NUS Graduate School for Integrative Sciences and Engineering
Research Project Write-up

Title of Project : Noninvasive measurement of blood Glucose concentration

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Short Description

Diabetes is a chronic epidermis with no known cure till date. Patients suffering from diabetes are required to monitor their blood glucose levels regularly to avoid complications such as kidney failure, blindness, stroke and poor blood circulation. Today, the most commonly utilized method for monitoring blood glucose level is by making use of a fingerstick method. It is an invasive method, which requires patients to prick their fingers to extract a small sample of blood from their fingertip. Repeated pricking of fingertips is required to constant monitoring. This project aims to develop a time-resolved optical spectroscopic method for noninvasive measurement of blood glucose concentration. It has been reported by previous studies that an increase in glucose concentration will increase the refractive index of the medium, reducing mismatch and directly reducing the scattering coefficient. The temporal point spread function of the light transmittance through human finger is highly sensitive to the subtle change in the scattering coefficient. More theoretical investigations and human subject experiments are needed for this new technique to become clinically acceptable.