



## **A Plasmacytoid Dendritic Cell-Based Assay to Screen the Allergenicity Potential of Chemicals**

Seyoum Ayehunie, Maureen Snell, Mitchell Klausner, and John Sheasgreen, MatTek Corporation, Ashland, MA, U.S.A.

An in vitro assay system that utilizes human cells to predict the allergenicity potential of chemicals will have utility throughout industry to monitor products for contact sensitization. Development of such a non-animal alternative assay system for hazard assessment is within the provisions of the European Union chemicals policy known as REACH (Registration, Evaluation, and Authorization of Chemicals). In this study, we investigated whether the CD86 expression level in plasmacytoid dendritic cells (pDC) could be used as a non-animal alternative to test for contact allergens. To achieve this goal, human DC were generated from CD34+ progenitor cells and the pDC fraction (CD123+/CD11c-) was harvested using FACS sorting. The pDC were exposed to chemical allergens (n=23) or irritants (n=18). Sub-toxic concentrations of each chemical were determined using FACS analysis of propidium iodide stained cells. Allergens were identified based on stimulation index (SI) calculated by the fold increase in CD86 expression. A material that had an SI = 1.5 in at least 50% of the pDC donors (n = 2-5 donors) was considered an allergen. Using this methodology, allergens increased expression of CD86 = 1.5 fold in 23 of 23 allergens (100%) but not for 78% of non-allergens (n=18). Based on these results, a preliminary prediction model was developed to identify chemical allergens (sensitivity = 100%, specificity = 78%, and accuracy = 89%). In conclusion, CD86 expression in pDC appears to be a sensitive and specific predictor of allergenicity of chemicals. The assay is advantageous because high throughput screening of chemicals is possible, donor-to-donor variation can be monitored, the cells are of human origin, and the assay is cost effective.

**To be presented at the Society of Toxicology (SOT) Annual Meeting, March 15-19, 2009 in Baltimore, MD (USA)**

**ID# 1529 Poster Board 328**

**Location: Exhibit Hall**

**Time of Presentation: Mar 18 9:00AM**