Research Journal of Optics and Photonics

Editorial

A Scitechnol Journal

Scope in Biophotonics

Yik Weng Yew

Biophotonics Information Laboratories, Yamagata Advanced Technology, Research & Development Center, 2-2-1 Matsuei, Yamagata 990-2473, Japan

Introduction

Biophotonics is that the study of optical processes in biological systems, both people who occur naturally and in bioengineered materials. a very important aspect of this field is imaging and sensing cells and tissue.

The scanner works by sending a laser at the surface of the skin. ... Biophotonics use a beam of sunshine , like a laser or an LED. On the microscopic scale, biophotonics are commonly applied to microscopy and optical coherence tomography. On a macroscopic scale, the sunshine is employed for diffuse optical imaging and tomography.

Biophotonics has therefore become the established general term for all techniques that affect the interaction between biological items and photons. This refers to emission, detection, absorption, reflection, modification, and creation of radiation from biomolecular, cells, tissues, organisms, and biomaterials. Areas of application are bioscience , medicine, agriculture, and ecology . almost like the differentiation between "electric" and "electronics," a difference are often made between applications like therapy and surgery, which use light mainly to transfer energy, and applications like diagnostics, which use light to excite matter and to transfer information back to the operator.

Applications

Biophotonics is an interdisciplinary field involving the interaction between electromagnetic wave and biological materials including: tissues, cells, sub-cellular structures, and molecules in living organisms

Laser micro-scalpel

Laser micro-scalpels are a mixture of microscopy and a femtosecond laser "can penetrate up to 250 micrometers into tissue and target single cells in 3-D space."

Optical tweezers

Optical tweezers (or traps) are scientific tools employed to maneuver microscopic particles like atoms, DNA, bacteria, viruses, and other sorts of nanoparticles. They use the light's momentum to exert small forces on a sample. this system allows for the organizing and sorting of cells, the tracking of the movement of bacteria, and therefore the changing of cell structure

Low level laser therapy

This therapy efficacy is somewhat controversial, the technology are often wont to treat wounds by repairing tissue and preventing tissue death. it's believed that would possibly convince be useful within the treatment of severe brain injury or trauma, stroke, and degenerative neurological diseases.

Photodynamic therapy

This therapy uses photosynthesizing chemicals and oxygen to induce a cellular reaction to light. It are often wont to kill cancer cells, treat acne, and reduce scarring. PT also can kill bacteria, viruses, and fungi. The technology provides treatment with little to no long-term side effects, is a smaller amount invasive than surgery and may be repeated more often than radiation.

Photothermal therapy

This therapy most ordinarily uses nanoparticles made from a metallic element to convert light into heat. The nanoparticles are engineered to soak up light within the 700-1000 nm range, where the physical body is optically transparent. When the particles are hit by light they heat up, disrupting or destroying the encompassing cells via hyperthermia.

Bioluminescence

Bioluminescence differs from biofluorescence therein it's the natural production of sunshine by chemical reactions within an organism, whereas biofluorescence and biophosphorescence are the absorption and reemission of sunshine from the natural environment.

Biophosphorescence

Biophosphorescence is analogous to biofluorescence in its requirement of sunshine at specified wavelengths as a provider of excitation energy. The difference here lies within the relative stability of the energized electron. Unlike with biofluorescence, here the electron retains stability within the forbidden triplet state, with a extended delay in emitting light leading to the effect that it continues to “glow-in-the-dark” even long after the stimulating light has been removed.

***Correspondingauthor:** Yik Weng Yew,Biophotonics Information Laboratories, Yamagata Advanced Technology, Research & Development Center,2-2-1 Matsuei, Yamagata 990-2473, Japan, E-mail: yikyewweg@upto.jp

Received date: March 01, 2021 Accepted date: March 15, 2021 Published date: March 29, 2021

SciTechnol International Publisher of Science, Technology and Medicine

All articles published in Research Optics and Photonics are the property of SciTechnol, and is protected by copyright laws. Copyright © 2021, SciTechnol, All Rights Reserved.