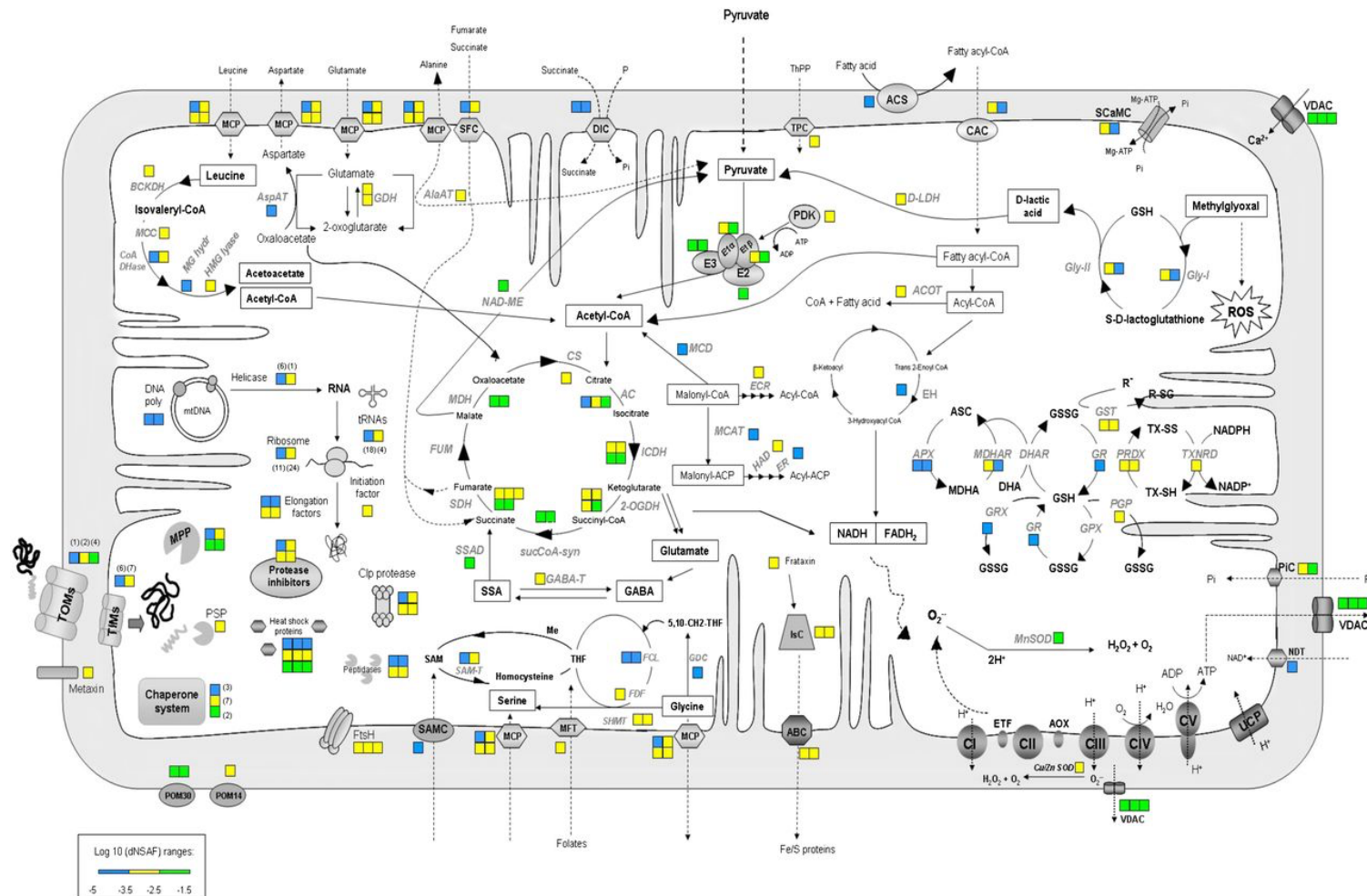




02 – CELLS AS THE BASIS OF LIFE

2.3b - Transport Across Membranes



Metabolism & Membranes



2.3.2 Cell metabolism is critical to the survival of cells.

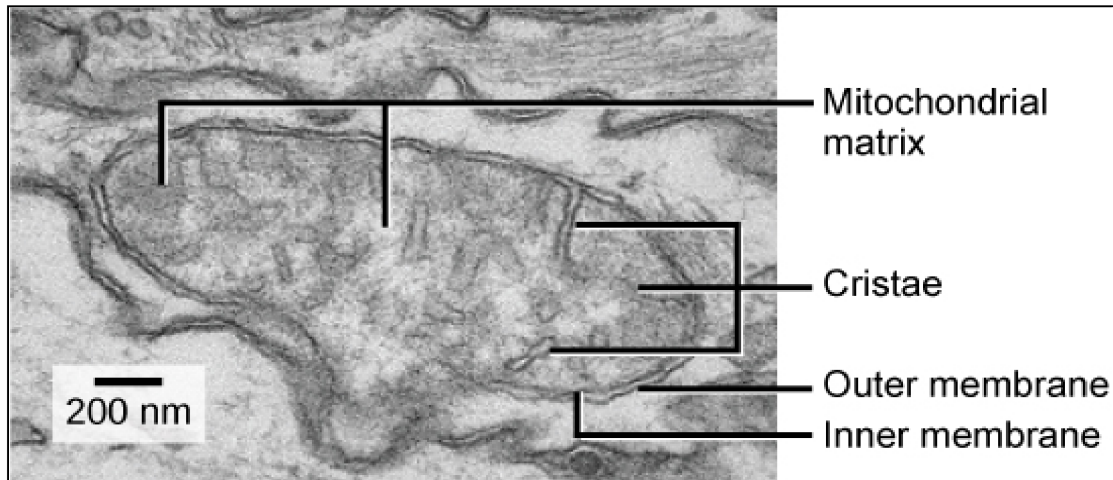


2.3.3 Biochemical processes in the cell are influenced by the nature and arrangement of **internal membranes** and the presence of specific **enzymes**.

Explain how the **structure** of internal membranes of mitochondria and chloroplasts **facilitates** some biochemical processes.

Metabolism & Membranes

Mitochondria



Optimum environment for respiration

Outer membrane:

*lipid bilayer; carrier and channel proteins; enzymes embedded that help catalyst reactions in cytoplasm

Inner membrane:

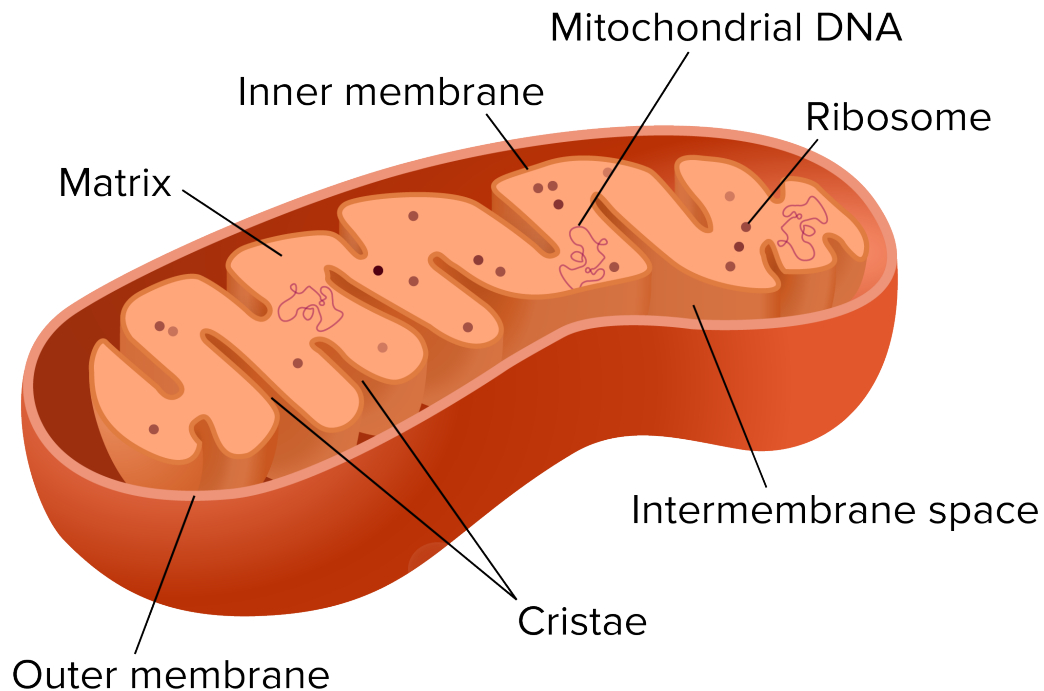
*lipid bilayer; contains enzymes used in ATP synthesis

Cristae:

*inner folds increase SA:V ratio of inner membrane; increase rate of ATP synthesis

Matrix:

*mitochondrial DNA; ribosomes; enzymes for reactions



Metabolism & Membranes

Chloroplast

Optimum environment for photosynthesis

Inner/Outer membrane:

*regulate transport of materials between stroma and cytoplasm; inner contains enzymes that make pigments and lipids

Thylakoid:

*membrane bound sacs containing light-absorbing pigments and enzymes

Granum:

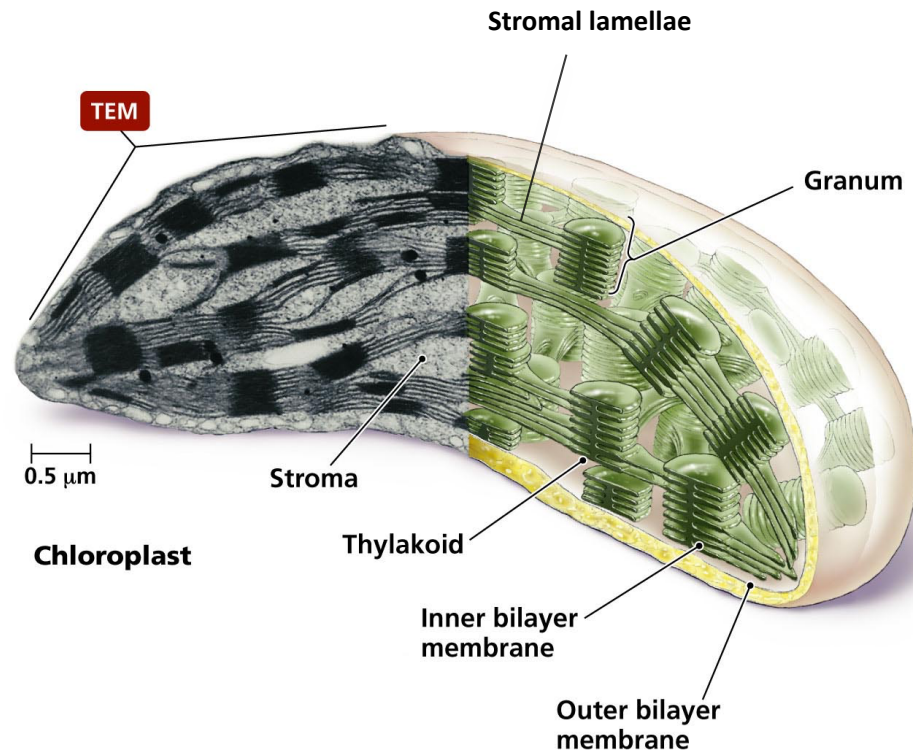
*stack of thylakoid = increase SA

Stroma:

*gel-like fluid containing enzymes and DNA and ribosomes

Stromal lamellae:

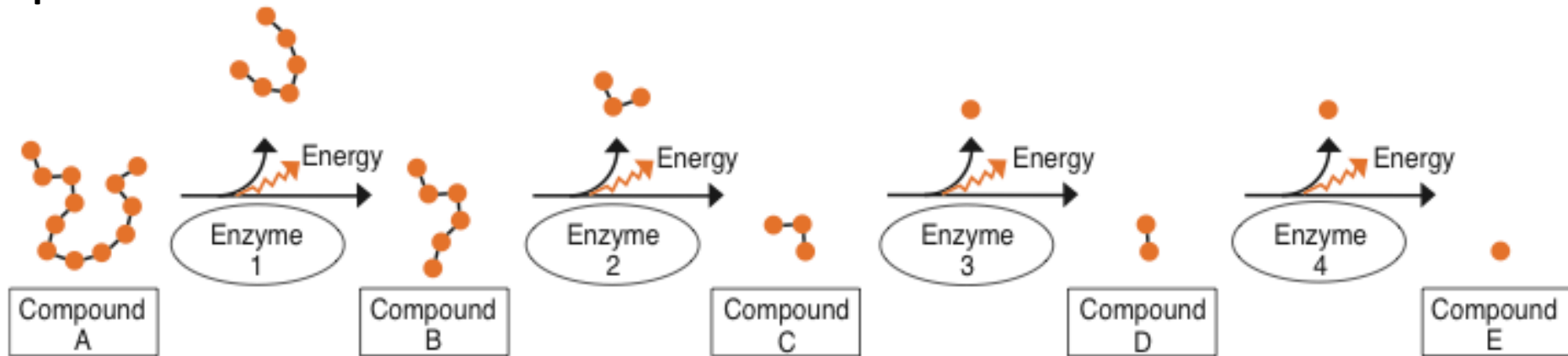
*extensions of thylakoid membranes = increase SA



Metabolic Pathways

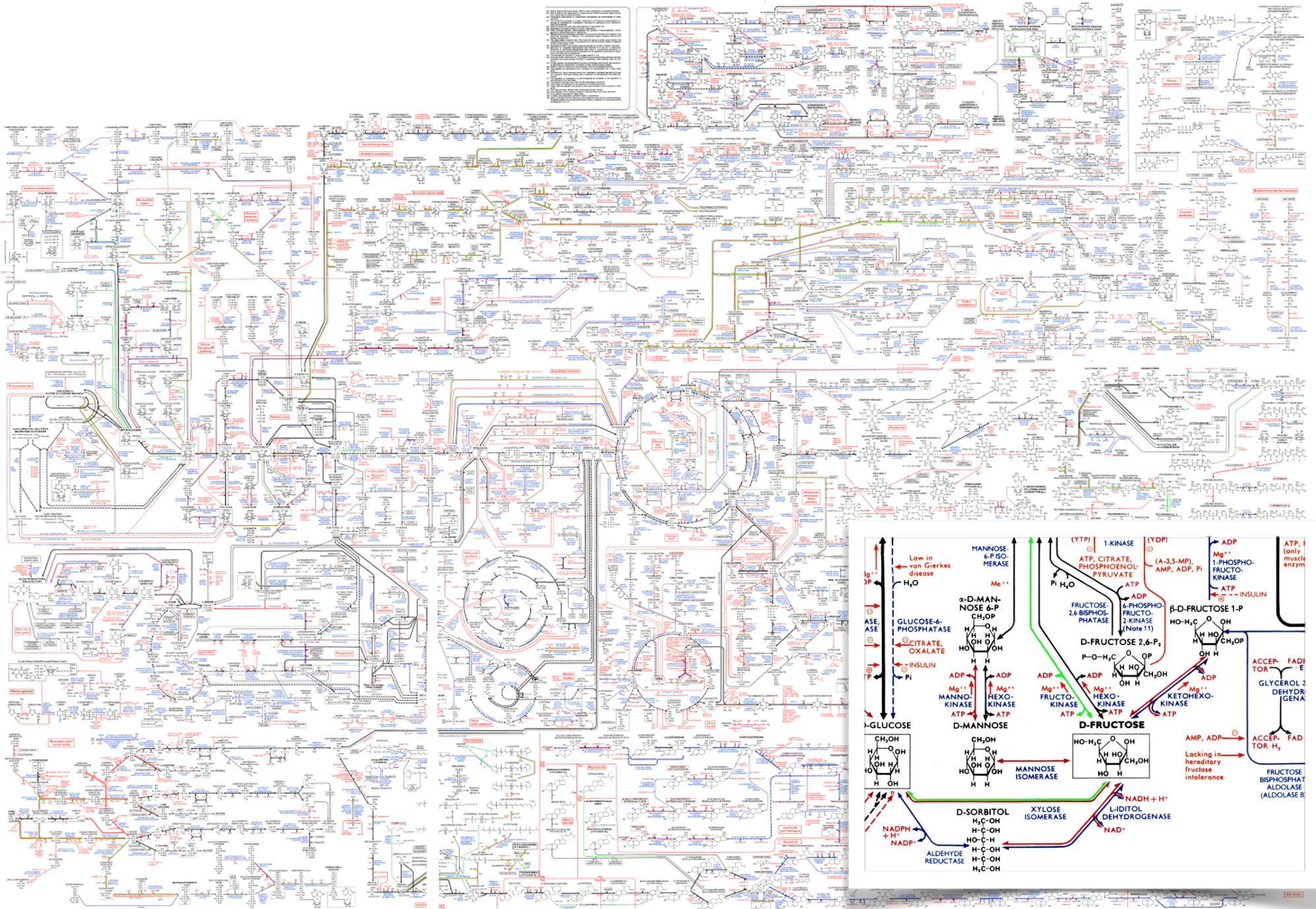
- ☑ Explain that in a metabolic pathway:
- there are many **regulated** steps
 - each step loses some energy as **heat**
 - some steps produce **intermediate** compounds
 - specific **enzymes** are required at each step.

Explain:

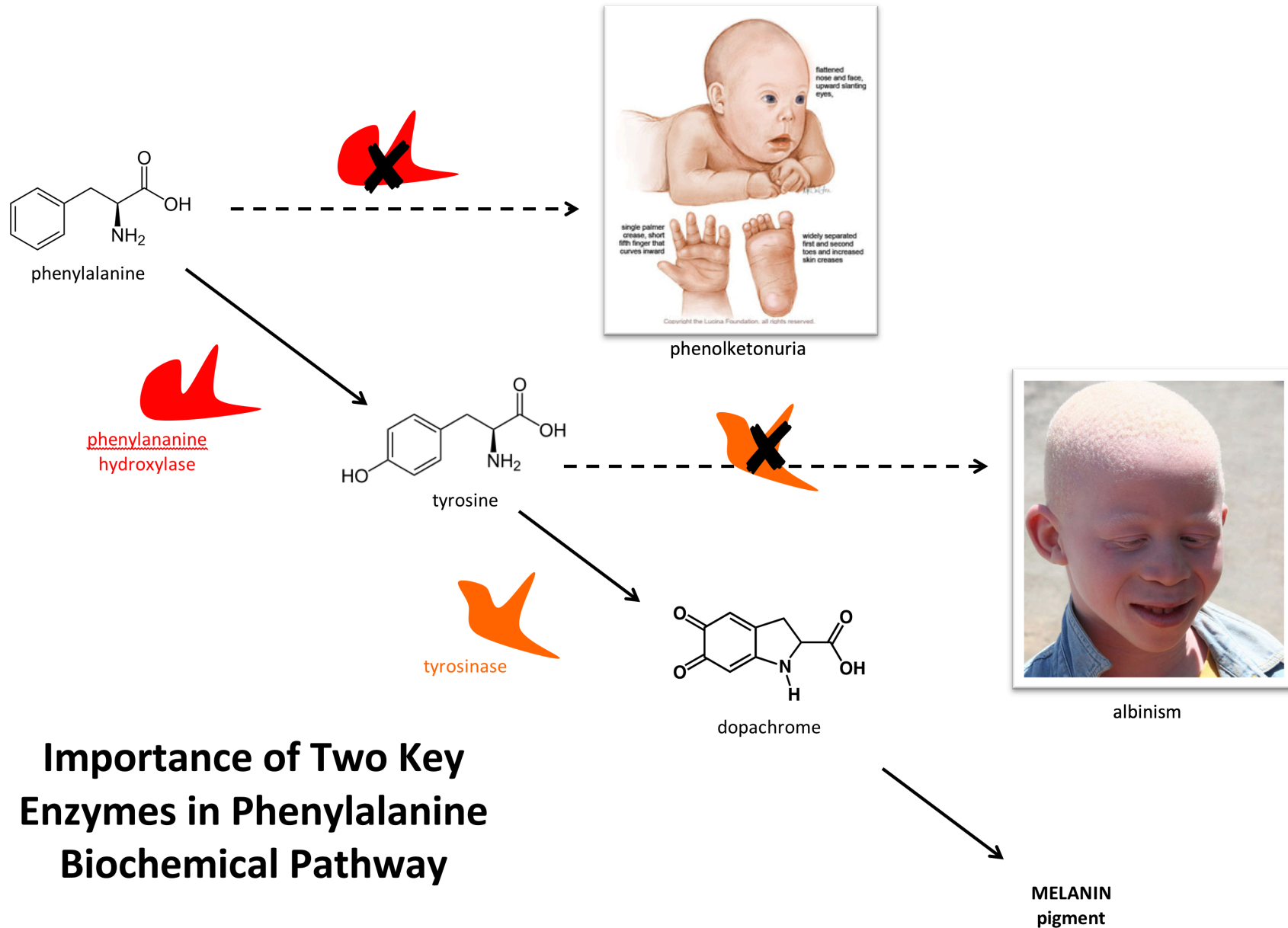


Regulatory enzymes (control by activating or inhibiting these)

Metabolic Pathways



Metabolic Pathways



Effect of Environmental Factors



2.3.4 Biochemical processes in the cell are influenced by environmental factors.

Temperature

Light intensity

pH

Availability of water

Availability of substrates and enzymes

Effect of Chemicals



2.3.5 Chemicals can interfere with cell metabolism.

- Discuss possible benefits and/or harmful effects of chemicals that human beings use.

Pesticides

Fertilizers

Antibiotics

Drugs (prescription)