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Omics guided vaccine development: R&D and industry perspective

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Vaccines are still the most efficient way to cut the health care cost, by simply preventing the occurrence of a disease at population level. However, diseases caused by pathogens such as malaria, influenza and HIV exhibiting highly variant antigen repertoire or high mutation rates still pose a challenge to vaccine development. Omics guided approaches using high throughput technologies (e.g. vaccinomics, genomics and transcriptomics) have enabled us to determine vaccine candidate for these challenging pathogens, however also resulting into massive and complex data. On the other hand, inter-individual variation in vaccine induced immune response is an impending factor to achieve the desired protection at population level. For example, Ovsyannikova and colleagues (2006) at Mayo vaccine research group USA had discovered a measles vaccine candidate by vaccinomics approach. However, they also noticed that genetic heterogeneity among immunized individuals was associated with vaccination failure. Precisely, genetic polymorphisms at HLA, SLAM and CD46 were among top factors found responsible for this effect. Different vaccination strategy could be adopted to improve immunity level in those cases. Similar stories exist for Hepatitis B and other vaccines. Thus, increasing number of analytical variables concerns the vaccine industry at multiple fronts, such as higher vaccine development cost, greater analytical complexity as well as regulatory issues. The discussion will constitute research as well as industry perspective of next generation approaches in vaccine development and associated drivers and challenges.

Biography

Ramesh Chandra Pandey has obtained Bachelor degree in Veterinary Medicine and Masters in Biotechnology from IIT Madras and subsequently completed his PhD in Molecular Medicine from Hannover Medical School, Germany. His past research expertise spans infectious diseases, clinical immunology and Hemato-oncology with several publications, presentations in international conferences in Germany, Austria and India. As a technical manager and consultant at Smart Analyst, he carries out strategy/management consulting, data analytics and BD&L advocacy in the area of vaccines, infectious diseases and immunology. He is also an Editorial Board Member of *International Journal of Bioinformatics Research*.

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