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From biomarker discovery to patient care

In recent decades, metabolism research was greatly accelerated by genetic engineering. Thanks to little “knock out” mice and transgenic mice we gained insight into numerous correlations between human genes and the physiological role of new potential biomarkers of human diseases. It is the role of creative analytical chemists to develop multiplexed high throughput analytical methods that detect and precisely quantify these new biomarkers in large number of biological samples. These high throughput methods are used in epidemiological studies that evaluate the relative efficacy of newly emerging biomarkers in predicting individual patient risk. If a biomarker is found effective, it can be considered a risk factor. At this point analytical chemists are presented with the new challenge of developing cost effective diagnostic methods measuring these risk factors in clinical laboratories and in point-of-care settings. Analytical chemists also need to develop gold standard reference methods for characterization of reference materials and organization of harmonization programs, to ensure the performance verification of clinical laboratories and commercial test kits or devices in routine patient care. Analytical chemist welcomes these challenges of being translators between basic metabolic research and patient care, and enjoys the opportunities where we can apply our broad range of skills and scientific creativity.

Biography

Zsuzsanna Kuklenyik has completed her Master's degree in Chemical Engineering at Technical University of Budapest, and her PhD degree at Emory University of Atlanta Georgia, where she also conducted Post-doctoral studies. Currently she is a senior research scientist in the Biological Mass Spectrometry Laboratory at the Centers for Disease Control and Prevention in Atlanta. She has published more than 40 papers in reputed journals on wide range of applications of hyphenated chromatographic techniques and mass spectrometry, such as biomonitoring of environmental chemicals, analysis of pre-exposure prophylactic drugs against HIV, biological toxins, and more recently, lipoproteins.

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