



Adipose tissue

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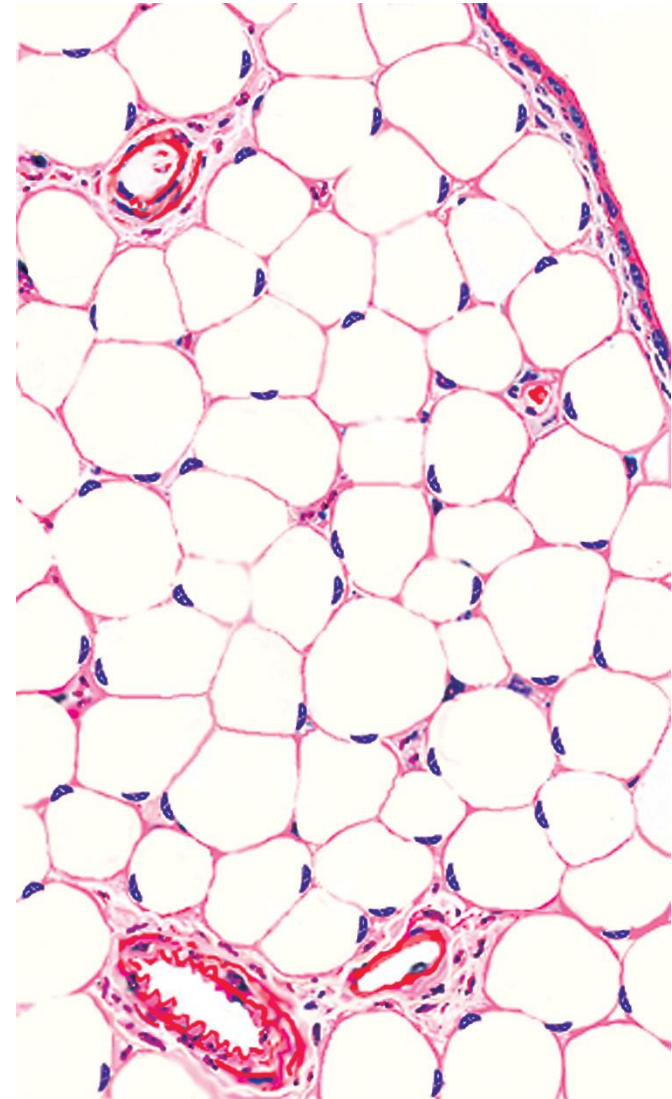
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Adipose tissue

Adipose tissue is a highly specialized loose connective tissue designed to store large quantities of triacylglycerols (triglycerides) and fat-soluble substances

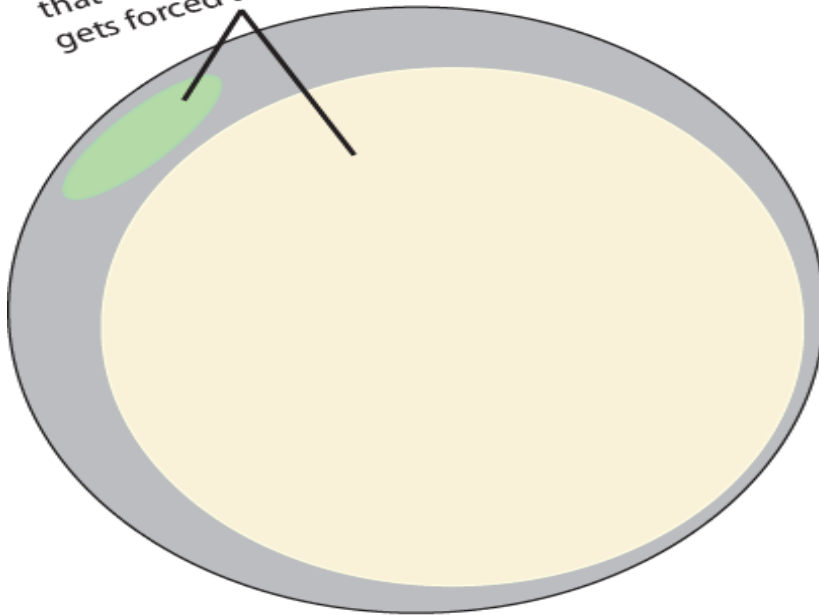
Is derived from embryonic mesenchyme

Each adipose cell, or adipocyte, stores lipid in cytoplasmic inclusions called **lipid droplets**



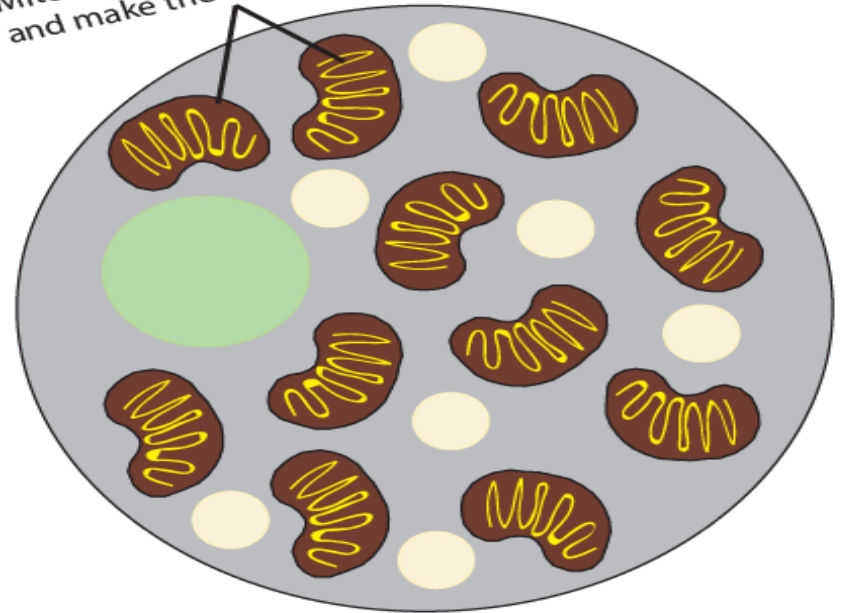
Two types of adipose tissue:
white adipose tissue and brown adipose tissue

The fat drop is so large
that everything else
gets forced to the edge



White Fat Cell

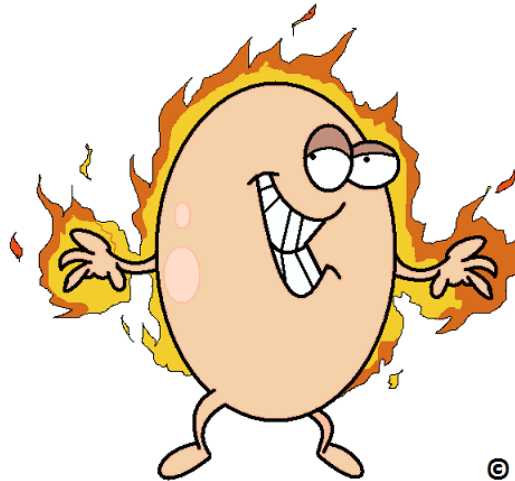
Mitochondria generate heat
and make the cell brown



Brown Fat Cell

Brown adipose tissue

- Is present in significant amounts in human infants
- Its primary function is to generate body heat
- Its distribution is very limited in the adult

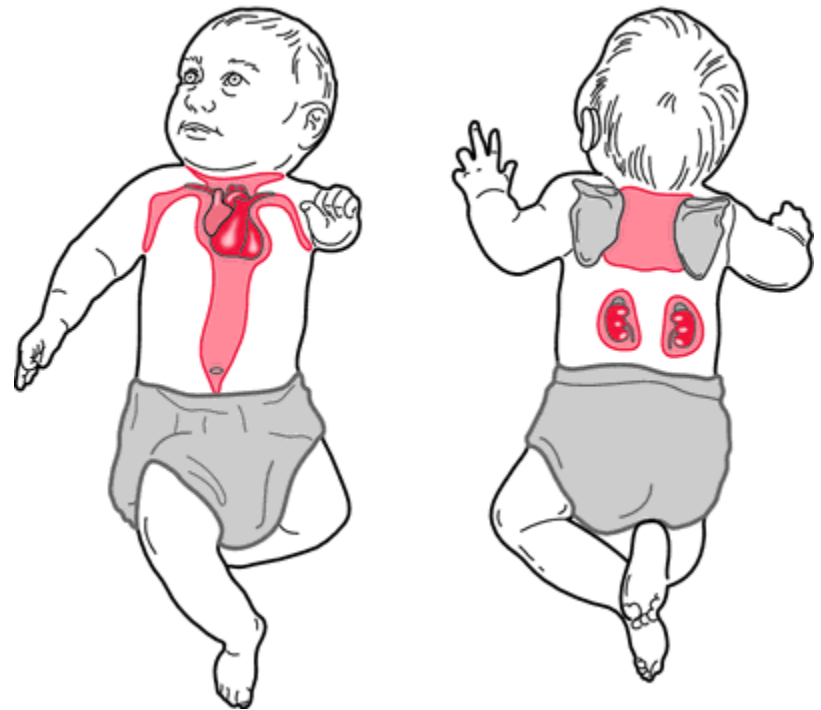


Account for 2-5 % of the body weight in a newborn

It is greatly reduced during childhood and adolescence

In adults it is found only in scattered areas, around kidneys and aorta

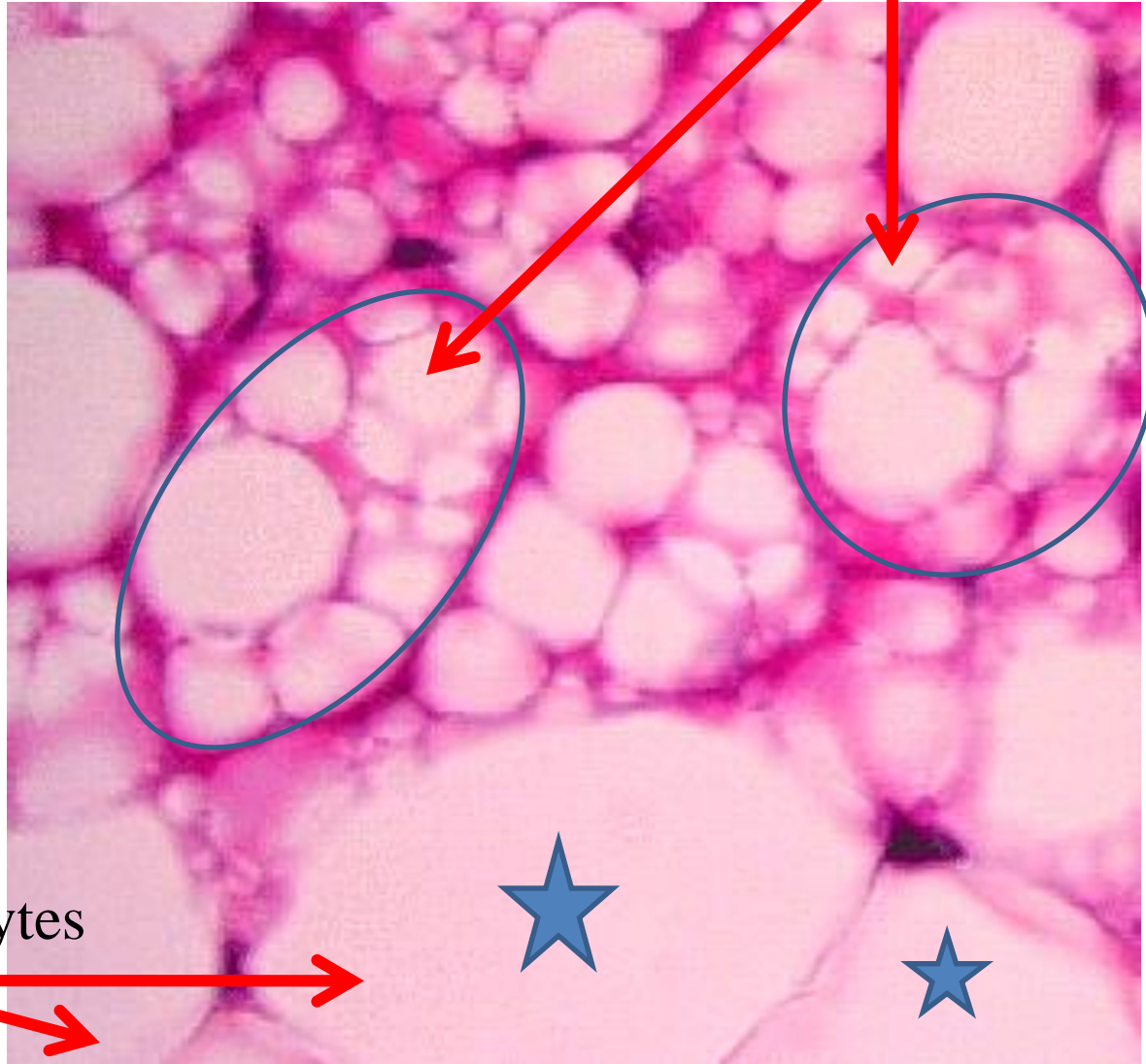
It is found in the mediastinum, the subcutaneous tissue between the scapulae, the area around the kidney and the area along the aorta.



Histologic characteristics

- Brown adipocytes are small cells that contain a centrally-placed nucleus and large numbers of mitochondria.
- Brown adipocytes are multilocular cells, i.e., each cell contains multiple small lipid droplets.
- Brown adipose tissue has a high metabolic rate capable of generating relatively high amounts of heat, a process that is physiologically important to infants prior to the maturation of their thermoregulatory mechanisms

Brown adipocytes

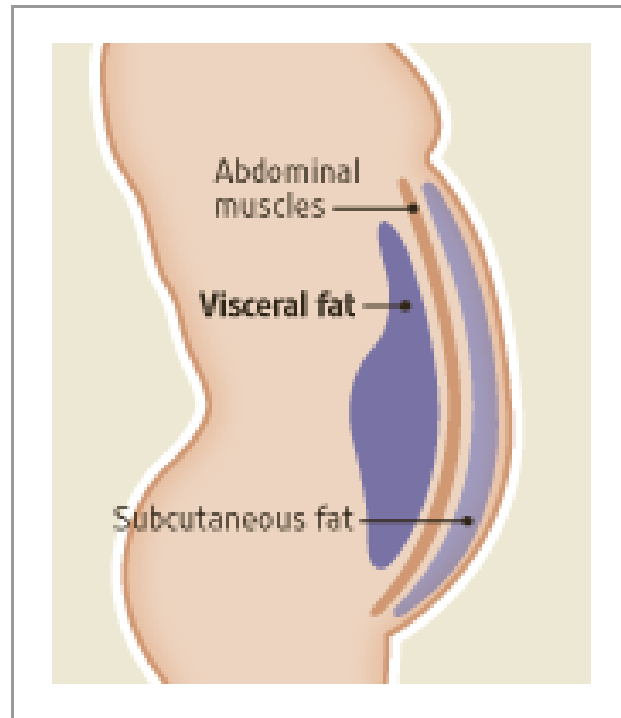


White adipocytes

White adipose tissue

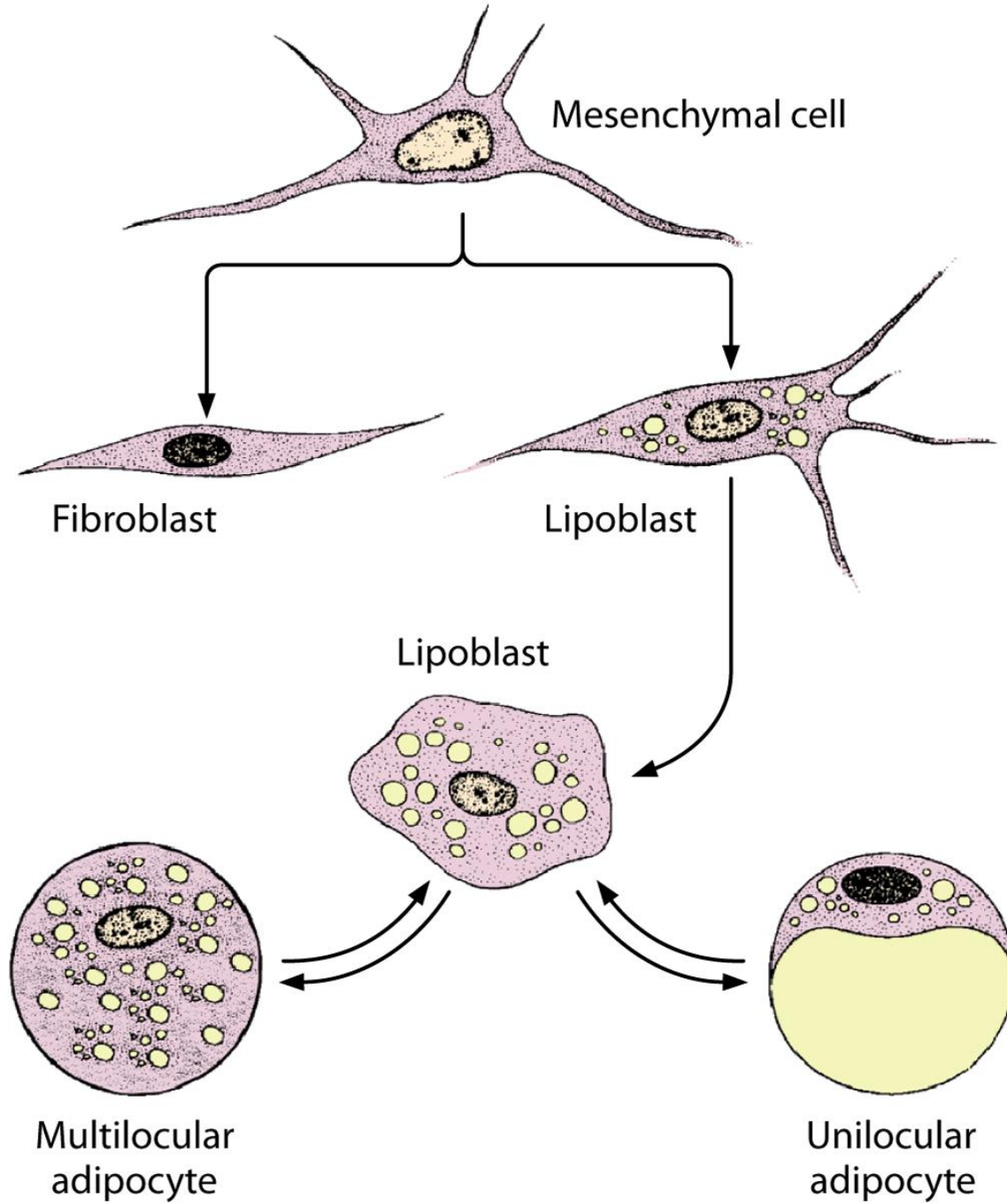
- Is the principal type of adipose tissue of the adult human
 - I. storage reservoir of metabolic fuel in the body
 - II. thermal insulator
 - III. protective cushion

- In the adult, white adipose tissue is primarily distributed subcutaneously and viscerally.

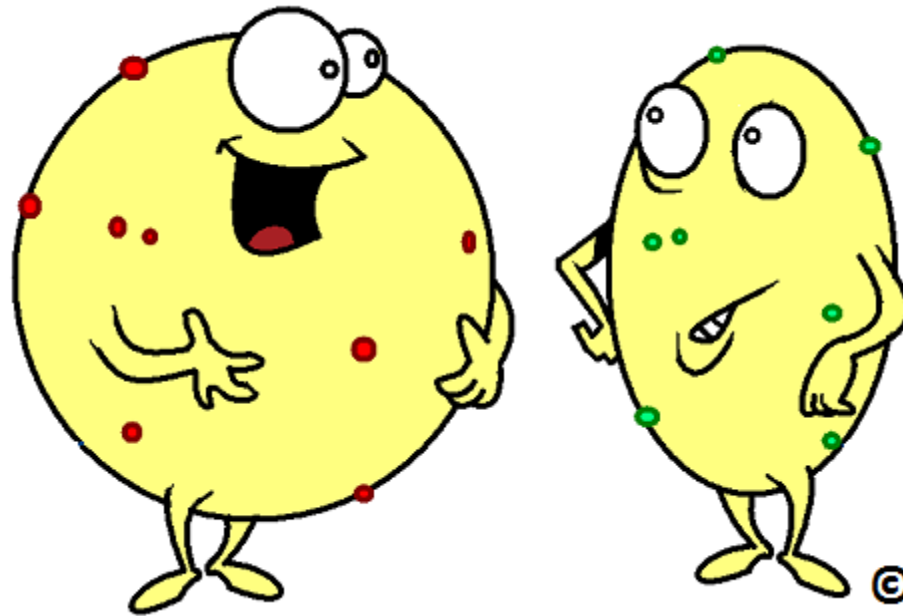


Histologic characteristics

- The white adipocytes are relatively large 50-150 μm in diameter, compared to brown adipocytes, and are dominated by the lipid droplet
- Non-membrane bound droplet
- Unilocular cells
- Signet ring appearance.
- The tissue is well vascularized
- Adipocytes are surrounded by a thin external lamina containing type 4 collagen



Thin adipocyte standing next to a fat adipocyte



The number of fat cells in your body remains constant throughout your adult life. Adults who gain or lose weight may do so through changes in the size of the adipocytes

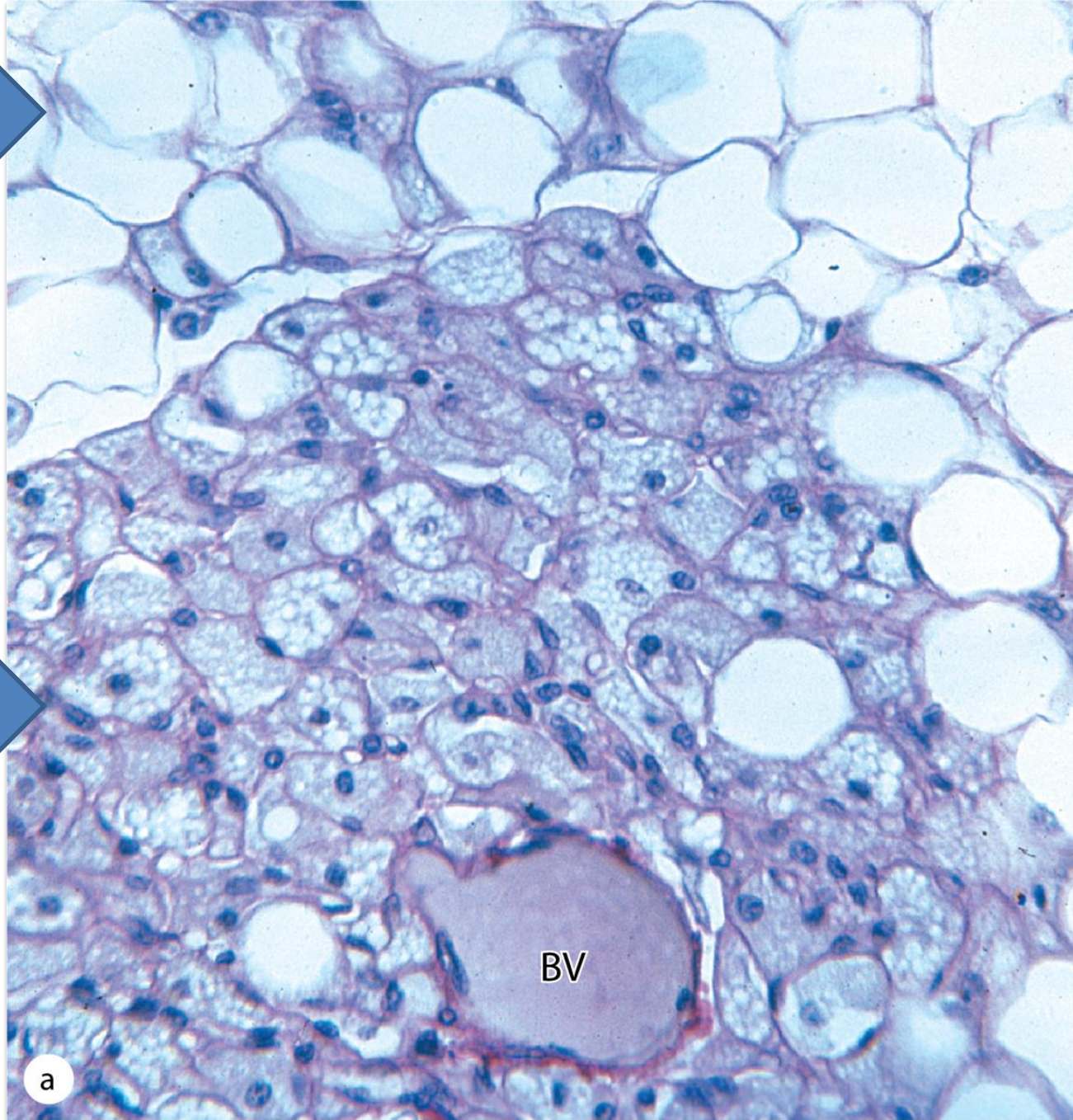
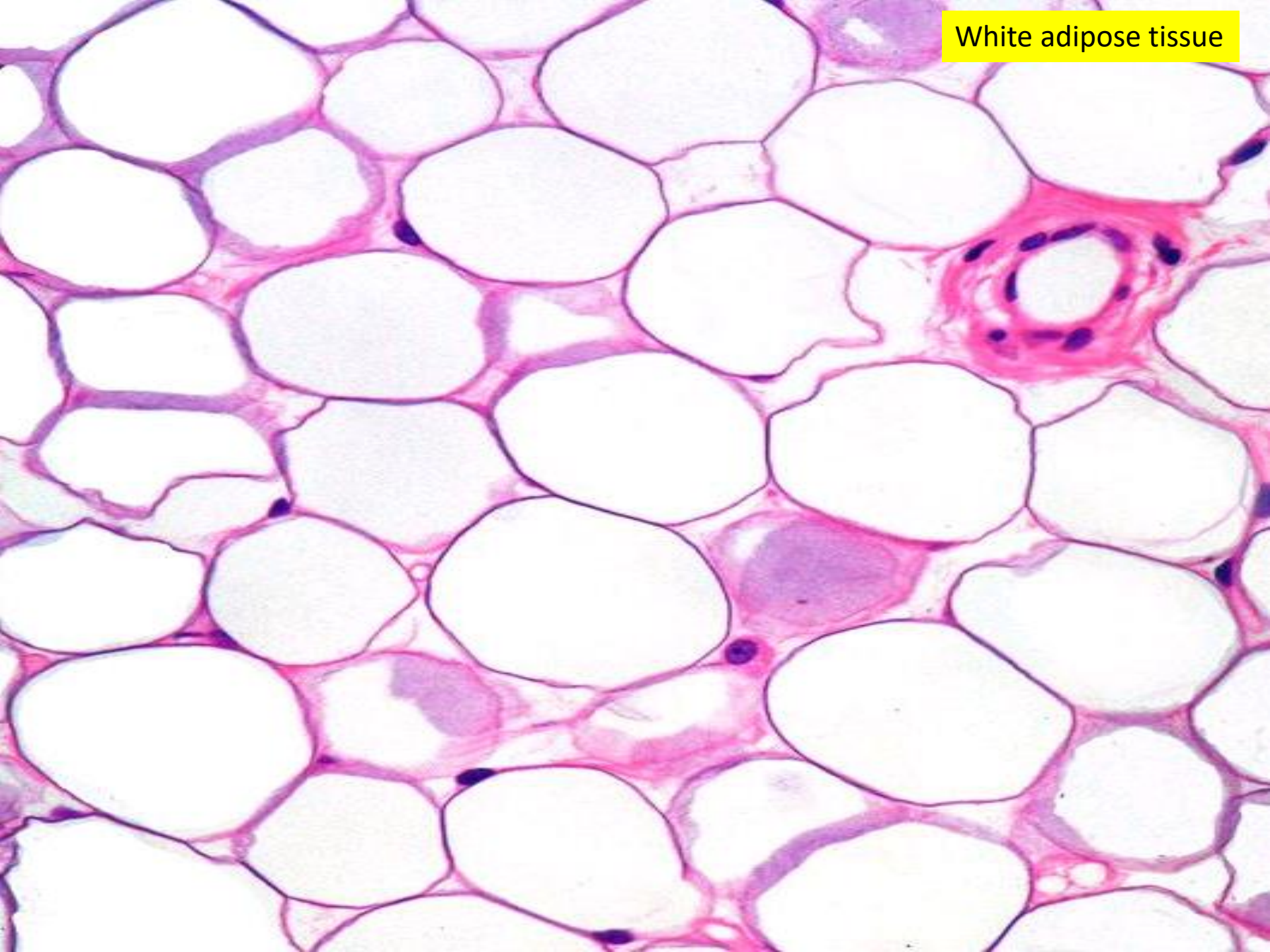


Figure 6-4

White adipose tissue



Brown adipose tissue

