



# Ultrathin Heteroprotein Film

## Why in News?

Scientists have developed **Ultra-Thin Hetero Protein films** with excellent **thermal, mechanical and pH stability** which can pave the way **for expanding applications of thin films in biomedical and food packaging industries.**

- It consists of two globular proteins: **Bovine Serum Albumin (BSA)** and **Lysozyme (Lys)**. They used the technique called using Langmuir-Blodgett (LB) technique which gives the **films thickness in the order of nanometer.**
- Globular proteins or spheroproteins are spherical proteins and are one of the common protein types. Globular proteins are **somewhat water-soluble, unlike the fibrous or membrane proteins.**

## What are the Benefits of Ultrathin Heteroprotein Film?

- Thinner as **compared to the other protein or plastic films.**
- They are **soft and thin and have the advantage of being more flexible** than the other films.
- In the recent past, several modifications of these protein films with the help of suitable heteroprotein complexes were reported by different research groups. These complexes **were usually developed from bulk solutions.**
- Films of BSA and Lys can be useful for **fabricating highly stable biodegradable thin films of different protein complexes** for expanding its applications in the area of thin-film technology.
- Diverse physicochemical methods such as parameter alteration or incorporation of different fatty acids or polyol moieties (glycerol, starch, gelatin, etc.) into this protein complex **can make the film free standing for diverse applications.**

## What are the Proteins?

- **About:**
  - Proteins are **composed of amino acids**, arranged into different groups. These fundamental amino acid sequences are specific and its arrangements are controlled by the **DNA (Deoxyribonucleic acid).**
  - There are two types of protein molecules, fibrous proteins and globular proteins.
    - Fibrous proteins are insoluble and elongated.
    - Globular proteins are soluble and compact.
- **Functions:**
  - **Enzymes:** Enzymes mostly carry out all numerous chemical reactions which take place within a cell. They also help in regenerating and creating DNA molecules and carry out complex processes.
  - **Hormones:** Proteins are involved in the creation of various types of hormones which help in balancing the components of the body. For example hormones like insulin, which helps in regulating blood sugar and secretin. It is also involved in the digestion process and formation of digestive juices.
  - **Antibody:** Antibody also known as an immunoglobulin. It is a type of protein which is majorly used by the immune system to repair and heal the body from foreign bacteria. They often work together with other immune cells to identify and separate the antigens

- from increasing until the white blood cells destroy them completely.
- **Energy:** Proteins are the major source of energy that helps in the movements of our body. It is important to have the right amount of protein in order to convert it into energy. Protein, when consumed in excess amounts, gets used to create fat and becomes part of the fat cells.

**Source: PIB**

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