Filariasis

(b)

Sweta Sushmita Tigga
Lecture- M.Sc Microbiology, Sem-III
Department of Microbiology,
DSPMU, Ranchi

Filariasis

- **Filariasis** is a parasitic disease caused by filaria that affect humans. Filiariasis is the name for a group of tropical diseases caused by various thread like parasitic round worms (nematodes) and their larvae.

- The larvae transmit the disease to humans through a mosquito bite. Filariasis is characterized by fever, chills, headache,and skin lesions in the early stages and, if untreated, can progress to include gross enl argement of the limbs and genitalia in a condition called elephantiasis

- These parasitic nematodes (roundworms) are clearly macroscopic in the adult stage (several centimeters in length, depending on the filariasis)

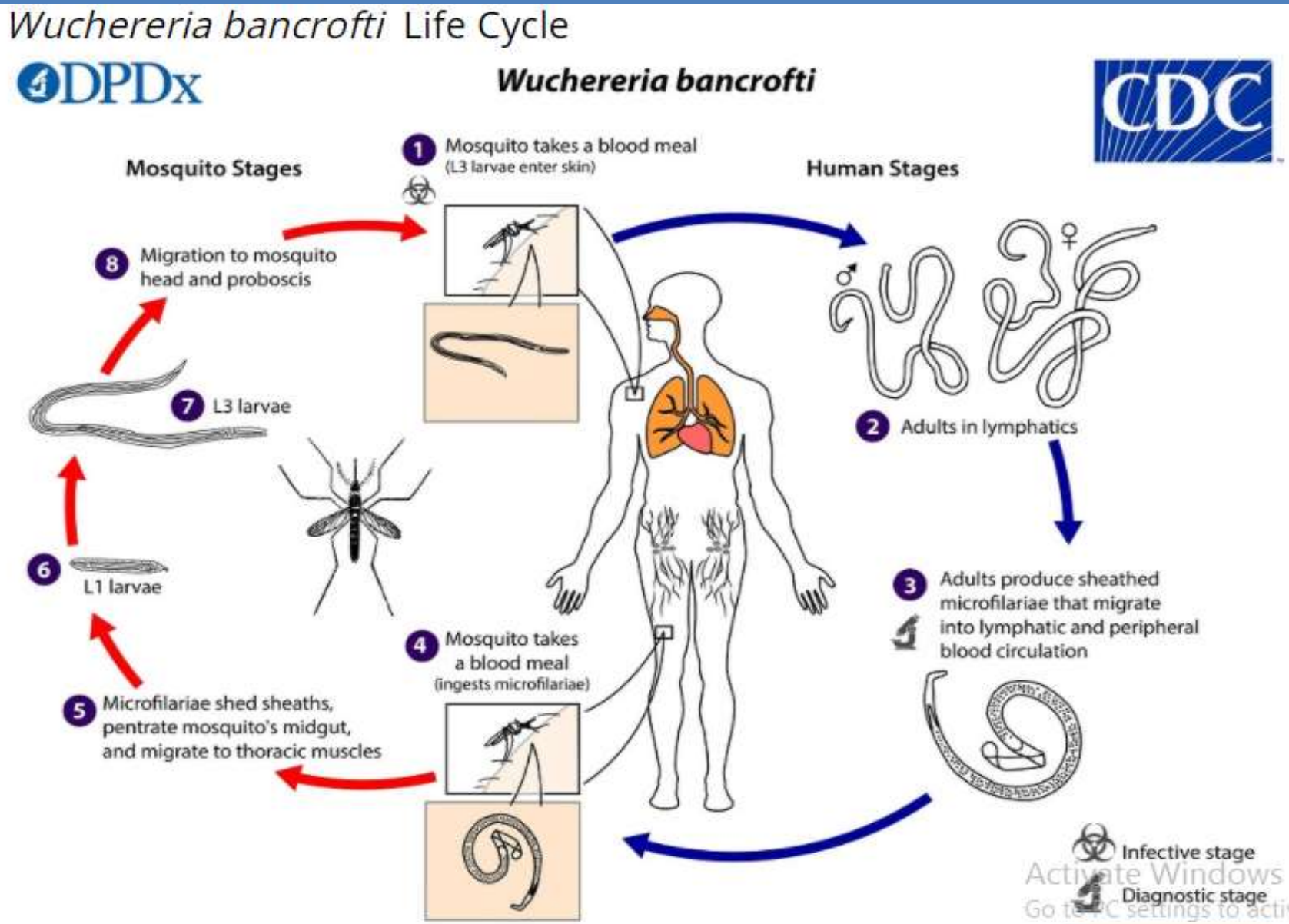
(b)

Figure 32.16 Symptoms of parasitic helminth infections. *(b)* Bancroft's filariasis (elephantiasis).

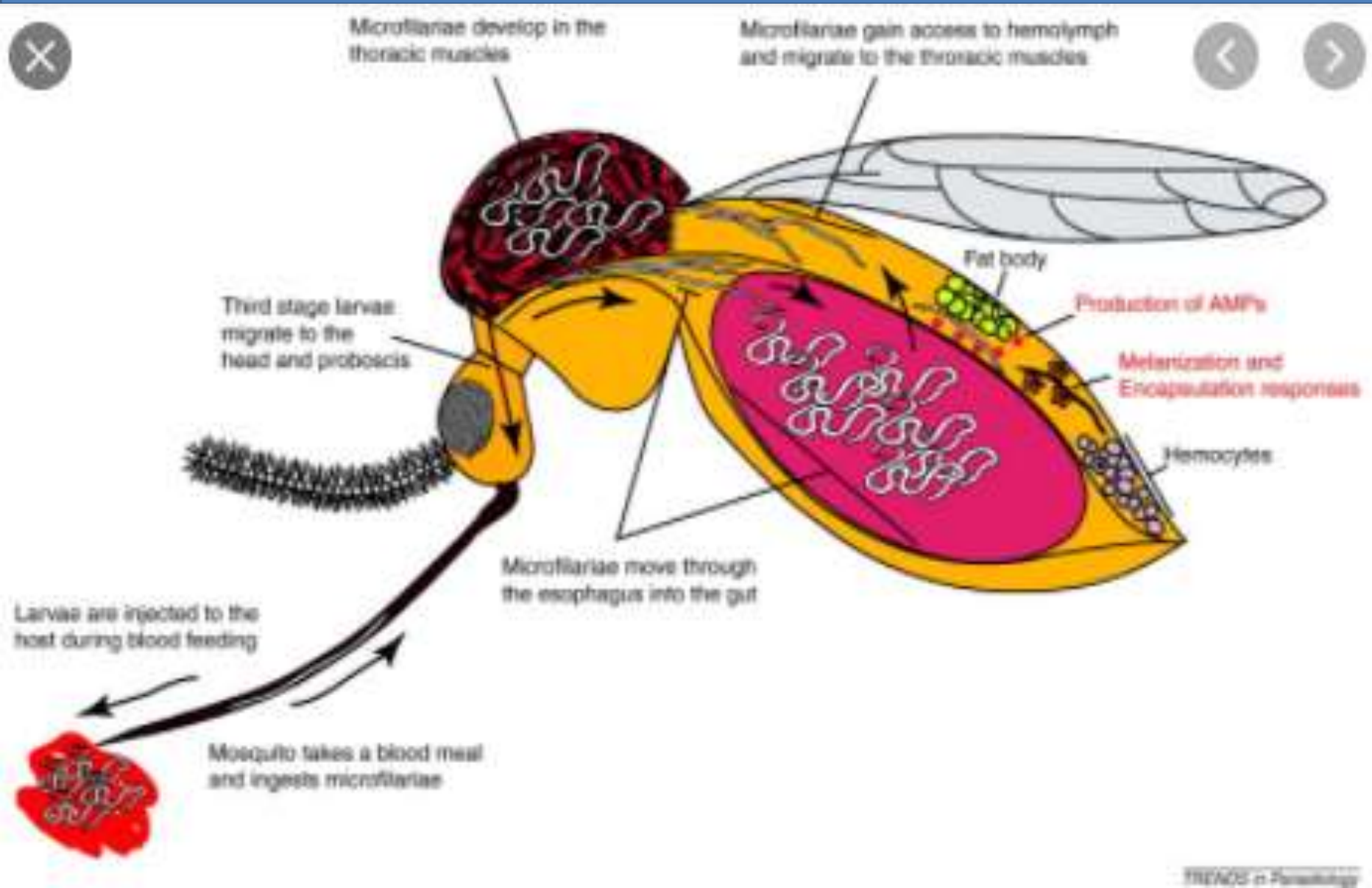
Bancroft's filariasis (also called "elephantiasis")

- *Bancroft's filariasis* (also caused "elephantiasis") is a chronic infection of the lymphatic system by *Wucheria bancrofti*. *W. bancrofti* carries out its lifecycle in two hosts. Humans serve as the definitive host and mosquitos as the intermediate host.
- The worm is transmitted to humans in tiny *microfilariae* in a mosquito bite.
- Once in the host, microfilariae develop into adult worms and these interrupt lymph flow, leading to major accumulation of fluids (edema).
- Fluid acculumation in lower regions of the body can cause massive enlargement of the legs.

Life cycle of Filiariasis



Life cycle of Filariasis



Life cycle of Filiariasis

During a blood meal, an infected mosquito introduces third-stage filarial larvae onto the skin of the human host, where they penetrate into the bite wound (1) . They develop in adults that commonly reside in the lymphatics (2) . The female worms measure 80 to 100 mm in length and 0.24 to 0.30 mm in diameter, while the males measure about 40 mm by 1 mm. Adults produce microfilariae measuring 244 to 296 µm by 7.5 to 10 µm, which are sheathed and have nocturnal periodicity, except the South Pacific microfilariae which have the absence of marked periodicity. The microfilariae migrate into lymph and blood channels moving actively through lymph and blood (3) . A mosquito ingests the microfilariae during a blood meal (4) . After ingestion, the microfilariae lose their sheaths and some of them work their way through the wall of the proventriculus and cardiac portion of the mosquito's midgut and reach the thoracic muscles (5) . There the microfilariae develop into first-stage (6) larvae and subsequently into third-stage infective larvae (7) . The third-stage infective larvae migrate through the hemocoel to the mosquito's prosbocis (8) and can infect another human when the mosquito takes a blood meal (1) .

Symptoms

- In cases of lymphatic filariasis, the most common form of the disease, the disease is caused by the adult worms actually living in the lymphatic vessels near the lymph nodes where they distort the vessels and cause local inflammation. In advanced stag es, the worms can actually obstruct the vessels, causing the surrounding tissue to be come enlarged.
- Symptoms vary, depending on what type of parasitic worm has caused the infection , but all infections usually begin with chills, headache, and fever between three mon ths and one year after the insect bite. There may also be swelling, redness, and paini n the arms, legs, or scrotum. Areas of pus (abscesses) may appear as a result of dyin g worms or a secondary bacterial infection.

Diagnosis

- The disease is diagnosed by taking a patient history, performing a **physical examination**, and by screening blood specimens for specific proteins produced by t he immune system in response to this infection (antibodies).
- Early diagnosis may be difficult because, in the first stages, the disease mimics other bacterial skin infections.
- To make an accurate diagnosis, the physician looks for a pattern of inflammation an d signs of lymphatic obstruction, together with the patient's possible exposure to fila riasis in an area where filariasis is common. The larvae (microfilariae) can also be fo und in the blood, but because mosquitos, which spread the disease, are active at nigh t, the larvae are usually only found in the blood between about 10 pm and 2 am.

Treatment

- Either ivermectin, albendazole, or diethylcarbamazine

is used to treat a filariasis infection by eliminating the larvae, impairing the adult worms' ability to reproduce, and by actually killing adult worms.

Unfortunately, much of the tissue damage may not be reversible. The medication is started at low doses to prevent reactions caused by large numbers of dying parasites.