SNS COLLEGE OF ENGINEERING

Kurumbapalayam (Po), Coimbatore – 641 107

AN AUTONOMOUS INSTITUTION

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Department of Mechanical Engineering

19BY701 - BIOLOGY FOR ENGINEERS

UNIT -3 |GENETICS AND IMMUNE SYSTEM

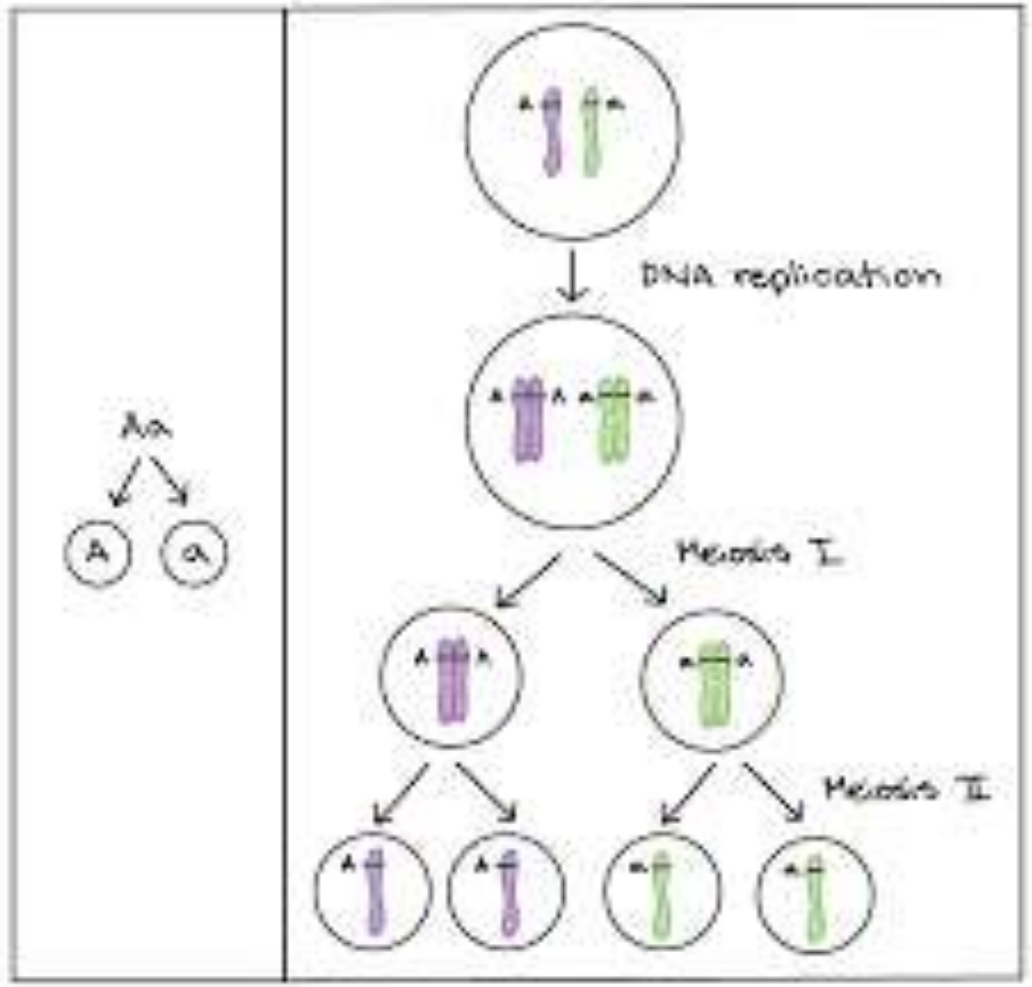
Prepared by

B.Balamurali

Ap/Mech

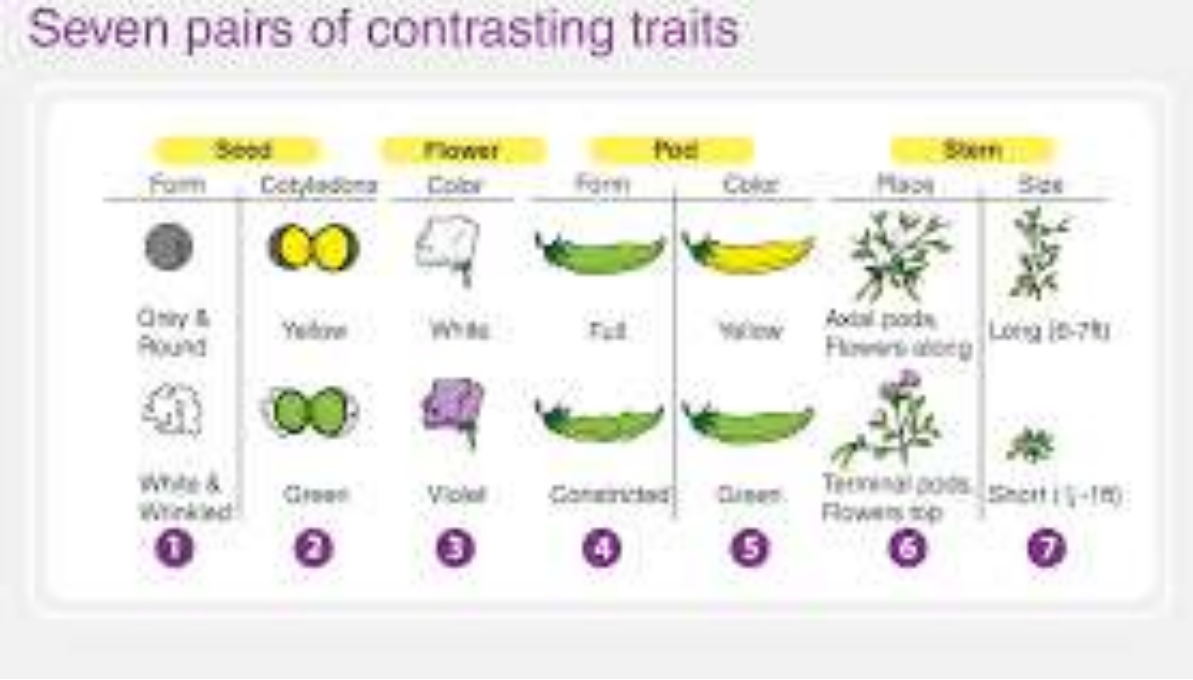
LAW OF INHERITANCE

- **The law of segregation states that every individual possesses two alleles and only one allele is passed on to the offspring**.
- The law of independent assortment states that the inheritance of one pair of genes is independent of inheritance of another pair.



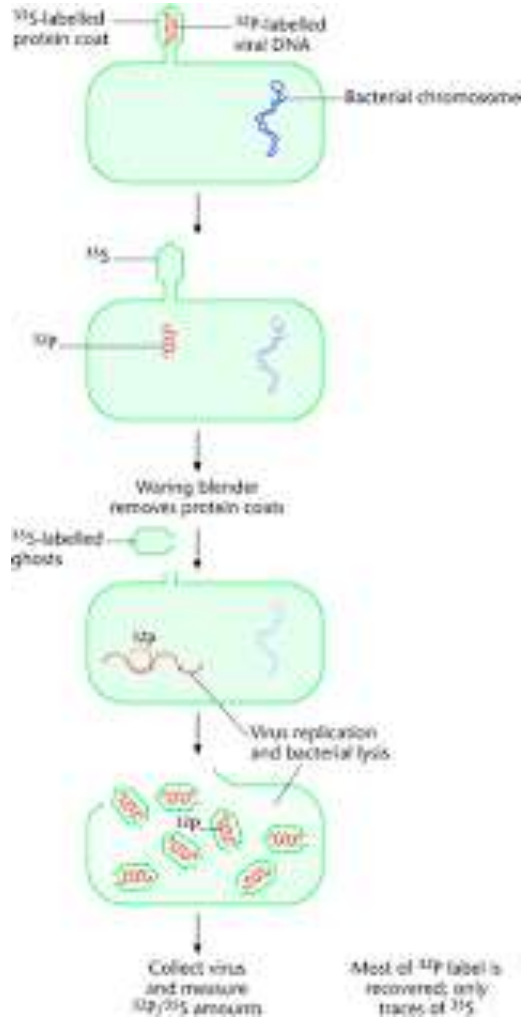
LAWS OF INHERITANCE VARIATION

- Inheritance is the process by which characters are passed on from parent to progeny; it is the basis of heredity.
- Variation is **the degree by which progeny differ from their parents**.



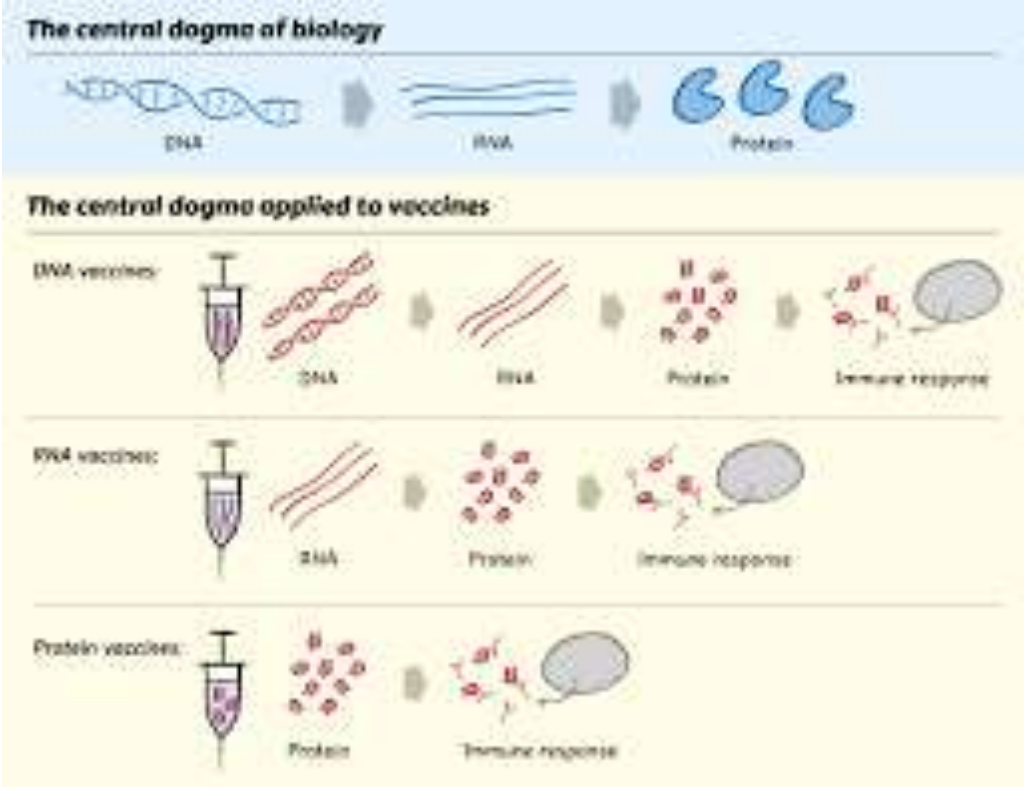
SPECIATION-NUCLEIC ACIDS AS A GENETIC MATERIAL

- The two main classes of nucleic acids are deoxyribonucleic acid (DNA) and ribonucleic acid (RNA).
- **DNA is the master blueprint for life and constitutes the genetic material in all free-living organisms and most viruses**.



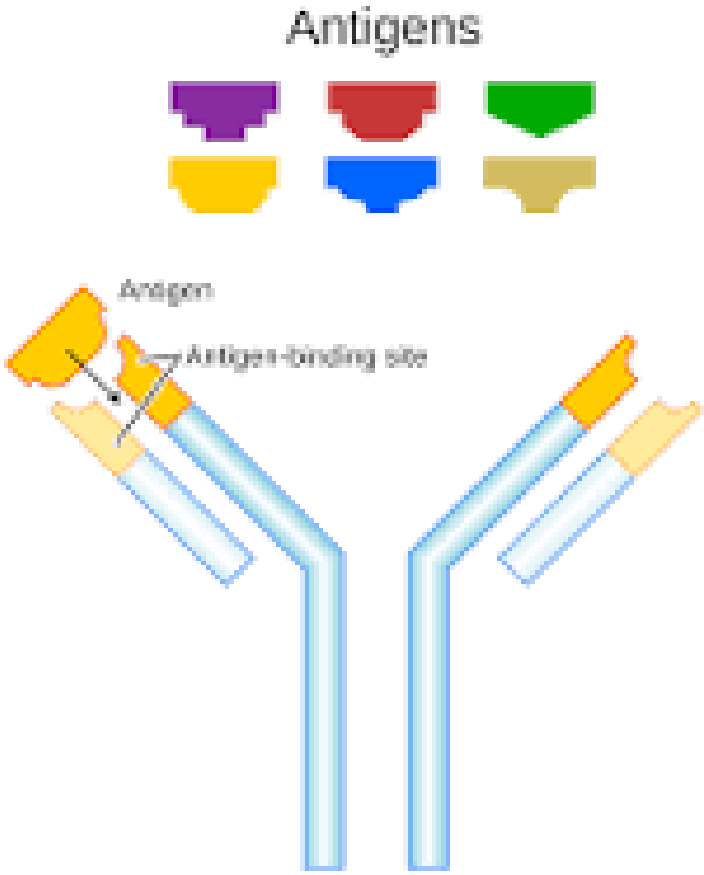
CENTRAL DOGMA IMMUNITY

- The central dogma of molecular biology explains the flow of genetic information, from DNA to RNA, to make a functional product, a protein.
- The central dogma suggests that DNA contains the information needed to make all of our proteins, and that RNA is a messenger that carries this information to the ribosomes.
- The ribosomes serve as factories in the cell where the information is ‘translated’ from a code into the functional product.



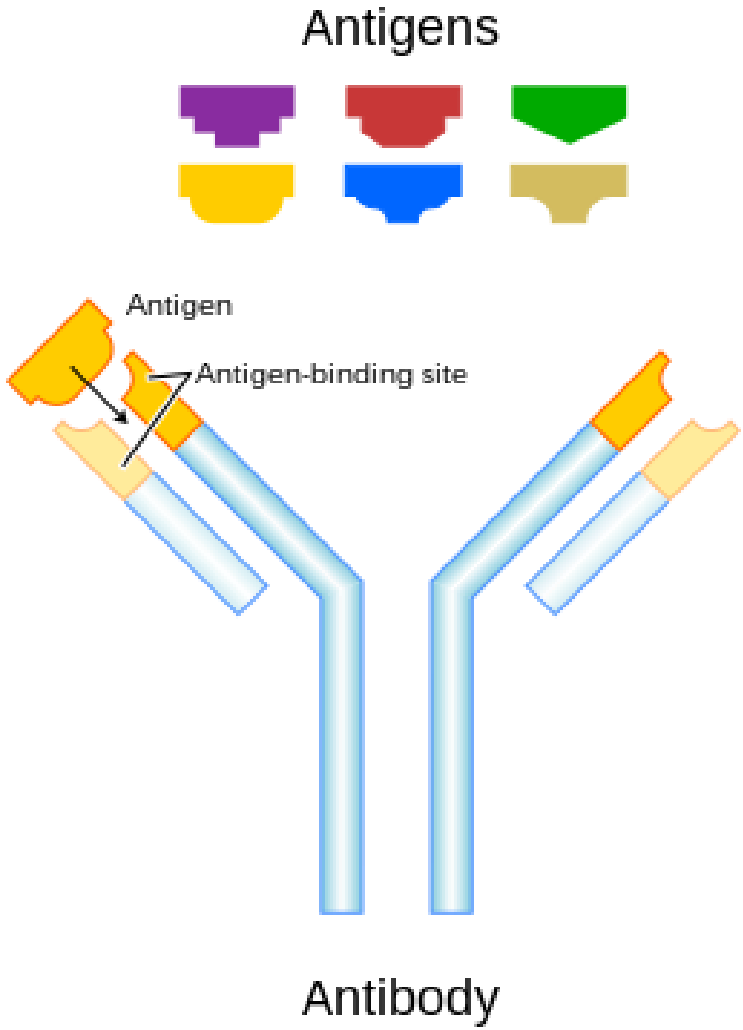
ANTIGENS

- **Any substance that causes the body to make an immune response against that substance**.
- Antigens include toxins, chemicals, bacteria, viruses, or other substances that come from outside the body.
- Body tissues and cells, including cancer cells, also have antigens on them that can cause an immune response.



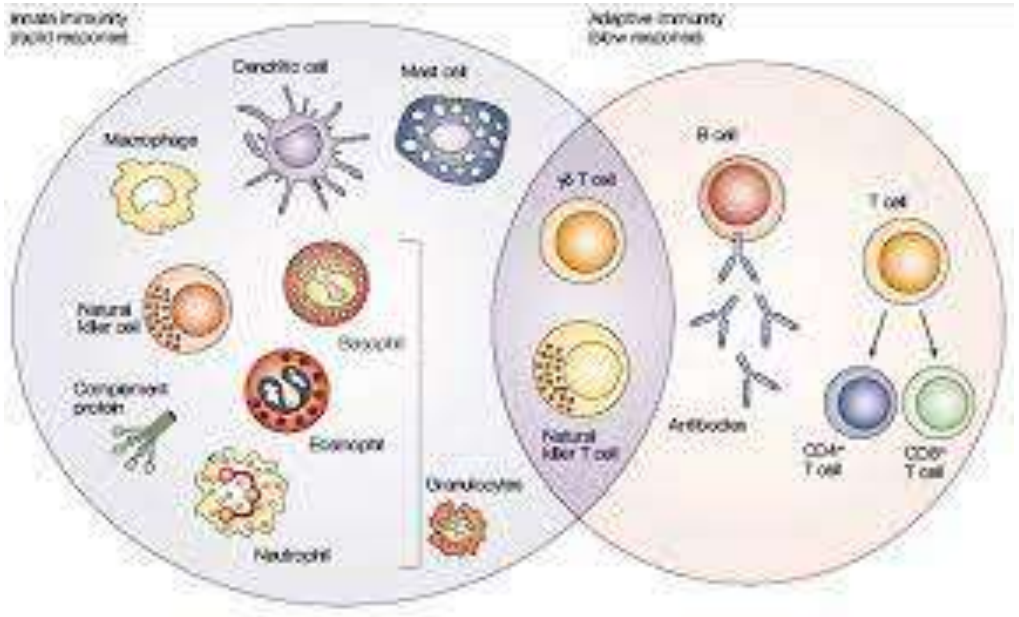
ANTIBODY

- An **antibody** (**Ab**), also known as an **immunoglobulin** (**Ig**) is a large, Y-shaped protein used by the immune system to identify and neutralize foreign objects such as pathogenic bacteria and viruses.
- The antibody recognizes a unique molecule of the pathogen, called an antigen



IMMUNE RESPONSE

- An **immune response** is a reaction which occurs within an organism for the purpose of defending against foreign invaders.
- These invaders include a wide variety of different microorganisms including viruses, bacteria, parasites, and fungi which could cause serious problems to the health of the host organism if not cleared from the body.



ASSESSMENT

Match the Following

1. ANTIGENS	a. Reaction which occurs within an organism
2. ANTIBODY	b. Recognizes a unique molecule of the pathogen, called an antigen
3. IMMUNE RESPONSE	c. Any substance that causes the body to make an immune response