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Opinion Article

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DNA Detection Using a Hydrophobic AIE Dye-Labelled Peptide Nucleic Acid Probe

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Introduction

As translational research goes, vaccine safety science has a deplorable record that now places the artificial immunization enterprise at real risk. Examples of research practices that border on fraud and certainly fit an agenda of risk perception minimization are well-known to the public, and this knowledge translates into vaccine hesitancy and refusal. Pushes for mandates without exemptions alienate the public to both medicine and science. Truly objective vaccine risk management via personalized immunity and respect for informed consent and choice will help practitioners build better relationships with their patients. A re-assessment of strategies to artificial immunization is needed. To that end, seven tracts, founded on thousands of research studies, are outlined that will help bring artificial immunization into the 21st Century: (1) reformulation, (2) risk indicators and biomarkers, (3) scheduling, (4) respect for laws and regulations governing informed consent, (5) regulating conflicts of interest, (6) regulatory reform and (7) enforcement of adverse event reporting are all areas ripe for improvement. An era of cottage-industry innovation in artificial immunization competing on the platform of safety is needed to foster competition.

A new systems approach to diseased states and wellness result in a new branch in the healthcare services, namely, Personalized Medicine (PM). To achieve the implementation of PM concept into the daily practice including clinical cardiology, it is necessary to create a fundamentally new strategy based upon the subclinical recognition of bio indicators (bio predictors and biomarkers) of hidden abnormalities long before the disease clinically manifests itself. Each decision-maker values the impact of their decision to use PM on their own budget and well-being, which may not necessarily be optimal for society as a whole. It would be extremely useful to integrate data harvesting from different databanks for applications such as prediction and personalization of further treatment to thus provide more tailored measures for the patients and persons-at-risk resulting in improved outcomes whilst securing the healthy state and wellness, reduced adverse events, and more cost effective use of health care resources. One of the most advanced areas in cardiology is atherosclerosis, cardiovascular and coronary disorders as well as in myocarditis.

A lack of medical guidelines has been identified by the majority of responders as the predominant barrier for adoption, indicating a need for the development of best practices and guidelines to support the implementation of PM into the daily practice of cardiologists. Implementation of PM requires a lot before the current model "physician-patient" could be gradually displaced by a new model "medical advisor-healthy person-at-risk". This is the reason for developing global scientific, clinical, social, and educational projects in the area of PM to elicit the content of the new branch.

Health-Related Communications

With the growth of personalized medicine, we know that a single drug will not be effective to the same degree in everyone, so why do we still believe that the same singular message would have the same effect for everyone? Day after day, the health care community struggles to effectively deliver critical messages to patients. In many areas of medicine, we can offer precise tailored and effective therapies, but in our attempts to communicate recommendations to patients, we lack the same specificity. Our over-arching goal is to improve health-related communications and messaging resulting in greater adherence, fewer wasted resources and improved outcomes for patients. A patient communication tool, operating at scale, has been developed to identify individual patient "mind-sets" specific to a medical condition. This presentation will describe a case study in colon cancer screening compliance. The investigation focuses on colon cancer screening because it is commonly recommended, has tremendous life-saving potential and each case of colon cancer is estimated to create a financial burden. The promise of "machine learning" is to gain insights to improve prediction accuracy and increase the probability of a desired outcome. An actionable medical communication methodology will be demonstrated that promotes and encourages healthy behaviors through scientifically-based, patient cantered, tailored messaging based on individual mind-sets. Applying basic machine learning principles to communication attendees will learn to better understand the variability of patient motivations specific to decision-making and choice. Multiple clinical and para-clinical research projects carried out at our Biomarkers Laboratory of the O'Brien Center for Acute kidney injury research, UC San Diego School of Medicine demonstrate that the urinary exosome protein content of an individual is rather specific to the health or disease etiology of the subject. For the purpose of this personalized medicine conference, we have focused on one of these etiologies, namely Coronary Artery Bypass Grafting (CABG). Between 4 to 15 days after cardiac surgery insult, 4 out of 10 CABG surgeries result in Acute Kidney Injury (AKI). AKI is determined by elevation in Serum creatinine (Scr). Scr elevation can only indicate kidney injury that has already occurred. Therefore, using only Scr elevation is of limited utility in either prediction or prevention of AKI episodes. Presently, AKI prevention in the clinic is thus an unmet clinical necessity. Our data show that urinary exosome protein content can potentially discriminate between who among the cardiac surgery patients will develop AKI versus who will not, even before Scr elevation has taken place. We reason that this provides the clinician with an opportunity to help the patient prevent AKI phenotype precipitation. In this talk/meeting, the following will be highlighted: (a) how to utilize and

develop this clinical opportunity into personalized preventive medicine strategy, (b) the constituent elements of this strategy, (c) the role of personalized omic integration analysis, (d) how to couple it with preventive therapy in principle guided by specific exosome biomarker analysis, and finally (e) the role of big data in precision delivery of personalized and preventive medicine. Further in addition, how exosome biomarker specificity can be expanded and utilized to achieve this precision delivery in other diseases or in healthy individuals in general, will be discussed.