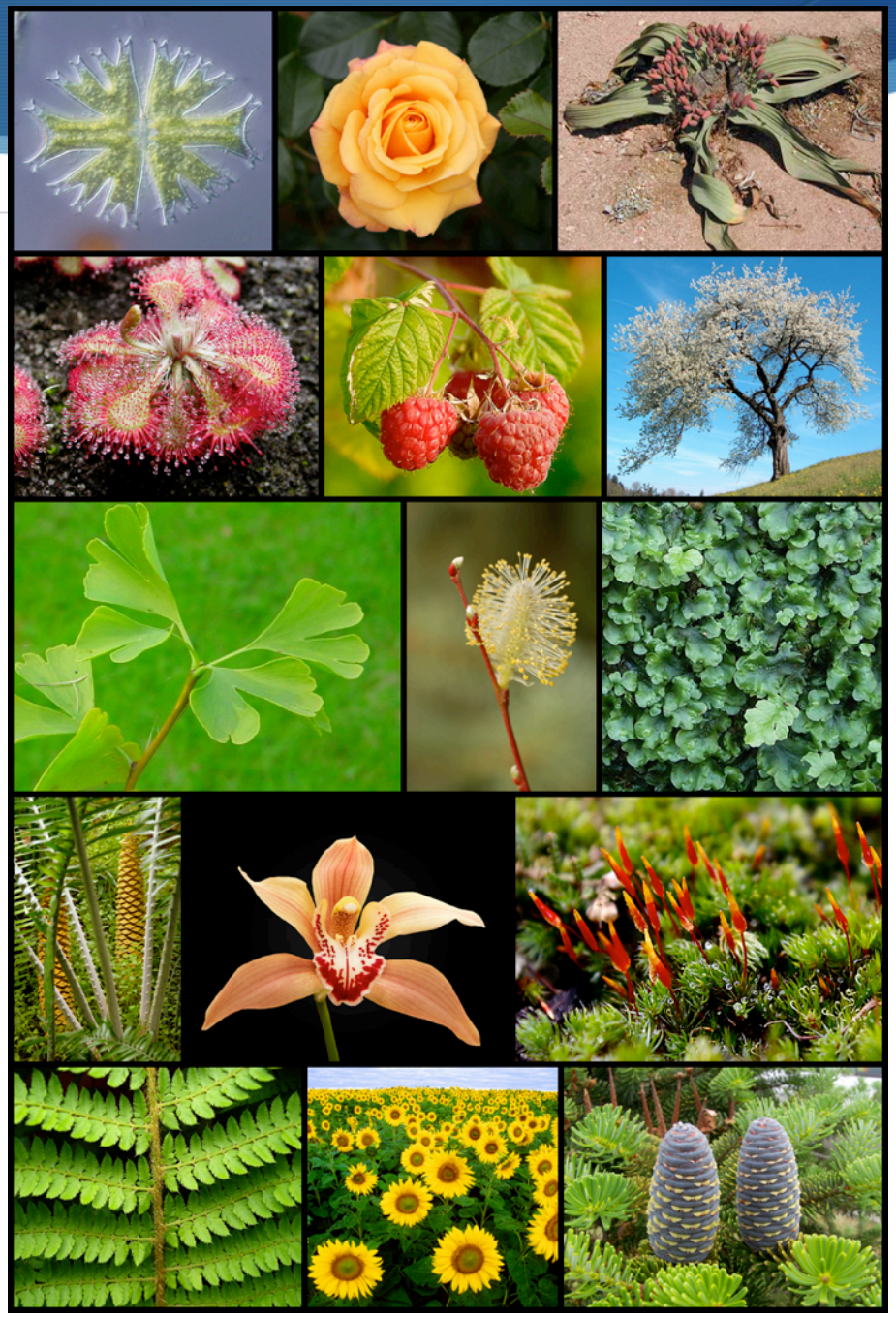
Plants

Plants come in all shapes and sizes, but they ALL have the ability to convert sunlight (electromagnetic) energy into sugar (chemical energy). This is done by a special structure in the plant cell called the chloroplast. Chloroplasts evolved from a photosynthetic bacteria and became adopted into larger cells to give them the ability to capture sunlight and make sugar… this is how we believe plant cells evolved.



Ferns comprise about 12,000 species of plants. Unlike mosses, they have vascular tissue to conduct fluids… xylem and phloem (making them vascular plants). They have stems, leaves, and roots like other vascular plants. Ferns reproduce via spores and have neither seeds nor flowers.

Angiosperms – Flowering Plants

Angiosperms are plants with flowers. The flowers have male and female structures that produce pollen (sperm) and eggs. When the flower is fertilized an embryo will form. The embryo forms inside a seed and the seed is inside a fruit…fertilized flowers form into fruits and the fruits contain seeds that contain embryos. The embryo will develop into a new plant if it is exposed to the correct environment.

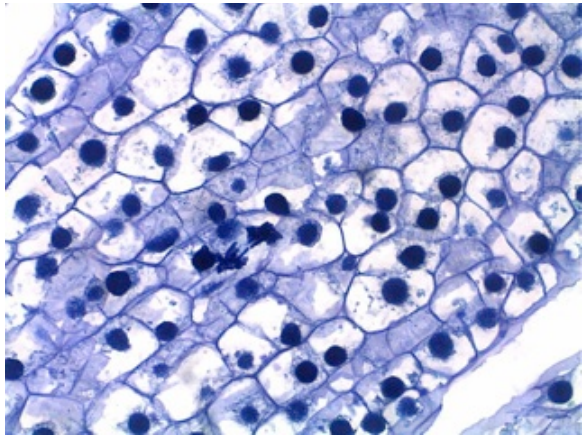
Four Main Plant Tissues

Dermal…forms a border around other cells
epidermis—typically the outer protective covering of plants
endodermis — typically an inner covering surrounding some internal structures

Vascular…transports fluids

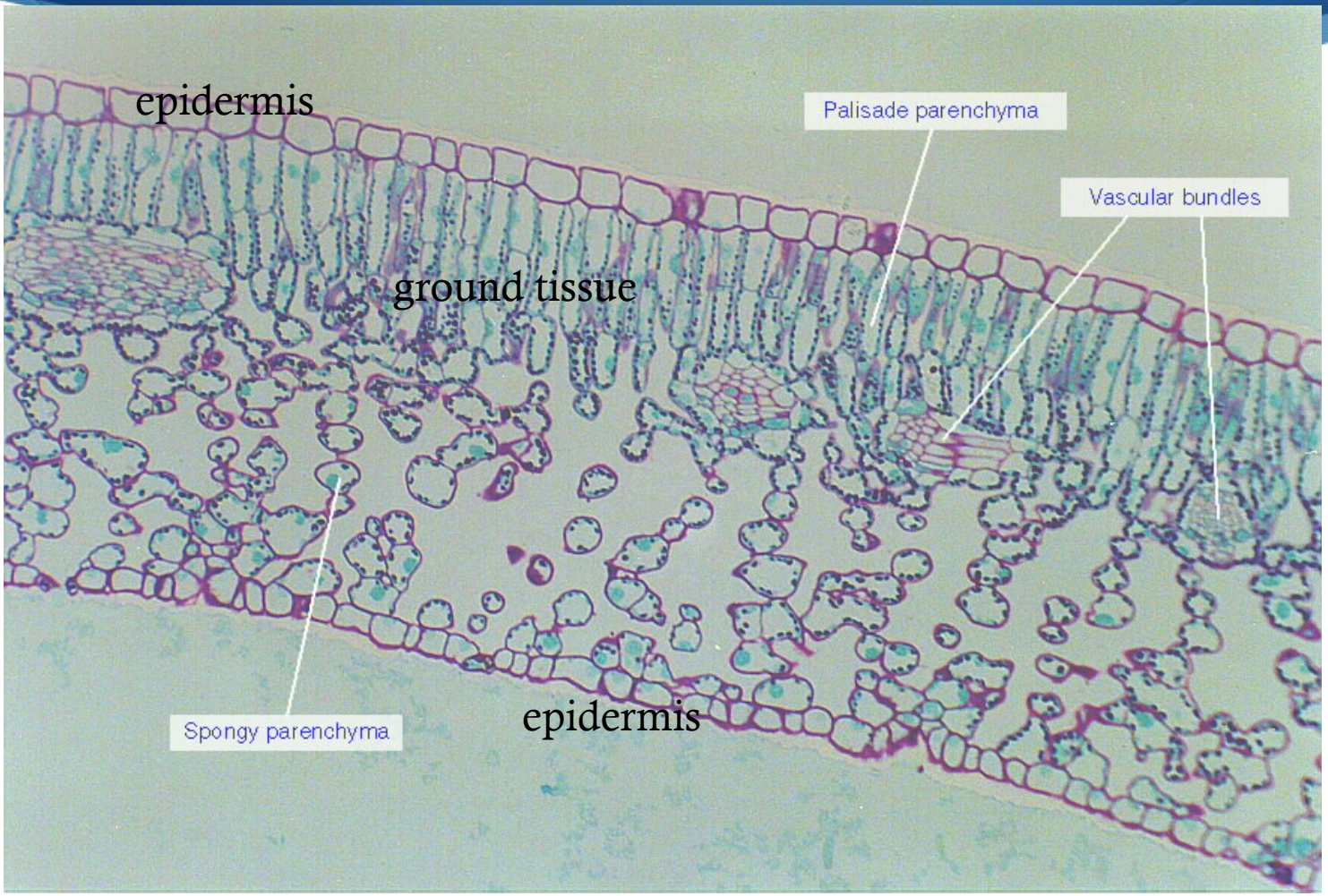
Ground …cells in between the epidermis and vascular tissue

Meristem…divide and differentiates into the above tissues (see picture below)



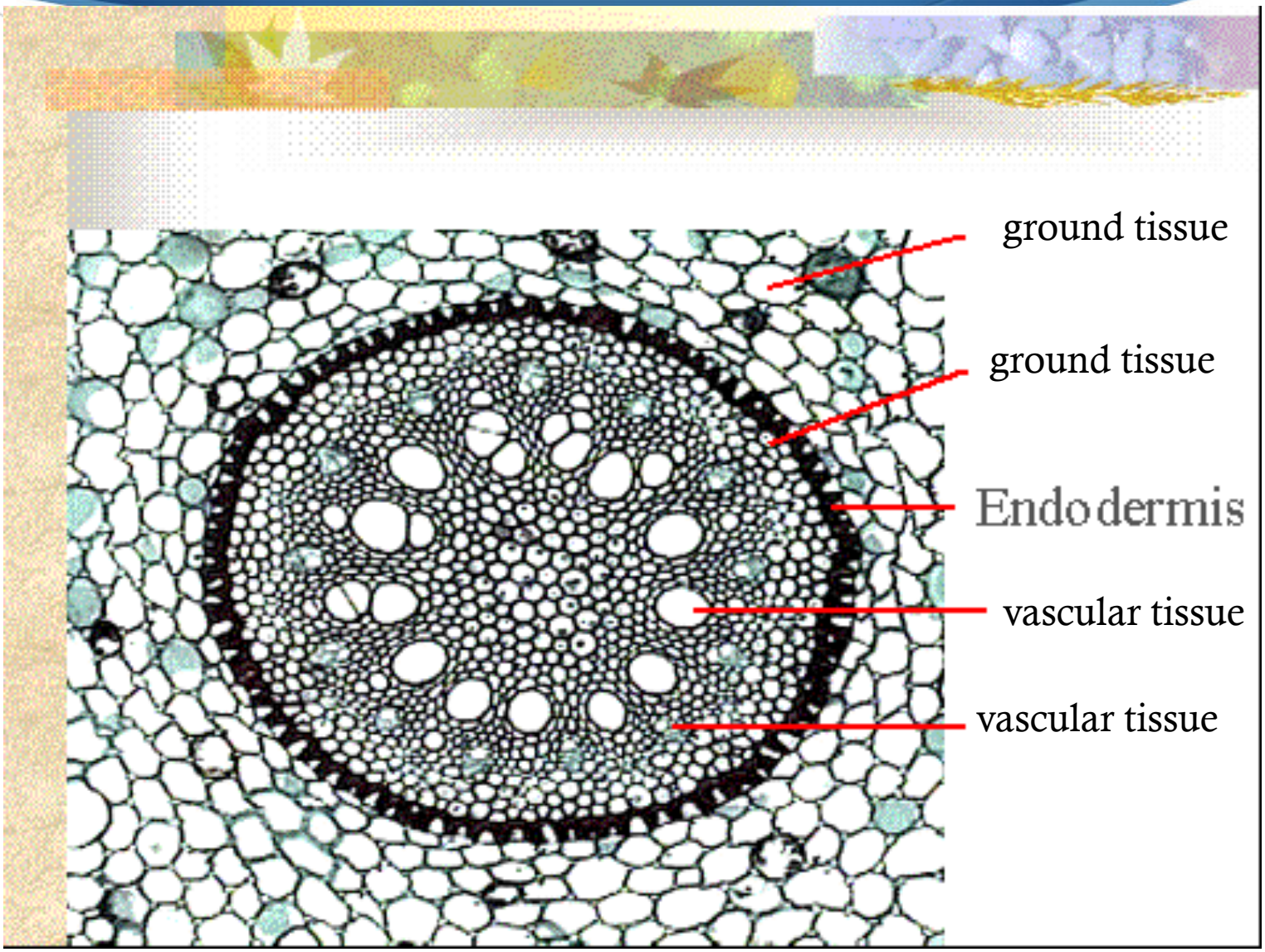
In this light micrograph taken at 400X we see meristematic tissue. Can you find the cell in late mitosis (anaphase)?

LEAF CROSS SECTION



In the light micrograph of a leaf, we see the upper and lower epidermal tissues and the inner ground tissue where photosynthesis occurs. The vascular bundles are (as you expect) are vascular tissue that conduct fluids.

Stem Cross-section



In this stem cross-section we find 3 of the four main plant tissues. Which one is missing?

Electron Micrograph of a Plant Cell

Typically, the largest organelle of a plant cell is its vacuole that stores fluid in the cells. When plants wilt, their vacuoles have lost too much water to remain firm and the plant sags.