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Marching toward individualized molecular testing for personalized patient care

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Abstract

Gene-based molecular diagnostics is changing the practice of medicine and will continue to do so for the foreseeable future. The major underlying principle of these diagnostic tests is the use of specific nucleic acid sequences as surrogates; amplification of the surrogate markers enables the detection of pathogens or disease-related gene mutations. Gene targets can be amplified by target-, probe or signal-based methods. Molecular profiling of various diseases using genomic or proteomic approaches opens up a molecular wonderland with promise and emergence of new molecular testing that will impact the practice of medicine to a greater degree in the future. My lecture will cover the followings:

• Definition of individualized molecular testing and personalized medicine
• Paradigm change of current medicine to personalized medicine
• Review of commercially available individualized molecular-based testing
• Definition and examples of theragnostics
• Refined definition and examples of pharmacogenomics
• Definition and examples of prognomics
• Future perspectives on individualized molecular testing for personalized medicine

Attend this lecture, you will:

• Understand the basic differences between the current medicine and personalized medicine
• Have an overall understanding of individualized molecular testing used in personalized disease treatments and patient care
• Know the three subcategories of individualized molecular testing
• Apprehend the trend of future personalized healthcare.

Biography

Richard Y. Zhao is a Professor of Pathology, Microbiology-Immunology and Human Virology at the School of Medicine, University of Maryland Baltimore. Dr. Zhao is also the Division Head of Molecular Pathology in the Department of Pathology, Director of Translational Genomics Laboratory in the School of Medicine, and Director of Molecular Diagnostics Laboratory at the University of Maryland Medical Center. Dr. Zhao's clinical expertise is in the area of molecular pathology and personalized medicine. His basic science research interests are in HIV/AIDS, cancer biology and nanoparticle-based single molecule detections. Dr. Zhao has published over one hundred scientific papers and has served on numerous scientific editorial boards including Clinical and Applied Immunology Reviews, Clinical Laboratory Science, Cell Research, Cell and Biosciences, Chinese Journal of Clinical and Experimental Virology, Journal of Clinical and Experimental Pathology, Journal of Molecular Genetics, Frontiers in Virology, PLoS One and Retrovirology. He has been invited to review scientific grant applications for funding agencies of nine different countries and has chaired a number of NIH grant review study panels. He has been invited to give scientific lectures world-wide.