Dear Editor,

Especially with the status of the technological advancements, it endures impossible to detach all absorbers and scatter sequence events within a diffuse, inhomogeneous environment. However, calculation methods have been sophisticated that try to appreciate the perturbation give rise to optical tissue properties and develop the image by partly correcting for these properties.1,2

An fluorescence imaging system has been advanced that implements such a correction scheme for light intensity variation in tissues.3-4 Improved precision was shown within phantoms and post-mortem tissues, independently of the optical property variation in tissues.5 At a 5-fold alteration of absorption variation within the fluorescent lesions, quantification errors were miniature from 25.0% in uncorrected images to 8.0% using the correction scheme.6

A latter new technology being investigated in this field is Fluorescence Differential Path-Length Spectroscopy (FDPS), which determines the fluorophore concentration based on the fluorescence intensity corrected for absorption that has the potential to furnish the real-time information on the photosensitiser pharmacokinetics, vascular physiology, and photosensitizer photobleaching etc based on the dosimetry of tumours that is receiving Photodynamic Therapy (PDT).7,8

FDPS facilitates quantitative concentration measurements can harmonize large variations in background absorption utilizing a simple correction algorithm. This makes it especially valuable for photosensitizer fluorescence spectroscopy in-vivo, during PDT, when the background of the absorption may change dramatically.9-10

Another feature of FDPS is that the collection volume may be regulate to match the relevant dimensions of the implementation.11-12

For fluorescence measurements of photosensitizers, it is stringent to selectively interrogate a relevant tissue volume to avert averaging photosensitiser concentrations over a volume that is either deeper or shallower than the purposed sampling volume.2-13

It is remarkable that while FDPS remains dependant on the scattering coefficient of tissue, that is predictable to have a relatively small influence on the signals collected particularly in tissues of the same type.14-15

However, presently this method can only be conducted using fibres optics measurements at a single point. An imaging version and following intraoperative applications have not been developed yet.

References


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