

Metabolism:

The chemical reactions that occur in living organisms, comprising anabolism and catabolism; may be qualified to mean the chemical reactions undergone by a particular substance, or class of substances, in a living organism.

OR alternately:

Processes that cause many of the chemical changes in living organisms, including anabolism and catabolism.

Metabolic processes typically transform small molecules, but also include macromolecular processes such as DNA repair and replication, and protein synthesis and degradation. [comment or to be revisited: Metabolic processes do not include single functions (or processes?) as protein-protein interactions, protein-nucleic acids, nor receptor-ligand interactions.]

Organismal metabolism:

Metabolic processes in multicellular organisms that occur at the tissue, organ, or organismal level. These processes, unlike cellular metabolism, can include transport of substances between cells when that transport is required.

Cellular metabolism:

Metabolic processes by which individual cells transform chemical substances.

Primary metabolism:

Primary metabolism encompasses reactions involving those compounds which are formed as a part of the normal anabolic and catabolic processes. These processes take place in most, if not all, cells of the organism.

MetaCyc (www.metacyc.org)

Taiz, Lincoln, and Eduardo Zeiger. "Surface Protection and Secondary Defense Compounds." *Plant Physiology*. New York: Benjamin/Cummings Publishing Company, Inc., 1991: 320-345.

Secondary metabolism:

Metabolism of secondary compounds, defined simply as compounds other than primary compounds. A compound is classified as a secondary metabolite if it does not seem to directly function in the processes of growth and development. Even though secondary compounds are a normal part of the metabolism of an organism, they are often produced in specialized cells, and tend to be more complex than primary compounds. Examples of secondary compounds include antibiotics, and plant chemical defenses such as alkaloids and steroids.

MetaCyc (www.metacyc.org)

Taiz, Lincoln, and Eduardo Zeiger. "Surface Protection and Secondary Defense Compounds." *Plant Physiology*. New York: Benjamin/Cummings Publishing Company, Inc., 1991: 320-345.

[item in sourceforge, should be readdressed via sourceforge]

Secondary metabolism:

Processes that result in many of the chemical changes of compounds that are not required for growth and maintenance of cells, and are often unique to a taxon. In multicellular organisms secondary metabolism is generally carried out in specific cell types, and may be useful for the organism as a whole. In unicellular organisms, secondary metabolism is often used for the production of antibiotics or for the utilization and acquisition of unusual nutrients.

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Metabolism Branch

- Physiological process
 - Metabolism (GO:0008152)
 - Organismal metabolism (new)
 - Cellular metabolism (new)
 - Primary metabolism (new)
 - Secondary metabolism (GO:0019748)
 - Anabolism (GO:0009058)
 - Catabolism (GO:0009056)
 - Regulation of metabolism
 - Generation of precursor metabolites and energy (rename energy pathways, needs definition, consult metacyc def)

Cellular Metabolism Parentage

- Physiological process
 - Cellular physiological process
 - Cellular metabolism
 - Metabolism (GO:0008152)
 - Cellular metabolism
- Cellular process
 - Cellular physiological process
 - Cellular metabolism

Organismal Metabolism Parentage

- Physiological process
 - Organismal physiological process
 - Organismal metabolism
 - Metabolism (GO:0008152)
 - Organismal metabolism

Where should the following go?

- Energy pathways:

Not defined.

- Electron transport:

The transport of electrons from an electron donor to an electron acceptor.

- Oxidative phosphorylation:

The phosphorylation of ADP to ATP that accompanies the oxidation of a metabolite through the operation of the respiratory chain. Oxidation of compounds establishes a proton gradient across the membrane, providing the energy for ATP synthesis.

Where should the following go?

- Metabolism resulting in cell growth:

The chemical reactions and physical changes that occur in living organisms that result in an increase in the mass (size) of a cell.

Delete this term.

- **long-term maintenance of gene activation:**

Any mechanism, at the level of transcription or post-transcription, maintaining gene activation in the long-term.

Move this term.

Are the following cellular or organismal metabolism?

- Alcohol metabolism
- Drug metabolism
- Other examples?

What are examples of organismal metabolism?

- C4 photosynthesis
- Salivary polysaccharide metabolism
- Lignification
- Starch metabolism
- Organismal lipid metabolism
- Hybernation