



SNS COLLEGE OF TECHNOLOGY

(An Autonomous Institution)

COIMBATORE-35

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Grade Approved by AICTE, New Delhi & Affiliated to Anna University,
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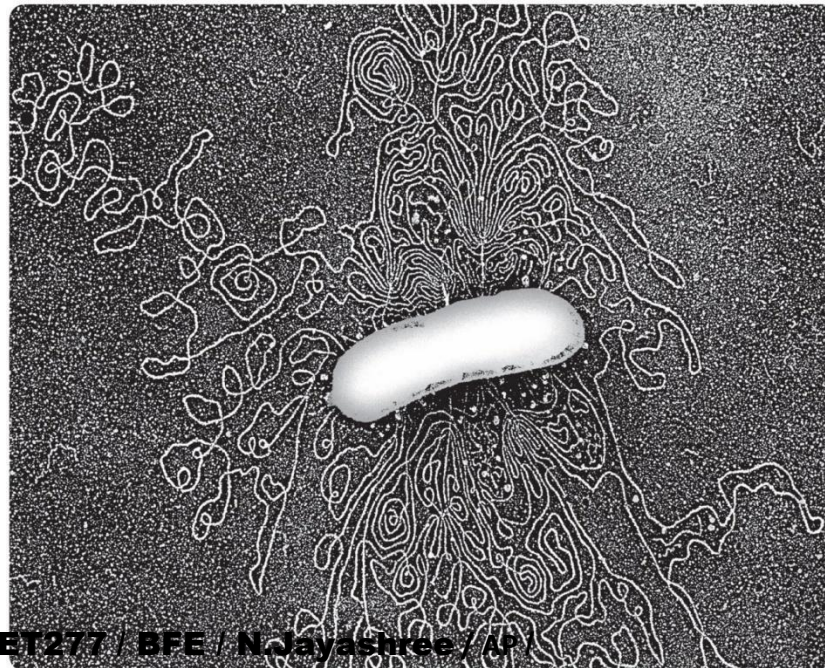


19GET277 / Biology For Engineers IV YEAR / VII SEMESTER UNIT-II: BIODIVERSITY

MICROBIAL SYSTEM HISTORY-TYPES OF MICROBES



Microbial Biotechnology

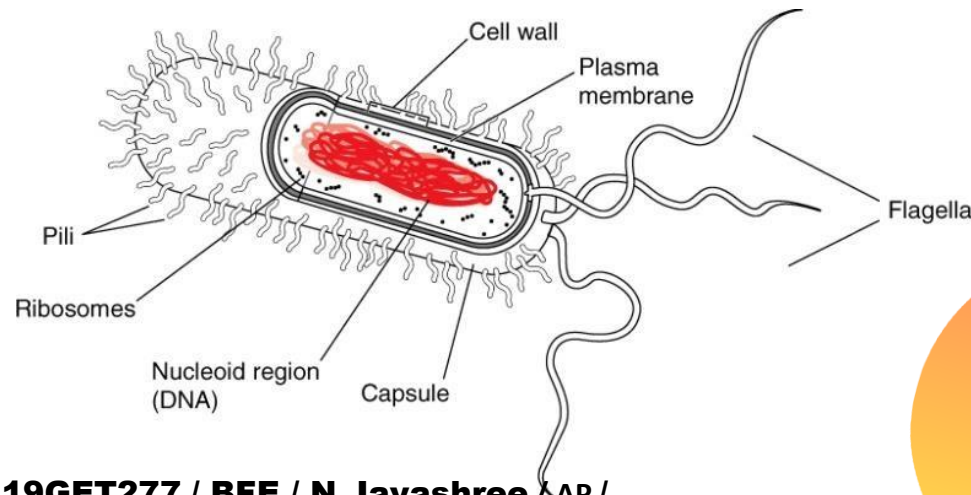




The Structure of Microbes

❖ Prokaryotes

- Archaeobacteria
 - Includes halophiles, thermophiles, "extremophiles"
- Eubacteria
 - On skin, soil, water, can be pathogenic

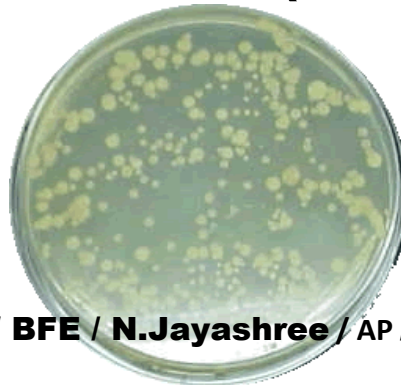




The Structure of Microbes

❖ Characteristics of Prokaryotes

- Generally smaller than Eukaryotes
- No nucleus
- Cell wall composed of peptidoglycan
- Conjugation (transfer of DNA by cytoplasmic bridge)
- Transduction (DNA is packaged in a virus and transferred to recipient bacterial cells)
- 20 minute growth rate (binary fission)





Least are Important Tools



- ❖ Single celled eukaryote
- ❖ Kingdom: Fungi
- ❖ Over 1.5 million species
- ❖ Source of antibiotics, blood cholesterol lowering drugs
- ❖ Able to do post translational modifications
- ❖ Grow anaerobic or aerobic
- ❖ Examples: *Pichia pastoris* (grows to a high density than most laboratory strains), has a lot of strong promoters, can be used in bioprocesses



Microorganisms as Tools

❖ Microbial Enzymes

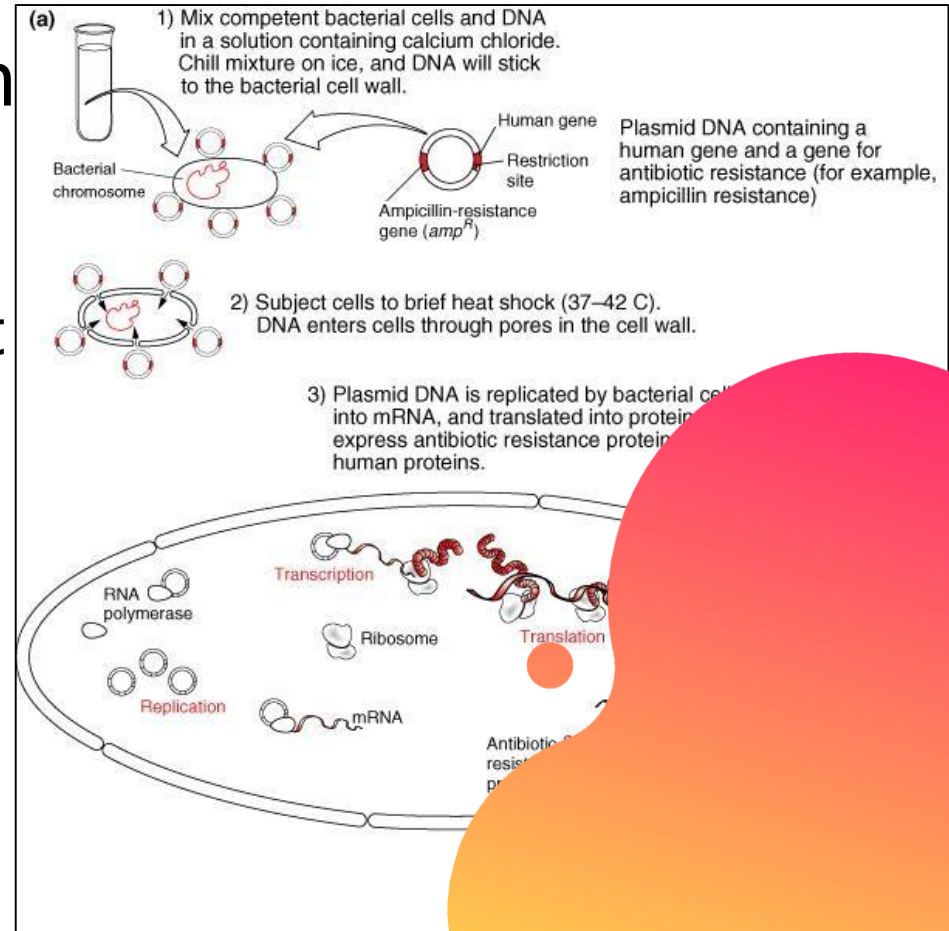
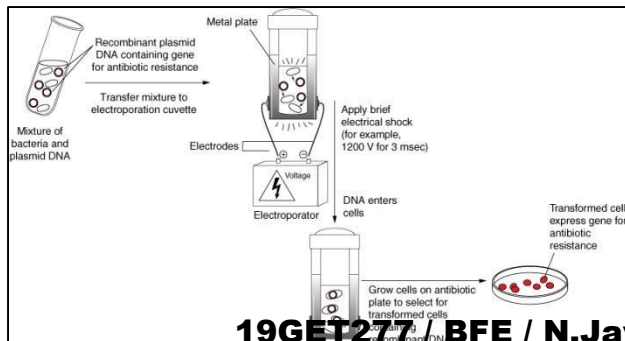
- Taq (DNA polymerase), cellulases, proteases, amylases



Microorganisms as Tools

• Bacterial Transformation

- The ability of bacteria to take in DNA from their surrounding environment
- Bacteria must be made competent to take up DNA

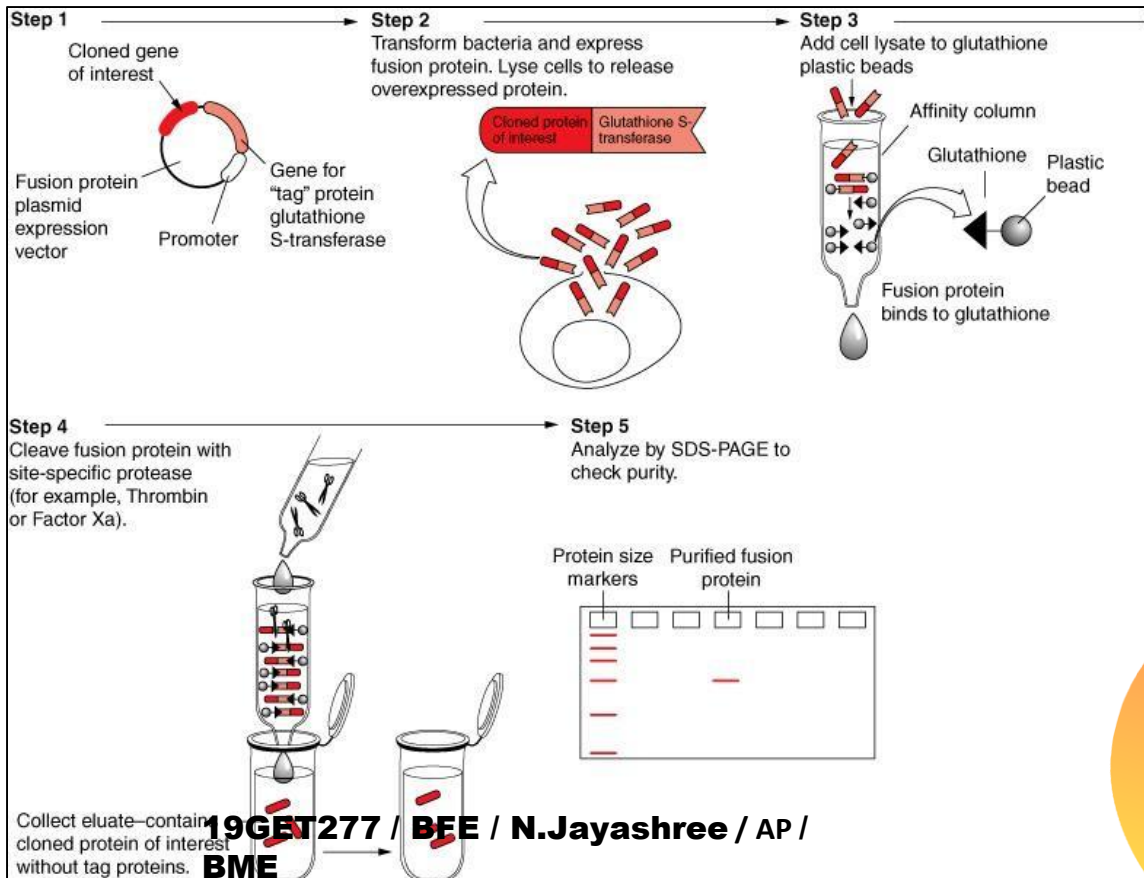




Microorganisms as Tools

❖ Cloning and Expression Techniques

- Fusion Proteins

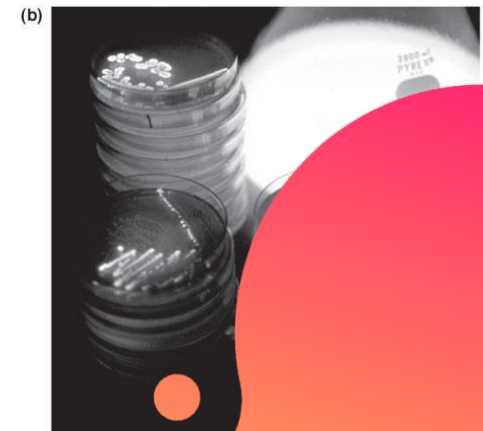
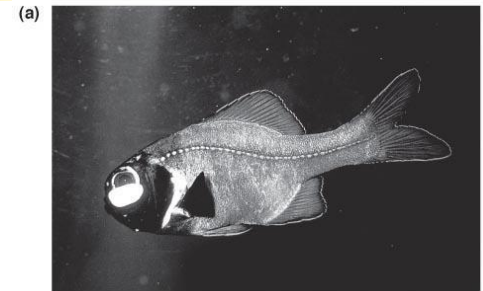




Microorganisms as Tools

Microbial Proteins as Reporters

- Examples: the lux gene which produces luciferase
- Used to develop a fluorescent bioassay to test for TB



(c) The light-releasing of
by luciferase

H

Luc



Microorganisms as Tools

Yeast Two-Hybrid System

- Used to study protein interactions

