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Sommario/riassunto	Light is the main source of energy for the primary process that sustains life on our planet, known as photosynthesis. Photosynthesis is the strategy adopted by many living organisms for capturing and incorporating energy, and it is under this context that light is primarily experienced, explored, and exploited. Plants perceive information from the ambient environment and communicate with other organisms using light. They have developed a plethora of photoreceptors that permit this communication with the surrounding environment. Additionally, the physical properties of light, such as the spectral quality, irradiance, intensity, and photoperiod, play an integral role in the morphogenesis, growth, and metabolism of many biochemical pathways in plants. To facilitate photosynthesis in controlled environments, light-emitting diodes (LEDs) have been shown to offer interesting prospects for use in plant lighting designs in controlled-environment agriculture (greenhouses) and growth chambers for in vitro cultures. In high-technology greenhouses (for instance, vertical agriculture), artificial light may assume both assimilative (optimizing photosynthetic efficiency) and control functionality (guiding growth and development or the synthesis and accumulation of plant metabolites). In vitro cultures are regulated by different factors, and among them, light is the most important.