

School of Basic and Applied Sciences

Course Code : BSDB2003

Course Name: Fundamentals of Microbiology



GALGOTIAS
UNIVERSITY

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Biomedical Science Sem III

Program Name: B.Sc. (H) Biochemistry/ Biological Science/

Introduction

- Bovine pleuro-pneumonia.
- Pasteur (1943)- discovered them in fluid of cattle.
- Nocard and Roux (1898)- Isolated them.
- Nowak (1929)- given the name.
- Evolution- Virus-mycoplasma- bacteria

General Characteristics

- Phylum *Tenericutes*, Mollicutes (*mollis*, soft; *kutis*, skin), and order *Mycoplasmatales*.
- Mycoplasma are generally slow-growing, highly fastidious, facultative anaerobes .
- Smallest organisms known. **PPLO- Pleuro Pneumonia like organism**
- **Size-0.2-0.8** μm ; flexible cells assume a spectrum of shapes.
- *Mycoplasma* species grow embedded beneath the surface of solid media. Classic **“fried egg” appearance**. **Small coccoid elements**.
- Susceptible to adverse environmental conditions, such as heat and drying.

General Characteristics

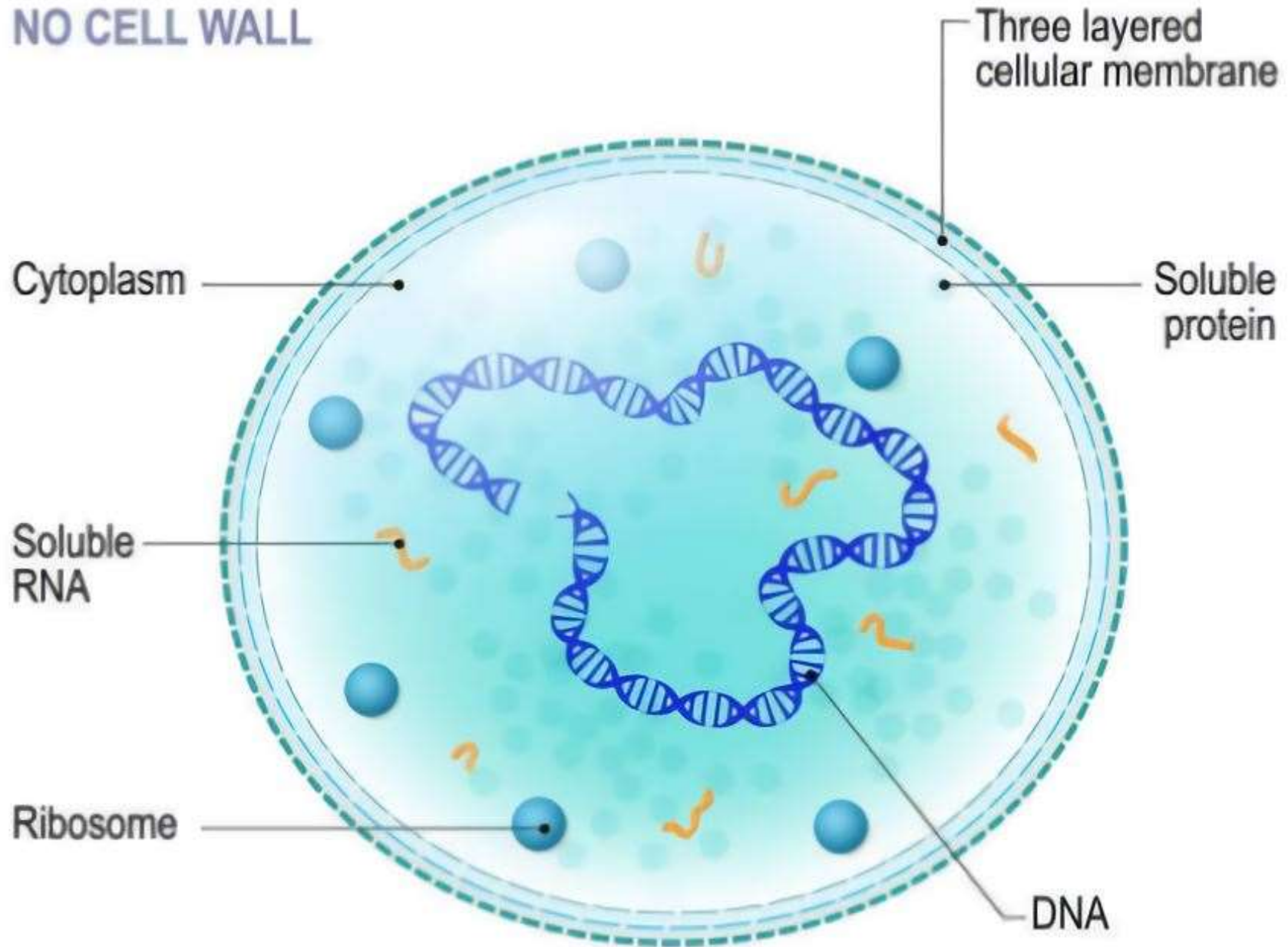
- Mostly pathogenic; live in **close association** of animal and plants.
- The new species, named *Mycoplasma laboratorium*, contains the smallest functional genome of any bacterium, with 382 genes of around 1.1 million base pairs; smaller than the largest known viral genome, that of Mimivirus with 1.2 Mbp.
- Mycoplasmas resemble protoplasts (bacteria treated to remove their cell walls), but they are more resistant to osmotic lysis and are able to survive conditions under which protoplasts lyse.
- In addition to sterols, certain mycoplasmas contain compounds called **lipoglycans**.
- Lipoglycans are **long-chain heteropolysaccharides**

General Characteristics

- Lipoglycans in some ways resemble the lipopolysaccharides in the outer membrane of gram-negative bacteria, except that they lack the lipid A backbone.
- Lipoglycans function to help **stabilize** the cytoplasmic membrane and have also been identified as facilitating **attachment** of mycoplasmas to cell surface **receptors** of animal cells.
- Mycoplasmas are sometimes referred to as **membrane parasites** because they acquire certain necessary lipids from host cell membranes.
- Broad spectrum antibiotics.
- DNA-4% and RNA 8%. Reproduction-Budding, binary fission

Structure

NO CELL WALL



Diseases in human

Pathogen	Implicated Diseases
<i>Mycoplasma genitalium</i>	Arthritis, chronic NGU, PID, other urogenital infections, infertility.
<i>Mycoplasma fermentans</i>	Arthritis, Gulf War Syndrome, Fibromyalgia, Chronic Fatigue Syndrome, Lupus.
<i>Mycoplasma salivarium</i>	Arthritis, Eye and ear infections, gingivitis.
<i>Mycoplasma hominis</i>	PID, infertility, NGU, vaginitis, cervicitis, amnionitis.
<i>Mycoplasma pneumoniae</i>	Pneumonia, asthma, upper and lower respiratory diseases, heart diseases.
<i>M. incognitos and M. penetrans</i>	urogenital infections, Autoimmune disorders.
<i>Mycoplasma pirum</i>	Urogenital infections and diseases .
<i>Mycoplasma faucium, M. lipophilum and M. buccale</i>	Diseases of the gingival crevices and respiratory tract.

Plant diseases

- ✓ Little leaf of brinjal
- ✓ Bunchy top of papaya
- ✓ Mulberry dwarf
- ✓ Aster yellow
- ✓ Potato witch's broom etc.

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