Research Interest: Trypanosome lytic factors, antimicrobial high density lipoproteins and their role in innate immunity

- **The disease:**

Human African Trypanosomiasis, also known as sleeping sickness, is a tsetse fly-borne parasitic disease that is fatal if left untreated. Thirty-six sub-Saharan countries are endemic for trypanosomiasis.

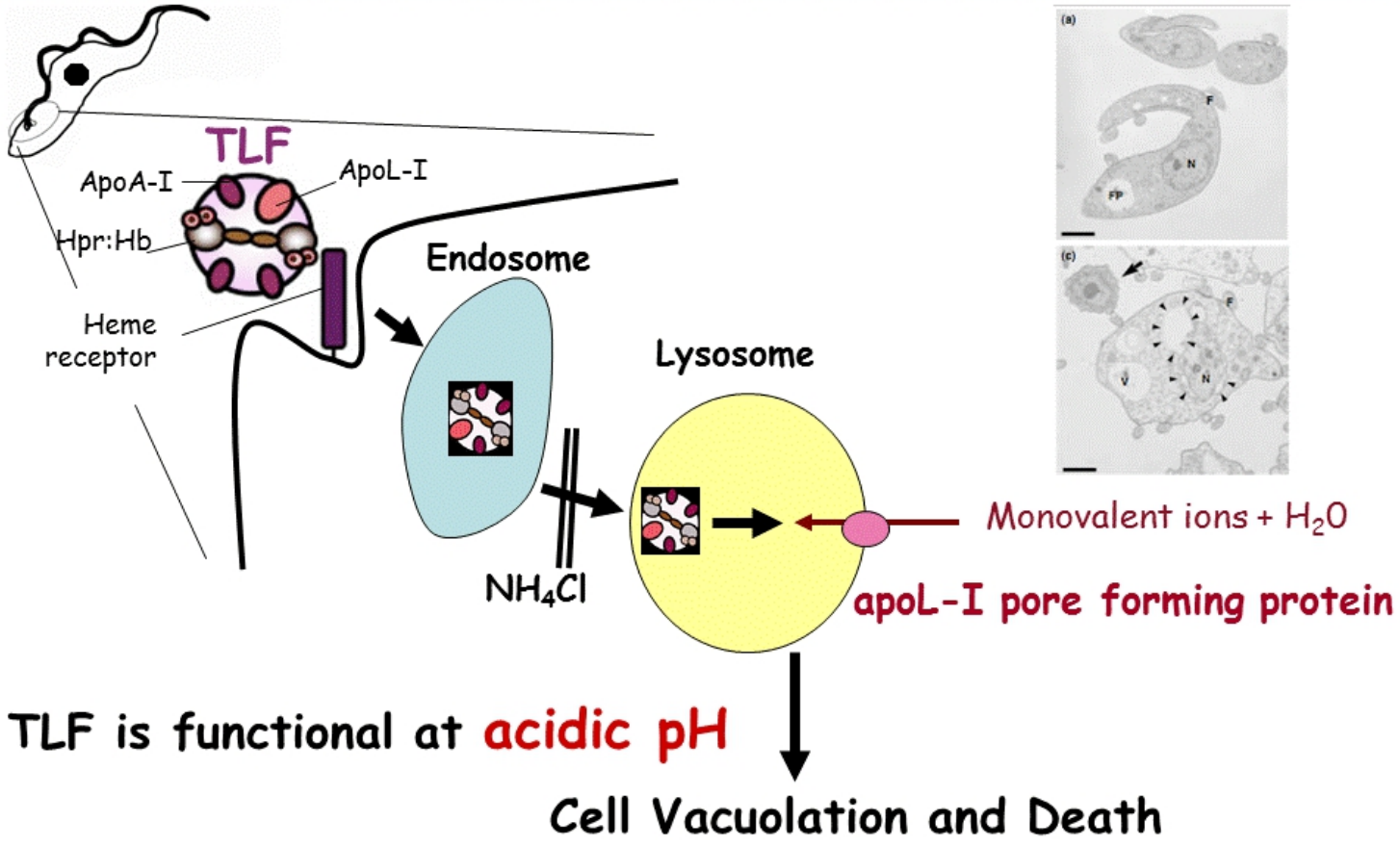
Both human and animal trypanosomiasis is considered a major obstacle to sustained economic growth. The animal disease causes immense human suffering through loss of the critical animal components, which are central to most African small scale agriculture. In the tsetse-infested areas, trypanosomiasis reduces the output of meat and milk by at least 50%.

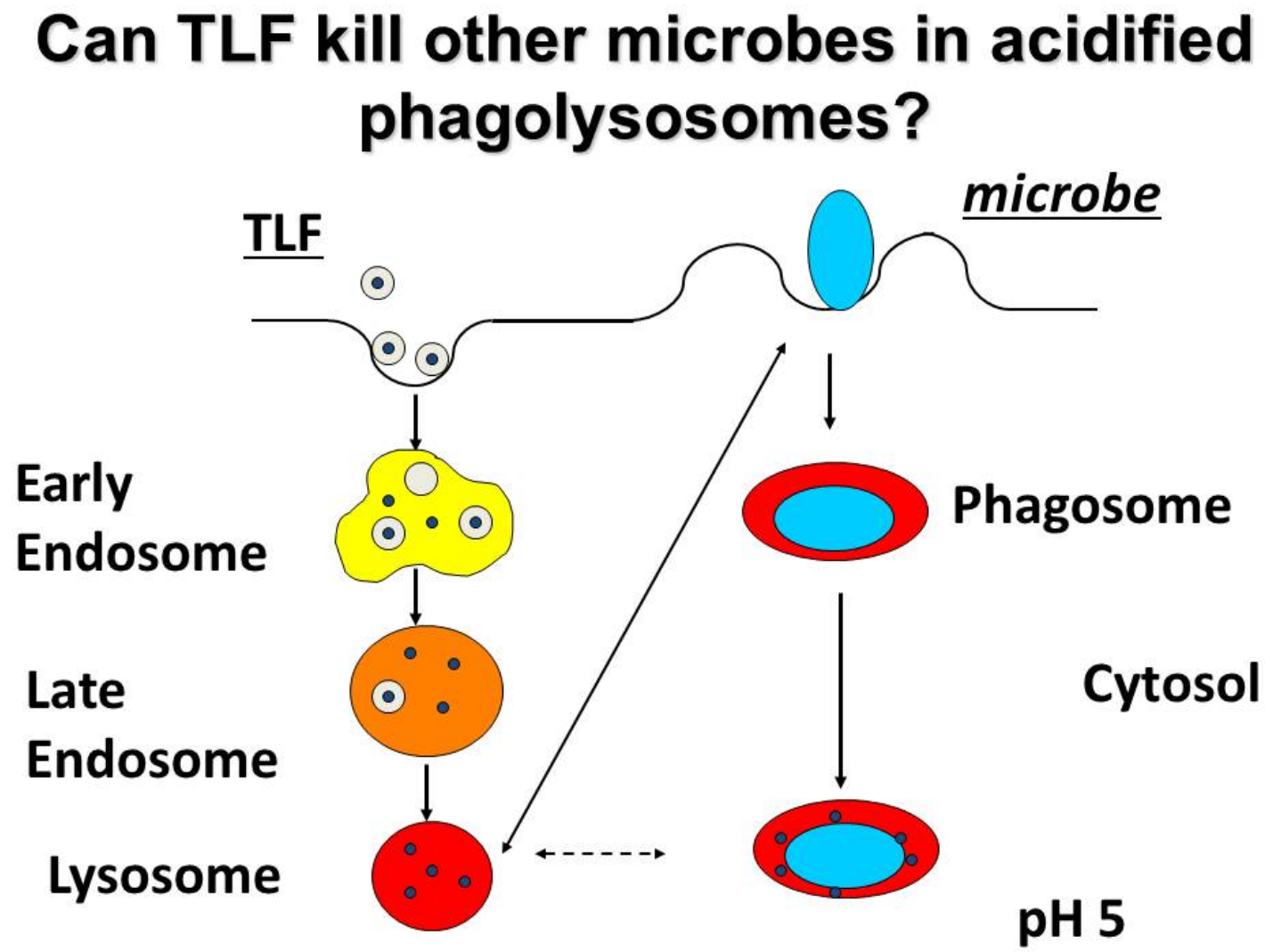
Accordingly, it is ranked among the top 10 global cattle diseases impacting on the poor and estimates of the cost of the disease to livestock keepers and consumers vary between US$1 and 5 billion annually. Trypanocidal drugs (e.g. homidium bromide) have been extensively used in animals (35 million doses/year), but drugs are expensive and toxic and resistance has been reported in at least 13 countries.

- **Trypanosome lytic factors:**

Our laboratory works on trypanosome lytic factors (TLFs), which are antimicrobial high-density lipoproteins that contribute to primate innate immunity. TLFs are characterized by their ability to kill African trypanosomes, which are extracellular protozoon parasites. The unique protein components of TLF are hemoglobin binding protein, Haptoglobin-related protein (Hpr) and a pore forming protein, apolipoprotein L-I (apoL-I) (Fig.1).

Mechanism of TLF mediated trypanolysis




Can TLF kill other microbes in acidified phagolysosomes?
TLF
microbe
Early Endosome
Late Endosome
Lysosome
Phagosome
Cytosol
pH 5