Science at the University of Auckland

Presented by iGEM

Who are we?

First of all...
Collecting Samples

Why collect samples?

Any ideas?

- To learn more about what you are studying
- To diagnose illnesses
- To collect data
- To discover new organisms
- To discover new medicines

http://www.coralreefecosystems.net/files/17/Collecting%20samples.jpg
https://www.thermofisher.com/blog/wp-content/uploads/2015/02/shutterstock_236668870.jpg

How do you do it?

Any ideas?

- With specific tools
  - Swabs
  - Petri dish
  - Agar
- Sterile conditions?
  - Depends on what you are sampling
- Exanple: Hand Wash
  1. Take a small amount of water in one palm and use two fingers to rub the water around your palm.
  2. Pour water into agar plate and spread around the plate with a cotton bud. (Be careful not to break the agar)

https://online-shop.eppendorf.com/upload/main/products/export-SCREEN-JPG-max1200pxW-96dpi-RGB/std.lang.all/230726.jpg
http://www.biosigma.com/media/catalog/category/swabs-1_1.jpg
https://images-na.ssl-images-amazon.com/images/I/51sujSFj-HL.jpg

Break into Groups!!
5 groups

What do you want to do?

1. Go outside and find some water or soil

OR

2. Use some water and do a hand wash

5 Minutes to Collect your Microbial Sample!

Microbiology

http://www.thinkgeek.com/images/products/zoom/bacteria.jpg

What is Microbiology?

Microbiology is the study of Microbes.

Why is Microbiology Important?

...

Any Ideas?

Before that...

What is a Microbe?

A microbe is an organism that is either very difficult or impossible to see with the naked eye.

- You need a Microscope!

They can be both Eukaryotes (organisms with organelles) or Prokaryotes (single-celled organisms with no organelles ie. Bacteria or Archaea)

Microbes are not all harmful!!
The majority of microbes are actually harmless.

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http://www.holganix.com/hs-fs/hubfs/Microbes-small.jpg?t=1504299326071&width=635&name=Microbes-small.jpg

Why is Microbiology Important?

Any new ideas?

- The discovery, diagnosis and study of diseases
- The discovery of new medicines
- Helps us to solve environmental issues
- Helps us understand how our own bodies work.
  - The Human Gut Microbiome!
- Cheese, Bread and Beer!

https://microbewiki.kenyon.edu/images/2/2b/Love283.jpg

Where do you find them?

Any Ideas?

“Everything is everywhere but the environment selects!”

Some Famous Microbes

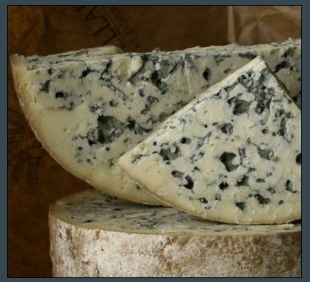
Saccharomyces cerevisiae

http://image.digitalinsightresearch.in/uploads/imagelibrary/Archive/FBR/baked%20items.jpg
http://www.menshealth.com/sites/menshealth.com/files/beer-main_0.jpg

- Is a Yeast, which means it is a Eukaryote
- Is found naturally in the skins of fruit
- Its most famous function is the production of Ethanol from Glucose
- Is used in the food industry for many things
  - Bread
  - Cheese
  - Yogurt
  - Wine
  - Beer
  - Spirits
  - Vegemite

Penicillium ssp.

- Is a Fungi, which means it is a Eukaryote
- Can naturally be found in soil
- The most famous function is the production of the antibiotic Penicillin from which most of today's antibiotics are derived

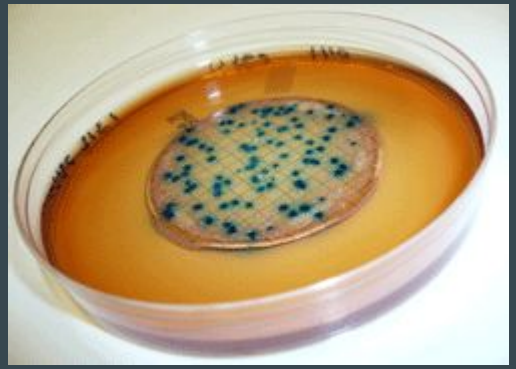


- Various species within the *Penicillium* genus are used for different products
  - Antibiotics
  - Cheeses (Camembert, Brie, Danish Blue Cheese and Gorgonzola
  - Many are also plant pathogens

https://cdn.shopify.com/s/files/1/0181/6997/files/About_Soft_Cheese_Header.jpg?1043
http://www.sciencemuseum.org.uk/hommedia.ashx?id=7507&size=Large
http://www.igourmet.com/images/topics/bluecheese4.jpg

Escherichia coli

- Is a Bacteria which means it is a prokaryote
- Is a gut microbe that can only survive outside of the body for a short time
- *E.coli* can live off of many different food sources and can produce many different bi-products
- Due to its small genome and the amount of research done on *E.coli* it is often used as a model organism in labs, is genetically modified to produce different compounds and is also a coliform used as an indicator organism to test for pathogens.



https://www.giantmicrobes.com/us/media/catalog/product/cache/2/image/675x1012.5/9df78eab33525d08d6e5fb8d27136e95/e/c/ecoli_2.jpg
https://www.mytrainingcourses.ca/images/ecoli.gif

What kinds of Microbes do you think are interesting?

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Find an interesting microbe to share with us next time!

What do you think so far about Microbiology?

What do you think about doing science at University?

Ask us about studying at the University of Auckland

Question Time

Things to remember for next time.

Remember to find a microbe that you think is interesting to share with us next time!

Think about any questions you might have for us. Ask us anything!

See you next time!