

Two photon microscope and optical coherence tomograph in dermatology

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In the clinical application, the light source would be used for diagnosis or treatment. However when we refer to biophotonics, it is usually used for diagnostic tools which use light to excite matter and to transfer information back to the operator.

The human skin is exposed to the environment and light tend to meet it easily. Therefore by observing the interactions between light and skin tissue, the biophotonics have introduced a lot of unique diagnostic

techniques. In the biophotonic techniques, the diagnosis is achieved by the pattern analysis of the images.

In the 4th industrial revolution, with the artificial intelligence(AI), the pattern analysis will be more accurate and faster. So, in this lecture, I will talk about the convergence of biophotonics and deep-learning of AI.

Although the biophotonics tend to be restricted to the diagnosis with analyzing the interaction between light source (photon and quantum) and biomaterial tissue, I would like to expand the field of biophotonics to the treatment. Because the exact treatment should be relied on the exact diagnosis.

In addition, the precisional medicine which is the main character of the future medicine, needs the convergence of diagnosis and treatment based on the big data analysis.

I will show you an example of precisional medicine which consists of biophotonic diagnosis and treatment.