



A Plasmacytoid Dendritic Cell-Based Assay System to Predict Allergenicity Potential of Chemicals

Seyoum Ayehunie, Helena Kandárová, Maureen Snell, Mitch Klausner and Patrick Hayden

[MatTek Corporation](#), Ashland, MA, U.S.A.

ABSTRACT/ INTRODUCTION

Development of a dendritic-cell based in vitro predictive test method for skin sensitization is of great importance. We investigated whether phenotypic and functional changes to subset of DC, plasmacytoid dendritic cells (pDC), could be used to identify allergens. To achieve this goal, normal human DC were generated from CD34+ progenitor cells and were cryopreserved until use. DC were then thawed and the pDC fraction (CD123+/CD11c-) was harvested using FACS sorting. The pDC were cultured and pulsed with chemical allergens (n=13) or irritants (n=7). Results showed that exposure of pDC (n=2-5 donors) to allergens induced an increased (1.5 fold) expression of CD86 for 12 of 13 allergens tested. On the other hand, 7 of 7 non-allergens did not result in an increase in CD86 expression. The predictive test method was found to have a sensitivity of 91-93% and specificity of 93-100%. In conclusion, CD86 expression on pDC appears to be a sensitive and specific predictor of allergenicity of chemicals.

The skin and the mucosal environment are continuously exposed to a broad variety of chemicals in the form of medicaments, metals, fabrics, cosmetics, topically applied ointments, food preservatives, perfumes, vehicle emulsifiers, and day-to-day use household products, all of which are potential contact allergens. Currently, more than 100,000 chemicals are in commercial use and another 2,000 new chemicals are produced every year. Therefore, evaluation of allergenicity is important to minimize the hazards of occupational and public exposure to chemicals and products.

To be presented at EUROTOX 2007, October 7-10, 2007, in Amsterdam, The Netherlands