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A Wirelessly Powered and Transmitting Current Sensing Device

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ABSTRACT

As the rate of incidence of diabetes increases in the modern world, more accurate and reliable methods of glucose detection must be developed for patients with diabetes. Currently, 25.8 million people have diabetes in the United States alone and account for \$174 billion in healthcare costs annually [1]. Devices that can be used without the need for as much patient interaction, regular replacement, or great patient expenses would be a large step forward in the ability of doctors and patients to effectively manage diabetes. To measure glucose concentrations in vivo, a biosensor is used to transduce glucose to an electrical current. Because of this, a device capable of converting an inputted current to a corresponding digital output, wirelessly transmitting the output to a computer, and operating completely on wireless powering was developed and tested. The device is able to take multiple measurements per second of an input current source within the range of 0 – 1mA at a resolution of about 4 μ A. This range can be reduced to smaller ranges with smaller resolutions within reason. For future work, the device will be tested with amperometric glucose sensors to create a fully, implantable wireless device.

KEYWORDS

Glucose sensor, continuous monitoring, wireless, implantable

REFERENCES

[1] National Institute of Health (2014). *The Facts About Diabetes: A Leading Cause of Death in the U.S.* [Online]. Available: <http://ndep.nih.gov/diabetes-facts/>