

Proceedings

A Fluorescence-Based POCT Device for Immunosuppressant-Drug Monitoring in Transplanted Patient [†]

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[†] Presented at the 1st International Electronic Conference on Biosensors, 2–17 November 2020; Available online: <https://iecb2020.sciforum.net/>.

Received: date; Accepted: date; Published: date

Abstract: In the treatment of transplanted patients, therapeutic drug monitoring represents one of the most crucial aspects for the identification of the correct dosage of immunosuppressants, aiming to ensure the appropriate medical treatment and to avoid the rejection of the transplanted organ. Since only protein-unbound (free) drugs can cross membranes and bind to receptors to produce the required pharmacological effect, free drug concentrations (2–8% for immunosuppressive drugs) are more closely related to efficacy and also to toxicity compared to plasma, serum or whole blood concentrations, better reflecting the clinical outcome. At this aim, a novel point of care testing (POCT) optical device for the detection of blood immunosuppressant free fraction in transplanted patients was designed and tested, with the body interface constituted by an intravascular microdialysis catheter (MicroEye[®]), which provides the dialysate as clinical sample. The work was undertaken in the framework of the EU project NANODEM (NANOphotonic DEvice for Multiple therapeutic drug monitoring). The benefit of this device will be an optimized dosage of the therapeutic drugs to support patient management in a clinical environment. Calibration curves for cyclosporine A (CyA) and mycophenolic acid (MPA) in dialysis perfusate (20% Lipofundin) were obtained with limit of detection for CyA and MPA of 0.48 ng/mL and 0.79 ng/mL, respectively.

Keywords: POCT; immunosuppressant; biosensor
