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Near infrared spectrometric investigation of pulsatile blood flow for non-invasive metabolite monitoring 🛒

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The non-invasive measurement of blood parameters is desirable for several reasons. A multi-wavelength near infrared approach based on the pulsatile blood flow—similar to pulse oximetry in the visible range—allows for a glucose assay with exclusive information probing from the vascular fluid space. Fast diffuse reflectance spectra were recorded from the human inner lip using a Fourier-Transform spectrometer equipped with an especially optimized custom-made accessory. The absorbance values of each spectral variable within the spectrum population obtained at least within a one-minute measurement period were Fourier transformed and the outstanding coefficient amplitudes were evaluated for the pulse frequency. These spectral Fourier coefficients can be composed to give the pulsatile near infrared blood spectrum (IR-plethysmography). An estimation of the experimental conditions necessary for pulse spectrometry with the goal of non-invasive metabolite monitoring is presented.

Topics

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