

## Working with DNA: Isolation and Fingerprinting

Funding and support received  
from...



## Today's Agenda:

- 1) Introduction
- 2) Safety
- 3) Basic Practice "Using a Pipetteman"
- 4) DNA Isolation Procedures
- 5) Restriction Enzymes and Gels
- 6) Yellowstone National Park and Bacterial Mats
- 7) Practice DNA Fingerprinting Problems
- 8) Analysis of our Fingerprinting Gels
- 9) Bacteria and DNA Basics
- 10) Closing

## Our Research Project - What We Are Cloning and Why

- We hope to identify new hot spring bacteria that cannot be grown on lab media
- To study these organisms, we extract DNA from hot springs that contain unknown bacteria



## Our Research Project - What We Are Cloning and Why

- We clone a specific identification gene (the 16S gene) from the hot spring DNA
- We place each hot spring gene into *E. coli*, our cloning factory
- And then we fingerprint and DNA sequence each hot spring clone



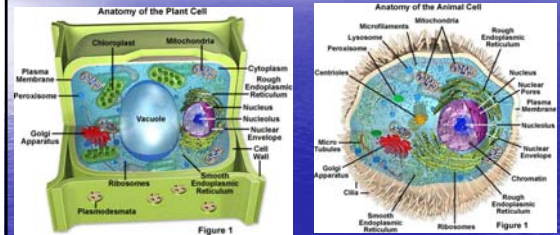
## Words to the cautious...

*Neither the *E. coli* we use nor the hot spring bacteria we study have ever been shown to be pathogenic. Although you will be working with *E. coli*, you will never come in contact with hot spring bacteria... just their DNA after it has been extracted from the once-living cells.*

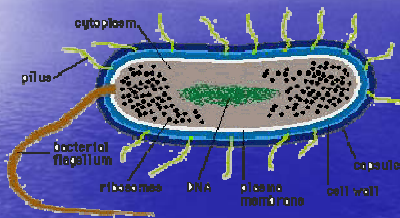
## Introduction:

- All living things contain cells
- Eukaryotes: more than one cell
- Prokaryotes: one cell organisms

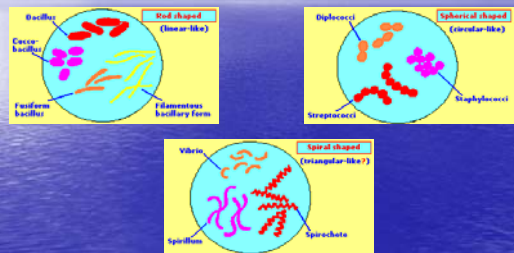
## The Boring (Yawn!!) Eukaryotic Plant and Animal Cells...



## The Exciting Bacterial Cell...



Bacteria come in many different shapes and sizes...take a quick look...



Bacteria can replicate easily...

- To grow, bacteria **divide** and **divide** and **divide** again.
- Problem: If you started with only 1 bacterial cell, and it divided 10 times, how many bacteria would you then have??

Bacteria are everywhere...

**Don't panic!!**  
**This is a good thing.**

We have bacteria growing on our bodies which are supposed to be there.