

## Light as a Multifunctional Tool for Medical Purposes

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Light as a whole, and visible light in particular, as an object for exploration, has existed since the days of the great Greek ancient philosophers Socrates, Plato and Aristotle. However, Euclid was the scientist who summarized for the first time all the accumulated knowledge. In the last century, physicists like Albert Einstein and Max Plank made suggestions against traditional and conservative beliefs on the nature of light. They proposed that light, except for an electromagnetic wave, could also be seen as a photon. Nowadays, scientific society classifies electromagnetic radiation (ER), namely light, into ionizing and non-ionizing. The main difference between those two is based on the energy of the emitted photons or particles: the greater energy, the greater penetration in the matter. However, ionizing radiation refers to the fact that the emitted photons/particles can interact in such a way with the matter, to be precise biological structures (i.e. tissues), that they can convert atoms into reactive ions. Notably, ionizing and non-ionizing radiation have been widely applied in medical and clinical practice over the last 6-7 decades to diagnose and treat various medical conditions. Modalities that use non-ionizing radiation have been magnetic resonance imaging, ultrasonography, low-level laser therapy or photobiomodulation, photodynamic therapy, and bright light therapy. Alternatively, modalities such as computed tomography, positron emission tomography, fluoroscopy, teletherapy, brachytherapy, gamma knife, etc., use ionizing radiation.

Meanwhile, technological evolution has led to greater integrity of those above therapeutic and diagnostic approaches in the healthcare sector. Consequently, we discuss the overall application of ER due to its beneficial impact on treating mental, neurodegenerative, dermatological and neurological disorders and various types of cancer.