

Photoacoustic imaging (optoacoustic imaging) is a biomedical imaging modality based on the photoacoustic effect. In photoacoustic imaging, non-ionizing laser pulses are delivered into biological tissues (when radio frequency pulses are used, the technology is referred to as hermoacoustic imaging). Some of the delivered energy will be absorbed and converted into heat, leading to transient thermoelastic expansion and thus wideband (i.e. MHz) ultrasonic emission. The generated ultrasonic waves are detected by ultrasonic transducers and then analyzed to produce images. It is known that optical absorption is closely associated with physiological properties, such as hemoglobin concentration and oxygen saturation. As a result, the magnitude of the ultrasonic emission (i.e. photoacoustic signal), which is proportional to the local energy deposition, reveals physiologically specific optical absorption contrast. 2D or 3D images of the targeted areas can then be formed.¹

In the present book, fifteen typical literatures about Photoacoustic imaging published on international authoritative journals were selected to introduce the worldwide newest progress, which contains reviews or original researches on Photoacoustic imaging. We hope this book can demonstrate advances in Photoacoustic imaging as well as give references to the researchers, students and other related people.

¹ https://en.wikipedia.org/wiki/Photoacoustic_imaging