Class 2

Polymorphism

Cell: an organised particle of living matter, capable of independent existence in particular environment. It's an integral and basic unit due to the cell membrane.

The basic features of eukaryotic cells are:

1. cell membrane

2. cell nucleus with nucleolus

3. Basic cytoplasm (hialoplasm) with organelles which are surrounded by complex intracellular membranes. It is able to move inside the cell and may contain movement structures like cilia, contractile filaments, mitotic spindle.

4. Ability to differentiate

Animal cells are characterised by **polymorphism** which means the multiformity of the cells. It concerns the shape and size of cells and is dependent on their localisation and function.

Erythrocytes

In birds, amphibians, reptiles and fish the erythrocytes are oval and there are also the nuclei. The size of the erythrocytes is about 12μm (length/perimeter).

In mammals, the erythrocytes are round from one side (from above) and from the other side they are shaped as biconcave disks (concave from both sides with thick and cylindrical edge). The size of the erythrocytes in mammals is about 5,5-7,3μm.

Oocyte

The oocytes are huge and spherical cells. The size of the egg cell in mammals is about 100-140μm.

Neurons

In the brain cortex there are pyramidal and spherical cells, in the cerebellum cortex there are spherical and pear-shaped neurons, in the spinal cord there are stellate neurons and in the ganglions there are oval cells.

The size of neurons vary from 4-150µm. The smallest are the spherical cells from cerebellum cortex and the biggest are the neurons in brain cortex.
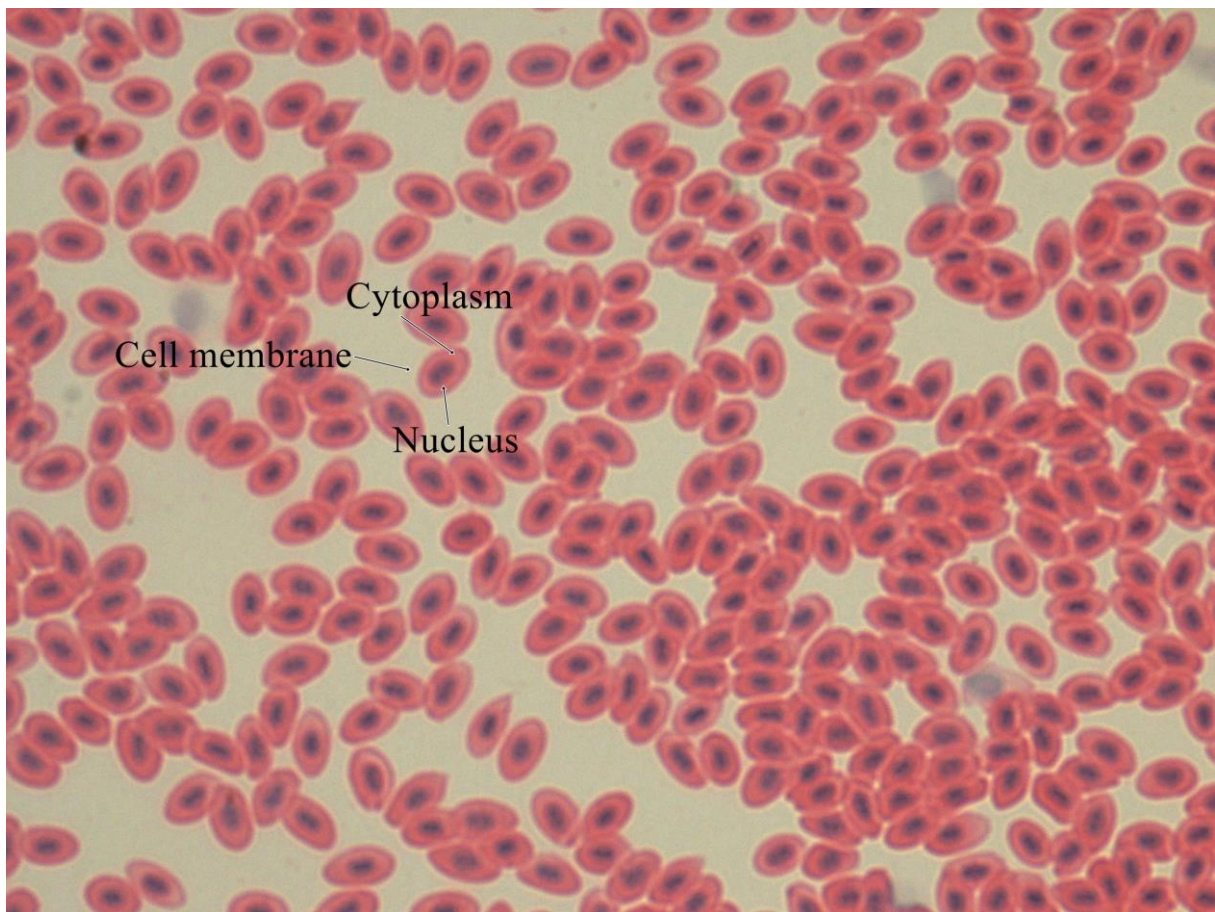
Fibrous astrocytes

The name of astrocytes is derived from the word aster in greek which means the star. The size of the astrocytes is about 18-30µm.
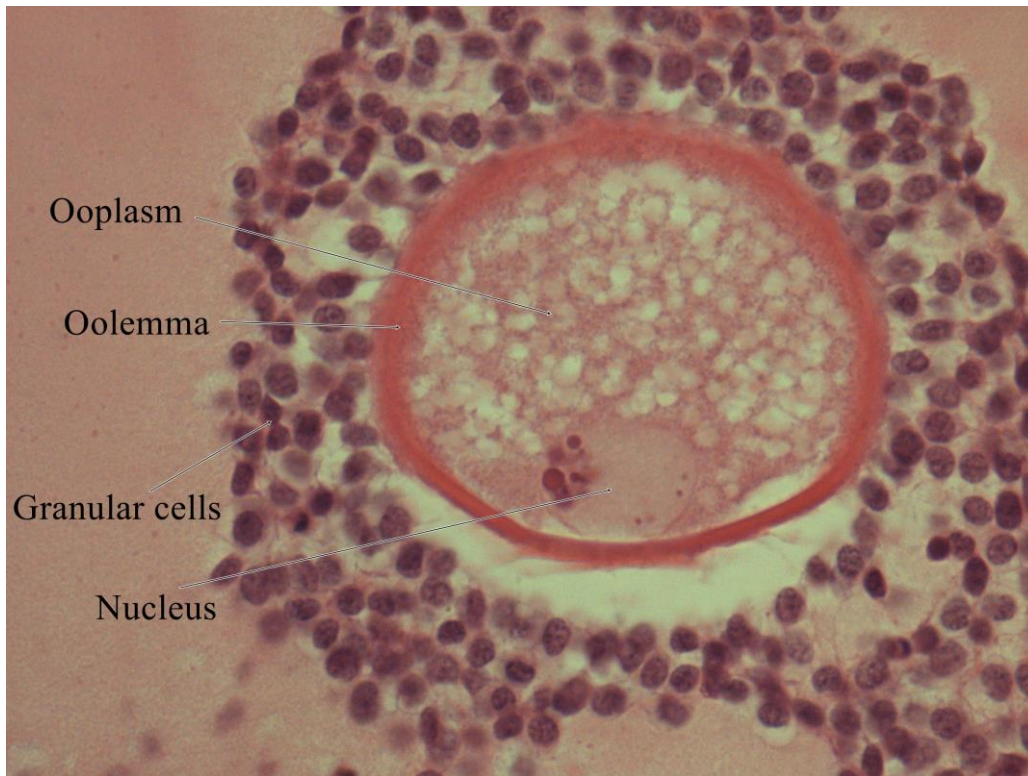
Myocytes

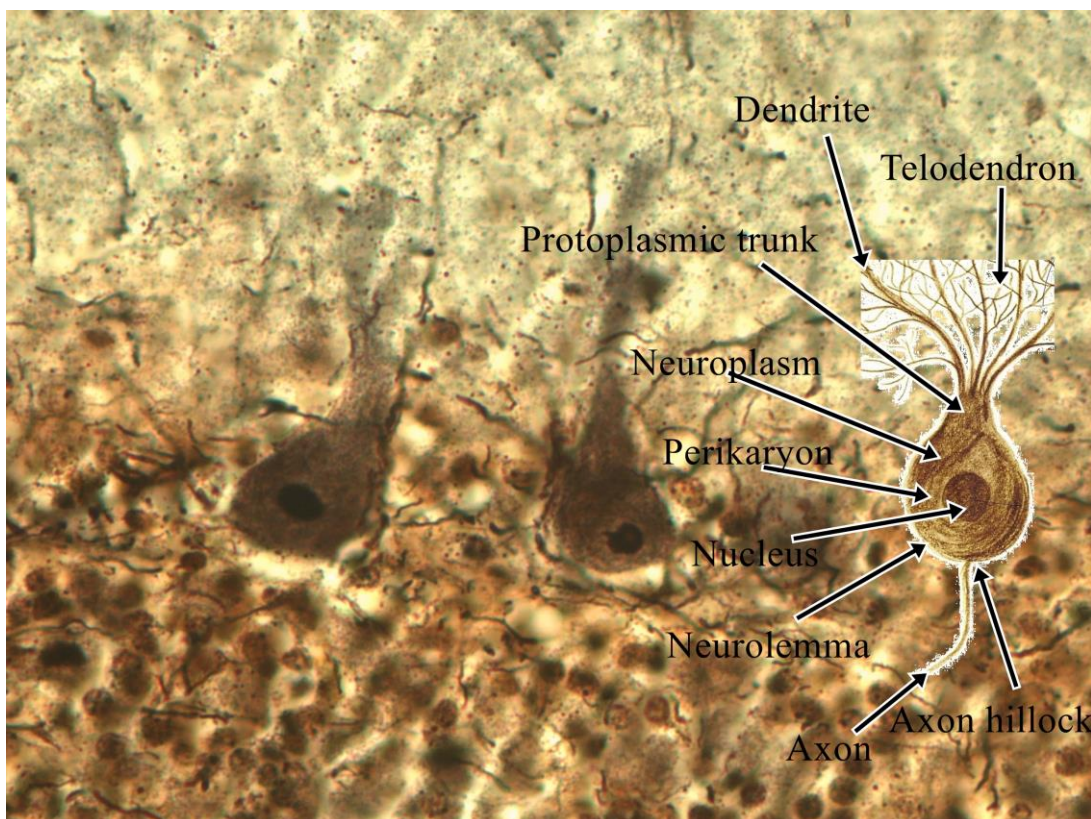Myocytes are fusiform. The size of the myocytes varies between 15µm in blood vessels to 500µm in pregnant uterus.
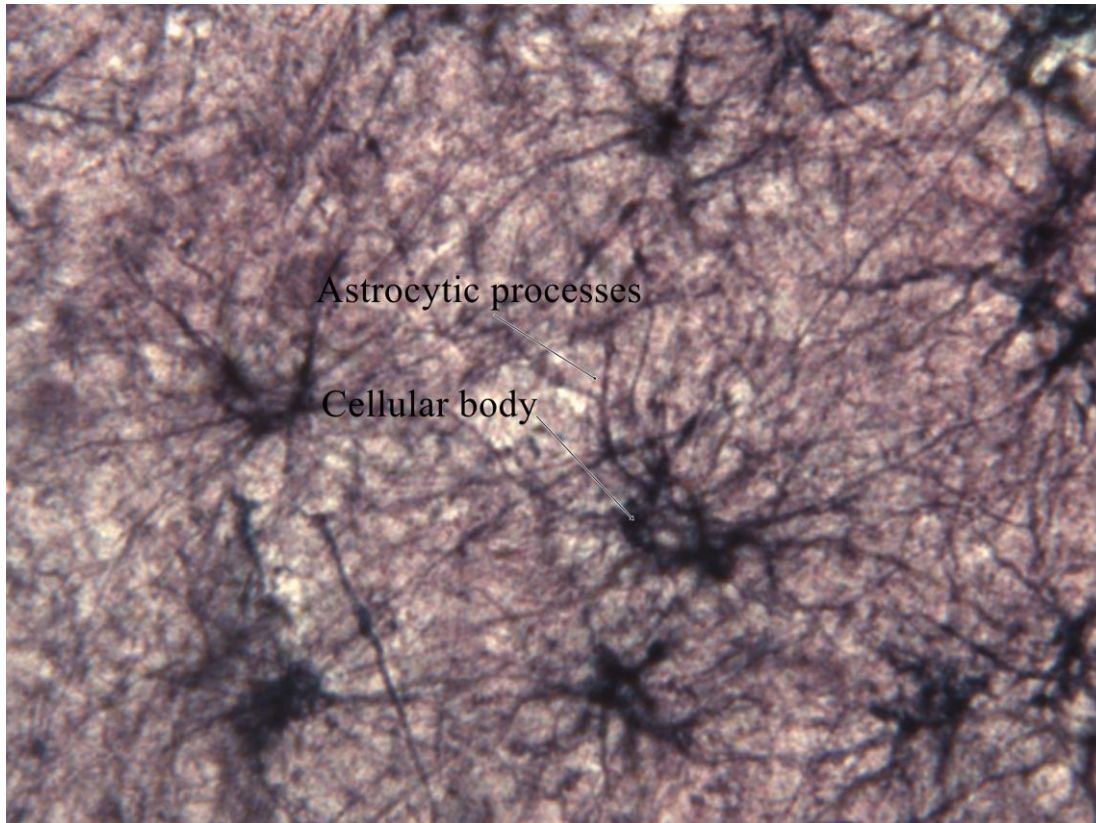
1. Avian red blood cells (H+E)

2. Oocyte (H+E)

Ooplasm

Oolemma

Granular cells

Nucleus

3. Pear-shaped neuron from cerebellar cortex (AgNO$_3$)

Dendrite

Telodendron

Protoplasmic trunk

Neuroplasm

Perikaryon

Nucleus

Neurolemma

Axon hillock

Axon

4. Fibrous astrocyte (Collewijn's method)

Astrocytic processes

Cellular body

5. Isolated myocytes (H+E)

Nucleus

Sarcoplasm

Sarcolemma