

# ENTAMOEBA HISTOLYTICA

**MEDICAL ACADEMY NAMED AFTER S.I. GEORGIEVSKY  
OF VERNADSKY CFU**

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## Classification of *Entamoeba histolytica*

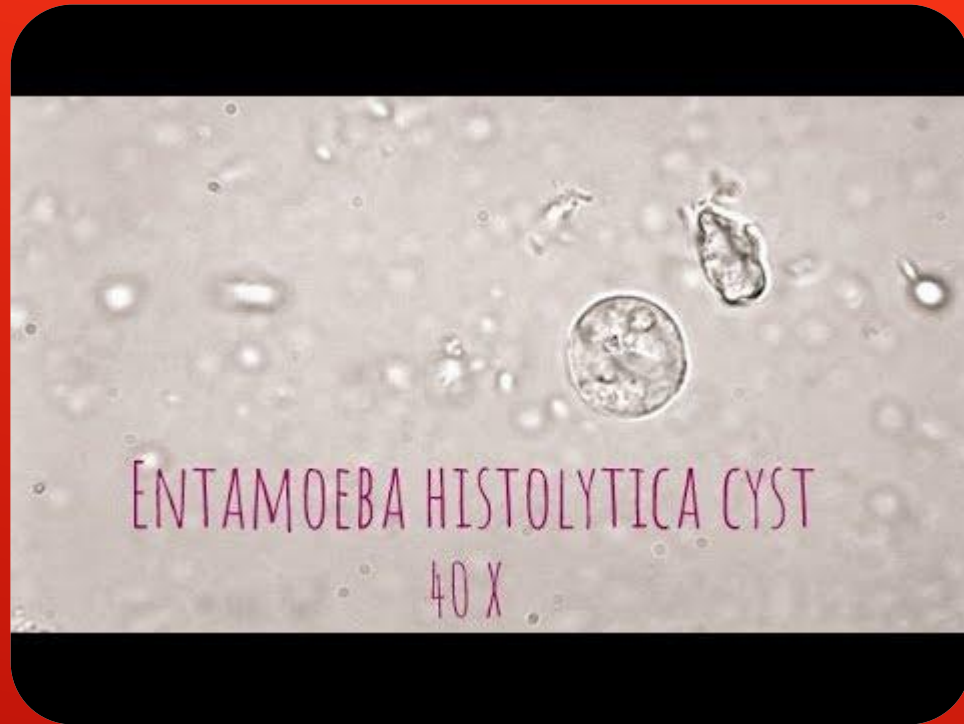
Phylum :- Protozoa

Class :- Lobosea

Order :- Amoebiae

Family :- Sarcodina

Genus :- *Entamoeba histolytica*



ENTAMOEBA HISTOLYTICA CYST

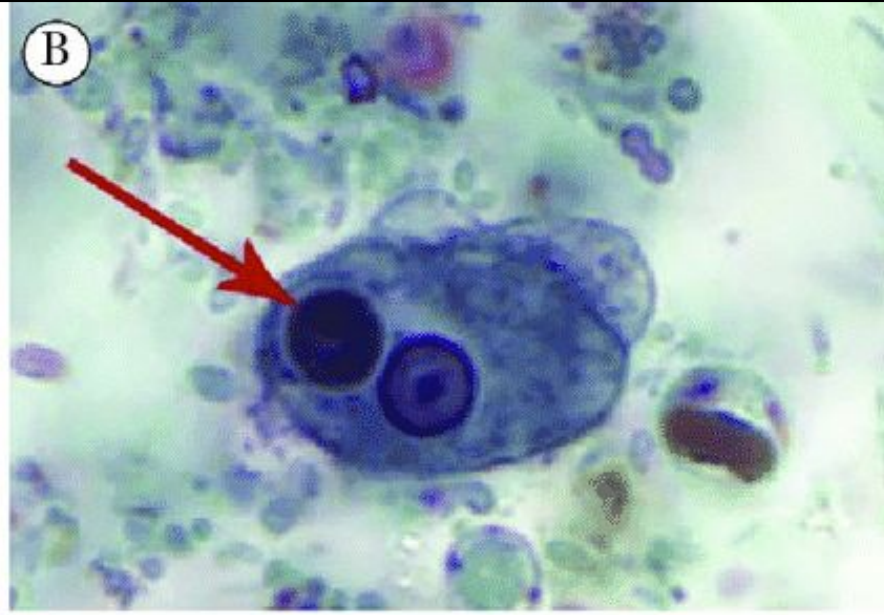
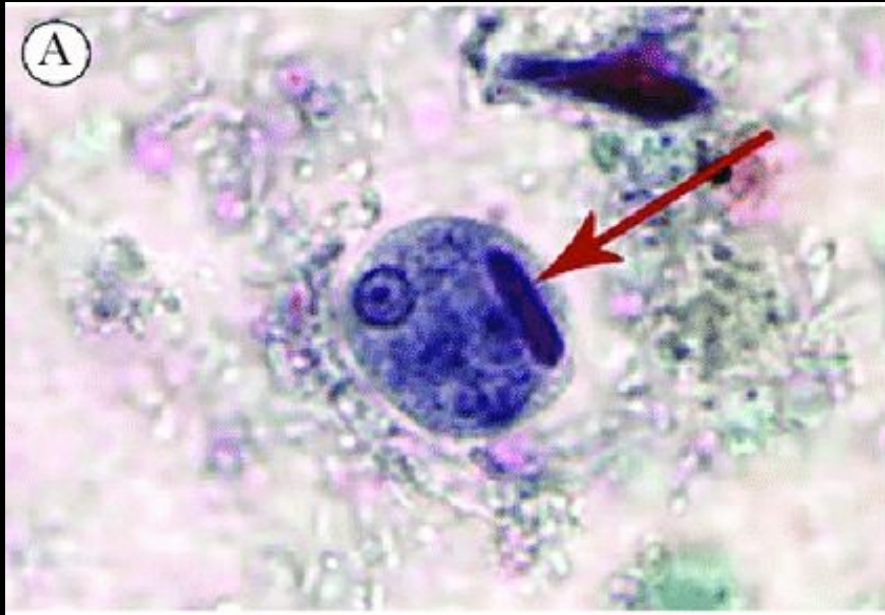
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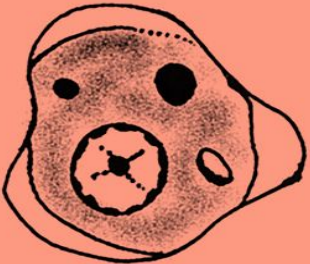
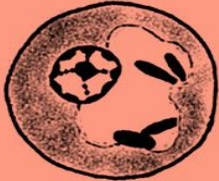


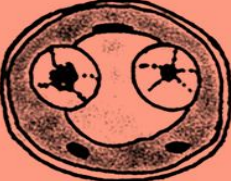
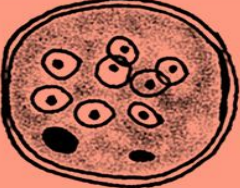




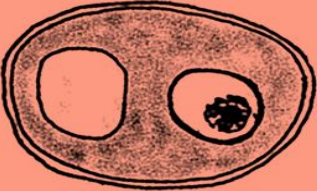


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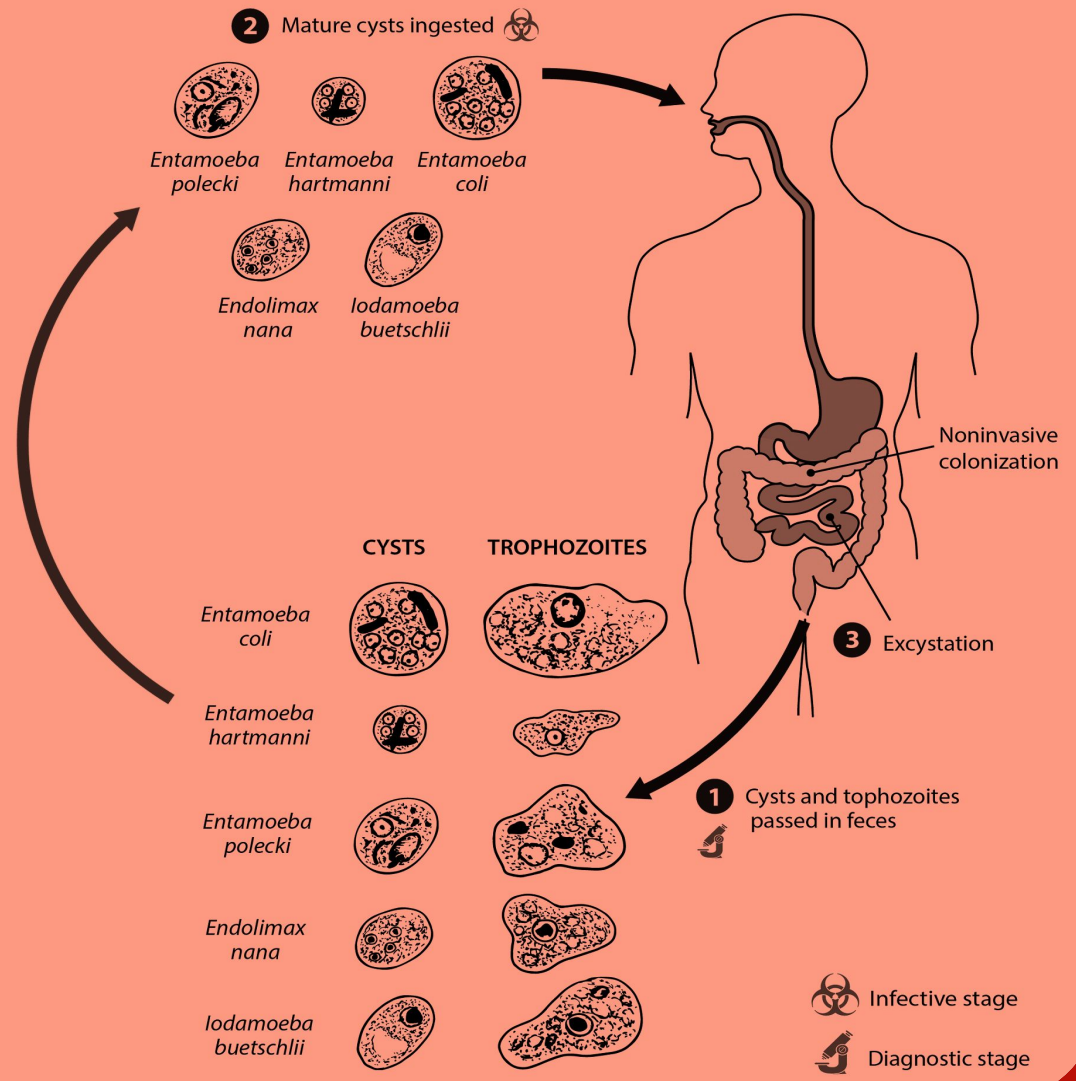


Anaerobic parasitic amoebozoan, part of the genus Entamoeba.<sup>[1]</sup> Predominantly infecting humans and other primates causing amoebiasis, *E. histolytica* is estimated to infect about 35-50 million people worldwide.<sup>[1]</sup> *E. histolytica* infection is estimated to kill more than 55,000 people each year



Organism	Trophozoite	Precyst	Cyst
<i>E. histolytica</i> <i>E. dispar</i> <i>E. moshkovskii</i>			
<i>E. coli</i>			
<i>E. hartmanni</i>			
<i>I. bütschlii</i>			

It was thought that 10% of the world population was infected, but these figures predate the recognition that at least 90% of these infections were due to a second species, ***E. dispar***.<sup>[3]</sup> Mammals such as dogs and cats can become infected transiently, but are not thought to contribute significantly to transmission.





# TRANSMISSION

The active (trophozoite) stage exists only in the host and in fresh loose feces; cysts survive outside the host in water, in soils, and on foods, especially under moist conditions on the latter. The infection can occur when a person puts anything into their mouth that has touched the feces of a person who is infected with *E. histolytica*, swallows something, such as water or food, that is contaminated with *E. histolytica*, or swallows *E. histolytica* cysts (eggs) picked up from contaminated surfaces or fingers.

## HISTORY

Subacute onset, blood /mucous in stool, travel /residence in endemic area

## CLINICAL SIGNS AND SYMPTOMS

Diarrhea/dysentery, abdominal pain in most, weight loss, fever ( $> 38^{\circ}\text{C}$ ) in  $< 20\%$

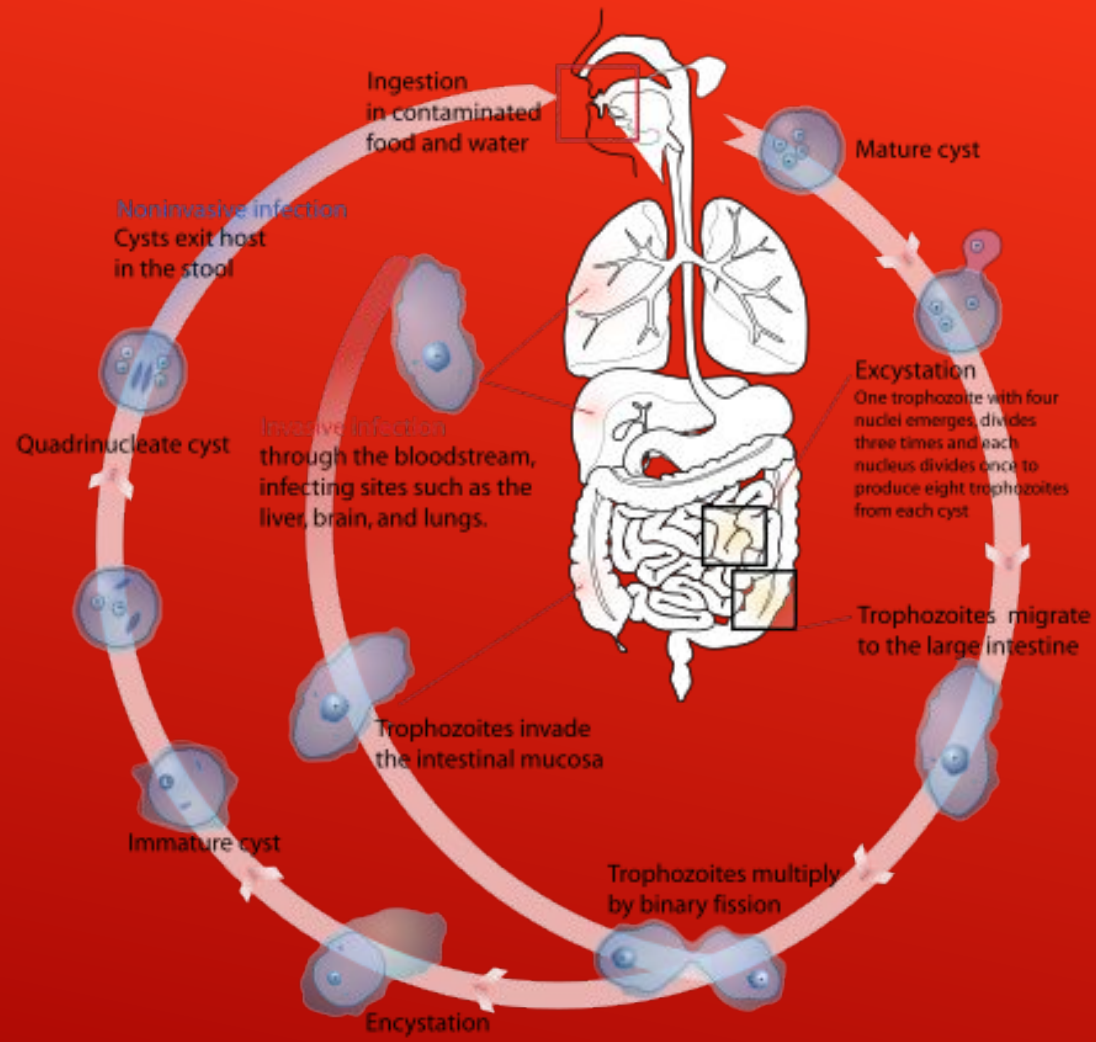
## DIAGNOSTIC TESTS TO SEPARATE INVASIVE FROM SECRETORY DIARRHEA

Lactoferrin, fecal leucocytes, occult blood

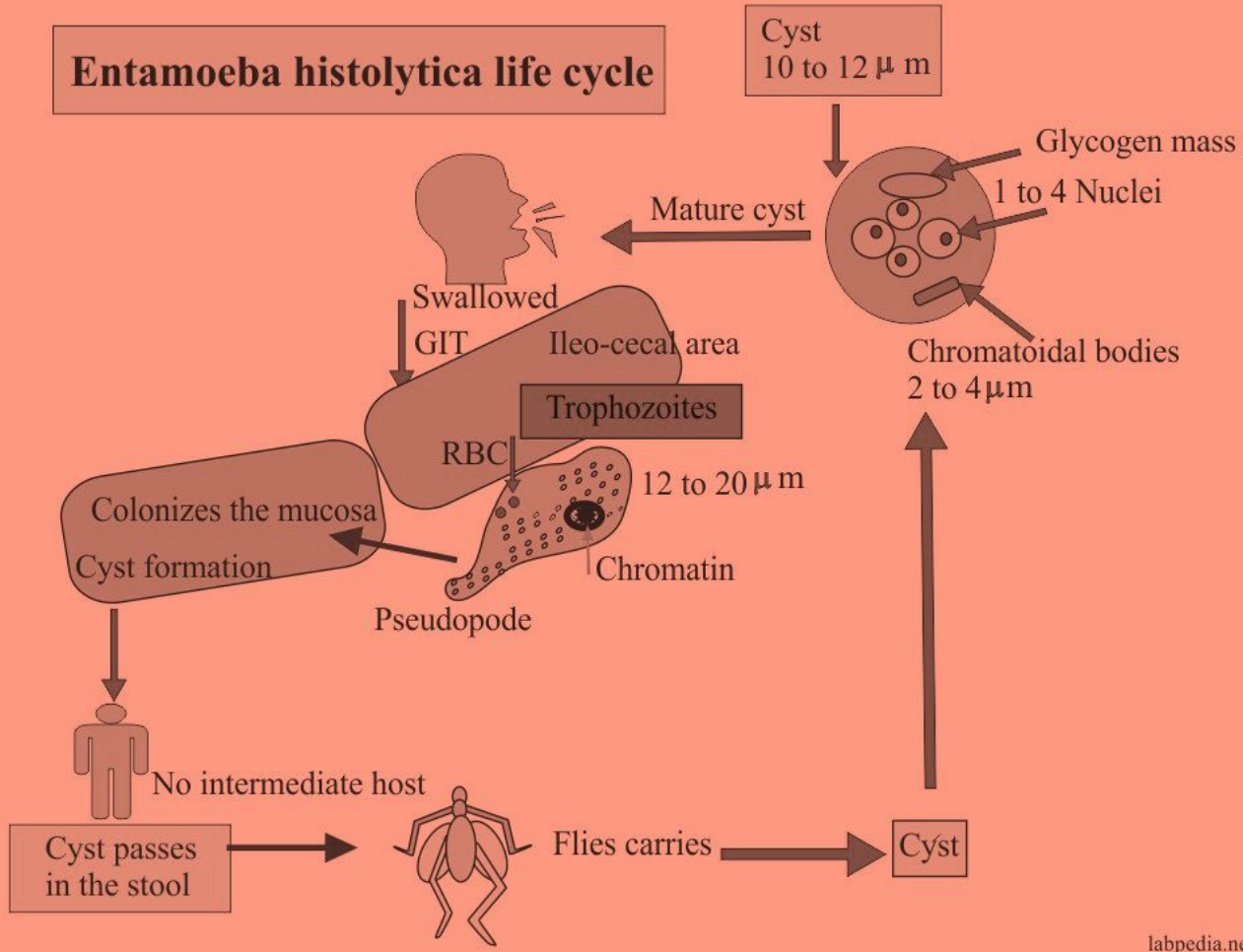
## UTILIZATION OF *E. histolytica* DIAGNOSTIC TESTS

A combination of  
Stool *E.histolytica* Ag-detection test  
or  
Stool PCR  
PLUS  
serology

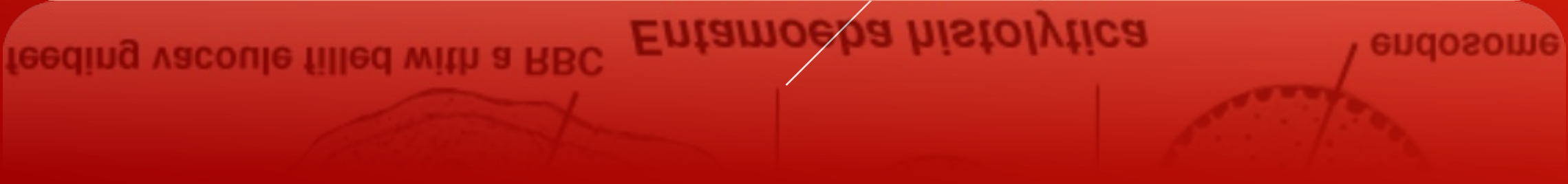
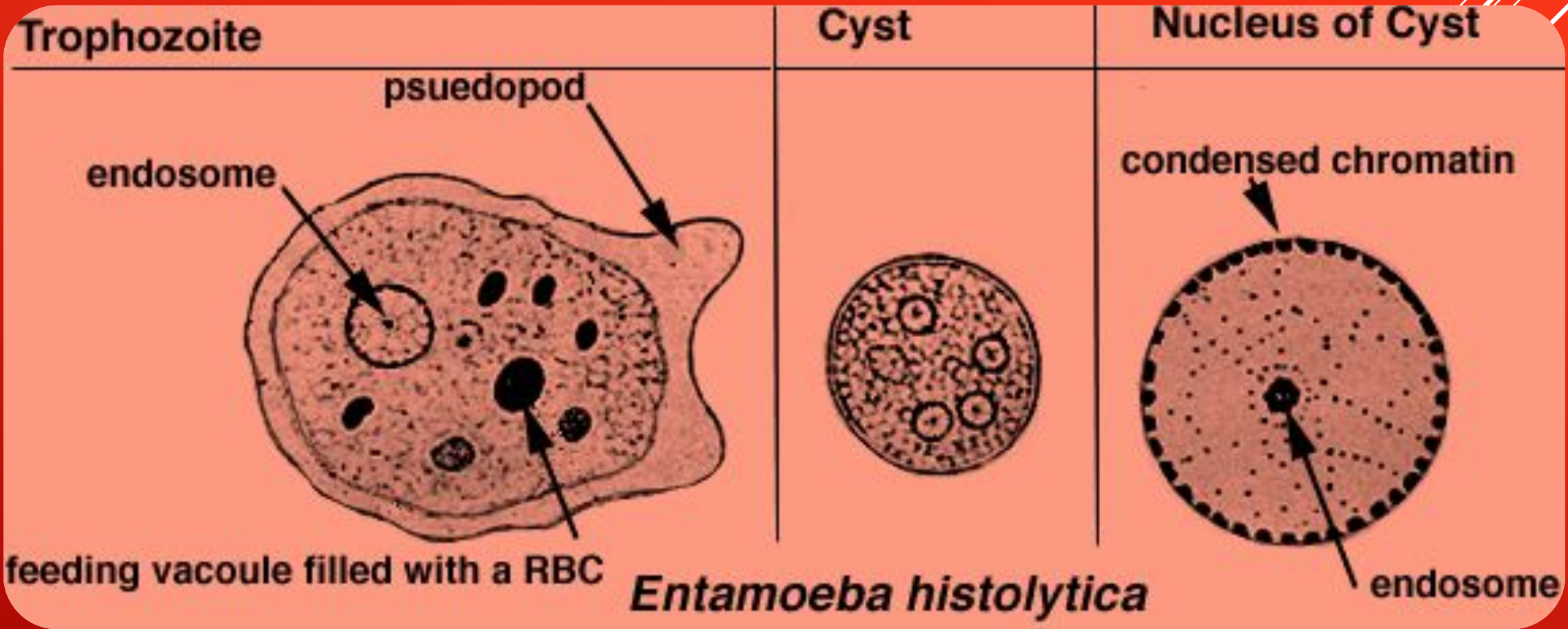
- ▶ The cysts are readily killed by heat and by freezing temperatures, and survive for only a few months outside of the host.<sup>[5]</sup> When cysts are swallowed they cause infections by excysting (releasing the trophozoite stage) in the digestive tract. The pathogenic nature of *E. histolytica* was first reported by Fedor A. Lösch in 1875,<sup>[1]</sup> but it was not given its Latin name until Fritz Schaudinn described it in 1903. *E. histolytica*, as its name suggests (histo-lytic = tissue destroying), is pathogenic; infection can be asymptomatic or can lead to amoebic dysentery or amoebic liver abscess.



# Entamoeba histolytica life cycle



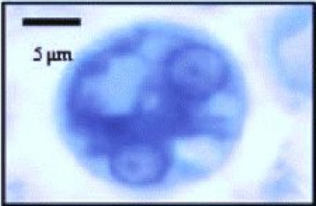
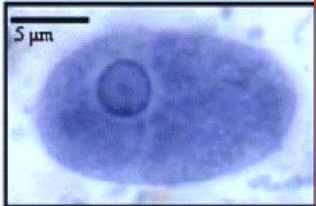
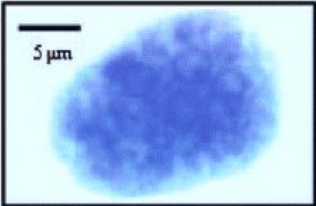
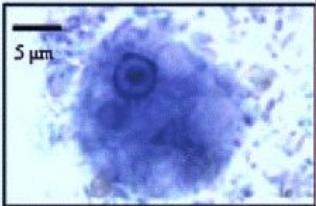
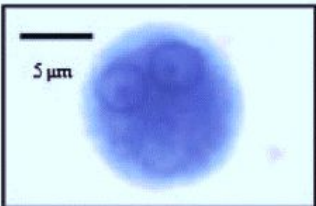
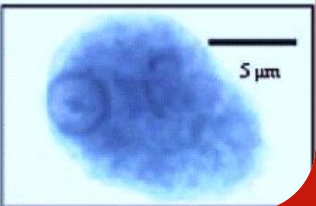
- ▶ Symptoms can include fulminating dysentery, bloody diarrhea, weight loss, fatigue, abdominal pain, and amoeboma. The amoeba can actually 'bore' into the intestinal wall, causing lesions and intestinal symptoms, and it may reach the blood stream. From there, it can reach different vital organs of the human body, usually the liver, but sometimes the lungs, brain, spleen, etc. A common outcome of this invasion of tissues is a liver abscess, which can be fatal if untreated. Ingested red blood cells are sometimes seen in the amoeba cell cytoplasm.



# RISK FACTORS

Poor sanitary conditions are known to increase the risk of contracting amebiasis *E. histolytica*.<sup>[8]</sup> In the United States, there is a much higher rate of amebiasis-related mortality in California and Texas, which might be caused by the proximity of those states to *E. histolytica*-endemic areas, such as Mexico, other parts of Latin America, and Asia.<sup>[9]</sup> *E. histolytica* is also recognized as an emerging sexually transmissible pathogen, especially in male homosexual relations, causing outbreaks in non-endemic regions.<sup>[10]</sup> As such, high-risk sex behaviour is also a potential source of infection.<sup>[11]</sup> Although it is unclear whether there is a causal link, studies indicate a higher chance of being infected with *E. histolytica* if one is also infected with HIV



Species	Cyst	Trophozoite
<i>E. histolytica</i> / <i>E. dispar</i> / <i>E.</i> <i>moshkovskii</i>	 5 μm	 5 μm
<i>E. coli</i>	 5 μm	 5 μm
<i>E. hartmanni</i>	 5 μm	 5 μm



# PATHOGEN INTERACTION

- ▶ *E. histolytica* may modulate the virulence of certain human viruses and is itself a host for its own viruses.
- ▶ For example, AIDS accentuates the damage and pathogenicity of *E. histolytica*.<sup>[13]</sup> On the other hand, cells infected with HIV are often consumed by *E. histolytica*. Infective HIV remains viable within the amoeba, although there has been no proof of human reinfection from amoeba carrying this virus.<sup>[23]</sup>
- ▶ A burst of research on viruses of *E. histolytica* stems from a series of papers published by Diamond et al. from 1972 to 1979. In 1972, they hypothesized two separate polyhedral and filamentous viral strains within *E. histolytica* that caused cell lysis. Perhaps the most novel observation was that two kinds of viral strains existed, and that within one type of amoeba (strain HB-301) the polyhedral strain had no detrimental effect but led to cell lysis in another (strain HK-9). Although Mattern et al. attempted to explore the possibility that these protozoal viruses could function like bacteriophages, they found no significant changes in *Entamoeba histolytica* virulence when infected by viruses.

# DIAGNOSIS

- ▶ *Diagnosis is confirmed by microscopic examination for trophozoites or cysts in fresh or suitably preserved faecal specimens, smears of aspirates or scrapings obtained by proctoscopy, and aspirates of abscesses or other tissue specimen. A blood test is also available but is only recommended when a healthcare provider believes the infection may have spread beyond the intestine (gut) to some other organ of the body, such as the liver. However, this blood test may not be helpful in diagnosing current illness because the test can be positive if the patient has had amebiasis in the past, even if they are not infected at present.* <sup>[26]</sup> *Stool antigen detection and PCR are available for diagnosis, and are more sensitive and specific than microscopy.*

THANK YOU

