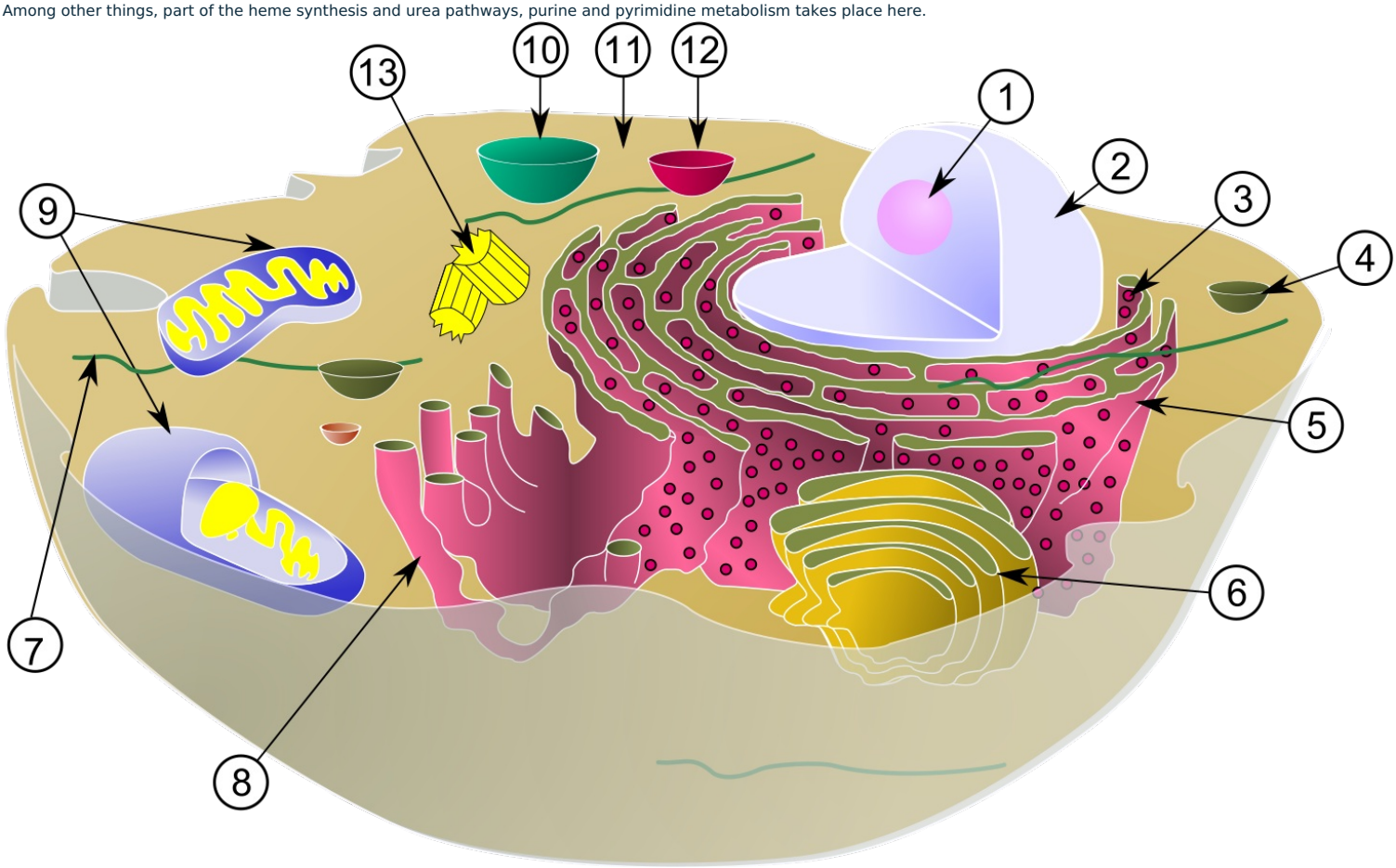
Orbital compartmentation

Cytosol

It is the cytoplasm itself, i.e. liquid part without organelles. Metabolism takes place here:

- **carbohydrates**: glycolysis, part gluconeogenesis, glycogenolysis and glycogen synthesis and pentose cycle
- **fatty acids**: MK synthesis
- **amino acid**: synthesis of non-essential AMK, some transaminations

Among other things, part of the heme synthesis and urea pathways, purine and pyrimidine metabolism takes place here.



Mitochondria

It belongs to the important organelles of cellular metabolism. Metabolism takes place here:

- **saccharides**: PDH, beginning of gluconeogenesis (conversion of pyruvate to oxaloacetate)
- **fatty acids**: β-oxidation of MK (Lynen's spiral), ketobodies synthesis (only liver cells), degradation of ketobodies (only extrahepatic tissues)
- **amino acid**: oxidative deamination of glutamate and some transaminations

The junction of all catabolic reactions is located here - Krebs cycle. The respiratory chain and oxidative phosphorylation take place on the inner mitochondrial membrane. Mitochondria are also important for heme and urea synthesis.

Rough endoplasmic reticulum

It has an important role in **proteosynthesis** (translation of mRNA takes place here). The synthesized proteins are subsequently **post-translationally modified** (oxidation, cleavage, methylation, phosphorylation, glycosylation).

Smooth endoplasmic reticulum

It has a significant role in the synthesis of TAG and phospholipids. Enzymes for "elongation" (up to a maximum length of 24 carbons in nervous tissue) and "desaturation" (up to a maximum distance of 9 carbons from the carboxyl group) of fatty acids are located here. Part of steroid synthesis and biotransformation of xenobiotics takes place here. In some tissues there is a localized **glucose-6-phosphatase** which converts glucose-6-phosphate into glucose.

Golgi Apparatus

Post-translational modification of proteins (e.g. glycosylation), further sorting of proteins and formation of ``secretory vesicles *takes place here.*

Lysosomes

It is used for the *hydrolytic cleavage* of proteins, carbohydrates, lipids and nucleic acids.

Peroxisomes

It serves to degrade MK with a long chain (from 20 carbons).