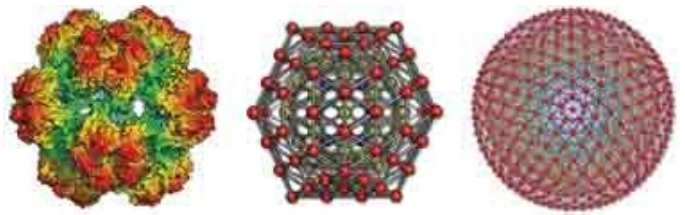


Biophysics

Biology studies life in its variety and complexity. It describes how organisms go about getting food, communicating, sensing the environment, and reproducing. On the other hand, physics looks for mathematical laws of nature and makes detailed predictions about the forces that drive idealized systems. Spanning the distance between the complexity of life and the simplicity of physical laws is the challenge of biophysics. Looking for the patterns in life and analyzing them with math and physics is a powerful way to gain insights.



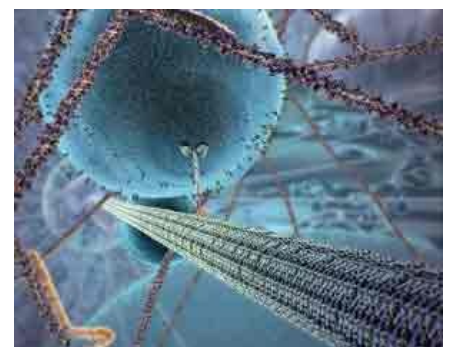
-Biophysics is a bridge between biology and physics?!!

Biophysics study

Biophysics study life at every level, from atoms and molecules to cells, organisms, and environments. As innovations come out of physics and biology labs, Biophysics find new areas to explore where they can apply their expertise, create new tools, and learn new things. The work always aims to find out how biological systems work. Biophysics asks questions, such as:

How do protein machines work?

Even though they are millions of times smaller than everyday machines, molecular machines work on the same principles. They use energy to do work. Biophysics reveals how each step is powered forward



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Medical Physics

Medical Physics (also called biomedical physics or medical biophysics or applied physics in medicine) is generally speaking the application of physics concepts, theories and methods to medicine or healthcare. Medical physics departments may be found in hospitals or universities.

In the case of hospital work the term 'Medical Physicist' is the title of a specific healthcare profession with a specific mission statement. Such Medical Physicists are often found in the following healthcare specialties: diagnostic and intervention radiology (also known as medical imaging), nuclear medicine, and radiation oncology (also known as radiotherapy).

Physical therapy

Or physiotherapy (often abbreviated to PT) is a physical medicine and rehabilitation specialty that repairs impairments and promotes mobility, function, and quality of life through examination, diagnosis, prognosis, and physical intervention (therapy using mechanical force and movements). It is carried out by physical therapists (known as physiotherapists in most countries)

In addition to clinical practice, other activities encompassed in the physical therapy profession include research, education. In many settings, physical therapy services may be provided alongside, or in conjunction with, other medical services.

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Physics: The scientific study of matter and energy and the effect that they have on each other.

Physiology: The scientific study of the way in which the bodies of living things work.

Biophysics: The science that uses the laws and methods of physics to explain biology.

Physiotherapy: The treatment of muscle stiffness, pain and injury, especially by rubbing and moving the sore parts.

The Future

Medical physics continues to play a valuable role in healthcare. More and more hospitals are buying MRI and PET scanners and more people with disabilities are receiving increasingly sophisticated devices.

Medical physicists are at the forefront of developments in healthcare. In the medical physicists plan radiotherapy treatments and ensure that the equipment is safe. They develop new methods using MRI and ultrasound, and assist people with disabilities. Medical physicists also work in both universities and industry, where they lead research into improving existing techniques and developing completely new ones.

Acronyms

CAT	Computed Axial Tomography
CT	Computed Tomography
ECG	Electrocardiogram
MRI	Magnetic Resonance Imaging
mSv	millisievert, a unit of radiation exposure
PET	Positron Emission Tomography
RF	Radiofrequency
2-D	Two dimensional
3-D	Three dimensional
4-D	Four dimensional (3 spatial dimensions and time)

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Glossary

Biopsy	The removal and examination of tissue from an ill person, in order to discover more about their illness.
Cyclotron	a machine used to accelerate charged particles. For PET, protons are accelerated, and then smashed into atoms which then become radioactive, emitting positrons.
Cyst	Pocket of tissue filled with fluid.
Diagnosis	Finding out what is wrong with a patient.
Half-life	The time taken for the activity of a radioisotope to drop by half.
Hearing loss	People with profound hearing loss mostly rely on lip reading or sign language. People with severe hearing loss get help from powerful hearing aids, though may also rely on lip reading.
Ionizing radiation	An alpha or beta particle, or a high energy electromagnetic wave, which has enough energy to completely remove an electron from an atom.
Near infrared	Electromagnetic waves that are in the infrared region of the spectrum but have frequencies near those of visible red light (around 800 nm).
Oesophagus	Part of the digestive system (food pipe/gullet), or the tube in the body which takes food from the mouth to the stomach.
Palliative	A treatment intended to ease pain and suffering rather than cure the patient,(drug or medical treatment that reduces pain without curing the cause of the pain)
Prosthetic	Something which artificially replaces a part of the body.
Radioisotope	An isotope that is unstable and will decay, emitting radiation.
Superconducting magnet	A magnet made by a current flowing in A coil of superconducting wire, which is so cold it no longer has any resistance.
Therapy	Treating the patient.
Endoscopy	Examining the body using a narrow tube.

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