Real World Medicine and Real World Patients: Critical Understanding for Translational and Precision Medicine, Michael N. Liebman, PhD, Managing Director, IPQ Analytics, Invited Professor, Shanghai Center for Bioinformatic Technology, Adjunct Professor, Drexel College of Medicine

Significant research efforts and resources are being directed towards the development of methodologies and data to support the Precision Medicine and the Cancer Moonshot Initiatives and to utilize these as the basis for translational medicine. Most of these focus on the development and implementation of technology that integrates genomics into clinical practice and/or the development of new diagnostics and therapeutics. The success of these efforts may be hindered by a lack of appreciation of the complexities present in real world clinical practice, e.g. quality and adherence to clinical guidelines, and real world patients, e.g. co-morbidities and poly-pharmacy. We have been developing and implementing system-based modeling approaches to facilitate the evaluation of these critical factors to enhance the goal of delivering the right care to the right patient.

The approach that we have developed, in collaboration with the Epidemiology and Health Research Department at the National Research Council of Italy (CNR-Pisa) involves the development of a Disease Process Model and its instantiation as an ontology implemented in a web-based platform. This disease-agnostic model has been successfully applied in drug and diagnostic development, clinical trial design (and evaluation), risk evaluation and clinical decision support applications. An additional critical component of this modeling approach incorporates the patient's underlying physiological development and the reality that risk, particularly to lifestyle and environmental factors, will vary throughout a patient's lifetime and stage of development. This workshop will address the gap between unmet clinical need and unstated, unmet clinical and provide examples from our work in breast cancer, pediatric Acute Respiratory Distress Syndrome (pARDS) and heart failure.