New Algorithm for Small Volume, Fast, Accurate Blood Analysis (FABA) for Blood Diagnostics via Hand-Held XRF on Drops Rapidly Solidified into Uniform Thin Films THILINA BALASOORIYA, WESLEY PENG, NIKHIL SURESH, AASHI GURIJALA, MOHAMMED SAHAL, NICOLE HERBOTS, MicroDrop Diagnostics LLC, ROBERT CULBERTSON, Arizona State University, Dept. of Physics, ERIC CULBERTSON, Ronald Reagan UCLA Medical Center, INNOVASTRIP RESEARCH TEAM — Comprehensive Blood Diagnostics (BD) uses mLs of blood, and hours to days for results. BD leads to a 74% rate of a serious illness, Hospital-Acquired-Anemia, in chronically ill patients. In this work, a new, fast, portable, comprehensive Small Volume BD device, InnovaStrip [1], solidifies drops into Homogeneous Thin Solid Films (HTSF). Using micro-Ls, HTSFs yield electrolytes and metals levels to +/- 10%, the medical standard, using Ion Beam Analysis and X-ray Fluorescence (XRF). Therefore, a new, Fast , Accurate Blood Analysis (FABA) [1] algorithm has to interface InnovaStrip with PCs/smartphones. FABA is developed initially for a low cost, hand-held XRF of HTSF App, called Fast Hand-Held Analysis for XRF(FHAX). Present XRF analysis software such as Spectra.Elements do not measure trace elements to +/- 10% because curve fitting focuses large XRF signals for all elements, not small trace element signals [1]. FABA extracts actual Riemann sum of X-ray counts for each selected trace element. FABA yields fast (<5 min), accurate BD to +/-10% of blood electrolytes and metals, in mg/dL not atomic % , via built-in HTSF of calibration solutions in InnovaStrip. [1] Balasooriya, Herbots, *et al.* Pat. Pend. (2020)

Thilina Balasooriya
MicroDrop Diagnostics LLC