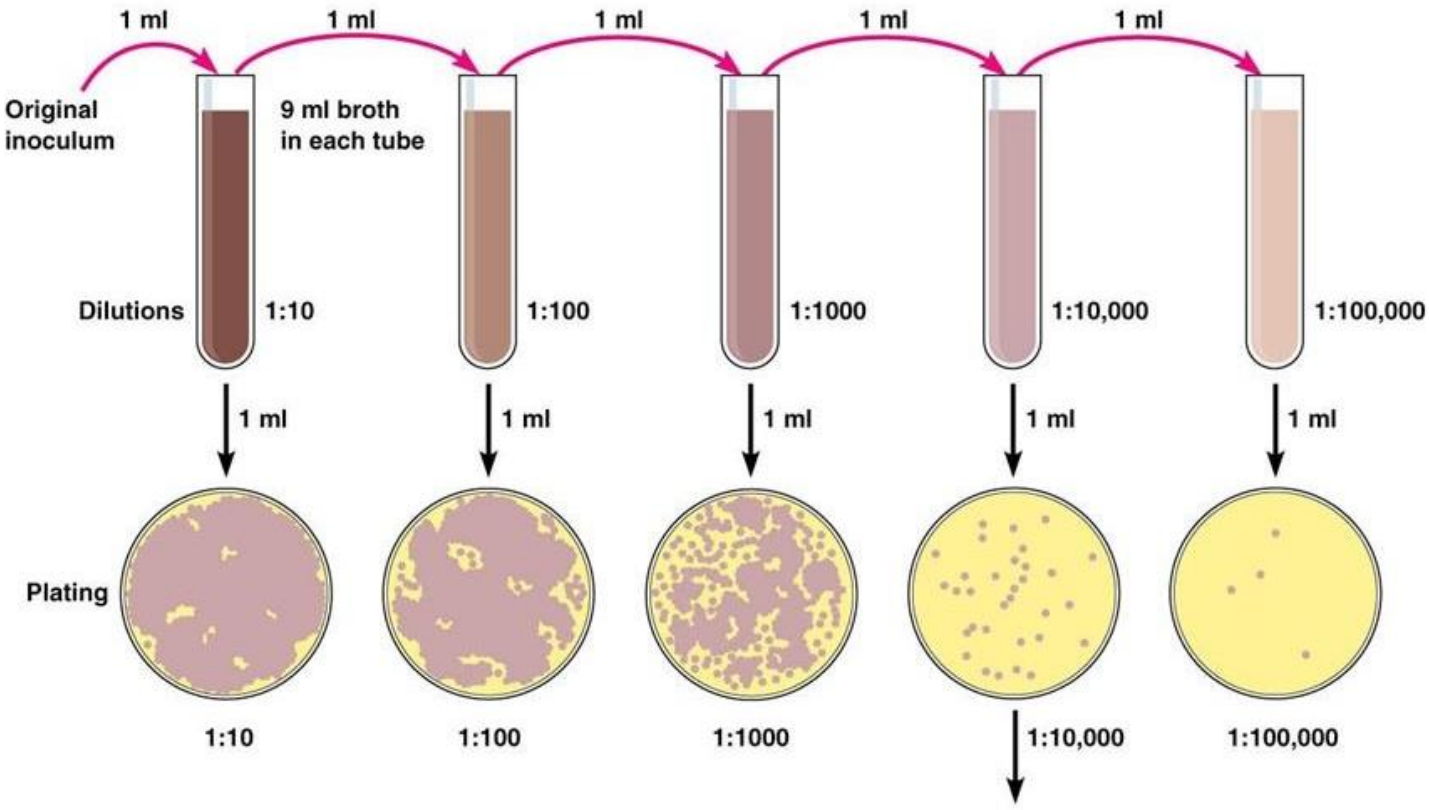
- Goal is to get isolated colonies
  - One bacterium (in theory) forms one colony

# Streaking for isolation




http://www.personal.psu.edu/faculty/k/h/khb4/enve301/301labs/lab4pureculture.html

# Serial dilution and plating




Calculation: Number of colonies on plate × 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 × 10,000 = 320,000 bacteria/ml in sample.)



https://www.slideshare.net/sarah_jumali/serial-dilution

# 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?