

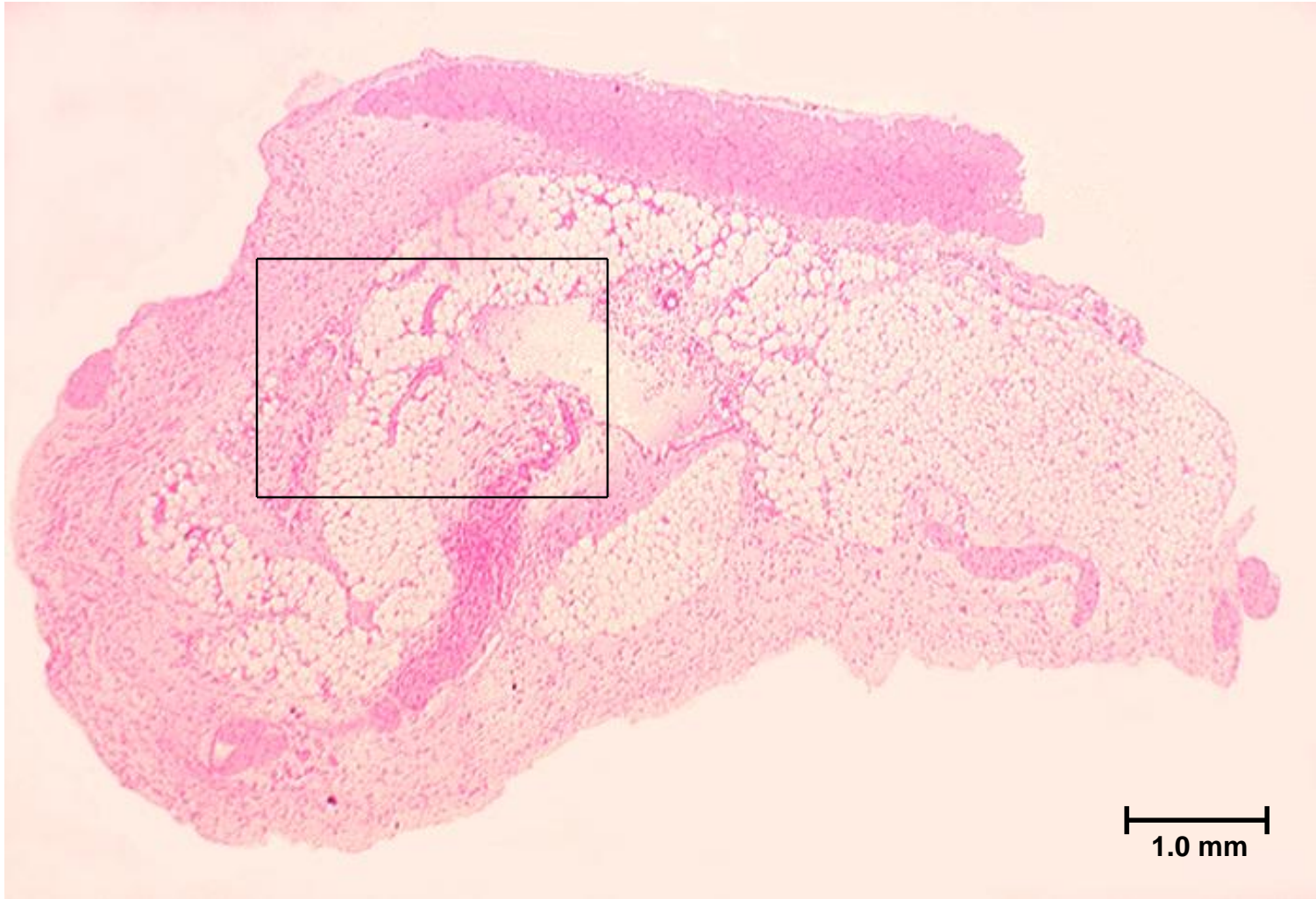
CONNECTIVE TISSUE

Objective

The main objective is to identify different types of connective tissue cells, protein fibres and connective tissue types that provide unique properties to different tissue varieties.

Areolar connective tissue

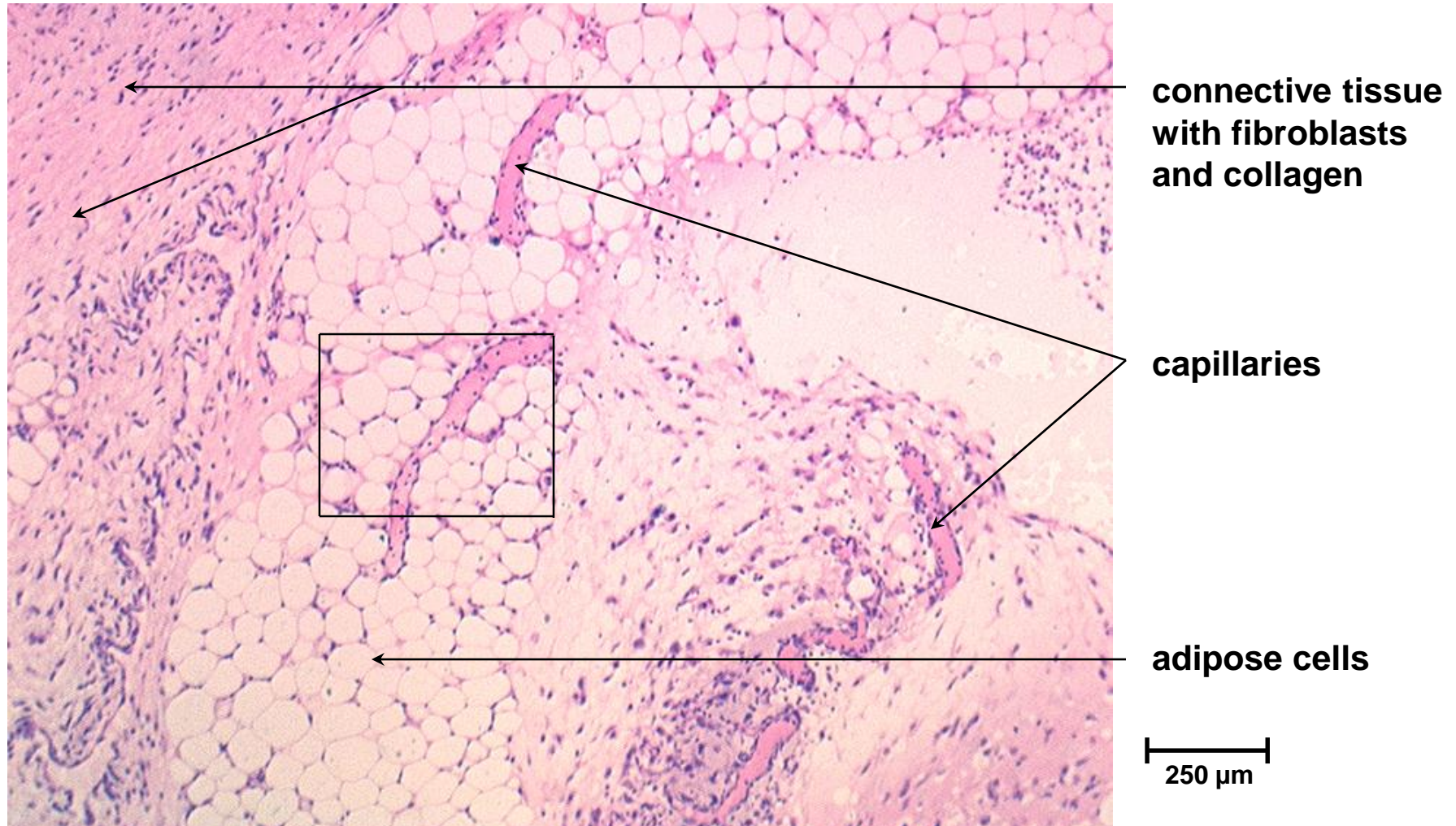
Slide as seen at lowest magnification. **Areolar** or **Loose** connective tissue.



Areolar connective tissue

Area from slide as seen with x4 objective lens.

Identify areas of adipose cells, blood vessels and fibroblasts with collagen fibre matrix.



Areolar connective tissue

Try to identify the following cell types:

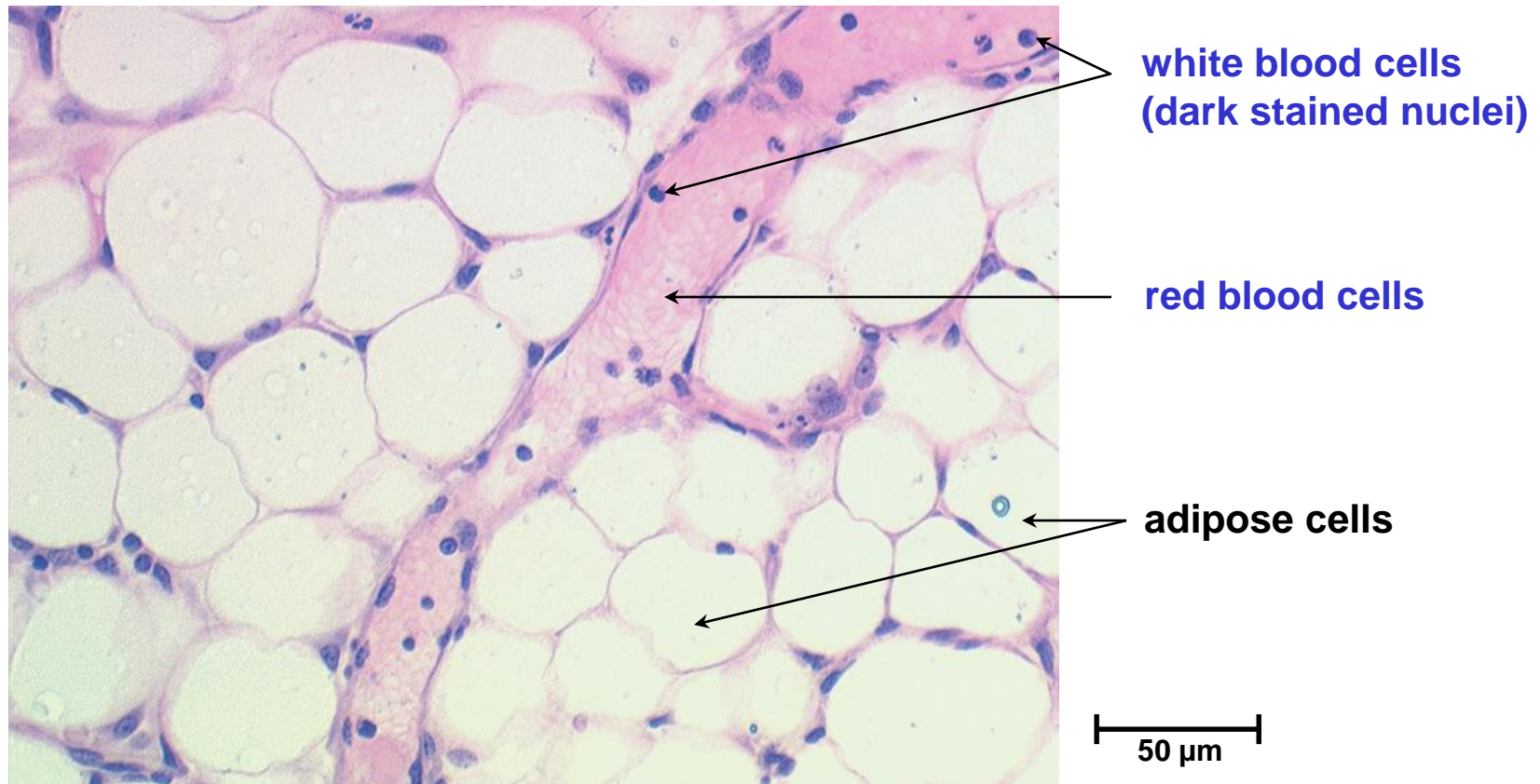
Adipose cells

Red and white blood cells

Fibroblasts see next picture.

Macrophages

Mast cells.

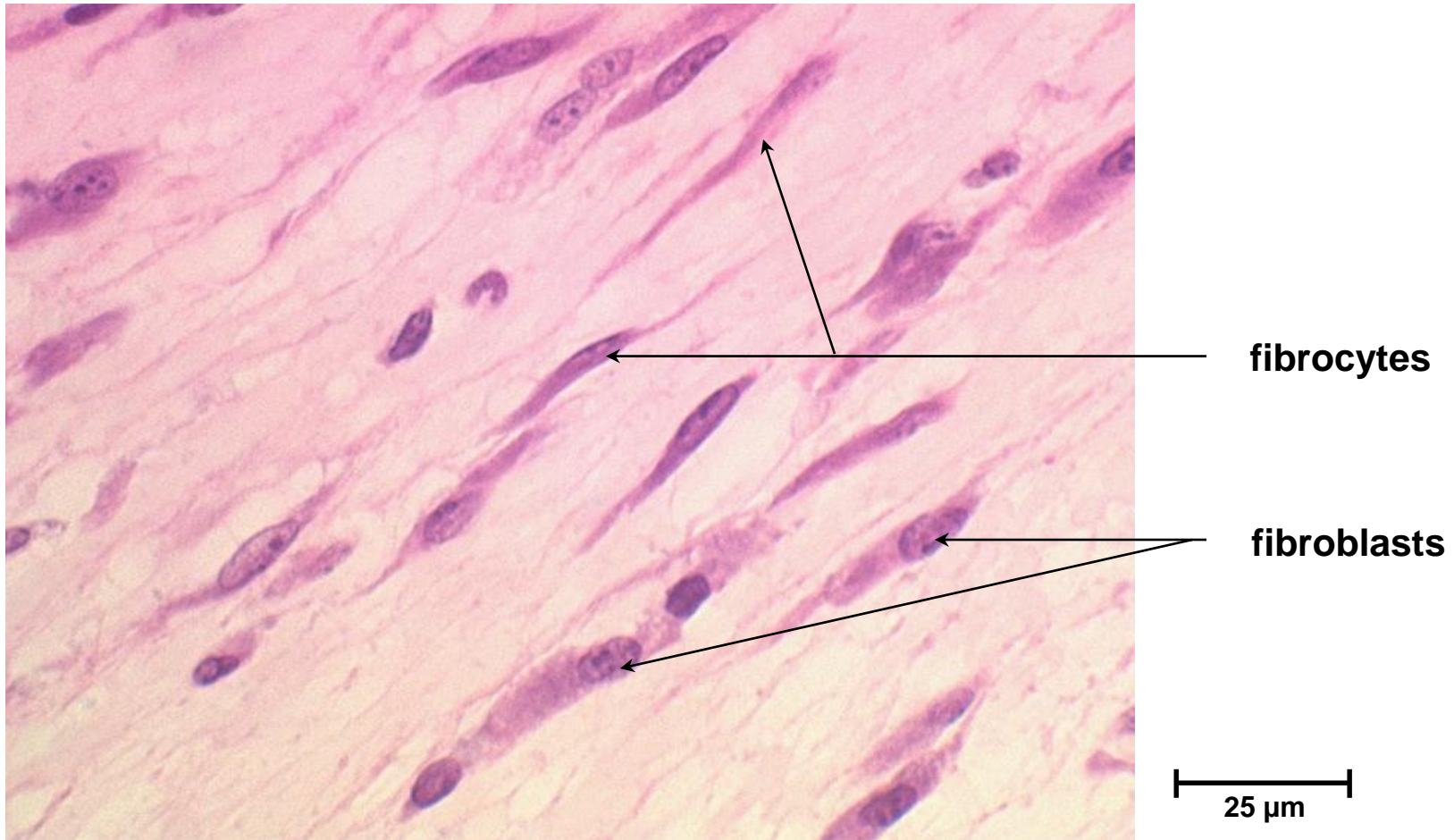


Areolar connective tissue

Try to identify the following cell types:

Fibroblasts : usually spindle shaped cells, the most representative cell type in

Fibrocytes : connective tissue. Inactive fibroblasts termed fibrocytes.



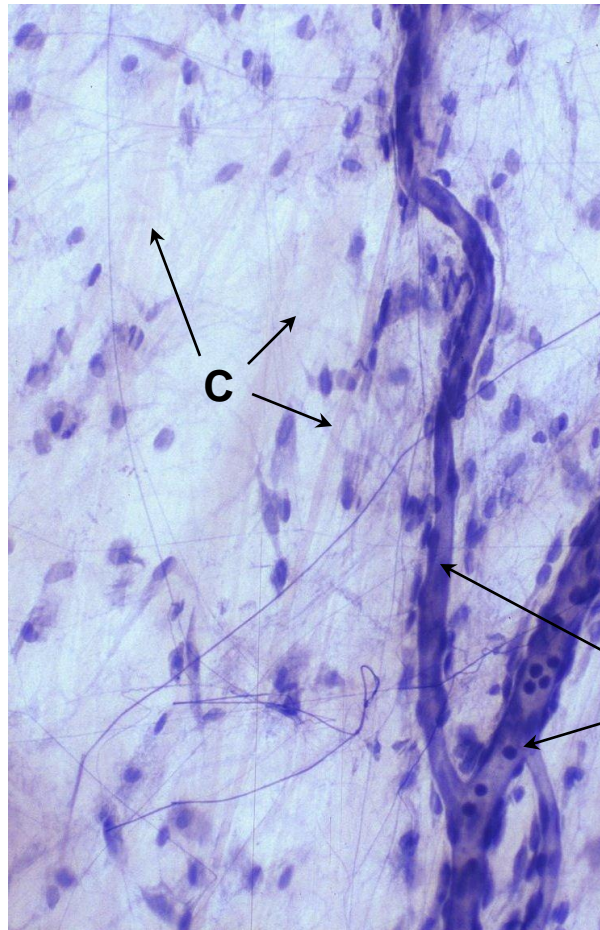
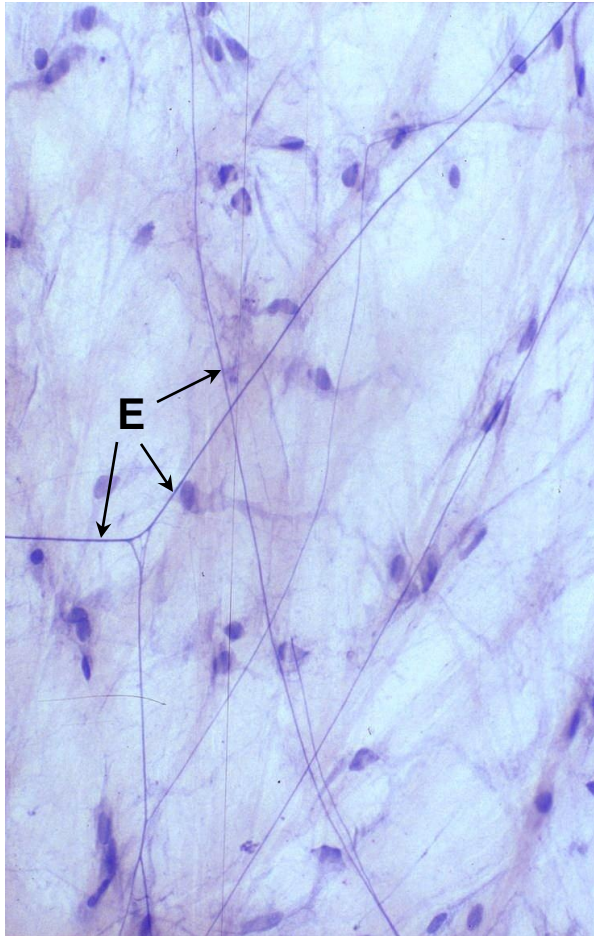
Stained spread preparation

Areolar connective tissue.

You should see two types of protein fibres in this preparation.

Which one of these is thinner and branched compared with lighter staining thicker wavy fibres?

Thinner branching elastic fibres and lightly staining wavy collagen fibres.



E : elastic fibres

C : collagen fibres

capillary

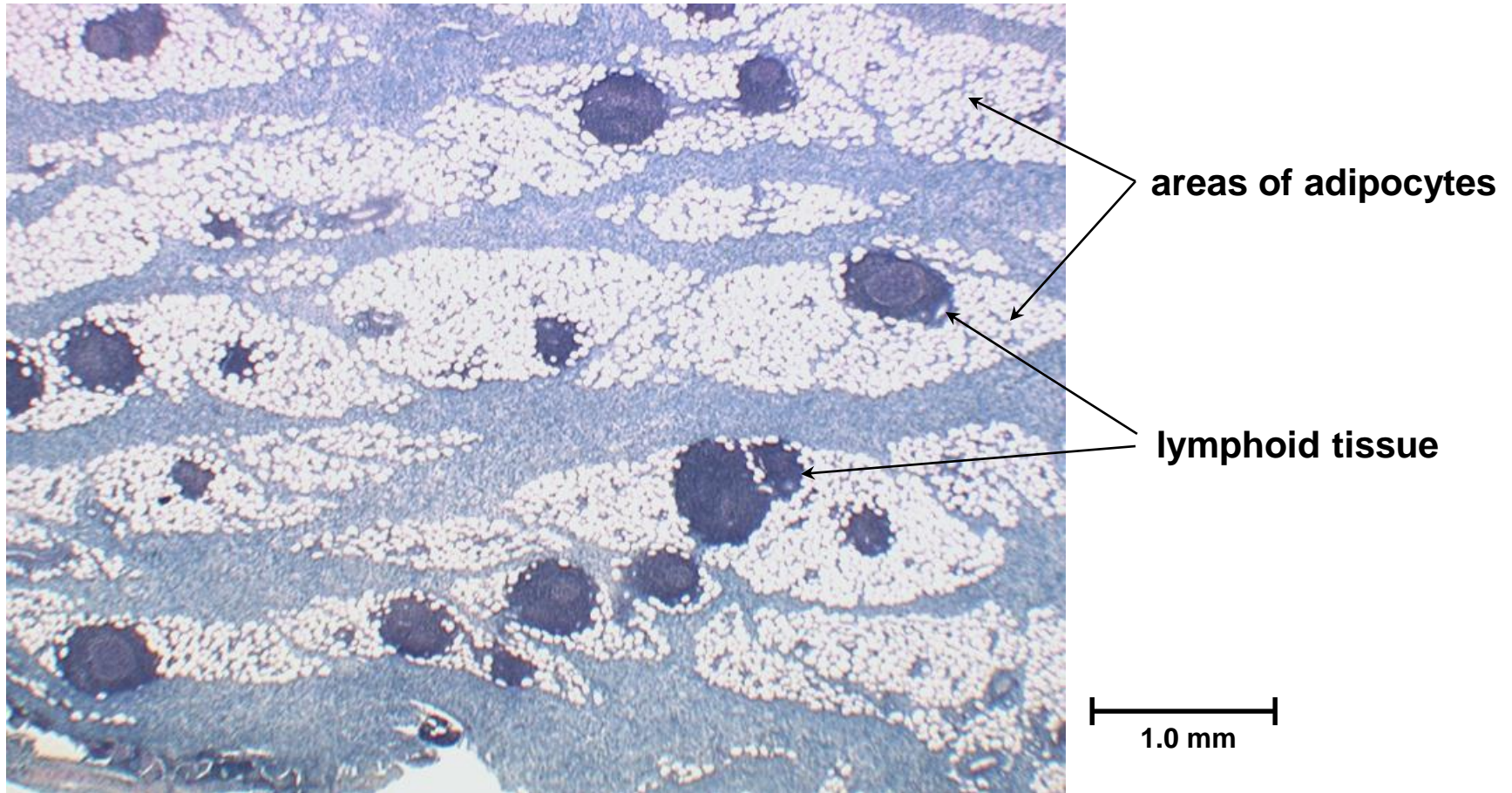
100 μm

Subcutaneous tissue (subcutis)

What sort of connective tissue is it?

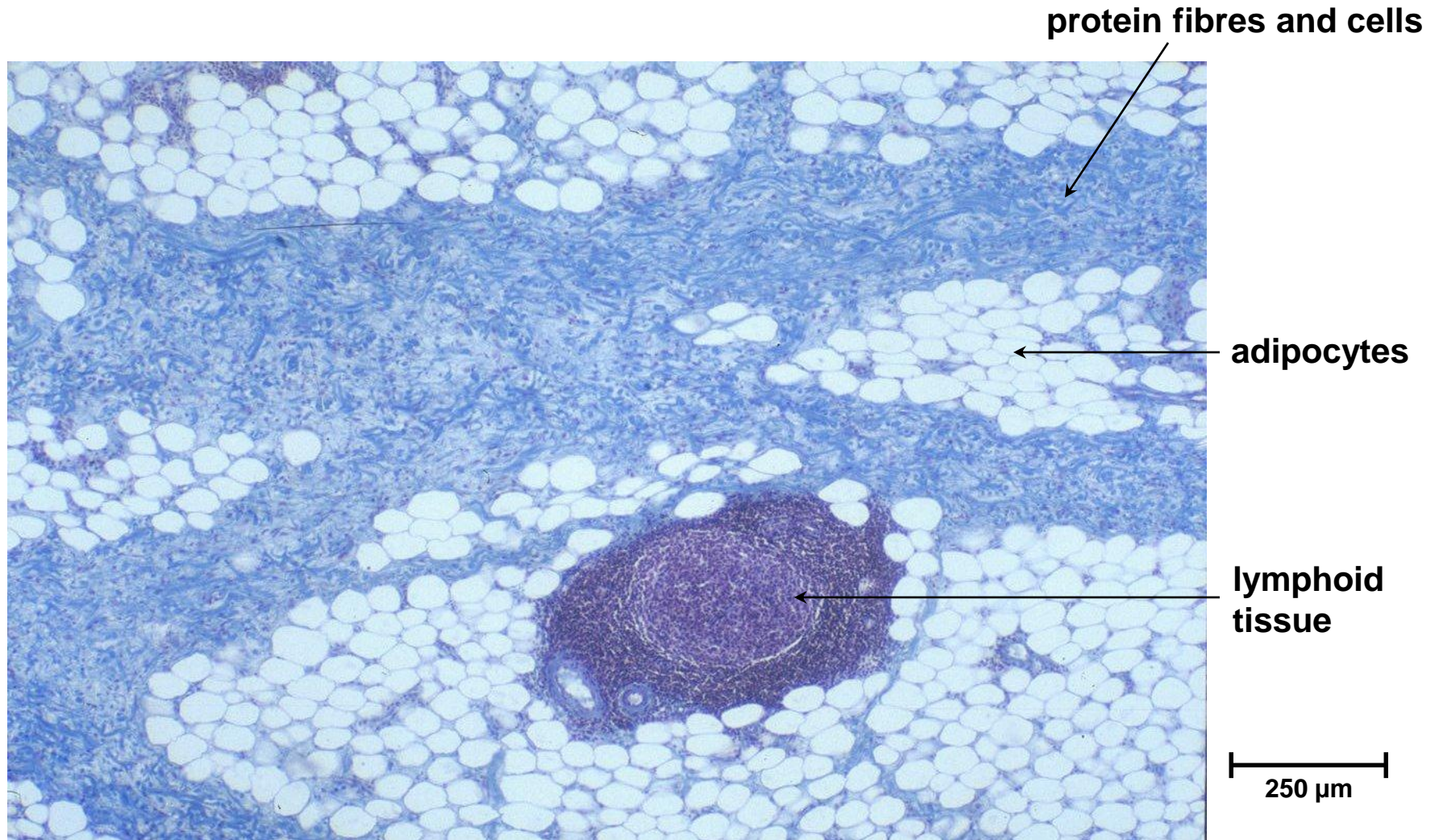
Subcutaneous connective tissue is another example of loose connective tissue.

This section also contains large clusters of purple staining lymphoid tissue.



Subcutaneous tissue

Section showing a large cluster of purple staining lymphoid tissue.



Subcutaneous tissue

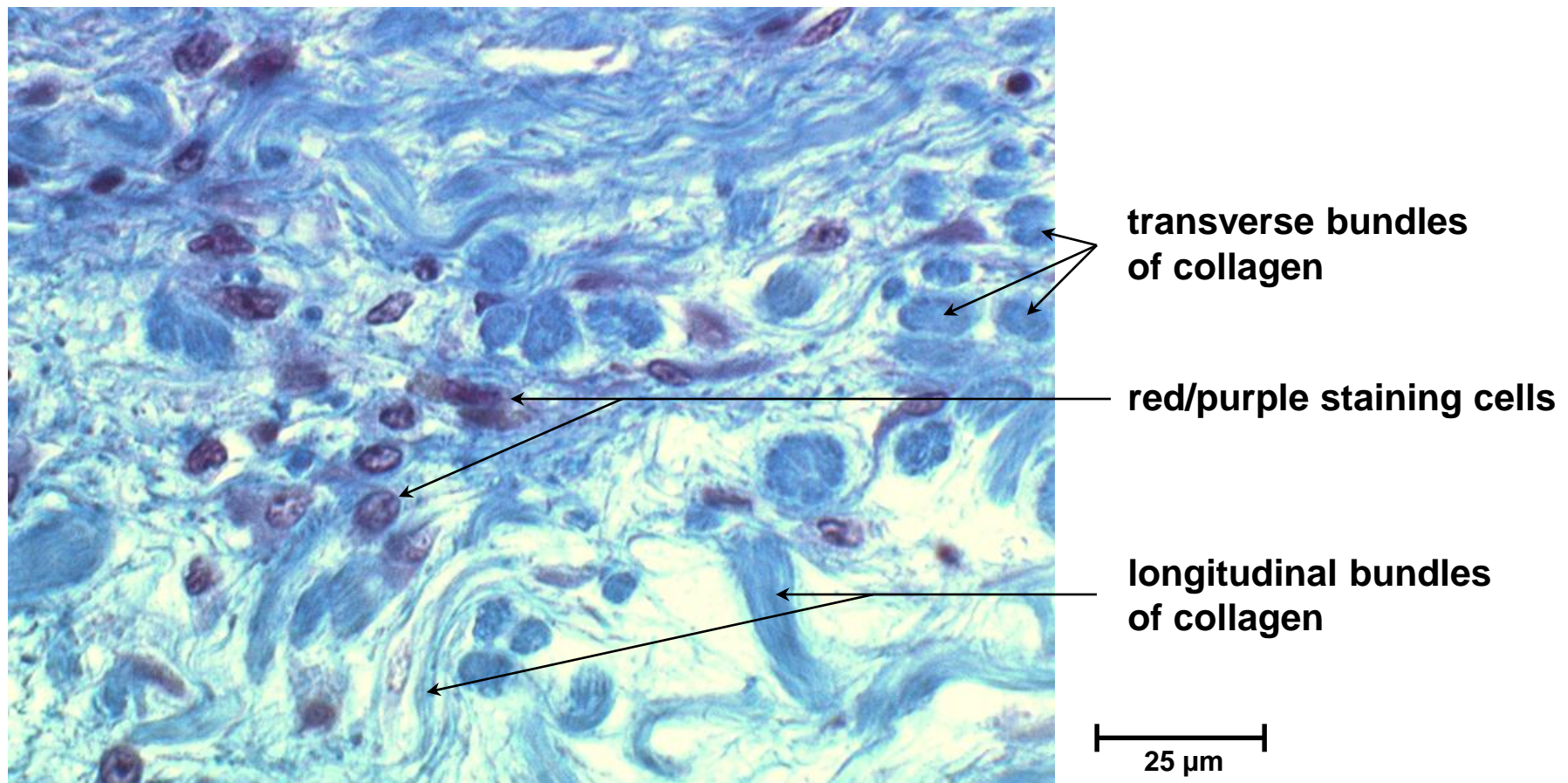
There is an abundance of protein fibres staining deep blue in this section.

What sort of protein fibre is it and how is it arranged?

Bundles of type 1 collagen fibres running in many directions.

What are the red cells?

Mostly fibroblasts but also macrophages and mast cells have stained purple/red.

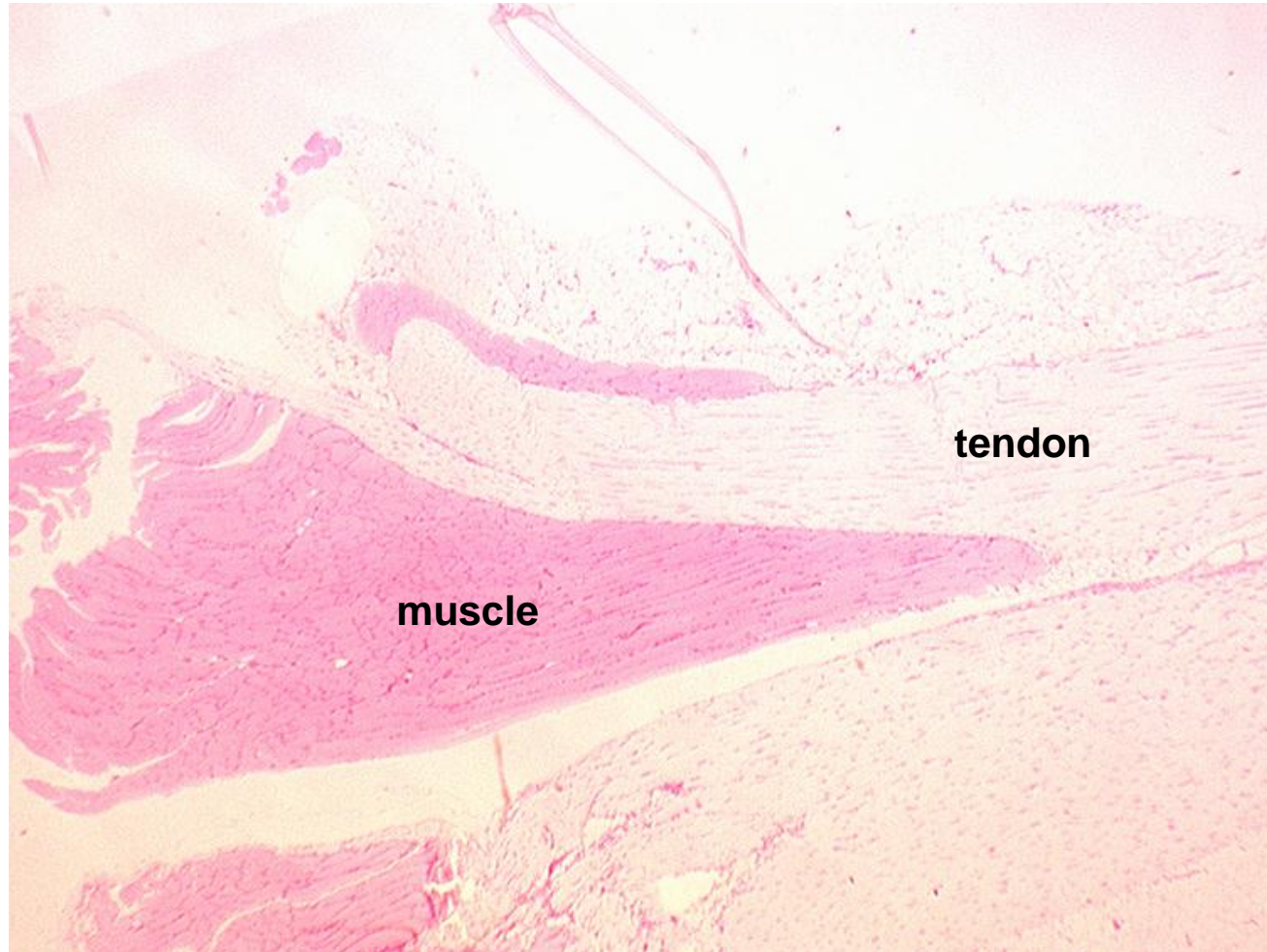


Tendon (Dense regular connective tissue)

This section contains both the muscle and the tendon.

What colour are the muscle cells?

Deep pink.



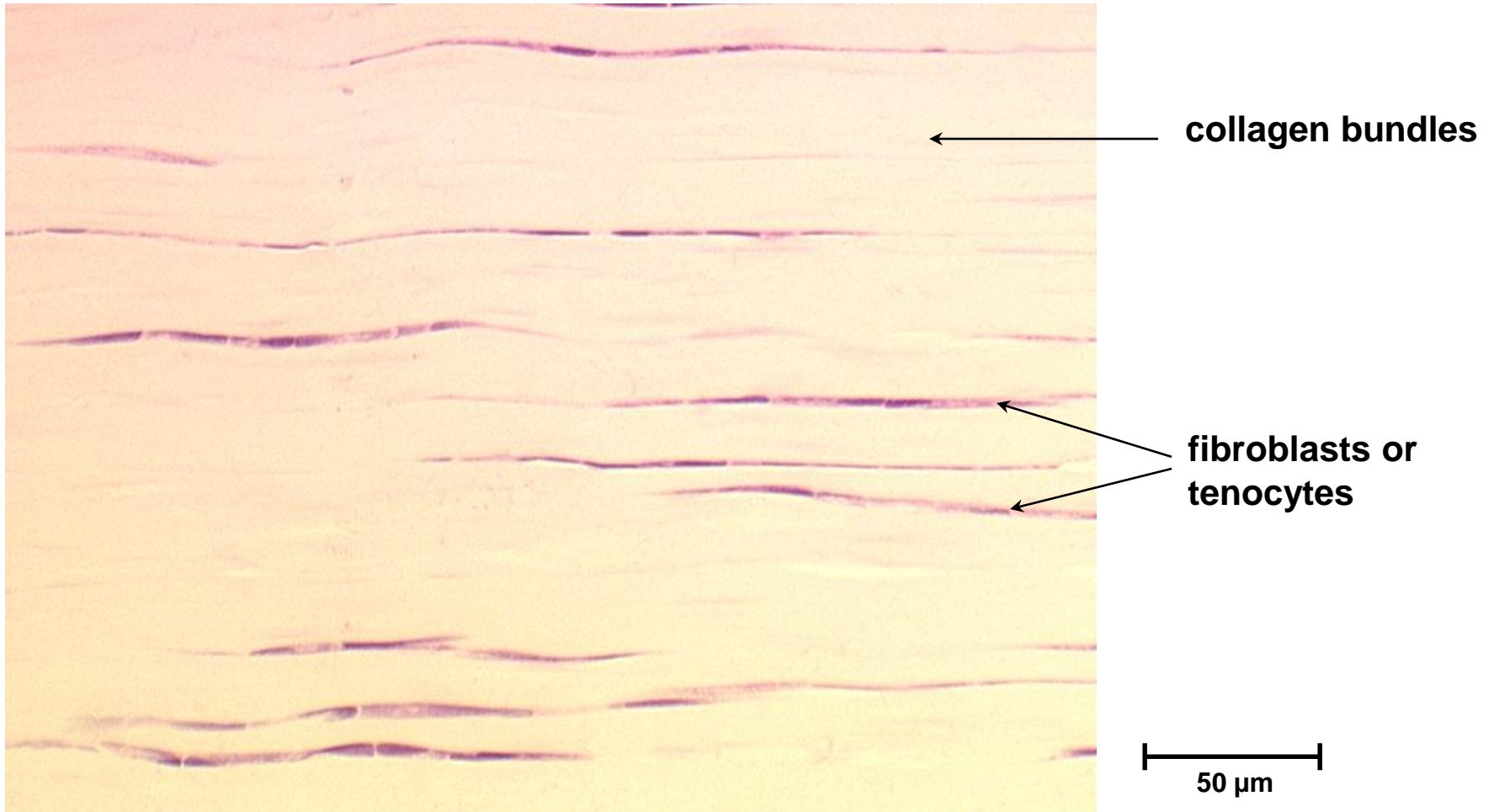
Tendon (Dense regular connective tissue)

What is the most abundant constituent of the tendon?

Mainly thick collagenous fibres, collagen type 1.

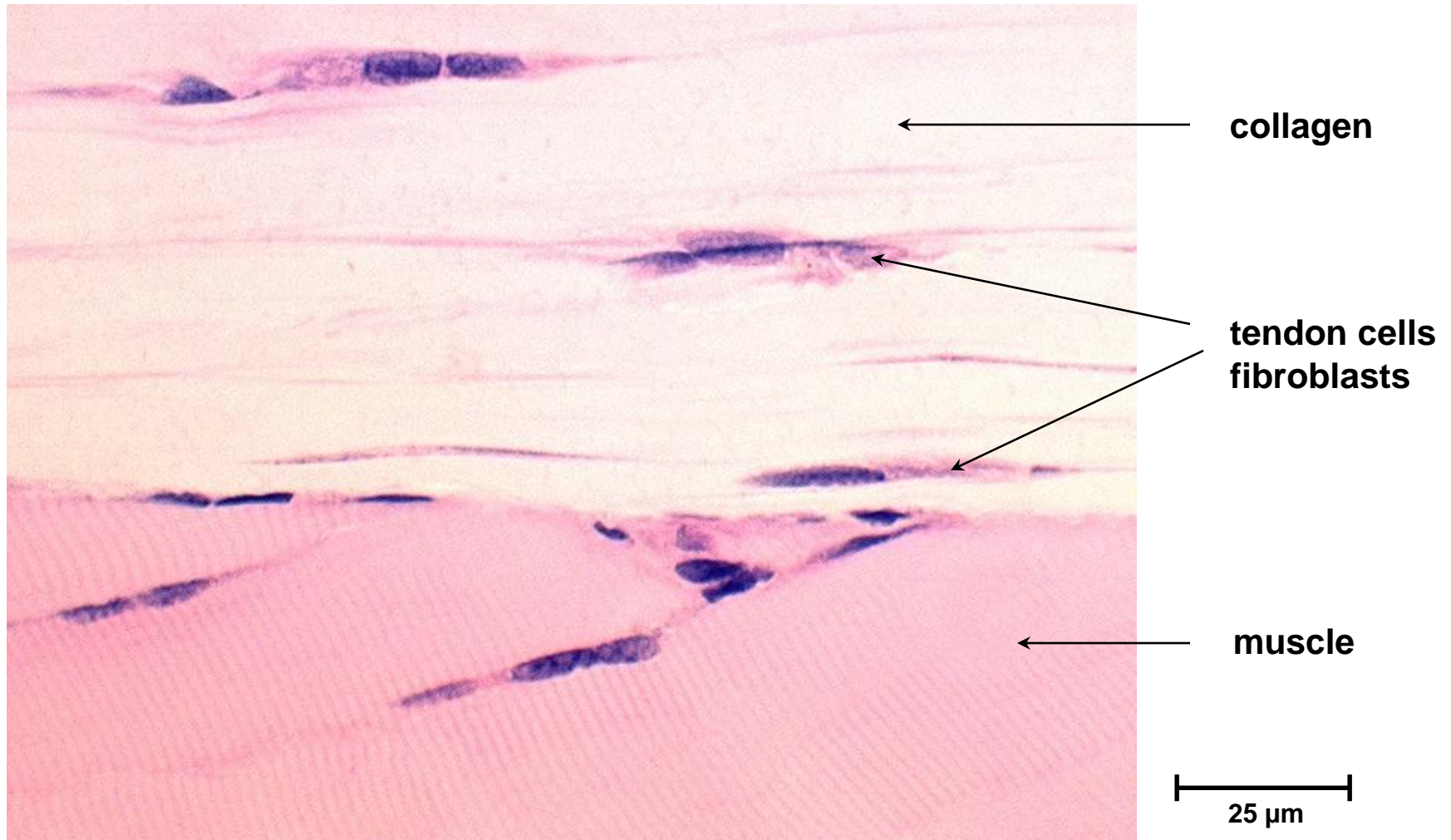
What is the orientation of protein fibres in the tendon?

Parallel bundles of closely packed collagen fibres.



Tendon (Dense regular connective tissue)

A higher magnification view showing the deep pink staining striated muscle with tendon cells insinuated between the bundles of protein fibres.

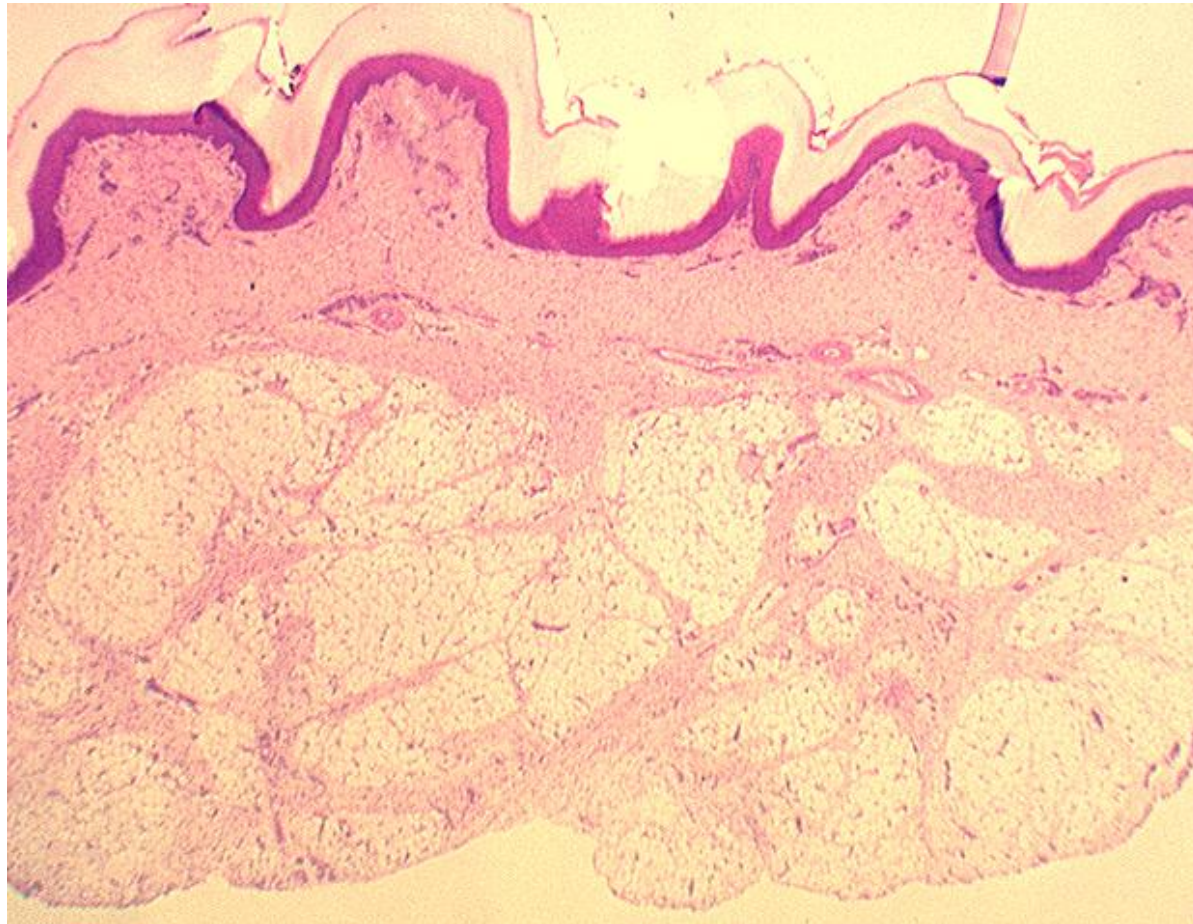


Dermis of skin

(Dense irregular connective tissue)

Why is this connective tissue described as irregular?

It consists of bundles of fibres running in a random orientation.



epidermis

dermis : area of dense
irregular connective tissue

hypodermis :
subcutaneous

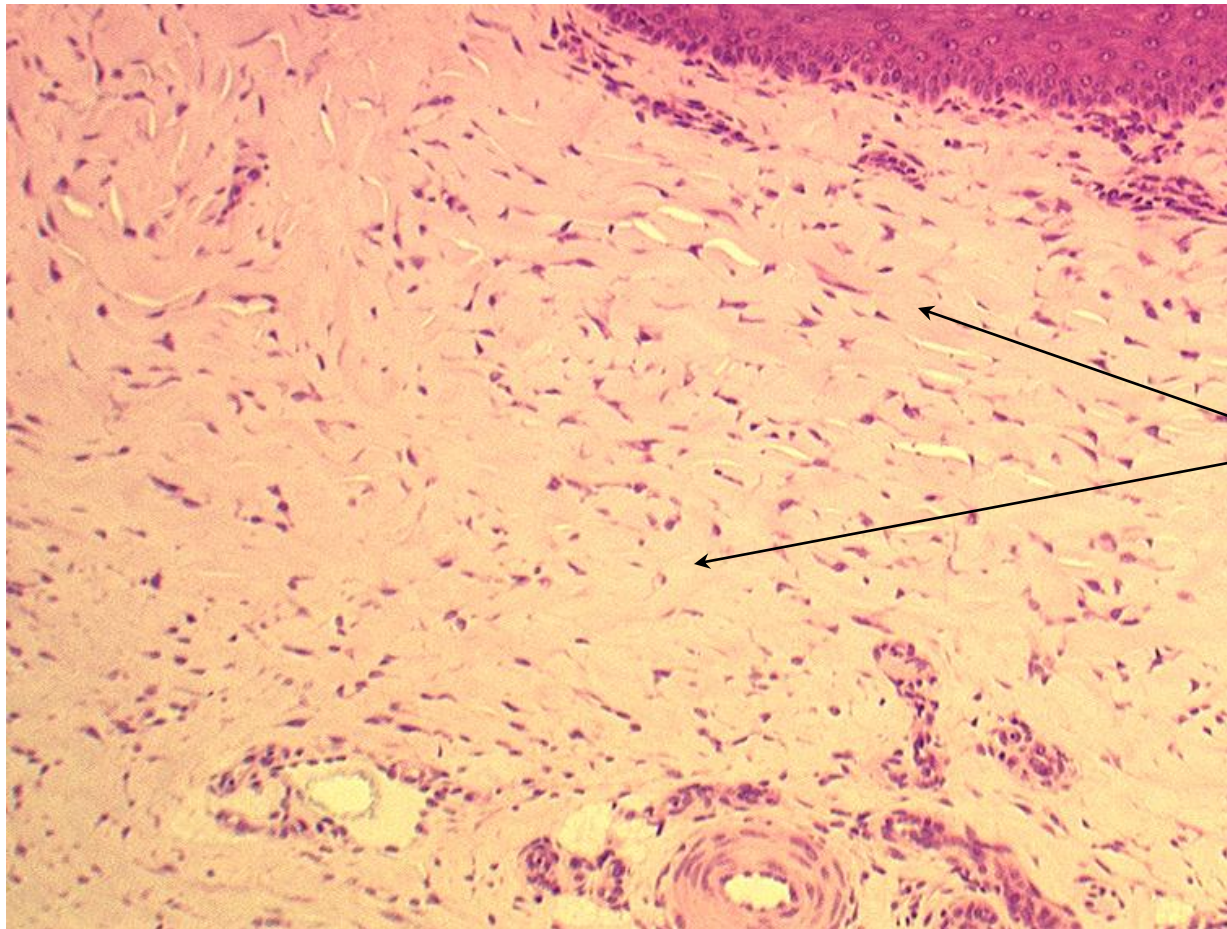
1.0 mm

Dermis of skin

(Dense irregular connective tissue)

What are the pale pink stained dense interwoven bundles of protein fibres composed of?

Mostly collagen type 1.



collagen bundles
in the dermis

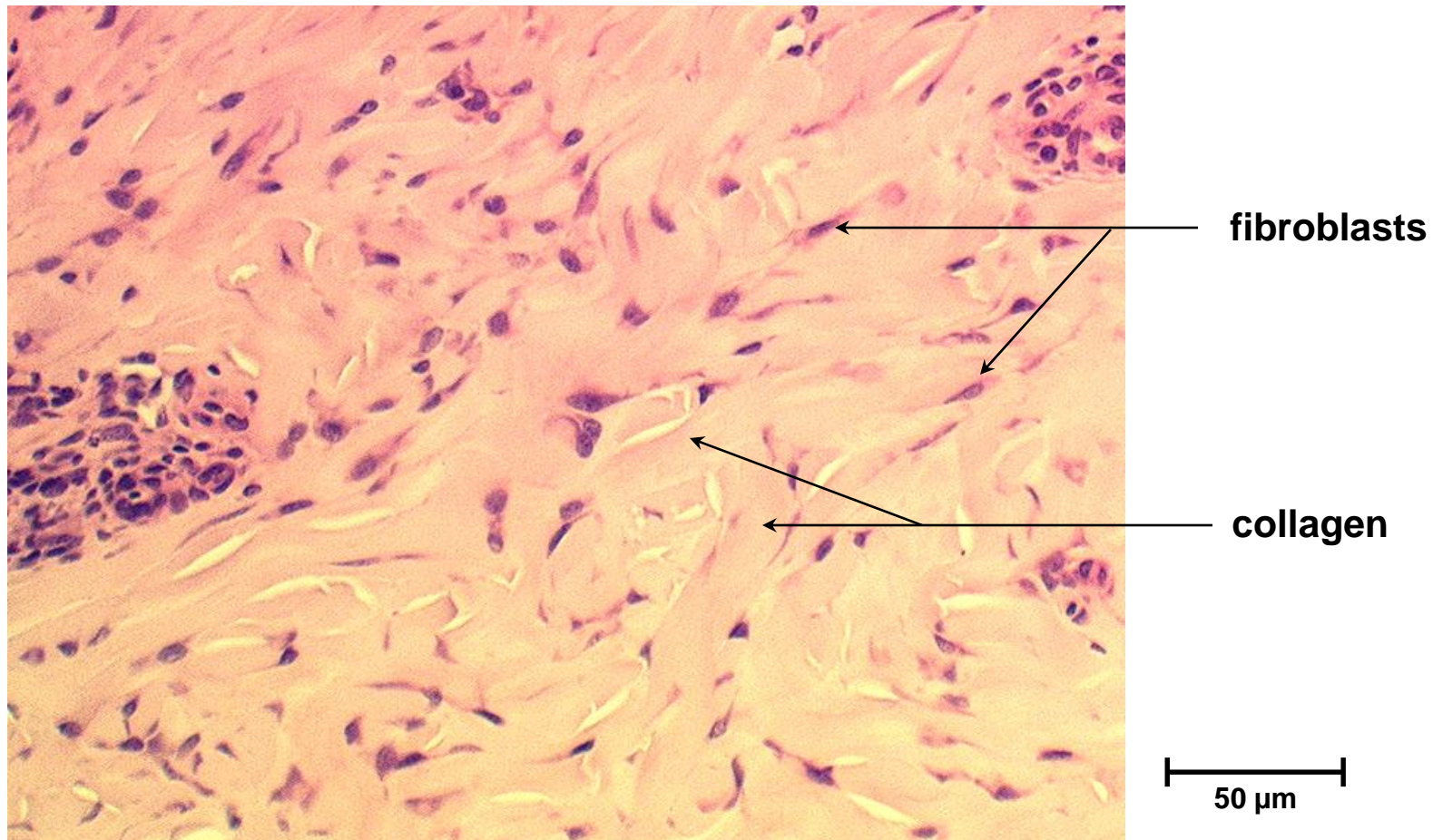
100 μ m

Dermis of skin

(Dense irregular connective tissue)

What is the purple staining major cell type found beneath the surface epidermis?

Fibroblasts are the predominant cell type present.



Ligamentum Nuchae

(Elastic connective tissue)

Most of the protein fibres have stained yellow in this section.

Nuchal Ligament Preparation



100 μ m

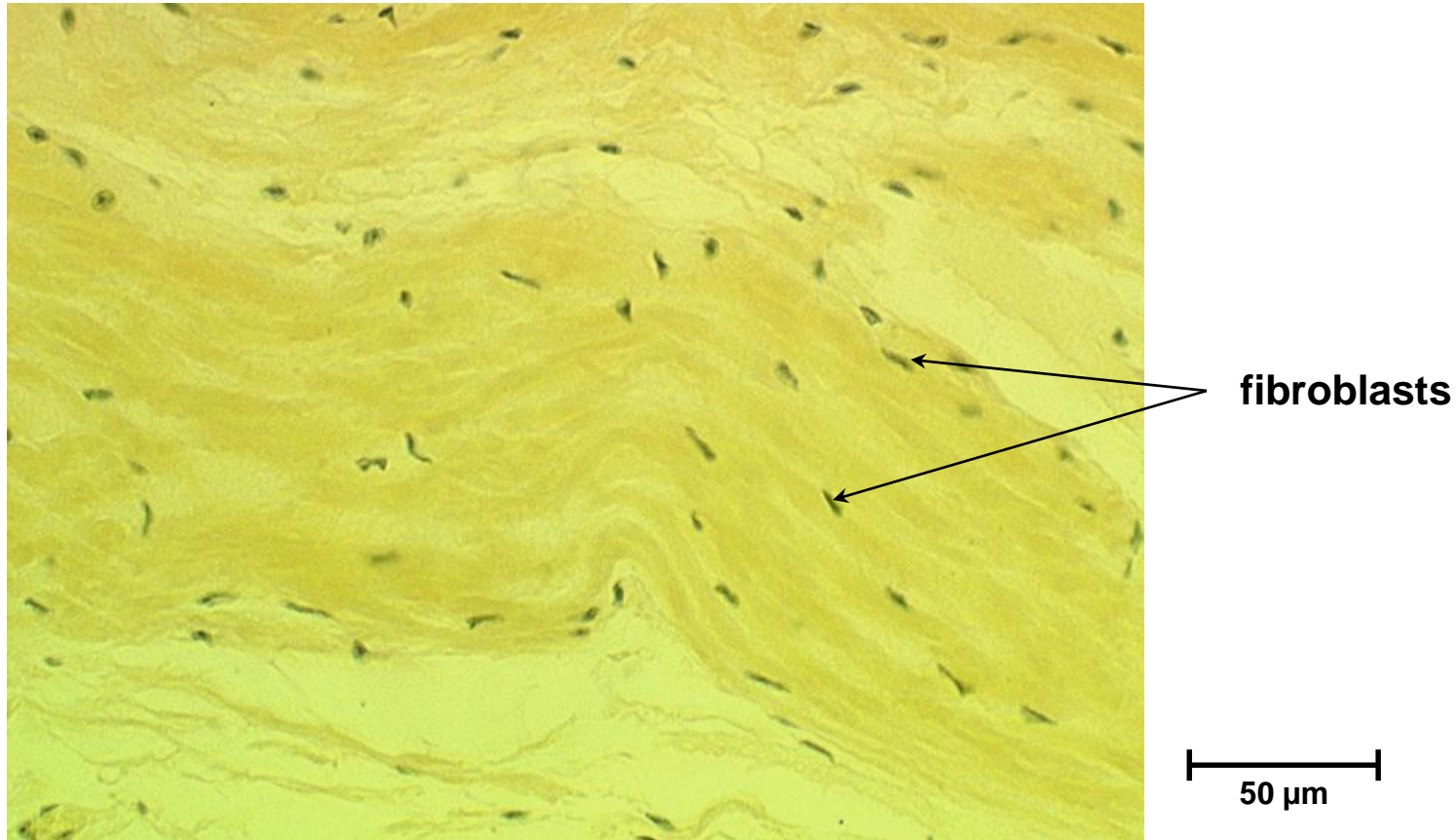
Ligamentum Nuchae

(Elastic connective tissue)

What are these protein fibres composed of?

Elastin.

Also note the presence of fibroblasts that have stained black.



Adipose unilocular (white)

Look for the cytoplasm and the nucleus.

Where is the nucleus situated in these cells?

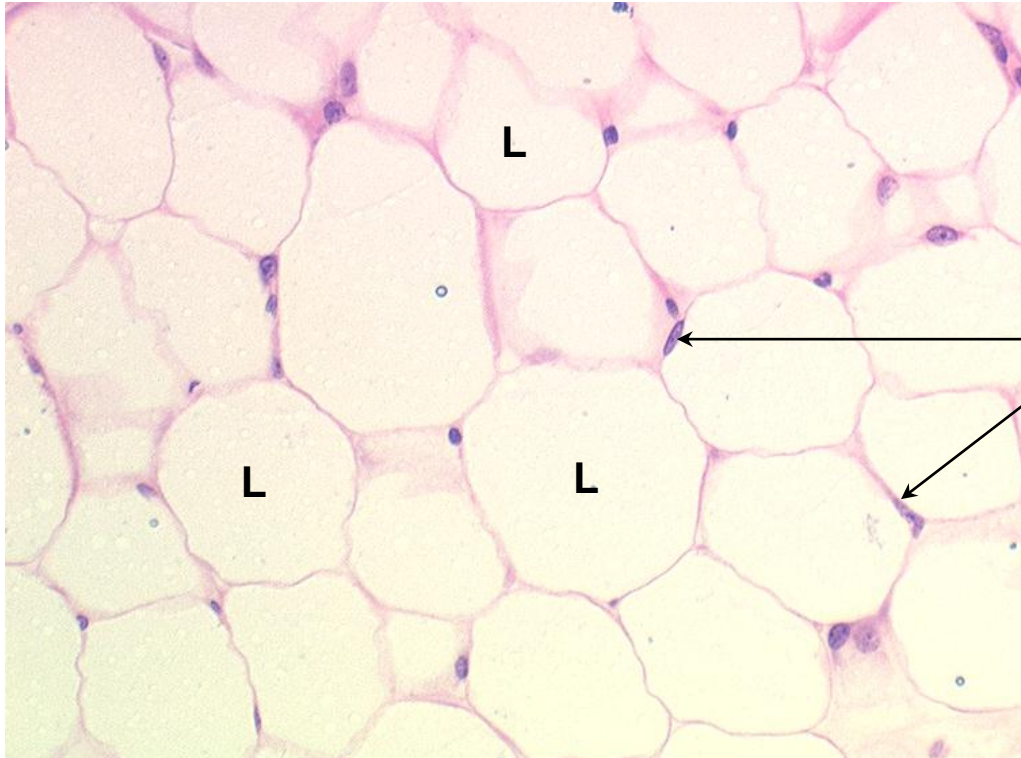
Flattened nucleus at the side of the cell.

What is the major component of these cells?

Lipid.

Why do they appear empty in this section?

Lipid requires special fixatives (such as osmium). In most preparations it is lost from the section during processing.



nuclei of adipocytes

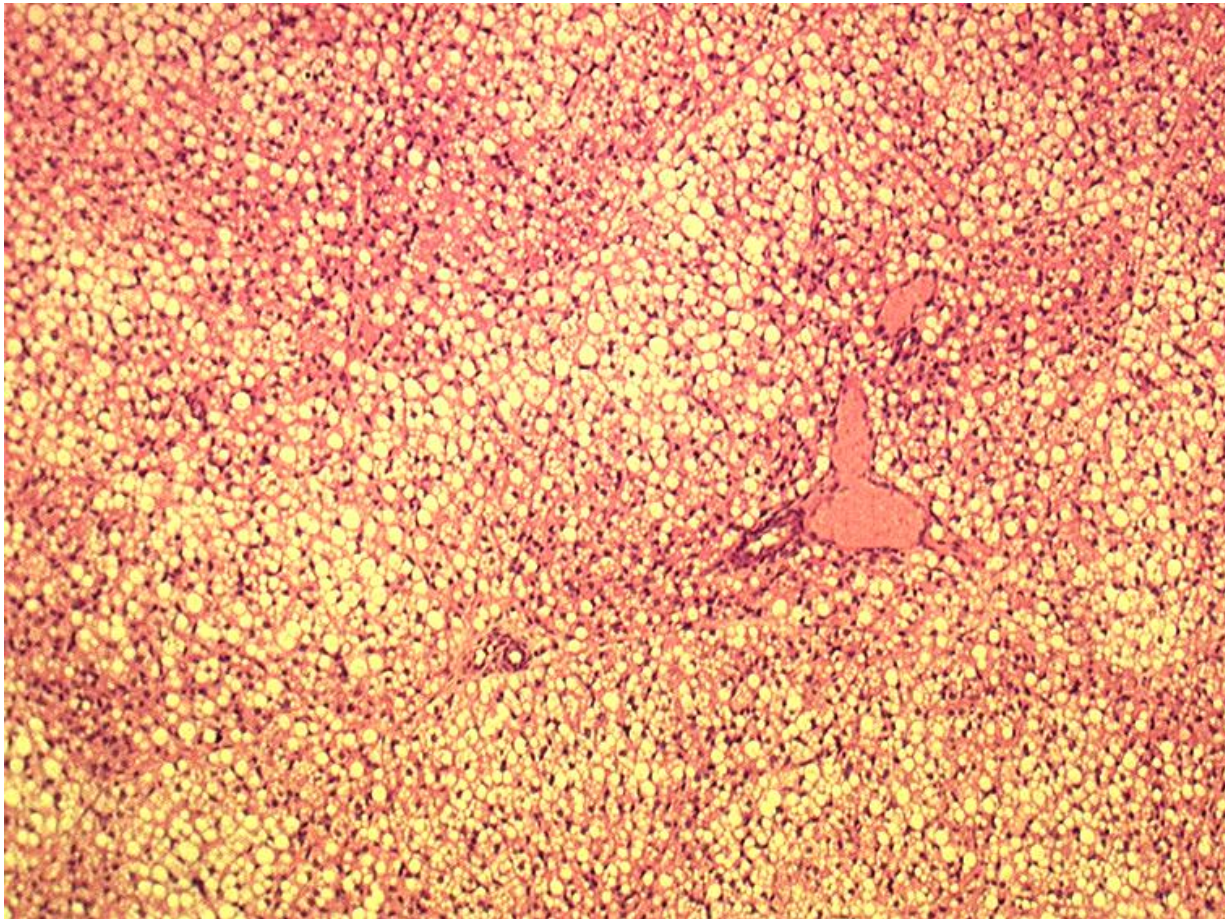
L : site of lipid droplets

50 μ m

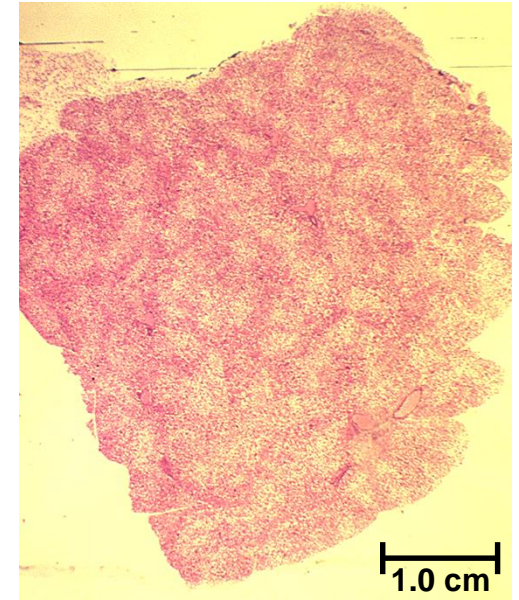
Adipose multilocular (brown)

Why is this tissue called multilocular?

Cells contain multiple lipid droplets.



Whole slide



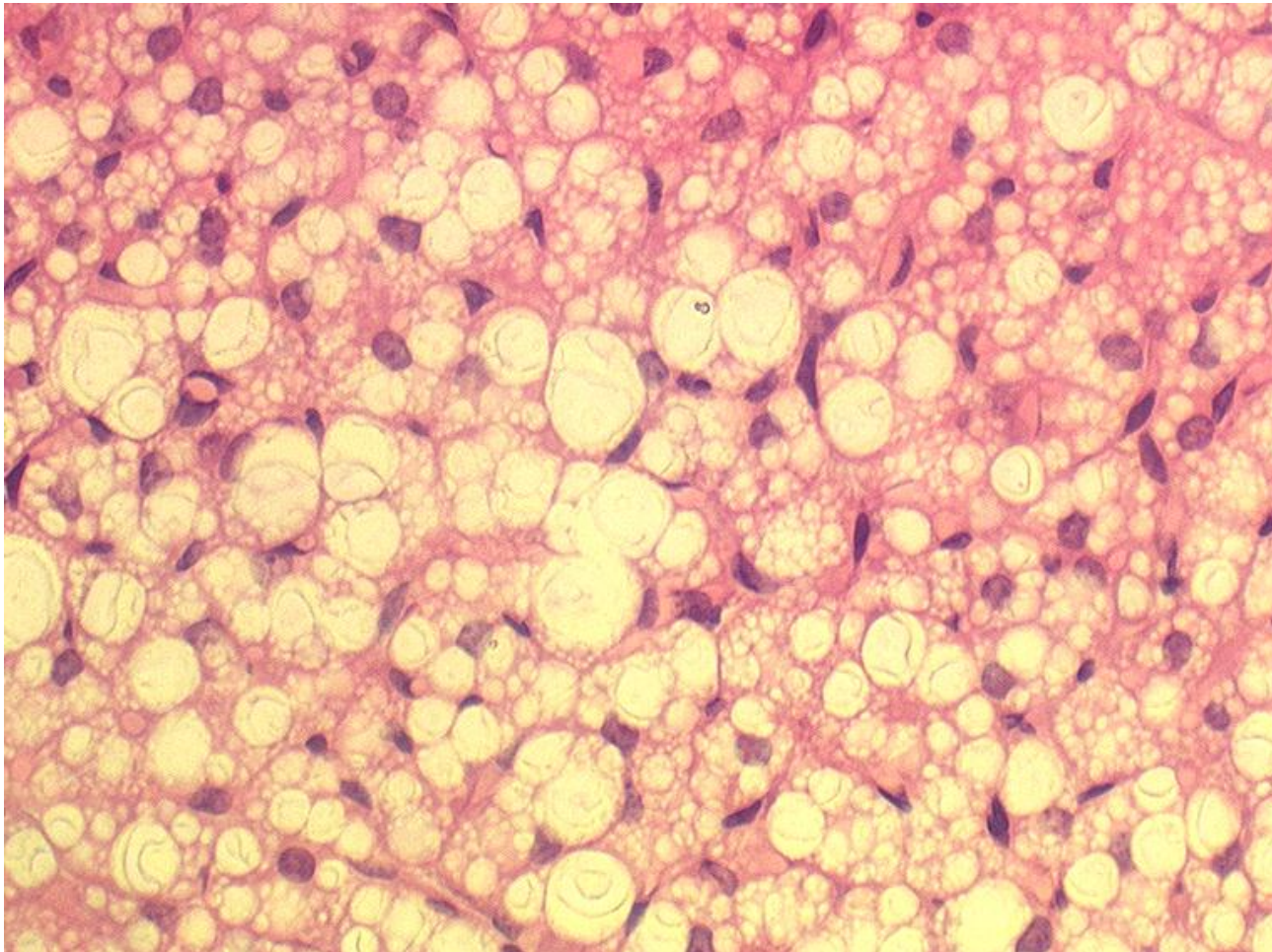
250 μm

1.0 cm

Adipose multilocular (brown)

Are all the adipocytes multilocular in this preparation or do you find any interspersed unilocular adipocytes as well?

Most appear to be multilocular, possibly some unilocular could be present.

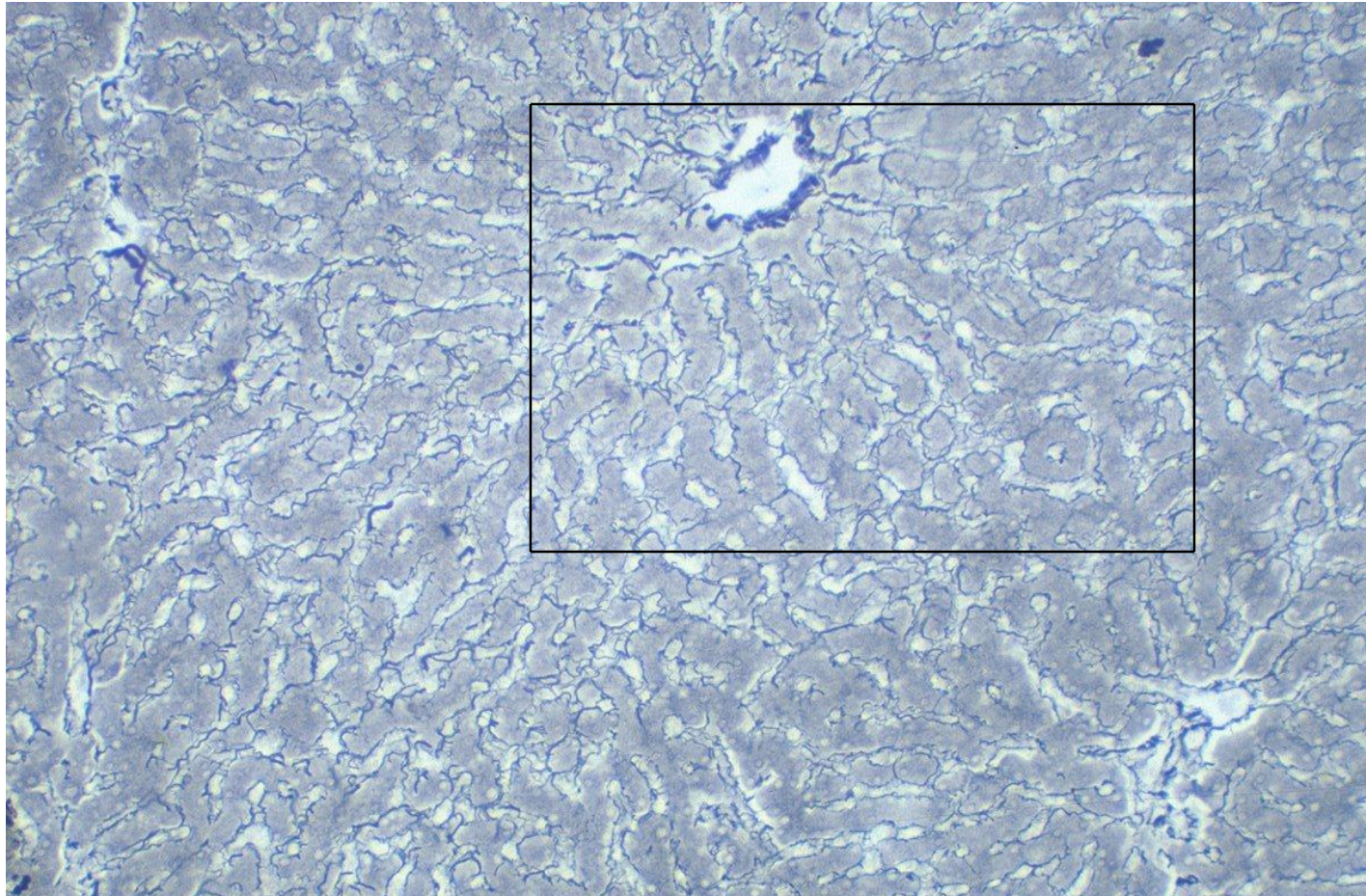


lipid droplets
variable in size

50 μ m

Reticular fibres in liver

Reticular fibres are only visible with special staining techniques.
In this example a silver stain has been used.

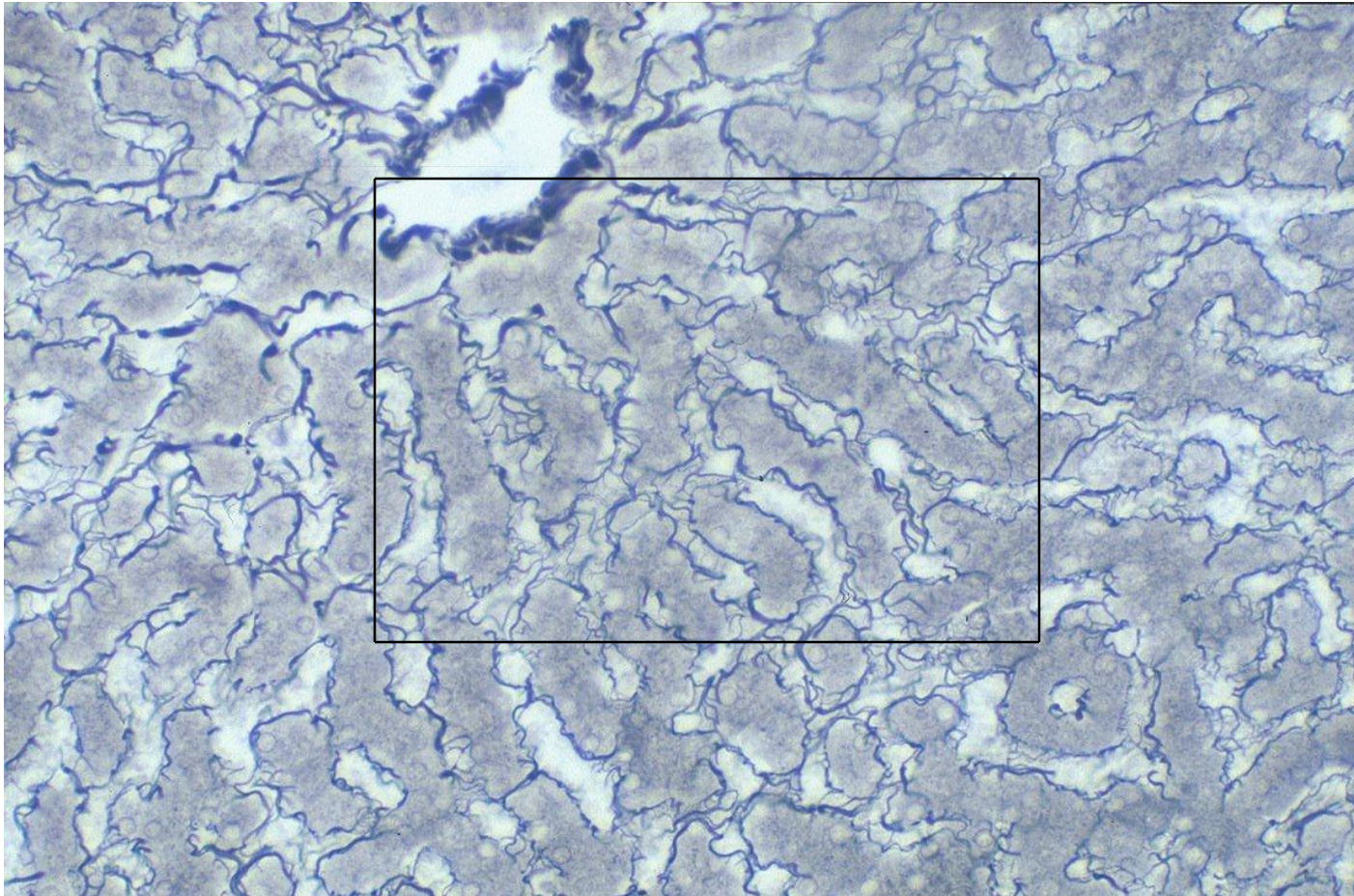


Reticular fibres in liver

Note the loose interwoven network created by the reticular fibres that are stained black.

What is this protein fibre composed of?

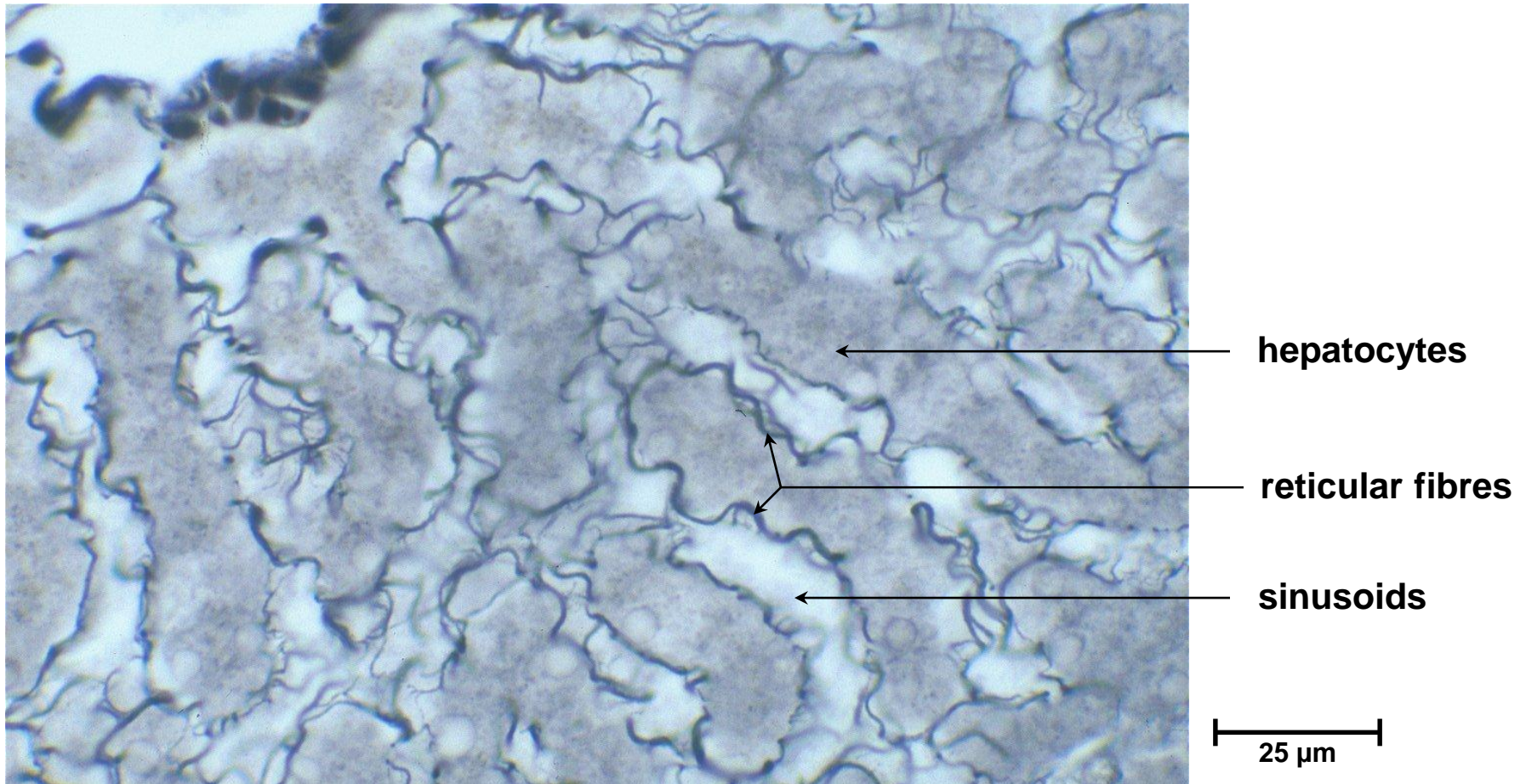
Collagen type III.



Reticular fibres in liver

Note the loose interwoven network created by the reticular fibres that are stained black. Why is this protein fibre most appropriate in these tissues?

Reticular fibres support tissues and organs, protecting cells and structures subjected to volume changes.



Reticular fibres in lymph node

The larger of the two sections on this slide.

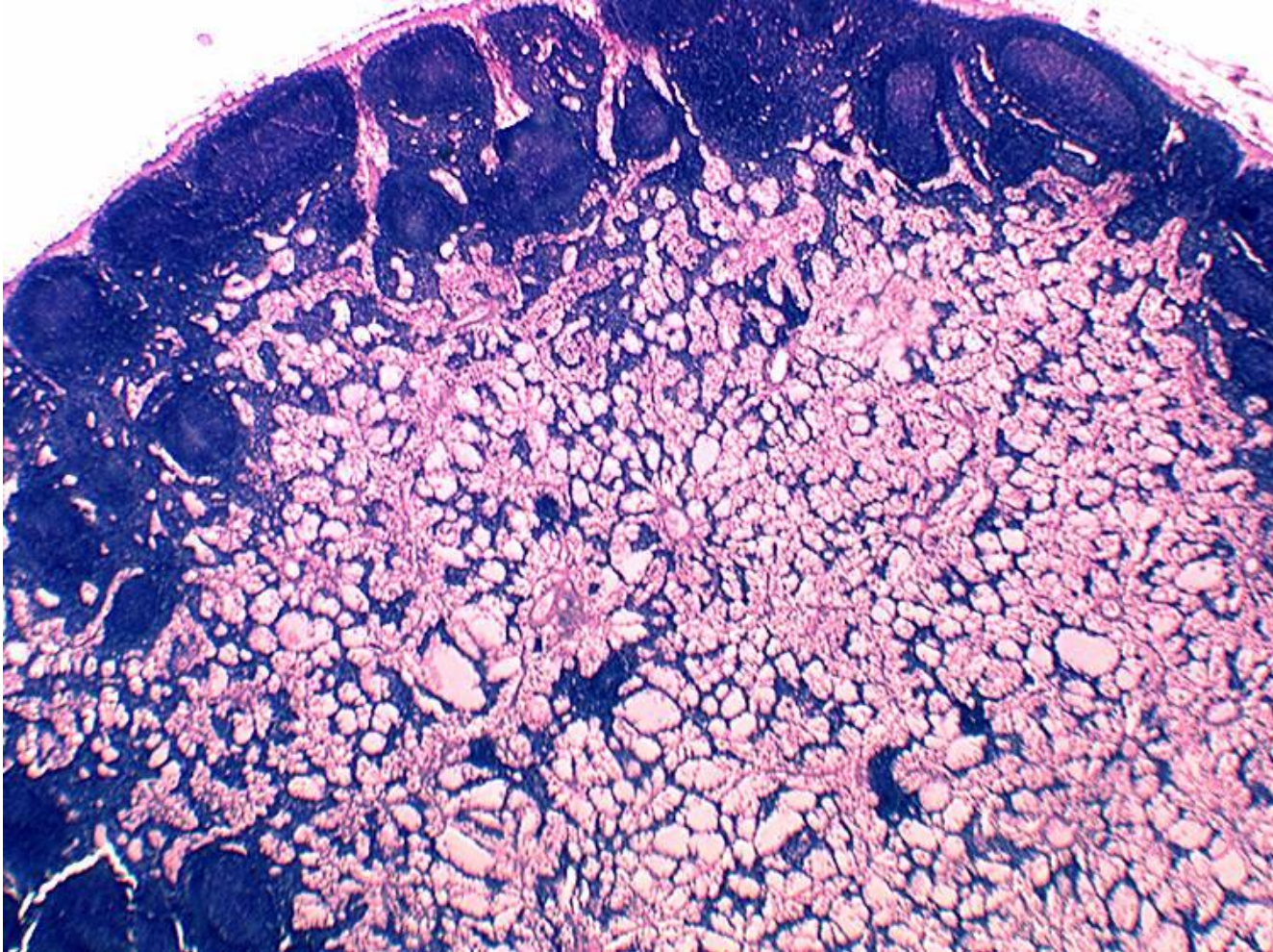
Under very low magnification.



2.5 mm

Reticular fibres in lymph node

Under low magnification.

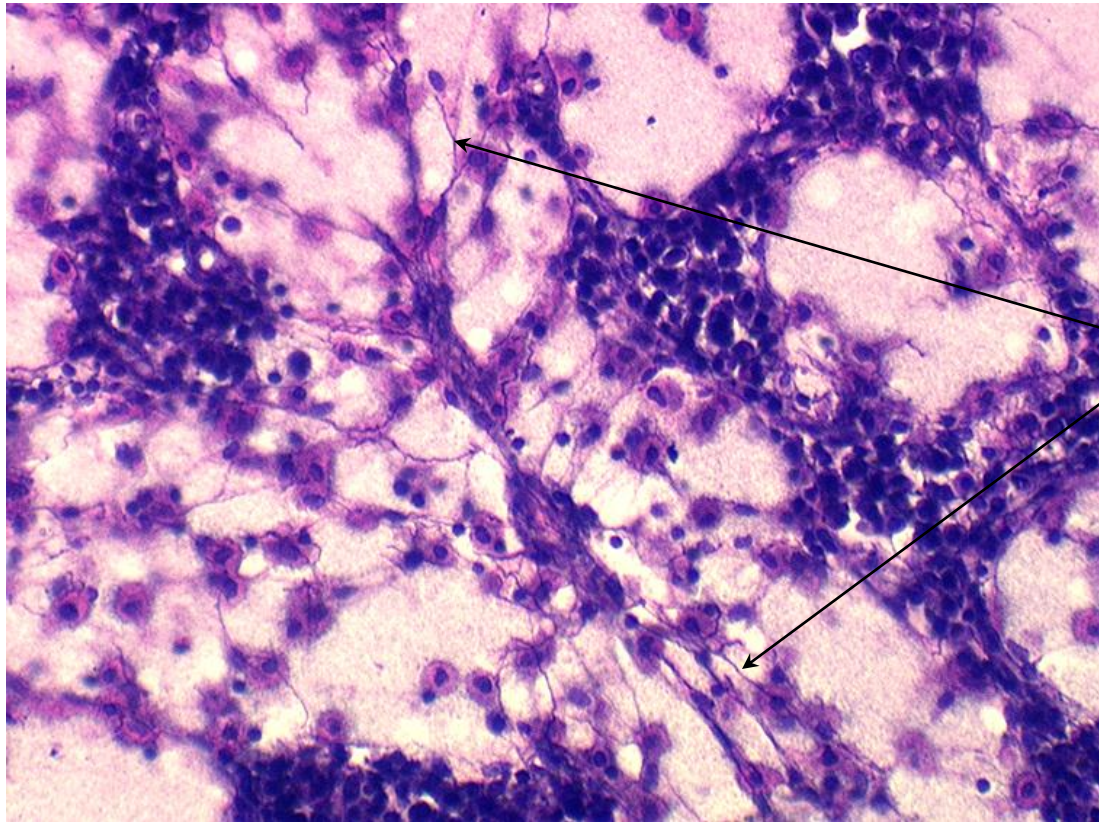


1.0 mm

Reticular fibres in lymph node

Note the loose interwoven network created by the reticular fibres that are stained black.
What is it composed of?

Collagen type III.



reticular fibres

50 μ m