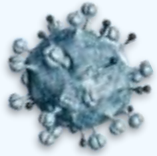
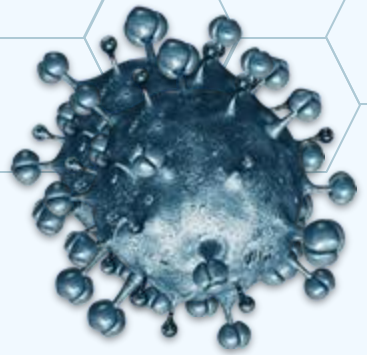
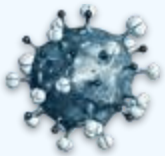
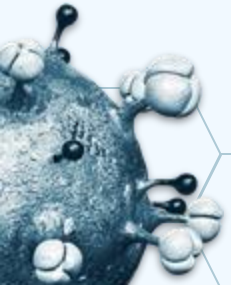


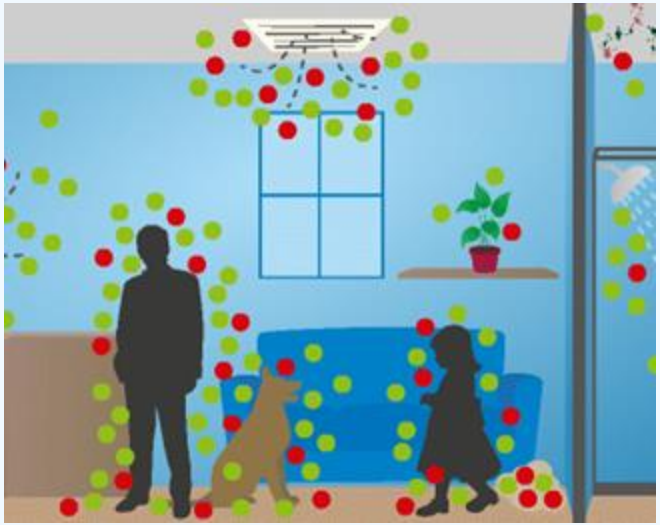

# Microbes in the air

Presented by : Science - Team 4


Our team

# Background

- **Microbes** are microscopic organisms such as bacteria, viruses, and fungi.
- Everywhere-in the air, water, soil, and even inside our bodies.
- Harmless **vs.** beneficial **vs.** harmful



# Purpose of Study

To investigate and compare the types and amounts of microbes and fungi in the air of different environments in our community. Also, to assess their potential positive or negative effects on health and the environment.

**Sampling Locations:**

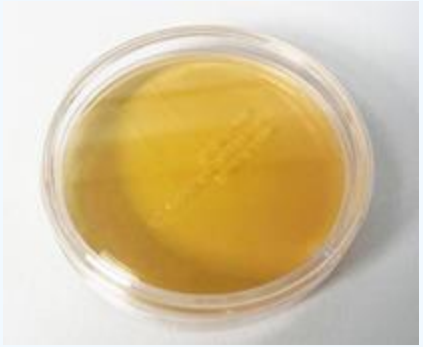
1. Parking Lot
2. Open Field
3. A/C Lecture Room
4. Canteen/Fine Foods

# Hypothesis

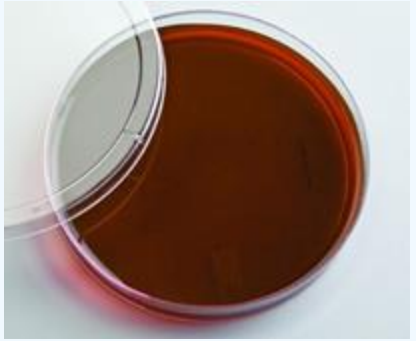
| | | |
|---|---|---|
| Open field | More fungal growth | Due to natural plant and soil activity |
| Canteen (Fine Food) | Primarily bacterial growth | Due to human activity and pollution. |
| Parking lot | | |
| A/C Lecture room | Majorly bacterial growth but limited fungal presence | Due to filtered air. |

# Methodology

Impactor



Yellow Yeast Potato Dextrose Agar



Red Eosin Methylene Blue Agar

# Methodology

Open Field

# Methodology

Parking Lot

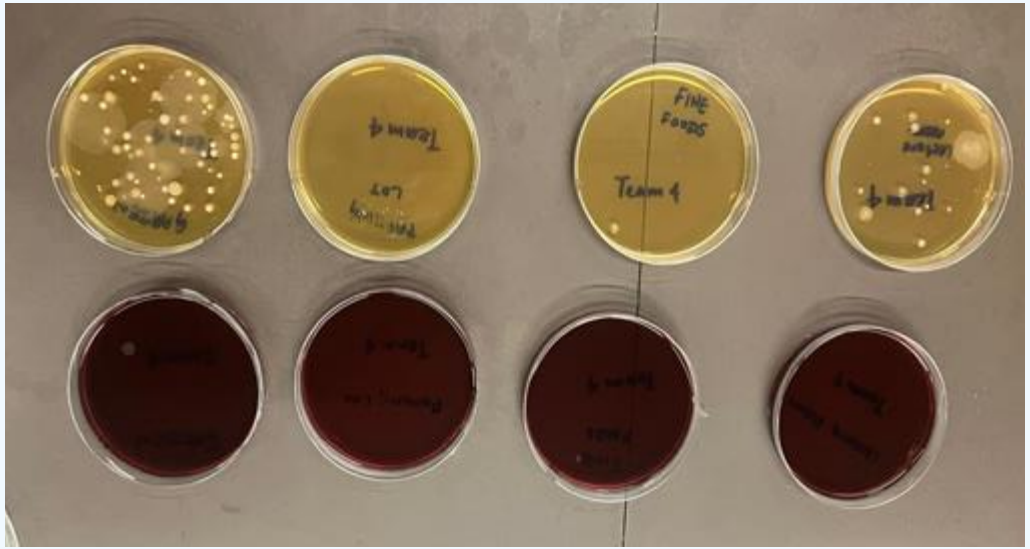
# Methodology

Fine Foods

# Methodology

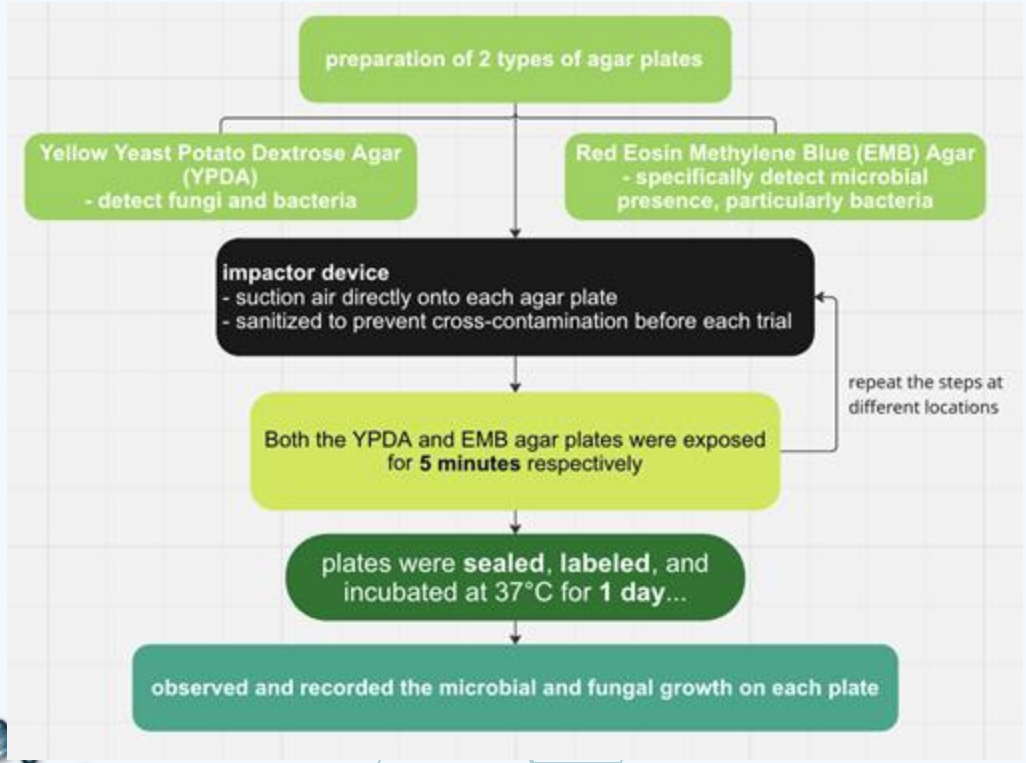
Lecture Room

# Methodology




Observation

# Methodology



# Visual Observation

## Location: A/C Lecture Room

Yellow Yeast Potato Dextrose Agar

Red Eosin Methylene Blue

# Visual Observation

## Location: Garden

Yellow Yeast Potato Dextrose Agar

Red Eosin Methylene Blue

# Visual Observation

## Location: Parking Lot

Yellow Yeast Potato Dextrose Agar

Red Eosin Methylene Blue

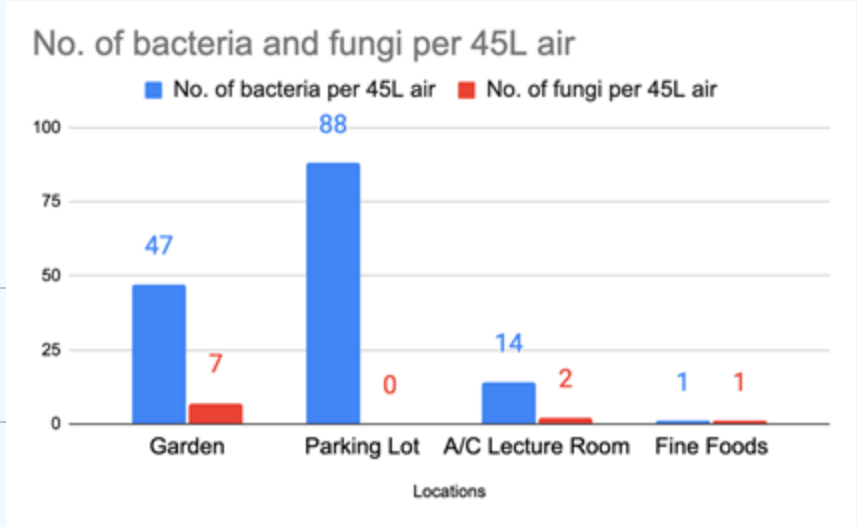
# Visual Observation

## Location: Fine Foods

Yellow Yeast Potato Dextrose Agar

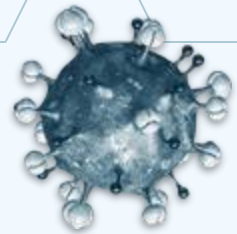
Red Eosin Methylene Blue

# Comparison




| Locations | Bacteria per 45L air | Fungi per 45L air |
|---|---|---|
| Garden | 47 | 7 |
| Parking Lot | 88 | 0 |
| A/C Lecture Room | 14 | 2 |
| Fine Foods | 1 | 1 |

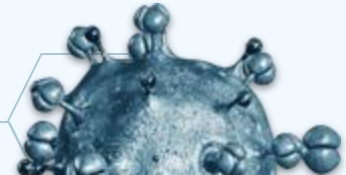


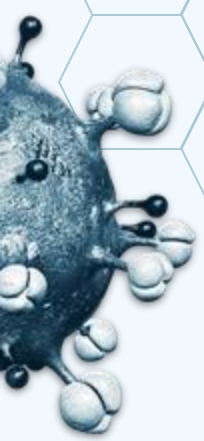


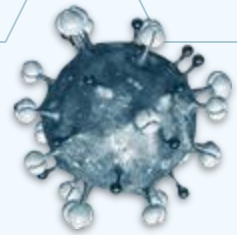
# Microbial Effect

**Higher bacterial growth** observed in the restaurant, parking lot, and A/C room
Likely sources: human activity, vehicle emissions, enclosed air systems
Microbes in these areas can have both positive and negative effects:

- ❌ **Negative**
- ✅ **Positive**







# Fungal Effect

Fungal colonies were most prominent in the garden, a natural environment with high organic matter and humidity.

Fungi in this setting can:
Support decomposition, nutrient cycling, and soil health.However, excess fungal spores in the air can trigger allergies or asthma in sensitive individuals.Minimal fungal presence in other areas suggests lower humidity and limited organic sources.

Microbes and fungi can be both helpful and harmful.
Clean air reduces health risks. Natural fungi help ecosystems.

# Conclusion

## Microbial air content varies greatly by environment.

- **Parking Lot:** highest **bacterial** count → exposure to airborne bacteria
- **Garden:** highest **fungal** presence (7) and moderate bacteria (47) → natural environments encourage fungal growth due to organic matter like plants and soil
- **A/C Lecture Room:** moderate bacterial (14) and **minimal** fungal (2)
- **Fine Foods (Canteen): very low** microbial counts → good sanitation and airflow control in food service areas

| Limitations | Improvements |
| --- | --- |
| No replication or averaging | Repeat sampling on **different days or times** |
| | Use **more plates per site** |
| some colonies may not have fully developed | Extend incubation time for fungi to grow more completely. |

# Real world implications

Fungi -  moist, natural settings

Bacteria - in urban and enclosed areas, where they may affect air quality and human health

Improve air sanitation, inform building ventilation strategies, and raise community awareness about the microbial world around us

# Gratitude Behind the Science


- Gratitude to **NUS** and the department for the opportunity and inspiration to conduct this program
- Special thanks to **our mentor, Dr. Carl**, for their mentorship and encouragement
- Thanks to one another in our team for teamwork, dedication, and collaboration
- Appreciation to **school staff** for logistical support and access to sampling areas

# Thank You