

Protozoa: Intestinal Amoebae

	Trophozoite	Cyst	Transmission	Infection	Symptoms	Diagnosis
Entamoeba histolytica pathogenic	10-20 um, irregular shape, single nucleus w/central karyosome, even chromatin, ingested RBCs	10-20 um, 1-4 nuclei w/central karyosome, even chromatin, cigar shaped chromatid bars	ingestion of cysts - fecal-oral route or contaminated food	amebiasis, amebic dysentery, amebic hepatitis	lrg intestines- asymp or amebic dysentery ; disseminated- hematogenous spread to liver, spleen lung or brain	cysts or trophozoites in feces; serology
Entamoeba hartmanni nonpathogenic	<10 um, single nucleus w/small central karyosome, even chromatin, no cytoplasmic inclusions	<10 um, 1-4 nuclei w/small central karyosome, even chromatin, no cytoplasmic inclusions				
Entamoeba coli nonpathogenic	>10um, single nucleus w/eccentric karyosome, irregular chromatin, ingested bacteria, no ingested RBCs	>10um, 1-8 nuclei w/eccentric karyosome, irregular chromatin, splinter-shaped, rough edged chromatid bars				
Endolimax nana nonpathogenic	6-12um, single nucleus w/irregular clumped karyosome, no peripheral chromatin, no cytoplasmic inclusions	6-112um, 1-4 nuclei w/irregular clumped karyosome, no peripheral chromatin, no cytoplasmic inclusions, ovoid shaped cyst				
Iodamoeba butschlii nonpathogenic	8-1um, single nucleus w/large irregular karyosome, no peripheral chromatin, no cytoplasmic inclusions	8-10um, single nucleus w/large irregular karyosome, no peripheral chromatin, large glycogen vacuole in cytoplasm				
Blastocystis cyst nonpathogenic	rarely seen	6-40um, 2-4 nuclei in cytoplasm outside of vacuole, large central vacuole in cytoplasm- 90% of organisms				

Protozoa: Free-living Pathogenic Amoebae

	Trophozoite	Cyst	Transmission	Infection	Symptoms	Diagnosis
Naegleria fowleri	7-20um, single nucleus w/large, central karyosome; CSF- many WBCs & no bacteria motile trophs	NO cysts in tissue	gains entry through nasal mucosa	PAM- primary amebic meningoencephalitis		ameboid form found inf CSF & tissues
Acanthamoeba sp.	10-45um, single nucleus w/no chromatin, no cytoplasmic inclusions	15-20um, single nucleus w/no chromatin, double walled, wrinkled appearance in tissue	inhalation of contaminated dust	GAE- granulomatous amebic encephalitis	brain abscesses, keratitis, sinuses, eye infections assoc. w/contact lens	

Ciliates: Ciliophora

	Trophozoites	Cyst	Transmission	Infection	Symptoms	Diagnosis
Balantidium coli	60 x 40 um, micro & macronucleus, cilia, cytostome	40-50 um, micro & macronucleus, cilia	ingestion of cyst contaminated food or water; commonly infects hogs	balantidian dysentery	asympt. or diarrhea w/alternating constipation	trophs or cysts in feces

Protozoa: Pathogenic Flagellates						
	Trophozoites	Cyst	Transmission	Infection	Symptoms	Diagnosis
Giardia lamblia	12-15um, bilateral symmetry, 2 nuclei, 2 median parabasal bodies, 2 axonemes, 8 flagella	9-12um, oval, 2-4 nuclei, 2 axonemes	contaminated water, fecal-oral route, oral-anal sex	"Traveler's Diarrhea", most common diarrheal disease transmitted by contam. Water in US	mild to severe diarrhea	trophozoites or cysts in feces & biopsies; ELISA
Dientamoeba fragilis	5um x 12um, 1-2 nuclei, very dense central chromatin	NO cyst stage	uncertain - may be fecal-oral	world-wide distribution	usu. Asymp, may have diarrhea, anorexia, ab pain	trophozoites in feces
Trichomonas vaginalis	10um x 20 um, 1 nucleus, 4 anterior flagella, undulating membrane (half of body), axostyle-posterior	NO cyst stage	sexual intercourse	trichomonad vaginitis, urethritis, trich (worldwide)	women-vaginal inflamm, itching, foul-smelling discharge, burning on urination; men-asymp	wet mount- motile trophs in urethral or vaginal discharge or urine; PAP smear
Trypanosoma sp.	trypomastigote- anterior flagellum, undulating membrane, nucleus, small subterminal kinetoplast; 15-30um x 15-30um		Tsetse fly (intermediate host) injects trypomastigotes from salivary glands	T. brucei rhodesiense- East African sleeping sickness; T. brucei gambiense- West African sleeping sickness	chancre at bite site, enlarged lymph nodes, fever, headache, night sweats, joint & muscle pain, motor changes, CNS impairment, coma & death may occur w/cardiac failure	trypomastigote in blood, lymph biopsies or CNS
Trypanosoma cruzi	trypomastigote-large intestinal kinetoplast		Triatoma or reduviid bug ingests trypomastigotes - epimastigote forms multiply in gut of bug	Chaga's disease (Mexico, Central & South America, Florida, Texas, California)	fever, enlarged spleen, liver & lymph nodes, CNS involvement; chronic-enlarged, weakened heart, sudden death; acute-kids-cardiac ganglia destruction, megacolon, periorbital edema if bitten near ear, often rapid death	amastigote in skin lesion at bite or in heart muscle; trypomastigote in blood smear (characteristic C shape); serology ELISA PCR