E97 A Paper Analytical Device to Evaluate Illicit Drug Supply Chains

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Learning Overview: The goal of this presentation is to clearly demonstrate the different levels of the supply chain that illicit drugs take to make it to market. This includes the various hands passed through from cook to dealers to end user. It is believed that different drugs spend a different amount of time in the supply chain as they are diluted with fillers and other drugs such as fentanyl; this is believed to be how fentanyl came to be so prevalent in the market today. By using a paper-based analytical device designed to identify illicit drugs and various cutting agents to assess a simulated supply chain, we can evaluate how well this field device can track supply chains.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by introducing a new paper-based analytical device (idPAD) that can field test illicit drugs and identify various cutting agents and be used as a potential tool for law enforcement and first responders. The presumptive drug tests currently used by law enforcement officers in the field are often critiqued by the public due to high false positive rates and subjective interpretation. This paper analytical device uses less solid sample than current presumptive tests, costs less than the test pouches, and can be used in fewer than five minutes. Additionally, a portable light box ensures consistent lighting on the idPAD so the colors can be read accurately, regardless of the environment, which lowers user error. Current testing on the idPAD includes evaluating its ability to track various supply chains to better understand how and where these drugs are entering the market. Further understanding of the illicit drug supply line will provide law enforcement with information to hopefully lower the spread of drugs.

By combining 12 chemical color tests that target specific functional groups in illicit drugs as well as various cutting agents, a unique color-bar code is generated for each substance. When illicit drugs are being brought to market, there are dilutions with different cutting agents as they are passed through the hands of dealers, which can reveal useful information about the supply chain. The idPAD has been used to evaluate a simulated supply chain. The idPAD's ability to identify the illicit substances and the cutting agents used, and to evaluate how many people are creating distinguishable batches of products, will be discussed.

Illicit Drug, Paper Analytical Device, Supply Chain