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Feasibility of monitoring cell mediated immunity during vaccine trials

An increasing number of new vaccines aim to elicit a response from the cellular components of the immune system, in addition to the classical establishment of an antibody-based immunity. T cell immunity is critically involved in combating infections and cancer, and plays a pathogenic role in autoimmune diseases and allergies. Therefore, monitoring antigen-specific T cells and their effector functions is crucial for the understanding of these diseases and for proper assessments of the efficacy of specific immune therapies such as vaccines in preclinical and clinical trials. Yet, unlike the detection of antibodies, reliable measurement of T cell-mediated immunity has remained a major challenge, due to several factors. One such factor is that the antigen-specific T cells of interest typically occur at very low frequencies in test samples, such as peripheral blood. Another factor is that for the reliable measurement of T cell function(s) it is necessary that the test conditions don't change the functionality of T cells in vitro as compared to the one in vivo. The many variables that can affect T cell functionality have earned T cell assays the reputation of being rather fragile, with even minor changes of test conditions potentially having a major impact on the test results. A major breakthrough in the field of T cell monitoring has been the introduction of protocols that facilitate cryopreservation of PBMC such that, upon thawing, the cells retain their full functionality. This has enabled the generation of "reference PBMC" as ideal tools for assay development and standardization. Examples of successful T cell monitoring using the ELISPOT assay will be presented.

Speaker Biography

Magdalena Tary-Lehmann is a Co-Founding Scientist and Chief Scientific Officer for Cellular Technology Limited (CTL) and an Adjunct Associate Professor of Case Western Reserve University (CASE) Department of Pathology. She has published more than 75 papers in peer-reviewed journals. She provides guidance and oversees technical operations of the performance of immunology assays in CTL's GLP- and CLIA compliant contract laboratory for various pharmaceutical and biotechnology clients, ensuring the ongoing scientific excellence of CTL. Over the past decade, she has worked with clients and regulatory agencies to develop and validate reference samples and controls for use in regulated immune monitoring assays.

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