Clinical Chemistry

May 2014 Audio Summary

This is the May 2014 issue of *Clinical Chemistry*, Volume 60, Issue 5.

On the cover this month: *Colored X-ray of a human chest with pulmonary tuberculosis in the patient's left lung (fluffy yellow areas).* In the developed world the focus of tuberculosis (TB) control involves the detection of latent TB infection to prevent reactivation to active disease. Healthcare workers are routinely tested using the tuberculin skin test. However, the tuberculin skin test can be affected by reader bias and prior bacille Calmette-Guérin vaccination. An alternative test, the interferon-γ release assay (IGRA), may improve diagnostic accuracy but also costs more to perform. The decision on which test to use is complex since the 2 tests differ in not just their costs but also analytical and operational performance characteristics. So which test to use? What are advantages and disadvantages of using these newer IGRAs? This month's issue of *Clinical Chemistry* contains a Q&A in which 5 experts answer these and other questions about the use of IGRAs for screening healthcare workers for TB.

Low Nonfasting Triglycerides and Reduced All-Cause Mortality: A Mendelian Randomization Study
By Mette Thomsen, et al.

Neither randomized intervention trials nor mendelian randomization studies have previously addressed the question of whether reduced plasma triglycerides lead to reduced all-cause mortality. Previous studies have simply lacked the statistical power to address this question. This is the first study to show that genetically low concentrations of nonfasting plasma triglycerides are associated with reduced all-cause mortality. This is a valuable observation for the design of future randomized intervention trials aimed at lowering triglycerides.

Development of an Immunoassay for the Kidney-Specific Protein *myo*-Inositol Oxygenase, a Potential Biomarker of Acute Kidney Injury
By Joseph P. Gaut, et al.

Acute kidney injury is an important clinical problem resulting in increased hospital stays, infections, and mortality. Plasma creatinine, the current diagnostic standard, is nonspecific and insensitive. Improved tools for acute kidney injury diagnosis are needed. The investigators conducting this study identified *myo*-inositol oxygenase as a kidney specific protein and developed the first immunoassay to detect *myo*-inositol oxygenase. Serum *myo*-inositol oxygenase was increased in mice with acute kidney injury. Plasma *myo*-inositol oxygenase increased in critically ill patients with kidney injury 2 days before plasma creatinine and was highest in patients with oliguric and dialysis-requiring injury. Plasma *myo*-inositol oxygenase represents a potential acute kidney injury biomarker.

Reference Interval Evaluation of High-Sensitivity Troponin T and N-Terminal B-Type Natriuretic Peptide in Vietnam and the US: The North South East West Trial
By Hanna Kim Gaggin, et al.

Expected concentrations of high-sensitivity troponin T and N-terminal pro-B type natriuretic peptide in healthy individuals have been derived from Western populations. However, the applicability of these reference intervals in different geographic and ethnic populations has not been sufficiently studied. The authors of this study compared concentrations of high-sensitivity troponin T and N-terminal pro-B type natriuretic peptide in 1157 self-reported healthy individuals from Vietnam and the United States. They found concentrations of both high-sensitivity troponin T and N-terminal pro-B type natriuretic peptide were slightly higher in Western populations, but neither difference was clinically significant. These data suggest the previously derived expected values for both high-sensitivity troponin T and N-terminal pro-B type natriuretic peptide may be applied in Asian populations.

Identification of Chromosomally Integrated Human Herpesvirus 6 by Droplet Digital PCR
By Ruth Hall Sedlak, et al.

Chromosomally integrated human herpesvirus 6, present in about 1% of the general population, complicates diagnosis of active human herpesvirus 6 infection by standard molecular quantitative methods. The authors of this study describe the design and application of a digital PCR assay for rapid clinical identification of chromosomally integrated human herpesvirus 6. The assay is validated for utilizing cellular specimens that previously tested positive for chromosomally integrated human herpesvirus 6 by the current gold-standard fluorescence in-situ hybridization assay. In addition, the assay provides excellent sensitivity and specificity using stored plasma samples. A rapid molecular test for chromosomally integrated human herpesvirus 6 may be particularly useful in the transplant setting and will facilitate retrospective analysis of the clinical significance of chromosomally integrated human herpesvirus 6.

Profiling Plasma MicroRNA in Nasopharyngeal Carcinoma with Deep Sequencing
By Hai-Yun Wang, et al.

This paper examined the utility of plasma microRNA profiling as derived by next-generation sequencing in the prognosis of nasopharyngeal carcinoma. In a first study the authors used next-generation sequencing to screen the plasma microRNAs to find those which were differentially expressed in nasopharyngeal carcinoma. In a second study they used bioinformatics analysis of the differentially expressed microRNAs that were confirmed by quantitative real-time PCR to characterize the relationship of these markers with patient survival. A prognostic index model constructed using Cox regression gave results that appeared useful in predicting survival of patients with nasopharyngeal carcinoma and raise the future possibility of a means to guide individualized therapy.

Liquid Chromatography-Tandem Mass Spectrometry Enzyme Assay for UDP-Galactose 4'-Epimerase: Use of Fragment Intensity Ratio in Differentiation of Structural Isomers
By Yijun Li, et al.

Diagnosis of UDP-galactose 4'-epimerase deficiency requires enzyme measurements in erythrocytes and other cells. In this report the authors developed a UDP-galactose 4'-epimerase assay using a novel liquid chromatography-tandem mass spectrometry-based method that employs the ratio of 2 fragments that are neither specific for substrate nor isomeric product, which coelute using liquid chromatography. This assay allowed the authors to largely reproduce the UDP-galactose 4'-epimerase analyses in erythrocytes and lymphoblasts that had been established in the Fridovich-Keil laboratory.