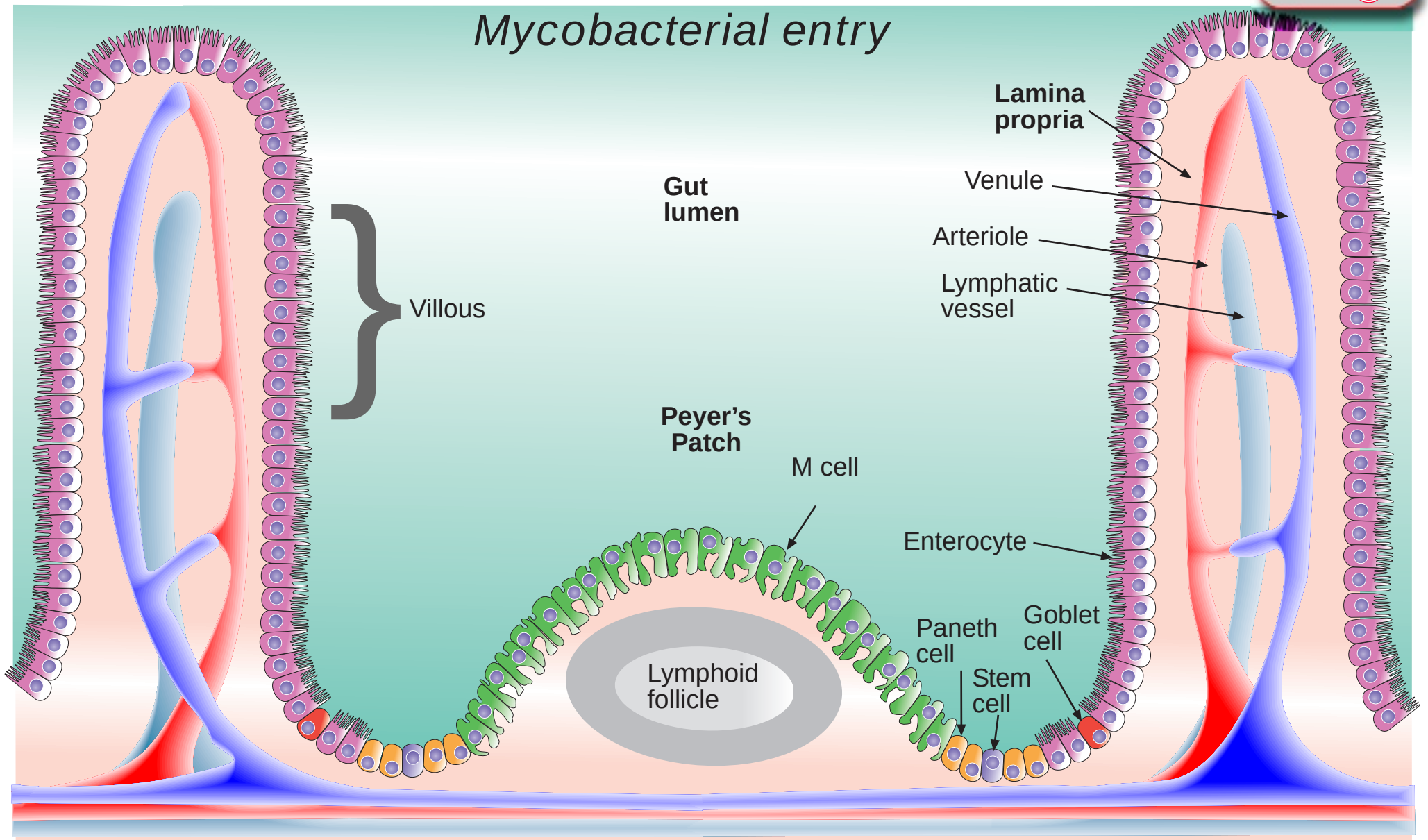
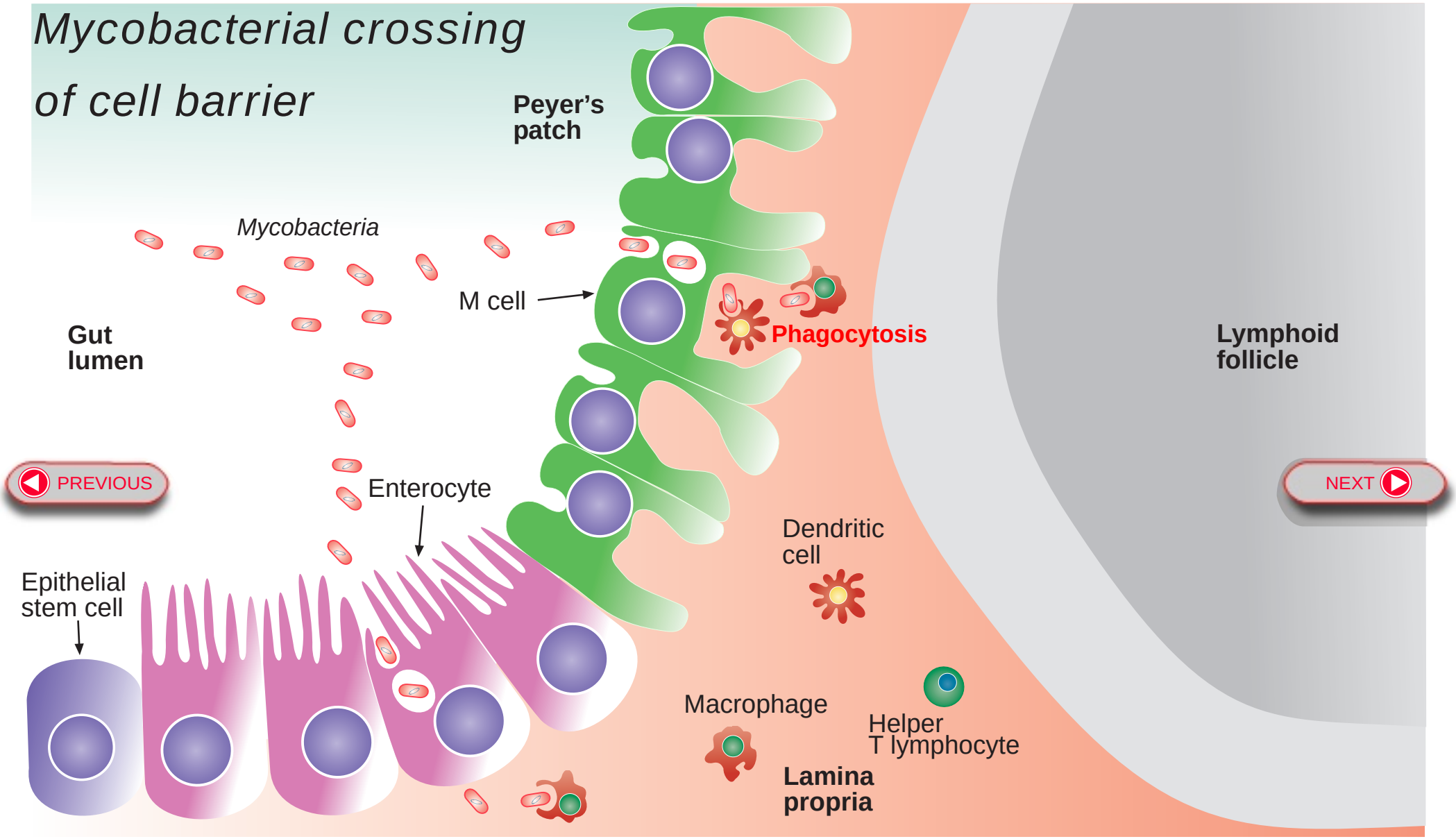
Mycobacterial entry

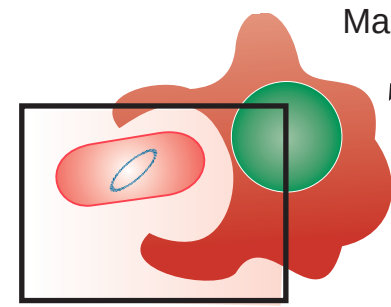


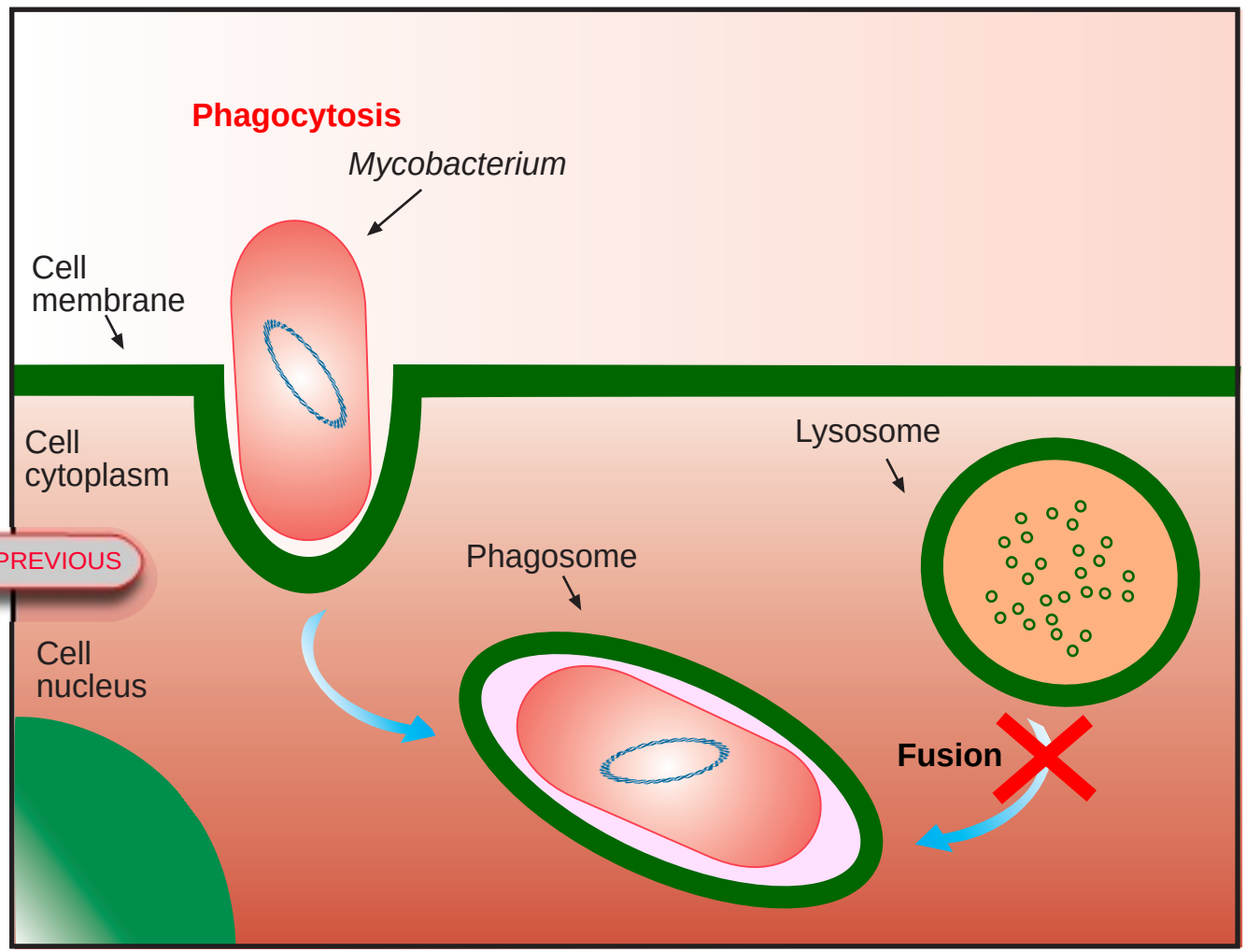
Mycobacteria are environmental pathogens that predominantly enter the body through the gut via contaminated food or water. They can also enter the lungs by inhalation of liquid droplets containing mycobacteria. Mycobacteria cross the gut cell barrier either via active transport through M cells (microfold) cells in the Peyer's patches of the small intestine or by receptor-mediated endocytosis into gut epithelial cells.



Macrophages are the preferred target cells of mycobacteria. Transport through M cells deliver mycobacteria directly to macrophages in the Peyer's patches of the small intestine. Receptor-mediated endocytosis of mycobacteria by gut epithelial cells leads to phagocytosis of bacteria by lamina propria macrophages.

Mycobacterial resistance to phagocytic killing

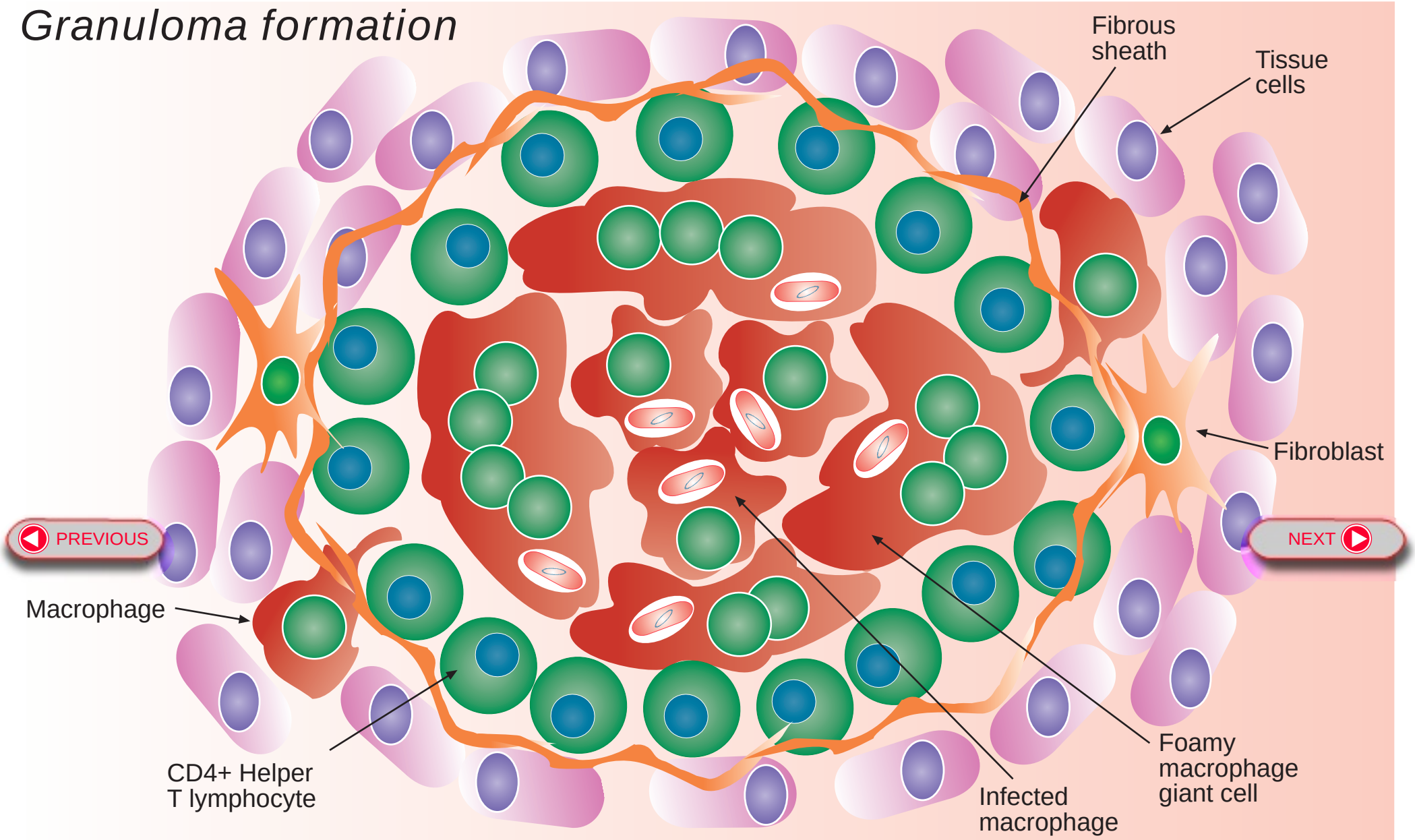




PREVIOUS
NEXT

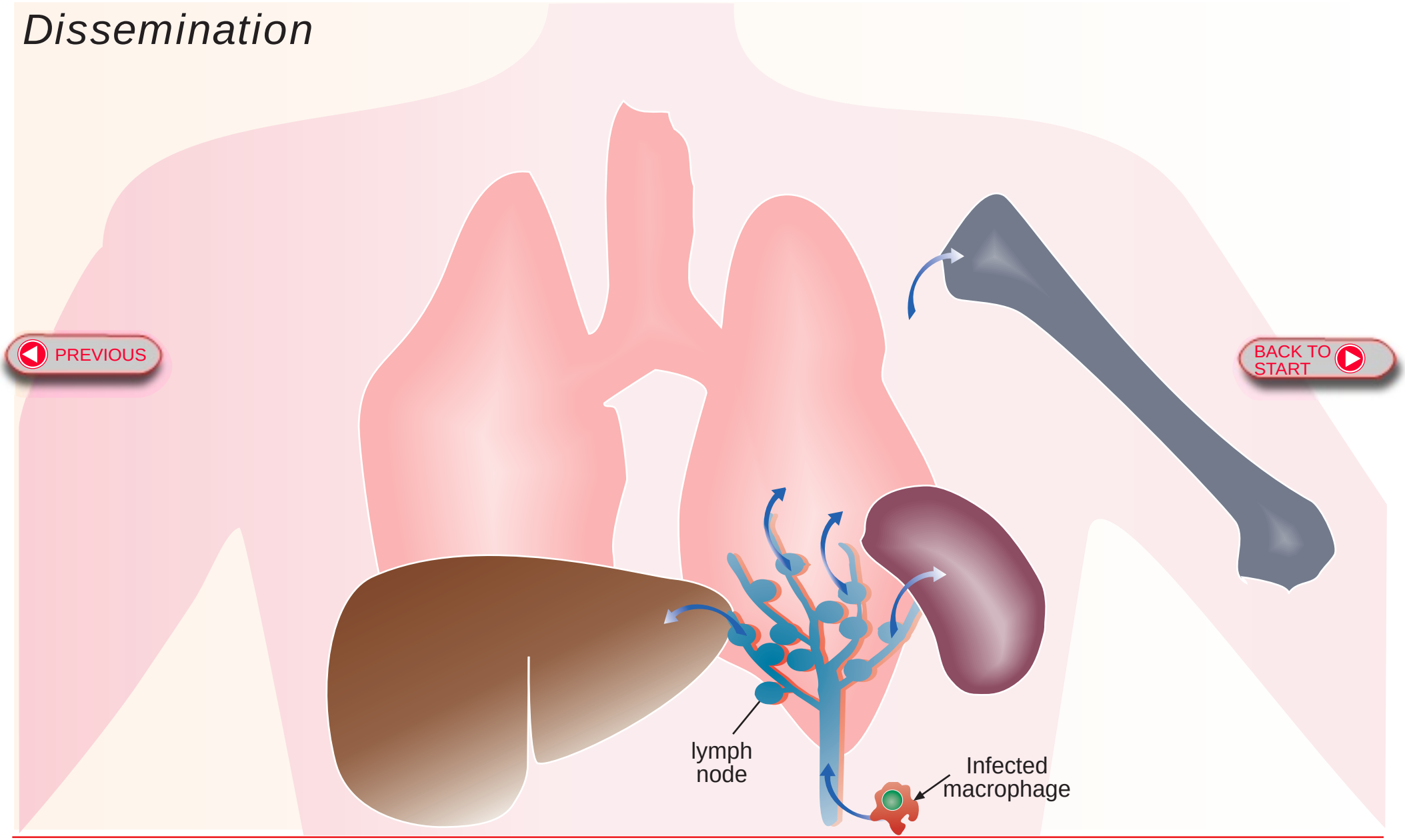
Phagocytosis of Mycobacteria by macrophages internalises bacteria in a membrane-bound phagosome. Under normal conditions, the phagosome fuses with a lysosome containing degradative molecules to form a phagolysosome in which the bacteria are killed. Pathogenic mycobacteria such as Mycobacterium tuberculosis and Mycobacterium avium have evolved mechanisms to prevent the fusion of the lysosome with the phagosome. Mycobacteria survive and multiply in the phagosome and can spread to other parts of the body when the macrophages migrate to other tissues.

Granuloma formation



In immunocompetent hosts, prevention of mycobacterial spread is achieved by the formation of a granuloma. A granuloma sequesters infected macrophages in the centre, surrounded by immune cells, predominantly CD4+ helper T lymphoctes. The fusion of infected macrophages to form foamy macrophage giant cells is thought to result from the release of mycolic acid products from infected cells. Later the centre of the granuloma may be filled with cell debris and live mycobacteria spilled from dead macrophages (caseation) and this poses a risk of spread if the granuloma ruptures. A sheath of collagen fibres produced by fibroblasts surrounds the cells inside. Granulomas do not form in HIV infected peoples.

Dissemination



Dissemination of mycobacteria from the site of infection to other tissues is thought to be due to the migration of infected macrophages to lymphoid tissue at other sites of the body.