Intelligent Hydrogel Synthesis and Bracelet Design to Detect Foreign Materials in the Human Body and in Beverages

Gulsen, Sude (School: Gaziantep Private Sanko College)
ASYALI, EKIN (School: Gaziantep Private Sanko College)

It is known that substances such as cocaine, barbiturates, LSD, and its derivatives, which have a stimulant and narcotic effect, have a strong addictive effect by directly affecting the central nervous system. Therefore, it is very important to detect these substances quickly and safely. This study, it was focused on the search for a solution in order to give a more accurate and valid result for the presumptive tests used today. A typical presumptive test consists of a foreign substance and a reagent that reacts with it and changes color. In the study, 19 different markers were synthesized and these markers were integrated into the gel by synthesizing a sodium alginate-based hydrogel. The prepared hydrogel was tested on store brought chicken skin surface which has residues of simulation cocaine and simulation morphine, 33 different urine samples obtained from forensic cases, 7 synthetic saliva containing various drugs, and 4 beverages containing simulation cocaine and simulation morphine. As a result of these tests, color changes were observed. It was observed that the synthesized hydrogel changed color in the presence of simulation drugs and real anonym samples from forensic cases. The synthesized hydrogel can be put into a wristband in the form of a watch, and it can even be turned into an item that people can carry with them and easily test it. In addition, a device with a color sensor was designed to detect the color formed in the hydrogel.

Awards Won:
First Award of $5,000
Sigma Xi, The Scientific Research Honor Society: Third Physical Science Award of $500