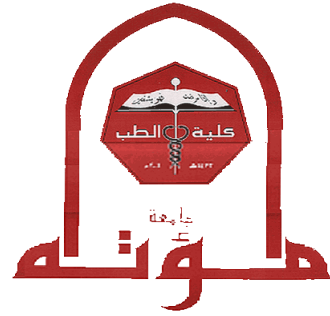


General Microbiology  
Lecture 17 & 18  
(Introduction to parasitology)  
(Protozoa)  
2022-2023

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# Définitions

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- **Medical Parasitology:** that branch of medical sciences that deals with parasites that cause or transmit disease to man.
- **Parasites:** organisms that live in or on a host (temporarily or permanently) deriving food and shelter and causing harm to that host.
- **Parasite** and **Parasitism** are terms that define a way of life.
- **Host:** Is a living organism that harbors the parasite

# Types of parasite

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1. **Ectoparasite:** A parasite that lives on the surface of the host (infestation).
2. **Endoparasite:** A parasite that lives inside the body of its host (infection).
3. **Obligatory parasite:** A parasite that is completely dependent upon a host for its survival.
4. **Facultative parasite:** A parasite that is capable of living both freely and as a parasite.
5. **Accidental (Incidental) parasite:** A parasite found in other host different from its normal host.

# Types of parasite

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6. **Permanent parasite:** A parasite that spends its life cycle on or in the body of its host.
8. **Temporary or Intermittent parasite:** A parasite that visits its host only for a short period of time for its meal.
9. **Opportunistic parasite:** A parasite that causes disease only in immunodeficient patients (AIDS, cancer patients), while in immunocompetent individuals, the parasite may exist in a latent form producing no or mild symptoms.
10. **Coprozoic or spurious parasite:** An organism that passes through the human intestine without causing any disease and is detected in the stool after ingestion.

# Types of Hosts

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- 1- Definitive host (D.H) (primary host):** harbors the adults or final stages or sexual stages (♂♀) in the development of parasite ex: man.
- 2- Reservoir host (R.H) (asymptomatic host):** the carrier host that harbors the mature (adult) stage of the parasite and well adapted to the parasite. It acts also as a source of infection to man and maintains the parasite in nature.
- 3- Intermediate host (I.H) (secondary host):** is the host in which larval stages or Intermediate stages or non-sexual reproduction take place

# Terms used in parasitology

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- **Carrier:** A host in a state of equilibrium with parasite **without or with minimal symptoms** of the disease, but he is **infective to others**.
- **Zoonosis:** Transmission of an infection from animal to man either **directly or indirectly via intermediate host** .
- **Infective stage (I.S):** The stage by which the infection takes place.
- **Diagnostic stage (D.S):** The stage by which we can diagnose the parasitic infection (disease).

# Terms used in parasitology

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**The habitat** is where the parasite lives and multiplies in the body of the definitive or intermediate host, like:

- Small intestine
- Large intestine
- Blood vessels
- Organs; liver, lung, heart, brain, .....
- Muscles
- Lymphatics
- Reticuloendothelial system
- Cells as red blood cells

## **Sources of parasitic infections**

- Water
- Soil
- Raw vegetables & fruits
- Animals
- Fish
- Vector [Arthropods]
- Blood

## **Modes of infection**

- Ingestion
- Inhalation
- Penetration of skin & mucous membrane.
- Bite of vector
- Direct contact
- Congenital transmission
- Blood transfusion
- Sexual



# Dangerous effects of parasitic infection

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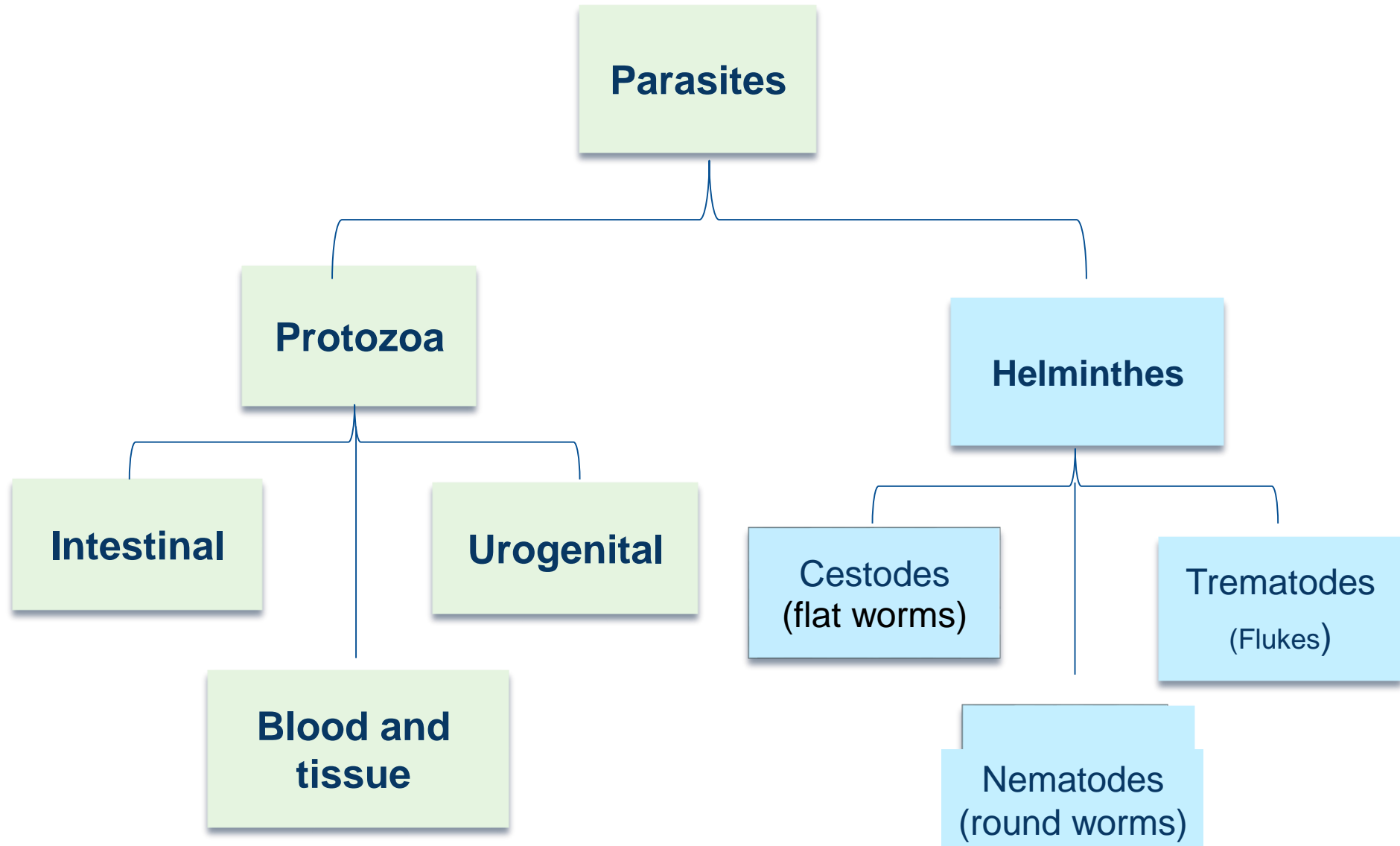
- 1- Parasitic toxic products: produce allergy or necrosis.
- 2- Anemia.
- 3- Loss of weight.
- 4- Fever & eosinophilia.
- 5- Mechanical obstruction.
- 6- Mechanical pressure.
- 8- Abortion or Congenital anomalies.

# Scheme of Study

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- Name of parasitic disease & causative parasite:  
e.g.: Disease name: **Elephantiasis**  
Parasite name: **W. bancrofti**
- Geographical Distribution.
- Life cycle
- Morphology (Adult, larva, ...) >> Lab.
- Pathogenesis & clinical picture
- Diagnosis (clinical & Lab.)
- Treatment
- Prevention & Control

# Classification of parasites





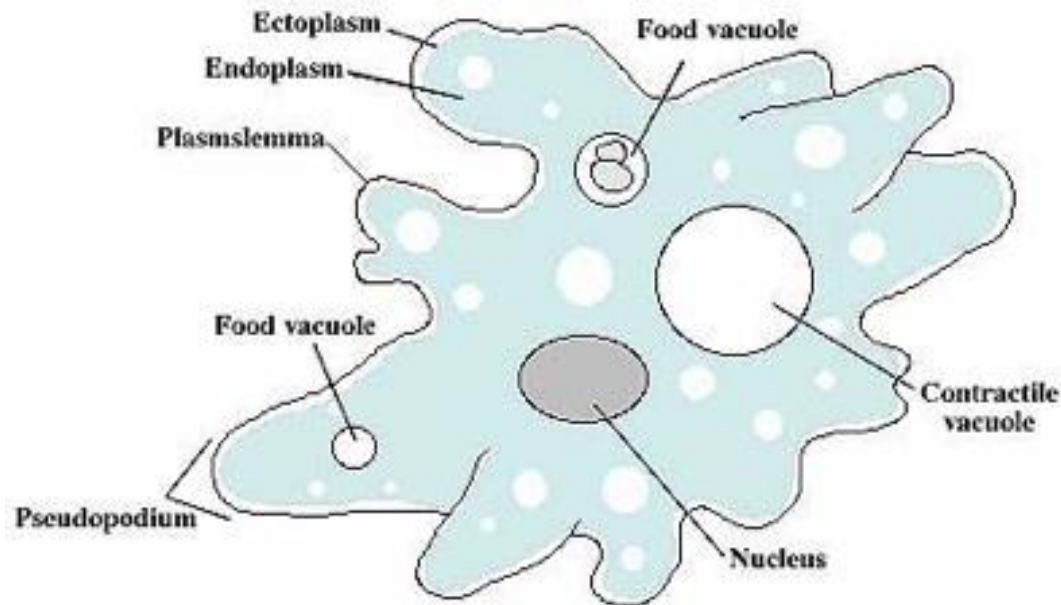
# Protozoa

**Protozoa** are microscopic unicellular organisms performing all physiological functions of life.

# Morphological characters

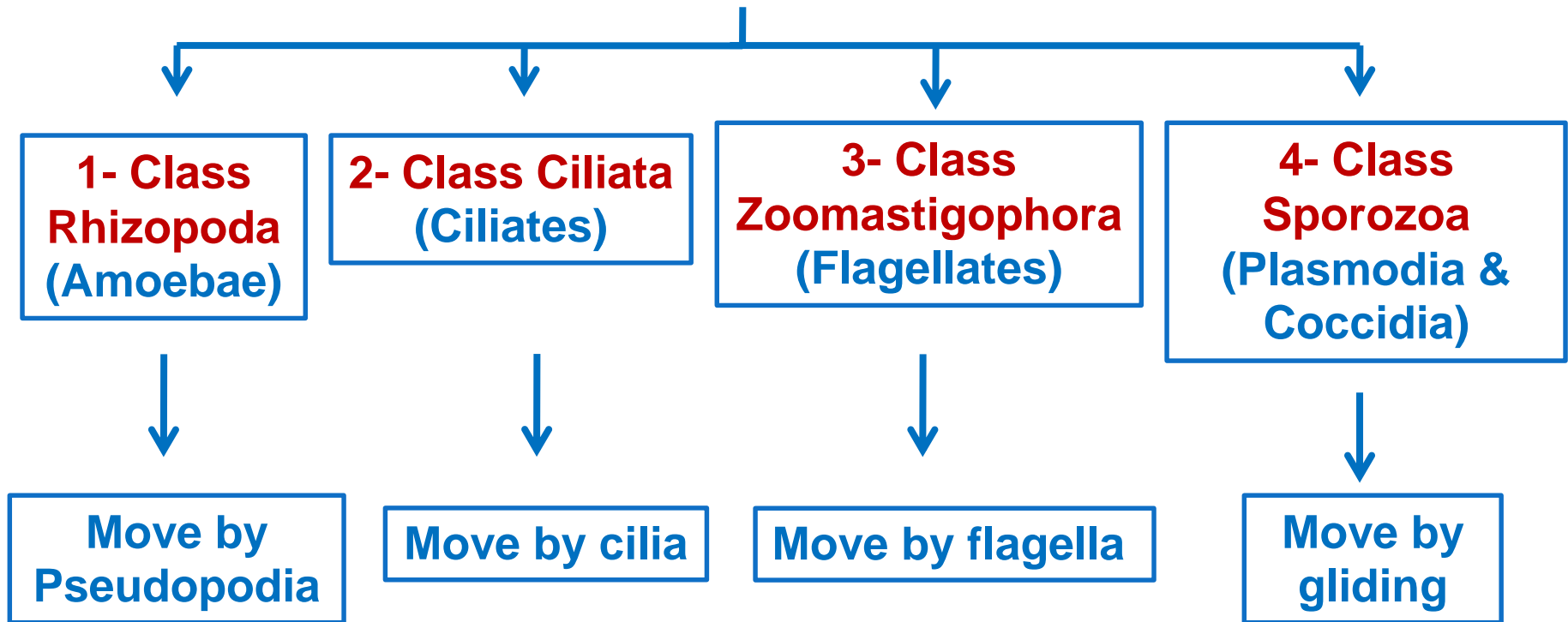
Protozoa are made of protoplasm that differentiated into:

- ❖ **Nucleoplasm.**
- ❖ **Cytoplasm which consists of:**
  - **Outer thin hyaline ectoplasm.**
  - **Inner granular endoplasm.**



# Classification of Phylum Protozoa

## 1- According to the organ of locomotion



## 2- According to the habitat

### 1- Intestinal protozoa

- **Amoeba:**  
*Entamoeba histolytica*
- **Ciliates:**  
*Blantidium coli*
- **Flagellates:**  
*Giardia lamblia*
- **Coccidia:**  
*Cryptosporidium*

### 2- Blood protozoa

- **Flagellates:**  
*Trypanosoma & Leishmania*
- **Plasmodia:**  
Malaria
- **Coccidia:**  
*Babesia*

### 3- Tissue protozoa

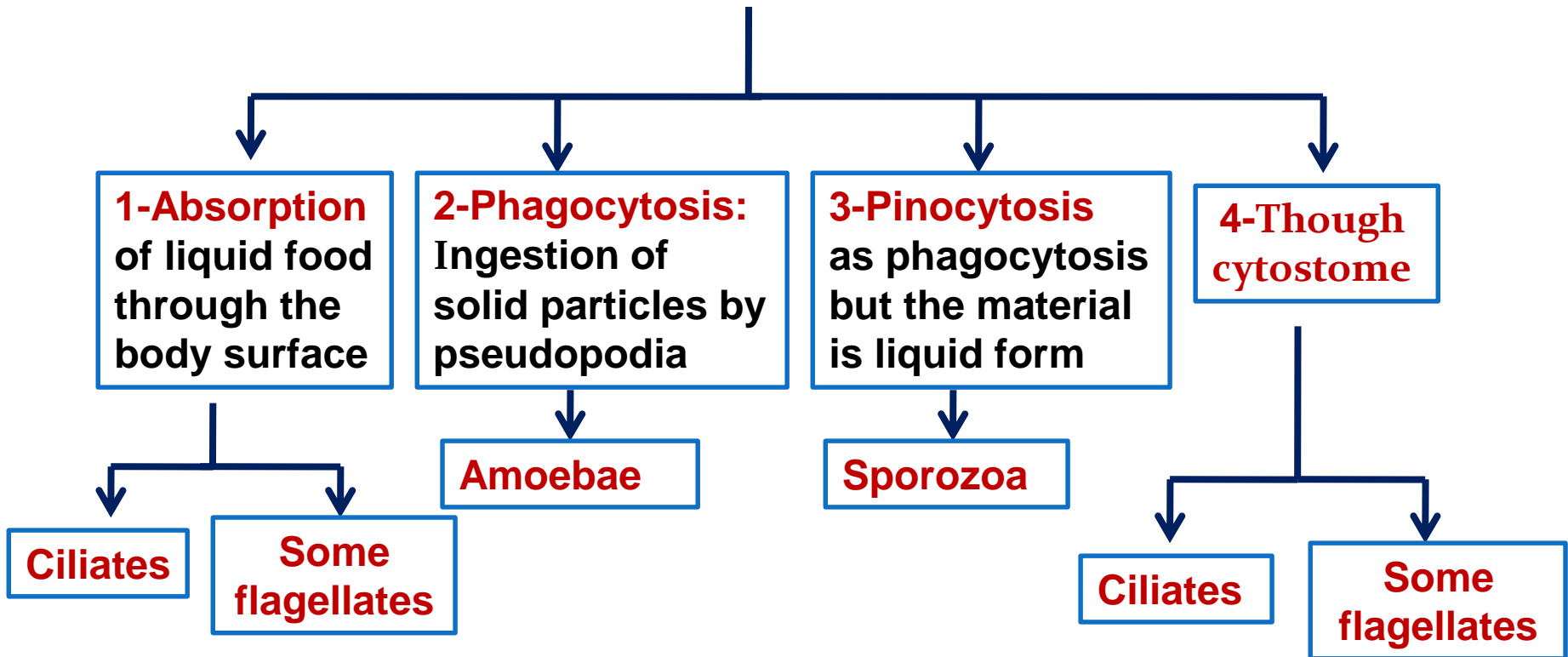
- **Flagellates:**  
*Trypanosoma & Leishmania*
- **Coccidia:**  
*Toxoplasma & Sarcocystis*

### 5- Urogenital protozoa

- **Flagellates:**  
*Trichomonas vaginalis*

# Biology of protozoa

## 1) Nutrition:





## 2)Respiration

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graph TD; A[2)Respiration] --> B[Aerobic]; A --> C[Anaerobic]; B --> D[For protozoa living in tissues or blood]; C --> E[For protozoa living in the intestinal lumen];
```

A flowchart starting with a yellow box labeled '2)Respiration'. A vertical line descends from this box to a horizontal line. From the horizontal line, two arrows point downwards to two separate boxes: 'Aerobic' on the left and 'Anaerobic' on the right. From the 'Aerobic' box, an arrow points down to a box containing the text 'For protozoa living in tissues or blood'. From the 'Anaerobic' box, an arrow points down to a box containing the text 'For protozoa living in the intestinal lumen'.

**Aerobic**

**For protozoa living  
in tissues or blood**

**Anaerobic**

**For protozoa living in  
the intestinal lumen**

### 3) Excretion

By diffusion through the body surface

Ex. Flagellates

By excretory vacuoles that rupture to the outside

Ex. Amoebae

By cytoproct (anal pore)

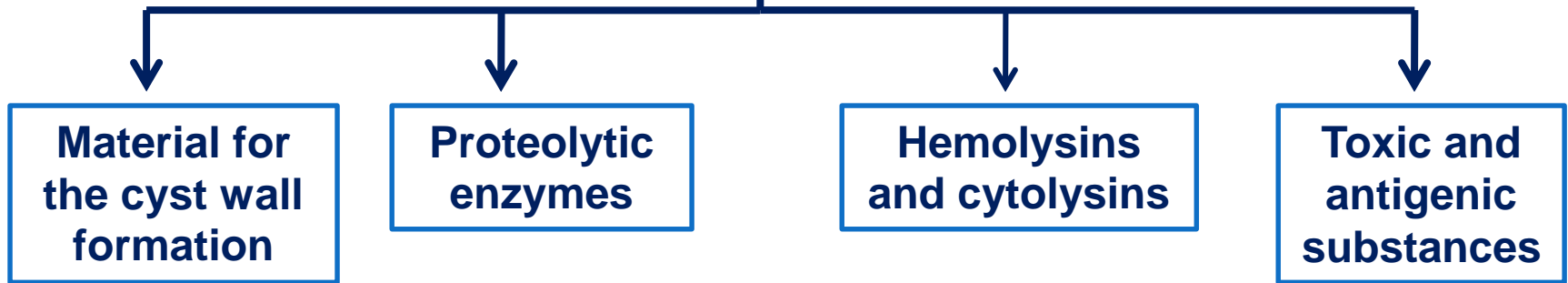
Ex. Ciliates

By deposition of the waste products (pigments) in the cytoplasm

Ex. Sporozoa

## 4) Secretions

Protozoa secrete



## 6) Encystation

Formation of cysts that resist unfavourable conditions outside the body and for protection against digestive juice of the gastrointestinal tract.