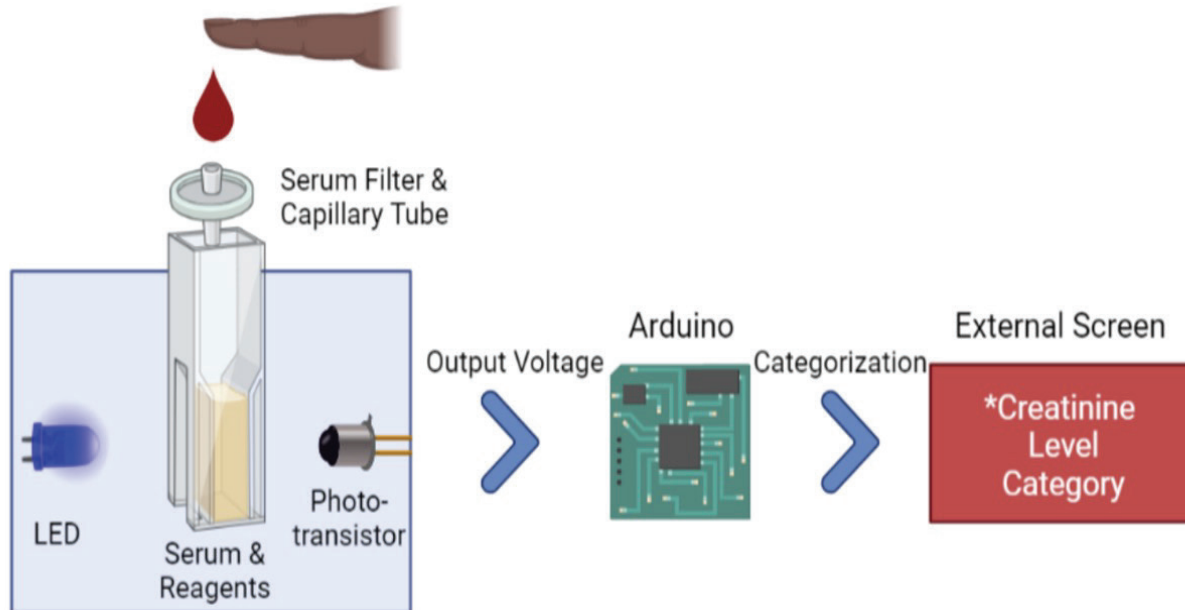


Development of Affordable Kidney Disease Diagnostic Device for Use in Low Resource Areas

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There is a huge need for more accessible options for the diagnosis of kidney disease in low-income areas. The device will be used to perform mass screening of individuals and provide a metric for additional testing and diagnosis from a licensed medical professional. It will return a semi-quantitative value based on low, slightly elevated, or high creatinine values using the results from a Jaffe reaction - a more affordable alternative to enzymatic reactions. The main component of our device is a small light proof cuvette holder and a cuvette with a lid to contain the blood sample (obtained from a finger-prick). The lid will hold a plasma separation membrane and a capillary tube to drain the serum. The blood will then mix with the reagent found in the cuvette and the reaction will occur. The reaction will run for five minutes and then the voltage drop will be recorded across the phototransistor at an absorption value of 500 nm. The patient will be categorized into a risk group based on the corresponding voltage reading, where higher readings indicate higher creatinine levels. The device will display this reading on a built-in LED screen. To achieve this functionality, 3-D printed components, simple spectrophotometer-like measurements, and a microprocessor (such as an Arduino) will be used to create the POC diagnostic device at an affordable price range.



*Categories are: normal, elevated, and very elevated