

# Industrial Microbiology: History, Applications, and Implications

---

**Prof. Nagwa Mohamed Aref**  
**566MICRO**

# Overview

---

- History
- Applications
- Further Research
- Conclusion



Bread was baked around 4000 BC

Louis Pasteur:

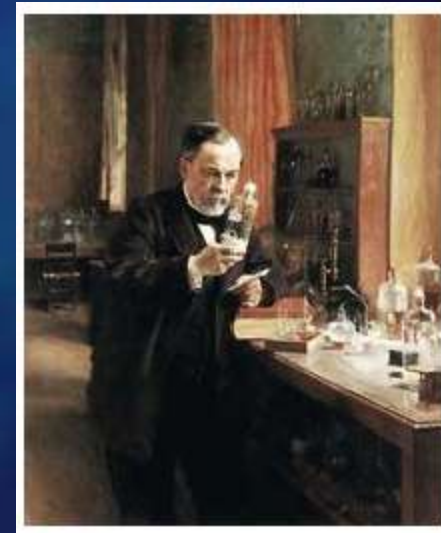
1857: Microbiology of lactic acids fermentations 1860

Role of yeast in ethanolic fermentation

mentation

ng –Antibiotics

tomycin



# *History of Industrial Microbiology*

---

- A period of ignorance( 1800)
- A period of discovery (1800-1900)
- A period of industrial development(post1900).

# History

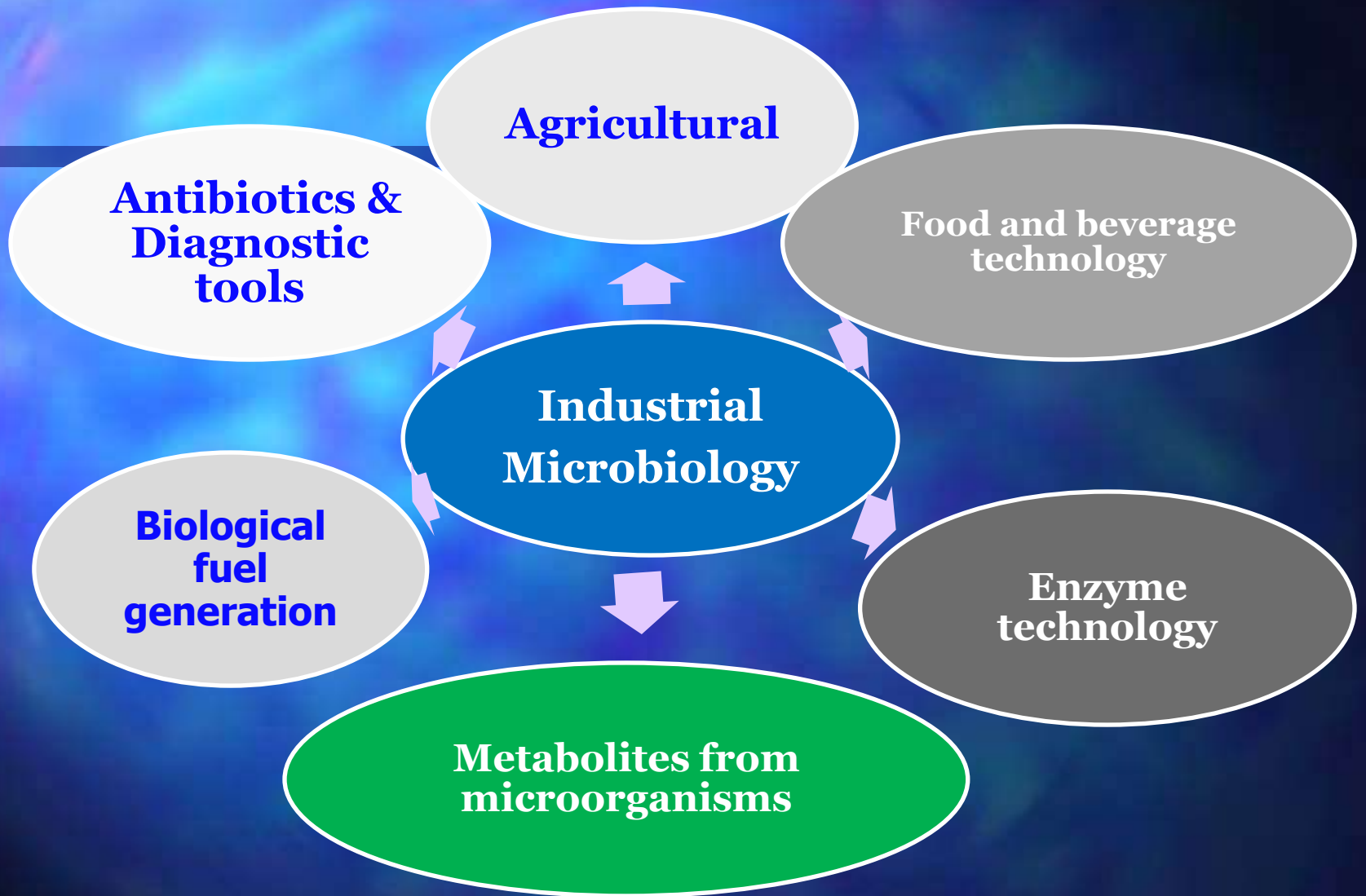
---

- Ancient History
- Medieval Times
- Recent History
  - van Leeuwenhoek
  - Pasteur
  - Tyndall
  - Buchner

- Modern Era
  - Fleming



- Florey, Chain
- Waksman



# Commercially Important Products

- General Industrial Applications
- Microbial Cells
- Large molecules they synthesize
- Primary metabolites
- Secondary metabolites



# General Industrial Applications

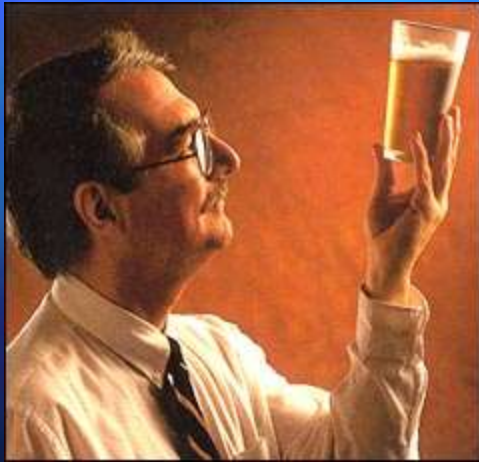
- Wastewater Treatment
- Bio-Mining
- Bioremediation





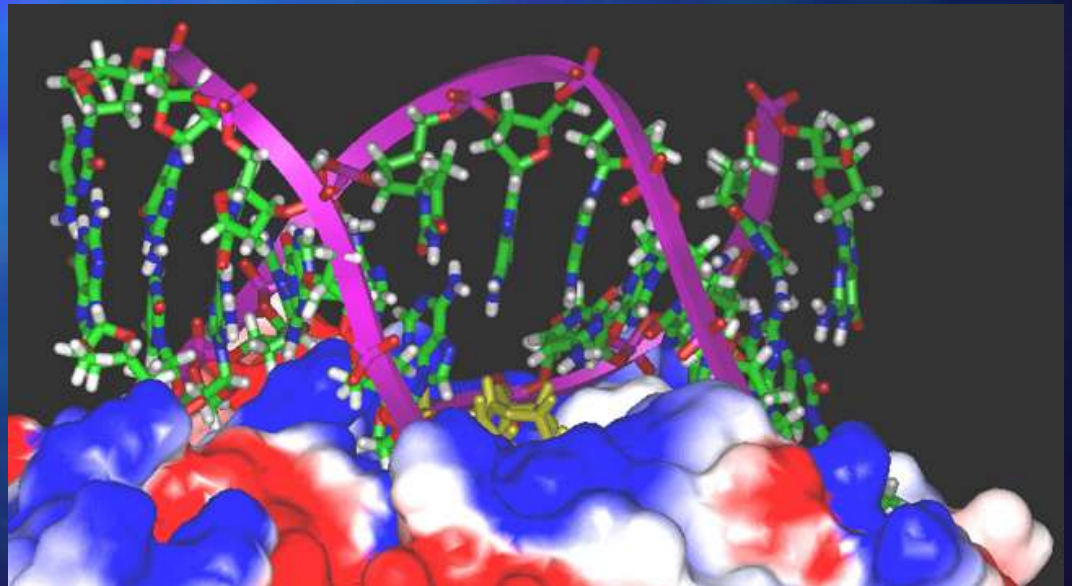
# Microbial Cells

- Source of Protein for Livestock
- Used in Biological Conversions



# Large Molecules Synthesized

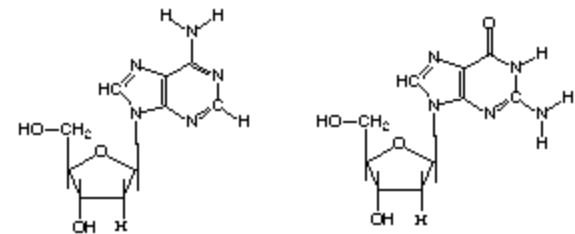
- Enzymes
- Polysaccharides
- Active Ingredients in
  - Pesticides
  - Vaccines



# Primary Metabolites

- Amino Acids
- Purine Nucleotides
- Vitamins
- Organic Acids

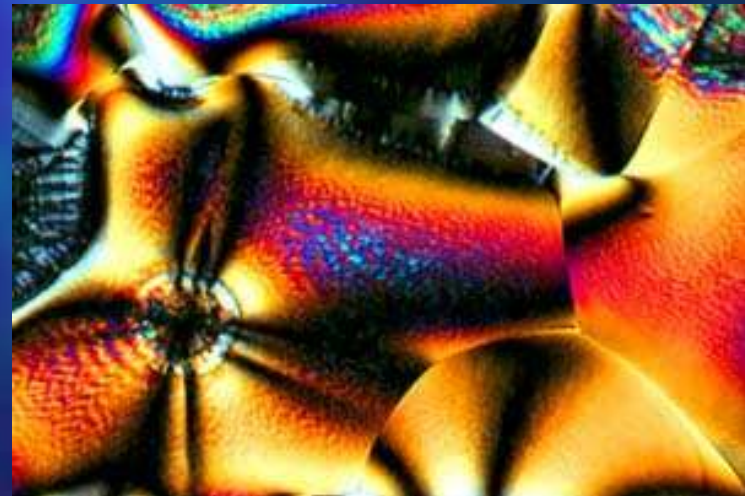
The Nucleotides of DNA



Adenine

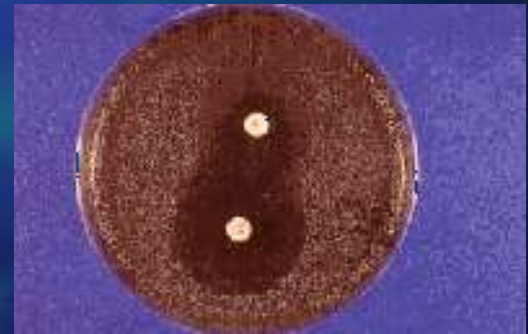
Guanosine

Purines



# Secondary Metabolites

- Antibiotics
- Toxins
- Alkaloids
- Plant Growth Factors



# Further Research

---

- Genetic Engineering
  - Recombinant DNA
  - Protoplast Fusion
- Gene Amplification



# Questions?

---

