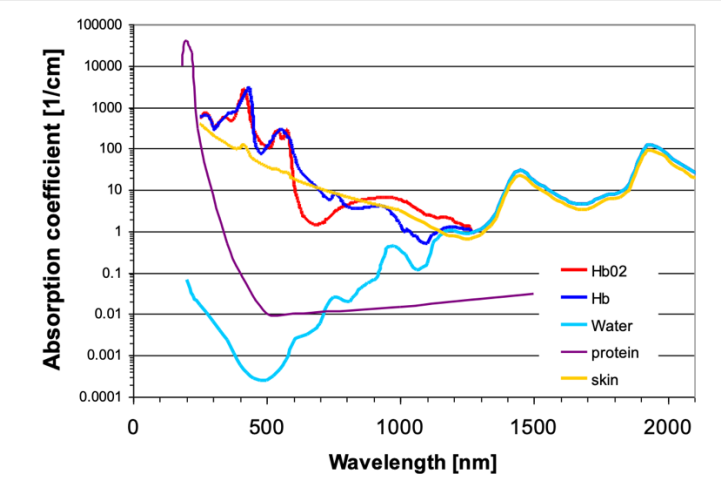
Optical properties of arterial blood

Amsterdam UMC, Univ. of Amsterdam, Location Academic Medical Center,
Dept. of Biomedical Engineering and Physics, www.amc.nl/bmep

An internship position is available at the Biomedical Engineering and Physics department of the Academic Medical Center (AMC). In our group, new treatment and diagnostic procedures based on innovative physical techniques are developed. Research is performed by a multidisciplinary team that includes physicists, engineers, mathematicians, medical doctors, biologists, and chemists.

Background

The optical properties of tissues are determined by the concentration and distribution of the constituents, such as blood, lipids and water. The (health) status of the tissue correlates with these concentrations and thus the optical properties of the tissue (e.g. μ , μ , μ' , g, …) can be used to monitor the status of the tissue. Determining these optical properties, however, is challenging as it is a combination of smart experimental measurements and appropriate modelling of the light-tissue interaction. A well-known application is the determination of the arterial oxygen level in arterial blood.



Based on the ratio of two wavelengths and clever algorithm, the arterial oxygen level can be measured with a simple device.

Research description

In this project you will investigate whether it is possible, with a similar device, to measure the optical properties of arterial blood in the near-infrared and to relate these measurements to the concentration of the different constituents of blood.

Requirements

We are looking for a Bachelor/Master student with knowledge of physics and engineering. Biological knowledge is NOT needed. The duration of the internship can be adjusted according to the curriculum.

Learning outcome

The student will gain knowledge in the field of biomedical optics and develop skills in building set-ups, understanding models to describe light-tissue interaction and apply these models to analyze the data. Being part of an interdisciplinary and international research group, the student will acquire competences including: (1) collaboration, (2) scientific writing, and (3) presentations.

Contact

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