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Editor
of
Journal of Alternative & Integrative Medicine

Bio-Sketch

Professor of Biochemistry at the University of Bologna. Since 1990 he has contributed to the development of in vivo magnetic resonance spectroscopy in basic research and in diagnostic applications. In 1987 he gained his master's degree in Chemistry, and PhD in Biochemistry in 1994. From 1992 to 1993 he has been working at the Department of Biochemistry and Biophysics of the University di Pennsylvania. His scientific activity ranged from organic and physical chemistry to biochemical thermodynamics. At present part of the activity is directed to the study of magnesium homeostasis in living human tissues and in vitro in cell culture. He contributed to the development of a novel procedure to simplify the treatment of the thermodynamics of complex systems making possible to re-unify the two worlds of chemical and biochemical thermodynamics, which so far have been treated separately, and represents a new paradigm in the biochemical thermodynamics.

Research Interests

- Biochemistry,
- biochemical thermodynamics,
- physical chemistry,
- cell imaging,
- alternative medicine,
- science and art integration,
- effect of sound on living systems.

Publications

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Collaborations

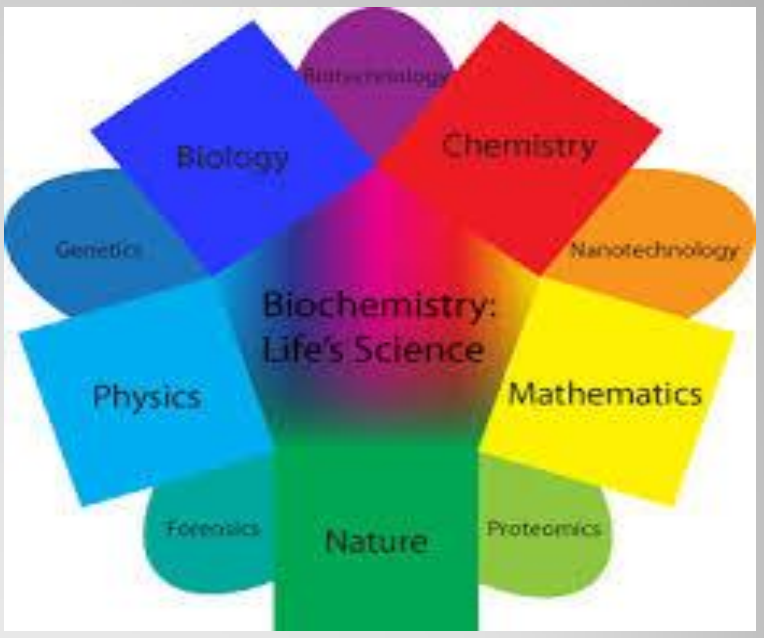
- Università degli Studi di VERONA
- Silicon Biosystems
- Università degli Studi di BOLOGNA
- Università degli Studi di BOLOGNA
- Università degli Studi di MILANO
- Università degli Studi di BOLOGNA
- Universitè de la Mediterranèe Aix Marseille II
- Università Cattolica del Sacro Cuore
- Cyanagen
- Università degli Studi di FIRENZE
- Consiglio nazionale delle ricerche - CNR
- Brigham Young University
- Università degli Studi di PAVIA
- Università degli Studi di FIRENZE
- Università degli Studi di MESSINA
- Università degli Studi di BOLOGNA

Introduction

Biochemistry

- Biochemistry is the chemistry of living things. It is concerned with the structure and chemical processes of proteins , carbohydrates , lipids , nucleic acids and other molecules found in or produced by organisms.
- It is the science in which chemistry is applied to the study of living organisms and the atoms and molecules which comprise living organisms. Take a closer look at what biochemistry is and why the science is important.
- Biochemistry is the study of the chemistry of living things. This includes organic molecules and their chemical reactions. Most people consider biochemistry to be synonymous with molecular biology.
- The principal types of biological molecules, or biomolecules are:

Research

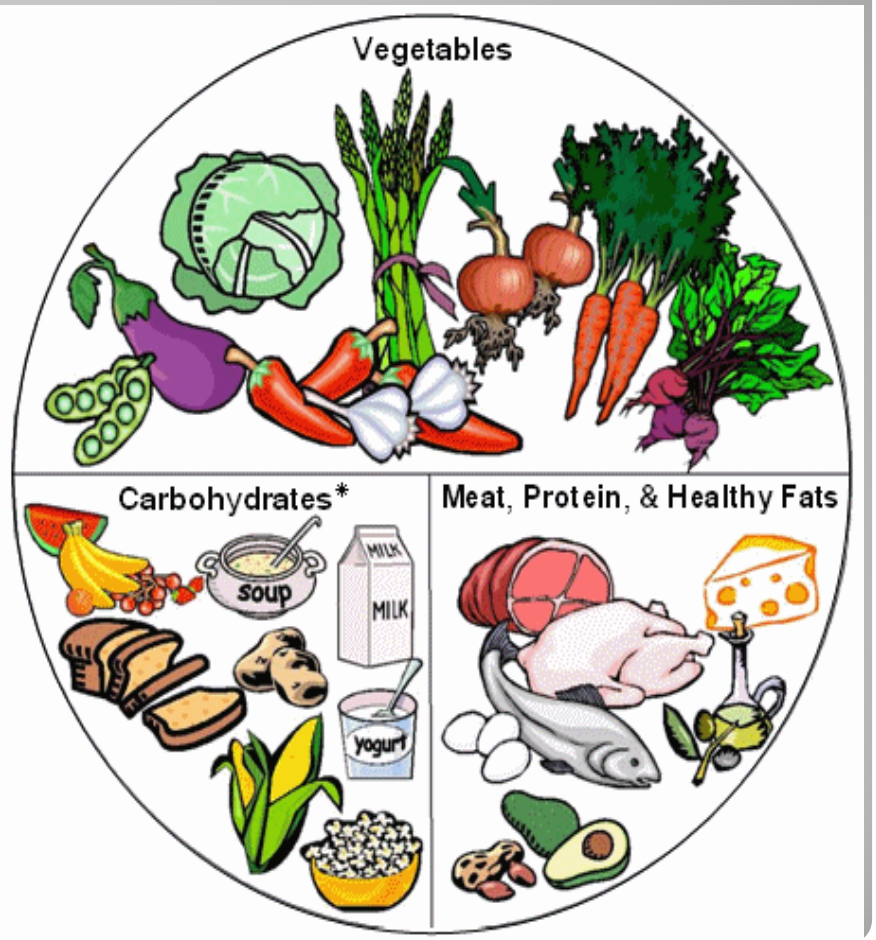

Biology
Chemistry
Genetics
Nanotechnology
Biochemistry:
Life's Science
Physics
Mathematics
Forensics
Nature
Proteomics

- ✓ carbohydrates
- ✓ lipids
- ✓ proteins
- ✓ nucleic acids

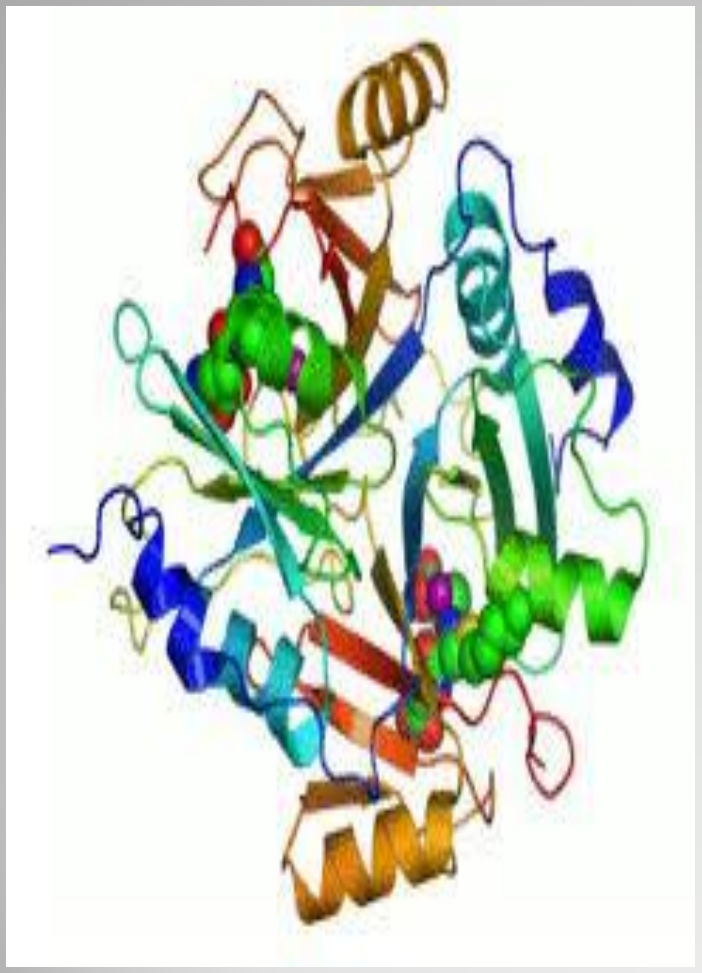
Many of these molecules are complex molecules called polymers, which are made up of monomer subunits. Biochemical molecules are based on carbon.

Carbohydrates

Carbohydrates consist of single-sugar units called monosaccharide's, double-monosaccharide units known as disaccharides and multiple-monosaccharide molecules that make up starches. The predominant purpose of the carbohydrates you eat is to provide fuel to your cells. Disaccharides and starches undergo digestion to reduce them to their individual sugars, and, once absorbed, they travel to the cells and tissues throughout your body to power your physical activities. A special type of carbohydrate, known as fiber, passes through your gut undigested. While fiber doesn't provide you with cellular energy, it improves your digestive health by regulating your bowel function.



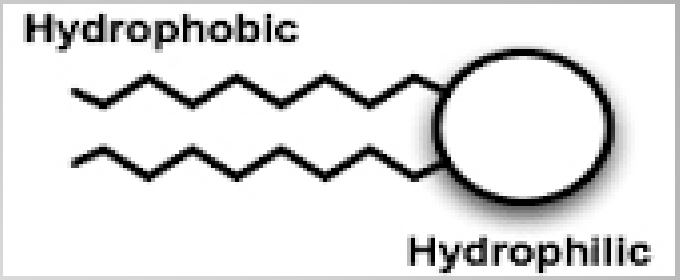
Proteins

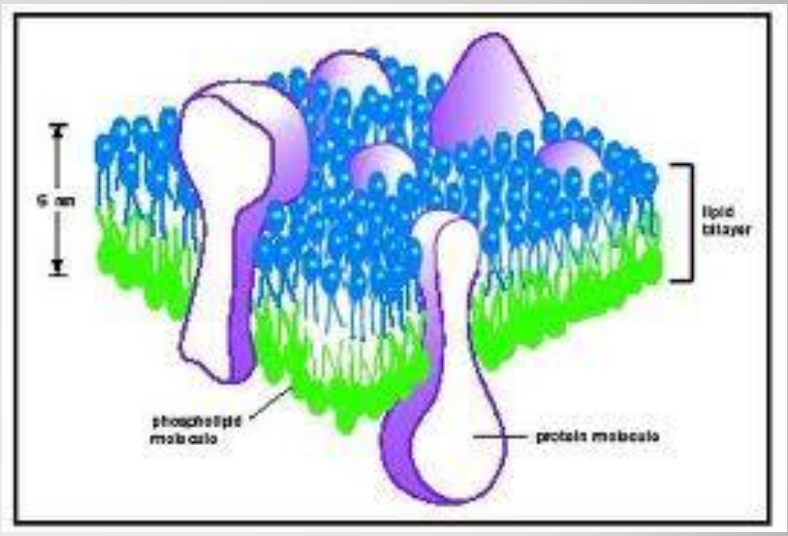


The building blocks that make up proteins are called amino acids. Proteins consist of 20 different amino acids, mixed and matched to create a vast array of larger molecules that support every process in your body. Digestion of protein results in a pool of single amino acids that your cells incorporate into new proteins as the need arises in your body. These molecules make up muscles and organs, transmit signals between cells, constitute immune molecules, help create the new proteins your tissues require and can serve as a fuel source in a pinch.

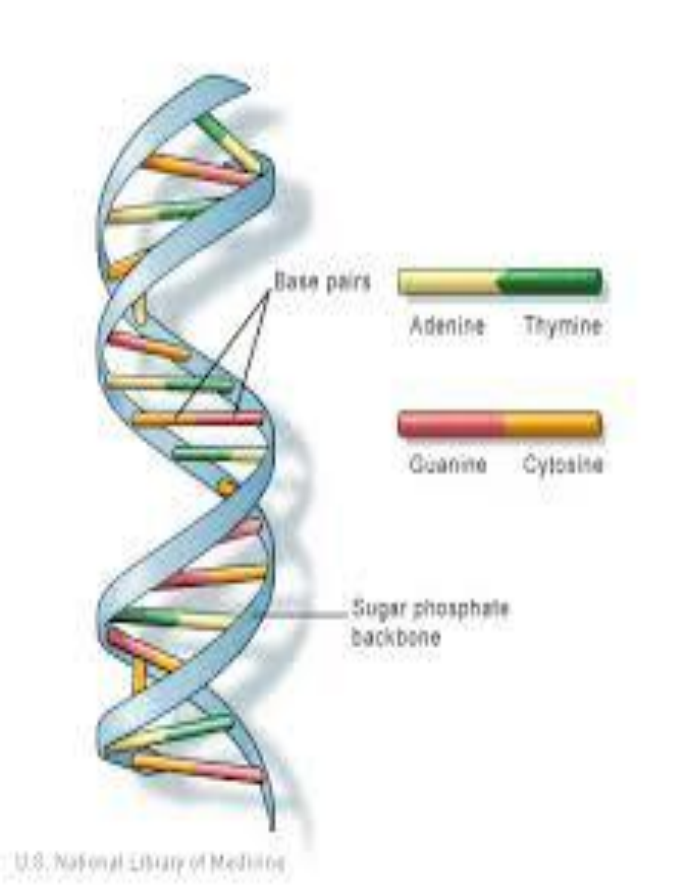
Lipids

Unlike the other macromolecules, lipids are not soluble in water, and they don't form long sequences made up of similar or repeating smaller units. The fats you consume are molecules called triglycerides, consisting of three fatty acids attached to a glycerol. The chemical nature of the fatty acids contained within the lipid determines its physical characteristics. For instance, a fatty acid that is saturated with as many hydrogen atoms as it can hold is solid at room temperature, while unsaturated fatty acids are liquid. These macromolecules store energy within fat tissue, and they cushion your internal organs against trauma. They also form the structure of cell membranes and contribute to the synthesis of hormones.





Nucleic Acids



Your cells contain two types of nucleic acids, ribonucleic acid and deoxyribonucleic acid, or RNA and DNA, respectively. They differ from the other macronutrients in that they are not a source of calories in your diet, and their role is strictly to direct the synthesis of new protein molecules. Made up of units called nucleotides, the nucleic acid DNA contains the genetic blueprint that influences your personal characteristics, while the nucleic acid RNA pulls together amino acids to form new proteins as your cells need them.

Biochemistry Used For?

- Biochemistry is used to learn about the biological processes which take place in cells and organisms.
- Biochemistry may be used to study the properties of biological molecules, for a variety of purposes. For example, a biochemist may study the characteristics of the keratin in hair so that a shampoo may be developed that enhances curliness or softness.
- Biochemists find uses for biomolecules. For example, a biochemist may use a certain lipid as a food additive.
- Alternatively, a biochemist might find a substitute for a usual biomolecule. For example, biochemists help to develop artificial sweeteners.
- Biochemists can help cells to produce new products. Gene therapy is within the realm of biochemistry. The development of biological machinery falls within the realm of biochemistry.

What Does a Biochemist Do?

Many biochemists work in chemistry labs. Some biochemists may focus on modeling, which would lead them to work with computers. Some biochemists work in the field, studying a biochemical system in an organism. Biochemists typically are associated with other scientists and engineers. Some biochemists are associated with universities and they may teach in addition to conducting research. Usually their research allows them to have a normal work schedule, based in one location, with a good salary and benefits.

Disciplines Are Related to Biochemistry

Biochemistry is closely related to other biological sciences that deal with molecules. There is considerable overlap between these disciplines:

- Molecular Genetics
- Pharmacology
- Molecular Biology
- Chemical Biology

Related Journals

- Journal of Community Medicine & Health Education
- Internal Medicine: Open Access
- General Medicine: Open Access
- Journal of Vascular Medicine & Surgery

Related Conferences

- **2nd International Conference on**

  Predictive, Preventive and Personalized Medicine & Molecular Diagnostics

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