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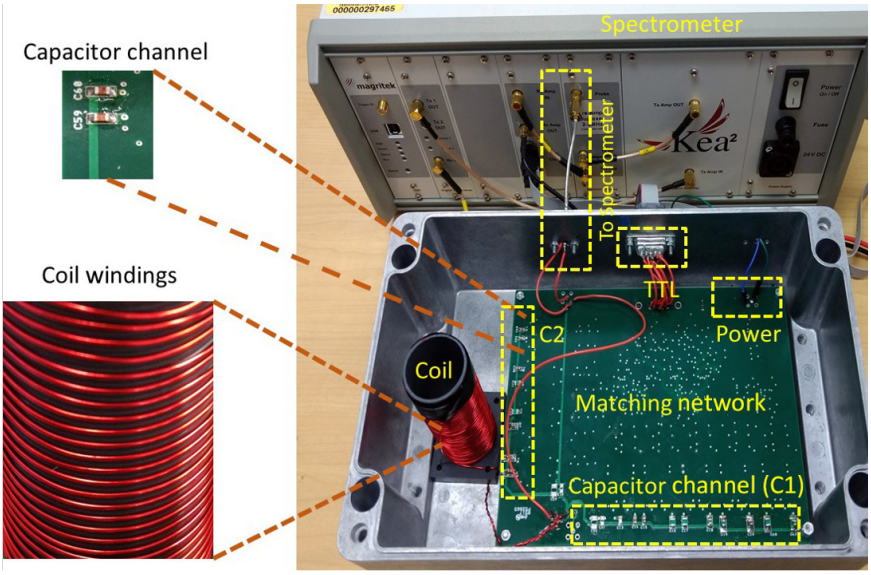
Medicine and Illegal Substance Detection in Mail Packaging Using NQR Spectroscopy

Kelsey Horace-Herron

Ph.D. Student, Electrical and Computer Engineering



The experimental setup of the spectrometer device, which consists of a solenoid and a tunable matching network.

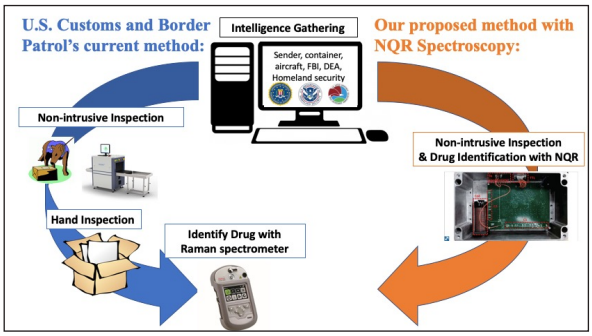
Counterfeit medicine is becoming a growing problem in developing countries and a danger to others worldwide.
This device aims to detect fake medicine before it is distributed to consumers by using Nuclear Quadrupole Resonance (NQR). NQR is a noninvasive technique that can be used to detect drugs even in opaque packaging.

IN THE FUTURE...

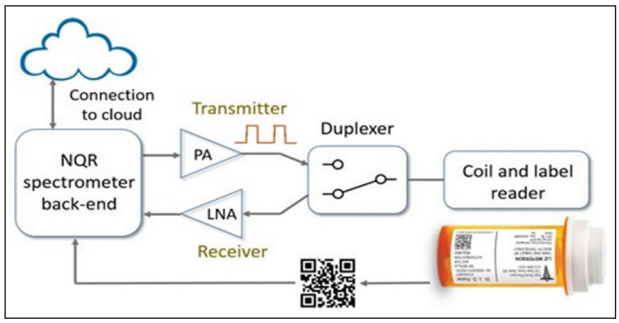
- Pharmacies could use the device to check medicine for authenticity before distributing to customers
- The team hopes to develop a low-cost, handheld version of the device for consumer use at home

10%

OF MEDICINES IN LOW- AND MIDDLE- INCOME COUNTRIES ARE SUBSTANDARD OR FALSIFIED*



The current methods used by U.S. Customs and Border Protection for drug detection are more invasive and less efficient than the NQR device.



Simplified block diagram of an NQR-based medicines authentication system. PA = Power Amplifier, LNA = Low-Noise Amplifier.

"The circulation of fake medicines and illegal substances through mail packaging has become a global problem. Current solutions are limited since they require expensive machinery and extensive sample preparation. NQR spectroscopy is a low-cost, non-invasive approach to efficiently authenticating medicine and illegal substances."

KELSEY HORACE-HERRON

Researchers: Kelsey Horace-Herron, Ph.D Student, Electrical and Computer Engineering; and Naren Masna, Ph.D. Student, Electrical Engineering

Principal Investigator: Swarup Bhunia

Dr. Swarup Bhunia is Semmoto Endowed Professor of IoT in the Department of Electrical and Computer Engineering, and Director of the Warren B. Nelms Institute for the Connected World.

* According to a 2017 report by World Health Organization

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