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Development of Novel Non-Invasive Diagnostic Methods for Early Detection of Prostate and Breast Cancer

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Development of Novel Non-Invasive Diagnostic Methods for Early Detection of Prostate and Breast Cancer

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The changes in the metabolic processes caused by cancer lead to the formation and/or increased concentration of volatile organic compounds (VOCs) in the human body. These VOCs found in urine can serve as markers for cancer. This study is to develop an analytical method to detect VOCs in urine using Stir Bar Sorptive Extraction (SBSE) along with Thermal Desorption-Gas Chromatography-Mass Spectrometry (TD-GC-MS). Parameters for optimizing the SBSE technique included the addition of salt, changing the sample pH, and addition of organic solvent (e.g. methanol). The addition of salt and change of pH caused an increase in the number of visible peaks and intensity on the chromatogram. However, the addition of methanol caused a negative effect on the visible peaks and intensity on the chromatogram. Future research will focus on the identification of VOCs unique to cancer patients and to explore the potential of using specific VOCs in urine as non-invasive diagnostic methods for breast and prostate cancer.