

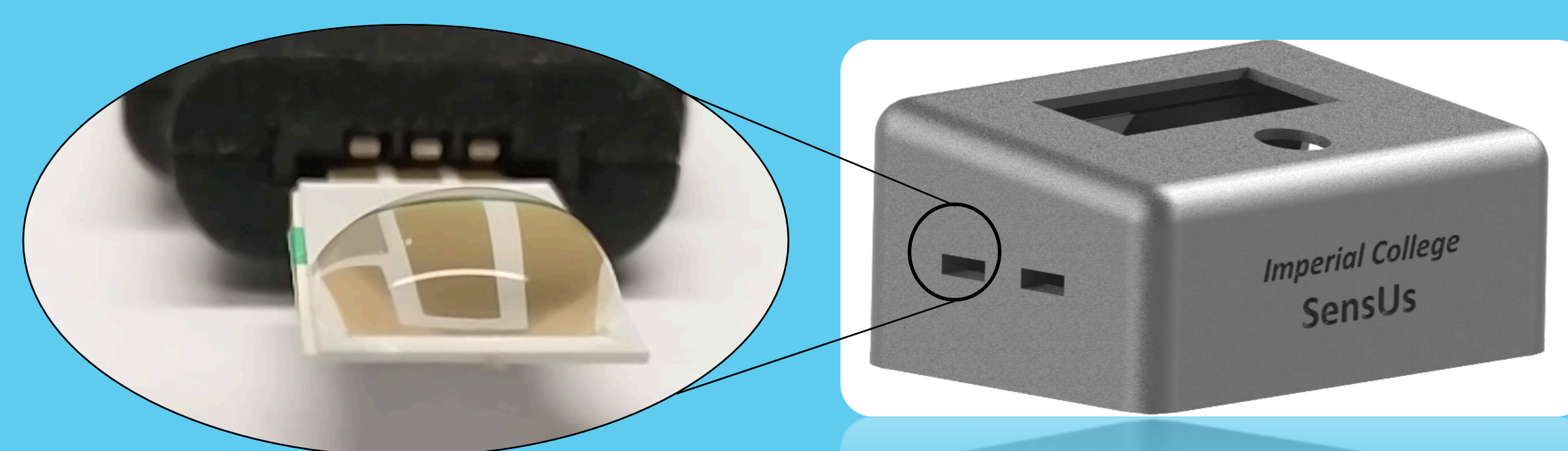
INTRODUCTION

Chronic Kidney Disease is a common long term disease capable of progressing from mild kidney damage (stage 1) to kidney failure (stage 5) amongst those affected. The best measure for the stage of kidney disease is a patient's glomerular filtration rate (GFR), normally calculated by a doctor from the results of the results of your blood creatinine test.

The Kreatus is an easy to use, low-cost, fast and accurate sensor displaying creatinine concentration measurements from a sample of blood and sending values to an android app which provides immediate GFR results for patients.

How it works:

1. The Electrodes



A three enzyme sequence deposited on gold sputtered electrodes with an Iridium oxide film transducer.



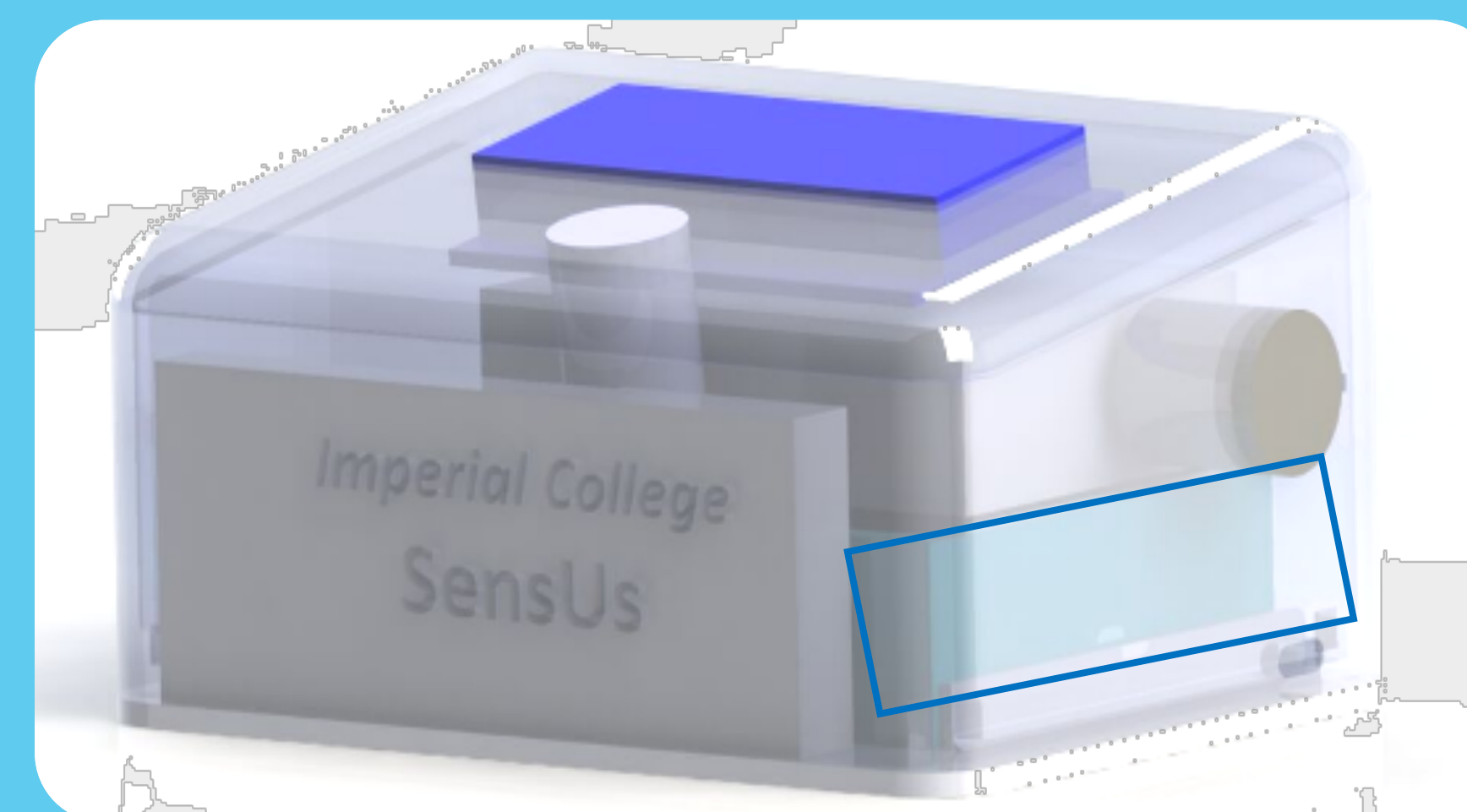
Two electrodes are simultaneously tested:

- Electrode 1 = all three enzymes
- Electrode 2 = urease

The blood Urea variation is then cancelled out

2. The Voltmeter

An Arduino was used as a voltmeter, calculating the potential difference between the working and reference electrodes.

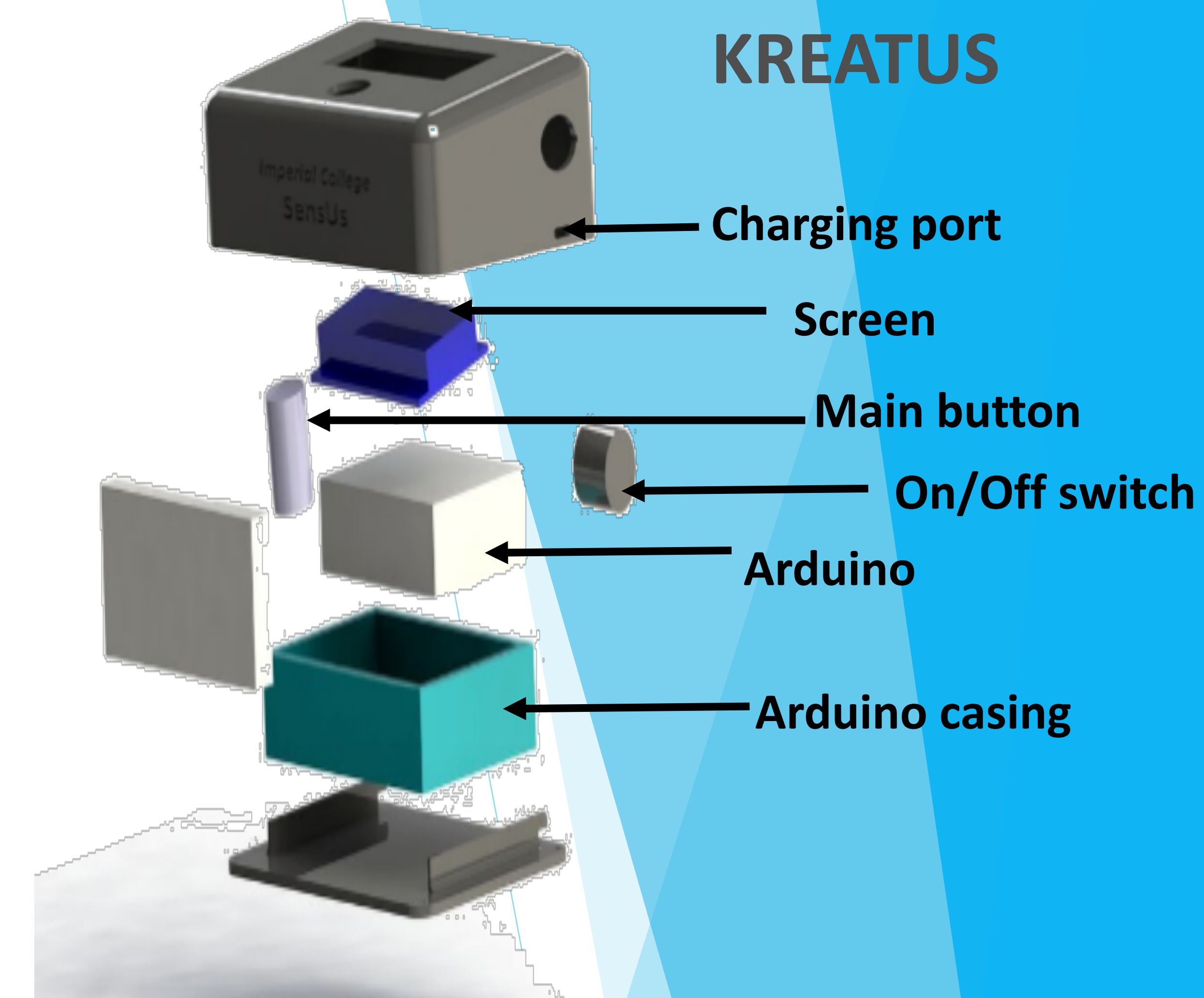


The sensor has 2 modes ;

.Voltage mode

.Creatinine concentration mode

Selecting the creatinine concentration mode the voltage value is compared against a pre-calibrated voltage/pH curve from which the corresponding pH is obtained. This is translated into a creatinine concentration value displayed on the screen.



3. The App



Via Bluetooth the Arduino sends the creatinine concentration value to the android app immediately as it is recorded.

Within the app patients can create a profile with personal information required to calculate the GFR.

Data is then stored in the app to monitor changes in GFR over time.