

3. Nucleolus

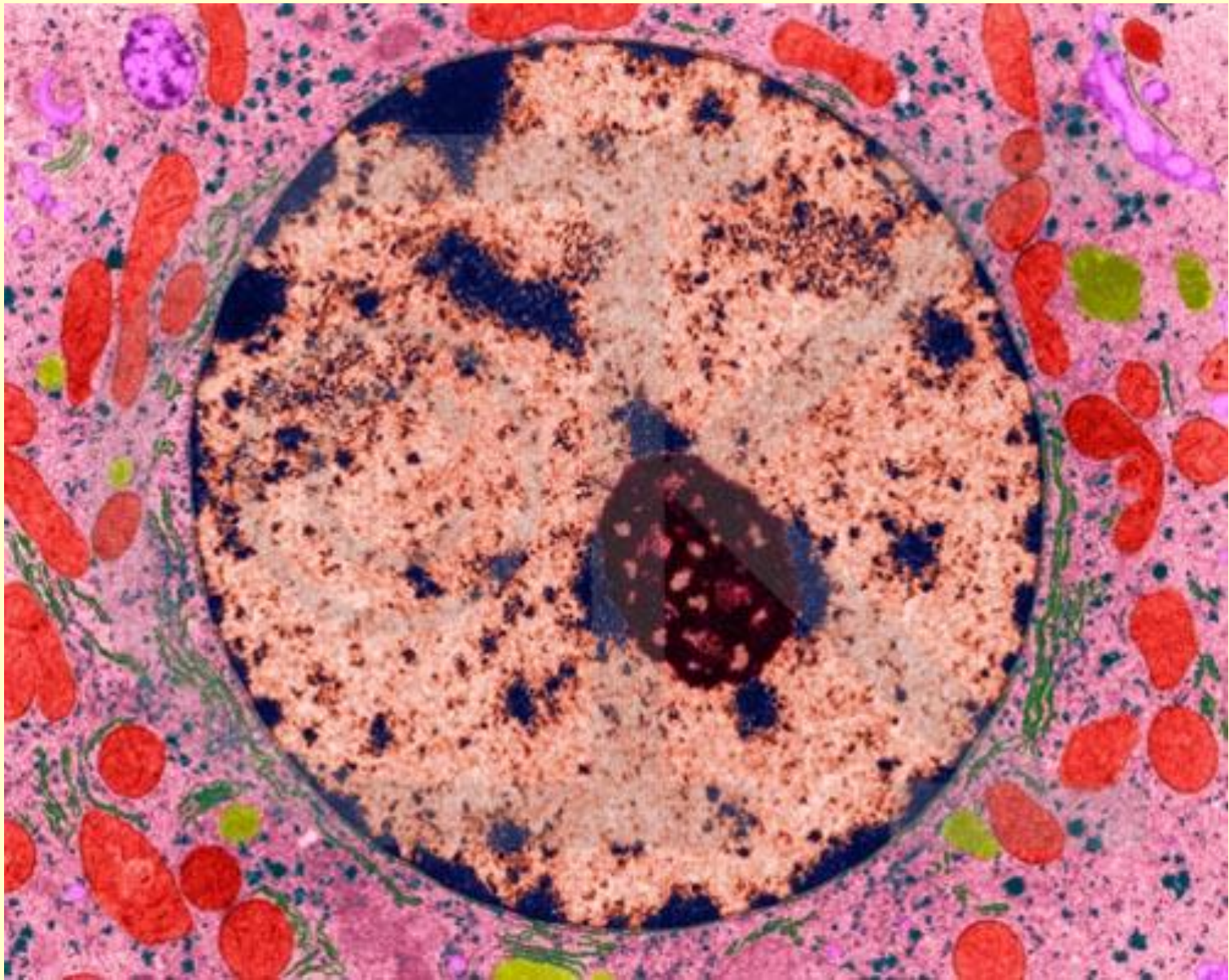
- Location: inside the nucleus
- Structure: dense granular bodies made up of DNA, RNA, and protein
- Function: produce ribosomes

4. Nuclear Envelope (Membrane)

- Location: surrounds the nucleus
- Structure: double membrane that contains dozens of pores
- Function: controls which materials enter and exit the cell

5. Chromosomes

- Location: found in the nucleus
- Structure: fine fibers composed of DNA and protein
- Function: contain genetic information that is passed on in cell division to each new generation



Liver cell nucleus with dark nucleolus

6. Endoplasmic Reticulum

- Location: found in the cytoplasm
- Structure: complex network of fluid-filled channels enclosed by membranes. Two forms:
 1. Rough ER - ribosomes present
 2. Smooth ER - ribosomes absent

Function:

1. Transport system.
2. Provide large surface area on which many chemical reactions may occur.
3. Divides cell into compartments, making it possible for a number of different reactions to go on at the same time.

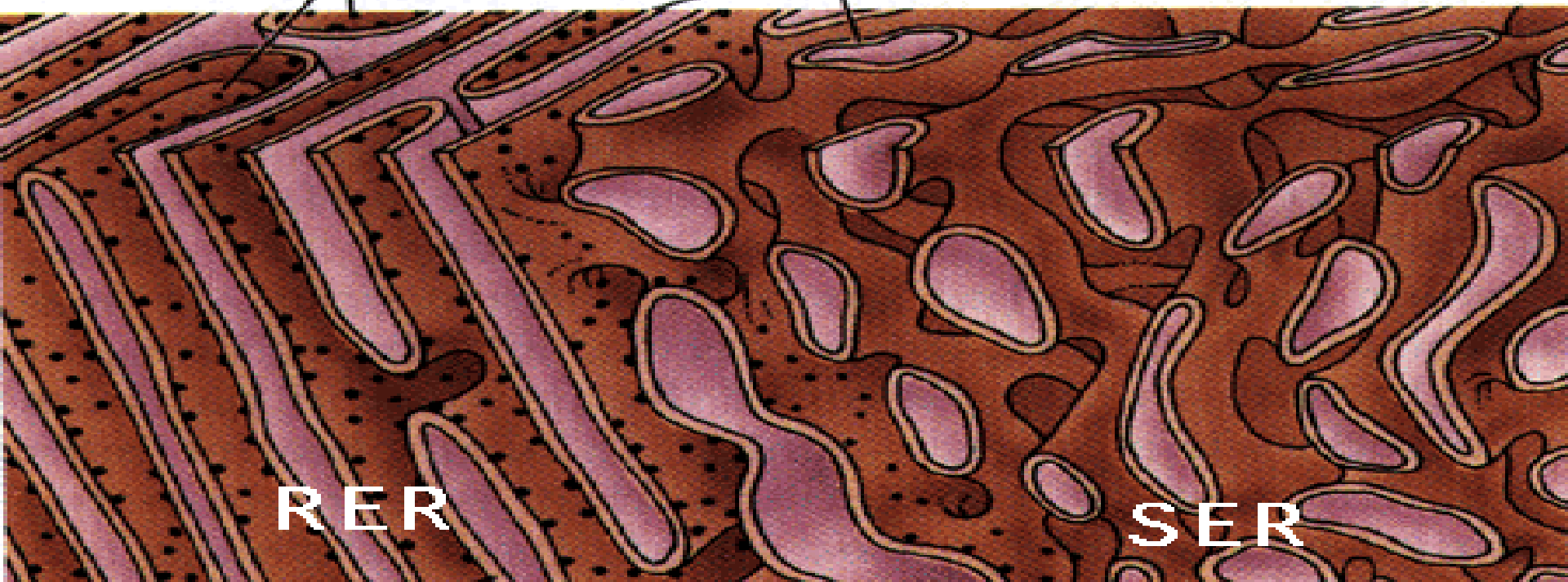
7. Ribosomes

- Location: found in the cytoplasm and on the endoplasmic reticulum.
- Structure: tiny, round organelles. Among the smallest organelles in the cell.
- Function: Protein production. The proteins are mostly enzymes that function in the cell's cytoplasm.



Ribosomes

Membranes



RER

SER

8. Mitochondria

- Location: found in the cytoplasm.
Numbers vary from 300 to 800 per cell depending on cellular activity.
- Structure: oval or slipper shaped with a double membrane:
 - A. Smooth outer membrane.
 - B. Inner membrane is highly folded, forming *cristae* that extend into the middle of the mitochondria. The cristae provide a large surface area where many biochemical reactions occur.

- Function: site of cellular respiration (energy release).

The biochemical reaction that produces energy in mitochondria:

Glucose + Oxygen -----> Carbon dioxide + water + energy



