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題名	NIR spectroscopic determination of urine components in spot urine: preliminary investigation towards optical point-of-care test
掲載雑誌	Medical & Biological Engineering & Computing
著者	Ikuto Suzuki, Mitsuhiro Ogawa, Kimihiro Seino, Masamichi Nogawa, Hisashi Naito, Ken-ichi Yamakoshi & Shinobu Tanaka
概要	<p>Presently, there is no convenient method to measure 24-h urinary Na excretion, which is an important index of daily Na intake, and 24-h urine collection involves a complex process. However, the Na-to-creatinine ratio (NCR) in spot urine has the potential to evaluate 24-h Na excretion and is useful for point-of-care testing. Thus, this study aimed to realize a near-infrared spectroscopic system to assess NCR in spot urine: (1) We attempted to estimate Na concentration using fewer than 10 wavelengths; (2) we calculated NCR using creatinine concentrations from our previous report and verified the NCR predictability. A calibration model was created using multi-linear regression analysis using 10 selected wavelengths in the range of Fourier-transform infrared spectrometer. Spot urine samples were obtained from healthy adults, and glucose powder was added to them to simulate diabetic samples. NCR was calculated using only six wavelengths, and the results confirmed the high accuracy of the estimated Na concentration even though inorganic components do not absorb near-infrared light. Our method enables to optically estimate NCR in spot urine, and it will be useful for point-of-care testing.</p> <p>DOI: 10.1007/s11517-019-02063-1</p>