Acellular



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formation of a hormone (angiotensin) that narrows/restricts blood vessels. (*See* also ACE).

 Acellular: Describing tissues or organisms that are not made up of separate cells but often have more than one nucleus (Fig. 7).





- Acentric chromosome: A chromosome without a centromere.
- Acentric fragment: Of a chromosome (generated by breakage) lacks a centromere and is lost at cell division.
- Acetosyringone: A phenolic compound produced by dicot plant cells at wound sites; acts as signal molecule for the expression of vir regulon of *Agrobacterium tumefaciens*.
- Acetylation: Addition of an acetyl (CH₃CO) group.
- Acetyl carnitine: One of the metabolites of mitochondria, it is a substrate (substance that is acted upon) for acylcarnitine transferase (which converts the acetyl carnitine to carnitine). Research indicates that consumption of acetyl carnitine helps increase the levels of acetylcholine and nerve growth factor (NGF) in the brain (Fig. 8).

Adaptive genetic variance

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- Acylcarnitine transferase: An enzyme that converts the mitochondrial metabolite acetyl carnitine into carnitine.
- Acyl-CoA: Acyl derivatives of coenzyme A (acyl-S-CoA).
- **AD**: An acronym referring to the group of diseases known collectively as autoimmune disorders. These include diseases such as multiple sclerosis, lupus, rheumatoid arthritis, etc.
- Ada enzyme: An enzyme in *Escherichia coli* that is involved in the direct repair of alkylation mutations.
- Adaptability: The potential or ability of a population to adapt to changes in the environmental condition through changes of its genetic structure.
- Adaptation: An internal change in a system in response to an external event in the system's environment (Fig. 16).



Fig. 16: Adaptation

- Adaptation traits: The complex of traits related to reproduction and survival of the individual in a particular production environment. Adaptation traits contribute to individual fitness. They are the traits subjected to selection during the evolution of animal genetic resources. By definition, these traits are also important to the ability of the animal genetic resource to be sustained in the production environment.
- Adaptin: A subunit of the cytosolic adaptor proteins that mediate formation of clathrin-coated vesicles. There are several types of adaptin subunits.
- Adaptive genetic variance: The proportion of genetic variation that is the summation of the effect of all individual genes influencing a trait. It is the average effect of substituting one allele for another.

Adhesion molecule

- Adhesion molecule: From the Latin adhaerere, to stick to, the term adhesion molecule refers to a glycoprotein (oligosaccharide) molecular chain that protrudes from the surface membrane of certain cells, causing cells possessing matching adhesion molecules to adhere to each other. For example, in 1952 Aaron Moscona observed that (harvesting enzyme-separated) chicken embryo cells did not remain separated, but instead coalesced again into an (embryo) aggregate. In 1955, Philip Townes and Johannes Holtfreter showed that like amphibian (e.g. frog) neuron cells will rejoin after being physically separated (e.g. with a knife blade); but unlike cells remain segregated (apart). Adhesion molecules also play a crucial role in guiding monocytes to sources of infection (e.g. pathogens) because adhesion molecules in the walls of blood vessels (after activation caused by pathogen invasion of adjacent tissue) adhere to like adhesion molecules in the membranes of monocytes in the blood. The monocytes pass through the blood vessel walls, become macrophages, and fight the pathogen infection (e.g. triggering tissue inflammation, etc.).
 - Adipocytes: Specialized cells within an organism's lymphatic system that store the triacylglycerols (also sometimes called triglycerides) after digestion of those fats, later releasing fatty acids and glycerol into the bloodstream when needed by the organism (Fig. 24).



Fig. 24: Adipocyte

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Affinity tag purification tag

be immobilized and the macromolecule stuck to it. A variant is to use an antibody as the immobilized molecule and use it to 'capture' its antigen, this is often called immune-affinity chromatography. A variation is pseudoaffinity chromatography, in which a compound which is like a biological ligand is immobilized on a solid material, and enzymes or other proteins are bound to it. Other techniques include metal affinity chromatography, where a metal ion is immobilized on a solid support; metal ions bind tightly and specifically to many biomolecules. The metal ion is bound to a chelator or chelating group, a chemical group that binds specifically and extremely tightly to that metal (Fig. 30).



Fig. 30: Affinity chromatography

• Affinity tag purification tag: An amino acid sequence that has been engineered into a protein to make its purification easier. These can work in a number of ways. The tag could be another protein, which binds to some other material very tightly thus allowing the protein to be purified by affinity chromatography. The tag could be a short amino acid sequence, which is recognized by an antibody. The antibody would then bind to the protein whereas it would not have done so before. One such short peptide, called FLAG, has been designed so that it is particularly easy to make antibodies against it. The tag could be a few amino

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